

March 19, 2024

Ms. Rikki Larson
Environmental Advisor
BP Cherry Point Refinery
4519 Grandview
Blaine, WA 98230

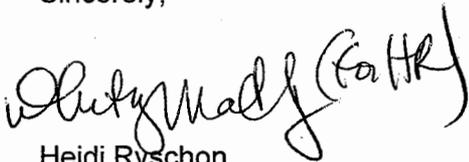
Subject: Results of chronic *Americamysis bahia* 2024 WET test – Rnd2

Ms. Larson:

Enclosed is a copy of the report for the chronic *Americamysis bahia* toxicity test conducted in February / March 2024.

We appreciate the opportunity to complete this study for BP Cherry Point. Please do not hesitate to call if you have any questions.

Sincerely,



Heidi Ryschon
Data Analyst
ryschonhl.tre@gmail.com



Rami B. Naddy, Ph.D.
Manager / Environmental Toxicologist
naddyrb.tre@gmail.com

Attachment:

14001-056-255

Report of Short-term Chronic Toxicity Testing using Mysids (*Americamysis bahia*)

**Project ID: 14001-056-255
February / March 2024**

Sponsor and Laboratory Information

Sponsor	BP Cherry Point Refinery 4519 Grandview Blaine, WA 98230
Project Officer	Rikki Larson (360) 812-4056
Testing Facility	TRE Environmental Strategies, LLC 100 Racquette Drive, Unit A Fort Collins, CO 80524 Fax: (970) 490-2963 State of Florida NELAP Laboratory ID: E87972 Washington DOE Laboratory ID: C566
Study Director	Rami B. Naddy, Ph.D. (970) 416-0916 email: naddyrb.tre@gmail.com
Report Author	Heidi Ryschon (970) 416-0916 email: ryschonhl.tre@gmail.com

Test Information

Test Basis	Short-Term Chronic under Static-Renewal Conditions USEPA (2002), method 1007.0 and Washington Department of Ecology (2016)
Test Dates and Time	February 27, 2024 @ 1400 to March 5, 2024 @ 1310
Test Length	7 days
Species	<i>Americamysis bahia</i>
Test Material	Effluent (Grab)
Facility	Cherry Point Refinery
Permit Number	WA-002290-0
Receiving Water	Strait of Georgia
Dilution Water	Synthetic Sea Water (Crystal Sea; target 25‰)
Concurrent Control Water	None
Test Concentrations	0 (control), 0.8, 2.4, 3.6, 7.2, and 10.8% effluent
Adjusted CCEC	0.8%
Permit Compliance	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

- Results described in this report apply only to the samples submitted to the laboratory and analyzed, as listed in the report
- Test results comply with The NELAC Institute (TNI) standards. Reports are intended to be considered in their entirety; TRE is not responsible for consequences arising from use of a partial report
- This report contains 7 pages plus 2 appendices

Effluent Collection and Receipt

Sample No.	Field No.	Collection Date & Time	TRE No.	Date of Receipt	Temp. at Arrival (°C)	Qual.
1	NA	02/26/24 @ 0915 – 0917	39020	02/27/24	3.5	
2	NA	02/28/24 @ 1012 – 1014	39033	02/29/24	3.6	
3	NA	03/01/24 @ 0902 – 0905	39039	03/02/24	4.2	

Note: See Appendix A for chain of custody records

Sample Characterization (as Received)

Sample No.	pH	Hard. (mg/L) ^{HA}	Alk. (mg/L) ^{HA}	Salinity (‰)	TRC (mg/L) ^G	NH ₃ -N (mg/L)
1	7.5	226	69	8	0.05	<1.0
2	7.3	220	53	6	0.06	<1.0
3	7.3	132	39	6	0.07	<1.0

Sample Characterization (after Salt Addition)

Sample No.	pH	Hard. (mg/L) ^{HA}	Alk. (mg/L) ^{HA}	Salinity (‰)	TRC (mg/L) ^G	NH ₃ -N (mg/L)
1	8.9	4,600	118	26	NM	NM
2	8.6	3,000	124	25	NM	NM
3	8.4	3,300	100	26	NM	NM

NM = not measured

Initial Dilution/Control Water Characterization

Batch No.	pH	Hard. (mg/L) ^{HA}	Alk. (mg/L) ^{HA}	Salinity (‰)	TRC (mg/L) ^G	NH ₃ -N (mg/L)
15259	8.8	4,300	122	25	<0.02	<1.0

Note: The dilution water was prepared by adding Crystal Sea salts to deionized (Milli-Q) water to a target salinity of 25‰

Test Conditions

Type	Static-Renewal Short-term Chronic	
Test Endpoints	Survival and growth	
Test Chambers	384-ml plastic cups	
Test Solution Volume	200 ml	
Replicates per Treatment	8	
Organisms per Replicate	5	
Test Temperature	26 ± 1°C (≤ 3°C differential)	
Lighting	Fluorescent, 16 hours light:8 hours dark	
Chamber Placement	Random according to computer-generated chart	
Aeration?	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes
Test Solution Renewal	Daily	

Test Organism

Species	<i>Americamysis bahia</i>
Age	7 days
Source	Aquatic BioSystems, Inc. (ABS); Fort Collins, CO (TRE Lot # 24-007)
Acclimation	None
Feeding	Fed 0.05 ml brine shrimp nauplii per test chamber 3x daily
Reference Toxicant Testing	Initiated February 27, 2024 using potassium chloride (KCl)

TEST RESULTS

Biological Data – Survival

Treatment (% Effluent)	Percent Survival of <i>Americamysis bahia</i>						
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
0 (Control)	100	97.5	97.5	97.5	97.5	97.5	97.5
0.8	100	100	100	100	100	100	100
2.4 ^{x2}	100	100	100	100	100	97.5	97.5
3.6 ^{x2}	100	100	100	96.9	96.9	96.9	96.9
7.2	100	100	100	100	100	100	100
10.8 ^{x2}	100	100	97.5	97.5	97.5	97.5	97.5

Note: See Appendix B for copies of laboratory data sheets

Biological Data – Growth (Dry Weight)

Treatment (% Effluent)	Mean Dry Weight/Original Organism (mg) ^{w1}	Significant Reduction Relative to the Dilution Water Control?	Mean Dry Weight/ Surviving Organism (mg) ^{w2}	Signification Reduction Relative to the Dilution Water Control?
0 (Dilution Water Cont.)	0.264	NA	0.270	NA
0.8	0.285	No	0.285	No
2.4	0.292	No	0.301	No
3.6	0.237	No	0.246	No
7.2	0.242	No	0.242	No
10.8	0.183	Yes	0.188	Yes
Percent Minimum Significant Difference (PMSD)	14.2	NA	13.5	NA

Note: See Appendix B for copies of laboratory data sheets

Data Analysis and Test Endpoints

Biological Endpoint	Statistical Endpoint	Value (% Effluent)	Endpoint < CCEC?
Survival	NOEC	10.8	No
	LOEC	>10.8	---
	IC ₂₅	>10.8	No
Growth (per original organism)	NOEC	7.2	No
	LOEC	10.8	---
	ChV	8.82	---
	IC ₂₅ (95% CI)	9.05 (7.69-9.87)	No
Growth (per surviving organism)	NOEC	7.2	No
	LOEC	10.8	---
	ChV	8.82	---

NOEC = No Observed Effect Concentration
 LOEC = Lowest Observed Effect Concentration
 ChV = Chronic Value
 IC₂₅ = 25% Inhibition Concentration
 Note: Analyses completed using, where appropriate, CETIS version 1.8.7 (2014).

Physical and Chemical Data

Treatment (% Effluent)	pH		Dissolved Oxygen (mg/L)		Salinity (‰)		Temperature (°C)		Qual.
	Low	High	Low	High	Low	High	Low	High	
0 (Control)	7.7	8.8	4.5	6.9	24	26	24	26	
10.8	7.7	8.9	3.6	6.9	24	26	24	26	O3
All Treatments	7.5	8.9	≥3.5		NA		24	26	T3, O3
							24	26	T4

Reference Toxicant Test Results for *A. bahia*

7-day IC ₂₅ (g KCl/L)	TRE Historical 95% Control Limits (g KCl/L)	
	Low	High
0.24	0.096	0.63

Power Standards Calculation

The power standard criterion for the WET test was met for this study (Appendix D).

References

CETIS. 2014. Comprehensive Environmental Toxicity Information System. User Guide (version 1.8.7). Tidepool Scientific, LLC. McKinleyville, CA.

USEPA. 2002. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to marine and estuarine organisms. Third Edition, EPA-821-R-02-014.

WDOE. 2016. Whole effluent toxicity testing guidance and test review criteria. Washington State Department of Ecology, Publication #WQ-R-95-80. Revised December 2016.

Explanation of Qualifiers

Note: study-specific narratives within the body of the report are denoted, if necessary, with the superscript letters **a - d**, and associated footnotes. Other qualifications and definitions are defined below.

- S - Sample temperature upon receipt was outside the range recommended by USEPA (2002), (i.e., 0 to 6°C or ambient if collected and used on the same day).
- I - Ice was present in the sample upon receipt.
- N1 - Sample was not used for testing.
- N2 - Liquid from container with ice was not used for testing.
- F - Sample was filtered to remove indigenous organisms prior to use.
- HT - Sample hold time (normally 36 hours) was exceeded.
- HA - Hardness and alkalinity concentrations are presented as CaCO₃.
- G - TRC = Total Residual Chlorine
- T1 - Temperatures measured in some of the old test solutions were outside the recommended test temperature range but the allowed 3°C differential was not exceeded.
- T2 - Temperatures measured in some of the old test solutions were outside the recommended test temperature range and the allowed 3°C differential was exceeded.
- T3 - Temperatures measured in test solutions.
- T4 - Continuous temperatures measured in the environmental chamber or water bath.
- X1 - Mean young per original female. If any 4th or higher broods were produced, they were excluded from calculation of mean young per female and statistical analysis of reproduction.
- X2 - One or more organisms in this treatment were lost or not found in the test chamber and were excluded from analysis, as the loss was attributed to technician error. See laboratory data sheets for additional detail, as appropriate.
- X3 - One or more male *C. dubia* were found in this treatment and were included in analysis of survival but excluded from analysis of reproduction. See laboratory data sheets for additional detail, as appropriate.
- X4 - One or more fish were alive at test termination but were lost during the drying/weighing process. These fish were included in analysis of survival but excluded from analysis of growth. See laboratory data sheets for additional detail, as appropriate.
- O1 - Dissolved oxygen concentrations were ≤ 4.0 mg/L in one or more treatments during the test; aeration was initiated in all test chambers. See laboratory data sheets for additional detail, as appropriate.
- O2 - Dissolved oxygen concentrations ≤ 4.0 mg/L were observed in one or more treatments only at test termination.
- O3 - Dissolved oxygen concentrations were ≤ 4.0 mg/L in one or more treatments during the test but aeration was not possible. See laboratory data sheets for additional detail, as appropriate.
- W1 - Weight per original number of organisms introduced at test initiation.
- W2 - Weight per surviving number of organisms at test termination.
- V1 - Value was statistically ($\alpha=0.05$ or 0.01, as appropriate) reduced relative to the control, but was considered a Type I error (anomalous false positive), and was disregarded. The NOEC was interpreted accordingly.
- V2 - Value was not statistically ($\alpha=0.05$ or 0.01, as appropriate) less than the control, but was considered a Type II error (anomalous false negative). The NOEC was interpreted accordingly.
- P1 - PMSD was below the lower bound indicated by USEPA (2002). A statistically significant reduction for a treatment was disregarded if the RPD for that treatment was less than the lower bound.
- P2 - PMSD was above the upper bound indicated by USEPA (2002), and statistically significant reductions in organism performance were detected.
- P3 - PMSD was above the upper bound indicated by USEPA (2002), and no statistically significant reductions in organism performance were detected.
- R - Monthly reference toxicant test endpoint for this species was outside the 95% control limits for the 20 most recent endpoints.

Statement of Quality Assurance

The test data were reviewed by the Quality Assurance Unit to assure that the study was performed in accordance with the protocol (if applicable) and standard operating procedures, and that the resulting data and report meet the requirements of TNI standards. This report is an accurate reflection of the raw data.

Chris Beddel for RBN
Quality Assurance Unit

3/19/2024
Date

Christy Mady (for HR)
Data Analyst

03/19/2024
Date

APPENDIX A
Chain of Custody Records

APPENDIX B

Test Data

QA 3/15/24

TOXICITY DATA PACKAGE COVER SHEET

Test Type: Chronic

Project Number: 14001-056-255

Test Substance: Effluent

Species: Americamysis bahia

Dilution Water Type: Salt water @ 25 ‰ ± 2 ppt

Organism Lot or Batch Number: 24-007

Concurrent Control Water Type: NA

Age: 7 days (7 days) Supplier: ABS

Date and Time Test Began: 2/27/24 @ 1400

Date and Time Test Ended: 3/4/24 @ 1310

Protocol Number: USEPA 2002, method 1007.0

Investigator(s): JH/MW/SS/MS/AT/ND/LW/RS

Background Information

Type of Test: Static-Renewal

pH control?: Yes No

If yes, give % CO₂: NA

Test Temperature: 26 ± 1 °C

Env. Chmbr/Bath #: 1 Test Chmbrs: 384-ml plastic cups

Photoperiod: 16 h light : 8 h dark

Light Intensity: 50 -- 100 ft.-c

Test Solution Vol.: 150 ml

Number of Replicates per Treatment: 8

Length of Test: 7 days 0.5 1

Number of Organisms per Replicate: 5

Type of Food and Quantity per Chamber: 0.10 ml B.S. AM+NOON Feeding Frequency: 3 x Daily

0.20 ml B.S. PM

Test Substance Characterization Parameters and Frequency:

Hardness: Sx Receipt Alkalinity: Sx Receipt NH₃: Sx Receipt TRC: Sx Receipt

pH: Daily Salinity: Daily

Test Concentrations (Volume:Volume): Control, 0.8, 2.4 3.6, 7.2, and 10.8% effluent

Agency Summary Sheet(s)?: NA

Reference Toxicant Data:	Test Dates: <u>2/27/24</u> to <u>3/5/24</u>	IC ₂₅ : <u>0.24</u>
Hist. 95% Control Limits:	<u>0.096</u> to <u>0.63</u>	Method for Determining Ref. Tox. Value: <u>Linear Interpolation</u>

Special Procedures and Considerations:
D.O. maintained ≥ 4.0 mg/L
Study Director Initials: <u>ABS for RSN</u> Date: <u>2/27/24</u>

1 JH 2/27/24:6 1 NB 3/5/24E

TEST SUBSTANCE USAGE LOG

AW
 3/18/24

Project Number: 14001-056-255

	Sample 1	Sample 2	Sample 3
Test Substance Number	39020	39033	39039
Test Substance Collection Date and Time	From: 2/26/24 @ 0915	From: 2/28/24 @ 1012	From: 3/1/24 @ 0902
	To: 2/26/24 @ 0917	To: 2/28/24 @ 1014	To: 3/1/24 @ 0905
Sample Type (Grab or Comp)	6066	Grab	Grab
Date Test Substance Received	2/27/24	2/29/24	3/2/24
Dilution Water Number RW# or TRE#, circle one	15259	15259 152600	15259
Concurrent Control Water RW#	NA	NA	NA
Date(s) Used	2/27/24	2/29/24	3/2/24
	2/28/24	3/1/24	3/3/24
			3/4/24

Preparation of Test Solutions

Test Substance Conc. (% Effluent)	Test Substance Volume (ml)	Dilution Water Volume (ml)	Total Volume (ml)	Test Substance Volume (ml)	Dilution Water Volume (ml)	Total Volume (ml)	Test Substance Volume (ml)	Dilution Water Volume (ml)	Total Volume (ml)
Control	0	0	1200						
0.8%	10	1190	1200						
2.4%	29	1171.2	1200						
3.6%	43	1156.8	1200						
7.2%	86	1113.6	1200						
10.8%	130	1070	1200						
Total	298	5702	7200						
Initials / Date	JH 2/27/24 Mixed MUC								
Initials / Date	MB 2/28/24 " "								
Initials / Date	JS 2/29/24 " "								
Initials / Date	MB 3/1/24 " "								
Initials / Date	AW 3/2/24 " "								
Initials / Date	WT 3/3/24 " "								
Initials / Date	MB 3/4/24 " "								
Initials / Date									

WSS 2/29/24JE

**MYSID (AMERICAMYSIS BAHIA)
 CHRONIC BIOLOGICAL DATA**

CA W 3/14/24

Project Number: 14001-056-255

%Conc.	Test Replicate	Number of Surviving Organisms								% Survival	Remarks	
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7			
Control	A	5	5	5	5	5	5	5	5	5	97.5	
	B	5	5	5	5	5	5	5	5	5		
	C	5	5	5	5	5	5	5	5	5		
	D	5	5	5	5	5	5	5	5	5		
	E	5	5	5	5	5	5	5	5	5		
	F	5	5	5	5	5	5	5	5	5		
	G	5	5	4	4	4	4	4	4	4		
	H	5	5	5	5	5	5	5	5	5		
0.8%	A	5	5	5	5	5	5	5	5	5	100	
	B	5	5	5	5	5	5	5	5	5		
	C	5	5	5	5	5	5	5	5	5		
	D	5	5	5	5	5	5	5	5	5		
	E	5	5	5	5	5	5	5	5	5		
	F	5	5	5	5	5	5	5	5	5		
	G	5	5	5	5	5	5	5	5	4 ^A		^A 1 org eaten 4/4
	H	5	5	5	5	5	5	5	5	5		
2.4%	A	5	5	5	5	5	5	5	5	5	97.5	
	B	5	5	5	5	5	5	5	5	5		
	C	5	5	5	5	5	5	5	4 [~]	4		[~] 1 org NF
	D	5	5	5	5	5	5	5	5	5		
	E	5	5	5	5	5	5	5	5	5		
	F	5	5	5	5	5	5	5	5	4 ^A		^A 1 org eaten
	G	5	5	5	5	5	5	5	5	5		
	H	5	5	5	5	5	5	5	5	5		
Date:	2/27/24	2/28/24	2/29/24	3/1/24	3/2/24	3/3/24	3/4/24	3/5/24				
Time:	1400	1010	1530	1520	1415	1015	1000	1310				
Initials:	JH/ML	MB	JS	MD	AW	WT	MD	MB				

**MYSID (AMERICAMYSIS BAHIA)
 CHRONIC BIOLOGICAL DATA**

GA [✓] 3/14/14

Project Number: 14001-056-255

%Conc.	Test Replicate	Number of Surviving Organisms								% Survival Remarks
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
3.6%	A	5	5	5	5	3 ⁿ	3	3	3	~1 org eaten, 1 org NF
	B	5	5	5	5	5	5	5	5	
	C	5	5	5	5	5	5	5	5	96.9
	D	5	5	5	5	5	5	5	5	
	E	5	4 ⁿ	4	4	4	4	4	4	~1 org eaten
	F	5	4 ⁿ	4	4	4	4	4	4	~1 org eaten
	G	5	5	5	5	5	5	5	5	
	H	5	5	5	5	5	5	5	5	
7.2%	A	5	5	5	5	5	5	5	5	100
	B	5	5	5	5	5	5	5	5	
	C	5	5	5	5	5	5	5	5	
	D	5	5	5	5	5	5	5	5	
	E	5	5	5	5	5	5	5	5	
	F	5	5	5	5	5	5	5	5	
	G	5	5	5	5	5	5	5	5	
	H	5	5	5	5	5	5	5	5	
10.8%	A	5	5	5	5	5	5	5	5	96.5
	B	5	5	5	5	5	5	5	5	
	C	5	5	5	5	5	5	5	5	
	D	5	5	5	5	5	5	5	5	
	E	5	5	5	5	5	5	5	5	
	F	5	5	5	5	5	5	5	5	
	G	5	5	5	5	5	5	5	5	
	H	5	3	3	4 ^o	4	4	4	4	
Date:	2/24/14	2/28/14	2/29/14	3/1/14	3/2/14	3/3/14	3/4/14	3/5/14		
Time:	1400	1010	1530	1520	1415	1015	1000	1310		
Initials:	JH/MB	MB	JS	M3	AIW	WT	MB	M3		

CHRONIC CHEMICAL DATA (INITIAL)

GA ✓
 3/18/24

Project Number: 14001-056-255

Test Species: *Americamysis bahia*

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Meter #	Remarks
Conc.: Control									All Conc.	
pH	8.0	8.7	8.1	8.6	8.5	8.4	8.2		19	
D.O. (mg/L)	6.5	6.9	7.36 ⁴	6.7	6.4	6.6	6.6		17	
Temp. (°C)	25	25.6	25	25.6	25	25	26		44	
Salt. (ppt)	25	25	25	26	25	25	26		#2	
Hard. (mg/L)	4300				4400				Titr.	
Alk. (mg/L)	122				120				Titr.	
TRC (mg/L)	60.2				60.02				#21	
NH ₃ (mg/L)	<1.0				<1.0				#1	
Conc.: 0.8%										
pH	8.0	8.7	8.1	8.6	8.6	8.4	8.2			
D.O. (mg/L)	6.6	6.9	7.46 ²	6.6	6.6	6.6	6.7			
Temp. (°C)	*	*	*	*	*	*	*			
Salt. (ppt)	25	25	25	25	25	25	26			
Hard. (mg/L)										
Alk. (mg/L)										
TRC (mg/L)										
NH ₃ (mg/L)										
Conc.: 2.4%										
pH	8.0	8.7	8.2	8.7	8.6	8.4	8.2			
D.O. (mg/L)	6.7	6.9	7.4	6.7	6.6	6.6	6.6			
Temp. (°C)	*	*	* ^{6.2}	*	*	*	*			
Salt. (ppt)	25	25	25	25	25	25	26			
Hard. (mg/L)										
Alk. (mg/L)										
TRC (mg/L)										
NH ₃ (mg/L)										
Conc.: 3.6%										
pH	8.9	8.7	8.2	8.6	8.6	8.4	8.2			
D.O. (mg/L)	6.7	6.9	7.96 ²	6.7	6.7	6.7	6.6			
Temp. (°C)	*	*	*	*	*	*	*			
Salt. (ppt)	25	25	25	25	25	25	26			
Date:	2/17/24	2/28/24	2/29/24	3/1/24	3/2/24	3/3/24	3/4/24			
Time:	1355	1000	1510	1515	1405	1005	0950			
Initials:	H	MB	S	MB	AW	WT	MB			

Note: Hardness, alkalinity, TRC, and NH₃ data appearing on this page have been transcribed from the wet chemistry log QA Form No. 084.

*Dilution/control water and effluent were brought to 20°C prior to making the dilution series. The temperature of resulting effluent dilution is assumed to also be 20°C.

① JS 2/24/24; E (wrong mode)
 ② MB 3/1/24 E

QA
 3/18/24

CHRONIC CHEMICAL DATA (INITIAL)

Project Number: 14001-056-255

Test Species: *Americamysis bahia*

%	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Meter #	Remarks
Conc.: 7.2%									All Conc.	
pH	8.9	8.7	8.2	8.5	8.6	8.4	8.3			
D.O. (mg/L)	0.7	6.9	7.962	6.7	6.8	6.6	6.6			
Temp. (°C)	*	*	*	*	*	*	*			
Salt. (ppt)	25	25	25	25	25	26	26			
Conc.: 10.8%										
pH	8.9	8.7	8.2	8.5	8.6	8.4	8.3			
D.O. (mg/L)	0.7	6.9	7.260	6.7	6.7	6.6	6.5			
Temp. (°C)	*	*	*	*	*	*	*			
Salt. (ppt)	25	25	25	25	25	26	26			
Conc.: 100%	Salted									
pH	8.9		8.6		8.4					
D.O. (mg/L) cond	34600		34600		31100					
Temp. (°C)	25	25.6	25	26	26	26	26			
Salt. (ppt)	26									
Hard. (mg/L)	4600		2200		3300					
Alk. (mg/L)	118		53		100					
TRC (mg/L)										
NH ₃ (mg/L)										
Conc.: 100%	Ambient	Salt	Amb	Salt	Amb	Salt			E/Salted	
pH	7.5	8.4	7.3	8.6	7.3				8.9	
D.O. (mg/L)										
Temp. (°C) cond									cond 34,600	
Salt. (ppt)	8	26	6	25	6				4600	26 ppt
Hard. (mg/L)	226		220	3000	132				5200	
Alk. (mg/L)	69		53	124	39				118	
TRC (mg/L)	0.05		0.06		0.07					
NH ₃ (mg/L)	<1.0		1.0		<1.0					
Date:	2/27/24	2/28/24	2/29/24	3/1/24	3/2/24	3/3/24	3/4/24			
Time:	1355	1000	1516	1517	1405	1005	0950			
Initials:	JH	MB	SS	MB	ALW	WT	MB			

Note: Hardness, alkalinity, TRC, and NH3 data appearing on this page have been transcribed from the wet chemistry log QA Form No. 084.

*Dilution/control water and effluent were brought to 20°C prior to making the dilution series. The temperature of resulting effluent dilution is assumed to also be 20°C.

① SS 2/29/24; E (turning mode) ② MB 2/29/24; 3000, 124 ③ MB 3/1/24 E
 ④ MB 3/1/24

QA
 3/18/24

CHRONIC CHEMICAL DATA (FINAL)

Project Number:	14001-056-255
Test Species:	<i>Americamysis bahia</i>

%	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Meter #	Remarks
Conc.: Control									All Conc.	
pH	8.2	7.9	7.8	7.8	8.1	7.9	7.7		19	
D.O. (mg/L)	6.2	6.5 ^{5.5}	4.5	4.9	5.2	5.3	4.5		17	
Temp (°C)	24	24	24	24	25	25	24		145	
Salt. (ppt)	26	25	25	24	25	24	26		2	
Conc.: 0.8%										
pH	8.2	7.8	7.8	7.8	8.0	7.9	7.7			
D.O. (mg/L)	6.0	5.8 ^{4.6}	4.5	4.4	5.3	4.7	3.8			
Temp (°C)	24	24	24	24	25	25	24			
Salt. (ppt)	26	25	25	25	25	24	26			
Conc.: 2.4%										
pH	8.3	7.8	7.7	7.9	8.0	7.9	7.7			
D.O. (mg/L)	5.3	5.9 ^{4.8}	3.7	4.5	5.3	4.7	3.5			
Temp (°C)	24	24	24	24	24	25	24			
Salt. (ppt)	26	25	25	25	25	24	26			
Conc.: 3.6%										
pH	8.3	7.8	7.8	7.9	8.0	7.9	7.7			
D.O. (mg/L)	5.8	4.4	4.0	4.6	5.4	4.7	3.6			
Temp (°C)	24	24	24	24	25	25	24			
Salt. (ppt)	26	25	25	25	25	24	25			
Conc.: 7.2%										
pH	8.3	7.8	7.8	7.9	8.0	7.9	7.7			
D.O. (mg/L)	5.7	4.6	3.7	4.5	5.4	4.9	3.6			
Temp (°C)	24	24	24	24	25	25	24			
Salt. (ppt)	26	25	25	25	25	24	25			
Conc.: 10.8%										
pH	8.3	7.8	7.8	7.9	8.0	7.9	7.7			
D.O. (mg/L)	5.8	4.8	4.1	4.7	5.5	5.1	3.6			
Temp (°C)	24	24	24	24	25	25	24			
Salt. (ppt)	26	26	25	24	24	24	24			
Date:	2/28/24	2/29/24	3/1/24	3/2/24	3/3/24	3/4/24	3/5/24			
Time:	1000	1510	1515	1405	1005	0950	1310			
Initials:	MB	JS	MB	AW	WT	MB	MS			

055 2/29/24; E (wrong mode)

DAILY TOXICITY TEST LOG

QA
 3/18/24

Project Number:	14001-056-255
Test Species:	<i>Americamysis bahia</i>

General Comments	Feeding	Initials/Date
Random Chart: Thermometer# <u>M-32</u>	0.05 ml B.S. 3 X Daily	
Test Day 0 Test Solution Mixed at: 1350 Test Organisms Added at: 1400	Fed @ Δ 1700 AIW	JH 2/27/24
Test Day 1 Real Time Temp= 25 °C Range (Min-Max) = 25-26 °C	Fed @ Δ 0815 JS Δ 1145 AI Δ 1600 JS	MB 2/28/24
Test Day 2 Real Time Temp= 25 °C Range (Min-Max) = * - 25 °C	Fed @ Δ 0835 JS Δ 1145 AIW Δ 1645 JS	JS 2/29/24
Test Day 3 Real Time Temp= 25 °C Range (Min-Max) = 24-26 °C	Fed @ Δ 0840 JS Δ 1230 AI Δ 1620 JS	MB 3/1/24
Test Day 4 Real Time Temp= 26 °C Range (Min-Max) = * - 26 °C	Fed @ Δ 0830 AIW Δ 1130 ND Δ 1530 ND	AIW 3/2/24
Test Day 5 Real Time Temp= 26 °C Range (Min-Max) = 24-26 °C	Fed @ Δ 0855 AI Δ 1130 AI Δ 1530 AI	WT 3/3/24
Test Day 6 Real Time Temp= 25 °C Range (Min-Max) = * - 26 °C	Fed @ Δ 0830 AI Δ 1130 AI Δ 1540 AI	MB 3/4/24
Test Day 7 Real Time Temp= 25 °C Range (Min-Max) = 24-26 °C	Fed @ Δ 0830 JS Δ 0850 JS	MB 3/5/24
Test Day 8 Real Time Temp= °C Range (Min-Max) = °C		

○ JS 3/5/24; E

SA m 3/14/24

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

Project Number: 14001-056-255 Test Substance Effluent Species A. bahia Oven #: 3
 Balance ID: Sartorius #1 Analyst Tare: JS from Date: 3/5/2024 Time: 1500
 Date/Time of Tare Wt: 3/5/24 @0950 Analyst Gross: AT/MB to Date: 3/6/2024 Time: 825
 Date/Time of Gross Wt: 3/10/24 @1445
 (options: Wet, Blot Dry, Dry (60-90°C), Dry (>100°C), AFDW (>500°C))

Weight Type: Dry (60-90C)

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Orig. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Control	A		1.16873	1.16991	0.00118	0.00136	5	0.272	0.2640	5	0.272	0.2702
	B		1.17145	1.17277	0.00132	0.00150	5	0.300		5	0.300	
	C		1.17595	1.17692	0.00097	0.00115	5	0.230		5	0.230	
	D		1.17628	1.17755	0.00127	0.00145	5	0.290		5	0.290	
	E		1.17728	1.17865	0.00137	0.00155	5	0.310		5	0.310	
	F		1.17730	1.17839	0.00109	0.00127	5	0.254		5	0.254	
	G		1.17700	1.17781	0.00081	0.00099	5	0.198		4	0.248	
	H		1.17180	1.17291	0.00111	0.00129	5	0.258		5	0.258	
0.80%	A		1.17711	1.17832	0.00121	0.00139	5	0.278	0.2848	5	0.278	0.2848
	B		1.17113	1.17236	0.00123	0.00141	5	0.282		5	0.282	
	C		1.17713	1.17853	0.00140	0.00158	5	0.316		5	0.316	
	D		1.17482	1.17619	0.00137	0.00155	5	0.310		5	0.310	
	E		1.17177	1.17293	0.00116	0.00134	5	0.268		5	0.268	
	F		1.16819	1.16954	0.00135	0.00153	5	0.306		5	0.306	
	G		1.17002	1.17076	0.00074	0.00092	4	0.230		4	0.230	
	H		1.16899	1.17025	0.00126	0.00144	5	0.288		5	0.288	
2.4%	A		1.17803	1.17915	0.00112	0.00130	5	0.260	0.2922	5	0.260	0.3008
	B		1.18018	1.18154	0.00136	0.00154	5	0.308		5	0.308	
	C		1.17823	1.17943	0.00120	0.00138	5	0.276		4	0.345	
	D		1.16419	1.16555	0.00136	0.00154	5	0.308		5	0.308	
	E		1.17769	1.17870	0.00101	0.00119	5	0.238		5	0.238	
	F		1.18339	1.18432	0.00093	0.00111	4	0.278		4	0.278	
	G		1.16273	1.16415	0.00142	0.00160	5	0.320		5	0.320	
	H		1.17452	1.17609	0.00157	0.00175	5	0.350		5	0.350	

Sam 3/14/24

Project Number:	14001-056-255		Test Substance		Effluent		Species	A. bahia	0.2372	0.283	0.2460
4%	A	1.17760	1.17827	0.00067	0.00085	4	0.213	3	0.283	0.2460	
	B	1.16440	1.16544	0.00104	0.00122	5	0.244	5	0.244		
	C	1.17686	1.17778	0.00092	0.00110	5	0.220	5	0.220		
	D	1.17781	1.17856	0.00075	0.00093	5	0.186	5	0.186		
	E	1.17107	1.17189	0.00082	0.00100	4	0.250	4	0.250		
	F	1.16728	1.16800	0.00072	0.00090	4	0.225	4	0.225		
	G	1.17201	1.17330	0.00129	0.00147	5	0.294	5	0.294		
	H	1.17707	1.17822	0.00115	0.00133	5	0.266	5	0.266		
7%	A	1.17356	1.17480	0.00124	0.00142	5	0.284	5	0.284	0.2418	
	B	1.17229	1.17313	0.00084	0.00102	5	0.204	5	0.204		
	C	1.17482	1.17566	0.00084	0.00102	5	0.204	5	0.204		
	D	1.17006	1.17115	0.00109	0.00127	5	0.254	5	0.254		
	E	1.17004	1.17126	0.00122	0.00140	5	0.280	5	0.280		
	F	1.17548	1.17666	0.00118	0.00136	5	0.272	5	0.272		
	G	1.17242	1.17336	0.00094	0.00112	5	0.224	5	0.224		
	H	1.16777	1.16865	0.00088	0.00106	5	0.212	5	0.212		
11%	A	1.17560	1.17640	0.00080	0.00098	5	0.196	5	0.196	0.1875	
	B	1.17564	1.17643	0.00079	0.00097	5	0.194	5	0.194		
	C	1.17068	1.17157	0.00089	0.00107	5	0.214	5	0.214		
	D	1.17492	1.17570	0.00078	0.00096	5	0.192	5	0.192		
	E	1.16752	1.16830	0.00078	0.00096	5	0.192	5	0.192		
	F	1.17692	1.17746	0.00054	0.00072	5	0.144	5	0.144		
	G	1.17131	1.17197	0.00066	0.00084	5	0.168	5	0.168		
	H	1.17430	1.17492	0.00062	0.00080	5	0.160	4	0.200		
Blank	1.17499	1.17481	-0.00018								

Summary Statistics for Survival Data

Treatment	N	Min	Max	Mean	SD	C.V.
Control	8	0.8	1.0	0.9750	0.0707	7.252%
0.80%	8	1.0	1.0	1.0000	0.0000	0.000%
2.4%	8	0.8	1.0	0.9750	0.0707	7.252%
4%	8	0.8	1.0	0.9688	0.0884	9.124%
7%	8	1.0	1.0	1.0000	0.0000	0.000%
11%	8	0.8	1.0	0.9750	0.0707	7.252%

BAW
3/14/24

Project Number: 14001-056-255

Test Substance

Effluent

Species

A. bahia

Summary Statistics for Growth Data (dry wt per original)

Treatment	N	Min	Max	Mean	SD	C.V.	% of Control
Control	8	0.198	0.310	0.2640	0.0374	14.173%	--
0.80%	8	0.230	0.316	0.2848	0.0278	9.761%	108%
2.4%	8	0.238	0.350	0.2922	0.0360	12.317%	111%
4%	8	0.186	0.294	0.2372	0.0337	14.201%	90%
7%	8	0.204	0.284	0.2418	0.0346	14.298%	92%
11%	7	0.144	0.214	0.1825	0.0229	12.574%	69%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Control	8	0.230	0.310	0.2702	0.0278	10.289%
0.80%	8	0.230	0.316	0.2848	0.0278	9.761%
2.4%	8	0.238	0.350	0.3008	0.0396	13.177%
4%	8	0.186	0.294	0.2460	0.0355	14.439%
7%	8	0.204	0.284	0.2418	0.0346	14.298%
11%	8	0.144	0.214	0.1875	0.0217	11.555%

Comments: Blank out of range

CETIS Analytical Report

Report Date: 14 Mar-24 13:50 (p 1 of 2)
 Test Code: 056-255 | 07-9881-1306

Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 19-1453-6533	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.8.7
Analyzed: 14 Mar-24 13:50	Analysis: Parametric-Control vs Treatments	Official Results: Yes
Batch ID: 08-6241-1137	Test Type: Growth-Survival-Fec (7d)	Analyst: Lab Tech
Start Date: 27 Feb-24 14:00	Protocol: EPA/821/R-02-014 (2002)	Diluent: Laboratory Seawater
Ending Date: 05 Mar-24 13:10	Species: Americamysis bahia	Brine: Crystal Sea
Duration: 6d 23h	Source: Aquatic Biosystems, CO	Age: 7d
Sample ID: 02-7284-9864	Code: 10435BC8	Client: BP Cherry Point
Sample Date: 26 Feb-24 09:17	Material: Ambient Sample	Project: WET Annual Compliance Test
Receive Date: 27 Feb-24 10:00	Source: Discharge Monitoring Report	
Sample Age: 29h (3.5 °C)	Station: Outfall 001	

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	14.2%	7.2	10.8	8.818	13.89

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Dilution Water		0.8	-1.278	2.31	0.037	14	0.9933	CDF	Non-Significant Effect
		2.4	-1.737	2.31	0.037	14	0.9986	CDF	Non-Significant Effect
		3.6	1.652	2.31	0.037	14	0.1724	CDF	Non-Significant Effect
		7.2	1.371	2.31	0.037	14	0.2639	CDF	Non-Significant Effect
		10.8*	5.021	2.31	0.037	14	<0.0001	CDF	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Control Trend	Mann-Kendall Trend			0.5484	Non-significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.06376704	0.01275341	5	12.1	<0.0001	Significant Effect
Error	0.04426494	0.001053927	42			
Total	0.108032		47			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.091	15.1	0.8364	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9806	0.934	0.6026	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	8	0.264	0.2327	0.2953	0.265	0.198	0.31	0.01323	14.2%	0.0%
0.8		8	0.2848	0.2615	0.308	0.285	0.23	0.316	0.009827	9.76%	-7.86%
2.4		8	0.2922	0.2621	0.3223	0.2928	0.238	0.35	0.01272	12.3%	-10.7%
3.6		8	0.2372	0.209	0.2653	0.2345	0.186	0.294	0.01191	14.2%	10.2%
7.2		8	0.2417	0.2129	0.2706	0.239	0.204	0.284	0.01222	14.3%	8.43%
10.8		8	0.1825	0.1633	0.2017	0.192	0.144	0.214	0.008113	12.6%	30.9%

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Dilution Water	0.272	0.3	0.23	0.29	0.31	0.254	0.198	0.258
0.8		0.278	0.282	0.316	0.31	0.268	0.306	0.23	0.288
2.4		0.26	0.308	0.276	0.308	0.238	0.2775	0.32	0.35
3.6		0.2125	0.244	0.22	0.186	0.25	0.225	0.294	0.266
7.2		0.284	0.204	0.204	0.254	0.28	0.272	0.224	0.212
10.8		0.196	0.194	0.214	0.192	0.192	0.144	0.168	0.16

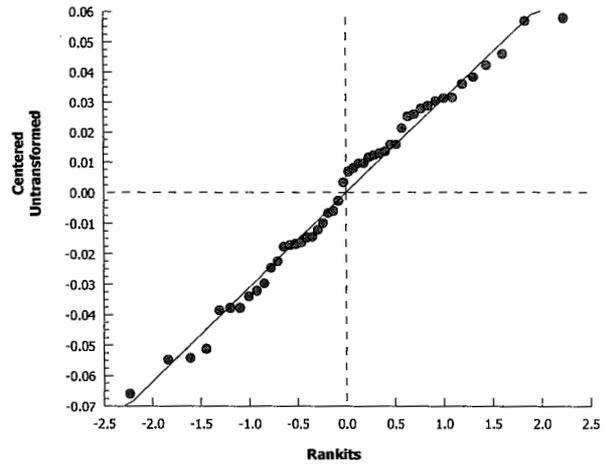
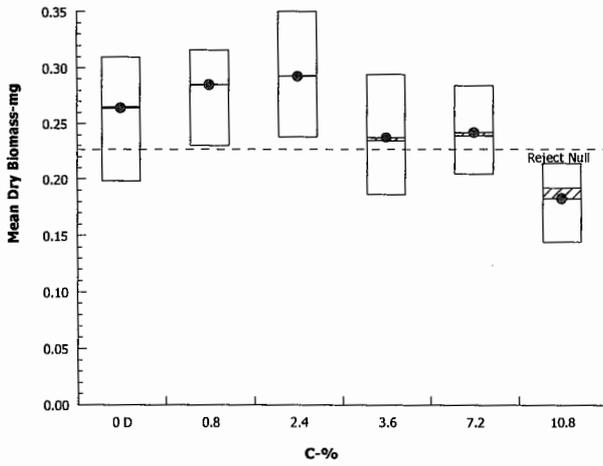
Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 19-1453-6533 Endpoint: Mean Dry Biomass-mg
Analyzed: 14 Mar-24 13:50 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.8.7
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 14 Mar-24 13:51 (p 1 of 2)
 Test Code: 056-255 | 07-9881-1306

Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 00-9839-3267	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.8.7
Analyzed: 14 Mar-24 13:51	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 08-6241-1137	Test Type: Growth-Survival-Fec (7d)	Analyst: Lab Tech
Start Date: 27 Feb-24 14:00	Protocol: EPA/821/R-02-014 (2002)	Diluent: Laboratory Seawater
Ending Date: 05 Mar-24 13:10	Species: Americamysis bahia	Brine: Crystal Sea
Duration: 6d 23h	Source: Aquatic Biosystems, CO	Age: 7d
Sample ID: 02-7284-9864	Code: 10435BC8	Client: BP Cherry Point
Sample Date: 26 Feb-24 09:17	Material: Ambient Sample	Project: WET Annual Compliance Test
Receive Date: 27 Feb-24 10:00	Source: Discharge Monitoring Report	
Sample Age: 29h (3.5 °C)	Station: Outfall 001	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	576060	200	Yes	Two-Point Interpolation

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Control Trend	Mann-Kendall Trend			0.5484	Non-significant Trend in Controls

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	2.812	2.544	3.269	35.56	30.59	39.31
IC10	3.224	2.936	7.327	31.02	13.65	34.06
IC15	7.276	3.271	8.125	13.74	12.31	30.57
IC20	8.162	3.582	8.967	12.25	11.15	27.92
IC25	9.047	7.685	9.873	11.05	10.13	13.01
IC40	>10.8	N/A	N/A	<9.259	NA	NA
IC50	>10.8	N/A	N/A	<9.259	NA	NA

Mean Dry Biomass-mg Summary

Calculated Variate

C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	8	0.264	0.198	0.31	0.01323	0.03742	14.2%	0.0%
0.8		8	0.2848	0.23	0.316	0.009827	0.02779	9.76%	-7.86%
2.4		8	0.2922	0.238	0.35	0.01272	0.03599	12.3%	-10.7%
3.6		8	0.2372	0.186	0.294	0.01191	0.03368	14.2%	10.2%
7.2		8	0.2417	0.204	0.284	0.01222	0.03457	14.3%	8.43%
10.8		8	0.1825	0.144	0.214	0.008113	0.02295	12.6%	30.9%

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Dilution Water	0.272	0.3	0.23	0.29	0.31	0.254	0.198	0.258
0.8		0.278	0.282	0.316	0.31	0.268	0.306	0.23	0.288
2.4		0.26	0.308	0.276	0.308	0.238	0.2775	0.32	0.35
3.6		0.2125	0.244	0.22	0.186	0.25	0.225	0.294	0.266
7.2		0.284	0.204	0.204	0.254	0.28	0.272	0.224	0.212
10.8		0.196	0.194	0.214	0.192	0.192	0.144	0.168	0.16

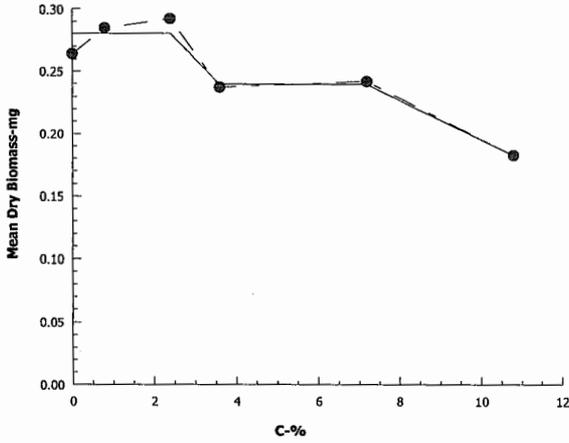
Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 00-9839-3267 Endpoint: Mean Dry Biomass-mg
Analyzed: 14 Mar-24 13:51 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.7
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 15 Mar-24 12:52 (p 1 of 2)
 Test Code: 056-255 | 07-9881-1306

Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 08-0391-6496	Endpoint: Mean Dry Weight-mg	CETIS Version: CETISv1.8.7
Analyzed: 15 Mar-24 12:52	Analysis: Parametric-Control vs Treatments	Official Results: Yes
Batch ID: 08-6241-1137	Test Type: Growth-Survival-Fec (7d)	Analyst: Lab Tech
Start Date: 27 Feb-24 14:00	Protocol: EPA/821/R-02-014 (2002)	Diluent: Laboratory Seawater
Ending Date: 05 Mar-24 13:10	Species: Americamysis bahia	Brine: Crystal Sea
Duration: 6d 23h	Source: Aquatic Biosystems, CO	Age: 7d
Sample ID: 02-7284-9864	Code: 10435BC8	Client: BP Cherry Point
Sample Date: 26 Feb-24 09:17	Material: Ambient Sample	Project: WET Annual Compliance Test
Receive Date: 27 Feb-24 10:00	Source: Discharge Monitoring Report	
Sample Age: 29h (3.5 °C)	Station: Outfall 001	

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	13.5%	7.2	10.8	8.818	13.89

Dunnett Multiple Comparison Test

Control	vs C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α :5%)
Dilution Water	0.8	-0.9177	2.31	0.037	14	0.9799	CDF	Non-Significant Effect
	2.4	-1.93	2.31	0.037	14	0.9993	CDF	Non-Significant Effect
	3.6	1.522	2.31	0.037	14	0.2117	CDF	Non-Significant Effect
	7.2	1.792	2.31	0.037	14	0.1360	CDF	Non-Significant Effect
	10.8*	5.211	2.31	0.037	14	<0.0001	CDF	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α :5%)
Control Trend	Mann-Kendall Trend			0.7195	Non-significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α :5%)
Between	0.06421112	0.01284222	5	12.75	<0.0001	Significant Effect
Error	0.0422997	0.001007136	42			
Total	0.1065108		47			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variances	Bartlett Equality of Variance	2.998	15.1	0.7002	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9697	0.934	0.2458	Normal Distribution

Mean Dry Weight-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	8	0.2702	0.2469	0.2934	0.265	0.23	0.31	0.009829	10.3%	0.0%
0.8		8	0.2848	0.2615	0.308	0.285	0.23	0.316	0.009827	9.76%	-5.39%
2.4		8	0.3008	0.2677	0.334	0.308	0.238	0.35	0.01401	13.2%	-11.3%
3.6		8	0.246	0.2163	0.2757	0.247	0.186	0.294	0.01256	14.4%	8.94%
7.2		8	0.2417	0.2129	0.2706	0.239	0.204	0.284	0.01222	14.3%	10.5%
10.8		8	0.1875	0.1694	0.2056	0.193	0.144	0.214	0.00766	11.6%	30.6%

Mean Dry Weight-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Dilution Water	0.272	0.3	0.23	0.29	0.31	0.254	0.2475	0.258
0.8		0.278	0.282	0.316	0.31	0.268	0.306	0.23	0.288
2.4		0.26	0.308	0.345	0.308	0.238	0.2775	0.32	0.35
3.6		0.2833	0.244	0.22	0.186	0.25	0.225	0.294	0.266
7.2		0.284	0.204	0.204	0.254	0.28	0.272	0.224	0.212
10.8		0.196	0.194	0.214	0.192	0.192	0.144	0.168	0.2

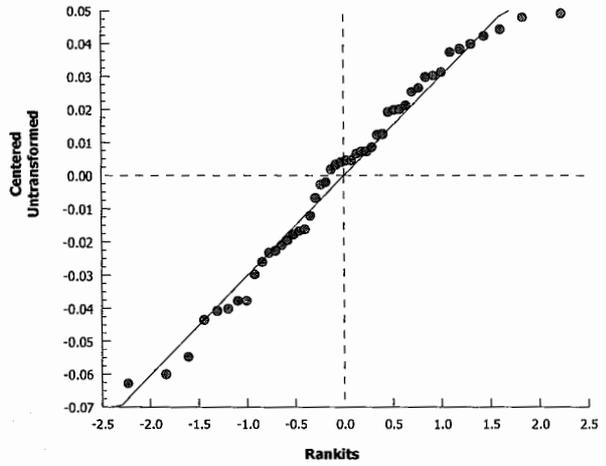
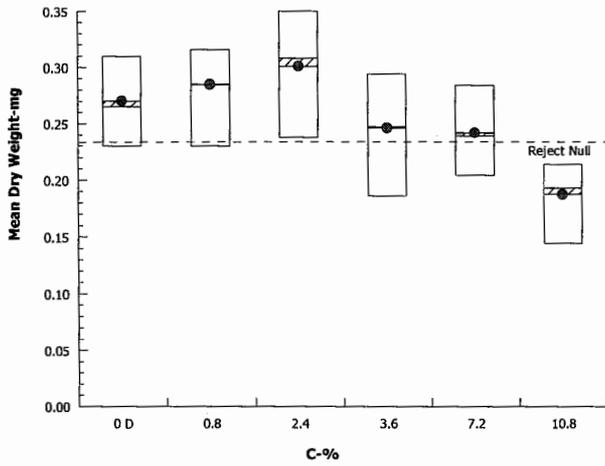
Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 08-0391-6496 Endpoint: Mean Dry Weight-mg
Analyzed: 15 Mar-24 12:52 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.8.7
Official Results: Yes

Graphics



APPENDIX C

Reference Toxicant Control Chart, Spreadsheet, and Raw Test Data

FILE IS MYSID CHRONIC 14001-904-XXX
 REFERENCE TOXICANT DATA FOR AMERICAMYSIS BAHIA CHRONICS
 COMMERCIALY SUPPLIED
 EXPRESSED AS G/L KCL, NOMINAL
 TRE ENVIRONMENTAL STRATEGIES, LLC
 IC25 BASED ON MEAN DRY WEIGHT PER ORIGINAL MYSID

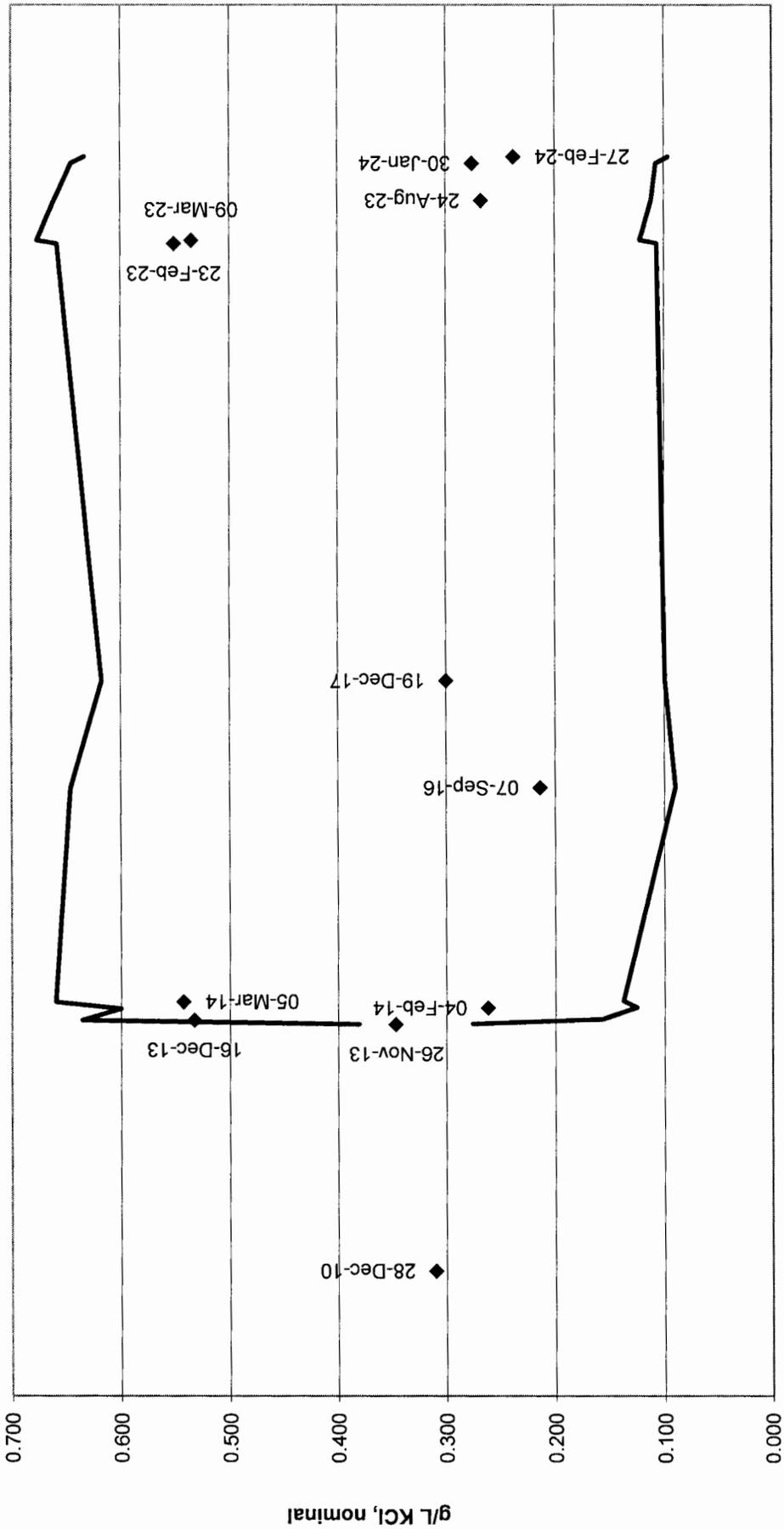
OK
3/15/24

ITONI	DATE	LOT	Linear X Transform		ACCEPTABLE RANGE			%CV
			IC25	MEAN	SD	LOW	HIGH	
1	28-Dec-10	10-045	0.310	0.310	#DIV/0!	#DIV/0!	#DIV/0!	
2	26-Nov-13	13-045	0.347	0.329	0.026	0.276	0.381	7.96
3	16-Dec-13	13-049	0.533	0.397	0.120	0.158	0.636	30.13
4	04-Feb-14	14-005	0.262	0.363	0.119	0.126	0.600	32.66
5	05-Mar-14	14-008	0.543	0.399	0.130	0.138	0.660	32.70
6	07-Sep-16	16-026	0.214	0.368	0.139	0.090	0.646	37.75
7	19-Dec-17	17-038	0.300	0.358	0.129	0.099	0.617	36.12
8	23-Feb-23	23-005	0.551	0.383	0.138	0.107	0.658	36.04
9	09-Mar-23	23-009	0.535	0.399	0.139	0.122	0.677	34.70
10	24-Aug-23	23-033	0.268	0.386	0.137	0.112	0.661	35.52
11	30-Jan-24	24-004	0.276	0.376	0.134	0.108	0.645	35.71
12	27-Feb-24	24-007	0.238	0.365	0.134	0.096	0.633	36.80
13								
14								
15								
16								
17								
18								
19								
20								

TRE Environmental Strategies, LLC
Americamysis bahia Chronic Ref Tox at 26C
 IC25 based on dry weight per original organism
 Commercially Supplied Organisms

01
 3/15/24

December 2010 through February 2024



Test Dates

TOXICITY DATA PACKAGE COVER SHEET

QA MW
3/14/24

Test Type: Chronic
Test Substance: 100 g/L KCl stock solution
Dilution Water Type: Salt Water @ 25‰ ± 2 ppt
Concurrent Control Water Type: N/A
Date and Time Test Began: 2/27/24 @ 1420
Protocol Number: USEPA 2002, method 1007.0

Project Number: 14001-904-1457
Species: Americamysis bahia
Organism Lot or Batch Number: 24-007
Age: 7 days (7 days) Supplier: ABS
Date and Time Test Ended: 3/5/24 @ 1340
Investigator(s): JA/MS/SS/BI/AW/BZ/KW/NK/UT
JH

Background Information

Type of Test: Static Renewal

pH Control?: Yes No If Yes, give % CO₂: N/A

Test Temperature: 26±1°C

Env. Chmbr/Bath #: 21 Test Chambers: 540 ml plastic containers

Photoperiod: 16 h light : 8 h dark

Light Intensity: 50 – 100 ft.-c

Test Solution Vol.: 150 ml

Number of Replicates per Treatment: 8

Length of Test: 7 days

Number of Organisms per Replicate: 5

Type of Food and Quantity per Chamber: 0.1 ml B.S / 0.2 ml B.S. (PM). ** Feeding Frequency: 3 x Daily

Test Substance Characterization Parameters and Frequency:

Hardness: Sx. Receipt

Alkalinity: Sx. Receipt

NH₃: Sx. Receipt pH: Daily SALINITY: daily in 1 rep of each treatment *

D.O.: Daily Temp.: Daily

TRC: Sx. Receipt

Test Concentrations (Volume): Control, 0.125, 0.25, 0.5 and 1.0 g/L of KCl

Agency Summary Sheet(s)? _____

Reference Toxicant Data: Test Dates: _____ to _____ LC ₅₀ or IC ₂₅ (Circle): _____
Hist. 95% Control Limits: _____ to _____ Method for Determining Ref. Tox. Value: _____

Special Procedures and Considerations:
DO measured using salinity compensating meter set @ _____ mg/L chloride at 26°C
D.O. maintained ≥ 4.0 mg/L; if DO ≤ 4.0 then aerate study
* Salinity measured in 1 rep of each treatment day 0; and 1 rep of each treatment days 1 to 7 in old solutions
** Feed 0.1 ml B.S AM and Noon and 0.2 ml B.S in PM
Study Director Initials: <u>AS</u> Date: <u>2/27/24</u>

TEST SUBSTANCE USAGE LOG

Project Number 14001-904-1457

QA 3/14/24

	Sample 1	Sample 2	Sample 3	Sample 4
Test Substance Number				
Stock Solution Preparation Date and Time	N/A			
Sample Type (Grab or Comp)	N/A			
Date Test Substance Received	Prepared stock			
Dilution Water Number RW# or TRE#, circle one				
Concurrent Control Water RW#	N/A			
Date(s) Used	2/27/24 3/2/24			
	2/28/24 3/3/24			
	2/29/24 3/4/24			
	3/1/24			

PREPARATION OF TEST SOLUTIONS

Test Substance Conc., g/L KCl	Test Substance Stock Volume (ml)	Dilution Water Volume (ml)	Total Volume (ml)	Test Substance Volume (ml)	Dilution Water Volume (ml)	Total Volume (ml)	Test Substance Volume (ml)	Dilution Water Volume (ml)	Total Volume (ml)
0	0	1200	1200						
0.125	1.5	1198.5	1200						
0.25	3	1197	1200						
0.5	6	1194	1200						
1.0	12	1188	1200						
Total	22.5	5977.5	6000						
Initials/Date	JA 2/27/24 mixed MyC								
Initials/Date	JS 2/28/24 " "								
Initials/Date	AW 2/29/24 " "								
Initials/Date	MB 3/1/24 " "								
Initials/Date	AE 3/2/24 " "								
Initials/Date	MB 3/3/24 " "								
Initials/Date	WT 3/4/24 " "								
Initials/Date									

QA M
 3/14/24

Mysid Shrimp (*Americamysis bahia*)
 CHRONIC BIOLOGICAL DATA

Project Number: 14001-904-1457

Conc. g/L	Test Replicate	Number of Surviving Organisms								Remarks	
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		
Control	A	5	5	5	5	5	5	5	5	5	2 survival ② 97.5 94.4 ~ 10g eaten
	B	5	5	5	5	5	5	5	5	5	
	C	5	5	5	5	5	5	5	5	5	
	D	5	5	5	5	5	5	5	5	5	
	E	5	5	5	5	5	5	5	5	5	
	F	5	5	5	4	3	3	3	3	3	
	G	5	5	5	5	5	5	5	5	5	
	H	5	5	5	5	4	4	4	4	4	
0.125	A	5	5	4	4	4	4	4	4	4	ATE 0.10g NF 95 ③
	B	5	5	5	5	5	5	5	5	5	
	C	5	84 ^a	4	4	4	4	4	4	4	
	D	5	5	5	54 ^b	4	4	4	4	4	
	E	5	5	5	5	5	5	5	5	5	
	F	5	5	5	5	5	5	5	5	5	
	G	5	5	5	5	5	5	5	5	5	
	H	5	5	5	5	5	5	5	5	5	
0.25	A	5	43 ^a	3	3	3	3	3	3	3	ATE 0.09g NF 75 80 76.9 ③
	B	5	5	4	4	4	4	4	4	4	
	C	5	5	5	5	34 ^b	4	4	4	4	
	D	5	5	5	5	5	5	5	4	4	
	E	5	5	4	4	4	4	4	4	4	
	F	5	5	4	4	3	3	3	3	3	
	G	5	5	5	5	5	5	5	5	5	
	H	5	5	3	3	3	3	3	3	3	
0.5	A	5	3	1	0	-	-	-	-	-	12.5
	B	5	03 ^s	4	2	2	1	1	1	1	
	C	5	02	0	-	-	-	-	-	-	
	D	5	04	2	1	1	1	0	-	-	
	E	5	03	0	-	-	-	-	-	-	
	F	5	3	2	1	1	1	1	1	1	
	G	5	3	1	1	1	1	1	1	1	
	H	5	04	2	2	2	2	2	2	2	
Date:		2/27/24	2/28/24	2/29/24	3/1/24	3/4/24	3/13/24	3/14/24	3/15/24		
Time:		1420	1025	1430	1045	1145	1040	1445	1340		
initials:		JA/M	JS	AIW	MS	MS	MS	WT	JH		

① JS 2/28/24 SE ② MS 3/1/24 ME ③ MS 3/4/24 E

Mysid Shrimp (*Americamysis bahia*)
 CHRONIC BIOLOGICAL DATA

QA 2/27/24
 3/14/24

Project Number: 14001-904-1457

Conc. g/L	Test Replicate	Number of Surviving Organisms								Remarks
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
1.0	A	5	0	/						O
	B	5	0	/						
	C	5	0	/						
	D	5	0	/						
	E	5	0	/						
	F	5	0	/						
	G	5	0	/						
	H	5	0	/						
	A									
	B									
	C									
	D									
	E									
	F									
	G									
	H									
	A									
	B									
	C									
	D									
	E									
	F									
	G									
	H									
	Date:	2/27/24	2/28/24	2/29/24	3/1/24		3/3/24	3/	3/5/24	
	Time:	1420	1025	1430	1045		1040		1340	
	Initials:	JA	JS	AIW	MB		M2		JH	

CHRONIC CHEMICAL DATA (INITIAL)

QAW
3/11/24

Project Number: 14001-904-1457

Test Species (Circle): *C. dubia* *D. magna* *D. pulex* *P. promelas* Other (Specify): **Americamysis bahia**

g/L		Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Meter #	Remarks
Conc.:	Cont									All Conc.	
pH		8.9	8.7	8.3	8.3	/	8.4	8.1		19	
D.O. (mg/L)		6.5	6.5	7.1	6.3	6.6	/	6.5	6.6	17	
Temp. (°C)		26	26	26	26	/	26	26		12-2	
Salinity (ppt)		25	25	25	25	/	25	25		2	
Hard. (mg/L)										Titr.	
Alk. (mg/L)										Titr.	
TRC (mg/L)											
NH ₃ (mg/L)											
Conc.:	0.125										
pH		8.9	8.7	8.3	8.3	/	8.4	8.2			
D.O. (mg/L)		6.4	6.5	7.3	6.2	6.6	/	6.5	6.4		
Temp. (°C)		*	*	*	*	/	*	*			
Salinity (ppt)		26	26	25	25	/	25	25			
Hard. (mg/L)											
Alk. (mg/L)											
TRC (mg/L)											
NH ₃ (mg/L)											
Conc.:	0.25										
pH		8.9	8.7	8.3	8.3	/	8.4	8.2			
D.O. (mg/L)		6.5	6.5	7.6	6.4	6.6	/	6.5	6.4		
Temp. (°C)		*	*	*	*	/	*	*			
Salinity (ppt)		26	26	25	25	/	26	26			
Hard. (mg/L)											
Alk. (mg/L)											
TRC (mg/L)											
NH ₃ (mg/L)											
Date:		2/27/24	2/28/24	2/29/24	3/1/24		3/3/24	3/4/24			▲ Salinity: 1 rep each treatment D 0
Time:		1310	1010	1420	1040		1040	1430			
Initials:		BJ	JS	AIW	MB		MB	WT			

NOTE: Hardness, alkalinity, TRC, and NH₃ data appearing on this page have been transcribed from the wet chemistry log, QA Form No. 084.
 * Dilution/control water and stock solution were brought to 26°C prior to mixing the dilution series. The temperature of resulting stock dilution is assumed to also be 26°C.

DAIW 2/29/24 JE, 6.3, 6.2, 6.2

Handwritten signature and date: 3/14/24

CHRONIC CHEMICAL DATA (INITIAL)

Project Number: 14001-904-1457

Test Species (Circle): *C. dubia* *D. magna* *D. pulex* *P. promelas* Other (Specify): **Americamysis bahia**

g/L	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Meter #	Remarks
Conc.: 0.5										
pH	8.9	8.7	8.3	8.3	/	8.4	8.2			
D.O. (mg/L)	6.4	6.5	6.4	6.6	/	6.5	6.4			
Temp. (°C)	*	*	*	*	/	*	*			
Salinity (ppt)	26 ^Δ	26	24 ^Δ	25	/	26	26			
Hard. (mg/L)										
Alk. (mg/L)										
TRC (mg/L)										
NH ₃ (mg/L)										
Conc.: 1.0										
pH	8.9	8.7	/	/	/	/	/			
D.O. (mg/L)	6.4	6.6	/	/	/	/	/			
Temp. (°C)	*	26	26	/	/	/	/			
Salinity (ppt)	26 ^Δ	26	/	/	/	/	/			
Hard. (mg/L)										
Alk. (mg/L)										
TRC (mg/L)										
NH ₃ (mg/L)										
Conc.:										
pH										
D.O. (mg/L)										
Temp. (°C)										
Salinity (ppt)										
Hard. (mg/L)										
Alk. (mg/L)										
TRC (mg/L)										
NH ₃ (mg/L)										
Date:	2/27/24	2/28/24	2/29/24	3/1/24		3/7/24	3/14/24			▲ Salinity, 1 rep each treatment D 0
Time:	1410	1010	1420	1140		1040	1430			
Initials:	RA	JS	AIW	MS		MS	WT			

NOTE: Hardness, alkalinity, TRC, and NH₃ data appearing on this page have been transcribed from the wet chemistry log, QA Form No. 084.
 * Dilution/control water and stock solution were brought to 26°C prior to mixing the dilution series. The temperature of resulting stock dilution is assumed to also be 26°C.

CHRONIC CHEMICAL DATA (FINAL)

at 3/11/24

g/L		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Meter #	Remarks
Project Number: 14001-904-1457										
Test Species (Circle): <i>C. dubia</i> <i>D. magna</i> <i>D. pulex</i> <i>P. promelas</i> Other (Specify): Americamysis bahia										
Conc.:	Cont.								All Conc.	
pH		8.2	7.9	8.0	/	8.0	7.8	7.5	19	
D.O. (mg/L)		5.9	5.0	4.9	/	5.3	4.4	4.3	17	
Temp. (°C)		24	24	24	/	24	24	24	145	
Salinity (ppt) ▲		26	25	26	/	26	26	27	2	
Conc.:	0.125									
pH		8.2	7.7	8.0	/	7.9	7.7	7.6		
D.O. (mg/L)		5.5	4.3	4.6	/	5.0	4.0	3.0		
Temp. (°C)		24	24	24	/	24	24	24		
Salinity (ppt) ▲		26	25	26	/	26	26	28 26		
Conc.:	0.25									
pH		8.2	7.7	8.0	/	7.9	7.7	7.7		
D.O. (mg/L)		5.4	4.1	4.6	/	4.7	4.0	4.1		
Temp. (°C)		24	24	24	/	24	24	24		
Salinity (ppt) ▲		27	25	25	/	26	27	26		
Conc.:	0.5									
pH		8.3	7.8	8.0	/	8.0	7.8	7.6		
D.O. (mg/L)		5.7	4.8	4.7	/	4.8	4.3	4.3		
Temp. (°C)		24	24	24	/	24	24	24		
Salinity (ppt) ▲		25	25	25	/	26	29	26		
Conc.:	1.0									
pH		8.3	/	/	/	/	/	/		
D.O. (mg/L)		5.7	/	/	/	/	/	/		
Temp. (°C)		24	/	/	/	/	/	/		
Salinity (ppt) ▲		27	/	/	/	/	/	/		
Conc.:										
pH										
D.O. (mg/L)										
Temp. (°C)		24								
Salinity (ppt) ▲		27								
Date:		2/11/24	2/19/24	3/1/24		3/12/24	3/14/24	3/15/24		▲ Salinity: 1 rep each treatment DAILY
Time:		1010	1420	1010		1040	1430	1335		
Initials:		JS	AW	MB		MB	WT	JH		

① JS 2/11/24: E

② JH 3/5/24: E

DAILY TOXICITY TEST LOG

QAN 3/14/24

Project Number: 14001-904-1457

Test Species (Circle): *C. dubia* *D. magna* *D. pulex* *P. promelas* *O. mykiss* Other (Specify): **Americamysis bahia**

General Comments	Measured salinity of stock = <u>25</u> ppt Measured salinity of dilution water = _____ ppt Measured Cl of stock = _____ mg/L Measured Cl of dilution water = _____ mg/L Random Chart ID: _____	Feeding Δ 0.1ml B.S. 2 x Daily * 0.2 ml B.S. 1 x Daily (PM)	Initials/Date
Test Day 0	Test Solution Mixed at: <u>1410</u> Test Organisms Added at: <u>1420</u>	Fed @ * 1700 AIW	PA 2/27/24
Test Day 1	Real Time Temp= <u>25</u> °C Range= <u>25-26</u> °C	Fed @ Δ 0815 JS Δ 1145 AI * 1600 JS	JS 2/28/24
Test Day 2	Real Time Temp= <u>25</u> °C Range= * <u>25</u> °C	Fed @ Δ 0835 JS Δ 1105 AIW * 1645 JS	AIW 2/29/24
Test Day 3	Real Time Temp= <u>25</u> °C Range= <u>24-26</u> °C	Fed @ Δ 0840 JS Δ 1230 AI * 1670 JS	MB 3/1/24
Test Day 4	Real Time Temp= <u>26</u> °C Range= 25 - <u>26</u> °C	Fed @ Δ 0830 AIW Δ 1155 AIW * 1530 ND	MB 3/2/24
Test Day 5	Real Time Temp= <u>26</u> °C Range= <u>24-26</u> °C	Fed @ Δ 0835 AI Δ 1130 AI * 1530 MB	MB 3/3/24
Test Day 6	Real Time Temp= <u>25</u> °C Range= * <u>26</u> °C	Fed @ Δ 0850 AI Δ 1130 AI * 1540 AI	WT 3/4/24
Test Day 7	Real Time Temp= <u>25</u> °C Range= <u>24-26</u> °C * accidentally fed 0.1ml B.S. @ am	* NONE	JH 3/5/24
Test Day 8			

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

RA *3/15/24*

Project Number: 14001-904-1457 Test Substance Effluent Species A. bahia Oven #: 3
 Balance ID: Sartorius #1 Analyst Tare: JS from Date: 3/5/2024 Time: 1450
 Date/Time of Tare Wt: 3/5/24 @1045 Analyst Gross: MB to Date: 3/6/2024 Time: 825
 Date/Time of Gross Wt: 3/10/24 @1330
 (options: Wet, Blot Dry, Dry (60-90°C), Dry (>100°C), AFDW (>500°C))

Weight Type: Dry (60-90C)

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Orig. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Control	A		1.17918	1.18011	0.00093	0.00095	5	0.190	0.2016	5	0.190	0.2150
	B		1.15802	1.15900	0.00098	0.00100	5	0.200		5	0.200	
	C		1.16751	1.16870	0.00119	0.00121	5	0.242		5	0.242	
	D		1.17472	1.17571	0.00099	0.00101	5	0.202		5	0.202	
	E		1.17544	1.17638	0.00094	0.00096	5	0.192		5	0.192	
	F		1.17655	1.17726	0.00071	0.00073	4	0.182		3	0.243	
	G		1.16788	1.16894	0.00106	0.00108	5	0.216		5	0.216	
	H		1.17588	1.17680	0.00092	0.00094	5	0.188		4	0.235	
0.13%	A		1.15950	1.16023	0.00073	0.00075	5	0.150	0.1956	4	0.188	0.2052
	B		1.17517	1.17625	0.00108	0.00110	5	0.220		5	0.220	
	C		1.17147	1.17215	0.00068	0.00070	4	0.175		4	0.175	
	D		1.17686	1.17762	0.00076	0.00078	5	0.156		4	0.195	
	E		1.17780	1.17888	0.00108	0.00110	5	0.220		5	0.220	
	F		1.16817	1.16933	0.00116	0.00118	5	0.236		5	0.236	
	G		1.17294	1.17392	0.00098	0.00100	5	0.200		5	0.200	
	H		1.18267	1.18369	0.00102	0.00104	5	0.208		5	0.208	
0.3%	A		1.16776	1.16812	0.00036	0.00038	3	0.127	0.1463	2	0.190	0.1933
	B		1.16763	1.16812	0.00049	0.00051	5	0.102		4	0.128	
	C		1.16208	1.16289	0.00081	0.00083	5	0.166		4	0.207	
	D		1.17639	1.17714	0.00075	0.00077	5	0.154		4	0.192	
	E		1.16619	1.16711	0.00092	0.00094	5	0.188		4	0.235	
	F		1.16926	1.16973	0.00047	0.00049	5	0.098		3	0.163	
	G		1.17235	1.17330	0.00095	0.00097	5	0.194		5	0.194	
	H		1.17412	1.17481	0.00069	0.00071	5	0.142		3	0.237	

Project Number: 14001-904-1457		Test Substance		Effluent		Species		A. bahia	
		0.00000	0.00000	5	0.0000	0.0275		0	
1%	A	0.00000	0.00000	5	0.010			1	0.050
	B	1.15741	1.15744	5	0.000			0	
	C			5	0.000			0	
	D			5	0.000			0	
	E			5	0.000			0	
	F	1.16985	1.16997	5	0.028			1	0.140
	G	1.16916	1.16917	5	0.006			1	0.030
	H	1.16518	1.16604	5	0.176			2	0.440
50%	A	0.00000	0.00000	5	0.0000				
	B	0.00000	0.00000	5	0.000				
	C	0.00000	0.00000	5	0.000				
	D	0.00000	0.00000	5	0.000				
	E	0.00000	0.00000	5	0.000				
	F	0.00000	0.00000	5	0.000				
	G	0.00000	0.00000	5	0.000				
	H	0.00000	0.00000	5	0.000				
100%	A	0.00000	0.00000	5	0.0000				
	B	0.00000	0.00000	5	0.000				
	C	0.00000	0.00000	5	0.000				
	D	0.00000	0.00000	5	0.000				
	E	0.00000	0.00000	5	0.000				
	F	0.00000	0.00000	5	0.000				
	G	0.00000	0.00000	5	0.000				
	H	0.00000	0.00000	5	0.000				
Blank	1.17330	1.17328		-0.00002					

QA 3/15/24

Summary Statistics for Survival Data

Treatment	N	Min	Max	Mean	SD	C.V.
Control	8	0.8	1.0	0.9438	0.1050	11.127%
0.13%	8	0.8	1.0	0.9500	0.0926	9.745%
0.3%	8	0.6	1.0	0.7583	0.1330	17.543%
1%	8	0.0	0.4	0.1250	0.1488	119.044%
50%	0	0.0	0.0	0.0000	0.0000	#DIV/0!
100%	0	0.0	0.0	0.0000	0.0000	#DIV/0!

Project Number: 14001-904-1457 Test Substance Effluent Species A. bahia

Summary Statistics for Growth Data (dry wt per original)

Treatment	N	Min	Max	Mean	SD	C.V.	% of Control
Control	8	0.182	0.2420.2016	0.0193	9.596%	--	--
0.13%	8	0.150	0.2360.1956	0.0318	16.243%	97%	97%
0.3%	8	0.098	0.1940.1463	0.0362	24.722%	73%	73%
1%	8	0.000	0.1760.0275	0.0608	220.961%	14%	14%
50%	8	0.000	0.0000.0000	0.0000	-	0%	0%
100%	7	0.000	0.0000.0000	0.0000	-	0%	0%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Control	8	0.190	0.2430.2150	0.0223	10.370%	
0.13%	8	0.175	0.2360.2052	0.0198	9.661%	
0.3%	8	0.128	0.2370.1933	0.0360	18.611%	
1%	4	0.030	0.440	0.1895	#VALUE!	
50%	0	0.000	0.000	-	-	
100%	0	0.000	0.000	-	-	

Comments: 0.25A only 2 orgs on pan

Handwritten signature and date: 3/15/14

CETIS Analytical Report

Report Date: 14 Mar-24 13:40 (p 1 of 2)
Test Code: 904-1457 | 09-4159-9460

Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 06-6239-8326	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.7
Analyzed: 14 Mar-24 13:40	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes
Batch ID: 02-3217-7427	Test Type: Growth-Survival-Fec (7d)	Analyst: Lab Tech
Start Date: 27 Feb-24 14:20	Protocol: EPA/821/R-02-014 (2002)	Diluent: Laboratory Seawater
Ending Date: 05 Mar-24 13:40	Species: Americamysis bahia	Brine: Crystal Sea
Duration: 6d 23h	Source: Aquatic Biosystems, CO	Age: 7
Sample ID: 13-0164-3289	Code: 4D958019	Client: Internal Lab
Sample Date: 27 Feb-24 10:00	Material: Potassium chloride	Project: Special Studies
Receive Date: 27 Feb-24 11:00	Source: Reference Toxicant	
Sample Age: 4h	Station: In House	

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	13.3%	0.125	0.25	0.1768	

Steel Many-One Rank Sum Test

Control	vs	C-gm/L	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α :5%)
Dilution Water		0.125	69	48	2	14	0.7866	Asymp	Non-Significant Effect
		0.25*	47.5	48	3	14	0.0405	Asymp	Significant Effect
		0.5*	36	48	0	14	0.0011	Asymp	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α :5%)
Control Trend	Mann-Kendall Trend			0.1071	Non-significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α :5%)
Between	4.284689	1.42823	3	75.95	<0.0001	Significant Effect
Error	0.5265458	0.01880521	28			
Total	4.811235		31			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variances	Bartlett Equality of Variance	1.212	11.3	0.7501	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.8466	0.908	0.0004	Non-normal Distribution

7d Survival Rate Summary

C-gm/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	8	0.9438	0.856	1	1	0.75	1	0.03713	11.1%	0.0%
0.125		8	0.95	0.8726	1	1	0.8	1	0.03273	9.75%	-0.66%
0.25		8	0.7688	0.6617	0.8758	0.8	0.6	1	0.04525	16.7%	18.5%
0.5		8	0.125	0.000596	0.2494	0.1	0	0.4	0.05261	119.0%	86.8%
1		8	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

C-gm/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	8	1.278	1.174	1.383	1.345	1.047	1.345	0.04424	9.79%	0.0%
0.125		8	1.282	1.192	1.373	1.345	1.107	1.345	0.03838	8.46%	-0.32%
0.25		8	1.074	0.952	1.196	1.107	0.8861	1.345	0.05164	13.6%	16.0%
0.5		8	0.3892	0.2532	0.5251	0.4125	0.2255	0.6847	0.05749	41.8%	69.6%
1		8	0.2255	0.2255	0.2255	0.2255	0.2255	0.2255	0	0.0%	82.4%

CETIS Analytical Report

Report Date: 14 Mar-24 13:40 (p 2 of 2)
 Test Code: 904-1457 | 09-4159-9460

Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 06-6239-8326 Endpoint: 7d Survival Rate CETIS Version: CETISv1.8.7
 Analyzed: 14 Mar-24 13:40 Analysis: Nonparametric-Control vs Treatments Official Results: Yes

7d Survival Rate Detail

C-gm/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Dilution Water	1	1	1	1	1	0.75	1	0.8
0.125		0.8	1	1	0.8	1	1	1	1
0.25		0.75	0.8	0.8	0.8	0.8	0.6	1	0.6
0.5		0	0.2	0	0	0	0.2	0.2	0.4
1		0	0	0	0	0	0	0	0

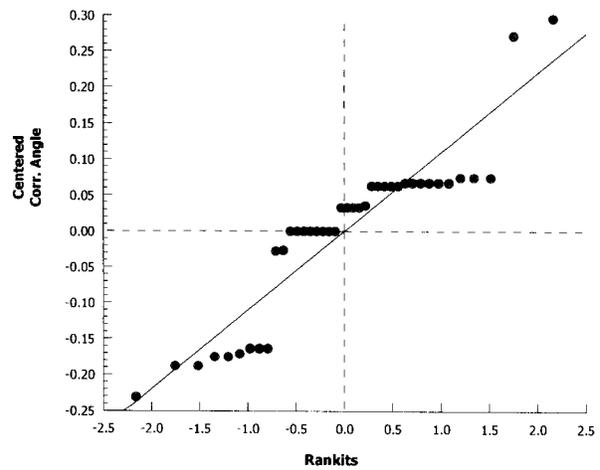
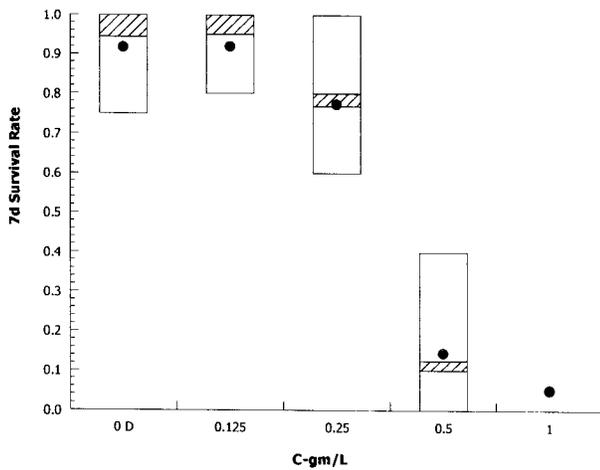
Angular (Corrected) Transformed Detail

C-gm/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Dilution Water	1.345	1.345	1.345	1.345	1.345	1.047	1.345	1.107
0.125		1.107	1.345	1.318	1.107	1.345	1.345	1.345	1.345
0.25		1.047	1.107	1.107	1.107	1.107	0.8861	1.345	0.8861
0.5		0.3614	0.4636	0.2255	0.2255	0.2255	0.4636	0.4636	0.6847
1		0.2255	0.2255	0.2255	0.2255	0.2255	0.2255	0.2255	0.2255

7d Survival Rate Binomials

C-gm/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Dilution Water	5/5	5/5	5/5	5/5	5/5	3/4	5/5	4/5
0.125		4/5	5/5	4/4	4/5	5/5	5/5	5/5	5/5
0.25		3/4	4/5	4/5	4/5	4/5	3/5	5/5	3/5
0.5		0/2	1/5	0/5	0/5	0/5	1/5	1/5	2/5
1		0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5

Graphics



CETIS Analytical Report

Report Date: 15 Mar-24 10:26 (p 1 of 2)

Test Code: 904-1457 | 09-4159-9460

Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 17-3842-5228	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.8.7
Analyzed: 15 Mar-24 10:26	Analysis: Parametric-Control vs Treatments	Official Results: Yes
Batch ID: 02-3217-7427	Test Type: Growth-Survival-Fec (7d)	Analyst: Lab Tech
Start Date: 27 Feb-24 14:20	Protocol: EPA/821/R-02-014 (2002)	Diluent: Laboratory Seawater
Ending Date: 05 Mar-24 13:40	Species: Americamysis bahia	Brine: Crystal Sea
Duration: 6d 23h	Source: Aquatic Biosystems, CO	Age: 7
Sample ID: 13-0164-3289	Code: 4D958019	Client: Internal Lab
Sample Date: 27 Feb-24 10:00	Material: Potassium chloride	Project: Special Studies
Receive Date: 27 Feb-24 11:00	Source: Reference Toxicant	
Sample Age: 4h	Station: In House	

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	15.0%	0.125	0.25	0.1768	

Dunnnett Multiple Comparison Test

Control	vs	C-gm/L	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Dilution Water		0.125	0.3964	2.02	0.030	14	0.5008	CDF	Non-Significant Effect
		0.25*	3.687	2.02	0.030	14	0.0013	CDF	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Control Trend	Mann-Kendall Trend			0.7195	Non-significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01470716	0.007353578	2	8.193	0.0023	Significant Effect
Error	0.01884748	0.0008974992	21			
Total	0.03355464		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.502	9.21	0.2862	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9599	0.884	0.4359	Normal Distribution

Mean Dry Biomass-mg Summary

C-gm/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	8	0.2016	0.1854	0.2177	0.196	0.1825	0.242	0.006838	9.6%	0.0%
0.125		8	0.1956	0.1691	0.2222	0.204	0.15	0.236	0.01123	16.2%	2.95%
0.25		8	0.1463	0.1161	0.1766	0.148	0.098	0.194	0.01279	24.7%	27.4%

Mean Dry Biomass-mg Detail

C-gm/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Dilution Water	0.19	0.2	0.242	0.202	0.192	0.1825	0.216	0.188
0.125		0.15	0.22	0.175	0.156	0.22	0.236	0.2	0.208
0.25		0.1267	0.102	0.166	0.154	0.188	0.098	0.194	0.142

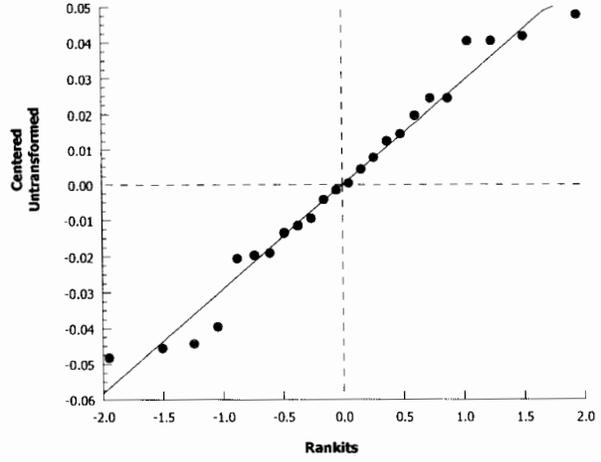
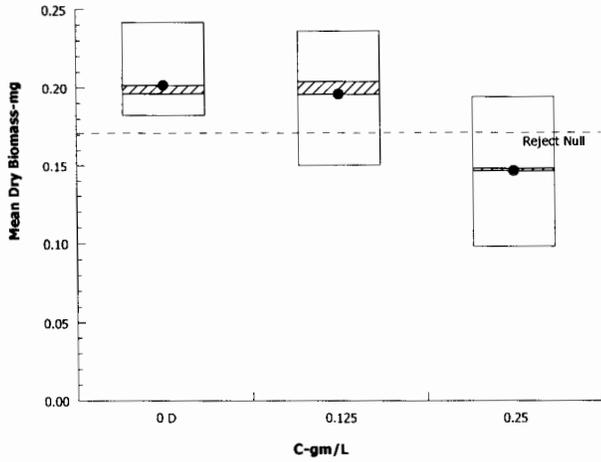
Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 17-3842-5228 Endpoint: Mean Dry Biomass-mg
Analyzed: 15 Mar-24 10:26 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.8.7
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 15 Mar-24 10:26 (p 1 of 2)
 Test Code: 904-1457 | 09-4159-9460

Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 19-3116-8796	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.8.7
Analyzed: 15 Mar-24 10:26	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 02-3217-7427	Test Type: Growth-Survival-Fec (7d)	Analyst: Lab Tech
Start Date: 27 Feb-24 14:20	Protocol: EPA/821/R-02-014 (2002)	Diluent: Laboratory Seawater
Ending Date: 05 Mar-24 13:40	Species: Americamysis bahia	Brine: Crystal Sea
Duration: 6d 23h	Source: Aquatic Biosystems, CO	Age: 7
Sample ID: 13-0164-3289	Code: 4D958019	Client: Internal Lab
Sample Date: 27 Feb-24 10:00	Material: Potassium chloride	Project: Special Studies
Receive Date: 27 Feb-24 11:00	Source: Reference Toxicant	
Sample Age: 4h	Station: In House	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1781727	200	Yes	Two-Point Interpolation

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α :5%)
Control Trend	Mann-Kendall Trend			0.7195	Non-significant Trend in Controls

Point Estimates

Level	gm/L	95% LCL	95% UCL
IC5	0.1355	0.03892	0.159
IC10	0.1611	0.07785	0.1931
IC15	0.1866	0.1168	0.232
IC20	0.2122	0.1582	0.2634
IC25	0.2377	0.1861	0.2891
IC40	0.3034	0.2485	0.3563
IC50	0.3458	0.3002	0.4027

Mean Dry Biomass-mg Summary

Calculated Variate

C-gm/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	8	0.2016	0.1825	0.242	0.006838	0.01934	9.6%	0.0%
0.125		8	0.1956	0.15	0.236	0.01123	0.03178	16.2%	2.95%
0.25		8	0.1463	0.098	0.194	0.01279	0.03618	24.7%	27.4%
0.5		8	0.0275	0	0.176	0.02148	0.06076	221.0%	86.4%
1		8	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Detail

C-gm/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Dilution Water	0.19	0.2	0.242	0.202	0.192	0.1825	0.216	0.188
0.125		0.15	0.22	0.175	0.156	0.22	0.236	0.2	0.208
0.25		0.1267	0.102	0.166	0.154	0.188	0.098	0.194	0.142
0.5		0	0.01	0	0	0	0.028	0.006	0.176
1		0	0	0	0	0	0	0	0

Mysidopsis 7-d Survival, Growth and Fecundity Test

TRE Environmental Strategies

Analysis ID: 19-3116-8796

Endpoint: Mean Dry Biomass-mg

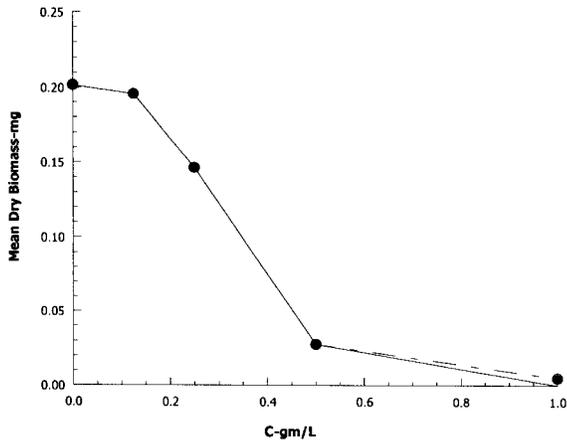
CETIS Version: CETISv1.8.7

Analyzed: 15 Mar-24 10:26

Analysis: Linear Interpolation (ICPIN)

Official Results: Yes

Graphics



APPENDIX D
Power Standards

SA
 5/18/24

POWER STANDARDS CALCULATION FOR CHRONIC TESTS

Project Number: 14001-056-255 Test Species: Americamysis bahia

Test Period: February 27, 2024 to March 5, 2024

CCEC	Mysid average weight / organism (mg)									
	Rep A	Rep B	Rep C	Rep D	Rep E	Rep F	Rep G	Rep H	Mean	
0.8% effluent	0.278	0.282	0.316	0.310	0.268	0.306	0.230	0.288	0.285 (A)	
Control	Rep A	Rep B	Rep C	Rep D	Rep E	Rep F	Rep G	Rep H	Mean	
Lab water	0.272	0.300	0.230	0.290	0.310	0.254	0.198	0.258	0.264 (B)	

1. 0.264 (B) - 0.285 (A) = -0.021 (C)
2. $[-0.021$ (C) \div 0.264 (B) = -0.0795 x 100 = -7.95 (D)
3. If (D) is \leq 39 percent, then this test has met the power standard.
4. This test **DOES** / DOES NOT meet the power standard.

Note: WET tests that fail WET limits do not have to meet power standards.