

Lehigh Hanson
HEIDELBERGCEMENT Group

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July 30, 2013

VIA ELECTRONIC MAIL

Ms. Dyan Whyte
Assistant Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

*Submittal of 2ndnd Quarter 2013 Results from Chronic Toxicity Sampling –
Directive 8, Water Code section 13267 Order, Order No. R2-2013-1005-A1*

Dear Ms. Whyte:

Enclosed, pursuant to the Regional Water Quality Control Board, San Francisco Bay Region's, ("Regional Water Board") June 27, 2013 Amended Water Code section 13267 Order, Order No. R2-2013-1005-A1, ("13267 Order"), Lehigh Southwest Cement Company ("Lehigh") timely encloses the results from the chronic toxicity water and sediment sampling performed during the second quarter of 2013 pursuant to the 13267 Order.

As detailed in the enclosed report, toxicity was not detected for *selenastrum capricornutum* or fathead minnow (effects did not exceed whole effluent toxicity thresholds). Please note that Lehigh is performing a TRE according to its work plan for *Ceriodaphnia dubia* for Ponds 4A, 13 and 14; thus, routine testing was not performed for those ponds in the second quarter.

As you know, Lehigh recently entered into a consent decree with the Sierra Club, in which Lehigh agreed to install treatment facilities to address metals and chronic toxicity. Lehigh will use the data generated pursuant to the 13267 Order, including the outcome of the TRE process, to aid the design and implementation of those treatment facilities.

If you or your staff have any questions regarding the enclosed document, or would like to discuss further, please do not hesitate to contact me.



Gregory Knapp
Director Environmental Affairs
Lehigh Hanson Region West

Cc: Brian Thompson, Regional Water Quality Control Board, San Francisco Bay Region
Nicole Granquist, Downey-Brand

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

July 29, 2013

Brant:

I have enclosed our report "Evaluation of the Chronic Toxicity of Lehigh Permanente Cement Plant Site Water Samples" for the samples collected June 10, 12, and 14, 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 IC₂₅ was >100% site water, resulting in <1 TUC (where TUC = 100/IC₂₅).

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/EC₂₅). The growth IC₂₅ was >100% site water, resulting in <1 TUC (where TUC = 100/IC₂₅).

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)
<i>Selenastrum capricornutum</i>			>100% site water	<1
<i>Pimephales promelas</i>	>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 IC₂₅ was >100% site water, resulting in <1 TUC (where TUC = 100/IC₂₅).

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/EC₂₅). The reproduction IC₂₅ was >100% site water, resulting in <1 TUC (where TUC = 100/IC₂₅).

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 IC₂₅ 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)
<i>Selenastrum capricornutum</i>			>100% site water	<1
<i>Ceriodaphnia dubia</i>	>100% site water	<1	>100% site water	<1
<i>Pimephales promelas</i>	>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 IC₂₅ was >100% site water, resulting in <1 TUC (where $TUC = 100/IC_{25}$).

Chronic Effects of Lehigh Pond 13 Site Water on Fathead Minnows

Due to the absence of significant mortalities, the EC point estimates could not be calculated, but can be assumed to be >100% site water, resulting in <1 TUC (where $TUC = 100/EC_{25}$). The growth IC₂₅ 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)
<i>Selenastrum capricornutum</i>			>100% site water	<1
<i>Pimephales promelas</i>	>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 IC₂₅ was >100% site water, resulting in <1 TUc (where TUc = 100/IC₂₅).

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/EC₂₅). The growth IC₂₅ was >100% site water, resulting in <1 TUc (where TUc = 100/IC₂₅).

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)
<i>Selenastrum capricornutum</i>			>100% site water	<1
<i>Pimephales promelas</i>	>100% site water	<1	>100% site water	<1

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

Regards,

Stephen L. Clark
Vice President & Special Projects Director

This testing was performed under Lab Order 21069. 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:	<i>Selenastrum capricornutum</i>	Sampling Date: June 10, 2013
Test Protocol:	EPA-821-R-02-013	Test Date: June 11-June 15, 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				4.95			
Lab Control				3.59			
6.25%				3.86			
12.5%				4.06			
25%				4.03			
50%				3.77			
100%				3.57			
Current Pond 4A Site Water Test Endpoints.							
Endpoint	NOEC	IC15	IC25	IC40	IC50	TUc	TUc Method
Cell Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC25

Current Pond 9 Site Water Test Data.							
Site Water Concentration				Mean Algal Cell Density (cells/mL x 10 ⁶)			
Hardness Blank				4.95			
Lab Control				3.70			
6.25%				4.24			
12.5%				3.67			
25%				4.73			
50%				4.96			
100%				5.27			
Current Pond 9 Site Water Test Endpoints.							
Endpoint	NOEC	IC15	IC25	IC40	IC50	TUc	TUc Method
Cell Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC25

Chronic Toxicity Test Species:	<i>Selenastrum capricornutum</i>	Sampling Date: June 10, 2013
Test Protocol:	EPA-821-R-02-013	Test Date: June 11-June 15, 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				4.95			
Lab Control				3.78			
6.25%				4.02			
12.5%				4.18			
25%				4.66			
50%				4.43			
100%				4.76			
Current Pond 13 Site Water Test Endpoints.							
Endpoint	NOEC	IC15	IC25	IC40	IC50	TUc	TUc Method
Cell Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC25

Current Pond 14 Site Water Test Data.							
Site Water Concentration				Mean Algal Cell Density (cells/mL x 10 ⁶)			
Hardness Blank				4.95			
Lab Control				3.97			
6.25%				4.23			
12.5%				4.25			
25%				4.57			
50%				4.66			
100%				5.32			
Current Pond 14 Site Water Test Endpoints.							
Endpoint	NOEC	IC15	IC25	IC40	IC50	TUc	TUc Method
Cell Growth	100%	>100%	>100%	>100%	>100%	<1	100/IC25

Chronic Toxicity Test Species:	<i>Ceriodaphnia dubia</i>	Sampling Dates: June 10, 12, and 14, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: June 11, 2013 - June 17, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Reproduction	

Current Pond 9 Site Water Test Data.							
Site Water Concentration			% Survival		Mean Reproduction (# neonates /female)		
Hardness Blank			10*		7		
Lab Control			80		31.4		
6.25%			100		30.6		
12.5%			100		31.7		
25%			100		24.9* ^a		
50%			100		30.7		
100%			100		25.1*		
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
Reproduction	50%	>100%	>100%	>100%	>100%	<1	100/IC25
Lab Control Survival (after ~96 hrs)				100%			
100% Site Water Survival (after ~96 hrs)				100%			

a – There was an interrupted concentration response curve at the 25% Pond 9 sample treatment. Given the absence of a significant reduction in reproduction at the 50% Pond 9 sample treatment, the response at the 25% treatment is considered anomalous.

Chronic Toxicity Test Species:	<i>Pimephales promelas</i>	Sampling Dates: June 10, 12, and 14, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: June 11, 2013 - June 18, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Growth	

Current Pond 4A Site Water Test Data.							
Site Water Concentration		% Survival			Mean Biomass (mg)		
Hardness Blank		92.5			0.63		
Lab Control		97.5			0.67		
6.25%		97.5			0.68		
12.5%		95			0.69		
25%		97.5			0.76		
50%		87.5			0.76		
100%		97.5			0.72		
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)				97.5%			
100% Site Water Survival (after ~96 hrs)				97.5%			

Current Pond 9 Site Water Test Data.							
Site Water Concentration		% Survival			Mean Biomass (mg)		
Hardness Blank		92.5			0.63		
Lab Control		95			0.61		
6.25%		92.5			0.63		
12.5%		92.5			0.67		
25%		92.5			0.67		
50%		97.5			0.75		
100%		95			0.76		
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)				95%			
100% Site Water Survival (after ~96 hrs)				95%			

Chronic Toxicity Test Species:	<i>Pimephales promelas</i>	Sampling Dates: June 10, 12, and 14, 2013
Test Protocol:	EPA-821-R-02-013	Test Dates: June 11, 2013 - June 18, 2013
Dilution Series:	6.25, 12.5, 25, 50, 100%	
Test Endpoint:	Survival, Growth	

Current Pond 13 Site Water Test Data.							
Site Water Concentration			% Survival		Mean Biomass (mg)		
Hardness Blank			92.5		0.63		
Lab Control			100		0.70		
6.25%			100		0.68		
12.5%			95		0.74		
25%			97.5		0.72		
50%			100		0.75		
100%			100		0.83		
Current Pond 13 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 14 Site Water Test Data.							
Site Water Concentration			% Survival		Mean Biomass (mg)		
Hardness Blank			92.5		0.63		
Lab Control			92.5		0.67		
6.25%			92.5		0.64		
12.5%			100		0.69		
25%			97.5		0.76		
50%			95		0.77		
100%			90		0.76		
Current Pond 14 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)				92.5%			
100% Site Water Survival (after ~96 hrs)				95%			

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

Samples collected June 10, 12, and 14, 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

July 2013



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

Samples collected June 10, 12, and 14, 2013

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1. INTRODUCTION

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

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

These toxicity tests were conducted on site water samples collected on June 10, 12, and 14, 2013. The site water samples were collected from Pond 4A, Pond 9, Pond 13, and Pond 14. In order to assess the sensitivity of the organisms to chemical stress, a reference toxicant test was performed concurrently with each test. This report describes the performance and results of these tests.

2. CHRONIC TOXICITY TEST PROCEDURES

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

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

2.1 Sample Receipt and Handling

On June 10, 12, and 14, samples of Lehigh Permanente site water samples were collected from 4 sites (designated Pond 4A, Pond 9, Pond 13, and Pond 14) into appropriately cleaned sample containers. These samples were transported, on ice and under chain-of-custody, to the PER testing laboratory in Fairfield, CA. Upon receipt at the testing laboratory, aliquots of each site water sample were collected for analysis of initial water quality characteristics (Table 1), with the remainder of each sample being stored at 0-6°C except when being used to prepare test solutions.

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



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

Sample Receipt Date	Sample ID	Temp. (°C)	pH	D.O. (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Conductivity (µS/cm)	Total Ammonia (mg/L N)
6/10/13	Pond 4A	3.0	8.01	9.9	194	629	1141	<1.0
	Pond 9	13.1*	7.58	9.1	203	613	1355	<1.0
	Pond 13	10.2*	8.04	9.6	154	567	1104	<1.0
	Pond 14	11.9*	7.73	9.2	152	556	1151	<1.0
6/12/13	Pond 4A	3.2	7.99	9.4	188	606	1123	<1.0
	Pond 9	6.1*	7.59	9.4	216	666	1371	<1.0
	Pond 13	7.2*	8.09	9.4	160	584	1076	<1.0
	Pond 14	11.4*	7.95	10.1	152	570	1129	<1.0
6/14/13	Pond 4A	6.4*	7.88	8.2	179	598	1133	<1.0
	Pond 9	6.5*	7.71	8.8	214	646	1405	<1.0
	Pond 13	8.3*	8.05	7.9	152	556	1086	<1.0
	Pond 14	12.9*	7.95	8.8	141	542	1131	<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.

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 661 mg/L, was prepared by PER staff by addition of reagent grade chemicals to Type 1 water (reverse-osmosis, de-ionized water) as per EPA guidance (EPA 1994, 2002). On the day prior to the initiation of testing, the 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., IC₅₀); all statistical analyses were performed using the CETIS[®] software. These response endpoints were then compared to the ‘typical response’ range established by the mean $\pm$ 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 661 mg/L, was prepared by PER staff by addition of reagent grade chemicals to Type 1 water (reverse-osmosis, de-ionized water) as per EPA guidance (EPA 1994, 2002). On the day prior to the initiation of testing, the 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 $\geq 60\%$ 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., EC₅₀); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the ‘typical response’ ranges established by the mean $\pm$ 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 661 mg/L, was prepared by PER staff by addition of reagent grade chemicals to Type 1 water (reverse-osmosis, de-ionized water) as per EPA guidance (EPA 2002). On the day prior to the initiation of testing, the 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., EC₅₀); all statistical analyses were made using the CETIS[®] software. These response endpoints were then compared to the



‘typical response’ ranges established by the mean $\pm$ 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 3,590,000 cells/mL at the Lab Water Control treatment. The IC₂₅ point estimate was >100% site water, resulting in <1 cell growth TUC (where TUC = 100/ IC₂₅).

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 <i>Selenastrum capricornutum</i> growth.	
Test Site Water Treatment	Mean Algal Cell Density (cells/mL x 10 ⁶)
Hardness Blank	4.95
Lab Water Control	3.59
6.25%	3.86
12.5%	4.06
25%	4.03
50%	3.77
100%	3.57
Summary of Statistics	
No Observable Effect Concentration (NOEC) =	100% site water
TUC (where TUC = 100/NOEC) =	1.0
Growth IC ₂₅ =	>100% site water
TUC (where TUC = 100/ IC ₂₅) =	<1
Growth IC ₅₀ =	>100% site water
TUC (where TUC = 100/ IC ₅₀) =	<1
Test PMSD =	7.4%



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 3,700,000 cells/mL at the Lab Water Control treatment. The IC₂₅ point estimate was >100% site water, resulting in <1 cell growth TUC (where TUC = 100/ IC₂₅).

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 <i>Selenastrum capricornutum</i> growth.	
Test Site Water Treatment	Mean Algal Cell Density (cells/mL x 10 ⁶)
Hardness Blank	4.95
Lab Water Control	3.70
6.25%	4.24
12.5%	3.67
25%	4.73
50%	4.96
100%	5.27
Summary of Statistics	
No Observable Effect Concentration (NOEC) =	100% site water
TUC (where TUC = 100/NOEC) =	1.0
Growth IC ₂₅ =	>100% site water
TUC (where TUC = 100/ IC ₂₅) =	<1
Growth IC ₅₀ =	>100% site water
TUC (where TUC = 100/ IC ₅₀) =	<1
Test PMSD =	5.7%



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 3,780,000 cells/mL at the Lab Water Control treatment. The IC₂₅ point estimate was >100% site water, resulting in <1 cell growth TUC (where TUC = 100/ IC₂₅).

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 <i>Selenastrum capricornutum</i> growth.	
Test Site Water Treatment	Mean Algal Cell Density (cells/mL x 10 ⁶)
Hardness Blank	4.95
Lab Water Control	3.78
6.25%	4.02
12.5%	4.18
25%	4.66
50%	4.43
100%	4.76
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%



3.1.4 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 3,970,000 cells/mL at the Lab Water Control treatment. The IC₂₅ point estimate was >100% site water, resulting in <1 cell growth TUC (where TUC = 100/ IC₂₅).

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 <i>Selenastrum capricornutum</i> growth.	
Test Site Water Treatment	Mean Algal Cell Density (cells/mL x 10 ⁶)
Hardness Blank	4.95
Lab Water Control	3.97
6.25%	4.23
12.5%	4.25
25%	4.57
50%	4.66
100%	5.32
Summary of Statistics	
No Observable Effect Concentration (NOEC) =	100% site water
TUC (where TUC = 100/NOEC) =	1.0
Growth IC ₂₅ =	>100% site water
TUC (where TUC = 100/ IC ₂₅) =	<1
Growth IC ₅₀ =	>100% site water
TUC (where TUC = 100/ IC ₅₀) =	<1
Test PMSD =	5.4%



3.2 Effects of Lehigh Site Water on *Ceriodaphnia dubia*

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

The results of this test are summarized below in Table 6. There was 80% 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/ EC₂₅).

There was a mean of 31.4 offspring per female at the Lab Water Control treatment. The IC₂₅ was >100% site water, resulting in <1 reproduction TUC (where TUC = 100/ IC₂₅).

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

Table 6. Effects of Lehigh Pond 9 site water on <i>Ceriodaphnia dubia</i> survival and reproduction.		
Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	10*	7.0
Lab Control	80	31.4
6.25%	100	30.6
12.5%	100	31.7
25%	100	24.9* ^b
50%	100	30.7
100%	100	25.1*
Summary of Key Statistics		
NOEC =	100% site water	50% site water
TUC (TUC = 100/NOEC) =	1	2
Survival EC ₂₅ or Reproduction IC ₂₅ =	>100% site water ^a	>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		19.1%

* 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.

b – There was an interrupted concentration response curve at the 25% Pond 9 sample treatment. Given the absence of a significant reduction in reproduction at the 50% Pond 9 sample treatment, the response at the 25% treatment is considered anomalous.



3.3 Effects of Lehigh Site Water on Fathead Minnows

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

The results of this test are summarized below in Table 7. There was 97.5% survival at the Lab Water Control treatment. Due to the absence of significant mortalities, the EC25 and EC50 could not be calculated, but can both be assumed to be >100% site water, resulting in <1 survival TUC (where TUC = 100/ EC25).

The mean fish biomass value was 0.67 mg at the Lab Water Control treatment. The IC25 was >100% site water, resulting in <1 survival TUC (where TUC = 100/ IC25).

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

Table 7. Effects of Lehigh Pond 4A site water on fathead minnow survival and growth.		
Test Site Water Treatment	Mean % Survival	Mean Fish Biomass Value (mg)
Hardness Blank	92.5	0.63
Lab Water Control	97.5	0.67
6.25%	97.5	0.68
12.5%	95	0.69
25%	97.5	0.76
50%	87.5	0.76
100%	97.5	0.72
Summary of Statistics		
NOEC =	100% site water	100% site water
TUC (TUC = 100/NOEC) =	1.0	1.0
Survival EC25 or Growth IC25 =	>100% site water ^a	>100% site water
TUC (TUC = 100/EC25 or 100/IC25) =	<1.0	<1.0
Survival EC50 or Growth IC50 =	>100% site water ^a	>100% site water
TUC (TUC = 100/EC50 or 100/IC50) =	<1.0	<1.0
Test PMSD	11.4%	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.



3.3.2 Effects of Lehigh Pond 9 Site Water on Fathead Minnows

The results of this test are summarized below in Table 8. There was 95% survival at the Lab Water Control treatment. Due to the absence of significant mortalities, the EC₂₅ and EC₅₀ could not be calculated, but can both be assumed to be >100% site water, resulting in <1 survival TUC (where TUC = 100/ EC₂₅).

The mean fish biomass value was 0.61 mg at the Lab Water Control treatment. The IC₂₅ was >100% site water, resulting in <1 survival TUC (where TUC = 100/ IC₂₅).

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

Table 8. Effects of Lehigh Pond 9 site water on fathead minnow survival and growth.		
Test Site Water Treatment	Mean % Survival	Mean Fish Biomass Value (mg)
Hardness Blank	92.5	0.63
Lab Water Control	95	0.61
6.25%	92.5	0.63
12.5%	92.5	0.67
25%	92.5	0.67
50%	97.5	0.75
100%	95	0.76
Summary of Statistics		
NOEC =	100% site water	100% site water
TUC (TUC = 100/NOEC) =	1.0	1.0
Survival EC ₂₅ or Growth IC ₂₅ =	>100% site water ^a	>100% site water
TUC (TUC = 100/EC ₂₅ or 100/IC ₂₅) =	<1.0	<1.0
Survival EC ₅₀ or Growth IC ₅₀ =	>100% site water ^a	>100% site water
TUC (TUC = 100/EC ₅₀ or 100/IC ₅₀) =	<1.0	<1.0
Test PMSD	17.3%	14.9%

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



3.3.3 Effects of Lehigh Pond 13 Site Water on Fathead Minnows

The results of this test are summarized below in Table 9. There was 100% survival at the Lab Water Control treatment. Due to the absence of significant mortalities, the EC₂₅ and EC₅₀ could not be calculated, but can both be assumed to be >100% site water, resulting in <1 survival TUC (where TUC = 100/ EC₂₅).

The mean fish biomass value was 0.70 mg at the Lab Water Control treatment. The IC₂₅ was >100% site water, resulting in <1 survival TUC (where TUC = 100/ IC₂₅).

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

Table 9. Effects of Lehigh Pond 13 site water on fathead minnow survival and growth.		
Test Site Water Treatment	Mean % Survival	Mean Fish Biomass Value (mg)
Hardness Blank	92.5	0.63
Lab Water Control	100	0.70
6.25%	100	0.68
12.5%	95	0.74
25%	97.5	0.72
50%	100	0.75
100%	100	0.83
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	5.9%	8.5%

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



3.3.4 Effects of Lehigh Pond 14 Site Water on Fathead Minnows

The results of this test are summarized below in Table 10. There was 92.5% survival at the Lab Water Control treatment. Due to the absence of significant mortalities, the EC₂₅ and EC₅₀ could not be calculated, but can both be assumed to be >100% site water, resulting in <1 survival TUC (where TUC = 100/ EC₂₅).

The mean fish biomass value was 0.67 mg at the Lab Water Control treatment. The IC₂₅ was >100% site water, resulting in <1 survival TUC (where TUC = 100/ IC₂₅).

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

Table 10. Effects of Lehigh Pond 14 site water on fathead minnow survival and growth.		
Test Site Water Treatment	Mean % Survival	Mean Fish Biomass Value (mg)
Hardness Blank	92.5	0.63
Lab Water Control	92.5	0.67
6.25%	92.5	0.64
12.5%	100	0.69
25%	97.5	0.76
50%	95	0.77
100%	90	0.76
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	12.3%	11.7%

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



4. AQUATIC TOXICITY DATA QUALITY CONTROL

Four QC measures were assessed during the toxicity testing:

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

4.1 Maintenance of Acceptable Test Conditions

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

4.2 Negative Control Testing

The responses at the Lab Control treatments were acceptable.

4.3 Positive Control Testing

4.3.1 Reference Toxicant Toxicity to *Selenastrum capricornutum*

The results of this test are summarized below in Table 11. There was a mean of 4,030,000 cells/mL at the Lab Control treatment. The IC₅₀ was 1.9 g/L NaCl. This IC₅₀ 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 L.

Table 11. Reference toxicant testing: Effects of NaCl on <i>Selenastrum capricornutum</i> .	
NaCl Treatment (g/L)	Mean Algal Cell Density (cells/mL x 10 ⁶)
Lab Water Control	4.03
0.125	3.89
0.25	3.69*
0.5	3.36*
1	2.81*
2	1.90*
Summary of Statistics	
Algal Growth IC ₅₀ =	1.9 g/L NaCl
“Typical Response” =	1.4 – 2.0 g/L NaCl

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



4.3.2 Reference Toxicant Toxicity to *Ceriodaphnia dubia*

The results of this test are summarized below in Table 12. There was 100% survival and a mean of 30.3 offspring in the Lab Control treatment. The survival EC₅₀ was 1920 mg/L NaCl, and the reproduction IC₅₀ was 1650 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 M.

Table 12. Reference toxicant testing: effects of NaCl on <i>Ceriodaphnia dubia</i> .		
NaCl Treatment (mg/L)	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Control	100	30.3
500	100	32.8
1000	100	31.0
1500	100	22.0*
2000	40*	0.9
2500	0*	0
Summary of Statistics		
Survival EC ₅₀ or Reproduction IC ₅₀ =	1920 mg/L NaCl	1650 mg/L NaCl
“Typical Response” =	1426 - 2313 mg/L NaCl	599 - 2024 mg/L NaCl

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



4.3.3 Reference Toxicant Toxicity to Fathead Minnows

The results of this test are summarized below in Table 13. There was 97.5% survival and a mean biomass value of 0.57 mg at the Lab Control treatment. The survival EC₅₀ was 4.0 g/L NaCl and the growth IC₅₀ was 2.8 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 N.

Table 13. Reference toxicant testing: effects of NaCl on fathead minnows.		
NaCl Treatment (g/L)	Mean % Survival	Mean Fish Biomass Value (mg)
Lab Control	97.5	0.57
0.75	97.5	0.64
1.5	85	0.50
3	55*	0.28
6	55*	0.17
9	0*	-
Summary of Statistics		
Survival EC ₅₀ or Growth IC ₅₀ =	4.0 g/L NaCl	2.8 g/L NaCl
“Typical Response” =	2.8 – 5.4 g/L NaCl	2.1 – 4.7 g/L NaCl

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

4.4 Concentration Response Relationships

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



5. SUMMARY AND CONCLUSIONS

Chronic Effects of Lehigh Pond 4A Site Water

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

The IC₂₅ was >100% site water, resulting in <1 TUc (where TUc = 100/IC₂₅).

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/EC₂₅). The growth IC₂₅ was >100% site water, resulting in <1 TUc (where TUc = 100/IC₂₅).

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)
<i>Selenastrum capricornutum</i>			>100% site water	<1
<i>Pimephales promelas</i>	>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 IC₂₅ was >100% site water, resulting in <1 TUc (where TUc = 100/IC₂₅).

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/EC₂₅). The reproduction IC₂₅ was >100% site water, resulting in <1 TUc (where TUc = 100/IC₂₅).

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/EC₂₅). The growth IC₂₅ was >100% site water, resulting in <1 TUc (where TUc = 100/IC₂₅).



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)
<i>Selenastrum capricornutum</i>			>100% site water	<1
<i>Ceriodaphnia dubia</i>	>100% site water	<1	>100% site water	<1
<i>Pimephales promelas</i>	>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 IC₂₅ was >100% site water, resulting in <1 TUC (where TUC = 100/IC₂₅).

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/EC₂₅). The growth IC₂₅ was >100% site water, resulting in <1 TUC (where TUC = 100/IC₂₅).

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)
<i>Selenastrum capricornutum</i>			>100% site water	<1
<i>Pimephales promelas</i>	>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 IC₂₅ was >100% site water, resulting in <1 TUC (where TUC = 100/IC₂₅).

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/EC₂₅). The growth IC₂₅ was >100% site water, resulting in <1 TUC (where TUC = 100/IC₂₅).



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)
<i>Selenastrum capricornutum</i>			>100% site water	<1
<i>Pimephales promelas</i>	>100% site water	<1	>100% site water	<1



Appendix A

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





Pacific EcoRisk

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

CHAIN-OF-CUSTODY RECORD

Results To: Robertson-Bryan, Inc		Invoice To: Lehigh Southwest Cement Co.		REQUESTED ANALYSIS														
Address: 9888 Kent Street Elk Grove, CA 95624		Address: P.O. Box 660140 Dallas, TX 75266		Sealestrum capricornutum Growth, EPA 1003.0 Ceriodaphnia dubia Survival and Reproduction, EPA 1002.0 Fathead Minnow Larval Survival and Growth, EPA 1000.0														
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	Type												
1 Pond 4A	6/10/13	1109	FW	Grab	1	5 gallon LDPE Cube	x		x									
2 Pond 13	6/10/13	1150	FW	Grab	1	5 gallon LDPE Cube	x		x									
3 Pond 9	6/10/13	1213	FW	Grab	1	5 gallon LDPE Cube	x	x	x									
4 Pond 14	6/10/13	1252	FW	Grab	1	5 gallon LDPE Cube	x		x									
5																		
6																		
7																		
8																		
9																		
10																		
Samples collected by: B. Jorgenson & P. Bedore																		
Comments/Special Instruction: Perform concurrent reference toxicant tests.							RELIQUINSHED BY:				RECEIVED BY:							
							Signature:				Signature:							
							Print: Brant Jorgenson				Print: Y. Khadivzova							
							Organization: PEST				Organization: PEST							
							Date: 6/10/13 Time: 1520				Date: 6-10-13 Time: 15.20							
							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.		REQUESTED ANALYSIS																			
Address: 9888 Kent Street		Address: P.O. Box 660140		<i>Seleanstrum capricornutum</i> Growth, EPA 1003.0 <i>Ceriodaphnia dubia</i> Survival and Reproduction, EPA 1002.0 Fathead Minnow Larval Survival and Growth, EPA 1000.0																			
Elk Grove, CA 95624		Dallas, TX 75266																					
Phone: 916 405-8911		Phone: (925) 244-6570																					
Attn: Brant Jorgenson		Attn: Greg Knapp																					
E-mail: brant@robertson-bryan.com		E-mail: Greg.Knapp@hanson.biz																					
Project Name: Lehigh Southwest Cement - Permanente Creek																							
P.O.#/Ref:																							
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/Comp	Container																		
					Number	Type																	
1 Pond 4A	6/12/13	10 53	FW	Grab	1	5 gallon LDPE Cube	x		x														
2 Pond 13	6/12/13	11 08	FW	Grab	1	5 gallon LDPE Cube	x		x														
3 Pond 9	6/12/13	11 41	FW	Grab	1	5 gallon LDPE Cube	x	x	x														
4 Pond 14	6/12/13	12 05	FW	Grab	1	5 gallon LDPE Cube	x		x														
5																							
6																							
7																							
8																							
9																							
10																							
Samples collected by: B. Jorgenson & P. Bedore																							
Comments/Special Instruction: Perform concurrent reference toxicant tests.						RELIQUINSHED BY:						RECEIVED BY:											
						Signature: <i>[Signature]</i>						Signature: <i>[Signature]</i>											
						Print: Brant Jorgenson						Print: Cory Alcarab											
						Organization: RBI						Organization: PER											
						Date: 6/12/13 Time: 1456						Date: 6/12/13 Time: 1455											
						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.		REQUESTED ANALYSIS														
Address: 9888 Kent Street Elk Grove, CA 95624		Address: P.O. Box 660140 Dallas, TX 75266		<i>Seleanstrum capricornutum</i> Growth, EPA 1003.0 <i>Ceriodapnia dubia</i> Survival and Reproduction, EPA 1002.0 Fathead Minnow Larval Survival and Growth, EPA 1000.0														
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	Type												
1 Pond 4A	6/14/13	1052	FW	Grab	1	5 gallon LDPE Cube	x		x									
2 Pond 13	6/14/13	1132	FW	Grab	1	5 gallon LDPE Cube	x		x									
3 Pond 9	6/14/13	1155	FW	Grab	1	5 gallon LDPE Cube	x	x	x									
4 Pond 14	6/14/13	1210	FW	Grab	1	5 gallon LDPE Cube	x		x									
5																		
6																		
7																		
8																		
9																		
10																		

Samples collected by: B. Jorgenson & B. Giudice											
Comments/Special Instruction: Perform concurrent reference toxicant tests.				RELIQUINSHED BY:				RECEIVED BY:			
				Signature: <i>[Signature]</i>				Signature: <i>[Signature]</i>			
				Print: Brant Jorgenson				Print: David Heron			
				Organization: RBI				Organization: PER			
				Date: 6/14/13 Time: 1420				Date: 6-14-13 Time: 1420			
Renewal Sample				RELIQUINSHED BY:				RECEIVED BY:			
				Signature:				Signature:			
				Print:				Print:			
				Organization:				Organization:			
				Date: Time:				Date: Time:			

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

Appendix B

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



CETIS Summary Report

Report Date: 20 Jun-13 09:57 (p 1 of 1)
 Test Code: 52140 | 18-9277-8096

Algal Growth Test							Pacific EcoRisk				
Batch ID:	17-0371-1554	Test Type:	Cell Growth				Analyst:	Padrick Anderson			
Start Date:	11 Jun-13 15:00	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Laboratory Water			
Ending Date:	15 Jun-13 15:00	Species:	Selenastrum capricornutum				Brine:	Not Applicable			
Duration:	96h	Source:	In-House Culture				Age:	6			
Sample ID:	17-7005-0817	Code:	Pond 4A				Client:	Lehigh Permanente			
Sample Date:	10 Jun-13 11:09	Material:	Effluent				Project:	21069			
Receive Date:	10 Jun-13 15:20	Source:	Lehigh Permanente								
Sample Age:	28h (3 °C)	Station:	Pond 4A								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
19-9404-2095	96h Cell Density-with EDTA 0	>0			8.9%		Equal Variance t Two-Sample Test				
10-8670-2097	96h Cell Density-with EDTA 100	>100	NA		7.37%	1	Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
12-0140-6384	96h Cell Density-with EDT	IC5	69.7	24.8	N/A	1.434	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	4.95E+6	4.83E+6	5.07E+6	4.49E+6	5.25E+6	1.62E+5	3.24E+5	6.55%	0.0%
0	Lab Water Contr	4	3.59E+6	3.57E+6	3.61E+6	3.51E+6	3.64E+6	2.80E+4	5.60E+4	1.56%	27.4%
6.25		4	3.86E+6	3.81E+6	3.92E+6	3.71E+6	4.05E+6	7.36E+4	1.47E+5	3.81%	21.9%
12.5		4	4.06E+6	4.03E+6	4.09E+6	3.93E+6	4.14E+6	4.64E+4	9.27E+4	2.28%	17.9%
25		4	4.03E+6	3.98E+6	4.07E+6	3.93E+6	4.19E+6	6.03E+4	1.21E+5	3.0%	18.6%
50		4	3.77E+6	3.69E+6	3.85E+6	3.51E+6	4.02E+6	1.05E+5	2.10E+5	5.58%	23.8%
100		4	3.57E+6	3.48E+6	3.65E+6	3.30E+6	3.85E+6	1.15E+5	2.30E+5	6.45%	27.9%
96h Cell Density-with EDTA Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Hardness Blank	4.49E+6	5.06E+6	5.25E+6	4.99E+6						
0	Lab Water Contr	3.64E+6	3.60E+6	3.51E+6	3.61E+6						
6.25		3.71E+6	4.05E+6	3.90E+6	3.79E+6						
12.5		4.06E+6	4.14E+6	4.11E+6	3.93E+6						
25		4.04E+6	4.19E+6	3.94E+6	3.93E+6						
50		3.74E+6	4.02E+6	3.81E+6	3.51E+6						
100		3.62E+6	3.30E+6	3.85E+6	3.50E+6						

CETIS Analytical Report

Report Date: 19 Jun-13 12:35 (p 2 of 2)
Test Code: 52140 | 18-9277-8096

Algal Growth Test										Pacific EcoRisk	
Analysis ID: 10-8670-2097		Endpoint: 96h Cell Density-with EDTA				CETIS Version: CETISv1.8.5					
Analyzed: 19 Jun-13 12:35		Analysis: Parametric-Control vs Treatments				Official Results: Yes					
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU		
Untransformed	NA	C > T	NA	NA	7.37%	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	-2.48	2.41	3E+05	6	0.9998	CDF	Non-Significant Effect		
		12.5	-4.27	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect		
		25	-3.96	2.41	3E+05	6	1.0000	CDF	Non-Significant Effect		
		50	-1.64	2.41	3E+05	6	0.9973	CDF	Non-Significant Effect		
		100	0.205	2.41	3E+05	6	0.7661	CDF	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	8.81E+11		1.762E+11		5	7.29	0.0007	Significant Effect			
Error	4.3525E+11		24180560000		18						
Total	1.31625E+12				23						
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Bartlett Equality of Variance		6.13	15.1	0.2941	Equal Variances					
Distribution	Shapiro-Wilk W Normality		0.968	0.884	0.6136	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	3.59E+6	3.50E+6	3.68E+6	3610000	3.51E+6	3.64E+6	2.80E+4	1.56%	0.0%
6.25		4	3.86E+6	3.63E+6	4.10E+6	3850000	3.71E+6	4.05E+6	7.36E+4	3.81%	-7.59%
12.5		4	4.06E+6	3.91E+6	4.21E+6	4090000	3.93E+6	4.14E+6	4.64E+4	2.28%	-13.1%
25		4	4.03E+6	3.83E+6	4.22E+6	3990000	3.93E+6	4.19E+6	6.03E+4	3.0%	-12.1%
50		4	3.77E+6	3.44E+6	4.10E+6	3780000	3.51E+6	4.02E+6	1.05E+5	5.58%	-5.01%
100		4	3.57E+6	3.20E+6	3.93E+6	3560000	3.30E+6	3.85E+6	1.15E+5	6.45%	0.63%
Graphics											

CETIS Analytical Report

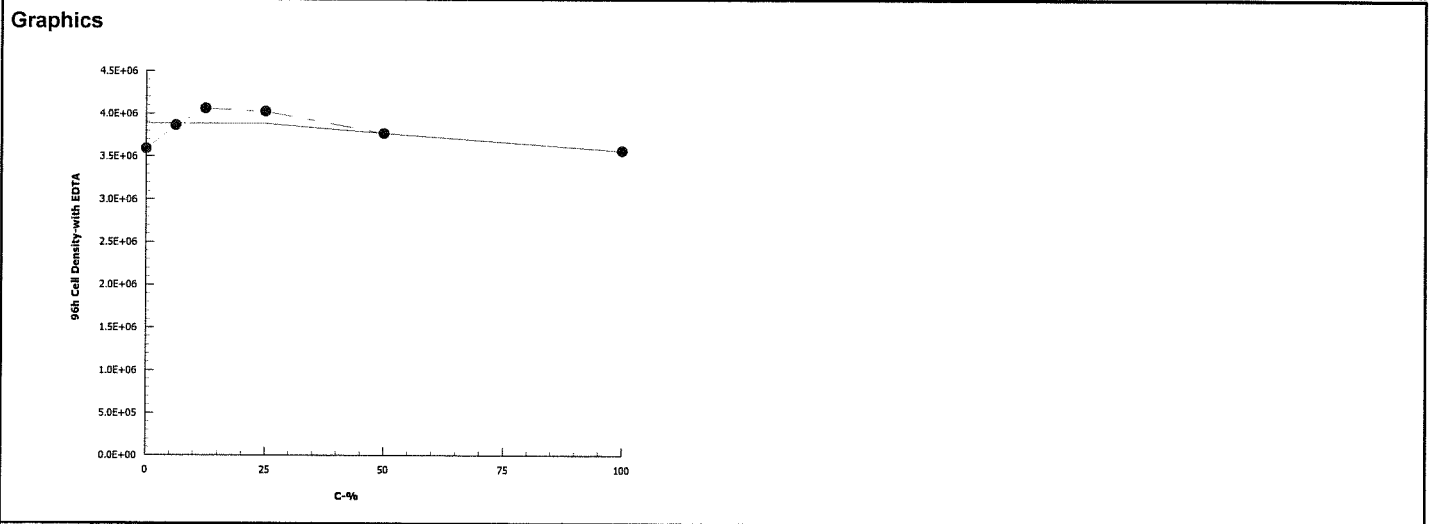
Report Date: 19 Jun-13 12:35 (p 1 of 1)
 Test Code: 52140 | 18-9277-8096

Algal Growth Test			Pacific EcoRisk		
Analysis ID:	12-0140-6384	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5
Analyzed:	19 Jun-13 12:35	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1506482	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	69.7	24.8	N/A	1.434	NA	4.039
IC10	>100	N/A	N/A	<1	NA	NA
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

96h Cell Density-with EDTA Summary			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	3.59E+6	3.51E+6	3.64E+6	2.80E+4	5.60E+4	1.56%	0.0%
6.25		4	3.86E+6	3.71E+6	4.05E+6	7.36E+4	1.47E+5	3.81%	-7.59%
12.5		4	4.06E+6	3.93E+6	4.14E+6	4.64E+4	9.27E+4	2.28%	-13.1%
25		4	4.03E+6	3.93E+6	4.19E+6	6.03E+4	1.21E+5	3.0%	-12.1%
50		4	3.77E+6	3.51E+6	4.02E+6	1.05E+5	2.10E+5	5.58%	-5.01%
100		4	3.57E+6	3.30E+6	3.85E+6	1.15E+5	2.30E+5	6.45%	0.63%



***Selenastrum capricornutum* Cell Density Enumeration Data**

Client: Lehigh Permanente Initial Count: 10,000 cells/mL
 Test Material: Pond 4A Enumerating Scientist: ICP
 Test Start Date: 6/14/13 Start Time: 1500 Project #: 21069
 Test End Date: 6/15/13 End Time: 1500 Test ID #: 52140

Treatment	Cell Density (cells/mL x 10 ⁶)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	3.64	3.60	3.51	3.61	3.59
6.25%	3.71	4.05	3.90	3.79	3.86
12.5%	4.06	4.14	4.11	3.93	4.06
25%	4.04	4.19	3.94	3.93	4.03
50%	3.74	4.02	3.81	3.51	3.77
100%	3.62	3.30	3.85	3.50	3.57
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	Control Mean Density (cells/mL x 10 ⁶)	% CV	Date:	Time:	Signoff:
	3.59	1.56	6/15/13	1800	

***Selenastrum capricornutum* Algal Toxicity Test Water Quality Data**
 Client: Lehigh Permanente
 Test Material: Pond 4A

 Test ID #: 52140
 Project #: 21069

 Test Date: 6/11/13
 Control/Diluent: Lab Water
 Shelf Zone #: R3/S1

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.5	7.50	8.9	90	Date: 6/11/13
6.25% Effluent	25.5	7.92	8.9	213	Sample ID: SP 32002
12.5% Effluent	25.5	7.85	8.9	313	Test Solution Prep: SC
25% Effluent	25.5	7.91	9.2	459	New WQ: DH
50% Effluent	25.5	7.99 8.07	10.2 9.8	1218 742	Innoculation Time: 1500
100% Effluent	25.5	7.99	10.2	1218	Innoculation Signoff: SC
Meter ID:	65A	PH16	R004	EC06	
Lab Water Control	25.4	8.39			Date: 6-12-13
6.25% Effluent	25.4	8.41			WQ Time: 10.00
12.5% Effluent	25.4	7.93			WQ Signoff: YH
25% Effluent	25.4	7.94			
50% Effluent	25.4	8.11			
100% Effluent	25.4	8.29			
Meter ID:	65A	PH16			
Lab Water Control	25.2	8.62			Date: 6-13-13
6.25% Effluent	25.2	8.34			WQ Time: 0900
12.5% Effluent	25.2	8.25			WQ Signoff: DH
25% Effluent	25.2	8.31			
50% Effluent	25.2	8.36			
100% Effluent	25.2	8.52			
Meter ID:	65A	PH15			
Lab Water Control	25.3	9.59			Date: 6-14-13
6.25% Effluent	25.3	9.70			WQ Time: 6-09.00
12.5% Effluent	25.3	9.50			WQ Signoff: YH
25% Effluent	25.3	9.31			
50% Effluent	25.3	9.02			
100% Effluent	25.3	8.43			
Meter ID:	25.3	PH18			
Lab Water Control	25.2	10.15 9.51	12.2	121	Date: 6/15/13
6.25% Effluent	25.2	10.15 9.55	12.4 13.4	193	Termination Time: 1500
12.5% Effluent	25.2	10.32 9.67	14.0	265	Termination Signoff: KP
25% Effluent	25.2	9.42 9.50	12.8	359	WQ Time: 0910
50% Effluent	25.2	9.40 9.05	11.9	563	WQ Signoff: FOS
100% Effluent	25.2	8.83 8.77	12.2	966	
Meter ID:	25.2 65A	PH16 PH18	R006	EC07	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 205	✓ 632	403.57

CETIS Analytical Report

Report Date: 19 Jun-13 12:35 (p 1 of 2)

Test Code: 52140 | 18-9277-8096

Algal Growth Test						Pacific EcoRisk
Analysis ID:	19-9404-2095	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5	
Analyzed:	19 Jun-13 12:35	Analysis:	Parametric-Two Sample	Official Results:	Yes	

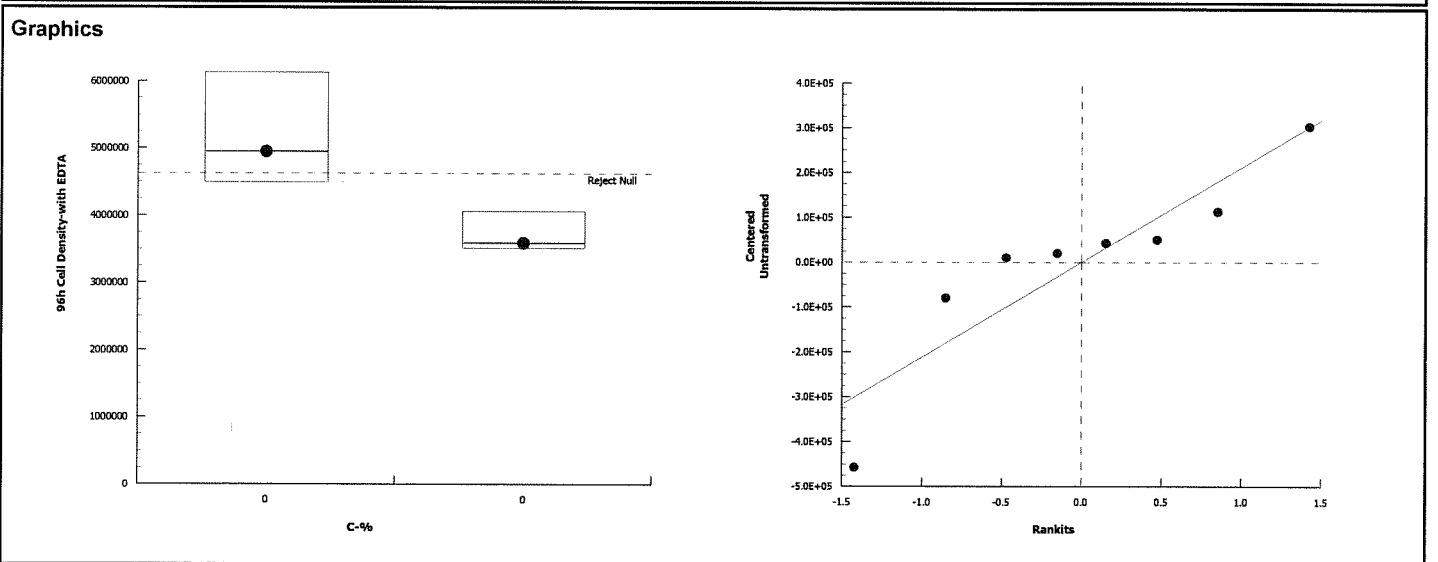
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	8.9%	Passes 96h cell density-with edta

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	-8.25	1.94	3E+05	6	0.9999	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.685613E+12	3.685613E+12	1	68.1	0.0002	Significant Effect
Error	3.24675E+11	54112500000	6			
Total	4.010288E+12		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F	33.5	47.5	0.0166	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.862	0.645	0.1255	Normal Distribution	

96h Cell Density-with EDTA Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Hardness Blank	4	4.95E+6	4.43E+6	5.46E+6	4070000	4.49E+6	5.25E+6	1.62E+5	6.55%	0.0%
0	Lab Water Contr	4	3.59E+6	3.50E+6	3.68E+6	4070000	3.51E+6	3.64E+6	2.80E+4	1.56%	27.4%



***Selenastrum capricornutum* Algal Toxicity Test Data Sheet**

Client: Lehigh Permanente Sample ID: Hardness Blank
 Test Start Date: 6/11/13 Test ID #: - Project #: 21069
 Test End Date: 6/15/13 Control/Diluent: Type 1 Water w/ EDTA Shelf #: R3/81

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Blank	25.5	8.36	9.1	2480	Date: 6/11/13
					Sample ID #: 32009
					Test Solution Prep: SS
					New WQ: OH
					Inoculation Time: 1500
					Inoculation Signoff: SS
Meter ID	65A	PH16	R004	EC06	Date: 6-12-13
Hardness Blank	25.4	8.63			WQ Time: 10.00
					WQ Signoff: YU
Meter ID	65-A	PH16			Date: 6-13-13
Hardness Blank	25.2	8.76			WQ Time: 0900
					WQ Signoff: PH
Meter ID	65A	PH15			Date: 6-14-13
Hardness Blank	25.3	8.93			WQ Time: 0900
					WQ Signoff: YU
Meter ID	65A	PH18			Date: 6/15/13
Hardness Blank	25.2	PH 8.15	13.4	2319	WQ Time: 0910
					WQ Signoff: F0B
Meter ID	65A	PH 8.15	R006	EC07	

Initial Count: 10,000 cells/mLTermination Time: 1500Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10 ⁶)				Mean Cell Density (cells/mL x 10 ⁶)		
	Rep A	Rep B	Rep C	Rep D			
Hardness Blank	4.49	5.06	5.25	4.99	4.95		
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:
			4.95	6.55	6/15/13	1800	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 363	✓ 681	403.57

Appendix C

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



CETIS Summary Report

Report Date: 19 Jun-13 12:31 (p 1 of 1)

Test Code: 52143 | 01-7053-7344

Algal Growth Test	Pacific EcoRisk
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Batch ID: 20-3342-1329	Test Type: Cell Growth	Analyst: Padrick Anderson
Start Date: 11 Jun-13 15:00	Protocol: EPA-821-R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 15 Jun-13 14:30	Species: Selenastrum capricornutum	Brine: Not Applicable
Duration: 95h	Source: In-House Culture	Age: 6

Sample ID: 21-2013-4670	Code: Pond 9	Client: Lehigh Permanente
Sample Date: 10 Jun-13 12:13	Material: Effluent	Project: 21069
Receive Date: 10 Jun-13 15:20	Source: Lehigh Permanente	
Sample Age: 27h (13.1 °C)	Station: Pond 9	

Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
04-7974-6480	96h Cell Density-with EDTA 0	>0			8.88%		Equal Variance t Two-Sample Test
05-1110-8546	96h Cell Density-with EDTA 100	>100	NA		5.71%	1	Dunnett Multiple Comparison Test

Point Estimate Summary							
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
00-6116-0303	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	4.95E+6	4.83E+6	5.07E+6	4.49E+6	5.25E+6	1.62E+5	3.24E+5	6.55%	0.0%
0	Lab Water Contr	4	3.70E+6	3.66E+6	3.73E+6	3.61E+6	3.79E+6	4.78E+4	9.57E+4	2.59%	25.3%
6.25		4	4.24E+6	4.21E+6	4.27E+6	4.12E+6	4.32E+6	4.42E+4	8.83E+4	2.08%	14.3%
12.5		4	3.67E+6	3.62E+6	3.71E+6	3.58E+6	3.83E+6	5.78E+4	1.16E+5	3.15%	25.9%
25		4	4.73E+6	4.67E+6	4.79E+6	4.54E+6	4.92E+6	7.76E+4	1.55E+5	3.28%	4.45%
50		4	4.96E+6	4.90E+6	5.01E+6	4.78E+6	5.13E+6	7.15E+4	1.43E+5	2.88%	-0.15%
100		4	5.27E+6	5.22E+6	5.32E+6	5.07E+6	5.35E+6	6.64E+4	1.33E+5	2.52%	-6.47%

96h Cell Density-with EDTA Detail					
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	4.49E+6	5.06E+6	5.25E+6	4.99E+6
0	Lab Water Contr	3.61E+6	3.79E+6	3.62E+6	3.77E+6
6.25		4.23E+6	4.29E+6	4.12E+6	4.32E+6
12.5		3.59E+6	3.58E+6	3.83E+6	3.66E+6
25		4.54E+6	4.72E+6	4.73E+6	4.92E+6
50		4.78E+6	4.95E+6	5.13E+6	4.96E+6
100		5.07E+6	5.34E+6	5.35E+6	5.31E+6

CETIS Analytical Report

Report Date: 19 Jun-13 12:31 (p 2 of 2)

Test Code: 52143 | 01-7053-7344

Algal Growth Test					Pacific EcoRisk				
Analysis ID:	05-1110-8546	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5				
Analyzed:	19 Jun-13 12:31	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes				

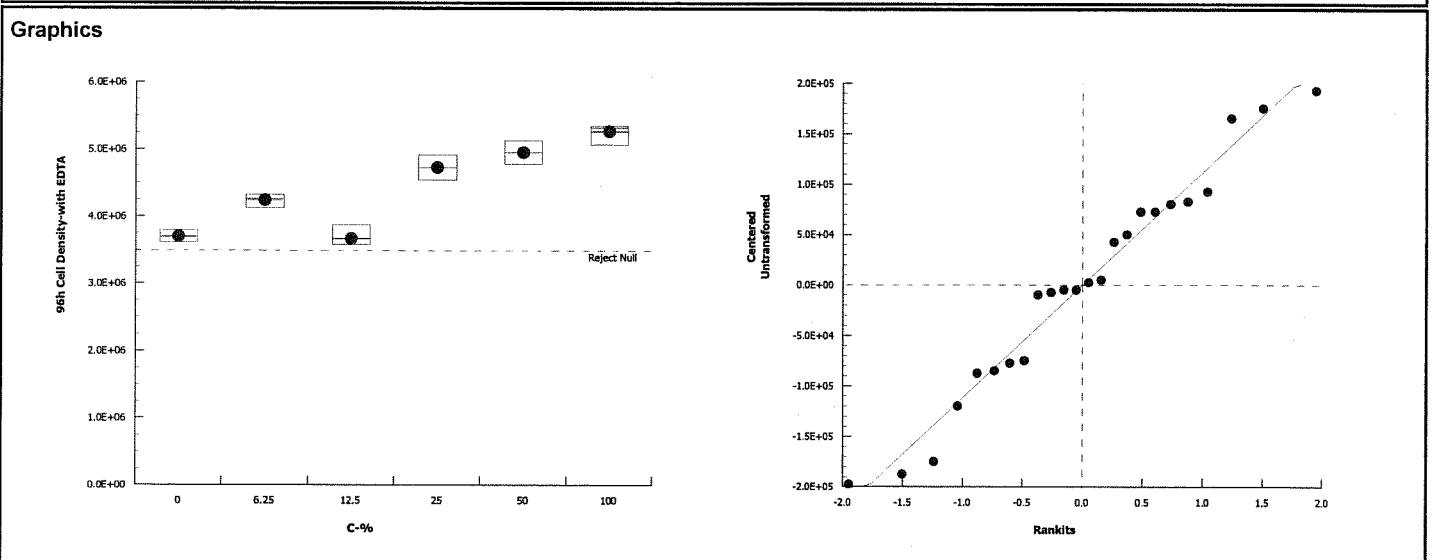
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	5.71%	100	>100	NA	1

Dunnett Multiple Comparison Test									
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-6.18	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		12.5	0.37	2.41	2E+05	6	0.7023	CDF	Non-Significant Effect
		25	-11.7	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		50	-14.3	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		100	-17.9	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.893171E+12	1.778634E+12	5	115	<0.0001	Significant Effect
Error	2.77425E+11	15412500000	18			
Total	9.170596E+12		23			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance	1.28	15.1	0.9372	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.963	0.884	0.5077	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	3.70E+6	3.55E+6	3.85E+6	3700000	3.61E+6	3.79E+6	4.78E+4	2.59%	0.0%
6.25		4	4.24E+6	4.10E+6	4.38E+6	4260000	4.12E+6	4.32E+6	4.42E+4	2.08%	-14.7%
12.5		4	3.67E+6	3.48E+6	3.85E+6	3630000	3.58E+6	3.83E+6	5.78E+4	3.15%	0.88%
25		4	4.73E+6	4.48E+6	4.97E+6	4730000	4.54E+6	4.92E+6	7.76E+4	3.28%	-27.9%
50		4	4.96E+6	4.73E+6	5.18E+6	4960000	4.78E+6	5.13E+6	7.15E+4	2.88%	-34.0%
100		4	5.27E+6	5.06E+6	5.48E+6	5330000	5.07E+6	5.35E+6	6.64E+4	2.52%	-42.5%



CETIS Analytical Report

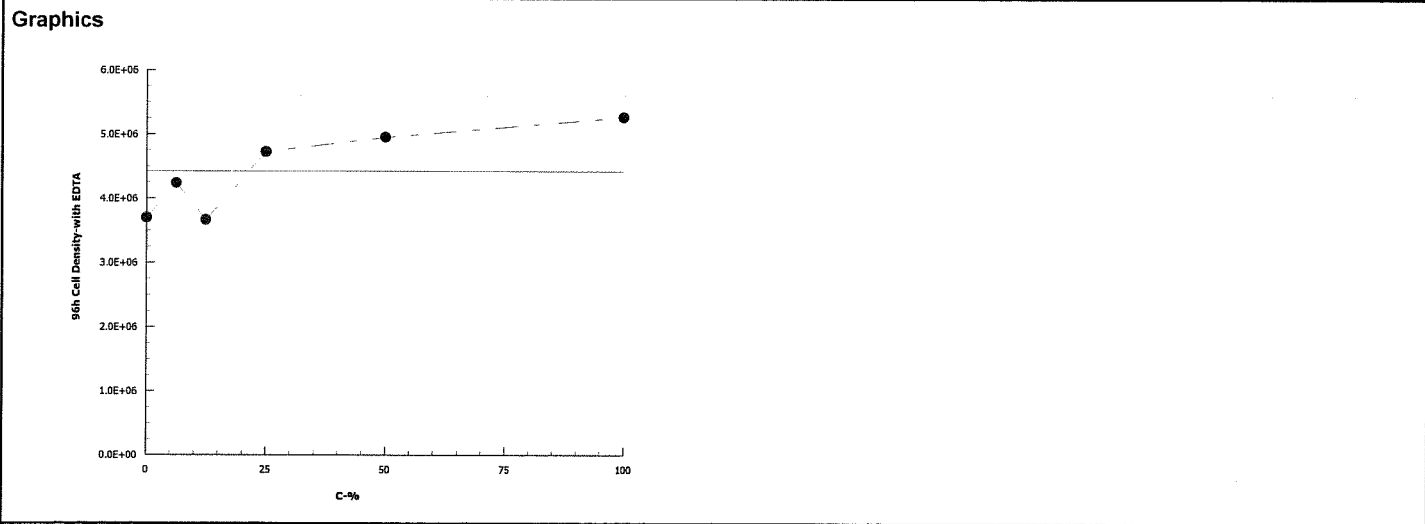
Report Date: 19 Jun-13 12:31 (p 1 of 1)
Test Code: 52143 | 01-7053-7344

Algal Growth Test			Pacific EcoRisk		
Analysis ID:	00-6116-0303	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5
Analyzed:	19 Jun-13 12:31	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	2067855	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 Control	4	3.70E+6	3.61E+6	3.79E+6	4.78E+4	9.57E+4	2.59%	0.0%	
6.25		4	4.24E+6	4.12E+6	4.32E+6	4.42E+4	8.83E+4	2.08%	-14.7%	
12.5		4	3.67E+6	3.58E+6	3.83E+6	5.78E+4	1.16E+5	3.15%	0.88%	
25		4	4.73E+6	4.54E+6	4.92E+6	7.76E+4	1.55E+5	3.28%	-27.9%	
50		4	4.96E+6	4.78E+6	5.13E+6	7.15E+4	1.43E+5	2.88%	-34.0%	
100		4	5.27E+6	5.07E+6	5.35E+6	6.64E+4	1.33E+5	2.52%	-42.5%	



***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: 6/11/13 Start Time: 1500 Project #: 21069
 Test End Date: 6/15/13 End Time: 1430 Test ID #: 52143

Treatment	Cell Density (cells/mL x 10 ⁶)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	3.61	3.79	3.62	3.77	3.70
6.25%	4.23	4.29	4.12	4.32	4.24
12.5%	3.59	3.58	3.83	3.66	3.67
25%	4.54	4.72	4.73	4.92	4.73
50%	4.78	4.95	5.13	4.96	4.96
100%	5.07	5.34	5.35	5.31	5.27
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	Control Mean Density (cells/mL x 10 ⁶)	% CV	Date:	Time:	Signoff:
	3.70	2.59	6/15/13	1800	

***Selenastrum capricornutum* Algal Toxicity Test Water Quality Data**
 Client: Lehigh Permanente
 Test Material: Pond 9

 Test ID #: 52143
 Project #: 21069

 Test Date: 6/11/13
 Control/Diluent: Lab Water
 Shelf Zone #: R3/S1

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.5	7.50	8.8	90	Date: 6/11/13
6.25% Effluent	25.5	7.52	8.8	214	Sample ID: 32003
12.5% Effluent	25.5	7.49	8.8	249	Test Solution Prep: SS
25% Effluent	25.5	7.64	9.0	559	New WQ: DH
50% Effluent	25.5	7.62	9.3	819	Innoculation Time: 1500
100% Effluent	25.5	7.62	9.5	1405	Innoculation Signoff: SS
Meter ID:	65A	PH16	R004	EC06	
Lab Water Control	25.4	8.39			Date: 6-12-13
6.25% Effluent	25.4	7.98			WQ Time: 10.00
12.5% Effluent	25.4	7.89			WQ Signoff: YK
25% Effluent	25.4	7.89			
50% Effluent	25.4	8.16			
100% Effluent	25.4	8.29			
Meter ID:	65A	PH16			
Lab Water Control	25.2	8.85			Date: 6-13-13
6.25% Effluent	25.2	8.59			WQ Time: 0900
12.5% Effluent	25.2	8.32			WQ Signoff: DH
25% Effluent	25.2	8.43			
50% Effluent	25.2	8.55			
100% Effluent	25.2	8.58			
Meter ID:	65A	PH15			
Lab Water Control	25.3	9.80			Date: 6-14-13
6.25% Effluent	25.3	9.68			WQ Time: 0900
12.5% Effluent	25.3	9.18			WQ Signoff: YK
25% Effluent	25.3	9.55			
50% Effluent	25.3	9.23			
100% Effluent	25.3	8.64			
Meter ID:	65A	PH18			
Lab Water Control	25.2	9.20	13.0	115	Date: 6/15/13
6.25% Effluent	25.2	9.32	11.3	225	Termination Time: 1430
12.5% Effluent	25.2	9.17	12.6	294	Termination Signoff: KP
25% Effluent	25.2	9.22	13.5	435	WQ Time: 0850
50% Effluent	25.2	9.32	11.7	686	WQ Signoff: FAYB
100% Effluent	25.2	9.08	12.4	1139	
Meter ID:	65A	PH16	P006	EC07	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 245	✓ 622	403.57

CETIS Analytical Report

Report Date: 19 Jun-13 12:31 (p 1 of 2)
Test Code: 52143 | 01-7053-7344

Algal Growth Test				Pacific EcoRisk	
Analysis ID: 04-7974-6480	Endpoint: 96h Cell Density-with EDTA			CETIS Version: CETISv1.8.5	
Analyzed: 19 Jun-13 12:31	Analysis: Parametric-Two Sample			Official Results: Yes	

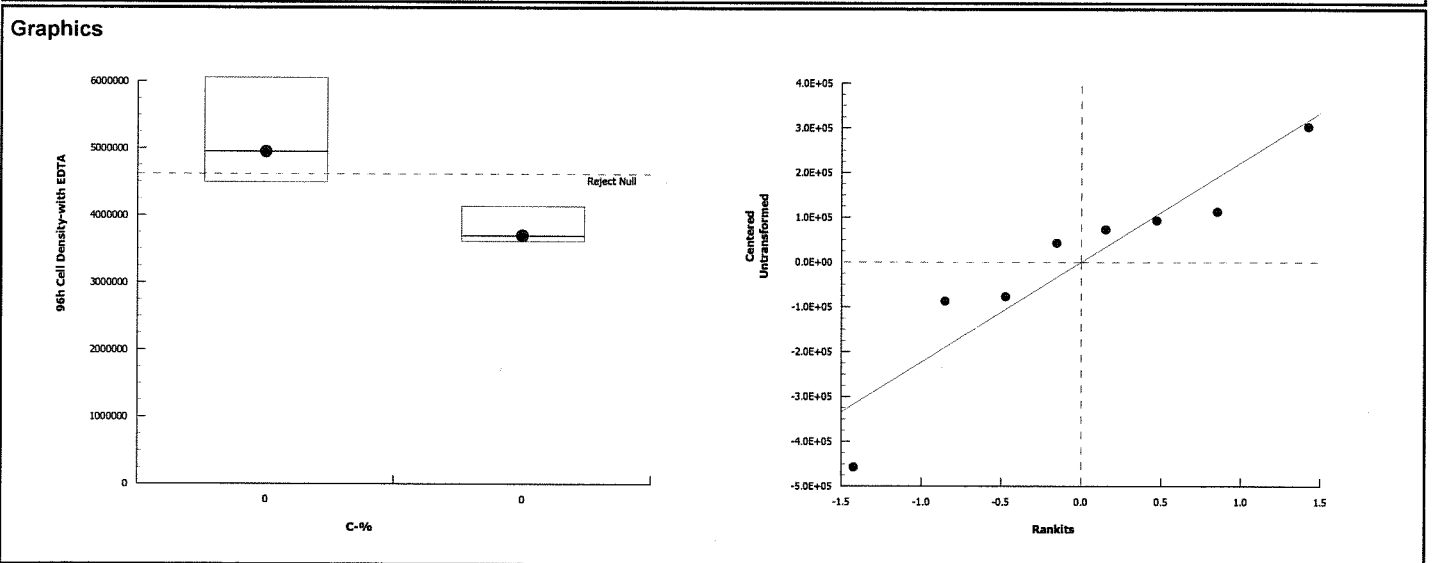
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	8.88%	Passes 96h cell density-with edta

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	-7.4	1.94	3E+05	6	0.9998	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.125E+12	3.125E+12	1	54.7	0.0003	Significant Effect
Error	3.4275E+11	57125000000	6			
Total	3.46775E+12		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F	11.5	47.5	0.0752	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.897	0.645	0.2731	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	3.70E+6	3.55E+6	3.85E+6	4140000	3.61E+6	3.79E+6	4.78E+4	2.59%	0.0%
0	Hardness Blank	4	4.95E+6	4.43E+6	5.46E+6	4140000	4.49E+6	5.25E+6	1.62E+5	6.55%	-33.8%



***Selenastrum capricornutum* Algal Toxicity Test Data Sheet**

Client: Lehigh Permanente Sample ID: Hardness Blank
 Test Start Date: 6/11/13 Test ID #: - Project #: 21069
 Test End Date: 6/15/13 Control/Diluent: Type 1 Water w/ EDTA Shelf #: R3/81

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Blank	25.5	8.36	9.1	2480	Date: 6/11/13
					Sample ID #: 32009
					Test Solution Prep: SS
					New WQ: OH
					Inoculation Time: 1500
					Inoculation Signoff: SS
Meter ID	65A	PH16	R004	EC06	
Hardness Blank	25.4	8.63			Date: 6-12-13
					WQ Time: 10.00
					WQ Signoff: YL
Meter ID	65-A	PH16			
Hardness Blank	25.2	8.76			Date: 6-13-13
					WQ Time: 0900
					WQ Signoff: YH
Meter ID	65A	PH15			
Hardness Blank	25.3	8.93			Date: 6-14-13
					WQ Time: 0900
					WQ Signoff: YL
Meter ID	65A	PH18			
Hardness Blank	25.2	8.43	9.15	13.4	2319
					Date: 6/15/13
					WQ Time: 0910
					WQ Signoff: F0B
Meter ID	65A	PH16	R006	EC07	

Initial Count: 10,000 cells/mLTermination Time: 1500Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10 ⁶)				Mean Cell Density (cells/mL x 10 ⁶)		
	Rep A	Rep B	Rep C	Rep D			
Hardness Blank	4.49	5.06	5.25	4.99	4.95		
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:
			4.95	6.55	6/15/13	1500	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 363	✓ 681	403.57

Appendix D

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



CETIS Summary Report

Report Date: 20 Jun-13 09:58 (p 1 of 1)
 Test Code: 520146 | 01-0538-3059

Algal Growth Test							Pacific EcoRisk				
Batch ID:	11-5994-3965	Test Type:	Cell Growth			Analyst:	Padrick Anderson				
Start Date:	11 Jun-13 15:00	Protocol:	EPA-821-R-02-013 (2002)			Diluent:	Laboratory Water				
Ending Date:	15 Jun-13 15:45	Species:	Selenastrum capricornutum			Brine:	Not Applicable				
Duration:	4d 1h	Source:	In-House Culture			Age:	6				
Sample ID:	10-8289-1172	Code:	Pond 13			Client:	Lehigh Permanente				
Sample Date:	10 Jun-13 11:50	Material:	Effluent			Project:	21069				
Receive Date:	10 Jun-13 15:20	Source:	Lehigh Permanente								
Sample Age:	27h (10.2 °C)	Station:	Pond 13								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
12-8962-0746	96h Cell Density-with EDTA 0		>0		10.0%		Equal Variance t Two-Sample Test				
01-3811-4065	96h Cell Density-with EDTA 100		>100	NA	6.28%	1	Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
01-8699-4466	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	4.95E+6	4.83E+6	5.07E+6	4.49E+6	5.25E+6	1.62E+5	3.24E+5	6.55%	0.0%
0	Lab Water Contr	4	3.78E+6	3.70E+6	3.86E+6	3.57E+6	4.06E+6	1.07E+5	2.15E+5	5.69%	23.6%
6.25		4	4.02E+6	4.00E+6	4.04E+6	3.95E+6	4.09E+6	2.87E+4	5.74E+4	1.43%	18.8%
12.5		4	4.18E+6	4.13E+6	4.23E+6	4.07E+6	4.33E+6	6.42E+4	1.28E+5	3.07%	15.5%
25		4	4.66E+6	4.63E+6	4.70E+6	4.59E+6	4.79E+6	4.39E+4	8.77E+4	1.88%	5.76%
50		4	4.43E+6	4.36E+6	4.49E+6	4.30E+6	4.67E+6	8.43E+4	1.69E+5	3.81%	10.6%
100		4	4.76E+6	4.71E+6	4.80E+6	4.58E+6	4.85E+6	6.03E+4	1.21E+5	2.54%	3.84%
96h Cell Density-with EDTA Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Hardness Blank	4.49E+6	5.06E+6	5.25E+6	4.99E+6						
0	Lab Water Contr	4.06E+6	3.82E+6	3.66E+6	3.57E+6						
6.25		4.09E+6	4.01E+6	3.95E+6	4.02E+6						
12.5		4.07E+6	4.08E+6	4.25E+6	4.33E+6						
25		4.64E+6	4.79E+6	4.63E+6	4.59E+6						
50		4.40E+6	4.30E+6	4.67E+6	4.33E+6						
100		4.58E+6	4.80E+6	4.85E+6	4.80E+6						

CETIS Analytical Report

Report Date: 19 Jun-13 12:45 (p 2 of 2)
Test Code: 520146 | 01-0538-3059

Algal Growth Test					Pacific EcoRisk				
Analysis ID:	01-3811-4065	Endpoint:	96h Cell Density-with EDTA		CETIS Version:	CETISv1.8.5			
Analyzed:	19 Jun-13 12:45	Analysis:	Parametric-Control vs Treatments		Official Results:	Yes			

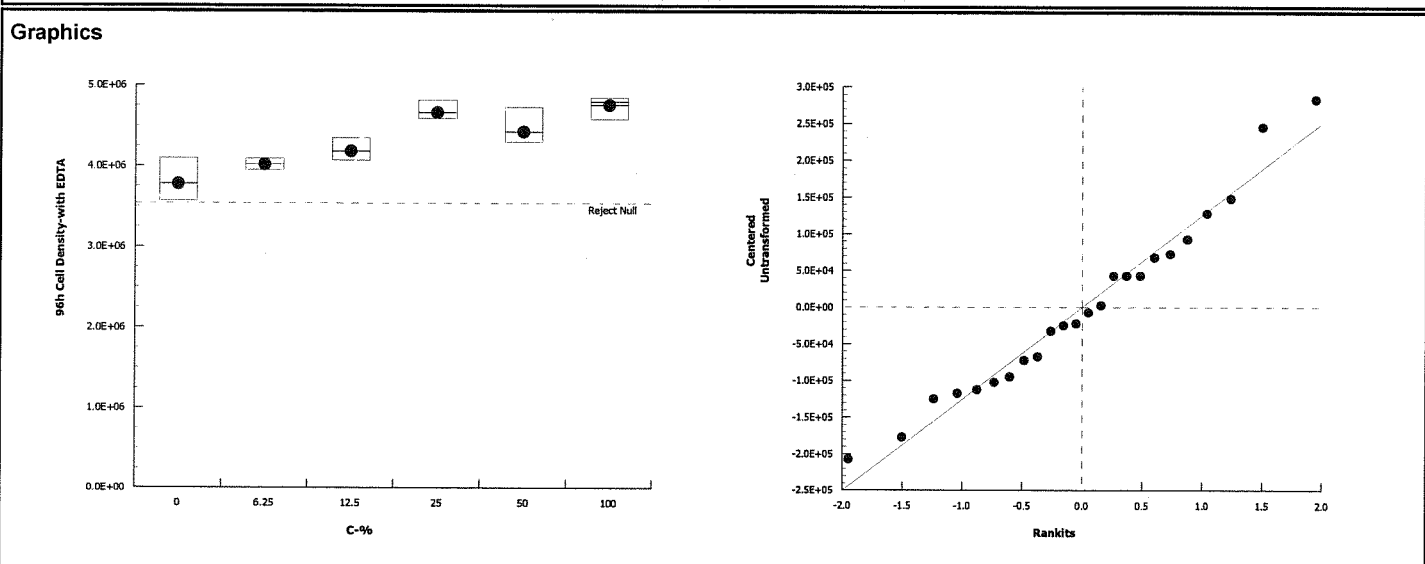
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	6.28%	100	>100	NA	1

Dunnett Multiple Comparison Test									
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-2.43	2.41	2E+05	6	0.9998	CDF	Non-Significant Effect
		12.5	-4.11	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		25	-8.98	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		50	-6.57	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		100	-9.94	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.891487E+12	5.782975E+11	5	29.8	<0.0001	Significant Effect
Error	3.49875E+11	19437500000	18			
Total	3.241362E+12		23			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance	5.08	15.1	0.4068	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.969	0.884	0.6364	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	3.78E+6	3.44E+6	4.12E+6	3740000	3.57E+6	4.06E+6	1.07E+5	5.69%	0.0%
6.25		4	4.02E+6	3.93E+6	4.11E+6	4020000	3.95E+6	4.09E+6	2.87E+4	1.43%	-6.35%
12.5		4	4.18E+6	3.98E+6	4.39E+6	4170000	4.07E+6	4.33E+6	6.42E+4	3.07%	-10.7%
25		4	4.66E+6	4.52E+6	4.80E+6	4640000	4.59E+6	4.79E+6	4.38E+4	1.88%	-23.4%
50		4	4.43E+6	4.16E+6	4.69E+6	4370000	4.30E+6	4.67E+6	8.43E+4	3.81%	-17.1%
100		4	4.76E+6	4.57E+6	4.95E+6	4800000	4.58E+6	4.85E+6	6.03E+4	2.54%	-25.9%



CETIS Analytical Report

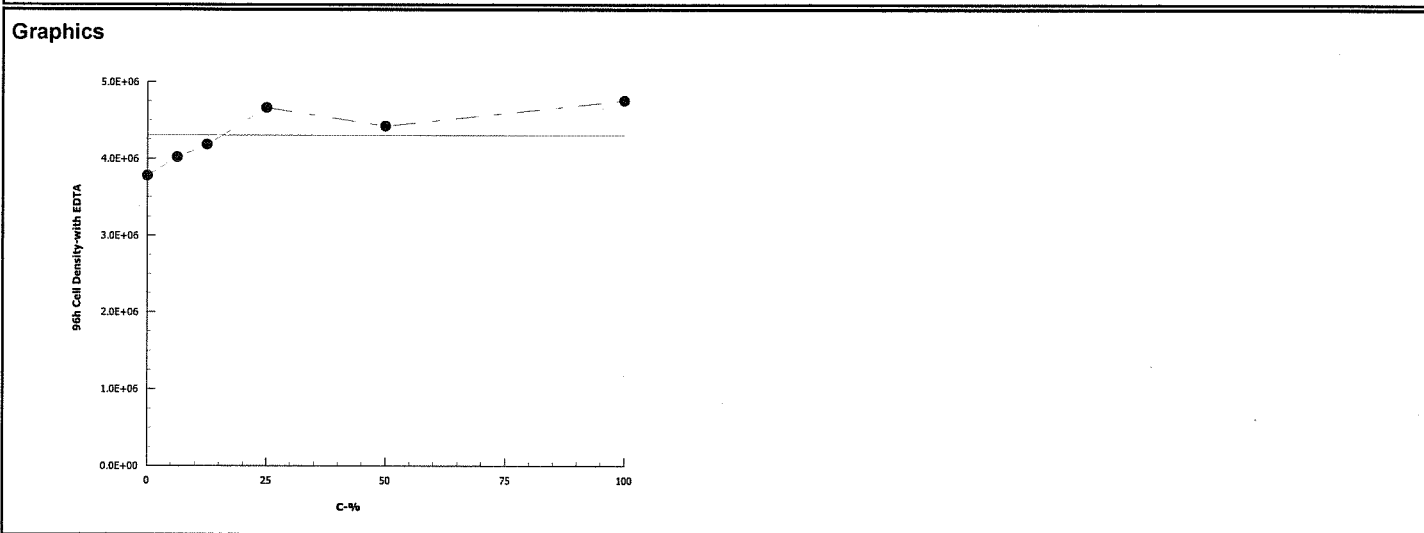
Report Date: 19 Jun-13 12:45 (p 1 of 1)
Test Code: 520146 | 01-0538-3059

Algal Growth Test			Pacific EcoRisk		
Analysis ID:	01-8699-4466	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5
Analyzed:	19 Jun-13 12:45	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1328102	200	Yes	Two-Point Interpolation

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

96h Cell Density-with EDTA Summary			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	3.78E+6	3.57E+6	4.06E+6	1.07E+5	2.15E+5	5.69%	0.0%
6.25		4	4.02E+6	3.95E+6	4.09E+6	2.87E+4	5.74E+4	1.43%	-6.35%
12.5		4	4.18E+6	4.07E+6	4.33E+6	6.42E+4	1.28E+5	3.07%	-10.7%
25		4	4.66E+6	4.59E+6	4.79E+6	4.38E+4	8.77E+4	1.88%	-23.4%
50		4	4.43E+6	4.30E+6	4.67E+6	8.43E+4	1.69E+5	3.81%	-17.1%
100		4	4.76E+6	4.58E+6	4.85E+6	6.03E+4	1.21E+5	2.54%	-25.9%



***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: 6/11/13 Start Time: 1500 Project #: 21069
 Test End Date: 6/15/13 End Time: 1545 Test ID #: 52146

Treatment	Cell Density (cells/mL x 10 ⁶)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	4.06	3.82	3.66	3.57	3.78
6.25%	4.09	4.01	3.95	4.02	4.02
12.5%	4.07	4.08	4.25	4.33	4.18
25%	4.64	4.79	4.63	4.59	4.66
50%	4.40	4.30	4.67	4.33	4.43
100%	4.58	4.80	4.85	6.523 4.80	4.76
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	Control Mean Density (cells/mL x 10 ⁶)	% CV	Date:	Time:	Signoff:
	3.78	5.69	6/15/13	1800	

***Selenastrum capricornutum* Algal Toxicity Test Water Quality Data**
 Client: Lehigh Permanente
 Test Material: Pond 13

 Test ID #: 52146
 Project #: 21069

 Test Date: 6/11/13
 Control/Diluent: Lab Water
 Shelf Zone #: R2/S1

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.4	7.50	8.7	91	Date: 6/11/13
6.25% Effluent	25.4	7.82	8.8	210	Sample ID: 32004
12.5% Effluent	25.4	7.78	9.0	293	Test Solution Prep: SS
25% Effluent	25.4	7.84	9.0	418	New WQ: DH
50% Effluent	25.4	7.94	9.5	726	Innoculation Time: 1500
100% Effluent	25.4	8.01	10.0	1165	Innoculation Signoff: SS
Meter ID:	06	PH16	R004	EC06	
Lab Water Control	25.4	8.55			Date: 6-12-13
6.25% Effluent	25.4	8.07			WQ Time: 10.00
12.5% Effluent	25.4	7.94			WQ Signoff: YML
25% Effluent	25.4	7.92			
50% Effluent	25.4	8.13			
100% Effluent	25.4	8.26			
Meter ID:	06	PH16			
Lab Water Control	25.1	8.59			Date: 6-13-13
6.25% Effluent	25.1	8.41			WQ Time: 0900
12.5% Effluent	25.1	8.37			WQ Signoff: DH
25% Effluent	25.1	8.41			
50% Effluent	25.1	8.45			
100% Effluent	25.1	8.61			
Meter ID:	06	PH15			
Lab Water Control	25.1	9.72			Date: 6-14-13
6.25% Effluent	25.1	9.64			WQ Time: 09.00
12.5% Effluent	25.1	9.56			WQ Signoff: YML
25% Effluent	25.1	9.50			
50% Effluent	25.1	9.30			
100% Effluent	25.1	8.79			
Meter ID:	06	PH18			
Lab Water Control	25.1	10.12 9.53	10.8	107	Date: 6/15/13
6.25% Effluent	25.1	10.23 9.51	12.8	189	Termination Time: 1545
12.5% Effluent	25.1	10.33 9.46	12.1	275	Termination Signoff: KP
25% Effluent	25.1	10.49 9.55	11.6	395	WQ Time: 0920
50% Effluent	25.1	10.01 9.09	13.3	567	WQ Signoff: PAN
100% Effluent	25.1	9.41 8.87	12.7	947	
Meter ID:	06	KP PH18	R006	EC07	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 160	✓ 581	410.68

CETIS Analytical Report

Report Date: 19 Jun-13 12:45 (p 1 of 2)
Test Code: 520146 | 01-0538-3059

Algal Growth Test				Pacific EcoRisk		
Analysis ID:	12-8962-0746	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5	
Analyzed:	19 Jun-13 12:45	Analysis:	Parametric-Two Sample	Official Results:	Yes	

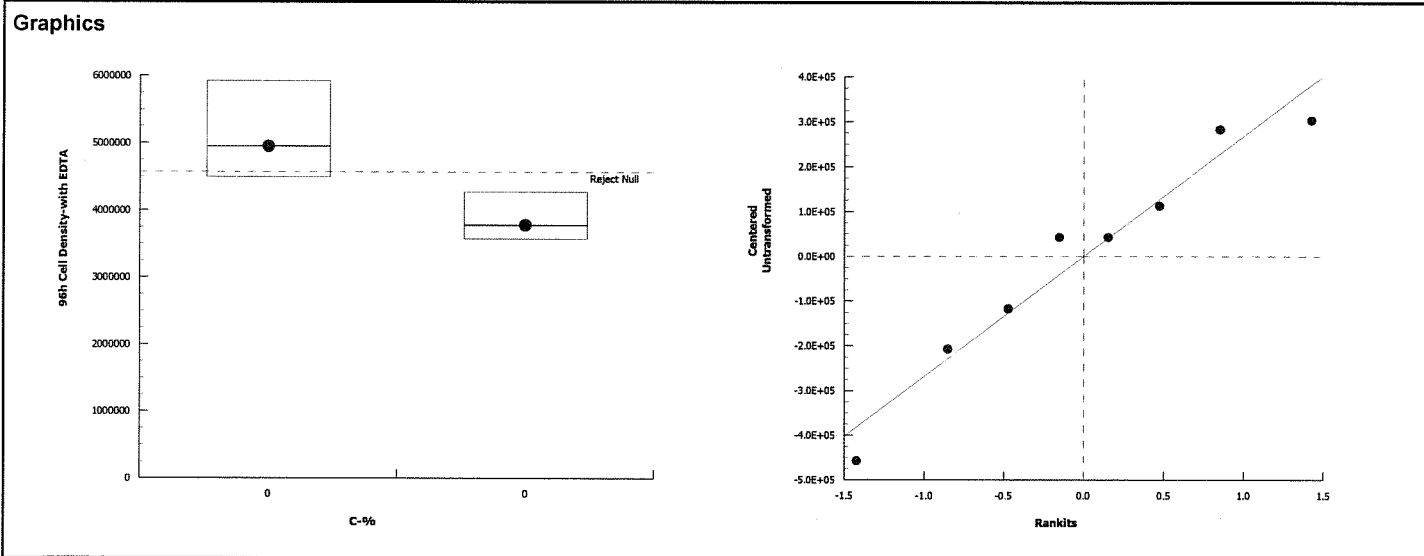
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	10.0%	Passes 96h cell density-with edta

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	-6.02	1.94	4E+05	6	0.9995	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.7378E+12	2.7378E+12	1	36.2	0.0010	Significant Effect
Error	4.5375E+11	75625000000	6			
Total	3.19155E+12		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F	2.28	47.5	0.5167	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.946	0.645	0.6692	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	3.78E+6	3.44E+6	4.12E+6	4280000	3.57E+6	4.06E+6	1.07E+5	5.69%	0.0%
0	Hardness Blank	4	4.95E+6	4.43E+6	5.46E+6	4280000	4.49E+6	5.25E+6	1.62E+5	6.55%	-31.0%



***Selenastrum capricornutum* Algal Toxicity Test Data Sheet**

Client: Lehigh Permanente Sample ID: Hardness Blank
 Test Start Date: 6/11/13 Test ID #: - Project #: 21069
 Test End Date: 6/15/13 Control/Diluent: Type 1 Water w/ EDTA Shelf #: RS/81

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Blank	25.5	8.36	9.1	2480	Date: 6/11/13
					Sample ID #: 32009
					Test Solution Prep: SS
					New WQ: OH
					Inoculation Time: 1500
Meter ID	65A	PH16	R004	EC06	Inoculation Signoff: SS
Hardness Blank	25.4	8.63			Date: 6-12-13
					WQ Time: 10.00
Meter ID	65-A	PH16			WQ Signoff: YL
Hardness Blank	25.2	8.76			Date: 6.13.13
					WQ Time: 0900
Meter ID	65A	PH15			WQ Signoff: YH
Hardness Blank	25.3	8.93			Date: 6-14-13
					WQ Time: 09-00
Meter ID	65A	PH18			WQ Signoff: YL
Hardness Blank	25.2	8.43	9.15	13.4	2319
					Date: 6/15/13
					WQ Time: 0910
Meter ID	65A	PH16	R006	EC07	WQ Signoff: FOR

Initial Count: 10,000 cells/mLTermination Time: 1500Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10 ⁶)				Mean Cell Density (cells/mL x 10 ⁶)		
	Rep A	Rep B	Rep C	Rep D			
Hardness Blank	4.49	5.06	5.25	4.99	4.95		
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:
			4.95	6.55	6/15/13	1800	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 353	✓ 631	403.57

Appendix E

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



CETIS Summary Report

Report Date: 20 Jun-13 09:58 (p 1 of 1)
 Test Code: 52149 | 04-8313-7367

Algal Growth Test							Pacific EcoRisk				
Batch ID:	14-0797-9796	Test Type:	Cell Growth				Analyst:	Padrick Anderson			
Start Date:	11 Jun-13 15:00	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Laboratory Water			
Ending Date:	15 Jun-13 16:15	Species:	Selenastrum capricornutum				Brine:	Not Applicable			
Duration:	4d 1h	Source:	In-House Culture				Age:	6			
Sample ID:	07-9648-1692	Code:	Pond 14				Client:	Lehigh Permanente			
Sample Date:	10 Jun-13 12:52	Material:	Effluent				Project:	21069			
Receive Date:	10 Jun-13 15:20	Source:	Lehigh Permanente								
Sample Age:	26h (11.9 °C)	Station:	Pond 14								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
19-2527-6414	96h Cell Density-with EDTA 0		>0		9.48%		Equal Variance t Two-Sample Test				
19-6632-5994	96h Cell Density-with EDTA 100		>100	NA	5.4%	1	Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
13-1441-1695	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	4.95E+6	4.83E+6	5.07E+6	4.49E+6	5.25E+6	1.62E+5	3.24E+5	6.55%	0.0%
0	Lab Water Contr	4	3.97E+6	3.89E+6	4.05E+6	3.80E+6	4.25E+6	1.06E+5	2.12E+5	5.34%	19.8%
6.25		4	4.23E+6	4.20E+6	4.25E+6	4.13E+6	4.28E+6	3.28E+4	6.56E+4	1.55%	14.6%
12.5		4	4.25E+6	4.18E+6	4.31E+6	4.03E+6	4.41E+6	8.64E+4	1.73E+5	4.07%	14.1%
25		4	4.57E+6	4.56E+6	4.58E+6	4.55E+6	4.62E+6	1.68E+4	3.37E+4	0.74%	7.63%
50		4	4.66E+6	4.62E+6	4.69E+6	4.53E+6	4.77E+6	4.92E+4	9.84E+4	2.11%	5.86%
100		4	5.32E+6	5.29E+6	5.35E+6	5.24E+6	5.40E+6	3.65E+4	7.30E+4	1.37%	-7.53%
96h Cell Density-with EDTA Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Hardness Blank	4.49E+6	5.06E+6	5.25E+6	4.99E+6						
0	Lab Water Contr	4.25E+6	3.80E+6	4.01E+6	3.81E+6						
6.25		4.25E+6	4.24E+6	4.28E+6	4.13E+6						
12.5		4.36E+6	4.19E+6	4.03E+6	4.41E+6						
25		4.62E+6	4.55E+6	4.55E+6	4.56E+6						
50		4.67E+6	4.77E+6	4.66E+6	4.53E+6						
100		5.28E+6	5.36E+6	5.40E+6	5.24E+6						

CETIS Analytical Report

Report Date: 19 Jun-13 12:40 (p 1 of 2)
Test Code: 52149 | 04-8313-7367

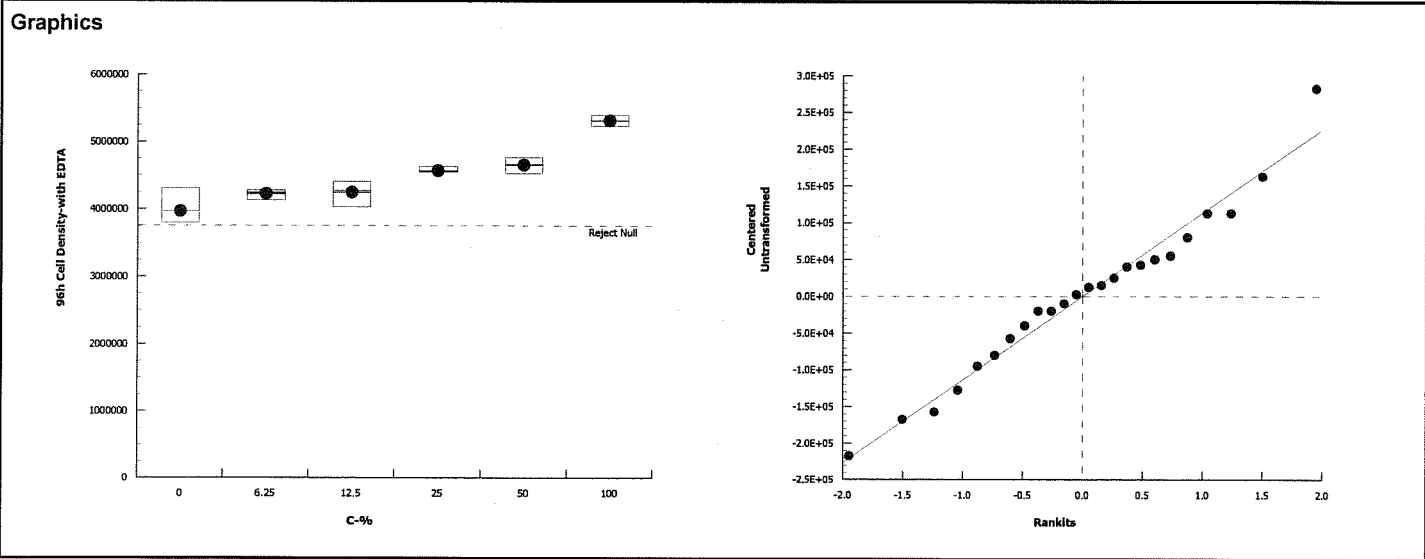
Algal Growth Test						Pacific EcoRisk			
Analysis ID:	19-6632-5994	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5				
Analyzed:	19 Jun-13 12:39	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes				
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	5.4%	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	-2.89	2.41	2E+05	6	0.9999	CDF	Non-Significant Effect
		12.5	-3.14	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		25	-6.77	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		50	-7.75	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect
		100	-15.2	2.41	2E+05	6	1.0000	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.500071E+12	9.000141E+11	5	56.7	<0.0001	Significant Effect
Error	2.85525E+11	15862500000	18			
Total	4.785596E+12		23			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance	10.2	15.1	0.0688	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.98	0.884	0.8893	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	3.97E+6	3.63E+6	4.30E+6	3910000	3.80E+6	4.25E+6	1.06E+5	5.34%	0.0%	
6.25		4	4.23E+6	4.12E+6	4.33E+6	4250000	4.13E+6	4.28E+6	3.28E+4	1.55%	-6.49%	
12.5		4	4.25E+6	3.97E+6	4.52E+6	4280000	4.03E+6	4.41E+6	8.64E+4	4.07%	-7.06%	
25		4	4.57E+6	4.52E+6	4.62E+6	4560000	4.55E+6	4.62E+6	1.68E+4	0.74%	-15.2%	
50		4	4.66E+6	4.50E+6	4.81E+6	4670000	4.53E+6	4.77E+6	4.92E+4	2.11%	-17.4%	
100		4	5.32E+6	5.20E+6	5.44E+6	5320000	5.24E+6	5.40E+6	3.65E+4	1.37%	-34.1%	



CETIS Analytical Report

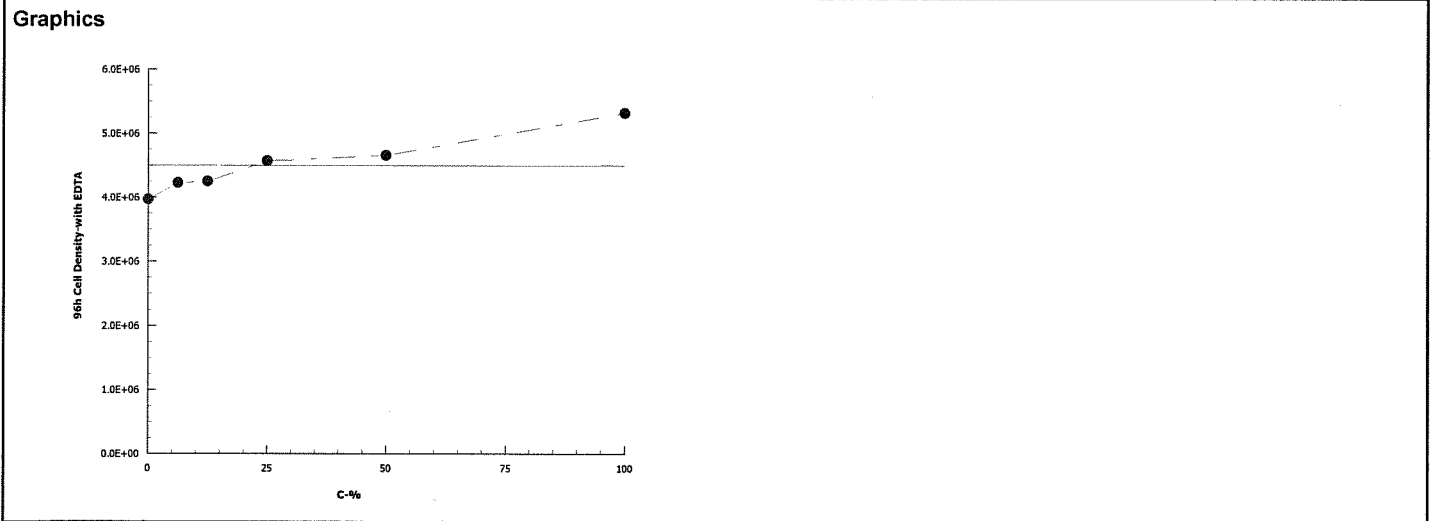
Report Date: 19 Jun-13 12:40 (p 1 of 1)
Test Code: 52149 | 04-8313-7367

Algal Growth Test			Pacific EcoRisk		
Analysis ID:	13-1441-1695	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5
Analyzed:	19 Jun-13 12:40	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	260388	200	Yes	Two-Point Interpolation

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

96h Cell Density-with EDTA Summary			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	3.97E+6	3.80E+6	4.25E+6	1.06E+5	2.12E+5	5.34%	0.0%
6.25		4	4.23E+6	4.13E+6	4.28E+6	3.28E+4	6.56E+4	1.55%	-6.49%
12.5		4	4.25E+6	4.03E+6	4.41E+6	8.64E+4	1.73E+5	4.07%	-7.06%
25		4	4.57E+6	4.55E+6	4.62E+6	1.68E+4	3.37E+4	0.74%	-15.2%
50		4	4.66E+6	4.53E+6	4.77E+6	4.92E+4	9.84E+4	2.11%	-17.4%
100		4	5.32E+6	5.24E+6	5.40E+6	3.65E+4	7.30E+4	1.37%	-34.1%



***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: 6/11/13 Start Time: 1500 Project #: 21069
 Test End Date: 6/15/13 End Time: 1615 Test ID #: 52149

Treatment	Cell Density (cells/mL x 10 ⁶)				
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	4.25	3.80	4.01	3.81	3.97
6.25%	4.25	4.24	4.28	4.13	4.23
12.5%	4.36	4.19	4.03	4.41	4.25
25%	4.62	4.55	4.55	4.56	4.57
50%	4.67	4.77	4.66	4.53	4.66
100%	5.28	5.36	5.40	5.24	5.32
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.	Control Mean Density (cells/mL x 10 ⁶)	% CV	Date:	Time:	Signoff:
	3.97	5.34	6/15/13	1800	A

***Selenastrum capricornutum* Algal Toxicity Test Water Quality Data**

Client: Lehigh Permanente
 Test Material: Pond 14

Test ID #: 52149
 Project #: 21069

Test Date: 6/11/13
 Control/Diluent: Lab Water
 Shelf Zone #: R2/S1

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	25.4	7.50	8.9	91	Date: 6/11/13
6.25% Effluent	25.4	7.83	8.8	186	Sample ID: 32005
12.5% Effluent	25.4	7.70	8.9	283	Test Solution Prep: SS
25% Effluent	25.4	7.65	9.1	446	New WQ: OH
50% Effluent	25.4	7.71	9.3	708	Innoculation Time: 1500
100% Effluent	25.4	7.77	10.2	1215	Innoculation Signoff: SS
Meter ID:	06	PH16	R004	EC06	
Lab Water Control	25.4	8.51			Date: 6-12-13
6.25% Effluent	25.4	8.09			WQ Time: 1000
12.5% Effluent	25.4	7.95			WQ Signoff: YK
25% Effluent	25.4	7.89			
50% Effluent	25.4	8.10			
100% Effluent	25.4	8.26			
Meter ID:	06	PH16			
Lab Water Control	25.1	8.11			Date: 6-13-13
6.25% Effluent	25.1	8.27			WQ Time: 0900
12.5% Effluent	25.1	8.29			WQ Signoff: OH
25% Effluent	25.1	8.32			
50% Effluent	25.1	8.37			
100% Effluent	25.1	8.53			
Meter ID:	06	PH15			
Lab Water Control	25.1	9.58			Date: 6-14-13
6.25% Effluent	25.1	9.66			WQ Time: 09.00
12.5% Effluent	25.1	9.60			WQ Signoff: YK
25% Effluent	25.1	9.48			
50% Effluent	25.1	9.22			
100% Effluent	25.1	8.97			
Meter ID:	06	PH18			
Lab Water Control	25.1	9.47 9.51	10.0	102	Date: 6/15/13
6.25% Effluent	25.1	9.86 9.45	11.9	183	Termination Time: 1415
12.5% Effluent	25.1	10.08 9.44	12.6	270	Termination Signoff: KP
25% Effluent	25.1	10.26 9.41	13.9	413	WQ Time: 0930
50% Effluent	25.1	9.95 9.22	14.3	625	WQ Signoff: FMS
100% Effluent	25.1	9.72 9.10	14.1	1002	
Meter ID:	06	14 PH16 PH18	PD06	EC07	

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 162	✓ 564	410.68

CETIS Analytical Report

Report Date: 19 Jun-13 12:40 (p 2 of 2)
Test Code: 52149 | 04-8313-7367

Algal Growth Test					Pacific EcoRisk	
Analysis ID:	19-2527-6414	Endpoint:	96h Cell Density-with EDTA	CETIS Version:	CETISv1.8.5	
Analyzed:	19 Jun-13 12:40	Analysis:	Parametric-Two Sample	Official Results:	Yes	

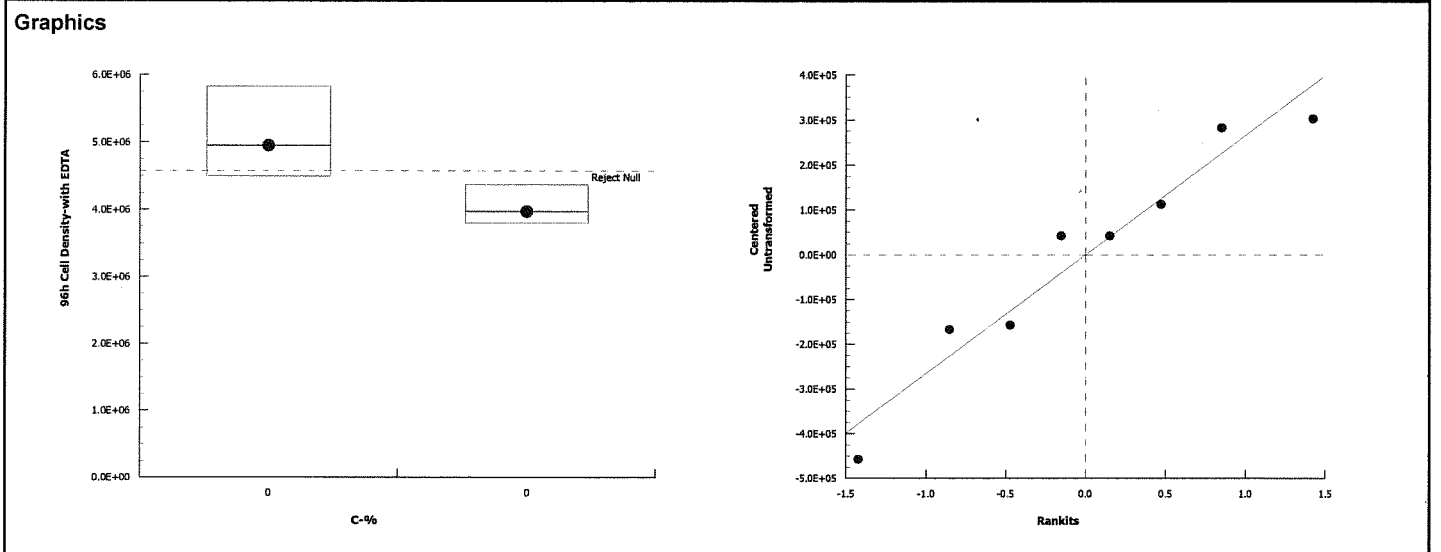
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	9.48%	Passes 96h cell density-with edta

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	-5.06	1.94	4E+05	6	0.9988	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.9208E+12	1.9208E+12	1	25.6	0.0023	Significant Effect
Error	4.4975E+11	74958330000	6			
Total	2.37055E+12		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F	2.34	47.5	0.5023	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.938	0.645	0.5901	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	3.97E+6	3.63E+6	4.30E+6	4370000	3.80E+6	4.25E+6	1.06E+5	5.34%	0.0%
0	Hardness Blank	4	4.95E+6	4.43E+6	5.46E+6	4370000	4.49E+6	5.25E+6	1.62E+5	6.55%	-24.7%



***Selenastrum capricornutum* Algal Toxicity Test Data Sheet**

Client: Lehigh Permanente Sample ID: Hardness Blank
 Test Start Date: 6/11/13 Test ID #: - Project #: 21069
 Test End Date: 6/15/13 Control/Diluent: Type 1 Water w/ EDTA Shelf #: R3/81

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Hardness Blank	25.5	8.36	9.1	2480	Date: 6/11/13
					Sample ID #: 32009
					Test Solution Prep: SS
					New WQ: OH
					Inoculation Time: 1500
					Inoculation Signoff: SS
Meter ID	65A	PH16	R004	EC06	Date: 6-12-13
Hardness Blank	25.4	8.63			WQ Time: 10.00
					WQ Signoff: YL
Meter ID	65A	PH16			Date: 6-13-13
Hardness Blank	25.2	8.76			WQ Time: 0900
					WQ Signoff: PH
Meter ID	65A	PH15			Date: 6-14-13
Hardness Blank	25.3	8.93			WQ Time: 09-00
					WQ Signoff: YL
Meter ID	65A	PH18			Date: 6/15/13
Hardness Blank	25.2	PH 8.15	13.4	2319	WQ Time: 0910
					WQ Signoff: F0B
Meter ID	65A	PH18	R006	EC07	

Initial Count: 10,000 cells/mLTermination Time: 1500Enumerating Scientist: KP

Treatment	Cell Density (cells/mL x 10 ⁶)				Mean Cell Density (cells/mL x 10 ⁶)
	Rep A	Rep B	Rep C	Rep D	
Hardness Blank	4.49	5.06	5.25	4.99	4.95
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:
		4.95	6.55	6/15/13	1400
					Signoff:

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
	✓ 353	✓ 681	403.57

Appendix F

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



CETIS Summary Report

Report Date: 19 Jun-13 12:08 (p 1 of 2)
Test Code: 52144 | 11-3000-3214

Ceriodaphnia Survival and Reproduction Test							Pacific EcoRisk				
Batch ID:	01-5566-1624	Test Type:	Reproduction-Survival (7d)				Analyst:	Padrick Anderson			
Start Date:	11 Jun-13 15:00	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Laboratory Water			
Ending Date:	17 Jun-13 17:40	Species:	Ceriodaphnia dubia				Brine:	Not Applicable			
Duration:	6d 3h	Source:	In-House Culture				Age:	1			
Sample ID:	13-5580-8120	Code:	Pond 9				Client:	Lehigh Permanente			
Sample Date:	10 Jun-13 12:13	Material:	Effluent				Project:	21069			
Receive Date:	10 Jun-13 15:20	Source:	Lehigh Permanente								
Sample Age:	27h (13.1 °C)	Station:	Pond 9								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
18-7490-9883	Reproduction	<0	0		8.37%		Equal Variance t Two-Sample Test				
09-7772-0554	Reproduction	50	100	70.71	19.1%	2	Bonferroni Adj t Test				
04-3601-1476	Survival	<0	0		NA		Fisher Exact Test				
04-7019-6108	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
03-0177-0288	Reproduction	IC5	17.3	4.22	52.8	5.791	Linear Interpolation (ICPIN)				
		IC10	23.1	15.3	80.6	4.323					
		IC15	69.9	20.2	N/A	1.432					
		IC20	99	24.2	N/A	1.01					
		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	7	5.99	8.01	4	12	0.856	2.71	38.7%	0.0%
0	Lab Water Contr	9	31.4	30	32.9	22	35	1.28	3.84	12.2%	-349.0%
6.25		10	30.6	29.4	31.8	23	34	1.01	3.2	10.5%	-337.0%
12.5		10	31.7	29.9	33.5	22	39	1.55	4.9	15.5%	-353.0%
25		10	24.9	21.9	27.9	11	34	2.56	8.1	32.5%	-256.0%
50		10	30.7	28.9	32.5	22	35	1.51	4.79	15.6%	-339.0%
100		10	25.1	22.8	27.4	17	35	1.97	6.23	24.8%	-259.0%
Survival Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	0.1	0	0.218	0	1	0.1	0.316	316.0%	0.0%
0	Lab Water Contr	10	0.8	0.643	0.957	0	1	0.133	0.422	52.7%	-700.0%
6.25		10	1	1	1	1	1	0	0	0.0%	-900.0%
12.5		10	1	1	1	1	1	0	0	0.0%	-900.0%
25		10	1	1	1	1	1	0	0	0.0%	-900.0%
50		10	1	1	1	1	1	0	0	0.0%	-900.0%
100		10	1	1	1	1	1	0	0	0.0%	-900.0%

CETIS Summary Report

Report Date:

19 Jun-13 12:08 (p 2 of 2)

Test Code:

52144 | 11-3000-3214

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	4	8	5	5	12	5	11	6	8	6
0	Lab Water Contr	35	34	34	31	31	32	22	33	31	
6.25		32	30	33	30	29	30	34	23	31	34
12.5		39	37	32	35	30	28	22	31	34	29
25		31	29	20	22	17	19	11	33	33	34
50		33	33	35	23	31	28	22	35	33	34
100		30	35	17	31	21	22	32	21	20	22
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	0	0	0	0	0	0	1	0	0	0
0	Lab Water Contr	1	1	1	1	1	0	1	0	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	0/1	0/1	0/1	0/1	0/1	0/1	1/1	0/1	0/1	0/1
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	0/1	1/1	0/1	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

PO

AB

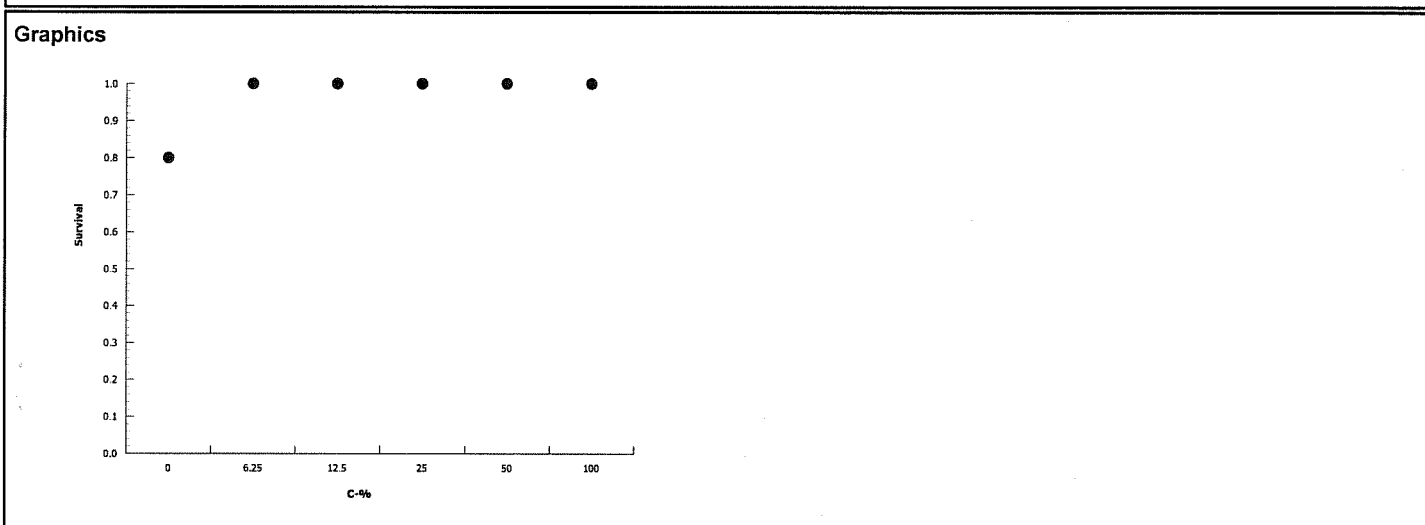
CETIS Analytical Report

Report Date: 19 Jun-13 12:08 (p 2 of 2)
Test Code: 52144 | 11-3000-3214

Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk			
Analysis ID: 04-7019-6108	Endpoint: Survival				CETIS Version: CETISv1.8.5			
Analyzed: 19 Jun-13 12:04	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

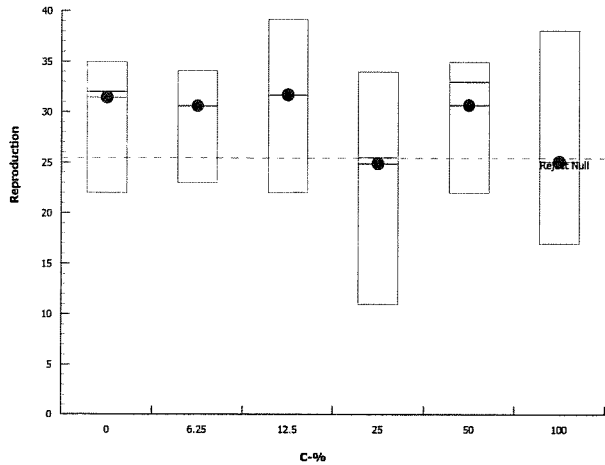
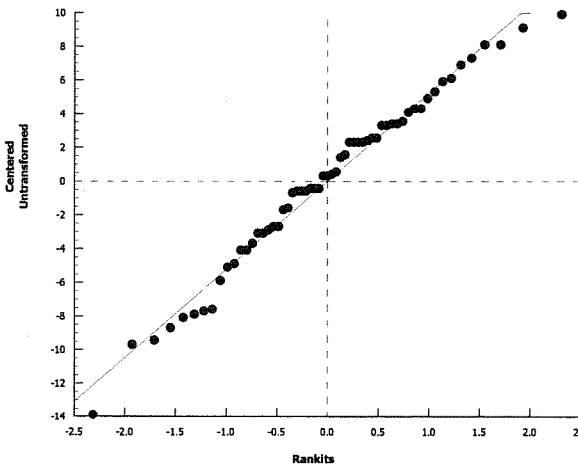
Fisher Exact/Bonferroni-Holm Test						
Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	1	1.0000	Exact	Non-Significant Effect
		12.5	1	1.0000	Exact	Non-Significant Effect
		25	1	1.0000	Exact	Non-Significant Effect
		50	1	1.0000	Exact	Non-Significant Effect
		100	1	1.0000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

Data Summary							
C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Water Cont	8	2	10	0.8	0.2	0.0%
6.25		10	0	10	1	0	-25.0%
12.5		10	0	10	1	0	-25.0%
25		10	0	10	1	0	-25.0%
50		10	0	10	1	0	-25.0%
100		10	0	10	1	0	-25.0%



CETIS Analytical Report

Report Date: 19 Jun-13 12:07 (p 2 of 2)
Test Code: 52144 | 11-3000-3214

Ceriodaphnia Survival and Reproduction Test										Pacific EcoRisk	
Analysis ID: 09-7772-0554		Endpoint: Reproduction		CETIS Version: CETISv1.8.5							
Analyzed: 19 Jun-13 12:06		Analysis: Parametric-Multiple Comparison		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU		
Untransformed	NA	C > T	NA	NA	19.1%	50	100	70.71	2		
Bonferroni Adj t Test											
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)		
Lab Water Control		6.25	0.337	2.4	6	17	1.0000	CDF	Non-Significant Effect		
		12.5	-0.102	2.4	6	17	1.0000	CDF	Non-Significant Effect		
		25*	2.61	2.4	6	17	0.0290	CDF	Significant Effect		
		50	0.297	2.4	6	17	1.0000	CDF	Non-Significant Effect		
		100*	2.53	2.4	6	17	0.0356	CDF	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	501.31		100.262		5	3.38	0.0101	Significant Effect			
Error	1572.622		29.67212		53						
Total	2073.932				58						
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Bartlett Equality of Variance		9.4	15.1	0.0943	Equal Variances					
Distribution	Shapiro-Wilk W Normality		0.981	0.945	0.4819	Normal Distribution					
Reproduction Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	9	31.4	28.5	34.4	32	22	35	1.28	12.2%	0.0%
6.25		10	30.6	28.3	32.9	30.5	23	34	1.01	10.5%	2.69%
12.5		10	31.7	28.2	35.2	31.5	22	39	1.55	15.5%	-0.81%
25		10	24.9	19.1	30.7	25.5	11	34	2.56	32.5%	20.8%
50		10	30.7	27.3	34.1	33	22	35	1.51	15.6%	2.37%
100		10	25.1	20.6	29.6	22	17	35	1.97	24.8%	20.2%
Graphics											
											

CETIS Analytical Report

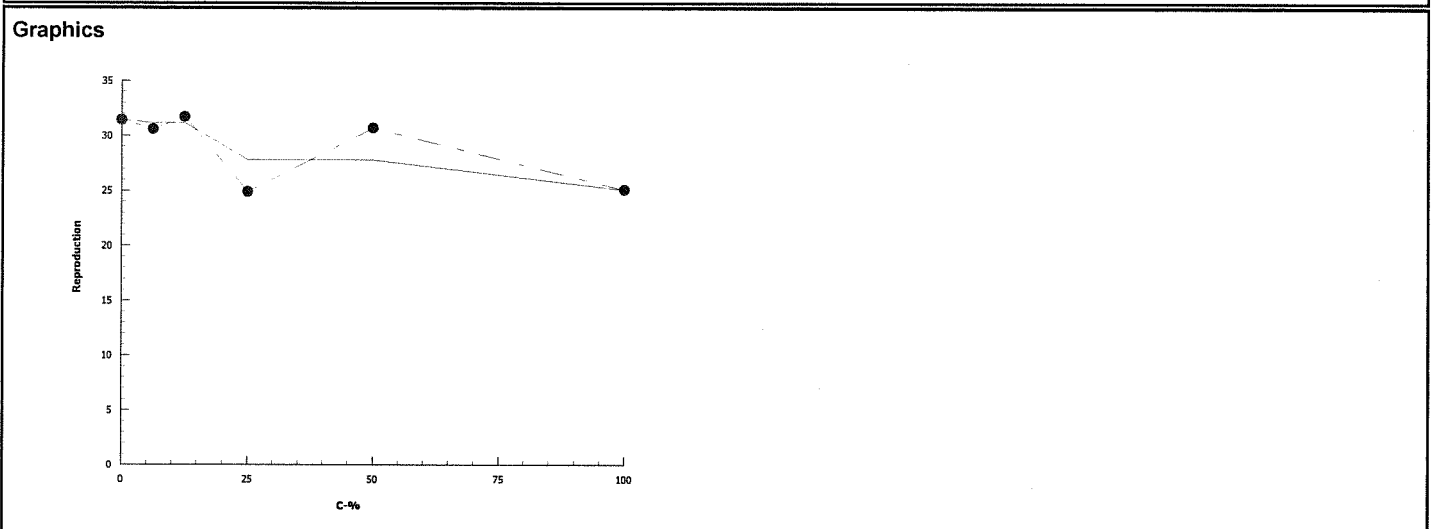
Report Date: 19 Jun-13 12:08 (p 1 of 1)
Test Code: 52144 | 11-3000-3214

Ceriodaphnia Survival and Reproduction Test				Pacific EcoRisk	
Analysis ID:	03-0177-0288	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.5
Analyzed:	19 Jun-13 12:07	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	345448	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	17.3	4.22	52.8	5.791	1.894	23.67
IC10	23.1	15.3	80.6	4.323	1.24	6.548
IC15	69.9	20.2	N/A	1.432	NA	4.942
IC20	99	24.2	N/A	1.01	NA	4.133
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	9	31.4	22	35	1.28	3.84	12.2%	0.0%
6.25		10	30.6	23	34	1.01	3.2	10.5%	2.69%
12.5		10	31.7	22	39	1.55	4.9	15.5%	-0.81%
25		10	24.9	11	34	2.56	8.1	32.5%	20.8%
50		10	30.7	22	35	1.51	4.79	15.6%	2.37%
100		10	25.1	17	35	1.97	6.23	24.8%	20.2%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test DataClient: Lehigh PermanenteMaterial: Pond 9Test Date: 6/11/13Project #: 21069Test ID: 52144Randomization: 10.6.9Control Water: Modified EPAMH

	Day	pH		D.O.		Cond. (μ S/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date	New WQ:	Test Init:
Lab Water Control	0	8.05		8.9		344	25.5	0	0	0	0	0	0	0	0	0	0	6/11/13	New WQ: <u>YK</u>	Test Init: <u>1500</u>
	1	8.14	8.17	8.5	8.8	346	25.5	0	0	0	0	0	0	0	0	0	0	6/12/13	New WQ: <u>RA</u>	Counts: <u>1410</u>
	2	7.90	8.00	8.7	8.7	383	25.5	0	0	0	0	0	0	0	0	0	0	6-13-13	New WQ: <u>RA</u>	Counts: <u>1410</u>
	3	7.78	8.17	8.6	8.8	345	25.3	5	5	0	6	5	5	6	5	6	6	6/14/13	New WQ: <u>DS</u>	Counts: <u>1530</u>
	4	7.99	8.11	8.5	8.6	342	25.6	0	0	0	0	11	9	0	11	0	0	6/15/13	New WQ: <u>W</u>	Counts: <u>1404</u>
	5	8.06	8.10	8.7	8.4	358	25.6	14	12	0	12	0	0	9	0	11	11	6-16-13	New WQ: <u>CA</u>	Counts: <u>1530</u>
	6	8.13	8.24	8.5	8.9	349	25.5	16	17	0	16	15	17	17	16	16	14	6-17-13	New WQ: <u>SN</u>	Counts: <u>1740</u>
	7												-		-				New WQ:	Counts:
	8												-		-				Old WQ:	Time:
	Total=	35		34		30		34	31	14	31	32	14	22	33	31		Mean Neonates/Female = 31.4		
6.25%	Day	pH		D.O.		Cond. (μ S/cm)		Survival / Reproduction										Sample ID		
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J			
	0	7.94		8.8		441		0	0	0	0	0	0	0	0	0	0	32003		
	1	8.04	8.09	8.6	8.6	421		0	0	0	0	0	0	0	0	0	0	32003		
	2	7.90	8.00	8.6	8.7	413		0	0	0	0	0	0	0	0	0	0	32037		
	3	7.86	8.21	8.7	8.9	426		6	7	5	5	6	6	5	6	5	6	32037		
	4	7.95	8.09	8.4	8.6	425		0	0	0	10	10	0	0	0	11	0	32058		
	5	8.05	8.12	8.7	8.3	427		11	6	11	0	0	10	12	5	0	10	32058		
	6	8.09	8.18	8.5	8.6	428		15	17	17	15	13	14	17	12	15	18	32058		
	7																			
	8																			
	Total=	32		30		33		30	29	30	34	23	31	34				Mean Neonates/Female = 30.6		

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test DataClient: Lehigh PermanenteMaterial: Pond 9Test Date: 6/11/13Project #: 21069Test ID: 52144Control Water: Modified EPAMH

	Day	pH		D.O.		Cond. (μ S/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
12.5%	0	7.90		8.6		493		0	0	0	0	0	0	0	0	0	0	
	1	7.97	8.08	8.6	8.5	490		0	0	0	0	0	0	0	0	0	0	
	2	7.88	8.17	8.7	8.6	491		0	0	0	0	0	0	0	0	0	0	
	3	7.93	8.23	8.7	8.7	492		5	5	5	6	5	5	6	5	5	5	
	4	7.93	8.13	8.4	8.6	507		0	0	0	12	10	10	0	11	0	0	
	5	8.02	8.18	8.7	8.4	504		15	13	11	0	0	0	11	0	11	11	
	6	8.06	8.14	8.6	8.5	504		19	19	16	17	15	13	5	15	18	13	
	7																	
	8																	
Total=								39	37	32	35	30	28	22	31	34	29	Mean Neonates/Female = 31.7
25%	0	7.86		8.6		624		0	0	0	0	0	0	0	0	0	0	
	1	7.90	8.09	8.8	8.4	639		0	0	0	0	0	0	0	0	0	0	
	2	7.85	8.20	8.8	8.6	632		0	0	0	0	0	0	0	0	0	0	
	3	7.91	8.27	8.7	8.7	642		5	5	6	0	5	5	0	6	6	5	
	4	7.91	8.22	8.5	8.5	641		0	0	0	7	0	0	0	10	0	11	
	5	7.99	8.26	8.8	8.3	638		8	9	10	0	0	0	5	0	11	0	
	6	8.04	8.20	8.7	8.4	643		18	15	13	15	12	14	6	17	16	18	
	7																	
	8																	
Total=								31	29	20	22	17	19	11	33	33	34	Mean Neonates/Female = 24.9

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test DataClient: Lehigh PermanenteMaterial: Pond 9Test Date: 6/11/13Project #: 21069Test ID: 52144Control Water: Modified EPAMH

	Day	pH		D.O.		Cond. (μ S/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	
50%	0	7.82		8.7		885		0	0	0	0	0	0	0	0	0	0	
	1	7.83	8.19	8.9	8.4	886		0	0	0	0	0	0	0	0	0	0	
	2	7.82	8.29	8.9	8.6	890		0	0	0	0	0	0	0	0	0	0	
	3	7.90	8.24	8.9	8.8	912		5	5	6	5	6	5	5	6	5	7	
	4	7.92	8.30	8.7	8.6	926		0	0	0	10	11	9	0	11	10	0	
	5	7.94	8.35	9.1	8.3	903		11	9	11	0	0	0	9	0	0	11	
	6	8.01	8.29	9.0	8.4	904		17	19	18	8	14	14	8	18	18	16	
	7																	
	8																	
Total=								33	33	35	23	31	28	22	35	33	34	Mean Neonates/Female = 30.7
100%	0	7.77		8.9		1335		0	0	0	0	0	0	0	0	0	0	
	1	7.80	8.13	9.3	8.5	1333		0	0	0	0	0	0	0	0	0	0	
	2	7.69	8.19	9.2	8.7	1370		0	0	0	0	0	0	0	0	0	0	
	3	7.88	8.38	9.4	8.7	1382		4	6	7	6	6	6	6	5	7	6	
	4	7.86	8.17	9.1	8.5	1348		0	0	0	10	9	11	0	9	10	0	
	5	7.80	8.23	9.8	8.4	1373		11	13	10	0	0	0	13	0	0	0	
	6	7.94	8.19	9.6	8.4	1375		15	16	0	15	6	5	13	7	3	16	
	7																	
	8																	
Total=								30	35	17	31	21	22	32	21	20	22	Mean Neonates/Female = 25.1

CETIS Analytical Report

Report Date: 19 Jun-13 12:08 (p 1 of 2)
 Test Code: 52144 | 11-3000-3214

Ceriodaphnia Survival and Reproduction Test						Pacific EcoRisk	
Analysis ID: 04-3601-1476		Endpoint: Survival		CETIS Version: CETISv1.8.5			
Analyzed: 19 Jun-13 12:04		Analysis: Single 2x2 Contingency Table		Official Results: Yes			
Data Transform		Zeta	Alt Hyp	Trials	Seed	Test Result	
Untransformed			C > T	NA	NA	Fails survival	
Fisher Exact Test							
Control	vs	Control	Test Stat	P-Value	P-Type	Decision(α:5%)	
Lab Water Control		Hardness Blank	0.00274	0.0027	Exact	Significant Effect	
Data Summary							
C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Hardness Blank	1	9	10	0.1	0.9	87.5%
0	Lab Water Cont	8	2	10	0.8	0.2	0.0%
Graphics							

CETIS Analytical Report

Report Date: 19 Jun-13 12:07 (p 1 of 2)
Test Code: 52144 | 11-3000-3214

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 18-7490-9883	Endpoint: Reproduction	CETIS Version: CETISv1.8.5
Analyzed: 19 Jun-13 12:04	Analysis: Parametric-Two Sample	Official Results: Yes

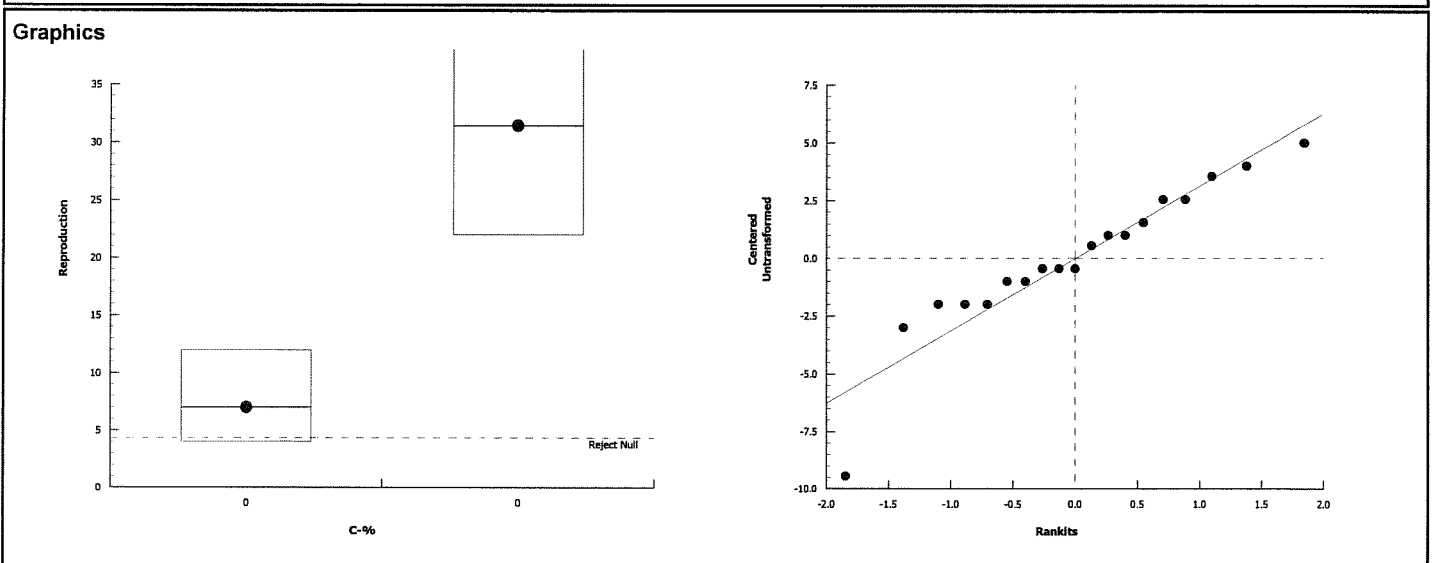
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	8.37%	Fails reproduction

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	16.2	1.74	2.63	17	<0.0001	CDF	Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2830.409	2830.409	1	261	<0.0001	Significant Effect
Error	184.2222	10.8366	17			
Total	3014.632		18			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F	2.02	6.69	0.3169	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.91	0.861	0.0728	Normal Distribution	

Reproduction Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	9	31.4	28.5	34.4	12	22	35	1.28	12.2%	0.0%
0	Hardness Blank	10	7	5.06	8.94	12	4	12	0.856	38.7%	77.7%



Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test DataClient: Lehigh PermanenteMaterial: Hardness ControlTest Date: 6/11/13Project #: 21069Test ID: 90-52147-52144Randomization: 10.2.1Control Water: Modified EPAMH

	Day	pH		D.O.		Cond. (μ S/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF		
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date	New WQ:	Test Init:
Hardness Control	0	8.33		8.6		2371	25.5	0	0	0	0	0	0	0	0	0	0	6/11/13	New WQ: YUC	Test Init: 1500
	1	8.37	8.73	8.8	8.7	2361	25.5	0	0	0	0	0	0	0	0	0	0	6/12/13	New WQ: RA	Counts: 1500
	2	8.36	8.64	9.0	8.9	2362	25.5	0	0	0	0	0	0	0	0	0	0	6/13/13	New WQ: W	Counts: 1500
	3	8.32	8.80	9.1	9.0	2364	25.3	4	6	5	5	4	5	5	6	0	6	6/14/13	New WQ: DS	Counts: 1500
	4	8.24	8.76	9.5	8.7	2404	25.6	X/0	0	0	X/0	7	X/0	0	X/0	5	X/0	6/15/13	New WQ: W	Counts: 1500
	5	8.32	8.76	8.9	8.5	2344	25.6	-	X/2	X/0	-	X/1	-	4	-	3	-	6-16-13	New WQ: CA	Counts: 1500
	6	8.37	8.74	9.2	8.5	2355	25.5	-	-	-	-	-	-	2	-	X/0	-	6-17-13	New WQ: SW	Counts: 1500
	7							-	-	-	-	-	-	-	-	-	-		New WQ:	Counts:
	8							-	-	-	-	-	-	-	-	-	-		Old WQ:	Time:
Total=								4	8	X/5	5	X/12	5	11	X/8	X/6	X/6	Mean Neonates/Female = 4.9 7.0		

Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test DataClient: Lehigh PermanenteMaterial: Meter IDsTest Date: 6/11/13Project #: 21069Test ID: 52144Control Water: Modified EPAMH

	Day	pH		D.O.		Cond. (μ S/cm)	Temp (°C)													SIGN-OFF		
		New	Old	New	Old															Date:	New WQ:	Old WQ:
Meter ID's	0	PH16		RD04		ECO6	30A													6/11/13	EC	-
	1	PH19	PH19	RD07	RD07	ECO7	30A													6/12/13	RA	SS
	2	PH15	PH15	RD04	RD04	ECO4	30A													6-13-13	NO	NO
	3	PH16	PH18	RD06	RD05	ECO4	30A													6/14/13	DS	EC
	4	PH15	PH15	RD07	RD07	ECO4	30A													6/15/13	SS	SS
	5	PH18	PH16	RD07	RD06	ECO7	30A													6-16-13	CA	SVV
	6	PH19	PH16	RD04	RD06	ECO6	30A													6-17-13	SVV	RS
	7																			Date:	New WQ:	Old WQ:
	8																			Date:	New WQ:	Old WQ:

Appendix G

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



CETIS Summary Report

Report Date: 20 Jun-13 11:44 (p 1 of 2)
Test Code: 52142 | 19-3241-5977

Chronic Larval Fish Survival and Growth Test							Pacific EcoRisk				
Batch ID:	05-7255-8125	Test Type:	Growth-Survival (7d)				Analyst:	Padrick Anderson			
Start Date:	11 Jun-13 16:00	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Laboratory Water			
Ending Date:	18 Jun-13 10:15	Species:	Pimephales promelas				Brine:	Not Applicable			
Duration:	6d 18h	Source:	Aquatox, AR				Age:	1			
Sample ID:	08-2165-1129	Code:	Pond 4A				Client:	Lehigh Permanente			
Sample Date:	10 Jun-13 11:09	Material:	Site Water				Project:	21069			
Receive Date:	10 Jun-13 15:20	Source:	Lehigh Permanente								
Sample Age:	29h (3 °C)	Station:	Pond 4A								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
05-9798-4735	7d Survival Rate	100	>100	NA	11.4%	1	Steel Many-One Rank Sum Test				
21-2306-3646	Mean Dry Biomass-mg	100	>100	NA	16.7%	1	Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
02-5548-4922	Mean Dry Biomass-mg	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)				
		IC10	>100	N/A	N/A	<1					
		IC15	>100	N/A	N/A	<1					
		IC20	>100	N/A	N/A	<1					
		IC25	>100	N/A	N/A	<1					
		IC40	>100	N/A	N/A	<1					
		IC50	>100	N/A	N/A	<1					
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	0.0%
0	Lab Water Contr	4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	-5.41%
6.25		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	-5.41%
12.5		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-2.7%
25		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	-5.41%
50		4	0.875	0.828	0.922	0.7	1	0.0629	0.126	14.4%	5.41%
100		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	-5.41%
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	0.634	0.618	0.649	0.58	0.677	0.0206	0.0411	6.49%	0.0%
0	Lab Water Contr	4	0.668	0.644	0.693	0.575	0.729	0.0329	0.0659	9.86%	-5.49%
6.25		4	0.677	0.668	0.687	0.653	0.712	0.0124	0.0248	3.66%	-6.95%
12.5		4	0.691	0.675	0.706	0.65	0.749	0.0209	0.0417	6.05%	-9.0%
25		4	0.764	0.742	0.785	0.687	0.813	0.0285	0.0569	7.46%	-20.5%
50		4	0.763	0.717	0.808	0.593	0.877	0.0603	0.121	15.8%	-20.4%
100		4	0.719	0.705	0.733	0.687	0.773	0.0187	0.0375	5.22%	-13.5%

CETIS Summary Report

Report Date: 20 Jun-13 11:44 (p 2 of 2)
 Test Code: 52142 | 19-3241-5977

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	0.9	0.9	1	0.9	
0	Lab Water Contr	0.9	1	1	1	
6.25		1	1	0.9	1	
12.5		1	1	0.9	0.9	
25		0.9	1	1	1	
50		1	0.9	0.9	0.7	
100		0.9	1	1	1	
Mean Dry Biomass-mg Detail						
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	
0	Hardness Blank	0.677	0.65	0.58	0.627	
0	Lab Water Contr	0.575	0.692	0.677	0.729	
6.25		0.653	0.712	0.672	0.673	
12.5		0.683	0.749	0.65	0.68	
25		0.754	0.687	0.8	0.813	
50		0.877	0.801	0.779	0.593	
100		0.71	0.773	0.705	0.687	
7d Survival Rate Binomials						
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	
0	Hardness Blank	9/10	9/10	10/10	9/10	
0	Lab Water Contr	9/10	10/10	10/10	10/10	
6.25		10/10	10/10	9/10	10/10	
12.5		10/10	10/10	9/10	9/10	
25		9/10	10/10	10/10	10/10	
50		10/10	9/10	9/10	7/10	
100		9/10	10/10	10/10	10/10	

CETIS Analytical Report

Report Date: 20 Jun-13 11:44 (p 1 of 2)
Test Code: 52142 | 19-3241-5977

Chronic Larval Fish Survival and Growth Test										Pacific EcoRisk	
Analysis ID: 05-9798-4735		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.5							
Analyzed: 20 Jun-13 11:44		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		11.4%	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	2	6	0.8333	Asymp	Non-Significant Effect		
		12.5	16	10	2	6	0.6105	Asymp	Non-Significant Effect		
		25	18	10	2	6	0.8333	Asymp	Non-Significant Effect		
		50	13.5	10	2	6	0.2853	Asymp	Non-Significant Effect		
		100	18	10	2	6	0.8333	Asymp	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.06861622		0.01372324		5	1.25	0.3260	Non-Significant Effect			
Error	0.1970511		0.01094728		18						
Total	0.2656673				23						
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Bartlett Equality of Variance		3.17	15.1	0.6731		Equal Variances				
Distribution	Shapiro-Wilk W Normality		0.833	0.884	0.0011		Non-normal Distribution				
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
6.25		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
12.5		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	2.56%
25		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
50		4	0.875	0.675	1	0.9	0.7	1	0.0629	14.4%	10.3%
100		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	0.0%
Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	0.0%
6.25		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	0.0%
12.5		4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	2.97%
25		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	0.0%
50		4	1.23	0.948	1.5	1.25	0.991	1.41	0.087	14.2%	10.6%
100		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	0.0%

Chronic Larval Fish Survival and Growth Test

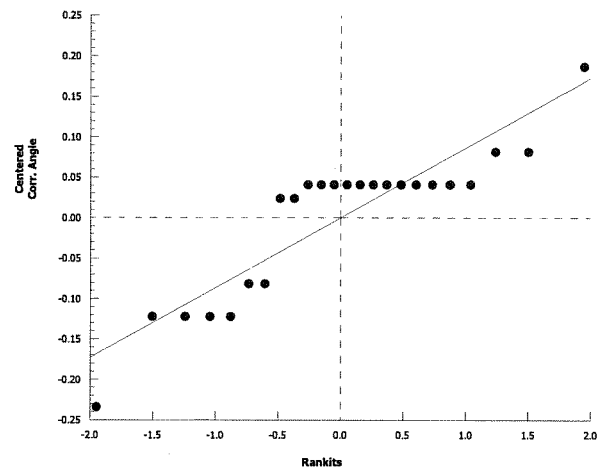
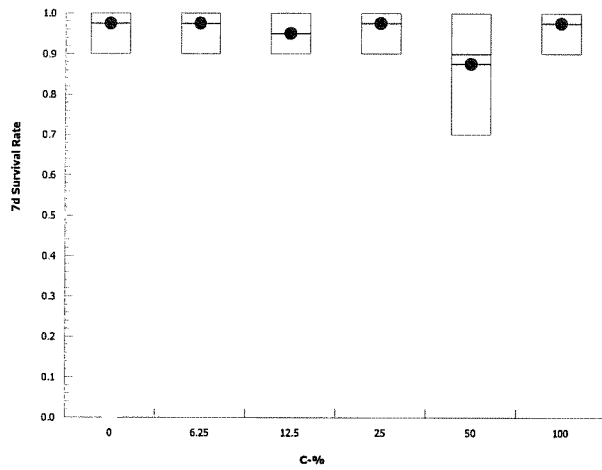
Pacific EcoRisk

Analysis ID: 05-9798-4735
 Analyzed: 20 Jun-13 11:44

Endpoint: 7d Survival Rate
 Analysis: Nonparametric-Control vs Treatments

CETIS Version: CETISv1.8.5
 Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 19 Jun-13 16:24 (p 5 of 6)

Test Code: 52142 | 19-3241-5977

Chronic Larval Fish Survival and Growth Test						Pacific EcoRisk			
Analysis ID:	21-2306-3646	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.5				
Analyzed:	19 Jun-13 16:23	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes				

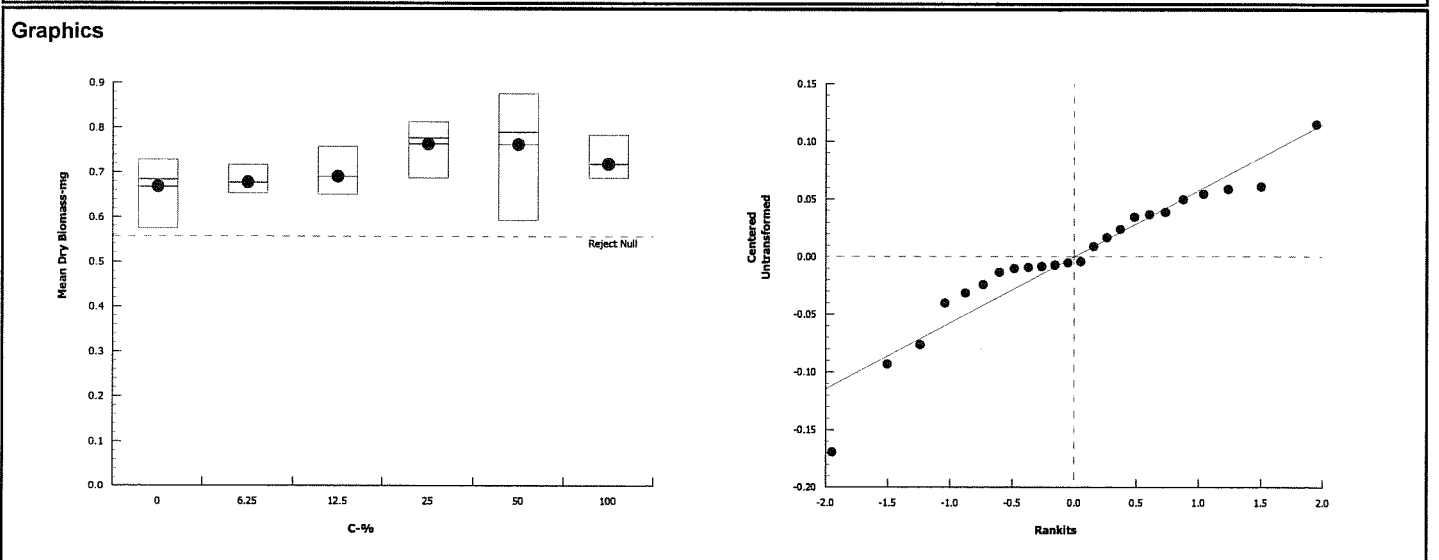
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	16.7%	100	>100	NA	1

Dunnett Multiple Comparison Test									
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-0.199	2.41	0.112	6	0.8853	CDF	Non-Significant Effect
		12.5	-0.479	2.41	0.112	6	0.9367	CDF	Non-Significant Effect
		25	-2.05	2.41	0.112	6	0.9992	CDF	Non-Significant Effect
		50	-2.03	2.41	0.112	6	0.9992	CDF	Non-Significant Effect
		100	-1.09	2.41	0.112	6	0.9864	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.03520463	0.007040927	5	1.63	0.2022	Non-Significant Effect
Error	0.07763334	0.004312963	18			
Total	0.112838		23			

Distributional Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	8.08	15.1	0.1521	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.935	0.884	0.1254	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	0.668	0.563	0.773	0.685	0.575	0.729	0.0329	9.86%	0.0%
6.25		4	0.677	0.638	0.717	0.672	0.653	0.712	0.0124	3.66%	-1.38%
12.5		4	0.691	0.624	0.757	0.682	0.65	0.749	0.0209	6.05%	-3.33%
25		4	0.764	0.673	0.854	0.777	0.687	0.813	0.0285	7.46%	-14.3%
50		4	0.763	0.571	0.954	0.79	0.593	0.877	0.0603	15.8%	-14.1%
100		4	0.719	0.659	0.778	0.707	0.687	0.773	0.0187	5.22%	-7.56%



CETIS Analytical Report

Report Date: 19 Jun-13 16:24 (p 1 of 1)

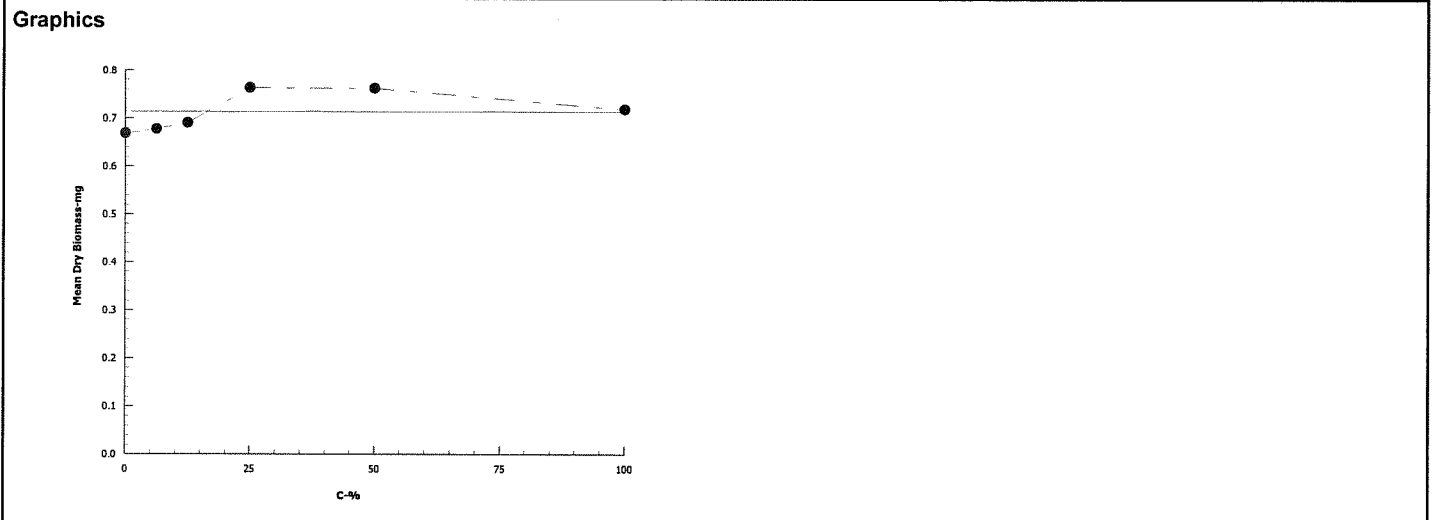
Test Code: 52142 | 19-3241-5977

Chronic Larval Fish Survival and Growth Test				Pacific EcoRisk
Analysis ID: 02-5548-4922	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.8.5		
Analyzed: 19 Jun-13 16:23	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes		

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	10351	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 Control	4	0.668	0.575	0.729	0.0329	0.0659	9.86%	0.0%
6.25		4	0.677	0.653	0.712	0.0124	0.0248	3.66%	-1.38%
12.5		4	0.691	0.65	0.749	0.0209	0.0417	6.05%	-3.33%
25		4	0.764	0.687	0.813	0.0285	0.0569	7.46%	-14.3%
50		4	0.763	0.593	0.877	0.0603	0.121	15.8%	-14.1%
100		4	0.719	0.687	0.773	0.0187	0.0375	5.22%	-7.56%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Pond 4A
 Test ID#: 52142 Project #: 21069
 Test Date: 6-11-13 Randomization: 4-7-5

Organism Log#: 7323 Age: 248hrs
 Organism Supplier: Aquator
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Treatment (%)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water	25.5	8.18		8.8		302	10	10	10	10	Date: 6-11-13
6.25	25.5	8.09		8.6		371	10	10	10	10	Sample ID: 32002
12.5	25.5	8.05		8.8		423	10	10	10	10	Test Solution Prep: <i>W</i>
25	25.5	8.05		8.9		546	10	10	10	10	New WQ: <i>OH</i>
50	25.5	8.07		9.2		756	10	10	10	10	Initiation Time: 1600
100	25.5	8.03		9.8		1148	10	10	10	10	Initiation Signoff: <i>W</i>
Meter ID	30A	PH16		RD04		EC06					
Lab Water	25.7	8.22	7.87	8.7	7.5	300	10	10	10	10	Date: 6/12/13
6.25	25.7	8.11	8.04	8.6	7.8	380	10	10	10	10	Sample ID: 32002
12.5	25.7	8.09	7.98	8.7	7.6	428	10	10	10	10	Test Solution Prep: <i>W</i>
25	25.7	8.03	7.90	8.8	7.7	540	9	10	10	10	New WQ: <i>RA</i>
50	25.7	7.97	8.06	8.9	7.7	758	10	10	10	9	Renewal Time: 1130
100	25.7	7.94	8.04	9.7	7.8	1139	10	10	10	10	Renewal Signoff: <i>W</i>
Meter ID	30A	PH19	PH19	RD07	RD07	EC07					Old WQ: <i>W</i>
Lab Water	25.6	8.34	8.47	9.2	8.3	299	10	10	10	10	Date: 6/13/13
6.25	25.6	8.19	8.06	8.8	8.3	361	10	10	10	10	Sample ID: 3203C
12.5	25.6	8.11	7.99	8.7	8.1	413	10	10	10	10	Test Solution Prep: <i>W</i>
25	25.6	8.05	7.96	8.9	8.2	544	9	10	10	10	New WQ: <i>W</i>
50	25.6	7.99	8.06	9.3	8.2	744	10	10	10	8	Renewal Time: 1050
100	25.6	7.96	8.07	10.5	8.2	1140	9	10	10	10	Renewal Signoff: <i>W</i>
Meter ID	30A	PH18	PH16	RD07	RD05	EC06					Old WQ: <i>W</i>
Lab Water	25.3	8.18	7.68	8.8	8.0	301	9	10	10	10	Date: 6/14/13
6.25	25.3	8.47	8.41	8.7	7.3	379	10	10	10	10	Sample ID: 32036
12.5	25.3	8.29	8.07	8.7	7.3	424	10	10	10	9	Test Solution Prep: <i>W</i>
25	25.3	8.13	7.95	8.8	7.2	541	9	10	10	10	New WQ: <i>W</i>
50	25.3	8.09	8.01	8.9	7.1	753	10	9	10	8	Renewal Time: 1420
100	25.3	8.05	7.97	9.2	7.1	1131	9	10	10	10	Renewal Signoff: <i>W</i>
Meter ID	30A	PH16	PH16	RD06	RD06	EC06					Old WQ: <i>W</i>

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Pond 4A
 Test ID#: 52142 Project #: 21069
 Test Date: 6-11-13 Randomization: 4.7.5

Organism Log#: 7323 Age: 248 hrs
 Organism Supplier: Aquator
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Treatment (%)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water	25.7	8.17	8.25	8.5	8.5	297	9	10	10	10	Date: <u>6-11-13</u>
6.25	25.7	8.12	8.16	8.6	8.2	371	10	10	10	10	Sample ID: <u>32057</u>
12.5	25.7	8.09	8.10	8.7	8.2	417	10	10	10	9	Test Solution Prep: <u>in</u>
25	25.7	8.06	8.15	8.7	8.3	525	9	10	10	10	New WQ: <u>in</u>
50	25.7	8.01	8.24	8.9	8.3	739	10	9	10	7	Renewal Time: <u>1105</u>
100	25.7	7.94	8.16	9.1	8.3	1118	9	10	10	10	Renewal Signoff: <u>SS</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH16</u>	<u>RDO7</u>	<u>RDO6</u>	<u>EC04</u>					Old WQ: <u>MK</u>
Lab Water	25.5	8.27	8.03	8.8	7.7	303	9	10	10	10	Date: <u>6-16-13</u>
6.25	25.5	8.16	7.93	8.9	7.8	369	10	10	9	10	Sample ID: <u>32057</u>
12.5	25.5	8.12	7.80	9.1	7.5	420	10	10	10	9	Test Solution Prep: <u>in</u>
25	25.5	8.08	7.95	9.2	7.6	533	9	10	10	10	New WQ: <u>SVV</u>
50	25.5	8.03	8.09	9.6	7.8	747	10	9	10	7	Renewal Time: <u>1055</u>
100	25.5	7.94	7.98	10.4	7.8	1125	9	10	10	10	Renewal Signoff: <u>in</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH18</u>	<u>RDO5</u>	<u>RDO7</u>	<u>EC04</u>					Old WQ: <u>GA</u>
Lab Water	25.3	8.34	7.83	8.7	7.7	309	9	10	10	10	Date: <u>6-17-13</u>
6.25	25.3	8.22	7.98	8.8	7.8	376	10	10	9	10	Sample ID: <u>32057</u>
12.5	25.3	8.21	7.85	9.0	7.7	434	10	10	9	9	Test Solution Prep: <u>in</u>
25	25.3	8.11	7.93	9.2	7.6	547	9	10	10	10	New WQ: <u>SVV</u>
50	25.3	8.07	8.09	9.5	7.6	754	10	9	9	7	Renewal Time: <u>1140</u>
100	25.3	8.01	8.08	10.5	7.7	1129	9	10	10	10	Renewal Signoff: <u>in</u>
Meter ID	<u>30A</u>	<u>PH19</u>	<u>PH15</u>	<u>RDO4</u>	<u>RDO5</u>	<u>EC06</u>					Old WQ: <u>GA</u>
Lab Water	25.6		7.83		7.8	315	9	10	10	10	Date: <u>6/18/13</u>
6.25	25.6		8.13		7.6	397	10	10	9	10	Sample ID: <u>-</u>
12.5	25.6		7.96		7.3	433	10	10	9	9	Termination Time: <u>1015</u>
25	25.6		7.86		7.2	554	9	10	10	10	Termination Signoff: <u>in</u>
50	25.6		7.86		7.2	763	10	9	9	7	Old WQ: <u>in</u>
100	25.6		7.98		7.3	1124	9	10	10	10	
Meter ID	<u>30A</u>		<u>PH15</u>		<u>RDO4</u>	<u>EC06</u>					

CETIS Analytical Report

Report Date: 19 Jun-13 16:24 (p 1 of 6)
Test Code: 52142 | 19-3241-5977

Chronic Larval Fish Survival and Growth Test										Pacific EcoRisk	
Analysis ID: 15-9553-4935		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.5							
Analyzed: 19 Jun-13 16:23		Analysis: Parametric-Two Sample		Official Results: Yes							
Data Transform		Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result				
Angular (Corrected)		NA	C > T	NA	NA	7.07%	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	1.41	1.94	0.112	6	0.1035	CDF	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.01327967		0.01327967		1	2	0.2070	Non-Significant Effect			
Error	0.039839		0.006639833		6						
Total	0.05311866				7						
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Variance Ratio F		1	47.5	1.0000	Equal Variances					
Distribution	Shapiro-Wilk W Normality		0.931	0.645	0.5224	Normal Distribution					
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	0.975	0.895	1	0.95	0.9	1	0.025	5.13%	0.0%
0	Hardness Blank	4	0.925	0.845	1	0.95	0.9	1	0.025	5.41%	5.13%
Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.37	1.24	1.5	1.33	1.25	1.41	0.0407	5.94%	0.0%
0	Hardness Blank	4	1.29	1.16	1.42	1.33	1.25	1.41	0.0407	6.32%	5.94%
Graphics											

CETIS Analytical Report

Report Date: 19 Jun-13 16:24 (p 4 of 6)
Test Code: 52142 | 19-3241-5977

Chronic Larval Fish Survival and Growth Test						Pacific EcoRisk
Analysis ID:	18-7747-6634	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.5	
Analyzed:	19 Jun-13 16:23	Analysis:	Parametric-Two Sample	Official Results:	Yes	

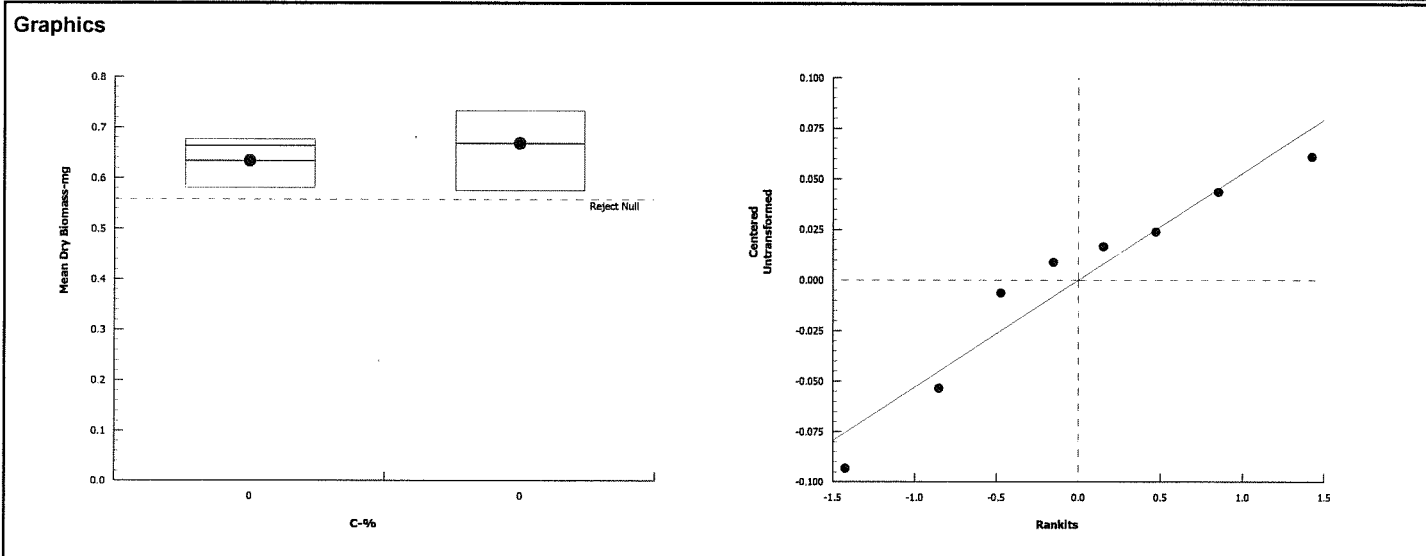
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	11.3%	Passes mean dry biomass-mg

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	0.895	1.94	0.076	6	0.2027	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.002415069	0.002415069	1	0.801	0.4053	Non-Significant Effect
Error	0.01809566	0.003015944	6			
Total	0.02051073		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F	2.57	47.5	0.4587	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.928	0.645	0.4991	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	0.668	0.563	0.773	0.664	0.575	0.729	0.0329	9.86%	0.0%
0	Hardness Blank	4	0.634	0.568	0.699	0.664	0.58	0.677	0.0206	6.49%	5.2%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Hardness Blank
 Test ID#: - Project #: 21069
 Test Date: 6-11-13 Randomization: 4.7.5

Organism Log#: 7323 Age: 648 hrs
 Organism Supplier: Aquatox
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Hardness Control	25.5	8.38		9.0		2432	10	10	10	10	Date: <u>6-11-13</u> Test Solution Prep: <u>W</u> Initiation Time: <u>1600</u> Initiation Signoff: <u>W</u>
Meter ID	<u>3830A</u>	<u>PH16</u>		<u>RD04</u>		<u>EC06</u>	New WQ: <u>PH</u>				
Hardness Control	25.7	8.40	8.58 <u>7.87</u>	8.9	7.6	2433	10	10	10	10	Date: <u>6/12/13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1130</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH19</u>	<u>PH19</u>	<u>RD07</u>	<u>RD07</u>	<u>EC07</u>	New WQ: <u>RA</u>	Old WQ: <u>W</u>			
Hardness Control	25.6	8.32	8.61	9.7	8.5	2432	10	9	10	10	Date: <u>6/13/13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1050</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH16</u>	<u>PH16</u>	<u>RD07</u>	<u>RD05</u>	<u>EC06</u>	New WQ: <u>W</u>	Old WQ: <u>W</u>			
Hardness Control	25.3	8.40	8.38	8.7	7.4	2412	9	9	10	9	Date: <u>6/14/13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1420</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH16</u>	<u>PH16</u>	<u>RD06</u>	<u>RD06</u>	<u>EC06</u>	New WQ: <u>MM</u>	Old WQ: <u>W</u>			
Hardness Control	25.7	8.28	8.66 <u>8.25</u> <u>MM</u>	8.6	8.5	2413	9	9	10	9	Date: <u>6/15/13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1105</u> Renewal Signoff: <u>SS</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH16</u>	<u>RD07</u>	<u>RD06</u>	<u>EC04</u>	New WQ: <u>W</u>	Old WQ: <u>MM</u>			
Hardness Control	25.5	8.31	8.55	9.1	7.5	2413	9	9	10	9	Date: <u>6-16-13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1055</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH18</u>	<u>RD05</u>	<u>RD07</u>	<u>EC04</u>	New WQ: <u>W</u>	Old WQ: <u>W</u>			
Hardness Control	25.3	8.42	8.53	9.0	7.7	2417	9	9	10	9	Date: <u>6-17-13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1140</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH19</u>	<u>PH15</u>	<u>RD04</u>	<u>RD05</u>	<u>EC06</u>	New WQ: <u>W</u>	Old WQ: <u>W</u>			
Hardness Control	25.6		8.54 <u>7.83</u>		7.6 <u>7.8</u>	2430 <u>315</u>	9	9	10	9	Date: <u>6/18/13</u> Termination Time: <u>1015</u> Termination Signoff: <u>W</u>
Meter ID	<u>30A</u>		<u>PH15</u>		<u>RD04</u>	<u>EC06</u>			Old WQ: <u>W</u>		

Fathead Minnow Dry Weight Data Sheet

Client: Lehigh Permanente Test ID #: 52142 Project #: 21069
 Sample: Pond 4A Tare Weight Date: 6-17-13 Sign-off: ML
 Test Date: 6/11/13 Final Weight Date: 6/19/13 Sign-off: ED

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	168.13	173.88	10	0.575
2		B	177.63	184.55	10	0.692
3		C	163.36	170.13	10	0.677
4		D	172.41	179.70	10	0.729
5	6.25	A	172.39	178.92	10	0.653
6		B	172.32	179.44	10	0.712
7		C	173.58	180.30	10	0.672
8		D	169.63	176.36	10	0.673
9	12.5	A	168.72	175.55	10	0.683
10		B	166.51	174.00	10	0.749
11		C	178.84	185.34	10	0.650
12		D	173.12	179.92	10	0.680
13	25	A	174.20	181.74	10	0.754
14		B	166.88	173.75	10	0.687
15		C	180.98	188.98	10	0.800
16		D	168.01	176.14	10	0.813
17	50	A	177.69	186.46	10	0.877
18		B	170.52	178.53	10	0.801
19		C	161.94	169.73	10	0.779
20		D	163.95	169.88	10	0.593
21	100	A	176.71	183.81	10	0.710
22		B	169.46	177.19	10	0.773
23		C	176.64	183.69	10	0.705
24		D	178.72	185.59	10	0.687
QA 1			173.99	173.95		
QA 2			166.77	166.74		
QA 3			167.67	167.65		
Balance ID:			BAL 01	Bal 01		

Fathead Minnow Dry Weight Data Sheet

Client: Lehigh Permanente Test ID #: 52142- Project # 21069
 Test Material: Hardness Blank Tare Weight Date: 6-17-13 Sign-off: yu
 Test Date: 6/11/13 Final Weight Date: 6/19/13 Sign-off: CD

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25.	Hardness Control	A	161.04	167.81	10	0.677
26		B	166.51	173.01	10	0.650
27		C	181.17	186.97	10	0.580
28		D	180.19	186.46	10	0.627
QA 4			162.53	162.50		

Appendix H

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



CETIS Summary Report

 Report Date: 20 Jun-13 11:47 (p 1 of 2)
 Test Code: 52145 | 03-8530-2024

Chronic Larval Fish Survival and Growth Test							Pacific EcoRisk				
Batch ID:	16-6400-2558	Test Type:	Growth-Survival (7d)				Analyst:	Padrick Anderson			
Start Date:	11 Jun-13 14:15	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Laboratory Water			
Ending Date:	18 Jun-13 10:00	Species:	Pimephales promelas				Brine:	Not Applicable			
Duration:	6d 20h	Source:	Aquatox, AR				Age:	1			
Sample ID:	18-8735-0216	Code:	Pond 9				Client:	Lehigh Permanente			
Sample Date:	10 Jun-13 12:13	Material:	Site Water				Project:	21069			
Receive Date:	10 Jun-13 15:20	Source:	Lehigh Permanente								
Sample Age:	26h (13.1 °C)	Station:	Pond 9								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
20-1322-1390	7d Survival Rate	100	>100	NA	17.3%	1	Steel Many-One Rank Sum Test				
19-4862-3161	Mean Dry Biomass-mg	100	>100	NA	14.9%	1	Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
01-0888-4282	Mean Dry Biomass-mg	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)				
		IC10	>100	N/A	N/A	<1					
		IC15	>100	N/A	N/A	<1					
		IC20	>100	N/A	N/A	<1					
		IC25	>100	N/A	N/A	<1					
		IC40	>100	N/A	N/A	<1					
		IC50	>100	N/A	N/A	<1					
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	0.0%
0	Lab Water Contr	4	0.95	0.913	0.987	0.8	1	0.05	0.1	10.5%	-2.7%
6.25		4	0.925	0.889	0.961	0.8	1	0.0479	0.0957	10.4%	0.0%
12.5		4	0.925	0.889	0.961	0.8	1	0.0479	0.0957	10.4%	0.0%
25		4	0.925	0.869	0.981	0.7	1	0.075	0.15	16.2%	0.0%
50		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	-5.41%
100		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-2.7%
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	0.634	0.618	0.649	0.58	0.677	0.0206	0.0411	6.49%	0.0%
0	Lab Water Contr	4	0.613	0.594	0.632	0.536	0.65	0.026	0.052	8.48%	3.24%
6.25		4	0.634	0.615	0.653	0.57	0.695	0.0255	0.0511	8.05%	-0.08%
12.5		4	0.667	0.654	0.68	0.645	0.718	0.0171	0.0342	5.13%	-5.29%
25		4	0.665	0.653	0.678	0.62	0.702	0.017	0.034	5.1%	-5.05%
50		4	0.747	0.72	0.774	0.65	0.816	0.0362	0.0724	9.7%	-17.9%
100		4	0.755	0.731	0.78	0.692	0.827	0.033	0.066	8.74%	-19.2%

CETIS Summary Report

Report Date: 20 Jun-13 11:47 (p 2 of 2)
 Test Code: 52145 | 03-8530-2024

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	0.9	0.9	1	0.9
0	Lab Water Contr	1	1	0.8	1
6.25		0.8	1	0.9	1
12.5		0.8	1	0.9	1
25		0.7	1	1	1
50		1	1	0.9	1
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	0.677	0.65	0.58	0.627
0	Lab Water Contr	0.65	0.536	0.631	0.635
6.25		0.57	0.695	0.636	0.635
12.5		0.653	0.718	0.645	0.652
25		0.667	0.62	0.702	0.673
50		0.736	0.816	0.65	0.785
100		0.707	0.795	0.827	0.692
7d Survival Rate Binomials					
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	9/10	9/10	10/10	9/10
0	Lab Water Contr	10/10	10/10	8/10	10/10
6.25		8/10	10/10	9/10	10/10
12.5		8/10	10/10	9/10	10/10
25		7/10	10/10	10/10	10/10
50		10/10	10/10	9/10	10/10
100		10/10	10/10	9/10	9/10

CETIS Analytical Report

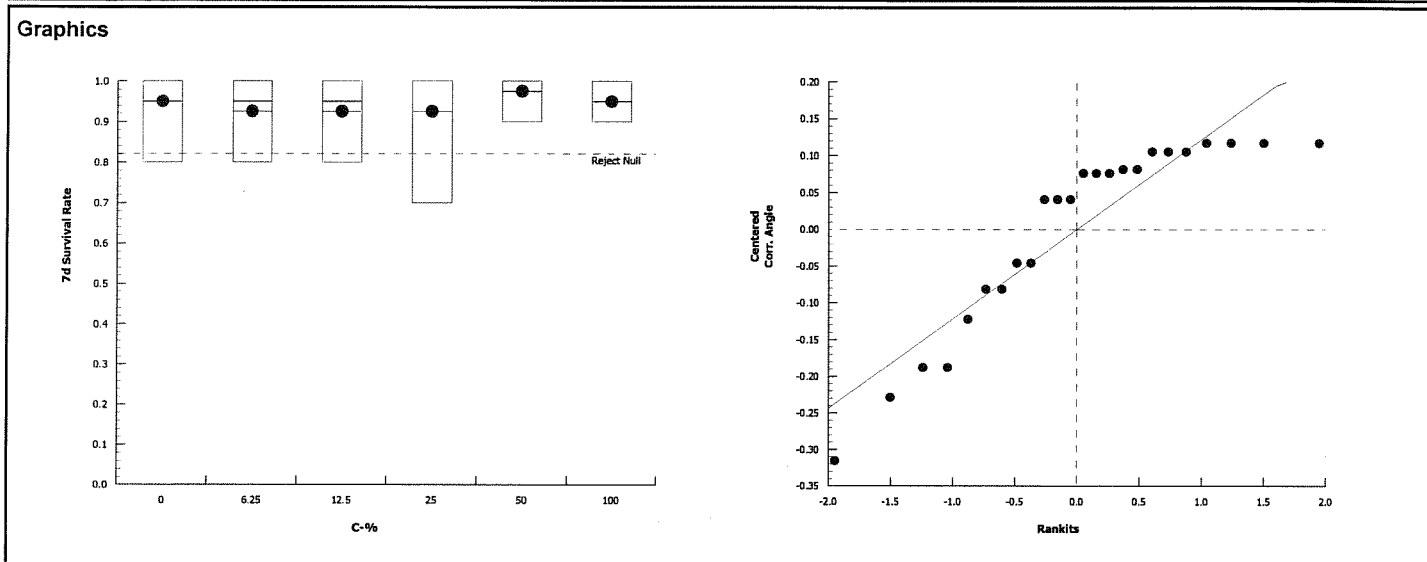
Report Date: 19 Jun-13 16:39 (p 2 of 5)
Test Code: 52145 | 03-8530-2024

Chronic Larval Fish Survival and Growth Test										Pacific EcoRisk	
Analysis ID: 20-1322-1390		Endpoint: 7d Survival Rate					CETIS Version: CETISv1.8.5				
Analyzed: 19 Jun-13 16:38		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		17.3%	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	16.5	10	2	6	0.6742	Asymp	Non-Significant Effect		
		12.5	16.5	10	2	6	0.6742	Asymp	Non-Significant Effect		
		25	17.5	10	1	6	0.7867	Asymp	Non-Significant Effect		
		50	18.5	10	1	6	0.8729	Asymp	Non-Significant Effect		
		100	17	10	1	6	0.7334	Asymp	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.01749163		0.003498326		5	0.166	0.9718	Non-Significant Effect			
Error	0.3785998		0.02103332		18						
Total	0.3960915				23						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Bartlett Equality of Variance			2.98	15.1	0.7033	Equal Variances				
Distribution	Shapiro-Wilk W Normality			0.838	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	0.925	0.773	1	0.95	0.8	1	0.0479	10.4%	2.63%
12.5		4	0.925	0.773	1	0.95	0.8	1	0.0479	10.4%	2.63%
25		4	0.925	0.686	1	1	0.7	1	0.075	16.2%	2.63%
50		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	-2.63%
100		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	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	1.34	1.09	1.58	1.41	1.11	1.41	0.0762	11.4%	0.0%
6.25		4	1.3	1.06	1.53	1.33	1.11	1.41	0.0735	11.3%	3.05%
12.5		4	1.3	1.06	1.53	1.33	1.11	1.41	0.0735	11.3%	3.05%
25		4	1.31	0.972	1.64	1.41	0.991	1.41	0.105	16.1%	2.17%
50		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	-2.66%
100		4	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	0.39%

CETIS Analytical Report

Report Date: 19 Jun-13 16:39 (p 3 of 5)
Test Code: 52145 | 03-8530-2024

Chronic Larval Fish Survival and Growth Test			Pacific EcoRisk
Analysis ID: 20-1322-1390	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.5	
Analyzed: 19 Jun-13 16:38	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

Report Date: 19 Jun-13 16:39 (p 5 of 5)

Test Code: 52145 | 03-8530-2024

Chronic Larval Fish Survival and Growth Test										Pacific EcoRisk	
Analysis ID: 19-4862-3161		Endpoint: Mean Dry Biomass-mg				CETIS Version: CETISv1.8.5					
Analyzed: 19 Jun-13 16:39		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		14.9%	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	-0.554	2.41	0.091	6	0.9467	CDF	Non-Significant Effect		
		12.5	-1.43	2.41	0.091	6	0.9948	CDF	Non-Significant Effect		
		25	-1.39	2.41	0.091	6	0.9942	CDF	Non-Significant Effect		
		50	-3.53	2.41	0.091	6	1.0000	CDF	Non-Significant Effect		
		100	-3.75	2.41	0.091	6	1.0000	CDF	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.06840813		0.01368163		5	4.76	0.0060	Significant Effect			
Error	0.05168679		0.002871488		18						
Total	0.1200949				23						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Bartlett Equality of Variance			2.52	15.1	0.7731	Equal Variances				
Distribution	Shapiro-Wilk W Normality			0.963	0.884	0.4999	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	0.613	0.53	0.696	0.633	0.536	0.65	0.026	8.48%	0.0%
6.25		4	0.634	0.553	0.715	0.636	0.57	0.695	0.0255	8.05%	-3.43%
12.5		4	0.667	0.613	0.721	0.653	0.645	0.718	0.0171	5.13%	-8.81%
25		4	0.665	0.611	0.72	0.67	0.62	0.702	0.017	5.1%	-8.56%
50		4	0.747	0.632	0.862	0.761	0.65	0.816	0.0362	9.7%	-21.8%
100		4	0.755	0.65	0.86	0.751	0.692	0.827	0.033	8.74%	-23.2%
Graphics											

CETIS Analytical Report

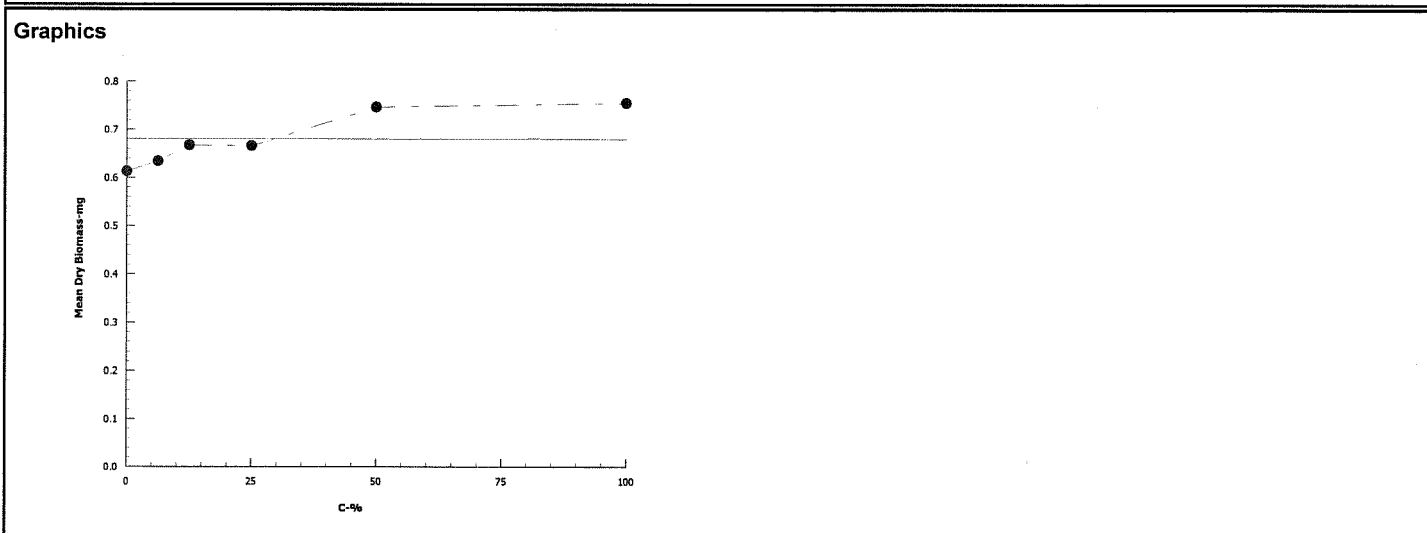
Report Date: 19 Jun-13 16:39 (p 1 of 1)
Test Code: 52145 | 03-8530-2024

Chronic Larval Fish Survival and Growth Test				Pacific EcoRisk
Analysis ID: 01-0888-4282	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.8.5		
Analyzed: 19 Jun-13 16:39	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes		

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1753060	200	Yes	Two-Point Interpolation

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

Mean Dry Biomass-mg Summary			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contro	4	0.613	0.536	0.65	0.026	0.052	8.48%	0.0%
6.25		4	0.634	0.57	0.695	0.0255	0.0511	8.05%	-3.43%
12.5		4	0.667	0.645	0.718	0.0171	0.0342	5.13%	-8.81%
25		4	0.665	0.62	0.702	0.017	0.034	5.1%	-8.56%
50		4	0.747	0.65	0.816	0.0362	0.0724	9.7%	-21.8%
100		4	0.755	0.692	0.827	0.033	0.066	8.74%	-23.2%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Pond 9
 Test ID#: 52145 Project #: 21069
 Test Date: 6-11-13 Randomization: 4.6.3

Organism Log#: 7327 Age: <48hrs
 Organism Supplier: Aquatox
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Treatment (%)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water	25.5	8.20		8.6		301	10	10	10	10	Date: <u>6-11-13</u>
6.25	25.5	8.04		8.6		379	10	10	10	10	Sample ID: <u>32003</u>
12.5	25.5	7.96		8.7		455	10	10	10	10	Test Solution Prep: <u>W</u>
25	25.5	7.86		8.8		598	10	10	10	10	New WQ: <u>W</u>
50	25.5	7.79		9.1		858	10	10	10	10	Initiation Time: <u>1415</u>
100	25.5	7.66		9.7		1345	10	10	10	10	Initiation Signoff: <u>W</u>
Meter ID	30A	PH16		RD07		EC06					
Lab Water	25.5	8.25	7.86	8.6	7.2	299	10	10	9	10	Date: <u>6/12/13</u>
6.25	25.5	8.12	7.82	8.6	7.3	372	9	10	10	10	Sample ID: <u>32003</u>
12.5	25.5	8.03	7.83	8.7	7.0	441	9	10	10	10	Test Solution Prep: <u>W</u>
25	25.5	7.92	7.89	8.9	7.0	591	9	10	10	10	New WQ: <u>PH</u>
50	25.5	7.84	8.01	9.2	7.2	858	10	10	10	10	Renewal Time: <u>1450</u>
100	25.5	7.79	8.06	10.0	6.4	1336	10	10	10	10	Renewal Signoff: <u>W</u>
Meter ID	30A	PH16	PH19	RD06	RD07	EC04					Old WQ: <u>KB</u>
Lab Water	25.6	8.29	8.18	8.6	8.0	304	10	10	9	10	Date: <u>6/13/13</u>
6.25	25.6	8.13	8.04	8.6	8.1	386	9	10	10	10	Sample ID: <u>32037</u>
12.5	25.6	8.02	8.03	8.6	8.1	464	9	10	10	10	Test Solution Prep: <u>W</u>
25	25.6	7.90	8.04	8.8	8.2	597	9	10	10	10	New WQ: <u>W</u>
50	25.6	7.75	8.17	9.4	8.2	884	10	10	10	10	Renewal Time: <u>8:00</u>
100	25.6	7.62	8.25	10.4	8.2	1390	10	10	10	9	Renewal Signoff: <u>W</u>
Meter ID	30A	PH14	PH16	RD07	RD05	EC06					Old WQ: <u>W</u>
Lab Water	25.6	8.06	8.13	8.8	7.8	299	10	10	8	10	Date: <u>6/14/13</u>
6.25	25.6	8.03	7.97	8.8	7.4	384	9	10	10	10	Sample ID: <u>32037</u>
12.5	25.6	8.02	7.88	8.8	7.2	454	9	10	10	10	Test Solution Prep: <u>W</u>
25	25.6	7.98	7.87	8.8	7.1	608	7	10	10	10	New WQ: <u>MM</u>
50	25.6	7.90	8.00	8.9	6.9	889	10	10	10	10	Renewal Time: <u>1400</u>
100	25.6	7.88	8.10	9.0	6.9	1394	10	10	10	9	Renewal Signoff: <u>W</u>
Meter ID	30A	PH16	PH16	RD06	RD06	EC06					Old WQ: <u>W</u>

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Pond 9
 Test ID#: 52145 Project #: 21069
 Test Date: 6-11-13 Randomization: 4.6.3

Organism Log#: 7327 Age: <48hrs
 Organism Supplier: Aquafax
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Treatment (%)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water	25.8	8.10	8.01	8.5	8.4	298	10	10	8	10	Date: 6/15/13
6.25	25.8	8.06	7.97	8.5	8.0	382	8	10	10	10	Sample ID: 32058
12.5	25.8	8.00	8.00	8.4	8.0	462	9	10	10	10	Test Solution Prep: <i>W</i>
25	25.8	7.92	8.05	8.6	8.2	606	7	10	10	10	New WQ: <i>W</i>
50	25.8	7.91	8.19	8.9	8.2	879	10	10	10	10	Renewal Time: 1115
100	25.8	7.85	8.31	9.5	8.1	1390	10	10	9	9	Renewal Signoff: <i>KP</i>
Meter ID	30A	PH15	PH16	RD07	RD06	EC04					Old WQ: <i>MK</i>
Lab Water	25.7	8.21	8.09	8.6	8.4	304	10	10	8	10	Date: 6-16-13
6.25	25.7	8.09	7.97	8.6	8.1	391	8	10	10	10	Sample ID: 32058
12.5	25.7	8.03	8.03	8.7	8.2	472	8	10	10	10	Test Solution Prep: <i>W</i>
25	25.7	7.93	8.12	9.1	8.5	618	7	10	10	10	New WQ: <i>SW</i>
50	25.7	7.88	8.23	9.4	8.5	898	10	10	10	10	Renewal Time: 1000
100	25.7	7.76	8.33	10.0	8.3	1397	10	10	9	9	Renewal Signoff: <i>EWK</i>
Meter ID	30A	PH15	PH15	RD05	RD05	EC04					Old WQ: <i>KB</i>
Lab Water	25.3	8.40	8.00	8.6	8.0	303	10	10	8	10	Date: 6-17-13
6.25	25.3	8.23	7.86	8.7	7.9	384	8	10	10	10	Sample ID: 32058
12.5	25.3	8.14	7.86	8.8	7.9	468	8	10	9	10	Test Solution Prep: <i>W</i>
25	25.3	8.05	7.97	9.1	7.8	603	7	10	10	10	New WQ: <i>SW</i>
50	25.3	7.96	8.10	9.4	7.7	902	10	10	9	10	Renewal Time: 1040
100	25.3	7.89	8.24	9.9	7.9	1415	10	10	9	9	Renewal Signoff: <i>W</i>
Meter ID	30A	PH19	PH15	RD04	RD05	EC06					Old WQ: <i>CA</i>
Lab Water	25.7		8.20		8.4	331	10	10	8	10	Date: 6/18/13
6.25	25.7		8.06		8.0	392	8	10	9	10	Sample ID: N/A
12.5	25.7		7.96		7.9	480	8	10	9	10	Termination Time: 1000
25	25.7		7.93		7.8	622	7	10	10	10	Termination Signoff: <i>KB</i>
50	25.7		8.04		7.8	936	10	10	9	10	Old WQ: <i>W</i>
100	25.7		8.18		7.8	1423	10	10	9	9	
Meter ID	30A		PH15		RD04	EC06					

CETIS Analytical Report

Report Date: 19 Jun-13 16:39 (p 1 of 5)
Test Code: 52145 | 03-8530-2024

Chronic Larval Fish Survival and Growth Test						Pacific EcoRisk
Analysis ID: 00-5089-5793	Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.5			
Analyzed: 19 Jun-13 16:38	Analysis: Parametric-Two Sample		Official Results: Yes			
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	10.9%	Passes 7d survival rate

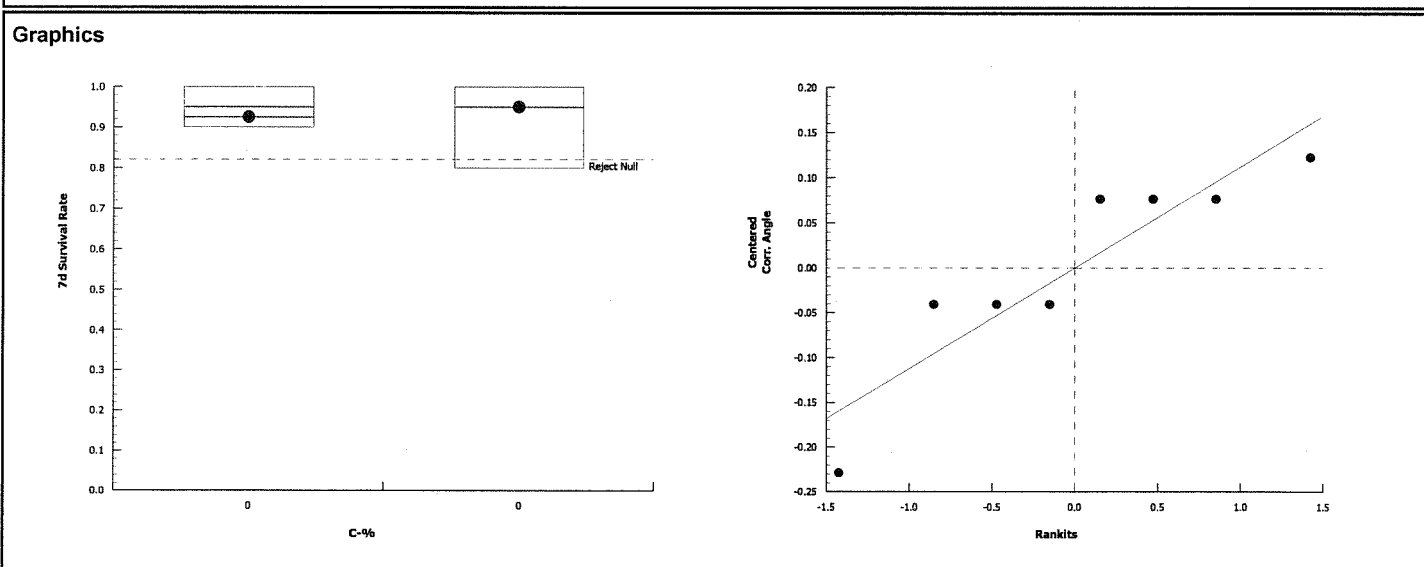
Equal Variance t Two-Sample Test								
Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	Decision(α:5%)
Lab Water Control		Hardness Blank	0.532	1.94	0.168	6	0.3068	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.004234007	0.004234007	1	0.283	0.6136	Non-Significant Effect
Error	0.08962759	0.01493793	6			
Total	0.0938616		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F	3.5	47.5	0.3310	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.852	0.645	0.1005	Normal Distribution	

7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Hardness Blank	4	0.925	0.845	1	0.95	0.9	1	0.025	5.41%	0.0%
0	Lab Water Contr	4	0.95	0.791	1	0.95	0.8	1	0.05	10.5%	-2.7%

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	1.33	1.11	1.41	0.0762	11.4%	0.0%
0	Hardness Blank	4	1.29	1.16	1.42	1.33	1.25	1.41	0.0407	6.32%	3.44%



CETIS Analytical Report

Report Date: 19 Jun-13 16:39 (p 4 of 5)

Test Code: 52145 | 03-8530-2024

Chronic Larval Fish Survival and Growth Test				Pacific EcoRisk	
Analysis ID:	04-6410-0824	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.5
Analyzed:	19 Jun-13 16:38	Analysis:	Parametric-Two Sample	Official Results:	Yes

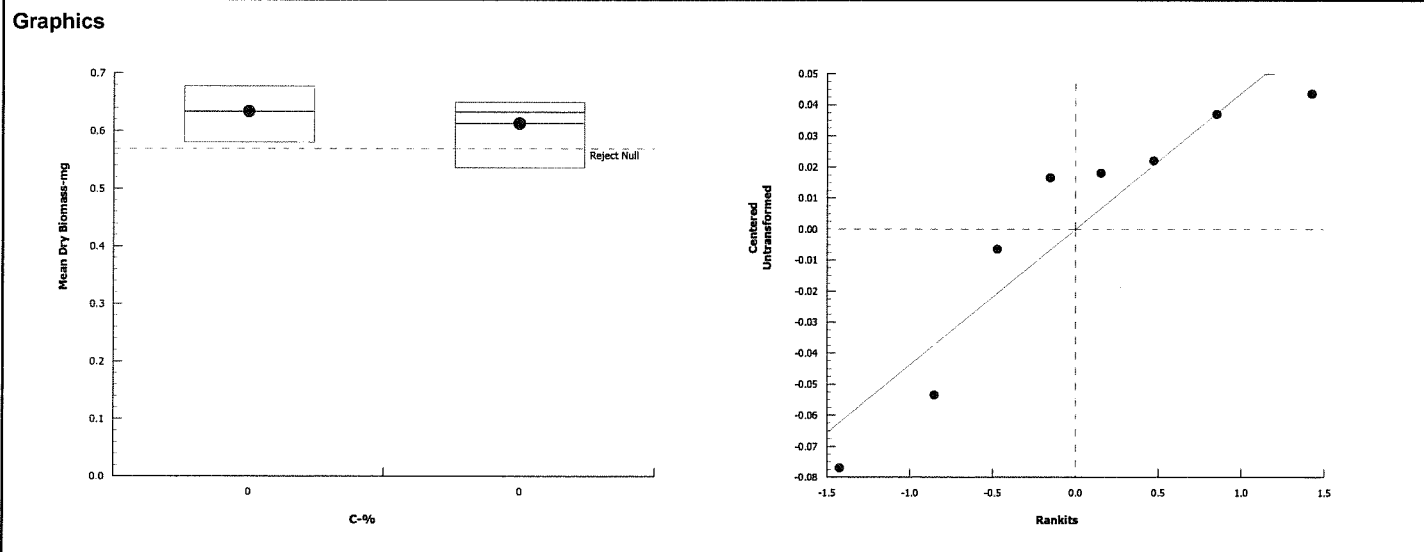
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	10.5%	Passes mean dry biomass-mg

Equal Variance t Two-Sample Test									
Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	-0.619	1.94	0.064	6	0.7206	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α :5%)
Between	0.0008404832	0.0008404832	1	0.383	0.5589	Non-Significant Effect
Error	0.01317506	0.002195843	6			
Total	0.01401554		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)	
Variances	Variance Ratio F	1.6	47.5	0.7091	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.863	0.645	0.1277	Normal Distribution	

Mean Dry Biomass-mg Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Hardness Blank	4	0.634	0.568	0.699	0.633	0.58	0.677	0.0206	6.49%	0.0%
0	Lab Water Contr	4	0.613	0.53	0.696	0.633	0.536	0.65	0.026	8.48%	3.24%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Hardness Blank
 Test ID#: - Project #: 21069
 Test Date: 6-11-13 Randomization: 4.7.5

Organism Log#: 7323 Age: 648 hrs
 Organism Supplier: Aquarox
 Control/Diluent: EPAMH
 Control Water Batch: 1594

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Hardness Control	25.5	8.38		9.0		2432	10	10	10	10	Date: <u>6-11-13</u> Test Solution Prep: <u>W</u> Initiation Time: <u>1600</u> Initiation Signoff: <u>W</u>
Meter ID	<u>3830A</u>	<u>PH16</u>		<u>R004</u>		<u>EC06</u>	New WQ: <u>PH</u>				
Hardness Control	25.7	8.40	8.58 <u>7.87</u>	8.9	7.6	2433	10	10	10	10	Date: <u>6/12/13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1130</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH19</u>	<u>PH19</u>	<u>R007</u>	<u>R007</u>	<u>EC07</u>	New WQ: <u>RA</u>		Old WQ: <u>W</u>		
Hardness Control	25.6	8.32	8.61	9.7	8.5	2432	10	9	10	10	Date: <u>6/13/13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1050</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH16</u>	<u>PH16</u>	<u>R007</u>	<u>R005</u>	<u>EC06</u>	New WQ: <u>W</u>		Old WQ: <u>W</u>		
Hardness Control	25.3	8.40	8.38	8.7	7.4	2412	9	9	10	9	Date: <u>6/14/13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1420</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH16</u>	<u>PH16</u>	<u>R006</u>	<u>R006</u>	<u>EC06</u>	New WQ: <u>W</u>		Old WQ: <u>W</u>		
Hardness Control	25.7	8.28	8.66 <u>8.25</u> <u>MK</u>	8.6	8.5	2413	9	9	10	9	Date: <u>6/15/13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1105</u> Renewal Signoff: <u>SS</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH16</u>	<u>R007</u>	<u>R006</u>	<u>EC04</u>	New WQ: <u>W</u>		Old WQ: <u>MK</u>		
Hardness Control	25.5	8.31	8.55	9.1	7.5	2413	9	9	10	9	Date: <u>6-16-13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1055</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH18</u>	<u>R005</u>	<u>R007</u>	<u>EC04</u>	New WQ: <u>SNV</u>		Old WQ: <u>CA</u>		
Hardness Control	25.3	8.42	8.53	9.0	7.7	2417	9	9	10	9	Date: <u>6-17-13</u> Test Solution Prep: <u>W</u> Renewal Time: <u>1140</u> Renewal Signoff: <u>W</u>
Meter ID	<u>30A</u>	<u>PH19</u>	<u>PH15</u>	<u>R004</u>	<u>R005</u>	<u>EC06</u>	New WQ: <u>SNV</u>		Old WQ: <u>CA</u>		
Hardness Control	25.6		8.54 <u>7.83</u>		7.6 <u>7.8</u>	2430 <u>315</u>	9	9	10	9	Date: <u>6/18/13</u> Termination Time: <u>1015</u> Termination Signoff: <u>W</u>
Meter ID	<u>30A</u>		<u>PH15</u>		<u>R004</u>	<u>EC06</u>			Old WQ: <u>W</u>		

Fathead Minnow Dry Weight Data Sheet

Client: Lehigh Permanente Test ID #: 52145 Project # 21069
 Sample: Pond 9 Tare Weight Date: 6/16/13 Sign-off: CA
 Test Date: 6/11/13 Final Weight Date: 6/18/13 Sign-off: FORB

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	179.64	186.14	10	0.650
2		B	168.51	173.87	10	0.536
3		C	183.43	189.74	10	0.631
4		D	170.18	176.53	10	0.635
5	6.25	A	168.28	173.98	10	0.570
6		B	182.93	189.88	10	0.695
7		C	171.39	177.75	10	0.636
8		D	166.73	173.08	10	0.635
9	12.5	A	176.08	182.61	10	0.653
10		B	175.44	182.62	10	0.718
11		C	181.16	187.61	10	0.645
12		D	182.00	188.52	10	0.652
13	25	A	175.51	182.18	10	0.667
14		B	181.47	187.67	10	0.620
15		C	169.60	176.62	10	0.702
16		D	174.78	181.51	10	0.673
17	50	A	171.36	178.72	10	0.736
18		B	181.06	189.22	10	0.816
19		C	177.66	184.16	10	0.650
20		D	182.56	190.41	10	0.785
21	100	A	170.33	177.40	10	0.707
22		B	174.04	181.99	10	0.795
23		C	175.39	183.66	10	0.827
24		D	175.65	182.857	10	0.692
QA 1			166.47	166.42		
QA 2			170.81	170.77		
QA 3			189.56	189.57		
Balance ID:			BAL01	BAL01		

Fathead Minnow Dry Weight Data Sheet

Client: Lehigh Permanente Test ID #: 52142- Project # 21069
 Test Material: Hardness Blank Tare Weight Date: 6-17-13 Sign-off: yu
 Test Date: 6/11/13 Final Weight Date: 6/19/13 Sign-off: CD

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25.	Hardness Control	A	161.04	167.81	10	0.677
26		B	166.51	173.01	10	0.650
27		C	181.17	186.97	10	0.580
28		D	180.19	186.46	10	0.627
QA 4			162.53	162.50		

Appendix I

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



CETIS Summary Report

 Report Date: 20 Jun-13 11:49 (p 1 of 2)
 Test Code: 52148 | 15-8839-6716

Chronic Larval Fish Survival and Growth Test							Pacific EcoRisk				
Batch ID:	14-4503-3010		Test Type:	Growth-Survival (7d)			Analyst:	Padrick Anderson			
Start Date:	11 Jun-13 14:35		Protocol:	EPA-821-R-02-013 (2002)			Diluent:	Laboratory Water			
Ending Date:	18 Jun-13 09:35		Species:	Pimephales promelas			Brine:	Not Applicable			
Duration:	6d 19h		Source:	Aquatox, AR			Age:	1			
Sample ID:	03-3380-7671		Code:	Pond 13			Client:	Lehigh Permanente			
Sample Date:	10 Jun-13 11:50		Material:	Site Water			Project:	21069			
Receive Date:	10 Jun-13 15:20		Source:	Lehigh Permanente							
Sample Age:	27h (10.2 °C)		Station:	Pond 13							
Comparison Summary											
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Method			
04-8213-3455	7d Survival Rate		100	>100	NA	5.9%	1	Steel Many-One Rank Sum Test			
19-4622-6825	Mean Dry Biomass-mg		100	>100	NA	8.54%	1	Dunnett Multiple Comparison Test			
Point Estimate Summary											
Analysis ID	Endpoint		Level	%	95% LCL	95% UCL	TU	Method			
01-7160-0100	Mean Dry Biomass-mg		IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)			
			IC10	>100	N/A	N/A	<1				
			IC15	>100	N/A	N/A	<1				
			IC20	>100	N/A	N/A	<1				
			IC25	>100	N/A	N/A	<1				
			IC40	>100	N/A	N/A	<1				
			IC50	>100	N/A	N/A	<1				
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	0.0%
0	Lab Water Contr	4	1	1	1	1	1	0	0	0.0%	-8.11%
6.25		4	1	1	1	1	1	0	0	0.0%	-8.11%
12.5		4	0.95	0.928	0.972	0.9	1	0.0289	0.0577	6.08%	-2.7%
25		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	-5.41%
50		4	1	1	1	1	1	0	0	0.0%	-8.11%
100		4	1	1	1	1	1	0	0	0.0%	-8.11%
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	0.634	0.618	0.649	0.58	0.677	0.0206	0.0411	6.49%	0.0%
0	Lab Water Contr	4	0.699	0.691	0.707	0.675	0.719	0.0104	0.0208	2.97%	-10.3%
6.25		4	0.683	0.677	0.688	0.668	0.697	0.00719	0.0144	2.11%	-7.77%
12.5		4	0.739	0.732	0.747	0.717	0.765	0.00987	0.0197	2.67%	-16.7%
25		4	0.724	0.714	0.735	0.686	0.747	0.0142	0.0285	3.93%	-14.4%
50		4	0.75	0.732	0.768	0.704	0.792	0.024	0.0481	6.41%	-18.4%
100		4	0.827	0.805	0.848	0.773	0.907	0.0284	0.0569	6.88%	-30.5%

CETIS Summary Report

Report Date: 20 Jun-13 11:49 (p 2 of 2)

Test Code: 52148 | 15-8839-6716

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	0.9	0.9	1	0.9	
0	Lab Water Contr	1	1	1	1	
6.25		1	1	1	1	
12.5		0.9	1	0.9	1	
25		1	1	1	0.9	
50		1	1	1	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	0.677	0.65	0.58	0.627	
0	Lab Water Contr	0.675	0.719	0.713	0.688	
6.25		0.673	0.693	0.697	0.668	
12.5		0.717	0.74	0.765	0.736	
25		0.686	0.72	0.747	0.745	
50		0.704	0.713	0.791	0.792	
100		0.907	0.812	0.814	0.773	
7d Survival Rate Binomials						
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	
0	Hardness Blank	9/10	9/10	10/10	9/10	
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	9/10	10/10	
25		10/10	10/10	10/10	9/10	
50		10/10	10/10	10/10	10/10	
100		10/10	10/10	10/10	10/10	

CETIS Analytical Report

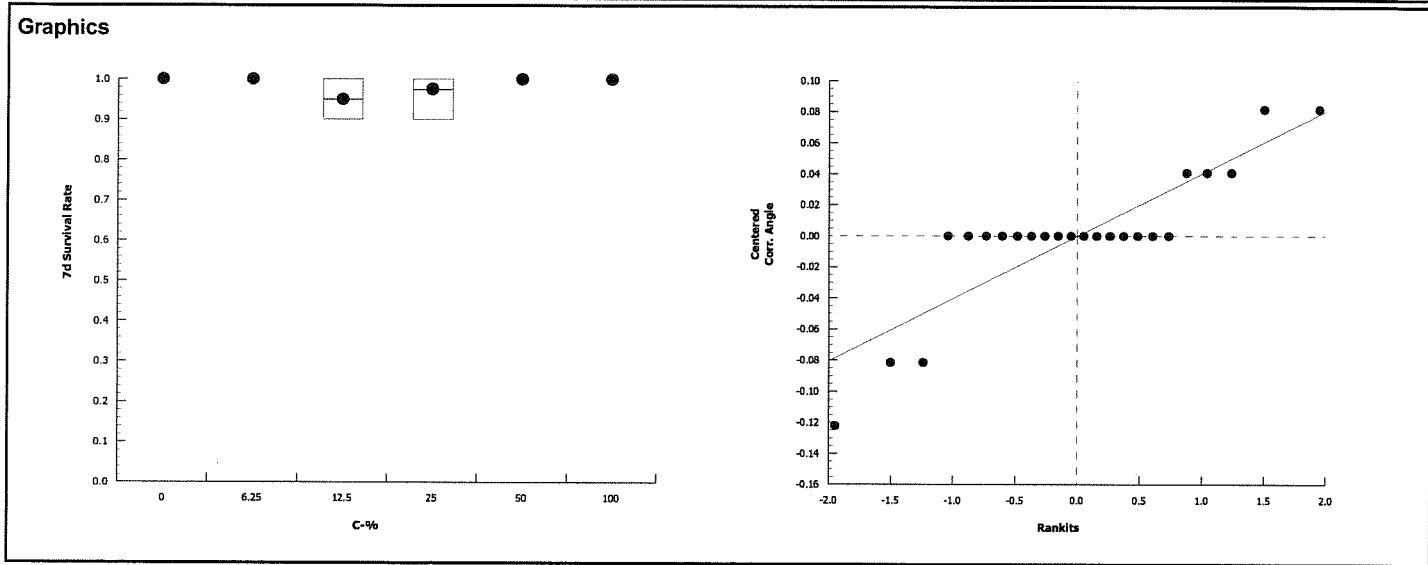
Report Date: 19 Jun-13 16:14 (p 2 of 5)
 Test Code: 52148 | 15-8839-6716

Chronic Larval Fish Survival and Growth Test										Pacific EcoRisk	
Analysis ID: 04-8213-3455		Endpoint: 7d Survival Rate					CETIS Version: CETISv1.8.5				
Analyzed: 19 Jun-13 16:13		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		5.9%	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	18	10	1	6	0.8333	Asymp	Non-Significant Effect		
		12.5	14	10	1	6	0.3451	Asymp	Non-Significant Effect		
		25	16	10	1	6	0.6105	Asymp	Non-Significant Effect		
		50	18	10	1	6	0.8333	Asymp	Non-Significant Effect		
		100	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	0.02323942		0.004647883		5	1.8	0.1637	Non-Significant Effect			
Error	0.04647883		0.002582157		18						
Total	0.06971824				23						
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Mod Levene Equality of Variance		4.2	4.25	0.0105		Equal Variances				
Variances	Levene Equality of Variance		20.2	4.25	<0.0001		Unequal Variances				
Distribution	Shapiro-Wilk W Normality		0.772	0.884	0.0001		Non-normal Distribution				
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	1	1	1	1	1	1	0	0.0%	0.0%
6.25		4	1	1	1	1	1	1	0	0.0%	0.0%
12.5		4	0.95	0.858	1	0.95	0.9	1	0.0289	6.08%	5.0%
25		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	2.5%
50		4	1	1	1	1	1	1	0	0.0%	0.0%
100		4	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	1.33	1.18	1.48	1.33	1.25	1.41	0.047	7.07%	5.77%
25		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	2.89%
50		4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
100		4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%

CETIS Analytical Report

Report Date: 19 Jun-13 16:14 (p 3 of 5)
 Test Code: 52148 | 15-8839-6716

Chronic Larval Fish Survival and Growth Test			Pacific EcoRisk
Analysis ID: 04-8213-3455	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.5	
Analyzed: 19 Jun-13 16:13	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

Report Date: 19 Jun-13 16:28 (p 2 of 2)
Test Code: 52148 | 15-8839-6716

Chronic Larval Fish Survival and Growth Test										Pacific EcoRisk	
Analysis ID: 19-4622-6825		Endpoint: Mean Dry Biomass-mg				CETIS Version: CETISv1.8.5					
Analyzed: 19 Jun-13 16:27		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	8.54%	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	0.645	2.41	0.06	6	0.5830	CDF	Non-Significant Effect		
		12.5	-1.64	2.41	0.06	6	0.9973	CDF	Non-Significant Effect		
		25	-1.04	2.41	0.06	6	0.9844	CDF	Non-Significant Effect		
		50	-2.07	2.41	0.06	6	0.9993	CDF	Non-Significant Effect		
		100	-5.15	2.41	0.06	6	1.0000	CDF	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.05099166		0.01019833		5	8.29	0.0003	Significant Effect			
Error	0.02215028		0.001230571		18						
Total	0.07314195				23						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Bartlett Equality of Variance			7.45	15.1	0.1895	Equal Variances				
Distribution	Shapiro-Wilk W Normality			0.973	0.884	0.7295	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	0.699	0.666	0.732	0.701	0.675	0.719	0.0104	2.97%	0.0%
6.25		4	0.683	0.66	0.706	0.683	0.668	0.697	0.00719	2.11%	2.29%
12.5		4	0.739	0.708	0.771	0.738	0.717	0.765	0.00987	2.67%	-5.83%
25		4	0.724	0.679	0.77	0.732	0.686	0.747	0.0142	3.93%	-3.69%
50		4	0.75	0.674	0.826	0.752	0.704	0.792	0.024	6.41%	-7.33%
100		4	0.827	0.736	0.917	0.813	0.773	0.907	0.0284	6.88%	-18.3%
Graphics											

CETIS Analytical Report

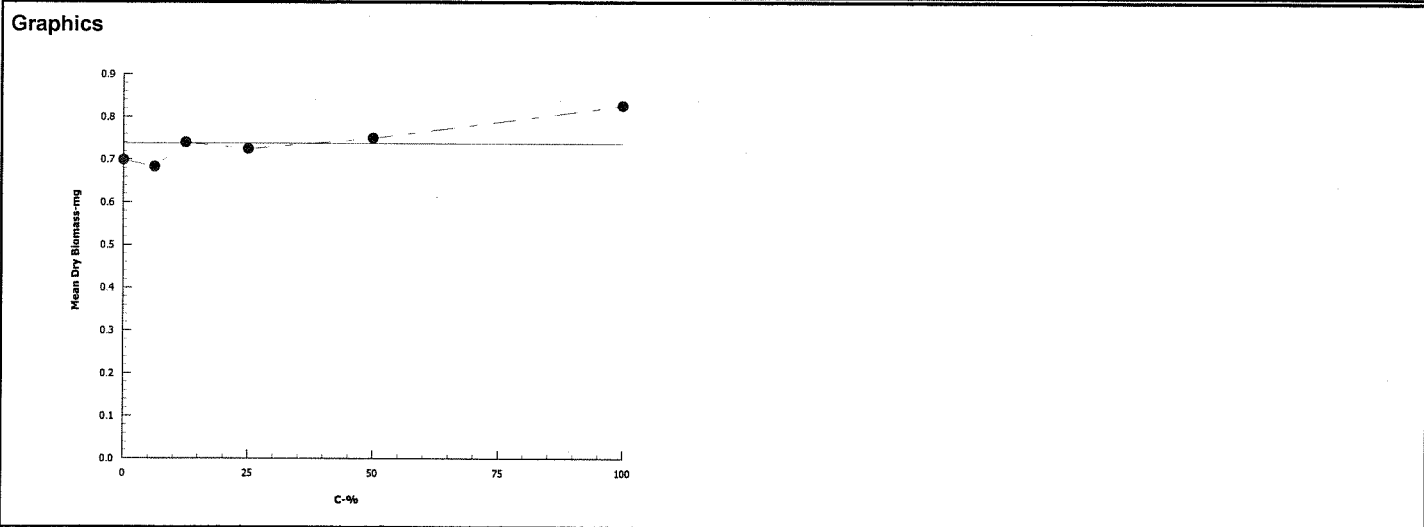
Report Date: 19 Jun-13 16:28 (p 1 of 1)
 Test Code: 52148 | 15-8839-6716

Chronic Larval Fish Survival and Growth Test				Pacific EcoRisk	
Analysis ID:	01-7160-0100	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.5
Analyzed:	19 Jun-13 16:27	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	632142	200	Yes	Two-Point Interpolation

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

Mean Dry Biomass-mg Summary			Calculated Variate							
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	Lab Water Contro	4	0.699	0.675	0.719	0.0104	0.0208	2.97%	0.0%	
6.25		4	0.683	0.668	0.697	0.00719	0.0144	2.11%	2.29%	
12.5		4	0.739	0.717	0.765	0.00987	0.0197	2.67%	-5.83%	
25		4	0.724	0.686	0.747	0.0142	0.0285	3.93%	-3.69%	
50		4	0.75	0.704	0.792	0.024	0.0481	6.41%	-7.33%	
100		4	0.827	0.773	0.907	0.0284	0.0569	6.88%	-18.3%	



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Pond 13
 Test ID#: 52148 Project #: 21069
 Test Date: 6-11-13 Randomization: 4.6.1

Organism Log#: 7323 Age: <48 hrs
 Organism Supplier: Aquatox
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Treatment (%)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water	25.5	8.23		8.9		302	10	10	10	10	Date: 6-11-13
6.25	25.5	8.16		8.7		358	10	10	10	10	Sample ID: 32004
12.5	25.5	8.15		8.8		421	10	10	10	10	Test Solution Prep: [initials]
25	25.5	8.14		8.9		521	10	10	10	10	New WQ: DH
50	25.5	8.14		9.4		730	10	10	10	10	Initiation Time: 1435
100	25.5	8.11		10.5		1096	10	10	10	10	Initiation Signoff: [initials]
Meter ID	30A	PH16		RDO4		EC06					
Lab Water	25.5	8.25	7.73	8.8	8.1	301	10	10	10	10	Date: 6/12/13
6.25	25.5	8.19	7.69	8.7	8.1	361	10	10	10	10	Sample ID: 32004
12.5	25.5	8.15	7.69	8.8	8.0	418	10	10	10	10	Test Solution Prep: [initials]
25	25.5	8.13	7.75	8.9	7.9	524	10	10	10	10	New WQ: DH
50	25.5	8.12	7.93	9.3	7.9	723	10	10	10	10	Renewal Time: 1330
100	25.5	8.09	8.05	10.1	8.0	1091	10	10	10	10	Renewal Signoff: [initials]
Meter ID	30A	PH16	PH19	RDO6	RDO7	EC04					Old WQ: [initials]
Lab Water	25.6	8.24	7.98	8.6	7.5	301	10	10	10	10	Date: 6/13/13
6.25	25.6	8.10	7.89	8.6	7.3	373	10	10	10	10	Sample ID: 32038
12.5	25.6	8.08	7.86	8.6	7.2	421	10	10	10	10	Test Solution Prep: [initials]
25	25.6	8.07	7.91	8.8	7.3	529	10	10	10	10	New WQ: [initials]
50	25.6	8.10	8.02	9.1	7.3	733	10	10	10	10	Renewal Time: 1145
100	25.6	8.06	8.13	9.6	7.3	1091	10	10	10	10	Renewal Signoff: [initials]
Meter ID	30A	PH16	PH18	RDO7	RDO5	EC06					Old WQ: [initials]
Lab Water	25.6	7.98	8.20	8.8	8.7	307	10	10	10	10	Date: 6/14/13
6.25	25.6	7.98	8.04	8.6	8.2	365	10	10	10	10	Sample ID: 32038
12.5	25.6	8.04	7.96	8.7	7.9	416	10	10	10	10	Test Solution Prep: [initials]
25	25.6	8.08	7.92	8.8	7.4	521	10	10	10	9	New WQ: DS
50	25.6	8.11	7.95	8.9	7.4	730	10	10	10	10	Renewal Time: 1300
100	25.6	8.12	8.08	9.4	7.4	1098	10	10	10	10	Renewal Signoff: [initials]
Meter ID	30A	PH16	PH16	RDO6	RDO6	EC06					Old WQ: [initials]

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Pond 13
 Test ID#: 52148 Project #: 21069
 Test Date: 6-11-13 Randomization: 4.6.1

Organism Log#: 7323 Age: <48 hrs
 Organism Supplier: Aquatox
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Treatment (%)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water	25.7	8.13	8.05	8.9	8.3	299	10	10	10	16	Date: 6/15/13
6.25	25.7	8.14	7.98	8.6	8.2	362	10	10	10	10	Sample ID: 32059
12.5	25.7	8.15	7.99	8.6	8.1	415	10	10	9	10	Test Solution Prep: <i>W</i>
25	25.7	8.16	7.99	8.8	8.1	526	10	10	10	9	New WQ: <i>W</i>
50	25.7	8.14	8.10	8.8	8.1	725	10	10	10	16	Renewal Time: 1030
100	25.7	8.10	8.23	9.8	8.1	1077	10	10	10	10	Renewal Signoff: KP
Meter ID	30A	PH15	PH15	RD07	RD07	EC04					Old WQ: SS
Lab Water	25.5	8.17	7.87	9.2	8.1	315	10	10	10	10	Date: 6-16-13
6.25	25.5	8.15	7.85	8.9	7.9	356	10	10	10	10	Sample ID: 32059
12.5	25.5	8.15	7.85	8.9	7.9	419	9	10	9	10	Test Solution Prep: <i>W</i>
25	25.5	8.14	7.86	9.1	8.2	545	10	10	10	9	New WQ: SNV
50	25.5	8.13	7.99	9.5	7.8	732	10	10	10	10	Renewal Time: 1120
100	25.5	8.11	8.17	10.1	7.8	1084	10	10	10	10	Renewal Signoff: <i>RL</i>
Meter ID	30A	PH15	PH16	RD05	RD06	EC04					Old WQ: FOUR
Lab Water	25.2	8.21	8.00	9.0	8.2	302	10	10	10	10	Date: 6-17-13
6.25	25.2	8.17	7.89	9.0	8.0	363	10	10	10	10	Sample ID: 32059
12.5	25.2	8.15	7.88	9.0	7.9	416	9	10	9	10	Test Solution Prep: <i>W</i>
25	25.2	8.14	7.90	9.1	8.0	531	10	10	10	9	New WQ: SNV
50	25.2	8.14	8.01	9.5	8.0	736	10	10	10	10	Renewal Time: 1110
100	25.2	8.12	8.10	10.2	8.0	1090	10	10	10	10	Renewal Signoff: <i>RL</i>
Meter ID	30A	PH19	PH15	RD04	RD07	EC06					Old WQ: <i>W</i>
Lab Water	25.1		8.13		7.8	313	10	10	10	10	Date: 6/18/13
6.25	25.1		7.91		7.5	370	10	10	10	10	Sample ID: -
12.5	25.1		7.83		7.4	426	9	10	9	10	Termination Time: 0935
25	25.1		7.88		7.3	540	10	10	10	9	Termination Signoff: SNV
50	25.1		7.94		7.2	752	10	10	10	10	Old WQ: <i>W</i>
100	25.1		7.99		7.2	1138	10	10	10	10	
Meter ID	30A		PH15		RD04	EC06					

CETIS Analytical Report

Report Date: 19 Jun-13 16:14 (p 1 of 5)
Test Code: 52148 | 15-8839-6716

Chronic Larval Fish Survival and Growth Test										Pacific EcoRisk	
Analysis ID: 10-8436-2640		Endpoint: 7d Survival Rate				CETIS Version: CETISv1.8.5					
Analyzed: 19 Jun-13 16:13		Analysis: Nonparametric-Two Sample				Official Results: Yes					
Data Transform		Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result				
Angular (Corrected)		NA	C > T	NA	NA	5.56%	Passes 7d survival rate				
Wilcoxon Rank Sum Two-Sample Test											
Control	vs	Control	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)		
Lab Water Control		Hardness Blank	12	NA	1	6	0.0714	Exact	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.02987925		0.02987925		1	9	0.0240	Significant Effect			
Error	0.0199195		0.003319917		6						
Total	0.04979875				7						
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Mod Levene Equality of Variance		1	13.7	0.3559	Equal Variances					
Variances	Levene Equality of Variance		9	13.7	0.0240	Equal Variances					
Distribution	Shapiro-Wilk W Normality		0.706	0.645	0.0027	Non-normal Distribution					
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	4	1	1	1	1	1	1	0	0.0%	0.0%
0	Hardness Blank	4	0.925	0.845	1	1	0.9	1	0.025	5.41%	7.5%
Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
0	Hardness Blank	4	1.29	1.16	1.42	1.41	1.25	1.41	0.0407	6.32%	8.66%
Graphics											

CETIS Analytical Report

Report Date: 19 Jun-13 16:28 (p 1 of 2)
Test Code: 52148 | 15-8839-6716

Chronic Larval Fish Survival and Growth Test				Pacific EcoRisk	
Analysis ID:	10-2637-3278	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.5
Analyzed:	19 Jun-13 16:27	Analysis:	Parametric-Two Sample	Official Results:	Yes

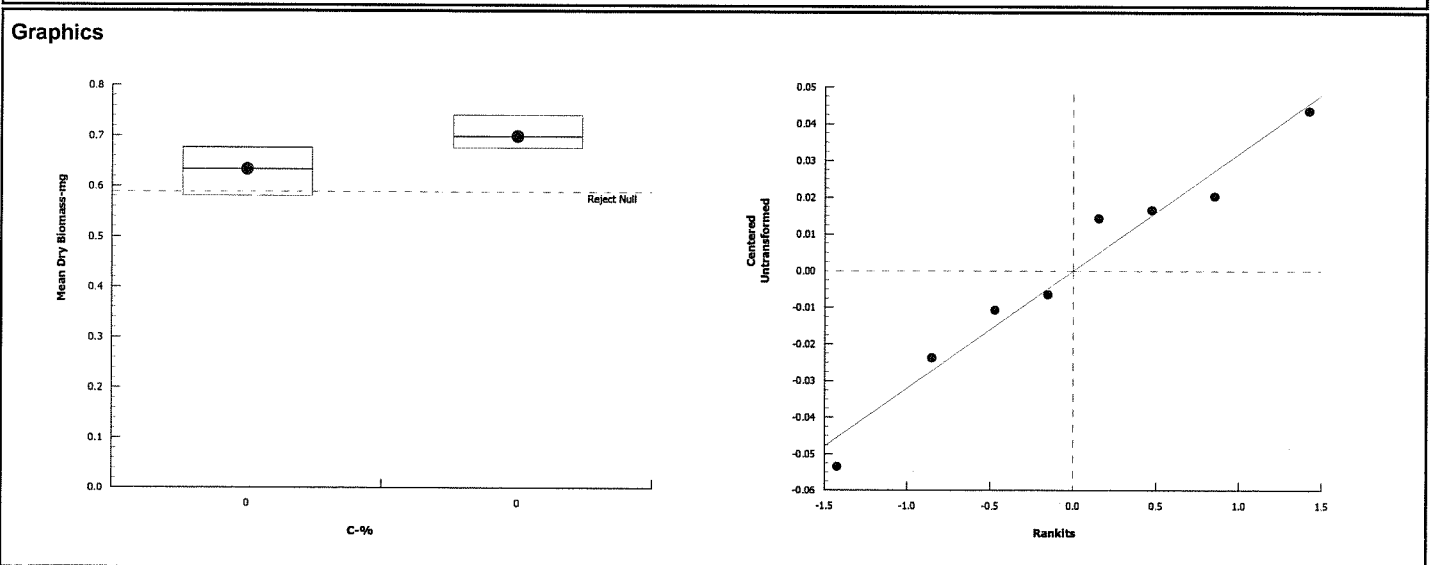
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	6.4%	Fails mean dry biomass-mg

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	2.83	1.94	0.045	6	0.0149	CDF	Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.008515132	0.008515132	1	8.03	0.0298	Significant Effect
Error	0.00636176	0.001060293	6			
Total	0.01487689		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F	3.92	47.5	0.2913	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.97	0.645	0.8974	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	0.699	0.666	0.732	0.676	0.675	0.719	0.0104	2.97%	0.0%
0	Hardness Blank	4	0.634	0.568	0.699	0.676	0.58	0.677	0.0206	6.49%	9.34%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Hardness Blank
 Test ID#: - Project #: 21069
 Test Date: 6-11-13 Randomization: 4.7.5

Organism Log#: 7323 Age: 648 hrs
 Organism Supplier: Aquatox
 Control/Diluent: EPAMH
 Control Water Batch: 1599

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Hardness Control	25.5	8.38		9.0		2432	10	10	10	10	Date: <u>6-11-13</u> Test Solution Prep: <u>JK</u> Initiation Time: <u>1600</u> Initiation Signoff: <u>JK</u>
Meter ID	<u>3830A</u>	<u>PH16</u>		<u>RD04</u>		<u>EC06</u>	New WQ: <u>PH</u>				
Hardness Control	25.7	8.40	8.58 <u>7.87</u>	8.9	7.6	2433	10	10	10	10	Date: <u>6/12/13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1130</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH19</u>	<u>PH19</u>	<u>RD07</u>	<u>RD07</u>	<u>EC07</u>	New WQ: <u>RA</u>	Old WQ: <u>YU</u>			
Hardness Control	25.6	8.32	8.61	9.7	8.5	2432	10	9	10	10	Date: <u>6/13/13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1050</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH16</u>	<u>PH16</u>	<u>RD07</u>	<u>RD05</u>	<u>EC06</u>	New WQ: <u>JK</u>	Old WQ: <u>JK</u>			
Hardness Control	25.3	8.40	8.38	8.7	7.4	2412	9	9	10	9	Date: <u>6/14/13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1420</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH16</u>	<u>PH16</u>	<u>RD06</u>	<u>RD06</u>	<u>EC06</u>	New WQ: <u>MM</u>	Old WQ: <u>mm</u>			
Hardness Control	25.7	8.28	8.66 <u>8.25</u> <u>MK</u>	8.6	8.5	2413	9	9	10	9	Date: <u>6/15/13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1105</u> Renewal Signoff: <u>SS</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH16</u>	<u>RD07</u>	<u>RD06</u>	<u>EC04</u>	New WQ: <u>JK</u>	Old WQ: <u>MK</u>			
Hardness Control	25.5	8.31	8.55	9.1	7.5	2413	9	9	10	9	Date: <u>6-16-13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1055</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH18</u>	<u>RD05</u>	<u>RD07</u>	<u>EC04</u>	New WQ: <u>SNV</u>	Old WQ: <u>CA</u>			
Hardness Control	25.3	8.42	8.53	9.0	7.7	2417	9	9	10	9	Date: <u>6-17-13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1140</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH19</u>	<u>PH15</u>	<u>RD04</u>	<u>RD05</u>	<u>EC06</u>	New WQ: <u>SNV</u>	Old WQ: <u>CA</u>			
Hardness Control	25.6		8.54 <u>7.83</u>		7.6 <u>7.8</u>	2430 <u>315</u>	9	9	10	9	Date: <u>6/18/13</u> Termination Time: <u>1015</u> Termination Signoff: <u>JK</u>
Meter ID	<u>30A</u>		<u>PH15</u>		<u>RD04</u>	<u>EC06</u>			Old WQ: <u>YU</u>		

Fathead Minnow Dry Weight Data Sheet

Client: Lehigh Permanente Test ID #: 52148 Project # 21069
 Sample: Pond 13 Tare Weight Date: 6/16/13 Sign-off: CA
 Test Date: 6/11/13 Final Weight Date: 6/19/13 Sign-off: FOVR

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	165.66	172.41	10	0.675
2		B	160.14	167.33	10	0.719
3		C	182.92	190.05	10	0.713
4		D	164.68	171.56	10	0.688
5	6.25	A	142.05	148.78	10	0.673
6		B	182.03	188.96	10	0.693
7		C	184.14	191.11	10	0.697
8		D	163.30	169.98	10	0.668
9	12.5	A	175.52	182.69	10	0.717
10		B	165.74	173.14	10	0.740
11		C	168.14	175.79	10	0.765
12		D	151.90	159.26	10	0.736
13	25	A	168.44	175.30	10	0.686
14		B	186.81	194.01	10	0.720
15		C	169.87	177.34	10	0.747
16		D	153.21	160.66	10	0.745
17	50	A	175.37	182.41	10	0.704
18		B	165.96	173.09	10	0.713
19		C	180.41	188.32	10	0.791
20		D	175.27	183.19	10	0.792
21	100	A	180.35	189.42	10	0.907
22		B	173.52	181.64	10	0.812
23		C	170.43	178.57	10	0.814
24		D	171.54	179.27	10	0.773
QA 1			171.29	171.25		
QA 2			179.98	179.94		
QA 3			178.87	178.82		
Balance ID:			BAL 01	BAL 01		

Fathead Minnow Dry Weight Data Sheet

Client: Lehigh Permanente
 Test Material: Hardness Blank
 Test Date: 6/11/13

Test ID #: 52142- Project # 21069
 Tare Weight Date: 6-17-13 Sign-off: yu
 Final Weight Date: 6/19/13 Sign-off: CD

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25	Hardness Control	A	161.04	167.81	10	0.677
26		B	166.51	173.01	10	0.650
27		C	181.17	186.97	10	0.580
28		D	180.19	186.46	10	0.627
QA4			162.53	162.50		

Appendix J

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



CETIS Summary Report

Report Date: 20 Jun-13 11:39 (p 1 of 2)
Test Code: 52151 | 19-9232-2747

Chronic Larval Fish Survival and Growth Test							Pacific EcoRisk				
Batch ID:	06-5043-6527	Test Type:	Growth-Survival (7d)				Analyst:	Padrick Anderson			
Start Date:	11 Jun-13 15:15	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Laboratory Water			
Ending Date:	18 Jun-13 09:35	Species:	Pimephales promelas				Brine:	Not Applicable			
Duration:	6d 18h	Source:	Aquatox, AR				Age:	1			
Sample ID:	10-6869-9194	Code:	Pond 14				Client:	Lehigh Permanente			
Sample Date:	10 Jun-13 12:52	Material:	Site Water				Project:	21069			
Receive Date:	10 Jun-13 15:20	Source:	Lehigh Permanente								
Sample Age:	26h (11.9 °C)	Station:	Pond 14								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
20-6259-7364	7d Survival Rate	100	>100	NA	12.3%	1	Dunnett Multiple Comparison Test				
07-7028-5289	Mean Dry Biomass-mg	100	>100	NA	11.7%	1	Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
00-3858-1659	Mean Dry Biomass-mg	IC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)				
		IC10	>100	N/A	N/A	<1					
		IC15	>100	N/A	N/A	<1					
		IC20	>100	N/A	N/A	<1					
		IC25	>100	N/A	N/A	<1					
		IC40	>100	N/A	N/A	<1					
		IC50	>100	N/A	N/A	<1					
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	0.0%
0	Lab Water Contr	4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	0.0%
6.25		4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	0.0%
12.5		4	1	1	1	1	1	0	0	0.0%	-8.11%
25		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	-5.41%
50		4	0.95	0.913	0.987	0.8	1	0.05	0.1	10.5%	-2.7%
100		4	0.9	0.87	0.93	0.8	1	0.0408	0.0816	9.07%	2.7%
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	0.634	0.618	0.649	0.58	0.677	0.0206	0.0411	6.49%	0.0%
0	Lab Water Contr	4	0.667	0.651	0.683	0.631	0.73	0.0217	0.0435	6.52%	-5.25%
6.25		4	0.644	0.622	0.667	0.564	0.709	0.03	0.06	9.31%	-1.74%
12.5		4	0.689	0.679	0.699	0.668	0.728	0.0139	0.0278	4.04%	-8.76%
25		4	0.761	0.751	0.772	0.729	0.792	0.0141	0.0282	3.7%	-20.2%
50		4	0.768	0.742	0.793	0.708	0.831	0.034	0.0679	8.85%	-21.2%
100		4	0.763	0.753	0.774	0.737	0.795	0.0147	0.0294	3.85%	-20.5%

CETIS Summary Report

Report Date: 20 Jun-13 11:39 (p 2 of 2)
 Test Code: 52151 | 19-9232-2747

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	0.9	0.9	1	0.9
0	Lab Water Contr	0.9	0.9	1	0.9
6.25		0.9	0.9	0.9	1
12.5		1	1	1	1
25		1	0.9	1	1
50		1	1	0.8	1
100		0.8	1	0.9	0.9
Mean Dry Biomass-mg Detail					
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	0.677	0.65	0.58	0.627
0	Lab Water Contr	0.73	0.655	0.651	0.631
6.25		0.709	0.657	0.648	0.564
12.5		0.668	0.728	0.69	0.67
25		0.776	0.792	0.729	0.748
50		0.822	0.831	0.71	0.708
100		0.795	0.737	0.782	0.74
7d Survival Rate Binomials					
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Hardness Blank	9/10	9/10	10/10	9/10
0	Lab Water Contr	9/10	9/10	10/10	9/10
6.25		9/10	9/10	9/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	9/10	10/10	10/10
50		10/10	10/10	8/10	10/10
100		8/10	10/10	9/10	9/10

CETIS Analytical Report

Report Date: 19 Jun-13 16:49 (p 2 of 5)
Test Code: 52151 | 19-9232-2747

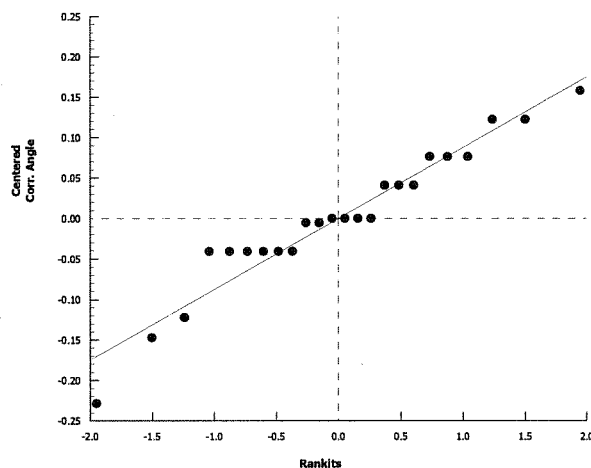
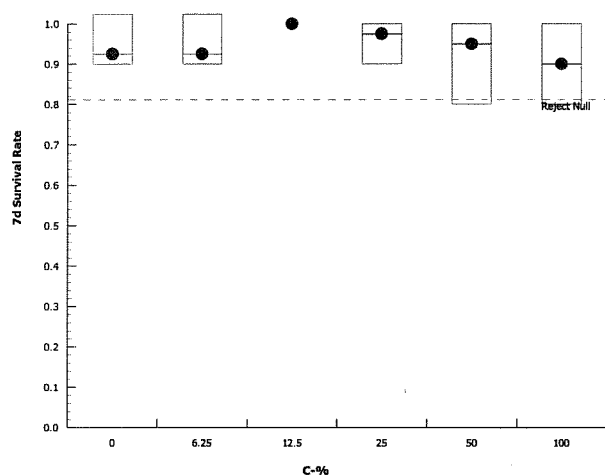
Chronic Larval Fish Survival and Growth Test										Pacific EcoRisk	
Analysis ID: 20-6259-7364		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.5							
Analyzed: 19 Jun-13 16:49		Analysis: Parametric-Control vs Treatments		Official Results: Yes							
Data Transform	Zeta	Alt Hyp	Trials	Seed			PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA			12.3%	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	2.41	0.168	6	0.8333	CDF	Non-Significant Effect		
		12.5	-1.75	2.41	0.168	6	0.9981	CDF	Non-Significant Effect		
		25	-1.17	2.41	0.168	6	0.9891	CDF	Non-Significant Effect		
		50	-0.658	2.41	0.168	6	0.9584	CDF	Non-Significant Effect		
		100	0.507	2.41	0.168	6	0.6444	CDF	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.06921761		0.01384352		5	1.42	0.2660	Non-Significant Effect			
Error	0.1760497		0.009780537		18						
Total	0.2452673				23						
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value		Decision(α:1%)				
Variances	Mod Levene Equality of Variance		0.379	4.25	0.8566		Equal Variances				
Variances	Levene Equality of Variance		1.83	4.25	0.1580		Equal Variances				
Distribution	Shapiro-Wilk W Normality		0.947	0.884	0.2365		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	0.925	0.845	1	0.9	0.9	1	0.025	5.41%	0.0%
6.25		4	0.925	0.845	1	0.9	0.9	1	0.025	5.41%	0.0%
12.5		4	1	1	1	1	1	1	0	0.0%	-8.11%
25		4	0.975	0.895	1	1	0.9	1	0.025	5.13%	-5.41%
50		4	0.95	0.791	1	1	0.8	1	0.05	10.5%	-2.7%
100		4	0.9	0.77	1	0.9	0.8	1	0.0408	9.07%	2.7%
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	1.29	1.16	1.42	1.25	1.25	1.41	0.0407	6.32%	0.0%
6.25		4	1.29	1.16	1.42	1.25	1.25	1.41	0.0407	6.32%	0.0%
12.5		4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	-9.48%
25		4	1.37	1.24	1.5	1.41	1.25	1.41	0.0407	5.94%	-6.32%
50		4	1.34	1.09	1.58	1.41	1.11	1.41	0.0762	11.4%	-3.57%
100		4	1.25	1.06	1.45	1.25	1.11	1.41	0.0623	9.93%	2.75%

CETIS Analytical Report

Report Date: 19 Jun-13 16:49 (p 3 of 5)
 Test Code: 52151 | 19-9232-2747

Chronic Larval Fish Survival and Growth Test			Pacific EcoRisk
Analysis ID: 20-6259-7364	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.5	
Analyzed: 19 Jun-13 16:49	Analysis: Parametric-Control vs Treatments	Official Results: Yes	

Graphics



CETIS Analytical Report

Report Date: 20 Jun-13 11:39 (p 1 of 1)
Test Code: 52151 | 19-9232-2747

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 07-7028-5289	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.8.5
Analyzed: 20 Jun-13 11:38	Analysis: Parametric-Control vs Treatments	Official Results: Yes

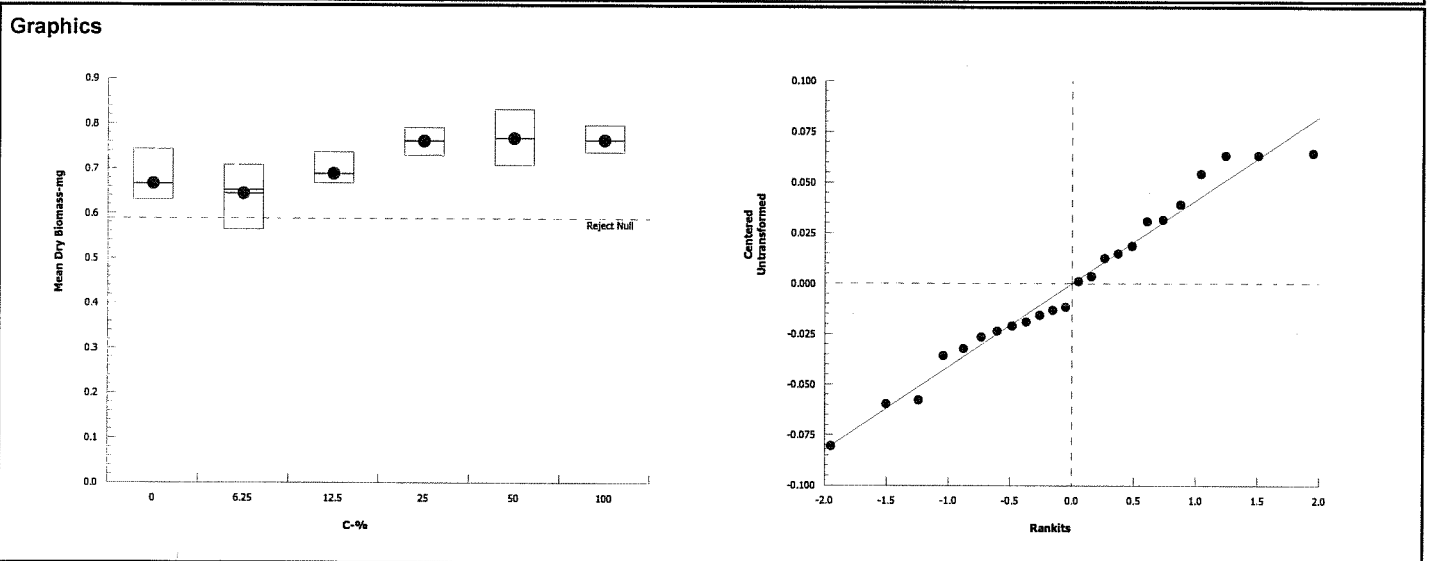
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	11.7%	100	>100	NA	1

Dunnett Multiple Comparison Test									
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	0.688	2.41	0.078	6	0.5633	CDF	Non-Significant Effect
		12.5	-0.688	2.41	0.078	6	0.9614	CDF	Non-Significant Effect
		25	-2.92	2.41	0.078	6	1.0000	CDF	Non-Significant Effect
		50	-3.12	2.41	0.078	6	1.0000	CDF	Non-Significant Effect
		100	-2.99	2.41	0.078	6	1.0000	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.06098736	0.01219747	5	5.84	0.0022	Significant Effect
Error	0.03761404	0.002089669	18			
Total	0.09860141		23			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance	4.28	15.1	0.5105	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.966	0.884	0.5745	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	0.667	0.598	0.736	0.653	0.631	0.73	0.0217	6.52%	0.0%
6.25		4	0.644	0.549	0.74	0.653	0.564	0.709	0.03	9.31%	3.34%
12.5		4	0.689	0.645	0.733	0.68	0.668	0.728	0.0139	4.04%	-3.34%
25		4	0.761	0.716	0.806	0.762	0.729	0.792	0.0141	3.7%	-14.2%
50		4	0.768	0.66	0.876	0.766	0.708	0.831	0.034	8.85%	-15.1%
100		4	0.763	0.717	0.81	0.761	0.737	0.795	0.0147	3.85%	-14.5%



CETIS Analytical Report

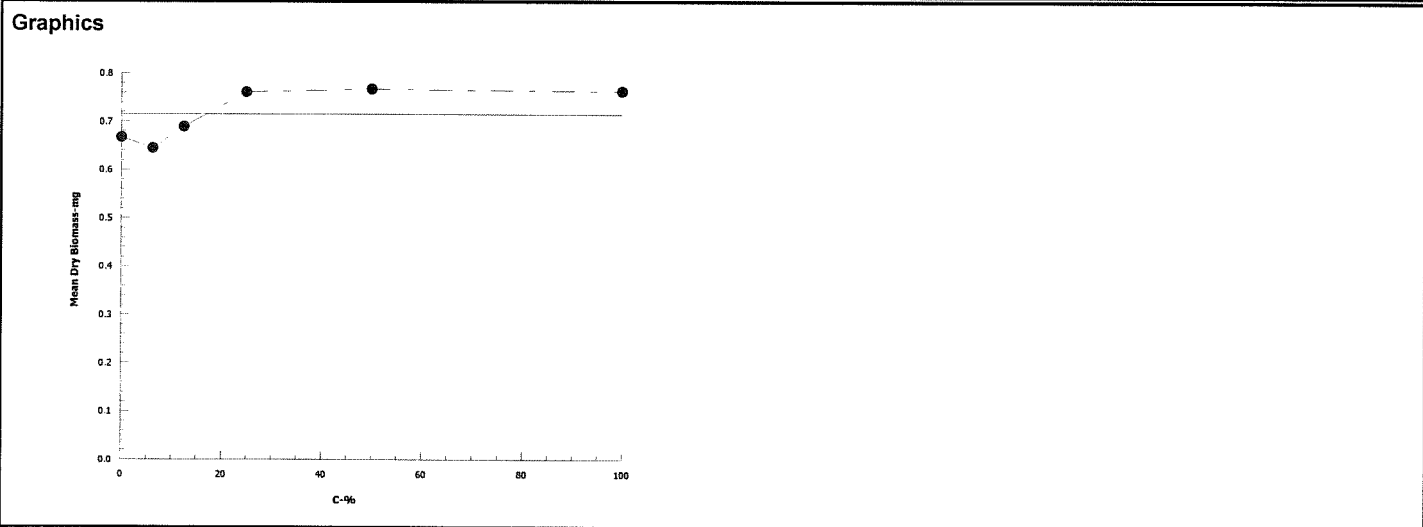
Report Date: 20 Jun-13 11:39 (p 1 of 1)
 Test Code: 52151 | 19-9232-2747

Chronic Larval Fish Survival and Growth Test				Pacific EcoRisk	
Analysis ID:	00-3858-1659	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.5
Analyzed:	20 Jun-13 11:38	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	955396	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	0.667	0.631	0.73	0.0217	0.0435	6.52%	0.0%	
6.25		4	0.644	0.564	0.709	0.03	0.06	9.31%	3.34%	
12.5		4	0.689	0.668	0.728	0.0139	0.0278	4.04%	-3.34%	
25		4	0.761	0.729	0.792	0.0141	0.0282	3.7%	-14.2%	
50		4	0.768	0.708	0.831	0.034	0.0679	8.85%	-15.1%	
100		4	0.763	0.737	0.795	0.0147	0.0294	3.85%	-14.5%	



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Pond 14
 Test ID#: 52151 Project #: 21069
 Test Date: 6-11-13 Randomization: 4.6.4

Organism Log#: 7323 Age: <48 hrs
 Organism Supplier: Aquator
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Treatment (%)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water	25.5	8.17		8.7		302	10	10	10	10	Date: <u>6-11-13</u>
6.25	25.5	8.11		8.7		364	10	10	10	10	Sample ID: <u>32005</u>
12.5	25.5	8.05		8.7		430	10	10	10	10	Test Solution Prep: <u>W</u>
25	25.5	7.97		8.9		539	10	10	10	10	New WQ: <u>OH</u>
50	25.5	7.90		9.3		756	10	10	10	10	Initiation Time: <u>1515</u>
100	25.5	7.79		10.3		1137	10	10	10	10	Initiation Signoff: <u>KP</u>
Meter ID	30A	PH16		RDO4		EC06					
Lab Water	25.6	8.20	7.91	8.6	8.0	298	9	10	10	10	Date: <u>6/12/13</u>
6.25	25.6	8.07	7.89	8.7	8.0	363	10	10	10	10	Sample ID: <u>32005</u>
12.5	25.6	8.01	7.93	8.7	8.2	420	10	10	10	10	Test Solution Prep: <u>W</u>
25	25.6	7.96	7.93	8.9	8.1	534	10	10	10	10	New WQ: <u>OH</u>
50	25.6	7.90	8.03	9.3	8.1	753	10	10	10	10	Renewal Time: <u>1200</u>
100	25.6	7.82	8.14	10.0	8.0	1133	10	10	10	10	Renewal Signoff: <u>OH</u>
Meter ID	30A	PH16	PH19	RDO6	RDO7	EC04					Old WQ: <u>OH</u>
Lab Water	25.6	8.21	8.03	8.6	7.7	301	9	9	10	10	Date: <u>6/13/13</u>
6.25	25.6	8.11	7.92	8.5	7.7	363	10	10	10	10	Sample ID: <u>32039</u>
12.5	25.6	8.07	7.89	8.6	7.6	428	10	10	10	10	Test Solution Prep: <u>W</u>
25	25.6	8.03	7.93	8.9	7.7	542	10	9	10	10	New WQ: <u>W</u>
50	25.6	8.01	8.02	9.3	7.7	761	10	10	10	10	Renewal Time: <u>1115</u>
100	25.6	7.93	8.16	9.3	7.7	1128	9	10	10	9	Renewal Signoff: <u>OH</u>
Meter ID	30A	PH18	PH18	RDO7	RDO5	EC06					Old WQ: <u>OH</u>
Lab Water	25.1	8.17	7.93	8.8	8.2	321	9	9	10	10	Date: <u>6/14/13</u>
6.25	25.1	8.13	7.94	8.8	7.8	373	9	9	10	10	Sample ID: <u>32039</u>
12.5	25.1	8.09	7.85	8.7	7.3	436	10	10	10	10	Test Solution Prep: <u>W</u>
25	25.1	8.07	7.80	8.8	7.3	542	10	10	10	10	New WQ: <u>W</u>
50	25.1	8.05	7.79	8.9	7.1	756	10	10	10	10	Renewal Time: <u>1400</u>
100	25.1	8.07	7.98	9.3	7.1	1157	9	10	10	9	Renewal Signoff: <u>OH</u>
Meter ID	30A	PH16	PH16	RDO6	RDO6	EC06					Old WQ: <u>W</u>

7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente Organism Log#: 7323 Age: <48hrs
 Test Material: Pond 14 Organism Supplier: Aquaton
 Test ID#: 52151 Project #: 21069 Control/Diluent: EPAMH
 Test Date: 6-11-13 Randomization: 4.64 Control Water Batch: 1598

Treatment (%)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water	25.7	8.13	8.17	8.5	8.3	299	9	9	10	9	Date: 6/15/13
6.25	25.7	8.11	8.06	8.6	8.2	353	9	9	10	10	Sample ID: 32060
12.5	25.7	8.10	8.03	8.7	8.2	421	10	10	10	10	Test Solution Prep: M
25	25.7	8.08	8.07	8.9	8.1	535	10	9	10	10	New WQ: M
50	25.7	8.04	8.16	9.1	8.1	735	10	10	10	10	Renewal Time: 1145
100	25.7	8.00	8.29	9.6	8.0	1125	9	10	10	9	Renewal Signoff: KP
Meter ID	30A	PH15	PH16	RD07	RD06	EC04					Old WQ: MK
Lab Water	25.5	8.24	8.09	9.3	8.6	300	9	9	10	9	Date: 6/16/13
6.25	25.5	8.14	8.02	9.0	8.6	370	9	9	10	10	Sample ID: 32060
12.5	25.5	8.12	8.02	9.0	8.5	425	10	10	10	10	Test Solution Prep: M
25	25.5	8.10	8.01	9.3	8.6	543	10	9	10	10	New WQ: SNV
50	25.5	8.05	8.09	9.6	8.7	748	10	10	9	10	Renewal Time: 1050
100	25.5	8.02	8.19	10.5	8.7	1133	9	10	10	9	Renewal Signoff: PL
Meter ID	30A	PH15	PH19	RD05	RD07	EC04					Old WQ: M
Lab Water	25.2	8.18	8.10	8.8	7.9	300	9	9	10	9	Date: 6-17-13
6.25	25.2	8.15	7.95	8.9	7.8	369	9	9	9	10	Sample ID: 32060
12.5	25.2	8.13	7.86	9.0	7.6	428	10	10	10	10	Test Solution Prep: M
25	25.2	8.11	7.82	9.2	7.7	542	10	9	10	10	New WQ: SNV
50	25.2	8.08	7.90	9.6	7.6	758	10	10	8	10	Renewal Time: 1145
100	25.2	8.03	8.09	10.3	7.6	1139	9	10	10	9	Renewal Signoff: PL
Meter ID	30A	PH19	PH15	RD04	RD07	EC06					Old WQ: M
Lab Water	25.1		8.10		7.6	312	9	9	10	9	Date: 6/18/13
6.25	25.1		7.98		7.5	370	9	9	9	10	Sample ID: -
12.5	25.1		7.90		7.6	434	10	10	10	10	Termination Time: 0935
25	25.1		7.87		7.5	547	10	9	10	10	Termination Signoff: MF
50	25.1		7.82		7.4	768	10	10	8	10	Old WQ: M
100	25.1		8.02		7.2	1150	8	10	9	9	
Meter ID	30A		PH15		RD04	EC06					

CETIS Analytical Report

Report Date: 19 Jun-13 16:49 (p 1 of 5)
Test Code: 52151 | 19-9232-2747

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 16-4981-9643	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.5
Analyzed: 19 Jun-13 16:48	Analysis: Nonparametric-Two Sample	Official Results: Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	7.74%	Passes 7d survival rate

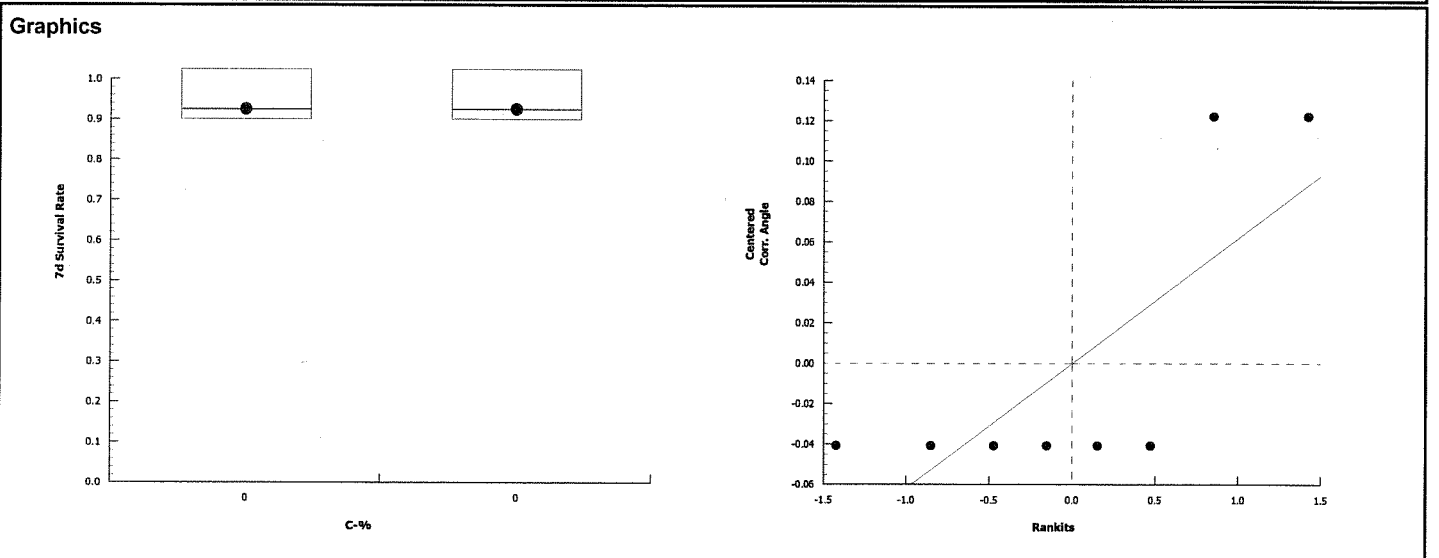
Wilcoxon Rank Sum Two-Sample Test									
Control	vs	Control	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	18	NA	2	6	0.7857	Exact	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	0	1.0000	Non-Significant Effect
Error	0.039839	0.006639833	6			
Total	0.039839		7			

Distributional Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variances	Variance Ratio F	1	47.5	1.0000	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.566	0.645	<0.0001	Non-normal Distribution

7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Hardness Blank	4	0.925	0.845	1	0.9	0.9	1	0.025	5.41%	0.0%
0	Lab Water Contr	4	0.925	0.845	1	0.9	0.9	1	0.025	5.41%	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	1.29	1.16	1.42	1.25	1.25	1.41	0.0407	6.32%	0.0%
0	Hardness Blank	4	1.29	1.16	1.42	1.25	1.25	1.41	0.0407	6.32%	0.0%



CETIS Analytical Report

Report Date: 19 Jun-13 16:49 (p 4 of 5)
Test Code: 52151 | 19-9232-2747

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 19-0590-6581	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.8.5
Analyzed: 19 Jun-13 16:49	Analysis: Parametric-Two Sample	Official Results: Yes

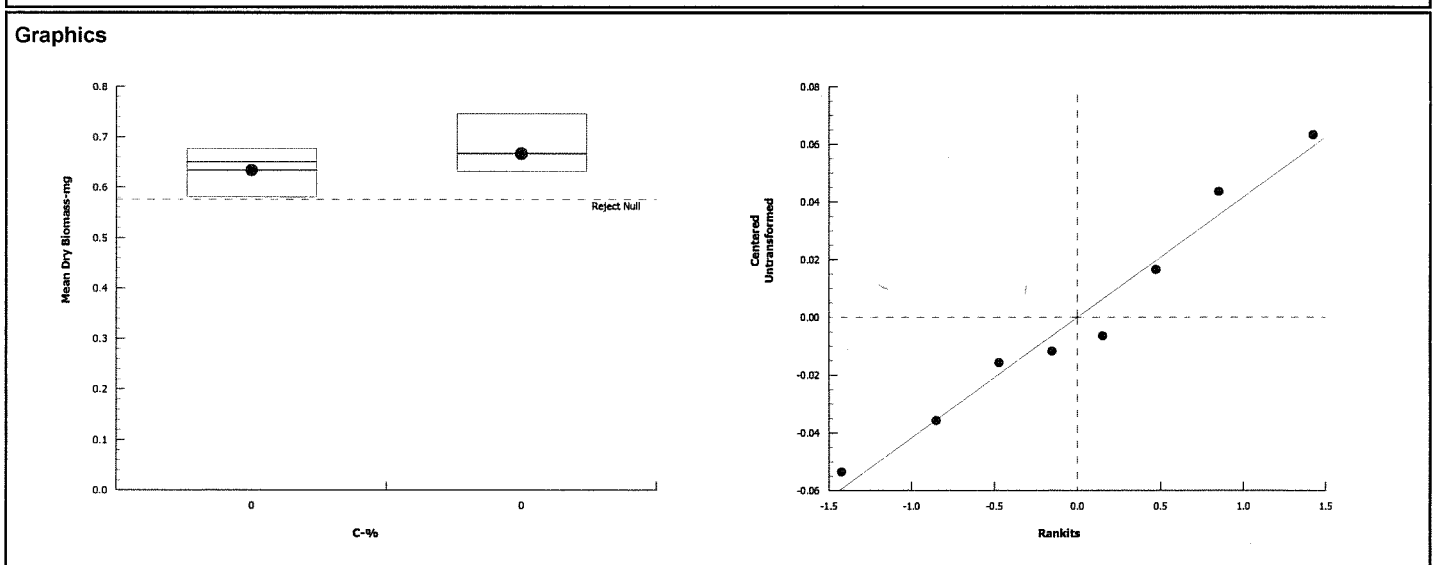
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	8.72%	Passes mean dry biomass-mg

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	1.11	1.94	0.058	6	0.1544	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.002211133	0.002211133	1	1.24	0.3088	Non-Significant Effect
Error	0.01073377	0.001788961	6			
Total	0.0129449		7			

Distributional Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.12	47.5	0.9294	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.963	0.645	0.8351	Normal Distribution

Mean Dry Biomass-mg Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Hardness Blank	4	0.634	0.568	0.699	0.651	0.58	0.677	0.0206	6.49%	0.0%
0	Lab Water Contr	4	0.667	0.598	0.736	0.651	0.631	0.73	0.0217	6.52%	-5.25%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Lehigh Permanente
 Test Material: Hardness Blank
 Test ID#: - Project #: 21069
 Test Date: 6-11-13 Randomization: 4.7.5

Organism Log#: 7323 Age: 648 hrs
 Organism Supplier: Aquatox
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Hardness Control	25.5	8.38		9.0		2432	10	10	10	10	Date: <u>6-11-13</u> Test Solution Prep: <u>JK</u> Initiation Time: <u>1600</u> Initiation Signoff: <u>JK</u>
Meter ID	<u>3830A</u>	<u>PH16</u>		<u>RD04</u>		<u>EC06</u>	New WQ: <u>PH</u>				
Hardness Control	25.7	8.40	8.58 <u>7.87</u>	8.9	7.6	2433	10	10	10	10	Date: <u>6/12/13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1130</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH19</u>	<u>PH19</u>	<u>RD07</u>	<u>RD07</u>	<u>EC07</u>	New WQ: <u>RA</u>	Old WQ: <u>YU</u>			
Hardness Control	25.6	8.32	8.61	9.7	8.5	2432	10	9	10	10	Date: <u>6/13/13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1050</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH16</u>	<u>PH16</u>	<u>RD07</u>	<u>RD05</u>	<u>EC06</u>	New WQ: <u>JK</u>	Old WQ: <u>JK</u>			
Hardness Control	25.3	8.40	8.38	8.7	7.4	2412	9	9	10	9	Date: <u>6/14/13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1420</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH16</u>	<u>PH16</u>	<u>RD06</u>	<u>RD06</u>	<u>EC06</u>	New WQ: <u>MM</u>	Old WQ: <u>mm</u>			
Hardness Control	25.7	8.28	8.66 <u>8.25</u> MK	8.6	8.5	2413	9	9	10	9	Date: <u>6/15/13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1105</u> Renewal Signoff: <u>SS</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH16</u>	<u>RD07</u>	<u>RD06</u>	<u>EC04</u>	New WQ: <u>JK</u>	Old WQ: <u>MK</u>			
Hardness Control	25.5	8.31	8.55	9.1	7.5	2413	9	9	10	9	Date: <u>6-16-13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1055</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH15</u>	<u>PH18</u>	<u>RD05</u>	<u>RD07</u>	<u>EC04</u>	New WQ: <u>SVV</u>	Old WQ: <u>CA</u>			
Hardness Control	25.3	8.42	8.53	9.0	7.7	2417	9	9	10	9	Date: <u>6-17-13</u> Test Solution Prep: <u>JK</u> Renewal Time: <u>1140</u> Renewal Signoff: <u>JK</u>
Meter ID	<u>30A</u>	<u>PH19</u>	<u>PH15</u>	<u>RD04</u>	<u>RD05</u>	<u>EC06</u>	New WQ: <u>SVV</u>	Old WQ: <u>CA</u>			
Hardness Control	25.6		8.54 <u>7.83</u>		7.6 <u>7.8</u>	2430 <u>315</u>	9	9	10	9	Date: <u>6/18/13</u> Termination Time: <u>1015</u> Termination Signoff: <u>CA</u>
Meter ID	<u>30A</u>		<u>PH15</u>		<u>RD04</u>	<u>EC06</u>			Old WQ: <u>YU</u>		

Fathead Minnow Dry Weight Data Sheet

Client: Lehigh Permanente Test ID #: 52151 Project # 21069
 Sample: Pond 14 Tare Weight Date: 6/16/13 Sign-off: CA
 Test Date: 6/11/13 Final Weight Date: 6/19/13 Sign-off: CO

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	147.44	154.74	10	0.730
2		B	193.08	199.63	10	0.655
3		C	143.73	150.24	10	0.651
4		D	162.99	169.30	10	0.631
5	6.25	A	149.95	157.04	10	0.709
6		B	197.00	203.57	10	0.657
7		C	183.71	190.19	10	0.648
8		D	153.86	159.50	10	0.564
9	12.5	A	155.35	162.03	10	0.668
10		B	185.78	193.06	10	0.728
11		C	177.15	184.05	10	0.690
12		D	146.93	153.63	10	0.670
13	25	A	148.66	156.42	10	0.776
14		B	152.88	160.80	10	0.792
15		C	166.04	173.33	10	0.729
16		D	185.28	192.76	10	0.748
17	50	A	173.87	182.09	10	0.822
18		B	164.58	172.89	10	0.831
19		C	163.56	170.66	10	0.710
20		D	170.22	177.30	10	0.708
21	100	A	160.13	168.08	10	0.795
22		B	176.53	183.90	10	0.737
23		C	200.96	208.78	10	0.782
24		D	159.60	167.00	10	0.740
QA 1			152.75	152.70		
QA 2			143.42	143.38		
QA 3			145.03	145.02		
Balance ID:			BAL01	BAL01		

Fathead Minnow Dry Weight Data Sheet

Client: Lehigh Permanente Test ID #: 52142- Project # 21069
 Test Material: Hardness Blank Tare Weight Date: 6-17-13 Sign-off: yu
 Test Date: 6/11/13 Final Weight Date: 6/19/13 Sign-off: CD

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
25.	Hardness Control	A	161.04	167.81	10	0.677
26		B	166.51	173.01	10	0.650
27		C	181.17	186.97	10	0.580
28		D	180.19	186.46	10	0.627
QA 4			162.53	162.50		

Appendix K

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



CETIS Summary Report

Report Date: 17 Jun-13 10:05 (p 1 of 1)
 Test Code: 52153 | 20-5666-3881

Algal Growth Test							Pacific EcoRisk				
Batch ID:	05-7119-8624	Test Type:	Cell Growth			Analyst:	Padrick Anderson				
Start Date:	11 Jun-13 15:00	Protocol:	EPA-821-R-02-013 (2002)			Diluent:	Laboratory Water				
Ending Date:	15 Jun-13 16:30	Species:	Selenastrum capricornutum			Brine:	Not Applicable				
Duration:	4d 2h	Source:	In-House Culture			Age:	6				
Sample ID:	17-5242-1432	Code:	NaCl			Client:	Reference Toxicant				
Sample Date:	11 Jun-13 15:00	Material:	Sodium chloride			Project:	21071				
Receive Date:	11 Jun-13 15:00	Source:	Reference Toxicant								
Sample Age:	NA (24.2 °C)	Station:	In House								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
09-5123-2837	96h Cell Density-with EDTA	0.125	0.25	0.1768	5.04%		Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method				
05-5773-3102	96h Cell Density-with EDTA	IC5	0.162	0.0264	0.313		Linear Interpolation (ICPIN)				
		IC10	0.297	0.0956	0.457						
		IC15	0.453	0.269	0.631						
		IC20	0.628	0.41	0.799						
		IC25	0.811	0.613	0.975						
		IC40	1.44	1.22	1.59						
		IC50	1.88	1.68	2.05						
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	4.03E+6	3.95E+6	4.10E+6	3.82E+6	4.30E+6	1.00E+5	2.01E+5	4.98%	0.0%
0.125		4	3.89E+6	3.84E+6	3.93E+6	3.77E+6	4.03E+6	5.52E+4	1.10E+5	2.84%	3.54%
0.25		4	3.69E+6	3.66E+6	3.71E+6	3.57E+6	3.74E+6	3.93E+4	7.85E+4	2.13%	8.5%
0.5		4	3.36E+6	3.32E+6	3.40E+6	3.22E+6	3.46E+6	5.11E+4	1.02E+5	3.04%	16.5%
1		4	2.81E+6	2.78E+6	2.85E+6	2.72E+6	2.92E+6	4.89E+4	9.78E+4	3.48%	30.2%
2		4	1.90E+6	1.87E+6	1.93E+6	1.80E+6	2.00E+6	4.13E+4	8.26E+4	4.34%	52.8%
96h Cell Density-with EDTA Detail											
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Lab Water Contr	4.30E+6	3.97E+6	3.82E+6	4.02E+6						
0.125		3.84E+6	3.90E+6	3.77E+6	4.03E+6						
0.25		3.73E+6	3.70E+6	3.57E+6	3.74E+6						
0.5		3.37E+6	3.22E+6	3.40E+6	3.46E+6						
1		2.74E+6	2.72E+6	2.92E+6	2.87E+6						
2		1.89E+6	1.92E+6	1.80E+6	2.00E+6						

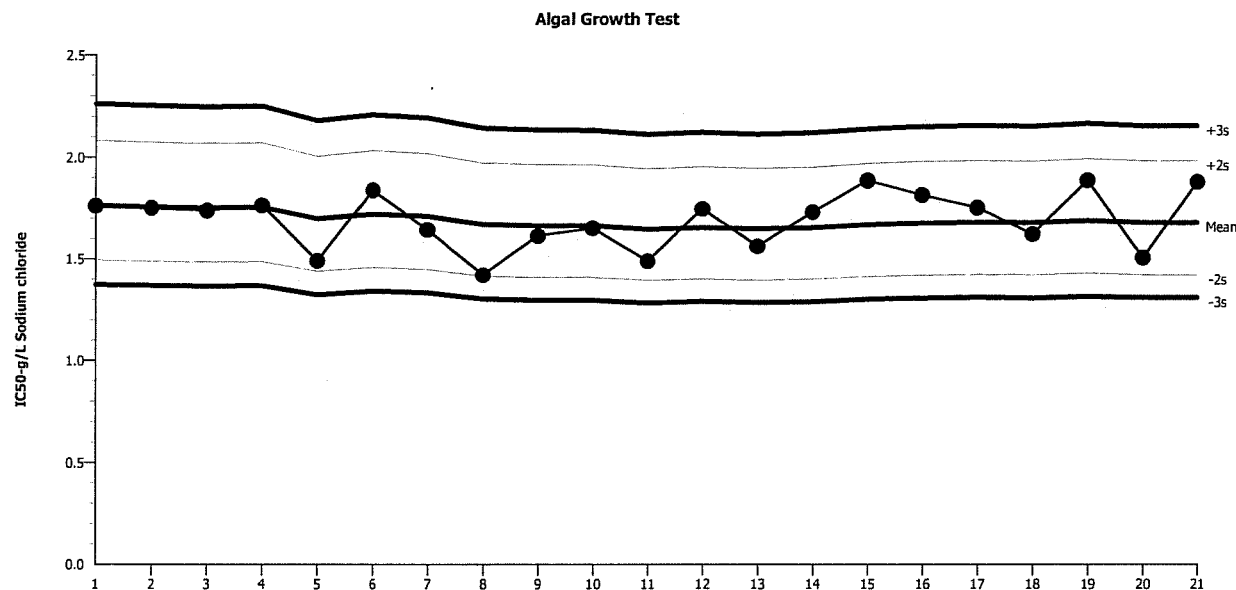
Algal Growth Test

All Matching Labs

Test Type: Cell Growth
Protocol: All Protocols

Organism: Selenastrum capricornutum (Green A)
Endpoint: 96h Cell Density-with EDTA

Material: Sodium chloride
Source: Reference Toxicant-REF



Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2012	Nov	21	15:50	1.763	0.08497	0.5952			21-1141-7186	16-3619-7547	Pacific EcoRisk
2		Dec	4	10:30	1.752	0.07378	0.5184			01-6270-2268	21-0519-9403	Pacific EcoRisk
3			11	15:00	1.738	0.06034	0.4257			02-9480-8478	13-6603-4421	Pacific EcoRisk
4			18	13:45	1.764	0.08653	0.6059			20-1735-8652	02-9000-5433	Pacific EcoRisk
5	2013	Jan	3	11:05	1.491	-0.187	-1.424			01-3205-3944	15-5844-7633	Pacific EcoRisk
6			15	16:00	1.838	0.1604	1.1			18-1462-0180	03-3727-6668	Pacific EcoRisk
7			22	15:45	1.643	-0.0352	-0.2554			13-5357-3620	19-8484-3909	Pacific EcoRisk
8		Feb	5	12:20	1.42	-0.2574	-2.006	(-)		01-0678-7250	21-1038-2081	Pacific EcoRisk
9			12	15:15	1.613	-0.06439	-0.4715			12-7793-2153	14-8229-5619	Pacific EcoRisk
10			26	11:15	1.651	-0.02669	-0.1932			06-4757-0702	15-8535-5604	Pacific EcoRisk
11			27	16:00	1.488	-0.1898	-1.447			05-8096-0111	10-2315-9578	Pacific EcoRisk
12		Mar	12	14:20	1.747	0.0687	0.4835			07-5840-8392	10-3581-3748	Pacific EcoRisk
13			19	15:30	1.561	-0.1165	-0.8668			20-7517-9218	19-9554-9304	Pacific EcoRisk
14			26	12:30	1.731	0.05366	0.3793			11-7782-4722	09-1472-6075	Pacific EcoRisk
15		Apr	9	11:50	1.885	0.2073	1.403			02-7576-3719	05-8343-6993	Pacific EcoRisk
16			10	15:15	1.814	0.1366	0.9427			13-2732-7170	20-3961-1168	Pacific EcoRisk
17			16	14:30	1.752	0.07431	0.5221			06-9817-4928	02-5501-2524	Pacific EcoRisk
18			23	17:00	1.621	-0.05717	-0.4177			18-0793-2383	13-5151-7104	Pacific EcoRisk
19		May	7	14:45	1.886	0.2085	1.411			09-5456-1579	14-3476-4063	Pacific EcoRisk
20		Jun	4	14:20	1.505	-0.1732	-1.312			00-2423-3035	04-6093-8577	Pacific EcoRisk
21			11	15:00	1.878	0.1999	1.356			20-5666-3881	05-5773-3102	Pacific EcoRisk

***Selenastrum capricornutum* Cell Density Enumeration Data**

Client: Reference Toxicant Initial Count: 10,000 cells/mL
 Test Material: NaCl Enumerating Scientist: Kp
 Test Start Date: 6/11/13 Start Time: 1500 Project #: 21071
 Test End Date: 6/15/13 End Time: 1030 Test ID #: 52153

Treatment					
	Rep A	Rep B	Rep C	Rep D	Mean
Lab Water Control	4.30	3.97	3.82	4.02	4.03
0.125	3.84	3.90	3.77	4.03	3.89
0.25	3.73	3.70	3.57	3.74	3.69
0.5	3.87 3.37	3.22	3.40	3.46	3.36
1	2.74	2.72	2.92	2.87	2.81
2	1.89	1.92	1.80	2.00	1.90
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:
	4.03	4.98	6/15/13	1800	

***Selenastrum capricornutum* Algal Toxicity Test Water Quality Data**Client: Reference ToxicantTest ID #: 52153Test Date: 6/11/13Test Material: NaClProject #: 21071Control/Diluent: Lab Water With EDTA

Reference Toxicant Test Treatment (g/L NaCl)	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	24.2	7.50	8.7	92	Date: 6/11/13
0.125	24.2	7.95	8.7	410	Test Solution Prep: SS
0.25	24.2	7.85	8.7	808	New WQ: 04
0.5	24.2	7.80	8.7	1246	Innoculation Time: 1500
1	24.2	7.73	8.7	2169	Innoculation Signoff: SS
2	24.2	7.67	8.7	3940	Shelf ID: R4/S1
Meter ID:	54	PH16	R004	EC06	
Lab Water Control	25.1	8.76			Date: 6/12/13
0.125	25.1	8.55			WQ Time: 0840
0.25	25.1	8.22			WQ Signoff: FOUR
0.5	25.1	8.10			
1	25.1	7.99			
2	25.1	7.87			
Meter ID:	54	PH16			
Lab Water Control	25.2	8.80			Date: 6-13-13
0.125	25.2	8.64			WQ Time: 0900
0.25	25.2	8.59			WQ Signoff: 04
0.5	25.2	8.41			
1	25.2	8.25			
2	25.2	8.15			
Meter ID:	54	PH15			
Lab Water Control	25.4	9.66			Date: 6-14-13
0.125	25.4	9.49			WQ Time: 09.00
0.25	25.4	9.60			WQ Signoff: 44
0.5	25.4	9.36			
1	25.4	9.20			
2	25.4	8.76			
Meter ID:	54	PH18			
Lab Water Control	25.4	9.64	11.2	109	Date: 6/15/13
0.125	25.4	9.68	11.4	328	Termination Time: 1630
0.25	25.4	9.52	11.5	578	Termination Signoff: KP
0.5	25.4	9.35	11.1	1058	WQ Time: 1000
1	25.4	9.37	10.8	2031	WQ Signoff: FOUR
2	25.4	9.15	9.8	3910	
Meter ID:	54	PH16 PH18	R006	EC07	

Initial Test Conditions			
Target: 4.000 g NaCl in 2 L	Alkalinity	Hardness	Light Intensity (ftc)
Actual: 4.003	✓ 9	✓ 15	390.26

Appendix L

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



CETIS Summary Report

Report Date: 29 Jul-13 13:53 (p 1 of 2)
 Test Code: 52123 | 14-5892-0357

Ceriodaphnia Survival and Reproduction Test							Pacific EcoRisk				
Batch ID:	17-1832-5726	Test Type:	Reproduction-Survival (7d)				Analyst:	Padrick Anderson			
Start Date:	11 Jun-13 16:00	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Laboratory Water			
Ending Date:	17 Jun-13 16:40	Species:	Ceriodaphnia dubia				Brine:	Not Applicable			
Duration:	6d 1h	Source:	In-House Culture				Age:	1			
Sample ID:	08-5825-8240	Code:	NaCl				Client:	Pacific Ecorisk			
Sample Date:	11 Jun-13 16:00	Material:	Sodium chloride				Project:	21060			
Receive Date:	11 Jun-13 16:00	Source:	Reference Toxicant								
Sample Age:	NA (25.7 °C)	Station:	In House								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
12-1627-1488	Reproduction	1000	1500	1225	21.6%		Wilcoxon/Bonferroni Adj Test				
00-5140-3010	Survival	1500	2000	1732	NA		Fisher Exact/Bonferroni-Holm Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method				
13-9288-2028	Reproduction	IC5	1060	278	1110		Linear Interpolation (ICPIN)				
		IC10	1150	676	1230						
		IC15	1230	1030	1340						
		IC20	1320	1140	1450						
		IC25	1410	1240	1520						
		IC40	1570	1510	1620						
		IC50	1650	1590	1690						
16-2600-5363	Survival	EC50	1920	1770	2080		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	8	30.3	26.3	34.2	5	38	3.7	10.5	34.6%	0.0%
500		8	32.8	31.3	34.2	25	39	1.35	3.81	11.6%	-8.26%
1000		9	31	29.8	32.2	24	36	1.09	3.28	10.6%	-2.48%
1500		8	22	21.1	22.9	19	25	0.824	2.33	10.6%	27.3%
2000		9	0.889	-0.107	1.88	0	8	0.889	2.67	300.0%	97.1%
2500		9	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	9	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	0.4	0.207	0.593	0	1	0.163	0.516	129.0%	60.0%
2500		10	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date: 29 Jul-13 13:53 (p 2 of 2)
 Test Code: 52123 | 14-5892-0357

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	35	38	30	33	33	5	35	33		
500		33	39	25	33	32	34	33	33		
1000		30	31	24	32	33	36	30	30	33	
1500		25	25	22	19	19	21	23	22		
2000		0	0	8	0	0	0	0	0	0	
2500		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	
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	0	1	0	0	0	0	0	1
2500		0	0	0	0	0	0	0	0	0	0
Survival Binomials											
C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
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	0/1	1/1	0/1	0/1	0/1	0/1	0/1	1/1
2500		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

Ceriodaphnia Survival and Reproduction Test

All Matching Labs

Test Type: Reproduction-Survival (7d)

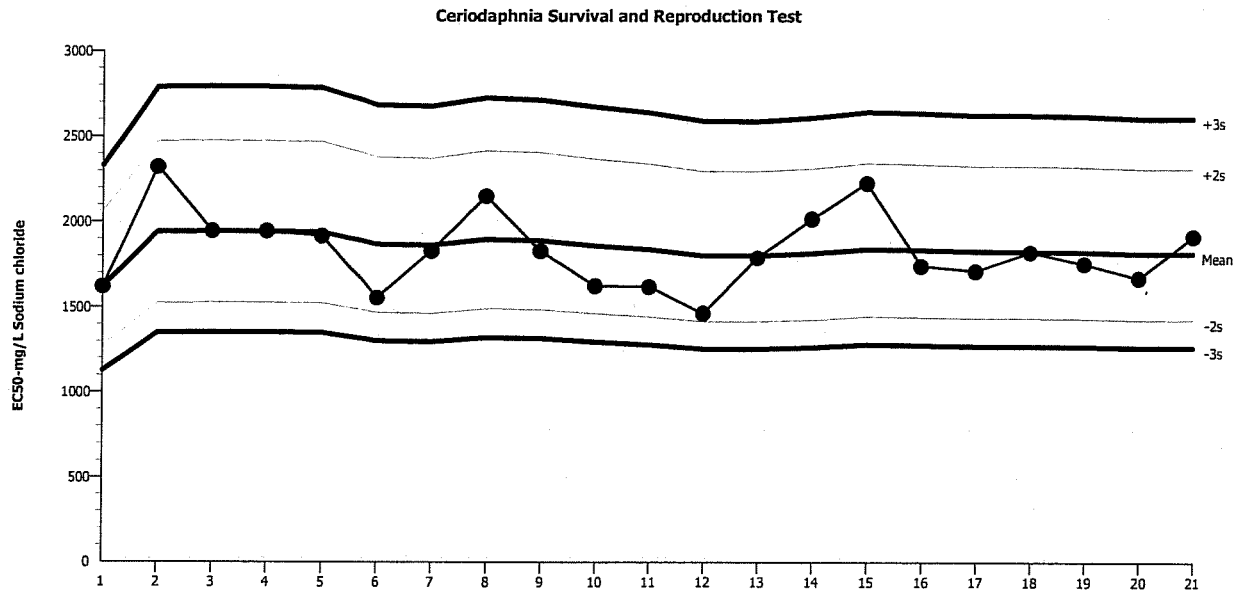
Organism: Ceriodaphnia dubia (Water Flea)

Material: Sodium chloride

Protocol: All Protocols

Endpoint: Survival

Source: Reference Toxicant-REF



Mean: 1817

Count: 20

-2s Warning Limit: 1426

-3s Action Limit: 1264

Sigma: NA

CV: 12.90%

+2s Warning Limit: 2313

+3s Action Limit: 2611

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2013	Mar	27	15:15	1621	-195.7	-0.9423			01-4769-0843	15-3055-4914	Pacific EcoRisk
2		Apr	2	14:10	2324	507.2	2.036	(+)		12-7676-8938	13-1402-3145	Pacific EcoRisk
3			5	16:00	1948	130.6	0.574			05-8592-4379	16-7595-6881	Pacific EcoRisk
4			5	16:00	1948	130.6	0.574			07-5599-3673	05-5091-5502	Pacific EcoRisk
5			9	16:00	1918	101.3	0.4485			00-1292-0987	06-4507-7686	Pacific EcoRisk
6			10	16:25	1556	-261.4	-1.285			05-5275-1475	01-5912-5169	Pacific EcoRisk
7			16	15:00	1831	13.54	0.06142			02-3233-8717	13-1637-7316	Pacific EcoRisk
8			18	16:00	2153	335.4	1.401			10-8338-4687	18-2038-5967	Pacific EcoRisk
9			23	13:30	1830	12.89	0.05849			05-6046-8220	13-0373-7710	Pacific EcoRisk
10			25	13:40	1625	-192.2	-0.9246			05-9227-8249	00-2203-9771	Pacific EcoRisk
11			30	14:00	1621	-196.2	-0.9452			04-5684-0899	19-0303-4606	Pacific EcoRisk
12		May	2	15:30	1464	-353.5	-1.79			17-0259-7550	09-2218-8178	Pacific EcoRisk
13			7	11:15	1791	-26.18	-0.1201			12-0346-1209	14-4932-1774	Pacific EcoRisk
14			8	13:40	2019	201.8	0.871			13-5743-2975	12-5533-3546	Pacific EcoRisk
15			14	15:01	2230	412.6	1.692			10-3627-8534	05-8452-1603	Pacific EcoRisk
16			21	15:30	1743	-74.13	-0.3445			17-8958-6942	10-7373-6018	Pacific EcoRisk
17			24	15:30	1714	-103.5	-0.4852			05-2719-4715	14-5747-9741	Pacific EcoRisk
18			28	14:50	1825	7.855	0.03568			16-4547-5216	15-7528-5220	Pacific EcoRisk
19		Jun	4	14:30	1756	-60.94	-0.2821			07-2390-0740	15-2345-8531	Pacific EcoRisk
20			5	14:15	1673	-144.1	-0.6832			20-1540-0884	14-0281-2345	Pacific EcoRisk
21			11	16:00	1918	101.3	0.4485			14-5892-0357	16-2600-5363	Pacific EcoRisk

Ceriodaphnia Survival and Reproduction Test

All Matching Labs

Test Type: Reproduction-Survival (7d)

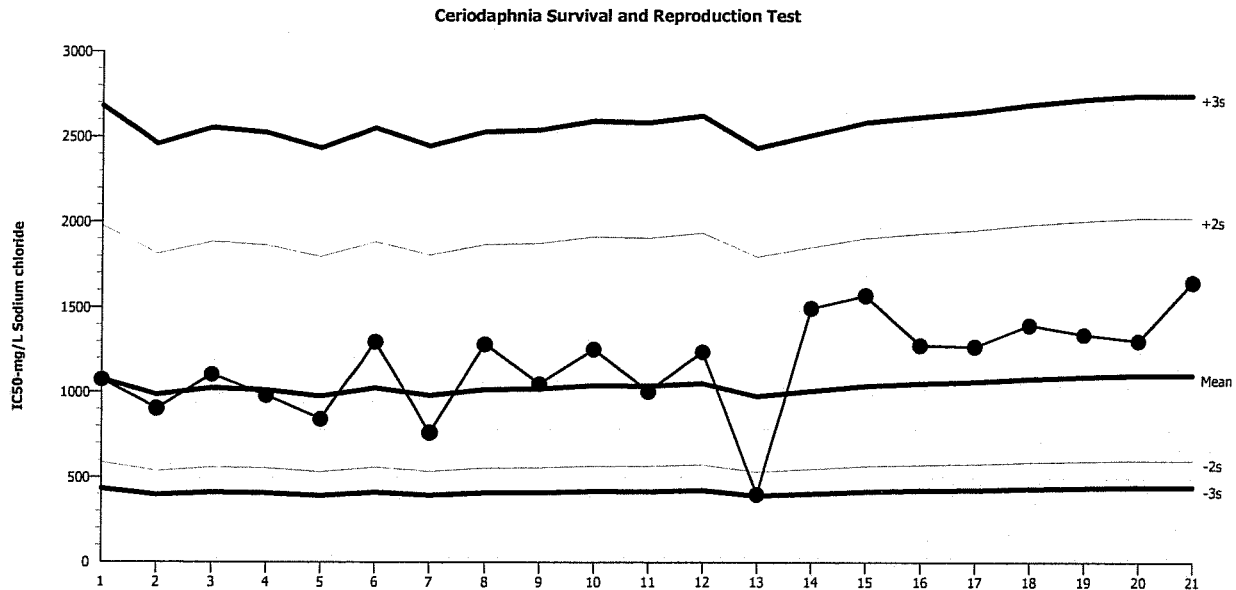
Organism: Ceriodaphnia dubia (Water Flea)

Material: Sodium chloride

Protocol: All Protocols

Endpoint: Reproduction

Source: Reference Toxicant-REF



Mean: 1101

Count: 20

-2s Warning Limit: 599.1

-3s Action Limit: 441.9

Sigma: NA

CV: 35.60%

+2s Warning Limit: 2024

+3s Action Limit: 2743

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2013	Mar	26	15:40	1076	-24.56	-0.07413			14-2842-2070	13-5367-1079	Pacific EcoRisk
2			27	15:15	903.7	-197.3	-0.6491			01-4769-0843	04-7313-6719	Pacific EcoRisk
3		Apr	2	14:10	1105	4.344	0.01294			12-7676-8938	21-0981-8243	Pacific EcoRisk
4			5	16:00	981.9	-119.1	-0.3762			05-8592-4379	05-7189-8242	Pacific EcoRisk
5			5	16:00	843	-258	-0.8774			07-5599-3673	05-6008-4398	Pacific EcoRisk
6			9	16:00	1297	195.7	0.5377			00-1292-0987	15-3649-5579	Pacific EcoRisk
7			10	16:25	762.4	-338.6	-1.208			05-5275-1475	03-6365-1824	Pacific EcoRisk
8			16	15:00	1284	182.6	0.5041			02-3233-8717	06-0637-7714	Pacific EcoRisk
9			18	16:00	1049	-52.21	-0.1597			10-8338-4687	00-9128-2437	Pacific EcoRisk
10			23	13:30	1253	152.2	0.4254			05-6046-8220	07-5418-0387	Pacific EcoRisk
11			25	13:40	1004	-96.86	-0.3026			05-9227-8249	05-6648-2686	Pacific EcoRisk
12			30	14:00	1237	136.2	0.3832			04-5684-0899	18-4786-5611	Pacific EcoRisk
13		May	2	15:30	400.3	-700.7	-3.325	(-)	(-)	17-0259-7550	04-2994-5811	Pacific EcoRisk
14			8	13:40	1496	394.6	1.007			13-5743-2975	05-4002-4216	Pacific EcoRisk
15			14	15:01	1569	468	1.164			10-3627-8534	08-3930-8135	Pacific EcoRisk
16			21	15:30	1277	176.1	0.4876			17-8958-6942	14-6809-4980	Pacific EcoRisk
17			24	15:30	1270	168.9	0.469			05-2719-4715	14-9704-9531	Pacific EcoRisk
18			28	14:50	1396	295	0.7801			16-4547-5216	00-0521-4969	Pacific EcoRisk
19		Jun	4	14:30	1341	239.6	0.647			07-2390-0740	12-5158-9384	Pacific EcoRisk
20			5	14:15	1304	203	0.5561			20-1540-0884	01-0258-2767	Pacific EcoRisk
21			11	16:00	1648	547	1.325			14-5892-0357	13-9288-2028	Pacific EcoRisk

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

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 6/11/13
 Project #: 21060 Test ID: 52123 Randomization: B.C.10 Control Water: Modified EPAMH

	Day	pH		D.O.		Conductivity (µS/cm)		Temp (°C)	Survival / Reproduction										SIGN-OFF	
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J		
Lab Water Control	0	8.29		8.8		348		25.7	0	0	0	0	0	0	0	0	0	0	Date: 6/11/13 New WQ: Test Init: 4/11/13 Sol'n Prep: YU Old WQ: Time: 1600	
	1	7.94	8.28	8.8	8.6	348	358	25.5	0	0	0	0	0	0	0	0	0	0	Date: 6/12/13 New WQ: YU Counts: 72 Sol'n Prep: YU Old WQ: YU Time: 1510	
	2	7.96	8.11	8.9	9.0	346	378	25.5	0	0	0	0	0	0	0	0	0	0	Date: 6/13/13 New WQ: YU Counts: 72 Sol'n Prep: KB Old WQ: YU Time: 1420	
	3	8.11	8.24	8.6	8.5	347	373	25.0	6	0	6	4	4	6	6	5	4	6	Date: 6/14/13 New WQ: YU Counts: 72 Sol'n Prep: YU Old WQ: YU Time: 1500	
	4	7.99	8.09	8.4	8.5	343	376	25.5	0	0	0	0	9	0	0	4/0	0	0	Date: 6/15/13 New WQ: YU Counts: 72 Sol'n Prep: YU Old WQ: YU Time: 1530	
	5	7.97	8.22	8.7	8.7	362	369	25.4	12	0	14	12	0	13	13	-	12	12	Date: 6/16/13 New WQ: YU Counts: 72 Sol'n Prep: YU Old WQ: YU Time: 1400	
	6	-	8.14	-	8.6	-	365	25.2	17	0	18	-	17	14	14	-	19	15	Date: 6/17/13 New WQ: YU Counts: 72 Sol'n Prep: YU Old WQ: YU Time: 1430	
	7																		Date: New WQ: Counts: Sol'n Prep: Old WQ: Time:	
	8																		Date: Old WQ: Counts: Time:	
Total=								35	36	38	36	30	33	33	4/5	35	33	Mean Neonates/Female = 25.8 26.8 30.3		
	Day	pH		D.O.		Conductivity (µS/cm)			Survival / Reproduction										RT BATCH NUMBER	
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J		
500 mg/L	0	8.13		8.6		1267			0	0	0	0	0	0	0	0	0	0	99	
	1	7.93	8.19	8.6	8.5	1358	1354		0	0	0	0	0	0	0	0	0	0	99	
	2	7.94	8.08	8.7	9.0	1830	1507		0	0	0	0	0	0	0	0	0	0	99	
	3	8.02	8.14	8.6	8.3	1339	1436		6	6	7	0	4	4	0	6	6	5	99	
	4	7.92	8.03	8.5	8.5	1346	1505		0	0	0	0	0	0	0	0	0	0	99	
	5	7.99	8.15	8.7	8.5	1395	1478		11	11	13	11	12	13	0	13	12	13	99	
	6	-	8.15	-	8.4	-	1487		16	19	19	14	17	15	0	15	15	15	-	
	7																			
	8																			
Total=								33	36	39	25	33	32	36	34	33	33	Mean Neonates/Female = 29.8 31.1 32.8		

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

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 6/11/13
 Project #: 21060 Test ID: 52123 Randomization: B.C.10 Control Water: Modified EPAMH

	Day	pH		D.O.		Conductivity (μ S/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	8.07		8.7		2213			0	0	0	0	0	0	0	0	0	0	
	1	7.92	8.13	8.6	8.4	2306	2429		0	0	0	0	0	0	0	0	0	0	
	2	7.93	8.07	8.7	9.0	2284	2519		0	0	0	0	0	0	0	0	0	0	
	3	7.96	8.12	8.6	8.3	2284	2517		4	0	6	0	4	4	6	4	6	6	
	4	7.89	8.02	8.6	8.5	2526	2572		0	0	0	0	10	0	0	0	0	0	
	5	7.95	8.13	8.8	8.4	2307	2553		12	0	11	10	0	12	13	10	11	11	
	6	-	8.16	-	8.4	-	2483		14	0	14	14	18	17	17	16	13	16	
	7																		
	8																		
Total=									30	3	31	24	32	33	34	30	30	33	Mean Neonates/Female = 27.9 31.0
1500 mg/L	0	8.03		9.0		3310			0	0	0	0	0	0	0	0	0	0	
	1	7.93	8.11	9.0	8.4	3260	3550		0	0	0	0	0	0	0	0	0	0	
	2	7.90	8.06	9.0	9.0	3230	3550		0	0	0	0	0	0	0	0	0	0	
	3	7.92	8.11	8.7	8.3	3240	3500		4	0	4	0	2	0	4	0	2	0	
	4	7.84	8.02	8.4	8.4	3280	3570		0	0	0	0	0	0	0	0	0	0	
	5	7.93	8.12	8.9	8.4	3300	3590		8	0	7	8	6	0	5	9	5	8	
	6	-	8.15	-	8.3	-	3470		13	0	14	14	11	0	10	12	16	14	
	7																		
	8																		
Total=									25	3	29	22	19	20	19	21	23	22	Mean Neonates/Female = 17.4 22.0

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

Client: _____ Reference Toxicant: _____ Material: Sodium Chloride Test Date: 6/11/13
 Project #: 21060 Test ID: 52123 Randomization: B.6.10 Control Water: Modified EPAMH

	Day	pH		D.O.		Conductivity ($\mu\text{S}/\text{cm}$)		Temp ($^{\circ}\text{C}$)	Survival / Reproduction										
		New	Old	New	Old	New	Old		A	B	C	D	E	F	G	H	I	J	
2000 mg/L	0	7.97		9.3		4150			0	0	0	0	0	0	0	0	0	0	
	1	7.91	8.09	9.0	8.4	4140	4510		0	0	0	0	0	0	0	0	0	0	
	2	7.86	8.06	9.2	9.0	4160	4530		0	0	1/0	0	1/0	1/0	1/0	1/0	1/0	0	
	3	7.88	8.11	9.2	8.3	4180	4500		0	0	-	0	-	-	-	-	-	0	
	4	7.61	8.02	9.0	8.4	4190	4540		0	0	-	0	-	-	-	-	-	0	
	5	7.91	8.10	9.1	8.4	4180	4540		0	0	-	0	-	-	-	-	-	0	
	6	-	8.14	-	8.3	-	4450		0	0	-	0	-	-	-	-	-		
	7										-		-	-	-	-	-		
	8										-		-	-	-	-	-		
Total=									7/0	7/0	1/0	7/0	1/0	1/0	1/0	1/0	1/0	7/0	Mean Neonates/Female = 0.89
2500 mg/L	0	7.93		9.7		5200			0	0	0	0	0	0	0	0	0	0	
	1	7.92	8.08	9.1	8.5	5120	5530		1/0	1/0	0	1/0	1/0	1/0	0	0	1/0	1/0	
	2	7.86	8.08	9.3	8.9	5110	5580		-	-	1/0	-	-	-	1/0	1/0	-	-	
	3	7.84	-	9.6	-	5140	5130		-	-	-	-	-	-	-	-	-	-	
	4	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
	6								-	-	-	-	-	-	-	-	-	-	
	7								-	-	-	-	-	-	-	-	-	-	
	8								-	-	-	-	-	-	-	-	-	-	
Total=									1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	Mean Neonates/Female = 0

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

Client: Pacific EcoRisk

Material: Meter IDs

Test Date: 6/11/13

Project #: 21060 Test ID: 52123

Control Water: Modified EPAMH

	Day	pH		D.O.		Conductivity ($\mu\text{S}/\text{cm}$)		Temp ($^{\circ}\text{C}$)											SIGN-OFF		
		New	Old	New	Old	New	Old												Date:	New WQ:	Old WQ:
Meter IDs	0	PH19		RD07		EC07		30A											6/11/13	CLC	
	1	PH19	PH19	RD07	RD04	EC07	EC06	30A											6/12/13	CLC	HP
	2	PH15	PH16	RD04	RD05	EC04	EC06	30A											6/13/13	CLC	HP
	3	PH16	PH16	RD06	RD06	EC06	EC06	30A											6/14/13	CLC	HP
	4	PH15	PH15	RD07	RD07	EC04	EC04	30A											6/15/13	CLC	SS
	5	PH18	PH16	RD07	RD06	EC07	EC06	30A											6/16/13	CLC	FOUS
	6	—	PH16	—	RD06	—	EC04	30A											6/17/13	—	PS
	7																		Date:	New WQ:	Old WQ:
	8																		Date:	New WQ:	Old WQ:

Appendix M

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



CETIS Summary Report

 Report Date: 23 Jun-13 16:34 (p 1 of 2)
 Test Code: 52152 | 17-3597-1058

Chronic Larval Fish Survival and Growth Test							Pacific EcoRisk				
Batch ID:	10-4394-2053	Test Type:	Growth-Survival (7d)				Analyst:	Eddie Kalombo			
Start Date:	11 Jun-13 16:15	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Laboratory Water			
Ending Date:	18 Jun-13 11:10	Species:	Pimephales promelas				Brine:	Not Applicable			
Duration:	6d 19h	Source:	Aquatox, AR				Age:	1			
Sample ID:	09-4137-1493	Code:	NaCl				Client:	Pacific Ecorisk			
Sample Date:	11 Jun-13 16:15	Material:	Sodium chloride				Project:	21070			
Receive Date:	11 Jun-13 16:15	Source:	Reference Toxicant								
Sample Age:	NA (25.5 °C)	Station:	In House								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
08-6510-8708	7d Survival Rate	1.5	3	2.121	10.6%		Steel Many-One Rank Sum Test				
15-6545-7569	Mean Dry Biomass-mg	1.5	>1.5	NA	14.1%		Dunnett Multiple Comparison Test				
07-7483-7431	Mean Dry Weight-mg	1.5	>1.5	NA	9.13%		Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method				
10-6399-9980	7d Survival Rate	EC5	1.1	0.581	1.58		Linear Regression (MLE)				
		EC10	1.46	0.863	1.99						
		EC15	1.77	1.13	2.33						
		EC20	2.06	1.39	2.64						
		EC25	2.35	1.65	2.95						
		EC40	3.28	2.54	3.97						
		EC50	4	3.23	4.84						
02-6862-3844	Mean Dry Biomass-mg	IC5	0.967	0.854	1.28		Linear Interpolation (ICPIN)				
		IC10	1.18	0.971	1.74						
		IC15	1.4	1.08	1.88						
		IC20	1.61	1.2	2.04						
		IC25	1.81	1.33	2.2						
		IC40	2.42	2.08	2.78						
		IC50	2.82	2.46	3.3						
7d Survival Rate Summary											
C-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	0.0%
0.75		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	0.0%
1.5		4	0.85	0.813	0.887	0.7	0.9	0.05	0.1	11.8%	12.8%
3		4	0.55	0.502	0.598	0.4	0.7	0.0645	0.129	23.5%	43.6%
6		4	0.55	0.513	0.587	0.4	0.6	0.05	0.1	18.2%	43.6%
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	0.572	0.555	0.588	0.541	0.637	0.0221	0.0443	7.74%	0.0%
0.75		4	0.635	0.612	0.657	0.548	0.687	0.0305	0.0609	9.6%	-11.0%
1.5		4	0.499	0.48	0.518	0.427	0.547	0.0254	0.0508	10.2%	12.8%
3		4	0.275	0.261	0.289	0.23	0.321	0.0192	0.0383	13.9%	51.9%
6		4	0.172	0.149	0.194	0.093	0.243	0.0308	0.0615	35.9%	70.0%
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	0.587	0.571	0.603	0.541	0.637	0.0219	0.0439	7.47%	0.0%
0.75		4	0.65	0.637	0.662	0.609	0.687	0.0168	0.0335	5.16%	-10.7%
1.5		4	0.588	0.579	0.597	0.567	0.61	0.012	0.0241	4.09%	-0.19%
3		4	0.514	0.479	0.55	0.376	0.575	0.0471	0.0942	18.3%	12.4%
6		4	0.305	0.278	0.332	0.232	0.405	0.0362	0.0725	23.7%	48.0%
9		4	0	0	0	0	0	0	0		100.0%

CETIS Summary Report

Report Date: 23 Jun-13 16:34 (p 2 of 2)
 Test Code: 52152 | 17-3597-1058

Chronic Larval Fish Survival and Growth Test						Pacific EcoRisk
7d Survival Rate Detail						
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	
0	Lab Water Contr	1	1	1	0.9	
0.75		0.9	1	1	1	
1.5		0.9	0.7	0.9	0.9	
3		0.6	0.4	0.7	0.5	
6		0.4	0.6	0.6	0.6	
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	0.541	0.637	0.561	0.548	
0.75		0.548	0.639	0.664	0.687	
1.5		0.511	0.427	0.547	0.51	
3		0.321	0.23	0.263	0.286	
6		0.093	0.17	0.243	0.18	
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	0.541	0.637	0.561	0.609	
0.75		0.609	0.639	0.664	0.687	
1.5		0.568	0.61	0.608	0.567	
3		0.535	0.575	0.376	0.572	
6		0.232	0.283	0.405	0.3	
9		0	0	0	0	
7d Survival Rate Binomials						
C-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	
0	Lab Water Contr	10/10	10/10	10/10	9/10	
0.75		9/10	10/10	10/10	10/10	
1.5		9/10	7/10	9/10	9/10	
3		6/10	4/10	7/10	5/10	
6		4/10	6/10	6/10	6/10	
9		0/10	0/10	0/10	0/10	

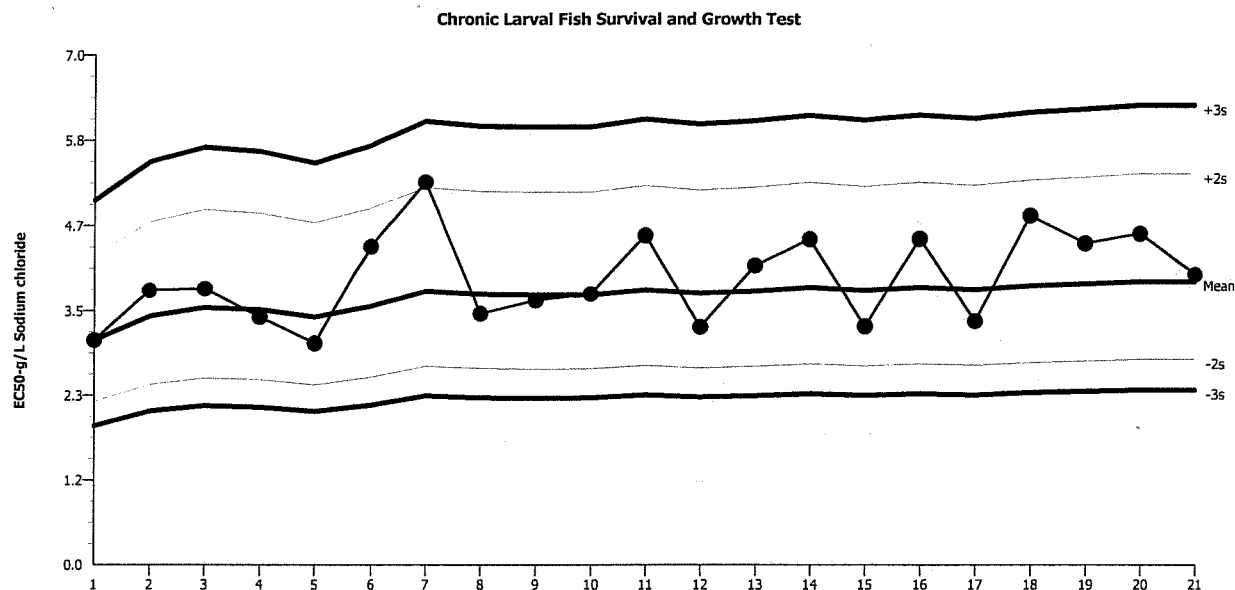
Chronic Larval Fish Survival and Growth Test

Pacific EcoRisk

Test Type: Growth-Survival (7d)
Protocol: EPA-821-R-02-013 (2002)

Organism: Pimephales promelas (Fathead Minn)
Endpoint: 7d Survival Rate

Material: Sodium chloride
Source: Reference Toxicant-REF



Mean: 3.9
Sigma: NA

Count: 20
CV: 17.40%

-2s Warning Limit: 2.83
+2s Warning Limit: 5.377

-3s Action Limit: 2.41
+3s Action Limit: 6.314

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Jan	15	16:20	3.096	-0.8043	-1.439			20-8476-2545	11-7633-6017
2			17	16:50	3.785	-0.1152	-0.1869			10-5550-1840	14-0048-6084
3			22	16:15	3.808	-0.09235	-0.1493			06-8612-5279	13-0734-1179
4		Feb	5	14:10	3.413	-0.4869	-0.8309			17-1491-1284	01-1442-0752
5			12	14:30	3.051	-0.8493	-1.53			01-6356-7312	08-3319-7756
6			26	16:30	4.385	0.4844	0.7295			08-7628-4268	07-6670-6949
7		Mar	5	14:15	5.268	1.368	1.873			06-1729-3880	07-6343-0859
8			12	16:30	3.458	-0.4417	-0.7489			05-5242-9647	15-5916-0190
9			15	16:20	3.641	-0.2587	-0.4276			18-6918-4054	01-1476-6508
10			19	14:40	3.734	-0.1665	-0.2718			16-0681-5909	02-0599-1036
11			21	15:35	4.535	0.6347	0.9395			01-1756-1842	09-7218-0153
12			26	17:00	3.278	-0.6222	-1.083			08-9032-1193	21-4259-1882
13		Apr	5	18:30	4.122	0.2215	0.3442			08-1236-3650	10-8388-5517
14			9	17:00	4.484	0.5839	0.8692			04-1636-7802	21-0461-6801
15			10	17:30	3.284	-0.6159	-1.071			02-6828-2085	09-3559-5450
16			16	15:30	4.489	0.5892	0.8766			05-0954-4952	07-8698-9576
17			23	14:30	3.357	-0.5427	-0.9335			14-6026-8912	15-4201-8601
18		May	7	16:05	4.808	0.9084	1.305			11-8273-1212	16-5906-0715
19			8	14:30	4.426	0.5263	0.7887			04-2800-8164	17-5286-6899
20		Jun	4	16:30	4.559	0.6585	0.9721			05-5046-5978	14-8243-0801
21			11	16:15	3.998	0.09817	0.1549			17-3597-1058	10-6399-9980

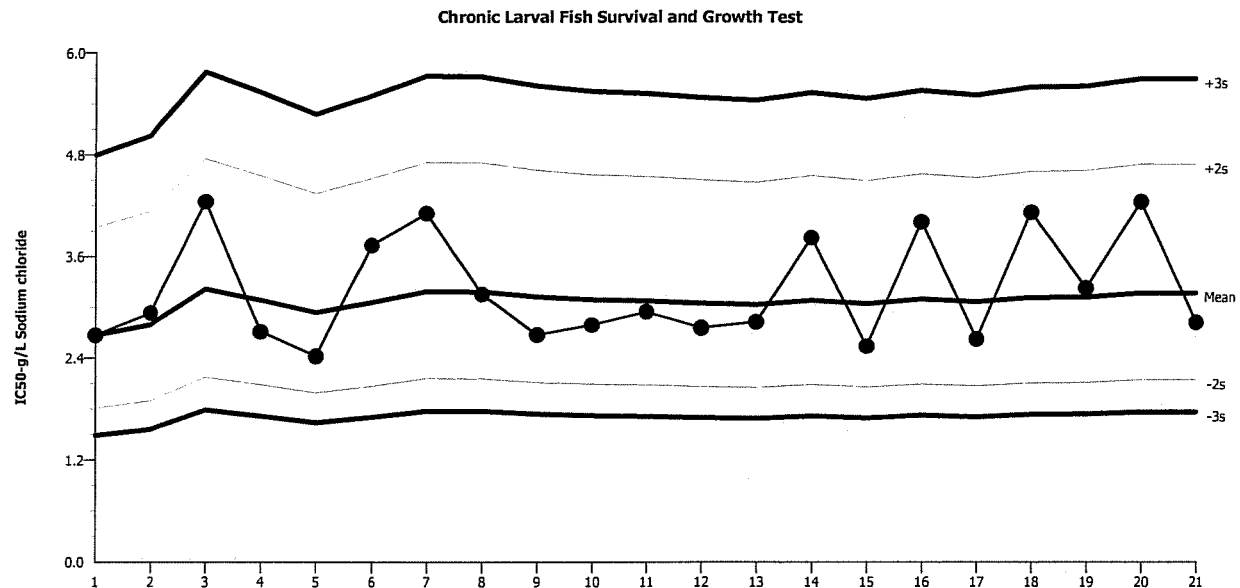
Chronic Larval Fish Survival and Growth Test

Pacific EcoRisk

Test Type: Growth-Survival (7d)
Protocol: EPA-821-R-02-013 (2002)

Organism: Pimephales promelas (Fathead Minn)
Endpoint: Mean Dry Biomass-mg

Material: Sodium chloride
Source: Reference Toxicant-REF



Mean: 3.171

Count: 20

-2s Warning Limit: 2.147

-3s Action Limit: 1.766

Sigma: NA

CV: 21.50%

+2s Warning Limit: 4.685

+3s Action Limit: 5.694

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Jan	15	16:20	2.67	-0.5004	-0.8803			20-8476-2545	10-5708-8737
2			17	16:50	2.936	-0.2345	-0.3938			10-5550-1840	03-0930-3918
3			22	16:15	4.251	1.08	1.503			06-8612-5279	09-5587-7133
4		Feb	5	14:10	2.715	-0.4555	-0.7949			17-1491-1284	19-2180-6599
5			12	14:30	2.424	-0.7465	-1.376			01-6356-7312	20-0395-8186
6			26	16:30	3.733	0.5618	0.8361			08-7628-4268	00-2068-0318
7		Mar	5	14:15	4.11	0.9395	1.33			06-1729-3880	14-9227-3036
8			12	16:30	3.155	-0.0158	-0.02561			05-5242-9647	13-6095-3744
9			15	16:20	2.678	-0.4932	-0.8664			18-6918-4054	07-9276-3319
10			19	14:40	2.793	-0.3774	-0.6495			16-0681-5909	16-1406-4771
11			21	15:35	2.947	-0.2242	-0.3759			01-1756-1842	11-0455-8006
12			26	17:00	2.758	-0.413	-0.7152			08-9032-1193	16-6380-5002
13		Apr	5	18:30	2.829	-0.342	-0.585			08-1236-3650	11-6964-2005
14			9	17:00	3.825	0.6544	0.9616			04-1636-7802	18-5038-0399
15			10	17:30	2.543	-0.6279	-1.131			02-6828-2085	15-8422-9494
16			16	15:30	4.013	0.8417	1.207			05-0954-4952	08-6438-2823
17			23	14:30	2.628	-0.5433	-0.9634			14-6026-8912	16-0723-0136
18		May	7	16:05	4.124	0.9527	1.347			11-8273-1212	19-0554-0604
19			8	14:30	3.229	0.05791	0.09277			04-2800-8164	10-7830-7081
20		Jun	4	16:30	4.247	1.076	1.498			05-5046-5978	19-8403-0783
21			11	16:15	2.822	-0.3489	-0.5975			17-3597-1058	02-6862-3844

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client: Reference Toxicant
 Test Material: Sodium Chloride
 Test ID#: 52152 Project #: 21070
 Test Date: 6/11/13 Randomization: 4.612

Organism Log#: 7323 Age: <48hrs
 Organism Supplier: Aquator
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Treatment (g/L)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)		# Live Organisms				SIGN-OFF
		New	Old	New	Old	New	Old	A	B	C	D	
Control	25.5	8.10		8.7		306		10	10	10	10	Date: 6/11/13
0.75	25.5	8.07		8.8		1906		10	10	10	10	Test Solution Prep.
1.5	25.5	8.05		8.9		3300		10	10	10	10	New WQ: <u>YK</u>
3	25.5	8.02		9.2		6230		10	10	10	10	Initiation Time: 1615
6	25.5	7.92		9.8		11370		10	10	10	10	Initiation Signoff: <u>YK</u>
9	25.5	7.88		10.3		16290		10	10	10	10	RT Stock Batch #: 160
Meter ID	30A	PH19		R007		E007						
Control	25.5	8.23	8.02	8.9	8.0	302	315	10	10	10	10	Date: 6/12/13
0.75	25.5	8.15	7.93	8.7	7.4	1823	1901	9	10	10	10	Test Solution Prep. <u>KP</u>
1.5	25.5	8.12	7.90	8.8	7.4	3250	3290	10	10	10	10	New WQ: <u>CE</u>
3	25.5	8.00	7.83	8.9	7.9	5970	6330	9	10	10	9	Renewal Time: 1250
6	25.5	8.00	7.80	9.0	7.9	11260	11460	9	10	10	10	Renewal Signoff: <u>YK</u>
9	25.5	7.94	7.76	9.5	8.0	11800	16590	0	0	0	0	Old WQ: <u>YK</u>
Meter ID	30A	PH16	PH19	R006	R007	E004	E007					RT Stock Batch #: 160
Control	25.6	8.14	8.17	8.8	8.5	300	314	10	10	10	10	Date: 6.13.13
0.75	25.6	8.10	8.08	8.5	8.3	1748	1879	9	10	10	10	Test Solution Prep. <u>DS</u>
1.5	25.6	8.07	8.04	8.6	8.3	3220	3320	10	10	10	9	New WQ: <u>YK</u>
3	25.6	8.03	7.99	8.6	8.3	5920	6140	9	10	10	8	Renewal Time: 1020
6	25.6	7.98	7.99	8.8	8.4	11040	11540	8	10	10	10	Renewal Signoff: <u>YK</u>
9	-	-	-	-	-	-	-	-	-	-	-	Old WQ: <u>YK</u>
Meter ID	30A	PH18	PH16	R006	R005	E006	E006					RT Stock Batch #: 161
Control	25.4	8.09	8.23	8.8	8.2	302	315	10	10	10	10	Date: 6/14/13
0.75	25.4	8.05	8.02	8.7	8.1	1814	1823	9	10	10	10	Test Solution Prep. <u>SS</u>
1.5	25.4	8.03	7.95	8.7	8.0	3120	3330	10	10	10	9	New WQ: <u>DS</u>
3	25.4	8.00	7.86	8.7	7.9	6050	6180	9	8	10	8	Renewal Time: 1125
6	25.4	7.94	7.77	8.8	7.8	11090	11300	7	10	10	8	Renewal Signoff: <u>YK</u>
9	-	-	-	-	-	-	-	-	-	-	-	Old WQ: <u>YK</u>
Meter ID	30A	PH16	PH16	R006	R006	E006	E006					RT Stock Batch #: 161

7 Day Chronic Fathead Minnow Reference Toxicant Test Data

Client: Reference Toxicant
 Test Material: Sodium Chloride
 Test ID#: 52152 Project #: 21070
 Test Date: 6/14/13 Randomization: 4.6.2

Organism Log#: 7323 Age: <48hrs
 Organism Supplier: Aquatex
 Control/Diluent: EPAMH
 Control Water Batch: 1598

Treatment (g/L)	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µs/cm)		# Live Organisms				SIGN-OFF
		new	old	new	old	New	Old	A	B	C	D	
Control	25.7	8.17	7.82	8.7	8.4	297	325	10	10	10	10	Date: 6/15/13
0.75	25.7	8.09	7.87	8.6	8.3	1882	1841	9	10	10	10	Test Solution Prep: SS
1.5	25.7	8.06	7.88	8.6	8.4	3220	3150	10	10	10	9	New WQ: 2
3	25.7	8.01	7.85	8.6	8.3	6000	6120	9	7	10	8	Renewal Time: 1155
6	25.7	7.94	7.84	8.9	8.3	11220	11100	6	8	10	7	Renewal Signoff: SS
9	-	-	-	-	-	-	-	-	-	-	-	Old WQ: KP
Meter ID	30A	PH15	PH16	R1207	R206	E104	E107					RT Stock Batch #: 161
Control	25.5	8.34	8.10	8.9	8.2	304	343	10	10	10	9	Date: 6/16/13
0.75	25.5	8.19	8.05	8.9	8.1	1952	1870	9	10	10	10	Test Solution Prep: PL
1.5	25.5	8.13	7.93	8.9	8.0	3310	3290	10	10	10	9	New WQ: SNV
3	25.5	8.06	7.86	9.0	8.0	6070	6060	8	6	9	6	Renewal Time: 1115
6	25.5	7.98	7.86	9.3	8.1	11330	11470	5	8	10	7	Renewal Signoff: 16
9	-	-	-	-	-	-	-	-	-	-	-	Old WQ: FOUR
Meter ID	30A	PH15	PH16	R205	R206	E104	E106					RT Stock Batch #: 161
Control	25.2	8.24	8.01	9.2	8.2	301	307	10	10	10	9	Date: 6/17/13
0.75	25.2	8.16	7.89	8.9	8.1	1851	1957	9	10	10	10	Test Solution Prep: PL
1.5	25.2	8.12	7.84	8.9	8.1	3260	3380	10	9	9	9	New WQ: SNV
3	25.2	8.05	7.80	9.1	8.0	5870	6160	6	4	7	5	Renewal Time: 1045
6	25.2	7.99	7.72	9.4	8.1	11040	11460	5	8	6	6	Renewal Signoff: PL
9	-	-	-	-	-	-	-	-	-	-	-	Old WQ: 44
Meter ID	30A	PH19	PH15	R204	R207	E106	E104					RT Stock Batch #: 161
Control	25.3		7.95		7.8		413	10	10	10	9	Date: 6/18/13
0.75	25.3		7.95		7.10		1891	9	10	10	10	Termination Time: 1110
1.5	25.3		7.91		7.10		3310	9	7	9	9	Termination Signoff: PL
3	25.3		7.86		7.3		5970	6	4	7	5	Old WQ: CE
6	25.3		7.83		7.2		11240	4	6	6	6	
9	-		-		-		-	-	-	-	-	
Meter ID	30A		PH18		R206		E107					

Fathead Minnow Dry Weight Data Sheet

Client: Reference Toxicant Test ID #: 52152 Project #: 21070
 Sample: Sodium Chloride Tare Weight Date: 6/13/13 Sign-off: RA
 Test Date: 6/11/13 Final Weight Date: 6/20/13 Sign-off: RA

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	178.64	184.05	10	0.541
2		B	159.32	165.69	10	0.637
3		C	166.21	171.82	10	0.561
4		D	174.34	179.82	10	0.548
5	0.75	A	163.29	168.77	10	0.548
6		B	172.86	179.25	10	0.639
7		C	174.85	181.49	10	0.664
8		D	176.18	183.05	10	0.687
9	1.5	A	168.55	173.66	10	0.511
10		B	179.18	181.54	10	0.427
11		C	179.19	184.66	10	0.547
12		D	175.45	180.55	10	0.510
13	3	A	170.99	174.20	10	0.321
14		B	163.50	165.80	10	0.230
15		C	179.03	181.66	10	0.263
16		D	165.80	168.66	10	0.236
17	6	A	177.07	178.00	10	0.093
18		B	172.68	174.38	10	0.170
19		C	179.90	182.33	10	0.243
20		D	166.15	167.95	10	0.180
21	9	A	175.65	-	10	-
22		B	179.96	-	10	-
23		C	171.07	-	10	-
24		D	175.76	-	10	-
QA1			179.65	179.67		
QA2			172.10	171.98		
QA3			175.34	175.36		
Balance ID:			BAL01	BA101		