

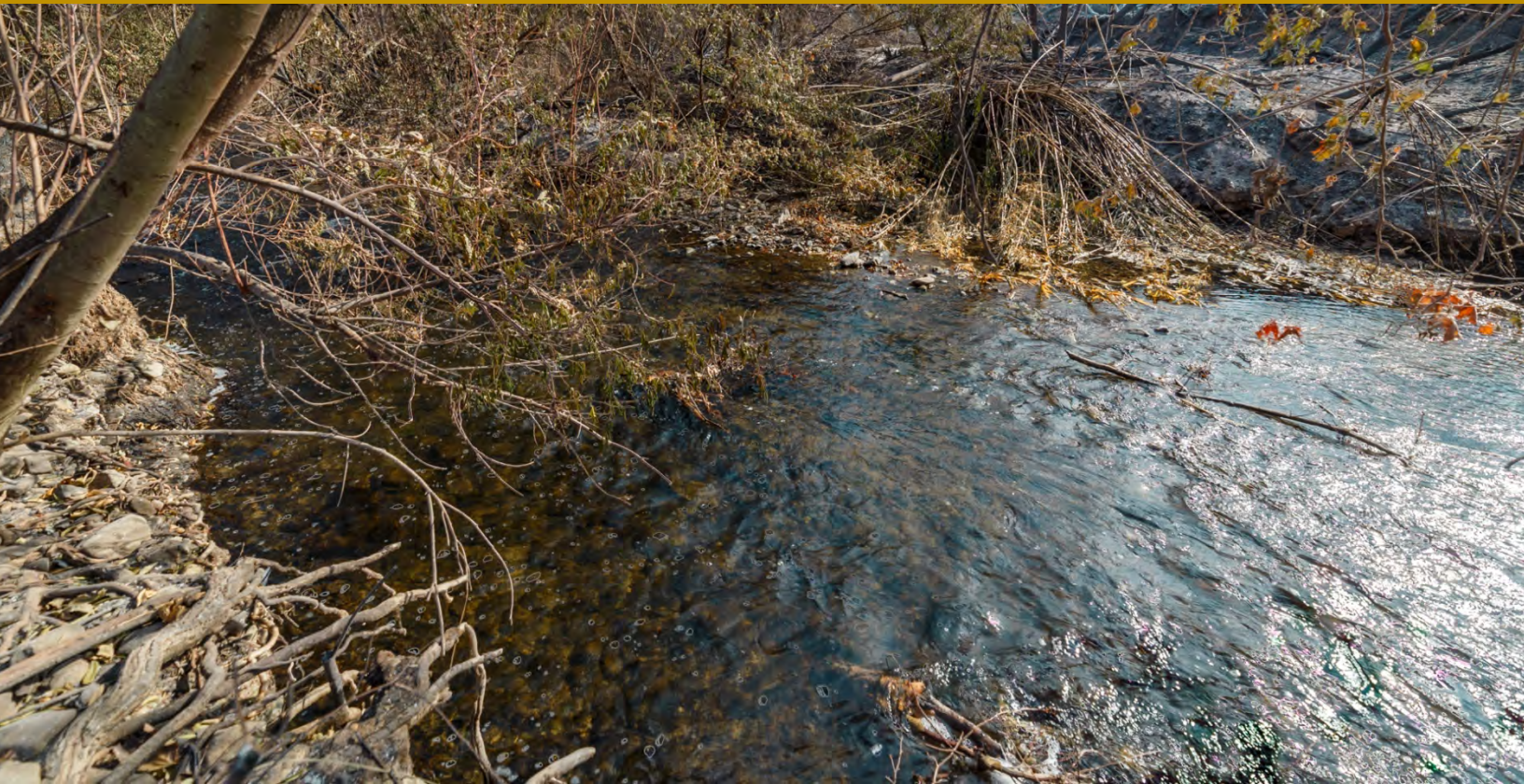


*Ventura Countywide
Stormwater Quality
Management Program*

2018-2019
Permit Year

Ventura Countywide Stormwater Quality
Management Program Annual Report

Attachment D Monitoring Appendices H - K



Camarillo
County of Ventura
Fillmore
Moorpark
Ojai
Oxnard
Port Hueneme
Santa Paula
Simi Valley
Thousand Oaks
Ventura

Ventura County Watershed Protection District

December 13, 2019

Appendix H. RWQCB Permission of Toxicity Species Substitution



California Regional Water Quality Control Board

Los Angeles Region



Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Linda S. Adams
Agency Secretary

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: <http://www.waterboards.ca.gov/losangeles>

Arnold Schwarzenegger
Governor

October 28, 2009

Ms. Norma Camacho, Director
Ventura County Watershed Protection District
800 South Victoria Ave., L#1600
Ventura, CA 93009-1600

Certified Mail
Return Receipt Requested
Claim No. 7009 0820 0001 6811 7509

**SUBJECT: TOXICITY TEST SPECIES SUBSTITUTION, VENTURA COUNTY
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE (MS4)
PERMIT (BOARD ORDER No. 09-0057; NPDES No. CAS004002)**

Dear Ms. Camacho:

On October 14, 2009, the Regional Board staff received a request from the Ventura County Watershed Protection District (County) to substitute topsmelt, *Atherinops affinis*, with the inland silverside, *Menidia beryllina*, due to the unavailability of topsmelt from the supplier. After consultation with US EPA staff, Regional Board staff denied the request. On October 15, 2009, the Regional Board received an e-mail from the County, titled "Notification of toxicity exception - (species unavailable) Ventura County MS4 NPDES Permit Order No. 09-0057 (Monitoring Program)". The County's e-mail communication was submitted pursuant to requirements in subparts D.5 and D.8(b) of the Ventura County MS4 Permit's Monitoring Program (Monitoring Program), which requires an explanation of the circumstance with documentation when toxicity tests cannot be performed to comply with the requirements of this permit, and written authorization from the Regional Board Executive Officer to substitute test species.

In order to evaluate the appropriateness of substituting topsmelt, *Atherinops affinis*, with the inland silverside, *Menidia beryllina*, in toxicity testing at mass emissions stations in the future, the Regional Board requires the County to conduct comparative static renewal toxicity tests on both species as follows. During the next storm event of this permit year (2009-10) and the first storm event of next permit year (2010-11), the County shall conduct toxicity tests on both topsmelt, *Atherinops affinis*, and the inland silverside, *Menidia beryllina*, along with giant kelp, *Macrocystis pyrifera*, and the purple sea urchin, *Strongylocentrotus purpuratus*, pursuant to subpart D.8(a) of the Monitoring Program. The County shall submit the results of the comparative toxicity tests as part of its reporting requirements.

RECEIVED

NOV 5 2009

California Environmental Protection Agency

Ms. Norma Camacho, Director
Ventura County Watershed Protection District

- 2 of 2 -

October 28, 2009

In the event that topsmelt, *Atherinops affinis*, is unavailable for testing during future sampling events conducted under the Monitoring Program, the County shall follow the protocol set forth in subpart D.5 of the Monitoring Program. The County shall notify the Regional Board by phone and e-mail as soon as possible if a test species is unavailable. Notification shall be sent directly to me as well as Tracy Woods, Stormwater Permitting Unit, with a copy to Renee Purdy, Chief, Regional Programs Section. The County shall submit to the Regional Board documentation of species unavailability from both the County's contract lab and the contract lab's supplier at least 48 hours prior to the planned sampling event to provide adequate time for my staff to evaluate any request for species substitution. Any approval or denial of a request for species substitution must be authorized pursuant to subpart D.8(b) of the Monitoring Program.

If you have any questions, please contact me at (213) 576-6605, or Renee Purdy at (213) 576-6783.

Sincerely,



Tracy J. Egoscue,
Executive Officer

cc: Mr. Bruce Fujimoto, Division of Water Quality, State Water Resources Control Board
Mr. Gerhardt Hubner, Ventura County Watershed Protection District
Mr. Arne Anselm, Ventura County Watershed Protection District

Appendix I. Aquatic Toxicity Testing Lab Results



Kelly Hahs
 Ventura County Watershed Protection District
 800 South Victoria Ave., L#1610
 Ventura, CA 93009

December 21, 2018

Kelly:

I have enclosed our report “Evaluation of the Toxicity of Ventura County Watershed Protection District Stormwater Samples” for the samples that were collected November 21, 22, and 29, 2018. The results of this testing are summarized below.

Toxicity summary for VCWPD mass emission station stormwater samples.			
Sample Station	Toxicity Present Relative to the Lab Control treatment?		
	Purple Urchin	<i>Atherinops affinis</i>	
	Fertilization	Survival	Growth
ME-CC		no	no
ME-SCR	no		
ME-VR2		no	no
MO-HUE ^a		no	no

a - This site is a major outfall station, and is tested using *A. affinis* when the salinity of the site water is >2 ppt.

Toxicity summary for VCWPD major outfall station stormwater samples.					
Sample Station	Toxicity Present Relative to the Lab Control treatment?				
	<i>Selenastrum capricornutum</i>	<i>Ceriodaphnia dubia</i>		Fathead Minnow	
	Growth	Survival	Reproduction	Survival	Growth
MO-CAM				YES	YES
MO-OJA				YES	YES
MO-MEI				no	YES
MO-VEN		no	YES		
MO-OXN				no	YES
MO-HUE		YES	YES		
MO-THO		no	no		
MO-MPK	no				
MO-SIM		no	no		
MO-FIL		no	YES		
MO-SPA				no ^a	YES^a

a – Pathogen-related mortality (PRM) was observed in this treatment.

Chronic Toxicity of VCWPD Stormwater to Purple Urchin Fertilization

There was ***no*** significant reduction in purple urchin fertilization in the ME-SCR stormwater sample.

Chronic Toxicity of VCWPD Stormwater to *Atherinops affinis* (Topsmelt)

There was ***no*** significant reduction in topsmelt survival or growth in any of the stormwater samples tested.

Chronic Toxicity of VCWPD Stormwater to *Selenastrum capricornutum*

There was ***no*** significant reduction in *S. capricornutum* growth in the MO-MPK stormwater sample.

Chronic Toxicity of VCWPD Stormwater to *Ceriodaphnia dubia*

There ***was*** a significant reduction in *C. dubia* survival in the MO-HUE stormwater sample; there was ***no*** significant reduction in *C. dubia* survival in any of the remaining stormwater samples. There was ***no*** significant reduction in *C. dubia* reproduction in the MO-THO and MO-SIM stormwater samples. However, there ***was*** a significant reduction in reproduction in the MO-VEN, MO-HUE, and MO-FIL stormwater samples. It must be noted that the elevated conductivity of the MO-HUE stormwater sample (~8500 µS/cm) was well above the tolerance range for this species, and therefore is the likely cause of the observed toxicity.

Chronic Toxicity of VCWPD Stormwater to Fathead Minnows

There was ***no*** significant reduction in fathead minnow survival in the MO-MEI, MO-OXN, and MO-SPA stormwater samples; there ***was*** a significant reduction in survival in the MO-CAM and MO-OJA stormwater samples. There ***was*** a significant reduction in fathead minnow growth in all stormwater samples tested.

It is important to note that pathogen related mortalities (PRM) were observed in the MO-SPA sample. PRM is considered an artifact of the test methodology. PRM is well documented in the EPA guidelines (EPA-821-R-02-013) as caused by microorganisms, and it is acknowledged that PRM interferes with the toxicity evaluation. PRM was not observed in the Lab Control treatment, indicating that the source of pathogens was the ambient water sample. To resolve the observation of PRM in the affected samples, future testing could be performed following the protocol using 20 test replicates noted in the EPA testing manual.

If you have any questions regarding the performance and interpretation of these tests, feel free to contact me or my colleague Stephen Clark at (707) 207-7760.

Sincerely,

Stevi Vasquez
Project Manager



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 29434.

Evaluation of the Toxicity of Ventura County Watershed Protection District Stormwater Samples

Samples collected November 21, 22, and 29, 2018

Prepared For:

Ventura County Watershed Protection District
800 South Victoria Ave., L#1610
Ventura, CA 93009

Prepared By:

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534

December 2018



Evaluation of the Toxicity of Ventura County Watershed Protection District Stormwater Samples

Samples collected November 21, 22, and 29, 2018

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- Appendix F Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the VCWPD Stormwater to Fathead Minnows

1. INTRODUCTION

Under contract to Ventura County Watershed Protection District, Pacific EcoRisk (PER) has been contracted to evaluate the toxicity of stormwater samples collected for the Ventura County Watershed Protection District (VCWPD). This evaluation consists of performing the following US EPA short-term chronic toxicity tests:

- echinoderm sperm fertilization test with the purple urchin, *Strongylocentrotus purpuratus*;
- 7-day survival and growth test with the topmelt, *Atherinops affinis*;
- 96-hour algal growth test with the green alga, *Selenastrum capricornutum*;
- 3-brood survival and reproduction test with the crustacean, *Ceriodaphnia dubia*; and
- 7-day survival and growth test with larval fathead minnows (*Pimephales promelas*).

These toxicity tests were conducted on stormwater samples collected on November 21, 22, and 29, 2018. This report describes the performance and results of these tests.

2. CHRONIC TOXICITY TEST PROCEDURES

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

- “Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms” (EPA/600/R-95/136); and
- “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 November 21-22, VCWPD staff collected stormwater samples from 11 stations into appropriately-cleaned containers; stormwater samples from three stations were collected on November 29. These samples were transported on ice and under chain-of-custody to the PER laboratory in Fairfield, CA. Upon receipt at the laboratory, aliquots of the water samples were collected for analysis of initial water quality characteristics (Tables 1a and 1b). The samples were then stored at 0-6°C except when being used to prepare test solutions. The chain-of-custody records for the collection and delivery of these samples are presented in Appendix A.

Date Sample Received	Sample ID	Temp. (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Total Ammonia (mg/L N)
11/23/18	ME-CC	0.0	7.79	10.3	1566	<1.0
11/30/18	ME-SCR	0.5	7.51	7.1	2074	<1.0
11/23/18	ME-VR2	0.0	7.83	10.6	1295	<1.0

Date Sample Received	Sample ID	Temp. (°C)	pH	D.O. (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Conductivity (µS/cm)	Total Ammonia (mg/L N)
11/23/18	MO-CAM	0.0	7.16	10.9	68	163	600	2.2
11/23/18	MO-OJA	0.0	7.23	10.4	32	83	377	2.3
11/23/18	MO-MEI	0.0	6.95	9.7	30	69	202	1.9
11/23/18	MO-VEN	0.0	7.13	11.2	14	35	161	<1.0
11/23/18	MO-OXN	0.0	7.15	10.1	33	108	359	2.2
11/23/18	MO-HUE	0.0	7.27	10.1	196	1105	8572	1.4
11/30/18	MO-THO	0.8	7.81	10.8	64	158	523	<1.0
11/23/18	MO-MPK	0.0	7.86	11.3	116	318	2526	<1.0
11/23/18	MO-SIM	0.0	7.48	10.5	54	185	551	1.4
11/23/18	MO-FIL	0.0	7.76	10.4	27	62	190	<1.0
11/30/18	MO-SPA	0.4	7.93	11.1	111	744	85	<1.0

2.2 Echinoderm Fertilization Toxicity Testing with *Strongylocentrotus purpuratus*

The echinoderm sperm cell fertilization test consists of exposing purple sea urchin sperm to the stormwater, after which the effects on successful fertilization of the eggs are determined. The specific procedures used in this testing are described below.

Sperm and eggs were generated from gravid adult purple urchins, *S. purpuratus*. The gravid adult urchins were obtained from a commercial supplier (Alexi Gabriel, San Diego, CA). Upon receipt at the lab, the urchins were held at 12°C. Spawning of the urchins was induced by injection with 0.5 M KCl, followed by vigorous shaking of the animals to stimulate gamete release, as per EPA guidelines. The gametes from each spawning individual were collected and examined microscopically; the gametes exhibiting the best quality (as determined from morphology and trial fertilization) were pooled to provide a composite of high quality sperm and a composite of high quality eggs.

The Lab Water Control medium for this test consisted of 1-µm filtered seawater (collected from the UC Granite Canyon Marine Lab). The stormwater sample was adjusted to the test salinity of approximately 33 ppt using an artificial sea salt (Tropic Marin®). As an additional QA measure, and in order to assess any potential artefactual toxicity that might have been caused by the addition of the sea salt to the sample, a Salt Control consisting of filtered seawater diluted to the salinity of the stormwater sample and then adjusted back to a salinity of approximately 33 ppt via addition of the same artificial sea salt was also prepared and tested. Routine water quality characteristics (pH, D.O., and salinity) were measured for each test solution prior to use in this test.

There were four replicates at each test treatment. Each test replicate consisted of a 30-mL glass vial to which five mL of appropriate test solution was added. The test was initiated with the inoculation of an appropriate quantity of sperm into each replicate vial to achieve a final sperm-to-egg ratio of 2000:1. After a 20-min exposure period, approximately 1000 eggs were inoculated into each vial. After an additional 20-min exposure, the test was terminated with all of the test embryos being fixed by the addition of 0.5 mL of 1% glutaraldehyde.

The contents of each preserved test vial were subsequently examined microscopically to determine the percentage of embryos exhibiting successful fertilization. The resulting percentage fertilization data were analyzed to determine any impairment caused by the stormwater; all statistical analyses were performed using CETIS™ (TidePool Scientific, McKinleyville, CA).

2.3 Survival and Growth Toxicity Testing with Topsmelt (*Atherinops affinis*)

The chronic toxicity test with topsmelt consists of exposing larval fish to the stormwater samples for seven days, after which effects on survival and growth are evaluated. The specific procedures used in this testing are described below.

The larval topsmelt used in these tests were obtained from a commercial supplier (Aquatic Biosystems, Fort Collins, CO). Upon receipt at the testing lab, the larval fish were maintained in aerated Lab Water Control medium, and were fed brine shrimp nauplii *ad libitum* during the pre-test holding period.

The Lab Water Control medium for these tests consisted of 1- μ m filtered U.C. Granite Canyon Marine Laboratory seawater. The stormwater samples were adjusted to a salinity of approximately 33 ppt via addition of an artificial sea salt (Crystal Seas®-bioassay grade). The samples were tested at the 100% concentration only. As an additional QA measure, and in order to assess any potential artefactual toxicity that might have been caused by the addition of the sea salt to the samples, a Salt Control consisting of filtered seawater diluted to the salinity of the stormwater sample and then adjusted back to a salinity of approximately 33 ppt via addition of the same artificial sea salt was also prepared and tested. Routine water quality characteristics (pH, D.O., and salinity) were measured for each test solution prior to use in these tests.

There were five replicates for each test treatment, each replicate consisting of 400 mL of test solution in a 600-mL glass beaker. The tests were initiated by randomly allocating five 14-day old topsmelt into each replicate beaker. The beakers were randomly positioned in a temperature-controlled room at 20°C (with temperature being monitored daily), under a 16L:8D photoperiod. These test fish were fed brine shrimp nauplii twice daily.

Each day of the tests, fresh test solutions were prepared as before. The test replicate beakers were examined, with any dead animals, uneaten food, wastes, and other detritus being removed. The number of live fish in each replicate was determined and then approximately 80% of the test

solution in each beaker was carefully poured out and replaced with fresh test solution. “Old” water quality characteristics (pH and D.O.) were measured on the old test water collected from one randomly selected replicate at each treatment.

After seven days exposure, the tests were terminated and the number of live fish in each replicate beaker was recorded. The fish from each replicate were then carefully euthanized in methanol, rinsed in de-ionized water, and transferred to a pre-tared weighing pan. The fish were then dried at 100°C for >24 hours and re-weighed to determine the total weight of fish in each replicate; the total weight was then divided by the initial number of fish per replicate to determine the biomass value. The resulting survival and growth data were analyzed to determine any impairment(s) caused by the stormwater samples; all statistical analyses were performed using CETIS.

2.4 Algal Growth Toxicity Testing with *Selenastrum capricornutum*

The short-term chronic toxicity algal test consists of exposing *Selenastrum capricornutum* to the stormwater for 96 hours, after which the effects on cell growth are evaluated. The specific procedures used in this testing are described below.

The Lab Water Control medium for this test consisted of Type 1 lab water (reverse-osmosis, filtered, de-ionized water) spiked with nutrients. The stormwater sample was tested at the 100% concentration only. An aliquot of the stormwater sample was 0.45-µm filtered and spiked with nutrients before use in the algal test. “New” water quality characteristics (pH, D.O., and conductivity) were measured on the resulting test solutions prior to use in the test.

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

These flasks were loosely capped and randomly positioned within a temperature-controlled room at 25°C, under continuous cool-white fluorescent illumination. Each replicate flask was shaken a minimum of three times daily. The temperature and pH were determined daily for the designated “water quality” replicate at each treatment.

After 96 (±2) hours exposure, the algal cell density in each replicate flask was determined by spectrophotometric analysis. The resulting cell density data were analyzed to determine any impairment caused by the stormwater; all statistical analyses were performed using CETIS.

2.5 Survival and Reproduction Toxicity Testing with *Ceriodaphnia dubia*

The short-term chronic *Ceriodaphnia* test consists of exposing individual females to the stormwater samples for the length of time it takes for the Lab Control treatment females to produce three 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 consisted of modified US EPA synthetic moderately hard water, prepared by addition of reagent grade chemicals to Type 1 lab water. The stormwater samples were tested at the 100% concentration only. Each treatment consisted of a 200 mL aliquot of test solution to which the alga *S. capricornutum* and Yeast-Cerophyll®-Trout food (YCT) had been added to provide food for the test organisms. “New” water quality characteristics (pH, D.O., and conductivity) were measured on these food-amended test solutions prior to use in 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. The tests were initiated by allocating one neonate (<24 hours old and within 8 hours of age) *C. dubia*, obtained from in-house laboratory cultures, into each replicate cup. The replicate cups were placed in a temperature-controlled room at 25°C, under cool white fluorescent lighting on a 16L:8D photoperiod.

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

After it was determined that $\geq 60\%$ of the *C. dubia* in the Lab Control treatments had produced their third brood of offspring, the tests were terminated. The resulting survival and reproduction data were analyzed to determine any impairment(s) caused by the stormwater samples. All statistical analyses were performed using CETIS.

2.6 Survival and Growth Toxicity Testing with Larval Fathead Minnows

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

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

The Lab Water Control medium for this test consisted of EPA synthetic moderately-hard water. The stormwater samples were tested at the 100% concentration only. “New” water quality characteristics (pH, D.O., and conductivity) were measured on these test solutions prior to use in the tests.

There were 4 replicates for each test treatment, each replicate consisting of 200 mL of test solution in a 600-mL glass beaker. The test was initiated by randomly allocating 10 larval fathead minnows (<48 hours old) into each replicate. The replicate beakers were placed in a temperature-controlled room at 25°C, under cool-white fluorescent lighting on a 16L:8D photoperiod. The test fish were fed brine shrimp nauplii twice daily.

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

After 7 days exposure, the test was terminated and the number of live fish in each replicate beaker was recorded. The fish from each replicate were then carefully euthanized in methanol, rinsed in de-ionized water, and transferred to a pre-tared weighing pan. These fish were then dried at 100°C for >24 hours and re-weighed to determine the total weight of fish in each replicate. The total weight was then divided by the initial number of fish per replicate to determine the “biomass value.” The resulting survival and biomass data were analyzed to determine any impairment(s) caused by the stormwater samples. All statistical analyses were performed using CETIS.

3. RESULTS

3.1 Effects of VCWPD Stormwater on Purple Urchin Fertilization

The results of this test are summarized in Table 2. There was no significant reduction in fertilization in the ME-SCR stormwater sample. The test data and summary of statistical analyses for this test are presented in Appendix B.

Test Initiation Date (Time)	Treatment/Sample ID	Mean % Fertilization
12/1/18 (1626)	Salt Control	89.8
	Lab Control	94.3
	ME-SCR	98.5

3.2 Effects of VCWPD Stormwater on *Atherinops affinis*

The results for these tests are summarized in Table 3. There was no significant reduction in survival or growth any of the stormwater samples tested. The test data and summary of statistical analyses for these tests are presented in Appendix C.

Test Initiation Date (Time)	Treatment/Sample ID	Mean % Survival	Mean Biomass Value (mg)
11/23/18 (1225)	Salt Control	88	1.70
	Lab Control	92	1.94
	ME-CC	84	1.68
	ME-VR2	92	2.20
	MO-HUE	88	1.83

3.3 Effects of VCWPD Stormwater on *Selenastrum capricornutum*

The results for this test are summarized in Table 4. There was no significant reduction in algal growth in the MO-MPK stormwater sample. The test data and summary of statistical analyses for this test are presented in Appendix D

Test Initiation Date (Time)	Treatment/Sample ID	Mean Algal Cell Density (cells/mL x 10 ⁶)
11/23/18 (1020)	Lab Control	3.03
	MO-MPK	7.34

3.4 Effects of VCWPD Stormwater on *Ceriodaphnia dubia*

The results for this test are summarized in Table 5. There was a significant reduction in *C. dubia* survival in the MO-HUE stormwater sample; there was no significant reduction in *C. dubia* survival in any of the remaining stormwater samples tested. There was no significant reduction in *C. dubia* reproduction in the MO-THO and MO-SIM stormwater samples. However, there was a significant reduction in reproduction in the MO-VEN, MO-HUE, and MO-FIL stormwater samples. It must be noted that the elevated conductivity of the MO-HUE stormwater sample (~8500 µS/cm) was well above the tolerance range for this species, and therefore is the likely cause of the observed toxicity. The test data and summary of statistical analyses are presented in Appendix E.

Test Initiation Date (Time)	Treatment/Sample ID	Mean % Survival	Mean Reproduction (# neonates/female)
11/24/18 (1113)	Lab Control-01	100	28.3
	MO-VEN	100	18.9*
	MO-HUE	0*	0* ^a
	MO-SIM	100	30.9
	MO-FIL	100	15.6*
12/1/18 (1557)	Lab Control-02	100	34.9
	MO-THO	100	32.9

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

a – The EPA manual indicates that “concentrations that had a significant toxic effect on one of the observed responses would not be subsequently tested for an effect on some other response as only applying to dilution series testing.” The Surface Water Ambient Monitoring Program (SWAMP) Roundtable has ruled that this does not apply to testing of 100% solution testing, and that hypothesis test results for both the survival and sub-lethal endpoints must be reported for SWAMP compliant programs. We have complied with this requirement by indicating that this treatment is toxic to survival and reproduction.

3.5 Effects of VCWPD Stormwater on Fathead Minnows

The results for this test are summarized in Table 6. There was no significant reduction in fathead minnow survival in the MO-MEI, MO-OXN, and MO-SPA stormwater samples; there was a significant reduction in survival in the MO-CAM and MO-OJA stormwater samples. There was a significant reduction in fathead minnow growth in all stormwater samples tested. The test data and summary of statistical analyses for this test are presented in Appendix F.

Table 6. Effects of VCWPD stormwater on fathead minnows.			
Test Initiation Date (Time)	Treatment/Sample ID	Mean % Survival	Mean Biomass Value (mg)
11/24/18 (1127)	Lab Control-01	100	1.00
	MO-CAM	77.5*	0.38^{*a}
	MO-OJA	57.5*	0.23^{*a}
	MO-MEI	85.0	0.46*
	MO-OXN	90.0	0.53*
12/1/18 (1323)	Lab Control-02	95.0	0.79
	MO-SPA	82.5	0.45^{*b}

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

a - The EPA manual indicates that “concentrations that had a significant toxic effect on one of the observed responses would not be subsequently tested for an effect on some other response as only applying to dilution series testing.” The Surface Water Ambient Monitoring Program (SWAMP) Roundtable has ruled that this does not apply to testing of 100% solution testing, and that hypothesis test results for both the survival and sub-lethal endpoints must be reported for SWAMP compliant programs. We have complied with this requirement by indicating that this treatment is toxic to survival and growth.

b - Pathogen related mortalities (PRM) were observed in this treatment. PRM is considered an artifact of the test methodology. PRM is well documented in the EPA guidelines (EPA-821-R-02-013) as caused by microorganisms, and it is acknowledged that PRM interferes with the toxicity evaluation. PRM was not observed in the Lab Control treatment, indicating that the source of pathogens was the stormwater sample.

4. AQUATIC TOXICITY DATA QUALITY CONTROL

Two QC measures were assessed during the toxicity testing:

- Maintenance of acceptable test conditions; and
- Negative Control testing;

4.1 Maintenance of Acceptable Test Conditions

Due to the timing of the storm, the urchin fertilization test, the *C. dubia* test using the sample collected November 29, and all fathead minnow tests were initiated outside the 36-hour hold time, but within 72 hours as allowed in the VCWPD MRP. Additionally, due to a lack of culture neonates on November 23, the *C. dubia* tests using samples collected November 21-22 were initiated the following morning, outside the 36-hour hold time, but within 72 hours as allowed in the VCWPD MRP. During the routine D.O. check of the *A. affinis* test on Day 3, the D.O. in the MO-HUE sample dropped to 5.7 mg/L. In order to prevent mortalities due to hypoxia, all replicates for this treatment were aerated for the remaining duration of the test. During the routine D.O. check of the November 24 fathead minnow test on Day 1, a low D.O. of 3.3 mg/L, 1.4 mg/L, 2.6 mg/L, and 3.7 mg/L was measured in the MO-CAM, MO-OJA, MO-MEI, and MO-OXN samples, respectively, resulting in aeration for the remainder of testing. During the routine D.O. check of the December 1 fathead minnow test on Day 1, a low D.O. of 2.4 mg/L was measured in the MO-SPA sample, resulting in aeration for the remainder of testing. One replicate in the MO-VEN *C. dubia* test was observed with two adult females in the replicate cup at test termination. As the brood count for that replicate was higher than the rest of the treatment, it is likely that both females had broods. Further investigation did not result in determining the source of the second adult and as such, the replicate was excluded from both survival and reproduction statistics.

Pathogen related mortalities (PRM) were observed in the fathead minnow test in site MO-SPA. PRM is considered an artifact of the test methodology. PRM is well documented in the EPA guidelines (EPA-821-R-02-013) as caused by microorganisms, and it is acknowledged that PRM interferes with the toxicity evaluation. PRM was not observed in the Lab Control treatment, indicating that the source of pathogens was the ambient water sample.

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

4.2 Negative Control Testing

The responses at the Lab Control treatments were acceptable.

5. SUMMARY AND CONCLUSIONS

An evaluation of the toxicity of VCWPD stormwater samples was conducted utilizing samples collected on November 21, 22, and 29, 2018. A summary of test results is provided below.

Chronic Toxicity of VCWPD Stormwater to Purple Urchin Fertilization

There was no significant reduction in purple urchin fertilization in the ME-SCR stormwater sample.

Chronic Toxicity of VCWPD Stormwater to *Atherinops affinis* (Topsmelt)

There was no significant reduction in topsmelt survival or growth in any of the stormwater samples tested.

Chronic Toxicity of VCWPD Stormwater to *Selenastrum capricornutum*

There was no significant reduction in *S. capricornutum* growth in the MO-MPK stormwater sample.

Chronic Toxicity of VCWPD Stormwater to *Ceriodaphnia dubia*

There was a significant reduction in *C. dubia* survival in the MO-HUE stormwater sample; there was no significant reduction in *C. dubia* survival in any of the remaining stormwater samples. There was no significant reduction in *C. dubia* reproduction in the MO-THO and MO-SIM stormwater samples. However, there was a significant reduction in reproduction in the MO-VEN, MO-HUE, and MO-FIL stormwater samples. It must be noted that the elevated conductivity of the MO-HUE stormwater sample (~8500 $\mu\text{S}/\text{cm}$) was well above the tolerance range for this species, and therefore is the likely cause of the observed toxicity.

Chronic Toxicity of VCWPD Stormwater to Fathead Minnows

There was no significant reduction in fathead minnow survival in the MO-MEI, MO-OXN, and MO-SPA stormwater samples; there was a significant reduction in survival in the MO-CAM and MO-OJA stormwater samples. There was a significant reduction in fathead minnow growth in all stormwater samples tested.

Appendix A

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



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

CHAIN-OF-CUSTODY RECORD

Results To:		Ventura County Watershed Protection District		Invoice To:		Ventura County Public Works Agency		REQUESTED ANALYSIS															
Address:		800 South Victoria Ave., L#1610 Ventura, CA 93009		Address:		Engineering Services Division 800 South Victoria Ave., L#1670 Ventura, CA 93009-1670		Topsmelt (Asterionops aminis) Survival and Growth, EPA 1006.011	Purple Urchin (<i>S. purpuratus</i>) Sperm Fertilization, EPA, 1008.0	Selenastrum Capricornutum Algal Growth, EPA 1003.0	Ceriodaphnia dubia Survival and Reproduction, EPA 1002.0	Fathead Minnow (<i>F. promelas</i>) Survival and Growth, EPA 1000.0											
Phone:	(805) 658-4375		Phone:																				
Attn:	Kelly Hahs		Attn:	Karen Goodman																			
E-mail:	Kelly.Hahs@ventura.org		E-mail:																				
Project Name:		NPDES Stormwater Monitoring Program - 2018/19-1 (Wet)																					
P.O.#/Ref:		Contract No. AE18-015																					
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/Comp	Container		Number	Type															
					Number	Type																	
1	MO-OXN	11/21/18	2340	STRMW	Grab	2	2.5-gal jerrican														X		
2	MO-HUE	11/22/18	0030	STRMW	Grab	2	2.5-gal jerrican						X										
3	MO-THO			STRMW	Grab	2	2.5-gal jerrican						X										
4	MO-MPK	11/22/18	0010	STRMW	Grab	2	2.5-gal jerrican			X													
5	MO-SIM	11/22/18	0110	STRMW	Grab	2	2.5-gal jerrican						X										
6	MO-FIL	11/22/18	0129	STRMW	Grab	2	2.5-gal jerrican						X										
7	MO-SPA			STRMW	Grab	2	2.5-gal jerrican													X			
8																							
9																							
10																							

Samples collected by:			
Comments/Special Instruction:		RELINQUISHED BY:	
<i>All sites/species: 100% concentration only</i>		Signature: <u>W-B-CAREY</u>	
<i>Perform TIE if >50% effect; notify client immediately if toxicity is observed</i>		Print: <u>W-B-Carey</u>	
<i>MO-HUE: If salinity >2ppt, perform additional topsmelt test for comparison</i>		Organization: <u>VCWPD</u>	
		Date: <u>11-22-18</u> Time: <u>1510</u>	
		RECEIVED BY:	
		Signature: <u>FRANK BUSTAMANTE</u>	
		Print: <u>FRANK BUSTAMANTE</u>	
		Organization: <u>REDLINE</u>	
		Date: <u>11/23/18</u> Time: <u>802AM</u>	
		RECEIVED BY:	
		Signature: <u>TREWS FISCHER</u>	
		Print: <u>TREWS FISCHER</u>	
		Organization: <u>PER</u>	
		Date: <u>11/23/18</u> Time: <u>0802</u>	

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



Pacific EcoRisk
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 (707) 207-7760 FAX (707) 207-7916

CHAIN-OF-CUSTODY RECORD

Results To: Ventura County Watershed Protection District		Invoice To: Ventura County Public Works Agency		REQUESTED ANALYSIS																	
Address: 800 South Victoria Ave., L#1610 Ventura, CA 93009-1610		Address: Engineering Services Division 800 South Victoria Ave., L#1670 Ventura, CA 93009-1670		Topsmeit (Vibrio parvulus) Survival and Growth, EPA 1006.011 Purple Urchin (S. purpuratus) Sperm Fertilization, EPA 1008.0 Selenastrum Capricornutum Algal Growth, EPA 1003.0 Ceriodaphnia dubia Survival and Reproduction, EPA 1002.0 Fathead Minnow (P. promelas) Survival and Growth, EPA 1000.0																	
Phone: (805) 658-4375		Phone:																			
Attn: Kelly Hahs		Attn: Karen Goodman																			
E-mail: Kelly.Hahs@ventura.org		E-mail:																			
Project Name: NPDES Stormwater Monitoring Program - 2018/19-1 (Wet)		P.O.#/Ref: Contract No. AE18-015																			
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Grab/Comp	Container		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
					Number	Type															
1 ME-CC	11/22/18	0130	STRMW	Grab	2	2.5-gal jerrican	X														
2 ME-SCR			STRMW	Grab	2	2.5-gal jerrican		X													
3 ME-VR2	11/22/18	0130	STRMW	Grab	2	2.5-gal jerrican	X														
4 MO-CAM	11/21/18	2235	STRMW	Grab	2	2.5-gal jerrican														X	
5 MO-OJA	11/21/18	2315	STRMW	Grab	2	2.5-gal jerrican														X	
6 MO-MEI	11/22/18	0020	STRMW	Grab	2	2.5-gal jerrican														X	
7 MO-VEN	11/21/18	2315	STRMW	Grab	2	2.5-gal jerrican														X	
8																					
9																					
10																					

Samples collected by:

Comments/Special Instruction:
 All sites/species: 100% concentration only
 Perform TIE if >50% effect; notify client immediately if toxicity is observed

RELINQUISHED BY:	RECEIVED BY:
Signature: W.B. CAREY	Signature: [Signature]
Print: W.B. CAREY	Print: FRANK BUSTAMANTE
Organization: VCWPB	Organization: REDLINE COURIER
Date: 11-22-18 Time: 1510	Date: 11/22/18 Time: 310am
RELINQUISHED BY:	RECEIVED BY:
Signature: [Signature]	Signature: Travis Fischer
Print: FRANK BUSTAMANTE	Print: TRAVIS FISCHER
Organization: REDLINE	Organization: PER
Date: 11/23/18 Time: 802am	Date: 11/23/18 Time: 0802

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



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CHAIN-OF-CUSTODY RECORD

Results To: Ventura County Watershed Protection District		Invoice To: Ventura County Public Works Agency		REQUESTED ANALYSIS																			
Address: 800 South Victoria Ave., L#1610 Ventura, CA 93009		Address: Engineering Services Division 800 South Victoria Ave., L#1670 Ventura, CA 93009-1670		topsmelt (<i>Atherinops affinis</i>) Survival and Growth, EPA 1006.011 Purple Urchin (<i>S. purpuratus</i>) Sperm Fertilization, EPA 1008.0 <i>Selenastrum Capricornutum</i> Algal Growth, EPA 1003.0 <i>Ceriodaphnia dubia</i> Survival and Reproduction, EPA 1002.0 Fathead Minnow (<i>F. promelas</i>) Survival and Growth, EPA 1000.0																			
Phone: (805) 658-4375		Phone:																					
Attn: Kelly Hahs		Attn: Karen Goodman																					
E-mail: Kelly.Hahs@ventura.org		E-mail:																					
Project Name: NPDES Stormwater Monitoring Program - 2018/19-2 (Wet)																							
P.O.#/Ref: Contract No. AE18-015																							
Client Sample ID	Sample Date	Sample Time	Sample Matrix*		Grab/Comp	Container																	
						Number	Type																
MO-GYN			STRMW		Grab	2	2.5-gal jerrican															X	
MO-HUE			STRMW		Grab	2	2.5-gal jerrican															X	
MO-THO	11-29-18	1415	STRMW	Grab	2	2.5-gal jerrican															X		
MO-MPK			STRMW	Grab	2	2.5-gal jerrican						X											
MO-SIM			STRMW	Grab	2	2.5-gal jerrican															X		
MO-FIL			STRMW	Grab	2	2.5-gal jerrican															X		
MO-SPA	11/29/18	0200	STRMW	Grab	2	2.5-gal jerrican															X		
ME-SCR	↓	1630	STRMW	Grab	2	"						X											
Samples collected by:																							
Comments/Special Instruction: <i>All sites/species: 100% concentration only</i> <i>Perform TIE if >50% effect; notify client immediately if toxicity is observed</i> <i>MO-HUE: If salinity >2ppt, perform additional topsmelt test for comparison</i>				RELINQUISHED BY:										RECEIVED BY:									
				Signature: Kelly Hahs					Signature: P.B.					Print: KELLY HAHS					Print: VIKTOR REZNIK				
				Organization: VCWPD										Organization:									
				Date: 11/30/18					Time: 0730					Date: 11/30/18					Time: 7:30am				
				RELINQUISHED BY:										RECEIVED BY:									
				Signature: P.B.					Signature: Karen					Print: VIKTOR REZNIK					Print: Y. Khadizera				
				Organization: Anno Express										Organization: PER									
				Date: 11/30/18					Time: 1415					Date: 11-30-18					Time: 1415				

*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 the VCWPD Stormwater to Purple Urchin Fertilization

CETIS Summary Report

Report Date: 12 Dec-18 14:57 (p 1 of 1)

Test Code: VCWPD_1201_SP | 03-6519-9191

Echinoid Fertilization Test						Pacific EcoRisk
------------------------------------	--	--	--	--	--	------------------------

Batch ID: 13-6437-7946	Test Type: Fertilization	Analyst: Stevi Vasquez
Start Date: 01 Dec-18 16:26	Protocol: EPA/600/R-95/136 (1995)	Diluent: Not Applicable
Ending Date: 01 Dec-18 17:05	Species: Strongylocentrotus purpuratus	Brine: Tropic Marin
Duration: 39m	Source: Alexi Gabriel	Age: N/A

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
VCWPD_1201_SP	17-6589-9394	01 Dec-18 16:26	01 Dec-18 16:26	n/a (11.6 °C)	Ventura County Watersh	29434
VCWPD_SP_SALT	16-7833-1950	01 Dec-18 16:26	01 Dec-18 16:26	n/a (11.5 °C)		
ME-SCR	00-0419-7965	29 Nov-18 16:30	30 Nov-18 14:15	48h (0.5 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
VCWPD_1201_SP	Lab Water	Ventura County Watershed Prote	LABQA	
VCWPD_SP_SALT	Salt Control	Ventura County Watershed Prote		
ME-SCR	Ambient Water	Ventura County Watershed Prote	ME-SCR	

Single Comparison Summary					
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	
18-7485-5966	Fertilization Rate	Equal Variance t Two-Sample Test	0.1408	VCWPD_SP_SALT passed fertilization rate	
11-4517-2914	Fertilization Rate	Equal Variance t Two-Sample Test	0.9408	ME-SCR passed fertilization rate	

Fertilization Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1201_SP	LW	4	0.943	0.865	1.000	0.880	0.990	0.024	0.049	5.15%	0.00%
VCWPD_SP_SALT	SA	4	0.898	0.804	0.991	0.830	0.970	0.029	0.059	6.52%	4.77%
ME-SCR		4	0.985	0.976	0.994	0.980	0.990	0.003	0.006	0.59%	-4.51%

Fertilization Rate Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	
VCWPD_1201_SP	LW	0.930	0.970	0.880	0.990	
VCWPD_SP_SALT	SA	0.970	0.880	0.910	0.830	
ME-SCR		0.980	0.990	0.980	0.990	

Fertilization Rate Binomials						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	
VCWPD_1201_SP	LW	93/100	97/100	88/100	99/100	
VCWPD_SP_SALT	SA	97/100	88/100	91/100	83/100	
ME-SCR		98/100	99/100	98/100	99/100	

CETIS Analytical Report

Report Date: 12 Dec-18 14:57 (p 1 of 2)

Test Code: VCWPD_1201_SP | 03-6519-9191

Echinoid Fertilization Test Pacific EcoRisk

Analysis ID: 11-4517-2914 Endpoint: Fertilization Rate CETIS Version: CETISv1.9.2
 Analyzed: 12 Dec-18 14:56 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	ME-SCR passed fertilization rate	5.28%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		ME-SCR	-1.82	1.94	0.11	6	CDF	0.9408	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0211795	0.0211795	1	3.32	0.1184	Non-Significant Effect
Error	0.0383157	0.006386	6			
Total	0.0594952		7			

Distributional Tests

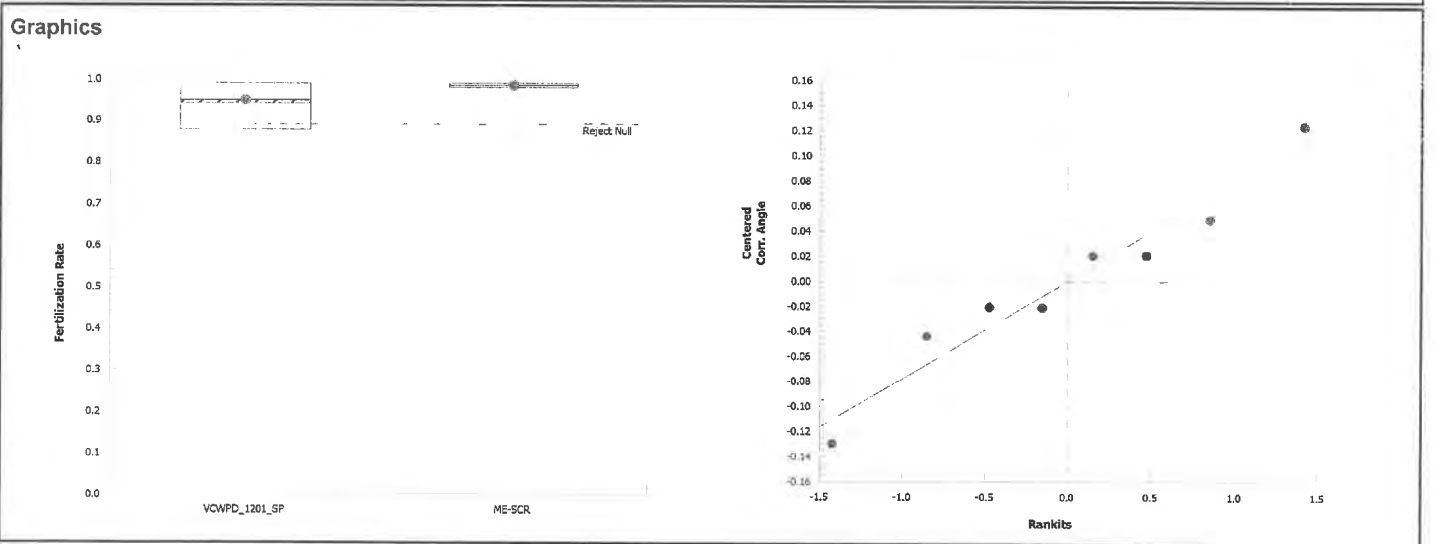
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	21	47.5	0.0324	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.969	0.645	0.8931	Normal Distribution

Fertilization Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1201_SP	LW	4	0.943	0.865	1.000	0.950	0.880	0.990	0.024	5.15%	0.00%
ME-SCR		4	0.985	0.976	0.994	0.985	0.980	0.990	0.003	0.59%	-4.51%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1201_SP	LW	4	1.35	1.17	1.52	1.35	1.22	1.47	0.0552	8.20%	0.00%
ME-SCR		4	1.45	1.41	1.49	1.45	1.43	1.47	0.012	1.66%	-7.64%



Echinoderm Fertilization Toxicity Test Water Chemistry Data

Client: Ventura County Watershed Protection District
 Test Material: ME-SCR
 Test Species: S. purpuratus
 Test ID#: 80311 Project #: 29434
 Sample Salinity adjusted with : Tropic Marin

Organism Log#: 11316 Age: N/A
 Organism Supplier: Alexi
 Control/Diluent: FSW
 Test Date: 12/1/18 Randomization: -

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Lab Water Control	11.6	7.77	7.8	34.0	Date: 12/1/18
100%	11.5	8.36	6.8	33.2 33.2	Sample ID: 51497
Meter ID	100A	pH24	R013	EC12	Test Solution Prep: JO
					New WQ: <i>pe</i>
					Innoculation Time: 1626
					Innoculation Signoff: JO

Echinoderm Fertilization Toxicity Test Data Sheet

Client: Ventura County Watershed Protection District Test Start Date: 12/1/18
 Test Material: ME-SCR Test End Date: 12/1/18
 Test Species: S. purpuratus Enumeration Date: 12/1/18
 Test ID #: 80311 Investigator: J
 Project #: 29434

Sample Salinity adjusted with : Tropic Marin

Concentration		Number of Fertilized Eggs	Number of Unfertilized Eggs	Total Number of Eggs	Percent Fertilization
Replicate					
Lab Water Control	A	93	7	100	93
	B	97	3	100	97
	C	88	12	100	88
	D	99	1	100	99
100%	A	98	2	100	98
	B	99	1	100	99
	C	98	2	100	98
	D	99	1	100	99

CETIS Analytical Report

Report Date: 12 Dec-18 14:57 (p 2 of 2)

Test Code: VCWPD_1201_SP | 03-6519-9191

Echinoid Fertilization Test Pacific EcoRisk

Analysis ID: 18-7485-5966 Endpoint: Fertilization Rate CETIS Version: CETISv1.9.2
 Analyzed: 12 Dec-18 14:57 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	VCWPD_SP_SALT passed fertilization rate	7.95%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		Salt Control	1.18	1.94	0.149	6	CDF	0.1408	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0163579	0.0163579	1	1.4	0.2816	Non-Significant Effect
Error	0.0701351	0.0116892	6			
Total	0.086493		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.09	47.5	0.9453	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.94	0.645	0.6092	Normal Distribution

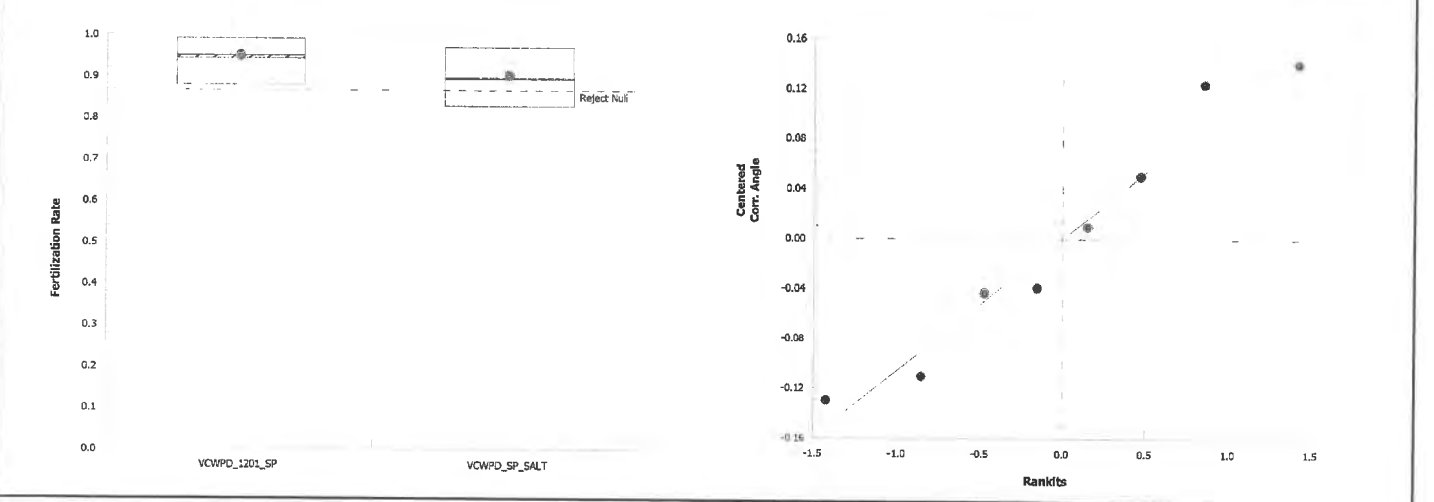
Fertilization Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1201_SP	LW	4	0.943	0.865	1.000	0.950	0.880	0.990	0.024	5.15%	0.00%
VCWPD_SP_SALT	SA	4	0.898	0.804	0.991	0.895	0.830	0.970	0.029	6.52%	4.77%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1201_SP	LW	4	1.35	1.17	1.52	1.35	1.22	1.47	0.0552	8.20%	0.00%
VCWPD_SP_SALT	SA	4	1.26	1.09	1.42	1.24	1.15	1.4	0.0529	8.42%	6.71%

Graphics



Echinoderm Fertilization Toxicity Test Water Chemistry Data

Client: Ventura County Watershed Protection District
 Test Material: Salt Control
 Test Species: S. purpuratus
 Test ID#: 80311 Project #: 29434
 Sample Salinity adjusted with : Tropic Marin

Organism Log#: 11316 Age: N/A
 Organism Supplier: Alexi
 Control/Diluent: FSW
 Test Date: 12/1/18 Randomization: —

Treatment	Temperature (°C)	pH	D.O. (mg/L)	Salinity (ppt)	Signoff
Lab Water Control	11.6	7.77	7.8	34.0	Date: 12/1/18
Salt Control	11.5	8.67	7.6	33.3	Test Solution Prep: JO
					New WQ: Jo
					Innoculation Time: 1626
					Innoculation Signoff: JO
Meter ID	100A	pH24	RD13	EC12	

Echinoderm Fertilization Toxicity Test Data Sheet

Client: Ventura County Watershed Protection District
 Test Material: Salt Control
 Test Species: *S. purpuratus*
 Test ID #: 80311
 Project #: 29434

Test Start Date: 12/1/18
 Test End Date: 12/1/18
 Enumeration Date: 12/1/18
 Investigator: JO

Sample Salinity adjusted with : Tropic Marin

Concentration	Replicate	Number of Fertilized Eggs	Number of Unfertilized Eggs	Total Number of Eggs	Percent Fertilization
Lab Water Control	A	93	7	100	93
	B	97	3	100	97
	C	88	12	100	88
	D	99	1	100	99
Salt Control	A	97	3	100	97
	B	88	12	100	88
	C	91	9	100	91
	D	83	17	100	83

Appendix C

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the VCWPD Stormwater to *Atherinops affinis*

CETIS Summary Report

Report Date: 06 Dec-18 11:18 (p 1 of 2)
 Test Code: VCWPD_1123_AA | 20-8046-1655

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

Batch ID: 09-3052-8477	Test Type: Growth-Survival (7d)	Analyst: Stevi Vasquez
Start Date: 23 Nov-18 12:25	Protocol: EPA/600/R-95/136 (1995)	Diluent: Not Applicable
Ending Date: 30 Nov-18 08:34	Species: Atherinops affinis	Brine: Crystal Sea
Duration: 6d 20h	Source: Aquatic Biosystems, CO	Age: 14

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
VCWPD_1123_AA	13-1519-8115	23 Nov-18 12:25	23 Nov-18 12:25	n/a (20.1 °C)	Ventura County Watersh	29434
VCWPD_AA_SALT	07-5380-4617	23 Nov-18 12:25	23 Nov-18 12:25	n/a (19.1 °C)		
ME-CC	09-8136-9357	22 Nov-18 01:30	23 Nov-18 08:02	35h (0 °C)		
ME-VR2	19-8396-2457	22 Nov-18 01:30	23 Nov-18 08:02	35h (0 °C)		
MO-HUE	02-1965-3242	22 Nov-18 00:30	23 Nov-18 08:02	36h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
VCWPD_1123_AA	Lab Water	Ventura County Watershed Prote	LABQA	
VCWPD_AA_SALT	Salt Control	Ventura County Watershed Prote		
ME-CC	Ambient Water	Ventura County Watershed Prote	ME-CC	
ME-VR2	Ambient Water	Ventura County Watershed Prote	ME-VR2	
MO-HUE	Ambient Water	Ventura County Watershed Prote	MO-HUE	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
11-9639-0399	7d Survival Rate	Equal Variance t Two-Sample Test	0.3480	VCWPD_AA_SALT passed 7d survival rate
15-8817-8476	7d Survival Rate	Equal Variance t Two-Sample Test	0.2020	ME-CC passed 7d survival rate
00-9464-5738	7d Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.7381	ME-VR2 passed 7d survival rate
00-0367-2190	7d Survival Rate	Equal Variance t Two-Sample Test	0.3480	MO-HUE passed 7d survival rate
14-2240-5459	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.1257	VCWPD_AA_SALT passed mean dry biomass
02-3207-9203	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.2020	ME-CC passed mean dry biomass-mg
08-3027-4251	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.8671	ME-VR2 passed mean dry biomass-mg
05-6650-6645	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.3448	MO-HUE passed mean dry biomass-mg

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1123_AA	LW	5	0.920	0.784	1.000	0.800	1.000	0.049	0.110	11.91%	0.00%
VCWPD_AA_SALT	SA	5	0.880	0.658	1.000	0.600	1.000	0.080	0.179	20.33%	4.35%
ME-CC		5	0.840	0.632	1.000	0.600	1.000	0.075	0.167	19.92%	8.70%
ME-VR2		5	0.920	0.784	1.000	0.800	1.000	0.049	0.110	11.91%	0.00%
MO-HUE		5	0.880	0.658	1.000	0.600	1.000	0.080	0.179	20.33%	4.35%

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1123_AA	LW	5	1.94	1.6	2.28	1.66	2.29	0.121	0.272	14.01%	0.00%
VCWPD_AA_SALT	SA	5	1.7	1.27	2.13	1.22	2.02	0.155	0.346	20.40%	12.54%
ME-CC		5	1.68	0.925	2.43	1.21	2.74	0.271	0.606	36.13%	13.49%
ME-VR2		5	2.2	1.7	2.69	1.71	2.68	0.177	0.397	18.06%	-13.27%
MO-HUE		5	1.83	1.16	2.49	0.986	2.34	0.24	0.538	29.43%	5.76%

CETIS Summary Report

Report Date: 06 Dec-18 11:18 (p 2 of 2)
 Test Code: VCWPD_1123_AA | 20-8046-1655

Chronic Larval Fish Survival and Growth Test							Pacific EcoRisk
7d Survival Rate Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
VCWPD_1123_AA	LW	1.000	0.800	0.800	1.000	1.000	
VCWPD_AA_SALT	SA	0.800	1.000	1.000	0.600	1.000	
ME-CC		0.800	0.800	1.000	0.600	1.000	
ME-VR2		1.000	0.800	1.000	0.800	1.000	
MO-HUE		0.600	1.000	1.000	1.000	0.800	
Mean Dry Biomass-mg Detail							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
VCWPD_1123_AA	LW	2.29	1.66	1.72	1.87	2.15	
VCWPD_AA_SALT	SA	1.22	1.79	1.98	1.46	2.02	
ME-CC		1.21	1.47	1.57	1.4	2.74	
ME-VR2		2.06	1.71	2.68	2.52	2.01	
MO-HUE		0.986	2.34	1.86	2.25	1.71	
7d Survival Rate Binomials							
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
VCWPD_1123_AA	LW	5/5	4/5	4/5	5/5	5/5	
VCWPD_AA_SALT	SA	4/5	5/5	5/5	3/5	5/5	
ME-CC		4/5	4/5	5/5	3/5	5/5	
ME-VR2		5/5	4/5	5/5	4/5	5/5	
MO-HUE		3/5	5/5	5/5	5/5	4/5	

CETIS Analytical Report

Report Date: 06 Dec-18 11:18 (p 1 of 8)
 Test Code: VCWPD_1123_AA | 20-8046-1655

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 15-8817-8476 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:16 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	ME-CC passed 7d survival rate	17.64%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		ME-CC	0.881	1.86	0.194	8	CDF	0.2020	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.021087	0.021087	1	0.776	0.4040	Non-Significant Effect
Error	0.217313	0.0271641	8			
Total	0.2384		9			

Distributional Tests

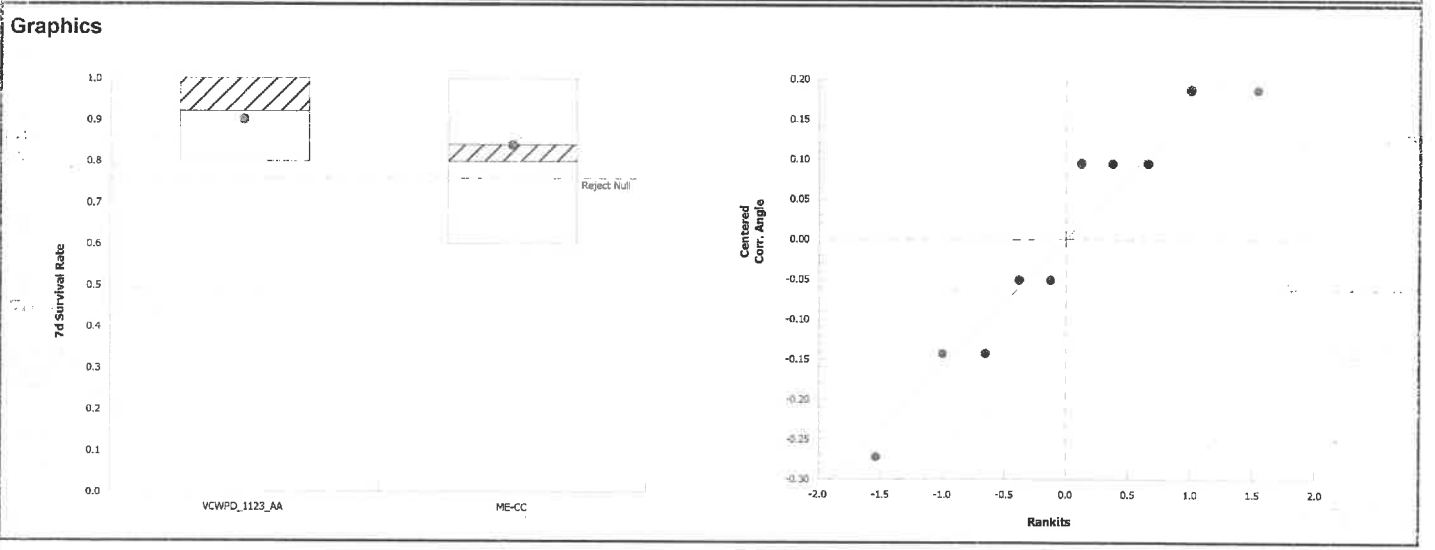
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.19	23.2	0.4655	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.919	0.741	0.3483	Normal Distribution

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	0.920	0.784	1.000	1.000	0.800	1.000	0.049	11.91%	0.00%
ME-CC		5	0.840	0.632	1.000	0.800	0.600	1.000	0.075	19.92%	8.70%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	1.25	1.09	1.41	1.35	1.11	1.35	0.0583	10.43%	0.00%
ME-CC		5	1.16	0.918	1.4	1.11	0.886	1.35	0.0864	16.68%	7.35%



CETIS Analytical Report

Report Date: 06 Dec-18 11:18 (p 5 of 8)
 Test Code: VCWPD_1123_AA | 20-8046-1655

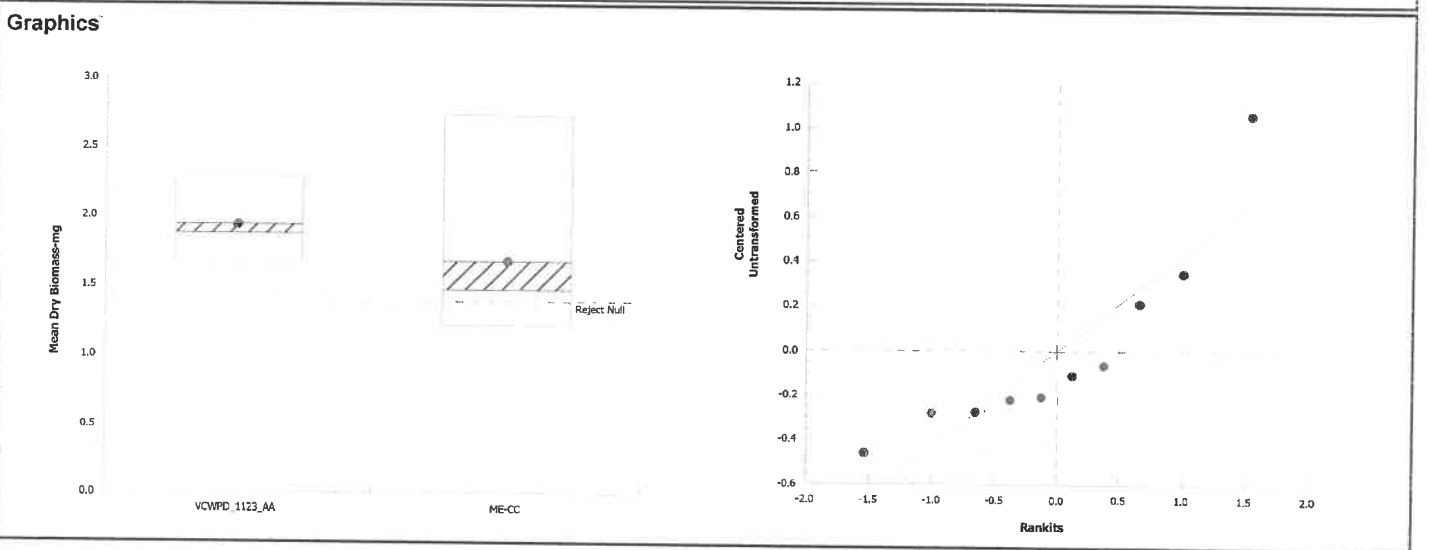
Chronic Larval Fish Survival and Growth Test				Pacific EcoRisk	
Analysis ID:	02-3207-9203	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.9.2
Analyzed:	06 Dec-18 11:17	Analysis:	Parametric-Two Sample	Official Results:	Yes
Data Transform	Alt Hyp	Comparison Result		PMSD	
Untransformed	C > T	ME-CC passed mean dry biomass-mg		28.48%	

Equal Variance t Two-Sample Test									
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		ME-CC	0.881	1.86	0.552	8	CDF	0.2020	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.171088	0.171088	1	0.776	0.4040	Non-Significant Effect
Error	1.76342	0.220428	8			
Total	1.93451		9			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F Test	4.98	23.2	0.1492	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.826	0.741	0.0303	Normal Distribution	

Mean Dry Biomass-mg Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	1.94	1.6	2.28	1.87	1.66	2.29	0.121	14.01%	0.00%
ME-CC		5	1.68	0.925	2.43	1.47	1.21	2.74	0.271	36.13%	13.49%



7 Day Chronic Topsmelt (*A. affinis*) Toxicity Test Data

Client: Ventura County Watershed Protection District
 Test Material: ME-CC
 Test ID#: 80308 Project #: 29434
 Test Date: 11/23/18 Randomization: 5.5-3

Organism Log#: 11300 Age: 14 days
 Organism Supplier: ABS
 Control Water: FSW
 Control Water Batch: -

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
Lab Water Control	20.1	7.89		9.8		34.1	5	5	5	5	5	Date: 11/23/18 Test Solution Prep: TF
100%	20.0	7.93		7.4		34.3	5	5	5	5	5	Initiation Time: R25 Initiation Signoff: TF
Meter ID	81A	PH19		RD11		EC11	New WQ: TF					Sample ID: 51378
Lab Water Control	20.6	7.88	7.76	7.7	6.6	34.3	5	5	5	5	5	Date: 11/24/18 Test Solution Prep: JO
100%	20.8	8.04	8.13	7.7	6.2	34.3	5	5	5	5	5	Renewal Time: 1030 Renewal Signoff: JO
Meter ID	109A	PH24	PH24	RD10	RD10	EC12	New WQ: TF	Old WQ: CD				Sample ID: 51378
Lab Water Control	20.0	7.62	7.81	7.8	6.4	34.2	5	5	5	5	5	Date: 11/25/18 Test Solution Prep: ER
100%	20.1	7.96	8.26	8.0	6.3	34.3	4	5	5	5	5	Renewal Time: 1145 Renewal Signoff: KL
Meter ID	108A	PH19	PH24	RD10	RD13	EC13	New WQ: KL	Old WQ: DH				Sample ID: 51378
Lab Water Control	19.9	7.70	7.67	8.1	6.4	34.2	5	5	5	5	5	Date: 11/26/18 Test Solution Prep: ER
100%	19.9	8.12	8.08	8.0	6.3	34.4	4	5	5	5	5	Renewal Time: 1055 Renewal Signoff: KB
Meter ID	109A	PH19	PH19	RD10	RD10	EC13	New WQ: SK	Old WQ: RTB				Sample ID: 51378
Lab Water Control	19.6	7.82	7.72	7.8	8.4	34.4	5	5	5	5	5	Date: 11/27/18 Test Solution Prep: TE
100%	20.0	8.00	8.12	7.9	7.6	34.4	4	5	5	3	5	Renewal Time: 1109 Renewal Signoff: RO
Meter ID	109A	PH25	PH25	RD10	RD10	EC13	New WQ: TA	Old WQ: TA				Sample ID: 51378
Lab Water Control	19.8	7.4	7.59	7.6	7.2	33.3	5	5	4	4	5	Date: 11/28/18 Test Solution Prep: KB
100%	20.0	7.92	8.12	10.1	7.8	34.4	4	4	5	3	5	Renewal Time: 1430 Renewal Signoff: KB
Meter ID	109A	PH25	PH25	RD11	RD11	EC10	New WQ: SAT	Old WQ: SAT				Sample ID: 51378
Lab Water Control	20.2 19.3 TF 11/29/18	7.80	7.58	10.3	5.9	33.4	5	4	4	5	5	Date: 11/29/18 Test Solution Prep: ER
100%	20.5 19.9 TF 11/29/18	7.89	7.93	9.8	6.1	33.2	4	4	5	3	5	Renewal Time: 1155 Renewal Signoff: TF
Meter ID	109A	PH19	PH19	RD12	RD12	EC12	New WQ: SAT	Old WQ: RVV				Sample ID: 51378
Lab Water Control	20.5		7.53		5.2	34.8	5	4	4	5	5	Date: 11/30/18 Termination Time: 0834
100%	20.7		7.92		4.4	34.2	4	4	5	3	5	Termination Signoff: LB
Meter ID	107A		PH19		RD13	EC13						

Chronic Topsmelt Dry Weight and Biomass Data

Client: Ventura County Water Protection District Test ID #: 80308 Project #: 29434
 Sample: ME-CC Tare Weight Date: 11-29-18 Sign-off: myl
 Test Date: 11/23/18 Final Weight Date: 12-4-18 Sign-off: AR

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	407.28	418.72	5	2.29
2		B	408.87	417.19	5	1.66
3		C	409.58	418.17	5	1.72
4		D	406.36	415.73	5	1.87
5		E	414.46	425.21	5	2.15
6		F	411.83	—	—	—
7	100%	A	418.16	424.23	5	1.21
8		B	409.09	416.44	5	1.47
9		C	416.00	423.84	5	1.57
10		D	411.90	418.89	5	1.40
11		E	410.95	424.63	5	2.74
12		F	411.84	—	—	—
QA 1			415.01	415.01		—
Balance ID			BAL04	Bal04		

CETIS Analytical Report

Report Date: 06 Dec-18 11:18 (p 2 of 8)

Test Code: VCWPD_1123_AA | 20-8046-1655

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 00-9464-5738 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:16 Analysis: Nonparametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	ME-VR2 passed 7d survival rate	13.97%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		ME-VR2	27.5	n/a	2	8	Exact	0.7381	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	0	1.0000	Non-Significant Effect
Error	0.136099	0.0170124	8			
Total	0.136099		9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1	23.2	1.0000	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.64	0.741	1.7E-04	Non-Normal Distribution

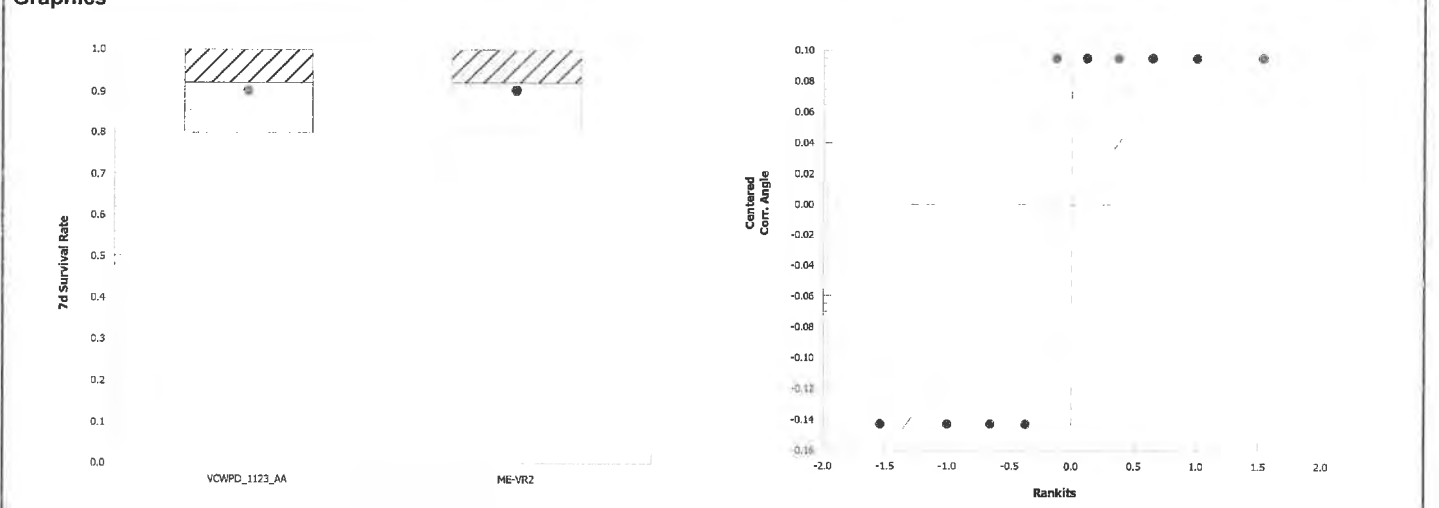
7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	0.920	0.784	1.000	1.000	0.800	1.000	0.049	11.91%	0.00%
ME-VR2		5	0.920	0.784	1.000	1.000	0.800	1.000	0.049	11.91%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	1.25	1.09	1.41	1.35	1.11	1.35	0.0583	10.43%	0.00%
ME-VR2		5	1.25	1.09	1.41	1.35	1.11	1.35	0.0583	10.43%	0.00%

Graphics



CETIS Analytical Report

Report Date: 06 Dec-18 11:18 (p 6 of 8)

Test Code: VCWPD_1123_AA | 20-8046-1655

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 08-3027-4251	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.2
Analyzed: 06 Dec-18 11:17	Analysis: Parametric-Two Sample	Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	ME-VR2 passed mean dry biomass-mg	20.61%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		ME-VR2	-1.2	1.86	0.4	8	CDF	0.8671	Non-Significant Effect

ANOVA Table

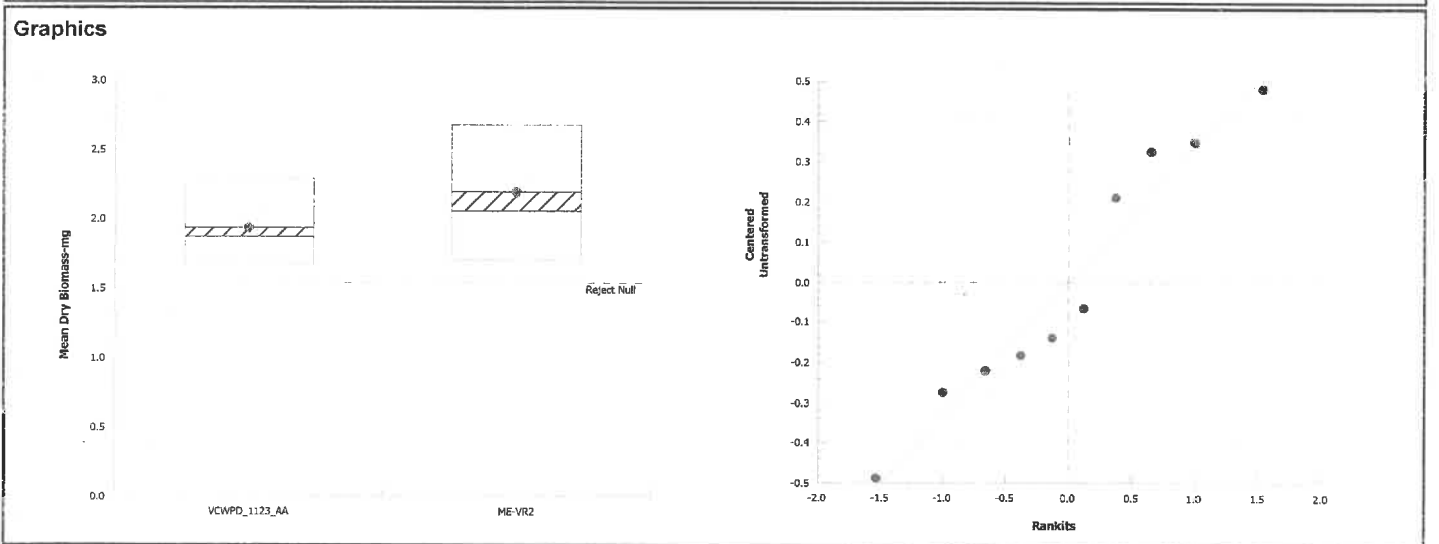
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.165374	0.165374	1	1.43	0.2657	Non-Significant Effect
Error	0.92392	0.11549	8			
Total	1.08929		9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.13	23.2	0.4815	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.937	0.741	0.5150	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	1.94	1.6	2.28	1.87	1.66	2.29	0.121	14.01%	0.00%
ME-VR2		5	2.2	1.7	2.69	2.06	1.71	2.68	0.177	18.06%	-13.27%



7 Day Chronic Topsmelt (*A. affinis*) Toxicity Test Data

Client: Ventura County Watershed Protection District
 Test Material: ME-VR2
 Test ID#: 80309 Project #: 29434
 Test Date: 11/23/18 Randomization: 5-5-3

Organism Log#: 11300 Age: 14 days
 Organism Supplier: ABS
 Control Water: FSW
 Control Water Batch: —

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
Lab Water Control	20.1	7.89		9.8		34.1	5	5	5	5	5	Date: 11/23/18 Test Solution Prep: TF
100%	19.9	7.85		8.0		34.4	5	5	5	5	5	Initiation Time: 1225 Initiation Signoff: TF
Meter ID	81A	PH19		RD11		EC11	New WQ: TF					Sample ID: 51379
Lab Water Control	20.6	7.88	7.76	7.7	6.6	34.3	5	5	5	5	5	Date: 11/24/18 Test Solution Prep: JO
100%	20.8	7.97	8.19	7.7	6.2	34.3	5	5	5	5	5	Renewal Time: 1030 Renewal Signoff: JO
Meter ID	109A	PH24	PH24	RD10	RD10	EC12	New WQ: TF	Old WQ: CO				Sample ID: 51379
Lab Water Control	20.0	7.62	7.51	7.8	6.4	34.2	5	5	5	5	5	Date: 11/25/18 Test Solution Prep: ER
100%	20.3	7.88	8.27	8.4	6.3	34.5	5	5	5	5	5	Renewal Time: 1145 Renewal Signoff: KL
Meter ID	108A	PH19	PH24	RD10	RD13	EC13	New WQ: KL	Old WQ: PH				Sample ID: 51379
Lab Water Control	19.9	7.70	7.67	8.1	6.4	34.2	5	5	5	5	5	Date: 11/26/18 Test Solution Prep: ER
100%	20.1	8.04	8.11	8.4	6.2	34.2	5	5	5	5	5	Renewal Time: 1055 Renewal Signoff: KL
Meter ID	109A	PH19	PH19	RD10	RD10	EC13	New WQ: SF	Old WQ: STB				Sample ID: 51379
Lab Water Control	19.6	7.82	7.72	7.8	8.4	34.4	5	5	5	5	5	Date: 11/27/18 Test Solution Prep: TF
100%	20.3	7.90	8.19	8.2	8.1	34.4	5	4	5	4	5	Renewal Time: 1109 Renewal Signoff: RB
Meter ID	109A	PH25	PH25	RD10	RD10	EC13	New WQ: TA	Old WQ: TA				Sample ID: 51379
Lab Water Control	19.8	7.4	7.59	7.6	7.2	33.3	5	5	5	5	5	Date: 11/28/18 Test Solution Prep: KB
100%	20.0	7.91	8.13	10.6	7.0	33.8	5	4	5	4	5	Renewal Time: 1430 Renewal Signoff: KB
Meter ID	109A	PH25	PH25	RD11	RD11	EC10	New WQ: SAT	Old WQ: SAT				Sample ID: 51379
Lab Water Control	20.7	7.50	7.58	10.3	5.9	33.4	5	4	4	5	5	Date: 11/29/18 Test Solution Prep: ER
100%	20.7	7.88	8.05	9.8	6.2	33.6	5	4	5	4	5	Renewal Time: 1153 Renewal Signoff: TF
Meter ID	109A	PH19	PH19	RD12	RD12	EC12	New WQ: SAT	Old WQ: 8VV				Sample ID: 51379
Lab Water Control	20.5		7.53		5.2	34.8	5	4	4	5	5	Date: 11/30/18 Termination Time: 0834
100%	20.8		8.04		5.5	34.0	5	4	5	4	5	Termination Signoff: LB
Meter ID	107A		PH19		RDB	EC13						

Chronic Topsmelt Dry Weight and Biomass Data

Client: Ventura County Water Protection District Test ID #: 80309 Project # 29434
 Sample: ME-VR2 Tare Weight Date: 11-29-18 Sign-off: myl
 Test Date: 11/23/18 Final Weight Date: 12-4-18 Sign-off: AR

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	407.28	418.72	5	2.29
2		B	408.87	417.19	5	1.66
3		C	409.58	418.17	5	1.72
4		D	406.36	415.73	5	1.87
5		E	414.46	425.21	5	2.15
6		F	411.83	—	—	—
13	100%	A	411.33	421.62	5	2.06
14		B	410.76	419.30	5	1.71
15		C	417.51	430.90	5	2.68
16		D	410.50	423.11	5	2.52
17		E	412.91	422.98	5	2.01
18		F	410.99	—	—	—
QA 1			415.01	415.01		—
Balance ID			BAL04	BAL 04		

CETIS Analytical Report

Report Date: 06 Dec-18 11:18 (p 3 of 8)
 Test Code: VCWPD_1123_AA | 20-8046-1655

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 00-0367-2190 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:17 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	MO-HUE passed 7d survival rate	18.50%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-HUE	0.405	1.86	0.203	8	CDF	0.3480	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0048873	0.0048873	1	0.164	0.6961	Non-Significant Effect
Error	0.238371	0.0297963	8			
Total	0.243258		9			

Distributional Tests

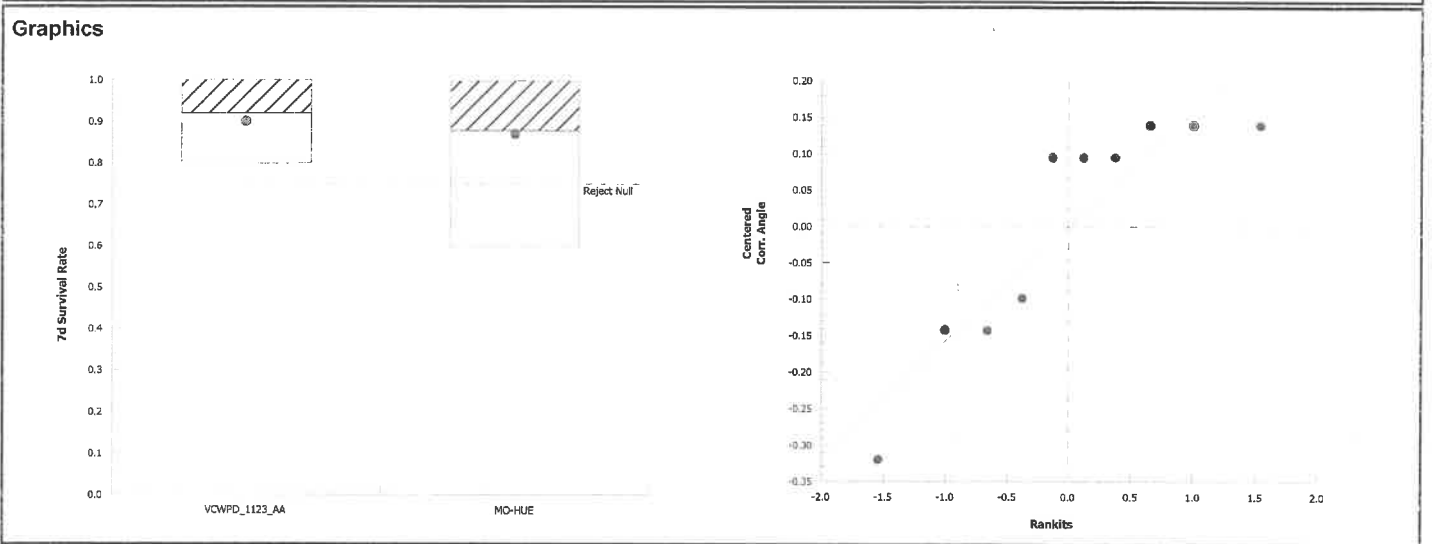
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.5	23.2	0.3959	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.815	0.741	0.0218	Normal Distribution

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	0.920	0.784	1.000	1.000	0.800	1.000	0.049	11.91%	0.00%
MO-HUE		5	0.880	0.658	1.000	1.000	0.600	1.000	0.080	20.33%	4.35%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	1.25	1.09	1.41	1.35	1.11	1.35	0.0583	10.43%	0.00%
MO-HUE		5	1.21	0.95	1.46	1.35	0.886	1.35	0.0923	17.11%	3.54%



CETIS Analytical Report

Report Date: 06 Dec-18 11:18 (p 7 of 8)
 Test Code: VCWPD_1123_AA | 20-8046-1655

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 05-6650-6645 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:17 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-HUE passed mean dry biomass-mg	25.84%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-HUE	0.414	1.86	0.501	8	CDF	0.3448	Non-Significant Effect

ANOVA Table

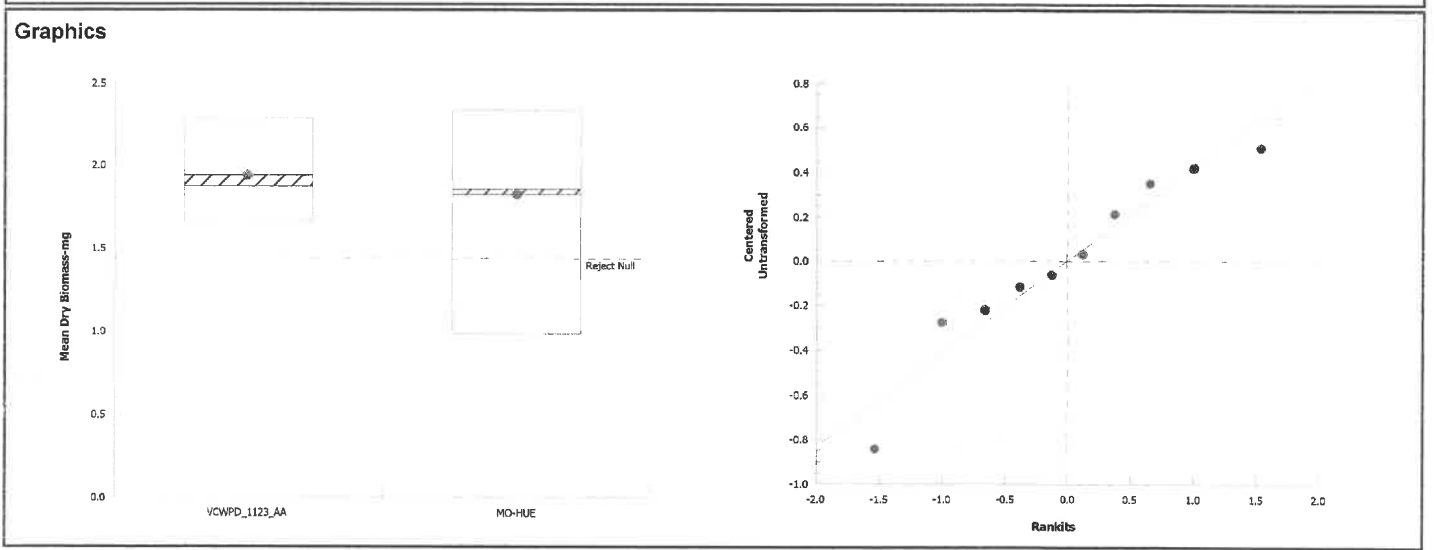
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0311387	0.0311387	1	0.172	0.6896	Non-Significant Effect
Error	1.45159	0.181448	8			
Total	1.48273		9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.92	23.2	0.2142	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.941	0.741	0.5695	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	1.94	1.6	2.28	1.87	1.66	2.29	0.121	14.01%	0.00%
MO-HUE		5	1.83	1.16	2.49	1.86	0.986	2.34	0.24	29.43%	5.76%



7 Day Chronic Topsmelt (*A. affinis*) Toxicity Test Data

Client: Ventura County Watershed Protection District Organism Log#: 11300 Age: 14 days
 Test Material: MO-HUE Organism Supplier: ABS
 Test ID#: 80310 Project #: 29434 Control Water: FSW
 Test Date: 11/23/18 Randomization: 5-5-3 Control Water Batch: -

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)	# Live Organisms					SIGN-OFF
		new	old	new	old		A	B	C	D	E	
Lab Water Control	20.1	7.89		9.8		34.1	5	5	5	5	5	Date: 11/23/18 Test Solution Prep: TF
100%	21.0	7.81		7.7		34.2	5	5	5	5	5	Initiation Time: 1225 Initiation Signoff: TF
Meter ID	81A	PH19		RD11		EC11	New WQ: TF					Sample ID: 51387
Lab Water Control	20.6	7.88	7.76	7.7	6.6	34.3	5	5	5	5	5	Date: 11/24/18 Test Solution Prep: JO
100%	20.8	7.94	8.06	8.0	6.0	34.4	5	5	5	5	5	Renewal Time: 1030 Renewal Signoff: JO
Meter ID	109A	PH24	PH24	RD10	RD10	EC12	New WQ: TF	Old WQ: (D)				Sample ID: 51387
Lab Water Control	20.0	7.62	7.81	7.8	6.4	34.2	5	5	5	5	5	Date: 11/25/18 Test Solution Prep: ER
100%	20.3	7.82	8.12	8.1	5.6	34.2	5	5	5	5	5	Renewal Time: 1145 Renewal Signoff: KL
Meter ID	108A	PH1A	PH24	RD10	RD13	EC13	New WQ: KL	Old WQ: DH				Sample ID: 51387
Lab Water Control	19.9	7.70	7.67	8.1	6.4	34.2	5	5	5	5	5	Date: 11/26/18 Test Solution Prep: ER
100%	20.1	7.97	8.00	8.0	5.7	34.3	5	5	5	5	5	Renewal Time: 1055 Renewal Signoff: KB
Meter ID	109A	PH1A	PH24	RD10	RD10	EC13	New WQ: SF	Old WQ: SJTB				Sample ID: 51387
Lab Water Control	19.6	8.61	7.72	7.8	8.4	34.4	5	5	5	5	5	Date: 11/27/18 Test Solution Prep: TF
100%	19.8	7.82	8.21	7.7	8.1	34.4	4	5	5	5	5	Renewal Time: 1109 Renewal Signoff: KB
Meter ID	109A	PH25	PH25	RD10	RD10	EC13	New WQ: TA	Old WQ: TA				Sample ID: 51387
Lab Water Control	19.9	7.4	7.59	7.6	7.2	33.3	5	5	4	4	5	Date: 11/28/18 Test Solution Prep: KB
100%	19.9	7.81	8.05	10.3	7.4	33.5	3	5	5	5	4	Renewal Time: 1430 Renewal Signoff: KB
Meter ID	109A	PH25	PH25	RD11	RD11	EC10	New WQ: SAT	Old WQ: SAT				Sample ID: 51387
Lab Water Control	20.2	7.80	7.58	10.3	5.9	33.4	5	4	4	5	5	Date: 11/29/18 Test Solution Prep: ER
100%	20.2	7.73	8.12	9.3	6.5	33.2	3	5	5	5	4	Renewal Time: 1153 Renewal Signoff: TF
Meter ID	109A	PH19	PH19	RD12	RD12	EC12	New WQ: SAT	Old WQ: 8VV				Sample ID: 51387
Lab Water Control	20.5		7.53		5.2	34.8	5	4	4	5	5	Date: 11/30/18 Termination Time: 0834
100%	20.4		8.07		5.1	33.8	3	5	5	5	4	Termination Signoff: LB
Meter ID	107A		PH19		RD13	EC13						

Chronic Topsmelt Dry Weight and Biomass Data

Client: Ventura County Water Protection District Test ID #: 80310 Project # 29434
 Sample: MO-HUE Tare Weight Date: 11-29-18 Sign-off: MFL
 Test Date: 11/23/18 Final Weight Date: 12-4-18 Sign-off: AR

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Control	A	407.28	418.72	5	2.29
2		B	408.87	417.19	5	1.66
3		C	409.58	418.17	5	1.72
4		D	406.36	415.73	5	1.87
5		E	414.46	425.21	5	2.15
6		F	411.83	-	-	-
19	100%	A	407.94	412.87	5	0.986
20		B	407.55	419.23	5	2.34
21		C	413.14	422.43	5	1.86
22		D	415.85	427.08	5	2.25
23		E	410.81	419.36	5	1.71
24		F	407.71	-	-	-
QA 1			415.01	415.01		-
Balance ID			BAL04	BAL04		

CETIS Analytical Report

Report Date: 06 Dec-18 11:18 (p 4 of 8)
 Test Code: VCWPD_1123_AA | 20-8046-1655

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

Analysis ID: 11-9639-0399 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:17 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	VCWPD_AA_SALT passed 7d survival rate	18.50%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		Salt Control	0.405	1.86	0.203	8	CDF	0.3480	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0048873	0.0048873	1	0.164	0.6961	Non-Significant Effect
Error	0.238371	0.0297963	8			
Total	0.243258		9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.5	23.2	0.3959	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.815	0.741	0.0218	Normal Distribution

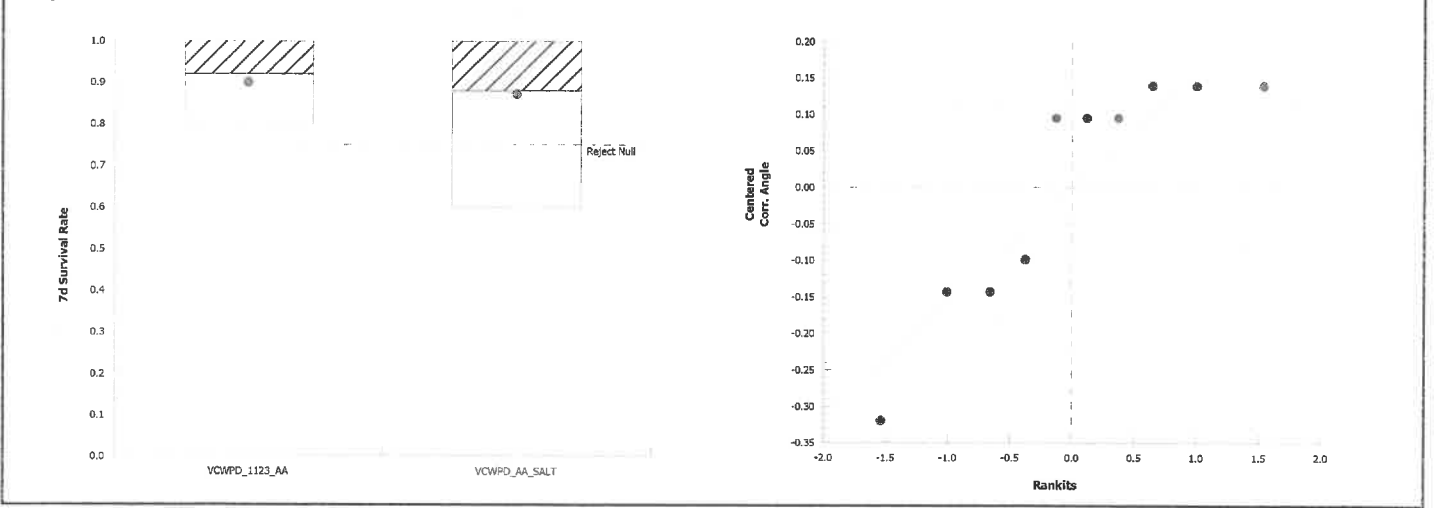
7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	0.920	0.784	1.000	1.000	0.800	1.000	0.049	11.91%	0.00%
VCWPD_AA_SALT	SA	5	0.880	0.658	1.000	1.000	0.600	1.000	0.080	20.33%	4.35%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	1.25	1.09	1.41	1.35	1.11	1.35	0.0583	10.43%	0.00%
VCWPD_AA_SALT	SA	5	1.21	0.95	1.46	1.35	0.886	1.35	0.0923	17.11%	3.54%

Graphics



CETIS Analytical Report

Report Date: 06 Dec-18 11:18 (p 8 of 8)
 Test Code: VCWPD_1123_AA | 20-8046-1655

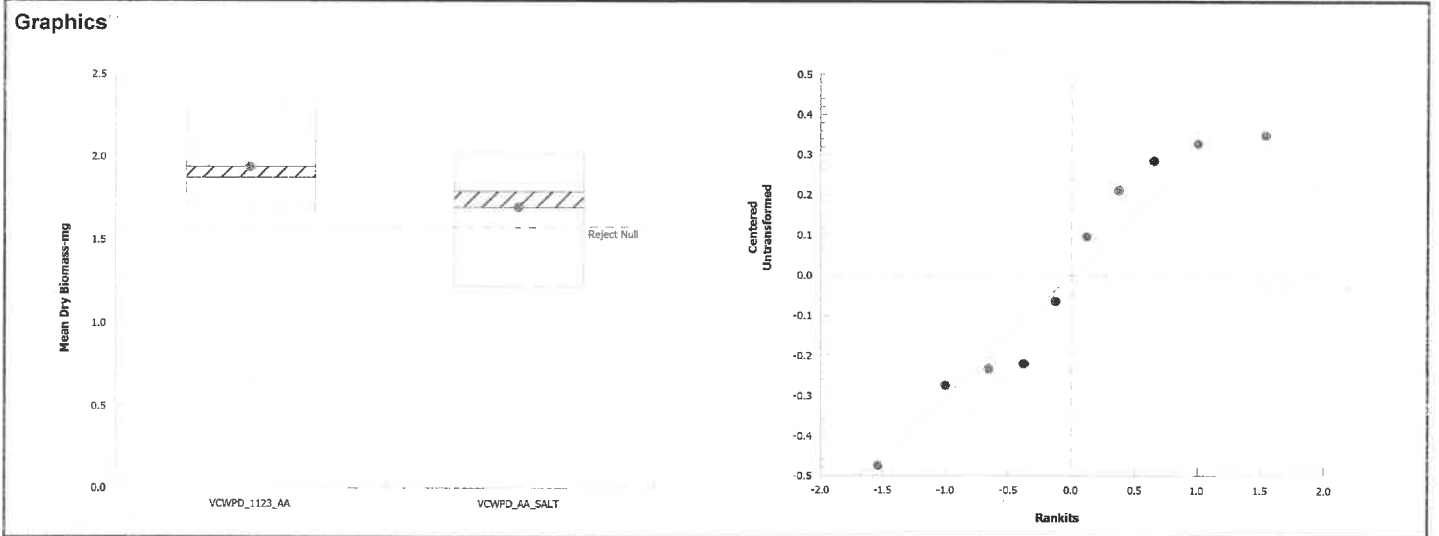
Chronic Larval Fish Survival and Growth Test			Pacific EcoRisk		
Analysis ID: 14-2240-5459	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.2			
Analyzed: 06 Dec-18 11:17	Analysis: Parametric-Two Sample	Official Results: Yes			
Data Transform	Alt Hyp	Comparison Result			PMSD
Untransformed	C > T	VCWPD_AA_SALT passed mean dry biomas			18.87%

Equal Variance t Two-Sample Test									
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		Salt Control	1.24	1.86	0.366	8	CDF	0.1257	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.147865	0.147865	1	1.53	0.2514	Non-Significant Effect
Error	0.773803	0.0967253	8			
Total	0.921668		9			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F Test	1.62	23.2	0.6504	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.917	0.741	0.3294	Normal Distribution	

Mean Dry Biomass-mg Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_AA	LW	5	1.94	1.6	2.28	1.87	1.66	2.29	0.121	14.01%	0.00%
VCWPD_AA_SALT	SA	5	1.7	1.27	2.13	1.79	1.22	2.02	0.155	20.40%	12.54%



7 Day Chronic Topsmelt (*A. affinis*) Toxicity Test Data

Client: Ventura County Watershed Protection District

Organism Log#: 11300 Age: 14 TF 11/23/18
28 days

Test Material: Salt Control

Organism Supplier: ABS

Test ID#: - Project #: 29434

Control Water: Diluted Filtered Seawater + Crystal Sea

Test Date: 11/23/18 Randomization: 553

Control Water Batch: -

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)	# Live Organisms					SIGN-OFF
		new	old	new	old		new	A	B	C	D	
Salt Control	19.1	8.22		8.2		34.2	5	5	5	5	5	Date: 11/23/18 Test Solution Prep: TF Initiation Time: 1225 Initiation Signoff: TF
Meter ID	91A	PH17		RD11		EC11	New WQ: TF					
Salt Control	20.7	8.31	8.04	7.9	6.6	34.4	5	5	5	5	5	Date: 11/24/18 Test Solution Prep: JO Renewal Time: 1030 Renewal Signoff: JO
Meter ID	109A	PH24	PH24	RD10	RD10	EC12	New WQ: TF		Old WQ: JO			
Salt Control	20.1	8.23	8.03	7.9	6.3	34.8	5	5	5	4	5	Date: 11/25/18 Test Solution Prep: GR Renewal Time: 1145 Renewal Signoff: KL
Meter ID	108A	PH19	PH24	RD10	RD13	EC13	New WQ: KL		Old WQ: DH			
Salt Control	19.9	8.40	7.81	8.0	6.5	34.2	5	5	5	3	5	Date: 11/26/18 Test Solution Prep: ER Renewal Time: 1055 Renewal Signoff: KB
Meter ID	109A	PH19	PH19	RD10	RD10	EC13	New WQ: 3F		Old WQ: 5073			
Salt Control	19.9	8.61	7.81	7.9	8.1	34.4	5	5	5	3	5	Date: 11/27/18 Test Solution Prep: TF Renewal Time: 1109 Renewal Signoff: RB
Meter ID	101A	PH25	PH25	RD10	RD10	EC13	New WQ: TA		Old WQ: TA			
Salt Control	20.0	8.1	7.81	9.2	7.3	33.7	5	5	5	3	5	Date: 11/28/18 Test Solution Prep: KB Renewal Time: 1430 Renewal Signoff: KB
Meter ID	109A	PH25	PH25	RD11	RD11	EC10	New WQ: GAT		Old WQ: SAT SAT			
Salt Control	20.4 19.9 TF 11/29/18	8.16 7.5 7.73	7.73	9.5	6.1	33.4	5	5	5	3	5	Date: 11/29/18 Test Solution Prep: GR Renewal Time: 1153 Renewal Signoff: TF
Meter ID	109A	PH19	PH19	RD12	RD12	EC12	New WQ: SAT		Old WQ: 8VV			
Salt Control	20.7		7.65		5.4	34.8	4	5	5	3	5	Date: 11/30/18 Termination Time: 0834 Termination Signoff: LZ
Meter ID	107A		PH19		RD13	EC13	Old WQ: TA					

Chronic Topsmelt Dry Weight Data

Client: Ventura County Watershed Protection District Test ID #: - Project # 29434
 Sample: Salt Control Tare Weight Date: 11-29-18 Sign-off: myl
 Test Date: 11/23/18 Final Weight Date: 12-4-18 Sign-off: AR

Pan ID	Concentration	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1A	Salt	A	414.11	420.21	5	1.22
2A	Control	B	411.27	420.23	5	1.79
3A		C	412.99	422.89	5	1.98
4A		D	410.46	417.77	5	1.46
5A		E	413.30	423.42	5	2.02

Appendix D

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the VCWPD Stormwater to *Selenastrum capricornutum*

CETIS Summary Report

Report Date: 06 Dec-18 11:23 (p 1 of 1)
 Test Code: VCWPD_1123_SC | 00-6855-1810

Algal Growth Test							Pacific EcoRisk				
Batch ID:	00-9959-2590	Test Type:	Cell Growth		Analyst:	Stevi Vasquez					
Start Date:	23 Nov-18 10:20	Protocol:	EPA-821-R-02-013 (2002)		Diluent:	Not Applicable					
Ending Date:	27 Nov-18 09:45	Species:	Selenastrum capricornutum		Brine:	Not Applicable					
Duration:	95h	Source:	In-House Culture		Age:	7					
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
VCWPD_1123_SC	04-3129-3925	23 Nov-18 10:20	23 Nov-18 10:20	n/a (24.4 °C)	Ventura County Watersh	29434					
MO-MPK	02-6415-9658	22 Nov-18 00:10	23 Nov-18 08:02	34h (0 °C)							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
VCWPD_1123_SC	Lab Water	Ventura County Watershed Prote	LABQA								
MO-MPK	Ambient Water	Ventura County Watershed Prote	MO-MPK								
Single Comparison Summary											
Analysis ID	Endpoint	Comparison Method			P-Value	Comparison Result					
12-1186-2003	96h Cell Density-without ED	Equal Variance t Two-Sample Test			1.0000	MO-MPK passed 96h cell density-without ed					
96h Cell Density-without EDTA Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1123_SC	LW	4	3.03E+6	2.72E+6	3.34E+6	2.81E+6	3.27E+6	9.68E+4	1.94E+5	6.40%	0.00%
MO-MPK		4	7.34E+6	6.89E+6	7.80E+6	7.06E+6	7.72E+6	1.44E+5	2.89E+5	3.93%	-142.61%
96h Cell Density-without EDTA Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4						
VCWPD_1123_SC	LW	3.27E+6	2.81E+6	2.96E+6	3.07E+6						
MO-MPK		7.41E+6	7.06E+6	7.72E+6	7.19E+6						

CETIS Analytical Report

Report Date: 06 Dec-18 11:23 (p 1 of 1)
 Test Code: VCWPD_1123_SC | 00-6855-1810

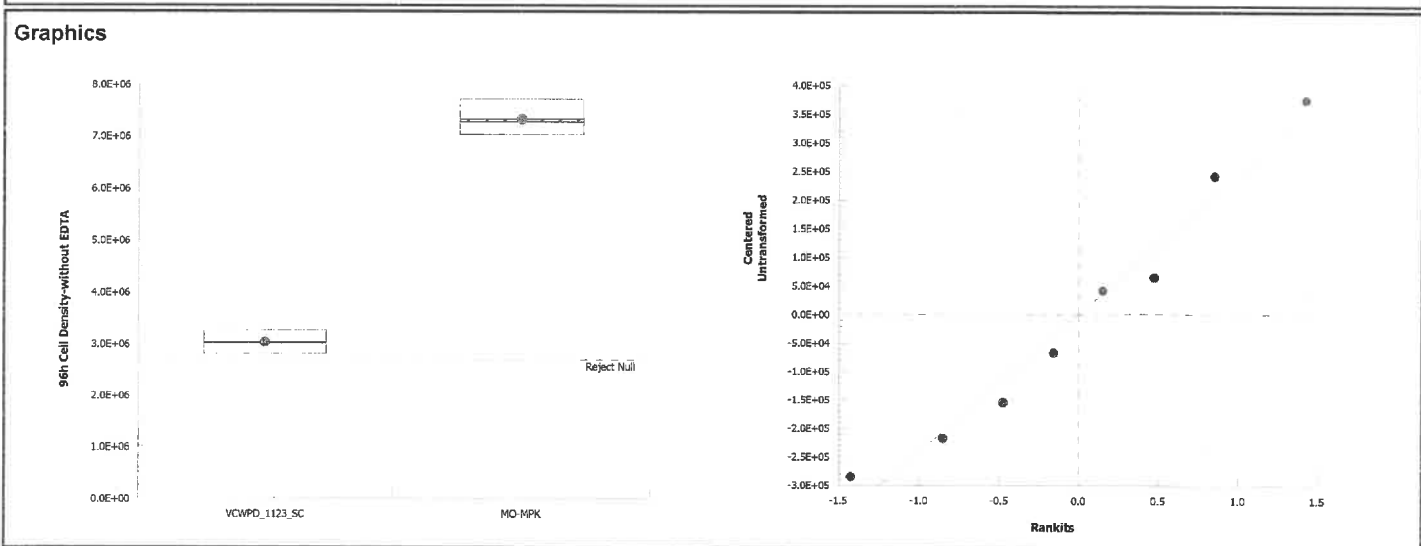
Algal Growth Test			Pacific EcoRisk		
Analysis ID: 12-1186-2003	Endpoint: 96h Cell Density-without EDTA	CETIS Version: CETISv1.9.2			
Analyzed: 06 Dec-18 11:23	Analysis: Parametric-Two Sample	Official Results: Yes			
Data Transform	Alt Hyp	Comparison Result	PMSD		
Untransformed	C > T	MO-MPK passed 96h cell density-without edta 11.16%			

Equal Variance t Two-Sample Test									
Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-MPK	-24.8	1.94	3E+05	6	CDF	1.0000	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.728E+13	3.728E+13	1	617	2.8E-07	Significant Effect
Error	3.626E+11	6.043E+10	6			
Total	3.764E+13		7			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Variance Ratio F Test	2.22	47.5	0.5286	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.959	0.645	0.7976	Normal Distribution	

96h Cell Density-without EDTA Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1123_SC	LW	4	3.03E+6	2.72E+6	3.34E+6	3.02E+6	2.81E+6	3.27E+6	9.68E+4	6.40%	0.00%
MO-MPK		4	7.34E+6	6.89E+6	7.80E+6	7.30E+6	7.06E+6	7.72E+6	1.44E+5	3.93%	-142.61%



Selenastrum capricornutum Algal Toxicity Test Data Sheet

Client: Ventura County Watershed Protection District
 Test Start Date: 11/23/18
 Test End Date: 11/27/18

Test Material: MO-MPK
 Test ID #: 80322 Project #: 29434
 Control/Diluent: Type I NO EDTA Shelf #: T6/R4/S1

Treatment	Cell Density (cells/mL x 10 ⁶)				Mean Cell Density (cells/mL x 10 ⁶)		
	Rep A	Rep B	Rep C	Rep D			
Lab Water Control	3.27	2.81	2.96	3.07	3.03		
100%	7.41	7.04	7.72	7.19	7.34		
This datasheet has been reviewed for completeness and consistency with Test Acceptability Criteria and/or other issues of concern.			Control Mean Density (cells/mL x 10 ⁶)	% CV	Date:	Time:	Signoff:
			3.03	6.38	11/27/18	0945	MB

Initial Count: 10,000 cells/mL Termination Time: 0945 Enumerating Scientist: MB

Test Treatment	Temp (°C)	pH	D.O. (mg/L)	Conductivity (µS/cm)	Sign-Off
Lab Water Control	24.4	7.50	9.0	87	Date: <u>11/23/18</u>
100%	24.2	7.60	10.0	2550 2606	Sample ID: <u>51385</u>
					Test Solution Prep: <u>RG</u>
					New WQ: <u>RG</u>
					Inoculation Time: <u>1020</u>
Meter ID	62A	PH 23	RD13	EC13	Inoculation Signoff: <u>RG</u>
Lab Water Control	25.9	8.19			Date: <u>11/24/18</u>
100%	25.9	7.82			WQ Time: <u>0848</u>
Meter ID	62A	PH19			WQ Signoff: <u>MYL</u>
Lab Water Control	26.0	8.62			Date: <u>11/25/18</u>
100%	26.0	8.31			WQ Time: <u>0850</u>
Meter ID	62A	PH 24			WQ Signoff: <u>ID</u>
Lab Water Control	26.22 26.22	9.39			Date: <u>11/26/18</u>
100%	26.26 26.26	9.50			WQ Time: <u>0901</u>
Meter ID	62A	PH 25			WQ Signoff: <u>ID</u>
Lab Water Control	25.1	9.73	9.4	108	Date: <u>11/27/18</u>
100%	25.1	10.38	15.9	2507	WQ Time: <u>0836</u>
Meter ID	62A	PH24	RD13	EC13	WQ Signoff: <u>AR</u>

Initial Test Conditions	Alkalinity	Hardness	Light Intensity (ftc)
✓	119	✓ 371	396

Appendix E

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the VCWPD Stormwater to *Ceriodaphnia dubia*

CETIS Summary Report

Report Date: 06 Dec-18 14:18 (p 1 of 2)
 Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Batch ID: 02-4296-7304	Test Type: Reproduction-Survival (7d)	Analyst: Stevi Vasquez
Start Date: 24 Nov-18 11:13	Protocol: EPA-821-R-02-013 (2002)	Diluent: Not Applicable
Ending Date: 30 Nov-18 15:49	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d 5h	Source: In-House Culture	Age: 1

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
VCWPD_1124_CD	20-4904-5898	24 Nov-18 11:13	24 Nov-18 11:13	n/a (24.6 °C)	Ventura County Watersh	29434
MO-VEN	15-6365-5653	21 Nov-18 23:15	23 Nov-18 08:02	60h (0 °C)		
MO-HUE	02-1965-3242	22 Nov-18 00:30	23 Nov-18 08:02	59h (0 °C)		
MO-SIM	07-0073-2265	22 Nov-18 01:10	23 Nov-18 08:02	58h (0 °C)		
MO-FIL	12-6512-2693	22 Nov-18 01:25	23 Nov-18 08:02	58h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
VCWPD_1124_CD	Lab Water	Ventura County Watershed Prote	LABQA	
MO-VEN	Ambient Water	Ventura County Watershed Prote	MO-VEN	
MO-HUE	Ambient Water	Ventura County Watershed Prote	MO-HUE	
MO-SIM	Ambient Water	Ventura County Watershed Prote	MO-SIM	
MO-FIL	Ambient Water	Ventura County Watershed Prote	MO-FIL	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
15-4845-8331	Reproduction	Equal Variance t Two-Sample Test	0.0042	MO-VEN failed reproduction
04-0336-8563	Reproduction	Wilcoxon Rank Sum Two-Sample Test	5.4E-06	MO-HUE failed reproduction
18-4248-6037	Reproduction	Equal Variance t Two-Sample Test	0.8773	MO-SIM passed reproduction
08-9184-2602	Reproduction	Equal Variance t Two-Sample Test	2.1E-04	MO-FIL failed reproduction
11-3879-4920	Survival	Fisher Exact Test	1.0000	MO-VEN passed survival
03-2885-1306	Survival	Fisher Exact Test	5.4E-06	MO-HUE failed survival
18-7563-5106	Survival	Fisher Exact Test	1.0000	MO-SIM passed survival
14-4960-6467	Survival	Fisher Exact Test	1.0000	MO-FIL passed survival

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1124_CD	LW	10	28.3	24.8	31.8	17	33	1.56	4.92	17.39%	0.00%
MO-VEN		9	18.9	12.3	25.5	4	29	2.85	8.55	45.27%	33.25%
MO-HUE		10	0	0	0	0	0	0	0		100.00%
MO-SIM		9	30.9	27.5	34.3	22	38	1.47	4.4	14.25%	-9.15%
MO-FIL		10	15.6	9.95	21.3	2	26	2.5	7.9	50.67%	44.88%

Survival Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1124_CD	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
MO-VEN		9	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
MO-HUE		10	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
MO-SIM		9	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
MO-FIL		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%

CETIS Summary Report

Report Date: 06 Dec-18 14:18 (p 2 of 2)
 Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Reproduction Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
VCWPD_1124_CD	LW	23	31	33	30	27	31	32	28	17	31
MO-VEN		26	23	29	17	24	25	4	12	10	
MO-HUE		0	0	0	0	0	0	0	0	0	0
MO-SIM		30	32	38	22	31	33	30	34	28	
MO-FIL		16	10	11	2	12	10	23	26	25	21
Survival Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
VCWPD_1124_CD	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
MO-VEN		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
MO-HUE		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MO-SIM		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
MO-FIL		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
VCWPD_1124_CD	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
MO-VEN		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
MO-HUE		0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1
MO-SIM		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	
MO-FIL		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 06 Dec-18 14:18 (p 1 of 4)

Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

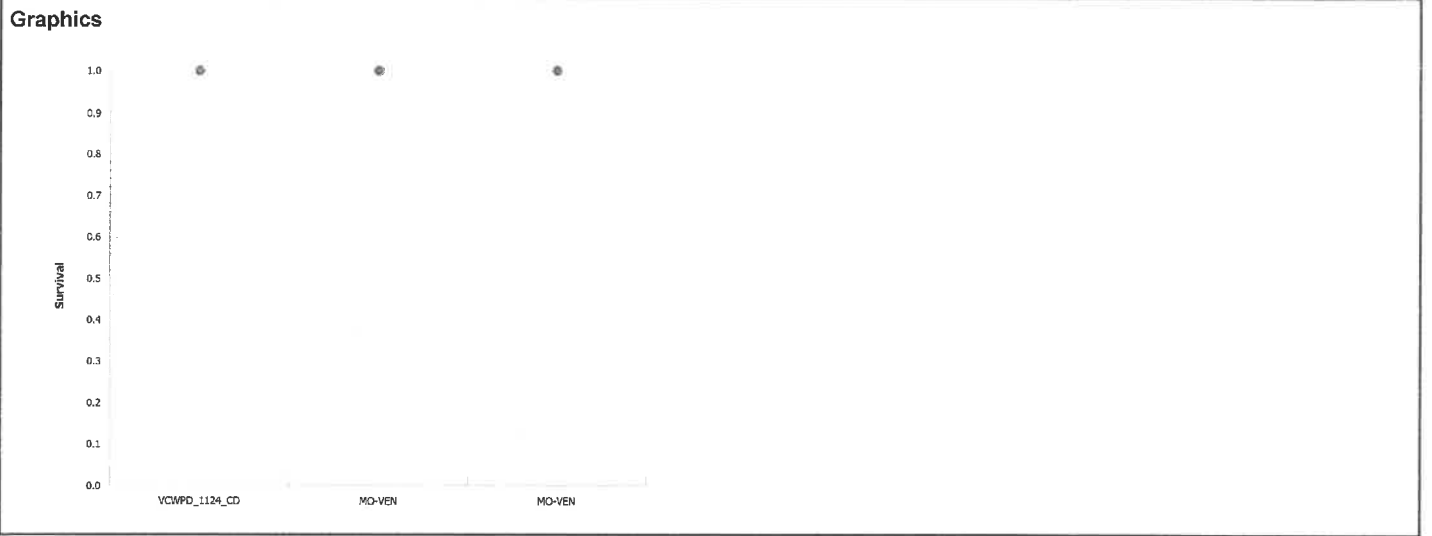
Analysis ID: 11-3879-4920	Endpoint: Survival	CETIS Version: CETISv1.9.2
Analyzed: 06 Dec-18 14:16	Analysis: Single 2x2 Contingency Table	Official Results: Yes

Fisher Exact Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-VEN	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
VCWPD_1124_CD	LW	10	0	10	1	0	0.0%
MO-VEN		9	0	9	1	0	0.0%



CETIS Analytical Report

Report Date: 06 Dec-18 14:17 (p 1 of 4)

Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 15-4845-8331	Endpoint: Reproduction	CETIS Version: CETISv1.9.2	
Analyzed: 06 Dec-18 14:17	Analysis: Parametric-Two Sample	Official Results: Yes	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-VEN failed reproduction	19.41%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-VEN*	2.98	1.74	5.49	17	CDF	0.0042	Significant Effect

ANOVA Table

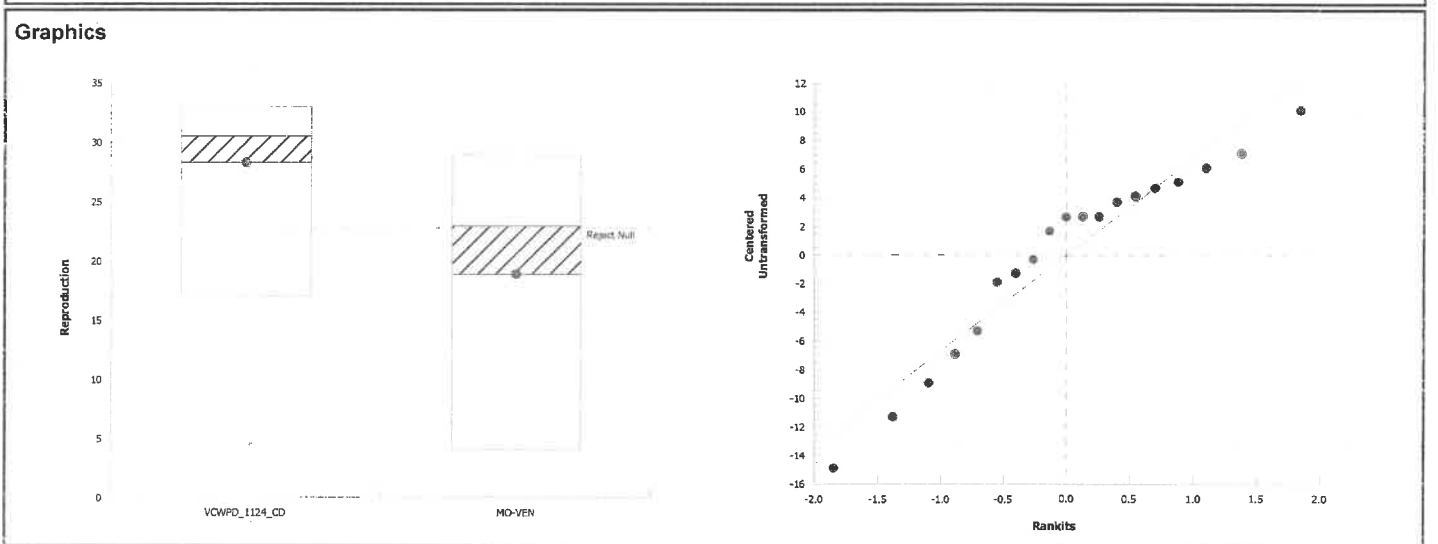
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	419.537	419.537	1	8.88	0.0084	Significant Effect
Error	802.989	47.2346	17			
Total	1222.53		18			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.02	6.69	0.1203	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.933	0.861	0.1928	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_CD	LW	10	28.3	24.8	31.8	30.5	17	33	1.56	17.39%	0.00%
MO-VEN		9	18.9	12.3	25.5	23	4	29	2.85	45.27%	33.25%



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

Client: Ventura County Watershed Protection District Material: MO-VEN Test Date: 11/24/18
 Project #: 29434 Test ID: 80317 Randomization: 10.7.1 Control Water: Modified EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF				
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init.:		
0	7.94		11.2		354	24.6	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/24/18	New WQ: TF	Test Init.: 7F
1	7.74	8.09	10.8	7.0	359	24.3	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/25/18	New WQ: KL	Counts: K6
2	7.59	7.81	10.6	8.1	360	24.8	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/26/18	New WQ: UU	Counts: ER
3	7.88	7.72	10.3	7.5	352	24.5	6	6	6	4	6	5	6	5	6	6	6	6	Date: 11/27/18	New WQ: TA	Counts: MB
4	7.82	7.82 6.4	10.3 6.4	7.7 7.7	350	24.8	7	11	11	11	7	11	11	0	0	0	0	0	Date: 11/28/18	New WQ: TA	Counts: EV
5	7.80	7.75	8.9	7.6	356	25.1	0	0	0	0	0	15	0	11	0	11	11	11	Date: 11/29/18	New WQ: SVV	Counts: ER
6	—	8.09	—	7.0	393	25.3	10	14	16	15	14	0	15	12	11	14	14	14	Date: 11/30/18	New WQ: —	Counts: R6
7																			Date:	New WQ:	Counts:
8																			Date:	Old WQ:	Counts:
Total=							23	31	33	30	27	31	32	28	17	31	Mean Neonates/Female = 28.3				
Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SAMPLE ID				
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Counts:		
0	7.24		10.3		153	24.5	0	0	0	0	0	0	0	0	0	0	0	0			51386
1	7.35	7.18	10.2	7.2	157	24.6	0	0	0	0	0	0	0	0	0	0	0	0			51386
2	7.37 6.89	7.36	10.2 9.3	8.1	152 164	24.3	0	0	0	0	0	0	0	0	0	0	0	0			51386
3	7.16	6.98	8.3	7.7	161	24.2	4	3	2	3	0	3	3	4	4	0	0	0			51386
4	6.89	7.63 7.51	10.2 6.1	8.0	162	24.7	7	8	0	9	0	9	0	0	0	6	6	6			51386
5	6.91	7.63	6.4	7.9	163	24.8	0	0	0	0	2	0	8	0	0	4	4	4			51386
6	—	7.56	—	7.9	172	25.3	15	12	27*	17	15	12	14	0	8	0	0	0			—
7																					
8																					
Total=							26	23	—	29	17	24	25	4	12	10	Mean Neonates/Female = 18.9				

*TWO adult females were observed in this replicate at test termination. As there is potentially two females in the replicate cup, the replicate was excluded from statistics.

CETIS Analytical Report

Report Date: 06 Dec-18 14:18 (p 2 of 4)
 Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

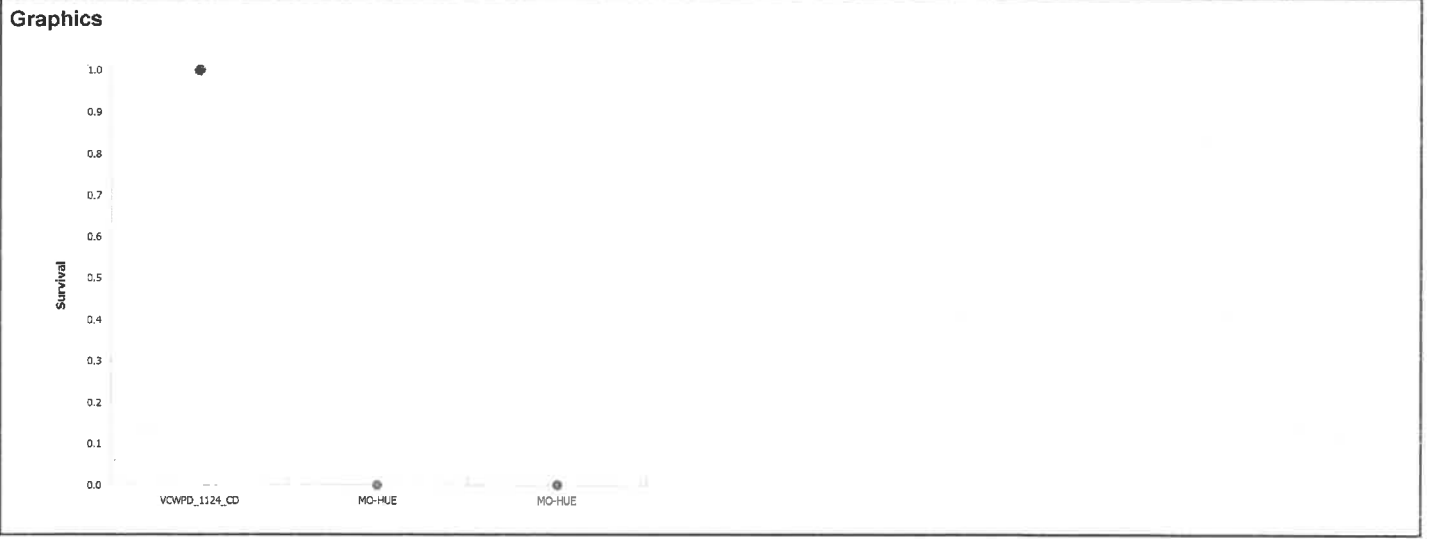
Analysis ID: 03-2885-1306 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 14:16 Analysis: Single 2x2 Contingency Table Official Results: Yes

Fisher Exact Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-HUE*	0.000	Exact	5.4E-06	Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
VCWPD_1124_CD	LW	10	0	10	1	0	0.0%
MO-HUE		0	10	10	0	1	100.0%



CETIS Analytical Report

Report Date: 06 Dec-18 14:18 (p 2 of 4)

Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 04-0336-8563	Endpoint: Reproduction	CETIS Version: CETISv1.9.2
Analyzed: 06 Dec-18 14:17	Analysis: Nonparametric-Two Sample	Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-HUE failed reproduction	9.54%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-HUE*	55	n/a	0	18	Exact	5.4E-06	Significant Effect

ANOVA Table

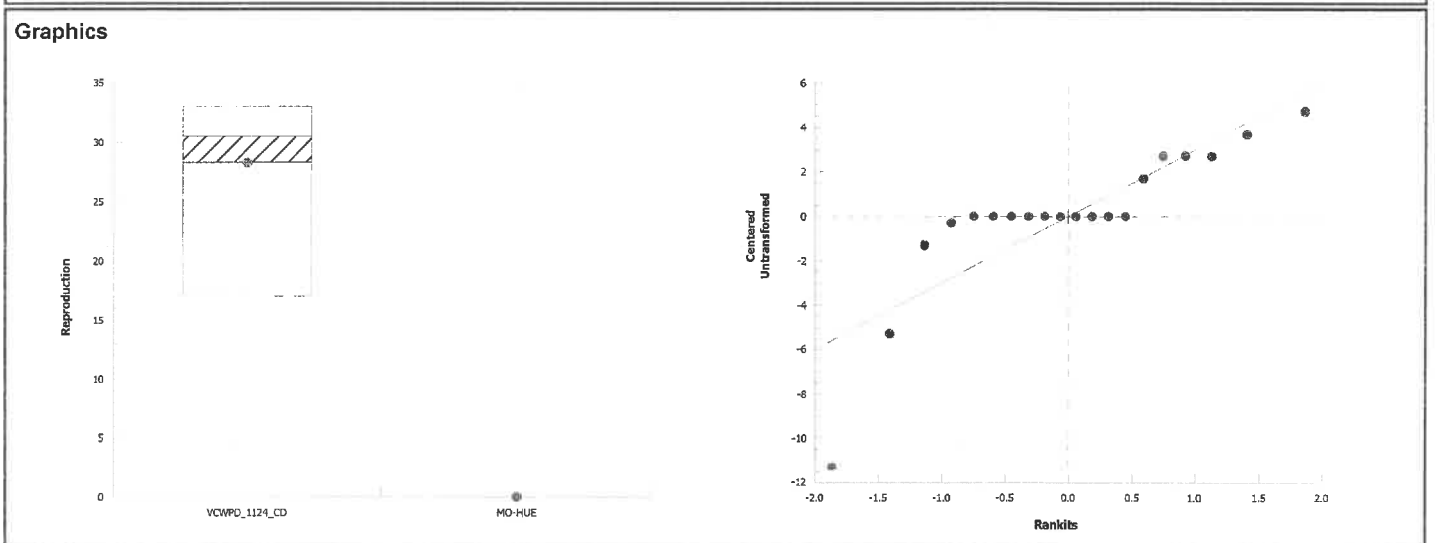
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4004.45	4004.45	1	330	<1.0E-37	Significant Effect
Error	218.1	12.1167	18			
Total	4222.55		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	13.9	8.29	0.0015	Unequal Variances
Variances	Mod Levene Equality of Variance Test	6.22	8.29	0.0226	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.751	0.866	1.8E-04	Non-Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_CD	LW	10	28.3	24.8	31.8	30.5	17	33	1.56	17.39%	0.00%
MO-HUE		10	0	0	0	0	0	0	0		100.00%



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

Client: Ventura County Watershed Protection District Material: MO-HUE Test Date: 11/24/18
 Project #: 29434 Test ID: 80318 Randomization: 107.1 Control Water: Modified EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF							
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init.:					
Lab Water Control	0	7.94		11.2		354	24.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/24/18	New WQ: TF	Test Init. TF	
	1	7.74	8.09	10.8	7.0	359	24.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/25/18	New WQ: KC	Counts: 46	
	2	7.59	7.84	10.6	8.1	360	24.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/26/18	New WQ: CR	Counts: CR	
	3	7.88	7.72	10.3	7.5	352	24.9	6	6	6	4	6	5	6	5	6	6	6	6	6	6	Date: 11/27/18	New WQ: TA	Counts: NB	
	4	7.89	7.82	6.4	7.7	350	24.8	7	11	11	11	7	11	11	0	0	0	0	0	0	0	Date: 11/28/18	New WQ: NB	Counts: NB	
	5	7.80	7.75	8.9	7.6	350	25.1	0	0	0	0	0	15	0	11	0	11	0	0	0	0	Date: 11/29/18	New WQ: CR	Counts: CR	
	6	-	8.09	-	7.0	393	25.3	10	14	16	15	14	0	15	12	11	14	0	0	0	0	Date: 11/30/18	New WQ: -	Counts: 82	
	7																					Date:	New WQ:	Counts:	
	8																					Date:	Old WQ:	Counts:	
Total=								23	31	33	30	27	31	32	28	17	31	Mean Neonates/Female = 28.3							
	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SAMPLE ID							
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init.:					
100%	0	7.65		11.2		8293	24.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0			51387	
	1	7.44	8.38	10.3	7.2	8342	25.1	1/0	1/0	1/0	0	0	1/0	1/0	0	1/0	0	1/0	0	1/0	0			51387	
	2	7.35	8.29	9.6	8.4	8343	24.9	-	-	-	1/0	1/0	-	-	1/0	-	1/0	-	1/0	-	1/0			51387	
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			51387 TF 11/27/18	
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	
	7																								
	8																								
Total=								1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	Mean Neonates/Female = 0					

CETIS Analytical Report

Report Date: 06 Dec-18 14:18 (p 3 of 4)
 Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

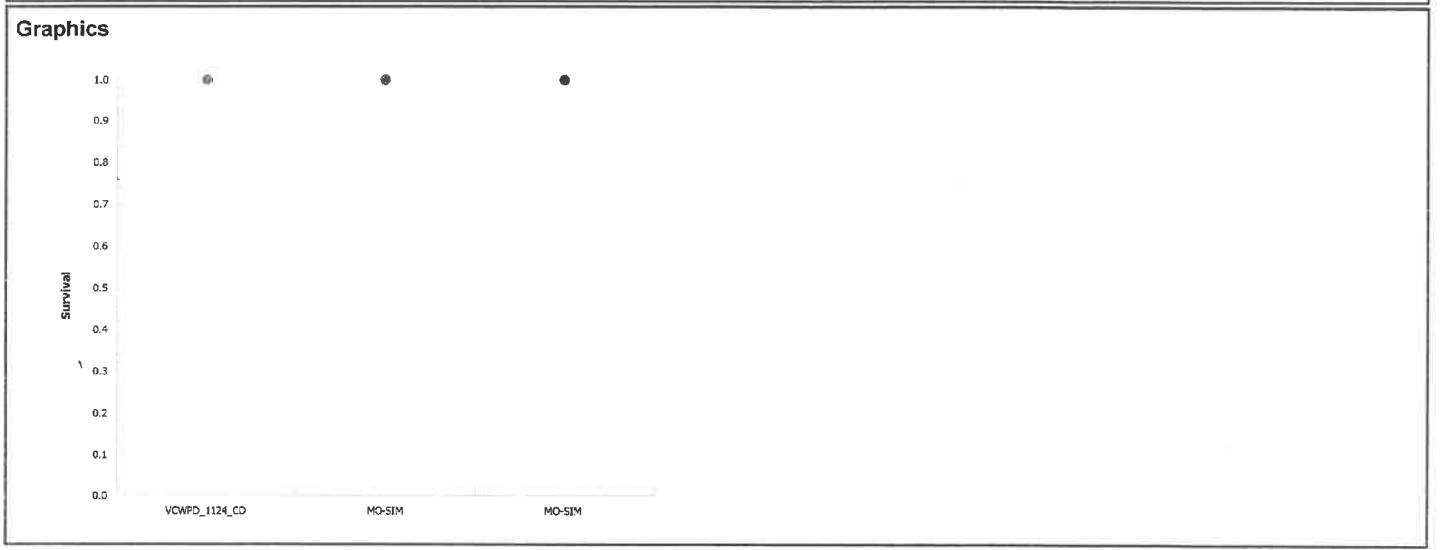
Analysis ID: 18-7563-5106 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 14:17 Analysis: Single 2x2 Contingency Table Official Results: Yes

Fisher Exact Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-SIM	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
VCWPD_1124_CD	LW	10	0	10	1	0	0.0%
MO-SIM		9	0	9	1	0	0.0%



CETIS Analytical Report

Report Date: 06 Dec-18 14:18 (p 3 of 4)
 Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 18-4248-6037 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 14:17 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-SIM passed reproduction	13.23%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-SIM	-1.2	1.74	3.74	17	CDF	0.8773	Non-Significant Effect

ANOVA Table

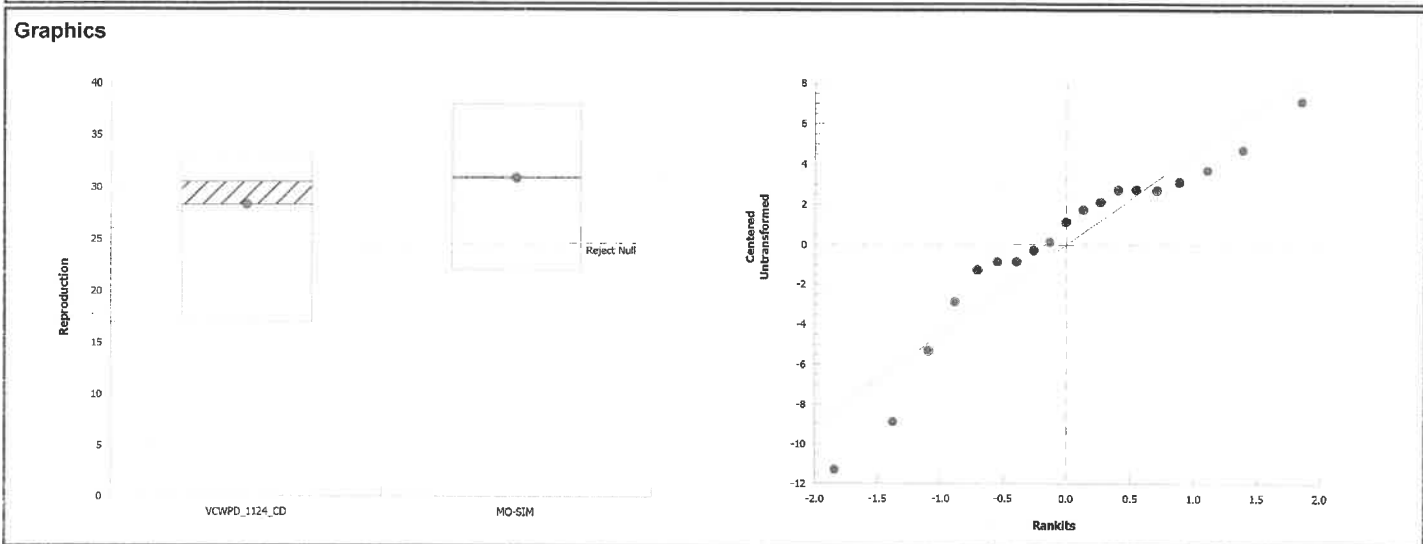
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	31.748	31.748	1	1.45	0.2455	Non-Significant Effect
Error	372.989	21.9405	17			
Total	404.737		18			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.25	7.34	0.7623	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.91	0.861	0.0754	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_CD	LW	10	28.3	24.8	31.8	30.5	17	33	1.56	17.39%	0.00%
MO-SIM		9	30.9	27.5	34.3	31	22	38	1.47	14.25%	-9.15%



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

Client: Ventura County Watershed Protection District Material: MO-SIM Test Date: 11/24/18
 Project #: 29434 Test ID: 80320 Randomization: 10-7-1 Control Water: Modified EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF					
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date	New WQ	Test Init. Time			
Lab Water Control	0	7.94		11.2		354	24.6	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/24/18	New WQ: TF	Test Init. Time: 11:13
	1	7.74	8.05	10.8	7.0	359	24.3	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/25/18	New WQ: KC	Counts: K6
	2	7.54	7.84	10.6	8.1	36.0	24.8	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/26/18	New WQ: DM	Counts: ER
	3	7.88	7.72	10.3	7.5	352	24.5	6	6	6	4	6	5	6	5	6	6	6	6	6	Date: 11/27/18	New WQ: TA	Counts: FB
	4	7.89	7.82	6.4	7.7	350	24.8	7	11	11	11	7	11	11	0	0	0	0	0	0	Date: 11/28/18	New WQ: TA	Counts: SV
	5	7.80	7.75	8.9	7.6	356	25.1	0	0	0	0	0	15	0	11	0	11	11	11	11	Date: 11/29/18	New WQ: SV	Counts: ER
	6	-	8.09	-	7.0	393	25.3	10	14	16	15	14	0	15	12	11	14	14	14	14	Date: 11/30/18	New WQ: -	Counts: 66
	7																				Date:	New WQ:	Counts:
	8																				Date:	Old WQ:	Time:
Total=								23	31	33	30	27	31	32	28	17	31	Mean Neonates/Female = 28.3					
100%	0	7.67		10.9		533	24.1	0	0	0	0	0	0	0	0	0	0	0	0	0	51388		
	1	7.61	7.80	10.4	7.1	546	24.0	0	0	0	0	0	0	0	0	0	0	0	0	0	51388		
	2	7.41	7.83	8.9	8.3	548	24.9	0	0	0	0	0	0	0	0	0	0	0	0	0	51388		
	3	7.48	7.66	8.3	7.8	541	24.4	2	2	3	4	2	4	6	4	5	4	4	4	4	51388		
	4	7.37	7.70	6.6	8.2	533	24.8	9	12	3	14	8	9	8	0	0	0	0	0	0	51388		
	5	7.09	7.60	6.7	7.7	552	24.9	0	18	7	0	0	0	0	12	13	12	12	12	12	51388		
	6	-	7.68	-	7.8	590	25.0	19	0	-	20	12	18	19	14	16	12	12	12	12	-		
	7																						
	8																						
Total=								30	32	26	38	22	31	33	30	34	28	Mean Neonates/Female = 30.9					

CETIS Analytical Report

Report Date: 06 Dec-18 14:18 (p 4 of 4)
 Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

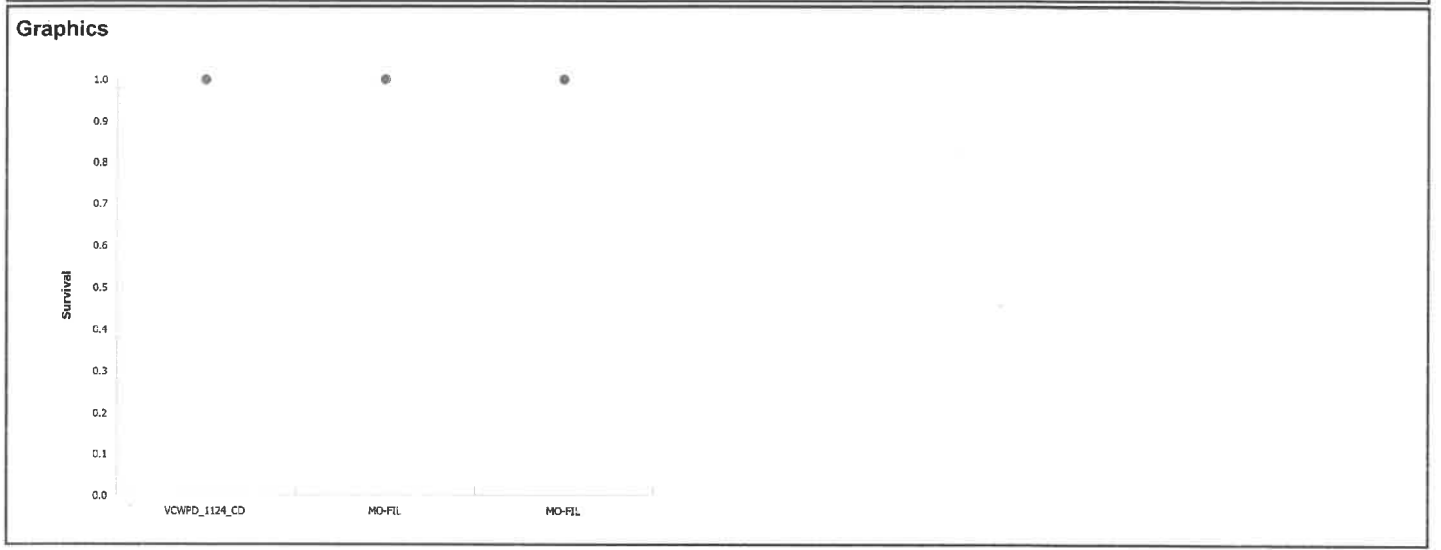
Analysis ID: 14-4960-6467 Endpoint: Survival CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 14:17 Analysis: Single 2x2 Contingency Table Official Results: Yes

Fisher Exact Test

Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-FIL	1.000	Exact	1.0000	Non-Significant Effect

Data Summary

Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
VCWPD_1124_CD	LW	10	0	10	1	0	0.0%
MO-FIL		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 06 Dec-18 14:18 (p 4 of 4)
 Test Code: VCWPD_1124_CD | 20-3234-3150

Ceriodaphnia Survival and Reproduction Test **Pacific EcoRisk**

Analysis ID: 08-9184-2602 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 14:17 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-FIL failed reproduction	18.04%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-FIL*	4.31	1.73	5.11	18	CDF	2.1E-04	Significant Effect

ANOVA Table

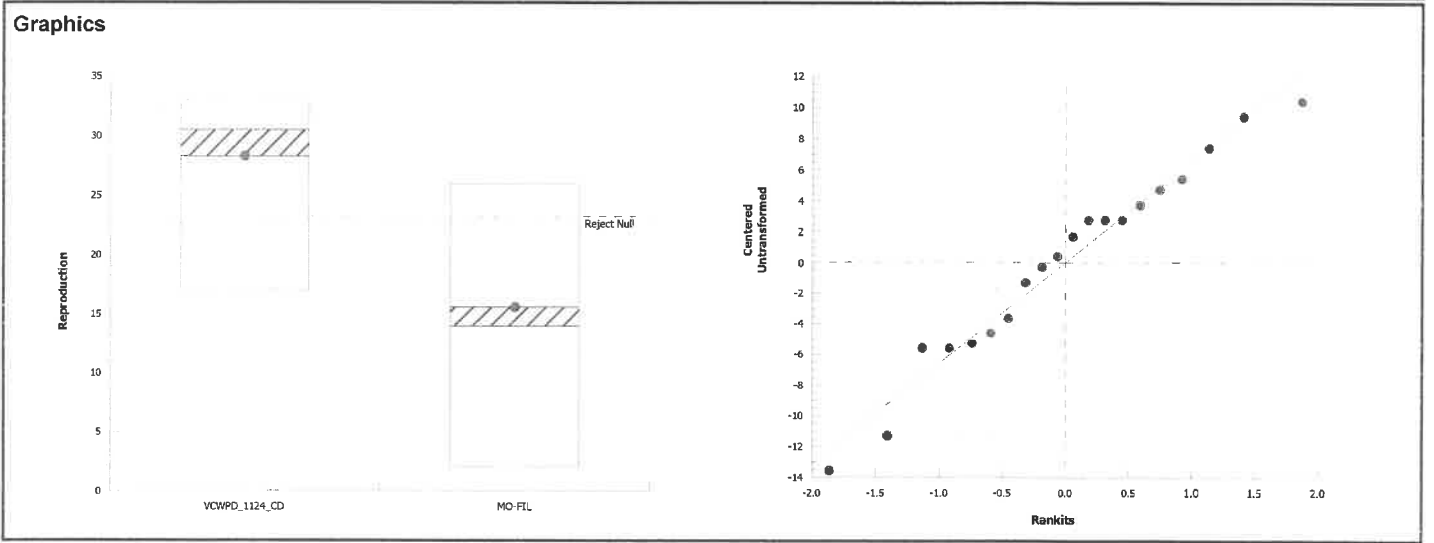
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	806.45	806.45	1	18.6	4.2E-04	Significant Effect
Error	780.5	43.3611	18			
Total	1586.95		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.58	6.54	0.1744	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.969	0.866	0.7331	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_CD	LW	10	28.3	24.8	31.8	30.5	17	33	1.56	17.39%	0.00%
MO-FIL		10	15.6	9.95	21.3	14	2	26	2.5	50.67%	44.88%



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

Client: Ventura County Watershed Protection District Material: MO-FIL Test Date: 11/24/18
 Project #: 29434 Test ID: 80321 Randomization: 10.7.1 Control Water: Modified EPAMH

	Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF						
		New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init.:				
Lab Water Control	0	7.94		11.2		354	24.6	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/24/18	New WQ: TF	Test Init.: TF	
	1	7.74	8.05	10.8	7.0	359	24.3	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/25/18	New WQ: KC	Counts: KB	
	2	7.59	7.84	10.6	8.1	360	24.8	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 11/26/18	New WQ: CM	Counts: ER	
	3	7.88	7.72	10.3	7.5	352	24.5	6	6	6	4	6	5	6	5	6	6	6	6	6	Date: 11/27/18	New WQ: TA	Counts: JB	
	4	7.89	7.82	6.4	7.7	350	24.8	7	11	11	11	7	11	11	0	0	0	0	0	0	Date: 11/28/18	New WQ: TA	Counts: BV	
	5	7.80	7.75	8.9	7.6	350	25.1	0	0	0	0	0	15	0	11	0	11	0	11	0	Date: 11/29/18	New WQ: SVJ	Counts: ER	
	6	—	8.09	—	7.0	393	25.3	10	14	16	15	14	0	15	12	11	14	0	14	0	Date: 11/30/18	New WQ: —	Counts: RB	
	7																					Date:	New WQ:	Counts:
	8																					Date:	Old WQ:	Time:
Total=								23	31	33	30	27	31	32	28	17	31	Mean Neonates/Female = 28.3						
100%	0	7.72		10.6		189	24.3	0	0	0	0	0	0	0	0	0	0	0	0	0			51389	
	1	7.59	7.50	10.1	7.5	192	24.8	0	0	0	0	0	0	0	0	0	0	0	0	0			51389	
	2	7.70	7.66	9.3	8.2	195	24.6	0	0	0	0	0	0	0	0	0	0	0	0	0			51389	
	3	7.36	7.36	8.5	8.0	194	24.2	4	3	1	2	1	0	0	1	0	0	0	0	0			51389	
	4	7.18	7.10 7.70	6.5	8.2	190	25.1	0	7	0	0	0	0	0	0	0	0	0	0	4			51389	
	5	7.12	7.68	7.2	8.1	198	24.5	0	0	0	0	0	0	8	10	9	7	0	0	0			51389	
	6	—	7.57	—	8.1	212	25.4	12	0	10	0	11	10	15	15	16	10	0	0	0			←	
	7																							
	8																							
Total=								16	10	11	2	12	10	23	26	25	21	Mean Neonates/Female = 15.6						

CETIS Summary Report

Report Date: 12 Dec-18 14:43 (p 1 of 1)
 Test Code: VCWPD_1201_CD | 06-5067-2466

Ceriodaphnia Survival and Reproduction Test											Pacific EcoRisk
Batch ID:	12-1902-0351	Test Type:	Reproduction-Survival (7d)				Analyst:	Stevi Vasquez			
Start Date:	01 Dec-18 15:57	Protocol:	EPA-821-R-02-013 (2002)				Diluent:	Not Applicable			
Ending Date:	07 Dec-18 16:00	Species:	Ceriodaphnia dubia				Brine:	Not Applicable			
Duration:	6d 0h	Source:	In-House Culture				Age:	1			
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
VCWPD_1201_CD	15-4630-7096	01 Dec-18 15:57	01 Dec-18 15:57	n/a (25 °C)	Ventura County Watersh	29434					
MO-THO	13-5932-8412	29 Nov-18 14:15	30 Nov-18 14:15	50h (0.8 °C)							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
VCWPD_1201_CD	Lab Water	Ventura County Watershed Prote	LABQA								
MO-THO	Ambient Water	Ventura County Watershed Prote	MO-THO								
Single Comparison Summary											
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result							
18-8548-5358	Reproduction	Equal Variance t Two-Sample Test	0.0566	MO-THO passed reproduction							
09-6458-6457	Survival	Fisher Exact Test	1.0000	MO-THO passed survival							
Reproduction Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1201_CD	LW	10	34.9	32.7	37.1	29	39	0.983	3.11	8.90%	0.00%
MO-THO		10	32.9	31.3	34.5	30	37	0.69	2.18	6.64%	5.73%
Survival Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1201_CD	LW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
MO-THO		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
Reproduction Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
VCWPD_1201_CD	LW	30	29	37	36	36	36	36	39	36	34
MO-THO		33	34	30	34	31	31	35	33	31	37
Survival Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
VCWPD_1201_CD	LW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
MO-THO		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Survival Binomials											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
VCWPD_1201_CD	LW	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
MO-THO		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

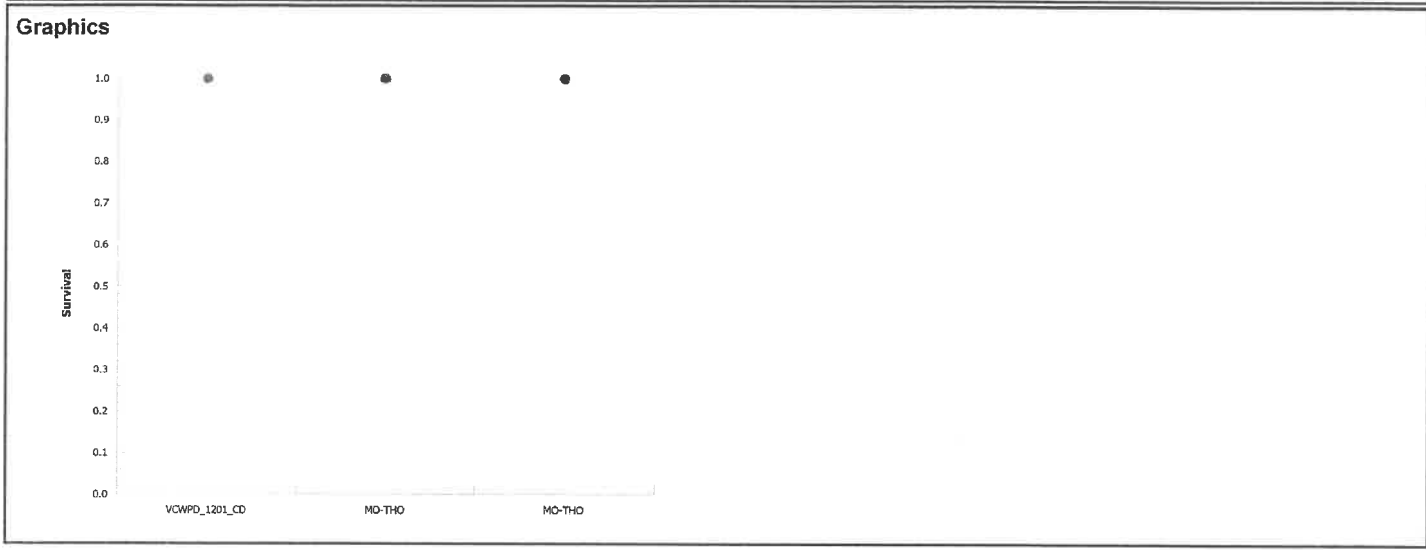
Report Date: 12 Dec-18 14:43 (p 1 of 1)
 Test Code: VCWPD_1201_CD | 06-5067-2466

Ceriodaphnia Survival and Reproduction Test	Pacific EcoRisk
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Analysis ID: 09-6458-6457	Endpoint: Survival	CETIS Version: CETISv1.9.2
Analyzed: 12 Dec-18 14:41	Analysis: Single 2x2 Contingency Table	Official Results: Yes

Fisher Exact Test						
Sample I	vs	Sample II	Test Stat	P-Type	P-Value	Decision(α :5%)
Lab Water Control		MO-THO	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Sample	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
VCWPD_1201_CD	LW	10	0	10	1	0	0.0%
MO-THO		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 12 Dec-18 14:43 (p 1 of 1)
 Test Code: VCWPD_1201_CD | 06-5067-2466

Ceriodaphnia Survival and Reproduction Test Pacific EcoRisk

Analysis ID: 18-8548-5358 Endpoint: Reproduction CETIS Version: CETISv1.9.2
 Analyzed: 12 Dec-18 14:43 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-THO passed reproduction	5.97%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-THO	1.67	1.73	2.08	18	CDF	0.0566	Non-Significant Effect

ANOVA Table

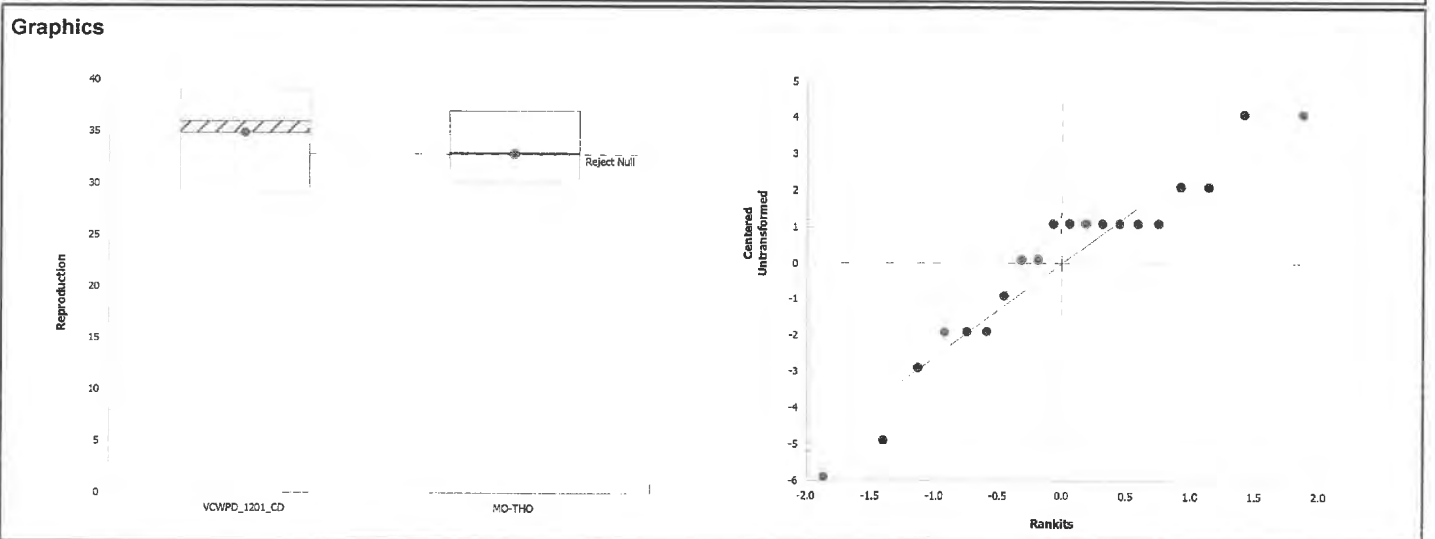
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	20	20	1	2.77	0.1131	Non-Significant Effect
Error	129.8	7.21111	18			
Total	149.8		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.03	6.54	0.3078	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.926	0.866	0.1301	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1201_CD	LW	10	34.9	32.7	37.1	36	29	39	0.983	8.90%	0.00%
MO-THO		10	32.9	31.3	34.5	33	30	37	0.69	6.64%	5.73%



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

Client: Ventura County Watershed Protection District Material: Lab Water Control Test Date: 12/11/18
 Project #: 29434 Test ID: 80319 Randomization: 10.4.9 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										SIGN-OFF					
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J	Date:	New WQ:	Test Init:			
0	7.84		8.6		352	25.0	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/11/18	New WQ: JR	Test Init: JR
1	7.64	7.86	7.7	7.9	352	24.1	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/12/18	New WQ: SAT	Counts: JCF
2	7.92	8.10	8.7	7.7	354	24.5	0	0	0	0	0	0	0	0	0	0	0	0	0	Date: 12/15/18	New WQ: MWL	Counts: JB
3	7.87	7.63	8.8	7.4	363	25.9	5	5	6	6	5	6	6	8	6	5				Date: 12/14/18	New WQ: TA	Counts: JG
4	7.84	7.66	7.9	7.1	357	25.0	10	10	0	10	0	12	13	13	0	0				Date: 12/5/18	New WQ: JR	Counts: JB
5	8.13	7.57	7.9	6.7	365	24.6	0	0	12	0	12	0	0	0	13	13				Date: 12/11/18	New WQ: JLL	Counts: TF
6	-	7.89	-	5.4	385	24.8	15	14	19	20	19	18	17	18	17	16				Date: 12/17/18	New WQ: JR	Counts: TK
7																				Date:	New WQ:	Counts:
8																				Date:	Old WQ:	Counts:
Total=							30	29	37	36	36	36	30	39	34	34	Mean Neonates/Female = 35.0 34.9					

30
37
12/11/18

SVV 12/12/18

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

Client: Ventura County Watershed Protection District Material: MO-THO Test Date: 12/1/18
 Project #: 29434 Test ID: 80319 Randomization: 10.4.9 Control Water: Mod EPAMH

Day	pH		D.O.		Cond. (µS/cm)	Temp (°C)	Survival / Reproduction										Sample ID	
	New	Old	New	Old			A	B	C	D	E	F	G	H	I	J		
0	7.67		10.4		515	25.4	0	0	0	0	0	0	0	0	0	0	0	51495
1	7.55	7.87	8.9	7.8	512	24.1	0	0	0	0	0	0	0	0	0	0	0	51495
2	7.64	7.99	10.4	8.0	514	24.7	0	0	0	0	0	0	0	0	0	0	0	51495
3	7.65	7.70	9.3	7.7	502	25.7	8	6	6	11	5	5	6	6	3	7	51495	
4	7.64	7.65	8.9	6.9	517	25.7	0	0	8	2	0	10	0	8	0	1	51495	
5	7.85	7.66	9.2	7.2	522	24.4	10	11	0	12	10	0	11	0	11	12	51495	
6	-	7.79	-	5.7	571	24.4	15	17	16	19	16	16	18	19	17	17	-	
7																		
8																		
Total=							33	34	30	34	31	31	35	33	31	37	37	Mean Neonates/Female = 32.9

Appendix F

Test Data and Summary of Statistics for the Evaluation of the Chronic Toxicity of the VCWPD Stormwater to Fathead Minnows

CETIS Summary Report

Report Date: 06 Dec-18 11:43 (p 1 of 2)
 Test Code: VCWPD_1124_PP | 12-2924-2791

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

Batch ID: 07-5632-3219	Test Type: Growth-Survival (7d)	Analyst: Stevi Vasquez
Start Date: 24 Nov-18 11:27	Protocol: EPA-821-R-02-013 (2002)	Diluent: Not Applicable
Ending Date: 01 Dec-18 08:17	Species: Pimephales promelas	Brine: Not Applicable
Duration: 6d 21h	Source: Aquatox, AR	Age: 1

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
VCWPD_1124_PP	02-1466-0048	24 Nov-18 11:27	24 Nov-18 11:27	n/a (24.9 °C)	Ventura County Watersh	29434
MO-CAM	06-9311-9853	21 Nov-18 22:35	23 Nov-18 08:02	61h (0 °C)		
MO-OJA	13-4924-9051	21 Nov-18 23:15	23 Nov-18 08:02	60h (0 °C)		
MO-MEI	15-7267-6340	22 Nov-18 00:20	23 Nov-18 08:02	59h (0 °C)		
MO-OXN	07-1416-6586	21 Nov-18 23:40	23 Nov-18 08:02	60h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
VCWPD_1124_PP	Lab Water	Ventura County Watershed Prote	LABQA	
MO-CAM	Ambient Water	Ventura County Watershed Prote	MO-CAM	
MO-OJA	Ambient Water	Ventura County Watershed Prote	MO-OJA	
MO-MEI	Ambient Water	Ventura County Watershed Prote	MO-MEI	
MO-OXN	Ambient Water	Ventura County Watershed Prote	MO-OXN	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result
06-1891-6906	7d Survival Rate	Equal Variance t Two-Sample Test	0.0166	MO-CAM failed 7d survival rate
13-0983-7195	7d Survival Rate	Equal Variance t Two-Sample Test	4.6E-04	MO-OJA failed 7d survival rate
06-3697-6362	7d Survival Rate	Equal Variance t Two-Sample Test	0.0519	MO-MEI passed 7d survival rate
12-0686-5588	7d Survival Rate	Equal Variance t Two-Sample Test	0.0961	MO-OXN passed 7d survival rate
02-0593-7827	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	4.2E-05	MO-CAM failed mean dry biomass-mg
03-9675-4352	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	1.1E-05	MO-OJA failed mean dry biomass-mg
11-7812-1469	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	1.9E-04	MO-MEI failed mean dry biomass-mg
20-2469-8603	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	4.3E-04	MO-OXN failed mean dry biomass-mg

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1124_PP	LW	4	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
MO-CAM		4	0.775	0.503	1.000	0.600	1.000	0.085	0.171	22.04%	22.50%
MO-OJA		4	0.575	0.303	0.847	0.400	0.800	0.085	0.171	29.70%	42.50%
MO-MEI		4	0.850	0.574	1.000	0.600	1.000	0.087	0.173	20.38%	15.00%
MO-OXN		4	0.900	0.675	1.000	0.700	1.000	0.071	0.141	15.71%	10.00%

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1124_PP	LW	4	1	0.834	1.17	0.867	1.12	0.0525	0.105	10.49%	0.00%
MO-CAM		4	0.379	0.249	0.508	0.275	0.474	0.0407	0.0815	21.53%	62.17%
MO-OJA		4	0.233	0.111	0.355	0.145	0.328	0.0383	0.0766	32.91%	76.74%
MO-MEI		4	0.463	0.292	0.633	0.33	0.577	0.0537	0.107	23.19%	53.75%
MO-OXN		4	0.532	0.354	0.709	0.449	0.693	0.0557	0.111	20.97%	46.88%

CETIS Summary Report

Report Date: 06 Dec-18 11:43 (p 2 of 2)

Test Code: VCWPD_1124_PP | 12-2924-2791

Chronic Larval Fish Survival and Growth Test						Pacific EcoRisk
7d Survival Rate Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	
VCWPD_1124_PP	LW	1.000	1.000	1.000	1.000	
MO-CAM		1.000	0.800	0.600	0.700	
MO-OJA		0.800	0.500	0.600	0.400	
MO-MEI		1.000	0.900	0.900	0.600	
MO-OXN		0.900	0.700	1.000	1.000	
Mean Dry Biomass-mg Detail						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	
VCWPD_1124_PP	LW	0.993	1.12	1.02	0.867	
MO-CAM		0.474	0.388	0.275	0.377	
MO-OJA		0.328	0.249	0.209	0.145	
MO-MEI		0.577	0.515	0.429	0.33	
MO-OXN		0.467	0.449	0.693	0.517	
7d Survival Rate Binomials						
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	
VCWPD_1124_PP	LW	10/10	10/10	10/10	10/10	
MO-CAM		10/10	8/10	6/10	7/10	
MO-OJA		8/10	5/10	6/10	4/10	
MO-MEI		10/10	9/10	9/10	6/10	
MO-OXN		9/10	7/10	10/10	10/10	

CETIS Analytical Report

Report Date: 06 Dec-18 11:43 (p 1 of 8)

Test Code: VCWPD_1124_PP | 12-2924-2791

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

Analysis ID: 06-1891-6906 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:38 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	MO-CAM failed 7d survival rate	13.73%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-CAM*	2.75	1.94	0.221	6	CDF	0.0166	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.195833	0.195833	1	7.58	0.0332	Significant Effect
Error	0.155012	0.0258353	6			
Total	0.350845		7			

Distributional Tests

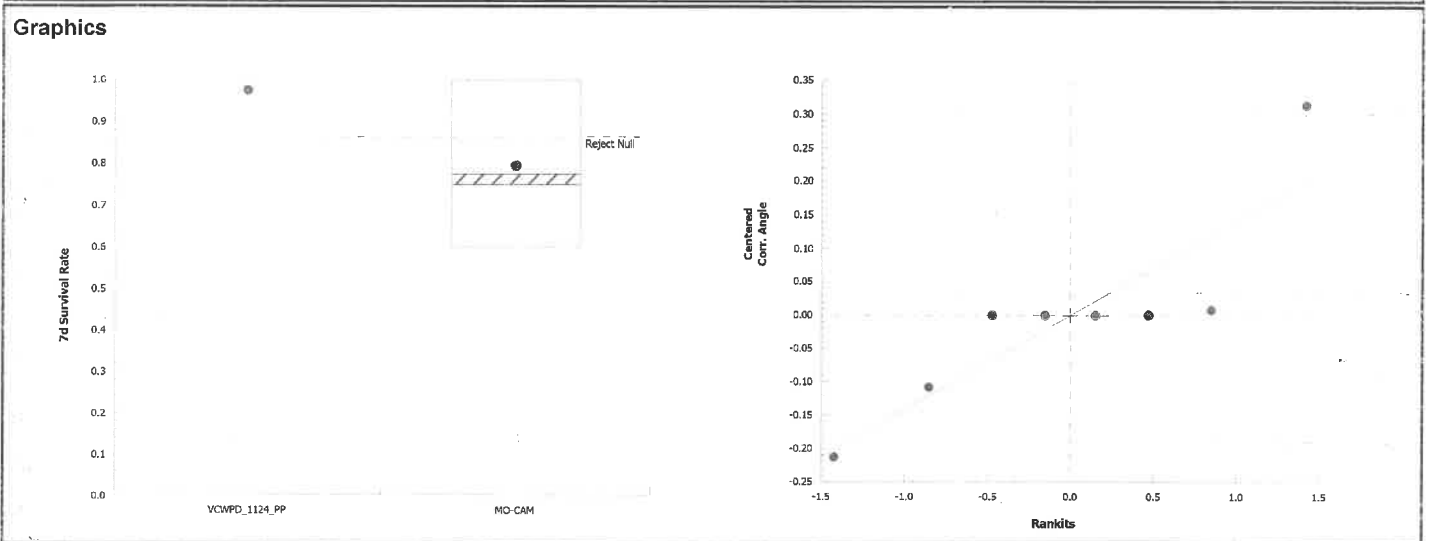
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	5.94	13.7	0.0506	Equal Variances
Variances	Mod Levene Equality of Variance Test	4.99	13.7	0.0670	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.813	0.645	0.0390	Normal Distribution

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
MO-CAM		4	0.775	0.503	1.000	0.750	0.600	1.000	0.085	22.04%	22.50%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%
MO-CAM		4	1.1	0.737	1.46	1.05	0.886	1.41	0.114	20.68%	22.16%



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

Analysis ID: 02-0593-7827 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:41 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-CAM failed mean dry biomass-mg	12.90%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-CAM*	9.36	1.94	0.129	6	CDF	4.2E-05	Significant Effect

ANOVA Table

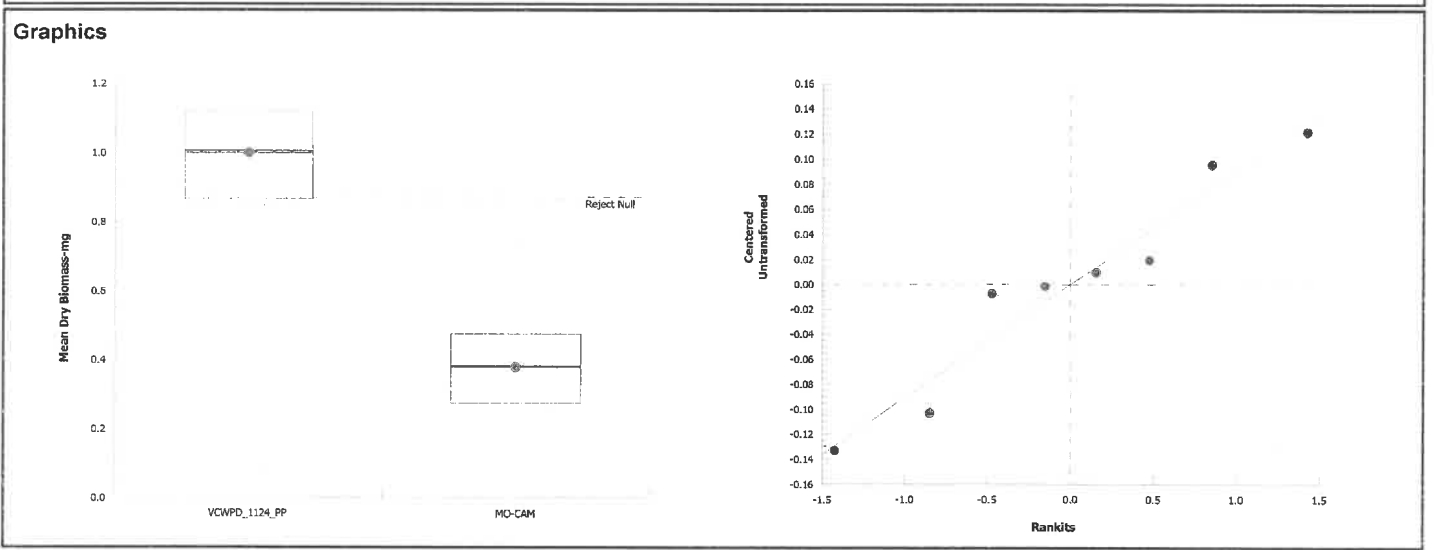
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.773768	0.773768	1	87.7	8.4E-05	Significant Effect
Error	0.0529455	0.0088243	6			
Total	0.826714		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.66	47.5	0.6883	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.936	0.645	0.5697	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.01	0.834	1.17	1.01	0.867	1.12	0.0525	10.49%	0.00%
MO-CAM		4	0.379	0.249	0.508	0.383	0.275	0.474	0.0407	21.53%	62.17%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Ventura County Watershed Protection District Organism Log#: 11303 Age: <48hr
 Test Material: MO-CAM Organism Supplier: Aquatox
 Test ID#: 80312 Project #: 29434 Control: EPAMH
 Test Date: 11/24/18 Randomization: 4.5.12 Control Water Batch: 212

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water Control	24.9	8.16		9.1		301	10	10	10	10	Date: 11/24/18 Test Solution Prep: JL
100%	25.0	7.23		10.5		605	10	10	10	10	Sample ID: 51381 Initiation Time: 1127
Meter ID	108A	PH24		RD10		EC10	New WQ: RB				Initiation Signoff: RB
Lab Water Control	24.8	7.96	7.93	8.8	6.6	309	10	10	10	10	Date: 11/25/18 Test Solution Prep: JL
100%	24.5	7.08	7.00	10.8	2.3	615	10	10	8	9	Sample ID: 51381 Renewal Time: 1040
Meter ID	109A	PH19	PH24	RD10	RD13	EC10	New WQ: KL		Old WQ: DH		Renewal Signoff: KB
Lab Water Control	24.4	7.95	7.89	8.9	8.0	303	10	10	10	10	Date: 11/26/18 Test Solution Prep: ER
100%	24.3	7.03	7.34	9.4	6.0	614	10	10	8	9	Sample ID: 51381 Renewal Time: 1250
Meter ID	PH18B1A	PH19	PH19	RD10	RD10	EC10	New WQ: JK		Old WQ: TV		Renewal Signoff: KB
Lab Water Control	24.4	7.85	7.65	8.4	8.2	300	10	10	10	10	Date: 11/27/18 Test Solution Prep: TF
100%	24.3	7.01	7.40	9.5	6.6	609	10	10	8	9	Sample ID: 51381 Renewal Time: 1029
Meter ID	81A	PH25	PH25	RD10	RD10	EC10	New WQ: TA		Old WQ: TA		Renewal Signoff: TF
Lab Water Control	25.2	7.86	7.67	8.5	7.3	308	10	10	10	10	Date: 11/28/18 Test Solution Prep: NB
100%	25.1	6.67	7.47	7.4	6.5	392	10	10	8	9	Sample ID: 51381 Renewal Time: 1113
Meter ID	107A	PH15	PH25	RD13	RD11	EC13	New WQ: SAT		Old WQ: SAT		Renewal Signoff: LZ
Lab Water Control	24.7	8.09	7.76	8.4	8.1	297	10	10	10	10	Date: 11/29/18 Test Solution Prep: ER
100%	24.7	6.49	7.43	7.4	6.6	603	10	10	8	9	Sample ID: 51381 Renewal Time: 1537
Meter ID	81A	PH15	PH19	RD10	RD10	EC10	New WQ: TA		Old WQ: TA		Renewal Signoff: KB
Lab Water Control	24.7	7.95	8.06	8.0	8.3	304	10	10	10	10	Date: 11/30/18 Test Solution Prep: KL
100%	24.7	6.69	7.78	7.3	7.3	596	10	10	8	9	Sample ID: 51381 Renewal Time: 1533
Meter ID	102A	PH19	PH24	RD13	RD11	EC13	New WQ: LZ		Old WQ: TA		Renewal Signoff: MW
Lab Water Control	24.6		7.80		6.7	321	10	10	10	10	Date: 12/1/18 Termination Time: 0817
100%	24.5		7.49		6.8	632	10	8	6	7	Termination Signoff: TF
Meter ID	81A		PH24		RD13	EC13			Old WQ: JR		

Fathead Minnow Dry Weight Data Sheet

Client: Ventura County Water Protection District Test ID #: 80312 Project #: 29434
 Test Material: MO-CAM Tare Weight Date: 11/28/18 Sign-off: TA
 Test Date: 11/24/18 Final Weight Date: 12-4-18 Sign-off: AR

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	414.87	424.80	10	0.993
2	Control	B	411.65	422.87	10	1.12
3		C	409.77	419.97	10	1.02
4		D	409.68	418.35	10	0.867
5	100%	A	412.12	416.86	10	0.474
6		B	410.12	414.00	10	0.388
7		C	418.52	421.27	10	0.275
8		D	411.27	415.04	10	0.377
QA1			412.31	412.32		
Balance ID:			Bal 04	Bal 04		

CETIS Analytical Report

Report Date: 06 Dec-18 11:43 (p 2 of 8)

Test Code: VCWPD_1124_PP | 12-2924-2791

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 13-0983-7195	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 06 Dec-18 11:39	Analysis: Parametric-Two Sample	Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	MO-OJA failed 7d survival rate	10.77%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-OJA*	6.05	1.94	0.176	6	CDF	4.6E-04	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.596626	0.596626	1	36.6	9.3E-04	Significant Effect
Error	0.0979151	0.0163192	6			
Total	0.694541		7			

Distributional Tests

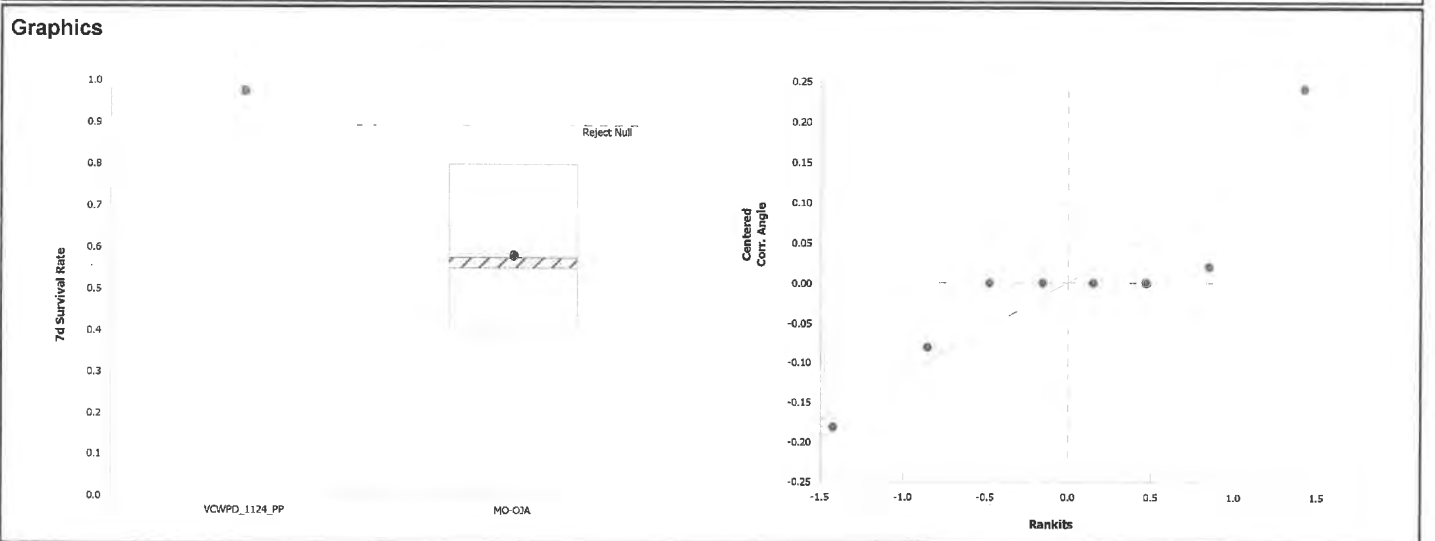
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	6.96	13.7	0.0387	Equal Variances
Variances	Mod Levene Equality of Variance Test	6.2	13.7	0.0472	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.844	0.645	0.0824	Normal Distribution

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
MO-OJA		4	0.575	0.303	0.847	0.550	0.400	0.800	0.085	29.70%	42.50%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%
MO-OJA		4	0.866	0.578	1.15	0.836	0.685	1.11	0.0903	20.87%	38.68%



CETIS Analytical Report

Report Date: 06 Dec-18 11:43 (p 6 of 8)

Test Code: VCWPD_1124_PP | 12-2924-2791

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 03-9675-4352 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:41 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-OJA failed mean dry biomass-mg	12.61%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-OJA*	11.8	1.94	0.126	6	CDF	1.1E-05	Significant Effect

ANOVA Table

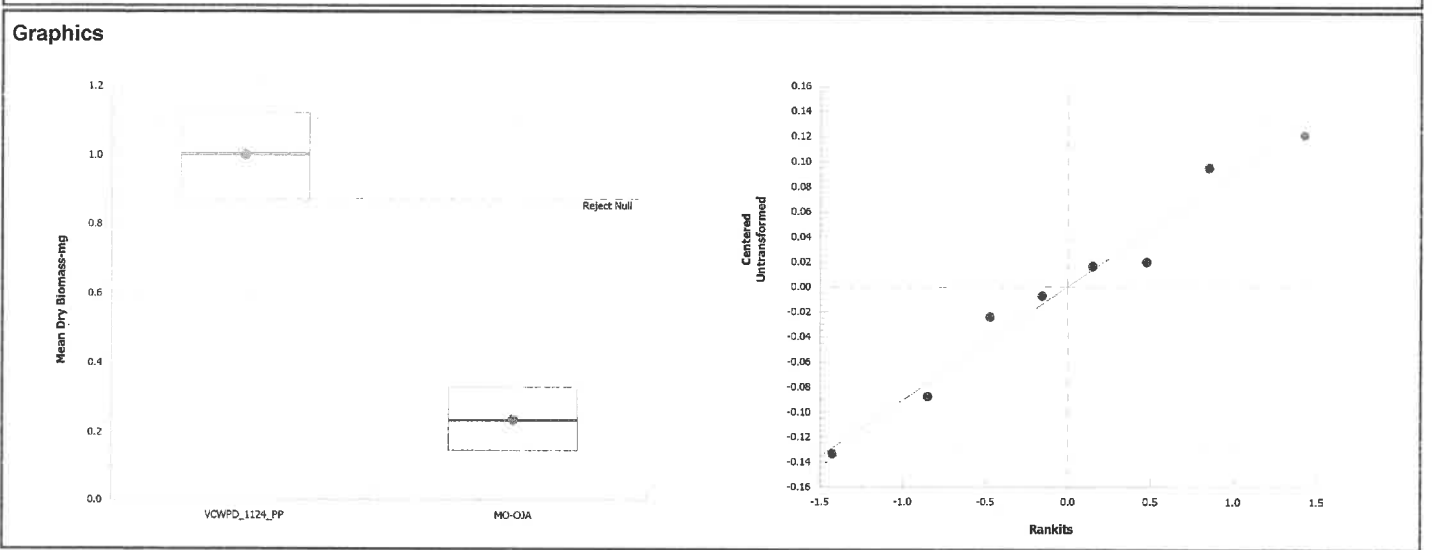
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.17888	1.17888	1	140	2.2E-05	Significant Effect
Error	0.0506219	0.008437	6			
Total	1.2295		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.88	47.5	0.6183	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.966	0.645	0.8614	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1	0.834	1.17	1.01	0.867	1.12	0.0525	10.49%	0.00%
MO-OJA		4	0.233	0.111	0.355	0.229	0.145	0.328	0.0383	32.91%	76.74%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Ventura County Watershed Protection District Organism Log#: 11303 Age: 248hr
 Test Material: MO-OJA Organism Supplier: Aquatic
 Test ID#: 80313 Project #: 29434 Control: EPAMH
 Test Date: 11/24/18 Randomization: 45:12 Control Water Batch: 2121

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water Control	24.9	8.16		9.1		301	10	10	10	10	Date: 11/24/18 Test Solution Prep: JL
100%	24.8	7.36		9.7		371	10	10	10	10	Sample ID: 51382 Initiation Time: 1127
Meter ID	68A	PH24		RD10		EC10	New WQ: R6				Initiation Signoff: R6
Lab Water Control	24.8	7.96	7.93	8.8	6.8	309	10	10	10	10	Date: 11/25/18 Test Solution Prep: JL
100%	24.1	7.11	7.00	9.5	2.8	381	8	5	8	7	Sample ID: 51382 Renewal Time: 1040
Meter ID	109A	PH19	PH24	RD10	RD13	EC10	New WQ: 15C	Old WQ: DA			Renewal Signoff: K6
Lab Water Control	24.4	7.95	7.89	8.9	8.0	303	10	10	10	10	Date: 11/26/18 Test Solution Prep: ER
100%	24.1	7.03	7.36	7.5	6.7	384	8	5	7	7	Sample ID: 51382 Renewal Time: 1250
Meter ID	81A	PH19	PH19	RD10	RD10	EC10	New WQ: SF	Old WQ: TK			Renewal Signoff: K6
Lab Water Control	24.4	7.85	7.65	8.4	8.2	300	10	10	10	10	Date: 11/27/18 Test Solution Prep: TF
100%	24.2	6.99	7.47	8.5	7.2	383	8	5	7	5	Sample ID: 51382 Renewal Time: 1029
Meter ID	81A	PH25	PH25	RD10	RD10	EC10	New WQ: TA	Old WQ: TA			Renewal Signoff: TF
Lab Water Control	25.2	7.86	7.67	8.5	7.3	305	10	10	10	10	Date: 11/28/18 Test Solution Prep: NB
100%	24.9	6.72	7.45	6.8	6.2	394 ^{LB} 536 ^{LB} 1138	8	5	6	4	Sample ID: 51382 Renewal Time: 1113
Meter ID	107A	PH15	PH25	RD13	RD11	EC13	New WQ: SAT	Old WQ: SAT			Renewal Signoff: LB
Lab Water Control	24.7	8.09	7.76	8.4	8.1	297	10	10	10	10	Date: 11/29/18 Test Solution Prep: ER
100%	24.6	6.70	7.43	7.7	6.7	390	8	5	6	4	Sample ID: 51382 Renewal Time: 1537
Meter ID	81A	PH15	PH19	RD10	RD10	EC10	New WQ: TB	Old WQ: TA			Renewal Signoff: K6
Lab Water Control	24.7	7.95	8.06	8.0	8.3	304	10	10	10	10	Date: 11/30/18 Test Solution Prep: KL
100%	24.6	6.81	7.85	8.6	7.4	400	8	5	6	4	Sample ID: 51382 Renewal Time: 1533
Meter ID	102A	PH19	PH24	RD13	RD11	EL13	New WQ: LB	Old WQ: TA			Renewal Signoff: MW
Lab Water Control	24.6		7.80		6.7	321	10	10	10	10	Date: 12/1/18 Termination Time: 0817
100%	24.6		7.62		6.7	428	8	5	6	4	Termination Signoff: TF
Meter ID	81A		PH24		RD13	EC13					Old WQ: SR

Fathead Minnow Dry Weight Data Sheet

Client: Ventura County Water Protection District Test ID #: 80313 Project #: 29434
 Test Material: MO-OJA Tare Weight Date: 11/28/18 Sign-off: TA
 Test Date: 11/24/18 Final Weight Date: 12-4-18 Sign-off: AR

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	414.87	424.80	10	0.993
2	Control	B	411.65	422.87	10	1.12
3		C	409.77	419.97	10	1.02
4		D	409.68	418.35	10	0.867
9	100%	A	415.92	419.20	10	0.323
10		B	409.96	412.45	10	0.249
11		C	412.40	414.49	10	0.209
12		D	410.88	412.33	10	0.145
QA2			411.94	411.94		
Balance ID:			Bal 04	Bal 04		

CETIS Analytical Report

Report Date: 06 Dec-18 11:43 (p 3 of 8)
 Test Code: VCWPD_1124_PP | 12-2924-2791

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 06-3697-6362 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:39 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	MO-MEI passed 7d survival rate	13.40%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-MEI	1.92	1.94	0.216	6	CDF	0.0519	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0907124	0.0907124	1	3.67	0.1039	Non-Significant Effect
Error	0.148306	0.0247176	6			
Total	0.239018		7			

Distributional Tests

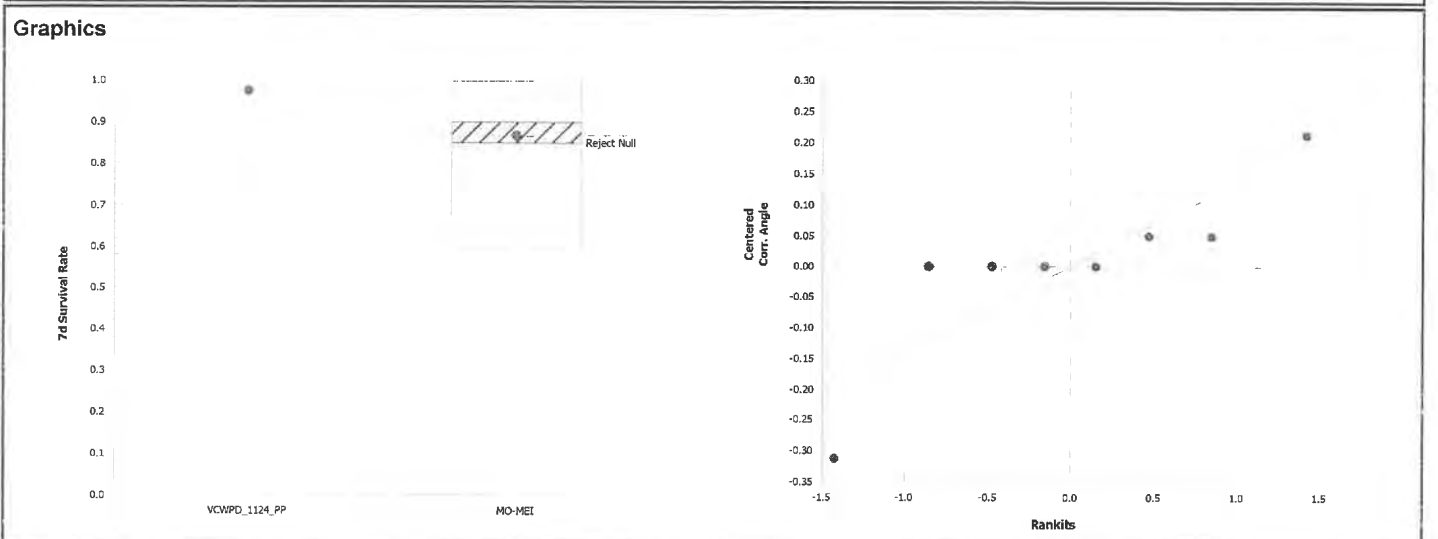
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	5.84	13.7	0.0522	Equal Variances
Variances	Mod Levene Equality of Variance Test	2.33	13.7	0.1780	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.792	0.645	0.0237	Normal Distribution

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
MO-MEI		4	0.850	0.574	1.000	0.900	0.600	1.000	0.087	20.38%	15.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%
MO-MEI		4	1.2	0.845	1.55	1.25	0.886	1.41	0.111	18.54%	15.08%



CETIS Analytical Report

Report Date: 06 Dec-18 11:43 (p 7 of 8)
 Test Code: VCWPD_1124_PP | 12-2924-2791

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 11-7812-1469 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:41 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-MEI failed mean dry biomass-mg	14.57%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-MEI*	7.17	1.94	0.146	6	CDF	1.9E-04	Significant Effect

ANOVA Table

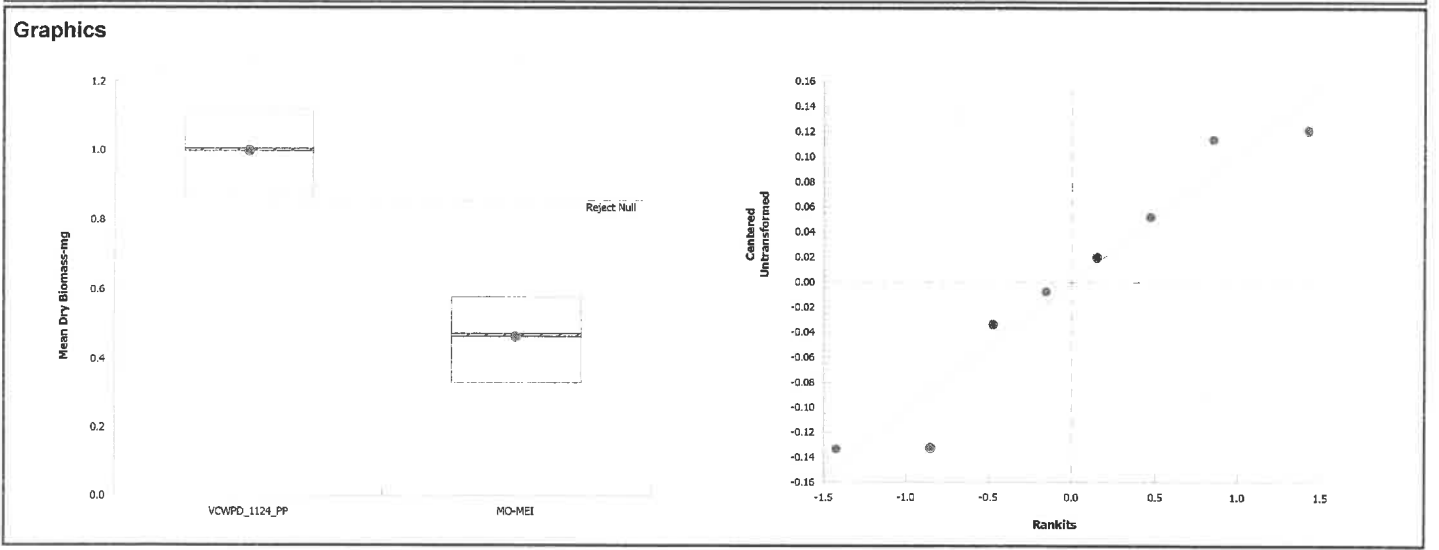
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.578351	0.578351	1	51.4	3.7E-04	Significant Effect
Error	0.0675646	0.0112608	6			
Total	0.645915		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.05	47.5	0.9713	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.918	0.645	0.4111	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1	0.834	1.17	1.01	0.867	1.12	0.0525	10.49%	0.00%
MO-MEI		4	0.463	0.292	0.633	0.472	0.33	0.577	0.0537	23.19%	53.75%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Ventura County Watershed Protection District Organism Log#: 11303 Age: L48hr
 Test Material: MO-MEI Organism Supplier: Aquatdx
 Test ID#: 80314 Project #: 29434 Control: EPAMH
 Test Date: 11/24/18 Randomization: 45.12 Control Water Batch: 2121

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water Control	24.9	8.16		9.1		301	10	10	10	10	Date: 11/24/18 Test Solution Prep: JL
100%	24.8	7.19		9.0		201	10	10	10	10	Sample ID: 51383 Initiation Time: 1127
Meter ID	608A	PH24		RD10		EC10	New WQ: R6				Initiation Signoff: R6
Lab Water Control	24.8	7.96	7.93	8.8	6.8	309	10	10	10	10	Date: 11/25/18 Test Solution Prep: JL
100%	24.4	7.01	7.04	9.0	3.6	206	10	9	9	B	Sample ID: 51383 Renewal Time: 1040
Meter ID	109A	PH19	PH24	RD10	RD13	EC10	New WQ: KL	Old WQ: DH			Renewal Signoff: KB
Lab Water Control	24.4	7.95	7.89	8.9	8.0	303	10	10	10	10	Date: 11/26/18 Test Solution Prep: ER
100%	24.1	7.00	7.29	7.6	6.7	208	10	9	9	B	Sample ID: 51383 Renewal Time: 1250
Meter ID	81A	PH16	PH19	RD10	RD10	EC10	New WQ: SF	Old WQ: TK			Renewal Signoff: KB
Lab Water Control	24.4	7.85	7.65	8.4	8.2	300	10	10	10	10	Date: 11/27/18 Test Solution Prep: TF
100%	24.2	6.86	7.36	8.5	6.5	207	10	9	9	8	Sample ID: 51383 Renewal Time: 1029
Meter ID	81A	PH25	PH25	RD10	RD10	EC10	New WQ: TA	Old WQ: TA			Renewal Signoff: JF
Lab Water Control	25.2	7.86	7.67	8.5	7.3	305	10	10	10	10	Date: 11/28/18 Test Solution Prep: NB
100%	24.8	6.67	7.45	7.1	6.1	213 235	10	9	9	7	Sample ID: 51383 Renewal Time: 1113
Meter ID	107A	PH15	PH25	RD13	RD11	EC13	New WQ: SAT	Old WQ: SAT			Renewal Signoff: LZ
Lab Water Control	24.7	8.09	7.76	8.4	8.1	297	10	10	10	10	Date: 11/29/18 Test Solution Prep: ER
100%	24.7	6.65	7.46	7.8	7.2	209	10	9	9	7	Sample ID: 51383 Renewal Time: 1537
Meter ID	81A	PH15	PH19	RD10	RD10	EC10	New WQ: TA	Old WQ: TA			Renewal Signoff: KB
Lab Water Control	24.7	7.95	8.06	8.0	8.3	304	10	10	10	10	Date: 11/30/18 Test Solution Prep: KL
100%	24.6	6.75	7.68	6.4	7.5	214	10	9	9	7	Sample ID: 51383 Renewal Time: 1533
Meter ID	102A	PH19	PH24	RD13	RD11	EC13	New WQ: LZ	Old WQ: TA			Renewal Signoff: MM
Lab Water Control	24.6		7.80		6.7	321	10	10	10	10	Date: 12/11/18 Termination Time: 0817
100%	24.5		7.46		6.7	229	10	9	9	6	Termination Signoff: TF
Meter ID	81A		PH24		RD13	EC13		Old WQ: SR			

Fathead Minnow Dry Weight Data Sheet

Client: Ventura County Water Protection District Test ID #: 80314 Project #: 29434
 Test Material: MO-MEI Tare Weight Date: 11/28/18 Sign-off: TA
 Test Date: 11/24/18 Final Weight Date: 12-4-18 Sign-off: AR

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	414.87	424.80	10	0.993
2	Control	B	411.65	422.87	10	0.867 ^{1.12}
3		C	409.77	419.97	10	1.02
4		D	409.68	418.35	10	0.867
13	100%	A	412.82	418.59	10	0.577
14		B	417.12	422.27	10	0.515
15		C	415.09	419.38	10	0.429
16		D	411.58	414.88	10	0.330
QA 1			412.31	412.32		
Balance ID:			Bal 04	Bal 04		

CETIS Analytical Report

Report Date: 06 Dec-18 11:43 (p 4 of 8)

Test Code: VCWPD_1124_PP | 12-2924-2791

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 12-0686-5588 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:39 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	MO-OXN passed 7d survival rate	11.88%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-OXN	1.47	1.94	0.193	6	CDF	0.0961	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0426072	0.0426072	1	2.16	0.1922	Non-Significant Effect
Error	0.118468	0.0197446	6			
Total	0.161075		7			

Distributional Tests

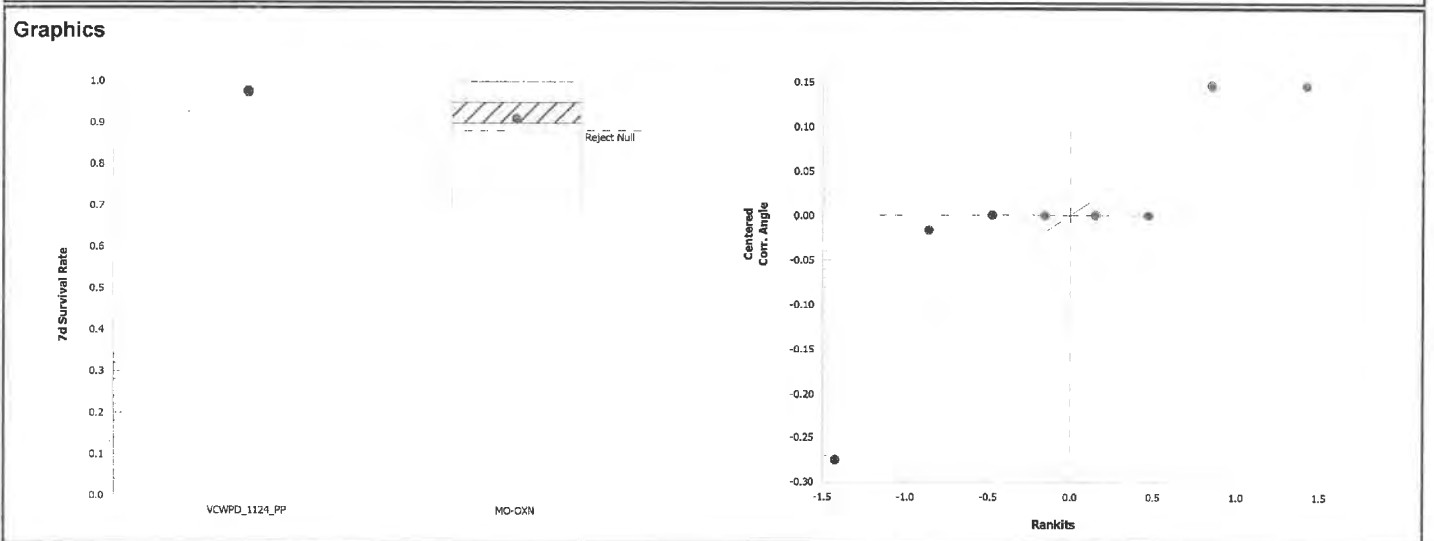
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	7.69	13.7	0.0323	Equal Variances
Variances	Mod Levene Equality of Variance Test	5.13	13.7	0.0642	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.791	0.645	0.0231	Normal Distribution

7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
MO-OXN		4	0.900	0.675	1.000	0.950	0.700	1.000	0.071	15.71%	10.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%
MO-OXN		4	1.27	0.95	1.58	1.33	0.991	1.41	0.0994	15.70%	10.34%



CETIS Analytical Report

Report Date: 06 Dec-18 11:43 (p 8 of 8)
 Test Code: VCWPD_1124_PP | 12-2924-2791

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 20-2469-8603 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.9.2
 Analyzed: 06 Dec-18 11:42 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-OXN failed mean dry biomass-mg	14.86%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-OXN*	6.13	1.94	0.149	6	CDF	4.3E-04	Significant Effect

ANOVA Table

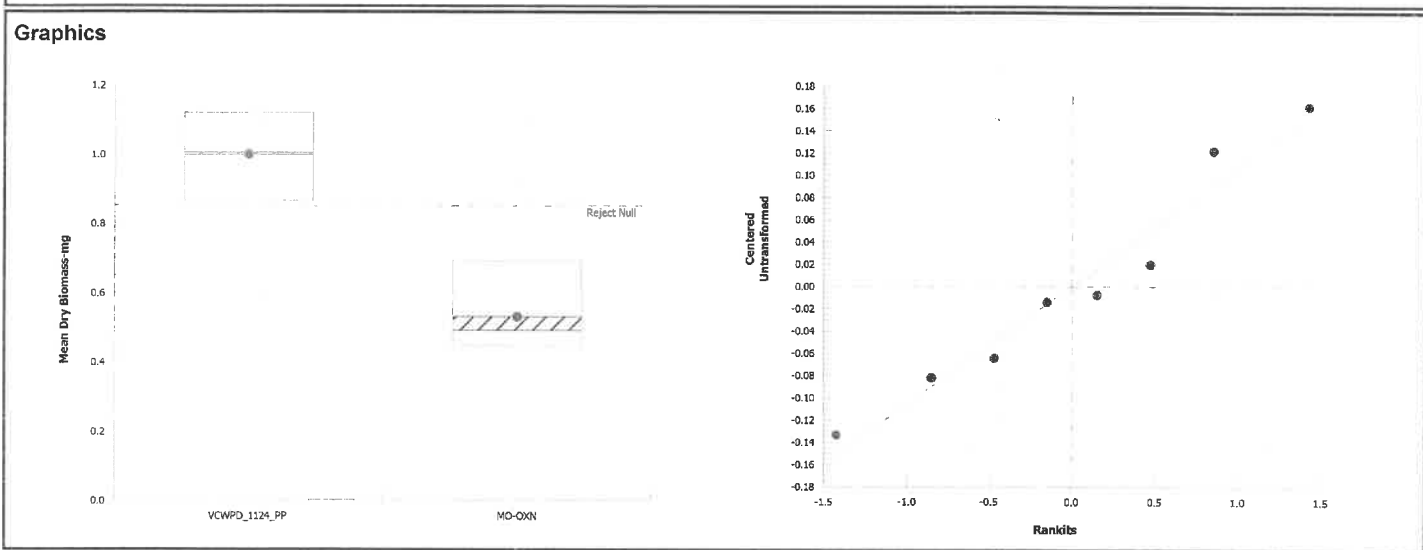
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.439922	0.439922	1	37.6	8.6E-04	Significant Effect
Error	0.0702805	0.0117134	6			
Total	0.510203		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.13	47.5	0.9232	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.948	0.645	0.6914	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1124_PP	LW	4	1.0	0.834	1.17	1.01	0.867	1.12	0.0525	10.49%	0.00%
MO-OXN		4	0.532	0.354	0.709	0.492	0.449	0.693	0.0557	20.97%	46.88%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Ventura County Watershed Protection District Organism Log#: 11303 Age: 248hr
 Test Material: MO-OXN Organism Supplier: Aquatox
 Test ID#: 80315 Project #: 29434 Control: EPAMH
 Test Date: 11/24/18 Randomization: 4.S.12 Control Water Batch: 2121

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water Control	24.9	8.16		9.1		301	10	10	10	10	Date: 11/24/18 Test Solution Prep: JL
100%	24.8	7.31		9.4		350	10	10	10	10	Sample ID: 51384 Initiation Time: 1127
Meter ID	108A	PH24		RD10		EC10	New WQ: RB				Initiation Signoff: RB
Lab Water Control	24.9	7.96	7.93	8.8	6.8	309	10	10	10	10	Date: 11/25/18 Test Solution Prep: JL
100%	24.10	7.06	7.05	9.3	4.0	354	10	10	10	10	Sample ID: 51384 Renewal Time: 1040
Meter ID	109A	PH19	PH24	RD10	RD13	EC10	New WQ: KC		Old WQ: DH		Renewal Signoff: KB
Lab Water Control	24.4	7.95	7.89	8.9	8.0	303	10	10	10	10	Date: 11/26/18 Test Solution Prep: ER
100%	24.3	6.96	7.30	8.0	6.8	356	10	8	10	10	Sample ID: 51384 Renewal Time: 1250
Meter ID	81A	PH19	PH19	RD10	RD10	EC10	New WQ: SP		Old WQ: TK		Renewal Signoff: KB
Lab Water Control	24.4	7.85	7.65	8.4	8.2	300	10	10	10	10	Date: 11/27/18 Test Solution Prep: TF
100%	24.3	6.82	7.28	9.2	7.5	352	9	7	10	10	Sample ID: 51384 Renewal Time: 1029
Meter ID	81A	PH25	PH25	RD10	RD10	EC10	New WQ: TA		Old WQ: TA		Renewal Signoff: TF
Lab Water Control	25.2	7.86	7.67	8.5	7.3	305	10	10	10	10	Date: 11/28/18 Test Solution Prep: NB
100%	25.0	6.62	7.35	7.7	6.7	353	9	7	10	10	Sample ID: 51384 Renewal Time: 1113
Meter ID	107A	PH15	PH15	RD13	RD11	EC13	New WQ: SAT		Old WQ: SAT		Renewal Signoff: LZ
Lab Water Control	24.7	8.09	7.76	8.4	8.1	297	10	10	10	10	Date: 11/29/18 Test Solution Prep: ER
100%	24.10	6.60	7.33	7.8	6.6	356	9	7	10	10	Sample ID: 51384 Renewal Time: 1537
Meter ID	81A	PH15	PH19	RD10	RD10	EC10	New WQ: TA		Old WQ: TA		Renewal Signoff: KB
Lab Water Control	24.7	7.95	8.06	8.0	8.3	304	10	10	10	10	Date: 11/30/18 Test Solution Prep: KL
100%	24.9	6.68	7.55	7.0	7.1	356	9	7	10	10	Sample ID: 51384 Renewal Time: 1533
Meter ID	102A	PH19	PH24	RD13	RD11	EC13	New WQ: LZ		Old WQ:		Renewal Signoff: MW
Lab Water Control	24.6		7.80		6.7	321	10	10	10	10	Date: 12/11/18 Termination Time: 08/7
100%	24.7		7.39		6.8	382	9	7	10	10	Termination Signoff: TF
Meter ID	81A		PH24		RD13	EC13			Old WQ: JR		

Fathead Minnow Dry Weight Data Sheet

Client: Ventura County Water Protection District Test ID #: 80315 Project #: 29434
 Test Material: MO-OXN Tare Weight Date: 11/28/18 Sign-off: TA
 Test Date: 11/24/18 Final Weight Date: 12-4-18 Sign-off: AR

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	414.87	424.80	10	0.993
2	Control	B	411.65	422.87	10	0.993 ^{1.12}
3		C	409.77	419.97	10	1.02
4		D	411.7 409.65	418.35	10	0.867
17	100%	A	411.78	416.45	10	0.467
18		B	406.72	411.21	10	0.449
19		C	418.36	425.29	10	0.693
20		D	414.45	419.62	10	0.517
QA2			411.94	411.94		
Balance ID:			Bal 04	Bal 04		

CETIS Summary Report

Report Date: 12 Dec-18 14:51 (p 1 of 1)
 Test Code: VCWPD_1201_PP | 20-8079-5193

Chronic Larval Fish Survival and Growth Test							Pacific EcoRisk				
Batch ID:	18-7289-3293	Test Type:	Growth-Survival (7d)			Analyst:	Stevi Vasquez				
Start Date:	01 Dec-18 13:23	Protocol:	EPA-821-R-02-013 (2002)			Diluent:	Not Applicable				
Ending Date:	08 Dec-18 08:15	Species:	Pimephales promelas			Brine:	Not Applicable				
Duration:	6d 19h	Source:	Aquatox, AR			Age:	1				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
VCWPD_1201_PP	05-8914-8651	01 Dec-18 13:23	01 Dec-18 13:23	n/a (24.6 °C)	Ventura County Watersh	29434					
MO-SPA	19-5530-9933	29 Nov-18 02:00	30 Nov-18 14:15	59h (0.4 °C)							
Sample Code	Material Type	Sample Source	Station Location	Lat/Long							
VCWPD_1201_PP	Lab Water	Ventura County Watershed Prote	LABQA								
MO-SPA	Ambient Water	Ventura County Watershed Prote	MO-SPA								
Single Comparison Summary											
Analysis ID	Endpoint	Comparison Method			P-Value	Comparison Result					
06-9901-2315	7d Survival Rate	Equal Variance t Two-Sample Test			0.1822	MO-SPA passed 7d survival rate					
05-1096-0853	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test			8.8E-04	MO-SPA failed mean dry biomass-mg					
7d Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1201_PP	LW	4	0.950	0.791	1.000	0.800	1.000	0.050	0.100	10.53%	0.00%
MO-SPA		4	0.825	0.497	1.000	0.600	1.000	0.103	0.206	24.99%	13.16%
Mean Dry Biomass-mg Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
VCWPD_1201_PP	LW	4	0.79	0.62	0.96	0.64	0.872	0.0534	0.107	13.54%	0.00%
MO-SPA		4	0.451	0.342	0.56	0.383	0.539	0.0342	0.0684	15.17%	42.88%
7d Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4						
VCWPD_1201_PP	LW	1.000	1.000	1.000	0.800						
MO-SPA		1.000	0.700	0.600	1.000						
Mean Dry Biomass-mg Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4						
VCWPD_1201_PP	LW	0.861	0.786	0.872	0.64						
MO-SPA		0.468	0.414	0.383	0.539						
7d Survival Rate Binomials											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4						
VCWPD_1201_PP	LW	10/10	10/10	10/10	8/10						
MO-SPA		11/11	7/10	6/10	11/11						

CETIS Analytical Report

Report Date: 12 Dec-18 14:50 (p 1 of 2)

Test Code: VCWPD_1201_PP | 20-8079-5193

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 06-9901-2315 Endpoint: 7d Survival Rate CETIS Version: CETISv1.9.2
 Analyzed: 12 Dec-18 14:50 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	MO-SPA passed 7d survival rate	23.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-SPA	0.981	1.94	0.311	6	CDF	0.1822	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0491468	0.0491468	1	0.962	0.3645	Non-Significant Effect
Error	0.306443	0.0510738	6			
Total	0.355589		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.4	47.5	0.3421	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.873	0.645	0.1627	Normal Distribution

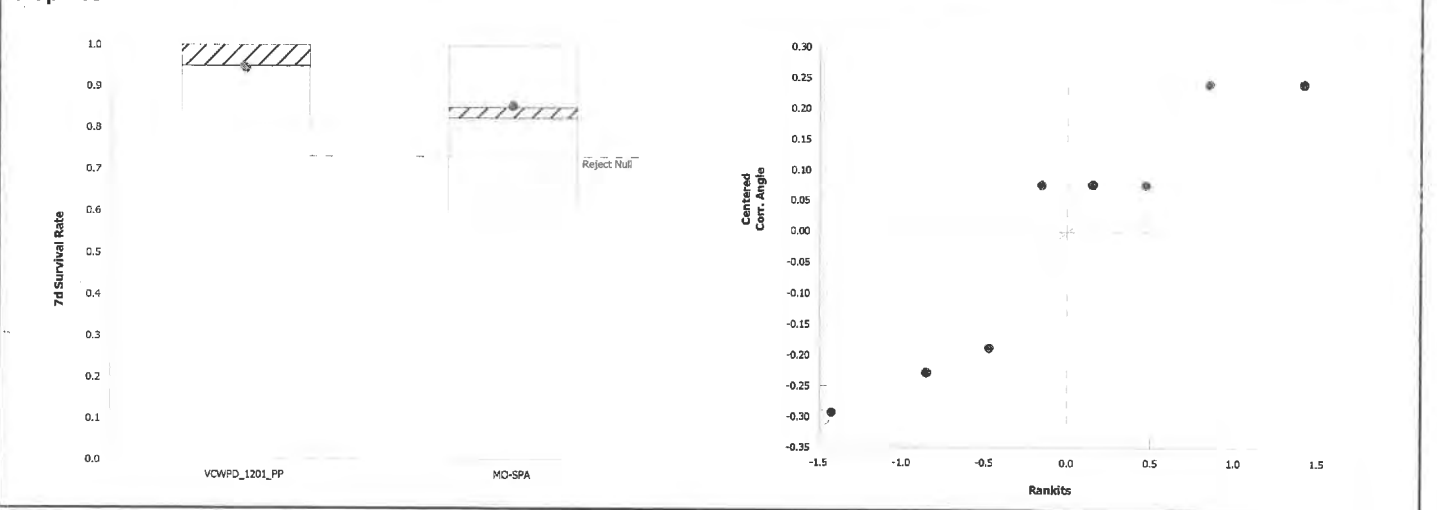
7d Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1201_PP	LW	4	0.950	0.791	1.000	1.000	0.800	1.000	0.050	10.53%	0.00%
MO-SPA		4	0.825	0.497	1.000	0.850	0.600	1.000	0.103	24.99%	13.16%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1201_PP	LW	4	1.34	1.09	1.58	1.41	1.11	1.41	0.0762	11.41%	0.00%
MO-SPA		4	1.18	0.732	1.63	1.21	0.886	1.42	0.14	23.83%	11.74%

Graphics



CETIS Analytical Report

Report Date: 12 Dec-18 14:50 (p 2 of 2)
 Test Code: VCWPD_1201_PP | 20-8079-5193

Chronic Larval Fish Survival and Growth Test Pacific EcoRisk

Analysis ID: 05-1096-0853 Endpoint: Mean Dry Biomass-mg CETIS Version: CETISv1.9.2
 Analyzed: 12 Dec-18 14:50 Analysis: Parametric-Two Sample Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	MO-SPA failed mean dry biomass-mg	15.61%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		MO-SPA*	5.34	1.94	0.123	6	CDF	8.8E-04	Significant Effect

ANOVA Table

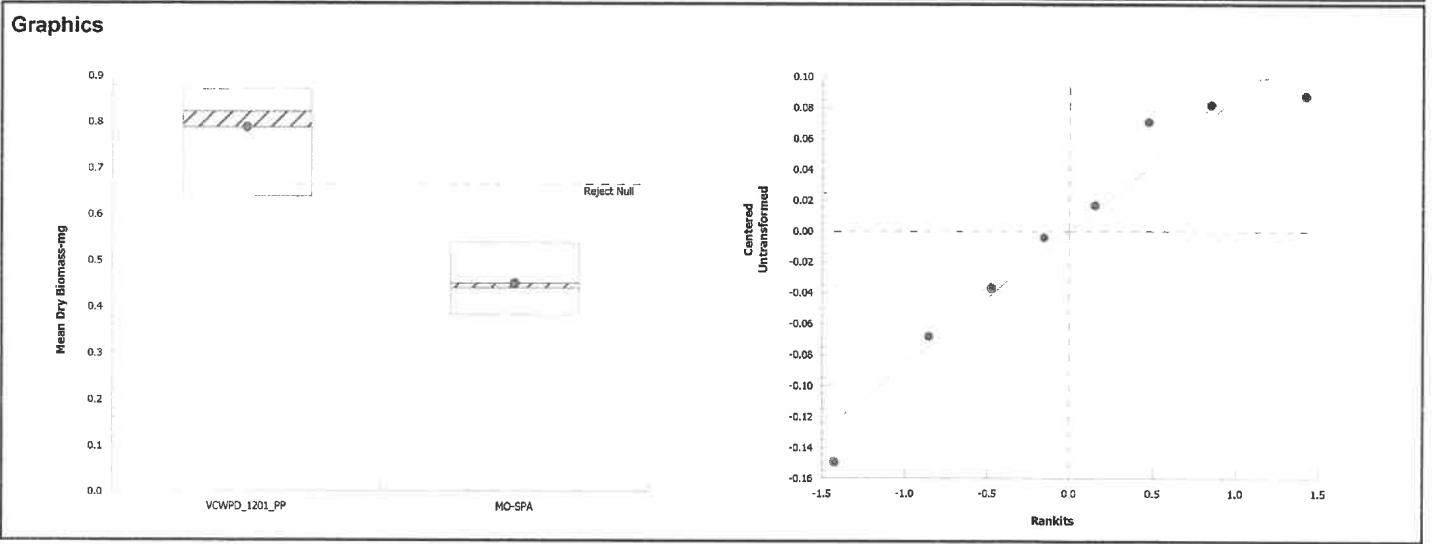
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.229411	0.229411	1	28.5	0.0018	Significant Effect
Error	0.0483291	0.0080549	6			
Total	0.27774		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.44	47.5	0.4830	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.926	0.645	0.4813	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
VCWPD_1201_PP	LW	4	0.79	0.62	0.96	0.823	0.64	0.872	0.0534	13.54%	0.00%
MO-SPA		4	0.451	0.342	0.56	0.441	0.383	0.539	0.0342	15.17%	42.88%



7 Day Chronic Fathead Minnow Toxicity Test Data

Client: Ventura County Watershed Protection District Organism Log#: 11317 Age: 48 hours
 Test Material: MO-SPA Organism Supplier: ARMADA
 Test ID#: 80316 Project #: 29434 Control: EPAMH
 Test Date: 12/1/18 Randomization: 4.2.1 Control Water Batch: 2123

Test Treatment	Temp (°C)	pH		D.O. (mg/L)		Conductivity (µS/cm)	# Live Organisms				SIGN-OFF
		new	old	new	old		A	B	C	D	
Lab Water Control	24.4	8.06		8.5		303	10	10	10	10	Date: 12/1/18 Test Solution Prep: TK
100%	24.4	7.61		10.8		84	11	10	10	11	Sample ID: 51496 Initiation Time: 1323
Meter ID	81A	PH15		RD11		EC11	New WQ: mtl				Initiation Signoff: NL
Lab Water Control	24.4	8.08	7.69	9.0	7.1	305	10	10	10	10	Date: 12/2/18 Test Solution Prep: KB
100%	24.9	7.48	6.99	11.0	6.4	88.4	11	8	10	11	Sample ID: 51496 Renewal Time: 0950
Meter ID	99A	PH24	PH24	RD10	RD10	EC10	New WQ: TP	Old WQ: JT			Renewal Signoff: KP
Lab Water Control	24.5	8.12	7.85	9.0	8.0	303	10	10	10	9	Date: 12/3/18 Test Solution Prep: WB
100%	24.4	7.44	7.48	11.2	8.2	85	11	7	10	11	Sample ID: 51496 Renewal Time: 1155
Meter ID	107A	PH24	PH24	RD11	RD11	EC11	New WQ: mtl	Old WQ: YL			Renewal Signoff: TK
Lab Water Control	24.6	8.14	7.81	8.6	8.3	310	10	10	10	9	Date: 12/4/18 Test Solution Prep: LE
100%	24.8	7.47	7.65	10.9	8.2	86	11	7	7	11	Sample ID: 51496 Renewal Time: 1029
Meter ID	100A	PH24	PH25	RD10	RD11	EC10	New WQ: TA	Old WQ: TA			Renewal Signoff: WB
Lab Water Control	24.2	7.97	7.83	8.1	7.6	299	10	10	10	9	Date: 12/5/18 Test Solution Prep: LZ
100%	24.5	7.32	7.47	9.1	6.0	81	11	7	7	11	Sample ID: 51496 Renewal Time: 1040
Meter ID	99A	PH24	PH25	RD13	RD12	EC13	New WQ: JT	Old WQ: SAT			Renewal Signoff: APF
Lab Water Control	24.6	8.03	7.52	8.3	6.2	303	10	10	10	8	Date: 12/6/18 Test Solution Prep: TK
100%	24.7	8.00	7.12	9.8	5.1	84	11	7	7	11	Sample ID: 51496 Renewal Time: 1055
Meter ID	100A	PH19	PH19	RD13	RD12	EC13	New WQ: YL	Old WQ: JR			Renewal Signoff: KL
Lab Water Control	25.1	8.06	8.09	8.1	8.1	326	10	10	10	8	Date: 12/7/18 Test Solution Prep: WB
100%	25.1	7.61	7.59	8.8	7.1	92	11	7	6	11	Sample ID: 51496 Renewal Time: 1040
Meter ID	93A	PH25	PH19	RD13	RD10	EC13	New WQ: PM	Old WQ: TA			Renewal Signoff: TF
Lab Water Control	25.5		8.07		8.3	320	10	10	10	8	Date: 12/8/18 Termination Time: 0815
100%	25.5		7.63		8.2	87	11	7	6	11	Termination Signoff: TF
Meter ID	93A		PH24		RD10	EC10		Old WQ: PM			

Fathead Minnow Dry Weight Data Sheet

Client: Ventura County Water Protection District Test ID #: 80316 Project #: 29434
 Test Material: MO-SPA Tare Weight Date: 12/4/18 Sign-off: TA
 Test Date: 12/11/18 Final Weight Date: 12/11/18 Sign-off: JR

Pan ID	Treatment	Replicate	Initial Pan Weight (mg)	Final Pan Weight (mg)	Initial # of Organisms	Biomass Value (mg)
1	Lab Water	A	410.48	419.09	10	0.861
2	Control	B	403.26	411.12	10	0.786
3		C	411.61	420.33	10	0.872
4		D	408.73	415.13	10	0.640
5	100%	A	400.67	405.82	11	0.468
6		B	411.85	415.99	10	0.414
7		C	411.88	415.71	10	0.383
8		D	405.25	411.18	11	0.539
QA			409.73	409.72		
Balance ID:			Bal 04	BAL04		

Appendix J. Dry-Weather Analytical Monitoring Results

	Site ID	Port Hueneme-3	Unincorporated-4	Camarillo-1	Fillmore-1
		DRY-HUE3	DRY-UNI4	MO-CAM	MO-FIL
	At Major Outfall?	No	No	Yes	Yes
	Location	Bubbling Springs @ RR xing	Arroyo Santa Rosa at Box Canyon confluence	Camarillo Hills Drain	North Fillmore Drain
	Date	08/20/19	08/21/19	08/21/19	08/20/19
	Time	14:10	09:45	07:30	9:35
Site Description	Conveyence Type	Natural channel	Box culvert	Box culvert	Box culvert
	Dimensions	N/A	N/A	8' x 24'	N/A
	Dominant Land Use	Commercial & residential	Residential & rural	Commercial & residential	Residential
	Site Elevation	0	250	100	430
Weather	Weather	Clear	Clear	Clear	Clear
	Wind Condtion	Slight breeze	Calm	Calm	Calm
	Air Temp. (C)	31	27	15.5	23.5
Trash	Trash (general area)	None	None	Light	Light
	Trash (stream banks)	Light	None	Light	Light
Observations	Water Clarity	Cloudy	Clear	Clear	Clear
	Water Color	Brown	Brown	Clear	Clear
	Odors	None	None	None	None
	Floatables	Other	None	None	None
	Foam	None	None	None	None
	Stains/ deposits	None	None	None	None
	Structural condition	Natural channel	Concrete channel	Concrete channel	Rip rap with concrete bottom
	Vegetation Condition	None	None	Sparse grasses	Grasses and watercress in channel
	Biology	Ducks in area	Aquatic snails	None	Aquatic snails
	Algae (suspended)	None	None	None	Green 30%
Algae (substrate)	None	None	Green 40%	Green 90%	
Water Chemistry (Field)	Dissolved Oxygen (%)	192.9	168.8	98.8	198.6
	Dissolved Oxygen (mg/L)	15.32	15.31	9.33	16.92
	Conductivity (µS)	10500	1083	870	1263
	Specific Conductance (µS)	10390	1191	1004	1301
	Salinity (ppt)	5.8	0.6	0.5	0.6
	Water Temp. (C)	25.7	20.4	18.1	23.4
	Water Temp. (F)	78.3	68.7	64.6	74.1
	pH	8.29	8.71	7.82	8.82
	Turbidity (NTU)	14.1	2.33	4.18	1.59
Water Chemistry (Lab)	Total Organic Carbon (mg/L)	10.0	9.6	7.2	6.8
	Total Hardness as CaCO ₃ (mg/L)	1,620	474	283	517
	Total Calcium (mg/L)	255	66.9	74.2	137
	Total Magnesium (mg/L)	240	74.6	23.7	42.7
	Dissolved Copper (µg/L)	0.44 (DNQ)	5.0	3.7	13.0
	Dissolved Lead (µg/L)	<0.031	<0.031	0.064 (DNQ)	0.031 (DNQ)
	Dissolved Zinc (µg/L)	1.1 (DNQ)	1.7 (DNQ)	3.7 (DNQ)	3.5 (DNQ)
	Total Coliform (MPN/100 mL)	64,880	120,330	298,700	7,270
<i>E. coli</i> (MPN/100 mL)	15,531	473	12,997	10	
Estimated Flow	Flow Status	Flowing	Flowing	Flowing	Flowing
	Water Width (ft.)	12.0	1.0	0.5	3.0
	Water Depth (ft.)	2.00	0.01	0.01	0.20
	Flow Velocity (ft/s)	0.05	1.50	2.00	0.01
	Flow Rate (ft ³ /s)	0.48	0.008	0.005	0.01
	Comments	Floatables leaf litter & bark	Channel recently scraped		

Site ID	Moorpark-2	Ojai-6	Oxnard-2	Santa Paula-3	
	DRY-MPK2	DRY-OJA6	DRY-OXN2	DRY-SPA3	
At Major Outfall?	No	No	No	No	
Location	Gabbert Drain	Tributary to Fox Barranca	Stroube Drain	Peck Rd Drain	
Date	08/21/19	08/20/19	08/20/19	08/20/19	
Time	08:15	11:35	08:10	10:45	
Site Description	Conveyence Type	Box culvert	Natural channel	Box culvert	
	Dimensions	5' x 12'	N/A	8' x 17'	
	Dominant Land Use	Commercial & residential	Residential	Residential	
	Site Elevation	460	720	70	224
Weather	Weather	Clear	Clear	Clear	
	Wind Condition	Calm	Calm	Calm	
	Air Temp. (C)	19.5	30	20.1	30
Trash	Trash (general area)	Light	Light	Light	Moderate
	Trash (stream banks)	Moderate	Light	Light	Moderate
Observations	Water Clarity	Clear	Clear	Clear	Clear
	Water Color	Clear	Clear	Clear	Clear
	Odors	None	None	None	None
	Floatables	None	None	None	None
	Foam	None	None	Very thin white scum upstream of sampling area	None
	Stains/ deposits	None	None	None	None
	Structural condition	Concrete channel	Natural channel	Concrete channel to rip rap	Concrete channel
	Vegetation Condition	None	Berry and poison oak on banks	Abundant watercress	None
	Biology	None	None	None	Aquatic bugs
	Algae (suspended)	None	None	Green 30%	None
	Algae (substrate)	Red 30%, Green 15%	Brown 80%	Green 80%	Brown 90%, Green 1%
Water Chemistry (Field)	Dissolved Oxygen (%)	Too shallow	93.1	95.8	201.5
	Dissolved Oxygen (mg/L)	Too shallow	8.42	8.94	15.20
	Conductivity (µS)	318.2	1293	1067	1819
	Specific Conductance (µS)	338.6	1428	1217	1674
	Salinity (ppt)	0.2	0.7	0.6	0.8
	Water Temp. (C)	22.1	20.0	18.5	29.3
	Water Temp. (F)	71.8	68.0	65.3	84.7
	pH	8.64	8.12	7.92	8.77
	Turbidity (NTU)	2.71	1.24	1.29	2.16
Water Chemistry (Lab)	Total Organic Carbon (mg/L)	8	2.2	5	11
	Total Hardness as CaCO ₃ (mg/L)	121	599	448	567
	Total Calcium (mg/L)	28.5	163	114	134
	Total Magnesium (mg/L)	12.0	46.7	39.8	56.4
	Dissolved Copper (µg/L)	5.5	0.39 (DNQ)	2.7	5.40
	Dissolved Lead (µg/L)	0.16 (DNQ)	<.0031	<.0031	0.72
	Dissolved Zinc (µg/L)	3 (DNQ)	2.2 (DNQ)	4.5 (DNQ)	36
	Total Coliform (MPN/100 mL)	173,290	9,804	1,720	5,475
<i>E. coli</i> (MPN/100 mL)	644	80	130	379	
Estimated Flow	Flow Status	Flowing	Flowing	Flowing	Flowing
	Water Width (ft.)	3.0	5.0	8.0	4.0
	Water Depth (ft.)	0.01	0.15	0.40	0.03
	Flow Velocity (ft/s)	1.00	0.25	0.05	0.50
	Flow Rate (ft ³ /s)	0.03	0.19	0.16	0.06
Comments	Flow too shallow to submerge DO probe				

Site ID	Simi Valley-1	Thousand Oaks-1	Ventura-5
	MO-SIM	MO-THO	DRY-VEN5
At Major Outfall?	Yes	Yes	No
Location	Bus Canyon Drain	North Fork Arroyo Concejo at Hill Canyon WWTP	Dent Drain
Date	08/21/19	08/21/19	08/20/19
Time	09:10	10:20	13:05
Site Description	Conveyence Type	Box culvert	Natural channel
	Dimensions	7' x 16'	N/A
	Dominant Land Use	Commercial & residential	Commercial, residential & rural
	Site Elevation	760	280
Weather	Weather	Clear	Clear
	Wind Condition	Calm	Calm
	Air Temp. (C)	25	29
Trash	Trash (general area)	Light	None
	Trash (stream banks)	Moderate	None
Observations	Water Clarity	Clear	Clear
	Water Color	Clear	Clear
	Odors	Musty	None
	Floatables	None	Other
	Foam	None	None
	Stains/ deposits	None	None
	Structural condition	Concrete channel	Rip-rap with natural bottom
	Vegetation Condition	None	Herbaceous growth and trees at stream edge
	Biology	None	None
	Algae (suspended)	None	None
Water Chemistry (Field)	Algae (substrate)	Green 70%	Brown 70%
	Dissolved Oxygen (%)	104.9	95.1
	Dissolved Oxygen (mg/L)	9.49	8.54
	Conductivity (µS)	2672	1555
	Specific Conductance (µS)	2956	1772
	Salinity (ppt)	1.5	0.9
	Water Temp. (C)	19.9	19.4
	Water Temp. (F)	67.8	66.9
	pH	7.87	8.13
	Turbidity (NTU)	1.39	1.14
Water Chemistry (Lab)	Total Organic Carbon (mg/L)	4.2	7.5
	Total Hardness as CaCO ₃ (mg/L)	1,200	219
	Total Calcium (mg/L)	291	43.3
	Total Magnesium (mg/L)	114	26.9
	Dissolved Copper (µg/L)	0.56	1.7
	Dissolved Lead (µg/L)	<0.031	0.053 (DNQ)
	Dissolved Zinc (µg/L)	1.2 (DNQ)	42
	Total Coliform (MPN/100 mL)	61,310	12,033
Estimated Flow	<i>E. coli</i> (MPN/100 mL)	148	85
	Flow Status	Flowing	Flowing
	Water Width (ft.)	10.0	12.0
	Water Depth (ft.)	0.05	0.80
	Flow Velocity (ft/s)	2.00	0.005
Flow Rate (ft ³ /s)	1.00	0.05	
Comments		Floatables sparse, thin, clear scum	

Appendix K. Formulas for WQO determination

BASIN PLAN and CALIFORNIA TOXICS RULE OBJECTIVES: FORMULAS

AMMONIA (BASIN PLAN)

Basin Plan Ammonia Objective formula selection is based on wet or dry event, COLD/MIGR designation status, early life stages (ELS) status, and salinity.

See the flow charts below to determine which formula to use:

Basin Plan NH3-N Objectives for Wet Weather

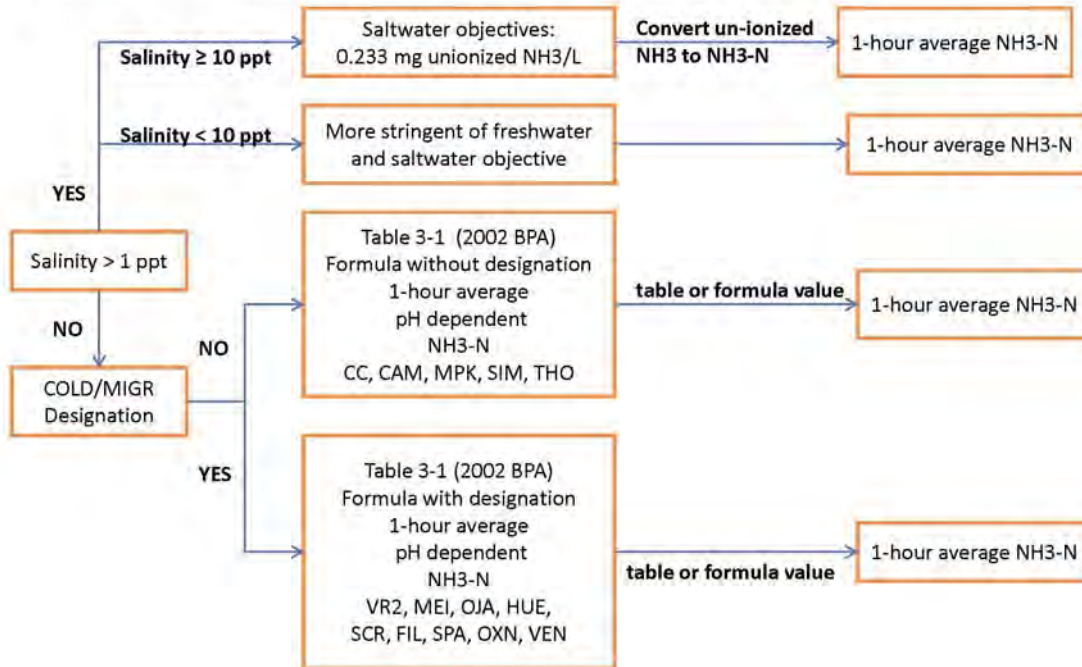


Table 3-1: One hour Average Objective for Ammonia-N for Freshwaters (mg N/L)

COLD and/or MIGR:

$$= \frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}}$$

NOT COLD and/or MIGR:

$$= \frac{0.411}{1 + 10^{7.204 - pH}} + \frac{58.4}{1 + 10^{pH - 7.204}}$$

Saltwater 1-hour objective for Ammonia-N

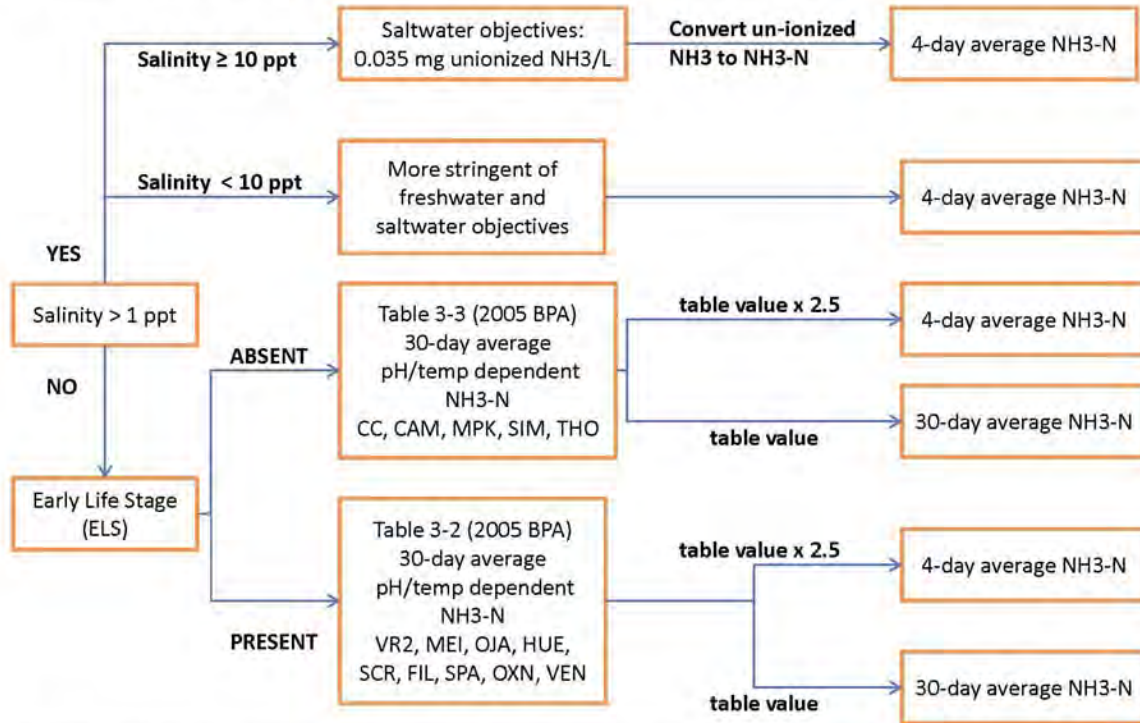
$$= 0.233 * \left(1 + 10^{\left[\left(9.245 + 0.116 * \frac{19.9273 * S}{1000 - 1.005109 * S} \right) + 0.0324(298 - T) + \frac{(0.0415)P}{T} - pH \right]} \right)$$

Where T= temperature expressed in °K (Note: Kelvin = Celsius + 273)

S = salinity (ppt)

P = pressure (assumed to be 1 atm)

Basin Plan NH3-N Objectives for Dry Weather



BPA 2005 p15-11 "Implementation actions to achieve applicable ammonia objectives must implement downstream objectives."
 NH3-N = NH3 x 0.822 4 day average objective = 2.5 x 30-day average objective

Table 3-2: 30-Day Average Objective for Ammonia-N for Freshwaters Applicable to Waters Subject to the “Early Life Stage Present” Condition (mg N/L)

$$= \left(\frac{0.0577}{1 + 10^{7.688-pH}} + \frac{2.487}{1 + 10^{pH-7.688}} \right) * \text{MIN}(2.85, 1.45 * 10^{0.028*(25-T)})$$

Where T= temperature expressed in °C.

Highest four-day average within the 30-day period shall not exceed 2.5 times the 30-day average objective as calculated above.

Table 3-3: 30-Day Average Objective for Ammonia-N for Freshwaters Applicable to Waters Subject to the “Early Life Stage Absent” Condition (mg N/L)

$$= \left(\frac{0.0577}{1 + 10^{7.688-pH}} + \frac{2.487}{1 + 10^{pH-7.688}} \right) * 1.45 * 10^{0.028*(25-\text{MAX}(T,7))}$$

Where T= temperature expressed in °C.

Highest four-day average within the 30-day period shall not exceed 2.5 times the 30-day average objective as calculated above.

Saltwater 4-day objective for Ammonia-N

$$= 0.035 * (1 + 10^{[(9.245 + 0.116 * \frac{19.9273 * S}{1000 - 1.005109 * S}) + 0.0324(298 - T) + \frac{(0.0415)P}{T} - pH]})$$

Where T= temperature expressed in °K (Note: Kelvin = Celsius + 273)

S = salinity (ppt)

P = pressure (assumed to be 1 atm)

PENTACHLOROPHENOL (CTR)

$$CMC = \exp(1.005(pH) - 4.869)$$

$$CCC = \exp(1.005(pH) - 5.134)$$

METALS (CTR)

[cadmium, chromium, copper, lead, nickel, silver, zinc]

$$CMC = WER * (Acute Conversion Factor) * (\exp\{m_A[\ln(hardness)] + b_A\})$$

$$CCC = WER * (Chronic Conversion Factor) * (\exp\{m_C[\ln(hardness)] + b_C\})$$

Note1: CCC formula contains error in CTR (says “Acute” not “Chronic” for Conversion Factor).

Note2: see note to Table 2 of Paragraph (b)(2) in the CTR, “The term conversion factor represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column.”

Note3: Conversion factors (CF) are provided as values in a table for chromium, copper, nickel, silver, and zinc. CF for cadmium and lead are calculated based on hardness, i.e.

$$Cadmium Acute CF = 1.136672 - [(\ln\{hardness\}) (0.041838)]$$

$$Cadmium Chronic CF = 1.101672 - [(\ln\{hardness\}) (0.041838)]$$

$$Lead Acute and Chronic CF = 1.46203 - [(\ln\{hardness\}) (0.145712)]$$

Note4: Only two WER in Ventura County and no stations discharge within the applicable reaches - Lower Calleguas Creek (Reach 2 which is Portrero Rd south to Mugu Lagoon) has a WER for copper of 3.69 and Mugu Lagoon copper WER is 1.51.