Paul Bedore
Robertson-Bryan, Inc.
9888 Kent Street
Elk Grove, CA 95624

February 25, 2015

Paul:

I have enclosed our report "Evaluation of the Chronic Toxicity of Lehigh Permanente Cement Plant Site Water Samples" for the samples collected January 19, 21, and 23, 2015. A summary of the results of this testing follows (note: TUc = 100/EC_{25} or 100/IC_{25}):

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

The survival EC_{25} was >100% site water, resulting in <1.0 TUc. The reproduction IC_{25} was 40.1% site water, resulting in 2.5 TUc.

Ceriodaphnia dubia Test Endpoint =	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% site water	40.1% site water
TUc =	<1.0	2.5

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

The survival EC_{25} and reproduction IC_{25} were both >100% site water, resulting in <1 TUc for both test endpoints.

Ceriodaphnia dubia Test Endpoint =	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% site water	>100% site water
TUc =	<1	<1

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

The survival EC_{25} and reproduction IC_{25} were both >100% site water, resulting in <1 TUc for both test endpoints.

Ceriodaphnia dubia Test Endpoint =	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% site water	>100% site water
TUc =	<1	<1

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

The survival EC_{25} and reproduction IC_{25} were both >100% site water, resulting in <1 TUc for both test endpoints.

Ceriodaphnia dubia Test Endpoint =	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% site water	>100% site water
TUc =	<1	<1

Samples from the Lehigh Permanente Cement Pilot Plant designated ITS Influent and ITS Effluent were also collected on January 19, 21, and 23, 2015. A summary of the results of this testing follows (note: TUc = 100/EC_{25} or 100/IC_{25}):

Chronic Effects of Lehigh ITS Influent on *Ceriodaphnia dubia*

The survival EC_{25} was >100% influent, resulting in <1.0 TUc. The reproduction IC_{25} was 48.9% influent, resulting in 2.0 TUc.

Ceriodaphnia dubia	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% influent	48.9% influent
TUc =	<1	2.0

Chronic Effects of Lehigh ITS Effluent on *Ceriodaphnia dubia*

The survival EC_{25} was >100% effluent, resulting in <1.0 TUc. The reproduction IC_{25} was 77.0% effluent, resulting in 1.3 TUc.

Ceriodaphnia dubia	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% effluent	77.0% effluent
TUc =	<1	1.3

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

Regards,

Digitally signed by com.apple.idms.appleid.prd.757339 6d6a2f514d2b446864737862394d70 787541673d3d
Date: 2015.02.25 13:26:08 -08'00'

Stephen L. Clark
Vice President & Special Projects Director

Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 23483.

NPDES Compliance Summary

Lehigh Southwest Cement Company
Permanente Facility
Chronic Toxicity for SFBRWQCB Reporting

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

Lehigh Pond 4A	Chronic Toxicity Test Species:	*Ceriodaphnia dubia*
	Test Protocol:	EPA-821-R-02-013
Sampling Dates: January 19, 21, and 23, 2015	Dilution Series:	6.25, 12.5, 25, 50, 100%
Test Dates: January 20-26, 2015	Test Endpoint:	Survival, Reproduction

Current Pond 4A Site Water Test Data.

Site Water Concentration	% Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Control	100	28.7
6.25%	100	31.1
12.5%	100	31.8
25%	100	29.5
50%	100	**18.6***
100%	100	**5.0***

Current Pond 4A Site Water Test Endpoints.

Endpoint	NOEC	EC_{15}-IC_{15}	EC_{25}-IC_{25}	EC_{40}-IC_{40}	EC_{50}-IC_{50}	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC_{25}
Reproduction	25%	33.1%	40.1%	51.0%	62.3%	2.5	100/IC_{25}

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

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

Summary of 11 Test Window for *Ceriodaphnia dubia*: Pond 4A

Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	96-hr Survival	Comments
1	Mar 25, 27, & 29, 2013	<6.25% (repro)	6.1% (repro)	16.5	10%	
2	May 6, 8, & 10, 2013	<6.25% (repro)	2.9% (repro)	34.7	80%	
3	Dec 9, 11, & 13, 2013	100% (repro)	>100% (repro)	<1	100%	
4	Mar 10, 12, & 14, 2014	25% (repro)	4.81% (repro)	20.8	0%	
5	Apr 7, 9, & 11, 2014	6.25% (repro)	8.4% (repro)	11.9	0%	
6	Sept 22, 24, & 26, 2014	50% (repro)	>100% (repro)	<1	100%	
7	Nov 10, 12, & 14, 2014	100% (repro)	>100% (repro)	<1	100%	
8	Jan 19, 21, & 23, 2015	25% (repro)	40.1% (repro)	2.5	100%	
9						
10						
11						

NPDES Compliance Summary

Lehigh Southwest Cement Company
Permanente Facility
Chronic Toxicity for SFBRWQCB Reporting

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

Lehigh Pond 9	Chronic Toxicity Test Species:	*Ceriodaphnia dubia*
	Test Protocol:	EPA-821-R-02-013
Sampling Dates: January 19, 21, and 23, 2015	Dilution Series:	6.25, 12.5, 25, 50, 100%
Test Dates: January 20-26, 2015	Test Endpoint:	Survival, Reproduction

Current Pond 9 Site Water Test Data.

Site Water Concentration	% Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Control	100	30.6
6.25%	100	32.0
12.5%	100	32.0
25%	100	32.1
50%	100	30.3
100%	100	**25.6***

Current Pond 9 Site Water Test Endpoints.

Endpoint	NOEC	EC_{15}-IC_{15}	EC_{25}-IC_{25}	EC_{40}-IC_{40}	EC_{50}-IC_{50}	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC_{25}
Reproduction	100%	85.9%	>100%	>100%	>100%	<1	100/IC_{25}

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

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

Summary of 11 Test Window for *Ceriodaphnia dubia*: Pond 9

Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	96-hr Survival	Comments
1	Mar 25, 27, & 29, 2013	100% (repro)	>100% (repro)	<1	100%	
2	Jun 10, 12, & 14, 2013	50% (repro)	>100% (repro)	<1	100%	
3	Sept 9, 11, & 13, 2013	50% (repro)	86.7% (repro)	1.2	90%	
4	Dec 9, 11, & 13, 2013	50% (repro)	85.6% (repro)	1.2	100%	
5	Feb 3, 5, & 7, 2014	100% (repro)	>100% (repro)	<1	100%	
6	Mar 14 & 18, 2014	100% (repro)	>100% (repro)	<1	100%	
7	Apr 7, 9, & 11, 2014	100% (repro)	89.2% (repro)	1.1	90%	
8	Sept 22, 24, & 26, 2014	100% (repro)	>100% (repro)	<1	100%	
9	Jan 19, 21, & 23, 2015	50% (repro)	>100% (repro)	<1	100%	
10						
11						

NPDES Compliance Summary

Lehigh Southwest Cement Company
Permanente Facility
Chronic Toxicity for SFBRWQCB Reporting

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

Lehigh Pond 13	Chronic Toxicity Test Species:	*Ceriodaphnia dubia*
	Test Protocol:	EPA-821-R-02-013
Sampling Dates: January 19, 21, and 23, 2015	Dilution Series:	6.25, 12.5, 25, 50, 100%
Test Dates: January 20-26, 2015	Test Endpoint:	Survival, Reproduction

Current Pond 13 Site Water Test Data.

Site Water Concentration	% Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Control	100	31.1
6.25%	100	36.2
12.5%	100	35.5
25%	100	33.3
50%	100	32.8
100%	100	33.0

Current Pond 13 Site Water Test Endpoints.

Endpoint	NOEC	EC_{15}-IC_{15}	EC_{25}-IC_{25}	EC_{40}-IC_{40}	EC_{50}-IC_{50}	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC_{25}
Reproduction	100%	>100%	>100%	>100%	>100%	<1	100/IC_{25}

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

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

Summary of 11 Test Window for *Ceriodaphnia dubia*: Pond 13

Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	96-hr Survival	Comments
1	Mar 25, 27, & 29, 2013	<6.25% (repro)	3.7% (repro)	27.3	30%	
2	May 6, 8, & 10, 2013	50% (repro)	6.1% (repro)	16.4	100%	
3	Dec 9, 11, & 13, 2013	100% (repro)	>100% (repro)	<1	100%	
4	Mar 14 & 18, 2014	50% (repro)	48% (repro)	2.1	100%	
5	Dec 8, 10, & 12, 2014	100% (repro)	43.9% (repro)	2.3	100%	
6	Jan 19, 21, & 23, 2015	100% (repro)	>100% (repro)	<1	100%	
7						
8						
9						
10						
11						

NPDES Compliance Summary

Lehigh Southwest Cement Company
Permanente Facility
Chronic Toxicity for SFBRWQCB Reporting

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

Lehigh Pond 14	Chronic Toxicity Test Species:	*Ceriodaphnia dubia*
	Test Protocol:	EPA-821-R-02-013
Sampling Dates: January 19, 21, and 23, 2015	Dilution Series:	6.25, 12.5, 25, 50, 100%
Test Dates: January 20-26, 2015	Test Endpoint:	Survival, Reproduction

Current Pond 14 Site Water Test Data.

Site Water Concentration	% Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Control	90	31.6
6.25%	100	35.2
12.5%	90	27.7
25%	100	33.8
50%	80	25.9
100%	100	29.3

Current Pond 14 Site Water Test Endpoints.

Endpoint	NOEC	EC_{15}-IC_{15}	EC_{25}-IC_{25}	EC_{40}-IC_{40}	EC_{50}-IC_{50}	TUc	TUc Method
Survival	100%	>100%	>100%	>100%	>100%	<1	100/EC_{25}
Reproduction	100%	44%	>100%	>100%	>100%	<1	100/IC_{25}

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

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

Summary of 11 Test Window for *Ceriodaphnia dubia*: Pond 14

Test #	Sample Dates	NOEC (%)	EC_{25} or IC_{25}	TUc	96-hr Survival	Comments
1	Mar 25, 27, & 29, 2013	25% (repro)	39.6% (repro)	2.5	30%	
2	May 6, 8, & 10, 2013	100%	87.1% (repro)	1.1	100%	
3	Dec 9, 11, & 13, 2013	100% (repro)	>100% (repro)	<1	100%	
4	Mar 14 & 18, 2014	100% (repro)	>100% (repro)	<1	100%	
5	Apr 7, 9, & 11, 2014	100% (repro)	>100% (repro)	<1	100%	
6	Sept 22, 24, & 26, 2014	100% (repro)	>100% (repro)	<1	100%	
7	Nov 10, 12, & 14, 2014	100% (repro)	>100% (repro)	<1	100%	
8	Jan 19, 21, & 23, 2015	100% (repro)	>100% (repro)	<1	100%	
9						
10						
11						

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

Samples collected January 19, 21, and 23, 2015

Prepared For

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

Prepared By

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

February 2015

PACIFIC ECORISK
ENVIRONMENTAL CONSULTING & TESTING

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

Samples collected January 19, 21, and 23, 2015

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

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) water samples from four sites (designated Pond 4A, Pond 9, Pond 13, and Pond 14), and influent (ITS Influent) and effluent (ITS Effluent) from a Pilot Plant. This evaluation consisted of performing the US EPA short-term chronic 3-brood (6-8 day) survival and reproduction test with the crustacean *Ceriodaphnia dubia*. These toxicity tests were conducted on samples collected on January 19, 21, and 23, 2015. In order to assess the sensitivity of the organisms to chemical stress, a reference toxicant test was performed. This report describes the performance and results of these tests.

2. CHRONIC TOXICITY TEST PROCEDURES

The method 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 January 19, 21, and 23, water samples from six Lehigh sites (designated Pond 4A, Pond 9, Pond 13, Pond 14, ITS Influent, and ITS Effluent) were collected into appropriately cleaned sample containers. These samples were transported on the day of collection, on ice and under chain-of-custody, to the PER testing laboratory in Fairfield, CA. Upon receipt at the testing laboratory, aliquots of each 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. Due to the presence of sulfides in the samples, the Pond 4A site water, ITS Influent, and ITS Effluent samples were aerated until sulfides were <0.1 mg/L.

The chain-of-custody records for the collection and delivery of the samples are presented in Appendix A.

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

Sample ID	Sample Receipt Date	Temp. (°C)	pH	D.O. (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Conductivity (µS/cm)	Total Ammonia (mg/L N)
Pond 4A	1/19/15	0.6	7.54	7.8	196	685	1410	<1.0
	1/21/15	3.4	7.71	3.5	206	712	1403	<1.0
	1/23/15	0.9	7.63	8.0	180	672	1382	<1.0
Pond 9	1/19/15	0.5	7.41	8.1	224	761	1511	<1.0
	1/21/15	5.1	7.61	9.1	228	790	1571	<1.0
	1/23/15	0.9	7.44	8.8	222	736	1497	<1.0
Pond 13	1/19/15	0.0	8.18	8.2	176	718	1387	<1.0
	1/21/15	5.9	8.03	9.8	198	712	1386	<1.0
	1/23/15	2.4	8.22	9.4	189	748	1397	<1.0
Pond 14	1/19/15	0.2	8.01	8.6	220	736	1451	<1.0
	1/21/15	8.1*	7.69	9.6	215	729	1471	<1.0
	1/23/15	2.4	7.69	8.7	216	704	1449	<1.0
ITS Influent	1/19/15	0.7	7.71	9.3	194	766	1446	<1.0
	1/21/15	2.1	7.65	9.2	228	730	1405	<1.0
	1/23/15	1.8	7.56	8.2	200	780	1470	<1.0
ITS Effluent	1/19/15	0.0	7.45	9.5	218	789	1440	<1.0
	1/21/15	1.7	7.28	8.7	202	739	1398	<1.0
	1/23/15	0.9	7.42	7.1	212	728	1399	<1.0

* This sample was transported and delivered on ice the day of sample collection.

2.2 Survival and Reproduction Toxicity Testing with *Ceriodaphnia dubia*

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

The Lab Water Control medium for this testing was modified EPA synthetic moderately hard water amended with 5% filtered ambient water from a clean reference site. The Lab Water Control medium and the samples were used to prepare test solutions at test treatment concentrations of 6.25%, 12.5%, 25%, 50%, and 100% sample for each of the six samples. At the request of the client, an additional Hardness Blank (consisting Type 1 water [reverse-osmosis, de-ionized water] amended with reagent-grade chemicals to a nominal hardness of 760 mg/L) was prepared and tested; prior to use, the Hardness Blank was filtered to remove any insoluble particulate material. For each test treatment, the test solution was amended with the alga *Selenastrum capricornutum* and Yeast-Cerophyll®-Trout (YCT) food to provide food for the

test organisms. "New" water quality characteristics (pH, dissolved oxygen [D.O.], and conductivity) were measured on these food-amended test solutions prior to use in these tests. There were 10 replicates for each test treatment, each replicate consisting of 15 mL of test solution in a 30-mL plastic cup. These "3-brood" tests were 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 tests, fresh test solutions were prepared and characterized as before, and a "new" set of replicate cups was prepared. The original test replicate cups were examined, with surviving "original" individual organisms being transferred to the corresponding new cup. The contents of each of the remaining "old" replicate cups was carefully examined and the number of neonate offspring produced by each original organism was determined, after which the "old" water quality characteristics (pH, D.O., and conductivity) were measured for the old media from one randomly-selected replicate at each treatment.

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

2.2.1 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 Water Control medium spiked with NaCl at test concentrations of 500, 1000, 1500, 2000, and 2500 mg/L. The resulting test response data were statistically analyzed to determine key dose-response point estimates (e.g., EC_{50}); all statistical analyses were made using the CETIS® software. These response endpoints were then compared to the 'typical response' ranges established by the mean ± 2 SD of the point estimates generated by the most recent previous reference toxicant tests performed by this lab.

3. RESULTS

3.1 Effects of Lehigh Samples on *Ceriodaphnia dubia*

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

The results of this test are summarized below in Table 2. The survival EC_{25} was >100% site water, resulting in <1.0 survival TUc (where TUc = 100/EC_{25}). The reproduction IC_{25} was 40.1% site water, resulting in 2.5 reproduction TUc (where TUc = 100/IC_{25}).

The test data and summary of statistical analyses for this test, excluding outlier data, are presented in Appendix B; the summary of statistical analyses for this test, including outlier data, are presented in Appendix C.

Table 2. Effects of Lehigh Pond 4A site water on *Ceriodaphnia dubia* survival and reproduction.

Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Water Control	100	28.7
6.25%	100	31.1[a]
12.5%	100	31.8[a]
25%	100	29.5
50%	100	**18.6***
100%	100	**5.0***
Summary of Key Statistics		
NOEC =	100% site water	25% site water
TUc (TUc = 100/NOEC) =	1.0	4.0
Survival EC_{25} or Reproduction IC_{25} =	>100% site water[b]	40.1% site water
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	<1.0	2.5
Survival EC_{50} or Reproduction IC_{50} =	>100% site water[b]	62.3% site water
TUc (TUc = 100/EC_{50} or 100/IC_{50}) =	<1.0	1.6

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

a – Statistical analyses indicated that the reproduction response for one of the replicates at this test treatment was a statistical outlier, and the results reported above are for the analyses of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

b - 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.

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

The results of this test are summarized below in Table 3. The survival EC_{25} and reproduction IC_{25} were both >100% site water, resulting in <1 TUc for both test endpoints (where TUc = $100/EC_{25}$ or $100/IC_{25}$).

The test data and summary of statistical analyses for this test, excluding outlier data, are presented in Appendix D; the summary of statistical analyses for this test, including outlier data, are presented in Appendix E.

Table 3. Effects of Lehigh Pond 9 site water on *Ceriodaphnia dubia* survival and reproduction.

Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Control	100	30.6
6.25%	100	32.0[a]
12.5%	100	32.0
25%	100	32.1[a]
50%	100	30.3
100%	100	**25.6***
Summary of Key Statistics		
NOEC =	100% site water	50% site water
TUc (TUc = 100/NOEC) =	1.0	2.0
Survival EC_{25} or Reproduction IC_{25} =	>100% site water[b]	>100% site water
TUc (TUc = $100/EC_{25}$ or $100/IC_{25}$) =	<1.0	<1.0
Survival EC_{50} or Reproduction IC_{50} =	>100% site water[b]	>100% site water
TUc (TUc = $100/EC_{50}$ or $100/IC_{50}$) =	<1.0	<1.0

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

a – Statistical analyses indicated that the reproduction response for one of the replicates at this test treatment was a statistical outlier, and the results reported above are for the analyses of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

b - 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.

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

The results of this test are summarized below in Table 4. The survival EC_{25} and reproduction IC_{25} were both >100% site water, resulting in <1 TUc for both test endpoints (where TUc = $100/EC_{25}$ or $100/IC_{25}$).

The test data and summary of statistical analyses for this test, excluding outlier data, are presented in Appendix F; the summary of statistical analyses for this test, including outlier data, are presented in Appendix G.

Table 4. Effects of Lehigh Pond 13 site water on *Ceriodaphnia dubia* survival and reproduction.

Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Control	100	31.1
6.25%	100	36.2
12.5%	100	35.5[a]
25%	100	33.3[b]
50%	100	32.8
100%	100	33.0
Summary of Key Statistics		
NOEC =	100% site water	100% site water
TUc (TUc = 100/NOEC) =	1.0	1.0
Survival EC_{25} or Reproduction IC_{25} =	>100% site water[c]	>100% site water
TUc (TUc = $100/EC_{25}$ or $100/IC_{25}$) =	<1.0	<1.0
Survival EC_{50} or Reproduction IC_{50} =	>100% site water[c]	>100% site water
TUc (TUc = $100/EC_{50}$ or $100/IC_{50}$) =	<1.0	<1.0

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

a – Due to staff error during transfer of adults into new test solution during the solution renewal at Day 5, there were only six replicates at the 12.5% test treatment.

b – Statistical analyses indicated that the reproduction response for one of the replicates at this test treatment was a statistical outlier, and the results reported above are for the analyses of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

c - 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.

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

The results of this test are summarized below in Table 5. The survival EC_{25} and reproduction IC_{25} were both >100% site water, resulting in <1 reproduction TUc for both test endpoints (where TUc = $100/EC_{25}$ or $100/IC_{25}$).

The test data and summary of statistical analyses for this test, excluding outlier data, are presented in Appendix H; the summary of statistical analyses for this test, including outlier data, are presented in Appendix I.

Table 5. Effects of Lehigh Pond 14 site water on *Ceriodaphnia dubia* survival and reproduction.

Site Water Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Control	90	31.6[a]
6.25%	100	35.2
12.5%	90	27.7
25%	100	33.8
50%	80	25.9
100%	100	29.3
Summary of Key Statistics		
NOEC =	100% site water	100% site water
TUc (TUc = 100/NOEC) =	1.0	1.0
Survival EC_{25} or Reproduction IC_{25} =	>100% site water[b]	>100% site water
TUc (TUc = $100/EC_{25}$ or $100/IC_{25}$) =	<1.0	<1.0
Survival EC_{50} or Reproduction IC_{50} =	>100% site water[b]	>100% site water
TUc (TUc = $100/EC_{50}$ or $100/IC_{50}$) =	<1.0	<1.0

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

a – Statistical analyses indicated that the reproduction response for one of the replicates at this test treatment was a statistical outlier, and the results reported above are for the analyses of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

b - 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.

3.1.5 Effects of Lehigh ITS Influent on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 6. The survival EC_{25} was >100% influent, resulting in <1.0 survival TUc (where TUc = 100/EC_{25}). The reproduction IC_{25} was 48.9% influent, resulting in 2.0 reproduction TUc (where TUc = 100/IC_{25}).

The test data and summary of statistical analyses for this test, excluding outlier data, are presented in Appendix J; the summary of statistical analyses for this test, including outlier data, are presented in Appendix K.

Table 6. Effects of Lehigh ITS Influent on *Ceriodaphnia dubia* survival and reproduction.

Influent Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Control	90	32.8[a]
6.25%	100	35.4
12.5%	100	32.1
25%	100	31.4
50%	100	**25.3***
100%	70	**9.5***
Summary of Key Statistics		
NOEC =	100% influent	25% influent
TUc (TUc = 100/NOEC) =	1.0	4.0
Survival EC_{25} or Reproduction IC_{25} =	>100% influent[b]	48.9% influent
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	<1.0	2.0
Survival EC_{50} or Reproduction IC_{50} =	>100% influent[b]	76.1% influent
TUc (TUc = 100/EC_{50} or 100/IC_{50}) =	<1.0	1.3

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

a – Statistical analyses indicated that the reproduction response for one of the replicates at this test treatment was a statistical outlier, and the results reported above are for the analyses of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

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

3.1.6 Effects of Lehigh ITS Effluent on *Ceriodaphnia dubia*

The results of this test are summarized below in Table 7. The survival EC_{25} was >100% effluent, resulting in <1.0 survival TUc (where TUc = 100/EC_{25}). The reproduction IC_{25} was 77.0% effluent, resulting in 1.3 reproduction TUc (where TUc = 100/IC_{25}).

The test data and summary of statistical analyses for this test, excluding outlier data, are presented in Appendix L; the summary of statistical analyses for this test, including outlier data, are presented in Appendix M.

Table 7. Effects of Lehigh ITS Effluent on *Ceriodaphnia dubia* survival and reproduction.

Effluent Treatment	Mean % Survival	Mean Reproduction (# neonates /female)
Hardness Blank	100	**9.9***
Lab Control	100	31.3[a]
6.25%	100	32.6
12.5%	100	33.6[a]
25%	100	31.3
50%	100	28.8
100%	100	**20.6***
Summary of Key Statistics		
NOEC =	100% effluent	50% effluent
TUc (TUc = 100/NOEC) =	1.0	2.0
Survival EC_{25} or Reproduction IC_{25} =	>100% effluent[b]	77.0% effluent
TUc (TUc = 100/EC_{25} or 100/IC_{25}) =	<1.0	1.3
Survival EC_{50} or Reproduction IC_{50} =	>100% effluent[b]	>100% effluent
TUc (TUc = 100/EC_{50} or 100/IC_{50}) =	<1.0	<1.0

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

a – Statistical analyses indicated that the reproduction response for one of the replicates at this test treatment was a statistical outlier, and the results reported above are for the analyses of the test data excluding this outlier. As per EPA guidelines, the test data were analyzed both with and without the outlier, and the results of both sets of analyses are reported in the appendices.

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

4. AQUATIC TOXICITY DATA QUALITY CONTROL

Four QC measures were assessed during the toxicity testing:

- Maintenance of acceptable test conditions;
- Negative Control testing;
- Assessment of concentration response relationship; and
- Positive Control (reference toxicant) testing.

Maintenance of Acceptable Test Conditions

The second sample of Pond 4A site water (collected and received January 21) had a D.O. concentration of 3.5 mg/L. Per the EPA method manual, the sample was aerated until D.O. concentrations reached >4 mg/L before use in test solution preparation. All other test conditions (pH, D.O., temperature, etc.) were within acceptable limits for these tests. All analyses were performed according to laboratory Standard Operating Procedures.

Negative Control Testing

The responses at the Lab Control treatments were acceptable.

Concentration Response Relationships

There were valid concentration-response relationships for the site water and reference toxicant tests (EPA-821-B-00-004).

Positive Control Testing - Reference Toxicant Toxicity

The results of this test are summarized below in Table 8. The survival EC_{50} and reproduction IC_{50} for these tests were 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 N.

Table 8. Reference toxicant testing: effects of NaCl on *Ceriodaphnia dubia*.

NaCl Treatment (mg/L)	Mean % Survival	Mean Reproduction (# neonates/female)
Lab Control	100	38.2
500	90	**31.2***
1000	100	**25.4***
1500	80	**7.7***
2000	50	**0***
2500	**10***	0.1
Summary of Statistics		
Survival EC_{50} or Reproduction IC_{50} =	1940 mg/L NaCl	1180 mg/L NaCl
"Typical Response" =	984 - 2823 mg/L NaCl	504 - 2296 mg/L NaCl

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

5. SUMMARY AND CONCLUSIONS

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

The survival EC_{25} was >100% site water, resulting in <1.0 TUc. The reproduction IC_{25} was 40.1% site water, resulting in 2.5 TUc.

Ceriodaphnia dubia Test Endpoint =	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% site water	40.1% site water
TUc =	<1.0	2.5

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

The survival EC_{25} and reproduction IC_{25} were both >100% site water, resulting in <1 TUc for both test endpoints.

Ceriodaphnia dubia Test Endpoint =	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% site water	>100% site water
TUc =	<1	<1

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

The survival EC_{25} and reproduction IC_{25} were both >100% site water, resulting in <1 TUc for both test endpoints.

Ceriodaphnia dubia Test Endpoint =	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% site water	>100% site water
TUc =	<1	<1

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

The survival EC_{25} and reproduction IC_{25} were both >100% site water, resulting in <1 TUc for both test endpoints.

Ceriodaphnia dubia Test Endpoint =	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% site water	>100% site water
TUc =	<1	<1

Chronic Effects of Lehigh ITS Influent on *Ceriodaphnia dubia*

The survival EC_{25} was >100% influent, resulting in <1.0 TUc. The reproduction IC_{25} was 48.9% influent, resulting in 2.0 TUc.

Ceriodaphnia dubia	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% influent	48.9% influent
TUc =	<1	2.0

Chronic Effects of Lehigh ITS Effluent on *Ceriodaphnia dubia*

The survival EC_{25} was >100% effluent, resulting in <1.0 TUc. The reproduction IC_{25} was 77.0% effluent, resulting in 1.3 TUc.

Ceriodaphnia dubia	Survival	Reproduction
Survival EC_{25} or Reproduction IC_{25} =	>100% effluent	77.0% effluent
TUc =	<1	1.3

Appendix A

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

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

CHAIN-OF-CUSTODY RECORD

Results To:	Robertson-Bryan, Inc	**Invoice To:**	Lehigh Southwest Cement Co.
Address:	9888 Kent Street Elk Grove, CA 95624	**Address:**	P.O. Box 660140 Dallas, TX 75266
Phone:	(916) 405-8918	**Phone:**	925-244-6570
Attn:	Paul Bedore	**Attn:**	Greg Knapp
E-mail:	paul@robertson-bryan.com	**E-mail:**	greg.knapp@hanson.biz
Project Name:	Lehigh Southwest Cement - Permanente Creek		
P.O.#/Ref:			

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/ Comp	Container Number	Container Type	REQUESTED ANALYSIS: *Ceriodapnia dubia* Surival and Reproduction, EPA 1002.0
1	Pond 4A	1.19.15	10:15	FW	Comp	1	2.5-gal LDPE Cube	x
2	Pond 13	↓	11:15	FW	Grab	1	2.5-gal LDPE Cube	x
3	Pond 14		12:30	FW	Grab	1	2.5-gal LDPE Cube	x
4	Pond 9		11:02	FW	Grab	1	2.5-gal LDPE Cube	x
5	ITS Influent		10:40	FW	Comp	1	2.5-gal LDPE Cube	x
6	ITS Effluent	↓	10:35	FW	Comp	1	2.5-gal LDPE Cube	x
7								
8								
9								
10								

Samples collected by: P. Bedore

Comments/Special Instruction:

Initiation Sample

Concurrent reference toxicant test

RELIQUINSHED BY:	RECEIVED BY:
Signature: Paul Bedore	Signature: Rahul Dutt
Print: Paul Bedore	Print: Rahul Dutt
Organization: RBI	Organization: PER
Date: 1/19/15 Time: 4:53 pm	Date: 1-19-15 Time: 1653
RELIQUINSHED BY:	**RECEIVED BY:**
Signature:	Signature:
Print:	Print:
Organization:	Organization:
Date: Time:	Date: Time:

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

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

CHAIN-OF-CUSTODY RECORD

Results To:	Robertson-Bryan, Inc	**Invoice To:**	Lehigh Southwest Cement Co.
Address:	9888 Kent Street Elk Grove, CA 95624	**Address:**	P.O. Box 660140 Dallas, TX 75266
Phone:	(916) 405-8918	**Phone:**	925-244-6570
Attn:	Paul Bedore	**Attn:**	Greg Knapp
E-mail:	paul@robertson-bryan.com	**E-mail:**	greg.knapp@hanson.biz
Project Name:	Lehigh Southwest Cement - Permanente Creek		
P.O.#/Ref:			

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/ Comp	Container Number	Container Type	REQUESTED ANALYSIS: *Ceriodapnia dubia* Surival and Reproduction, EPA 1002.0
1	Pond 4A	1/21/15	10:15	FW	Comp	1	2.5-gal LDPE Cube	x
2	Pond 13	↓	12:10	FW	Grab	1	2.5-gal LDPE Cube	x
3	Pond 14		12:45	FW	Grab	1	2.5-gal LDPE Cube	x
4	Pond 9		11:00	FW	Grab	1	2.5-gal LDPE Cube	x
5	ITS Influent		10:04	FW	Comp	1	2.5-gal LDPE Cube	x
6	ITS Effluent	↓	10:38	FW	Comp	1	2.5-gal LDPE Cube	x
7								
8								
9								
10								

Samples collected by: P Bedore

Comments/Special Instruction:

Renewal Sample

Concurrent reference toxicant test

RELIQUINSHED BY:	RECEIVED BY:
Signature: Paul Bedore	Signature: Sean Echeverria
Print: Paul Bedore	Print: Sean Echeverria
Organization: RBI	Organization: PER
Date: 1/21/15 Time: 1423	Date: 1/21/15 Time: 1423
RELIQUINSHED BY:	**RECEIVED BY:**
Signature:	Signature:
Print:	Print:
Organization:	Organization:
Date: Time:	Date: Time:

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

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

CHAIN-OF-CUSTODY RECORD

Results To:	Robertson-Bryan, Inc	**Invoice To:**	Lehigh Southwest Cement Co.
Address:	9888 Kent Street Elk Grove, CA 95624	**Address:**	P.O. Box 660140 Dallas, TX 75266
Phone:	(916) 405-8918	**Phone:**	925-244-6570
Attn:	Paul Bedore	**Attn:**	Greg Knapp
E-mail:	paul@robertson-bryan.com	**E-mail:**	greg.knapp@hanson.biz
Project Name:	Lehigh Southwest Cement - Permanente Creek		
P.O.#/Ref:			

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/ Comp	Container Number	Container Type	REQUESTED ANALYSIS: *Ceriodapnia dubia* Survival and Reproduction, EPA 1002.0
1	Pond 4A	1-23-15	925	FW	Comp	1	2.5-gal LDPE Cube	x
2	Pond 13	"	1040	FW	Grab	1	2.5-gal LDPE Cube	x
3	Pond 14	"	11:10	FW	Grab	1	2.5-gal LDPE Cube	x
4	Pond 9	"	1015	FW	Grab RDS 1-23-15	1	2.5-gal LDPE Cube	x
5	ITS Influent	"	950	FW	~~Comp~~ GRAB	1	2.5-gal LDPE Cube	x
6	ITS Effluent	↓	925	FW	Comp	1	2.5-gal LDPE Cube	x
7								
8								
9								
10								

Samples collected by: P Bedore

Comments/Special Instruction:

Renewal Sample

Concurrent reference toxicant test

RELIQUINSHED BY:	RECEIVED BY:
Signature: Paul Bedore	Signature: Gayle
Print: Paul Bedore	Print: Gurgan Yagnik
Organization: RBI	Organization: PER
Date: 1/23/15 Time: 1305	Date: 1/23/15 Time: 1305
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 *Ceriodaphnia dubia*: Analysis Excludes Outlier Data

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	19-7868-4765	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	20 Jan-15 14:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 16:05	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 2h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	12-6162-2676	**Code:**	Pond 4A	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 10:15	**Material:**	Site Water	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	28h (0.6 °C)	**Station:**	Pond 4A		

Batch Note: Excluding outlier replicates 6.25%-A and 12.5%-C

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
03-3452-0716	Reproduction	25	50	35.36	15.2%	4	Wilcoxon/Bonferroni Adj Test
00-8924-0984	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
09-9739-3339	Reproduction	IC5	26.1	18.2	29.1	3.826	Linear Interpolation (ICPIN)
		IC10	29.6	24.9	33.3	3.374	
		IC15	33.1	28.6	37.4	3.017	
		IC20	36.6	31.8	41.5	2.729	
		IC25	40.1	35.1	45.9	2.491	
		IC40	51	43.5	59.7	1.959	
		IC50	62.3	49.1	69	1.606	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	28.7	27.2	30.2	25	31	0.667	2.11	7.35%	0.0%
6.25		9	31.1	26.8	35.5	18	36	1.89	5.67	18.2%	-8.4%
12.5		9	31.8	29.6	33.9	29	36	0.925	2.77	8.73%	-10.7%
25		10	29.5	27.2	31.8	23	34	1.02	3.24	11.0%	-2.79%
50		10	18.6	14.2	23	5	27	1.94	6.13	33.0%	35.2%
100		10	5	3	7	0	9	0.882	2.79	55.8%	82.6%

Survival Summary

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

Analyst: PD QA: MF

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	Lab Water Contr	30	31	25	30	30	31	28	27	26	29
6.25			33	30	18	33	36	27	33	34	36
12.5		29	31		32	33	36	31	29	36	29
25		29	23	31	26	30	28	30	31	34	33
50		27	15	20	16	5	21	17	25	18	22
100		8	6	5	6	5	6	4	9	1	0

Survival Detail

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

Survival Binomials

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	00-8924-0984	**Endpoint:** Survival	**CETIS Version:** CETISv1.8.7
Analyzed:	27 Jan-15 8:58	**Analysis:** STP 2x2 Contingency Tables	**Official Results:** Yes

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

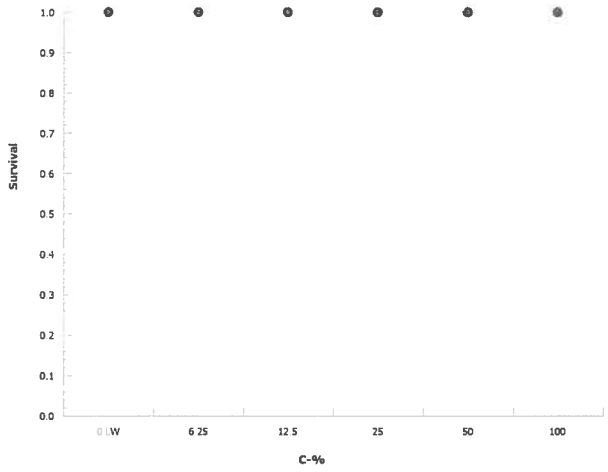
Fisher Exact/Bonferroni-Holm Test

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

Data Summary

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

Graphics



Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	03-3452-0716	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:02	**Analysis:**	Nonparametric-Multiple Comparison	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	15.2%	25	50	35.36	4

Wilcoxon/Bonferroni Adj Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	114	NA	2	17	1.0000	Exact	Non-Significant Effect
		12.5	117	NA	3	17	1.0000	Exact	Non-Significant Effect
		25	116	NA	6	18	1.0000	Exact	Non-Significant Effect
		50*	58	NA	2	18	0.0002	Exact	Significant Effect
		100*	55	NA	0	18	<0.0001	Exact	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5423.452	1084.69	5	65.5	<0.0001	Significant Effect
Error	861.4445	16.56624	52			
Total	6284.896		57			

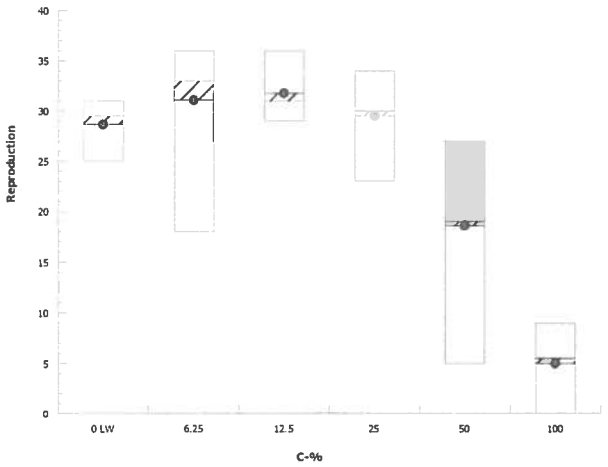
Distributional Tests

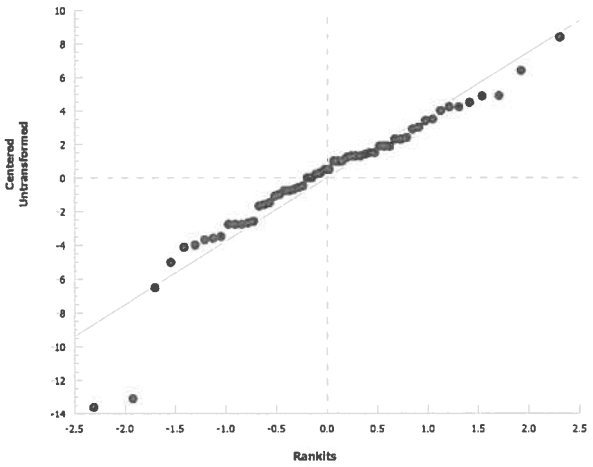
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	15.5	15.1	0.0084	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.917	0.944	0.0007	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	28.7	27.2	30.2	29.5	25	31	0.667	7.35%	0.0%
6.25		9	31.1	26.8	35.5	33	18	36	1.89	18.2%	-8.4%
12.5		9	31.8	29.6	33.9	31	29	36	0.925	8.73%	-10.7%
25		10	29.5	27.2	31.8	30	23	34	1.02	11.0%	-2.79%
50		10	18.6	14.2	23	19	5	27	1.94	33.0%	35.2%
100		10	5	3	7	5.5	0	9	0.882	55.8%	82.6%

Graphics





Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	09-9739-3339	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.7
Analyzed:	27 Jan-15 9:02	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	555681	200	Yes	Two-Point Interpolation

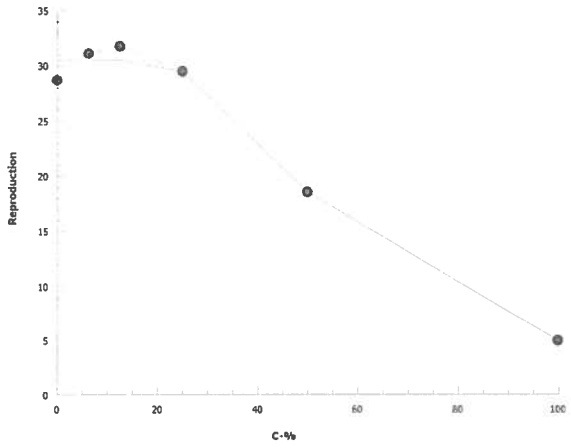
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	26.1	18.2	29.1	3.826	3.433	5.499
IC10	29.6	24.9	33.3	3.374	3.007	4.013
IC15	33.1	28.6	37.4	3.017	2.675	3.5
IC20	36.6	31.8	41.5	2.729	2.409	3.145
IC25	40.1	35.1	45.9	2.491	2.177	2.85
IC40	51	43.5	59.7	1.959	1.675	2.3
IC50	62.3	49.1	69	1.606	1.449	2.037

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	28.7	25	31	0.667	2.11	7.35%	0.0%
6.25		9	31.1	18	36	1.89	5.67	18.2%	-8.4%
12.5		9	31.8	29	36	0.925	2.77	8.73%	-10.7%
25		10	29.5	23	34	1.02	3.24	11.0%	-2.79%
50		10	18.6	5	27	1.94	6.13	33.0%	35.2%
100		10	5	0	9	0.882	2.79	55.8%	82.6%

Graphics



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

Client: **Lehigh Permanente** Material: **Pond 4A** Test Date: 1-20-15

Project #: 23483 Test ID: 60820 Randomization: 10.69 / 10.21 Control Water: Modified EPAMH + 5% American River

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	8.04		7.9		343	25.0	0	0	0	0	0	0	0	0	0	0	Date: 1-20-15 New WQ: RO Test Init: YJ Sol'n Prep: JM Time: 1430
1	8.22	8.21	8.3	7.7	331	25.0	0	0	0	0	0	0	0	0	0	0	Date: 1/21/15 New WQ: FOUB Counts: CJD Sol'n Prep: JM Old WQ: RG Time: 1105
2	7.97	7.61	8.6	7.7	322	25.2	0	0	0	0	0	0	0	0	0	0	Date: 1/22/15 New WQ: RG Counts: JC Sol'n Prep: JC Old WQ: RG Time: 1535
3	7.93	7.96	8.8	8.5	321	25.4	6	6	5	5	5	5	5	6	4	4	Date: 1/23/15 New WQ: SE Counts: JC Sol'n Prep: OD Old WQ: GH Time: 1435
4	8.03	7.99	8.5	8.4	326	25.6	0	5	0	10	9	9	6	5	0	0	Date: 1/24/15 New WQ: RG Counts: YJ Sol'n Prep: YJ Old WQ: JF Time: 1400
5	8.10	8.06	8.5	7.0	318	25.7	11	4	9	0	0	0	0	0	10	11	Date: 1/25/15 New WQ: SD Counts: CJD Sol'n Prep: CJD Old WQ: SD Time: 1515
6	—	8.12	—	8.1	341	25.6	13	16	11	15	16	17	15	16	12	14	Date: 1/26/15 New WQ: — Counts: MIA Sol'n Prep: — Old WQ: PA Time: 1605
7																	Date: New WQ: Counts Sol'n Prep: Old WQ: Time
8																	Date: Old WQ: Counts Time
						Total=	30	31	25	30	30	31	28	27	26	29	Mean Neonates/Female = 28.7

6.25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
0	7.98		8.0		401	0	0	0	0	6	0	0	0	0	0	37251
1	8.07	8.15	8.1	8.2	412	0	0	0	0	0	0	0	0	0	0	37251
2	7.89	7.66	8.5	8.0	406	0	0	0	0	0	0	0	0	0	0	37277
3	7.81	7.97	8.7	8.4	403	0	6	6	6	5	5	5	6	6	6	37277
4	8.04	8.02	8.6	8.5	406	0	10	8	0	0	11	8	9	0	0	37302
5	8.07	8.13	8.5	7.4	404	0	0	0	9	10	0	0	0	11	13	37302
6	—	8.14	—	8.3	421	2	17	16	MIA 3	MIA 3 / 18	20	14	18	17	17	—
7																
8																
						Total= 2	33	30	18	33	36	27	33	34	36	Mean Neonates/Female = 28.2

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

Client: **Lehigh Permanente** Material: **Pond 4A** Test Date: 1-20-15

Project #: 23483 Test ID: 60820 Control Water: Modified EPAMH + 5% American River

12.5%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.92		8.1		475		0	0	0	0	0	0	0	0	0	0	
1	7.96	8.14	8.4	8.3	487		0	0	0	0	0	0	0	0	0	0	
2	7.86	7.72	8.5	8.0	483		0	0	0	0	0	0	0	0	0	0	
3	7.73	8.08	8.8	8.3	479		36	6	6	5	7	7	5	5	6	7	
4	8.04	8.02	8.6	8.4	482		5	10	12	11	11	12	11	8	0	0	
5	8.11	8.13	8.5	7.3	476		0	0	0	0	0	0	0	0	13	6	
6	–	8.11	–	8.4	504		18	15	0	16	15	17	15	16	17	16	
7																	
8																	
						Total=	29	31	18	32	33	36	31	29	36	29	Mean Neonates/Female = 30.4

25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
0	7.83		8.1		612	0	0	0	0	0	0	0	0	0	0	
1	7.87	8.17	8.5	8.4	641	0	0	0	0	0	0	0	0	0	0	
2	7.80	7.73	8.4	8.0	628	0	0	0	0	0	0	0	0	0	0	
3	7.60	8.06	8.5	8.2	620	5	0	6	2	6	5	5	4	5	5	
4	8.06	8.08	8.6	8.4	620	0	8	10	8	9	7	11	10	0	0	
5	8.16	8.15	8.5	7.4	619	10	0	0	0	0	0	0	0	13	11	
6	–	8.16	–	7.7	646	14	15	15	16	15	16	14	17	16	17	
7																
8																
					Total=	29	23	31	26	30	28	30	31	34	33	Mean Neonates/Female = 29.5

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

Client: **Lehigh Permanente** Material: **Pond 4A** Test Date: 1-20-15

Project #: 23483 Test ID: 60820 Control Water: Modified EPAMH + 5% American River

50%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (μS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.73		7.6		~~8~~ 874 (PA 1-20-15)		0	0	0	0	0	0	0	0	0	0	
1	7.71	8.23	8.5	8.4	897		0	0	0	0	0	0	0	0	0	0	
2	7.75	7.83	8.2	8.0	892		0	0	0	0	0	0	0	0	0	0	
3	7.47	8.15	7.4	8.3	889		3	0	0	0	1	1	1	0	1	0	
4	8.08	8.15	8.5	8.3	888		0	6	0	7	0	6	6	0	0	0	
5	8.29	8.19	8.4	7.4	878		10	0	8	0	4	0	0	12	6	12	
6	–	8.17	–	8.1	918		14	9	12	9	0	14	10	13	11	10	
7																	
8																	
						Total=	27	15	20	16	5	~~20~~ 21 (PA)	17	25	~~16~~ 18 (PA)	22	Mean Neonates/Female = ~~18.5~~ 18.6 (PA)

100%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (μS/cm)		A	B	C	D	E	F	G	H	I	J	
0	7.55		7.6		1370		0	0	0	0	0	0	0	0	0	0	
1	7.49	8.33	8.4	8.0	1408		0	0	0	0	0	0	0	0	0	0	
2	7.81	8.01	7.3	8.3	1385		0	0	0	0	0	0	0	0	0	0	
3	7.32	8.29	4.8	8.3	1357		0	0	0	0	0	0	0	0	0	0	
4	8.08	8.29	8.4	8.3	1369		0	0	0	0	0	0	3	0	0	0	
5	8.35	8.27	8.4	7.7	1358		6	6	2	2	5	4	0	6	0	0	
6	–	8.24	–	8.2	1420		2	0	3	4	0	2	1	3	1	0	
7																	
8																	
						Total=	8	6	5	6	5	6	4	9	1	0	Mean Neonates/Female = 5.0

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 1-2015

Project #: 23483 Test ID: 60820 Control Water: Modified EPAMH + 5% American River

Meter ID's

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	SIGN-OFF Date:	New WQ:	Old WQ:
0	PH19		RD09		EC10	30A	1-20-15	RO	
1	PH21	PH22	RD11	RD12	EC08	30A	1/21/15	RG	RG
2	PH19	PH19	RD11	RD11	EC09	30A	1/22/15	RG	RG
3	PH22	PH22	RD12	RD12	EC11	30A	1/23/15	SE	GY
4	PH21	PH19	RD11	RD10	EC09	30A	1/24/15	RG	SE
5	PH19	PH22	RD09	RD11	EC09	30A	1/25/15	SD	SD
6	—	PH19	—	RD09	EC10	30A	1/26/15	—	PO
7									
8									

Appendix C

Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 4A Site Water to *Ceriodaphnia dubia*: Analysis Includes Outlier Data

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

Batch ID:	19-7868-4765	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	20 Jan-15 14:30	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 16:05	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 2h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	12-6162-2676	**Code:**	Pond 4A	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 10:15	**Material:**	Site Water	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	28h (0.6 °C)	**Station:**	Pond 4A		

Batch Note: Including outlier replicates 6.25%-A and 12.5%-C

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
05-0985-5988	Reproduction	25	50	35.36	20.6%	4	Steel Many-One Rank Sum Test
00-8924-0984	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
03-2208-5108	Reproduction	IC5	28.4	4.98	29.5	3.516	Linear Interpolation (ICPIN)
		IC10	31.9	26.1	34.1	3.136	
		IC15	35.3	30.4	39	2.83	
		IC20	38.8	33.8	43.7	2.579	
		IC25	42.2	36.8	48.8	2.369	
		IC40	54	45.1	63.9	1.853	
		IC50	64.7	51.9	72.1	1.545	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	28.7	27.2	30.2	25	31	0.667	2.11	7.35%	0.0%
6.25		10	28.2	20.6	35.8	2	36	3.37	10.6	37.7%	1.74%
12.5		10	30.4	26.8	34	18	36	1.61	5.08	16.7%	-5.92%
25		10	29.5	27.2	31.8	23	34	1.02	3.24	11.0%	-2.79%
50		10	18.6	14.2	23	5	27	1.94	6.13	33.0%	35.2%
100		10	5	3	7	0	9	0.882	2.79	55.8%	82.6%

Survival Summary

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	30	31	25	30	30	31	28	27	26	29
6.25		2	33	30	18	33	36	27	33	34	36
12.5		29	31	18	32	33	36	31	29	36	29
25		29	23	31	26	30	28	30	31	34	33
50		27	15	20	16	5	21	17	25	18	22
100		8	6	5	6	5	6	4	9	1	0

Survival Detail

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

Survival Binomials

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

CETIS Analytical Report

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

Analysis ID:	00-8924-0984	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:58	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

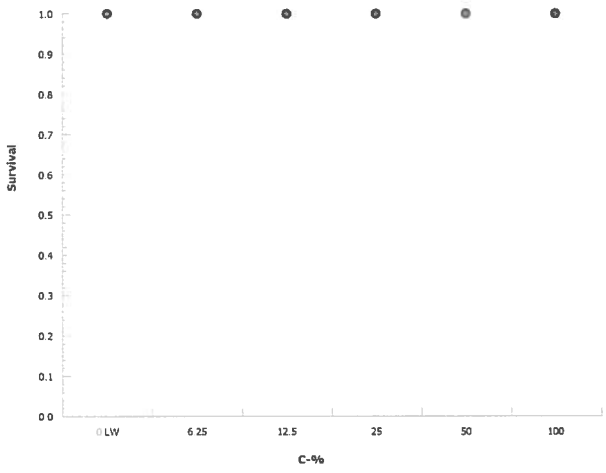
Fisher Exact/Bonferroni-Holm Test

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

Data Summary

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

Graphics



Analyst: _____ QA: MF

CETIS Analytical Report

Test Code: 60820 | 18-4317-4097

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	05-0985-5988	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:00	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	20.6%	25	50	35.36	4

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	124	75	2	18	0.9966	Asymp	Non-Significant Effect
		12.5	127	75	3	18	0.9983	Asymp	Non-Significant Effect
		25	116	75	6	18	0.9727	Asymp	Non-Significant Effect
		50*	58	75	2	18	0.0009	Asymp	Significant Effect
		100*	55	75	0	18	0.0004	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4989.4	997.88	5	30	<0.0001	Significant Effect
Error	1795	33.24074	54			
Total	6784.4		59			

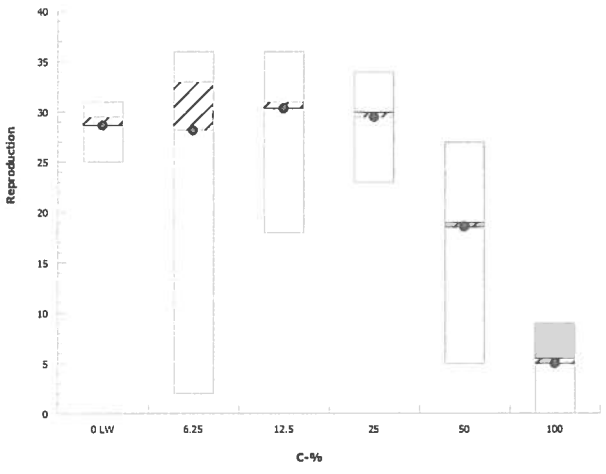
Distributional Tests

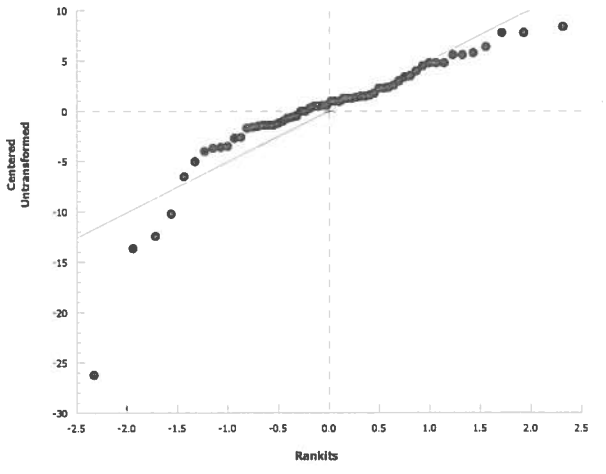
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	30.3	15.1	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.826	0.946	<0.0001	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	28.7	27.2	30.2	29.5	25	31	0.667	7.35%	0.0%
6.25		10	28.2	20.6	35.8	33	2	36	3.37	37.7%	1.74%
12.5		10	30.4	26.8	34	31	18	36	1.61	16.7%	-5.92%
25		10	29.5	27.2	31.8	30	23	34	1.02	11.0%	-2.79%
50		10	18.6	14.2	23	19	5	27	1.94	33.0%	35.2%
100		10	5	3	7	5.5	0	9	0.882	55.8%	82.6%

Graphics





Analyst: QA: MF

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	03-2208-5108	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:00	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1355809	200	Yes	Two-Point Interpolation

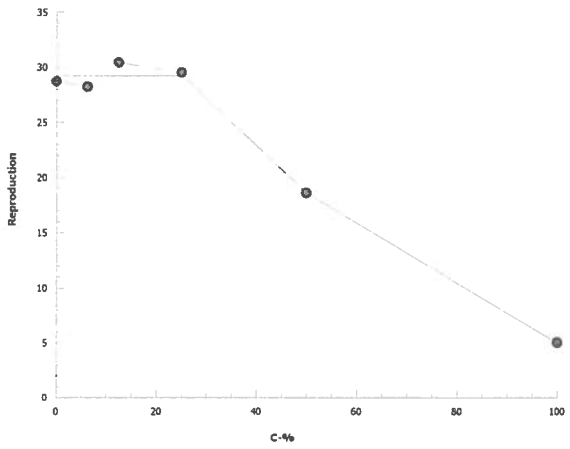
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	28.4	4.98	29.5	3.516	3.39	20.09
IC10	31.9	26.1	34.1	3.136	2.936	3.826
IC15	35.3	30.4	39	2.83	2.563	3.287
IC20	38.8	33.8	43.7	2.579	2.289	2.963
IC25	42.2	36.8	48.8	2.369	2.051	2.718
IC40	54	45.1	63.9	1.853	1.565	2.217
IC50	64.7	51.9	72.1	1.545	1.387	1.927

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	28.7	25	31	0.667	2.11	7.35%	0.0%
6.25		10	28.2	2	36	3.37	10.6	37.7%	1.74%
12.5		10	30.4	18	36	1.61	5.08	16.7%	-5.92%
25		10	29.5	23	34	1.02	3.24	11.0%	-2.79%
50		10	18.6	5	27	1.94	6.13	33.0%	35.2%
100		10	5	0	9	0.882	2.79	55.8%	82.6%

Graphics



Appendix D

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

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

Batch ID:	04-4897-0286	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Fong
Start Date:	20 Jan-15 15:10	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 16:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	00-3694-0457	**Code:**	Pond 9	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 11:02	**Material:**	Site Water	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	28h (0.5 °C)	**Station:**	Pond 9		

Batch Note: Excluding Outlier Replicates 6.25%-G and 25%-A

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
05-5205-9315	Reproduction	50	100	70.71	13.4%	2	Bonferroni Adj t Test
02-3299-5157	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
18-2916-5424	Reproduction	IC5	52.2	29.4	65	1.916	Linear Interpolation (ICPIN)
		IC10	69	40.5	83.4	1.448	
		IC15	85.9	49.4	N/A	1.164	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	9.9	6.84	13	4	16	1.35	4.28	43.2%	0.0%
0	Lab Water Contr	10	30.6	27.8	33.4	25	36	1.23	3.89	12.7%	-209.0%
6.25		9	32	30.2	33.8	28	34	0.782	2.35	7.33%	-223.0%
12.5		10	32	29.2	34.8	27	39	1.22	3.86	12.1%	-223.0%
25		9	32.1	29.5	34.8	28	40	1.15	3.44	10.7%	-224.0%
50		10	30.3	26.4	34.2	20	37	1.71	5.4	17.8%	-206.0%
100		10	25.6	23.3	27.9	21	30	1	3.17	12.4%	-159.0%

Survival Summary

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Hardness Blank	7	12	4	7	4	10	11	13	16	15
0	Lab Water Contr	36	31	31	35	32	25	26	30	26	34
6.25		34	33	34	31	34	28		34	29	31
12.5		32	30	29	29	38	27	31	32	39	33
25			32	32	33	40	28	29	33	32	30
50		32	37	32	20	25	25	34	32	36	30
100		27	27	21	22	28	26	30	28	21	26

Survival Detail

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

Survival Binomials

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

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

Analysis ID:	02-3299-5157	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:22	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

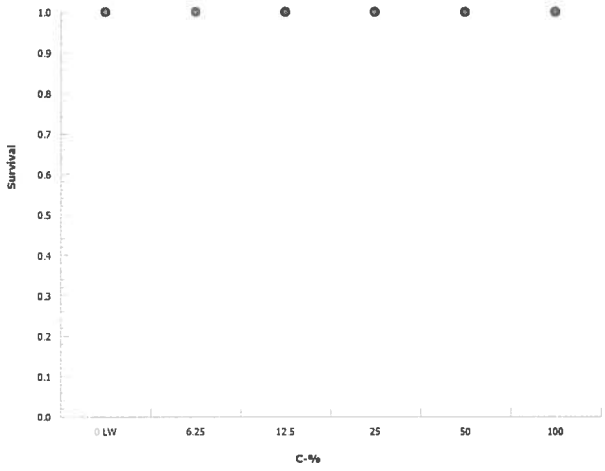
Fisher Exact/Bonferroni-Holm Test

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

Data Summary

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

Graphics



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

Analysis ID:	05-5205-9315	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:25	**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	13.4%	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	-0.796	2.4	4.22	17	1.0000	CDF	Non-Significant Effect
		12.5	-0.818	2.4	4.11	18	1.0000	CDF	Non-Significant Effect
		25	-0.859	2.4	4.22	17	1.0000	CDF	Non-Significant Effect
		50	0.175	2.4	4.11	18	1.0000	CDF	Non-Significant Effect
		100*	2.92	2.4	4.11	18	0.0129	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	305.8663	61.17326	5	4.18	0.0029	Significant Effect
Error	761.7889	14.64979	52			
Total	1067.655		57			

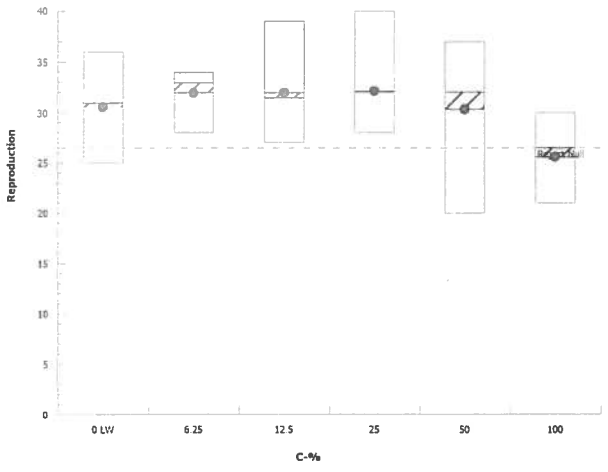
Distributional Tests

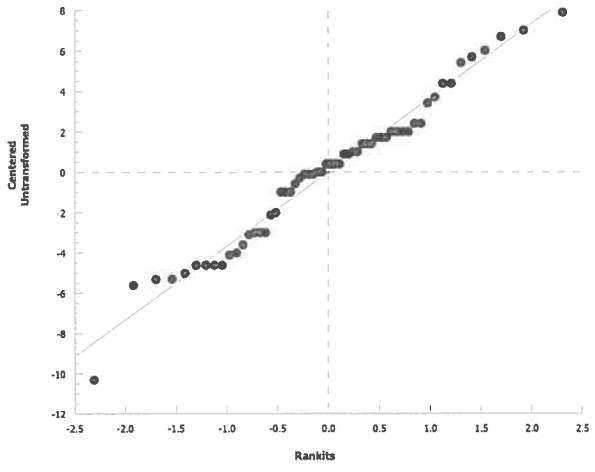
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	6.02	15.1	0.3045	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.978	0.944	0.3679	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	30.6	27.8	33.4	31	25	36	1.23	12.7%	0.0%
6.25		9	32	30.2	33.8	33	28	34	0.782	7.33%	-4.58%
12.5		10	32	29.2	34.8	31.5	27	39	1.22	12.1%	-4.58%
25		9	32.1	29.5	34.8	32	28	40	1.15	10.7%	-4.94%
50		10	30.3	26.4	34.2	32	20	37	1.71	17.8%	0.98%
100		10	25.6	23.3	27.9	26.5	21	30	1	12.4%	16.3%

Graphics





Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	18-2916-5424	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:25	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1407388	200	Yes	Two-Point Interpolation

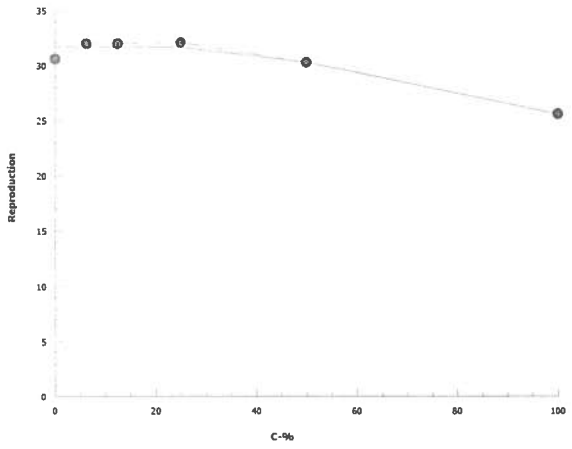
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	52.2	29.4	65	1.916	1.539	3.396
IC10	69	40.5	83.4	1.448	1.199	2.468
IC15	85.9	49.4	N/A	1.164	NA	2.024
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	30.6	25	36	1.23	3.89	12.7%	0.0%
6.25		9	32	28	34	0.782	2.35	7.33%	-4.58%
12.5		10	32	27	39	1.22	3.86	12.1%	-4.58%
25		9	32.1	28	40	1.15	3.44	10.7%	-4.94%
50		10	30.3	20	37	1.71	5.4	17.8%	0.98%
100		10	25.6	21	30	1	3.17	12.4%	16.3%

Graphics



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

Client: **Lehigh Permanente** Material: **Pond 9** Test Date: 1-20-15

Project #: 23483 Test ID: 60821 Randomization: 10, 6, 13 Control Water: Modified EPAMH + 5% American River

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	7.93		8.1		333	25.0	0	0	0	0	0	0	0	0	0	0
1	8.08	8.16	8.2	8.5	333	25.0	0	0	0	0	0	0	0	0	0	0
2	8.08	8.15	8.8	7.7	326	25.2	0	0	0	0	0	0	0	0	0	0
3	7.88	8.18	8.9	8.7	355	25.4	5	5	6	6	6	6	6	6	6	5
4	7.99	8.13	8.7	7.0	324	25.6	0	7	6	12	7	5	5	7	5	0
5	8.11	8.37	8.4	7.7	339	25.8	13	0	0	0	1	1	0	0	0	11
6	8.17	8.40	8.3	8.3	337	25.6	18	19	19	17	18	13	15	17	15	18
7																
8																
						Total=	36	31	31	35	32	25	26	30	26	37

SIGN-OFF

Date:	New WQ:	Test Init.: AHF	
Sol'n Prep: AHF	Old WQ: PO	Time: 1510	
Date: 1/21/15	New WQ: FCWB	Counts: YJ	
Sol'n Prep: SM	Old WQ: RG	Time: 1120	
Date: 1/22/15	New WQ: KLP	Counts: SS	
Sol'n Prep: YJ	Old WQ: RG	Time: 1520	
Date: 1/23/15	New WQ: SE	Counts: CO	
Sol'n Prep: CO	Old WQ: SOM	Time: 1530	
Date: 1/24/15	New WQ: FCWB	Counts: AWS	
Sol'n Prep: YJ	Old WQ: TM	Time: 1545	
Date: 1/25/14	New WQ: RWB	Counts: PQ	
Sol'n Prep: SM	Old WQ: SD	Time: 1600	
Date: 1/26/15	New WQ: LL	Counts: CJD	
Sol'n Prep: MA	Old WQ: MA	Time: 1600	
Date:	New WQ:	Counts:	
Sol'n Prep:	Old WQ:	Time:	
Date:	Old WQ:	Counts:	
		Time:	

Mean Neonates/Female = 30.6

6.25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
0	7.88		8.1		408	0	0	0	0	0	0	0	0	0	0	37252
1	7.99	8.28	8.0	8.5	420	0	0	0	0	0	0	0	0	0	0	37252
2	7.90	8.03	8.9	7.8	500	0	0	0	0	0	0	0	0	0	0	37281
3	7.84	8.08	9.1	8.6	420	5	6	6	5	6	5	6	6	6	6	37281
4	7.96	8.32	8.7	6.4	420	0	8	9	9	0	7	0	8	6	7	37305
5	8.01	8.24	8.5	7.6 SD	417	11	0	0	0	10	0	14	0	0	0	37305
6	8.01	8.16	8.6	8.4	415	18	19	19	17	18	16	20	20	17	18	37305
7																
8																
					Total=	34	33	34	31	34	28	40	34	29	31	

Mean Neonates/Female = 32.8

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

Client: **Lehigh Permanente** Material: **Pond 9** Test Date: 1-20-15

Project #: 23483 Test ID: 60821 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
12.5%	0	7.87		8.0		493		0	0	0	0	0	0	0	0	0	0	
	1	7.91	8.25	8.3	8.6	503		0	0	0	0	0	0	0	0	0	0	
	2	7.91	7.97	8.9	7.8	506		0	0	0	0	0	0	0	0	0	0	
	3	7.78	7.94	9.1	8.4	494		7	6	6	5	7	5	6	5	7	10	
	4	7.89	8.28	8.8	7.1	499		8	0	4	10	12	9	8	8	0	0	
	5	7.95	8.15	8.6	7.8	500		0	8	0	0	0	0	0	0	12	11	
	6	7.89	8.10	8.9	8.5	500		17	16	19	14	19	13	17	14	20	16	
	7																	
	8																	
							Total=	32	30	29	29	38	27	31	32	39	33	Mean Neonates/Female = 32.0

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
25%	0	7.80		8.2		651		0	0	0	0	0	0	0	0	0	0	
	1	7.80	8.24	8.6	8.6	659		0	0	0	0	0	0	0	0	0	0	
	2	7.81	7.98	8.9	7.9	658		0	0	0	0	0	0	0	0	0	0	
	3	7.71	8.05	9.1	8.5	646		0	6	5	6	8	5	6	5	7	6	
	4	7.80	8.33	8.8	7.2	647		5	8	8	10	0	7	9	11	0	6	
	5	7.86	8.16	8.6	7.3	642		10	0	0	0	13	0	0	0	10	0	
	6	7.79	8.13	9.0	8.4	652		0	18	19	17	19	16	14	17	15	18	
	7																	
	8																	
							Total=	15	32	32	33	40	28	29	33	32	30	Mean Neonates/Female = 30.4

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

Client: **Lehigh Permanente** Material: **Pond 9** Test Date: 1-20-15

Project #: 23483 Test ID: 60821 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
50%	0	7.67		8.2		941		0	0	0	0	0	0	0	0	0	0	
	1	7.66	8.24	8.7	8.5	959		0	0	0	0	0	0	0	0	0	0	
	2	7.69	7.98	9.0	8.0	961		0	0	0	0	0	0	0	0	0	0	
	3	7.61	8.14	9.3	8.6	948		6	6	6	6	5	6	7	6	7	7	
	4	7.69	8.39	9.0	6.1	942		0	0	9	3	3	3	8	6	0	6	
	5	7.76	8.20	8.9	7.4	934		10	12	0	11	0	0	0	0	14	0	
	6	7.68	8.22	9.1	8.3	938		16	19	17	0	17	16	19	20	15	17	
	7																	
	8																	
							Total=	32	37	32	20	25	25	34	32	36	30	Mean Neonates/Female = 30.3

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
100%	0	7.55		8.4		1473	0	0	0	0	0	0	0	0	0	0	
	1	7.50	8.13	8.9	8.8	1502	0	0	0	0	0	0	0	0	0	0	
	2	7.55	7.95	9.1	8.0	1505	0	0	0	0	0	0	0	0	0	0	
	3	7.48	8.02	9.8	8.5	1489	6	5	0	5	6	6	5	5	5	6	
	4	7.57	8.26	9.5	5.8	1475	5 (1/16)	7 (1/24/16)	5	1	7	4	6	8	3	4	
	5	7.62	8.12	8.7	7.6	1444	0	0	0	0	0	0	0	0	0	0	
	6	7.60	8.11	10.0	8.5	1481	16	15	16	16	15	16	19	15	13	16	
	7																
	8																
							Total= 27	27	21	22	28	26	30	28	21	26	Mean Neonates/Female = 25.6

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

Analysis ID:	01-7523-7925	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:22	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

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

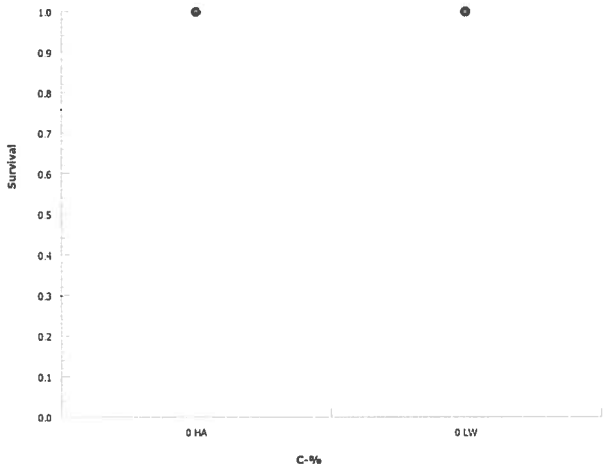
Fisher Exact Test

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

Data Summary

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

Graphics



Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	16-9388-9607	**Endpoint:** Reproduction	**CETIS Version:** CETISv1.8.7
Analyzed:	27 Jan-15 9:23	**Analysis:** Parametric-Two Sample	**Official Results:** Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Untransformed	NA	C > T	NA	NA	10.4%	Fails reproduction

Equal Variance t Two-Sample Test

Control	vs	Control	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Hardness Blank	11.3	1.73	3.17	18	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2142.45	2142.45	1	128	<0.0001	Significant Effect
Error	301.3	16.73889	18			
Total	2443.75		19			

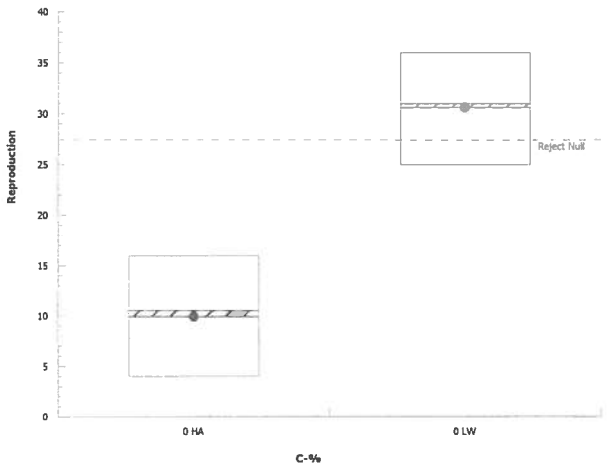
Distributional Tests

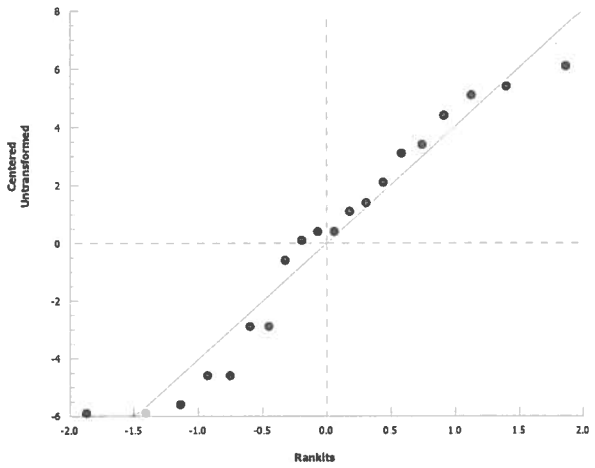
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.21	6.54	0.7821	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.933	0.866	0.1788	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	30.6	27.8	33.4	31	25	36	1.23	12.7%	0.0%
0	Hardness Blank	10	9.9	6.84	13	10.5	4	16	1.35	43.2%	67.6%

Graphics





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

Client: **Lehigh Permanente** Material: **Hardness Blank** Test Date: 1-20-15

Project #: 23483 Test ID: 60821 Randomization: 10.2.1 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
Hardness Blank	0	7.87		8.3		1684	26.0	0	0	0	0	0	0	0	0	0	0	Date: 1-20-15 New WQ: RD Test Init: MRF Sol'n Prep: JM Time: 1510
	1	7.69	8.15	8.9	8.6	1682	25.0	0	0	0	0	0	0	0	0	0	0	Date: 1/21/15 New WQ: FCVB Counts: YJ Sol'n Prep: SM Old WQ: RG Time: 1120
	2	7.89	7.90	10.3	7.9	1687	25.2	0	0	0	0	0	0	0	0	0	0	Date: 1/22/15 New WQ: KLP Counts: SS Sol'n Prep: YJ Old WQ: RG Time: 1520
	3	7.81	8.19	10.5	8.8	1627	25.4	5	2	4	3	4	4	3	3	4	3	Date: 1/23/15 New WQ: SE Counts: CD Sol'n Prep: CD Old WQ: SDM Time: 1530
	4	7.79	8.36	10.6	6.2	1664	25.6	0	0	0	4	0	0	0	0	0	3	Date: 1/24/15 New WQ: FCVB Counts: AWS Sol'n Prep: YJ Old WQ: TM Time: 1545
	5	7.82	8.05	10.7	7.9	1664	25.8	2	0	0	0	0	0	0	4	2	0	Date: 1/25/15 New WQ: FCVB Counts: AA Sol'n Prep: ~~MA~~ MA SM Old WQ: SD Time: 1600
	6	7.78	8.12	10.0	8.2	1640	25.6	0	10	0	0	0	6	8	6	10	9	Date: 1/26/15 New WQ: KLP Counts: CSD Sol'n Prep: MA Old WQ: MA Time: 1600
	7																	Date: New WQ: Counts Sol'n Prep: Old WQ: Time
	8																	Date: Old WQ: Counts Sol'n Prep: Time
							Total=	7	12	4	7	4	10	11	13	16	15	Mean Neonates/Female = 9.9

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 1-20-15

Project #: 23483 Test ID: 60821 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	SIGN-OFF		
Meter ID's	0	PH19		RD09		EC10	30A	Date: 1-20-15	New WQ: RO	
	1	PH21	PH22	RD11	RD12	EC08	30A	Date: 1/21/15	New WQ: FOVB	Old WQ: RG
	2	PH15	PH19	RD12	RD11	EC08	30A	Date: 1-22-15	New WQ: KLP	Old WQ: RG
	3	PH22	PH22	RD12	RD12	EC11	30A	Date: 1/23/15	New WQ: SE	Old WQ: SDM
	4	PH15	PH21	RD10	RD11	EC11	30A	Date: 1/24/15	New WQ: FOVB	Old WQ: TM
	5	PH21	PH22	RD10	RD11	EC10	30A	Date: 1/25/15	New WQ: FOVB	Old WQ: SD
	6	PH21	PH22	RD10	RD12	EC09	30A	Date: 1/26/15	New WQ: KL	Old WQ: MA
	7							Date:	New WQ:	Old WQ:
	8							Date:		Old WQ

Appendix E

Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 9 Site Water to *Ceriodaphnia dubia*: Analysis Includes Outlier Data

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

Batch ID:	04-4897-0286	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Fong
Start Date:	20 Jan-15 15:10	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 16:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	00-3694-0457	**Code:**	Pond 9	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 11:02	**Material:**	Site Water	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	28h (0.5 °C)	**Station:**	Pond 9		

Batch Note: Including Outlier Replicates 6.25%-G and 25%-A

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
21-1546-0578	Reproduction	50	100	70.71	15.0%	2	Dunnett Multiple Comparison Test
02-3299-5157	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
07-3339-5331	Reproduction	IC5	51	14.7	66.4	1.962	Linear Interpolation (ICPIN)
		IC10	67.9	21.8	84.8	1.473	
		IC15	84.8	47.1	N/A	1.179	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Hardness Blank	10	9.9	6.84	13	4	16	1.35	4.28	43.2%	0.0%
0	Lab Water Contr	10	30.6	27.8	33.4	25	36	1.23	3.89	12.7%	-209.0%
6.25		10	32.8	30.4	35.2	28	40	1.06	3.36	10.2%	-231.0%
12.5		10	32	29.2	34.8	27	39	1.22	3.86	12.1%	-223.0%
25		10	30.4	25.9	34.9	15	40	2	6.31	20.8%	-207.0%
50		10	30.3	26.4	34.2	20	37	1.71	5.4	17.8%	-206.0%
100		10	25.6	23.3	27.9	21	30	1	3.17	12.4%	-159.0%

Survival Summary

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Hardness Blank	7	12	4	7	4	10	11	13	16	15
0	Lab Water Contr	36	31	31	35	32	25	26	30	26	34
6.25		34	33	34	31	34	28	40	34	29	31
12.5		32	30	29	29	38	27	31	32	39	33
25		15	32	32	33	40	28	29	33	32	30
50		32	37	32	20	25	25	34	32	36	30
100		27	27	21	22	28	26	30	28	21	26

Survival Detail

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

Survival Binomials

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

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

Analysis ID:	02-3299-5157	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:22	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

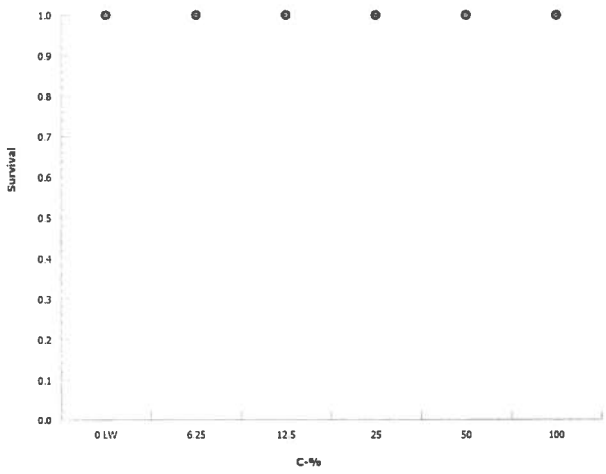
Fisher Exact/Bonferroni-Holm Test

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

Data Summary

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

Graphics



Analyst: MF QA

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	21-1546-0578	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.7
Analyzed:	27 Jan-15 9:22	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	15.0%	50	100	70.71	2

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-1.1	2.29	4.58	18	0.9883	CDF	Non-Significant Effect
		12.5	-0.699	2.29	4.58	18	0.9639	CDF	Non-Significant Effect
		25	0.0999	2.29	4.58	18	0.8020	CDF	Non-Significant Effect
		50	0.15	2.29	4.58	18	0.7850	CDF	Non-Significant Effect
		100*	2.5	2.29	4.58	18	0.0313	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	313.2833	62.65667	5	3.12	0.0150	Significant Effect
Error	1082.9	20.0537	54			
Total	1396.183		59			

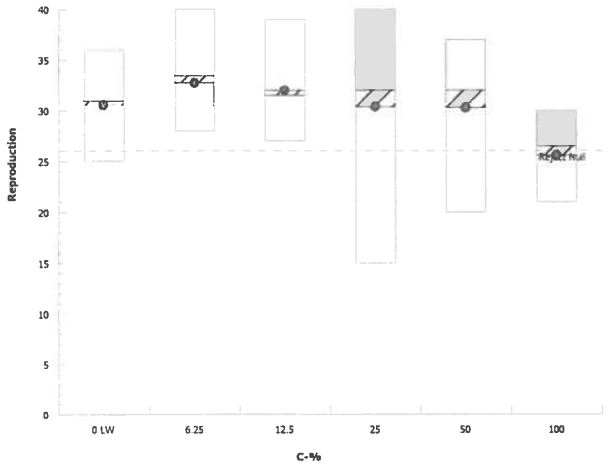
Distributional Tests

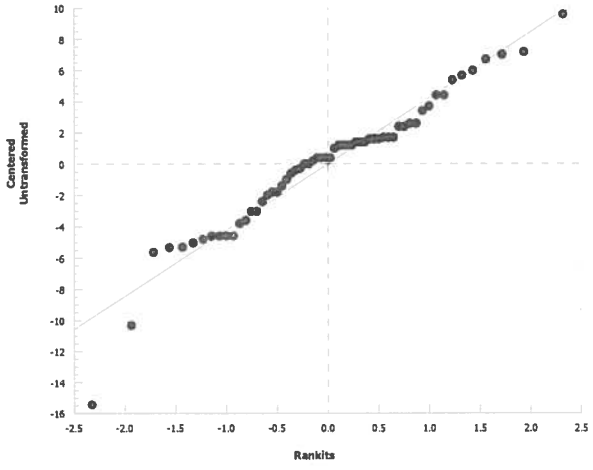
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	6.77	15.1	0.2383	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.954	0.946	0.0242	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	30.6	27.8	33.4	31	25	36	1.23	12.7%	0.0%
6.25		10	32.8	30.4	35.2	33.5	28	40	1.06	10.2%	-7.19%
12.5		10	32	29.2	34.8	31.5	27	39	1.22	12.1%	-4.58%
25		10	30.4	25.9	34.9	32	15	40	2	20.8%	0.65%
50		10	30.3	26.4	34.2	32	20	37	1.71	17.8%	0.98%
100		10	25.6	23.3	27.9	26.5	21	30	1	12.4%	16.3%

Graphics





CETIS Analytical Report

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	07-3339-5331	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:22	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	705911	200	Yes	Two-Point Interpolation

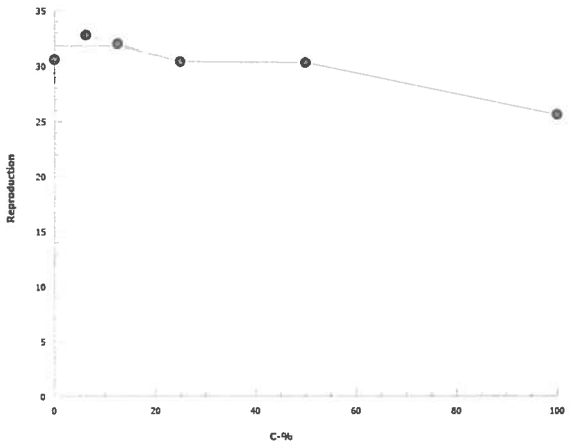
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	51	14.7	66.4	1.962	1.505	6.794
IC10	67.9	21.8	84.8	1.473	1.179	4.589
IC15	84.8	47.1	N/A	1.179	NA	2.125
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	30.6	25	36	1.23	3.89	12.7%	0.0%
6.25		10	32.8	28	40	1.06	3.36	10.2%	-7.19%
12.5		10	32	27	39	1.22	3.86	12.1%	-4.58%
25		10	30.4	15	40	2	6.31	20.8%	0.65%
50		10	30.3	20	37	1.71	5.4	17.8%	0.98%
100		10	25.6	21	30	1	3.17	12.4%	16.3%

Graphics



Analyst: MF QA

Appendix F

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	19-7890-6839	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Fong
Start Date:	20 Jan-15 13:45	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 14:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	08-1663-1612	**Code:**	Pond 13	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 11:15	**Material:**	Site Water	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	26h (0 °C)	**Station:**	Pond 13		

Batch Note: Excluding Outlier Replicate 25%-F

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-4214-3241	Reproduction	100	>100	NA	15.2%	1	Bonferroni Adj t Test
06-1404-1721	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
21-0290-6215	Reproduction	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	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	31.1	27.2	35	21	39	1.71	5.4	17.4%	0.0%
6.25		10	36.2	33.8	38.6	32	44	1.05	3.33	9.19%	-16.4%
12.5		6	35.5	30.9	40.1	28	41	1.8	4.42	12.4%	-14.1%
25		9	33.3	31.2	35.5	31	38	0.928	2.78	8.35%	-7.18%
50		10	32.8	29	36.6	26	39	1.66	5.25	16.0%	-5.47%
100		10	33	29.8	36.2	24	38	1.4	4.42	13.4%	-6.11%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		6	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	34	31	39	21	25	34	28	35	29	35
6.25		36	35	39	36	34	32	34	37	35	44
12.5		38	34	41	28	35	37				
25		38	37	35	31	31		32	31	31	34
50		35	35	35	39	37	28	26	26	28	39
100		37	31	38	36	31	37	29	35	24	32

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	06-1404-1721	Endpoint: Survival	CETIS Version: CETISv1.8.7
Analyzed:	27 Jan-15 8:53	Analysis: STP 2x2 Contingency Tables	Official Results: Yes

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

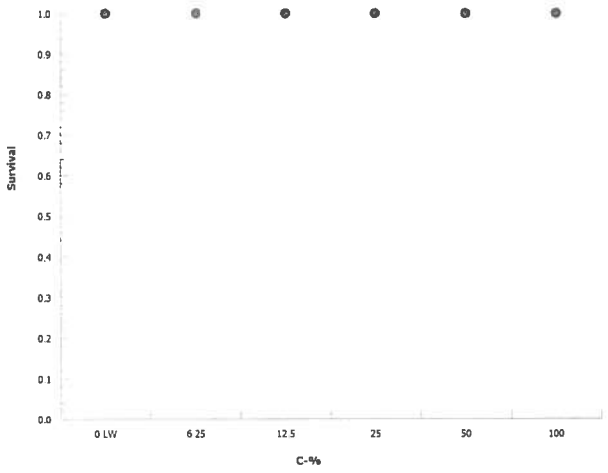
Fisher Exact/Bonferroni-Holm Test

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

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Water Cont	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		6	0	6	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%

Graphics



Analyst: MF QA:

CETIS Analytical Report

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	15-4214-3241	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:56	**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	15.2%	100	>100	NA	1

Bonferroni Adj t Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-2.6	2.4	4.72	18	1.0000	CDF	Non-Significant Effect
		12.5	-1.94	2.4	5.46	14	1.0000	CDF	Non-Significant Effect
		25	-1.11	2.4	4.85	17	1.0000	CDF	Non-Significant Effect
		50	-0.865	2.4	4.72	18	1.0000	CDF	Non-Significant Effect
		100	-0.967	2.4	4.72	18	1.0000	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	162.1091	32.42182	5	1.68	0.1571	Non-Significant Effect
Error	945.6	19.29796	49			
Total	1107.709		54			

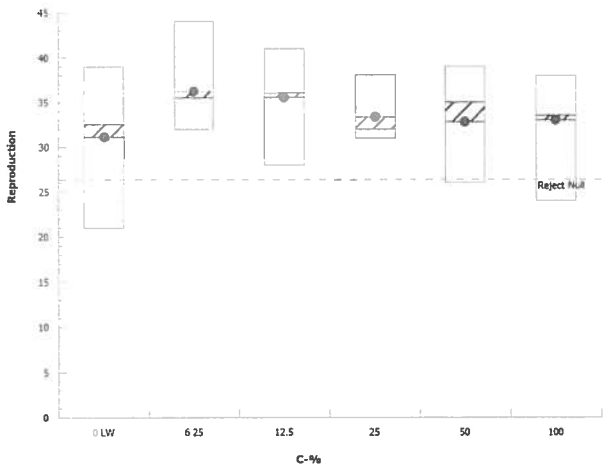
Distributional Tests

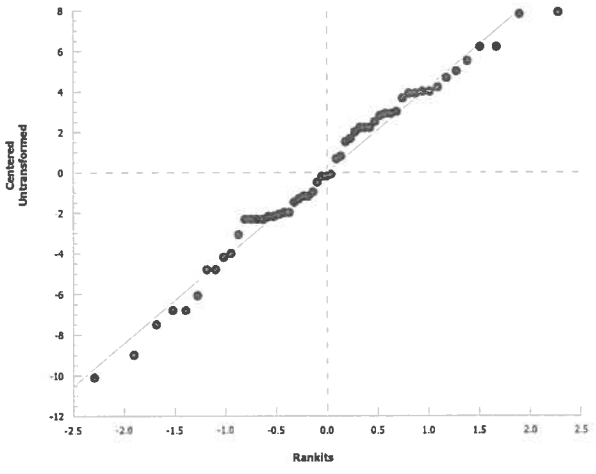
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	4.96	15.1	0.4206	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.98	0.942	0.4824	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	31.1	27.2	35	32.5	21	39	1.71	17.4%	0.0%
6.25		10	36.2	33.8	38.6	35.5	32	44	1.05	9.19%	-16.4%
12.5		6	35.5	30.9	40.1	36	28	41	1.8	12.4%	-14.1%
25		9	33.3	31.2	35.5	32	31	38	0.928	8.35%	-7.18%
50		10	32.8	29	36.6	35	26	39	1.66	16.0%	-5.47%
100		10	33	29.8	36.2	33.5	24	38	1.4	13.4%	-6.11%

Graphics





Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	21-0290-6215	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:57	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	247590	200	Yes	Two-Point Interpolation

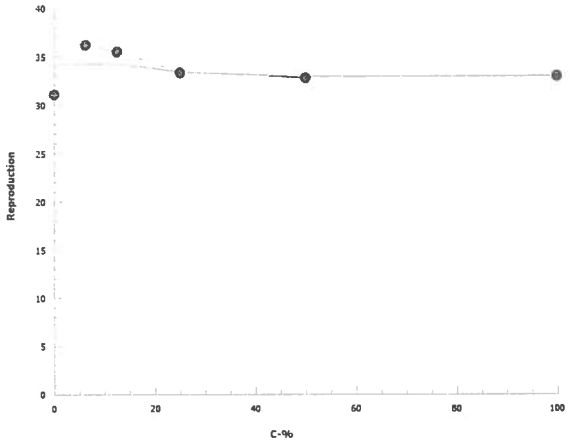
Point Estimates

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

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	31.1	21	39	1.71	5.4	17.4%	0.0%
6.25		10	36.2	32	44	1.05	3.33	9.19%	-16.4%
12.5		6	35.5	28	41	1.8	4.42	12.4%	-14.1%
25		9	33.3	31	38	0.928	2.78	8.35%	-7.18%
50		10	32.8	26	39	1.66	5.25	16.0%	-5.47%
100		10	33	24	38	1.4	4.42	13.4%	-6.11%

Graphics



Analyst: MF QA:

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

Client: **Lehigh Permanente** Material: **Pond 13** Test Date: 1/20/15

Project #: 23483 Test ID: 60822 Randomization: 10,6,3 Control Water: Modified EPAMH + 5% American River

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	7.84		8.4		322	25.0	0	0	0	0	0	0	0	0	0	0
1	8.07	8.28	8.9	8.2	332	25.0	0	0	0	0	0	0	0	0	0	0
2	8.14	7.93	8.5	8.2	326	25.2	0	0	0	0	0	0	0	0	0	0
3	7.89	7.98	9.4	8.1	317	25.5	6	6	5	3	4	5	5	5	6	7
4	7.96	7.91	8.6	8.5	323	25.9	0	6	0	5	5	10	6	8	7	0
5	7.89	7.81	8.5	7.4	322	25.7	10	0	11	0	0	0	0	0	0	10
6	7.95	7.91	8.9	8.6	327	25.8	18	19	23	13	16	19	17	22	16	18
7																
8																
						Total=	34	31	39	21	25	34	28	35	29	35

Mean Neonates/Female = 31.1

SIGN-OFF

	Date	Sol'n Prep	New WQ	Old WQ	Test Init / Counts	Time
0	1/20/15	YJ	RD		SM	1345
1	1/21/15	SM	FOUR	RG	YJ	1050
2	1/22/15	YJ	RG	RG	YJ	1345
3	1/23/15	CD	5E	SDM	MH	1605
4	1/24/15	YJ	FOUR	SE	TM	1545
5	1/25/15	SM	FOUR	SD	TM	1545
6	1/26/15	MA	[illegible]	MA	GP	1430
7						
8						

6.25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
0	7.91		8.3		401	0	0	0	0	0	0	0	0	0	0	37253
1	8.03	8.23	8.6	8.3	405	0	0	0	0	0	0	0	0	0	0	37253
2	7.99	7.94	8.4	8.3	412	0	0	0	0	0	0	0	0	0	0	37280
3	7.94	8.05	9.0	7.9	406	5	6	7	4	5	6	6	7	6	8	37280
4	7.97	7.98	8.7	7.7	407	0	4	10	0	9	8	8	10	9	0	37300
5	7.93	7.89	8.5	7.4	406	11	9	0	13	0	0	0	0	0	15	37300
6	8.02	7.92	8.7	8.4	407	20	25	22	19	20	18	20	20	20	21	37300
7																
8																
					Total=	36	35	39	36	34	32	34	37	35	44	

Mean Neonates/Female = 36.2

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

Client: **Lehigh Permanente** Material: **Pond 13** Test Date: 1/20/15

Project #: 23483 Test ID: 60822 Control Water: Modified EPAMH + 5% American River

12.5%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.94		8.0		475		0	0	0	0	0	0	0	0	0	0	
1	8.04	8.23	8.6	8.3	482		0	0	0	0	0	0	0	0	0	0	
2	7.96	7.95	8.5	8.4	485		0	0	0	0	0	0	0	0	0	0	
3	7.97	8.03	9.1	8.0	476		6	5	7	3	5	6	6	7	6	7	
4	7.97	8.02	8.8	7.7	483		0	10	0	8	0	0	0	9	10	0	
5	7.98	7.99	8.5	7.5	483		12	0	12	0	13	11	10	0	0	13	
6	8.05	7.93	8.7	8.4	483		20	19	22	17	17	20	cp ~~0~~ *	*	*	*	
7													—	—	—	—	
8													—	—	—	—	
						Total=	38	34	41	28	35	37	—	—	—	—	Mean Neonates/Female = 35.5

25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.97		8.2		614		0	0	0	0	0	0	0	0	0	0	
1	8.03	8.23	8.6	8.4	612		0	0	0	0	0	0	0	0	0	0	
2	7.95	7.95	8.5	8.4	624		0	0	0	0	0	0	0	0	0	0	
3	8.02	8.11	9.1	8.0	623		5	6	6	5	4	5	7	5	5	5	
4	8.03 ~~8.08~~	~~8.01~~ sk	8.9	~~8.1~~ 8.0 sk	628		0	10	10	8	9	6	8	6	6	0	
5	8.01	8.04	8.6	7.6	626		12	0	0	1	0	7 cp	0	0	0	10	
6	8.10	7.98	8.9	8.4	632		21	21	19	17	18	~~17~~ 0	17	20	20	19	
7																	
8																	
						Total=	38	37	35	31	31	18	32	31	31	34	Mean Neonates/Female = 31.8

* Staff error - adults not transferred to new cups on Day 5; data analyzed using the remaining 6 replicates.

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

Client: **Lehigh Permanente** Material: **Pond 13** Test Date: 1/20/14

Project #: 23483 Test ID: 60822 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
50%	0	8.01		8.5		878		0	0	0	0	0	0	0	0	0	0	
	1	8.03	8.29	8.9	8.4	893		0	0	0	0	0	0	0	0	0	0	
	2	7.94	8.04	8.6	8.5	896		0	0	0	0	0	0	0	0	0	0	
	3	8.07	8.20	9.4	8.0	887		6	6	5	4	8	6	7	6	6	5	
	4	8.08	8.16	9.0	8.2	895		70	0	7	11	8	4	9	8	3	0	
	5	8.04	8.14	8.7	7.6	908		10	9	1	0	0	0	10	1	1	12	
	6	8.13	8.04	9.1	8.3	882		19	20	22	22	21	18	0	11	18	22	
	7																	
	8																	
							Total=	35	35	35	34	37	28	26	26	28	39	Mean Neonates/Female = 32.8

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
100%	0	8.07		8.8		1349		0	0	0	0	0	0	0	0	0	0	
	1	8.08	8.29	9.3	8.3	1366		0	0	0	0	0	0	0	0	0	0	
	2	8.00	8.08	8.8	8.4	1367		0	0	0	0	0	0	0	0	0	0	
	3	8.09	8.25	9.7	8.0	1345		7	5	7	6	6	5	5	6	0	3	
	4	8.12	8.23	9.5	7.5	1382		0	6	10	9	3	12	6	10	7	0	
	5	8.07	8.12	8.9	7.5	1399		10	0	0	1	0	0	0	0	0	12	
	6	8.18	8.11	9.5	8.1	1396		20	20	21	20	22	20	18	19	17	17	
	7																	
	8																	
							Total=	37	31	38	36	31	37	29	35	24	32	Mean Neonates/Female = 33.0

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 1/20/15

Project #: 23483 Test ID: 60822 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	SIGN-OFF
Meter ID's	0	PH19		RD09		EC10	30A	Date: 1-20-15 New WQ: RD
	1	PH21	PH22	RD11	RD12	EC08	30A	Date: 1/21/15 New WQ: FOUR Old WQ: RG
	2	PH19	PH15	RD14	RD12	EC11	30A	Date: 1/22/15 New WQ: RG Old WQ: RG
	3	PH23	PH19	RD12	RD09	EC11	30A	Date: 1/23/15 New WQ: SE Old WQ: SDM
	4	PH22	PH19	RD09	RD10	EC08	30A	Date: 1/24/15 New WQ: FOUR Old WQ: SE
	5	PH19	PH22	RD09	RD11	EC09	30A	Date: 1/25/15 New WQ: FOUR Old WQ: SD
	6	PH21	PH22	RD10	RD12	EC09	30A	Date: 1/26/15 New WQ: YG Old WQ: MA
	7							Date: New WQ: Old WQ
	8							Date: Old WQ

Appendix G

Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 13 Site Water to *Ceriodaphnia dubia*: Analysis Includes Outlier Data

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

Batch ID:	19-7890-6839	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Fong
Start Date:	20 Jan-15 13:45	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 14:30	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	08-1663-1612	**Code:**	Pond 13	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 11:15	**Material:**	Site Water	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	26h (0 °C)	**Station:**	Pond 13		

Batch Note: Including Outlier Replicate 25%-F

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
01-0462-4443	Reproduction	100	>100	NA	16.6%	1	Bonferroni Adj t Test
06-1404-1721	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
07-9756-9284	Reproduction	IC5	24.9	14.2	N/A	4.023	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	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	31.1	27.2	35	21	39	1.71	5.4	17.4%	0.0%
6.25		10	36.2	33.8	38.6	32	44	1.05	3.33	9.19%	-16.4%
12.5		6	35.5	30.9	40.1	28	41	1.8	4.42	12.4%	-14.1%
25		10	31.8	27.9	35.7	18	38	1.74	5.51	17.3%	-2.25%
50		10	32.8	29	36.6	26	39	1.66	5.25	16.0%	-5.47%
100		10	33	29.8	36.2	24	38	1.4	4.42	13.4%	-6.11%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		6	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	34	31	39	21	25	34	28	35	29	35
6.25		36	35	39	36	34	32	34	37	35	44
12.5		38	34	41	28	35	37				
25		38	37	35	31	31	18	32	31	31	34
50		35	35	35	39	37	28	26	26	28	39
100		37	31	38	36	31	37	29	35	24	32

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

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

Analysis ID:	06-1404-1721	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:53	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

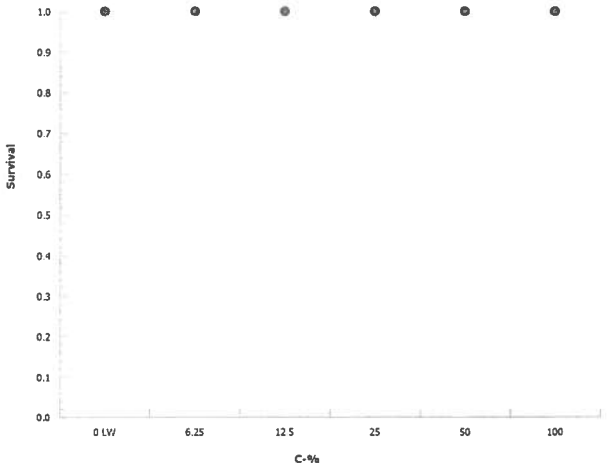
Fisher Exact/Bonferroni-Holm Test

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

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Water Cont	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		6	0	6	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%

Graphics



CETIS Analytical Report

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

Analysis ID:	01-0462-4443	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:53	**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	16.6%	100	>100	NA	1

Bonferroni Adj t Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-2.37	2.4	5.17	18	1.0000	CDF	Non-Significant Effect
		12.5	-1.77	2.4	5.97	14	1.0000	CDF	Non-Significant Effect
		25	-0.325	2.4	5.17	18	1.0000	CDF	Non-Significant Effect
		50	-0.79	2.4	5.17	18	1.0000	CDF	Non-Significant Effect
		100	-0.883	2.4	5.17	18	1.0000	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	187.3	37.46	5	1.62	0.1723	Non-Significant Effect
Error	1157.2	23.144	50			
Total	1344.5		55			

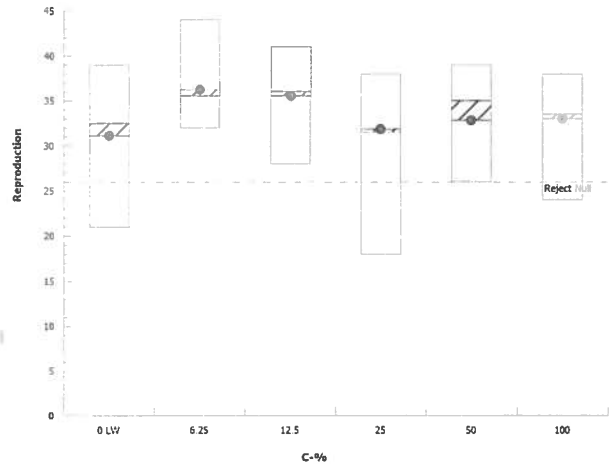
Distributional Tests

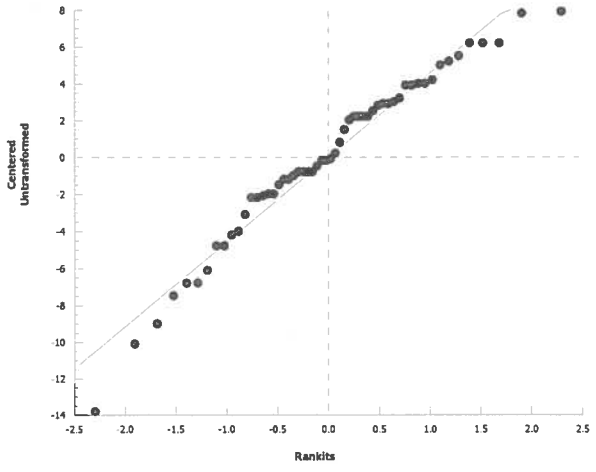
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.77	15.1	0.7351	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.966	0.943	0.1131	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	31.1	27.2	35	32.5	21	39	1.71	17.4%	0.0%
6.25		10	36.2	33.8	38.6	35.5	32	44	1.05	9.19%	-16.4%
12.5		6	35.5	30.9	40.1	36	28	41	1.8	12.4%	-14.1%
25		10	31.8	27.9	35.7	31.5	18	38	1.74	17.3%	-2.25%
50		10	32.8	29	36.6	35	26	39	1.66	16.0%	-5.47%
100		10	33	29.8	36.2	33.5	24	38	1.4	13.4%	-6.11%

Graphics





Analyst: MF QA

Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	07-9756-9284	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:53	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	538400	200	Yes	Two-Point Interpolation

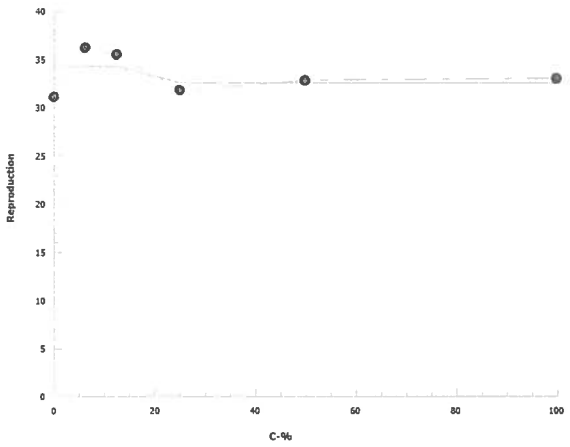
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	24.9	14.2	N/A	4.023	NA	7.037
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

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	31.1	21	39	1.71	5.4	17.4%	0.0%
6.25		10	36.2	32	44	1.05	3.33	9.19%	-16.4%
12.5		6	35.5	28	41	1.8	4.42	12.4%	-14.1%
25		10	31.8	18	38	1.74	5.51	17.3%	-2.25%
50		10	32.8	26	39	1.66	5.25	16.0%	-5.47%
100		10	33	24	38	1.4	4.42	13.4%	-6.11%

Graphics



Analyst: MF QA:

Appendix H

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

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

Batch ID:	01-2233-6859	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	20 Jan-15 14:40	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 15:20	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	17-1934-3036	**Code:**	Pond 14	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 12:30	**Material:**	Site Water	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	26h (0.2 °C)	**Station:**	Pond 14		

Batch Note: Excluding outlier replicate CTL-J

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-3044-5644	Reproduction	100	>100	NA	29.7%	1	Wilcoxon/Bonferroni Adj Test
06-2211-0125	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
06-9920-0919	Reproduction	IC5	10.2	7.77	59.6	9.785	Linear Interpolation (ICPIN)
		IC10	30.6	9.33	N/A	3.264	
		IC15	43.9	10.9	N/A	2.279	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	9	31.6	27.7	35.4	22	36	1.68	5.03	15.9%	0.0%
6.25		10	35.2	32.8	37.6	30	39	1.07	3.39	9.64%	-11.5%
12.5		10	27.7	18.3	37.1	0	40	4.16	13.2	47.5%	12.2%
25		10	33.8	31.1	36.5	27	39	1.2	3.79	11.2%	-7.11%
50		10	25.9	16	35.8	0	37	4.38	13.9	53.5%	17.9%
100		10	29.3	26.9	31.7	23	34	1.07	3.37	11.5%	7.15%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	0.9	0.674	1	0	1	0.1	0.316	35.1%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	-11.1%
12.5		10	0.9	0.674	1	0	1	0.1	0.316	35.1%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	-11.1%
50		10	0.8	0.498	1	0	1	0.133	0.422	52.7%	11.1%
100		10	1	1	1	1	1	0	0	0.0%	-11.1%

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	Lab Water Contr	35	36	33	22	36	33	35	26	28	
6.25		37	33	30	31	39	36	32	39	38	37
12.5		37	33	32	37	40	12	33	18	0	35
25		39	32	29	37	37	32	36	27	34	35
50		31	37	31	29	35	32	34	30	0	0
100		30	23	27	32	29	31	25	31	34	31

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	06-2211-0125	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:11	**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

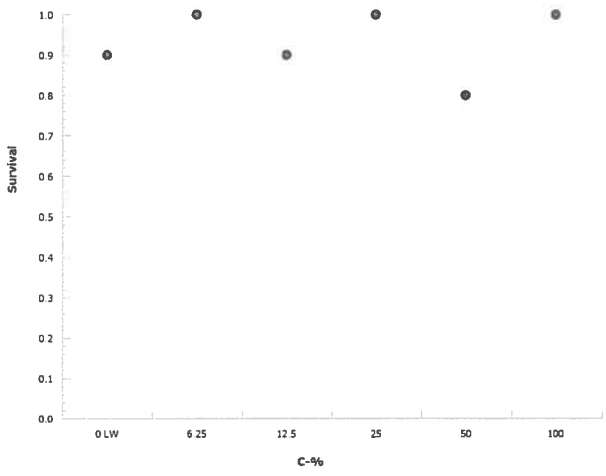
Fisher Exact/Bonferroni-Holm Test

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	0.763	1.0000	Exact	Non-Significant Effect
		25	1	1.0000	Exact	Non-Significant Effect
		50	0.5	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	9	1	10	0.9	0.1	0.0%
6.25		10	0	10	1	0	-11.1%
12.5		9	1	10	0.9	0.1	0.0%
25		10	0	10	1	0	-11.1%
50		8	2	10	0.8	0.2	11.1%
100		10	0	10	1	0	-11.1%

Graphics



Analyst: _____ QA: MF

CETIS Analytical Report

Test Code: 60823 | 09-1711-2334

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	14-3044-5644	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:13	**Analysis:**	Nonparametric-Multiple Comparison	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	29.7%	100	>100	NA	1

Wilcoxon/Bonferroni Adj Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	121	NA	3	17	1.0000	Exact	Non-Significant Effect
		12.5	99	NA	2	17	1.0000	Exact	Non-Significant Effect
		25	112	NA	3	17	1.0000	Exact	Non-Significant Effect
		50	90	NA	1	17	1.0000	Exact	Non-Significant Effect
		100	82	NA	0	17	0.3756	Exact	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	644.0201	128.804	5	1.78	0.1321	Non-Significant Effect
Error	3826.522	72.19853	53			
Total	4470.542		58			

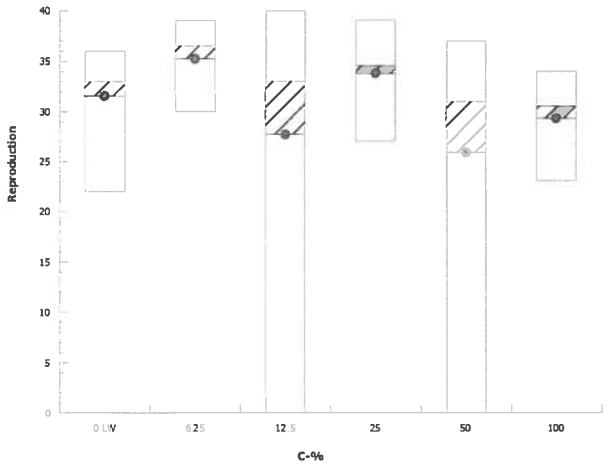
Distributional Tests

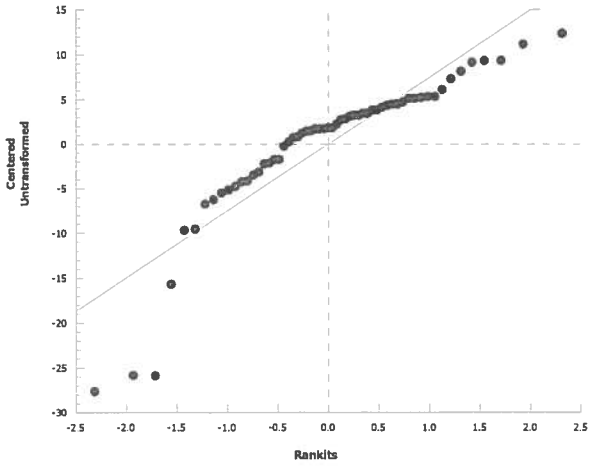
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	37.7	15.1	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.828	0.945	<0.0001	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	9	31.6	27.7	35.4	33	22	36	1.68	15.9%	0.0%
6.25		10	35.2	32.8	37.6	36.5	30	39	1.07	9.64%	-11.5%
12.5		10	27.7	18.3	37.1	33	0	40	4.16	47.5%	12.2%
25		10	33.8	31.1	36.5	34.5	27	39	1.2	11.2%	-7.11%
50		10	25.9	16	35.8	31	0	37	4.38	53.5%	17.9%
100		10	29.3	26.9	31.7	30.5	23	34	1.07	11.5%	7.15%

Graphics





Analyst: PJ QA: MF

CETIS Analytical Report

Test Code: 60823 | 09-1711-2334

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	06-9920-0919	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:13	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	172996	200	Yes	Two-Point Interpolation

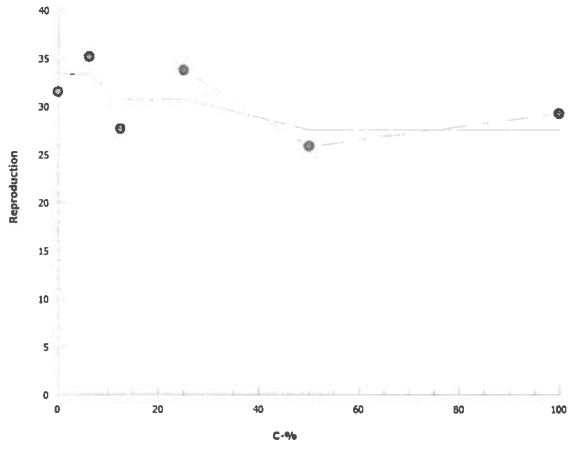
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	10.2	7.77	59.6	9.785	1.678	12.86
IC10	30.6	9.33	N/A	3.264	NA	10.71
IC15	43.9	10.9	N/A	2.279	NA	9.194
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	9	31.6	22	36	1.68	5.03	15.9%	0.0%
6.25		10	35.2	30	39	1.07	3.39	9.64%	-11.5%
12.5		10	27.7	0	40	4.16	13.2	47.5%	12.2%
25		10	33.8	27	39	1.2	3.79	11.2%	-7.11%
50		10	25.9	0	37	4.38	13.9	53.5%	17.9%
100		10	29.3	23	34	1.07	3.37	11.5%	7.15%

Graphics



Analyst: PP QA: MF

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

Client: **Lehigh Permanente** Material: **Pond 14** Test Date: 1-20-15

Project #: 23483 Test ID: 60823 Randomization: 10-6-13 Control Water: Modified EPAMH + 5% American River

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	8.14		8.0		339	25.0	0	0	0	0	0	0	0	0	0	0
1	8.02	8.06	8.8	8.8	325	24.9	0	0	0	0	0	0	0	0	0	0
2	7.88	7.99	9.2	8.8	333	25.2	0	0	0	0	0	0	0	0	0	X/0
3	7.89	7.97	8.9	8.1	328	25.4	5	5	5	5	6	5	7	8	4	–
4	7.83	8.12	8.5	7.8	320	25.9	0	0	0	4	0	11	8	0	0	–
5	7.97	8.21	8.7	8.1	323	25.8	13	13	12	0	11	0	0	0	8	–
6	–	8.19	–	7.7	341	25.7	17	18	16	13	19	17	20	18	16	–
7																–
8																–
						Total=	35	36	33	22	36	33	35	26	28	X/0

SIGN-OFF

- Date: 1-20-15 Sol'n Prep: APF New WQ: YU Test Init: 1440 Time: JM
- Date: 1/21/15 Sol'n Prep: SM New WQ: FOUB Old WQ: KUP Counts: ARF Time: 1115
- Date: 1/22/15 Sol'n Prep: YJ New WQ: KUP Old WQ: KUP Counts: YJ Time: 1425
- Date: 1/23/15 Sol'n Prep: CO New WQ: SE Old WQ: GY Counts: CO Time: 1415
- Date: 1/24/15 Sol'n Prep: YJ New WQ: SD Old WQ: SE Counts: YJ Time: 1530
- Date: 1/25/15 Sol'n Prep: SM New WQ: FWS Old WQ: FWS Counts: PA Time: 1345
- Date: 1/26/15 Sol'n Prep: -- New WQ: -- Old WQ: PA Counts: SM Time: 1520
- Date: Sol'n Prep: New WQ: Old WQ: Counts: Time:
- Date: Old WQ: Counts: Time:

Mean Neonates/Female = 28.4

6.25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
0	8.13		8.0		404	0	0	0	0	0	0	0	0	0	0	37254
1	7.96	8.12	8.7	8.7	414	0	0	0	0	0	0	0	0	0	0	37254
2	7.90	8.04	8.9	8.1	417	0	0	0	0	0	0	0	0	0	0	37278
3	7.88	8.03	9.0	8.4	401	0	5	6	6	5	5	5	6	6	0	37278
4	7.83	8.09	8.7	8.1	413	5	0	7	8	0	13	0	0	0	7	37301
5	8.02	8.19	8.9	8.1	412	13	10	0	0	15	0	10	14	14	12	37301
6	–	8.14	–	7.9	442	19	18	17	17	19	18	17	19	18	18	–
7																
8																
					Total=	37	33	30	31	39	36	32	39	38	37	

Mean Neonates/Female = 35.2

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

Client: **Lehigh Permanente** Material: **Pond 14** Test Date: 1-20-15

Project #: 23483 Test ID: 60823 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
12.5%	0	8.10		8.1		483		0	0	0	0	0	0	0	0	0	0	
	1	7.97	8.19	8.6	8.7	497		0	0	0	0	0	0	0	0	X/0	0	
	2	7.91	8.12	8.9	8.4	499		0	0	0	0	0	0	0	0	-	0	
	3	7.87	8.05	9.1	8.5	500		7	6	5	7	6	2	6	6	-	0	
	4	7.83	8.21	8.7	8.4	487		0	0	0	0	0	3	8	5	-	4	
	5	8.01	8.23	8.8	8.1	488		12	11	10	11	14	0	0	0	-	13	
	6	—	8.10	—	8.1	687		18	16	17	19	20	7	19	7	-	18	
	7															-		
	8															-		
							Total=	37	33	32	37	40	12	33	18	X/0	35	Mean Neonates/Female = 27.7

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
25%	0	8.05		8.2		628		0	0	0	0	0	0	0	0	0	0	
	1	7.92	8.26	8.6	8.7	643		0	0	0	0	0	0	0	0	0	0	
	2	7.90	8.17 (KM 1-22-15)	9.0	8.6	652		0	0	0	0	0	0	0	0	0	0	
	3	7.84	8.10	9.1	8.6	643		7	7	5	7	6	5	5	6	5	5	
	4	7.77	8.16	8.9	8.2	635		0	9	0	0	0	10	0	5	0	0	
	5	7.99	8.29	8.7	8.2	623		13	0	8	11	13	0	12	0	12	12	
	6	—	8.15	—	8.2	759		19	16	16	19	18	17	19	16	17	18	
	7																	
	8																	
							Total=	39	32	29	37	37	32	36	27	34	~~37~~ 35 SM	Mean Neonates/Female 33.8

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

Client: **Lehigh Permanente** Material: **Pond 14** Test Date: 1-20-15

Project #: 23483 Test ID: 60823 Control Water: Modified EPAMH + 5% American River

50%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	8.03		8.3		904		0	0	0	0	0	0	0	0	0	0	
1	7.87	8.35	8.8	8.7	921		0	0	0	0	0	0	0	0	X/c	0	
2	7.85	8.14	9.3	8.7	922		0	0	0	0	0	0	0	0	Dec	X/0	
3	7.80	8.21	9.2	8.5	921		6	6	6	6	6	6	6	6	–	–	
4	7.75	8.24	8.9	8.3	909		0	0	9	6	0	8	9	7	–	–	
5	7.95	8.41	8.8	8.2	898		10	12	0	0	12	0	0	0	–	–	
6	–	8.23	–	7.9	987		15	19	16	17	17	18	19	17	–	–	
7															–	–	
8															–	–	
						Total=	31	37	31	29	35	32	34	30	X/0	X/0	Mean Neonates/Female = 25.9

100%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
0	7.99		8.4		1404		0	0	0	0	0	0	0	0	0	0	
1	7.85	8.22	9.2	8.8	1425		0	0	0	0	0	0	0	0	0	0	
2	7.86	8.11	9.8	8.6	1445		0	0	0	0	0	0	0	0	0	0	
3	7.74	8.06	9.1	8.6	1426		5	3	4	6	6	5	5	5	6	5	
4	7.68	8.05	9.1	8.7	1413		0	4	0	0	7	8	6	0	0	0	
5	7.86	8.20	9.0	8.3	1404		10	0	9	9	0	0	0	10	11	10	
6	–	8.14	–	8.1	1389		15	16	14	17	16	18	14	16	17	16	
7																	
8																	
						Total=	30	23	27	32	29	31	25	31	34	31	Mean Neonates/Female = 29.3

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 1-20-15

Project #: 23483 Test ID: 60823 Control Water: Modified EPAMH + 5% American River

Meter ID's

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	SIGN-OFF
0	PH19		RD09		EC10	30A	Date: 1-2015 New WQ: [illegible]
1	PH21	pH22	RD11	RD12	EC08	30A	Date: 1/21/15 New WQ: FOVB Old WQ: KLP
2	PH15	PH21	RD12	RD10	EC08	30A	Date: 1/22/15 New WQ: KLP Old WQ: KLP
3	PH22	PH22	RD12	RD12	EC11	30A	Date: 1/23/15 New WQ: SE Old WQ: GY
4	PH19	PH19	RD12	RD10	EC10	30A	Date: 1/24/15 New WQ: SD Old WQ: SE
5	PH21	PH21	RD10	RD10	EC10	30A	Date: 1/25/15 New WQ: FOVB Old WQ: FOVB
6	—	PH19	—	RD09	EC10	30A	Date: 1.26.15 New WQ: — Old WQ: PA
7							Date: New WQ: Old WQ:
8							Date: Old WQ:

Appendix I

Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh Pond 14 Site Water to *Ceriodaphnia dubia*: Analysis Includes Outlier Data

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	01-2233-6859	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	20 Jan-15 14:40	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 15:20	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	17-1934-3036	**Code:**	Pond 14	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 12:30	**Material:**	Site Water	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	26h (0.2 °C)	**Station:**	Pond 14		

Batch Note: Including outlier replicate CTL-J

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-6676-8095	Reproduction	100	>100	NA	33.7%	1	Steel Many-One Rank Sum Test
06-2211-0125	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
10-4664-4443	Reproduction	IC5	29.3	8.1	N/A	3.415	Linear Interpolation (ICPIN)
		IC10	41.9	10	N/A	2.386	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	28.4	20.5	36.3	0	36	3.49	11	38.9%	0.0%
6.25		10	35.2	32.8	37.6	30	39	1.07	3.39	9.64%	-23.9%
12.5		10	27.7	18.3	37.1	0	40	4.16	13.2	47.5%	2.46%
25		10	33.8	31.1	36.5	27	39	1.2	3.79	11.2%	-19.0%
50		10	25.9	16	35.8	0	37	4.38	13.9	53.5%	8.8%
100		10	29.3	26.9	31.7	23	34	1.07	3.37	11.5%	-3.17%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	0.9	0.674	1	0	1	0.1	0.316	35.1%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	-11.1%
12.5		10	0.9	0.674	1	0	1	0.1	0.316	35.1%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	-11.1%
50		10	0.8	0.498	1	0	1	0.133	0.422	52.7%	11.1%
100		10	1	1	1	1	1	0	0	0.0%	-11.1%

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	Lab Water Contr	35	36	33	22	36	33	35	26	28	0
6.25		37	33	30	31	39	36	32	39	38	37
12.5		37	33	32	37	40	12	33	18	0	35
25		39	32	29	37	37	32	36	27	34	35
50		31	37	31	29	35	32	34	30	0	0
100		30	23	27	32	29	31	25	31	34	31

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	06-2211-0125	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:11	**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

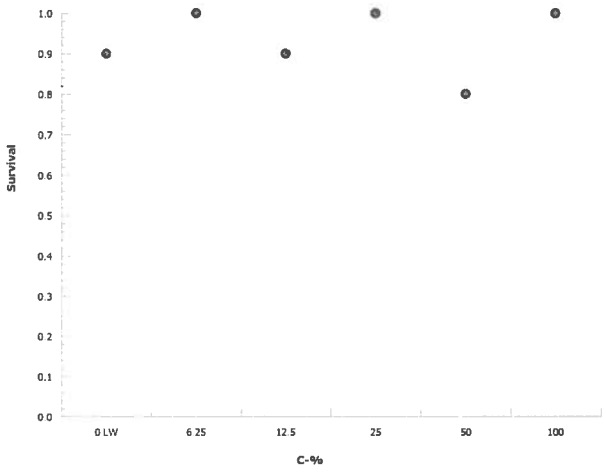
Fisher Exact/Bonferroni-Holm Test

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	0.763	1.0000	Exact	Non-Significant Effect
		25	1	1.0000	Exact	Non-Significant Effect
		50	0.5	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	9	1	10	0.9	0.1	0.0%
6.25		10	0	10	1	0	-11.1%
12.5		9	1	10	0.9	0.1	0.0%
25		10	0	10	1	0	-11.1%
50		8	2	10	0.8	0.2	11.1%
100		10	0	10	1	0	-11.1%

Graphics



Analyst: _____ QA: MF

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

Analysis ID:	12-6676-8095	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:11	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	33.7%	100	>100	NA	1

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	131	75	3	18	0.9996	Asymp	Non-Significant Effect
		12.5	109	75	3	18	0.9005	Asymp	Non-Significant Effect
		25	122	75	3	18	0.9941	Asymp	Non-Significant Effect
		50	99	75	2	18	0.6654	Asymp	Non-Significant Effect
		100	92	75	0	18	0.4218	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	666.15	133.23	5	1.52	0.1980	Non-Significant Effect
Error	4722.7	87.45741	54			
Total	5388.85		59			

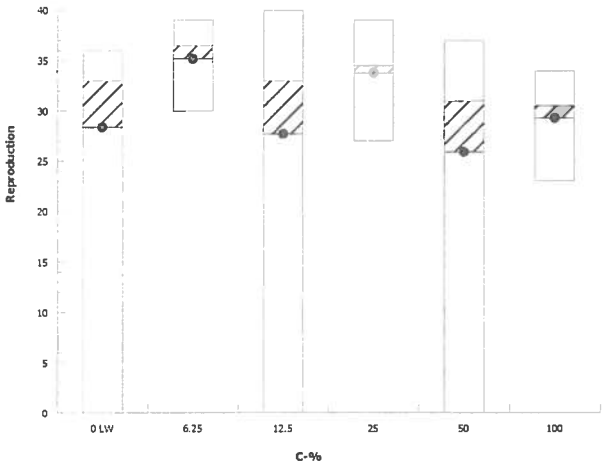
Distributional Tests

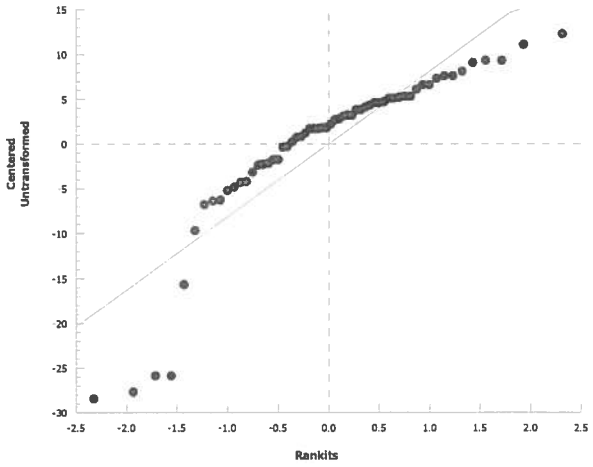
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	35.1	15.1	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.807	0.946	<0.0001	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	28.4	20.5	36.3	33	0	36	3.49	38.9%	0.0%
6.25		10	35.2	32.8	37.6	36.5	30	39	1.07	9.64%	-23.9%
12.5		10	27.7	18.3	37.1	33	0	40	4.16	47.5%	2.46%
25		10	33.8	31.1	36.5	34.5	27	39	1.2	11.2%	-19.0%
50		10	25.9	16	35.8	31	0	37	4.38	53.5%	8.8%
100		10	29.3	26.9	31.7	30.5	23	34	1.07	11.5%	-3.17%

Graphics





CETIS Analytical Report

Test Code: 60823 | 09-1711-2334

Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	10-4664-4443	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:11	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	162004	200	Yes	Two-Point Interpolation

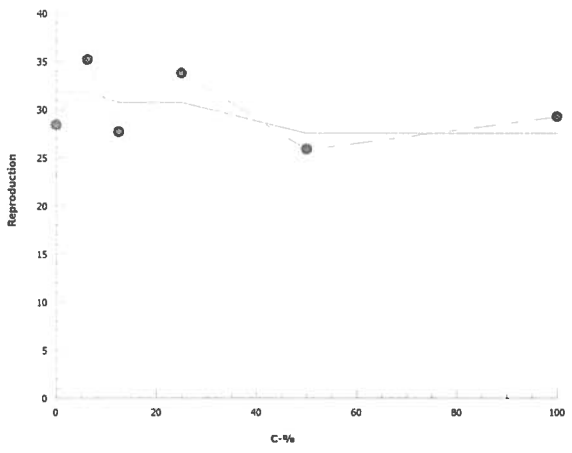
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	29.3	8.1	N/A	3.415	NA	12.34
IC10	41.9	10	N/A	2.386	NA	10
IC15	>100	N/A	N/A	<1	NA	NA
IC20	>100	N/A	N/A	<1	NA	NA
IC25	>100	N/A	N/A	<1	NA	NA
IC40	>100	N/A	N/A	<1	NA	NA
IC50	>100	N/A	N/A	<1	NA	NA

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	28.4	0	36	3.49	11	38.9%	0.0%
6.25		10	35.2	30	39	1.07	3.39	9.64%	-23.9%
12.5		10	27.7	0	40	4.16	13.2	47.5%	2.46%
25		10	33.8	27	39	1.2	3.79	11.2%	-19.0%
50		10	25.9	0	37	4.38	13.9	53.5%	8.8%
100		10	29.3	23	34	1.07	3.37	11.5%	-3.17%

Graphics



Analyst: _____ QA: MF

Appendix J

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh ITS Influent to *Ceriodaphnia dubia*: Analysis Excludes Outlier Data

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	21-0540-0547	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Padrick Anderson
Start Date:	20 Jan-15 14:50	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 16:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 1h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	10-5680-7030	**Code:**	ITS Influent	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 10:40	**Material:**	Influent	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	28h (0.7 °C)	**Station:**	ITS Influent		

Batch Note: Excluding outlier replicate CTL-A

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
03-7851-1995	Reproduction	25	50	35.36	11.9%	4	Bonferroni Adj t Test
13-4372-8164	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
12-8399-9485	Reproduction	IC5	11.6	8.9	28.1	8.616	Linear Interpolation (ICPIN)
		IC10	28	11.7	33.9	3.578	
		IC15	34.9	25.4	40.8	2.862	
		IC20	41.9	34.6	49.2	2.385	
		IC25	48.9	42.3	54.8	2.045	
		IC40	65.3	60.4	70.6	1.531	
		IC50	76.1	71.6	82.9	1.314	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	9	32.8	30.4	35.2	27	37	1.04	3.11	9.5%	0.0%
6.25		10	35.4	32.3	38.5	29	42	1.37	4.33	12.2%	-8.0%
12.5		10	32.1	30	34.2	28	37	0.948	3	9.34%	2.07%
25		10	31.4	29.2	33.6	27	35	0.968	3.06	9.75%	4.2%
50		10	25.3	23.5	27.1	22	29	0.775	2.45	9.69%	22.8%
100		10	9.5	6.17	12.8	5	16	1.47	4.65	48.9%	71.0%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	0.9	0.674	1	0	1	0.1	0.316	35.1%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	-11.1%
12.5		10	1	1	1	1	1	0	0	0.0%	-11.1%
25		10	1	1	1	1	1	0	0	0.0%	-11.1%
50		10	1	1	1	1	1	0	0	0.0%	-11.1%
100		10	0.7	0.354	1	0	1	0.153	0.483	69.0%	22.2%

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	Lab Water Contr		29	37	33	35	35	27	32	34	33
6.25		33	36	34	42	32	40	40	29	37	31
12.5		28	33	34	37	29	32	33	28	32	35
25		27	27	29	33	35	30	33	31	34	35
50		29	25	22	25	28	26	22	24	24	28
100		6	15	5	5	6	5	16	10	15	12

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

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

Analysis ID:	13-4372-8164	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:38	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

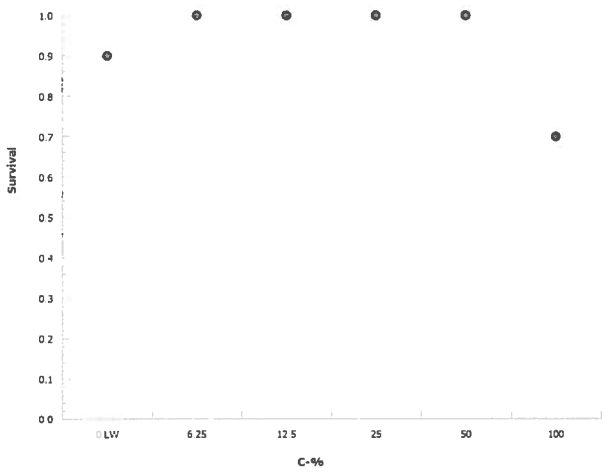
Fisher Exact/Bonferroni-Holm Test

Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	1	1.0000	Exact	Non-Significant Effect
		12.5	1	1.0000	Exact	Non-Significant Effect
		25	1	1.0000	Exact	Non-Significant Effect
		50	1	1.0000	Exact	Non-Significant Effect
		100	0.291	1.0000	Exact	Non-Significant Effect

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Water Cont	9	1	10	0.9	0.1	0.0%
6.25		10	0	10	1	0	-11.1%
12.5		10	0	10	1	0	-11.1%
25		10	0	10	1	0	-11.1%
50		10	0	10	1	0	-11.1%
100		7	3	10	0.7	0.3	22.2%

Graphics



Analyst: _____ QA: MF

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

Analysis ID: 03-7851-1995 **Endpoint:** Reproduction **CETIS Version:** CETISv1.8.7
Analyzed: 27 Jan-15 8:46 **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	11.9%	25	50	35.36	4

Bonferroni Adj t Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	-1.62	2.4	3.89	17	1.0000	CDF	Non-Significant Effect
		12.5	0.418	2.4	3.89	17	1.0000	CDF	Non-Significant Effect
		25	0.85	2.4	3.89	17	0.9981	CDF	Non-Significant Effect
		50*	4.61	2.4	3.89	17	<0.0001	CDF	Significant Effect
		100*	14.4	2.4	3.89	17	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4525.365	905.0729	5	72.7	<0.0001	Significant Effect
Error	659.8555	12.4501	53			
Total	5185.22		58			

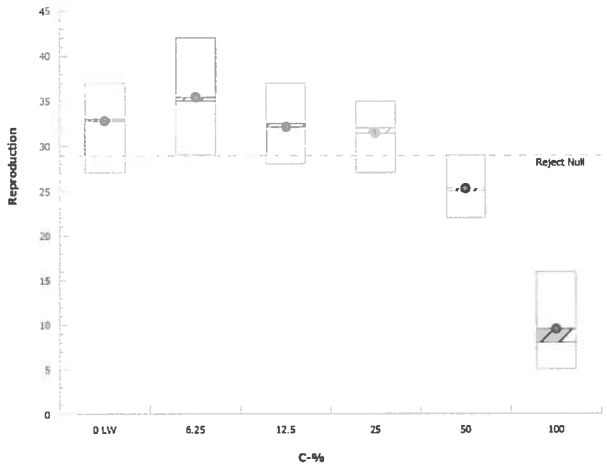
Distributional Tests

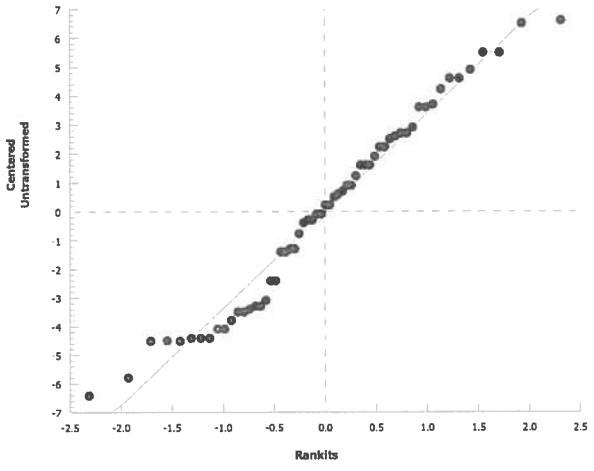
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	5.18	15.1	0.3945	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.968	0.945	0.1165	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	9	32.8	30.4	35.2	33	27	37	1.04	9.5%	0.0%
6.25		10	35.4	32.3	38.5	35	29	42	1.37	12.2%	-8.0%
12.5		10	32.1	30	34.2	32.5	28	37	0.948	9.34%	2.07%
25		10	31.4	29.2	33.6	32	27	35	0.968	9.75%	4.2%
50		10	25.3	23.5	27.1	25	22	29	0.775	9.69%	22.8%
100		10	9.5	6.17	12.8	8	5	16	1.47	48.9%	71.0%

Graphics





CETIS Analytical Report

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	12-8399-9485	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.7
Analyzed:	27 Jan-15 8:46	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	584213	200	Yes	Two-Point Interpolation

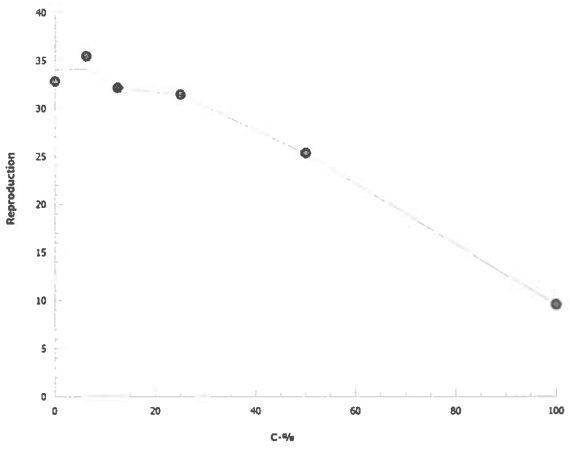
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	11.6	8.9	28.1	8.616	3.561	11.24
IC10	28	11.7	33.9	3.578	2.954	8.516
IC15	34.9	25.4	40.8	2.862	2.449	3.937
IC20	41.9	34.6	49.2	2.385	2.032	2.892
IC25	48.9	42.3	54.8	2.045	1.826	2.363
IC40	65.3	60.4	70.6	1.531	1.416	1.655
IC50	76.1	71.6	82.9	1.314	1.207	1.396

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	9	32.8	27	37	1.04	3.11	9.5%	0.0%
6.25		10	35.4	29	42	1.37	4.33	12.2%	-8.0%
12.5		10	32.1	28	37	0.948	3	9.34%	2.07%
25		10	31.4	27	35	0.968	3.06	9.75%	4.2%
50		10	25.3	22	29	0.775	2.45	9.69%	22.8%
100		10	9.5	5	16	1.47	4.65	48.9%	71.0%

Graphics



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

Client: **Lehigh Permanente** Material: **ITS Influent** Test Date: 1/20/15

Project #: 23483 Test ID: 60824 Randomization: 10.7.3 Control Water: Modified EPAMH + 5% American River

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.94		7.4		323	24.9	0	0	0	0	0	0	0	0	0	0	Date: 1/20/15 New WQ: YM Test Init.: SVV; Sol'n Prep: AKF Time: 1450
1	7.92	8.06	8.8	8.3	330	24.9	0	0	0	0	0	0	0	0	0	0	Date: 1/21/15 New WQ: FOLB Counts: CP; Sol'n Prep: SM Old WQ: RG Time: 1050
2	8.36	~~7.8~~ 7.68	8.6	7.6	321	25.2	0	0	0	0	0	0	0	0	0	0	Date: 1/22/15 New WQ: RG Counts: Le; Sol'n Prep: Le Old WQ: YJ Time: 1600
3	7.94	8.04	9.3	8.6	327	25.9	4	4	5	6	6	6	5	6	6	6	Date: 1/23/15 New WQ: SE Counts: SS; Sol'n Prep: CD Old WQ: KMP Time: 1325
4	8.02	7.86	8.7	7.8	323	25.6	~~X~~ 10	9	14	AKF 10	~~0~~ 11	11	7	10	0	0	Date: 1/24/15 New WQ: RG Counts: AKF; Sol'n Prep: YJ Old WQ: YJ Time: 1619
5	7.97	8.04	9.1	7.4	324	25.8	–	0	0	AKF 70	0	0	0	0	11	10	Date: 1/25/15 New WQ: FNB Counts: PB; Sol'n Prep: SM Old WQ: FNB Time: 1420
6	–	8.07	–	7.8	337	25.6	–	16	18	AKF 7 17	18	18	15	16	17	17	Date: 1-26-15 New WQ: – Counts: [illegible]; Sol'n Prep: – Old WQ: PA Time: 1600
7							–			AKF 7							Date: New WQ: Counts:; Sol'n Prep: Old WQ: Time:
8							–			AKF 33							Date: Old WQ: Counts:; Time:
						Total=	X/14	29	37	~~AKF~~ 6	35	35	27	32	34	33	Mean Neonates/Female = 30.9

6.25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		A	B	C	D	E	F	G	H	I	J	Sample ID
0	7.93		7.7		406		0	0	0	0	0	0	0	0	0	0	37255
1	7.87	8.05	8.4	8.3	414		0	0	0	0	0	0	0	0	0	0	37255
2	8.10	7.86	8.6	7.8	~~482~~ 406 Le 1/22/15		0	0	0	0	0	0	0	0	0	0	37279
3	7.88	8.08	9.1	8.5	409		5	5	7	7	0	7	6	6	6	0	37279
4	7.99	7.94	8.7	8.0	417		11	10	9	14	0	12	0	8	0	7	37303
5	8.00	8.04	8.8	7.3	414		0	0	0	0	13	0	12	0	11	8	37303
6	–	7.98	–	8.1	485		17	21	18	21	19	21	22	15	20	16	–
7																	
8																	
						Total=	33	36	34	42	32	40	40	29	37	31	Mean Neonates/Female = 35.4

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

Client: **Lehigh Permanente** Material: **ITS Influent** Test Date: 1/20/15

Project #: 23483 Test ID: 60824 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
12.5%	0	7.91		7.9		489		0	0	0	0	0	0	0	0	0	0	
	1	7.87	8.06	8.5	8.4	493		0	0	0	0	0	0	0	0	0	0	
	2	8.09	7.88	8.5	7.6	487		0	0	0	0	0	0	0	0	0	0	
	3	7.86	8.13	9.1	8.6	485		5	6	5	7	4	4	5	4	5	5	
	4	7.95	7.96	8.7	8.0	499		10	12	10	13	9	13	11	13	0	0	
	5	8.00	8.06	8.7	7.5	488		0	0	0	0	0	0	0	0	9	10	
	6	-	8.03	-	8.2	543		13	15	19	17	16	15	17	11	18	20	
	7																	
	8																	
							Total=	28	33	34	37	29	32	33	28	32	35	Mean Neonates/Female = 32.1

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
25%	0	7.86		8.0		636		0	0	0	0	0	0	0	0	0	0	
	1	7.81	8.08	8.6	8.4	635		0	0	0	0	0	0	0	0	0	0	
	2	8.03	7.94	8.5	7.5	630		0	0	0	0	0	0	0	0	0	0	
	3	7.82	8.18	9.1	8.7	594		4	4	5	5	5	7	6	5	8	6	
	4	7.88	8.03	8.8	8.0	648		11	10	10	11	14	11	11	0	0	0	
	5	7.91	8.11	8.7	7.6	638		0	0	0	0	0	0	0	11	11	12	
	6	-	8.12	-	8.4	703		12	13	14	17	16	12	16	15	15	17	
	7																	
	8																	
							Total=	27	27	29	33	35	30	33	31	34	35	Mean Neonates/Female = 31.4

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

Client: **Lehigh Permanente** Material: **ITS Influent** Test Date: 1/20/15

Project #: 23483 Test ID: 60824 Control Water: Modified EPAMH + 5% American River

50%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
0	7.78		8.3		913		0	0	0	0	0	0	0	0	0	0	
1	7.81	8.19	8.9	8.5	908		0	0	0	0	0	0	0	0	0	0	
2	8.00	8.08	8.5	7.9	891		0	0	0	0	0	0	0	0	0	0	
3	7.78	8.26	9.3	8.7	888		5	5	4	5	5	6	5	6	4	6	
4	7.78	8.12	8.8	8.0	~~932~~ 940		9	8	8	10	0	9	6	7	8	0	
5	7.84	8.22	8.7	7.5	917		0	0	0	0	9	0	2	11	1	9	
6	-	8.20	-	8.0	985		15	12	10	10	14	11	11	15	11	13	
7																	
8																	
						Total=	29	25	22	25	28	26	22	24	24	28	Mean Neonates/Female = 25.3

100%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
0	7.74		8.7		1421	0	0	0	0	0	0	0	0	0	0	
1	7.67	8.17	9.0	8.4	1411	0	0	0	0	0	0	0	0	0	0	
2	8.01	8.03	8.3	8.0	1377	0	0	0	0	0	0	0	0	0	0	
3	7.69	8.21	10.1	8.7	1361	6	6	5	5	6	5	6	5	7	7	
4	7.68	8.11	9.0	8.1	1449	X/0	0	X/0	X/0	0	0	5	0	0	0	
5	7.75	8.15	8.9	7.6	1427	-	3	-	-	0	0	0	5	5	2	
6	-	8.13	-	8.1	1483	-	6	-	-	0	0	5	0	3	3	
7						-		-	-							
8						-		-	-							
					Total=	X/0	15	X/5	X/5	6	5	16	10	15	12	Mean Neonates/Female = 9.5

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 1/20/15

Project #: 23483 Test ID: 60824 Control Water: Modified EPAMH + 5% American River

Meter ID's

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	SIGN-OFF
0	PH22		RD11		EC08	30A	Date: 1-2015 New WQ: [illegible]
1	PH21	PH 22	RD11	RD12	EC08	30A	Date: 1/21/15 New WQ: FOUR Old WQ: R6
2	PH19	PH19	RD11	RD11	EC09	30A	Date: 1/22/15 New WQ: R6 Old WQ: YJ
3	PH22	pH22	RD12	RD12	EC11	30A	Date: 1/23/15 New WQ: SE Old WQ: KMP
4	PH21	PH19	RD11	RD10	EC09	30A	Date: 1/24/15 New WQ: R6 Old WQ: YJ
5	PH21	PH19	RD10	RD09	EC10	30A	Date: 1/25/15 New WQ: FOUR Old WQ: FOUR
6	—	PH19	—	RD09	EC10	30A	Date: 1-26-15 New WQ: — Old WQ: [illegible]
7							Date: New WQ: Old WQ
8							Date: Old WQ

Appendix K

Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh ITS Influent to *Ceriodaphnia dubia*: Analysis Includes Outlier Data

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	21-0540-0547	Test Type:	Reproduction-Survival (7d)	Analyst:	Padrick Anderson
Start Date:	20 Jan-15 14:50	Protocol:	EPA-821-R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	26 Jan-15 16:00	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Duration:	6d 1h	Source:	In-House Culture	Age:	1

Sample ID:	10-5680-7030	Code:	ITS Influent	Client:	Lehigh Permanente
Sample Date:	19 Jan-15 10:40	Material:	Influent	Project:	23483
Receive Date:	19 Jan-15 16:53	Source:	Lehigh Permanente		
Sample Age:	28h (0.7 °C)	Station:	ITS Influent		

Batch Note: Including outlier replicate CTL-A

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
13-4490-5924	Reproduction	25	50	35.36	14.1%	4	Steel Many-One Rank Sum Test
13-4372-8164	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
17-6230-3079	Reproduction	IC5	23.3	9.21	31.4	4.283	Linear Interpolation (ICPIN)
		IC10	31.4	12.2	38.1	3.183	
		IC15	38.2	27.8	45.2	2.617	
		IC20	45	36.9	51.5	2.222	
		IC25	51.4	44.3	56.5	1.946	
		IC40	67.1	62.2	72.7	1.49	
		IC50	77.6	72	84.7	1.288	

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	30.9	26.2	35.6	14	37	2.09	6.62	21.4%	0.0%
6.25		10	35.4	32.3	38.5	29	42	1.37	4.33	12.2%	-14.6%
12.5		10	32.1	30	34.2	28	37	0.948	3	9.34%	-3.88%
25		10	31.4	29.2	33.6	27	35	0.968	3.06	9.75%	-1.62%
50		10	25.3	23.5	27.1	22	29	0.775	2.45	9.69%	18.1%
100		10	9.5	6.17	12.8	5	16	1.47	4.65	48.9%	69.3%

Survival Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	0.9	0.674	1	0	1	0.1	0.316	35.1%	0.0%
6.25		10	1	1	1	1	1	0	0	0.0%	-11.1%
12.5		10	1	1	1	1	1	0	0	0.0%	-11.1%
25		10	1	1	1	1	1	0	0	0.0%	-11.1%
50		10	1	1	1	1	1	0	0	0.0%	-11.1%
100		10	0.7	0.354	1	0	1	0.153	0.483	69.0%	22.2%

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	Lab Water Contr	14	29	37	33	35	35	27	32	34	33
6.25		33	36	34	42	32	40	40	29	37	31
12.5		28	33	34	37	29	32	33	28	32	35
25		27	27	29	33	35	30	33	31	34	35
50		29	25	22	25	28	26	22	24	24	28
100		6	15	5	5	6	5	16	10	15	12

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

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

Analysis ID:	13-4372-8164	**Endpoint:** Survival	**CETIS Version:** CETISv1.8.7
Analyzed:	27 Jan-15 8:38	**Analysis:** STP 2x2 Contingency Tables	**Official Results:** Yes

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

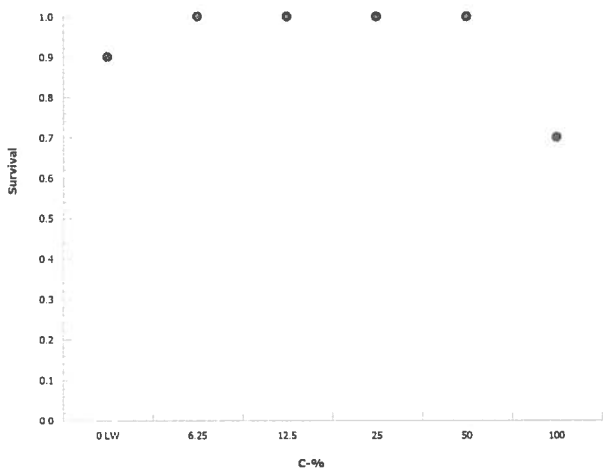
Fisher Exact/Bonferroni-Holm Test

Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	1	1.0000	Exact	Non-Significant Effect
		12.5	1	1.0000	Exact	Non-Significant Effect
		25	1	1.0000	Exact	Non-Significant Effect
		50	1	1.0000	Exact	Non-Significant Effect
		100	0.291	1.0000	Exact	Non-Significant Effect

Data Summary

C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Lab Water Cont	9	1	10	0.9	0.1	0.0%
6.25		10	0	10	1	0	-11.1%
12.5		10	0	10	1	0	-11.1%
25		10	0	10	1	0	-11.1%
50		10	0	10	1	0	-11.1%
100		7	3	10	0.7	0.3	22.2%

Graphics



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

Analysis ID:	13-4490-5924	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:40	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	14.1%	25	50	35.36	4

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		6.25	124	75	5	18	0.9966	Asymp	Non-Significant Effect
		12.5	103	75	6	18	0.7709	Asymp	Non-Significant Effect
		25	99	75	5	18	0.6654	Asymp	Non-Significant Effect
		50*	68.5	75	1	18	0.0126	Asymp	Significant Effect
		100*	58	75	0	18	0.0009	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4391.533	878.3066	5	48.5	<0.0001	Significant Effect
Error	977.2	18.0963	54			
Total	5368.733		59			

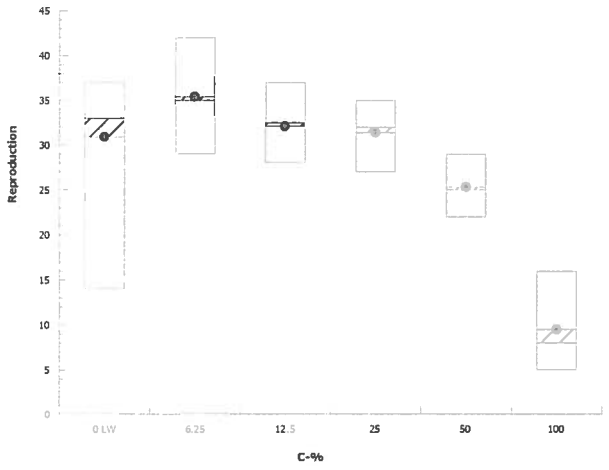
Distributional Tests

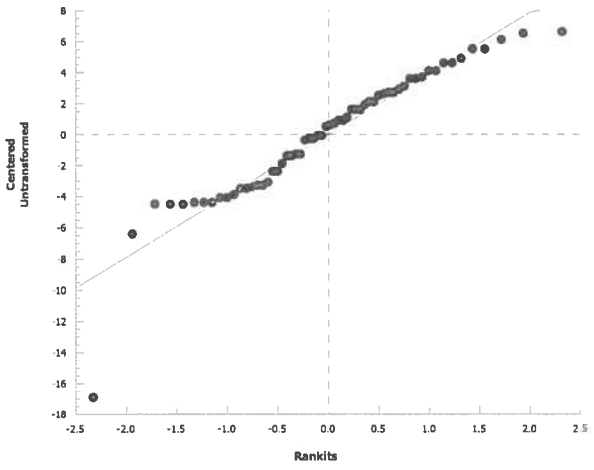
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	11.8	15.1	0.0383	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.919	0.946	0.0007	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	30.9	26.2	35.6	33	14	37	2.09	21.4%	0.0%
6.25		10	35.4	32.3	38.5	35	29	42	1.37	12.2%	-14.6%
12.5		10	32.1	30	34.2	32.5	28	37	0.948	9.34%	-3.88%
25		10	31.4	29.2	33.6	32	27	35	0.968	9.75%	-1.62%
50		10	25.3	23.5	27.1	25	22	29	0.775	9.69%	18.1%
100		10	9.5	6.17	12.8	8	5	16	1.47	48.9%	69.3%

Graphics





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

Analysis ID:	17-6230-3079	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:41	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	292093	200	Yes	Two-Point Interpolation

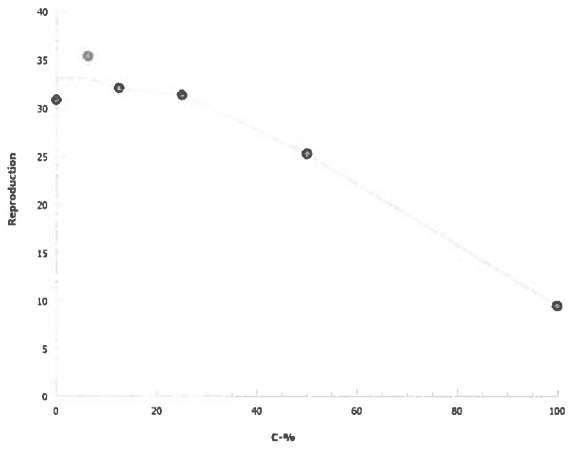
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	23.3	9.21	31.4	4.283	3.184	10.85
IC10	31.4	12.2	38.1	3.183	2.627	8.214
IC15	38.2	27.8	45.2	2.617	2.215	3.596
IC20	45	36.9	51.5	2.222	1.942	2.708
IC25	51.4	44.3	56.5	1.946	1.768	2.256
IC40	67.1	62.2	72.7	1.49	1.375	1.609
IC50	77.6	72	84.7	1.288	1.181	1.389

Reproduction Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	30.9	14	37	2.09	6.62	21.4%	0.0%
6.25		10	35.4	29	42	1.37	4.33	12.2%	-14.6%
12.5		10	32.1	28	37	0.948	3	9.34%	-3.88%
25		10	31.4	27	35	0.968	3.06	9.75%	-1.62%
50		10	25.3	22	29	0.775	2.45	9.69%	18.1%
100		10	9.5	5	16	1.47	4.65	48.9%	69.3%

Graphics



Analyst: _____ QA: MF

Appendix L

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh ITS Effluent to *Ceriodaphnia dubia*: Analysis Excludes Outlier Data

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Batch ID:	15-8847-3355	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Fong
Start Date:	20 Jan-15 14:40	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 16:25	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 2h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	12-2489-9186	**Code:**	ITS Effluent	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 10:35	**Material:**	Effluent	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	28h (0 °C)	**Station:**	ITS Effluent		

Batch Note: Excluding Outlier Replicates C-D and 12.5%-E

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
03-2979-6633	Reproduction	50	100	70.71	9.99%	2	Bonferroni Adj t Test
08-9436-9330	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
20-2083-8806	Reproduction	IC5	29.3	16.6	40.9	3.415	Linear Interpolation (ICPIN)
		IC10	45.5	28	56.5	2.196	
		IC15	57.2	45.2	66	1.749	
		IC20	67.1	56.8	75.7	1.491	
		IC25	77	68	87.5	1.299	
		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	Lab Water Contr	9	31.3	28.2	34.5	26	37	1.35	4.06	13.0%	0.0%
6.25		10	32.6	30.7	34.5	30	37	0.833	2.63	8.08%	-4.04%
12.5		9	33.6	31.9	35.2	31	36	0.709	2.13	6.34%	-7.09%
25		10	31.3	29.9	32.7	29	35	0.597	1.89	6.03%	0.11%
50		10	28.8	27.1	30.5	25	32	0.772	2.44	8.47%	8.09%
100		10	20.6	18.2	23	15	25	1.07	3.37	16.4%	34.3%

Survival Summary

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	26	31	37		26	30	36	32	29	35
6.25		31	31	30	31	30	34	35	36	31	37
12.5		34	35	33	36		36	31	31	35	31
25		31	35	31	29	33	33	31	31	29	30
50		27	29	30	32	25	27	32	30	26	30
100		24	25	20	23	24	18	21	19	15	17

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

Survival Binomials

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

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

Analysis ID: 08-9436-9330 **Endpoint:** Survival **CETIS Version:** CETISv1.8.7
Analyzed: 27 Jan-15 8:59 **Analysis:** STP 2x2 Contingency Tables **Official Results:** Yes

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

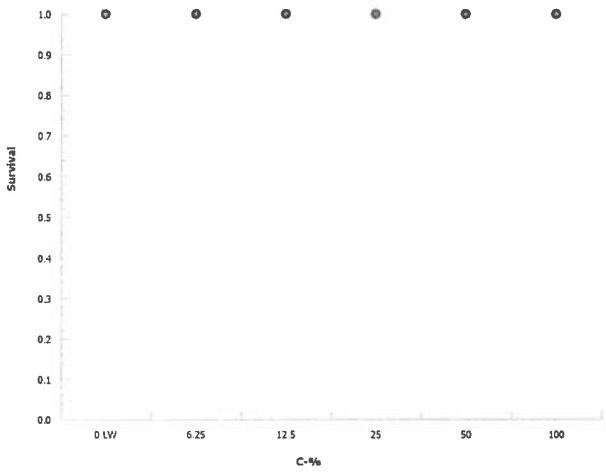
Fisher Exact/Bonferroni-Holm Test

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

Data Summary

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

Graphics



Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Analysis ID:	03-2979-6633	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 9:06	**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	9.99%	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	-0.972	2.4	3.13	17	1.0000	CDF	Non-Significant Effect
		12.5	-1.66	2.4	3.21	16	1.0000	CDF	Non-Significant Effect
		25	0.0256	2.4	3.13	17	1.0000	CDF	Non-Significant Effect
		50	1.94	2.4	3.13	17	0.1436	CDF	Non-Significant Effect
		100*	8.23	2.4	3.13	17	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1103.157	220.6314	5	27.4	<0.0001	Significant Effect
Error	418.7222	8.05235	52			
Total	1521.879		57			

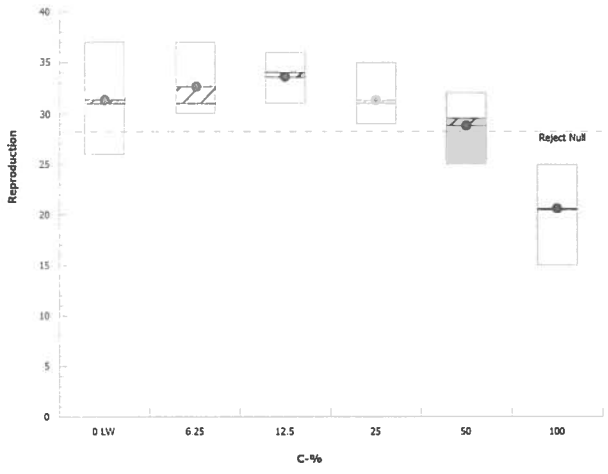
Distributional Tests

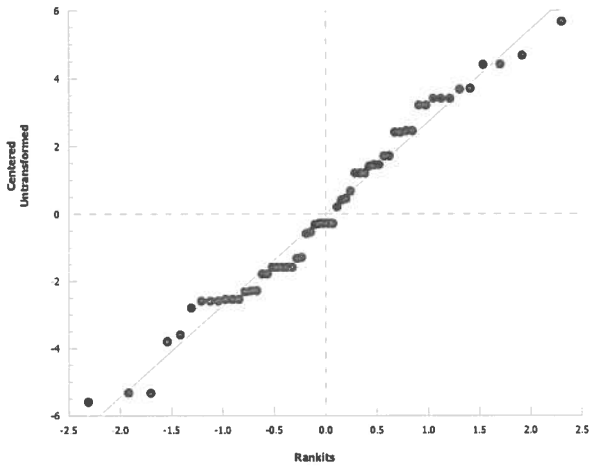
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	6.84	15.1	0.2330	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.975	0.944	0.2625	Normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	9	31.3	28.2	34.5	31	26	37	1.35	13.0%	0.0%
6.25		10	32.6	30.7	34.5	31	30	37	0.833	8.08%	-4.04%
12.5		9	33.6	31.9	35.2	34	31	36	0.709	6.34%	-7.09%
25		10	31.3	29.9	32.7	31	29	35	0.597	6.03%	0.11%
50		10	28.8	27.1	30.5	29.5	25	32	0.772	8.47%	8.09%
100		10	20.6	18.2	23	20.5	15	25	1.07	16.4%	34.3%

Graphics





Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	20-2083-8806	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.7
Analyzed:	27 Jan-15 9:06	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	867689	200	Yes	Two-Point Interpolation

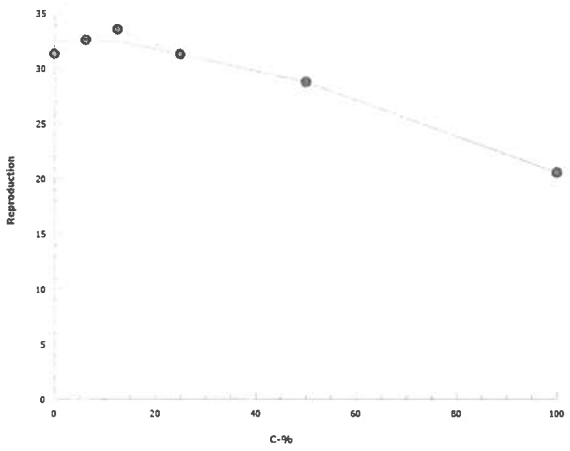
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	29.3	16.6	40.9	3.415	2.445	6.008
IC10	45.5	28	56.5	2.196	1.77	3.571
IC15	57.2	45.2	66	1.749	1.514	2.212
IC20	67.1	56.8	75.7	1.491	1.321	1.761
IC25	77	68	87.5	1.299	1.143	1.471
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 Contr	9	31.3	26	37	1.35	4.06	13.0%	0.0%
6.25		10	32.6	30	37	0.833	2.63	8.08%	-4.04%
12.5		9	33.6	31	36	0.709	2.13	6.34%	-7.09%
25		10	31.3	29	35	0.597	1.89	6.03%	0.11%
50		10	28.8	25	32	0.772	2.44	8.47%	8.09%
100		10	20.6	15	25	1.07	3.37	16.4%	34.3%

Graphics



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

Client: **Lehigh Permanente** Material: **ITS Effluent** Test Date: 1-20-15

Project #: 23483 Test ID: 60825 Randomization: B.6.10 Control Water: Modified EPAMH + 5% American River

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	8.10		8.3		317	24.9	0	0	0	0	0	0	0	0	0	0
1	8.14	7.97	8.9	8.6	335	25.0	0	0	0	0	0	0	0	0	0	0
2	8.32	7.81	9.1	7.8	321	25.2	0	0	0	0	0	0	0	0	0	0
3	7.89	8.05	8.9	7.5	319	25.9	5	6	6	5	5	4	6	5	5	6
4	8.15	7.99	9.0	7.8	322	25.6	7	0	0	6	6	10	0	0	8	0
5	8.28	7.97	8.5	6.4	316	25.8	0	10	13	0	0	0	13	11	0	12
6	—	8.01	—	6.8	340	25.7	14	15	18	0	15	16	17	16	16	17
7																
8																
						Total=	26	~~21~~ MF	37	11	26	30	36	32	29	35

SIGN-OFF

Date: 1-20-15 New WQ: Test Init.: LE
Sol'n Prep: JM Old WQ: RO Time: 1440

Date: 1/21/15 New WQ: FOLB Counts: YJ
Sol'n Prep: JM Old WQ: RG Time: 1000

Date: 1/22/15 New WQ: RG Counts: TM
Sol'n Prep: LE Old WQ: YJ Time: 1600

Date: 1/23/15 New WQ: SE Counts: SS
Sol'n Prep: LO Old WQ: KMP Time: 1430

Date: 1/24/15 New WQ: RG Counts: AFF
Sol'n Prep: YJ Old WQ: SE Time: 1435

Date: 1/25/15 New WQ: SD Counts: PA
Sol'n Prep: CJD Old WQ: SD Time: 1500

Date: 1-26-15 New WQ: — Counts: SM
Sol'n Prep: — Old WQ: JM Time: 1625

Date: New WQ: Counts:
Sol'n Prep: Old WQ: Time:

Date: Old WQ: Counts:
Time:

Mean Neonates/Female = MF ~~28.5~~ 29.3

6.25%

Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	Sample ID
0	8.00		8.2		405	0	0	0	0	0	0	0	0	0	0	37256
1	8.01	8.10	8.7	8.5	414	0	0	0	0	0	0	0	0	0	0	37256
2	8.11	7.95	8.4	8.1	406	0	0	0	0	0	0	0	0	0	0	37282
3	7.81	8.06	9.0	7.8	406	3	6	5	6	4	6	5	5	6	7	37282
4	8.04	8.05	8.7	8.3	413	11	9	11	10	0	11	0	0	0	0	37304
5	8.21	8.01	8.5	7.2	408	0	0	0	0	10	0	12	13	10	13	37304
6	—	8.03	—	7.6	412	17	16	14	15	16	17	18	18	15	17	—
7																
8																
						Total= ~~30~~ MF 31	31	30	31	30	34	35	36	31	37	

Mean Neonates/Female = MF ~~32.5~~ 32.6

31

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

Client: **Lehigh Permanente** Material: **ITS Effluent** Test Date: 1-20-15

Project #: 23483 Test ID: 60825 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
12.5%	0	7.93		8.4		484		0	0	0	0	0	0	0	0	0	0	
	1	7.87	8.20	8.8	8.6	489		0	0	0	0	0	0	0	0	0	0	
	2	8.01	7.97	8.4	8.1	484		0	0	0	0	0	0	0	0	0	0	
	3	7.75	8.13	9.0	7.9	477		5	5	5	6	4	6	6	6	5	5	
	4	8.00	8.07	8.6	8.4	490		0	0	12	0	0	11	9	0	0	0	
	5	8.23	8.05	8.4	7.4	487		12	13	1	13	7	1	0	9	13	10	
	6	—	8.10	—	6.6	521		17	17	15	17	15	18	16	16	17	16	
	7																	
	8																	
							Total=	34	35	33	36	28 24 M+F	36	31	31	35	31	Mean Neonates/Female = M+F 33.0 32.8

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
25°o	0	7.83		8.0		631		0	0	0	0	0	0	0	0	0	0	
	1	7.79	8.21	8.8	8.4	641		0	0	0	0	0	0	0	0	0	0	
	2	7.96	8.12	8.3	8.3	625		0	0	0	0	0	0	0	0	0	0	
	3	7.69	8.13	9.1	7.3	629		4	6	5	6	6	6	5	4	6	5	
	4	8.01	8.13	8.5	8.4	638		0	0	0	8	0	11	10	0	8	0	
	5	8.30	8.10	8.3	7.5	629		11	12	10	0	10	0	0	12	0	9	
	6	—	8.16	—	7.2	655		16	17	16	15	17	16	16	15	15	16	
	7																	
	8																	
							Total=	31	35	31	29	33	33	31	31	29	30	Mean Neonates/Female = 31.3

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

Client: **Lehigh Permanente** Material: **ITS Effluent** Test Date: 1-20-15

Project #: 23483 Test ID: 60825 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J	SIGN-OFF
50%	0	7.66		8.1		907		0	0	0	0	0	0	0	0	0	0	
	1	7.61	8.33	8.9	8.3	913		0	0	0	0	0	0	0	0	0	0	
	2	7.95	8.19	8.1	7.9	895		0	0	0	0	0	0	0	0	0	0	
	3	7.61	8.25	9.1	7.2	893		6	5	3	3	4	4	6	0	5	4	
	4	7.99	8.20	8.4	8.4	910		7	0	0	13	0	9	10	0	7	0	
	5	8.38	8.20	8.3	7.5	896		0	9	12	0	8	0	0	14	0	11	
	6	—	8.23	—	7.9	931		14	15	15	16	13	14	16	16	14	15	
	7																	
	8																	
							Total=	27	29	30	32	25	27	32	30	26	30	Mean Neonates/Female = 28.8

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)		Survival / Reproduction A	B	C	D	E	F	G	H	I	J	
100%	0	7.56		8.5		1394		0	0	0	0	0	0	0	0	0	0	
	1	7.40	8.33	8.7	7.6	1398		0	0	0	0	0	0	0	0	0	0	
	2	8.14	8.08	7.2	7.9	1355		0	0	0	0	0	0	0	0	0	0	
	3	7.42	8.29	8.9	7.9	1377		2	0	0	0	0	0	0	0	0	0	
	4	7.96	8.24	8.2	8.3	1409		0	0	0	0	0	0	0	0	0	0	
	5	8.41	8.21	8.2	7.7	1381		10	11	8	9	11	10	9	8	8	6	
	6	—	8.18	—	8.1	1367		12	14	12	14	13	8	12	11	7	11	
	7																	
	8																	
							Total=	24	25	20	23	24	18	21	19	15	17	Mean Neonates/Female = 20.6

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

Client: **Lehigh Permanente** Material: **Meter IDs** Test Date: 1-20-15

Project #: 23483 Test ID: 60825 Control Water: Modified EPAMH + 5% American River

	Day	pH New	pH Old	D.O. New	D.O. Old	Cond. (µS/cm)	Temp (°C)	SIGN-OFF		
Meter ID's	0	PH19		RD09		EC10	30A	Date: 1-20-15	New WQ: RD	
	1	PH21	PH22	RD11	RD12	EC08	30A	Date: 1/21/15	New WQ: FOUB	Old WQ: RG
	2	PH19	PH19	RD11	RD11	EC09	30A	Date: 1/22/15	New WQ: RG	Old WQ: YS
	3	PH22	PH19	RD12	1-23 RD09 RD12 Blue	EC11	30A	Date: 1/23/15	New WQ: SE	Old WQ: KMP
	4	PH21	PH19	RD11	RD10	EC09	30A	Date: 1/24/15	New WQ: RG	Old WQ: SE
	5	PH19	PH22	RD09	RD11	EC09	30A	Date: 1/25/15	New WQ: SD	Old WQ: SD
	6	–	PH19	–	RD09	EC10	30A	Date: 1-26-15	New WQ: –	Old WQ:
	7							Date:	New WQ:	Old WQ
	8							Date:		Old WQ

Appendix M

Summary of Statistics for the Evaluation of the Chronic Toxicity of Lehigh ITS Effluent to *Ceriodaphnia dubia*: Analysis Includes Outlier Data

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

Batch ID:	15-8847-3355	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	Michelle Fong
Start Date:	20 Jan-15 14:40	**Protocol:**	EPA-821-R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	26 Jan-15 16:25	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d 2h	**Source:**	In-House Culture	**Age:**	1

Sample ID:	12-2489-9186	**Code:**	ITS Effluent	**Client:**	Lehigh Permanente
Sample Date:	19 Jan-15 10:35	**Material:**	Effluent	**Project:**	23483
Receive Date:	19 Jan-15 16:53	**Source:**	Lehigh Permanente		
Sample Age:	28h (0 °C)	**Station:**	ITS Effluent		

Batch Note: Including Outlier Replicates C-D and 12.5%-E

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
01-9934-9666	Reproduction	50	100	70.71	13.8%	2	Steel Many-One Rank Sum Test
08-9436-9330	Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
19-2856-3144	Reproduction	IC5	38.1	15.6	53.4	2.624	Linear Interpolation (ICPIN)
		IC10	52.4	29.8	63.1	1.909	
		IC15	62	47.3	72.6	1.613	
		IC20	71.6	57.8	82.8	1.396	
		IC25	81.3	68.5	93.7	1.231	
		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	Lab Water Contr	10	29.3	23.9	34.7	11	37	2.37	7.48	25.5%	0.0%
6.25		10	32.6	30.7	34.5	30	37	0.833	2.63	8.08%	-11.3%
12.5		10	32.8	30.6	35	26	36	0.987	3.12	9.51%	-11.9%
25		10	31.3	29.9	32.7	29	35	0.597	1.89	6.03%	-6.83%
50		10	28.8	27.1	30.5	25	32	0.772	2.44	8.47%	1.71%
100		10	20.6	18.2	23	15	25	1.07	3.37	16.4%	29.7%

Survival Summary

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

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Reproduction Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	26	31	37	11	26	30	36	32	29	35
6.25		31	31	30	31	30	34	35	36	31	37
12.5		34	35	33	36	26	36	31	31	35	31
25		31	35	31	29	33	33	31	31	29	30
50		27	29	30	32	25	27	32	30	26	30
100		24	25	20	23	24	18	21	19	15	17

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

Survival Binomials

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

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

Analysis ID:	08-9436-9330	**Endpoint:**	Survival	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:59	**Analysis:**	STP 2x2 Contingency Tables	**Official Results:**	Yes

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

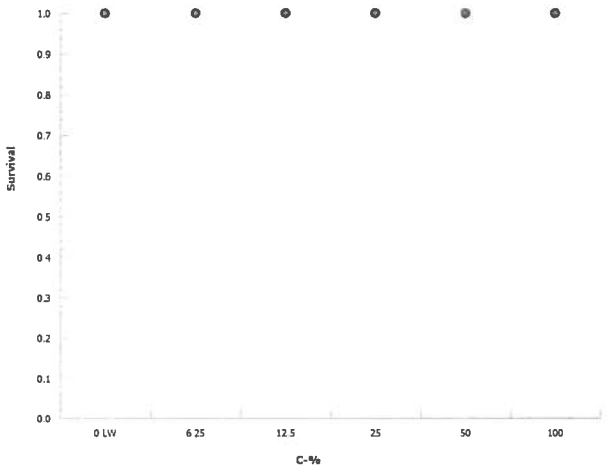
Fisher Exact/Bonferroni-Holm Test

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

Data Summary

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

Graphics



Analyst: MF QA:

CETIS Analytical Report

Report Date: 27 Jan-15 09:01 (p 1 of 1)
Test Code: 60825 | 00-5511-2871

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

Analysis ID:	01-9934-9666	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:59	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	13.8%	50	100	70.71	2

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	119	75	5	18	0.9860	Asymp	Non-Significant Effect
		12.5	120	75	4	18	0.9889	Asymp	Non-Significant Effect
		25	110	75	4	18	0.9223	Asymp	Non-Significant Effect
		50	94	75	4	18	0.4923	Asymp	Non-Significant Effect
		100*	65	75	0	18	0.0056	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1030.533	206.1067	5	13.2	<0.0001	Significant Effect
Error	842.2	15.5963	54			
Total	1872.733		59			

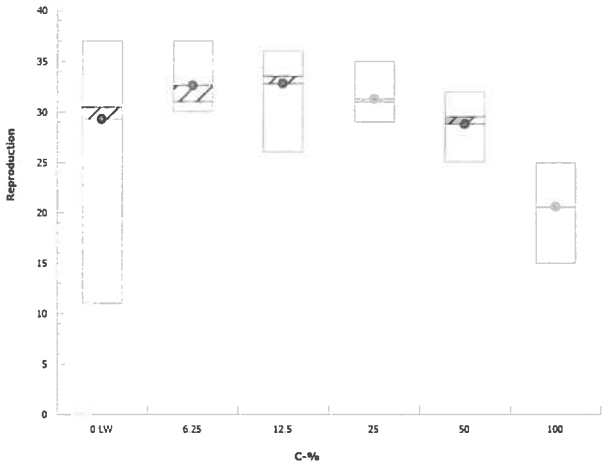
Distributional Tests

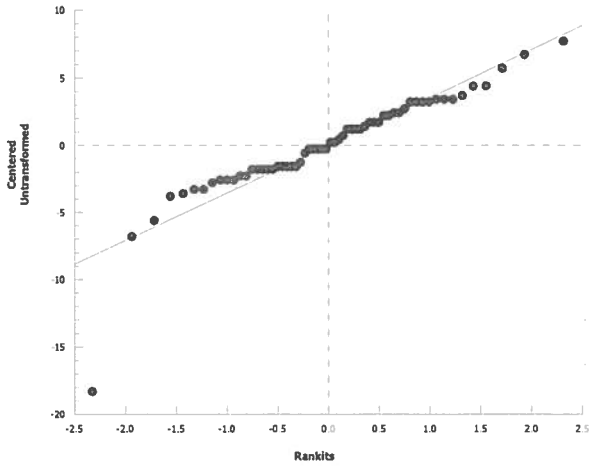
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	23.8	15.1	0.0002	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.87	0.946	<0.0001	Non-normal Distribution

Reproduction Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	10	29.3	23.9	34.7	30.5	11	37	2.37	25.5%	0.0%
6.25		10	32.6	30.7	34.5	31	30	37	0.833	8.08%	-11.3%
12.5		10	32.8	30.6	35	33.5	26	36	0.987	9.51%	-11.9%
25		10	31.3	29.9	32.7	31	29	35	0.597	6.03%	-6.83%
50		10	28.8	27.1	30.5	29.5	25	32	0.772	8.47%	1.71%
100		10	20.6	18.2	23	20.5	15	25	1.07	16.4%	29.7%

Graphics





Ceriodaphnia Survival and Reproduction Test					Pacific EcoRisk
Analysis ID:	19-2856-3144	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.8.7
Analyzed:	27 Jan-15 8:59	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	885562	200	Yes	Two-Point Interpolation

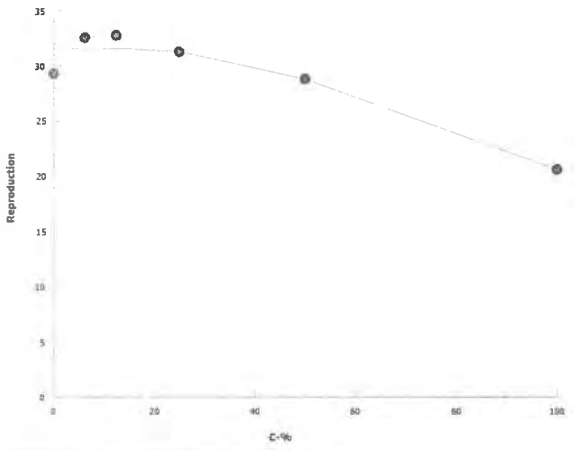
Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	38.1	15.6	53.4	2.624	1.874	6.4
IC10	52.4	29.8	63.1	1.909	1.584	3.36
IC15	62	47.3	72.6	1.613	1.376	2.113
IC20	71.6	57.8	82.8	1.396	1.207	1.73
IC25	81.3	68.5	93.7	1.231	1.068	1.46
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 Contr	10	29.3	11	37	2.37	7.48	25.5%	0.0%
6.25		10	32.6	30	37	0.833	2.63	8.08%	-11.3%
12.5		10	32.8	26	36	0.987	3.12	9.51%	-11.9%
25		10	31.3	29	35	0.597	1.89	6.03%	-6.83%
50		10	28.8	25	32	0.772	2.44	8.47%	1.71%
100		10	20.6	15	25	1.07	3.37	16.4%	29.7%

Graphics



Analyst: MF QA:

Appendix N

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

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

Batch ID:	03-2777-3828	Test Type:	Reproduction-Survival (7d)	Analyst:	Padrick Anderson
Start Date:	20 Jan-15 14:40	Protocol:	EPA-821-R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	26 Jan-15 15:15	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Duration:	6d 1h	Source:	In-House Culture	Age:	1

Sample ID:	14-8420-4130	Code:	NaCl	Client:	Pacific Ecorisk
Sample Date:	20 Jan-15 14:40	Material:	Sodium chloride	Project:	23510
Receive Date:	20 Jan-15 14:40	Source:	Reference Toxicant		
Sample Age:	NA (25 °C)	Station:	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
05-4123-4825	Reproduction	<500	500	NA	17.3%		Steel Many-One Rank Sum Test
00-3897-1709	Survival	2000	2500	2236	NA		Fisher Exact/Bonferroni-Holm Test

Point Estimate Summary

Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method
12-7788-7764	Reproduction	IC5	136	73.9	345		Linear Interpolation (ICPIN)
		IC10	273	148	563		
		IC15	409	222	688		
		IC20	555	295	889		
		IC25	720	369	1030		
		IC40	1070	807	1170		
		IC50	1180	1040	1260		
12-6310-7890	Survival	EC5	1330	530	1620		Linear Regression (MLE)
		EC10	1450	685	1710		
		EC15	1530	812	1780		
		EC20	1600	929	1840		
		EC25	1660	1040	1900		
		EC40	1830	1360	2090		
		EC50	1940	1570	2250		

Reproduction Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	38.2	35.1	41.3	31	47	1.36	4.32	11.3%	0.0%
500		10	31.2	24.9	37.5	8	40	2.79	8.82	28.3%	18.3%
1000		10	25.4	19	31.8	5	33	2.83	8.93	35.2%	33.5%
1500		10	7.7	2.89	12.5	0	18	2.12	6.72	87.2%	79.8%
2000		10	0	0	0	0	0	0	0		100.0%
2500		10	0.1	-0.126	0.326	0	1	0.1	0.316	316.0%	99.7%

Survival Summary

C-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	10	1	1	1	1	1	0	0	0.0%	0.0%
500		10	0.9	0.674	1	0	1	0.1	0.316	35.1%	10.0%
1000		10	1	1	1	1	1	0	0	0.0%	0.0%
1500		10	0.8	0.498	1	0	1	0.133	0.422	52.7%	20.0%
2000		10	0.5	0.123	0.877	0	1	0.167	0.527	105.0%	50.0%
2500		10	0.1	0	0.326	0	1	0.1	0.316	316.0%	90.0%

Ceriodaphnia Survival and Reproduction Test — Pacific EcoRisk

Reproduction Detail

C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	40	35	47	35	37	41	37	31	39	40
500		32	35	8	34	30	37	40	30	36	30
1000		5	16	31	31	31	33	25	28	32	22
1500		2	0	4	18	11	5	11	18	8	0
2000		0	0	0	0	0	0	0	0	0	0
2500		0	0	0	0	0	1	0	0	0	0

Survival Detail

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

Survival Binomials

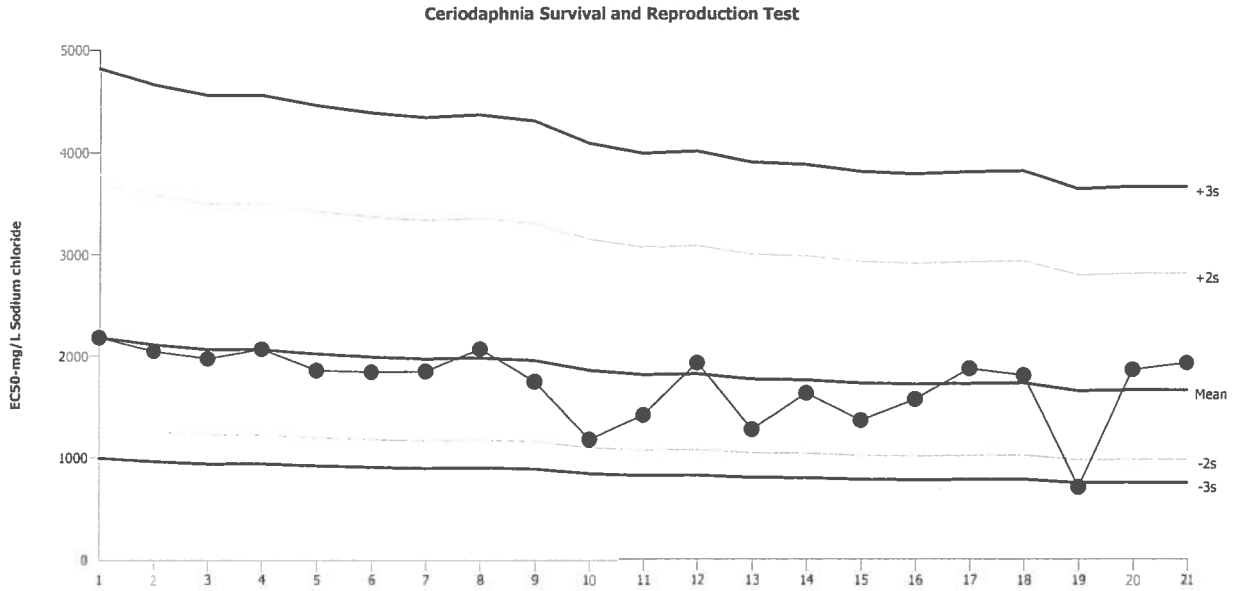
C-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Lab Water Contr	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
500		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1000		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
1500		1/1	0/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
2000		0/1	0/1	1/1	1/1	1/1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

CETIS QC Plot

Report Date: 27 Jan-15 09:21 (1 of 1)

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

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



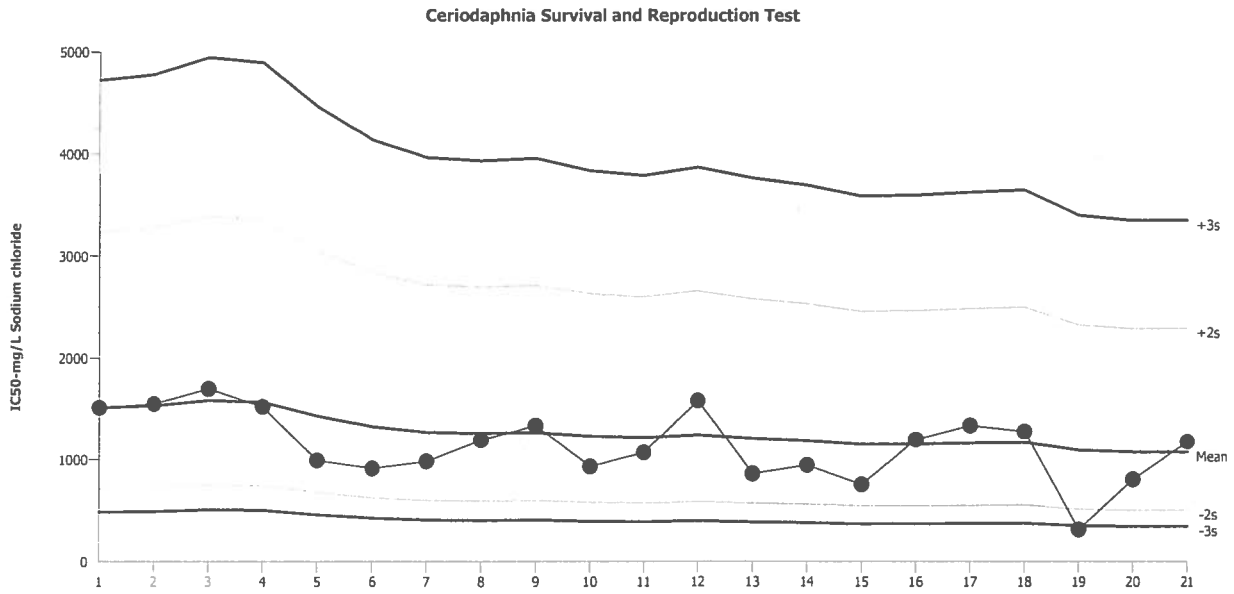
Mean:	1667	**Count:**	20	**-2s Warning Limit:**	984.2	**-3s Action Limit:**	756.3
Sigma:	NA	**CV:**	30.10%	**+2s Warning Limit:**	2823	**+3s Action Limit:**	3673

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2014	Oct	28	14:40	2188	520.4	1.031			21-3240-3782	06-9569-4360
2		Nov	4	11:15	2050	382.5	0.7841			12-4427-9835	10-3626-4099
3			5	13:20	1975	307.4	0.6424			15-5938-4159	10-3208-5026
4			11	11:30	2073	405.5	0.8264			06-1719-6605	17-5878-5844
5			13	14:25	1856	188.8	0.4072			11-4316-0420	00-7821-4183
6			18	14:00	1839	171.5	0.3717			07-3229-1543	21-2213-3237
7			19	14:30	1846	178.5	0.3862			13-7073-6619	11-3184-8368
8			20	14:40	2073	405.5	0.8264			06-1269-3283	08-8571-2119
9		Dec	2	13:00	1744	76.84	0.171			02-4437-1091	13-5751-3347
10			3	14:55	1176	-491.3	-1.325			04-7372-1518	10-5549-3214
11			4	16:30	1417	-250.3	-0.6176			13-7035-8737	14-4689-7561
12			9	11:15	1934	267	0.5638			16-5221-3733	10-5331-9927
13			13	16:50	1276	-391.3	-1.015			11-1005-3264	21-3031-1330
14			16	13:15	1633	-34	-0.07823			02-0330-7526	11-9425-2266
15			17	14:30	1365	-302.2	-0.7591			17-4580-8099	17-4459-4680
16			27	13:55	1574	-93.24	-0.2185			19-6371-3745	07-6237-3258
17			30	11:05	1880	212.9	0.4562			12-1674-6055	21-1950-9022
18			31	10:10	1811	143.5	0.3135			07-8575-9296	16-2486-0257
19	2015	Jan	7	13:50	711.5	-955.9	-3.233	(-)	(-)	04-1879-1470	07-2760-0466
20			13	15:00	1870	202.6	0.4354			18-8201-5612	15-3341-0814
21			20	14:40	1940	272.4	0.5745			06-4867-0844	12-6310-7890

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

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



Mean:	1075	**Count:**	20	**-2s Warning Limit:**	503.7	**-3s Action Limit:**	344.8
Sigma:	NA	**CV:**	46.10%	**+2s Warning Limit:**	2296	**+3s Action Limit:**	3355

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2014	Nov	4	11:15	1515	439.6	0.9041			12-4427-9835	10-8892-3994
2			5	13:20	1550	474.9	0.9649			15-5938-4159	11-8685-2426
3			6	15:10	1699	623.7	1.207			03-0778-9509	09-1396-9937
4			11	11:30	1523	447.6	0.9181			06-1719-6605	21-2632-5233
5			13	14:25	990.7	-84.18	-0.2151			11-4316-0420	10-8588-2077
6			18	14:00	911.2	-163.8	-0.4359			07-3229-1543	09-8206-0685
7			19	14:30	981.3	-93.61	-0.2403			13-7073-6619	21-2746-9227
8			20	14:40	1191	116.3	0.2708			06-1269-3283	09-0164-7000
9		Dec	2	13:00	1338	262.9	0.577			02-4437-1091	19-0543-8854
10			3	14:55	930	-144.9	-0.3819			04-7372-1518	15-6066-5693
11			4	16:30	1067	-7.458	-0.01836			13-7035-8737	01-3822-7879
12			9	11:15	1582	507.1	1.019			16-5221-3733	05-8851-8691
13			13	16:50	860.2	-214.7	-0.5875			11-1005-3264	11-9000-4076
14			16	13:15	943.8	-131.1	-0.3431			02-0330-7526	02-5520-8751
15			17	14:30	755	-319.9	-0.9316			17-4580-8099	20-2585-5917
16			27	13:55	1197	122.1	0.2836			19-6371-3745	08-4187-0572
17			30	11:05	1340	265.3	0.5817			12-1674-6055	00-0924-7503
18			31	10:10	1279	204.1	0.4585			07-8575-9296	20-4631-4765
19	2015	Jan	7	13:50	314.1	-760.8	-3.244	(-)	(-)	04-1879-1470	18-5488-7081
20			13	15:00	805.3	-269.6	-0.7614			18-8201-5612	00-9804-9233
21			20	14:40	1178	103	0.2414			06-4867-0844	12-7788-7764

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

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 1/20/15

Project #: 23510 Test ID: 60877 Randomization: 10.7.15 Control Water: Modified EPAMH + 5% American River

Lab Water Control

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	8.01		7.6		321		25.0	0	0	0	0	0	0	0	0	0	0
1	7.97	8.09	9.1	8.4	331	340	25.1	0	0	0	0	0	0	0	0	0	0
2	7.94	8.25	9.0	7.6	336	359	25.0	0	0	0	0	0	0	0	0	0	0
3	7.94	7.99	8.7	8.4	327	389	25.4	7	5	7	7	6	8	7	5	6	5
4	7.93	7.98	8.7	8.9	324	375	25.9	0	0	0	9	11	0	0	7	0	0
5	7.95	7.75	8.7	6.8	324	354	25.6	13	13	15	1	20	16	12	0	12	14
6	—	8.15	—	7.9	—	353	25.6	20	17	25	18	0	17	18	SMV 19	21	21
7																	
8																	
							Total=	40	35	47	35	37	41	37	31	39	40

Mean Neonates/Female = 38.2

SIGN-OFF

Date: 1/20/15	New WQ: VL	Test Init: SM	
Sol'n Prep: SM	Old WQ:	Time: 1440	
Date: 1/21/15	New WQ: KUP	Counts: CP	
Sol'n Prep: MA	Old WQ: KUP	Time: 1120	
Date: 1/22/15	New WQ: KUP	Counts: CJD	
Sol'n Prep: MA	Old WQ: RO	Time: 1420	
Date: 1/23/15	New WQ: SE	Counts: YJ	
Sol'n Prep: ARF	Old WQ: SE	Time: 1515	
Date: 1/24/15	New WQ: PW	Counts: TM	
Sol'n Prep: ARF	Old WQ: SD	Time: 1430	
Date: 1-25.15	New WQ: VL	Counts: MF	
Sol'n Prep: PA	Old WQ: SD	Time: 1600	
Date: 1/26/15	New WQ: —	Counts: SVV	
Sol'n Prep: —	Old WQ: PA	Time: 1515	
Date:	New WQ:	Counts:	
Sol'n Prep:	Old WQ:	Time:	
Date:	Old WQ:	Counts:	
		Time:	

500 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	8.00		7.6		1278		0	0	0	0	0	0	0	0	0	0
1	7.96	8.09	8.8	8.5	1199	1346	0	0	0	0	0	0	0	0	0	0
2	7.99	8.15	9.0	7.8	1230	NM	0	0	0	0	0	0	0	0	0	0
3	7.84	7.91	9.0	8.6	1291	1343	4	6	8	7	7	6	6	8	7	4
4	7.92	8.00	8.8	8.5	1277	1409	0	0	1/0	8	11	0	0	8	0	0
5	7.93	7.85	8.6	7.3	1248	1406	11	13	—	19	12	13	14	14	12	10
6	—	8.10	—	7.7	—	1318	17	16	—	0	0	18	20	0	17	16
7									—							
8									—							
						Total=	32	35	1/8	34	30	37	40	30	36	30

Mean Neonates/Female = 31.2

RT BATCH NUMBER

166
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Short-Term Chronic 3-Brood *Ceriodaphnia dubia* Survival & Reproduction Test Data

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 1/20/15

Project #: 23510 Test ID: 60877 Randomization: 10.7.15 Control Water: Modified EPAMH + 5% American River

1000 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	8.00		7.4		2190			0	0	0	0	0	0	0	0	0	0
1	7.97	8.07	8.9	8.5	2244	2275		0	0	0	0	0	0	0	0	0	0
2	8.01	8.07	9.2	7.8	2224	2661		0	0	0	0	0	0	0	0	0	0
3	7.77	7.86	9.4	8.6	2213	2366		5	5	6	4	7	5	7	6	6	4
4	7.90	7.97	9.1	8.5	2263	2508		0	0	0	0	7	9	6	11	0	0
5	7.88	7.91	8.9	7.6	2191	2618		0	0	10	11	0	2	0	0	13	0
6	—	805	—	7.7	—	2302		0	11	15	16	17	17	12	11	13	18
7																	
8																	
							Total=	5	16	31	31	31	33	25	28	32	22

Mean Neonates/Female = 25.4

1500 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	7.97		7.8		3130		0	0	0	0	0	0	0	0	0	0
1	7.96	8.05	9.0	8.5	3100	3230	0	0	0	0	0	0	0	0	0	0
2	8.01	8.02	9.5	7.9	3140	3840	0	0	0	0	0	0	0	0	0	0
3	7.74	7.83	9.6	8.6	3143	3420	2	0	4	1	0	2	3	3	0	0
4	7.87	7.96	9.4	8.1	3130	3427	0	0	0	0	5	0	0	5	0	0
5	7.84	7.93	9.1	7.5	3140	3417	0	X/0	X/0	5	6	0	8	0	0	0
6	—	803	—	7.9	—	3288	0	-	-	12	0	3	0	10	8	0
7								-	-							
8								-	-							
							Total=	2	X/0	X/4	18	11	5	11	18	8	0

Mean Neonates/Female = 7.7

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

Client: **Reference Toxicant** Material: **Sodium Chloride** Test Date: 1/20/15

Project #: 23510 Test ID: 60877 Randomization: 10.17.15 Control Water: Modified EPAMH + 5% American River

2000 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	7.94		8.3		4100			0	0	0	0	0	0	0	0	0	0
1	7.95	8.04	9.5	8.6	4000	4270		0	0	0	0	0	0	0	0	0	0
2	7.99	8.04	9.6	7.8	4070	4300		0	X/0	0	0	0	0	0	0	X/0	0
3	7.74	7.81	10.0	8.5	3990	4340		0	-	0	0	0	0	0	0	-	0
4	7.81	7.92	10.2	8.4	4000	4400		*	-	0	0	0	0	X/0	0	-	X/0
5	7.81	7.91	9.4	7.6	4010	4519		X/0	-	0	0	0	0	-	0	-	-
6	-	7.97	-	8.0	-	4546		-	-	0	0	0	0	-	0	-	-
7								-	-					-		-	-
8								-	-					-		-	-
							Total=	X/0	X/0	0	0	0	0	X/0	0	X/0	X/0

Mean Neonates/Female = 0

2500 mg/L

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	Survival / Reproduction A	B	C	D	E	F	G	H	I	J
0	7.92		8.4		4940			0	0	0	0	0	0	0	0	0	0
1	7.94	8.00	9.6	8.6	4880	5380		0	0	0	0	0	0	0	0	0	0
2	7.98	7.94	10.1	7.8	4940	6360		X/0	X/0	X/0	0	0	0	0	0	0	X/0
3	7.70	7.82	10.3	8.5	4873	5560		-	-	-	0	X/0	0	X/0	0	X/0	-
4	7.76	7.90	9.8	8.4	4870	5514		-	-	-	0	-	0	-	0	-	-
5	7.79	7.97	9.8	6.5	4910	5114		-	-	-	0	-	0	-	0	-	-
6	-	7.96	-	8.2	-	5400		-	-	-	X/0	-	1	-	X/0	-	-
7								-	-	-	-	-		-	-	-	-
8								-	-	-	-	-		-	-	-	-
							Total=	X/0	X/0	X/0	X/0	X/0	1	X/0	X/0	X/0	X/0

Mean Neonates/Female = 0.1

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

Client: **Reference Toxicant** Material: **Meter IDs** Test Date: 1/20/15

Project #: 23510 Test ID: 60877 Control Water: Modified EPAMH + 5% American River

Meter IDs

Day	pH New	pH Old	D.O. New	D.O. Old	Conductivity (µS/cm) New	Conductivity (µS/cm) Old	Temp (°C)	SIGN-OFF
0	PH22		RD11		EC08		30A	Date: 1/20/15 New WQ: KM
1	PH21	PH22	RD11	RD12	EC08	EC09	30A	Date: 1/21/15 New WQ: FCVB Old WQ: KMP
2	PH15	PH19	RD12	RD4	EC08	EC09	30A	Date: 1/22/15 New WQ: KMP Old WQ: RD
3	PH22	PH22	RD9	RD12	EC11	EC11	30A	Date: 1/23/15 New WQ: SE Old WQ: SE
4	PH15	PH19	RD10	RD10	EC11	EC11	30A	Date: 1/24/15 New WQ: FCVB Old WQ: SD
5	PH19	PH22	RD09	RD11	EC09	EC11	30A	Date: 1/25/15 New WQ: FCVB Old WQ: SD
6	—	PH19	—	RD09	—	EC10	30A	Date: 1/26/15 New WQ: — Old WQ: PG
7								Date: New WQ: Old WQ:
8								Date: Old WQ: