APPENDIX E

First Quarter 2018 Analytical Laboratory Reports and Validation Reports

APPENDIX E

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DATA VALIDATION REPORT

Boeing SSFL Outfall 009

SAMPLE DELIVERY GROUP: 440-206741-2

Prepared for

Haley & Aldrich

April 20, 2018







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TABLES

- 1 Sample Identification
- 2 Data Qualifier Reference
- 3 Reason Code Reference



I. INTRODUCTION

Task Order Title: Boeing SSFL Outfall 009

Contract: 40458-078 and 40458-083 **MEC^x Project No.:** 1272.003D.01 002

Sample Delivery Group: 440-206741-2

Project Manager: K. Miller

Matrix: Water
QC Level: IV

No. of Samples: 1

No. of Reanalyses/Dilutions: 0
Laboratory: TestAmerica - Irvine

TABLE 1 - SAMPLE IDENTIFICATION

| Sample Name | Lab Sample Name | Matrix | Collection | Method |
|--------------------------|--------------------|--------|-------------------------|----------------------------------|
| Outfall009_20180322_Comp | 440- 206741-1 | Water | 3/22/2018 3:30:00 PM | CALC, E1613B, E525.2, E100.2, |
| | 200741-1 | | 3.30.00 FIVI | EPA-821-R-02-013 |



II. SAMPLE MANAGEMENT

According to the case narrative, sample condition upon receipt form and the chain-of-custody (COC) provided by the laboratory for sample delivery group (SDG) 440-206741-2:

- The laboratory received samples in this SDG on ice and within the temperature limits of ≤6 degrees Celsius (°C) and >0°C.
- Field and laboratory personnel signed and dated the COC.
- According to the Login Sample Receipt Checklist, custody seals were absent on the coolers; however, no evidence of tampering was noted.
- The original COC lacked collection times. The samples were logged per the collection times on the sample labels.
- Analysis for chronic toxicity was subcontracted to Aquatic Bioassy and Consulting Laboratories.
- Analysis for asbestos was subcontracted to LA Testing.
- Analysis for dioxins was subcontracted to TA-West Sacramento.



TABLE 2 - DATA QUALIFIER REFERENCE

| Qualifier | Organics | Inorganics |
|-----------|---|---|
| U | The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit. | The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit. |
| J | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. |
| J+ | The result is an estimated quantity, but the result may be biased high. | The result is an estimated quantity, but the result may be biased high. |
| J- | The result is an estimated quantity, but the result may be biased low. | The result is an estimated quantity, but the result may be biased low. |
| UJ | The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise. | The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise. |
| N | The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification." | Not applicable. |
| NJ | The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample. | Not applicable. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample. | The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample. |



TABLE 3 - REASON CODE REFERENCE

| | TABLE 5 - REASON CODE | - NET ENERGE |
|----------------|--|--|
| Reason Code | Organic | Inorganic |
| Н | Holding time was exceeded. | Holding time was exceeded. |
| S | Surrogate recovery was outside control limits. | Not applicable. |
| С | Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination (r²) was <0.990. | Correlation coefficient (r) was <0.995. |
| R | Calibration relative response factor (RRF) was <0.05. | Percent recovery (%R) for calibration was outside control limits. |
| В | The analyte was detected in an associated blank as well as in the sample. | The analyte was detected in an associated blank as well as in the sample. |
| L | Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits. | LCS or LCSD %R was outside the control limits. |
| L1 | LCS/LCSD relative percent difference (RPD) was outside the control limit. | LCS/LCSD RPD was outside the control limit. |
| Q | Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits. | MS or MSD %R was outside the control limit. |
| Q1 | MS/MSD RPD was outside the control limit. | MS/MSD RPD was outside the control limit. |
| E | Result was reported as an estimated maximum possible concentration (EMPC). | Laboratory duplicate RPD was outside the control limit. |
| I | Internal standard recovery was outside control limits. | Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits. |
| I1 | Not applicable. | ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits. |
| Α | Not applicable. | Serial dilution %D was outside control limits. |
| М | Tuning (BFB or DFTPP) was not compliant. | ICPMS tune was not compliant. |
| Т | The analyte was detected in an associated trip blank as well as in the sample. | Not applicable. |
| + | False positive – reported compound was not present. | False positive – reported compound was not present. |
| - | False negative – compound was present but not reported. | False negative – compound was present but not reported. |



| Reason Code | Organic | Inorganic |
|----------------|--|--|
| F | The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample. | The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample. |
| F1 | Field duplicate RPD was outside the control limit. | Field duplicate RPD was outside the control limit. |
| \$ | The reviewer corrected the reported result and/or other information. | The reviewer corrected the reported result and/or other information. |
| D | The analysis was not used because another more technically sound analysis was available. | The analysis was not used because another more technically sound analysis was available. |
| Р | Instrument performance not compliant. | Post digestion spike recovery was outside of control limits. |
| DNQ | The reported result is above the method detection limit but is less than the reporting limit. | The reported result is above the method detection limit but is less than the reporting limit. |
| *11, *111 | Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found. | Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found. |



III. EPA METHOD 1613B — DIOXIN/FURANS

L. Calvin of MEC^x reviewed the SDG on April 20, 2018

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the MEC^X Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 0), USEPA Method 1613B, and the National Functional Guidelines Chlorinated Dioxin/Furan Data Review (2011).

III.1. HOLDING TIMES

Extraction and analytical holding times were met. The water sample was extracted and analyzed within one year of collection.

III.2. INSTRUMENT PERFORMANCE

Instrument performance criteria were met. Following are findings associated with instrument performance:

III.2.1. GC COLUMN PERFORMANCE

A Windows Defining Mix (WDM) containing the first and last eluting congeners of each descriptor and isomer specificity compounds was analyzed prior to the initial calibration sequence and at the beginning of each analytical sequence. The GC column performance in the calibrations was acceptable, with the height of the valley between the closely eluting isomers and 2,3,7,8-TCDD reported as less than 25%.

III.2.2. MASS SPECTROMETER PERFORMANCE

The mass spectrometer performance was acceptable with the static resolving power greater than 10,000.

III.3. CALIBRATION

Calibration criteria were met. The initial calibration was acceptable with %RSDs \leq 20% for the 15 native compounds (calibration by isotope dilution) and \leq 35% for the two native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the Method 1613B control limits for all standards.

Continuing Calibration: Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of the analytical sequence. The VER was acceptable with the concentrations within the acceptance criteria listed in Table 6 of EPA Method 1613B. The ion abundance ratios and relative retention times were within the method control limits.

III.4. QUALITY CONTROL SAMPLES

III.4.1. **METHOD BLANKS**

The method blank had detects above the EDL and below the reporting limit for all isomers and all totals. Isomer results for the method blank contaminants detected below the reporting limit were qualified as nondetects (U) at the level of contamination based upon professional judgement and the guidance for blank qualification in the National Functional Guidelines for Dioxin Review. The method blank concentration of OCDD was >10× the sample result above the reporting limit; therefore, the sample result for OCDD was also qualified as a nondetect. The reviewer verified that peaks comprising total detects for HpCDD, HpCDF, HxCDD, and PeCDF in the method blank were the same peaks comprising the totals in sample



Outfall009_20180322_Comp at similar concentrations. The total results were qualified as nondetects (U) at the level of contamination.

III.4.2. LABORATORY CONTROL SAMPLES

Recoveries were within the acceptance criteria listed in Table 6 of Method 1613B, and RPDs were within the laboratory control limit of ≤50%.

III.5. FIELD QC SAMPLES

MEC^X evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC^X used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

111.5.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.

III.5.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.

III.6. INTERNAL STANDARDS PERFORMANCE

The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613B.

III.7. COMPOUND IDENTIFICATION

Compound identification was verified. The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613B. Isomer 2,3,7,8-TCDF was not detected in the initial analysis of the sample, therefore, confirmation analysis was not required.

III.8. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantitation was verified by recalculating a representative number of sample and LCS results. The laboratory calculated and reported compound-specific detection limits. Detects between the EDL and the RL were qualified as estimated (J) and coded with DNQ to comply with the NPDES permit; however, after qualification for method blank contamination, no detects remained. Nondetects are valid to the EDL. Per client request, results below the EDL meeting retention time and signal to noise (S/N) criteria were to be reported; however, this sample had no reported detects below the EDL.

Following qualification for method blank contamination, isomers reported as estimated maximum possible concentrations (EMPCs) were not detected in the sample of this SDG. Total results for HpCDD and HpCDF each included an EMPC peak; however, the method blank included the same peaks, and the total results were not further qualified for EMPCs, as they were previously qualified as method blank contamination.



IV. EPA METHODS 525.2— SEMIVOLATILE ORGANIC COMPOUNDS (SVOCS)

L. Calvin of MEC^x reviewed the SDG on April 20, 2018

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the MEC^X Data Validation Procedure for Semivolatile Organics (DVP-3, Rev. 1), EPA Method 525.2, and the National Functional Guidelines for Superfund Organic Methods Data Review (2014).

IV.1. HOLDING TIMES

The extraction and analytical holding times were met. The sample was extracted within 24 hours of collection and analyzed within 30 days of extraction.

IV.2.GC/MS TUNING AND CALIBRATION

The DFTPP tunes met the method abundance criteria. The sample was analyzed within 12 hours of the DFTPP injection time.

Calibration criteria were met. The initial calibration average RRFs were \geq 0.05 and r^2 for applicable target compounds were \geq 0.990%. The continuing calibration RRFs were \geq 0.05 and recoveries were within the method QC limits of 70-130%.

IV.3. QUALITY CONTROL SAMPLES

IV.3.1. **METHOD BLANKS**

Target compounds were not detected in the method blank.

IV.3.2. LABORATORY CONTROL SAMPLES

LCS recoveries were within the control limits of 70-130%.

IV.3.3. SURROGATE RECOVERY

Surrogate recoveries were within laboratory control limits of 70-130%.

IV.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses were performed on the sample in this SDG. The recovery for diazinon in the MSD was below the control limits of 70-130% at 57%; however, as the MS recovery and the RPD were acceptable, qualifications were not assigned for the single recovery outlier. RPDs were within the control limit of ≤30%.

IV.4. FIELD QC SAMPLES

MEC^x evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC^x used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below:

IV.4.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.

IV.4.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.



IV.5. INTERNAL STANDARDS PERFORMANCE

The internal standard area counts were within the method control limits established by the continuing calibration standards of $\pm 30\%$ for areas and ± 10 seconds for retention times.

IV.6. COMPOUND IDENTIFICATION

Compound identification was verified. The laboratory analyzed for chlorpyrifos and diazinon by Method 525.2. Review of the sample chromatogram, retention times, and spectra indicated no problems with target compound identification.

IV.7. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification was verified. The reporting limits were supported by the low point of the initial calibration and the laboratory MDLs. Reported nondetects are valid to the reporting limit.

IV.8. TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

The laboratory did not report TICs for this SDG.

IV.9. SYSTEM PERFORMANCE

Review of the raw data indicated no problems with system performance.

V. VARIOUS METHODS — GENERAL CHEMISTRY

Marcia Hilchey of MEC^x reviewed the SDG on April 11, 2018.

The sample listed in Table 1 for these analyses was validated based on the guidelines outlined in the MEC^X Data Validation Procedure for General Minerals (DVP-6, Rev. 1), EPA Methods 100.2 and 821-R-02-013, and National Functional Guidelines for Inorganic Superfund Data Review (2014).

V.1. HOLDING TIMES

The analytical holding time for chronic toxicity, 36 hours, was met. The analytical holding time for asbestos, 48 hours, was not met. The sample was analyzed 7 days after collection. The laboratory subjected the sample to UV and ozonation to minimize bacteriological growth. The reviewer qualified the nondetect result as an estimated nondetect (UJ) as a conservative measure based on professional judgment and the QAPP holding time.

V.2. CALIBRATION

For chronic toxicity, instruments were calibrated as per the manufacturer requirements and standard reference toxicant testing was performed to verify culture health and sensitivity. Method Test Acceptability criteria (TAC) were met. Summaries indicated that asbestos analytical instrument calibrations met requirements.

V.3. QUALITY CONTROL SAMPLES

V.3.1. **METHOD BLANKS**

The method blank for asbestos had no detects. The chronic toxicity tests met the negative control criteria



of the laboratory and method.

V.3.2. LABORATORY CONTROL SAMPLES

Laboratory control samples are not applicable to these methods. The positive control criteria were met for the chronic toxicity test.

V.3.3. LABORATORY DUPLICATES

Laboratory duplicate analyses were not performed on the sample in this SDG.

V.3.4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD analyses are not applicable to these methods.

V.4. SAMPLE RESULT VERIFICATION

The sample results reported on the summary reports were verified against the raw data. No transcription errors or calculation errors were noted.

The required 0.2 MFL analytical sensitivity was not reached for asbestos due to excessive particulates. The reported analytical sensitivity for asbestos was 1.0 MFL.

Due to the initial test result of 35.62% effect on the undiluted sample, the laboratory initiated TIE procedures for the *Selenastrum capricornutum*. The initial TIE observation was 8.12% effect. This indicates that the initial observed toxicity was most likely caused by volatile substances that dissipate rendering the sample less toxic. Although the initial growth determination fails, the sample passes the permit TIE limitation of \geq 50%. No further TIE manipulation was performed. The sample passed the *Ceriodaphnia dubia* and *Pimephales promelas* growth and reproduction tests.

V.5. FIELD QC SAMPLES

MEC^x evaluated field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC^x used the remaining detects to evaluate the associated site sample. Findings associated with field QC samples are summarized below.

V.5.1. FIELD BLANKS AND EQUIPMENT BLANKS

Field blank or equipment blank samples were not identified for this SDG.

V.5.2. FIELD DUPLICATES

Field duplicate samples were not identified in this SDG.

Validated Sample Result Forms: 4402067412

Analysis Method E1613B

Sample Name Outfall009_20180322_Comp Matrix Type: WM Result Type: TRG

Sample Date: 3/22/2018 3:30:00 PM Validation Level: 8

Lab Sample Name: 440-206741-1

| Analyte I | Fraction: | CAS No | Result Value | RL | MDL | Result Units | Lab Qualifier | Validation Qualifier | Validation Notes |
|--|-----------|------------|-----------------|----------|------------|-----------------|------------------|-------------------------|---------------------|
| 1,2,3,4,6,7,8,9- Octachlorodibenzofuran (OCDF) | N : | 39001-02-0 | 0.000016 | 0.00010 | 0.00000047 | ug/L | J,DXMB | U | В |
| 1,2,3,4,6,7,8,9-Octachlorodibenzo-jdioxin (OCDD) | p- N | 3268-87-9 | 0.00020 | 0.00010 | 0.00000042 | ug/L | MB | U | В |
| 1,2,3,4,6,7,8- Heptachlorodibenzofuran (HpCDF) | | 67562-39-4 | 0.0000041 | 0.000050 | 0.00000040 | ug/L | J,DXMB | U | В |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p dioxin (HpCDD) | - N | 35822-46-9 | 0.000017 | 0.000050 | 0.00000049 | ug/L | J,DXMB | U | В |
| 1,2,3,4,7,8,9- Heptachlorodibenzofuran (HpCDF) | | 55673-89-7 | | 0.000050 | 0.00000051 | ug/L | U | U | |
| 1,2,3,4,7,8-Hexachlorodibenzofurar (HxCDF) | n N | 70648-26-9 | | 0.000050 | 0.00000081 | ug/L | U | U | |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) | N : | 39227-28-6 | 0.0000022 | 0.000050 | 0.00000044 | ug/L | J,DXMB | U | В |
| 1,2,3,6,7,8-Hexachlorodibenzofurar (HxCDF) | n N | 57117-44-9 | | 0.000050 | 0.00000080 | ug/L | U | U | |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD) | N : | 57653-85-7 | 0.0000014 | 0.000050 | 0.00000041 | ug/L | J,DXMB | U | В |
| 1,2,3,7,8,9-Hexachlorodibenzofurar (HxCDF) | n N | 72918-21-9 | | 0.000050 | 0.00000049 | ug/L | U | U | |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD) | N | 19408-74-3 | 0.00000095 | 0.000050 | 0.00000040 | ug/L | J,DXMB | U | В |
| 1,2,3,7,8-Pentachlorodibenzofuran (PeCDF) | N : | 57117-41-6 | | 0.000050 | 0.00000042 | ug/L | U | U | |
| 1,2,3,7,8-Pentachlorodibenzo-p- dioxin (PeCDD) | N 4 | 40321-76-4 | | 0.000050 | 0.00000051 | ug/L | U | U | |
| 2,3,4,6,7,8-Hexachlorodibenzofurar (HxCDF) | n N | 60851-34-5 | | 0.000050 | 0.00000058 | ug/L | U | U | |
| 2,3,4,7,8-Pentachlorodibenzofuran (PeCDF) | N : | 57117-31-4 | | 0.000050 | 0.00000046 | ug/L | U | U | |
| 2,3,7,8-Tetrachlorodibenzofuran (TCDF) | N : | 51207-31-9 | | 0.000010 | 0.00000038 | ug/L | U | U | |
| 2,3,7,8-Tetrachlorodibenzo-p-dioxit (TCDD) | n N | 1746-01-6 | | 0.000010 | 0.00000040 | ug/L | U | U | |
| Total Heptachlorodibenzofuran (HpCDF) | N : | 38998-75-3 | 0.0000096 | 0.000050 | 0.00000046 | ug/L | J,DXMB | U | В |
| Total Heptachlorodibenzo-p-dioxin (HpCDD) | N : | 37871-00-4 | 0.000038 | 0.000050 | 0.00000049 | ug/L | J,DXMB | U | В |
| Total Hexachlorodibenzofuran (HxCDF) | N : | 55684-94-1 | | 0.000050 | 0.00000049 | ug/L | U | U | |
| Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture | N : | 34465-46-8 | 0.0000055 | 0.000050 | 0.00000042 | ug/L | J,DXMB | U | В |

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| Analysis Method | E16 | 13B | | | | | | | | |
|---|-----|------------|------------|----------|------------|------|---------|---|---|--|
| Total Pentachlorodibenzofuran (PeCDF) | N | 30402-15-4 | 0.00000056 | 0.000050 | 0.00000044 | ug/L | J,DXqMB | U | В | |
| Total Pentachlorodibenzo-p-dioxin (PeCDD) | N | 36088-22-9 | | 0.000050 | 0.00000051 | ug/L | U | U | | |
| Total Tetrachlorodibenzofuran (TCDF) | N | 55722-27-5 | | 0.000010 | 0.00000038 | ug/L | U | U | | |
| Total Tetrachlorodibenzo-p-dioxin (TCDD) | N | 41903-57-5 | | 0.000010 | 0.00000040 | ug/L | U | U | | |

Analysis Method E525.2

Sample Name Outfall009_20180322_Comp Matrix Type: WM Result Type: TRG

Sample Date: 3/22/2018 3:30:00 PM Validation Level: 8

Lab Sample Name: 440-206741-2

Analyte Fraction: CAS No Result RL**MDL** Result Lab Validation Validation Value Units Qualifier Qualifier Notes Chlorpyrifos 2921-88-2 6.9 ng/L U U Diazinon 333-41-5 U U 5.2 ng/L

Analysis Method EPA100.2

Sample Name Outfall009_20180322_Comp Matrix Type: WM Result Type: TRG

Sample Date: 3/22/2018 3:30:00 PM Validation Level: 8

Lab Sample Name: 440-206741-2

Analyte Fraction: CAS No Result RL**MDL** Result Lab Validation Validation Value Units Qualifier Qualifier Notes 1332-21-4 1.00 MFL UJ Asbestos Н

Analysis Method EPA-821-R-02-013

Sample Name Outfall009 20180322 Comp Matrix Type: WM Result Type: TRG

Sample Date: 3/22/2018 3:30:00 PM Validation Level: 8

Lab Sample Name: 440-206741-2

Fraction: CAS No RL **Analyte** Result MDL Result Lab Validation Validation Qualifier Value Units Qualifier Notes Chronic Toxicity, Selenastrum N CHRTOXSELEN 8.12 % effect Chronic Toxicity, Selenastrum N CHRTOXSELEN 35.62 % effect

Tuesday, April 24, 2018 Page 2 of 2



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Irvine 17461 Derian Ave Suite 100

Irvine, CA 92614-5817 Tel: (949)261-1022

TestAmerica Job ID: 440-206741-2

Client Project/Site: Annual Outfall 009 Comp

For:

Haley & Aldrich, Inc. 400 E Van Buren St. Suite 545 Phoenix, Arizona 85004

Attn: Katherine Miller

Authorized for release by: 4/18/2018 6:43:44 PM

Urvashi Patel, Manager of Project Management (949)261-1022

urvashi.patel@testamericainc.com

.....LINKS

Review your project results through Total Access

Have a Question?



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Usli fatel

4/18/2018 6:43:44 PM

Manager of Project Management

Urvashi Patel

I certify under penalty of perjury that the information contained in this report and all attachments was produced in accordance with the indicated methods and laboratory standard operating procedures, except as noted, and are complete and accurate to the best of my knowledge and belief. Subcontract laboratory reports that are attached have been evaluated for completeness and quality control acceptability.

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Sample Summary

Client: Haley & Aldrich, Inc. Project/Site: Annual Outfall 009 Comp

TestAmerica Job ID: 440-206741-2

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---------------|--------------------------|--------|----------------|----------------|
| 440-206741-1 | Outfall009_20180322_Comp | Water | 03/22/18 15:30 | 03/22/18 20:00 |

Case Narrative

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

TestAmerica Job ID: 440-206741-2

Job ID: 440-206741-2

Laboratory: TestAmerica Irvine

Narrative

Job Narrative 440-206741-2

Comments

No additional comments.

Receipt

The samples were received on 3/22/2018 8:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 5 coolers at receipt time were 2.1° C, 2.1° C, 2.3° C, 3.5° C and 3.6° C.

Dioxin

Method(s) 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: Outfall009_20180322_Comp (440-206741-1), (CCV 320-215705/2), (LCS 320-215317/2-A), (LCSD 320-215317/3-A) and (MB 320-215317/1-A). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Method(s) 1613B: EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD associated with the following samples run on instrument 11D2 exceeded this criteria: (CCV 320-215889/2) and (MB 320-215317/1-A). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Subcontract non-Sister

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Dioxin Pres

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Subcontract Work

Methods Ceriodaphnia, Chronic-Selenestrum, Fathead Larvae: These methods were subcontracted to Aquatic Bioassay - Ventura, CA. The subcontract laboratory certifications are different from that of the facility issuing the final report.

Method Asbestos 100.2: This method was subcontracted to LA Testing. The subcontract laboratory certification is different from that of the facility issuing the final report.

Method Weck-525.2-Diazinon and Chlorpyrifos: This method was subcontracted to Weck Laboratories, Inc.. The subcontract laboratory certification is different from that of the facility issuing the final report.

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Client Sample Results

Client: Haley & Aldrich, Inc.

Date Collected: 03/22/18 15:30

Date Received: 03/22/18 20:00

Project/Site: Annual Outfall 009 Comp

Client Sample ID: Outfall009_20180322_Comp

TestAmerica Job ID: 440-206741-2

Lab Sample ID: 440-206741-1

Matrix: Water

| Method: 1613B - Dioxins Analyte | | Qualifier | RL | EDL | Unit | D | Prepared | Analyzed | Dil Fa |
|------------------------------------|------------|-----------|----------------------|-----------|------|---|----------------|----------------|--------|
| 2,3,7,8-TCDD | ND | | 0.000010 | | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 2,3,7,8-TCDF | ND | | 0.000010 | 0.0000003 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,7,8-PeCDD | ND | | 0.000050 | 0.0000005 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,7,8-PeCDF | ND | | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 2,3,4,7,8-PeCDF | ND | | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,4,7,8-HxCDD | 0.0000022 | J,DX MB | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,6,7,8-HxCDD | 0.0000014 | J,DX MB | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,7,8,9-HxCDD | 0.00000095 | J,DX MB | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,4,7,8-HxCDF | ND | | 0.000050 | 0.0000008 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,6,7,8-HxCDF | ND | | 0.000050 | 0.0000008 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,7,8,9-HxCDF | ND | | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 2,3,4,6,7,8-HxCDF | ND | | 0.000050 | 0.0000005 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,4,6,7,8-HpCDD | 0.000017 | J,DX MB | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,4,6,7,8-HpCDF | 0.0000041 | J,DX MB | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| 1,2,3,4,7,8,9-HpCDF | ND | | 0.000050 | 0.0000005 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| OCDD | 0.00020 | MB | 0.00010 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| OCDF | 0.000016 | J,DX MB | 0.00010 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| Total TCDD | ND | | 0.000010 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| Total TCDF | ND | | 0.000010 | 0.0000003 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| Total PeCDD | ND | | 0.000050 | 0.0000005 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| Total PeCDF | 0.00000056 | J,DX q MB | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| Total HxCDD | 0.0000055 | J,DX MB | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| Total HxCDF | ND | | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| Total HpCDD | 0.000038 | J,DX MB | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| Total HpCDF | 0.0000096 | J,DX MB | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 19:34 | |
| Isotope Dilution | %Recovery | Qualifier | Limits | 6 | | | Prepared | Analyzed | Dil F |
| 13C-2,3,7,8-TCDD | 83 | | 25 - 164 | | | | | 03/30/18 19:34 | |
| 13C-2,3,7,8-TCDF | 80 | | 24 - 169 | | | | | 03/30/18 19:34 | |
| 13C-1,2,3,7,8-PeCDD | 77 | | 24 - 109 25 - 181 | | | | | 03/30/18 19:34 | |
| 130-1,2,3,1,0-F80DD | // | | 20 - 101 | | | | 03/29/10 01.29 | 03/30/10 19.34 | |

TestAmerica Irvine

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4/18/2018

Client Sample Results

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

TestAmerica Job ID: 440-206741-2

Client Sample ID: Outfall009_20180322_Comp Lab Sample ID: 440-206741-1

Date Collected: 03/22/18 15:30 Date Received: 03/22/18 20:00 Matrix: Water

| Isotope Dilution | %Recovery Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|-------------------------|---------------------|-----------------|----------------|----------------|---------|
| 13C-2,3,4,7,8-PeCDF | 79 | 21 - 178 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-1,2,3,4,7,8-HxCDD | 79 | 32 - 141 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-1,2,3,6,7,8-HxCDD | 83 | 28 - 130 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-1,2,3,4,7,8-HxCDF | 74 | 26 - 152 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-1,2,3,6,7,8-HxCDF | 76 | 26 - 123 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-1,2,3,7,8,9-HxCDF | 74 | 29 - 147 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-2,3,4,6,7,8-HxCDF | 73 | 28 - 136 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-1,2,3,4,6,7,8-HpCDD | 73 | 23 - 140 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-1,2,3,4,6,7,8-HpCDF | 75 | 28 - 143 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-1,2,3,4,7,8,9-HpCDF | 73 | 26 - 138 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| 13C-OCDD | 66 | 17 - 157 | 03/29/18 07:29 | 03/30/18 19:34 | 1 |
| Surrogate | %Recovery Qualifier | Limits | Prepared | Analyzed | Dil Fac |
| 37CI4-2,3,7,8-TCDD | 103 | <u>35 - 197</u> | 03/29/18 07:29 | 03/30/18 19:34 | 1 |

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Method Summary

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

TestAmerica Job ID: 440-206741-2

| Method | Method Description | Protocol | Laboratory |
|-------------|---|-----------|------------|
| 1613B | Dioxins and Furans (HRGC/HRMS) | 40CFR136A | TAL SAC |
| 100.2 | EPA 100.2 Asbestos in Drinking Water | EPA | LA Testing |
| EPA | Bioassay | EPA | ABC |
| Subcontract | Weck-525.2-Diazinon and Chlorpyrifos | None | Weck Lab |
| 1613B | Separatory Funnel (L/L) Extraction with Soxhlet Extraction of Dioxin and Furans | 40CFR136A | TAL SAC |

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

None = None

Laboratory References:

ABC = Aquatic Bioassay - Ventura, CA, 29 North Olive Street, Ventura, CA 93001

LA Testing = LA Testing, 520 Mission Street, South Pasadena, CA 91030

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Weck Lab = Weck Laboratories, Inc., 14859 East Clark Avenue, City of Industry, CA 917451396

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Lab Chronicle

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

TestAmerica Job ID: 440-206741-2

Lab Sample ID: 440-206741-1

Matrix: Water

Date Collected: 03/22/18 15:30 Date Received: 03/22/18 20:00

| | Batch | Batch | | Dil | Initial | Final | Batch | Prepared | | |
|-----------|----------|--------|-----|--------|----------|---------|--------|----------------|---------|---------|
| Prep Type | Type | Method | Run | Factor | Amount | Amount | Number | or Analyzed | Analyst | Lab |
| Total/NA | Prep | 1613B | | | 990.5 mL | 20.0 uL | 215317 | 03/29/18 07:29 | KQT | TAL SAC |
| Total/NA | Analysis | 1613B | | 1 | | | 215705 | 03/30/18 19:34 | ALM | TAL SAC |

Laboratory References:

ABC = Aquatic Bioassay - Ventura, CA, 29 North Olive Street, Ventura, CA 93001

LA Testing = LA Testing, 520 Mission Street, South Pasadena, CA 91030

Client Sample ID: Outfall009_20180322_Comp

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Weck Lab = Weck Laboratories, Inc., 14859 East Clark Avenue, City of Industry, CA 917451396

Client: Haley & Aldrich, Inc.

13C-1,2,3,7,8-PeCDF

Project/Site: Annual Outfall 009 Comp

TestAmerica Job ID: 440-206741-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

| Lab Sample ID: MB 320-215317/1-A Matrix: Water | | | | C | | ple ID: Method Prep Type: To | otal/NA | |
|---|-----------|----|----------|---|----------|---------------------------------|---------|--|
| Analysis Batch: 215705 | | | | | | Prep Batch: | 215317 | |
| МВ | MB | | | | | | | |
| Analyte Result | Qualifier | RL | EDL Unit | D | Prepared | Analyzed | Dil Fac | |

| Analysis Batch: 215705 | MR | МВ | | | | | | Prep Batch: | 215317 |
|------------------------|------------|-----------|----------|-----------|------|---|----------------|----------------|---------|
| Analyte | | Qualifier | RL | EDL | Unit | D | Prepared | Analyzed | Dil Fac |
| 2,3,7,8-TCDD | 0.00000274 | | 0.000010 | 0.0000005 | | _ | · | 03/30/18 15:44 | 1 |
| 1,2,3,7,8-PeCDD | 0.00000397 | J,DX | 0.000050 | 0.0000005 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,7,8-PeCDF | 0.00000309 | J,DX q | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 2,3,4,7,8-PeCDF | 0.00000255 | J,DX q | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,4,7,8-HxCDD | 0.00000383 | J,DX | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,6,7,8-HxCDD | 0.00000290 | J,DX | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,7,8,9-HxCDD | 0.00000271 | J,DX q | 0.000050 | 0.0000003 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,4,7,8-HxCDF | 0.00000255 | J,DX | 0.000050 | 0.0000007 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,6,7,8-HxCDF | 0.00000235 | J,DX | 0.000050 | 0.0000007 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,7,8,9-HxCDF | 0.00000281 | J,DX | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 2,3,4,6,7,8-HxCDF | 0.00000191 | J,DX | 0.000050 | 0.0000005 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,4,6,7,8-HpCDD | 0.00000451 | J,DX | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,4,6,7,8-HpCDF | 0.00000290 | J,DX | 0.000050 | 0.0000003 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 1,2,3,4,7,8,9-HpCDF | 0.00000269 | J,DX q | 0.000050 | 0.0000003 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| OCDD | 0.0000211 | J,DX | 0.00010 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| OCDF | 0.00000629 | J,DX | 0.00010 | 0.0000005 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| Total TCDD | 0.00000274 | J,DX | 0.000010 | 0.0000005 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| Total TCDF | 0.00000168 | J,DX | 0.000010 | 0.0000003 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| Total PeCDD | 0.00000397 | J,DX | 0.000050 | 0.0000005 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| Total PeCDF | 0.00000564 | J,DX q | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| Total HxCDD | 0.00000943 | J,DX q | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| Total HxCDF | 0.00000963 | J,DX | 0.000050 | 0.0000006 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| Total HpCDD | 0.00000711 | J,DX | 0.000050 | 0.0000004 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| Total HpCDF | 0.00000559 | J,DX q | 0.000050 | 0.0000003 | ug/L | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| | MB | MB | | Ū | | | | | |
| Isotope Dilution | %Recovery | | Limits | | | | Prepared | Analyzed | Dil Fac |
| 13C-2,3,7,8-TCDD | | | 25 - 164 | | | | 03/29/18 07:29 | 03/30/18 15:44 | |
| 13C-2,3,7,8-TCDF | 78 | | 24 - 169 | | | | 03/29/18 07:29 | 03/30/18 15:44 | 1 |
| 13C-1,2,3,7,8-PeCDD | 79 | | 25 - 181 | | | | | 03/30/18 15:44 | 1 |
| | <u>-</u> | | | | | | | | |

TestAmerica Irvine

03/29/18 07:29 03/30/18 15:44

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Client: Haley & Aldrich, Inc.

Matrix: Water

13C-OCDD

Surrogate

37CI4-2,3,7,8-TCDD

Project/Site: Annual Outfall 009 Comp

Lab Sample ID: MB 320-215317/1-A

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

65

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TestAmerica Job ID: 440-206741-2

Client Sample ID: Method Blank Prep Type: Total/NA

Prep Batch: 215317

| Analysis Batch: 215705 | | | | | Prep Batch: 215317 | | |
|-------------------------|-----------|-----------|----------|----------------|---------------------------|---------|--|
| | MB | MB | | | • | | |
| Isotope Dilution | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac | |
| 13C-2,3,4,7,8-PeCDF | 81 | | 21 - 178 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |
| 13C-1,2,3,4,7,8-HxCDD | 80 | | 32 - 141 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |
| 13C-1,2,3,6,7,8-HxCDD | 85 | | 28 - 130 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |
| 13C-1,2,3,4,7,8-HxCDF | 73 | | 26 - 152 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |
| 13C-1,2,3,6,7,8-HxCDF | 76 | | 26 - 123 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |
| 13C-1,2,3,7,8,9-HxCDF | 75 | | 29 - 147 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |
| 13C-2,3,4,6,7,8-HxCDF | 73 | | 28 - 136 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |
| 13C-1,2,3,4,6,7,8-HpCDD | 72 | | 23 - 140 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |
| 13C-1,2,3,4,6,7,8-HpCDF | 74 | | 28 - 143 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |
| 13C-1,2,3,4,7,8,9-HpCDF | 72 | | 26 - 138 | 03/29/18 07:29 | 03/30/18 15:44 | 1 | |

MB MB %Recovery Qualifier Limits

17 - 157

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Prepared Dil Fac Analyzed 03/29/18 07:29 03/30/18 15:44

03/29/18 07:29 03/30/18 15:44

Lab Sample ID: LCS 320-215317/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 215705 Prep Batch: 215317**

| - | Spike | LCS | LCS | | | | %Rec. | |
|---------------------|----------|----------|-----------|------|---|------|---------------------|--|
| Analyte | Added | Result | Qualifier | Unit | D | %Rec | Limits | |
| 2,3,7,8-TCDD | 0.000200 | 0.000197 | MB | ug/L | | 99 | 67 - 158 | |
| 2,3,7,8-TCDF | 0.000200 | 0.000191 | MB | ug/L | | 95 | 75 ₋ 158 | |
| 1,2,3,7,8-PeCDD | 0.00100 | 0.00106 | MB | ug/L | | 106 | 70 - 142 | |
| 1,2,3,7,8-PeCDF | 0.00100 | 0.000966 | MB | ug/L | | 97 | 80 - 134 | |
| 2,3,4,7,8-PeCDF | 0.00100 | 0.000971 | MB | ug/L | | 97 | 68 ₋ 160 | |
| 1,2,3,4,7,8-HxCDD | 0.00100 | 0.000953 | MB | ug/L | | 95 | 70 - 164 | |
| 1,2,3,6,7,8-HxCDD | 0.00100 | 0.000888 | MB | ug/L | | 89 | 76 - 134 | |
| 1,2,3,7,8,9-HxCDD | 0.00100 | 0.000942 | MB | ug/L | | 94 | 64 - 162 | |
| 1,2,3,4,7,8-HxCDF | 0.00100 | 0.000962 | MB | ug/L | | 96 | 72 - 134 | |
| 1,2,3,6,7,8-HxCDF | 0.00100 | 0.000970 | MB | ug/L | | 97 | 84 - 130 | |
| 1,2,3,7,8,9-HxCDF | 0.00100 | 0.000961 | MB | ug/L | | 96 | 78 ₋ 130 | |
| 2,3,4,6,7,8-HxCDF | 0.00100 | 0.000983 | MB | ug/L | | 98 | 70 ₋ 156 | |
| 1,2,3,4,6,7,8-HpCDD | 0.00100 | 0.00102 | MB | ug/L | | 102 | 70 - 140 | |
| 1,2,3,4,6,7,8-HpCDF | 0.00100 | 0.000935 | MB | ug/L | | 94 | 82 - 122 | |
| 1,2,3,4,7,8,9-HpCDF | 0.00100 | 0.000920 | MB | ug/L | | 92 | 78 ₋ 138 | |
| OCDD | 0.00200 | 0.00185 | MB | ug/L | | 92 | 78 ₋ 144 | |
| OCDF | 0.00200 | 0.00181 | MB | ug/L | | 91 | 63 - 170 | |

| OCDI | | 0.00200 | 0.00101 IVID | ug/L | 31 03-170 |
|--|-------------|-----------------|--------------|------|-----------|
| | LCS LC | cs | | | |
| Isotope Dilution | %Recovery Q | ualifier Limits | | | |
| 13C-2,3,7,8-TCDD | 81 | 20 - 175 | _ | | |
| 13C-2,3,7,8-TCDF | 80 | 22 - 152 | | | |
| 13C-1,2,3,7,8-PeCDD | 78 | 21 - 227 | | | |
| 13C-1,2,3,7,8-PeCDF | 79 | 21 - 192 | | | |
| 13C-2,3,4,7,8-PeCDF | 81 | 13 - 328 | | | |
| 13C-1,2,3,4,7,8-HxCDD | 80 | 21 - 193 | | | |
| 13C-1,2,3,6,7,8-HxCDD | 85 | 25 - 163 | | | |
| 13C-1,2,3,4,7,8-HxCDF | 75 | 19 - 202 | | | |
| 13C-1,2,3,6,7,8-HxCDF | 76 | 21 - 159 | | | |
| I and the second se | | | | | |

TestAmerica Irvine

Page 11 of 97

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

Lab Sample ID: LCS 320-215317/2-A

TestAmerica Job ID: 440-206741-2

Client Sample ID: Lab Control Sample Prep Type: Total/NA

Prep Batch: 215317

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

%Recovery Qualifier

104

Analysis Batch: 215705 LCS LCS %Recovery Qualifier Isotope Dilution Limits 77 17 - 205 13C-1,2,3,7,8,9-HxCDF 13C-2,3,4,6,7,8-HxCDF 74 22 - 176 73 13C-1,2,3,4,6,7,8-HpCDD 26 - 166 13C-1,2,3,4,6,7,8-HpCDF 78 21 - 158 13C-1,2,3,4,7,8,9-HpCDF 74 20 - 186 13C-OCDD 67 13 - 199 LCS LCS

Lab Sample ID: LCSD 320-215317/3-A

Matrix: Water

37CI4-2,3,7,8-TCDD

Surrogate

OCDF

Matrix: Water

Client Sample ID: Lab Control Sample Dup

84

63 - 170

Prep Type: Total/NA **Prep Batch: 215317**

Analysis Batch: 215705 LCSD LCSD Spike %Rec. **RPD** Added Result Qualifier Unit D %Rec Limits RPD Limit **Analyte** 2,3,7,8-TCDD 0.000200 0.000197 MB 67 - 158 50 ug/L 99 0 2,3,7,8-TCDF 0.000200 0.000188 MB ug/L 94 75 - 158 50 1 1,2,3,7,8-PeCDD 0.00100 0.00108 MB ug/L 108 70 - 14250 1,2,3,7,8-PeCDF 0.00100 0.000964 MB ug/L 96 80 - 134 50 2,3,4,7,8-PeCDF 0.00100 0.000972 MB ug/L 97 68 - 160n 50 0.00100 0.000967 MB 97 70 - 164 50 1,2,3,4,7,8-HxCDD ug/L 1,2,3,6,7,8-HxCDD 91 2 0.00100 0.000905 MB ug/L 76 - 134 50 1,2,3,7,8,9-HxCDD 0.00100 0.000831 MB ug/L 83 64 - 162 13 50 0.000969 MB 97 72 - 134 1,2,3,4,7,8-HxCDF 0.00100 ug/L 50 1,2,3,6,7,8-HxCDF 0.00100 0.000982 MB ug/L 98 84 - 130 50 1,2,3,7,8,9-HxCDF 0.00100 0.000954 MB ug/L 95 78 - 130 50 2,3,4,6,7,8-HxCDF 0.00100 0.000976 MB ug/L 98 70 - 156 50 1,2,3,4,6,7,8-HpCDD 0.00100 0.00102 MB ug/L 102 70 - 140 50 0.000965 MB 97 82 - 122 50 1,2,3,4,6,7,8-HpCDF 0.00100 ug/L 3 0.00100 0.000912 MB 91 78 - 138 50 1,2,3,4,7,8,9-HpCDF ug/L OCDD 0.00200 0.00195 MB ug/L 98 78 - 1445 50

0.00168 MB

ug/L

0.00200

Limits

31 - 191

LCSD LCSD

| Isotope Dilution | %Recovery | Qualifier | Limits |
|-------------------------|-----------|-----------|----------|
| 13C-2,3,7,8-TCDD | 81 | | 20 - 175 |
| 13C-2,3,7,8-TCDF | 79 | | 22 - 152 |
| 13C-1,2,3,7,8-PeCDD | 78 | | 21 - 227 |
| 13C-1,2,3,7,8-PeCDF | 79 | | 21 - 192 |
| 13C-2,3,4,7,8-PeCDF | 81 | | 13 - 328 |
| 13C-1,2,3,4,7,8-HxCDD | 95 | | 21 - 193 |
| 13C-1,2,3,6,7,8-HxCDD | 98 | | 25 - 163 |
| 13C-1,2,3,4,7,8-HxCDF | 92 | | 19 - 202 |
| 13C-1,2,3,6,7,8-HxCDF | 95 | | 21 - 159 |
| 13C-1,2,3,7,8,9-HxCDF | 65 | | 17 - 205 |
| 13C-2,3,4,6,7,8-HxCDF | 90 | | 22 - 176 |
| 13C-1,2,3,4,6,7,8-HpCDD | 78 | | 26 - 166 |
| 13C-1,2,3,4,6,7,8-HpCDF | 61 | | 21 - 158 |
| 13C-1,2,3,4,7,8,9-HpCDF | 76 | | 20 - 186 |

TestAmerica Irvine

Page 12 of 97

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

Lab Sample ID: LCSD 320-215317/3-A

TestAmerica Job ID: 440-206741-2

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Client Sample ID: Method Blank

Prep Batch: 215317

Prep Type: Total/NA Prep Batch: 215317

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Matrix: Water Analysis Batch: 215705

LCSD LCSD

Isotope Dilution%RecoveryQualifierLimits13C-OCDD7813 - 199

LCSD LCSD

 Surrogate
 %Recovery
 Qualifier
 Limits

 37C/4-2,3,7,8-TCDD
 104
 31 - 191

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Lab Sample ID: MB 320-215317/1-A

Matrix: Water

Analysis Batch: 215889

MB MB

 $\frac{\text{Analyte}}{2,3,7,8-\text{TCDF-RA}} \qquad \frac{\text{Result}}{0.00000285} \quad \frac{\text{Qualifier}}{\text{J,DX}} \qquad \frac{\text{RL}}{0.000010} \quad \frac{\text{EDL}}{0.0000004} \quad \frac{\text{Unit}}{\text{ug/L}} \qquad \frac{\text{D}}{0.3/29/18 \ 07:29} \quad \frac{\text{Analyzed}}{0.4/02/18 \ 12:53} \qquad \frac{\text{Dil Fac}}{1} = \frac{1}{1} = \frac{1$

MB MB

 Isotope Dilution
 %Recovery
 Qualifier
 Limits
 Prepared
 Analyzed
 Dil Fac

 13C-2,3,7,8-TCDF - RA
 74
 24 - 169
 03/29/18 07:29
 04/02/18 12:53
 1

MB MB

 Surrogate
 %Recovery
 Qualifier
 Limits
 Prepared
 Analyzed
 Dil Fac

 37C/4-2,3,7,8-TCDD - RA
 92
 35 - 197
 03/29/18 07:29
 04/02/18 12:53
 1

TestAmerica Irvine

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QC Association Summary

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

TestAmerica Job ID: 440-206741-2

Specialty Organics

Prep Batch: 215317

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|------------------------|--------------------------|-----------|--------|--------|------------|
| 440-206741-1 | Outfall009_20180322_Comp | Total/NA | Water | 1613B | |
| MB 320-215317/1-A | Method Blank | Total/NA | Water | 1613B | |
| MB 320-215317/1-A - RA | Method Blank | Total/NA | Water | 1613B | |
| LCS 320-215317/2-A | Lab Control Sample | Total/NA | Water | 1613B | |
| LCSD 320-215317/3-A | Lab Control Sample Dup | Total/NA | Water | 1613B | |

Analysis Batch: 215705

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------------|--------------------------|-----------|--------|--------|------------|
| 440-206741-1 | Outfall009_20180322_Comp | Total/NA | Water | 1613B | 215317 |
| MB 320-215317/1-A | Method Blank | Total/NA | Water | 1613B | 215317 |
| LCS 320-215317/2-A | Lab Control Sample | Total/NA | Water | 1613B | 215317 |
| LCSD 320-215317/3-A | Lab Control Sample Dup | Total/NA | Water | 1613B | 215317 |

Analysis Batch: 215889

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|------------------------|------------------|-----------|--------|--------|------------|
| MB 320-215317/1-A - RA | Method Blank | Total/NA | Water | 1613B | 215317 |

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Definitions/Glossary

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

Qualifier Description

Toxicity Equivalent Quotient (Dioxin)

TestAmerica Job ID: 440-206741-2

Qualifiers

DioxinQualifier

| J,DX | Estimated value; value < lowest standard (MQL), but >than MDL |
|------|---|
| MB | Analyte present in the method blank |
| q | The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The |
| | measured ion ratio does not meet qualitative identification criteria and indicates a possible interference. |

Glossary

TEQ

| Ciocoary | |
|----------------|---|
| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
| a | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| | |

TestAmerica Irvine

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc. TestAmerica Job ID: 440-206741-2

Project/Site: Annual Outfall 009 Comp

Laboratory: TestAmerica Irvine

The accreditations/certifications listed below are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|------------|---------------|-------------------|-----------------------|------------------------|
| California | State Program | 9 | CA ELAP 2706 | 06-30-18 |

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | Program EPA Region | | Expiration Date | | |
|--------------------|-----------------------|--------------------|---------------|------------------------|--|--|
| Alaska (UST) | State Program | 10 | 17-020 | 01-20-21 | | |
| Arizona | State Program | 9 | 9 AZ0708 0 | | | |
| Arkansas DEQ | State Program | 6 | 6 88-0691 0 | | | |
| California | State Program | 9 | 2897 | 01-31-19 | | |
| Colorado | State Program | 8 | CA00044 | 08-31-18 | | |
| Connecticut | State Program | 1 | PH-0691 | 06-30-19 | | |
| Florida | NELAP | 4 | E87570 | 06-30-18 | | |
| Georgia | State Program | 4 | N/A | 01-28-19 | | |
| Hawaii | State Program | 9 | N/A | 01-29-19 | | |
| Illinois | NELAP | 5 | 200060 | 03-17-19 | | |
| Kansas | NELAP | 7 | E-10375 | 10-31-18 | | |
| L-A-B | DoD ELAP | | L2468 | 01-20-21 | | |
| Louisiana | NELAP | 6 | 6 30612 | | | |
| Maine | State Program | 1 | CA0004 | 04-14-18 * | | |
| Michigan | State Program | 5 | 5 9947 | | | |
| Nevada | State Program | 9 | CA00044 | 07-31-18 | | |
| New Hampshire | NELAP | 1 | 2997 | 04-18-18 * | | |
| New Jersey | NELAP | 2 | CA005 | 06-30-18 | | |
| New York | NELAP | 2 | 11666 | 03-31-19 | | |
| Oregon | NELAP | 10 | 4040 | 01-29-19 | | |
| Pennsylvania | NELAP 3 68-01272 | | 68-01272 | 03-31-19 | | |
| Texas | NELAP | 6 | T104704399 | 05-31-18 | | |
| US Fish & Wildlife | Federal | | LE148388-0 | 07-31-18 | | |
| USDA | Federal | | P330-11-00436 | 01-17-21 | | |
| USEPA UCMR | Federal | 1 | CA00044 | 11-06-18 | | |
| Utah | NELAP | 8 | CA00044 | 02-28-19 | | |
| Virginia | nia NELAP 3 460 | | 460278 | 03-14-19 | | |
| Washington | State Program | 10 | C581 | 05-05-18 | | |
| West Virginia (DW) | State Program | 3 | 9930C | 12-31-18 | | |
| Wyoming | Vyoming State Program | | 8TMS-L | 01-28-19 | | |

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.



Certificate of Analysis

FINAL REPORT

Work Orders: 8C23035

Report Date: 4/05/2018

Received Date: 3/23/2018

Turnaround Time: 7 workdays

Phones: (949) 261-1022

03/30/18 22:52

Fax: (949) 260-3297

P.O. #:

Billing Code:

Attn: Urvashi Patel

Project: 440-206741-1

Client: TestAmerica - Irvine CA

17461 Derian Ave, Suite 100

Irvine, CA 92614

Dear Urvashi Patel,

Triphenyl phosphate

Enclosed are the results of analyses for samples received 3/23/18 with the Chain-of-Custody document. The samples were received in good condition, at 2.1 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

XX

Sample Results

| Sample: Outfall009_20 | 180322_Comp (440-206741-1) | | | | | | Sampled: 03/22/18 0:0 | 1 by Client |
|----------------------------|----------------------------|---------------|-----|-------------|---------------|-----|-----------------------|-------------|
| 8C23035-01 (| Water) | | | | | | | |
| Analyte | | Result | MDL | MRL | Units | Dil | Analyzed | Qualifier |
| Method: EPA 525.2M | Batch ID: W8C1385 | Instr: GCMS13 | | Prepared: 0 | 3/23/18 09:40 | | Analyst: EFC | |
| Chlorpyrifos | | ND | 6.9 | 10 | ng/l | 1 | 03/30/18 22:52 | |
| Diazinon | | ND | 5.2 | 10 | ng/l | 1 | 03/30/18 22:52 | |
| Surrogate(s) | | | | | | | | |
| 1,3-Dimethyl-2-nitrobenzen | e | 97% | | 76-128 | Conc: 48 | 35 | 03/30/18 22:52 | |

143%

40-163

Conc: 713

8C23035 Page 1 of 3

14859 East Clark Avenue, City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

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Certificate of Analysis

| | _ | |
|---------|----------|----------|
| Ouality | Control | Results |
| Quality | Continuo | 11630113 |

| Semivolatile Organics - Low Level by Tander | m GC/MS/MS | | | | | | | | | | |
|--|------------|-------------|-------|--------|------------------|--------------|----------|--------|-----|-------|-----------|
| | | | | | Spike | Source | | %REC | | RPD | |
| Analyte | Result | MDL | MRL | Units | Level | Result | %REC | Limits | RPD | Limit | Qualifier |
| | | | | | | | | | | | |
| Blank (W8C1385-BLK1) | | | | | Prepared: 03/23/ | 18 Analyzed: | 03/30/18 | | | | |
| Chlorpyrifos | ND | 6.9 | 10 | ng/l | | | | | | | |
| Diazinon | ND | 5.2 | 10 | ng/l | | | | | | | |
| Surrogate(s) | | | | | | | | | | | |
| 1,3-Dimethyl-2-nitrobenzene | | | | ng/l | 500 | | 68 | 76-128 | | | S-11 |
| Triphenyl phosphate | | | 506 | ng/l | 500 | | 101 | 40-163 | | | |
| LCS (W8C1385-BS1) | | | | | Prepared: 03/23/ | 18 Analyzed: | 03/30/18 | | | | |
| Chlorpyrifos | 41.0 | 6.9 | 10 | ng/l | 50.0 | | 82 | 37-169 | | | |
| Diazinon | 30.9 | 5.2 | 10 | ng/l | 50.0 | | 62 | 43-152 | | | |
| Surrogate(s) | | | | | | | | | | | |
| 1,3-Dimethyl-2-nitrobenzene | | | 357 | ng/l | 500 | | 71 | 76-128 | | | S-11 |
| Triphenyl phosphate | | | - 499 | ng/l | 500 | | 100 | 40-163 | | | |
| Matrix Spike (W8C1385-MS1) | Source | : 8C22030-0 | 11 | | Prepared: 03/23/ | 19 Analyzoda | 02/20/10 | | | | |
| Chlorpyrifos | | 6.9 | 10 | ng/l | 50.0 | ND | 124 | 37-168 | | | |
| Diazinon | | 5.2 | 10 | ng/l | 50.0 | ND | 110 | 36-153 | | | |
| | | | | 119/1 | 00.0 | 140 | 110 | 00-100 | | | |
| Surrogate(s) 1,3-Dimethyl-2-nitrobenzene | | | | ng/l | 500 | | 93 | 76-128 | | | |
| Triphenyl phosphate | | | 600 | ng/l | 500 | | 120 | 40-163 | | | |
| | | | | J | | | | | | | |
| Matrix Spike (W8C1385-MS2) | | : 8C23035-0 | | n a /l | Prepared: 03/23/ | = | | 27 460 | | | |
| Chlorpyrifos | | 6.9 | 10 | ng/l | 50.0 | ND | 145 | 37-168 | | | |
| Diazinon | | 5.2 | 10 | ng/l | 50.0 | ND | 141 | 36-153 | | | |
| Surrogate(s) 1,3-Dimethyl-2-nitrobenzene | | | | ng/l | 500 | | 93 | 76-128 | | | S-11 |
| • | | | | • | | | | | | | 3-11 |
| Triphenyl phosphate | | | 760 | ng/l | 500 | | 152 | 40-163 | | | |
| Matrix Spike Dup (W8C1385-MSD1) | | : 8C22030-0 |)1 | | Prepared: 03/23/ | 18 Analyzed: | 03/30/18 | | | | |
| Chlorpyrifos | 75.9 | 6.9 | 10 | ng/l | 50.0 | ND | 152 | 37-168 | 20 | 30 | |
| Diazinon | 61.1 | 5.2 | 10 | ng/l | 50.0 | ND | 122 | 36-153 | 10 | 30 | |
| Surrogate(s) | | | | | | | | | | | |
| 1,3-Dimethyl-2-nitrobenzene | | | 458 | ng/l | 500 | | 92 | 76-128 | | | |
| Triphenyl phosphate | | | 777 | ng/l | 500 | | 155 | 40-163 | | | S-11 |
| Matrix Spike Dup (W8C1385-MSD2) Source: 8C23035-01 | | |)1 | | Prepared: 03/23/ | 18 Analyzed: | 03/30/18 | | | | |
| Chlorpyrifos | | 6.9 | 10 | ng/l | 50.0 | ND | 144 | 37-168 | 0.6 | 30 | |
| Diazinon | 56.9 | 5.2 | 10 | ng/l | 50.0 | ND | 114 | 36-153 | 21 | 30 | |
| Surrogate(s) | | | | | | | | | | | |
| | | | 496 | ng/l | 500 | | 99 | 76-128 | | | |
| Triphenyl phosphate | | | 759 | ng/l | 500 | | 152 | 40-163 | | | |

Page 2 of 3 8C23035 14859 East Clark Avenue, City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634



Certificate of Analysis

FINAL REPORT

| W | Notes and | Definitions |
|---|--------------|-------------|
| 4 | I TOLOG GITG | |

| Item | Definition |
|--------|--|
| S-11 | Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate. |
| ND | NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL. |
| Dil | Dilution |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |
| % Rec | Percent Recovery |
| Source | Sample that was matrix spiked or duplicated. |
| MDL | Method Detection Limit |
| MRL | The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ) and Detection Limit for Reporting (DLR) |
| MDA | Minimum Detectable Activity |
| NR | Not Reportable |
| TIC | Tentatively Identified Compound (TIC) using mass spectrometry. The reported concentration is relative concentration based on the nearest internal standard. If the library search produces no matches at, or above 85%, the compound is reported as unknown. |

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance. An Absence of Total Coliform meets the drinking water standards as established by the California State Water Resources Control Board (SWRCB) All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS 002.

Reviewed by:











Regina Giancola Project Manager

DoD-ELAP #L2457 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • ISO 17025 #L2457.01 • LACSD #10143 • NJ-DEP #CA015

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

8C23035 Page 3 of 3



LA Testing

520 Mission Street South Pasadena, CA 91030 Phone/Fax: (323) 254-9960 / (323) 254-9982

http://www.LATesting.com / pasadenalab@latesting.com

LA Testing Order ID: 321806893 TEST72 Customer ID: 44009879 Customer PO:

Project ID:

Attn: Urvashi Patel

> TestAmerica - Irvine, CA 17461 Derian Avenue Suite 100

Irvine, CA 92614

Phone: (949) 261-1022 Fax: (949) 260-3297 Collected: 03/22/2018 Received: 03/24/2018

Analyzed: 04/02/2018

44009879 /440-120425.1/ 440-206741-1/ Boeing NPDES SSFL outfalls Proj:

Test Report: Determination of Asbestos Structures >10µm in Drinking Water Performed by the 100.2 Method (EPA 600/R-94/134)

ASBESTOS

| Sample ID Client / EMSL | Sample Filtration Date/Time | Original Sample Vol. Filtered | Effective Filter Area | Area Analyzed | Asbestos Types | Fibers Detected | Analytical Sensitivity | Concentration | Confidence Limits |
|-----------------------------|-----------------------------------|-------------------------------------|-----------------------------|------------------|-------------------|--------------------|---------------------------|---------------------|----------------------|
| | | (ml) | (mm²) | (mm²) | | | MFL | (million fibers per | liter) |
| Outfall 009_20180322_Com | 3/29/2018 | 5 | 1288 | 0.2580 | None Detected | ND | 1.00 | <1.00 | 0.00 - 3.70 |

p (440-206741-1) 321806893-0001

Due to excessive particulate the analytical sensitivity of 0.2 MFL as

required by the method was not reached.

Sample ozonated prior to analysis due to lab receipt time exceeding 48hr method hold time.

Analyst(s)

Sherrie Ahmad

Jerry Drapala Ph.D, Laboratory Manager or Other Approved Signatory

Any questions please contact Jerry Drapala.

Initial report from: 04/02/2018 12:52:24

Sample collection and containers provided by the client, acceptable bottle blank level is defined as <0.01MFL>10um. ND=None Detected. This report relates only to those items tested. This report may not be reproduced, except in full, without written permission by LA Testing. Samples received in good condition unless otherwise noted.

Samples analyzed by LA Testing South Pasadena, CA CA ELAP 2283

Test Report: TEM100.2-7.35.11 Printed: 4/02/2018 12:52PM

(1)

Page 1 of 1



April 17, 2018

Ms. Urvashi Patel TestAmerica Irvine 17461 Derian Avenue, Suite 100 Irvine, CA 92614

Dear Ms. Patel:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms EPA-821-R-02-013." Results were as follows:

CLIENT:

TestAmerica Irvine

SAMPLE I.D.:

Outfall 009

DATE RECEIVED:

23 March - 18

ABC LAB. NO.:

TAM0318.263

CHRONIC FATHEAD LARVAE SURVIVAL & GROWTH BIOASSAY

IWC = 100.00%

TST RESULT

SURVIVAL = PASS %

% EFFECT = 3.42 %

GROWTH = PASS

% EFFECT = -9.99 %

Yours very truly

Scott Johnson

Laboratory Director

3

1

9

10

12

15

1(

17 Apr-18 08:12 (p 1 of 1)

Test Code:

TAM0318.263fml | 06-5046-1520

| | | | | | | | lest | Code: | TAM0318 | .263fml 06 | -5046-152 |
|---|--|----------------|--|--|----------------------|------------------|--------------------------------|------------------|----------------------------|----------------|----------------|
| Fathead Minn | ow 7-d Larval | Survival a | nd Growt | n Test | | | | Aquatic B | ioassay & (| Consulting | Labs, Inc. |
| Batch ID: Start Date: Ending Date: Duration: | 06-9786-9458 23 Mar-18 13:5 30 Mar-18 12:2 6d 23h | 50 Pı 25 Sı | est Type: rotocol: pecies: ource: | Growth-Surviva EPA/821/R-02- Pimephales pro Aquatic Biosyst | 013 (2002) omelas | | Anal Dilue Brine Age: | ent: Labo | oratory Wate Applicable | er | |
| • | 18-8658-7754 22 Mar-18 15:3 23 Mar-18 13:3 22h (2.1 °C) | 30 M | ode: aterial: ource: tation: | TAM0318.263fi Sample Water Bioassay Repo Outfall 009 | | | Clier Proj | | t America Ir ing-SSFL N | | |
| Single Comp | arison Summa | rv | | | | | | | | | |
| Analysis ID 17-0999-6248 | Endpoint 7d Survival Ra Mean Dry Wei | te | TST-\ | parison Method Velch's t Test Velch's t Test | | | P-Value 1.4E-05 1.7E-05 | 100% pas | son Result sed 7d surv | | g |
| Test Accepta | bility | | | | | TAC | Limits | | | | |
| Analysis ID | Endpoint | | Attrib | ute | Test Stat | | Upper | Overlap | Decision | | |
| | 7d Survival Ra Mean Dry Wei | | | ol Resp ol Resp | 0.975 0.3342 | 0.8 0.25 | >> >> | Yes Yes | Passes C Passes C | | |
| 7d Survival R | late Summary | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 100 | N | 8 | 0.975 0.941 | | 1.0000 0.9882 | 0.8667 0.8667 | 1.0000 1.0000 | 0.0175 0.0197 | 0.0496 0.0556 | 5.09% 5.91% | 0.00% 3.42% |
| Mean Dry We | ight-mg Summ | ary | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | N | 8 | 0.334 | | 0.3624 | 0.2857 | 0.3831 | 0.01192 | 0.03371 | 10.09% | 0.00% |
| 100 | | 8 | 0.367 | 6 0.332 | 0.4032 | 0.2943 | 0.4385 | 0.01506 | 0.04258 | 11.58% | -9.99% |
| 7d Survival R | Rate Detail | | | | | | | | | | |
| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | | |
| 0 | N | 1.0000 | 0.933 | 3 1.0000 | 0.8667 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | | |
| 100 | | 0.9333 | 0.933 | 3 1.0000 | 1.0000 | 0.8667 | 0.9333 | 0.8667 | 1.0000 | | |
| Mean Dry We | ight-mg Detail | | | | | | | | | | |
| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | | |
| 0 | N | 0.2867 | 0.285 | 7 0.3407 | 0.3831 | 0.3293 | 0.3587 | 0.3387 | 0.3507 | | |
| 100 | | 0.2943 | 0.381 | 4 0.3793 | 0.3373 | 0.37 | 0.3471 | 0.4385 | 0.3927 | | |
| 7d Survival R | Rate Binomials | | | | | | | | | | |
| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | | |
| 0 | N | 15/15 | 14/15 | 15/15 | 13/15 | 15/15 | 15/15 | 15/15 | 15/15 | | |

100

14/15

14/15

15/15

13/15

15/15

14/15

15/15

13/15

17 Apr-18 08:12 (p 1 of 4)

Test Code:

TAM0318.263fml | 06-5046-1520

| | | | | | | | lest | Code: | TAM0318. | .263fm1 06 | 5-5046- | 152 |
|--|-----------------------------|-------------------------------|----------------|-----------------|------------------|------------------|------------------|------------------|-------------------|----------------|----------------|-----|
| Fathead Minnow | v 7-d Larval S | urvival an | d Growt | h Test | 140 | | | Aquatic Bi | oassay & (| Consulting | Labs, | Inc |
| | 7-0999-6248 | En | dpoint: | 7d Survival Rat | te | | CETI | S Version: | CETISv1 | .9.2 | | |
| Analyzed: 1 | 17 Apr-18 8:11 | Ana | alysis: | Parametric Bio | equivalence- | Two Sample | Offic | ial Results: | Yes | | | |
| Batch ID: 06 | 6-9786-9458 | Tes | t Type: | Growth-Surviva | ıl (7d) | | Anal | yst: | | | | |
| Start Date: 23 | 3 Mar-18 13:50 | | tocol: | EPA/821/R-02- | | | Dilue | nt: Labo | ratory Wate | er | | |
| Ending Date: 30 |) Mar-18 12:25 | Spe | ecies: | Pimephales pro | omelas | | Brine | : Not A | Applicable | | | |
| Duration: 60 | d 23h | So | urce: | Aquatic Biosys | tems, CO | | Age: | | | | | |
| Sample ID: 18 | 3-8658-7754 | Co | de: | TAM0318.263f | ml | | Clier | nt: Test | America Irv | /ine | | _ |
| Sample Date: 22 | 2 Mar-18 15:30 |) Ma | terial: | Sample Water | | | Proje | ect: Boei | ng-SSFL Ni | PDES | | |
| Receipt Date: 23 | 3 Mar-18 13:30 | So | urce: | Bioassay Repo | ort | | | | | | | |
| Sample Age: 22 | 2h (2.1 °C) | Sta | tion: | Outfall 009 | | | | | | | | |
| Data Transform | | Alt Hyp | | | TST_b | | Comparis | on Result | | | | _ |
| Angular (Correcte | ed) | C*b < T | | | 0.75 | | 100% pas | sed 7d survi | val rate | | | |
| TST-Welch's t T | est | | | | | | | | | | | _ |
| Control vs | Control I | 1 | Test | Stat Critical | DF | P-Type | P-Value | Decision(| a:25%) | | | |
| Negative Control | 100* | | 6.517 | 0.6955 | 12 | CDF | 1.4E-05 | Non-Signif | icant Effect | | | _ |
| Test Acceptabili | ity Criteria | TAC | Limits | | | | | | | | | |
| Attribute | Test Stat | Lower | Uppe | r Overlap | Decision | | | | | | | |
| Control Resp | 0.975 | 0.8 | >> | Yes | Passes Cr | riteria | | | | | | |
| ANOVA Table | | | | | | | | | | | | |
| Source | Sum Squa | ares | Mean | Square | DF | F Stat | P-Value | Decision(| a:5%) | | | |
| Between | 0.0161115 | 5 | 0.016 | 1115 | 1 | 1.694 | 0.2141 | | icant Effect | | | |
| Error | 0.133168 | | 0.009 | 512 | 14 | | | | | | | |
| Total | 0.149279 | | | | 15 | | | | | | | |
| Distributional To | ests | | | | | | | | | | | |
| Attribute | Test | | | | Test Stat | Critical | P-Value | Decision(| a:1%) | | | |
| Variances | Levene Ed | quality of V | ariance i | Test | 0.2218 | 8.862 | 0.6449 | Equal Vari | | | | _ |
| Variances | | ne Equality | | | 0.5891 | 8.862 | 0.4555 | Equal Vari | | | | |
| Variances | | Ratio F Tes | | | 1.243 | 8.885 | 0.7814 | Equal Vari | | | | |
| Distribution | | Darling A2 | | itv Test | 0.8855 | 3.878 | 0.0235 | Normal Dis | | | | |
| Distribution | | Skewnes | | , | 1.393 | 2.576 | 0.1635 | Normal Dis | | | | |
| Distribution | • | ov-Smirnov | | | 0.2536 | 0.2471 | 0.0071 | | al Distributi | on | | |
| Distribution | _ | /ilk W Norr | | est | 0.8881 | 0.8408 | 0.0519 | Normal Dis | | OII | | |
| | | | | | | 0.0100 | 0.0070 | Troillia Di | orno di con | | | _ |
| 7d Survival Rate | Code | Count | Maan | n 95% LCL | 059/ 1101 | Madian | Billion | May | C44 F | CV9/ | 0/ 55 | |
| Conc-% | | | Mean | | | | Min | Max | Std Err | CV% | %Eff | |
| 0 100 | N | 8 8 | 0.975 0.941 | | 1.0000 0.9882 | 1.0000 0.9333 | 0.8667 0.8667 | 1.0000 1.0000 | 0.0175 0.0197 | 5.09% 5.91% | 0.009 3.429 | |
| | | | | 0.0002 | 0.0002 | 0.0000 | 0.0007 | 1.0000 | 0.0107 | 0.0170 | 0.72 | - |
| Angular (Correct Conc-% | cted) Transfor Code | mea Sumi Count | nary Mean | 050/101 | 059/ 1101 | Modic: | Min | Men | Std Err | C1/0/ | 0/ = ** | · |
| 0 | N | | | | | Median | Min 1.107 | Max | | CV% | %Eff | |
| 100 | 1.4 | 8 | 1.394 1.331 | | 1.471 1.417 | 1.441 1.31 | 1.197 1.197 | 1.441 1.441 | 0.03256 0.0363 | 6.60% 7.72% | 0.00° 4.55° | |
| 100 | | ō | 1.331 | 1,245 | 1.417 | 1.31 | 1.197 | 1.441 | 0.0303 | 1.1270 | 4.55 | 70 |
| | o Dotoil | | _ | | | | | | | | | |
| | | | Rep 2 | 2 Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | | | _ |
| Conc-% | Code | Rep 1 | | 1 2000 | | | 1.0000 | 1.0000 | 1.0000 | | | |
| Conc-% | | 1.0000 | 0.933 | | 0.8667 | 1.0000 | | | | | | |
| Conc-% | Code | | | | 0.8667 1.0000 | 0.8667 | 0.9333 | 0.8667 | 1.0000 | | | |
| Conc-% 0 100 | Code N | 1.0000 0.9333 | 0.933 0.933 | | | | | | | | | |
| 7d Survival Rate Conc-% 0 100 Angular (Correc Conc-% | Code N | 1.0000 0.9333 | 0.933 0.933 | 1.0000 | | | | | | | | |
| Conc-% 0 100 Angular (Correc | Code N cted) Transfor | 1.0000 0.9333 med Detai | 0.933 0.933 | 1.0000 | 1.0000 | 0.8667 | 0.9333 | 0.8667 | 1.0000 | | | |

Analyst:_____QA:____

17 Apr-18 08:12 (p 2 of 4)

Test Code: TAM03

TAM0318.263fml | 06-5046-1520

Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed: 17-0999-6248 17 Apr-18 8:11 **Endpoint:** 7d Survival Rate **Analysis:** Parametric Bioed

Parametric Bioequivalence-Two Sample

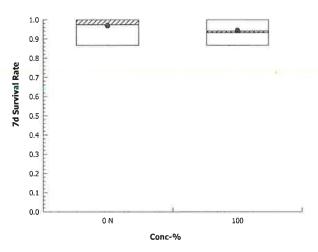
CETIS Version: CET Official Results: Yes

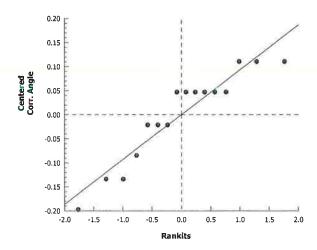
CETISv1.9.2

7d Survival Rate Binomials

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | |
|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| 0 | N | 15/15 | 14/15 | 15/15 | 13/15 | 15/15 | 15/15 | 15/15 | 15/15 | |
| 100 | | 14/15 | 14/15 | 15/15 | 15/15 | 13/15 | 14/15 | 13/15 | 15/15 | |

Graphics





17 Apr-18 08:12 (p 3 of 4)

Test Code:

TAM0318.263fml | 06-5046-1520

| | | | | | | | rest | | | | -5040-154 |
|---|--|--|---|---------------------------|---|--|---|---|--|-------------------|---------------------|
| Fathead Minn | now 7-d Larval S | urvival and | Growth T | est | | | | Aquatic Bi | oassay & C | onsulting | Labs, Inc |
| Analysis ID: | 00-4288-9979 | End | point: M | ean Dry Weig | ht-mg | | CETI | S Version: | CETISv1. | 9.2 | |
| Analyzed: | 17 Apr-18 8:11 | Ana | l ysis: Pa | arametric Bio | equivalence- | Two Sample | Offic | al Results: | Yes | | |
| Batch ID: | 06-9786-9458 | Test | Type: G | rowth-Surviva | l (7d) | | Analy | /st: | | | |
| Start Date: | 23 Mar-18 13:50 | Prof | ocol: El | PA/821/R-02- | 013 (2002) | | Dilue | nt: Labo | ratory Wate | er | |
| Ending Date: | 30 Mar-18 12:25 | Spe | cies: Pi | mephales pro | melas | | Brine | : Not A | Applicable | | |
| Duration: | 6d 23h | Sou | rce: Ad | quatic Biosyst | ems, CO | | Age: | | | | |
| Sample ID: | 18-8658-7754 | Cod | e: TA | | nl | | Clien | t: Test | America Irv | ine | |
| Sample Date: | : 22 Mar-18 15:30 | Mat | erial: Sa | ample Water | | | Proje | ct: Boei | ng-SSFL NF | PDES | |
| Receipt Date: | : 23 Mar-18 13:30 | Sou | rce: Bi | oassay Repo | rt | | | | | | |
| Sample Age: | 22h (2.1 °C) | Stat | ion: O | utfall 009 | | | | | | | |
| Data Transfor | rm | Alt Hyp | | | TST_b | | Comparis | on Result | | | |
| Untransformed | d | C*b < T | | | 0.75 | | 100% pas | sed mean dr | y weight-m | 9 | |
| TST-Welch's | t Test | | | | | | | | | | |
| Control | vs Control I | l | Test Sta | t Critical | DF | P-Type | P-Value | Decision(| a:25%) | | |
| Negative Cont | trol 100* | | 6.679 | 0.6974 | 11 | CDF | 1.7E-05 | Non-Signif | icant Effect | | |
| Test Acceptal | bility Criteria | TAC L | imits | | | | | | | | |
| Attribute | Test Stat | | Upper | Overlap | Decision | | | | | | |
| Control Resp | 0.3342 | 0.25 | >> | Yes | Passes Cr | iteria | | | | | |
| ANOVA Table | 9 | | | | | | | | | | |
| Source | Sum Squ | ares | Mean So | quare | DF | F Stat | P-Value | Decision(| a:5%) | | |
| Between | 0.0044620 |) | 0.004462 | 20 | 1 | 3.025 | 0.1039 | Non-Signif | icant Effect | | |
| Error | 0.0206484 | 1 | 0.001474 | 49 | 14 | | | | | | |
| Total | 0.0251104 | 1 | | | 15 | | | | | | |
| Distributiona | l Tests | | | | | | | | | | |
| Attribute | Test | | | | Test Stat | Critical | P-Value | Decision(| α:1%) | | |
| Variances | Levene Ed | quality of Va | rianca Tac | | 0.0004 | | | | | | |
| | | quanty or ve | mance res | il | 0.2381 | 8.862 | 0.6332 | Equal Vari | ances | | |
| Variances | | ne Equality | | | 0.2381 0.2403 | 8.862 8.862 | 0.6332 0.6316 | Equal Vari Equal Vari | | | |
| Variances Variances | Mod Leve | | of Varianc | | | | | • | ances | | |
| | Mod Leve Variance i | ne Equality | of Varianc | e Test | 0.2403 | 8.862 | 0.6316 | Equal Vari | ances ances | | |
| Variances | Mod Leve Variance I Anderson- | ne Equality Ratio F Tes | of Varianc : Normality [:] | e Test | 0.2403 1.596 | 8.862 8.885 | 0.6316 0.5524 | Equal Vari Equal Vari | ances ances stribution | | |
| Variances Distribution | Mod Leve Variance f Anderson- D'Agostino Kolmogore | ne Equality Ratio F Tes -Darling A2 D Skewness OV-Smirnov | of Variance : Normality [:] Test D Test | e Test | 0.2403 1.596 0.3384 | 8.862 8.885 3.878 | 0.6316 0.5524 0.5059 | Equal Vari Equal Vari Normal Dis | ances ances stribution stribution | | |
| Variances Distribution Distribution | Mod Leve Variance f Anderson- D'Agostino Kolmogore | ne Equality Ratio F Tes Darling A2 o Skewness | of Variance : Normality [:] Test D Test | e Test | 0.2403 1.596 0.3384 0.3872 | 8.862 8.885 3.878 2.576 | 0.6316 0.5524 0.5059 0.6986 | Equal Vari Equal Vari Normal Dis | ances ances stribution stribution stribution | | |
| Variances Distribution Distribution Distribution Distribution | Mod Leve Variance f Anderson- D'Agostino Kolmogore | ne Equality Ratio F Tes Darling A2 Skewness ov-Smirnov Vilk W Norm | of Variance : Normality [:] Test D Test | e Test | 0.2403 1.596 0.3384 0.3872 0.151 | 8.862 8.885 3.878 2.576 0.2471 | 0.6316 0.5524 0.5059 0.6986 0.4424 | Equal Vari Equal Vari Normal Dis Normal Dis | ances ances stribution stribution stribution | | |
| Variances Distribution Distribution Distribution Distribution | Mod Leve Variance f Anderson- D'Agostino Kolmogoro Shapiro-W | ne Equality Ratio F Tes Darling A2 Skewness ov-Smirnov Vilk W Norm | of Variance : Normality [:] Test D Test | e Test | 0.2403 1.596 0.3384 0.3872 0.151 0.9719 | 8.862 8.885 3.878 2.576 0.2471 0.8408 | 0.6316 0.5524 0.5059 0.6986 0.4424 | Equal Vari Equal Vari Normal Dis Normal Dis | ances ances stribution stribution stribution | CV% | %Effec |
| Variances Distribution Distribution Distribution Distribution Distribution | Mod Leve Variance f Anderson- D'Agostine Kolmogor Shapiro-W eight-mg Summa | ne Equality Ratio F Tes -Darling A2 o Skewness ov-Smirnov Vilk W Norm | of Variance Normality Test D Test ality Test | 95% LCL 0.306 | 0.2403 1.596 0.3384 0.3872 0.151 0.9719 95% UCL 0.3624 | 8.862 8.885 3.878 2.576 0.2471 0.8408 | 0.6316 0.5524 0.5059 0.6986 0.4424 0.8680 | Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis | ances ances stribution stribution stribution | CV% 10.09% | %Effec 0.00% |
| Variances Distribution Distribution Distribution Distribution Distribution Mean Dry We Conc-% | Mod Leve Variance I Anderson- D'Agostine Kolmogore Shapiro-W eight-mg Summa | ne Equality Ratio F Tes -Darling A2 o Skewness ov-Smirnov /ilk W Norm ary Count | of Variance Normality Test D Test ality Test | e Test Test 95% LCL | 0.2403 1.596 0.3384 0.3872 0.151 0.9719 | 8.862 8.885 3.878 2.576 0.2471 0.8408 | 0.6316 0.5524 0.5059 0.6986 0.4424 0.8680 | Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis Normal Dis | ances ances stribution stribution stribution stribution Stribution | | 0.00% |
| Variances Distribution Distribution Distribution Distribution Mean Dry We Conc-% 0 100 | Mod Leve Variance I Anderson- D'Agostine Kolmogore Shapiro-W Pight-mg Summa | ne Equality Ratio F Tes -Darling A2 o Skewness ov-Smirnov //lik W Norm ary Count 8 | of Variance: Normality Test D Test ality Test Mean 0.3342 | 95% LCL 0.306 | 0.2403 1.596 0.3384 0.3872 0.151 0.9719 95% UCL 0.3624 | 8.862 8.885 3.878 2.576 0.2471 0.8408 Median 0.3397 | 0.6316 0.5524 0.5059 0.6986 0.4424 0.8680 Min 0.2857 | Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis Normal Dis | ances ances stribution stribution stribution stribution stribution | 10.09% | 0.00% |
| Variances Distribution Distribution Distribution Distribution Mean Dry We Conc-% 0 100 | Mod Leve Variance I Anderson- D'Agostine Kolmogore Shapiro-W eight-mg Summa Code N | ne Equality Ratio F Tes -Darling A2 o Skewness ov-Smirnov //lik W Norm ary Count 8 | of Variance: Normality Test D Test ality Test Mean 0.3342 | 95% LCL 0.306 | 0.2403 1.596 0.3384 0.3872 0.151 0.9719 95% UCL 0.3624 | 8.862 8.885 3.878 2.576 0.2471 0.8408 Median 0.3397 | 0.6316 0.5524 0.5059 0.6986 0.4424 0.8680 Min 0.2857 | Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis Normal Dis | ances ances stribution stribution stribution stribution stribution | 10.09% | |
| Variances Distribution Distribution Distribution Distribution Distribution Mean Dry We Conc-% 0 100 Mean Dry We | Mod Leve Variance f Anderson- D'Agostine Kolmogore Shapiro-W Pight-mg Summa Code N | ne Equality Ratio F Tes Darling A2 Skewness OV-Smirnov Vilk W Norm Count 8 8 | of Variance: Normality Test D Test cality Test Mean 0.3342 0.3676 | 95% LCL 0.306 0.332 | 0.2403 1.596 0.3384 0.3872 0.151 0.9719 95% UCL 0.3624 0.4032 | 8.862 8.885 3.878 2.576 0.2471 0.8408 Median 0.3397 0.3747 | 0.6316 0.5524 0.5059 0.6986 0.4424 0.8680 Min 0.2857 0.2943 | Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis Max 0.3831 0.4385 | ances ances stribution stribution stribution Stribution Std Err 0.01192 0.01506 | 10.09% | |

17 Apr-18 08:12 (p 4 of 4)

Test Code:

TAM0318.263fml | 06-5046-1520

Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

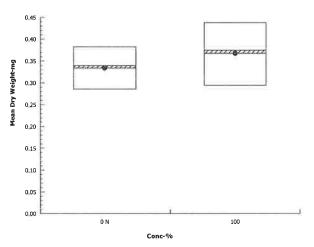
00-4288-9979 17 Apr-18 8:11 Endpoint: Mean Dry Weight-mg Analysis:

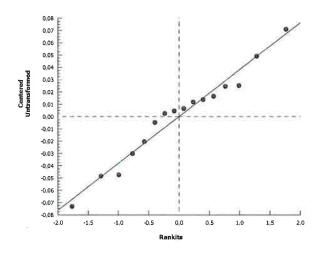
Parametric Bioequivalence-Two Sample

CETIS Version: Official Results: Yes

CETISv1.9.2

Graphics





000-189-126-0

CETIS™ v1.9.2.6

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Analyst: QA: 4/18/2018

17 Apr-18 08:12 (p 1 of 2)

Test Code:

TAM0318.263fml | 06-5046-1520

| | | | | | | | | | | 0.200 | 0 00 10 1020 |
|--------------------------|---------------------------------|--------|-------------------------|----------------|-----------|-----|-----|----------------------|----------------|------------|--------------|
| Fathead Mini | now 7-d Larval S | urviva | and Growt | th Test | | | | Aqua | tic Bioassay & | Consulting | g Labs, Inc. |
| Batch ID: Start Date: | 06-9786-9458 23 Mar-18 13:50 |) | Test Type: Protocol: | Growth-Surviv | | | | Analyst: Diluent: | Laboratory Wa | ter | |
| Ending Date: | : 30 Mar-18 12:25 | 5 | Species: | Pimephales pr | omelas | | | Brine: | Not Applicable | | |
| Duration: | 6d 23h | | Source: | Aquatic Biosys | stems, CO | | | Age: | | | |
| Sample ID: | 18-8658-7754 | | Code: | TAM0318.263 | fml | | | Client: | Test America I | rvine | |
| - | : 22 Mar-18 15:30 | | Material: | Sample Water | | | | Project: | Boeing-SSFL I | NPDES | |
| Receipt Date | : 23 Mar-18 13:30 |) | Source: | Bioassay Repo | ort | | | | | | |
| Sample Age: | 22h (2.1 °C) | | Station: | Outfall 009 | | | | | | | |
| Alkalinity (Ca | aCO3)-mg/L | | | | | | | | | | |
| Conc-% | Code | Count | | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 8 | 61.75 | 60.88 | 62.62 | 61 | 63 | 0.366 | 1.035 | 1.68% | 0 |
| 100 | | 8 | 28 | 28 | 28 | 28 | 28 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 44.88 | 35.58 | 54.17 | 28 | 63 | 4.361 | 17.44 | 38.87% | 0 (0%) |
| Conductivity | -µmhos | | | | | | | | | | |
| Conc-% | Code | Count | | 95% LCL | 95% UCL | | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 8 | 353.9 | 347.5 | 360.3 | 347 | 367 | 2.702 | 7.643 | 2.16% | 0 |
| 100 | | 8 | 83.5 | 78.1 | 88.9 | 70 | 89 | 2.283 | 6.459 | 7.74% | 0 |
| Overall | | 16 | 218.7 | 144.2 | 293.2 | 70 | 367 | 34.95 | 139.8 | 63.92% | 0 (0%) |
| Dissolved Ox | xygen-mg/L | | | | | | | | | | |
| Conc-% | Code | Count | | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 8 | 7.6 | 7.325 | 7.875 | 7.3 | 8.2 | 0.116 | | 4.34% | 0 |
| 100 | | 8 | 7.4 | 6.253 | 8.547 | 4.7 | 9.5 | 0.485 | | 18.54% | 0 |
| Overall | | 16 | 7.5 | 6.983 | 8.017 | 4.7 | 9.5 | 0.242 | 4 0.9695 | 12.93% | 0 (0%) |
| Hardness (Ca | aCO3)-mg/L | | | | | | | | | | |
| Conc-% | Code | Coun | t Mean | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 8 | 94.88 | 92.71 | 97.04 | 93 | 98 | 0.914 | 9 2.588 | 2.73% | 0 |
| 100 | | 8 | 49 | 49 | 49 | 49 | 49 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 71.94 | 59.28 | 84.6 | 49 | 98 | 5.939 | 23.76 | 33.02% | 0 (0%) |
| pH-Units | | | | | | | | | | | |
| Conc-% | Code | Coun | t Mean | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 8 | 7.725 | 7.553 | 7.897 | 7.3 | 7.9 | 0.072 | 58 0.2053 | 2.66% | 0 |
| 100 | | 8 | 7.325 | 7.117 | 7.533 | 7 | 7.8 | 0.088 | | 3.4% | 0 |
| Overall | | 16 | 7.525 | 7.364 | 7.686 | 7 | 7.9 | 0.075 | 55 0.3022 | 4.02% | 0 (0%) |
| Temperature | -°C | | | | | | | | | | |
| Conc-% | Code | Coun | | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 100 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.00% | 0 (0%) |
| | | | | | | | | | | | |

Analyst:_____QA:_____

17 Apr-18 08:12 (p 2 of 2)

Test Code:

TAM0318.263fml | 06-5046-1520

| | | | | | | | | 1AM0310.203IIII 00-3040-1320 |
|--------------|--|--|--|--|---|--|---|---|
| w 7-d Larval | Survival a | nd Growth | Test | | | | Aquatio | Bioassay & Consulting Labs, Inc. |
| O3)-mg/L | | | | | | | | |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| N | 63 | 63 | 63 | 61 | 61 | 61 | 61 | 61 |
| | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 |
| mhos | | | | | | | | |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| N | 352 | 347 | 348 | 353 | 347 | 353 | 364 | 367 |
| | 81 | 88 | 88 | 88 | 84 | 89 | 70 | 80 |
| gen-mg/L | | | | | | | | |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| N | 7.3 | 7.7 | 7.8 | 7.8 | 7.4 | 7.3 | 7.3 | 8.2 |
| | 9.5 | 7.9 | 7.8 | 7.7 | .7.1 | 7.9 | 6.6 | 4.7 |
| CO3)-mg/L | | | | | | | | |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| N | 98 | 98 | 98 | 93 | 93 | 93 | 93 | 93 |
| | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |
| | | | | | | | | |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| N | 7.6 | 7.7 | 7.9 | 7.9 | 7.7 | 7.9 | 7.8 | 7.3 |
| _ | 7.2 | 7.3 | 7.4 | 7.5 | .7.1 | 7.3 | 7 | 7.8 |
| С | | | | | 7 | | | |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| | CO3)-mg/L Code N Imhos Code N Ingen-mg/L Code N Code N Code N Code Code | Code 1 N 63 28 mhos Code 1 N 352 81 rgen-mg/L Code 1 N 7.3 9.5 CO3)-mg/L Code 1 N 98 49 Code 1 N 7.6 7.2 C Code 1 N 7.6 7.2 | Code 1 2 N 63 63 28 28 Imhos Code 1 2 N 352 347 81 88 Igen-mg/L Code 1 2 N 7.3 7.7 9.5 7.9 CO3)-mg/L Code 1 2 N 98 98 49 49 Code 1 2 N 7.6 7.7 7.2 7.3 C Code 1 2 N 7.6 7.7 7.2 7.3 | Code 1 2 3 N 63 63 63 28 28 28 Immhos Code 1 2 3 N 352 347 348 81 88 88 Ingen-mg/L 2 3 Code 1 2 3 N 7.3 7.7 7.8 9.5 7.9 7.8 CO3)-mg/L 2 3 N 98 98 98 49 49 49 Code 1 2 3 N 7.6 7.7 7.9 7.2 7.3 7.4 C Code 1 2 3 N 24 24 24 | Code 1 2 3 4 N 63 63 63 61 28 28 28 28 28 Imhos Code 1 2 3 4 N 352 347 348 353 81 88 88 88 Igen-mg/L Code 1 2 3 4 N 7.3 7.7 7.8 7.8 9.5 7.9 7.8 7.7 CO3)-mg/L Code 1 2 3 4 N 98 98 98 98 93 49 49 49 49 Code 1 2 3 4 N 98 98 98 98 93 49 49 49 49 Code 1 2 3 4 N 7.6 7.7 7.9 7.9 7.2 7.3 7.4 7.5 CC Code 1 2 3 4 N 7.6 7.7 7.9 7.9 7.2 7.3 7.4 7.5 | Code 1 2 3 4 5 N 63 63 63 61 61 28 28 28 28 28 28 28 Imhos Code 1 2 3 4 5 N 352 347 348 353 347 81 88 88 88 88 Igen-mg/L Code 1 2 3 4 5 N 7.3 7.7 7.8 7.8 7.8 7.4 9.5 7.9 7.8 7.7 7.1 CO3)-mg/L Code 1 2 3 4 5 N 98 98 98 98 93 93 49 49 49 49 49 49 Code 1 2 3 4 5 N 7.6 7.7 7.9 7.9 7.9 7.2 7.3 7.4 7.5 7.1 C Code 1 2 3 4 5 Code 1 2 3 4 5 Code 1 5 7.7 7.9 7.9 7.9 7.2 7.3 7.4 7.5 7.1 C Code 1 2 3 4 5 Code 1 5 7.7 7.9 7.9 7.9 Code 1 7.2 7.3 7.4 7.5 7.1 C | Code 1 2 3 4 5 6 N 7.3 7.7 7.8 7.8 7.4 7.3 9.5 7.9 7.9 7.9 7.2 7.3 7.4 7.5 7.1 7.9 7.9 7.2 7.3 7.4 7.5 7.1 7.3 CC Code 1 2 3 4 5 6 C C Code 1 2 3 4 5 6 C C Code 1 2 3 4 5 6 C C Code 1 2 3 4 5 6 C C Code 1 2 3 4 5 6 C C C Code 1 2 3 4 5 6 C C C C C C C C C C C C C C C C C C | Code 1 2 3 4 5 6 7 N 63 63 63 63 61 61 61 61 61 28 28 28 28 28 28 28 28 28 Imhos Code 1 2 3 4 5 6 7 N 352 347 348 353 347 353 364 81 88 88 88 84 89 70 Igen-mg/L Code 1 2 3 4 5 6 7 N 7.3 7.7 7.8 7.8 7.8 7.4 7.3 7.3 9.5 7.9 7.8 7.7 7.1 7.9 6.6 CO3)-mg/L Code 1 2 3 4 5 6 7 N 98 98 98 98 93 93 93 93 49 49 49 49 49 49 49 49 Code 1 2 3 4 5 6 7 N 98 98 98 98 98 93 93 93 93 49 49 49 49 49 49 49 Code 1 2 3 4 5 6 7 N 7.6 7.7 7.9 7.9 7.9 7.8 7.2 7.3 7.4 7.5 7.1 7.3 7 C Code 1 2 3 4 5 6 7 Code 1 7.7 7.9 7.9 7.9 7.8 Code 1 7.7 7.9 7.9 7.9 7.8 Code 1 2 3 4 5 6 7 Code 1 2 3 4 5 6 7 |

Analyst:____QA:___



April 17, 2018

Ms. Urvashi Patel TestAmerica Irvine 17461 Derian Avenue, Suite 100 Irvine, CA 92614

Dear Ms. Patel:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms EPA-821-R-02-013.* " Results were as follows:*

CLIENT:

TestAmerica Irvine

SAMPLE I.D.:

Outfall 009

DATE RECEIVED:

23 March - 18

ABC LAB. NO.:

TAM0318.263

IWC = 100.00%

CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY

TST RESULT

SURVIVAL = PASS

% EFFECT = 0.00 %

REPRODUCTION = PASS

% EFFECT = 2.62 %

Yours very truly,

Scott Johnson

Laboratory Director

*Note: The chronic survival TST analysis is not available for ceriodaphnia dubia, see CETIS report using TST-Welch's t Test.

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17 Apr-18 08:12 (p 1 of 1)

Test Code:

TAM0318.263 | 04-2811-8946

| | | | | | | | lest | Code: | TAMOS | 318.263 04 | -2811-894 |
|--|------------------------|---------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------|--------------------------|-------------------|--------------------------|---------------------------|
| Ceriodaphnia | a 7-d Survival and | d Reprodu | ction Te | st | | | | Aquatic B | lioassay & 0 | Consulting | Labs, Inc |
| Batch ID: | 06-4642-3889 | Tes | t Type: | Reproduction-S | Survival (7d) | | Anal | yst: | | | |
| Start Date: | 23 Mar-18 13:50 | Pro | tocol: | EPA/821/R-02- | 013 (2002) | | Dilue | ent: Lab | oratory Wate | er | |
| Ending Date: | : 30 Mar-18 12:25 | Spe | ecies: | Ceriodaphnia d | ubia | | Brin | e: Not | Applicable | | |
| Duration: | 6d 23h | Sou | ırce: | Aquatic Biosys | tems, CO | | Age: | | | | |
| Sample ID: | 03-9351-8313 | Cod | de: | TAM0318.263 | | | Clier | nt: Tes | t America In | /ine | |
| Sample Date | : 22 Mar-18 15:30 | Mat | terial: | Sample Water | | | Proje | ect: Boe | ing-SSFL N | PDES | |
| Receipt Date | : 23 Mar-18 13:30 | Sou | urce: | Bioassay Repo | rt | | | | | | |
| Sample Age: | : 22h (2.1 °C) | Sta | tion: | Outfall 009 | | | | | | | |
| Single Comp | parison Summary | | | | | | | | | | |
| Analysis ID | Endpoint | | Comp | arison Method | | | P-Value | Comparis | son Result | | |
| 12-3242-3365 | 5 7d Survival Rate | | Fisher | Exact Test | | | 1.0000 | 100% pas | sed 7d surv | ival rate | |
| 19-0017-9456 | 6 Reproduction | | TST-V | elch's t Test | | | 0.0069 | 100% pas | sed reprodu | ction | |
| Test Accepta | ability | | | | | TAC | Limits | | | | |
| Analysis ID | Endpoint | | Attrib | ute | Test Stat | Lower | Upper | Overlap | Decision | | |
| 12-3242-3365 | 5 7d Survival Rate | | Contro | l Resp | 1 | 0.8 | >> | Yes | Passes C | riteria | |
| 19-0017-9456 | 6 Reproduction | | Contro | ol Resp | 25.16 | 15 | >> | Yes | Passes C | riteria | |
| 7d Survival F | Rate Summary | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | N | 20 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.00% | 0.00% |
| 100 | | 20 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1,0000 | 0.0000 | 0.0000 | 0.00% | 0.00% |
| Reproductio | n Summary | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | N | 19 | 25.16 | 22.05 | 28.27 | 14 | 37 | 1.479 | 6.449 | 25.63% | 0.00% |
| 100 | | 20 | 24.5 | 20.64 | 28.36 | 10 | 38 | 1.845 | 8.249 | 33.67% | 2.62% |
| 7d Survival F | Rate Detail | | | | | | | | | | |
| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
| 0 | N | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 100 | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Reproductio | n Detail | | | | | | | | | | |
| Conc-% | Code | Rep 1 | Rep 2 | | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
| | N | | 31 | 14 | 30 | 26 | 22 | 20 | 35 | 23 | 21 |
| 0 | | | | | | | 0.0 | 40 | 34 | 28 | 20 |
| 0 | | 23 | 20 | 37 | 24 | 20 | 32 | 18 | 34 | 20 | |
| | | 23 32 | 20 32 | 37 22 | 24 22 | 20 25 | 32 33 | 32 | 24 | 20 | 29 |
| | | | | | | | | | | | |
| 100 | Rate Binomials | 32 | 32 | 22 | 22 | 25 | 33 | 32 | 24 | 20 | 29 |
| 100 7d Survival I | Rate Binomials Code | 32 | 32 | 22 10 | 22 | 25 | 33 | 32 | 24 | 20 | 29 |
| 100 7d Survival I Conc-% | | 32 14 | 32 11 | 22 10 | 22 16 | 25 18 | 33 38 | 32 38 | 24 28 | 20 23 | 29 23 |
| 100 7d Survival I Conc-% | Code | 32 14 Rep 1 | 32 11 Rep 2 | 22 10 Rep 3 | 22 16 Rep 4 | 25 18 Rep 5 | 33 38 Rep 6 | 32 38 Rep 7 | 24 28 Rep 8 | 20 23 Rep 9 | 29 23 Rep 10 |
| 0 100 7d Survival I Conc-% 0 | Code | 32 14 Rep 1 1/1 | 32 11 Rep 2 | 22 10 Rep 3 | 22 16 Rep 4 | 25 18 Rep 5 | 33 38 Rep 6 | 32 38 Rep 7 | 24 28 Rep 8 | 20 23 Rep 9 | 29 23 Rep 10 |

Analyst: QA: PASS

17 Apr-18 08:12 (p 1 of 2)

Test Code:

TAM0318.263 | 04-2811-8946

| | | | | | | | | | lest | Code: | TAM0318.263 04-2811-8946 |
|---------------------------|--------------|---------------------------|-------|-----------------|---------|--------------------------------|---------------|-----------|----------|------------------------------|-------------------------------|
| Ceriodaphnia | 7-d 5 | Survival and | d Rep | roducti | on Tes | t | | | | Aquatic Bio | assay & Consulting Labs, Inc. |
| Analysis ID: Analyzed: | | 0017-9456 Apr-18 19:08 | 3 | Endpo Analys | | Reproduction Parametric Bio | equivalence- | Two Sampl | | IS Version: cial Results: | CETISv1.9.2 Yes |
| Batch ID: | 06-4 | 642-3889 | | Test T | ype: F | Reproduction- | Survival (7d) | | Ana | lyst: | |
| Start Date: | 23 N | tar-18 13:50 | | Proto | col: E | EPA/821/R-02 | -013 (2002) | | Dilu | ent: Labora | atory Water |
| Ending Date: | 30 N | 1ar-18 12:25 | | Speci | es: (| Deriodaphnia d | dubia | | Brin | e: Not Ap | pplicable |
| Duration: | 6d 2 | 23h | | Sourc | e: / | Aquatic Biosys | stems, CO | | Age | : | |
| Sample ID: | 03-9 | 351-8313 | | Code: | 7 | ΓΑΜ0318.263 | | | Clie | nt: Test A | merica Irvine |
| Sample Date: | 22 N | 1ar-18 15:30 | | Mater | ial: S | Sample Water | | | Proj | ect: Boeing | g-SSFL NPDES |
| Receipt Date: | 23 N | 1ar-18 13:30 | | Sourc | e: E | Bioassay Repo | ort | | | | |
| Sample Age: | 22h | (2.1 °C) | | Statio | n: (| Outfall 009 | | | | | |
| Data Transfoi | rm | | Alt | Нур | | | TST_b | | Compari | son Result | |
| Untransformed | b | | C*b | < T | | | 0.75 | | 100% pas | ssed reproduct | ion |
| TST-Welch's | t Tes | t | | | | | | | | | |
| Control | vs | Control I | | | Test St | at Critical | DF | P-Type | P-Value | Decision(α: | 20%) |
| Negative Cont | trol | 100* | | | 2.616 | 0.8538 | 30 | CDF | 0.0069 | Non-Signific | ant Effect |
| Test Accepta | bility | Criteria | - | ΓAC Lim | nits | | | | | | |
| Attribute | | Test Stat | Low | er er | Upper | Overlap | Decision | | | | |
| Control Resp | | 25.16 | 15 | | >> | Yes | Passes Cr | iteria | | | |
| ANOVA Table |) | | | | | | | | | | |
| Source | | Sum Squa | ares | | Mean S | Square | DF | F Stat | P-Value | Decision(α | 5%) |
| Between | | 4.21727 | | | 4.2172 | 7 | 1 | 0.07643 | 0.7837 | Non-Signific | ant Effect |
| Error | | 2041.53 | | | 55.176 | 4 | 37 | - | | | |
| Total | | 2045.74 | | | | | 38 | | | | |
| Distributiona | l Test | ts | | | | | | | | | |
| Attribute | | Test | | | | | Test Stat | Critical | P-Value | Decision(a | :1%) |

| Attribute | Test | Test Stat | Critical | P-Value | Decision(α:1%) |
|--------------|--------------------------------------|-----------|----------|---------|---------------------|
| Variances | Levene Equality of Variance Test | 0.8805 | 7.373 | 0.3542 | Equal Variances |
| Variances | Mod Levene Equality of Variance Test | 0.562 | 7.396 | 0.4583 | Equal Variances |
| Variances | Variance Ratio F Test | 1.636 | 3.527 | 0.3016 | Equal Variances |
| Distribution | Anderson-Darling A2 Normality Test | 0.3898 | 3.878 | 0.3876 | Normal Distribution |
| Distribution | D'Agostino Kurtosis Test | 1.109 | 2.576 | 0.2674 | Normal Distribution |
| Distribution | D'Agostino Skewness Test | 0.1539 | 2.576 | 0.8777 | Normal Distribution |
| Distribution | D'Agostino-Pearson K2 Omnibus Test | 1.254 | 9.21 | 0.5342 | Normal Distribution |
| Distribution | Kolmogorov-Smirnov D Test | 0.1012 | 0.1637 | 0.3811 | Normal Distribution |
| Distribution | Shapiro-Wilk W Normality Test | 0.9736 | 0.9219 | 0.4803 | Normal Distribution |

Reproduction Summary

| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect |
|--------|------|-------|-------|---------|---------|--------|-----|-----|---------|--------|---------|
| 0 | N | 19 | 25.16 | 22.05 | 28.27 | 23 | 14 | 37 | 1.479 | 25.63% | 0.00% |
| 100 | | 20 | 24.5 | 20.64 | 28.36 | 23.5 | 10 | 38 | 1.845 | 33.67% | 2.62% |

Reproduction Detail

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | N | 31 | 14 | 30 | 26 | 22 | 20 | 35 | 23 | 21 | 23 |
| | | 20 | 37 | 24 | 20 | 32 | 18 | 34 | 28 | 20 | |
| 100 | | 32 | 32 | 22 | 22 | 25 | 33 | 32 | 24 | 20 | 29 |
| | | 14 | 11 | 10 | 16 | 18 | 38 | 38 | 28 | 23 | 23 |

Analyst: QA:

17 Apr-18 08:12 (p 2 of 2)

Test Code:

TAM0318.263 | 04-2811-8946

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

19-0017-9456 15 Apr-18 19:08

Ceriodaphnia 7-d Survival and Reproduction Test

Endpoint: Reproduction Analysis:

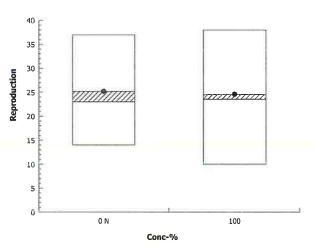
Parametric Bioequivalence-Two Sample

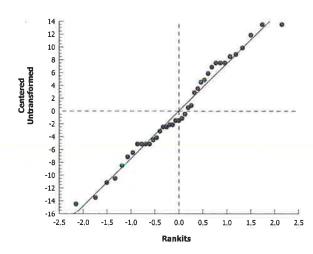
CETIS Version:

CETISv1.9.2

Official Results: Yes

Graphics





CETIS™ v1.9.2.6

Page 32 of 97

17 Apr-18 08:12 (p 1 of 2)

Test Code:

TAM0318,263 | 04-2811-8946

| | | | | | | | Test Code | e: | TAM0318.263 04-2811-8946 |
|---------------|-----------------|----------------|-----------|-------------|--------------|-----------------|-------------|-----------|-------------------------------|
| Ceriodaphnia | 7-d Survival an | d Reproduction | Test | | | | Aqu | uatic Bio | assay & Consulting Labs, Inc. |
| Analysis ID: | 12-3242-3365 | Endpoint | t: 7d Su | rvival Rate | 9 | | CETIS Ve | rsion: | CETISv1.9.2 |
| Analyzed: | 15 Apr-18 19:0 | 8 Analysis: | Single | 2x2 Cont | ingency Tab | ole | Official Re | esults: | Yes |
| Batch ID: | 06-4642-3889 | Test Type | e: Repro | duction-S | urvival (7d) | | Analyst: | | |
| Start Date: | 23 Mar-18 13:50 | Protocol | : EPA/8 | 321/R-02-0 | 013 (2002) | | Diluent: | Labor | atory Water |
| Ending Date: | 30 Mar-18 12:25 | Species: | Cerio | daphnia di | ubia | | Brine: | Not A | pplicable |
| Duration: | 6d 23h | Source: | Aquat | ic Biosyst | ems, CO | | Age: | | |
| Sample ID: | 03-9351-8313 | Code: | TAMO | 318.263 | | | Client: | Test A | America Irvine |
| Sample Date: | 22 Mar-18 15:30 | Material: | Samp | le Water | | | Project: | Boein | g-SSFL NPDES |
| Receipt Date: | 23 Mar-18 13:30 | Source: | Bioas | say Repor | t | | | | |
| Sample Age: | 22h (2.1 °C) | Station: | Outfa | II 009 | | | | | |
| Data Transfor | m | Alt Hyp | | | | Com | nparison R | tesult | |
| Untransformed | | C > T | | | | 1009 | % passed 7 | d surviv | al rate |
| Fisher Exact | Test | | | | | | | | |
| Control | vs Group | Tes | st Stat F | P-Type | P-Value | Decision(α:5%) | | | |
| Negative Cont | rol 100 | 1.0 | 000 E | Exact | 1.0000 | Non-Significant | Effect | | |
| Test Acceptal | oility Criteria | TAC Limits | | | | | | | |
| Attribute | Test Stat | Lower Up | per (| Overlap | Decision | | | | |
| Control Resp | 1 | 0.8 >> | | res . | Passes Cr | itoria | | | |

| 7d | Survival | Rate | Detail | |
|----|----------|------|--------|--|
| | | | | |

Code

N

NR

20

20

R

0

0

NR + R

20

20

Conc-%

0

100

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0 | N | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 100 | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |

1

1

Prop NR Prop R

0

0

%Effect

0.0%

0.0%

7d Survival Rate Binomials

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | N | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| | | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| 100 | | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| | | 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:

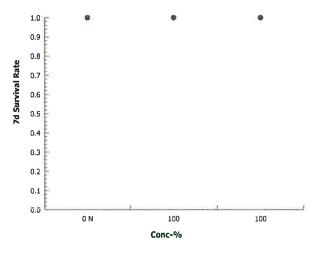
17 Apr-18 08:12 (p 2 of 2)

Test Code:

TAM0318.263 | 04-2811-8946

| Ceriodaphnia | 7-d Survival and Re | production T | est | Aquatic Bi | oassay & Consulting Labs, Inc. |
|--------------|---------------------|--------------|------------------------------|-------------------|--------------------------------|
| Analysis ID: | 12-3242-3365 | Endpoint: | 7d Survival Rate | CETIS Version: | CETISv1.9.2 |
| Analyzed: | 15 Apr-18 19:08 | Analysis: | Single 2x2 Contingency Table | Official Results: | Yes |





Analyst: QA:

17 Apr-18 08:12 (p 1 of 2)

Test Code:

TAM0318.263 | 04-2811-8946

| | | | | | | | | Test Code: | TAMO | 318.263 0 | 4-2811-8946 |
|----------------|-------------------|--------|-------------|----------------|---------------|-----|-----|------------|----------------|-------------|--------------|
| Ceriodaphnia | a 7-d Survival an | d Repr | oduction Te | est | | | | Aquat | ic Bioassay & | Consulting | g Labs, Inc. |
| Batch ID: | 06-4642-3889 | | Test Type: | Reproduction-S | Survival (7d) | | | Analyst: | | | |
| Start Date: | 23 Mar-18 13:50 |) | Protocol: | EPA/821/R-02- | -013 (2002) | | - 1 | Diluent: | Laboratory Wa | ter | |
| Ending Date: | 30 Mar-18 12:25 | 5 | Species: | Ceriodaphnia d | lubia | | 1 | Brine: | Not Applicable | | |
| Duration: | 6d 23h | | Source: | Aquatic Biosys | tems, CO | | | Age: | | | |
| Sample ID: | 03-9351-8313 | | Code: | TAM0318.263 | | | | Client: | Test America I | rvine | |
| Sample Date: | : 22 Mar-18 15:30 |) | Material: | Sample Water | | | 1 | Project: | Boeing-SSFL N | NPDES | |
| • | : 23 Mar-18 13:30 |) | Source: | Bioassay Repo | ort | | | | | | |
| Sample Age: | 22h (2.1 °C) | | Station: | Outfall 009 | | | | | | | |
| Alkalinity (Ca | CO3)-mg/L | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Er | r Std Dev | CV% | QA Count |
| 0 | N | 8 | 61.75 | 60.88 | 62.62 | 61 | 63 | 0.366 | 1.035 | 1.68% | 0 |
| 100 | | 8 | 28 | 28 | 28 | 28 | 28 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 44.88 | 35.58 | 54.17 | 28 | 63 | 4.361 | 17.44 | 38.87% | 0 (0%) |
| Conductivity | -µmhos | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Er | r Std Dev | CV% | QA Count |
| 0 | N | 8 | 353.9 | 347.5 | 360.3 | 347 | 367 | 2.702 | 7.643 | 2.16% | 0 |
| 100 | | 8 | 83.5 | 78.1 | 88.9 | 70 | 89 | 2.283 | 6.459 | 7.74% | 0 |
| Overall | | 16 | 218.7 | 144.2 | 293.2 | 70 | 367 | 34.95 | 139.8 | 63.92% | 0 (0%) |
| Dissolved Ox | kygen-mg/L | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std E | r Std Dev | CV% | QA Count |
| 0 | N | 8 | 7.6 | 7.325 | 7.875 | 7.3 | 8.2 | 0.1165 | 0.3295 | 4.34% | 0 |
| 100 | | 8 | 7.4 | 6.253 | 8.547 | 4.7 | 9.5 | 0.4851 | 1.372 | 18.54% | 0 |
| Overall | | 16 | 7.5 | 6.983 | 8.017 | 4.7 | 9.5 | 0.2424 | 0.9695 | 12.93% | 0 (0%) |
| Hardness (Ca | aCO3)-mg/L | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 8 | 94.88 | 92.71 | 97.04 | 93 | 98 | 0.9149 | 2.588 | 2.73% | 0 |
| 100 | | 8 | 49 | 49 | 49 | 49 | 49 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 71.94 | 59.28 | 84.6 | 49 | 98 | 5.939 | 23.76 | 33.02% | 0 (0%) |
| pH-Units | | | | | | | | | | | |
| Conc-% | Code | Coun | t Mean | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 8 | 7.725 | 7.553 | 7.897 | 7.3 | 7.9 | 0.072 | 58 0.2053 | 2.66% | 0 |
| 100 | | 8 | 7.325 | 7.117 | 7.533 | 7 | 7.8 | 0.088 | 14 0.2493 | 3.4% | 0 |
| Overall | | 16 | 7.525 | 7.364 | 7.686 | 7 | 7.9 | 0.075 | 55 0.3022 | 4.02% | 0 (0%) |
| Temperature | -°C | | | | | | | | | | |
| Conc-% | Code | Coun | Mean Mean | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 100 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.00% | 0 (0%) |
| | | | | | | | | | | | |

Analyst: _____ QA:____

CETIS Measurement Report

Report Date: Test Code: 17 Apr-18 08:12 (p 2 of 2) TAM0318.263 | 04-2811-8946

| | | | | | | | ıe | st Code: | TAM0318.263 04-2811-8946 |
|-----------------|----------------|------------|-------------|-----|-----|-----|-----|----------|----------------------------------|
| Ceriodaphnia 7 | 7-d Survival a | ind Reprod | duction Tes | it | | - | | Aquatio | Bioassay & Consulting Labs, Inc. |
| Alkalinity (CaC | O3)-mg/L | | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | N | 63 | 63 | 63 | 61 | 61 | 61 | 61 | 61 |
| 100 | | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 |
| Conductivity-µ | mhos | | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | N | 352 | 347 | 348 | 353 | 347 | 353 | 364 | 367 |
| 100 | | 81 | 88 | 88 | 88 | 84 | 89 | 70 | 80 |
| Dissolved Oxy | gen-mg/L | | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | N | 7.3 | 7.7 | 7.8 | 7.8 | 7.4 | 7.3 | 7.3 | 8.2 |
| 100 | | 9.5 | 7.9 | 7.8 | 7.7 | 7.1 | 7.9 | 6.6 | 4.7 |
| Hardness (CaC | O3)-mg/L | | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | N | 98 | 98 | 98 | 93 | 93 | 93 | 93 | 93 |
| 100 | Ta ta t | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |
| pH-Units | | | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | N | 7.6 | 7.7 | 7.9 | 7.9 | 7.7 | 7.9 | 7.8 | 7.3 |
| 100 | | 7.2 | 7.3 | 7.4 | 7.5 | 7.1 | 7.3 | 7 | 7.8 |
| Temperature-° | С | | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| 100 | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |



April 17, 2018

Ms. Urvashi Patel TestAmerica Irvine 17461 Derian Avenue, Suite 100 Irvine, CA 92614

Dear Ms. Patel:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013. Results were as follows:

CLIENT:

TestAmerica Irvine

SAMPLE I.D.:

Outfall 009

DATE RECEIVED:

23 March - 18

ABC LAB. NO.:

TAM0318.263

CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY

IWC = 100.00 %

TST RESULT

*GROWTH = FAIL% EFFECT = 35.62 %

* Passes permit TIE limitation of $\geq 50\%$ effect

Yours very truly,

Scott Johnson

Laboratory Director

29 north olive st. ventura, ca 93001 (805) 643 5621 aquabio.org

17 Apr-18 08:13 (p 1 of 1)

| CE 113 Suii | ппагу керо | rt | | | | | | Code: | | | 2-1041-4138 |
|----------------|-----------------|-----------|---------|--------------|-------------|----------|----------|------------|---------------|------------|-------------|
| Selenastrum | Growth Test | | | | | | | Aquatic B | ioassay & C | Consulting | Labs, Inc. |
| Batch ID: | 15-8687-8202 | Test Type | : Cell | Growth | | | Analy | /st: | | | |
| Start Date: | 23 Mar-18 14:30 | Protocol: | EPA | 1/821/R-02-0 | 013 (2002) | | Dilue | nt: Labo | oratory Wate | er | |
| Ending Date: | 27 Mar-18 13:15 | Species: | Sele | enastrum ca | pricornutum | | Brine | : Not | Applicable | | |
| Duration: | 95h | Source: | Aqu | atic Biosyst | ems, CO | | Age: | | | | |
| Sample ID: | 15-0565-9247 | Code: | TAN | //0318.263s | el | | Clien | t: Test | : America Irv | rine | |
| Sample Date: | 22 Mar-18 15:30 | Material: | Sam | nple Water | | | Proje | ct: Boei | ing-SSFL N | PDES | |
| Receipt Date: | 23 Mar-18 13:30 | Source: | Bioa | assay Repoi | rt | | | | | | |
| Sample Age: | 23h (2.1 °C) | Station: | Outf | fall 009 | | | | | | | |
| Single Compa | arison Summary | | | | | | | | | | |
| Analysis ID | Endpoint | Com | paris | on Method | | | P-Value | Comparis | on Result | | |
| 10-3873-5772 | Cell Density | TST | -Welch | n's t Test | | | 1.0000 | 100% faile | ed cell densi | ty | |
| Test Acceptal | bility | | | | | TAC L | imits | | | | |
| Analysis ID | Endpoint | Attri | bute | | Test Stat | Lower | Upper | Overlap | Decision | | |
| 10-3873-5772 | Cell Density | Con | trol CV | / | 0.04486 | << | 0.2 | Yes | Passes Cr | iteria | |
| 10-3873-5772 | Cell Density | Con | trol Re | sp | 1.69E+6 | 1000000 | >> | Yes | Passes Cr | riteria | |
| Cell Density S | Summary | | | | | | | | | | |
| Conc-% | Code | Count Mea | n | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | N | 8 1.69 | 5E+6 | 1.631E+6 | 1.758E+6 | 1.561E+6 | 1.772E+6 | 2.688E+4 | 7.602E+4 | 4.49% | 0.00% |
| 100 | | 8 1.09 | 1E+6 | 1.042E+6 | 1.140E+6 | 1.018E+6 | 1.169E+6 | 2.056E+4 | 5.815E+4 | 5.33% | 35.62% |
| Cell Density [| Detail | | | | | | | | | | |
| Conc-% | Code | Rep 1 Rep | 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | | |

100

Ν

1.692E+6 1.730E+6 1.749E+6 1.772E+6 1.751E+6 1.703E+6 1.561E+6 1.599E+6

1.155E+6 1.018E+6 1.119E+6 1.169E+6 1.038E+6 1.057E+6 1.127E+6 1.045E+6

17 Apr-18 08:13 (p 1 of 2)

Test Code:

TAM0318.263sel | 02-1041-4138

| | | | | | | | | | | | 2-1041-413 |
|---|--|--|---|---|--|--|---|---|--|-----------|----------------------------|
| Selenastrum (| Growth Test | | | | | | | Aquatic Bi | oassay & C | onsulting | Labs, Inc. |
| Analysis ID: | 10-3873-5772 | End | ooint: Ce | ell Density | | | CETIS | S Version: | CETISv1. | 9.2 | |
| Analyzed: | 28 Mar-18 12:2 | 1 Anal | ysis: Pa | rametric Bioe | quivalence- | Two Sample | Offici | al Results: | Yes | | |
| Batch ID: | 15-8687-8202 | Test | Type: Ce | ell Growth | | | Analy | st: | | | |
| Start Date: | 23 Mar-18 14:30 | Prote | ocol: EF | PA/821/R-02-0 | 13 (2002) | | Dilue | nt: Labo | ratory Wate | r | |
| Ending Date: | 27 Mar-18 13:15 | Spec | cies: Se | elenastrum ca | pricornutum | | Brine | : Not A | Applicable | | |
| Duration: | 95h | Sour | rce: Ac | uatic Biosyst | ems, CO | | Age: | | | | |
| Sample ID: | 15-0565-9247 | Code | e: TA | M0318.263se | el | | Clien | t: Test | America Irv | ine | |
| Sample Date: | 22 Mar-18 15:30 |) Mate | rial: Sa | ample Water | | | Proje | ct: Boei | ng-SSFL NF | PDES | |
| Receipt Date: | 23 Mar-18 13:30 | Sour | rce: Bi | oassay Repor | t | | | | | | |
| Sample Age: | 23h (2.1 °C) | Stati | on: O | utfall 009 | | | | | | | |
| Data Transfor | m | Alt Hyp | | | TST_b | | Comparis | on Result | | | |
| Untransformed | | C*b < T | | | 0.75 | | 100% faile | d cell densit | ty | | |
| TST-Welch's t | Test | | | | | | | | | | |
| Control | vs Conc-% | | Test Stat | t Critical | DF | P-Type | P-Value | Decision(| α:25%) | | |
| Negative Cont | rol 100 | | -6.251 | 0.6938 | 13 | CDF | 1.0000 | Significant | Effect | | |
| Test Acceptat | oility Criteria | TAC Li | mits | | | | | | | | |
| Attribute | Test Stat | | Upper | Overlap | Decision | | | | | | |
| Control CV | 0.04486 | << | 0.2 | Yes | Passes Cr | iteria | | | | | |
| Control Resp | 1.69 E+ 6 | 1000000 | >> | Yes | Passes Cr | iteria | | | | | |
| | | | | | | | | | | | |
| ANOVA Table | | | | | | | | | | | |
| ANOVA Table Source | Sum Squ | ares | Mean Sq | _l uare | DF | F Stat | P-Value | Decision(| α:5%) | | |
| | | | Mean Sq 1.457E+ | | DF 1 | F Stat 318.2 | P-Value <1.0E-37 | Decision(| | | |
| Source | Sum Squ | 2 | | 12 | | | | | | | |
| Source Between | Sum Squ 1.457E+1 | 2 0 | 1.457E+ | 12 | 1 | | | | | | |
| Source Between Error Total | Sum Squ 1.457E+1 6.412E+1 1.522E+1 | 2 0 | 1.457E+ | 12 | 1 14 | | | | | | |
| Source Between Error Total Distributional | Sum Squ 1.457E+1 6.412E+1 1.522E+1 | 2 0 | 1.457E+ | 12 | 1 14 | 318.2 | | | Effect | | |
| Source Between Error Total Distributional | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests | 2 0 | 1.457E+ 4.58E+09 | 12 9 | 1 14 15 | 318.2 | <1.0E-37 | Significant | Effect α:1%) | | |
| Source Between Error Total Distributional Attribute Variances | Sum Squ | 2 0 2 | 1.457E+ 4.58E+09 | 12 9 | 1 14 15 Test Stat | 318.2 Critical | <1.0E-37 | Significant Decision(| Effect α:1%) ances | | |
| Source Between Error Total Distributional Attribute Variances Variances | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Edition Mod L | 2 0 2 quality of Vai | 1.457E+ 4.58E+09 | 12 9 | 1 14 15 Test Stat 0.1463 | 318.2 Critical 8.862 | <1.0E-37 P-Value 0.7079 | Significant Decision(Equal Vari | Effect α:1%) ances ances | | |
| Source Between Error Total Distributional Attribute Variances Variances | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Edited Mod Lever Variance | 2 0 2 quality of Var ne Equality o | 1.457E+* 4.58E+09 riance Tes | t e Test | 1 14 15 Test Stat 0.1463 0.04911 | 318.2 Critical 8.862 8.862 | <1.0E-37 P-Value 0.7079 0.8278 | Decision(Equal Vari | α:1%) ances ances ances ances | | |
| Source Between Error Total Distributional Attribute Variances Variances Variances | Sum Squ 1.457E+1. 6.412E+1. 1.522E+1. Tests Test Levene Edition Mod Leven Variance In Anderson | 2 0 2 quality of Var ne Equality of Ratio F Test | 1.457E+1.4.58E+09 riance Tes of Variance | t e Test | 1 14 15 Test Stat 0.1463 0.04911 1.709 | 318.2 Critical 8.862 8.862 8.885 | <1.0E-37 P-Value 0.7079 0.8278 0.4964 | Decision(Equal Vari Equal Vari Equal Vari | α:1%) ances ances ances stribution | | |
| Source Between Error Total Distributional Attribute Variances Variances Variances Ustribution | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Ed Mod Leve Variance I Anderson- D'Agostin | 2 0 2 quality of Var ne Equality of Ratio F Test -Darling A2 N | 1.457E+* 4.58E+09 riance Tes of Variance Normality Test | t e Test | 1 14 15 Test Stat 0.1463 0.04911 1.709 0.492 | 318.2 Critical 8.862 8.862 8.885 3.878 | P-Value 0.7079 0.8278 0.4964 0.2224 | Decision(Equal Vari Equal Vari Equal Vari Normal Dis | α:1%) ances ances ances stribution stribution | | |
| Between Error Total Distributional Attribute Variances Variances Variances Distribution Distribution Distribution | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Ed Mod Leve Variance I Anderson- D'Agostin- Kolmogor | 2 quality of Var ne Equality of Ratio F Test -Darling A2 No | 1.457E+109 4.58E+09 riance Tes of Variance Normality Test D Test | t e Test | 1 14 15 Test Stat 0.1463 0.04911 1.709 0.492 1.14 | 318.2 Critical 8.862 8.862 8.885 3.878 2.576 | <1.0E-37 P-Value 0.7079 0.8278 0.4964 0.2224 0.2544 | Decision(Equal Vari Equal Vari Equal Vari Normal Dis | α:1%) ances ances ances stribution stribution | | |
| Between Error Total Distributional Attribute Variances Variances Ustribution Distribution Distribution Distribution Distribution Distribution | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Edit Mod Leve Variance Identification D'Agostine Kolmogor Shapiro-V | quality of Var ne Equality of Ratio F Test -Darling A2 No o Skewness ov-Smirnov I | 1.457E+109 4.58E+09 riance Tes of Variance Normality Test D Test | t e Test | 1 14 15 Test Stat 0.1463 0.04911 1.709 0.492 1.14 0.1658 | 318.2 Critical 8.862 8.862 8.885 3.878 2.576 0.2471 | <1.0E-37 P-Value 0.7079 0.8278 0.4964 0.2224 0.2544 0.2893 | Decision(Equal Vari Equal Vari Equal Vari Normal Dis Normal Dis | α:1%) ances ances ances stribution stribution | | |
| Between Error Total Distributional Attribute Variances Variances Variances Distribution Distribution Distribution Distribution Cell Density S | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Edit Mod Leve Variance Identification D'Agostine Kolmogor Shapiro-V | quality of Var ne Equality of Ratio F Test -Darling A2 No o Skewness ov-Smirnov I | 1.457E+109 4.58E+09 riance Tes of Variance Normality Test D Test | t e Test Fest 95% LCL | 1 14 15 Test Stat 0.1463 0.04911 1.709 0.492 1.14 0.1658 0.9275 | 318.2 Critical 8.862 8.862 8.885 3.878 2.576 0.2471 0.8408 | <1.0E-37 P-Value 0.7079 0.8278 0.4964 0.2224 0.2544 0.2893 | Decision(Equal Vari Equal Vari Equal Vari Normal Dis Normal Dis | α:1%) ances ances ances stribution stribution | CV% | %Effect |
| Between Error Total Distributional Attribute Variances Variances Variances Distribution Distribution Distribution Distribution Cell Density S Conc-% 0 | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Edit Mod Leve Variance Identification D'Agostinic Kolmogor Shapiro-V | quality of Var quality of Var ne Equality of Ratio F Test -Darling A2 No o Skewness ov-Smirnov I Vilk W Norma | 1.457E+1.4.58E+09 riance Tes of Variance Normality Test D Test ality Test | t e Test Fest 95% LCL | 1 14 15 Test Stat 0.1463 0.04911 1.709 0.492 1.14 0.1658 0.9275 | 318.2 Critical 8.862 8.862 8.885 3.878 2.576 0.2471 0.8408 | P-Value 0.7079 0.8278 0.4964 0.2224 0.2544 0.2893 0.2228 | Decision(Equal Vari Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis | α:1%) ances ances ances stribution stribution stribution | | %Effect 0.00% |
| Between Error Total Distributional Attribute Variances Variances Variances Distribution Distribution | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Edit Mod Leve Variance Identification D'Agostine Kolmogor Shapiro-V Summary Code | quality of Var ne Equality of Ratio F Test -Darling A2 No o Skewness ov-Smirnov I Vilk W Norma | 1.457E+1.4.58E+09 riance Tes of Variance Normality Test D Test ality Test Mean 1.695E+6 | t e Test Fest 95% LCL | 1 14 15 Test Stat 0.1463 0.04911 1.709 0.492 1.14 0.1658 0.9275 95% UCL 1.758E+6 | 318.2 Critical 8.862 8.862 8.885 3.878 2.576 0.2471 0.8408 Median 1.716E+6 | P-Value 0.7079 0.8278 0.4964 0.2224 0.2544 0.2893 0.2228 Min 1.561E+6 | Decision(Equal Vari Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis Normal Dis | α:1%) ances ances ances stribution stribution stribution Std Err 2.688E+4 | 4.49% | %Effect 0.00% 35.62% |
| Between Error Total Distributional Attribute Variances Variances Variances Distribution Distribution Distribution Cell Density S Conc-% 0 100 | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Edit Mod Leve Variance Identification D'Agostinic Kolmogor Shapiro-V Summary Code N | quality of Var ne Equality of Ratio F Test -Darling A2 N o Skewness ov-Smirnov I Vilk W Norma | 1.457E+1.4.58E+09 riance Tes of Variance Normality Test D Test ality Test Mean 1.695E+6 | 12 9 t e Test Fest 95% LCL 6 1.631E+6 | 1 14 15 Test Stat 0.1463 0.04911 1.709 0.492 1.14 0.1658 0.9275 95% UCL 1.758E+6 | 318.2 Critical 8.862 8.862 8.885 3.878 2.576 0.2471 0.8408 Median 1.716E+6 | P-Value 0.7079 0.8278 0.4964 0.2224 0.2544 0.2893 0.2228 Min 1.561E+6 | Decision(Equal Vari Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis Normal Dis | α:1%) ances ances ances stribution stribution stribution Std Err 2.688E+4 | 4.49% | 0.00% |
| Between Error Total Distributional Attribute Variances Variances Variances Distribution Distribution Distribution Distribution Cell Density S Conc-% 0 | Sum Squ 1.457E+1 6.412E+1 1.522E+1 Tests Test Levene Edit Mod Leve Variance Identification D'Agostinic Kolmogor Shapiro-V Summary Code N | quality of Var ne Equality of Ratio F Test -Darling A2 N o Skewness ov-Smirnov I Vilk W Norma | 1.457E+1.4.58E+09 riance Tes of Variance Normality Test D Test ality Test Mean 1.695E+6 | 12 9 t e Test Fest 95% LCL 6 1.631E+6 | 1 14 15 Test Stat 0.1463 0.04911 1.709 0.492 1.14 0.1658 0.9275 95% UCL 1.758E+6 | 318.2 Critical 8.862 8.862 8.885 3.878 2.576 0.2471 0.8408 Median 1.716E+6 | P-Value 0.7079 0.8278 0.4964 0.2224 0.2544 0.2893 0.2228 Min 1.561E+6 | Decision(Equal Vari Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis Normal Dis | α:1%) ances ances ances stribution stribution stribution Std Err 2.688E+4 | 4.49% | 0.00% |
| Between Error Total Distributional Attribute Variances Variances Variances Distribution Distribution Distribution Distribution Cell Density S Conc-% 0 100 Cell Density I | Sum Squ 1.457E+1 6.412E+1 1.522E+1 1.522E+1 Tests Test Levene Edit Mod Leve Variance I Anderson- D'Agostine Kolmogor Shapiro-V Summary Code N | quality of Var ne Equality of Ratio F Test -Darling A2 No Skewness ov-Smirnov I Vilk W Norma Count 8 8 | 1.457E+1 4.58E+09 riance Tes of Variance Normality Test D Test ality Test Ality Test Mean 1.695E+1 1.091E+1 | 12 9 t e Test Fest 95% LCL 6 1.631E+6 6 1.042E+6 | 1 14 15 Test Stat 0.1463 0.04911 1.709 0.492 1.14 0.1658 0.9275 95% UCL 1.758E+6 1.140E+6 | 318.2 Critical 8.862 8.862 8.885 3.878 2.576 0.2471 0.8408 Median 1.716E+6 1.088E+6 | P-Value 0.7079 0.8278 0.4964 0.2224 0.2544 0.2893 0.2228 Min 1.561E+6 1.018E+6 | Decision(Equal Vari Equal Vari Equal Vari Normal Dis Normal Dis Normal Dis Normal Dis 1.772E+6 1.169E+6 | effect a:1%) ances ances ances stribution stribution stribution Std Err 2.688E+4 2.056E+4 | 4.49% | 0.00% |

CETIS Analytical Report

Report Date:

17 Apr-18 08:13 (p 2 of 2)

Test Code:

TAM0318.263sel | 02-1041-4138

Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

10-3873-5772 28 Mar-18 12:21 Endpoint: Cell Density Analysis:

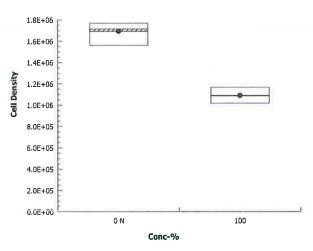
Parametric Bioequivalence-Two Sample

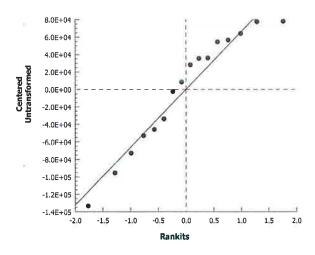
CETIS Version: Official Results:

CETISv1.9.2

Yes

Graphics





000-189-126-0

CETIS™ v1.9.2.6 Page 40 of 97

QA: Analyst:_

4/18/2018

17 Apr-18 08:13 (p 1 of 2)

Test Code:

TAM0318.263sel | 02-1041-4138

| | | | | | | | | Test Code: | TAM031 | 8.263sel 0 | 2-1041-4138 |
|---------------------|----------------|-------------|-----------|----------------|--------------|------|------|--------------|--------------|--------------|--------------|
| Selenastrum | Growth Test | | | | | | | Aquatic I | Bioassay & | Consulting | g Labs, Inc. |
| Batch ID: | 15-8687-8202 | T | est Type: | Cell Growth | | | | Analyst: | | | |
| Start Date: | 23 Mar-18 14:3 | 30 P | rotocol: | EPA/821/R-02 | -013 (2002) | | | Diluent: Lat | oratory Wa | ter | |
| Ending Date: | 27 Mar-18 13: | 15 S | pecies: | Selenastrum c | apricornutur | n | | Brine: Not | Applicable | | |
| Duration: | 95h | s | ource: | Aquatic Biosys | tems, CO | | | Age: | | | |
| Sample ID: | 15-0565-9247 | С | ode: | TAM0318.263 | sel | | | Client: Tes | st America I | rvine | |
| Sample Date: | 22 Mar-18 15:3 | 30 M | laterial: | Sample Water | | | | Project: Boo | eing-SSFL N | IPDES | |
| Receipt Date: | 23 Mar-18 13:3 | 30 S | ource: | Bioassay Repo | ort | | | | | | |
| Sample Age: | 23h (2.1 °C) | s | tation: | Outfall 009 | | | | | | | |
| Alkalinity (Ca | CO3)-mg/L | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 1 | 62 | | | 62 | 62 | 0 | 0 | 0.0% | 0 |
| 100 | | 1 | 40 | | | 40 | 40 | 0 | 0 | 0.0% | 0 |
| Overall | | 2 | 51 | -88.77 | 190.8 | 40 | 62 | 11 | 15.56 | 30.50% | 0 (0%) |
| Conductivity- | μmhos | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 5 | 457 | 445.2 | 468.8 | 448 | 471 | 4.243 | 9.487 | 2.08% | 0 |
| 100 | | 5 | 179.2 | 172.7 | 185.7 | 174 | 188 | 2.354 | 5.263 | 2.94% | 0 |
| Overall | | 10 | 318.1 | 213.2 | 423 | 174 | 471 | 46.36 | 146.6 | 46.08% | 0 (0%) |
| Hardness (Ca | CO3)-mg/L | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 1 | 101 | | | 101 | 101 | 0 | 0 | 0.0% | 0 |
| 100 | | 1 | 57 | | | 57 | 57 | 0 | 0 | 0.0% | 0 |
| Overall | | 2 | 79 | -200.5 | 358.5 | 57 | 101 | 22 | 31.11 | 39.38% | 0 (0%) |
| pH-Units | | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 5 | 7.82 | 7.598 | 8.042 | 7.5 | 7.9 | 0.08 | 0.1789 | 2.29% | 0 |
| 100 | | 5 | 7.8 | 7.568 | 8.032 | 7.6 | 8 | 0.08367 | 0.1871 | 2.4% | 0 |
| Overall | | 10 | 7.81 | 7.686 | 7.934 | 7.5 | 8 | 0.05467 | 0.1729 | 2.21% | 0 (0%) |
| Temperature | -°C | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 5 | 24.48 | 24.24 | 24.72 | 24.3 | 24.8 | 0.08604 | 0.1924 | 0.79% | 0 |
| 100 | | 5 | 24.48 | 24.24 | 24.72 | 24.3 | 24.8 | 0.08604 | 0.1924 | 0.79% | 0 |
| Overall | | 10 | 24.48 | 24.35 | 24.61 | 24.3 | 24.8 | 0.05735 | 0.1814 | 0.74% | 0 (0%) |
| | | | | | | | | | | | |

17 Apr-18 08:13 (p 2 of 2)

Test Code:

TAM0318.263sel | 02-1041-4138

| | | | | | | | rest Code. | TAMOS 10.2035e1 02-104 1-4 130 |
|----------------|-------------|------|------|------|------|-------|------------|----------------------------------|
| Selenastrum (| Growth Test | | | | | | Aquatic | Bioassay & Consulting Labs, Inc. |
| Alkalinity (Ca | CO3)-mg/L | | | | | | | |
| Conc-% | Code | 1 | | | | | | |
| 0 | N | 62 | | | | | | |
| 100 | | 40 | | | | | | |
| Conductivity- | ımhos | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | | |
| 0 | N | 454 | 450 | 448 | 462 | 471 | | |
| 100 | | 174 | 177 | 178 | 179 | 188 | | |
| Hardness (Ca | CO3)-mg/L | | | | | | | |
| Conc-% | Code | 1 | | | | | | |
| 0 | N | 101 | | | | | | |
| 100 | | 57 | | | | | | |
| pH-Units | | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | | |
| 0 | N | 7.9 | 7.9 | 7.9 | 7.9 | 7.5 | | |
| 100 | | 7.6 | 7.7 | 7.7 | 8 | 8 | | |
| Temperature- | ,C | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | | |
| 0 | N | 24.3 | 24.4 | 24.4 | 24.8 | 24.5 | | |
| 100 | | 24.3 | 24.4 | 24.4 | 24.8 | _24.5 | | |

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April 17, 2018

Ms. Urvashi Patel TestAmerica Irvine 17461 Derian Avenue, Suite 100 Irvine, CA 92614

Dear Ms. Patel:

We received one sample from your laboratory in our laboratory on March 23, 2018, identified as Outfall 009, ABC lab number TAM0318.263. We conducted initial chronic toxicity tests on these samples with the water flea, *Ceriodaphnia dubia &* fathead minnow, *Pimephales promelas* and the green algae, *Selenastrum capricornutum*. The sample had an initial test result of 35.62% effect in the undiluted sample for the green algae test. Based on these results, we initiated TIE procedures. The initial component of the TIE is to conduct a baseline test. The baseline test was conducted and it resulted in 8.12% effect. This indicates that the initial observed toxicity was most likely caused by volitle substances that dissipated rendering the sample less toxic. Based on these results there was no need to proceed with the TIE manipulations. No TIE report will be issued.

Please feel free to phone me at your convenience if you have any questions.

Sincerely

Scott Johnson

Laboratory Director

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April 17, 2018

Ms. Urvashi Patel TestAmerica Irvine 17461 Derian Avenue, Suite 100 Irvine, CA 92614

Dear Ms. Patel:

We are pleased to present the enclosed revised bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA-821-R-02-013.* Results were as follows:

CLIENT:

TestAmerica Irvine

SAMPLE I.D.:

Outfall 009

DATE RECEIVED:

23 March - 18

ABC LAB. NO.:

TAM0318.263(TIE BASELINE)

CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY

NOEC = 100.00 %

TUc = 1.00

IC25 = >100.00%

IC50 = >100.00%

Yours very truly,

Scott Johnson

Laboratory Director

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17 Apr-18 10:36 (p 1 of 1)

Test Code:

IC20

IC25

IC40

IC50

>100

>100

>100

>100

n/a

n/a

n/a

n/a

TAM0318.263TIEB | 15-8007-4039

n/a

n/a

n/a

n/a

<1

<1

<1

<1

| Selenastrum | Growth Test | | | | Aquati | ic Bioassay & C | onsulting | Labs, Inc. |
|---------------------|-----------------|------------|------------------------------|-------|----------|------------------|-----------|------------|
| Batch ID: | 13-1324-8215 | Test Type: | Cell Growth | An | alyst: | | | |
| Start Date: | 29 Mar-18 12:10 | Protocol: | EPA/821/R-02-013 (2002) | Dil | uent: l | Laboratory Wate | er | |
| Ending Date: | 02 Apr-18 10:35 | Species: | Selenastrum capricornutum | Bri | ine: 1 | Not Applicable | | |
| Duration: | 94h | Source: | Aquatic Biosystems, CO | Ag | e: | | | |
| Sample ID: | 08-4076-8529 | Code: | TAM0318.263TIEB | Cli | ent: | Test America Irv | rine | |
| Sample Date: | 22 Mar-18 15:30 | Material: | Sample Water | Pre | oject: l | Boeing-SSFL N | PDES | |
| Receipt Date: | 23 Mar-18 13:30 | Source: | Bioassay Report | | | | | |
| Sample Age: | 6d 21h (2.1 °C) | Station: | Outfall 009 | | | | | |
| Multiple Com | parison Summary | | | | | | | |
| Analysis ID | Endpoint | Comp | parison Method | NOEL | LOEL | TOEL | TU | PMSD √ |
| 11-2203-8834 | Cell Density | Dunn | ett Multiple Comparison Test | 100 | > 100 | n/a | 1 | 9.74% |
| Point Estimat | te Summary | | | | | | | |
| Analysis ID | Endpoint | Point | Estimate Method | Level | % | 95% LCL | 95% UCL | TU √ |
| 02-4601-6572 | Cell Density | Linea | r Interpolation (ICPIN) | IC5 | 69.35 | 59.48 | 94.25 | 1.442 |
| | | | | IC10 | 88.7 | 68.95 | n/a | 1.127 |
| | | | | IC15 | >100 | n/a | n/a | <1 |

| Test Acceptal | bility | | | TAC L | imits | | |
|---------------|--------------|--------------|-----------|---------|-------|---------|-----------------|
| Analysis ID | Endpoint | Attribute | Test Stat | Lower | Upper | Overlap | Decision |
| 02-4601-6572 | Cell Density | Control CV | 0.02409 | << | 0.2 | Yes | Passes Criteria |
| 11-2203-8834 | Cell Density | Control CV | 0.02409 | << | 0.2 | Yes | Passes Criteria |
| 02-4601-6572 | Cell Density | Control Resp | 1.15E+6 | 1000000 | >> | Yes | Passes Criteria |
| 11-2203-8834 | Cell Density | Control Resp | 1.15E+6 | 1000000 | >> | Yes | Passes Criteria |

| Cell Density | Summary | | | | | | | | | | |
|--------------|---------|-------|----------|----------|----------|----------|----------|----------|----------|-------|---------|
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | N | 4 | 1.147E+6 | 1.103E+6 | 1:191E+6 | 1.122E+6 | 1.186E+6 | 1.382E+4 | 2.763E+4 | 2.41% | 0.00% |
| 50 | | 4 | 1.274E+6 | 1.114E+6 | 1.433E+6 | 1.129E+6 | 1.350E+6 | 5.014E+4 | 1.003E+5 | 7.87% | -11.03% |
| 100 | | 4 | 1.054E+6 | 9.421E+5 | 1.166E+6 | 9.690E+5 | 1.122E+6 | 3.519E+4 | 7.038E+4 | 6.68% | 8.12% |

| Cell Density | Detail | | | | | |
|--------------|--------|----------|----------|----------|----------|--|
| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | |
| 0 | N | 1.146E+6 | 1.135E+6 | 1.122E+6 | 1.186E+6 | |
| 50 | | 1.350E+6 | 1.129E+6 | 1.331E+6 | 1.285E+6 | |
| 100 | | 1 025516 | 1 100546 | 1 122516 | 0.600E+6 | |

17 Apr-18 10:36 (p 1 of 2)

Test Code:

TAM0318.263TIEB | 15-8007-4039

| | | | | | | | Test | Code: | AM0318.26 | 311EB 1 | 5-8007-40 |
|-------------------|----------------|--------------|-------------|---------------|---------------|----------|---------|-------------|---------------|-----------|-----------|
| Selenastrum Gro | owth Test | | | | | | | Aquatic Bi | ioassay & C | onsulting | Labs, Inc |
| Analysis ID: 1 | 1-2203-8834 | End | point: Ce | II Density | | | CETIS | S Version: | CETISv1. | 9.2 | |
| Analyzed: 0 | 3 Apr-18 9:58 | Anal | ysis: Pa | rametric-Con | trol vs Treat | ments | Offici | al Results: | Yes | | |
| Batch ID: 13 | 3-1324-8215 | Test | Type: Ce | II Growth | | | Analy | /st: | | | |
| Start Date: 29 | Mar-18 12:10 | | | A/821/R-02-0 | 013 (2002) | | Dilue | | ratory Wate | er | |
| Ending Date: 02 | 2 Apr-18 10:35 | Spec | | lenastrum ca | . , | | Brine | | Applicable | | |
| Duration: 94 | · | Soul | | uatic Biosyst | • | | Age: | | | | |
| Sample ID: 08 | 3-4076-8529 | Code | o: TA | M0318.263T | IER | | Clien | tı Tost | America Irv | ino | |
| Sample Date: 22 | | | | mple Water | ILD | | Proje | | ng-SSFL NF | | |
| Receipt Date: 23 | | | | assay Repor | rt | | i ioje | Ct. Doei | 11g-001 L 141 | DEG | |
| Sample Age: 60 | | Stati | | itfall 009 | | | | | | | |
| | | | | | | | | | | | |
| Data Transform | | Alt Hyp | | | | | NOEL | LOEL | TOEL | TU | PMSD |
| Untransformed | | C > T | | | | | 100 > | > 100 | n/a | 1 | 9.74% |
| Dunnett Multiple | e Comparison | Test | | | | | | | | | |
| Control vs | Conc-% | | Test Stat | Critical | MSD DF | P-Type | P-Value | Decision(| α:5%) | | |
| Negative Control | 50 | | -2.467 | 2.18 | 1E+05 6 | CDF | 0.9959 | Non-Signif | icant Effect | | |
| | 100 | | 1.817 | 2.18 | 1E+05 6 | CDF | 0.0877 | Non-Signif | icant Effect | | |
| Test Acceptabili | tv Criteria | T40.1 | | | | | | | | | |
| Attribute | Test Stat | TAC Li | Upper | Overlap | Decision | | | | | | |
| Control CV | 0.02409 | << | 0.2 | Yes | Passes Cr | iteria | | | | | |
| Control Resp | 1.15E+6 | 1000000 | >> | Yes | Passes Cr | | | | | | |
| ANOVA Table | | | | | | | | | | | |
| Source | Sum Squa | ares | Mean Sq | uare | DF | F Stat | P-Value | Decision(| α:5%) | | |
| Between | 9.723E+10 |) | 4.862E+1 | 0 | 2 | 9.246 | 0.0066 | Significant | Effect | | |
| Error | 4.732E+10 |) | 5.258E+0 | 9 | 9 | | | | | | |
| Total | 1.446E+11 | | | | 11 | | | | | | |
| Distributional To | ests | | | | | | | | | | |
| Attribute | Test | | | | Test Stat | Critical | P-Value | Decision(| a:1%) | | |
| Variances | | uality of Va | riance Test | | 3.503 | 9.21 | 0.1735 | Equal Vari | | | |
| Variances | | uality of Va | | | 2.266 | 8.022 | 0.1596 | Equal Vari | | | |
| Variances | | ne Equality | | | 1.148 | 8.022 | 0.3596 | Equal Var | | | |
| Distribution | | Darling A2 I | | | 0.4177 | 3.878 | 0.3340 | Normal Di | | | |
| Distribution | | Skewness | | | 1.583 | 2.576 | 0.1135 | Normal Di | | | |
| Distribution | _ | v-Smirnov | | | 0.162 | 0.2801 | 0.5744 | Normal Di | | | |
| Distribution | • | ilk W Norm | | | 0.92 | 0.8025 | 0.2855 | Normal Di | | | |
| Cell Density Sur | mmary | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effec |
| 0 | N | 4 | 1.147E+6 | | 1.191E+6 | | | | | | 0.00% |
| 50 | | 4 | | 3 1.114E+6 | | | | | | | -11.03% |
| 100 | | 4 | | 9.421E+5 | | | | | | | 8.12% |
| Cell Density Det | tail | | | | | | | | | | |
| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | | | | | | |
| 0 | N | 1.146E+6 | | | | | | | | | |
| 50 | | 1.350E+6 | 1.129E+6 | 3 1.331E+6 | | | | | | | |
| 400 | | 4.0055:0 | 4.4005.4 | 4.4005:0 | 0:000= : = | | | | | | |

1.025E+6 1.100E+6 1.122E+6 9.690E+5

100

Selenastrum Growth Test

Report Date:

17 Apr-18 10:36 (p 2 of 2)

Test Code:

TAM0318.263TIEB | 15-8007-4039

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

11-2203-8834 03 Apr-18 9:58

Cell Density Endpoint:

Analysis:

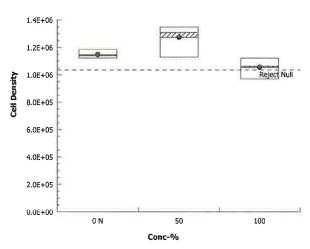
Parametric-Control vs Treatments

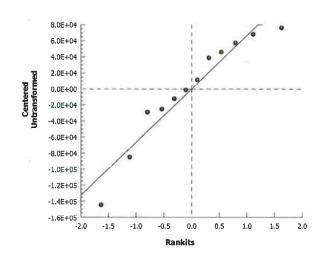
CETIS Version: Official Results:

CETISv1.9.2

Yes

Graphics





17 Apr-18 10:36 (p 1 of 2)

Test Code:

TAM0318.263TIEB | 15-8007-4039

| | | | | | | | Test Code: | T | FAM0318.263TIEB | 15-8007-4039 |
|---------------------|-----------------|------------|--------|----------------|-----------------|-------------|--------------|---------|-------------------|---------------|
| Selenastrum | Growth Test | | | | | | Aqua | atic Bi | oassay & Consulti | ng Labs, Inc. |
| Analysis ID: | 02-4601-6572 | Endpoin | | II Density | | | CETIS Vers | sion: | CETISv1.9.2 | |
| Analyzed: | 03 Apr-18 9:58 | Analysis | : Line | ear Interpolat | ion (ICPIN) | | Official Re | sults: | Yes | |
| Batch ID: | 13-1324-8215 | Test Typ | e: Cel | II Growth | | | Analyst: | | | |
| Start Date: | 29 Mar-18 12:10 | Protocol | : EP | A/821/R-02-0 | 13 (2002) | | Diluent: | Labo | oratory Water | |
| Ending Date: | 02 Apr-18 10:35 | Species: | Sel | lenastrum ca | pricornutum | | Brine: | Not A | Applicable | |
| Duration: | 94h | Source: | Aqı | uatic Biosyste | ems, CO | | Age: | | | |
| Sample ID: | 08-4076-8529 | Code: | TAI | M0318.263TI | EB | | Client: | Test | America Irvine | |
| Sample Date: | 22 Mar-18 15:30 | Material | Sar | mple Water | | | Project: | Boei | ng-SSFL NPDES | |
| Receipt Date | 23 Mar-18 13:30 | Source: | Bio | assay Repor | t | | | | | |
| Sample Age: | 6d 21h (2.1 °C) | Station: | Out | tfall 009 | | | | | | |
| Linear Interp | olation Options | | | | | | | | | |
| X Transform | Y Transform | Seed | Re | samples | Exp 95% CL | Method | | | | |
| Linear | Linear | 0 | 280 | 0 | Yes | Two-Point I | nterpolation | | | |
| Test Accepta | bility Criteria | TAC Limits | 3 | | | | | | | |
| Attribute | Test Stat | Lower Up | per | Overlap | Decision | | | | | |
| Control CV | 0.02409 | << 0.2 | | Yes | Passes Criteria | | | | | |
| Control Resp | 1.15E+6 | 1000000 >> | | Yes | Passes Criteria | | | | | |
| Point Estima | tes | | | | | | | | | |
| Level % | 95% LCL | 95% UCL TU | | 95% LCL | 95% UCL | | | | | |
| IC5 69.3 | 5 59.48 | 94.25 1.4 | 42 | 1.061 | 1.681 | | | | | |
| IC10 88.7 | 68.95 | n/a 1.1 | 27 | n/a | 1.45 | | | | | |
| IC15 >100 |) n/a | n/a <1 | | n/a | n/a | | | | | |
| IC20 >100 |) n/a | n/a <1 | | n/a | n/a | | | | | |
| IC25 >100 |) n/a | n/a <1 | | n/a | n/a | | | | | |
| IC40 >100 |) n/a | n/a <1 | | n/a | n/a | | | | | |

| Cell Density S | Summary | | | | Cal | culated Var | iate | | |
|----------------|---------|-------|----------|----------|----------|-------------|----------|-------|---------|
| Conc-% | Code | Count | Mean | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | N | 4 | 1.147E+6 | 1.122E+6 | 1.186E+6 | 1.382E+4 | 2.763E+4 | 2.41% | 0.0% |
| 50 | | 4 | 1.274E+6 | 1.129E+6 | 1.350E+6 | 5.014E+4 | 1.003E+5 | 7.87% | -11.03% |
| 100 | | 4 | 1.054E+6 | 9.690E+5 | 1.122E+6 | 3.519E+4 | 7.038E+4 | 6.68% | 8.12% |

n/a

Cell Density Detail

>100

n/a

n/a

IC50

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | |
|--------|------|----------|----------|----------|----------|--|
| 0 | N | 1.146E+6 | 1.135E+6 | 1.122E+6 | 1.186E+6 | |
| 50 | | 1.350E+6 | 1.129E+6 | 1.331E+6 | 1.285E+6 | |
| 100 | | 1.025E+6 | 1.100E+6 | 1.122E+6 | 9.690E+5 | |

<1

n/a

17 Apr-18 10:36 (p 2 of 2)

Test Code:

TAM0318.263TIEB | 15-8007-4039

Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

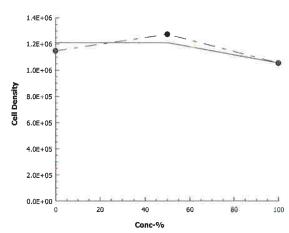
02-4601-6572 03 Apr-18 9:58

Cell Density Endpoint:

Analysis: Linear Interpolation (ICPIN) **CETIS Version:** Official Results:

CETISv1.9.2

Graphics



Yes

17 Apr-18 10:36 (p 1 of 2)

Test Code:

TAM0318.263TIEB | 15-8007-4039

| | | | | | | | | Test Code: | TAM0318.2 | 263TIEB 1 | 5-8007-4039 |
|----------------|------------------|-------|------------|----------------|--------------|------|------|------------|----------------|-------------|--------------|
| Selenastrum | Growth Test | | | | | | | Aquat | tic Bioassay & | Consulting | g Labs, Inc. |
| Batch ID: | 13-1324-8215 | | Test Type: | Cell Growth | | | | Analyst: | | | |
| Start Date: | 29 Mar-18 12:1 | 10 | Protocol: | EPA/821/R-02 | -013 (2002) | | | Diluent: | Laboratory Wa | ter | |
| Ending Date: | 02 Apr-18 10:3 | 5 | Species: | Selenastrum c | apricornutur | n | | Brine: | Not Applicable | | |
| Duration: | 94h | | Source: | Aquatic Biosys | tems, CO | | | Age: | | | |
| Sample ID: | 08-4076-8529 | | Code: | TAM0318.263 | TIEB | | | Client: | Test America I | rvine | |
| Sample Date: | : 22 Mar-18 15:3 | 30 | Material: | Sample Water | - | | | Project: | Boeing-SSFL N | NPDES | |
| Receipt Date: | : 23 Mar-18 13:3 | 30 | Source: | Bioassay Repo | ort | | | • | Ū | | |
| Sample Age: | 6d 21h (2.1 °C | >) | Station: | Outfall 009 | | | | | | | |
| Alkalinity (Ca | CO3)-mg/L | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Ei | r Std Dev | CV% | _QA Count |
| 0 | N | 1 | 69 | | | 69 | 69 | 0 | 0 | 0.0% | 0 |
| 50 | | 1 | 54 | | | 54 | 54 | 0 | 0 | 0.0% | 0 |
| 100 | | 1 | 33 | | | 33 | 33 | 0 | 0 | 0.0% | 0 |
| Overall | | 3 | 52 | 7.079 | 96.92 | 33 | 69 | 10.44 | 18.08 | 34.78% | 0 (0%) |
| Conductivity | -µmhos | | | | | | | | | | |
| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Coun |
| 0 | N | 5 | 450.8 | 440.8 | 460.8 | 442 | 464 | 3.597 | 8.044 | 1.78% | 0 |
| 50 | | 5 | 457.2 | 440.2 | 474.2 | 447 | 480 | 6.127 | 13.7 | 3.0% | 0 |
| 100 | | 5 | 173.4 | 163.4 | 183.4 | 161 | 181 | 3.586 | 8.019 | 4.62% | 0 |
| Overall | | 15 | 360.5 | 284.4 | 436.5 | 161 | 480 | 35.44 | 137.3 | 38.08% | 0 (0%) |
| Hardness (Ca | aCO3)-mg/L | | | | | | | | | | |
| Conc-% | Code | Coun | t Mean | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Coun |
| 0 | N | 1 | 98 | | | 98 | 98 | 0 | 0 | 0.0% | 0 |
| 50 | | 1 | 111 | | | 111 | 111 | 0 | 0 | 0.0% | 0 |
| 100 | | 1 | 62 | | | 62 | 62 | 0 | 0 | 0.0% | 0 |
| Overall | | 3 | 90.33 | 27.28 | 153.4 | 62 | 111 | 14.66 | 25.38 | 28.10% | 0 (0%) |
| pH-Units | | | | | | | | | | | |
| Conc-% | Code | Coun | t Mean | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Count |
| 0 | N | 5 | 7.78 | 7.676 | 7.884 | 7.7 | 7.9 | 0.0374 | 42 0.08367 | 1.08% | 0 |
| 50 | | 5 | 8 | 7.912 | 8.088 | 7.9 | 8.1 | 0.0316 | 62 0.07071 | 0.88% | 0 |
| 100 | | 5 | 7.98 | 7.876 | 8.084 | 7.9 | 8.1 | 0.0374 | 42 0.08366 | 1.05% | 0 |
| Overall | | 15 | 7.92 | 7.85 | 7.99 | 7.7 | 8.1 | 0.0326 | 66 0.1265 | 1.60% | 0 (0%) |
| Temperature | -°C | | | | | | | | | | |
| Conc-% | Code | Coun | t Mean | 95% LCL | 95% UCL | Min | Max | Std E | rr Std Dev | CV% | QA Coun |
| 0 | N | 5 | 24.68 | 24.52 | 24.84 | 24.5 | 24.8 | 0.0583 | 32 0.1304 | 0.53% | 0 |
| 50 | | 5 | 24.68 | 24.52 | 24.84 | 24.5 | 24.8 | 0.0583 | 32 0.1304 | 0.53% | 0 |
| 400 | | _ | 04.00 | 0.4.50 | 04.04 | 04.5 | 010 | 0.050 | 0 1001 | 0.700/ | • |

Analyst:_____QA:____

0.53%

0.49%

0

0 (0%)

100

Overall

5

15

24.68

24.68

24.52

24.61

24.84

24.75

24.5

24.5

24.8

24.8

0.05832

0.03117

0.1304

0.1207

17 Apr-18 10:36 (p 2 of 2)

Fest Code:

TAM0318.263TIEB | 15-8007-4039

| | | | | | | | Test Code: | TAM0318.263TIEB 15-8007-4039 |
|-----------------|------------|------|------|------|------|------|------------|------------------------------------|
| Selenastrum G | rowth Test | | | | | | Aquati | c Bioassay & Consulting Labs, Inc. |
| Alkalinity (CaC | O3)-mg/L | | | | | | | |
| Conc-% | Code | 1 | | | | | | |
| 0 | N | 69 | | | | | | |
| 50 | | 54 | | | | | | |
| 100 | | 33 | | | | | | |
| Conductivity-µ | mhos | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | | |
| 0 | N | 442 | 449 | 449 | 450 | 464 | | |
| 50 | | 449 | 480 | 447 | 450 | 460 | | |
| 100 | | 161 | 170 | 177 | 178 | 181 | | |
| Hardness (CaC | O3)-mg/L | | | | | | | |
| Conc-% | Code | 1 | | | | | | |
| 0 | N | 98 | | | | | | |
| 50 | | 111 | | | | | | |
| 100 | | 62 | | | | | | |
| pH-Units | | | | | | 9 | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | | |
| 0 | N | 7.7 | 7.7 | 7.8 | 7.8 | 7.9 | | |
| 50 | | 8 | 7.9 | 8 | 8 | 8.1 | | |
| 100 | | 7.9 | 7.9 | 8 | 8 | 8.1 | | |
| Temperature-° | C | | | | | | | |
| Conc-% | Code | 1 | 2 | 3 | 4 | 5 | | |
| 0 | N | 24.8 | 24.7 | 24.6 | 24.5 | 24.8 | | |
| 50 | | 24.8 | 24.7 | 24.6 | 24.5 | 24.8 | | |
| 100 | | 24.8 | 24.7 | 24.6 | 24.5 | 24.8 | | |

| 11 | 10 | 2 | Relinquished By | Me de la constante de la const | Relinquished By | | | | | | | Outhall 009 | | | | | | | | Sample | Sampler: | TestAmerica Laboratories Inc. | TestAmerica's service | Test America Conta 17461 Derian Ave s Irvine CA 92614 Tel 849-260-3269 Cell 949-333-9055 | Haley & Aldrich 5333 Mission Cent San Diego, CA 92 | Client Name/Address: |
|-----|----------------|---------------|---|--|---|-------|------------------------------------|---------------------------|--|---|--|-----------------|---|---|--|------------|-------------|---------------------------------|-----------------|----------------------|-----------------------------------|---------------------------------------|---|--|--|----------------------|
| " " | | And Sher | Date/Time | ell 3- | Data/Time: | | Constituted by constituting County | Certains and Certains Edm | Outral009_20180322_Comp_F | | | | | 1 | Outfali009 20180322 Comp | | | | | Sample 1.D | | tra of season produced and season for | for INe CoC shall be performed in a | Test America Contact: Urvashi Patal 17461 Derian Ave Sutte #100 Irvine CA 92614 Tel 949-260-3269 Cell 949-333-9055 | Haley & Aldrich 5333 Mission Center Rd Sulte 300 San Diego, CA 92108 | drass: |
| | An | puker | \ | 31/20 | 28/181.2 | | | STOCKEGE | 3/22/2018 | , | | 0 | | • | 3/22/2018 | <i>i</i> • | | 24 | • 6 | Sampling Date/Time | | | ecordance with the T&Cs within Blanket Serv | | | |
| | SA | 11 | Com | 100 | Con | | M | MW | W | MW | | MW | MW | WW | | \neg | WW | MA | MA MA | Sample | | 1 | Sarvice | - | | |
| | 23-16 (230 | 18/64/2 A | Company: | OO STATE | Janes Shares | | 1 L Glass Amber | 1 L Glass Amber | borosilicate viale | 1 L Poly | Donosilicate viale | 1 L Glass Amber | 1 Gal Cube | 1 L Glast Amber | 2.6 Gal Cube | 1 L Poly | 500 mt Poly | 500 mL Poly | 1 L Gless Amber | 0 | 978. | 520. | Proje | | Annu | |
| | (N) | B | | 00 | | 11 | 1 | 9 2 | PA W | ω | 4 | 9 | ž | | ω, | <u>.</u> | - | | 2 3 | 0 | 234,503 | 289,860 | ect Mana | 0 | Boeing Pe | |
| | Q, | R | | 2 | 1 | | z : | zz | | | 3 | z | 8 | | z | z z | 2 | 2 | z | - | ger: Ma 3, 818.5 | 6, 520.9 | здег. Ка | Comp | Boeing-SSFL NPDES Permit 2018 Jail Outfall (003-007, 009) | Project: |
| | | (8) | | | 2 2 | - 1 1 | One one | None | None | None | HNCS | None | None | None | None | S None | OTIO | None | None HNC | 8 | 978,234,5033, 818,599,0702 (cell) | 520.289.8806, 520.904.6944 (cell) | Project Manager: Katherine Miller | Ψ | Boeing-SSFL NPDES Permit 2018 Permit 2007, 009, 010 | 1 |
| | | | Racelyad By | vacawag a | gend: R | | 28 3 | | 320 | 195 | 310 | 250 | 235 | 230 | 23 | + | + | | 1 8 | 9 | (cell) | (cell) | Viller | | 9 | |
| | \overline{C} | 2 | | 1 | Rout | | ₹ ₹ | 8 8 | Yes | Yes | 31-1 | ž | No | Yes | 8 | ई ह | 중 | ž | S S | Ö | Reco | overa | ble | Metals: | — _T | - |
| | Rel: | De, C | (the | -) | Legend: R = Routine, A = Annual Received By Date/Time: TX 30 | | | | | | Fame with | | | | | H | | | × | (E20 Han (E20 | 00.7): dness 00.8): | Al, A as C Ag, C | s, B acc | Metals: , Be, Cr, Fe, NI, 03 Cu, Pb, Sb, Se, | V, Zn, I | 2 |
| | 1 | | 0 | × | Annual Desertion | | | x | | | 6 | I | | | | | | \dashv | × | | | | | geners) (E1613E | | 2 |
| | 1/1/1 | ۸ | Date/Time | Cataliana | 30 | | - | - | | | | + | | - | H | + | × | × | + | - | 00) S (SM2 | | | NO2-N, Perchic 160:1) | | 2/2 |
| | 1 4/1/5 | 16 | W | | | | | + | | É | | E | | | ICI | × | \vdash | | | TSS | (160. | 2 (SI | M25 | 40D)) | | , |
| | 1/1/1 | Ex. | 1/2 | | 17-te-E | | | | | 3 (*11 | j. | OLIU | | | ıp. u | | | | | (E20 | dness | Al, A BSC | s, B acx | , Be, Cr, Fe, Ni, | | 20 |
| | 4/1/ | top | 5 | | 18 | | | | | (J.L.) | 1 | 61111 | v | × | aç Ç | | | | | Groz Triti Con | ss Alpi um (H | ha(E l-3) (I I Rad | 900 E90 | 0), Gross Beta(1 3.0), Sr-90 (E903 226 (E903.0 or 304.0), Uranium | E900.0), 5.0), Total E903.1) | |
| | 7111 | m | 00 | | | | | | | | | 100 | - | | | | | | | K-4 |), CS- | 137 | (E90 | 01.0 or E901.1) Selenastrum | 44 - 1 P. P. LOCK | ANA |
| | , / | BB | 0 | | | | - | + | | 11 | | - | × | | 1 | × | H | _ | + | (EP | A-821 | -R-00 | 2-01 | 3) -CN-E / E335.2) | | ANALYSIS REQUIRE |
| | / | A.E | No or or | Sample Intact: | Tun 24 I | | I | + | | 1 | | L | | - | 1 | , | H | | + | - | | _ | _ | Pesticides+PCB | s (E608) | EQU! |
| | (2) | 16 | Store sample Data Require No Level IV: | 는 를 당 기술 | Turn-aroun 24 Hour 48 Hour | | T | | | 0 | × | - 6 | | | - | - | | | + | Tota | al Rec | oven | able | Metals: Mercury | (E245.1) | RED |
| | 2/ | 1500 | rements | Sample integrity: (Check) | Turn-around time: (Check) 24 Hour: 72 Hou 48 Hour: 5 Day: | | 1 | 1 | × | f | | - | | _ | H | + | H | | + | + | | _ | _ | etals: Mercury (E | - | |
| | 901 | 14 | Store samples for 6 months. Data Requirements: (Check) No Level IV: | heck) | (Check) 72 Hour. 5 Day: | | | 1 | | | | | | | | 1 | | | | | | | | | | |
| | ∞ | 3/ | <u>}</u> | | | | + | + | | - | 1 | + | - | - | H | + | H | | + | - | | - | | | - | |
| | 18 1336 | 3/23/18 12:20 | All Level IV:X | On loe: | 10 Day: X Normal: | | Hold | Hold | Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures. | Filther and preserve wiin 24hrs of receipt at lab | Sample receiving DO NOT OPEN BAG. Bag to be opened in Mercury Prep using clean procedures. | | Only test if first or second rain events of the year | another workorder. Analyze duplicate, not MS/MSD. | Unnitered and unpreserved analysis. Separate RAD onto | | | 48 hours Holding Time NOS & NO2 | | | | | | Comments | | |



CHRONIC FATHEAD MINNOW SURVIVAL AND GROWTH BIOASSAY

DATE:

22 March 2018

STANDARD TOXICANT:

Copper Chloride

ENDPOINT:

SURVIVAL

NOEC =

75.00 ug/l

EC25 =

85.14 ug/l

EC50 =

115.50 ug/l

ENDPOINT:

GROWTH

NOEC =

38.00 ug/l

IC25 =

71.44 ug/l

IC50 =

103.40 ug/l

Yours very truly,

Scott Johnson

Laboratory Director

16 Apr-18 14:53 (p 1 of 2)

Test Code:

FML032218 | 06-6197-0797

| | | | | | | | les | t Code: | FML | 032218 06 | -6197 - 07 | 797 |
|---------------|--|------------------------------|--|------------------|-----------|--|--------|-----------|-----------------|-------------|-------------------|----------|
| Fathead Minn | ow 7-d Larval | Survival a | nd Growth | Test | | | | Aquatic E | Bioassay & 0 | Consulting | Labs, In | ıc. |
| _ | 17-9499-1313 22 Mar-18 12: 29 Mar-18 10: | 45 P 46 S | Test Type: Growth-Survival (7d) Protocol: EPA/821/R-02-013 (2002) Species: Pimephales promelas | | | Analyst: Diluent: Laboratory Water Brine: Not Applicable | | | | | | |
| Duration: | 6d 22h | S | ource: | Aquatic Biosys | Age | : | | | | | | |
| Sample ID: | 16-2465-0128 | С | Code: FML032218 | | | | | nt: AB | C Labs | | | |
| Sample Date: | 22 Mar-18 12: | 45 M | laterial: | Copper chloric | le | | Pro | ject: REI | F TOX | | | |
| Receipt Date: | | S | Source: Reference Toxicant | | | | | | | | | |
| Sample Age: | n/a | S | tation: | REF TOX | | | | | | | | |
| Multiple Com | parison Sumn | nary | | | | | | | | | | |
| Analysis ID | Endpoint | | Comp | arison Metho | d | | NOEL | LOEL | TOEL | TU | PMSD | · < |
| | 7d Survival Ra | Steel Many-One Rank Sum Test | | | | 75 | 150 | 106.1 | | 9.29% | | |
| 17-6048-4784 | Mean Dry Wei | ight-mg | Dunnett Multiple Comparison Test | | | | 38 | 75 | 53.39 | | 14.9% | |
| Point Estimat | te Summary | | | | | | | | | | | |
| Analysis ID | Endpoint | | Point | Estimate Meth | nod | | Level | μg/L | 95% LCL | 95% UCL | TU | ✓ |
| 02-4944-0700 | 7d Survival Ra | ate | Linear | Interpolation (| ICPIN) | | EC5 | 46.22 | 33.07 | 95.42 | | |
| | | | | , | , | | EC10 | 58.56 | 41.45 | 95.78 | | |
| | | | | | | | EC15 | 70.89 | 45.59 | 96.56 | | |
| | | | | | | | EC20 | 79.05 | 50.76 | 99.84 | | |
| | | | | | | | EC25 | 85.14 | 56.46 | 103.9 | | |
| | | | | | | | EC40 | 103.4 | 80.2 | 118 | | |
| | | | | | | | EC50 | 115.5 | 98.68 | 128.5 | | |
| 16-6177-8212 | Mean Dry We | ight-mg | Linear Interpolation (ICPIN) | | | | IC5 | 26.19 | 6.372 | 31.91 | | _ |
| | | | | | | | IC10 | 38.18 | 5.264 | 46.09 | | ~ |
| | | | | | | | IC15 | 49.27 | 38.79 | 67.13 | | ~ |
| | | | | | | | IC20 | 60.35 | 46.22 | 86.71 | | |
| | | | | | | | IC25 | 71.44 | 51.93 | 88.12 | | _ |
| | | | | | | | IC40 | 91.26 | 74.97 | 102.5 | | ~ |
| | | | | | | | IC50 | 103.4 | 90.52 | 113.4 | | ~ |
| Test Accepta | bility | | | | | TAC | Limits | | | | | |
| Analysis ID | Endpoint | | Attrib | ute | Test Stat | Lower | Upper | Overlap | Decision | | | |
| 02-4944-0700 | 7d Survival Ra | ate | Contro | l Resp | 1 | 8.0 | >> | Yes | Passes C | riteria | | |
| 21-0024-8428 | 7d Survival Ra | ate | Contro | ol Resp | 1 | 0.8 | >> | Yes | Passes C | riteria | | |
| 16-6177-8212 | Mean Dry Weight-mg | | Contro | l Resp | 0.2693 | 0.25 | >> | Yes | Passes Criteria | | | |
| 17-6048-4784 | 84 Mean Dry Weight-mg | | Control Resp 0.2693 0.25 | | | 0.25 | >> | Yes | Passes Criteria | | | |
| 17-6048-4784 | 8-4784 Mean Dry Weight-mg | | | PMSD 0.1487 0.12 | | | 0.3 | Yes | Passes Criteria | | | |
| 7d Survival F | Rate Summary | | | | | | | | | | | |
| Conc-µg/L | Code | Count | Mean | 95% LCI | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effe | ct |
| 0 | N | 4 | 1.000 | | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.00% | 0.00% | , |
| 10 | | 4 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.00% | 0.00% | , |
| 19 | | 4 | 1.000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.00% | 0.00% | , |
| 38 | | 4 | 0.983 | 0.9303 | 1.0000 | 0.9333 | 1.0000 | 0.0167 | 0.0333 | 3.39% | 1.67% | , |
| | | | 0.000 | 0.5808 | 1.0000 | 0.6667 | 1.0000 | 0.0794 | 0.1587 | 19.04% | 16.679 | 0/2 |
| 75 | | 4 | 0.833 | 0.5000 | 1.0000 | 0.0001 | 1.0000 | 0.0734 | 0.1007 | 13.0476 | 10.07 | 70 |

Mean Dry Weight-mg Summary

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
|-----------|------|-------|---------|----------|---------|--------|--------|----------|----------|--------|----------------|
| 0 | N | 4 | 0.2693 | 0.2441 | 0.2946 | 0.256 | 0.2907 | 0.007926 | 0.01585 | 5.89% | 0.00% |
| 10 | | 4 | 0.3123 | 0.2969 | 0.3277 | 0.3007 | 0.3227 | 0.004842 | 0.009684 | 3.10% | -15.97% |
| 19 | | 4 | 0.285 | 0.2327 | 0.3373 | 0.24 | 0.3127 | 0.01644 | 0.03289 | 11.54% | <i>-</i> 5.82% |
| 38 | | 4 | 0.262 | 0.2534 | 0.2705 | 0.256 | 0.268 | 0.002684 | 0.005369 | 2.05% | 2.73% |
| 75 | | 4 | 0.2135 | 0.1663 | 0.2606 | 0.1779 | 0.2436 | 0.01481 | 0.02962 | 13.88% | 20.75% |
| 150 | | 4 | 0.03375 | -0.01631 | 0.08381 | 0.005 | 0.07 | 0.01573 | 0.03146 | 93.21% | 87.47% |

Report Date: Test Code:

16 Apr-18 14:53 (p 2 of 2)

| FIVILU322 | 218 0 | 0-019 | 7-079 | _ |
|-----------|---------|-------|-------|---|
| | | | | |

| Fathead Minno | w 7-d Larval | Survival an | d Growth T | est | | Aquatic Bioassay & Consulting Labs, Inc. |
|-----------------|--------------|-------------|------------|--------|--------|--|
| 7d Survival Rat | e Detail | | | | | |
| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | |
| 0 | N | 1.0000 | 1.0000 | 1.0000 | 1.0000 | |
| 10 | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | |
| 19 | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | |
| 38 | | 0.9333 | 1.0000 | 1.0000 | 1.0000 | |
| 75 | | 0.9333 | 0.6667 | 0.7333 | 1.0000 | |
| 150 | | 0.3333 | 0.2000 | 0.1333 | 0.2000 | |
| Mean Dry Weig | ht-mg Detail | | | | | " |
| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | |
| 0 | N | 0.2587 | 0.272 | 0.256 | 0.2907 | |
| 10 | | 0.3227 | 0.3173 | 0.3087 | 0.3007 | |
| 19 | | 0.3127 | 0.2813 | 0.306 | 0.24 | |
| 38 | | 0.2593 | 0.2647 | 0.268 | 0.256 | |
| 75 | | 0.1779 | 0.231 | 0.2436 | 0.2013 | |
| 150 | | 0.05 | 0.07 | 0.005 | 0.01 | |
| 7d Survival Rat | e Binomials | | | | | |
| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | |
| 0 | N | 15/15 | 15/15 | 15/15 | 15/15 | |
| 10 | | 15/15 | 15/15 | 15/15 | 15/15 | |

19

38

75

150

15/15

14/15

14/15

5/15

15/15

15/15

10/15

3/15

15/15

15/15

11/15

2/15

15/15

15/15

15/15

3/15

16 Apr-18 14:52 (p 1 of 4)

| CE IIS Alia | ilytical Report | | | Test Code | . , | | |
|--|--|--|---|--|------------------------------------|--|--|
| Fathead Minn | ow 7-d Larval Survi | val and Growt | h Test | Aquatic Bioassay & Consulting Labs, I | | | |
| Analysis ID: Analyzed: | 21-0024-8428 16 Apr-18 14:51 | Endpoint: Analysis: | 7d Survival Rate Nonparametric-Control vs Treatments | CETIS Vei Official Re | | | |
| Batch ID: Start Date: Ending Date: Duration: | 17-9499-1313 22 Mar-18 12:45 29 Mar-18 10:46 6d 22h | Test Type: Protocol: Species: Source: | Growth-Survival (7d) EPA/821/R-02-013 (2002) Pimephales promelas Aquatic Biosystems, CO | Analyst: Diluent: Brine: Age: | Laboratory Water Not Applicable | | |
| Sample ID: Sample Date: Receipt Date: Sample Age: | | Code: Material: Source: Station: | FML032218 Copper chloride Reference Toxicant REF TOX | Client: Project: | ABC Labs REF TOX | | |
| Data Transfor | rm Al | t Hvp | | NOEL LO | EL TOEL TU PMSD | | |

| Data Transform | Alt Hyp | NOEL | LOEL | TOEL | TU | PMSD |
|---------------------|---------|------|------|-------|----|-------|
| Angular (Corrected) | C > T | 75 | 150 | 106.1 | | 9.29% |
| | | | | | | |

| Control vs | Conc-µg/L | Test Stat | Critical | Ties | DF | P-Type | P-Value | Decision(a:5%) |
|------------------|-----------|-----------|----------|------|----|--------|---------|------------------------|
| Negative Control | 10 | 18 | 10 | 1 | 6 | Asymp | 0.8333 | Non-Significant Effect |
| | 19 | 18 | 10 | 1 | 6 | Asymp | 0.8333 | Non-Significant Effect |
| | 38 | 16 | 10 | 1 | 6 | Asymp | 0.6105 | Non-Significant Effect |
| | 75 | 12 | 10 | 1 | 6 | Asymp | 0.1424 | Non-Significant Effect |
| | 150* | 10 | 10 | 0 | 6 | Asymp | 0.0417 | Significant Effect |

| Test Acceptabili | ty Criteria | TAC | Limits | | | |
|------------------|-------------|-------|--------|---------|-----------------|--|
| Attribute | Test Stat | Lower | Upper | Overlap | Decision | |
| Control Resp | 1 | 0.8 | >> | Yes | Passes Criteria | |

| ANOVA Table | | | | | | | | |
|-------------|-------------|-------------|----|--------|----------|--------------------|--|--|
| Source | Sum Squares | Mean Square | DF | F Stat | P-Value | Decision(α:5%) | | |
| Between | 2.92688 | 0.585376 | 5 | 52.22 | <1.0E-37 | Significant Effect | | |
| Error | 0.201764 | 0.0112091 | 18 | | | | | |
| Total | 3.12865 | | 23 | | | | | |

| Distributional Tests | | | | | | | | |
|----------------------|--------------------------------------|-----------|----------|----------|-------------------------|--|--|--|
| Attribute | Test | Test Stat | Critical | P-Value | Decision(α:1%) | | | |
| Variances | Levene Equality of Variance Test | 15.38 | 4.248 | 5.9E-06 | Unequal Variances | | | |
| Variances | Mod Levene Equality of Variance Test | 9.661 | 4.248 | 1.3E-04 | Unequal Variances | | | |
| Distribution | Anderson-Darling A2 Normality Test | 2.309 | 3.878 | <1.0E-37 | Non-Normal Distribution | | | |
| Distribution | D'Agostino Kurtosis Test | 2.2 | 2.576 | 0.0278 | Normal Distribution | | | |
| Distribution | D'Agostino Skewness Test | 0.5127 | 2.576 | 0.6082 | Normal Distribution | | | |
| Distribution | D'Agostino-Pearson K2 Omnibus Test | 5.102 | 9.21 | 0.0780 | Normal Distribution | | | |
| Distribution | Kolmogorov-Smirnov D Test | 0.2676 | 0.2056 | 1.1E-04 | Non-Normal Distribution | | | |
| Distribution | Shapiro-Wilk W Normality Test | 0.8418 | 0.884 | 0.0015 | Non-Normal Distribution | | | |

| d Survival Rate Summary | | | | | | | | | | | |
|-------------------------|------|-------|--------|---------|---------|--------|--------|--------|---------|--------|---------|
| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect |
| 0 | N | 4 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.00% | 0.00% |
| 10 | | 4 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.00% | 0.00% |
| 19 | | 4 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.00% | 0.00% |
| 38 | | 4 | 0.9833 | 0.9303 | 1.0000 | 1.0000 | 0.9333 | 1.0000 | 0.0167 | 3.39% | 1.67% |
| 75 | | 4 | 0.8333 | 0.5808 | 1.0000 | 0.8333 | 0.6667 | 1.0000 | 0.0794 | 19.04% | 16.67% |
| 150 | | 4 | 0.2167 | 0.0832 | 0.3501 | 0.2000 | 0.1333 | 0.3333 | 0.0419 | 38.72% | 78.33% |

16 Apr-18 14:52 (p 2 of 4)

Test Code:

FML032218 | 06-6197-0797

| 06-6197-0797 | |
|--------------|--|
| dan Laba Jaa | |

| Aquatic | Bioassay 8 | ę. | Consulting | Labs. | Inc. |
|----------|------------|----|------------|-------|------|
| , idamin | | _ | comcaning | ~, | |

| Analysis ID: | 21-0024-8428 | Endpoint: | 7d Survival Rate | CETIS Version: | CETISv1.9.2 |
|--------------|-----------------|-----------|-------------------------------------|-------------------|-------------|
| Analyzed: | 16 Apr-18 14:51 | Analysis: | Nonparametric-Control vs Treatments | Official Results: | Yes |

Fathead Minnow 7-d Larval Survival and Growth Test

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect |
|-----------|------|-------|--------|---------|---------|--------|--------|--------|---------|--------|---------|
| 0 | N | 4 | 1.441 | 1.441 | 1.442 | 1.441 | 1.441 | 1.441 | 0 | 0.00% | 0.00% |
| 10 | | 4 | 1.441 | 1.441 | 1.442 | 1.441 | 1.441 | 1.441 | 0 | 0.00% | 0.00% |
| 19 | | 4 | 1.441 | 1.441 | 1.442 | 1.441 | 1.441 | 1.441 | 0 | 0.00% | 0.00% |
| 38 | | 4 | 1.408 | 1.304 | 1.513 | 1.441 | 1.31 | 1.441 | 0.03292 | 4.68% | 2.28% |
| 75 | | 4 | 1.184 | 0.8178 | 1.549 | 1.169 | 0.9553 | 1.441 | 0.115 | 19.43% | 17.88% |
| 150 | | 4 | 0.4791 | 0.3196 | 0.6387 | 0.4636 | 0.3738 | 0.6155 | 0.05014 | 20.93% | 66.76% |

7d Survival Rate Detail

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|-----------|------|--------|--------|--------|--------|
| 0 | N | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 10 | | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 19 | | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 38 | | 0.9333 | 1.0000 | 1.0000 | 1.0000 |
| 75 | | 0.9333 | 0.6667 | 0.7333 | 1.0000 |
| 150 | | 0.3333 | 0.2000 | 0.1333 | 0.2000 |

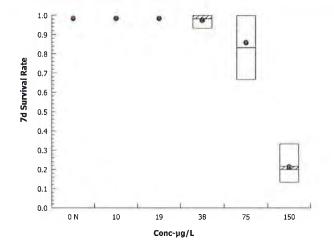
Angular (Corrected) Transformed Detail

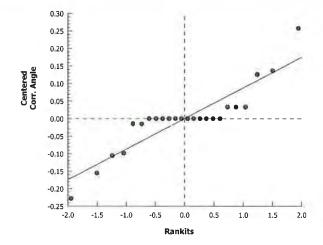
| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | |
|-----------|------|--------|--------|--------|--------|--|
| 0 | N | 1.441 | 1.441 | 1.441 | 1.441 | |
| 10 | | 1.441 | 1.441 | 1.441 | 1.441 | |
| 19 | | 1.441 | 1.441 | 1.441 | 1.441 | |
| 38 | | 1.31 | 1.441 | 1.441 | 1.441 | |
| 75 | | 1.31 | 0.9553 | 1.028 | 1.441 | |
| 150 | | 0.6155 | 0.4636 | 0.3738 | 0.4636 | |

7d Survival Rate Binomials

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|-----------|------|-------|-------|-------|-------|
| 0 | N | 15/15 | 15/15 | 15/15 | 15/15 |
| 10 | | 15/15 | 15/15 | 15/15 | 15/15 |
| 19 | | 15/15 | 15/15 | 15/15 | 15/15 |
| 38 | | 14/15 | 15/15 | 15/15 | 15/15 |
| 75 | | 14/15 | 10/15 | 11/15 | 15/15 |
| 150 | | 5/15 | 3/15 | 2/15 | 3/15 |

Graphics





Ending Date: 29 Mar-18 10:46

Sample Date: 22 Mar-18 12:45

6d 22h

Analysis ID:

Analyzed:

Batch ID:

Start Date:

Duration:

Sample ID:

Total

Report Date: Test Code:

16 Apr-18 14:52 (p 3 of 4)

FML032218 | 06-6197-0797

| Aqu | Aquatic Bioassay & Consulting Labs, Inc. | | | | | | | | | |
|-------------|--|--|--|--|--|--|--|--|--|--|
| CETIS Ver | sion: CETISv1.9.2 | | | | | | | | | |
| Official Re | sults: Yes | | | | | | | | | |
| Analyst: | | | | | | | | | | |
| Diluent: | Laboratory Water | | | | | | | | | |
| Brine: | Not Applicable | | | | | | | | | |
| Age: | | | | | | | | | | |
| | | | | | | | | | | |

Client: ABC Labs

FML032218 Copper chloride Project: **REF TOX**

Receipt Date: Source: Reference Toxicant

Sample Age: n/a **REF TOX** Station:

0.214604

Fathead Minnow 7-d Larval Survival and Growth Test

17-6048-4784

17-9499-1313

16-2465-0128

22 Mar-18 12:45

16 Apr-18 14:51

| Data Transform | Alt Hyp | NOEL | LOEL | TOEL | TU | PMSD |
|----------------|---------|------|------|-------|----|--------|
| Untransformed | C > T | 38 | 75 | 53.39 | | 14.87% |

Parametric-Control vs Treatments

EPA/821/R-02-013 (2002)

Pimephales promelas

Aquatic Biosystems, CO

Endpoint: Mean Dry Weight-mg

Test Type: Growth-Survival (7d)

Analysis:

Protocol:

Species:

Source:

Code:

Material:

| Dunnett Multiple Comparison Test | | | | | | | | | |
|----------------------------------|-----------|-----------|----------|-------|----|--------|---------|------------------------|--|
| Control vs | Conc-µg/L | Test Stat | Critical | MSD | DF | P-Type | P-Value | Decision(α:5%) | |
| Negative Control | 10 | -2.584 | 2.407 | 0.040 | 6 | CDF | 0.9999 | Non-Significant Effect | |
| | 19 | -0.9415 | 2.407 | 0.040 | 6 | CDF | 0.9798 | Non-Significant Effect | |
| | 38 | 0.4414 | 2.407 | 0.040 | 6 | CDF | 0.6727 | Non-Significant Effect | |
| | 75* | 3.358 | 2.407 | 0:040 | 6 | CDF | 0.0073 | Significant Effect | |
| | 150* | 14.16 | 2.407 | 0.040 | 6 | CDF | 2.7E-05 | Significant Effect | |

| Test Acceptability Criteria | | TAC | Limits | | |
|-----------------------------|-----------|-------|--------|---------|-----------------|
| Attribute | Test Stat | Lower | Upper | Overlap | Decision |
| Control Resp | 0.2693 | 0.25 | >> | Yes | Passes Criteria |
| PMSD | 0.1487 | 0.12 | 0.3 | Yes | Passes Criteria |

| ANOVA Table | | | | | | | | |
|-------------|-------------|-------------|----|--------|----------|--------------------|--|--|
| Source | Sum Squares | Mean Square | DF | F Stat | P-Value | Decision(α:5%) | | |
| Between | 0.204636 | 0.0409272 | 5 | 73.9 | <1.0E-37 | Significant Effect | | |
| Error | 0.0099681 | 0.0005538 | 18 | | | | | |

23

| Distributional Tests | | | | | | | | | | |
|----------------------|--------------------------------------|-----------|----------|---------|---------------------|--|--|--|--|--|
| Attribute | Test | Test Stat | Critical | P-Value | Decision(a:1%) | | | | | |
| Variances | Bartlett Equality of Variance Test | 10.12 | 15.09 | 0.0719 | Equal Variances | | | | | |
| Variances | Levene Equality of Variance Test | 3.915 | 4.248 | 0.0141 | Equal Variances | | | | | |
| Variances | Mod Levene Equality of Variance Test | 3.085 | 4.248 | 0.0349 | Equal Variances | | | | | |
| Distribution | Anderson-Darling A2 Normality Test | 0.1881 | 3.878 | 0.9564 | Normal Distribution | | | | | |
| Distribution | D'Agostino Kurtosis Test | 0.1174 | 2.576 | 0.9066 | Normal Distribution | | | | | |
| Distribution | D'Agostino Skewness Test | 0.6368 | 2.576 | 0.5243 | Normal Distribution | | | | | |
| Distribution | D'Agostino-Pearson K2 Omnibus Test | 0.4193 | 9.21 | 0.8109 | Normal Distribution | | | | | |
| Distribution | Kolmogorov-Smirnov D Test | 0.09427 | 0.2056 | 0.9412 | Normal Distribution | | | | | |
| Distribution | Shapiro-Wilk W Normality Test | 0.9812 | 0.884 | 0.9172 | Normal Distribution | | | | | |

| Mean Dry Weig | Mean Dry Weight-mg Summary | | | | | | | | | | | |
|---------------|----------------------------|-------|---------|----------|---------|--------|--------|--------|----------|--------|---------|--|
| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect | |
| 0 | N | 4 | 0.2693 | 0.2441 | 0.2946 | 0.2653 | 0.256 | 0.2907 | 0.007926 | 5.89% | 0.00% | |
| 10 | | 4 | 0.3123 | 0.2969 | 0.3277 | 0.313 | 0.3007 | 0.3227 | 0.004842 | 3.10% | -15.97% | |
| 19 | | 4 | 0.285 | 0.2327 | 0.3373 | 0.2937 | 0.24 | 0.3127 | 0.01644 | 11.54% | -5.82% | |
| 38 | | 4 | 0.262 | 0.2534 | 0.2705 | 0.262 | 0.256 | 0.268 | 0.002685 | 2.05% | 2.73% | |
| 75 | | 4 | 0.2135 | 0.1663 | 0.2606 | 0.2162 | 0.1779 | 0.2436 | 0.01481 | 13.88% | 20.75% | |
| 150 | | 4 | 0.03375 | -0.01631 | 0.08381 | 0.03 | 0.005 | 0.07 | 0.01573 | 93.21% | 87.47% | |
| | | | | | | | | | | | | |

16 Apr-18 14:52 (p 4 of 4)

Test Code:

FML032218 | 06-6197-0797

| Fathead | Minnow | 7-d | Larval | Survival | and | Growth | Toet |
|----------|----------|------|--------|----------|-----|---------|------|
| ralligau | MINITORA | 7 -u | Laivai | Julvivai | anu | GLOMIII | 1621 |

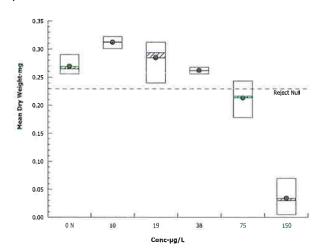
| Agustic | Bioassav | & Concul | ltina I ahe | Inc |
|---------|----------|----------|-------------|-----|
| | | | | |

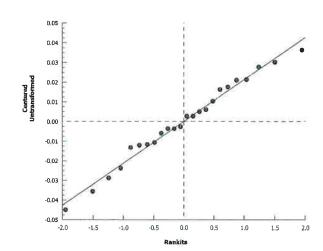
| Analysis ID: | 17-6048-4784 | Endpoint: | Mean Dry Weight-mg | CETIS Version: | CETISv1.9.2 |
|--------------|-----------------|-----------|----------------------------------|-----------------------|-------------|
| Analyzed: | 16 Apr-18 14:51 | Analysis: | Parametric-Control vs Treatments | Official Results: | Yes |

Mean Dry Weight-mg Detail

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|-----------|------|--------|--------|--------|--------|
| 0 | N | 0.2587 | 0.272 | 0.256 | 0.2907 |
| 10 | | 0.3227 | 0.3173 | 0.3087 | 0.3007 |
| 19 | | 0.3127 | 0.2813 | 0.306 | 0.24 |
| 38 | | 0.2593 | 0.2647 | 0.268 | 0.256 |
| 75 | | 0.1779 | 0.231 | 0.2436 | 0.2013 |
| 150 | | 0.05 | 0.07 | 0.005 | 0.01 |

Graphics





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16 Apr-18 14:52 (p 1 of 4)

| 5E113 | Anaiy | ушсаг керо | rt | | | | | | est Code | | - | 14.52 (p 1 01 4) 3 06-6197-0797 |
|--------------------|-----------|---------------------------------|-------------|-----------------|-------------------------------------|------------|-----------|--------------|------------|---------------|----------|--------------------------------------|
| Fathea | d Minno | w 7-d Larval Sเ | ırvival and | Growt | h Test | | | | Aqu | atic Bioassay | & Consul | ting Labs, Inc. |
| Analysi Analyze | | 02-4944-0700 16 Apr-18 14:51 | | point: ysis: | 7d Survival Rat Linear Interpola | | ۷) | | ETIS Ver | sion: CETIS | Sv1.9.2 | |
| Batch I | D: 1 | 7-9499-1313 | Test | Type: | Growth-Surviva | al (7d) | | Aı | nalyst: | | | |
| Start D | ate: 2 | 2 Mar-18 12:45 | Prot | ocol: | EPA/821/R-02- | 013 (2002) | | | iluent: | Laboratory W | /ater | |
| Ending | Date: 2 | 9 Mar-18 10:46 | Spe | cies: | Pimephales pro | omelas | | В | rine: | Not Applicab | le | |
| Duratio | n: 6 | 6d 22h | Sou | rce: | Aquatic Biosys | tems, CO | | A | ge: | | | |
| Sample | : ID: 1 | 6-2465-0128 | Cod | e: | FML032218 | | | С | lient: | ABC Labs | | |
| Sample | Date: 2 | 22 Mar-18 12:45 | Mate | erial: | Copper chlorid | е | | P | roject: | REF TOX | | |
| Receip | t Date: | | Sou | rce: | Reference Tox | icant | | | | | | |
| Sample | Age: n | n/a | Stat | ion: | REF TOX | | | | | | | |
| Linear | Interpola | ation Options | | | | | | | | | | |
| X Trans | sform | Y Transform | See | d | Resamples | Exp 95% | 6CL M | lethod | | | | |
| Linear | | Linear | 0 | | 280 | Yes | Т | wo-Point Int | erpolatior | 1 | | |
| Test Ac | ceptabil | lity Criteria | TAC L | imits | | | | | | | | |
| Attribu | te | Test Stat | Lower | Uppe | r Overlap | Decision | 1 | | | | | |
| Control | Resp | 1 | 8.0 | >> | Yes | Passes (| Criteria | | | | | |
| Point E | stimates | s | | | | | | | | | | |
| Level | μg/L | 95% LCL | 95% UCL | | | | | | | | | |
| EC5 | 46.22 | 33.07 | 95.42 | | | | | | | | | |
| EC10 | 58.56 | 41.45 | 95.78 | | | | | | | | | |
| EC15 | 70.89 | 45.59 | 96.56 | | | | | | | | | |
| EC20 | 79.05 | 50.76 | 99.84 | | | | | | | | | |
| EC25 | 85.14 | 56.46 | 103.9 | | | | | | | | | |
| EC40 | 103.4 | 80.2 | 118 | | | | | | | | | |
| EC50 | 115.5 | 98.68 | 128.5 | | | | | | | | | |
| 7d Sur | vival Rat | te Summary | | | | Calc | ulated Va | ariate(A/B) | | | | |
| Conc-µ | ıg/L | Code | Count | Mean | n Min | Max | Std Er | r Std De | ev CV% | % %Effec | et A | В |
| 0 | | N | 4 | 1.000 | 00 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.00 | 0.0% | 60 | 60 |
| 10 | | | 4 | 1.000 | 00 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.00 | 0.0% | 60 | 60 |
| 4.0 | | | 4 | | | | | | | | | |

| 7d Survival Rate Summary | | | Calculated Variate(A/B) | | | | | | | | |
|--------------------------|------|-------|-------------------------|--------|--------|---------|---------|--------|---------|----|----|
| Conc-µg/L | Code | Count | Mean | Min | Max | Std Err | Std Dev | CV% | %Effect | Α | В |
| 0 | N | 4 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.00% | 0.0% | 60 | 60 |
| 10 | | 4 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.00% | 0.0% | 60 | 60 |
| 19 | | 4 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.00% | 0.0% | 60 | 60 |
| 38 | | 4 | 0.9833 | 0.9333 | 1.0000 | 0.0167 | 0.0333 | 3.39% | 1.67% | 59 | 60 |
| 75 | | 4 | 0.8333 | 0.6667 | 1.0000 | 0.0794 | 0.1587 | 19.04% | 16.67% | 50 | 60 |
| 150 | | 4 | 0.2167 | 0.1333 | 0.3333 | 0.0419 | 0.0839 | 38.72% | 78.33% | 13 | 60 |

7d Survival Rate Detail

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|-----------|------|--------|--------|--------|--------|
| 0 | N | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 10 | | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 19 | | 1.0000 | 1.0000 | 1.0000 | 1,0000 |
| 38 | | 0.9333 | 1.0000 | 1.0000 | 1.0000 |
| 75 | | 0.9333 | 0.6667 | 0.7333 | 1.0000 |
| 150 | | 0.3333 | 0.2000 | 0.1333 | 0.2000 |

7d Survival Rate Binomials

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | |
|-----------|------|-------|-------|-------|-------|--|
| 0 | N | 15/15 | 15/15 | 15/15 | 15/15 | |
| 10 | | 15/15 | 15/15 | 15/15 | 15/15 | |
| 19 | | 15/15 | 15/15 | 15/15 | 15/15 | |
| 38 | | 14/15 | 15/15 | 15/15 | 15/15 | |
| 75 | | 14/15 | 10/15 | 11/15 | 15/15 | |
| 150 | | 5/15 | 3/15 | 2/15 | 3/15 | |

4/18/2018

16 Apr-18 14:52 (p 2 of 4)

Test Code:

FML032218 | 06-6197-0797

Fathead Minnow 7-d Larval Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

02-4944-0700 16 Apr-18 14:51

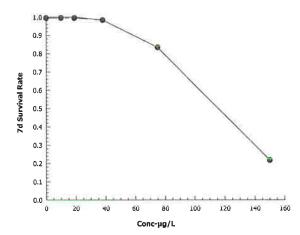
Endpoint: 7d Survival Rate Analysis:

Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2

Official Results: Yes

Graphics



16 Apr-18 14:52 (p 3 of 4)

| | ary trout respo | | | | | Test Code: | FML032218 06-6197-0797 |
|--|---------------------------------|---|---|--------------------------|--------------|-----------------------------------|----------------------------------|
| Fathead Min | now 7-d Larval Su | urvival and Growt | h Test | | | Aquatic I | Bioassay & Consulting Labs, Inc. |
| Analysis ID: Analyzed: | 16-6177-8212 16 Apr-18 14:51 | Endpoint: Analysis: | Mean Dry Weig Linear Interpola | Ū | | CETIS Version Official Results | |
| Batch ID: Start Date: | 17-9499-1313 22 Mar-18 12:45 | Protocol: | Growth-Surviva EPA/821/R-02- | 013 (2002) | | | poratory Water |
| Ending Date: Duration: | 29 Mar-18 10:46 6d 22h | Species: Source: | Pimephales pro Aquatic Biosyst | | | Brine: No Age: | t Applicable |
| Sample ID: Sample Date Receipt Date Sample Age: | | Code: Material: Source: Station: | FML032218 Copper chloride Reference Toxi REF TOX | | | | C Labs F TOX |
| Linear Interp | olation Options Y Transform | Seed | Pagamalag | Exp 95% CL | Method | | |
| Linear | Linear | 0 | Resamples 280 | Yes | Two-Point Ir | nterpolation | |
| • | bility Criteria | TAC Limits | | | | | |
| Attribute Control Resp | 0,2693 | Lower Uppe | r Overlap Yes | Decision Passes Criteria | | | |
| Point Estima | tes | | | | | | |
| Level μg/L | | 95% UCL 31.91 | | - | | | |
| IC10 38.1 | | 46.09 | | | | | |
| IC15 49.2 IC20 60.3 | | 67.13 86.71 | | | | | |
| IC25 71.4 IC40 91.2 IC50 103 | 6 74.97 | 88.12 102.5 113.4 | | | | | |

| Mean Dry Weig | ht-mg Sumn | nary | Calculated Variate | | | | | | | |
|---------------|------------|-------|--------------------|--------|--------|----------|----------|--------|---------|--|
| Conc-µg/L | Code | Count | Mean | Min | Max | Std Err | Std Dev | CV% | %Effect | |
| 0 | N | 4 | 0.2693 | 0.256 | 0.2907 | 0.007926 | 0.01585 | 5.89% | 0.0% | |
| 10 | | 4 | 0.3123 | 0.3007 | 0.3227 | 0.004842 | 0.009684 | 3.10% | -15.97% | |
| 19 | | 4 | 0.285 | 0.24 | 0.3127 | 0.01644 | 0.03289 | 11.54% | -5.82% | |
| 38 | | 4 | 0.262 | 0.256 | 0.268 | 0.002685 | 0.005369 | 2.05% | 2.73% | |
| 75 | | 4 | 0.2135 | 0.1779 | 0.2436 | 0.01481 | 0.02962 | 13.88% | 20.75% | |
| 150 | | 4 | 0.03375 | 0.005 | 0.07 | 0.01573 | 0.03146 | 93.21% | 87.47% | |

Mean Dry Weight-mg Detail

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|-----------|------|--------|--------|--------|--------|
| 0 | N | 0.2587 | 0.272 | 0.256 | 0.2907 |
| _ | IN | | | | |
| 10 | | 0.3227 | 0.3173 | 0.3087 | 0.3007 |
| 19 | | 0.3127 | 0.2813 | 0.306 | 0.24 |
| 38 | | 0.2593 | 0.2647 | 0.268 | 0.256 |
| 75 | | 0.1779 | 0.231 | 0.2436 | 0.2013 |
| 150 | | 0.05 | 0.07 | 0.005 | 0.01 |

CETIS Analytical Report

Report Date:

16 Apr-18 14:52 (p 4 of 4)

Test Code:

FML032218 | 06-6197-0797

Fathead Minnow 7-d Larval Survival and Growth Test

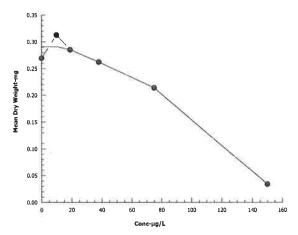
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed: 16-6177-8212 16 Apr-18 14:51 Endpoint: Mean Dry Weight-mg
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2

Official Results: Yes

Graphics



Analyst:____QA:____

Report Date: Test Code:

16 Apr-18 14:53 (p 1 of 2)

FML032218 | 06-6197-0797

Aquatic Bioassay & Consulting Labs, Inc.

17-9499-1313 Test Type: Growth-Survival (7d) 22 Mar-18 12:45 Protocol: EPA/821/R-02-013 (2002) Ending Date: 29 Mar-18 10:46 Species: Pimephales promelas 6d 22h Source: Aquatic Biosystems, CO

Diluent: Brine: Age:

Analyst:

Laboratory Water Not Applicable

Client:

ABC Labs

Project: **REF TOX**

Sample ID: 16-2465-0128 Sample Date: 22 Mar-18 12:45 Receipt Date:

Batch ID:

Duration:

Start Date:

Code: Material: Source:

Copper chloride Reference Toxicant

FML032218

Sample Age: n/a Station: **REF TOX**

Fathead Minnow 7-d Larval Survival and Growth Test

Alkalinity (CaCO3)-mg/L

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
|-----------|------|-------|------|---------|---------|-----|-----|---------|---------|-------|----------|
| 0 | N | 8 | 62 | 61.11 | 62.89 | 61 | 63 | 0.378 | 1.069 | 1.72% | 0 |
| 150 | | 8 | 68 | 68 | 68 | 68 | 68 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 65 | 63.3 | 66.7 | 61 | 68 | 0.7958 | 3.183 | 4.90% | 0 (0%) |

Conductivity-µmhos

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
|-----------|------|-------|-------|---------|---------|-----|-----|---------|---------|-------|----------|
| 0 | N | 8 | 351.4 | 346.5 | 356.2 | 347 | 364 | 2.044 | 5.78 | 1.65% | 0 |
| 10 | | 8 | 355.4 | 348.1 | 362.7 | 347 | 374 | 3.093 | 8.749 | 2.46% | 0 |
| 19 | | 8 | 347.1 | 343 | 351.2 | 338 | 353 | 1.726 | 4.883 | 1.41% | 0 |
| 38 | | 8 | 346.4 | 342.3 | 350.5 | 338 | 353 | 1.731 | 4.897 | 1.41% | 0 |
| 75 | | 8 | 346.6 | 342.3 | 350.9 | 339 | 355 | 1.812 | 5.125 | 1.48% | 0 |
| 150 | | 8 | 347.8 | 342 | 353.5 | 339 | 361 | 2.426 | 6.861 | 1.97% | 0 |
| Overall | | 48 | 349.1 | 347.2 | 351.1 | 338 | 374 | 0.9713 | 6.73 | 1.93% | 0 (0%) |

Dissolved Oxygen-mg/L

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
|-----------|------|-------|-------|---------|---------|-----|-----|---------|---------|-------|----------|
| 0 | N | 8 | 7.688 | 7.441 | 7.934 | 7.3 | 8.2 | 0.1043 | 0.2949 | 3.84% | 0 |
| 10 | | 8 | 8.1 | 7.832 | 8.368 | 7.7 | 8.6 | 0.1134 | 0.3207 | 3.96% | 0 |
| 19 | | 8 | 8.212 | 7.877 | 8.548 | 7.7 | 8.7 | 0.142 | 0.4016 | 4.89% | 0 |
| 38 | | 8 | 8.175 | 7.854 | 8.496 | 7.6 | 8.6 | 0.1359 | 0.3845 | 4.7% | 0 |
| 75 | | 8 | 8.25 | 7.91 | 8.59 | 7.5 | 8.6 | 0.1439 | 0.4071 | 4.93% | 0 |
| 150 | | 8 | 8.175 | 7.863 | 8.487 | 7.5 | 8.6 | 0.1319 | 0.3732 | 4.57% | 0 |
| Overall | | 48 | 8,1 | 7.985 | 8.215 | 7.3 | 8.7 | 0.05712 | 0.3957 | 4.89% | 0 (0%) |

Hardness (CaCO3)-mg/L

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
|-----------|------|-------|-------|---------|---------|-----|-----|---------|---------|-------|----------|
| 0 | N | 8 | 95.5 | 93.27 | 97.73 | 93 | 98 | 0.9449 | 2.673 | 2.8% | 0 |
| 150 | | 8 | 99 | 99 | 99 | 99 | 99 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 97.25 | 95.88 | 98.62 | 93 | 99 | 0.6423 | 2.569 | 2.64% | 0 (0%) |

pH-Units

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
|-----------|------|-------|-------|---------|---------|-----|-----|---------|---------|-------|----------|
| 0 | N | 8 | 7.725 | 7.521 | 7.929 | 7.2 | 7.9 | 0.08608 | 0.2435 | 3.15% | 0 |
| 10 | | 8 | 7.675 | 7.509 | 7.841 | 7.3 | 7.9 | 0.07008 | 0.1982 | 2.58% | 0 |
| 19 | | 8 | 7.525 | 7.365 | 7.685 | 7.3 | 7.8 | 0.06748 | 0.1909 | 2.54% | 0 |
| 38 | | 8 | 7.463 | 7.308 | 7.617 | 7.3 | 7.8 | 0.06529 | 0.1847 | 2.48% | 0 |
| 75 | | 8 | 7.413 | 7.255 | 7.57 | 7.2 | 7.8 | 0.06665 | 0.1885 | 2.54% | 0 |
| 150 | | 8 | 7.363 | 7.19 | 7.535 | 7.2 | 7.8 | 0.07304 | 0.2066 | 2.81% | 0 |
| Overall | | 48 | 7.527 | 7.459 | 7.595 | 7.2 | 7.9 | 0.03378 | 0.2341 | 3.11% | 0 (0%) |

Report Date: Test Code: 16 Apr-18 14:53 (p 2 of 2) FML032218 | 06-6197-0797

| | | | | Test Code: FML032218 06-6197-0 | | | | | | | |
|------------------|------------|------------|-----------|----------------------------------|-----|------|-----|---------|------------|-----------|--------------|
| Fathead Minnow | 7-d Larval | Survival a | nd Growth | Test | | | | Aquatic | Bioassay & | Consultin | g Labs, Inc. |
| Temperature-°C | | | | | | | | | | | |
| Conc-µg/L | Code | Count | Mean | 95% LCL | | Min | Max | Std Err | Std Dev | CV% | QA Coun |
| 0 | N | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 10 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 19 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 38 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 75 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 150 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| Overall | | 48 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.00% | 0 (0%) |
| Alkalinity (CaCO | 3)-mg/L | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 63 | 63 | 63 | 63 | 61 | 61 | 61 | 61 | | |
| 150 | | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 | | |
| Conductivity-µm | hos | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 347 | 352 | 347 | 348 | 353 | 347 | 353 | 364 | | |
| 10 | | 347 | 355 | 350 | 350 | 350 | 356 | 374 | 361 | | |
| 19 | | 342 | 347 | 348 | 349 | 338 | 353 | 349 | 351 | | |
| 38 | | 341 | 346 | 347 | 348 | 338 | 353 | 347 | 351 | | |
| 75 | | 343 | 345 | 345 | 345 | 339 | 355 | 349 | 352 | | |
| 150 | | 342 | 348 | 345 | 345 | 339 | 361 | 349 | 353 | | |
| Dissolved Oxyge | en-mg/L | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | - 5 | 6 | 7 | 8 | | |
| 0 | N | 7.8 | 7.3 | 7.7 | 7.8 | 7.8 | 7.6 | 7.3 | 8.2 | | |
| 10 | | 8.6 | 8.4 | 7.8 | 7.7 | 7.8 | 8.1 | 8.1 | 8.3 | | |
| 19 | | 8.6 | 8.7 | 7.9 | 7.7 | 7.7 | 8.2 | 8.4 | 8.5 | | |
| 38 | | 8.6 | 8.6 | 7.9 | 7.8 | 7.6 | 8.1 | 8.3 | 8.5 | | |
| 75 | | 8.6 | 8.6 | 8 | 7.0 | 7.5 | 8.1 | 8.4 | 8.6 | | |
| 150 | | 8.6 | 8.6 | 8 | 7.9 | 7.5 | 8.4 | 8.2 | 8.2 | | |
| Hardness (CaCO |)3)-ma/L | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 98 | 98 | 98 | 98 | 93 | 93 | 93 | 93 | | |
| 150 | | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | | |
| pH-Units | | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 7.9 | 7.6 | 7.7 | 7.9 | 7.9 | 7.7 | 7.9 | 7.2 | | |
| 10 | | 7.9 | 7.5 | 7.6 | 7.8 | 7.8 | 7.8 | 7.7 | 7.3 | | |
| 19 | | 7.8 | 7.4 | 7.5 | 7.7 | 7.7 | 7.3 | 7.5 | 7.3 | | |
| 38 | | 7.8 | 7.3 | 7.4 | 7.6 | 7.6 | 7.3 | 7.3 | 7.4 | | |
| 75 | | 7.8 | 7.3 | 7.3 | 7.5 | -7.5 | 7.3 | 7.2 | 7.4 | | |
| 150 | | 7.8 | 7.2 | 7.3 | 7.4 | 7.5 | 7.2 | 7.2 | 7.3 | | |
| Temperature-°C | | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | | |
| 10 | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | | |
| 19 | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | | |
| 38 | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | | |
| 75 | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | | |
| 150 | | 24 | 24 | | 24 | | | | | | |
| 150 | | 24 | ∠4 | 24 | 24 | 24 | 24 | 24 | 24 | | |

Analyst:_____QA:___

000-189-126-0

CETIS™ v1.9.2.6



CHRONIC CERIODAPHNIA SURVIVAL AND REPRODUCTION BIOASSAY

DATE:

6 March - 2018

STANDARD TOXICANT: Copper Chloride

ENDPOINT:

SURVIVAL

NOEC =

5.00 ug/l

EC25 =

5.46 ug/l

EC50 =

7.73 ug/l

ENDPOINT:

REPRODUCTION

NOEC =

10.00 ug/l

IC25 =

16.06 ug/l

IC50 =

22.63 ug/l

Yours very truly,

Scott Johnson

Laboratory Director

4/18/2018

14 Mar-18 08:39 (p 1 of 2)

Test Code:

CER030618 | 14-4114-6075

| Ceriodaphnia 7-d Survival and Reproduction Test | | | | | | | | Aquatic Bioassay & Consulting Labs, Inc. | | | | | |
|--|--|--|--|--|--|---|---|---|--|--|--|---|--|
| Batch ID: | 02-3712-1683 | Test Type | e: Repr | oduction-Su | urvival (7d) | | Ana | lyst: | | | | | |
| Start Date: | 06 Mar-18 14:00 | Protocol | : EPA/ | /821/R-02-0 | 13 (2002) | | Diluent: Laboratory Water | | | | | | |
| Ending Date: | 13 Mar-18 14:00 | Species: | Cerio | odaphnia du | ıbia | | Brin | e: No | t Applicable | | | | |
| Duration: | 7d 0h | Source: | Aqua | atic Biosyste | ems, CO | | Age | | | | | | |
| Sample ID: | 14-1125-6244 | Code: | CER | 030618 | | | Clie | nt: AE | BC Labs | | | | |
| • | 06 Mar-18 14:00 | Material: | Copp | oer chloride | | | Proj | | F TOX | | | | |
| Receipt Date: | | Source: | | rence Toxic | | | | | | | | | |
| Sample Age: | n/a | Station: | | | | | | | | | | | |
| Multiple Com | parison Summar | 'y | | | | | | | | | | | |
| Analysis ID | Endpoint | | mpariso | n Method | | | NOEL | LOEL | TOEL | TU | PMS | D · | |
| 02-0389-9938 | 7d Survival Rate | Fisl | her Exac | ct/Bonferror | ni-Holm Test | | 5 | 10 | 7.071 | | n/a | | |
| 07-9880-4424 | Reproduction | Ste | el Many- | -One Rank | Sum Test | | 10 | 30 | 17.32 | | 41.5% | % | |
| Point Estimat | e Summarv | | | | | | | | | | | | |
| Analysis ID | Endpoint | Poi | int Estin | | Level | μg/L | 95% LCL | 95% UCL | TU | , | | | |
| | 7d Survival Rate | | | polation (IC | | | EC5 | 0.75 | 0.4286 | 5 | | | |
| | | | | , | / | | EC10 | 1.5 | 0.8571 | 5.294 | | | |
| | | | | | | | EC15 | 2.25 | 1.286 | 5.625 | | | |
| | | | | | | | EC20 | 5 | 1.714 | 6.111 | | | |
| | | | | | | | EC25 | 5.455 | 2.143 | 6.538 | | | |
| | | | | | | | EC40 | 6.818 | 5 | 8.333 | | | |
| | | | | | | | EC50 | 7.727 | 6.154 | 10 | | | |
| | Reproduction | Lin | ear Inter | nolation (IC | :PINI) | | IC5 | 10.8 | 0.7892 | 11.48 | | - | |
| 15-6638-7895 | 5-6638-7895 Reproduction Linear Interpolation (IC | | | | | | | | | | | | |
| 05-6638-7895 | | IC10 | | | | | | | 1 578 | | | | |
| 05-6638-7895 | | | | | | | | 12.12 13.43 | 1.578 | 12.99 | | | |
| 05-6638-7895 | | | | | | | IC15 | 13.43 | 2.368 | 14.48 | | | |
| 05-6638-7895 | | | | | | | IC15 IC20 | 13.43 14.74 | 2.368 3.952 | 14.48 15.98 | | | |
| 05-6638-7895 | | | | | | | IC15 IC20 IC25 | 13.43 14.74 16.06 | 2.368 3.952 6.148 | 14.48 15.98 17.47 | | | |
| 05-6638-7895 | | | | | | | IC15 IC20 IC25 IC40 | 13.43 14.74 16.06 20 | 2.368 3.952 6.148 12.39 | 14.48 15.98 17.47 22.53 | | | |
| | | | | | | | IC15 IC20 IC25 | 13.43 14.74 16.06 | 2.368 3.952 6.148 | 14.48 15.98 17.47 | | | |
| Test Acceptal | • | | | | T 1011 | | IC15 IC20 IC25 IC40 IC50 | 13.43 14.74 16.06 20 22.63 | 2.368 3.952 6.148 12.39 16.38 | 14.48 15.98 17.47 22.53 | | | |
| Test Acceptal Analysis ID | Endpoint | | tribute | | Test Stat | Lower | IC15 IC20 IC25 IC40 IC50 IC50 Limits Upper | 13.43 14.74 16.06 20 22.63 | 2.368 3.952 6.148 12.39 16.38 | 14.48 15.98 17.47 22.53 26.21 | | | |
| Test Acceptal Analysis ID 02-0389-9938 | Endpoint 7d Survival Rate | Со | ntrol Res | • | 1 | Lower 0.8 | IC15 IC20 IC25 IC40 IC50 | 13.43 14.74 16.06 20 22.63 Overlap | 2.368 3.952 6.148 12.39 16.38 Decision Passes C | 14.48 15.98 17.47 22.53 26.21 | | | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 | Endpoint 7d Survival Rate 7d Survival Rate | Co Co | ntrol Res | sp | 1 | 0.8 0.8 | IC15 IC20 IC25 IC40 IC50 IC50 Limits Upper | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes | 2.368 3.952 6.148 12.39 16.38 Decision Passes Co | 14.48 15.98 17.47 22.53 26.21 | | | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 | Endpoint 7d Survival Rate 7d Survival Rate | Co Co | ntrol Res | sp | 1 | Lower 0.8 | IC15 IC20 IC25 IC40 IC50 | 13.43 14.74 16.06 20 22.63 Overlap | 2.368 3.952 6.148 12.39 16.38 Decision Passes C | 14.48 15.98 17.47 22.53 26.21 | | | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction | Co Co Co | entrol Res entrol Res entrol Res | sp sp | 1 1 20.5 20.5 | 0.8 0.8 15 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> >> >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes | 2.368 3.952 6.148 12.39 16.38 Decision Passes Co Passes Co Passes Co Passes Co Passes Co | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria | | | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction | Co Co Co | entrol Res entrol Res entrol Res | sp sp | 1 1 20.5 | 0.8 0.8 15 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes | 2.368 3.952 6.148 12.39 16.38 Decision Passes Co Passes Co Passes Co | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria | | | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary | Co Co Co PM | ontrol Resontrol Res | sp sp sp | 1 1 20.5 20.5 0.415 | 0.8 0.8 15 15 0.13 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> >> >> 0.47 | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes | 2.368 3.952 6.148 12.39 16.38 Decision Passes Ci Passes Ci Passes Ci Passes Ci Passes Ci | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria | | | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 7d Survival R Conc-μg/L | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary Code | Co Co Co PM | entrol Res entrol Res entrol Res entrol Res MSD | sp sp sp 95% LCL | 1 1 20.5 20.5 0.415 | 0.8 0.8 15 15 0.13 | IC15 IC20 IC25 IC40 IC50 -imits Upper >> >> 0.47 | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes | 2.368 3.952 6.148 12.39 16.38 Decision Passes Ci Passes Ci Passes Ci Passes Ci Std Dev | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria | %Eff | | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 7d Survival R Conc-μg/L | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary | Count Me 10 1.0 | entrol Resentrol Res | 95% LCL 1.0000 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 | 0.8 0.8 15 15 0.13 Min 1.0000 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> >> 0.47 Max 1.0000 | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes Yes O.0000 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Std Dev 0.0000 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria cv% 0.00% | 0.009 | % | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 7d Survival R Conc-μg/L 0 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary Code | Count Me 10 1.0 10 0.8 | entrol Resontrol Res | 95% LCL 1.0000 0.4984 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> >> 0.47 Max 1.0000 1.0000 | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Std Dev 0.0000 0.4216 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria cv% 0.00% 52.70% | 0.009 20.00 | % 0% | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 7d Survival R Conc-µg/L 0 3 5 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary Code | Count Me 10 1.0 10 0.8 10 0.8 | entrol Resontrol Res | 95% LCL 1.0000 0.4984 0.4984 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 1.0000 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Passes C O 0.0000 0.4216 0.4216 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 20.00% 52.70% | 0.009 20.00 20.00 | % 0% 0% | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 7d Survival R Conc-μg/L 0 3 5 10 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary Code | Count Me 10 1.0 10 0.8 10 0.2 | entrol Resontrol Res | 95% LCL 1.0000 0.4984 0.0000 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 1.0000 0.5016 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> >> 0.47 Max 1.0000 1.0000 1.0000 | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1333 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Passes C 0.0000 0.4216 0.4216 0.4216 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 20.00% 52.70% 52.70% 210.82% | 0.009 20.00 20.00 80.00 | % 0% 0% | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 7d Survival R Conc-μg/L 0 3 5 10 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary Code | Count Me 10 1.0 10 0.8 10 0.2 10 0.3 | entrol Resontrol Res | 95% LCL 1.0000 0.4984 0.0000 0.0000 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 0.5016 0.6456 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 0.0000 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1333 0.1528 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Passes C 0.0000 0.4216 0.4216 0.4216 0.4830 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 20.00% 52.70% 52.70% 210.82% 161.02% | 0.009 20.00 20.00 80.00 70.00 | % 0% 0% 0% | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 7d Survival R Conc-μg/L 0 3 5 10 30 50 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary Code N | Count Me 10 1.0 10 0.8 10 0.2 10 0.3 | entrol Resontrol Res | 95% LCL 1.0000 0.4984 0.0000 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 1.0000 0.5016 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> >> 0.47 Max 1.0000 1.0000 1.0000 | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1333 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Passes C 0.0000 0.4216 0.4216 0.4216 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 20.00% 52.70% 52.70% 210.82% | 0.009 20.00 20.00 80.00 | % 0% 0% 0% | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 07-9880-4424 0 Survival R Conc-μg/L 0 3 5 10 30 50 Reproduction | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary Code N | Count Me 10 1.0 10 0.8 10 0.2 10 0.3 10 0.2 | entrol Resolution Reso | 95% LCL 1.0000 0.4984 0.4984 0.0000 0.0000 0.0000 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 0.5016 0.6456 0.5016 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1333 0.1528 0.1333 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Passes C 0.0000 0.4216 0.4216 0.4216 0.4216 0.4216 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 22.53 26.21 riteria riteria riteria riteria 23.70% 210.82% 210.82% 210.82% | 0.009 20.00 20.00 80.00 70.00 80.00 | % 0% 0% 0% 0% | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 07-9880-4424 07-980-4424 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction At Summary Code N Summary Code | Count Me 10 1.0 10 0.8 10 0.2 10 0.3 10 0.2 Count Me | entrol Resontrol | 95% LCL 1.0000 0.4984 0.4984 0.0000 0.0000 95% LCL | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 0.5016 0.6456 0.5016 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 Min | IC15 IC20 IC25 IC40 IC50 Limits Upper >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1333 0.1528 0.1333 Std Err | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Passes C 0.0000 0.4216 0.4216 0.4216 0.4216 0.4216 0.4216 0.4216 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 22.53 26.21 riteria riteria riteria riteria riteria 21.00% 210.82% 210.82% 210.82% | 0.009 20.00 20.00 80.00 70.00 80.00 | % 0% 0% 0% 0% | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 7d Survival R Conc-μg/L 0 3 5 10 30 Feproduction Conc-μg/L | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction ate Summary Code N | Count Me 10 1.0 10 0.8 10 0.2 10 0.3 10 0.2 Count Me | entrol Resontrol | 95% LCL 1.0000 0.4984 0.4984 0.0000 0.0000 95% LCL | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 0.5016 0.6456 0.5016 95% UCL 24.54 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 Min 14 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1528 0.1333 Std Err 1.784 | 2.368 3.952 6.148 12.39 16.38 Decision Passes Ci Passes Ci Passes Ci Passes Ci Passes Ci Additional Color C | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 20.00% 52.70% 52.70% 210.82% 161.02% 210.82% CV% 27.52% | 0.009 20.00 20.00 80.00 70.00 80.00 | % 0% 0% 0% 0% 0% | |
| Test Acceptals Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 07-9880-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 07-980-4424 08-4424 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction At Summary Code N Summary Code | Count Me 10 1.0 10 0.8 10 0.3 10 0.2 Count Me 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 | entrol Resontrol | 95% LCL 1.0000 0.4984 0.4984 0.0000 0.0000 0.0000 95% LCL 16.46 11.49 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 0.5016 0.6456 0.5016 95% UCL 24.54 26.51 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 Min 14 0 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1528 0.1333 Std Err 1.784 3.32 | 2.368 3.952 6.148 12.39 16.38 Decision Passes Ci Passes Ci Passes Ci Passes Ci Passes Ci Passes Ci Std Dev 0.0000 0.4216 0.4216 0.4216 0.4216 0.4216 Std Dev 5.642 10.5 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 20.00% 52.70% 52.70% 210.82% 161.02% 210.82% CV% 27.52% 55.26% | 0.009 20.00 80.00 70.00 80.00 %Eff 0.009 | % 0% 0% 0% 0% fec % | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 7d Survival R Conc-μg/L 0 3 5 10 30 50 Reproduction Conc-μg/L 0 3 5 5 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction At Summary Code N Summary Code | Count Me 10 1.0 10 0.8 10 0.2 10 0.2 Count Me 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 2.1 | entrol Resontrol | 95% LCL 1.0000 0.4984 0.4984 0.0000 0.0000 0.0000 95% LCL 16.46 11.49 13.31 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 0.5016 0.6456 0.5016 95% UCL 24.54 26.51 29.29 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 Min 14 0 0 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1333 0.1528 0.1333 Std Err 1.784 3.32 3.531 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Passes C Std Dev 0.0000 0.4216 0.4216 0.4216 0.4216 0.4216 0.4216 Std Dev 5.642 10.5 11.17 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 200% 52.70% 52.70% 210.82% 161.02% 210.82% CV% 27.52% 55.26% 52.42% | 0.009 20.00 80.00 70.00 80.00 %Eff 0.009 7.329 -3.90 | % 0% 0% 0% 0% fec % % | |
| Test Acceptal Analysis ID 02-0389-9938 15-1388-7401 05-6638-7895 07-9880-4424 07-9880-4424 7d Survival R Conc-μg/L 0 3 5 10 30 50 Reproduction Conc-μg/L 0 3 5 10 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction At Summary Code N Summary Code | Count Me 10 1.0 10 0.8 10 0.2 10 0.2 10 10 19 10 20. 10 19 10 21. 10 20. | entrol Resentrol | 95% LCL 1.0000 0.4984 0.4984 0.0000 0.0000 0.0000 95% LCL 16.46 11.49 13.31 12.92 | 95% UCL 1.0000 1.0000 0.5016 0.5016 95% UCL 24.54 26.51 29.29 27.28 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 0.0000 Min 14 0 0 7 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1333 0.1528 0.1333 Std Err 1.784 3.32 3.531 3.174 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Passes C Std Dev 0.0000 0.4216 0.4216 0.4216 0.4216 0.4216 0.4216 Std Dev 5.642 10.5 11.17 10.04 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 200% 52.70% 52.70% 210.82% 161.02% 210.82% 55.26% 52.42% 49.94% | 0.009 20.00 80.00 70.00 80.00 %Eff 0.009 7.329 -3.90 | % 0% 0% 0% 0% 0% fec % % % | |
| Test Acceptal Analysis ID 02-0389-9938 | Endpoint 7d Survival Rate 7d Survival Rate Reproduction Reproduction Reproduction At Summary Code N Summary Code | Count Me 10 1.0 10 0.8 10 0.2 10 0.2 Count Me 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 1.0 10 2.1 | entrol Resentrol | 95% LCL 1.0000 0.4984 0.4984 0.0000 0.0000 0.0000 95% LCL 16.46 11.49 13.31 | 1 1 20.5 20.5 0.415 95% UCL 1.0000 1.0000 0.5016 0.6456 0.5016 95% UCL 24.54 26.51 29.29 | 0.8 0.8 15 15 0.13 Min 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 Min 14 0 0 | IC15 IC20 IC25 IC40 IC50 Limits Upper >> | 13.43 14.74 16.06 20 22.63 Overlap Yes Yes Yes Yes Yes O.0000 0.1333 0.1333 0.1333 0.1528 0.1333 Std Err 1.784 3.32 3.531 | 2.368 3.952 6.148 12.39 16.38 Decision Passes C Passes C Passes C Passes C Passes C Std Dev 0.0000 0.4216 0.4216 0.4216 0.4216 0.4216 0.4216 Std Dev 5.642 10.5 11.17 | 14.48 15.98 17.47 22.53 26.21 riteria riteria riteria riteria riteria 200% 52.70% 52.70% 210.82% 161.02% 210.82% CV% 27.52% 55.26% 52.42% | 0.009 20.00 80.00 70.00 80.00 %Eff 0.009 7.329 -3.90 | % 0% 0% 0% 0% 0% | |

Report Date: Test Code:

14 Mar-18 08:39 (p 2 of 2)

| CEF | R030 | 618 | İ | 14-4114-6075 |
|-----|------|-----|---|--------------|
| | | | | |

| Ceriodaphnia | 7-d Survival | and Repro | duction Test |
|--------------|--------------|------------|--------------|
| Conodapinna | , a carrira | ana itopio | adotton root |

| | Aquatic | Bioassay | & | Consulting | Labs, | Inc |
|--|---------|----------|---|------------|-------|-----|
|--|---------|----------|---|------------|-------|-----|

| 7d Survival Rate Detail | | | | | | | | | | | | | |
|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|--|
| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 | | |
| 0 | N | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | | |
| 3 | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 1.0000 | | |
| 5 | | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 1.0000 | | |
| 10 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | | |
| 30 | | 0.0000 | 0.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 0.0000 | 0.0000 | | |
| 50 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | | |
| Reproduction | Detail | | | | | | | | | | | | |
| C | Carla | Day 4 | D 2 | D 2 | Dan 4 | D 5 | D C | D 7 | Dan 0 | D 0 | Da. 40 | | |

| Reproduction Detail | | | | | | | | | | | | | |
|---------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--|--|
| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 | | |
| 0 | N | 14 | 16 | 18 | 17 | 23 | 22 | 21 | 28 | 15 | 31 | | |
| 3 | | 13 | 28 | 12 | 23 | 27 | 29 | 23 | 0 | 6 | 29 | | |
| 5 | | 20 | 22 | 28 | 0 | 31 | 26 | 22 | 31 | 3 | 30 | | |
| 10 | | 28 | 11 | 11 | 33 | 7 | 12 | 19 | 17 | 30 | 33 | | |
| 30 | | 0 | 3 | 11 | 5 | 0 | 0 | 6 | 18 | 1 | 1 | | |
| 50 | | 0 | Û | 0 | 0 | 0 | Û | 0 | 0 | i | 11 | | |

| 7d Survival Ra | d Survival Rate Binomials | | | | | | | | | | | | | |
|----------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--|--|--|
| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 | | | |
| 0 | N | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | | | |
| 3 | | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 0/1 | 0/1 | 1/1 | | | |
| 5 | | 1/1 | 1/1 | 1/1 | 0/1 | 1/1 | 1/1 | 1/1 | 1/1 | 0/1 | 1/1 | | | |
| 10 | | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 1/1 | 1/1 | | | |
| 30 | | 0/1 | 0/1 | 1/1 | 1/1 | 0/1 | 0/1 | 0/1 | 1/1 | 0/1 | 0/1 | | | |
| 50 | | 0/1 | 0/1 | 0/1 | 0/1 | - 0/1 | 0/1 | 0/1 | 0/1 | 1/1 | 1/1 | | | |
| | | | | | | | | | | | | | | |

14 Mar-18 08:39 (p 1 of 2)

| LIIS Alla | 113 Allalytical Report | | | | | | | | | Test Code: CER030618 14-4 | | | 14-4114-6075 |
|---------------|------------------------|---------------|-----------|----------|----------------|-----------|--------|-----------|---------|-----------------------------|----------------|----------|----------------|
| Ceriodaphnia | 7-d | Survival and | d Reprodu | ction Te | st | | | | | Aquatic | Bioassay & | Consulti | ing Labs, Inc. |
| Analysis ID: | 07- | 9880-4424 | Ene | dpoint: | Reproduction | | | | CETI | S Version | : CETISv | 1.9.2 | |
| Analyzed: | 14 | Mar-18 8:38 | Ana | alysis: | Nonparametri | c-Contro | l vs T | reatments | Offic | ial Result | s: Yes | | |
| Batch ID: | 02-3 | 712-1683 | Tes | t Type: | Reproduction- | -Survival | (7d) | | Anal | yst: | | | |
| Start Date: | ۸ 60 | /lar-18 14:00 | Pro | tocol: | EPA/821/R-02 | 2-013 (20 | 02) | | Dilue | nt: La | boratory Wa | ter | |
| Ending Date: | 13 N | /lar-18 14:00 | Spe | ecies: | Ceriodaphnia | dubia | | | Brine | : No | t Applicable | | |
| Duration: | 7d (| 0h | So | urce: | Aquatic Biosy | stems, C | 0 | | Age: | | | | |
| Sample ID: | 14-1 | 125-6244 | Co | de: | CER030618 | | | | Clier | it: AE | 3C Labs | | |
| Sample Date: | : 06 N | //ar-18 14:00 | Ma | terial: | Copper chloric | de | | | Proje | ect: RE | F TOX | | |
| Receipt Date: | : | | So | urce: | Reference To | xicant | | | | | | | |
| Sample Age: | n/a | | Sta | tion: | | | | | | | | | |
| Data Transfo | rm | | Alt Hyp | | | | | | NOEL | LOEL | TOEL | TU | PMSD |
| Untransforme | d | | C > T | | | | | | 10 | 30 | 17.32 | | 41.50% |
| Steel Many-C | ne R | ank Sum Te | st | | | | | | | | | | |
| Control | vs | Conc-µg/ | L | Test S | tat Critical | Ties | DF | P-Type | P-Value | Decisio | n(α:5%) | | |
| Negative Con | trol | 3 | | 104.5 | 75 | 2 | 18 | Asymp | 0.8218 | Non-Sig | nificant Effec | t | |
| | | 5 | | 117.5 | 75 | 3 | 18 | Asymp | 0.9824 | Non-Sig | nificant Effec | et | |
| | | 10 | | 101 | 75 | 2 | 18 | Asymp | 0.7280 | Non-Sig | nificant Effec | ct | |
| | | 30* | | 59.5 | 75 | 1 | 18 | Asymp | 0.0014 | Significa | int Effect | | |
| | | 50* | | 55 | 75 | 0 | 18 | Asymp | 3.8E-04 | Significa | ent Effect | | |
| Test Accepta | bility | Criteria | TAC | Limits | | | | | | | | | |
| Attribute | | Test Stat | Lower | Upper | Overlap | Deci | sion | | | | | | |
| Control Resp | | 20.5 | 15 | >> | Yes | Pass | es Cr | iteria | | | | | |
| PMSD | | 0.415 | 0.13 | 0.47 | Yes | Dage | es Cr | !4 = u! = | | | | | |

Sum Squares

4107.13

3729.6

7836.73

Mean Square

821.427

69.0667

ANOVA Table Source

Between

Error

Total

| Attribute | Test | Test Stat | Critical | P-Value | Decision(a:1%) |
|--------------|--------------------------------------|-----------|----------|---------|---------------------|
| Variances | Bartlett Equality of Variance Test | 15.3 | 15.09 | 0.0091 | Unequal Variances |
| Variances | Levene Equality of Variance Test | 4.316 | 3.377 | 0.0022 | Unequal Variances |
| Variances | Mod Levene Equality of Variance Test | 2.76 | 3.377 | 0.0272 | Equal Variances |
| Distribution | Anderson-Darling A2 Normality Test | 0.8305 | 3.878 | 0.0320 | Normal Distribution |
| Distribution | D'Agostino Kurtosis Test | 0.5634 | 2.576 | 0.5732 | Normal Distribution |
| Distribution | D'Agostino Skewness Test | 1.531 | 2.576 | 0.1259 | Normal Distribution |
| Distribution | D'Agostino-Pearson K2 Omnibus Test | 2.66 | 9.21 | 0.2645 | Normal Distribution |
| Distribution | Kolmogorov-Smirnov D Test | 0.08835 | 0.1331 | 0.2704 | Normal Distribution |
| Distribution | Shapiro-Wilk W Normality Test | 0.9564 | 0.9459 | 0.0313 | Normal Distribution |

DF

5

54

59

F Stat

11.89

P-Value

<1.0E-37

Decision(a:5%)

Significant Effect

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect |
|-----------|------|-------|------|---------|---------|--------|-----|-----|---------|---------|---------|
| 0 | N | 10 | 20.5 | 16.46 | 24.54 | 19.5 | 14 | 31 | 1.784 | 27.52% | 0.00% |
| 3 | | 10 | 19 | 11.49 | 26.51 | 23 | 0 | 29 | 3.32 | 55.26% | 7.32% |
| 5 | | 10 | 21.3 | 13.31 | 29.29 | 24 | 0 | 31 | 3.531 | 52.42% | -3.90% |
| 10 | | 10 | 20.1 | 12.92 | 27.28 | 18 | 7 | 33 | 3.174 | 49.94% | 1.95% |
| 30 | | 10 | 4.5 | 0.2713 | 8.729 | 2 | 0 | 18 | 1.869 | 131.36% | 78.05% |
| 50 | | 10 | 1.2 | -1.273 | 3.673 | 0 | 0 | 11 | 1.093 | 288.14% | 94.15% |

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Test Code:

CER030618 | 14-4114-6075

Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

07-9880-4424 14 Mar-18 8:38 Endpoint: Reproduction Analysis:

Nonparametric-Control vs Treatments

CETIS Version: Official Results:

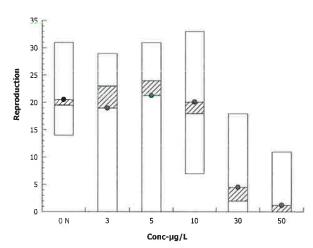
CETISv1.9.2

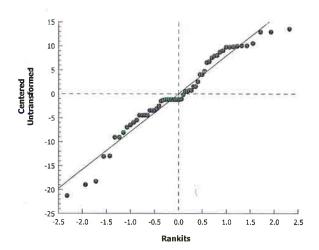
Yes

Reproduction Detail

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|-----------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | N | 14 | 16 | 18 | 17 | 23 | 22 | 21 | 28 | 15 | 31 |
| 3 | | 13 | 28 | 12 | 23 | 27 | 29 | 23 | 0 | 6 | 29 |
| 5 | | 20 | 22 | 28 | 0 | 31 | 26 | 22 | 31 | 3 | 30 |
| 10 | | 28 | 11 | 11 | 33 | 7 | 12 | 19 | 17 | 30 | 33 |
| 30 | | 0 | 3 | 11 | 5 | 0 | 0 | 6 | 18 | 1 | 1 |
| 50 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 |

Graphics





14 Mar-18 08:39 (p 1 of 4)

| JE 118 | э Апа | iyticai Kepo | rt | | | | | • | Code: | | | 14-4114-607 |
|---|-----------------------|------------------|------------|---------|----------------------------|------------------|------------------|------------------|------------------|----------------|--------|--------------|
| Cerioda | aphnia | 7-d Survival and | l Reproduc | tion Te | est | | | | | | | ng Labs, Inc |
| Analysi | | 15-1388-7401 | | | 7d Survival Rate | | | | IS Version: | CETISv1 | .9.2 | |
| Analyz | | 14 Mar-18 8:38 | Anal | ysis: | Linear Interpolat | tion (ICPIN) | | Offi | cial Results: | Yes | | |
| Batch I | D: | 02-3712-1683 | Test | Type: | Reproduction-St | urvival (7d) | | Ana | lyst: | | | |
| Start D | | 06 Mar-18 14:00 | | ocol: | EPA/821/R-02-0 | . , | | | | oratory Wate | er | |
| _ | • | 13 Mar-18 14:00 | • | cies: | Ceriodaphnia du | | | Brir | ie: Not | Applicable | | |
| Duratio | on: | 7d 0h | Sou | rce: | Aquatic Biosyste | ems, CO | | Age | : | | | |
| Sample | e ID: | 14-1125-6244 | Cod | e: | CER030618 | | | Clie | nt: ABC | Labs | | |
| Sample | e Date: | 06 Mar-18 14:00 | Mate | erial: | Copper chloride | | | Pro | ject: REF | TOX | | |
| Receip | t Date: | | Sou | rce: | Reference Toxic | cant | | | | | | |
| Sample | e Age: | n/a | Stat | ion: | | | | | | | | |
| inear | Interpo | lation Options | | | | | | | | | | |
| X Tran | sform | Y Transform | See | d | Resamples | Exp 95% | CL Met | hod | | | | |
| inear | | Linear | 0 | | 280 | Yes | Two | -Point Inter | oolation | | | |
| Test A | cceptab | oility Criteria | TAC L | imite | | | | | | | | |
| Attribu | | Test Stat | | Uppe | г Overlap | Decision | | | | | | |
| Control | | 1 | 0.8 | >> | Yes | Passes C | riteria | | | | | |
| Point E | Estimate | es | | | | | | | | | | |
| Level | μg/L | 95% LCL | 95% UCL | | | | | | | | | |
| EC5 | 0.75 | 0.4286 | 5 | | | | | | | | | |
| EC10 | 1.5 | 0.8571 | 5.294 | | | | | | | | | |
| EC15 | 2.25 | 1.286 | 5.625 | | | | | | | | | |
| EC20 | 5 | 1.714 | 6.111 | | | | | | | | | |
| EC25 | 5.455 | 2.143 | 6.538 | | | | | | | | | |
| EC40 | 6.818 | 5 | 8.333 | | | | | | | | | |
| EC50 | 7.727 | 6.154 | 10 | | | | | | | | | |
| 7d Sur | vival R | ate Summary | | | | Calcu | lated Vari | ate(A/B) | | | | |
| | | Code | Count | Mear | Min | Max | Std Err | Std Dev | CV% | %Effect | Α | В |
| Conc- | ug/L | | | 4.000 | 4 0000 | 1.0000 | 0.0000 | 0.0000 | 0.00% | 0.0% | 10 | 10 |
| | ug/L | N | 10 | 1.000 | 00 0 1.0000 | 1.0000 | | | | | | |
| 0 | ug/L | N | 10 10 | 0.800 | | 1.0000 | 0.1333 | 0.4216 | 52.70% | 20.0% | 8 | 10 |
| Conc-_l 0 3 5 | ug/L | N | | | 0.0000 | | | 0.4216 0.4216 | 52.70% 52.70% | 20.0% 20.0% | 8 8 | 10 10 |
| 0 | ид/с | N | 10 | 0.800 | 0.0000 0.0000 | 1.0000 | 0.1333 | | | | | |
| 0 3 5 | л д/ г. | N | 10 10 | 0.800 | 0.0000 0.0000 0.0000 | 1.0000 1.0000 | 0.1333 0.1333 | 0.4216 | 52.70% | 20.0% | 8 | 10 |

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|-----------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0 | N | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 3 | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 1.0000 |
| 5 | | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 1.0000 |
| 10 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 |
| 30 | | 0.0000 | 0.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 0.0000 | 0.0000 |
| 50 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 |

| 7d Survival Ra | d Survival Rate Binomials | | | | | | | | | | | |
|----------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--|
| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 | |
| 0 | N | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | |
| 3 | | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 0/1 | 0/1 | 1/1 | |
| 5 | | 1/1 | 1/1 | 1/1 | 0/1 | 1/1 | 1/1 | 1/1 | 1/1 | 0/1 | 1/1 | |
| 10 | | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 1/1 | 1/1 | |
| 30 | | 0/1 | 0/1 | 1/1 | 1/1 | 0/1 | 0/1 | 0/1 | 1/1 | 0/1 | 0/1 | |
| 50 | | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 0/1 | 1/1 | 1/1 | |

CETIS Analytical Report

Report Date:

14 Mar-18 08:39 (p 2 of 4)

Test Code:

CER030618 | 14-4114-6075

| Ceriodaphnia 7-d St | urvival and F | Reproduction | Test |
|---------------------|---------------|--------------|------|
|---------------------|---------------|--------------|------|

Aquatic Bioassay & Consulting Labs, Inc.

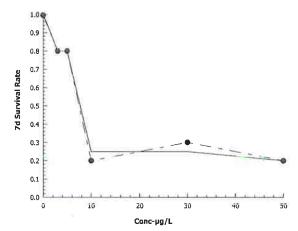
Analysis ID: Analyzed: 15-1388-7401 14 Mar-18 8:38 Endpoint: 7d Survival Rate

Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2

Official Results: Yes

Graphics



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14 Mar-18 08:39 (p 3 of 4)

Test Code:

CER030618 | 14-4114-6075

| | | | | | | | | Test Code | : | CER030618 14-4114- | 6075 |
|---------|---------|-----------------|----------------|------|------------------|-----------------|-----------|---------------|---------|---------------------------|------|
| Cerioda | aphnia | 7-d Survival an | d Reproduction | n Te | st | | | Aqu | atic Bi | oassay & Consulting Labs, | Inc. |
| Analysi | | 05-6638-7895 | Endpoi | nt: | Reproduction | | | CETIS Ver | sion: | CETISv1.9.2 | |
| Analyze | ed: | 14 Mar-18 8:38 | Analysi: | s: | Linear Interpola | ition (ICPIN) | | Official Re | sults: | Yes | |
| Batch I | D: | 02-3712-1683 | Test Ty | pe: | Reproduction-S | Survival (7d) | | Analyst: | | | |
| Start D | ate: | 06 Mar-18 14:00 | D Protoco | ol: | EPA/821/R-02- | 013 (2002) | | Diluent: | Labo | ratory Water | |
| Ending | Date: | 13 Mar-18 14:00 | Species | s: | Ceriodaphnia d | ubia | | Brine: | Not A | \pplicable | |
| Duratio | n: | 7d 0h | Source | : | Aquatic Biosyst | tems, CO | | Age: | | | |
| Sample | D: | 14-1125-6244 | Code: | | CER030618 | | | Client: | ABC | Labs | |
| Sample | e Date: | 06 Mar-18 14:0 | O Materia | 1: | Copper chloride | Э | | Project: | REF | TOX | |
| Receip | t Date: | | Source | : | Reference Toxi | cant | | | | | |
| Sample | e Age: | n/a | Station | : | | | | | | | |
| Linear | Interp | olation Options | | | | | | | | | |
| X Trans | sform | Y Transform | n Seed | | Resamples | Exp 95% CL | Method | | | | |
| Linear | | Linear | 0 | | 280 | Yes | Two-Point | Interpolation | n | | |
| Test A | ccepta | bility Criteria | TAC Limit | ts | | | | | | | |
| Attribu | te | Test Stat | | pper | Overlap | Decision | | | | | |
| Control | Resp | 20.5 | 15 >> | > | Yes | Passes Criteria | | | | | |
| Point E | Estimat | tes | | | | | | | | | |
| Level | μg/L | 95% LCL | 95% UCL | | | | | | | | |
| IC5 | 10.8 | 0.7892 | 11.48 | | | | | | | | |
| IC10 | 12.12 | 2 1.578 | 12.99 | | | | | | | | |
| IC15 | 13.43 | 3 2.368 | 14.48 | | | | | | | | |
| IC20 | 14.7 | 4 3.952 | 15.98 | | | | | | | | |
| IC25 | 16.00 | 6 6.148 | 17.47 | | | | | | | | |

| Reproduction | Summary | | Calculated Variate | | | | | | | |
|--------------|---------|-------|--------------------|-----|-----|---------|---------|---------|---------|--|
| Conc-µg/L | Code | Count | Mean | Min | Max | Std Err | Std Dev | CV% | %Effect | |
| 0 | N | 10 | 20.5 | 14 | 31 | 1.784 | 5.642 | 27.52% | 0.0% | |
| 3 | | 10 | 19 | 0 | 29 | 3.32 | 10.5 | 55.26% | 7.32% | |
| 5 | | 10 | 21.3 | 0 | 31 | 3.531 | 11.17 | 52.42% | -3.9% | |
| 10 | | 10 | 20.1 | 7 | 33 | 3.174 | 10.04 | 49.94% | 1.95% | |
| 30 | | 10 | 4.5 | 0 | 18 | 1.869 | 5.911 | 131.40% | 78.05% | |
| 50 | | 10 | 1.2 | 0 | 11 | 1.093 | 3.458 | 288.10% | 94.15% | |

| Re | nro | duct | ion | Detail | |
|----|-----|------|-----|--------|--|

20

22.63

12.39

16.38

22.53

26.21

IC40

IC50

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|-----------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 0 | N | 14 | 16 | 18 | 17 | 23 | 22 | 21 | 28 | 15 | 31 |
| 3 | | 13 | 28 | 12 | 23 | 27 | 29 | 23 | 0 | 6 | 29 |
| 5 | | 20 | 22 | 28 | 0 | 31 | 26 | 22 | 31 | 3 | 30 |
| 10 | | 28 | 11 | 11 | 33 | 7 | 12 | 19 | 17 | 30 | 33 |
| 30 | | 0 | 3 | 11 | 5 | 0 | 0 | 6 | 18 | 1 | 1 |
| 50 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 |

CETIS Analytical Report

Report Date:

14 Mar-18 08:39 (p 4 of 4)

Test Code:

CER030618 | 14-4114-6075

Ceriodaphnia 7-d Survival and Reproduction Test

Aquatic Bioassay & Consulting Labs, Inc.

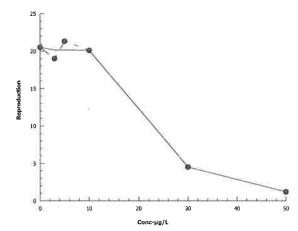
Analysis ID: Analyzed: 05-6638-7895 14 Mar-18 8:38 Endpoint: Reproduction

Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2

Official Results: Yes

Graphics



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14 Mar-18 08:39 (p 1 of 2)

Test Code:

CER030618 | 14-4114-6075

| | | | | | | | | T | est C | ode: | CEF | R030618 14 | -4114-607 |
|--|-------------------------|---|--|---------------------------------------|--|--|--|---|------------------|--|---|---|---|
| Ceriodaphnia | 7-d Surviva | l and Repr | oduction T | est | | | | | , | Aquatic I | Bioassay & | Consulting | Labs, Inc |
| Analysis ID: Analyzed: | 02-0389-99 14 Mar-18 | | Endpoint: Analysis: | | | e ngency Tabl | es | | | Version I Results | | 1.9.2 | |
| Batch ID: | 02-3712-168 | 33 | | | | urvival (7d) | | Δ | nalys | † · | * | | |
| Start Date: | 06 Mar-18 1 | | Protocol: | | | 013 (2002) | | | iluen | | oratory Wa | ter | |
| Ending Date: | | | Species: | | daphnia d | | | | rine: | | t Applicable | | |
| Duration: | 7d 0h | | Source: | | tic Biosyst | | | | ge: | | | | |
| Sample ID: | 14-1125-624 | 14 | Code: | CER | 030618 | | | С | lient: | AB | C Labs | | |
| Sample Date: | 06 Mar-18 1 | 4:00 | Material: | Сорр | er chloride |) | | Р | rojec | t: RE | F TOX | | |
| Receipt Date: | ; | | Source: | Refer | rence Toxi | cant | | | | | | | |
| Sample Age: | n/a | | Station: | | | | | | | | | | |
| Data Transfor | rm | Alt H | ур | | | | | NOEL | | LOEL | TOEL | TU | |
| Untransformed | d | C > T | | | | | | 5 | | 10 | 7.071 | | |
| Fisher Exact/ | Bonferroni-l | lolm Test | | | | | | | | | | | |
| | vs Grou | р | | | P-Type | P-Value | Decision | | | | | | |
| Negative Cont | | | 0.236 | - | Exact | 0.4737 | Non-Sign | | | | | | |
| | 5 | | 0.236 | | Exact | 0.4737 | Non-Signi | | ect | | | | |
| | 10* | | 0.000 | | Exact | 0.0018 | Significan | | | | | | |
| | 30* 50* | | 0.001 | | Exact Exact | 0.0046 0.0018 | Significan Significan | | | | | | |
| | | | 0.000 |) 4 | Exact | 0.0016 | Significan | IL EHECL | | | | | |
| Test Acceptal | • | 17 | AC Limits | | | | | | | | | | |
| Attribute | | Stat Lowe | | | Overlap | Decision | | | | | | | |
| Control Resp | 1 | 0.8 | >> | | Yes | Passes Cı | riteria | | | | | | |
| Data Summai | ry | | | | | | | | | | | | |
| Conc-µg/L | Code | NR | R | | NR + R | Prop NR | Prop R | %Effe | ct | | | | |
| 0 | N | 10 | 0 | | 10 | 1 | 0 | 0.0% | | | | | |
| 3 | | 8 | 2 | | 10 | 0.8 | 0.2 | 20.0% | | | | | |
| 5 | | 8 | 2 | | 10 | 0.8 | 0.2 | 20.0% | | | | | |
| 10 | | 2 | 8 | | 10 | 0.2 | 0.8 | 80.0% | | | | | |
| 30 | | 3 | 7 | | 10 | 0.3 | 0.7 | 70.0% | | | | | |
| 50 | | 2 | 8 | | 10 | 0.2 | 0.8 | 80.0% | | | | | |
| 7d Survival R | Rate Detail | | | | | | | | | | | | |
| Conc-µg/L | Code | Rep | | | Rep 3 | Rep 4 | Rep 5 | Rep 6 | | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
| 0 | N | 1.000 | 00 1000 | ٦Δ. | 4 0000 | 1 0000 | | |) | 4 0000 | 1.0000 | 1.0000 | 1.0000 |
| _ | | | | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | | 1.0000 | | | |
| | | 1.000 | 00 1.000 | 00 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |) | 1.0000 | 0.0000 | 0.0000 | 1.0000 |
| 5 | | 1.000 1.000 | 00 1.000 00 1.000 | 00 00 | 1.0000 1.0000 | 1.0000 0.0000 | 1.0000 1.0000 | 1.0000 |)) | 1.0000 1.0000 | 0.0000 1.0000 | 0.0000 | 1.0000 |
| | | 1.000 1.000 0.000 | 00 1.000 00 1.000 00 0.000 | 00 00 00 | 1.0000 1.0000 0.0000 | 1.0000 0.0000 0.0000 | 1.0000 1.0000 0.0000 | 1.0000 1.0000 0.0000 |))) | 1.0000 1.0000 0.0000 | 0.0000 1.0000 0.0000 | 0.0000 1.0000 | 1.0000 1.0000 |
| 5 10 30 | | 1.000 1.000 | 00 1.000 00 1.000 00 0.000 | 00 00 00 | 1.0000 1.0000 | 1.0000 0.0000 | 1.0000 1.0000 | 1.0000 |))) | 1.0000 1.0000 | 0.0000 1.0000 | 0.0000 | 1.0000 |
| 5 10 30 | | 1.000 1.000 0.000 | 1.000 00 1.000 00 0.000 00 0.000 | 00 00 00 00 | 1.0000 1.0000 0.0000 | 1.0000 0.0000 0.0000 | 1.0000 1.0000 0.0000 | 1.0000 1.0000 0.0000 |))) | 1.0000 1.0000 0.0000 | 0.0000 1.0000 0.0000 | 0.0000 1.0000 | 1.0000 1.0000 |
| 5 10 30 50 | Rate Binomia | 1.000 1.000 0.000 0.000 | 1.000 00 1.000 00 0.000 00 0.000 | 00 00 00 00 | 1.0000 1.0000 0.0000 1.0000 | 1.0000 0.0000 0.0000 1.0000 | 1.0000 1.0000 0.0000 0.0000 | 1.0000 1.0000 0.0000 |))) | 1.0000 1.0000 0.0000 0.0000 | 0.0000 1.0000 0.0000 1.0000 | 0.0000 1.0000 0.0000 | 1.0000 1.0000 0.0000 |
| 5 10 30 50 7d Survival R Conc-µg/L | Code | 1.000 1.000 0.000 0.000 0.000 | 1.000 1.000 1.000 00 0.000 00 0.000 1 Rep | 00 00 00 00 00 00 | 1.0000 1.0000 0.0000 1.0000 0.0000 | 1.0000 0.0000 0.0000 1.0000 0.0000 | 1.0000 1.0000 0.0000 0.0000 0.0000 | 1.0000 1.0000 0.0000 0.0000 0.0000 |)))) | 1.0000 1.0000 0.0000 0.0000 0.0000 | 0.0000 1.0000 0.0000 1.0000 0.0000 | 0.0000 1.0000 0.0000 1.0000 | 1.0000 1.0000 0.0000 1.0000 |
| 5 10 30 50 7d Survival R Conc-μg/L | | 1.000 1.000 0.000 0.000 0.000 | 1.000 1.000 1.000 00 0.000 00 0.000 1 Rep | 00 00 00 00 00 00 | 1.0000 1.0000 0.0000 1.0000 0.0000 Rep 3 | 1.0000 0.0000 0.0000 1.0000 0.0000 Rep 4 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 5 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 6 |)))) | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 7 | 0.0000 1.0000 0.0000 1.0000 0.0000 Rep 8 | 0.0000 1.0000 0.0000 1.0000 Rep 9 | 1.0000 1.0000 0.0000 1.0000 Rep 10 |
| 5 10 30 50 7d Survival R Conc-μg/L 0 3 | Code | 1.000 1.000 0.000 0.000 0.000 1ls Rep 1/1 | 1.000 000 1.000 000 0.000 000 0.000 000 0.000 1 Rep 1/1 1/1 | 00 00 00 00 00 00 | 1.0000 1.0000 0.0000 1.0000 0.0000 Rep 3 1/1 | 1.0000 0.0000 0.0000 1.0000 0.0000 Rep 4 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 5 1/1 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 6 |)))) | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 7 1/1 | 0.0000 1.0000 0.0000 1.0000 0.0000 Rep 8 | 0.0000 1.0000 0.0000 1.0000 Rep 9 | 1.0000 1.0000 0.0000 1.0000 Rep 10 |
| 5 10 30 50 7d Survival R Conc-µg/L 0 3 5 | Code | 1.000 1.000 0.000 0.000 0.000 1.000 1.15 Rep 1/1 1/1 | 1.000 000 1.000 000 0.000 000 0.000 000 0.000 1 Rep 1/1 1/1 1/1 | 00 00 00 00 00 00 2 | 1.0000 1.0000 0.0000 1.0000 0.0000 Rep 3 1/1 1/1 | 1.0000 0.0000 0.0000 1.0000 0.0000 Rep 4 1/1 1/1 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 5 1/1 1/1 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 6 |) | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 7 1/1 1/1 | 0.0000 1.0000 0.0000 1.0000 0.0000 Rep 8 1/1 0/1 1/1 | 0.0000 1.0000 0.0000 1.0000 Rep 9 1/1 0/1 | 1.0000 1.0000 0.0000 1.0000 Rep 10 1/1 1/1 |
| 5 10 30 50 7d Survival R Conc-μg/L 0 3 5 10 | Code | 1.000 1.000 0.000 0.000 0.000 1.000 | 1.000 00 1.000 00 0.000 00 0.000 00 0.000 1 Rep 1/1 1/1 1/1 0/1 | 00 00 00 00 00 00 2 | 1.0000 1.0000 0.0000 1.0000 0.0000 Rep 3 1/1 1/1 1/1 | 1.0000 0.0000 0.0000 1.0000 0.0000 Rep 4 1/1 1/1 0/1 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 5 1/1 1/1 1/1 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 6 1/1 1/1 1/1 0/1 |) | 1.0000 1.0000 0.0000 0.0000 0.0000 0.0000 Rep 7 1/1 1/1 1/1 | 0.0000 1.0000 0.0000 1.0000 0.0000 Rep 8 1/1 0/1 1/1 0/1 | 0.0000 1.0000 0.0000 1.0000 Rep 9 1/1 0/1 0/1 1/1 | 1.0000 1.0000 0.0000 1.0000 Rep 10 1/1 1/1 1/1 |
| 5 10 30 50 7d Survival R Conc-µg/L 0 3 5 | Code | 1.000 1.000 0.000 0.000 0.000 1.000 1.15 Rep 1/1 1/1 | 1.000 000 1.000 000 0.000 000 0.000 000 0.000 1 Rep 1/1 1/1 1/1 | 00 00 00 00 00 00 2 | 1.0000 1.0000 0.0000 1.0000 0.0000 Rep 3 1/1 1/1 | 1.0000 0.0000 0.0000 1.0000 0.0000 Rep 4 1/1 1/1 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 5 1/1 1/1 | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 6 |) | 1.0000 1.0000 0.0000 0.0000 0.0000 Rep 7 1/1 1/1 | 0.0000 1.0000 0.0000 1.0000 0.0000 Rep 8 1/1 0/1 1/1 | 0.0000 1.0000 0.0000 1.0000 Rep 9 1/1 0/1 | 1.0000 1.0000 0.0000 1.0000 Rep 10 1/1 1/1 |

CETIS Analytical Report

Report Date:

14 Mar-18 08:39 (p 2 of 2)

Test Code:

CER030618 | 14-4114-6075

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

02-0389-9938 14 Mar-18 8:38 Endpoint: 7d Survival Rate Analysis:

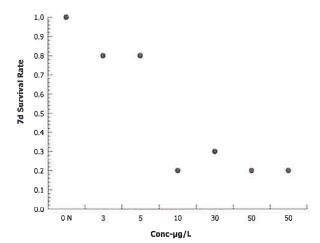
STP 2xK Contingency Tables

CETIS Version:

CETISv1.9.2

Official Results: Yes

Graphics



14 Mar-18 08:39 (p 1 of 2)

Test Code:

CER030618 | 14-4114-6075

| | | • | | | | | | Test Code: | CE | R030618 1 | 14-4114-6075 |
|----------------|----------------|--------|-------------|----------------|---------------|-----|-----|------------|----------------|-------------|--------------|
| Ceriodaphnia | 7-d Survival a | nd Rep | roduction T | est | | | | Aquati | c Bioassay & | Consultin | g Labs, Inc. |
| Batch ID: | 02-3712-1683 | | Test Type: | Reproduction-S | Survival (7d) | | | Analyst: | | | |
| Start Date: | 06 Mar-18 14:0 | 00 | Protocol: | EPA/821/R-02 | -013 (2002) | | | Diluent: L | aboratory Wa | ter | |
| Ending Date: | 13 Mar-18 14:0 | 00 | Species: | Ceriodaphnia d | dubia | | | | Not Applicable | | |
| Duration: | 7d 0h | | Source: | Aquatic Biosys | | | | Age: | | | |
| Sample ID: | 14-1125-6244 | | Code: | CER030618 | | | | Client: / | ABC Labs | | |
| Sample Date: | 06 Mar-18 14:0 | 00 | Material: | Copper chlorid | е | | | Project: F | REF TOX | | |
| Receipt Date: | | | Source: | Reference Tox | cicant | | | | | | |
| Sample Age: | n/a | | Station: | | | | | | | | |
| Alkalinity (Ca | CO3)-mg/L | | | | | | | | | | |
| Conc-µg/L | Code | Coun | t Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 8 | 66 | 66 | 66 | 66 | 66 | 0 | 0 | 0.0% | 0 |
| 50 | | 8 | 66 | 66 | 66 | 66 | 66 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 66 | 66 | 66 | 66 | 66 | 0 | 0 | 0.00% | 0 (0%) |
| Conductivity- | -µmhos | | | | | | | | | | |
| Conc-µg/L | Code | Coun | t Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 8 | 344.5 | 340.9 | 348.1 | 340 | 351 | 1.512 | 4.276 | 1.24% | 0 |
| 3 | | 8 | 350.1 | 333.3 | 366.9 | 338 | 399 | 7.1 | 20.08 | 5.74% | 0 |
| 5 | | 8 | 341.4 | 338.6 | 344.2 | 338 | 348 | 1.194 | 3.378 | 0.99% | 0 |
| 10 | | 8 | 339.4 | 336.4 | 342.4 | 336 | 346 | 1.267 | 3.583 | 1.06% | 0 |
| 30 | | 8 | 337.1 | 332.4 | 341.8 | 330 | 348 | 1.986 | 5.617 | 1.67% | 0 |
| 50 | | 8 | 342.8 | 335.6 | 349.9 | 337 | 357 | 3.022 | 8.548 | 2.49% | 0 |
| Overall | | 48 | 342.5 | 339.6 | 345.4 | 330 | 399 | 1.439 | 9.968 | 2.91% | 0 (0%) |
| Dissolved Ox | kygen-mg/L | | | | | | | | | | |
| Conc-µg/L | Code | Coun | t Mean | 95% LCL | 95% UCL | Min | Max | Std Eri | Std Dev | CV% | QA Count |
| 0 | N | 8 | 7.8 | 7.525 | 8.075 | 7.3 | 8.4 | 0.1165 | 0.3295 | 4.22% | 0 |
| 3 | | 8 | 7.937 | 7.566 | 8.309 | 7.6 | 8.7 | 0.1569 | 0.4438 | 5.59% | 0 |
| 5 | | 8 | 7.687 | 7.102 | 8.273 | 6.2 | 8.7 | 0.2474 | 0.6999 | 9.1% | 0 |
| 10 | | 8 | 7.875 | 7.447 | 8.303 | 7.2 | 8.7 | 0.181 | 0.512 | 6.5% | 0 |
| 30 | | 8 | 7.962 | 7.553 | 8.372 | 7.3 | 8.7 | 0.1731 | 0.4897 | 6.15% | 0 |
| 50 | | 8 | 7.688 | 7.072 | 8.303 | 6.2 | 8.7 | 0.2601 | 0.7357 | 9.57% | 0 |
| Overall | | 48 | 7.825 | 7.67 | 7.98 | 6.2 | 8.7 | 0.0772 | 1 0.5349 | 6.84% | 0 (0%) |
| Hardness (Ca | aCO3)-mg/L | | | | | | | | | | |
| Conc-µg/L | Code | Coun | | | 95% UCL | | Max | Std Er | Std Dev | CV% | QA Count |
| 0 | N | 8 | 94 | 94 | 94 | 94 | 94 | 0 | 0 | 0.0% | 0 |
| 50 | | 8 | 95 | 95 | 95 | 95 | 95 | 0 | 0 | 0.0% | 0 |
| Overall | | 16 | 94.5 | 94.22 | 94.78 | 94 | 95 | 0.1291 | 0.5164 | 0.55% | 0 (0%) |
| pH-Units | | | | | | | | | | | |
| Conc-µg/L | Code | Cour | | | | Min | Max | | | CV% | QA Count |
| 0 | N | 8 | 7.925 | | 7.999 | 7.8 | 8 | 0.0313 | 4 0.08864 | 1.12% | 0 |
| 3 | | 8 | 7.75 | 7.673 | 7.827 | 7.6 | 7.9 | 0.0327 | 3 0.09258 | 1.2% | 0 |
| 5 | | 8 | 7.738 | 7.675 | 7.8 | 7.6 | 7.8 | 0.0263 | 1 0.07441 | 0.96% | 0 |
| 40 | | | | 7.044 | 7 700 | | | 0.00=0 | 0.4000 | 4 000/ | • |

1.39%

1.39%

1.76%

1.64%

0

0

0

0 (0%)

0.1069

0.1069

0.1356

0.1272

0.0378

0.0378

0.04795

0.01835

10

30

50

Overall

8

8

8

48

7.7

7.7

7.688

7.75

7.611

7.611

7.574

7.713

7.789

7.789

7.801

7.787

7.5

7.5

7.4

7.4

7.8

7.8

7.8

8

Report Date: Test Code: 14 Mar-18 08:39 (p 2 of 2) CER030618 | 14-4114-6075

| | | | | | | | Те | st Code: | CEI | KU3U618 | 14-4114-6075 |
|------------------|---------------|------------|-------------|------------------------------------|----------|----------|----------|--------------|----------|---------|--------------|
| Ceriodaphnia 7 | -d Survival a | and Reprod | luction Tes | Aquatic Bioassay & Consulting Labs | | | | g Labs, Inc. | | | |
| Temperature-°C | | | | | | | | | | | |
| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Coun |
| 0 | N | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 3 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 5 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 10 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 30 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| 50 | | 8 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.0% | 0 |
| Overall | | 48 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0.00% | 0 (0%) |
| Alkalinity (CaCo | O3)-mg/L | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | | |
| 50 | | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | | |
| Conductivity-µւ | mhos | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 351 | 346 | 342 | 350 | 340 | 340 | 345 | 342 | | |
| 3 | | 348 | 345 | 342 | 348 | 338 | 341 | 340 | 399 | | |
| 5 | | 340 | 340 | 340 | 345 | 341 | 338 | 339 | 348 | | |
| 10 | | 336 | 337 | 338 | 344 | 338 | 338 | 338 | 346 | | |
| 30 | | 330 | 332 | 333 | 338 | 339 | 339 | 338 | 348 | | |
| 50 | | 356 | 338 | 337 | 338 | 337 | 340 | 339 | 357 | | |
| Dissolved Oxyg | gen-mg/L | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 8 | 7.8 | 7.8 | 7.9 | 7.5 | 7.3 | 7.7 | 8.4 | | |
| 3 | | 8.7 | 7.7 | 7.7 | 8.6 | 7.6 | 7.7 | 7.8 | 7.7 | | |
| 5 | | 8.7 | 7.7 | 7.7 | 6.2 | 7.7 | 7.6 | 7.8 | 8.1 | | |
| 10 | | 8.7 | 7.8 | 7.7 | 8.6 | 7.7 | 7.6 | 7.7 | 7.2 | | |
| 30 | | 87 | 7 A | 77 | 86 | 73 | 77 | 77 | я 2 | | |
| 50 | | 8.7 | 7.8 | 7.7 | 8.3 | 7.3 | 7.8 | 7.7 | 6.2 | | |
| Hardness (CaC | O3)-mg/L | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | | |
| 50 | | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | | |
| pH-Units | | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 7.9 | 7.9 | 8 | 7.8 | 8 | 8 | 8 | 7.8 | | |
| 3 | | 7.8 | 7.9 | 7.7 | 7.7 | 7.8 | 7.7 | 7.8 | 7.6 | | |
| 5 | | 7.8 | 7.8 | 7.8 | 7.7 | 7.8 | 7.7 | 7.7 | 7.6 | | |
| 10 | | 7.7 | 7.8 | 7.8 | 7.7 | 7.8 | 7.7 | 7.6 | 7.5 | | |
| 30 | | 7.7 | 7.8 | 7.8 | 7.7 | 7.8 | 7.7 | 7.5 | 7.6 | | |
| 50 | | 7.7 | 7.8 | 7.8 | 7.7 | 7.8 | 7.7 | 7.6 | 7.4 | | |
| Temperature-°0 | | | | | | | | | | | |
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 0 | N | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | | |
| | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | | |
| 3 | | | | | | | | | | | |
| 3 5 | | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | | |
| | | 24 24 | 24 24 | 24 24 | 24 24 | 24 24 | 24 24 | 24 24 | 24 24 | | |
| 5 | | | | | | | | | | | |

Analyst: QA;



CHRONIC SELENASTRUM GROWTH BIOASSAY

DATE:

8 March - 2018

STANDARD TOXICANT: Cadmium Chloride

NOEC =

40.00 ug/l

IC25 =

85.88 ug/l

IC50 =

113.40 ug/l

Yours very truly,

Scott Johnson

Laboratory Director

29 north olive st. ventura, ca 93001 (805) 643 5621 aquabio.org

Page 79 of 97

Selenastrum Growth Test

Ending Date: 12 Mar-18 11:30

Sample Date: 08 Mar-18 12:36

95h

Batch ID:

Start Date:

Duration:

Sample ID:

Receipt Date:

Report Date: Test Code:

Analyst:

Diluent:

22 Mar-18 08:34 (p 1 of 1)

se: SEL030818 | 06-7676-7890

| Αqu | atic Bioassay & Consulting Labs, Inc. |
|------|---------------------------------------|
| /st: | |
| nt: | Laboratory Water |
| | Not Applicable |

Brine: Not Applicable

Age:

SEL030818s Client: Internal Lab
Cadmium chloride Project: REF TOX

Material: Cadmium chloride Source: Reference Toxicant

Test Type: Cell Growth

Protocol:

Species:

Source:

Code:

EPA/821/R-02-013 (2002)

Aquatic Biosystems, CO

Selenastrum capricornutum

Sample Age: n/a Station:

04-5085-2596

01-7924-9043

08 Mar-18 12:36

Multiple Comparison Summary

| Analysis ID Endpoint | Comparison Method | NOEL | LOEL | TOEL | TU | PMSD √ |
|---------------------------|----------------------------------|------|------|-------|----|--------|
| 08-5786-6342 Cell Density | Dunnett Multiple Comparison Test | 40 | 80 | 56.57 | | 6.04% |

Point Estimate Summary

| Analysis ID | Endpoint | Point Estimate Method | Level | μg/L | 95% LCL | 95% UCL TU | ✓ |
|--------------|--------------|------------------------------|-------|-------|---------|------------|---|
| 05-0330-6571 | Cell Density | Linear Interpolation (ICPIN) | IC5 | 41.97 | 26.31 | 55.07 | |
| | | | IC10 | 54.95 | 39.98 | 67.02 | |
| | | | IC15 | 67.92 | 55.33 | 79.69 | |
| | | | IC20 | 80.38 | 69.95 | 85.46 | |
| | | | IC25 | 85.88 | 81.22 | 90.52 | |
| | | | IC40 | 102.4 | 99.08 | 106 | |
| | | | IC50 | 113.4 | 110.6 | 116.8 | |

| Test Acceptab | pility | | | TAC L | | | |
|---------------|--------------|--------------|-----------|---------|-------|---------|-----------------|
| Analysis ID | Endpoint | Attribute | Test Stat | Lower | Upper | Overlap | Decision |
| 05-0330-6571 | Cell Density | Control CV | 0.02162 | << | 0.2 | Yes | Passes Criteria |
| 08-5786-6342 | Cell Density | Control CV | 0.02162 | << | 0.2 | Yes | Passes Criteria |
| 05-0330-6571 | Cell Density | Control Resp | 1.06E+6 | 1000000 | >> | Yes | Passes Criteria |
| 08-5786-6342 | Cell Density | Control Resp | 1.06E+6 | 1000000 | >> | Yes | Passes Criteria |
| 08-5786-6342 | Cell Density | PMSD | 0.0604 | 0.091 | 0.29 | Yes | Below Criteria |

Cell Density Summary

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | %Effect |
|-----------|------|-------|----------|----------|----------|----------|----------|----------|----------|--------|---------|
| 0 | N | 4 | 1.060E+6 | 1.023E+6 | 1.096E+6 | 1.033E+6 | 1.089E+6 | 1.146E+4 | 2.291E+4 | 2.16% | 0.00% |
| 20 | | 4 | 1.133E+6 | 1.018E+6 | 1.248E+6 | 1.059E+6 | 1.203E+6 | 3.616E+4 | 7.233E+4 | 6.38% | -6.94% |
| 40 | | 4 | 1.050E+6 | 9.967E+5 | 1.103E+6 | 1.002E+6 | 1.078E+6 | 1.673E+4 | 3.347E+4 | 3.19% | 0.92% |
| 80 | | 4 | 8.810E+5 | 8.522E+5 | 9.098E+5 | 8.620E+5 | 9.010E+5 | 9.046E+3 | 1.809E+4 | 2.05% | 16.87% |
| 140 | | 4 | 2.832E+5 | 2.439E+5 | 3.226E+5 | 2.600E+5 | 3.130E+5 | 1.238E+4 | 2.476E+4 | 8.74% | 73.27% |
| 180 | | 4 | 2.230E+5 | 1.818E+5 | 2.642E+5 | 2.010E+5 | 2.550E+5 | 1.294E+4 | 2.587E+4 | 11.60% | 78.96% |

Cell Density Detail

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|-----------|------|----------|----------|----------|----------|
| 0 | N | 1.089E+6 | 1.058E+6 | 1.033E+6 | 1.059E+6 |
| 20 | | 1.084E+6 | 1.059E+6 | 1.203E+6 | 1.187E+6 |
| 40 | | 1.054E+6 | 1.002E+6 | 1.066E+6 | 1.078E+6 |
| 80 | | 8.620E+5 | 8.910E+5 | 8.700E+5 | 9.010E+5 |
| 140 | | 2.940E+5 | 2.600E+5 | 2.660E+5 | 3.130E+5 |
| 180 | | 2.550E+5 | 2.330E+5 | 2.010E+5 | 2.030E+5 |

22 Mar-18 08:33 (p 1 of 2) SEL030818 | 06-7676-7890

Test Code: Selenastrum Growth Test Aquatic Bioassay & Consulting Labs, Inc. Analysis ID: 08-5786-6342 Endpoint: Cell Density **CETIS Version:** CETISv1.9.2 Analyzed: 19 Mar-18 13:53 Analysis: Parametric-Control vs Treatments Official Results: Yes Batch ID: 04-5085-2596 Test Type: Cell Growth Analyst: Start Date: 08 Mar-18 12:36 EPA/821/R-02-013 (2002) Diluent: Laboratory Water Protocol: Ending Date: 12 Mar-18 11:30 Species: Selenastrum capricornutum Brine: Not Applicable **Duration:** 95h Source: Aquatic Biosystems, CO Age: Sample ID: 01-7924-9043 SEL030818s Code: Client: Internal Lab **REF TOX** Sample Date: 08 Mar-18 12:36 Material: Cadmium chloride Project: Receipt Date: Source: Reference Toxicant Sample Age: n/a Station:

| Data Transform | Alt Hyp | NOEL | LOEL | TOEL | TU | PMSD |
|----------------|---------|------|------|-------|----|-------|
| Untransformed | C > T | 40 | 80 | 56.57 | | 6.04% |

Dunnett Multiple Comparison Test

| Control vs | Conc-µg/L | Test Stat | Critical | MSD DF P-Type | P-Value | Decision(α:5%) |
|------------------|-----------|-----------|----------|---------------|---------|------------------------|
| Negative Control | 20 | -2.764 | 2.407 | 64010 6 CDF | 0.9999 | Non-Significant Effect |
| | 40 | 0.3667 | 2.407 | 64010 6 CDF | 0.7037 | Non-Significant Effect |
| | 80* | 6.722 | 2.407 | 64010 6 CDF | 3.3E-05 | Significant Effect |
| | 140* | 29.2 | 2.407 | 64010 6 CDF | 2.7E-05 | Significant Effect |
| | 180* | 31.47 | 2.407 | 64010 6 CDF | 2.7E-05 | Significant Effect |

| Test Acceptabili | ty Criteria | TAC L | imits | | | |
|------------------|-------------|---------|-------|---------|-----------------|--|
| Attribute | Test Stat | Lower | Upper | Overlap | Decision | |
| Control CV | 0.02162 | << | 0.2 | Yes | Passes Criteria | |
| Control Resp | 1.06E+6 | 1000000 | >> | Yes | Passes Criteria | |
| PMSD | 0.0604 | 0.091 | 0.29 | Yes | Below Criteria | |

ANOVA Table

| Source | Sum Squares | Mean Square | DF | F Stat | P-Value | Decision(α:5%) |
|---------|-------------|-------------|----|--------|----------|--------------------|
| Between | 3.371E+12 | 6.742E+11 | 5 | 476.7 | <1.0E-37 | Significant Effect |
| Error | 2.546E+10 | 1.414E+09 | 18 | | | |
| Total | 3.396E+12 | | 23 | | | |

Distributional Tests

| Attribute | Test | Test Stat | Critical | P-Value | Decision(α:1%) |
|--------------|--------------------------------------|-----------|----------|---------|---------------------|
| Variances | Bartlett Equality of Variance Test | 7.871 | 15.09 | 0.1635 | Equal Variances |
| Variances | Levene Equality of Variance Test | 8.358 | 4.248 | 3.1E-04 | Unequal Variances |
| Variances | Mod Levene Equality of Variance Test | 6.233 | 4.248 | 0.0016 | Unequal Variances |
| Distribution | Anderson-Darling A2 Normality Test | 0.2236 | 3.878 | 0.8577 | Normal Distribution |
| Distribution | D'Agostino Kurtosis Test | 0.4399 | 2.576 | 0.6600 | Normal Distribution |
| Distribution | D'Agostino Skewness Test | 0.2519 | 2.576 | 0.8011 | Normal Distribution |
| Distribution | D'Agostino-Pearson K2 Omnibus Test | 0.257 | 9.21 | 0.8794 | Normal Distribution |
| Distribution | Kolmogorov-Smirnov D Test | 0.08568 | 0.2056 | 1.0000 | Normal Distribution |
| Distribution | Shapiro-Wilk W Normality Test | 0.9856 | 0.884 | 0.9734 | Normal Distribution |

Cell Density Summary

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Median | Min | Max | Std Err | CV% | %Effect |
|-----------|------|-------|----------|----------|----------|----------|----------|----------|----------|--------|---------|
| 0 | N | 4 | 1.060E+6 | 1.023E+6 | 1.096E+6 | 1.058E+6 | 1.033E+6 | 1.089E+6 | 1.146E+4 | 2.16% | 0.00% |
| 20 | | 4 | 1.133E+6 | 1.018E+6 | 1.248E+6 | 1.136E+6 | 1.059E+6 | 1.203E+6 | 3.616E+4 | 6.38% | -6.94% |
| 40 | | 4 | 1.050E+6 | 9.967E+5 | 1.103E+6 | 1.060E+6 | 1.002E+6 | 1.078E+6 | 1.673E+4 | 3.19% | 0.92% |
| 80 | | 4 | 8.810E+5 | 8.522E+5 | 9.098E+5 | 8.805E+5 | 8.620E+5 | 9.010E+5 | 9.046E+3 | 2.05% | 16.87% |
| 140 | | 4 | 2.832E+5 | 2.439E+5 | 3.226E+5 | 2.800E+5 | 2.600E+5 | 3.130E+5 | 1.238E+4 | 8.74% | 73.27% |
| 180 | | 4 | 2.230E+5 | 1.818E+5 | 2.642E+5 | 2.180E+5 | 2.010E+5 | 2.550E+5 | 1.294E+4 | 11.60% | 78.96% |

2

4

5

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13

15

16

19 Mar-18 13:53

Selenastrum Growth Test

Report Date:

22 Mar-18 08:33 (p 2 of 2)

Test Code:

SEL030818 | 06-7676-7890

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 08-5786-6342 Endpoint: Cell Density

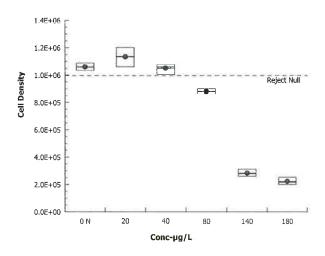
Endpoint:Cell DensityCETIS Version:CETISv1.9.2Analysis:Parametric-Control vs TreatmentsOfficial Results:Yes

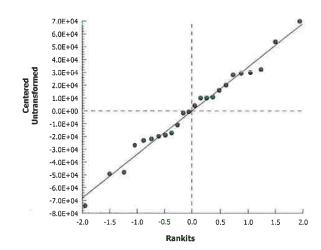
Cell Density Detail

Analyzed:

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 |
|-----------|------|----------|----------|----------|----------|
| 0 | N | 1.089E+6 | 1.058E+6 | 1.033E+6 | 1.059E+6 |
| 20 | | 1.084E+6 | 1.059E+6 | 1.203E+6 | 1.187E+6 |
| 40 | | 1.054E+6 | 1.002E+6 | 1.066E+6 | 1.078E+6 |
| 80 | | 8.620E+5 | 8.910E+5 | 8.700E+5 | 9.010E+5 |
| 140 | | 2.940E+5 | 2.600E+5 | 2.660E+5 | 3.130E+5 |
| 180 | | 2.550E+5 | 2.330E+5 | 2.010E+5 | 2.030E+5 |

Graphics





22 Mar-18 08:33 (p 1 of 2)

| g | Labs, | Inc. | |
|---|-------|------|--|
| | | | |

| SE 115 AI | naiyti | саі керо | rτ | | | | | Test Code | | | 818 06-7676-7890 |
|-------------------|-------------|---------------|--------------|--------|------------------|-----------------|-----------|---------------|---------|--------------|--------------------|
| Selenastru | m Grow | th Test | | | | | | Aqu | atic Bi | passay & Cor | sulting Labs, Inc. |
| Analysis ID | : 05- | 0330-6571 | Endı | ooint: | Cell Density | | | CETIS Ver | sion: | CETISv1.9.2 | 2 |
| Analyzed: | 19 | Mar-18 13:53 | 3 Anal | ysis: | Linear Interpola | ition (ICPIN) | | Official Re | sults: | Yes | |
| Batch ID: | 04-5 | 085-2596 | Test | Туре: | Cell Growth | | | Analyst: | | | |
| Start Date: | 08 N | 1ar-18 12:36 | Prot | ocol: | EPA/821/R-02- | 013 (2002) | | Diluent: | Labo | ratory Water | |
| Ending Dat | e: 12 N | /lar-18 11:30 | Spec | cies: | Selenastrum ca | apricornutum | | Brine: | Not A | pplicable | |
| Duration: | 95h | | Soul | rce: | Aquatic Biosyst | tems, CO | | Age: | | | |
| Sample ID: | 01-7 | 924-9043 | Code | e: | SEL030818s | | | Client: | Interr | nal Lab | |
| Sample Da | te: 08 N | /lar-18 12:36 | Mate | rial: | Cadmium chlor | ide | | Project: | REF | TOX | |
| Receipt Da | te: | | Soui | rce: | Reference Toxi | cant | | | | | |
| Sample Ag | e: n/a | | Stati | on: | | | | | | | |
| Linear Inte | rpolatio | n Options | | | | | | | | | |
| X Transfor | m \ | / Transform | Seed | d | Resamples | Exp 95% CL | Method | | | | |
| Linear | L | inear | 0 | | 280 | Yes | Two-Point | Interpolation | n | | |
| Test Accep | tability | Criteria | TAC Li | mits | | | | | | | |
| Attribute | | Test Stat | | Uppe | r Overlap | Decision | | | | | |
| Control CV | | 0.02162 | << | 0.2 | Yes | Passes Criteria | | | | | |
| Control Res | p | 1.06E+6 | 1000000 | >> | Yes | Passes Criteria | | | | | |
| Point Estin | nates | | | | | | | | | | |
| Level µg | ı/L | 95% LCL | 95% UCL | | | | | | | | |
| IC5 41 | .97 | 26.31 | 55.07 | | | | | | | | |
| IC10 54 | .95 | 39.98 | 67.02 | | | | | | | | |
| IC15 67 | .92 | 55.33 | 79.69 | | | | | | | | |
| IC20 80 | .38 | 69.95 | 85.46 | | | | | | | | |
| | | 04.00 | 00.50 | | | | | | | | |
| | .88. | 81.22 | 90.52 | | | | | | | | |
| 1C25 85 | 5,88 2.4 | 99.08 | 90.52 106 | | | | | | | | |

| Cell Density Su | ummary | | Calculated Variate | | | | | | |
|-----------------|--------|-------|--------------------|----------|----------|----------|----------|--------|---------|
| Conc-µg/L | Code | Count | Mean | Min | Max | Std Err | Std Dev | CV% | %Effect |
| 0 | N | 4 | 1.060E+6 | 1.033E+6 | 1.089E+6 | 1.146E+4 | 2.291E+4 | 2.16% | 0.0% |
| 20 | | 4 | 1.133E+6 | 1.059E+6 | 1.203E+6 | 3.616E+4 | 7.232E+4 | 6.38% | -6.94% |
| 40 | | 4 | 1.050E+6 | 1.002E+6 | 1.078E+6 | 1.673E+4 | 3.347E+4 | 3.19% | 0.92% |
| 80 | | 4 | 8.810E+5 | 8.620E+5 | 9.010E+5 | 9.046E+3 | 1.809E+4 | 2.05% | 16.87% |
| 140 | | 4 | 2.832E+5 | 2.600E+5 | 3.130E+5 | 1.238E+4 | 2.476E+4 | 8.74% | 73.27% |
| 180 | | 4 | 2.230E+5 | 2.010E+5 | 2.550E+5 | 1.294E+4 | 2.587E+4 | 11.60% | 78.96% |

Cell Density Detail

| Conc-µg/L | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | |
|-----------|------|----------|----------|----------|----------|--|
| 0 | N | 1.089E+6 | 1.058E+6 | 1.033E+6 | 1.059E+6 | |
| 20 | | 1.084E+6 | 1.059E+6 | 1.203E+6 | 1.187E+6 | |
| 40 | | 1.054E+6 | 1.002E+6 | 1.066E+6 | 1.078E+6 | |
| 80 | | 8.620E+5 | 8.910E+5 | 8.700E+5 | 9.010E+5 | |
| 140 | | 2.940E+5 | 2.600E+5 | 2.660E+5 | 3.130E+5 | |
| 180 | | 2.550E+5 | 2.330E+5 | 2.010E+5 | 2.030E+5 | |

22 Mar-18 08:34 (p 2 of 2)

Test Code:

SEL030818 | 06-7676-7890

Selenastrum Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

05-0330-6571 19 Mar-18 13:53

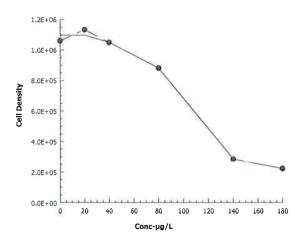
Cell Density Endpoint:

Analysis: Linear Interpolation (ICPIN)

CETISv1.9.2 **CETIS Version:**

Official Results: Yes

Graphics



Code

Count

Mean

Conc-µg/L

QA Count

| CETIS Mea | asurement | Repoi | t | | | | | eport Date: est Code: | | | :34 (p 1 of 2) 06-7676-7890 |
|---------------------|-----------------|-------|------------|----------------|--------------|-----|-----|--------------------------|---------------|-------|--------------------------------|
| Selenastrum | Growth Test | | | | | | | | | · | g Labs, Inc. |
| Batch ID: | 04-5085-2596 | | Test Type: | Cell Growth | | | A | nalyst: | | | |
| Start Date: | 08 Mar-18 12: | 36 | Protocol: | EPA/821/R-02 | -013 (2002) | | Di | iluent: La | aboratory Wa | ter | |
| Ending Date: | 12 Mar-18 11: | 30 | Species: | Selenastrum c | apricornutur | n | В | rine: N | ot Applicable | | |
| Duration: | 95h | | Source: | Aquatic Biosys | tems, CO | | A | ge: | | | |
| Sample ID: | 01-7924-9043 | | Code: | SEL030818s | | | С | lient: In | ternal Lab | | |
| Sample Date: | : 08 Mar-18 12: | 36 | Material: | Cadmium chlo | ride | | P | roject: R | EF TOX | | |
| Receipt Date: | | | Source: | Reference Tox | icant | | | | | | |
| Sample Age: | n/a | | Station: | | | | | | | | |
| Alkalinity (Ca | CO3)-mg/L | | | | | | | | | | |
| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 1 | 60 | | | 60 | 60 | 0 | 0 | 0.0% | 0 |
| 20 | | 1 | 53 | | | 53 | 53 | 0 | 0 | 0.0% | 0 |
| 40 | | 1 | 57 | | | 57 | 57 | 0 | 0 | 0.0% | 0 |
| 80 | | 1 | 62 | | | 62 | 62 | 0 | 0 | 0.0% | 0 |
| 140 | | 1 | 64 | | | 64 | 64 | 0 | 0 | 0.0% | 0 |
| 180 | | 1 | 54 | | | 54 | 54 | 0 | 0 | 0.0% | 0 |
| Overall | | 6 | 58.33 | 53.7 | 62.96 | 53 | 64 | 1.801 | 4.412 | 7.56% | 0 (0%) |
| Conductivity- | -umhos | | | | | | | | | | |

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
|---------------|----------|-------|-------|---------|---------|-----|-----|---------|---------|-------|----------|
| Hardness (CaC | O3)-mg/L | | | | | | | | | | |
| Overall | | 30 | 431 | 415.2 | 446.7 | 377 | 510 | 7.707 | 42.21 | 9.79% | 0 (0%) |
| 180 | | 5 | 380.8 | 375.4 | 386.2 | 377 | 388 | 1.934 | 4.324 | 1.14% | 0 |
| 140 | | 5 | 393.6 | 387.3 | 399.9 | 387 | 400 | 2.272 | 5.079 | 1.29% | 0 |
| 80 | | 5 | 418.8 | 413 | 424.6 | 412 | 425 | 2.083 | 4.658 | 1.11% | 0 |
| 40 | | 5 | 429.2 | 424.2 | 434.2 | 425 | 435 | 1.8 | 4.025 | 0.94% | 0 |
| 20 | | 5 | 503.8 | 492.9 | 514.7 | 490 | 510 | 3.929 | 8.786 | 1.74% | 0 |
| 0 | N | 5 | 459.6 | 453.7 | 465.5 | 453 | 466 | 2.112 | 4.722 | 1.03% | 0 |

Max

Std Err

Std Dev

CV%

95% LCL 95% UCL Min

| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
|-----------|------|-------|-------|---------|---------|-----|-----|---------|---------|-------|----------|
| 0 | N | 1 | 103 | | | 103 | 103 | 0 | 0 | 0.0% | 0 |
| 20 | | 1 | 98 | | | 98 | 98 | 0 | 0 | 0.0% | 0 |
| 40 | | 1 | 110 | | | 110 | 110 | 0 | 0 | 0.0% | 0 |
| 80 | | 1 | 111 | | | 111 | 111 | 0 | 0 | 0.0% | 0 |
| 140 | | 1 | 110 | | | 110 | 110 | 0 | 0 | 0.0% | 0 |
| 180 | | 1 | 93 | | | 93 | 93 | 0 | 0 | 0.0% | 0 |
| Overall | | 6 | 104.2 | 96.33 | 112 | 93 | 111 | 3.049 | 7.468 | 7.17% | 0 (0%) |

| pH-Units | | | | | | | | | | | |
|-----------|------|-------|-------|---------|---------|-----|-----|----------|---------|-------|----------|
| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 5 | 7.78 | 7.724 | 7.836 | 7.7 | 7.8 | 0.02001 | 0.04473 | 0.58% | 0 |
| 20 | | 5 | 7.84 | 7.772 | 7.908 | 7.8 | 7.9 | 0.02449 | 0.05477 | 0.7% | 0 |
| 40 | | 5 | 7.84 | 7.772 | 7.908 | 7.8 | 7.9 | 0.02449 | 0.05477 | 0.7% | 0 |
| 80 | | 5 | 7.82 | 7.764 | 7.876 | 7.8 | 7.9 | 0.02 | 0.04473 | 0.57% | 0 |
| 140 | | 5 | 7.82 | 7.764 | 7.876 | 7.8 | 7.9 | 0.02 | 0.04473 | 0.57% | 0 |
| 180 | | 5 | 7.8 | 7.799 | 7.801 | 7.8 | 7.8 | 0 | 0 | 0.0% | 0 |
| Overall | | 30 | 7.817 | 7.799 | 7.834 | 7.7 | 7.9 | 0.008419 | 0.04611 | 0.59% | 0 (0%) |

Selenastrum Growth Test

Report Date:

22 Mar-18 08:34 (p 2 of 2)

Test Code: SEL030818 | 06-7676-7890

Aquatic Bioassay & Consulting Labs, Inc.

| CV% | OA Count | |
|-----|----------|--|
| | | |
| | | |

| Temperature-°C | C | | | | | | | | | | |
|----------------|------|-------|-------|---------|---------|------|-----|---------|---------|-------|----------|
| Conc-µg/L | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV% | QA Count |
| 0 | N | 5 | 24.84 | 24.73 | 24.95 | 24.8 | 25 | 0.04004 | 0.08953 | 0.36% | 0 |
| 20 | | 5 | 24.84 | 24.73 | 24.95 | 24.8 | 25 | 0.04004 | 0.08953 | 0.36% | 0 |
| 40 | | 5 | 24.84 | 24.73 | 24.95 | 24.8 | 25 | 0.04004 | 0.08953 | 0.36% | 0 |
| 80 | | 5 | 24.84 | 24.73 | 24.95 | 24.8 | 25 | 0.04004 | 0.08953 | 0.36% | 0 |
| 140 | | 5 | 24.84 | 24.73 | 24.95 | 24.8 | 25 | 0.04004 | 0.08953 | 0.36% | 0 |
| 180 | | 5 | 24.84 | 24.73 | 24.95 | 24.8 | 25 | 0.04004 | 0.08953 | 0.36% | 0 |
| Overali | | 30 | 24.84 | 24.81 | 24.87 | 24.8 | 25 | 0.01486 | 0.08137 | 0.33% | 0 (0%) |

| Alkalinity (CaC | O3)-mg/L | | |
|-----------------|----------|----|--|
| Conc-µg/L | Code | 1 | |
| 0 | N | 60 | |
| 20 | | 53 | |
| 40 | | 57 | |
| 80 | | 62 | |
| 140 | | 64 | |
| 180 | | 54 | |

| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | |
|-----------|------|-----|-----|-----|-----|-----|--|
| 0 | N | 453 | 458 | 461 | 466 | 460 | |
| 20 | | 490 | 500 | 510 | 509 | 510 | |
| 40 | | 425 | 429 | 426 | 431 | 435 | |
| 80 | | 412 | 420 | 418 | 419 | 425 | |
| 140 | | 387 | 391 | 393 | 397 | 400 | |
| 180 | | 377 | 378 | 381 | 380 | 388 | |

| 40 | | 720 | 723 | 720 | 701 | 400 | | |
|--------------|-----------|-----|-----|-----|-----|-----|--|--|
| 80 | | 412 | 420 | 418 | 419 | 425 | | |
| 140 | | 387 | 391 | 393 | 397 | 400 | | |
| 180 | | 377 | 378 | 381 | 380 | 388 | | |
| Hardness (Ca | CO3)-mg/L | | | | | | | |
| Conc-µg/L | Code | 1 | | | | | | |
| Ō | NI. | 103 | | | | | | |
| 20 | | 98 | | | | | | |
| | | | | | | | | |

| Conc pg/L | 0000 | • | | | |
|-----------|------|-----|--|--|--|
| Ō | N | 103 | | | |
| 20 | | 98 | | | |
| 40 | | 110 | | | |
| 80 | | 111 | | | |
| 140 | | 110 | | | |
| 180 | | 93 | | | |
| pH-Units | | | | | |

| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | |
|-----------|------|-----|-----|-----|-----|-----|--|
|) | N | 7.8 | 7.7 | 7.8 | 7.8 | 7.8 | |
| 20 | | 7.9 | 7.9 | 7.8 | 7.8 | 7.8 | |
| 40 | | 7.9 | 7.9 | 7.8 | 7.8 | 7.8 | |
| 80 | | 7.9 | 7.8 | 7.8 | 7.8 | 7.8 | |
| 140 | | 7.9 | 7.8 | 7.8 | 7.8 | 7.8 | |
| 180 | | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | |

| Temperature-°0 | С | | | | | | |
|----------------|------|------|------|------|----|------|--|
| Conc-µg/L | Code | 1 | 2 | 3 | 4 | 5 | |
| 0 | N | 24.8 | 24.8 | 24.8 | 25 | 24.8 | |
| 20 | | 24.8 | 24.8 | 24.8 | 25 | 24.8 | |
| 40 | | 24.8 | 24.8 | 24.8 | 25 | 24.8 | |
| 80 | | 24.8 | 24.8 | 24.8 | 25 | 24.8 | |
| 140 | | 24.8 | 24.8 | 24.8 | 25 | 24.8 | |
| 180 | | 24.8 | 24.8 | 24.8 | 25 | 24.8 | |

Patel, Urvashi

From: Baluran, Dwayne < DBaluran@haleyaldrich.com>

Sent: Friday, March 30, 2018 3:25 PM

To: Patel, Urvashi
Cc: Miller, Katherine

Subject: SSFL Boeing - COC 440-206741

Attachments: COC 440-206741 (201803222242)_20180328_DB update.pdf

-External Email-

Hi Urvashi,

Catching up on the recent sampling events that occurred, could you please ensure that sample delivery group **440-206741** (OF009 – Annual Composite) reflects the following:

• COC had no sample time written on; lab listed time in receipt from labels. Updated COC sample times to 15:30, scanned, and is attached here.

If you have any questions feel free to contact me.

Thank you,

Dwayne Baluran, EIT, QSP

Staff Engineer

Haley & Aldrich, Inc.

5850 Canoga Avenue | Suite 400 Woodland Hills, CA 91367

T: (978) 234.5022 C: (818) 224.0704

www.haleyaldrich.com

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440-206741 Chain of Custody

| Client Name/Address | a/Address: | | | | ď | Project: | | | | | | | | | ANALYSIS REQUIRED | IS REC | ZIREC | | | | | | |
|---|---|---|--|--------------------|-------------------|---|-------------|-------------|--|-------------------------|---|--------------------|---|---|-------------------|-----------|--------------|------------|---|-----------------|---------------------|---|-------------|
| Haley & Aldrich | Variety | | | _ | Soeing-S. | Boeing-SSFL NPDES | (A) | | | ┝ | | | | lest (C | _ | | <u> </u> | - | _ | L | _ | | |
| 5333 Missic | 5333 Mission Center Rd Suite 300 | | | | Per | Permit 2018 | | | 'uz | - 6 | | | | 0.00 1 EX | | | | | ····· | | | | _ |
| San Diego, CA 92108 | CA 92108 | | | Annual | | Outfall (003-007, 009, 010) | 39,010 | | ۷, ۲ | | | | - | 63) 63 2 0) | | | _ | | | | | | |
| Test Americ | Test America Contact: Urvashi Patel | | | | ē ° | | | | , se. | | | ıN. | | 5905 0 or mui | | | | | | | | | _ |
| 17461 Derlan Ave Irvine CA 92614 Tel 949-280-3269 | 17461 Dertern Ave Suthe #100 Irvine CA 92614 1949-280-3269 | | | | , | <u> </u> | | | letais 3e, Cr, Fe, 1, Pb, Sb, : | nens) (E19 102-N, Pe | | | als Be, Cr, Fe, 3 u, Pb, Sb, - |), Gross B 0), Sr-90 () 226 (E903 (M.0), Uran 0 or E901 | mudzenek (| N-E \ E3G | +sebicides+ | ale: Mecul | sęa. Welcin | | | Comments | |
| TestAmerica's & Agreement# 201 | UCBI SPENJACHONO. The Commercial services under the Cock with the performed in accordance with the TACs within Steriors Services Agreements 2019: 16-1 redunential by and bokeven I takey & Addrich, Inc., its subsidiaries and efficies, and | nce with the T&Cs within Blanks in C., its subsidenies and officials. | Service | Proje | * Manag | Project Manager: Katherine Miller | ne Militer | | As, B, I Caco: Cd, Ci | | | | | | | | | | | | | | |
| Sampler: | boratories fra. | | | Field | Manage 14 FOR3 | Field Manager: Mark Dominick 978 234 5033 818 589 0702 (cell) | y S | | #A:(7) #B: 889 #B: Ag, | | 2W524 |) S.OBt vlossiC | | (H-3) (H-3) (Sum 22 (Sum 22 | | | | | Alcees/1 | | | | |
| Sample | Semple I.D. | Sampling Data/Time | Sample | Q define | ē ; | Preservative | Bottle | MS/MSD | E200 E200 E200 | 303) 3 ' K | | _ | _ | initiui Imoc Imoc Imoc Imoc Imoc Imoc Imoc Imoc | | | | | 1000 | | | | |
| Description | | | N. | 500 ml. Poly | j 6 | Ş | 8 | _ |) × | Т | | 1 | | | 7 | 4 | ┿ | ╁ | 1 | t | - | | 7 |
| | | * | ــــــــــــــــــــــــــــــــــــــ | 11. Glass Ambe | 7 | None | 15 | ž | | × | | L | - | | | | | Н | Н | | | | |
| | | ~ | ₹ | SOO mil. Poly | 8 | None | 蒄 | 198 | | Ĥ | × | | | | | | | | | | 48 ho | 48 hours Holding Time NO3 & NO2 | |
| | | • | ₹ | 500 mL Poly | F | 202 | \$ | £ | | | × | L | - | | L | | \vdash | - | | | | | |
| | | • | 1 | 1 t. Poly | , | None | 185 | ş | | H | | × | | | H | | Н | | | | | | |
| | | | MM | 500 mL Poly | 3 | NeOH | 220 | Yes | - | _ | | | _ | | | × | | | | | | | П |
| | Certificity 20160327 Comp | * 8000000 | W | 2 5 Galf Cube | e | None | 525 | Yes | | | | | | | Ц | | | | | | Unfilte | Unfiltered and unpreserved enables - Separate DAD outs | |
| | | • | MW. | 1 & Cansa Amber | 8 | None | 730 | , Xee | | | | | | × | | | | | | | thous | another workerder. | |
| | | | | | | | 4 | | | + | 1 | 1 | † | | + | 1 | \dagger | + | 1 | † | Ansk | Analyze dupilcate, not MS/MSD. | Т |
| D- | | , | ž | 1 Oaf Cube | 7, | 2 2 2 | 288 | £ | | | | | | | × | | | | | | 5 6 | Only test if the or second rain events of the year | |
| Outual 009 | | • | MA | 1 L Glass Ambe | 9 | None | 250 | æ | | | L | | | | | | × | | | | | | |
| ~ · | | | | | | | | | 017 | | L | | | | | | | | | | e a | Sample racelying DO NOT OPEN | |
| 2Ω / | | | | Doroelloste vizile | • | HINOS | <u></u> | <u> </u> | Ser Ser | ىد. | | | | | | | | × | | | 9 6 | 84G Bag to be opened in Mercury Prep using deen procedures. | _ |
| of C | | • | ¥ | 11. Poly | | ş | \$ | 3 | | | <u> </u> | \vdash | × | | - | | ┝ | - | | | Page 5 | Filter and preserve win 24hrs of receipt at lab | 1 |
| | | | I | | | | + | | | t | - | - | t | | ╀ | | t | l | - | | - | | Т |
| , | Outhall009_20180322_Comp_F | * 8102/52% | \$ | borosilizita viali | 2 | No. | § | , \$ | | | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | ···· | | | | | | × | | Samp BAG Prep | Sampte receMng DO NOT OPEN BAG Bag to be opened in Mercury Prep using clean procedures. | > |
| | | , | Š | 1 L Glass Ambe | 2 | Spie | 2 | 2 | | - | L | | l | | L | | ┢ | | | | 꾶 | | |
| | Outhali009_20180322_Comp_Extra | 37272018 | W | 500 mL Poly | - | NO. | 35 | ş | | F | I | _ | | | _ | | | _ | | | Hold | | |
| | | • | 35 | 11. Glass Ambe | 2 | None | 992 | £ | | <u> </u> | | | | | | | # | _ | | | 왕 | | |
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| | | • | | | | | Legend | R = Rol | Legend: R = Routine, A = Annual | innual | | | | | | | | | | | | | |
| Relinquished By | By Date/Time | | Сопралу | pany. | , | | Received B | AG DA | ., | å | Date/Time. | , | | | | | un-aro | und time | Turn-around time: (Check) | | | | |
| 1 | | "C/(" - | - | | | , | - | 7 | / | 7 | , | \ \(\disp | 3776 | | | | 24 Hour | | 72 Hour. | 4 | 10 Day: | X X | |
| The | | 1 -111/1/25C | 77 | 1. 1. 1. | 11 | 17.50 | Ď | 1911 | | 17.50 | 50, | | | | | Ì | 48 Hour. | | 5 Dey | | NG. | Normal · | |
| Reinquished B | By Destartine | | 8 | pany. | | | Receiv | kg pa | (| 8 | Date/Time: | | | | | | 1 | 1 | | | | | |
| 7 | 124 S | 1/2/1 | A 0 00 | ب | P | γ, | | \ | | >~ | | | | | | | Intect | i Respirit | Intact: | | . <u>ප</u> රි | | |
| Reimquished | By Date/Time. | | Com | Company: | | | Received By | / Ag pe | m | ā | Date/Time | | _ | | | | Store sa | mples fo | Store samples for 6 months. Data Receirements: (Check) | pi S | | | |
| | | | | | | | | لاد | The state of the s | | | 322 | 2 | 002 | | 2 | No Level IV: | Ë | | | All Level IV | × | |
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CHAIN OF CUSTODY FORM

Page 1 of 2

ANALYSIS REQUIRED

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Project:
Boeing-SSFL NPDES
Permit 2018
Amusi Cutfall (p03-007, 009, 010)
Outfall 009

Only at Outfall 008, 009
Extract within 24 Hours of sampling

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¥ 2 2 2 **8**

R None ₽

1 L Glass Amber 1 L Glass Amber

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Outhalloog_20/80322_Comp_Extra

1 L Glass Amber 500 mt. Paly

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Outral1009_20180322_Comp

Outfail 009

1L Poly

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175 275 88 £ 52

None None

Container Type 11 Glass Amber

Sampling Date/Time

Sample I.D.

270

Comments

(N), Total (E218.6)

Chlorpyrifos, Diazinon (ES25.2) (S.001Aq3) sotsedsA

Priority Pollutants-SVOCs (E625)

Irvine CA 926/4
Tel 949-260-3269
Tel 949-333-9055
Testimenta's services with the Table performed in accordance with the Table with Barket Service Testimenta's services used this coordance with the Table with Barket Service Testimenta by and between Heley & Adrich, inc., its subsidiaries and elifesies, and Testimental Laboratories inc.

San Dieso, CA 92108 Test America Contact: Urvashi Patei 17461 Derlan Ave Sulte #100

5333 Mission Center Rd Suite 300

Haley & Aldrich

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10 Dey: X <u>اون</u> ق Aff Level IV. Store samples for 6 months. Data Requirements: (Chack) 72 Hour Turn-around time: (Check) Semple Integrity: (Check) No Level IV: 24 Hour: 48 Hour: Infact: 2000 17:30 328 Date/Time 322% Legend: R = Routine, A = Annual Thulk Received By eceived By 2000 3-14-/8/ Date/Time. 3-221 Date/Time.

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Test America

Page 89 of 97

4/18/2018

Test America

CHAIN OF CUSTODY FORM

| | | Reimquened by | M | Reimquarted By | - | | | | | 1 | Contain cost | | | | | | | | Bample | Sempler: | TostAmericas Laboratories inc. | TegiAmerica's ser. | Test America Conta 17461 Derian Ave i Irvine CA 92614 Tel 949-280-3269 Cell 949-333-9055 | Haley & Aldrich 5333 Mission Center F San Diego, CA 92108 | Client Name/Address: |
|--|--------|---|---------------------------|--|--|---|------------------------------|---|---|---|---------------------|---|--------------------|--------------------------|--|--|--------------------------|-------------|----------------------|--|---|--|---|--|----------------------|
| | | Date Time | ell 3- | Data/lines | | 55 | Outsi009_20180322_Comp_Extre | CHERRINAS, 20180322, COMP., F | | | + | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | | Outtail009_20180322_Comp | | | | | Sample I.D. | with the standard of the stand | allocke inc. | giAmerica's services under the CoC shall be performed in sucontainne with the TeCs within Service teams and settled a new formation of the CoC shall be performed 2015-10-11 authorized and settled a new formation of the contained and settled a new formation of the contained and settled and the contained and the contai | Test America Contact. Urrestri Patel 7/461 Deritan Ave Sutte #100 vrine CA 92614 Tel 949-290-3269 Jell 949-333-9055 | Haley & Aldrich 5333 Mission Center Rd Suite 300 San Diego, CA 92108 | Address: |
| | | | 18/20 | 2.16/1830 | فيتراث والمرابعة | 15:30 | | 15.30 | | | | 10.00 | יח, טי | 3/22/2018 | | | - | | Sampling Cate/Time | | 6 Tablification of the Annual | on with the Tace within blanks in | | | |
| | | Company | 000 | Company | | MAN | WW WW | WW | MW | | WW | MM | MM | WW | MW | MAA | WW | W | Sample | | 200 | ervice | | | |
| | | any: | C | , i | | 1 L Gipse Amber | 1 L Glass Amber | borossicate viala | 1 L Poty | Dorosticate viale | 1 L Glass Amber | 1 Gal Cube | I L Glaze Amber | 2 6 Gal Cube | 1 L Poly | 500 mL Poly | 500 ml Poly | 500 mL Poly | Container Type | 978 | 520 | Pro | | Annı | |
| × 1.7 | | | 0 | M | | | N W | *** | 3 | 8 | 6 | · No. | | 60 6 | Н | + | + | 3 4 | Cont | 234.503 | 289.860 | ect Manz | Q | Boeing- Pe al Outfall | |
| 3 - 60 | - | | 200 | 13 | | None | None | None | None | HNO | None | None | None | None | None | None | None | FONH | Preservative | 978.234.5033, 818.589.0702 (cell) | 520.289.8606, 520.904.6844 (cell) | Project Manager: Katherine Miller | Comp | Boeing-SSFL NPDES Permit 2018 Annual Outfall [003-007, 009, 010] | onuject: |
| _ | 0 | 3 | | 1 | | Н | | | - | - | 1 | | | Н | \square | 1 | 4 | 1 | | 9.0702 (c | 4.6844 | herme Mi | | 7, 009, 0 | |
| 16-1 | 3 | Received By | recoved sy | A D | and: | H | 110 No | 320 Yes | 195 Yea | 510 | 250 Yes | 236 No | 230 Yes | 226 Yes | 11 | + | 135 Yes | 1 | Bottle MS/MSD | <u>*</u> | (Je | Tor | | Ē | |
| 1 | 4 | A | 0 | Sall 17:30 | Pourtha A | H | | | | French Ste | | | | - | | | - | × | Tota (E20 Haro | Reco | Wera N, As as Ca | ble s, B, aCC | Metais Be, Cr, Fe, Ni, 13 2u, Pb, Sb, Se, 1 | V, Zn, | |
| ~ | - | 0 | × | 13 | 2000 | H | F | | | T. | | | | I | | + | - | - | TCD | D (an | i all c | con | genera) (E1613E | 9 | |
| 6 | 1.6/21 | Date/Time | Usto/ime | 7:30 | | | - | | - | | - | | | - | H | × | * | + | - | (SM2 | _ | | NO2-N, Perchio 60 1) | rate | |
| P | ú . | 3/2 | | | - | I | T | | | | | | | | × | 1 | 1 | İ | 1. | (160. | | | | | |
| • | • | 31/24 | | 1ke-8 | | | | | × | 2.71 | Acres Constitutions | | | | - | | | | (E20 Hard (E20 | 0 7) / 0 7) / Iness (0.8): / | NVed N, As SS Co | Me S, B, BCC Sd, C | tals Be, Cr, Fe, Ni, 13 XI, Pb, Sb, Se, 1 | V, Zn, | |
| | | 02 8 | | * | | *************************************** | | | | | | | * | | | | | | | | | | 0), Gross Beta(E .0), Sr-90 (E905 226 (E903 0 or 04.0), Uranium (1 0 or E901.1) | and any change in | |
| | | 000 | | | | H | + | | | | + | × | | \dagger | H | + | + | + | Chro | - | xicity | 7 - 5 | elenastrum | | ANALYSIS REQUIRE |
| The state of the s | | | = 0 | F 0 4 | | П | I | | | | | | | × | П | 1 | 1 | L | | | _ | - | CN-E / E335 2) | | IS REQ |
| | 1266 | Store sample Data Require No Level IV: | Sample Integrity: (Check) | Turn-around time: 24 Hour 48 Hour. | | Z | + | | | × | × | | _ | + | H | + | + | + | - | | | ***** | Pesticides+PCBs Metals Mercury | | URED |
| Custody | 0 | ples for direment V: | tegnty: (| nd time: | | H | + | × | | | | | | + | H | + | + | + | | | | | tals Meroury (E | | |
| dy | | Store samples for 6 months. Data Requirements: (Check) No Level IV: | Check) | (Check) 72 Hour. 5 Day: | | I | 1 | | | | L | | | I | | 1 | 1 | | | | | | | | |
| A control of the cont | 1000 | All Level IV. | On Ice | 10 Day: X | | Hold | Hold | Sample receiving DO NOT OPEN BAG Bag to be opened in Mercury Prep using clean procedures. | Pilter and preserve with 24hr receipt at lab | Sample receiving DO NOT OPEN BAG Bag to be opened in Mercury Prep using clash procedures. | | Only test if first or second rain events of the year | another workerder. | Unitered and unpreserved | - Annual Control of the Control of t | Principle of the Asset Street Contract Contract Con- | As house Haldes Time Nog | | | | | 80 W. | Comments | A CONTRACTOR OF THE CONTRACTOR | |

16 3/22

Page1 of 2

Test America

CHAIN OF CUSTODY FORM

| Cilent Name/Address: | San Dieen, CA 92108 | Test America Contact: Urvaehi Patei 17461 Derian Ave Suite #100 Irvine CA 92614 Tel 949-290-3269 Cell 949-333-9055 | TestAmentica's denvices under this CoC shall be performed in accordance with the TaCs within Blanket Service | Test/America Leboratories inc. | Sampler: | | Sample Sample I.D. | | 201200 2012022 | Transport of the contract of | | Outfail 009 | T | 9 | | | | | | | | | | | Outhill009, 20180322,5 | Outhail009_20180322_0 | Outsil1009_20180322_5 |
|--|--|--|--|----------------------------------|------------------------------|--|---------------------|-----------------|--------------------------|------------------------------|-------------|--|----------|-----------------|-------|-------------|-------------|--------|------|------|---|--|-----------------------------------|---------------------------|--|--|--|
| The state of the s | | | med in accordance with the T&Cs within Bla | | | - The state of the | Sampling Date/Time | | 2_ | フト | 0000 | 2 | DE 15:30 | | | | | | | | | Deter inno. | | Detertine. | 16 111111111 | 6 11 111 | 26 1111111 |
| | | | anket Service | | | 100 | ne Sample Matrix | MW & | WW P | WW @ | WW . | WA | ww * | - | | | | | | | | Company | Company | Company | Company Company | Compan | Company, |
| | Annual | | Project | 520.28 | Field | - | Container Type | 1 L Glass Amber | 1L Poly | 1 L Glass Amber | 500 mL Poly | | H | 1 L Glass Amber | - | | | ++++++ | | | | | | | | | |
| Project: | Permit 2018 Outfall (003-007 | Comp | Manager | 9.8806, 5. | Manager: | 10000 | Cont. | - | - | a | 3 | 2 | | 2 | N | N | N | N | м | N | | | | | | | |
| Project: Bosing-SSFL NPDES | Permit 2018 Permit 2018 Annual Cutfall (003-007, 009, 010) | ap 9009 | Project Manager: Katherine Miller | 520.289.8806, 520.804.8944 (cell | Field Manager: Mark Dominick | 01 0:20 1:00:00 (| Preservative | None | None | Ţ. | None | None | TO. | . 101 | | 1100 | | | Pro- | | | Legend: R = Routine, A = Annual | egend. R | egend: R | egend. R | egend. | egend. R |
| | , 010 | | Miller | 14 (cell) | rinick | ((voii) | Bottle | - | | 275 | 28 | - | i | 275 | ++- | | | | | | 275 | Routine, A | 275 Populine, Received | 275 Received 6 | Roceived By Received By Receiv | Routine, Rocavari | Received By Received By |
| | | /OC- #==0 | 1 | | | - | CISHUSIN | Yes | ह | Yes | ag a | - | - | 8 8 | +++ | | | +++++ | | | 8 | No No No No No No No No No No No No No N | A s Anni | A s Anni | A a Ami | By Anni | By A Anni By A Anni By A B Anni By By By By By By By By By By By By By |
| - A | | /OCs (E625) | _ | | Poliu os (El | _ | | × | × | | 1 | | I | x | x | x | | | | | | | | | 3 | | - 40 |
| | | on (E525.2) | zino | , D | rifos, | orp | Chlo | | | × | | | | Ξ | 1 = 1 | T I | т . | | | x x | 1 | DawTime × | Dana I | DawTime X | On the Date of the Land of the | Outer Date of the Control of the Con | Onto Date of the Control of the Cont |
| A | | 5) | 218,6 | I (E | Total | VI) | Cr (V | | | | | × | × | × | × | × | × | × | × | × | × | X | Time | | | | |
| | | | | | - | _ | | - | | | 1 | | + | | | | | | | | | | | 7.3. | 77:3, | 7:3. | 1 1 |
| A | | | | | | _ | | | | | 1 | | - | | | | | | | | | | | | | | |
| ALYSIS | | all me | _ | | | _ | | + | - | | + | - | | | | | | | | | | Tun | 17um | 1 Tun | Turn-arrow 24 Hour: 48 Hour: | Turn-q 24 Hou 48 Hou Intact: | Turn 24 H 48 H 26 H 16 |
| ANALYSIS REQUIRED | | | | | | | | | | | 1 | | | | | | | | | | | -around t | -around t | Tury-ground t 24 Hour: | -around t | -around t cour: cour: | -arround t tour: -our: -our: -y: -samples |
| RED | | | | | - you - 2 | | | - | - | - | + | | | | + | | | | | | | Ime: (Clu | Turn-ground times (Cheek) 72 Hour | Inne: (Ch | Turn-around time: (Check) 24 hour: 72 Hour 48 hour: 5 Day: Check) | ilme: (Cha | Turn-around time: (Check) 24 Hour: 72 Hour. 48 Hour: 5 Day: Intact: Check) Intact: Transition of months. Store samples for 6 months. |
| 11 | | •••• | | | | | | 1 | 1 | | + | | + | | | | | | | | | 900) | eely Hour | (Cheek) 72 Hour 5 Day: | peck) peck) peck) peck) peck) peck) peck) peck) peck) | " ⁵ | |
| | | Comments | | | - | - | | | Only at Outfatt 008, 009 | Extract within 24-Hours of | Announce | MARKET TO SERVICE THE PERSON NAMED IN COLUMN N | Hold | Hold | Hold | Hold | Hold | Hold | Hold | Hold | Hold | Hold | Day: | Hold Hold Hold Normal: X | Day: | Day: | Day: |

Page 2 of 2

| Irvine, CA 92614-5817 Phone (949) 261-1022 Fax (949) 260-3297 | | | | | THE LEADER IN EN | THE LEADER IN ENVIRONMENTAL TESTING |
|--|--|---|--|---|---------------------------------------|---|
| Client Information (Sub Contract Lab) | Sampler | Lab | Lab PM: Patel, Urvashi | Carrier Tracking No(s): | COC No: 440-120429.1 | |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: | E-Mail: urvashi patel@testamericainc.com | State of Origin; California | Page: Page 1 of 1 | |
| Company. TestAmerica Laboratories, Inc. | | | Accreditations Required (See note): State Program - California | - | Job #; 440-206741-1 | |
| Address: 880 Riverside Parkway. | Due Date Requested: 4/3/2018 | | Analysis Requested | duested | S | :: |
| City. West Sacramento | TAT Requested (days): | | | | B - NaOH C - Zn Acetate | M - Rexane N - None O - AsNaO2 |
| State, Zip: CA, 95605 | | | IsloT l | | | P - Na204S Q - Na2SO3 R - Na2S2O3 |
| Phone: 916-373-5600(Tel) 916-372-1059(Fax) | PO#, | | Mar | | 70 | S - H2SO4 T - TSP Dodecahydrate |
| | WO#: | | (0) | S | I - Ice J - DI Water | U - Acetone V - MCAA |
| Project Name: Boeing NPDES SSFL outfalls | Project #: 44009879 | | 03 OL V | a en let | K-EDTA L-EDA | W - pH 4-5 Z - other (specify) |
| Site: | SSOW#. | | SD (N | noo Jo | Other: | |
| Samulo Identification . Client ID (1 at 10) | Sample Date Time G | Sample Matrix Type Septid. (C=Comp, Ownwater, Septid. | M/SM mrohe9 | JedmuN letoT | | Special Instructions/Note: |
| Cample recimination - Orient is (Lab is) | X | - 75 | X | × | | |
| O. #501000 20180322 Ccmp (440 206241.1) | 1 | nate/W | * | | × - | See QAS, Boeing_w/u to zero; Use Boeing |
| Outlatious_20 100322_0011p (440-2001 41-1) | J22/10 Pacific | | < | N | glassware. | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Note: Since laboratory accreditations are subject to change, TestAmerica | ca Laboratories, Inc. places the ownership of meth | od, analyte & accreditation | n compliance upon out subcontract laboratories. | This sample shipment is forwarded under | r chain-of-custody. If th | re laboratory does not |
| currently maintain accreditation in the State of Origin listed above for analysis/lests/matrix being analyzed, the samples must be shipped back to the TestAmenica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmenica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmenica Laboratories, Inc. | nalysis/lests/matrix being analyzed, the samples miser current to date, return the signed Chain of Cus | ust be shipped back to the total to the said co | re TestAmerica laboratory or other instructions wi inplicance to TestAmerica Laboratories, Inc. | be provided. Any changes to accreditat | ion status should be bro | ought to TestAmerica |
| Possible Hazard Identification Unconfirmed | | | Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Return To Client Disposal By Lab Archive For Mon | assessed if samples are retain | tained longer than 1 i Archive For | nonth) Months |
| Deliverable Requested: I, II, III, M, Other (specify) | Primary Deliverable Rank: 2 | | Special Instructions/QC Requirements | | | |
| Empty Kit Relinduished by: / | - | , , , | Time: | Method of Shipment: | | |
| Reinfulshadlann Reinfuls Albu | Date/fine | Company | Received by Received by | Date/Time: | 076 3/ | Company (200 |
| Reimquished by: | Date/Time. | Company | Received by: | Date/Time: | | Company |
| Custody Seals Intact: Custody Seal No.: | | | Cooler Temperature(s) [®] C and Other Remarks: | emarks: 7 // | | |

TestAmerica Irvine

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc. Job Number: 440-206741-2

Login Number: 206741 List Source: TestAmerica Irvine

List Number: 1

Creator: Garcia, Veronica G

| Creator: García, Veronica G | | |
|--|--------|-------------|
| Question | Answer | Comment |
| Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td> | True | |
| The cooler's custody seal, if present, is intact. | N/A | Not present |
| Sample custody seals, if present, are intact. | N/A | Not Present |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

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Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc. Job Number: 440-206741-2

Login Number: 206741 List Source: TestAmerica Sacramento
List Number: 3 List Creation: 03/24/18 04:33 PM

Creator: Hytrek, Cheryl

| Creator: Hytrek, Cheryl | | |
|--|--------|------------------------------------|
| Question | Answer | Comment |
| Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td> | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | N/A | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | 2.1 |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | Received project as a subcontract. |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica Irvine

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Isotope Dilution Summary

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

TestAmerica Job ID: 440-206741-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water Prep Type: Total/NA

| | | | Perc | ent Isotope | Dilution Re | covery (Ac | ceptance L | imits) | |
|------------------------|--------------------------|----------|----------|-------------|-------------|------------|------------|----------|----------|
| | | TCDD | TCDF | PeCDD | PeCDF | PeCF | HxCDD | HxDD | HxCDF |
| Lab Sample ID | Client Sample ID | (25-164) | (24-169) | (25-181) | (24-185) | (21-178) | (32-141) | (28-130) | (26-152) |
| 440-206741-1 | Outfall009_20180322_Comp | 83 | 80 | 77 | 78 | 79 | 79 | 83 | 74 |
| MB 320-215317/1-A | Method Blank | 78 | 78 | 79 | 78 | 81 | 80 | 85 | 73 |
| MB 320-215317/1-A - RA | Method Blank | | 74 | | | | | | |
| | | | Perc | ent Isotope | Dilution Re | covery (Ac | ceptance L | imits) | |
| | | HxDF | HxCF | 13CHxCF | HpCDD | HpCDF | HpCDF2 | OCDD | |

| | | | Perc | ent isotope | Dilution Re | covery (Ac | ceptance L | 11111(5) |
|------------------------|--------------------------|----------|----------|-------------|-------------|------------|------------|----------|
| | | HxDF | HxCF | 13CHxCF | HpCDD | HpCDF | HpCDF2 | OCDD |
| Lab Sample ID | Client Sample ID | (26-123) | (29-147) | (28-136) | (23-140) | (28-143) | (26-138) | (17-157) |
| 440-206741-1 | Outfall009_20180322_Comp | 76 | 74 | 73 | 73 | 75 | 73 | 66 |
| MB 320-215317/1-A | Method Blank | 76 | 75 | 73 | 72 | 74 | 72 | 65 |
| MB 320-215317/1-A - RA | Method Blank | | | | | | | |

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD

TCDF = 13C-2,3,7,8-TCDF

PeCDD = 13C-1,2,3,7,8-PeCDD

PeCDF = 13C-1,2,3,7,8-PeCDF

PeCF = 13C-2,3,4,7,8-PeCDF

HxCDD = 13C-1,2,3,4,7,8-HxCDD

HxDD = 13C-1,2,3,6,7,8-HxCDD

HxCDF = 13C-1,2,3,4,7,8-HxCDF

HxDF = 13C-1,2,3,6,7,8-HxCDF

HxCF = 13C-1,2,3,7,8,9-HxCDF

13CHxCF = 13C-2,3,4,6,7,8-HxCDF

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD

HpCDF = 13C-1,2,3,4,6,7,8-HpCDF

HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF

OCDD = 13C-OCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water Prep Type: Total/NA

| | | | Perc | ent Isotope | Dilution Re | covery (Ac | ceptance L | imits) | |
|---------------------|------------------------|----------|----------|-------------|-------------|------------|------------|----------|----------|
| | | TCDD | TCDF | PeCDD | PeCDF | PeCF | HxCDD | HxDD | HxCDF |
| Lab Sample ID | Client Sample ID | (20-175) | (22-152) | (21-227) | (21-192) | (13-328) | (21-193) | (25-163) | (19-202) |
| LCS 320-215317/2-A | Lab Control Sample | 81 | 80 | 78 | 79 | 81 | 80 | 85 | 75 |
| LCSD 320-215317/3-A | Lab Control Sample Dup | 81 | 79 | 78 | 79 | 81 | 95 | 98 | 92 |
| | | | Perc | ent Isotope | Dilution Re | covery (Ac | ceptance L | imits) | |
| | | HxDF | HxCF | 13CHxCF | HpCDD | HpCDF | HpCDF2 | OCDD | |
| Lab Sample ID | Client Sample ID | (21-159) | (17-205) | (22-176) | (26-166) | (21-158) | (20-186) | (13-199) | |
| LCS 320-215317/2-A | Lab Control Sample | 76 | 77 | 74 | 73 | 78 | 74 | 67 | |
| LCSD 320-215317/3-A | Lab Control Sample Dup | 95 | 65 | 90 | 78 | 61 | 76 | 78 | |

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD

TCDF = 13C-2,3,7,8-TCDF

PeCDD = 13C-1,2,3,7,8-PeCDD

PeCDF = 13C-1,2,3,7,8-PeCDF

PeCF = 13C-2,3,4,7,8-PeCDF

HxCDD = 13C-1,2,3,4,7,8-HxCDD

HxDD = 13C-1,2,3,6,7,8-HxCDD

TestAmerica Irvine

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Isotope Dilution Summary

Client: Haley & Aldrich, Inc.

Project/Site: Annual Outfall 009 Comp

HxCDF = 13C-1,2,3,4,7,8-HxCDFHxDF = 13C-1,2,3,6,7,8-HxCDFHxCF = 13C-1,2,3,7,8,9-HxCDF13CHxCF = 13C-2,3,4,6,7,8-HxCDF HpCDD = 13C-1,2,3,4,6,7,8-HpCDDHpCDF = 13C-1,2,3,4,6,7,8-HpCDF HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF OCDD = 13C-OCDD

TestAmerica Job ID: 440-206741-2

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING



| otes: | Therm. ID: AK-2 / AK-3 / AK-4 / AK-5 / H. | | | |
|-------|---|-------|-----|----|
| | Ice Wet Gel | Other | | |
| | Cooler Custody Seal: Sew | | | |
| | Cooler Custody Seal: | | | - |
| | Sample Custody Seal: | | | |
| | Cooler ID: (6+2 | | | |
| | Temp: Observed 24c | | | |
| | From: Temp Blank Sample | Ď | | |
| | | | | |
| | | | | |
| | | Yes | No | NA |
| | Perchlorate has headspace? | ם | | D) |
| | CoC is complete w/o discrepancies? | D) | | |
| | Samples received within holding time? | D | | |
| | Sample preservatives verified? | | | 00 |
| | Cooler compromised/tampered with? | | D | |
| | Samples compromised/tampered with? | | Þ | |
| | Samples w/o discrepancies? | Þ | | |
| | Sample containers have legible labels? | Ø | | |
| | Containers are not broken or leaking? | D | | |
| | Sample date/times are provided. | M | | |
| | Appropriate containers are used? | OF NO | | |
| | Sample bottles are completely filled? | B | | |
| | Zero headspace?* | | | b |
| | Multiphasic samples are not present? | 10 | | |
| | Sample temp OK? | M | | |
| | Sample out of temp? | 0 | (0) | |
| | 2011 11/11 | | 2 | |

Job:

プロ