

Acute and Chronic Toxicity Testing Results for Wyckoff Eagle Harbor Groundwater Treatment Plant

Monitoring Period: October 2020

Prepared for:

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Prepared by:

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Data Quality Assurance:

- Enthalpy Analytical is accredited in accordance with NELAP by the State of Oregon Environmental Laboratory Accreditation Program (ORELAP ID 4053). It is also certified by the State of California Water Resources Control Board Environmental Laboratory Accreditation Program (Certificate No. 1802) and the State of Washington Department of Ecology (Lab ID C552). Specific fields of testing applicable to each accreditation are available upon request.
- All data have been reviewed and verified.
- All test results have met minimum test acceptability criteria under their respective US EPA protocols, unless otherwise noted in this report.
- All tests have met internal Quality Assurance Program requirements.

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Results verified by: ____

Introduction

Acute and ch ronic toxicity tests were performed using a g roundwater composite sample collected on October 27, 2020 from the Wyckoff Eagle Harbor Groundwater Treatment Plant on Bainbridge Island in W ashington. The tests w ere performed to sa tisfy q uarterly and annual monitoring requirements according to the project Quality Assurance Project Plan (QAPP 2013). The chronic bioassay was conducted using the bivalve *Mytilus galloprovincialis* (Mediterranean mussel) and the acute bioassay was conducted using the f ish *Menidia beryllina* (inland silverside). Testing w as performed a t Enthalpy A nalytical located i n San D iego, C alifornia between October 28 and November 1, 2020.

Materials and Methods

The groundwater sample was collected into a low-density polyethylene cu bitainer by Jacobs personnel, packed in a co oler containing i.e., and shipped overnight to Enthalpy. Appropriate chain-of-custody (COC) procedures were employed during collection and transport. Upon arrival at the laboratory, the cooler was opened, the sample inspected, and the contents verified against information on the COC form. Standard water quality parameters were measured and recorded on a sample check-in form and are summarized in Table 1. The sample was stored at 4° C in the dark until used for testing.

Sample ID	102720; Location SP-11
Enthalpy Log-in Number	20-1180
Collection Date; Time	10/27/2020; 0918h
Receipt Date; Time	10/28/2020; 0935h
Receipt Temperature (°C)	3.4
Dissolved Oxygen (mg/L)	7.8
рН	7.54
Salinity (ppt)	9.5
Alkalinity (mg/L CaCO ₃)	396
Total Chlorine (mg/L)	0.02
Total Ammonia (mg/L as N)	2.5

Table 1. Sample Information

Test Methods

Chronic toxicity testing was conducted according to the method set forth in USEPA 1995 and acute toxicity testing was conducted according to the method set forth in USEPA 2002. The methods are summarized in Tables 2 and 3.

Table 2. Summary of Methods for th	le Bivalve Larval Development Test
Test Period	10/28/2020, 1550h to 10/30/2020, 1500h
Test Organism	Mytilus galloprovincialis
Test Organism Source	Taylor Shellfish (Shelton, WA)
Test Organism Age	4 hours post fertilization
Test Duration	48 ± 2 hours
Test Type	Static
Test Chamber, Test Solution Volume	30 mL glass vial, 10 mL
Test Temperature	15 ± 1°C
Dilution Water	Laboratory Seawater (Source: Scripps Institution of Oceanography [SIO] intake) diluted with de-ionized water
Additional Control	Brine Control (de-ionized water and hypersaline brine)
Test Salinity	30 ± 2 ppt
Source of Salinity	Hypersaline brine made by freezing seawater to a salinity of 94.3 ppt
Test Concentrations (% sample)	75.8 ^ª , 35, 18, 9, 4, and 2%, lab and brine controls
Number of Replicates	5
Photoperiod	16 hours light/8 hours dark
Test Protocol	EPA/600/R-95/136
Test Acceptability Criteria for Controls	\geq 50% mean survival, \geq 90% mean development rate
Reference Toxicant	Copper chloride ^b
Statistical Software	CETIS™ 1.8.7.20

Table 2. Summary of Methods for the Bivalve Larval Development Test

^a Highest concentration tested due to the addition of hypersaline brine

^b A deviation to the QAPP was approved by USEPA and Washington Department of Ecology to conduct reference toxicant testing with copper chloride instead of copper sulfate.

Table 3. Summary of Methods for the Inland Silverside Acute Survival Test

Table 5. Guillina y of Methods for the	e inianu Silversiue Acute Sulvivai Test
Test Period	10/28/2020, 1545h to 11/1/2020, 1445h
Test Organism	Menidia beryllina
Test Organism Source	Aquatic Indicators (St. Augustine, FL)
Test Organism Age	14 days
Test Duration	96 ± 2 hours
Test Type	Static - renewal
Test Chamber, Test Solution Volume	500mL Plastic Cup, 250mL
Test Temperature	25 ± 1°C
Dilution Water	Salt Control (Instant Ocean™ brand sea salts added to de- ionized water)
Additional Control	Laboratory Seawater (Source: SIO intake) diluted with de- ionized water
Test Salinity	30 ± 2 ppt
Source of Salinity	Instant Ocean™ brand sea salts
Test Concentrations (% sample)	100, 50, 25, 12.5, and 6.25%, lab and salt controls
Number of Replicates	4
Photoperiod	16 hours light/8 hours dark
Test Protocol	EPA/821/R-02/012, 2002 Acute Manual
Test Acceptability Criteria for Controls	\ge 90% mean survival
Reference Toxicant	Copper chloride
Statistical Software	CETIS™ 1.8.7.20

Results

There were no statistically significant effects observed in any effluent concentration tested for the survival or development endpoint of the bivalve test. This results in a no observed effect concentration (NOEC) of 75.8 (the highest concentration tested) and a chronic toxic unit (TU_c) of less than 1.32 for both endpoints.

There were no statistically significant effects observed in any effluent concentration tested for the su rvival endpoint of the inland si lverside test. This results in a no observed effect concentration (NOEC) of 100 and an acute toxic unit (TU_a) of 1.0.

Statistical results for the acute and chronic toxicity tests are summarized in Table 4. Detailed summaries of the acute and chronic toxicity tests are provided in Tables 5 and 6, respectively. Individual statistical summaries for the tests and co pies of the l aboratory bench sheets are provided in Appendix A. The sample check-in sheet and COC form are provided in Appendices B and C, respectively.

Species	Endpoint	NOEC (% effluent)	LOEC (% effluent)	Toxic Unit (TU _a /TU _c)	EC ₂₅ (% effluent)
Inland Silverside	Survival	100	> 100	1.0	> 100
Bivalve	Normal Development	75.8	> 75.8	< 1.32	> 75.8
Divalve	Survival	75.8	> 75.8	< 1.32	> 75.8

Table 4. Summary of Statistical Results for the Chronic Toxicity Tests

NOEC = No Observed Effect Concentration

LOEC = Lowest Observed Effect Concentration

Acute Toxic Unit $(TU_a) = 100/LC_{50}$. A TU_a of 1.0 indicates no toxicity in the sample.

Chronic Toxic Unit (TU_c) = 100/NOEC. NOTE: Since 100% sample was not tested, the TU_c value can only be calculated up to the highest concentration tested. If no toxicity is observed at this concentration, the TU_c is reported as less than the calculated value. Effect Concentration 25 (IC_{25}) = Concentration expected to cause an effect to 25% of the organisms

Concentration (% Effluent)	Mean Survival (%)
0 (Salt Control)	100
0 (Lab Control)	100
6.25	95.0
12.5	100
25	100
50	100
100	100

Table 5. Detailed Results for the Inland Silverside Acute Survival Test

Table 6. Detailed Results for the Bivalve Development Chronic Toxicity Test

Concentration (% Effluent)	Mean Survival (%)	Mean Normal Development (%)
0 (Brine Control)	99.8	96.8
0 (Lab Control)	99.0	95.6
2	99.2	95.9
4	99.3	96.7
9	98.4	97.2
18	96.1	96.5
35	99.9	97.8
75.8 ^ª	97.9	96.5

^a Highest concentration tested due to the addition of hypersaline brine

Quality Assurance

The sample was received in good condition and within the appropriate temperature range of 0-6°C. Testing occurred within the required 36 hour holding time. All control acceptability criteria were met and water quality parameters remained within the appropriate ranges throughout the test. Statistical anal yses followed st andard U SEPA f lowchart se lections. D ose-response relationships were r eviewed t o ensure the reliability of the results. Based on the dose responses observed, the calculated effects concentrations were deemed reliable. Minor QA/QC issues that were unlikely to have any bearing on the final test results, such as slight temperature deviations, are noted on the data sheets and a list of qualifier codes used on bench data sheets is presented in Appendix D.

Reference Toxicant

Results for t he r eference toxicant tests used t o m onitor I aboratory performance and t est organism sensitivity ar e su mmarized in Table 7. The r eference t oxicant tests met al I t est acceptability criteria. Additionally, the results for both reference toxicant tests were within the acceptable range of the mean historical test results plus or minus two standard deviations. This indicates that the sensitivity of these batches of organisms was typical for our laboratory. The reference toxicant statistical summaries and laboratory bench sheets are provided in Appendix E.

Table 7. Reference Toxicant Test Results	Table 7.	Reference	Toxicant	Test Results
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Species	Endpoint	EC₅₀ (μg/L copper)	Historical mean ± 2 SD (µg/L copper)	CV (%)
Bivalve	Normal Development	7.26	10.2 ± 6.48	31.8
Bivalve	Survival	29.8	29.5 ± 4.41	7.48
Inland Silverside	Survival	137	186 ± 93.2	25.1

Effect Concentration 50 (EC_{50}) = Concentration expected to cause an effect to 50% of the organisms CV = Coefficient of Variation.

References

- CH2MHill. 2013. Quality Assurance Project Plan Groundwater Treatment Plant Operations, Maintenance, Bainbridge, Washington. Prepared for USEPA Region 10 June 5, 2013.
- Standard Guide for Conducting Static Acute Toxicity Tests with Embryos of Four Species of Saltwater Bivalve Molluscs. 1989. ASTM Standard E 724-89.
- Tidepool S cientific Software. 2000 -2013. C ETIS C omprehensive E nvironmental Toxicity Information System Software, Version 1.8.7.20.
- USEPA. 1995. S hort-Term M ethod for E stimating the C hronic Toxicity of E ffluents and Receiving Waters t o the West C oast M arine and E stuarine Organisms. E PA/600/R-95/136. pp. 209-258 and 389-465.
- USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. United States Environmental Protection Agency Office of Water, Washington DC (EPA-821-R-02-012).
- Washington State Department of Ecology. 2016. Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. Publication No. WQ-R-95-80. Revised June 2016

Appendix A Statistical Summaries and Raw Bench Sheets **Bivalve Larval Development Test**

20 Nov-20 13:58 (p 1 of 2) 2010-S165 | 13-3633-9954

Bivalve Larval	Survival and D)evelop	oment Test					5 0 C 2/2			nental (CA)
Batch ID: Start Date: Ending Date: Duration:	09-0976-5985 28 Oct-20 15:5 30 Oct-20 15:0 47h		Test Type: Protocol: Species: Source:	Development-S EPA/600/R-95/ Mytilus gallopro Taylor Shellfish	136 (1995) ovincialis			ne: Froz	ted Natural en Seawate	Percent and the second second	
and the second second second	20-2216-8976 27 Oct-20 09:1 28 Oct-20 09:3 31h (3.4 °C)		Code: Material: Source: Station:	20-1180 Effluent Sample Jacobs Wyckoff	e		Clie Pro	ent: Jaco ject:	obs		
Comparison S	Summary										
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	ти	Method			
18-9069-1216	Development F	Rate	75.8	>75.8	NA	2.41%	<1.319	Dunnett M	ultiple Com	parison Te	st
20-6639-0887	Survival Rate		75.8	>75.8	NA	3.16%	<1.319		y-One Rank	and the second second	
Point Estimate	e Summary				100	100					
Analysis ID	Endpoint		Level	%	95% LCL	95% UCI	LTU	Method			
15-3007-2344	Development F	Rate	EC25	>75.8	N/A	N/A	<1.319	Linear Inte	erpolation (IC	CPIN)	
			EC50	>75.8	N/A	N/A	<1.319				
19-0694-7295	Survival Rate		EC25		N/A	N/A	<1.319	Linear Inte	erpolation (I	CPIN)	
			EC50	>75.8	N/A	N/A	<1.319				
Test Acceptab	oility			100	1000	1.5					
Analysis ID	Endpoint		Attrib	oute	Test Stat	TAC Lin	nits	Overlap	Decision		
15-3007-2344	Development F	Rate	Contr	ol Resp	0.9676	0.9 - NL		Yes	Passes A	cceptability	Criteria
18-9069-1216	Development F	Rate	Contr	ol Resp	0.9676	0.9 - NL		Yes	Passes A	cceptability	Criteria
19-0694-7295	Survival Rate		Contr	ol Resp	0.9977	0.5 - NL		Yes		cceptability	
20-6639-0887	Survival Rate		Contr	ol Resp	0.9977	0.5 - NL		Yes	Passes A	cceptability	Criteria
Development	Rate Summary	17.1	-	100	0						
C-%	Control Type	Coun	nt Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Brine Control	5	0.967	6 0.9568	0.9784	0.9535	0.9763	0.003898	0.008716	0.9%	0.0%
0	Lab Control	5	0.955		0.969	0.9399	0.9643	0.004814		1.13%	1.24%
2		5	0.959		0.9864	0.924	0.9845	0.009783	0.02188	2.28%	0.87%
4		5	0.966		0.9838	0.9468	0.9827	0.006201	0.01386	1.43%	0.1%
9		5	0.971		0.9843	0.962	0.9828	0.00455	0.01017	1.05%	-0.41%
18		5	0.965		0.9866	0.9351	0.9806	0.00779	0.01742	1.81%	0.28%
35		5	0.977		0.9919 0.9774	0.9647	0.9896 0.977	0.005133		1.17% 1.02%	-1.03% 0.26%
75.8	0	5	0.905	1 0.9529	0.9774	0.9324	0.977	0.004414	0.00901	1.02 70	0.2076
Survival Rate		Cour	t Mass	05% 1.01	05% 1101	Min	May	Std Err	Std Dev	CV%	%Effect
	Control Type				95% UCL		Max	0.002339	0.005231	0.52%	0.0%
0	Brine Control	5	0.997		1	0.9883	1	0.002339		1.59%	0.0%
0 2	Lab Control	5 5	0.989		1	0.9591	1	0.008187		1.85%	0.59%
4		5	0.991		4	0.9649	1	0.007018	0.01569	1.58%	0.47%
9		5	0.983		1	0.924	1	0.01496	0.03344	3.4%	1.41%
18		5	0.961		1	0.9006	1	0.02365	0.05289	5.5%	3.63%
35		5	0.998	8 0.9956	1	0.9942	1	0.00117	0.002615	0.26%	-0.12%

Bivalve La	arval Survival and D	Developmen	nt Test				Nautilus Environmental (CA
Developm	ent Rate Detail		1.1.1				
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Brine Control	0.9535	0.9763	0.9659	0.9713	0.9711	
0	Lab Control	0.9636	0.9399	0.9643	0.9613	0.949	
2		0.924	0.9626	0.9617	0.9845	0.9634	
4		0.9758	0.9607	0.9827	0.9468	0.9672	
9		0.9828	0.962	0.9826	0.9647	0.9661	
18		0.9718	0.9683	0.9691	0.9806	0.9351	
35		0.9771	0.9647	0.9896	0.9886	0.9679	
75.8		0.977	0.9689	0.9524	0.9694	0.9578	
Survival F	Rate Detail	1.10					
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Brine Control	1	0.9883	1	4	1	
0	Lab Control	0.9649	1	0.9825	1	1	
2		1	1	1	1	0.9591	
4		0.9649	1	1	1	1	
9		1	0.924	1	0.9942	1	
18		1	1	1	0.9064	0.9006	
35		1	0.9942	1	1	1.1	
75.8		1	0.9415	0.9825	1	0.9708	
Developm	ent Rate Binomials						
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Brine Control	164/172	165/169	170/176	169/174	168/173	
0	Lab Control	159/165	172/183	162/168	174/181	186/196	
2		158/171	180/187	176/183	190/193	158/164	
4		161/165	171/178	170/173	178/188	177/183	
9		171/174	152/158	169/172	164/170	171/177	
18		172/177	183/189	188/194	152/155	144/154	
35		171/175	164/170	191/193	174/176	181/187	
75.8		170/174	156/161	160/168	190/196	159/166	
Survival F	Rate Binomials						
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Brine Control	171/171	169/171	171/171	171/171	171/171	
0	Lab Control	165/171	171/171	168/171	171/171	171/171	
2		171/171	171/171	171/171	171/171	164/171	
4		165/171	171/171	171/171	171/171	171/171	
9		171/171	158/171	171/171	170/171	171/171	
18		171/171	171/171	171/171	155/171	154/171	
35		171/171	170/171	171/171	171/171	171/171	
75.8		171/171	161/171	168/171	171/171	166/171	

CETIS Ana	alytical Rep	ort							ort Date: Code:			00 (p 1 of 3-3633-995
Bivalve Larva	al Survival and [Developme	nt Test							Nautilus	Environ	mental (CA
Analysis ID: Analyzed:	18-9069-1216 20 Nov-20 13:			velopment R ametric-Con		eat	ments	1.	S Version		8.7	
Data Transfo	rm	Zeta	Alt Hyp	Trials	Seed	-		PMSD	NOEL	LOEL	TOEL	TU
Angular (Corr		NA	C > T	NA	NA	-		2.41%	75.8	>75.8	NA	1.319
Dunnett Mult	iple Compariso	n Test			-	-		- 11-				
Control	vs C-%		Test Stat	Critical	MSD I	DF	P-Value	P-Type	Decision	(a:5%)		
Brine Control	2		0,7363	2,407	0.059	8	0.5748	CDF	Non-Sign	ificant Effect		_
	4		0.03392	2.407	0.059		0.8478	CDF		ificant Effect		
	9		-0.5279	2.407	0.059		0.9552	CDF		ificant Effect		
	18		0.1915	2.407	0.059		0.7989	CDF	and the second s	ificant Effect		
	35		-1.389	2.407	0.059		0.9964	CDF		ificant Effect		
	75.8		0.2737	2.407	0.059		0.7701	CDF	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ificant Effect		
ANOVA Table	9		A 14									
Source	Sum Squ	ares	Mean Squ	lare	DF		F Stat	P-Value	Decision	(a:5%)		
Between	0.008288	882	0.0013814	8	6		0.9319	0.4877	Non-Sign	ificant Effect		
Error	0.041507	9	0.0014824	25	28							
Total	0.049796	78			34	_						
Distributiona	I Tests						1					
Attribute	Test			Test Stat	Critical		P-Value	Decision	(a:1%)			
Variances	Bartlett E	Equality of V	/ariance	3.538	16.81		0.7389	Equal Var	iances			
Distribution	Shapiro-	Wilk W Nor	mality	0.9818	0.9146	1.1	0.8175	Normal D	istribution	_		
Development	t Rate Summary	9		1.1	7.4.44			10 m	1.1	1.5	77.7	2- T.
C-%	Control Type	Count	Mean	95% LCL	95% UC	L	Median	Min	Max	Std Err	CV%	%Effect
0	Brine Control	5	0.9676	0.9568	0.9784	17	0.9711	0.9535	0.9763	0.003898	0.9%	0.0%
		5	0.9592	0.9321	0.9864		0.9626	0.924	0.9845	0.009783	2.28%	0.87%
2		5	0.9666	0.9494	0.9838		0.9672	0.9468	0.9827	0.0062	1.43%	0.1%
2 4		5						0.962	0.9828	0.00455	1.05%	-0.41%
4		5	0.9716	0.959	0.9843		0.9661	0.001				0.28%
4 9			0.9716 0.965	0.959 0.9433	0.9843 0.9866		0.9661 0.9691	0.9351	0.9806	0.00779	1.81%	
		5							0.9806 0.9896		1.17%	-1.03%
4 9 18		5 5	0.965	0.9433	0.9866		0.9691	0.9351	0.9806	0.00779		-1.03% 0.26%
4 9 18 35 75.8	rected) Transfor	5 5 5 5	0.965 0.9776 0.9651	0.9433 0.9634	0.9866 0.9919 0.9774		0.9691 0.9771 0.9689	0.9351 0.9647 0.9524	0.9806 0.9896	0.00779 0.005133 0.004414	1.17% 1.02%	0.26%
4 9 18 35 75.8 Angular (Cor	rected) Transfor Control Type	5 5 5 5 rmed Sum Count	0.965 0.9776 0.9651 nary Mean	0.9433 0.9634	0.9866 0.9919 0.9774	2	0.9691 0.9771	0.9351 0.9647	0.9806 0.9896	0.00779 0.005133	1.17% 1.02% CV%	0.26% %Effect
4 9 18 35 75.8 Angular (Cor C-% 0	and the second second	5 5 5 5 rmed Sum	0.965 0.9776 0.9651 nary	0.9433 0.9634 0.9529	0.9866 0.9919 0.9774	;L	0.9691 0.9771 0.9689 Median 1.4	0.9351 0.9647 0.9524 Min 1.353	0.9806 0.9896 0.977 Max 1.416	0.00779 0.005133 0.004414 Std Err 0.01063	1.17% 1.02% CV% 1.71%	0.26% %Effect 0.0%
4 9 18 35 75.8 Angular (Cor C-% 0	Control Type	5 5 5 5 5 5 Count 5 5	0.965 0.9776 0.9651 nary Mean	0.9433 0.9634 0.9529 95% LCL	0.9866 0.9919 0.9774 95% UC	ж.	0.9691 0.9771 0.9689 Median	0.9351 0.9647 0.9524 Min	0.9806 0.9896 0.977 Max	0.00779 0.005133 0.004414 Std Err	1.17% 1.02% CV%	0.26% %Effect 0.0% 1.29%
4 9 18 35 75.8 Angular (Cor C-% 0 2	Control Type	5 5 5 5 med Sum Count 5	0.965 0.9776 0.9651 mary <u>Mean</u> 1.391	0.9433 0.9634 0.9529 95% LCL 1.362	0.9866 0.9919 0.9774 95% UC 1.421	21	0.9691 0.9771 0.9689 Median 1.4	0.9351 0.9647 0.9524 Min 1.353	0.9806 0.9896 0.977 Max 1.416	0.00779 0.005133 0.004414 Std Err 0.01063	1.17% 1.02% CV% 1.71%	0.26% %Effec 0.0%
4 9 18 35 75.8 Angular (Cor C-% 0 2 4	Control Type	5 5 5 5 5 5 Count 5 5	0.965 0.9776 0.9651 mary <u>Mean</u> 1.391 1.373	0.9433 0.9634 0.9529 95% LCL 1.362 1.305	0.9866 0.9919 0.9774 95% UC 1.421 1.441		0.9691 0.9771 0.9689 Median 1.4 1.376	0.9351 0.9647 0.9524 Min 1.353 1.291	0.9806 0.9896 0.977 Max 1.416 1.446	0.00779 0.005133 0.004414 Std Err 0.01063 0.02448	1.17% 1.02% CV% 1.71% 3.99%	0.26% %Effec 0.0% 1.29%
4 9 18 35 75.8	Control Type	5 5 5 5 7 7 7 7 7 5 5 5 5	0.965 0.9776 0.9651 mary Mean 1.391 1.373 1.39	0.9433 0.9634 0.9529 95% LCL 1.362 1.305 1.342	0.9866 0.9919 0.9774 95% UC 1.421 1.441 1.438	<u>, L</u>	0.9691 0.9771 0.9689 Median 1.4 1.376 1.389	0.9351 0.9647 0.9524 <u>Min</u> 1.353 1.291 1.338	0.9806 0.9896 0.977 Max 1.416 1.446 1.439	0.00779 0.005133 0.004414 Std Err 0.01063 0.02448 0.01736	1.17% 1.02% CV% 1.71% 3.99% 2.79%	0.26% %Effect 0.0% 1.29% 0.06%
4 9 18 35 75.8 Angular (Cor C-% 0 2 4 9	Control Type	5 5 5 5 5 Count 5 5 5 5 5	0.965 0.9776 0.9651 mary Mean 1.391 1.373 1.39 1.404	0.9433 0.9634 0.9529 95% LCL 1.362 1.305 1.342 1.364	0.9866 0.9919 0.9774 95% UC 1.421 1.441 1.438 1.444	<u></u>	0.9691 0.9771 0.9689 Median 1.4 1.376 1.389 1.386	0.9351 0.9647 0.9524 Min 1.353 1.291 1.338 1.375	0.9806 0.9896 0.977 Max 1.416 1.446 1.439 1.439	0.00779 0.005133 0.004414 Std Err 0.01063 0.02448 0.01736 0.01432	1.17% 1.02% CV% 1.71% 3.99% 2.79% 2.28%	0.26% %Effect 0.0% 1.29% 0.06% -0.92%

SETIS Ana	alytical Rep	ort						ort Date: Code:			00 (p 2 of 3-3633-995
Bivalve Larva	al Survival and D	Develop	ment Test					121	Nautilus	Environ	nental (C/
Analysis ID: Analyzed:	20-6639-0887 20 Nov-20 13:			vival Rate	Control vs	Freatments		IS Version: ial Results:	CETISv1. Yes	8.7	
Data Transfo	m	Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	TU
Angular (Corr	ected)	NA	C > T	NA	NA		3.16%	75.8	>75.8	NA	1.319
Steel Many-C	One Rank Sum T	est					11				
Control	vs C-%		Test Stat	Critical	Ties DI	P-Value	P-Type	Decision(c	a:5%)		
Brine Control			27	16	1 8	0.8267	Asymp		icant Effect		
	4		27	16	1 8	0.8267	Asymp		icant Effect		
	9		25	16	1 8	0.6693	Asymp		icant Effect		
	18		24	16	1 8	0.5746	Asymp		icant Effect		
	35		28	16	1 8	0.8838	Asymp	and the second	icant Effect		
	75.8		21	16	1 8	0.2891	Asymp		icant Effect		
ANOVA Table	e						1.1.1	1.0			
Source	Sum Squ	ares	Mean Squ	lare	DF	F Stat	P-Value	Decision(d	a:5%)		
Between	0.044345		0.0073908		6	0.9712	0.4626	Non-Signifi	icant Effect		
Error	0.213077		0.0076099		28			C. L. C.			
and the second sec											
Total	0.257422	8			34	-					_
Total Distributiona		8		_		_					
1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		8		Test Stat		P-Value	Decision	(a:1%)			
Distributiona	al Tests Test		of Variance	Test Stat 16.94	34	P-Value 0.0095	Decision Unequal				
Distributiona Attribute	al Tests Test	Equality of			34 Critical		Unequal		n		
Distributiona Attribute Variances Distribution	al Tests Test Bartlett E Shapiro-	Equality of		16.94	34 Critical 16.81	0.0095	Unequal	/ariances	n		
Distributiona Attribute Variances	al Tests Test Bartlett E Shapiro-	Equality of	Normality	16.94	34 Critical 16.81	0.0095 0.0011	Unequal Non-norm	/ariances	n Std Err	CV%	%Effect
Distributiona Attribute Variances Distribution Survival Rate C-% 0	al Tests Test Bartlett E Shapiro- e Summary	Equality of Wilk W M Count 5	Normality t Mean 0.9977	16.94 0.879 95% LCL 0.9912	34 Critical 16.81 0.9146 95% UCL 1	0.0095 0.0011 Median 1	Unequal Non-norm Min 0.9883	/ariances aal Distributio Max 1	Std Err 0.002339	0.52%	0.0%
Distributiona Attribute Variances Distribution Survival Rate C-%	al Tests Test Bartlett E Shapiro- e Summary Control Type	Equality of Wilk W M Count 5 5 5	Normality t Mean 0.9977 0.9918	16.94 0.879 95% LCL 0.9912 0.9691	34 Critical 16.81 0.9146 95% UCL 1 1	0.0095 0.0011 Median 1 1	Unequal N Non-norm Min 0.9883 0.9591	/ariances aal Distributio Max 1 1	Std Err 0.002339 0.008187	0.52% 1.85%	0.0% 0.59%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4	al Tests Test Bartlett E Shapiro- e Summary Control Type	Equality of Wilk W M Count 5 5 5 5 5	Normality t Mean 0.9977 0.9918 0.993	16.94 0.879 95% LCL 0.9912 0.9691 0.9735	34 Critical 16.81 0.9146 95% UCL 1 1 1 1	0.0095 0.0011 Median 1 1 1	Unequal N Non-norm Min 0.9883 0.9591 0.9649	/ariances aal Distributio Max 1 1 1	Std Err 0.002339 0.008187 0.007017	0.52% 1.85% 1.58%	0.0% 0.59% 0.47%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9	al Tests Test Bartlett E Shapiro- e Summary Control Type	Equality of Wilk W N Count 5 5 5 5 5 5	Normality Mean 0.9977 0.9918 0.993 0.9836	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1	0.0095 0.0011 Median 1 1 1 1	Unequal N Non-norm Min 0.9883 0.9591 0.9649 0.924	/ariances nal Distributio Max 1 1 1 1	Std Err 0.002339 0.008187 0.007017 0.01496	0.52% 1.85% 1.58% 3.4%	0.0% 0.59% 0.47% 1.41%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18	al Tests Test Bartlett E Shapiro- e Summary Control Type	Equality of Wilk W N 5 5 5 5 5 5 5 5	Mormality Mean 0.9977 0.9918 0.993 0.9836 0.9614	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1	0.0095 0.0011 Median 1 1 1 1 1 1	Unequal Non-norm Min 0.9883 0.9591 0.9649 0.924 0.9006	/ariances nal Distributio Max 1 1 1 1 1 1	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365	0.52% 1.85% 1.58% 3.4% 5.5%	0.0% 0.59% 0.47% 1.41% 3.63%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35	al Tests Test Bartlett E Shapiro- e Summary Control Type	Equality c Wilk W M 5 5 5 5 5 5 5 5	Normality Mean 0.9977 0.9918 0.993 0.9836 0.9614 0.9988	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957 0.9956	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1 1 1 1	0.0095 0.0011 Median 1 1 1 1 1 1 1 1	Unequal N Non-norm Min 0.9883 0.9591 0.9649 0.924 0.9006 0.9942	/ariances nal Distributio Max 1 1 1 1 1 1 1 1	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365 0.00117	0.52% 1.85% 1.58% 3.4% 5.5% 0.26%	0.0% 0.59% 0.47% 1.41% 3.63% -0.12%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35 75.8	al Tests Test Bartlett E Shapiro- e Summary Control Type Brine Control	Equality of Wilk W N 5 5 5 5 5 5 5 5 5 5 5 5 5	Mormality 0.9977 0.9918 0.993 0.9836 0.9614 0.9988 0.9789	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1	0.0095 0.0011 Median 1 1 1 1 1 1	Unequal Non-norm Min 0.9883 0.9591 0.9649 0.924 0.9006	/ariances nal Distributio Max 1 1 1 1 1 1	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365	0.52% 1.85% 1.58% 3.4% 5.5%	0.0% 0.59% 0.47% 1.41% 3.63%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35 75.8 Angular (Cor	al Tests Test Bartlett E Shapiro- e Summary Control Type Brine Control	Equality of Wilk W N 5 5 5 5 5 5 5 5 5 5 5 5	Normality Mean 0.9977 0.9918 0.993 0.9836 0.9614 0.9988 0.9789 mmary	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957 0.9956 0.9487	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1 1 1 1 1	0.0095 0.0011 Median 1 1 1 1 1 1 0.9825	Unequal N Non-norm 0.9883 0.9591 0.9649 0.924 0.9006 0.9942 0.9415	/ariances hal Distributio Max 1 1 1 1 1 1 1 1 1	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365 0.00117 0.01088	0.52% 1.85% 1.58% 3.4% 5.5% 0.26% 2.49%	0.0% 0.59% 0.47% 1.41% 3.63% -0.12% 1.88%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35 75.8 Angular (Cor C-%	al Tests Test Bartlett E Shapiro- e Summary Control Type Brine Control Brine Control	Equality of Wilk W N 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Mormality Mean 0.9977 0.9918 0.993 0.9836 0.9614 0.9988 0.9789 mmary t Mean	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957 0.9956 0.9487 95% LCL	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1 1 1 95% UCL	0.0095 0.0011 Median 1 1 1 1 1 0.9825 Median	Unequal Non-norm Min 0.9883 0.9591 0.9649 0.924 0.9006 0.9942 0.9415 Min	/ariances nal Distributio Max 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365 0.00117 0.01088 Std Err	0.52% 1.85% 1.58% 3.4% 5.5% 0.26% 2.49%	0.0% 0.59% 0.47% 1.41% 3.63% -0.12% 1.88%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35 75.8 Angular (Cor C-% 0	al Tests Test Bartlett E Shapiro- e Summary Control Type Brine Control	Equality of Wilk W N 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Mean 0.9977 0.9918 0.993 0.9836 0.9614 0.9988 0.9789 mmary t Mean 1.519	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957 0.9956 0.9487 95% LCL 1.48	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.0095 0.0011 Median 1 1 1 1 1 0.9825 Median 1.533	Unequal N Non-norm 0.9883 0.9591 0.9649 0.924 0.9006 0.9942 0.9415 Min 1.462	Variances nal Distributio Max 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365 0.00117 0.01088 Std Err 0.01402	0.52% 1.85% 1.58% 3.4% 5.5% 0.26% 2.49% CV% 2.07%	0.0% 0.59% 0.47% 1.41% 3.63% -0.12% 1.88% %Effec 0.0%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35 75.8 Angular (Cor C-% 0 2	al Tests Test Bartlett E Shapiro- e Summary Control Type Brine Control Brine Control	Count 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Normality Mean 0.9977 0.9918 0.993 0.9836 0.9614 0.9988 0.9789 mmary t Mean 1.519 1.499	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957 0.9956 0.9487 95% LCL 1.48 1.408	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1 95% UCL 1.557 1.591	0.0095 0.0011 1 1 1 1 1 1 0.9825 Median 1.533 1.533	Unequal V Non-norm 0.9883 0.9591 0.9649 0.924 0.9006 0.9942 0.9415 0.9415 Min 1.462 1.367	/ariances nal Distributio Max 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365 0.00117 0.01088 Std Err 0.01402 0.0331	0.52% 1.85% 1.58% 3.4% 5.5% 0.26% 2.49% CV% 2.07% 4.94%	0.0% 0.59% 0.47% 1.41% 3.63% -0.12% 1.88% %Effec 0.0% 1.26%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35 75.8 Angular (Cor C-% 0 2 4 4 9 18 35 75.8	al Tests Test Bartlett E Shapiro- e Summary Control Type Brine Control Brine Control	Equality of Wilk W N 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Normality Mean 0.9977 0.9918 0.993 0.9836 0.9614 0.9988 0.9789 mmary t Mean 1.519 1.499 1.503	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957 0.9956 0.9487 95% LCL 1.48 1.408 1.419	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1 1 1 95% UCL 1.557 1.591 1.586	0.0095 0.0011 1 1 1 1 1 1 0.9825 Median 1.533 1.533 1.533	Unequal N Non-norm 0.9883 0.9591 0.9649 0.924 0.9006 0.9942 0.9415 0.9415 Min 1.462 1.367 1.382	/ariances nal Distributio Max 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 533 1.533 1.533	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365 0.00117 0.01088 Std Err 0.01402 0.0331 0.03004	0.52% 1.85% 1.58% 3.4% 5.5% 0.26% 2.49% CV% 2.07% 4.94% 4.47%	0.0% 0.59% 0.47% 1.41% 3.63% -0.12% 1.88% %Effec 0.0% 1.26% 1.06%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35 75.8 Angular (Cor C-% 0 2 2 4 9 0 2 2 4 9 9	al Tests Test Bartlett E Shapiro- e Summary Control Type Brine Control Brine Control	Equality of Wilk W N 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Normality Mean 0.9977 0.9918 0.993 0.9836 0.9614 0.9988 0.9789 mmary t Mean 1.519 1.499 1.503 1.477	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957 0.9956 0.9487 95% LCL 1.48 1.408 1.419 1.346	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1 1 1 1 95% UCL 1.557 1.591 1.586 1.607	0.0095 0.0011 1 1 1 1 1 1 0.9825 Median 1.533 1.533 1.533 1.533	Unequal V Non-norm 0.9883 0.9591 0.9649 0.924 0.9006 0.9942 0.9415 Min 1.462 1.367 1.382 1.291	/ariances nal Distributio Max 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 533 1.533 1.533 1.533	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365 0.00117 0.01088 Std Err 0.01402 0.0331 0.03004 0.04689	0.52% 1.85% 1.58% 3.4% 5.5% 0.26% 2.49% CV% 2.07% 4.94% 4.47% 7.1%	0.0% 0.59% 0.47% 1.41% 3.63% -0.12% 1.88% %Effec 0.0% 1.26% 1.06% 2.76%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35 75.8 Angular (Cor C-% 0 2 4 9 2 4 9 18 35 75.8	al Tests Test Bartlett E Shapiro- e Summary Control Type Brine Control Brine Control	Equality of Wilk W N 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Normality Mean 0.9977 0.9918 0.993 0.9836 0.9614 0.9988 0.9789 mmary Mean 1.519 1.499 1.503 1.477 1.422	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957 0.9956 0.9487 95% LCL 1.48 1.408 1.419 1.346 1.233	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1 1 1 95% UCL 1.557 1.591 1.586 1.607 1.61	0.0095 0.0011 Median 1 1 1 1 1 0.9825 Median 1.533 1.533 1.533 1.533 1.533	Unequal V Non-norm 0.9883 0.9591 0.9649 0.924 0.9006 0.9942 0.9415 Min 1.462 1.367 1.382 1.291 1.25	/ariances nal Distributio Max 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 533 1.533 1.533 1.533 1.533	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365 0.00117 0.01088 Std Err 0.01402 0.0331 0.03004 0.04689 0.06801	0.52% 1.85% 1.58% 3.4% 5.5% 0.26% 2.49% 2.49% 2.07% 4.94% 4.47% 7.1% 10.7%	0.0% 0.59% 0.47% 1.41% 3.63% -0.12% 1.88% %Effec 0.0% 1.26% 1.06% 2.76% 6.39%
Distributiona Attribute Variances Distribution Survival Rate C-% 0 2 4 9 18 35 75.8 Angular (Cor C-% 0 2 2 4 9 0 2 2 4 9 9	al Tests Test Bartlett E Shapiro- e Summary Control Type Brine Control Brine Control	Equality of Wilk W N 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Normality Mean 0.9977 0.9918 0.993 0.9836 0.9614 0.9988 0.9789 mmary t Mean 1.519 1.499 1.503 1.477	16.94 0.879 95% LCL 0.9912 0.9691 0.9735 0.9421 0.8957 0.9956 0.9487 95% LCL 1.48 1.408 1.419 1.346	34 Critical 16.81 0.9146 95% UCL 1 1 1 1 1 1 1 1 1 1 95% UCL 1.557 1.591 1.586 1.607	0.0095 0.0011 1 1 1 1 1 1 0.9825 Median 1.533 1.533 1.533 1.533	Unequal V Non-norm 0.9883 0.9591 0.9649 0.924 0.9006 0.9942 0.9415 Min 1.462 1.367 1.382 1.291	/ariances nal Distributio Max 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 533 1.533 1.533 1.533	Std Err 0.002339 0.008187 0.007017 0.01496 0.02365 0.00117 0.01088 Std Err 0.01402 0.0331 0.03004 0.04689	0.52% 1.85% 1.58% 3.4% 5.5% 0.26% 2.49% CV% 2.07% 4.94% 4.47% 7.1%	0.0% 0.59% 0.47% 1.41% 3.63% -0.12% 1.88% %Effec 0.0% 1.26% 1.06% 2.76%

CETIS	6 Anal	ytical Repo	ort						port Date: st Code:	20 Nov-20 13:58 (p 1 of 2) 2010-S165 13-3633-9954		
Bivalve	e Larval	Survival and D	Developme	ent Test	1					Nautilu	s Enviror	mental (CA)
Analysis ID: 15-3007-2344 Analyzed: 20 Nov-20 13:57			dpoint: Development F alysis: Linear Interpola					TIS Version: icial Results:	CETISv1 Yes	.8.7		
		lation Options		- 4					-			
X Transform Y Transform Linear Linear			ed 8155			-Point Inte	polation					
Point E	Estimate	s										
Level	%	95% LCL	95% UC	LTU	95% LCL	95% UCL						
EC25	>75.8	N/A	N/A	<1.31	9 NA	NA						
EC50	>75.8	N/A	N/A	<1.31	9 NA	NA						
Develo	pment l	Rate Summary				Calco	ulated Varia	ate(A/B)				100
C-%	C	ontrol Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	в
0	B	rine Control	5	0.967	6 0.9535	0.9763	0.003898	0.00871	7 0.9%	0.0%	836	864
2			5	0.959	2 0.924	0.9845	0.009783	0.02188	2.28%	0.87%	862	898
4			5	0.966	6 0.9468	0.9827	0.0062	0.01386	1.43%	0.1%	857	887
9			5	0.971	6 0.962	0.9828	0.00455	0.01017	1.05%	-0.41%	827	851
18			5	0.965	0.9351	0.9806	0.00779	0.01742	1.81%	0.28%	839	869
35			5	0.977	6 0.9647	0.9896	0.005133	0.01148	1.17%	-1.03%	881	901
75.8			5	0.965	0.9524	0.977	0.004414	0.00987	1.02%	0.26%	835	865

CETIS	6 Analy	tical Repo	ort				Report Date: Test Code:			20 Nov-20 13:58 (p 2 of 2) 2010-S165 13-3633-9954		
Bivalve	Larval	Survival and D	evelopme	ent Test	- 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990					Nautilus	s Environ	mental (CA)
Analysis ID: 19-0694-7295 Analyzed: 20 Nov-20 13:57			dpoint: Survival Rate alysis: Linear Interpolation (ICPIN)				CETIS Version: CETISV Official Results: Yes			.8.7		
Linear	Interpola	ation Options	-			7.57		0.00				
X Trans	sform	Y Transform	Se	ed	Resamples	Exp 95%	CL Meth	od		_		
Linear	near Linear		13	37627	1000	Yes	Two-	Point Interp	olation			
Point E	stimates	5										
Level	%	95% LCL	95% UC	L TU	95% LCL	95% UCL						
EC25	>75.8	N/A	N/A	<1.31	9 NA	NA						
EC50	>75.8	N/A	N/A	<1.31	9 NA	NA						
Surviva	al Rate S	ummary				Calcul	ated Variat	te(A/B)				
C-%	Co	ntrol Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	в
0	Bri	ne Control	5	0.997	7 0.9883	1	0.002339	0.005231	0.52%	0.0%	853	855
2			5	0.991	8 0.9591	1	0.008187	0.01831	1.85%	0.59%	848	855
4			5	0.993	0.9649	1	0.007017	0.01569	1.58%	0.47%	849	855
9			5	0.983	6 0.924	1	0.01496	0.03344	3.4%	1.41%	841	855
18			5	0.961	4 0.9006	1	0.02365	0.05289	5.5%	3.63%	822	855
35			5	0.998	8 0.9942	1	0.00117	0.002616	0.26%	-0.12%	854	855
75.8			5	0.978	9 0.9415	1	0.01088	0.02432	2.49%	1.88%	837	855

Analyst: JU QA: BUIZBYZO

CETIS Test Data Worksheet

Bivalve Larval Survival and Development Test

Nautilus Environmental (CA)

Start Date: End Date: Sample Date	30 0	Oct-20 Oct-20 Oct-20	1		Mytilus galloprovi EPA/600/R-95/13 Effluent Sample			Sample Code: 20- 1180 Sample Source: Jacobs Sample Station: Wyckoff
C-%	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
			31			155	152	an 11/17/20
			32 •			168	160	
			33			173	168	
			34			161	156	
			35			137	181	
			36			169	165	
	1.1		37			173	170	
			38			166	159	
	1-11		39		-	1,77	171	
			40			170	164	
			41			164	158	
			42			196	190	
			43			181	174	
			44			168		
	-		45			177	162 172	
			46			175	171	
			47			183	177	
	-		48			172	169	
		-	49			153	152	
			50			178	171	
			51			138	178	
			52			196	186	
			53			165	161	
		-	54			170	164	
			55			194	188	
			56			184	130	
	-		57			193	191	
		-	58		-	174		
			59				169	
			60			189	183 144	
			61		-			
			62			165	159	
		-	63			176	170	
			64			174	170 164 174	
			65			172	167	
			66			176	111	
		-	67		-	171 183 183	158	
	-	-	68		-	183	176	
						105	172	
			69			144	171	
			70			193	190	

CETIS Test Data Worksheet

Report Date:

27 Oct-20 11:38 (p 1 of 1) Test Code: 2010-5165 13-3633-9954/4FA6EDF26

Bivalve Larval Survival and Development Test

Nautilue	Environmental	(CA)
Nauulus	Environmental	(CA)

Start Date: End Date: Sample Date:	30 0	Oct-20 Oct-20 Oct-20	n.)	Species: Protocol: Material:	Mytilus galloprovi EPA/600/R-95/13 Effluent Sample			Sample Code: 20- \150 Sample Source: Jacobs Sample Station: Wyckoff
C-%	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	BC	1	64					
0	BC	2	36					
0	BC	3	62			180	173	RT 10/31/20
0	BC	4	58			100	115	
0	BC	5	33					
0	LC	1	61					
0	LC	2	68					
0	LC	3	44			164	159	RT
0	LC	4	43			101	101	
0	LC	5	52			1		
2		1	66					
2		2	56					
2		3	67			186	178	er
2		4	70			100	110	K1
2		5	41					
4		1	53			1		
4		2	50					
4		3	37		-	179	176	Pr
4		4	51			111	110	
4		5	47					
9		1	69					
9		2	49					
9		3	48			178	175	RT
9		4	40			110	114	
9		5	39					
18		1	45					
18		2	59					
18		3	55			183	175	A
18		4	31			100	1.15	
18		5	60					
35		1	46					
35		2	54					
35		3	57			193	189	RA
35		4	65			1.1.4		
35		5	35					
75.8 76/	1	1	63					
1 76		2	34					
760		3	32			175	169	FT
16 [®]		4	42			1. 1. 1.	10.	
1 /76		5	38					

QC: RT

@QIS PT 10/20120 (BQUSACS 11/3/2020 000-089-187-4



Marine Chronic Bioassay DM-014

Client: Jacobs

Sample ID: Wyckoff

Sample Log No .: 20- 1180

Test No.: 2010-S 65

Water Quality Measurements

 Test Species:
 M. galloprovincialis

 Start Date/Time:
 10/28/2020
 1550

 End Date/Time:
 10/30/2020
 1500

Concentration (% sample)	Salinity (ppt)			Т	Temperature (°C)			Dissolved Oxygen (mg/L)			pH (pH units)		
(15	0	24	48	0	24	48	0	24	48	0	24	48	
Lab Control	30.1	29.8	29.8	14.0	14.2	15.3	5.9	89	8.3	8.15	803	8.04	
Brine Control	30.4	30.1	30.1	14.3	14.2	15.0	8.6	8.9	8.4	8.23	8.10	8.06	
2	Z9.7	29.9	29.9	14.4	14.2	15,1	8.8	8.8	8.4	8.14	8.06	8.06	
4	29.8	29.9	29.9	14.3	14.2	15.2	89	8.8	83	8.10	8.06	8.09	
9	29.9	29,9	29.9	14.1	14.2	151	8.9	8.8	83	8.06	8.05	8.12	
18	29.9	30.0	30.1	14.3	14.2	15.2	8.9	8.8	8.3	7.97	8.07	8.18	
35	29.8	29.9	30.0	14.0	14.3	15.1	8.8	8.8	83	7.86	8.07	8.23	
75.8	30.1	30.2	30.2	14.1	14.4	15.2	8.9	8.7	83	7.74	8.06	8.3	
	-												
				-			-		1 - 5				

Technician Initials:	WQ Readings: R Dilutions made by: R	0 24 T RT T	48 RT	Environmental Chamber:
Comments:	0 hrs: 24 hrs:			
QC Check:	48 hrs: ACS 11/3/2020			Final Review: 30 12 3 20

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

Brine Dilution Worksheet

DC-010							
Project:	e ID: Wyckoff			Analyst:	RT		
Sample ID:			Te	est Date:	10/28/2020 Mussel Development		
Test No:			_ Те	est Type:			
Salinity of Ef	fluent	9.5					
Salinity of Br	rine	94.3	Date of Brin	ne used:	9/1/2020		
Target Salini	ty	30	Alkalinity of Brine Control		112	mg/L as CaCO3	
Test Dilution	Volume	250	_				
		Effluent	Brine Control				
Salinity Adju	stment Factor:						
(TS - SE)/(SB	8 - TS) =	0.32	0.47				
TS = targe	et salinity						
	have the last of the second of the						

SE = salinity of effluent

Marine Chronic Bioassay

SB = salinity of brine

Concentration %	Effluent Volume (ml)	Salinity Adjustment Factor	Brine Volume (ml)	Dilute to: (ml)
Control	NA	NA	NA	250
2	5.0	0.32	1.6	250
4	10.0	0.32	3.2	250
9	22.5	0.32	7.2	250
18	45.0	0.32	14.3	250
35	87.5	0.32	27.9	250
75.8	189.6	0.32	60.4	250

	DI Volume			
Brine Control	129.5	0.47	60.4	250

Total Brine Volume Required (ml): 175.1

QC Check: Ars 11/3/2010

Final Review: 100 12/3/2.2

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120

Marine Chronic Bioassay DM-013

Larval Development Worksheet

Client/Sample:	Jacobs / wychoff	Start Date/Time:	10/28/2020	1550
Test No.:	2010-5165	End Date/Time:	10/30/2020	1500
Test Species:	Mytilus galloprovincialis	Technician Initials:	RT/EG	12
Animal Source/Ba	atch Tank: Taylor/53.5C		1.100	
Date Received:	7/16/2020			
Test Chambers:	30 mL glass shell vials			
Sample Volume:	10 ml			

Spawn Information

Sex Male

First Game

Gamete	Selection

mete Release Time:	10.55
nete nelease fille.	112.21

Sex	Beaker Number(s)	Condition (sperm motility, egg density, color, shape, etc.)
Male	3,4,5,8	average density good notility
Female 1	2	good density, vellow, mostly round
Female 2	4	grege density, pay yellow nostry wind
Female 3	-	Jos Je so my, par para

Female 5

Egg Fertilization Time: 1215

Embryo Stock Selection

Stock Number	% of embryos at 2-cell division stage
Female 1	99
Female 2	99
Female 3	

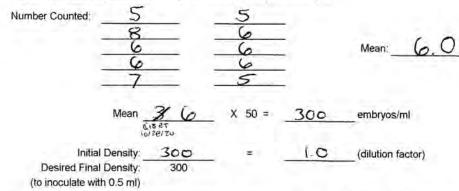
Stock(s) chosen for testing:	2

Embryo Inoculum Preparation

Target count on Sedgwick-Rafter slide for desired density is 6 embryos

Number Spawning

9+



Prepare the embryo inoculum according to the calculated dilution factor. For example, if the dilution factor is 2.25, use 100 ml of existing stock (1 part) and 125 ml of dilution water (1.25 parts).

TØ Vial No.	No. Dividing	Total	% Dividing	Mean % Dividing
TØA	151	152	99.3%	
TØB	188	189	99.5%	1005
TØC	197	197	100.0%	1994
TØD	169	170	99.4%	1.1.1.2.1
TØE	160	162	98.8%	
TØF	160	161	99.4%	
x =	171	1.00	14 Y 17 T	

48-h QC: 166/170 = 97.6%

Comments:

QC Check:

ACS 11/3/2020

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

Final Review: BO 12/3 20

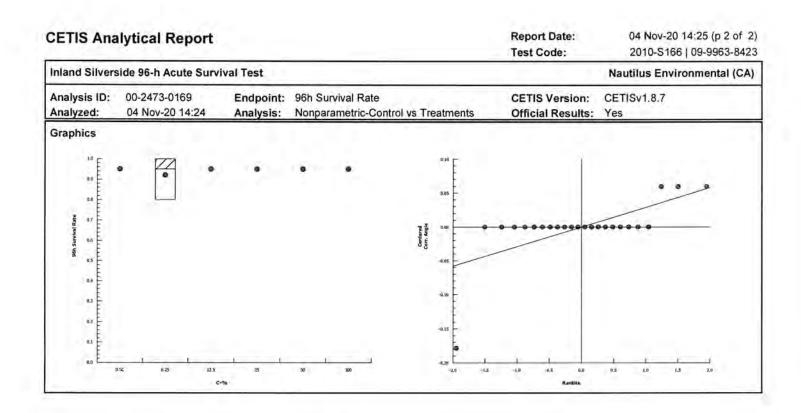
Inland Silverside Acute Survival Test

CETIS Sum	nmary Repo	rt				Report Date: Test Code:			04 Nov-20 14:25 (p 1 of 1 2010-S166 09-9963-8423					
Inland Silvers	ide 96-h Acute S	Surviva	l Test						Nautilu	s Environm	iental (CA)			
Batch ID: Start Date: Ending Date: Duration:	02-3600-7228 28 Oct-20 15:49 01 Nov-20 14:4 95h	5	Test Type: Protocol: Species: Source:	Survival (96h) EPA/821/R-02- Menidia beryllin Aquatic Indicate	a		t I	Analyst: Diluent: Dilu Brine: Not Age: 14d	Arthfia ted Notural Applicable	Seawater	ocean			
Sample ID: Sample Date: Receive Date: Sample Age:			Code: Material: Source: Station:	20-1180 Effluent Sample Jacobs Wyckoff				Client: Jac Project:	obs					
Comparison S	Summary													
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	ти	Method						
00-2473-0169	96h Survival Ra	ate	100	>100	NA	9.2%	1	Steel Mar	y-One Rank	Sum Test				
Test Acceptat			Attrib	uto	Test Stat	TAC Lin	nite	Overlap	Decision					
Analysis ID 00-2473-0169	Endpoint 96h Survival Ra	ate		ol Resp	1	0.9 - NL	ints	Yes		cceptability	Criteria			
96h Survival F	Rate Summary						_							
C-%	Control Type	Coun	t Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect			
0	Lab Control	4	1	1	1	1	1	0	0	0.0%	0.0%			
0	Salt Control	4	1	1	1	1	1	0	0	0.0%	0.0%			
6.25		4	0.95	0.7909	1	0.8	1	0.05	0.1	10.53%	5.0%			
12.5		4	1	1	1	1	1	0	0	0.0%	0.0%			
25		4	1	1	1	1	1	0	0	0.0%	0.0%			
50		4	1	1	1	1	1	0	0	0.0%	0.0%			
100		4	1	1	1	1	1	0	0	0.0%	0.0%			
96h Survival F	Rate Detail													
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	_	-							
0	Lab Control	1	1	1	1									
0	Salt Control	1	1	3	1									
6.25		1	0.8	1	1									
12.5		1	1	1	1									
25		1	1	1	1									
50		1	1	1	1									
100		1	1	1	1									

@ Q18 BO 12/3/20

CETIS Ana	alytical Rep	ort							ort Date: Code:		lov-20 14:2 0-S166 09	
Inland Silver	side 96-h Acute	Surviva	l Test							Nautilus	Environn	nental (CA
Analysis ID: Analyzed:	00-2473-0169 04 Nov-20 14:		Endpoint: Analysis:	96h Survival Ra Nonparametric-		Tr	eatments	10.77	IS Version: al Results:	CETISv1 Yes	.8.7	
Data Transfo	rm	Zeta	Alt Hy	p Trials	Seed			PMSD	NOEL	LOEL	TOEL	TU
Angular (Corr	ected)	NA	C > T	NA	NA			9.2%	100	>100	NA	1
Steel Many-C	Dne Rank Sum T	est		1.1.1				6	1. A. S.	0.00		
Control	vs C-%		Test S	tat Critical	Ties D	DF	P-Value	P-Type	Decision(a:5%)		
Salt Control	6.25		16	10	1 6		0.6105	Asymp	Non-Signif	icant Effect		
1000	12.5		18	10	1 6	Ċ.	0.8333	Asymp	Non-Signif	icant Effect		
	25		18	10	1 6		0.8333	Asymp	Non-Signif	icant Effect		
	50		18	10	1 6	F	0.8333	Asymp	Non-Signif	icant Effect		
	100		18	10	1 6	Ę.	0.8333	Asymp	Non-Signif	icant Effect		
ANOVA Table	e											
Source	Sum Squ	ares	Mean	Square	DF		F Stat	P-Value	Decision(a:5%)		
Between	0.011814	_	0.0023	62829	5		1	0.4457	Non-Signif	icant Effect	2	
Error	0.042530	92	0.0023	62829	18							
Total	0.054345	07			23							
Distributiona	al Tests											
Attribute	Test			Test Stat	Critical	1	P-Value	Decision	(α:1%)			
Variances	Mod Lev	ene Equ	ality of Varia	ince 1	4.248	1	0.4457	Equal Va	riances			
Variances	Levene E	Equality	of Variance	9	4.248		0.0002	Unequal	Variances			
Distribution	Shapiro-	Wilk W	Normality	0.4634	0.884		<0.0001	Non-norm	al Distributio	on		
96h Survival	Rate Summary	2.5	100	1000								
C-%	Control Type	Coun	t Mean	95% LCL	95% UC	L	Median	Min	Max	Std Err	CV%	%Effect
0	Salt Control	4	1	1	1		1	1	1	0	0.0%	0.0%
6.25		4	0.95	0.7909	1		1	0.8	1	0.05	10.53%	5.0%
12.5		4	1	1	1		1	1	1	0	0.0%	0.0%
25		4	1	1	1		1	1	1	0	0.0%	0.0%
50		4	1	1	1		1	1	1	0	0.0%	0.0%
100		4	1	1	1	_	1	1	1	0	0.0%	0.0%
Angular (Cor	rrected) Transfor	med Su	mmary									
C-%	Control Type	Coun	t Mean	95% LCL		L		Min	Max	Std Err	CV%	%Effect
0	Salt Control	4	1.345		1.346		1.345	1.345	1.345	0	0.0%	0.0%
6.25		4	1.286	1.096	1.475		1.345	1.107	1.345	0.05953	9.26%	4.43%
12.5		4	1.345		1.346		1.345	1.345	1.345	0	0.0%	0.0%
25		4	1.345	1.345	1.346		1.345	1.345	1.345	0	0.0%	0.0%
and the second sec		4	1.345	1.345	1.346		1.345	1.345	1.345	0	0.0%	0.0%
50		4	1.345		1.346		1.345	1.345	1.345	0	0.0%	0.0%

Analyst: JU QA: Ballyco



Analyst: Ju QA: BO12/3/20

Marine Acute Bioassay

Static-Renewal Conditions

Water Quality Measurements & Test Organism Survival

Client: Jacobs	Test Species: A. affinis M. bery	lina	1	Tech Ini	tials	
Sample ID: Wyckoff	Start Date/Time: 10/28/2020 1545		0 2	4 48	72	96
Sample Log-in No.: 20- 1180	End Date/Time: 11/1/2020 1445	Counts:	RR	Til	pm	AS
Test No.: 2010-S 16		Readings: A	5 2	FRT	VM	1KL
		Dilutions made by: 4	>	RT		

Concentration (%)	Rep			ber o ganis					Salinit (ppt)				Ter	npera (°C)	ture			Disso	lved C (mg/L		n			pH (units)	
1.4		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Lab Control	A	5	5	5	5	5	30.0	29.4	29.1	30.2	30.5	241	24.3	24.1	24,2	24.3	7.3	5.8	6.5	6.0	4.7	\$.05	286	306	778	7.7
	в	5	5	5	5	5			30.5					24.6					5.6			1		7.50		
	С	5	5	5	5	5																				
	D	5	5	5	5	5																				
Salt Control	A	5	5	5	15	5	30.1	D.3	30.5	30.7	31.1	24.4	24,6	24.1	24,5	24.6	7.1	5.7	6.5	5.2	4.4	5.18	7.99	8.24	795	7.
	в	5	5	5	5	5			30.6				100	24.9					4.9				-	7.92		
	С	5	5	5	5	5								X												
	D	5	5	5	5	5																	3			
6.25%	Α	5	5	5	5	5	30,0	30,0	30.4	30.4	31.0	25.0	24.8	24.2	24.7	24.7	7.0	53	6.5	4.9	4.4	\$12	8.03	\$ 20	201	8.
	в	5	5	4	A	4			10.7					135.1	1				47					502		
	С	5	5	5	5	5		1.00							X											
	D	5	5	5	5	5											2			1			-	1.3		
12.5%	A	5	5	5	5	5	29.9	29.9	303	30.5	30.9	25,1	24.9	24.2	24,8	24.7	7.0	5.2	6.5	4.8	45	5.07	8.05	316	807	8
	в	5	5	5	5	5			30-1					25.1					47					807		
	С	S	5	5	5	5									1				-	2		1				-
	D	5	5	5	5	5			80.3	6									1							1
25	A	5	5	5	5	5	29,6	29.8	123	30.6	30.9	24,2	249	24.0	24,5	24.9	7.1	5)	6.7	5.0	4,7	8,00	806	8.08	8.12	8.
	в	5	5	5	5	5			30.0					25.1				1.	4,1	12				\$14	4	
	С	5	5	5	5	5					110															
	D	5	5	5	5	5					1															
50	Α	5	5	5	5	5	29.4	29,5	20.0	30.3	31.	24,1	24.9	24.1	24.5	24.8	7.2	51	7.0	5.0	4.5	288	8.10	7.97	3.19	8.
	в	5	5	5	5	5			29.8	-		1		24.9					4.8			1		8 25		
	С	\$	5	5	5	S							1.											·		
	D	5	5	5	5	S	30.1				1	1		1.												
100	A	5	5	3	5				-		30,5	24.0	24.9		24.S	24.9	7.6	4.9			4.3	7.75	8.11	7.82	8.20	8.
	в	5	5	5	5	9	Ð		30.2	-	-			25.1		- 1			4.6					8.31		
	C	5	5	5	5	S								13									-	1		-
	D	5	5	5	15	5				-	1					2						1.0	1			1
ial Counts QC'd b Initiated b	y: 4	2	GHIA	21	Q15 Par 10		1			nviror			mber:	1.1	*			-				_	Foo	ding T	Imas	
mal Source/Dat	e Rece	ived	:	H9 101	271	20	dic	Her	3	- 11			iation:		1		-		-			0	1	1	1	9
mal Acclimation	n Quali	fiers	(circl	le all i	that a	pply)				G	222	Q2	3 /	Q24	ICno	nə			-			1	24	48	72	-
mments:		i = it	nitial r	eadin	g in fr	esh te	est sol	ution, f	= fina	l read	ing in	test ch	amber	prior	to ren	ewal					AM: PM:	man	OTUC			08
C Check:		Org	anism	is fed	prior 1	o initi	iation, Se	circle XPe	one ()/ ince	D'	DG1 7.30	4 A	510	1281 3°C	Sh	IFT	120	Ithi			BC	12	13/2	20	

@ Q13 pm 11/3/20 Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

Appendix B Sample Check-In Information Client: Jacobs, Wyckoff Sample 10! 102720 Wyckoff (102720)

Enthalpy Analytical

Sample Check-In Information

4340 Vandever Avenue	Sample ID.	102720	Wychoff 1	02720)			DC-005
San Diego, CA 92120		2010-5165.			Sample Description:		
					A. coloriess dear,	oderless,	no debris
			1	i i			
Sample (A, B, C):	A						
Log-in No. (20-xxxx):	1180						
Sample Collection Date & Time:			1	r	COC Complete (Y/N)?		
Sample Receipt Date & Time:	10/28/20 0935			-1	AV B_C_		
Number of Containers & Container Type:	i-41 cubi)		
Approx. Total Volume Received (L):	4				Filtration? Y (N		
Check-in Temperature (°C)	3.4				Initials: A) B)	C)	
Temperature OK? ¹	Ŷ N	YN	Y N	YN	Pore Size:		
DO (mg/L)	7.8				Organisms	or Debris	
pH (units)	7.54				Salinity Adjustment? (Y)	1	
Conductivity (µS/cm)	15,500			1	Test: Mussel Sou	rce: Brink Ta	rget ppt: 36
Salinity (ppt)	@9895	4			Test: Manidia Sou	rce: Instant Ta	rget ppt: 36
Alkalinity (mg/L) ²	396				Test: Sou		rget ppt:
Hardness (mg/L) ^{2, 3}	10-1-1				pH Adjustment? Y (N)		
Total Chlorine (mg/L)	0.02				· · · · · · · · · · · · · · · · · · ·	A B	с
Technician Initials	af				Initial pH:		
					Amount of HCI added:		1
Test Performed: MUSSEl Veryel Norment	Control/Dilution W	ater: 8.2 / La	b SW / Lab ART	Other	Final pH:		
Test Performed: Mussel Development	Alkalinity: 105	Hardness of	or Salinity: 30 mot		Cl ₂ Adjustment? Y N		
Additional Control? () N	= Brine	Alkalinity: 112	Hardness or S	Salinity: Port		A B	с
				-	Initial Free Cl ₂ :		1 1 1 1 1 1 1 1
Test Performed: Acute Menidia	Control/Dilution W	ater: 8:2 / La	b SW / Lab ART	Other:	STS added:		
	Alkalinity: 156	Hardness of	or Salinity: 30pp	7	Final Free Cl ₂ :		1
Test Performed: Acute Menidia Additional Control? () N	= Lab SW.	Alkalinity: 10 5	Hardness or S	Salinity: 30 ppt			
U				- 11	Sample Aeration? Y N		
Test Performed:	Control/Dilution W	ater: 8:2 / La	b SW / Lab ART	Other:		A B	с
	Alkalinity:	Hardness of	or Salinity:		Initial D.O.		1
Additional Control? Y N	=	Alkalinity:	Hardness or S	Salinity:	Duration & Rate		
					Final D.O.		
Notes: ¹ Temperature of sample should				ne.			0
² mg/L as CaCO3, ³ Measured	for freshwater sample	es only, NA = Not	Applicable		Subsamples for Additiona	Chemistry Requ	uired? (Y) N
Additional Comments: A GIE GF 10/28/20	Devek	Jacob			NH3 Other Tech Initials A Gh		
Additional Comments: V QIE 4F 10 120 A	10 Q1 8 AT 5 1	0128/2020					
						QC Check: 600	ACS 11/3/20
							and the second s

Final Review: BO1213120

tal Ammon	ia Analysis					Overlying Wa
001						
Cli	ent: Jacobs					
	ect: Wyckoff					
Test Ty	pe: Menidia acute and mussel de	velopment				
DI Bla	ank:	Te	st Start Date:	10/28/2020	1	Analyst: 4R
SW Bla	ank:				A	Analyst: <u>4</u> nalysis Date: <u>11 4 </u>
				ć		N x 1.22
	Sample ID	Nautilus ID	Sub-Sample Date	Test Day	NH3-N (mg/L)	Ammonia (mg/L)
	Blank Spike (10 mg/L NH3)		NA	NA	9.2	11.2
	Jacobs Wyckoff	20-1180	10/28/2020	0	2.5	3.1
				_		
		1			-	
					-	
	Spike Check (10 mg/L NH ₃)	-	NA	NA		
	Spike Offeck (10 mg/L NH3)			NA		
				_		

Relative Percent Difference (RPD) = [sample] (mg/L) - [sample duplicate] (mg/L) x 100 [average ammonia] (mg/L)

Acceptable Range: 0-20%

3 -7

3 0

15

C

2

Acceptable Range: 80-120%^b

3.0

2 3 フ

C 2

2

Percent Recovery = [spiked sample] (mg/L) - [sample] (mg/L) x 100 nominal [spike] (mg/L)

BATCHGASAMPLE

Sample Duplicate^a

Sample Duplicate + Spike^a

Spike Check (10 mg/L NH₃)

QC Sample ID	[NH ₃]	[Sample Dup]	[Spike]	[Spike]	RPD	% Recovery
Blank	0.0	NA	112	10	NA	112
BATCHQASAMPLE	3.7	3.9	15.0	10	53	113

20-1185

20-1185

30120

NA

NA

NA

Manadard

10

4

NA

NA

NA

Manufact

Comments:

Notes: ^aUnless otherwise noted, the last sample listed on the datasheet is used for duplicate and duplicate + spike QC check.

^b Acceptable range for % recovery applies only to the blank spike. Spike recoveries in samples may vary based on sample matrix and are for information only ^c Calculation not performed due to one or both values below the method detection limit. Method Detection Limit (MDL) = 0.5 mg/L

QC Check: ACS 11/4/2020

Final Review:

BO12/3/20

Oursele day of Martin

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

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Appendix C Chain-of-Custody Form

Page 1 of 1

Enthalpy Analytical (REGION COPY)

DateShipped: 10/27/2020 CarrierName: FedEx AirbillNo: 7719 1306 6217

Jacobs, Wyckoff-Wyckoff Eagle Harbor GWTP 2020/WA Project Code: WEH-029S Cooler #: 1 of 1

No: 10-102720-095252-0490

2020T10P000DD210W2LA00 Contact Name: Keith Allers Contact Phone: 206-780-1711

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	Sample Type
102720		Ground Water/ K.Allers	Composite	ACTOX-CHRTOX(8 Weeks)	(< 6 C) (1)	SP-11	10/27/2020 09:18	Field Sample
						-		

	Shipment for Case Complete? N
Special Instructions:	Samples Transferred From Chain of Custody #
Analysis Key: ACTOX-CHRTOX=Acute Toxicity, Chronic Toxicity	

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Kenth Ille JACOBS	10-27-2020	Elizabethe Enthalpy SD	10/28/20 0935	Receipt Temp: 3.4°C Log # 20-1120

Appendix D List of Qualifier Codes



Glossary of Qualifier Codes:

- Q1 Temperatures out of recommended range; corrective action taken and recorded in Test Temperature Correction Log
- Q2 Temperatures out of recommended range; no action taken, test terminated same day
- Q3 Sample aerated prior to initiation or renewal due to dissolved oxygen (D.O.) levels below 6.0 mg/L
- Q4 Test aerated; D.O. levels dropped below 4.0 mg/L
- Q5 Test initiated with aeration due to an anticipated drop in D.O.
- Q6 Airline obstructed or fell out of replicate and replaced; drop in D.O. occurred
- Q7 Salinity out of recommended range
- Q8 Spilled test chamber/ Unable to recover test organism(s)
- Q9 Inadequate sample volume remaining, 50% renewal performed
- Q10 Inadequate sample volume remaining, no renewal performed
- Q11 Sample out of holding time; refer to QA section of report
- Q12 Replicate(s) not initiated; excluded from data analysis
- Q13 Survival counts not recorded due to poor visibility or heavy debris
- Q14 D.O. percent saturation was checked and was $\leq 110\%$
- Q15 Did not meet minimum test acceptability criteria. Refer to QA section of report.
- Q16 Percent minimum significant difference (PMSD) was <u>below</u> the lower bound limit for acceptability. This indicates that statistics may be over-sensitive in detecting a difference from the control due to low variability in the data set.
- Q17 Percent minimum significant difference (PMSD) was <u>above</u> the upper bound limit for acceptability. This indicates that statistics may be under-sensitive in detecting a difference from the control due to high variability in the data set.
- Q18 Incorrect Entry
- Q19 Illegible Entry
- Q20 Miscalculation
- Q21 Other (provide reason in comments section)
- Q22 Greater than 10% mortality observed upon receipt and/or in holding prior to test initiation. Organisms acclimated to test conditions at Nautilus and ultimately deemed fit to use for testing.
- Q23 Test or ganisms r eceived at a <u>temperature</u> greater than 3°C ou tside t he r ecommended t est temperature range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. O rganisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.
- Q24 Test organisms received at <u>salinity</u> greater than 3 ppt outside of the recommended test salinity range. H owever, due t o age -specific pr otocol r equirements and/ or s ample ho lding t ime constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.

Appendix E Reference Toxicant Test Results **Bivalve Larval Development Test**

Report Date: Test Code: 16 Nov-20 12:11 (p 1 of 3) 201028msdv | 09-4043-4676

Bivalve Larval	Survival and Developr	nent Test							Nautilus Environmental (CA
Batch ID: Start Date: Ending Date: Duration:	28 Oct-20 15:50 F 30 Oct-20 15:00 S	Test Type: Protocol: Species: Source:	Development- EPA/600/R-95 Mytilus gallopr Taylor Shellfis	/136 (1995) ovincialis		-	Analyst: Diluent: Brine: Age:		ed Natural Seawater Applicable
Sample ID: Sample Date: Receive Date: Sample Age:	28 Oct-20 1 28 Oct-20 5	Code: Material: Source: Station:	201028msdv Copper chloric Reference Toy Copper Chloric	kicant			Client: Project:	Inter	nal
Comparison S	ummary	**************************************							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	τU	Meth	nod	
19-7661-4518 17-7885-6687 17-2684-3616	Combined Development Ra2.5Development Rate2.5		5 5 40	3.536 3.536 28.28	3.96% 2.24% 3.11%		Dunr	nett M	ultiple Comparison Test ultiple Comparison Test y-One Rank Sum Test
Point Estimate	Summary				<u></u>		<u></u>		
Analysis ID	Endpoint	Level	μg/Ľ	95% LCL	95% UCL	TU	Meth	nod	
02-6542-7057	Combined Developmen	nt Ra EC25 EC50	5.816 7.269	5.634 7.148	5.988 7.383		Linea	ar Inte	erpolation (ICPIN)
12-0840-2779	Development Rate	EC25 EC50	5.798 7.257	5.642 7.156	5.954 7.362		Linea	Linear Interpolation (ICPIN)	
15-7574-6891	Survival Rate	EC25 EC50	24.73 29.82	24.32 29.54	25.06 30.04		Linea	ar Inte	erpolation (ICPIN)
Test Acceptab	ility								
Analysis ID	Endpoint	Attrib	ute	Test Stat	TAC Limi	ts	Ove	rlap	Decision
12-0840-2779 17-7885-6687 15-7574-6891	Development Rate Development Rate Survival Rate	Contr	ol Resp ol Resp ol Resp	0.9694 0.9694 0.986	0.9 - NL 0.9 - NL 0.5 - NL		Yes Yes Yes		Passes Acceptability Criteria Passes Acceptability Criteria Passes Acceptability Criteria
17-2684-3616 19-7661-4518	Survival Rate Combined Developmer		ol Resp)	0.986 0.03965	0.5 - NL NL - 0.25		Yes No		Passes Acceptability Criteria Passes Acceptability Criteria

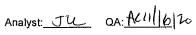
Analyst: JU QA: 1011/16/20

000-089-187-4

Report Date: Test Code:

16 Nov-20 12:11 (p 2 of 3) 201028msdv | 09-4043-4676

Bivalve Lar	val Survival and E	Developmen	nt Test				-		Nautilus	Environm	nental (CA)
Combined	Development Rate	Summary									
C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Мах	Std Err	Std Dev	CV%	%Effect
0	Lab Control	5	0.9557	0.9376	0.9738	0.9415	0.9734	0.006515	0.01457	1.52%	0.0%
2.5		5	0.971	0.9246	1	0.9064	0.9946	0.01672	0.03738	3.85%	-1.61%
5		5	0.8582	0.8268	0.8896	0.8298	0.8962	0.01131	0.02528	2.95%	10.2%
10		5	0.02901	0.01884	0.03918	0.01744	0.03846	0.003663	0.00819	28.23%	96.96%
20		5	0	0	0	0	0	0	0		100.0%
40		5	0 ·	0	0	0	0	0	0		100.0%
Developme	nt Rate Summary										
C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Мах	Std Err	Std Dev	CV%	%Effect
0	Lab Control	5	0.9694	0.9572	0.9816	0.9548	0.9817	0.004391	0.009818	1.01%	0.0%
2.5		5	0.9811	0.9604	1	0.9568	0.9946	0.007456	0.01667	1.7%	-1.21%
5		5	0.8654	0.8348	0.896	0.8298	0.8962	0.01103	0.02466	2.85%	10.73%
10		5	0.02936	0.01876	0.03996	0.01744	0.03846	0.003818	0.008538	29.08%	96.97%
20		5	0	0	0	0	0	0	0		100.0%
40		5	0	0	0	0	0	0	0		100.0%
Survival Ra	ite Summary										
C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Мах	Std Err	Std Dev	CV%	%Effect
0	Lab Control	5	0.986	0.9616	1	0.9591	1	0.008791	0.01966	1.99%	0.0%
2.5		5	0.9895	0.9602	1	0.9474	1	0.01053	0.02354	2.38%	-0.36%
5		5	0.9918	0.9691	1	0.9591	1	0.008187	0.01831	1.85%	-0.59%
10		5	0.9906	0.9647	1	0.9532	1	0.009357	0.02092	2.11%	-0.47%
20		5	0.9719	0.9505	0.9933	0.9532	1	0.007714	0.01725	1.78%	1.42%
40		5	0	0	0	0	0	0	0		100.0%
Combined	Development Rate	e Detail									
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	Lab Control	0.9734	0.9672	0.9415	0.9548	0.9415					
2.5		0.9064	0.9943	0.989	0.9709	0.9946					
5		0.8652	0.8579	0.8298	0.8421	0.8962					
10		0.0266	0.03846	0.02747	0.03509	0.01744					
20		0	0	0	0	0					
40		0	0	0	0	0					
	nt Rate Detail								,		
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0- µg/ ∟	Lab Control	0.9734	0.9672	0.9699	0.9548	0.9817					
	Lab Control	0.9754	0.9972	0.989	0.9548	0.9946					
2.5				0.989 0.8298							
5		0.8652	0.8579		0.878	0.8962					
10		0.0266	0.03846	0.02747	0.03681	0.01744					
20		0	0	0	0	0					
20											
40		0	0	0	0	0					
			0	0	0	0					N 4700
40	ate Detail Control Type		0 Rep 2	0 Rep 3	0 Rep 4	Rep 5					
40 Survival Ra		0									
40 Survival Ra C-μg/L	Control Type	0 Rep 1	Rep 2	Rep 3	Rep 4	Rep 5			,	<u>.</u>	
40 Survival Ra C-μg/L 0	Control Type	0 Rep 1 1	Rep 2	Rep 3	Rep 4	Rep 5 0.9591					
40 Survival Ra C-μg/L 0 2.5 5	Control Type	0 Rep 1 1 0.9474	Rep 2 1 1	Rep 3 0.9708 1	Rep 4 1 1	Rep 5 0.9591 1					
40 Survival Ra C-μg/L 0 2.5	Control Type	0 Rep 1 1 0.9474 1	Rep 2 1 1	Rep 3 0.9708 1 1	Rep 4 1 1 0.9591	Rep 5 0.9591 1 1					



Report Date: Test Code:

16 Nov-20 12:11 (p 3 of 3) 201028msdv j 09-4043-4676

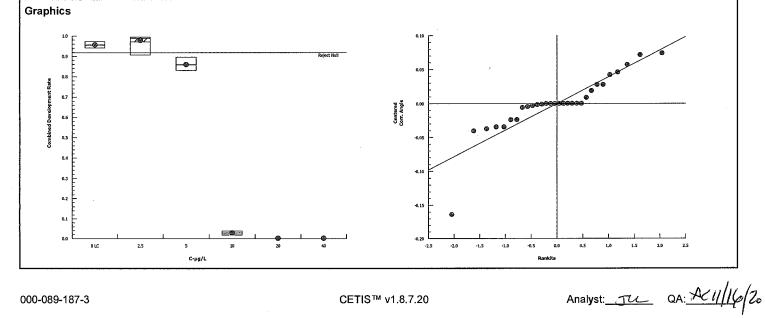
Bivalve Larval Survival and Development Test

Nautilus Er	vironmental (CA)

Combined	Development Rate	e Binomials	;				
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Lab Control	183/188	177/183	161/171	169/177	161/171	
2.5		155/171	173/174	179/181	167/172	185/186	
5		154/178	163/190	156/188	144/171	164/183	
10		5/188	7/182	5/182	6/171	3/172	
20		0/171	0/171	0/182	0/171	0/171 .	
40		0/17 1	0/171	0/171	0/171	0/171	
Developm	ent Rate Binomials	6					
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Lab Control	183/188	177/183	161/166	169/177	161/164	
2.5		155/162	173/174	179/181	167/172	185/186	
5		154/178	163/190	156/188	144/164	164/183	
10		5/188	7/182	5/182	6/163	3/172	
20		0/163	0/166	0/182	0/166	0/165	
40		0/1	0/1	0/1	0/1	0/1	
Survival R	ate Binomials						
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Lab Control	171/171	171/171	166/171	171/171	164/171	
2.5		162/17 1	171/171	171/171	171/ 171	171/171	
5		171/171	171/171	171/171	164/171	171/171	
10		171/171	171/171	171/171	163/171	171/171	
20		163/171	166/171	171/171	166/171	165/171	
40		0/171	0/171	0/171	0/171	0/171	

Analyst: JU QA: ACII/16/20

CETIS An	alytical Repo	ort					-	ort Date:			0 (p 1 of 4)
Pivalvo Lanu	al Survival and [Jourdonm	nt Toot				Test	Code:	······	· · · · ·	-4043-4676 ental (CA)
									Nautitus	Environi	
Analysis ID: Analyzed:	19-7661-4518 16 Nov-20 12: ⁻		dpoint: Cor alysis: Par	nbined Deve ametric-Con				S Version: ial Results:	CETISv1. Yes	8.7	
Data Transfo	orm	Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	TU
Angular (Corr	ected)	NA	C > T	NA	NA		3.96%	2.5	5	3.536	
Dunnett Mult	tiple Comparisor	n Test				1 <u>4</u>					
Control	vs C-µg/L		Test Stat	Critical	MSD DF	P-Value	P-Type	Decision(a:5%)		
Lab Control	2.5		-1.713	2.227	0.081 8	0.9935	CDF		icant Effect	· · ·	
	5*		4.813	2.227	0.081 8	0.0003	CDF	Significant	Effect		
	10*		32.73	2.227	0.081 8	<0.0001	CDF	Significant			
ANOVA Table	e										
Source	Sum Squ	ares	Mean Squ	lare	DF	F Stat	P-Value	Decision(a:5%)		
Between	5.143419		1.714473		3	517.7	<0.0001	Significant	Effect		
Error	0.052989	96	0.0033118	73	16						
Total	5.196409				19						
Distributiona	al Tests										
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)			
Variances	Bartlett E	quality of	Variance	8.513	11.34	0.0365	Equal Var	iances			
				0.8852	0.866	0 0000		atribution			
Distribution	Shapiro-	Wilk W No	rmality	0.0002	0.000	0.0220	Normal Di	stribution			
	Shapiro- evelopment Rate			0.0002		0.0220	Normal Di				
	· · · · · · · · · · · · · · · · · · ·			95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Combined D	evelopment Rate	e Summar	/						Std Err 0.006515	CV% 1.52%	%Effect 0.0%
Combined D C-µg/L	evelopment Rate Control Type	e Summar Count	y Mean	95% LCL	95% UCL	Median	Min	Max			
Combined D C-µg/L 0	evelopment Rate Control Type	Summar Count 5	Mean 0.9557	95% LCL 0.9376	95% UCL 0.9738	Median 0.9548	Min 0.9415	Max 0.9734	0.006515	1.52% 3.85% 2.95%	0.0% -1.61% 10.2%
Combined D C-µg/L 0 2.5	evelopment Rate Control Type	Summar Count 5 5	Mean 0.9557 0.971	95% LCL 0.9376 0.9246	95% UCL 0.9738 1	Median 0.9548 0.989	Min 0.9415 0.9064	Max 0.9734 0.9946	0.006515 0.01672	1.52% 3.85%	0.0% -1.61% 10.2% 96.96%
Combined D C-µg/L 0 2.5 5 10 20	evelopment Rate Control Type	Summar Count 5 5 5 5	Mean 0.9557 0.971 0.8582	95% LCL 0.9376 0.9246 0.8268	95% UCL 0.9738 1 0.8896	Median 0.9548 0.989 0.8579	Min 0.9415 0.9064 0.8298	Max 0.9734 0.9946 0.8962	0.006515 0.01672 0.01131 0.003663 0	1.52% 3.85% 2.95%	0.0% -1.61% 10.2% 96.96% 100.0%
Combined D C-µg/L 0 2.5 5 10	evelopment Rate Control Type	Summar Count 5 5 5 5 5	Mean 0.9557 0.971 0.8582 0.02901	95% LCL 0.9376 0.9246 0.8268 0.01884	95% UCL 0.9738 1 0.8896 0.03918	Median 0.9548 0.989 0.8579 0.02747	Min 0.9415 0.9064 0.8298 0.01744	Max 0.9734 0.9946 0.8962 0.03846	0.006515 0.01672 0.01131 0.003663	1.52% 3.85% 2.95%	0.0% -1.61% 10.2% 96.96%
Combined D C-µg/L 0 2.5 5 10 20 40	evelopment Rate Control Type	Summar Count 5 5 5 5 5 5 5 5 5 5 5	y Mean 0.9557 0.971 0.8582 0.02901 0 0	95% LCL 0.9376 0.9246 0.8268 0.01884 0	95% UCL 0.9738 1 0.8896 0.03918 0	Median 0.9548 0.989 0.8579 0.02747 0	Min 0.9415 0.9064 0.8298 0.01744 0	Max 0.9734 0.9946 0.8962 0.03846 0	0.006515 0.01672 0.01131 0.003663 0	1.52% 3.85% 2.95%	0.0% -1.61% 10.2% 96.96% 100.0%
Combined D C-µg/L 0 2.5 5 10 20 40	evelopment Rate Control Type Lab Control	Summar Count 5 5 5 5 5 5 5 5 5 5 5	y Mean 0.9557 0.971 0.8582 0.02901 0 0	95% LCL 0.9376 0.9246 0.8268 0.01884 0	95% UCL 0.9738 1 0.8896 0.03918 0	Median 0.9548 0.989 0.8579 0.02747 0	Min 0.9415 0.9064 0.8298 0.01744 0	Max 0.9734 0.9946 0.8962 0.03846 0	0.006515 0.01672 0.01131 0.003663 0	1.52% 3.85% 2.95%	0.0% -1.61% 10.2% 96.96% 100.0%
Combined D C-µg/L 0 2.5 5 10 20 40 Angular (Cor	evelopment Rate Control Type Lab Control	Summary Count 5 5 5 5 5 5 5 5 5	Mean 0.9557 0.971 0.8582 0.02901 0 0 0	95% LCL 0.9376 0.9246 0.8268 0.01884 0 0	95% UCL 0.9738 1 0.8896 0.03918 0 0	Median 0.9548 0.989 0.8579 0.02747 0 0	Min 0.9415 0.9064 0.8298 0.01744 0 0	Max 0.9734 0.9946 0.8962 0.03846 0 0	0.006515 0.01672 0.01131 0.003663 0 0	1.52% 3.85% 2.95% 28.23%	0.0% -1.61% 10.2% 96.96% 100.0% 100.0%
Combined D C-µg/L 0 2.5 5 10 20 40 Angular (Cor C-µg/L	evelopment Rate Control Type Lab Control rrected) Transfor Control Type	Summary Count 5 5 5 5 5 5 5 5 5 5 5 5 7 7 8 7 8 7 8 7	Mean 0.9557 0.971 0.8582 0.02901 0 0 mary Mean	95% LCL 0.9376 0.9246 0.8268 0.01884 0 0 95% LCL	95% UCL 0.9738 1 0.8896 0.03918 0 0 95% UCL	Median 0.9548 0.989 0.8579 0.02747 0 0 0	Min 0.9415 0.9064 0.8298 0.01744 0 0 Min	Max 0.9734 0.9946 0.8962 0.03846 0 0 0	0.006515 0.01672 0.01131 0.003663 0 0 Std Err	1.52% 3.85% 2.95% 28.23%	0.0% -1.61% 10.2% 96.96% 100.0% 100.0%
Combined D C-µg/L 0 2.5 5 10 20 40 Angular (Cor C-µg/L 0	evelopment Rate Control Type Lab Control rrected) Transfor Control Type	Summary Count 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Mean 0.9557 0.971 0.8582 0.02901 0 0 mary Mean 1.361	95% LCL 0.9376 0.9246 0.8268 0.01884 0 0 95% LCL 1.316	95% UCL 0.9738 1 0.8896 0.03918 0 0 95% UCL 1.406	Median 0.9548 0.989 0.8579 0.02747 0 0 0 Median 1.357	Min 0.9415 0.9064 0.8298 0.01744 0 0 0 Min 1.327	Max 0.9734 0.9946 0.8962 0.03846 0 0 Max 1.407	0.006515 0.01672 0.01131 0.003663 0 0 Std Err 0.01624	1.52% 3.85% 2.95% 28.23% CV% 2.67% 7.0% 3.13%	0.0% -1.61% 10.2% 96.96% 100.0% 100.0% %Effect 0.0%
Combined D C-µg/L 0 2.5 5 10 20 40 Angular (Cor C-µg/L 0 2.5	evelopment Rate Control Type Lab Control rrected) Transfor Control Type	2 Summary Count 5 5 5 5 5 5 5 5 5 5 5 5 5	y Mean 0.9557 0.971 0.8582 0.02901 0 0 0 mary Mean 1.361 1.423	95% LCL 0.9376 0.9246 0.8268 0.01884 0 0 95% LCL 1.316 1.3	95% UCL 0.9738 1 0.8896 0.03918 0 0 95% UCL 1.406 1.547	Median 0.9548 0.989 0.8579 0.02747 0 0 0 Median 1.357 1.465	Min 0.9415 0.9064 0.8298 0.01744 0 0 0 Min 1.327 1.26	Max 0.9734 0.9946 0.8962 0.03846 0 0 0 Max 1.407 1.497	0.006515 0.01672 0.01131 0.003663 0 0 Std Err 0.01624 0.04453	1.52% 3.85% 2.95% 28.23% CV% 2.67% 7.0%	0.0% -1.61% 10.2% 96.96% 100.0% 100.0% %Effect 0.0% -4.58%
Combined D C-µg/L 0 2.5 5 10 20 40 Angular (Cor C-µg/L 0 2.5 5	evelopment Rate Control Type Lab Control rrected) Transfor Control Type	2 Summary 5 5 5 5 5 5 5 5 5 5 5 5 5	y Mean 0.9557 0.971 0.8582 0.02901 0 0 0 mary Mean 1.361 1.423 1.186	95% LCL 0.9376 0.9246 0.8268 0.01884 0 0 95% LCL 1.316 1.3 1.14	95% UCL 0.9738 1 0.8896 0.03918 0 0 95% UCL 1.406 1.547 1.232	Median 0.9548 0.989 0.8579 0.02747 0 0 0 Median 1.357 1.465 1.184	Min 0.9415 0.9064 0.8298 0.01744 0 0 0 Min 1.327 1.26 1.146	Max 0.9734 0.9946 0.8962 0.03846 0 0 0 Max 1.407 1.497 1.243	0.006515 0.01672 0.01131 0.003663 0 0 Std Err 0.01624 0.04453 0.01659	1.52% 3.85% 2.95% 28.23% CV% 2.67% 7.0% 3.13%	0.0% -1.61% 10.2% 96.96% 100.0% 100.0% * Effect 0.0% -4.58% 12.87%



CETIS™ v1.8.7.20

CETIS Analytical Report

Report Date: Test Code:

						Test	Code:	20102	8msdv 09	-4043-467
al Survival and D)evelopr	nent Test						Nautilus	Environm	iental (CA
17-7885-6687 16 Nov-20 12:1		•	•		ments				8.7	
rm	Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	ΤU
ected)	NA	C > T	NA	NA		2.24%	2.5	5	3.536	
tiple Comparisor	ידפאנ דפאנ				·					
		Test Stat	Critical	MSD DF	P-Value	P-Type	Decision(a:5%)		
2.5	<u> </u>	-1.846	2.227	0.057 8	0.9955	CDF			P	
5*		7.878	2.227	0.057 8	<0.0001	CDF	-			
10*		48.18	2.227	0.057 8	<0.0001	CDF	Significant	Effect		
e										
Sum Squ	ares	Mean Sq	uare	DF	F Stat	P-Value	Decision(a:5%)		
5.349535				3	1101	<0.0001	Significant	Effect		
	31	0.001619	082							
5.3/5441				19						
al Tests										
Test	<u></u>				P-Value					
	•		3.431	11.34	0.3298					
Shapiro-\	Wilk W N	lormality	0.9598	0.866	0.5404	Normal Di	stribution			
t Rate Summary										
Control Type	Count	t Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control	5	0.9694	0.9572	0.9816	0.9699	0.9548	0.9817	0.004391		0.0%
										-1.21% 10.73%
										96.97%
							0.00040	0	20.0070	100.0%
	5	0	0	0	0	0	0	0		100.0%
rrected) Transfor	med Su	mmary	<u></u>		<u> </u>					
-			95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
Lab Control		1.397	1.361		1.396	1.357	1.435	0.01276	2.04%	0.0%
	-		1.368	4 540	4 405	4 0 0 4	1.497	0.02712		-3.36%
	5	1.444	1.300	1.519	1.465	1.361	1.497	0.027 12	4.2%	
	5	1.196	1.152	1.241	1.195	1.146	1.243	0.01612	3.01%	14.35%
	5 5	1.196 0.1706	1.152 0.1381	1.241 0.2031	1.195 0.1665	1.146 0.1325	1.243 0.1974	0.01612 0.0117	3.01% 15.34%	87.78%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751	1.241 0.2031 0.03961	1.195 0.1665 0.03882	1.146 0.1325 0.03707	1.243 0.1974 0.03917	0.01612 0.0117 0.000379	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5	1.196 0.1706	1.152 0.1381	1.241 0.2031	1.195 0.1665	1.146 0.1325	1.243 0.1974	0.01612 0.0117	3.01% 15.34%	87.78%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751	1.241 0.2031 0.03961	1.195 0.1665 0.03882	1.146 0.1325 0.03707	1.243 0.1974 0.03917	0.01612 0.0117 0.000379	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961	1.195 0.1665 0.03882	1.146 0.1325 0.03707	1.243 0.1974 0.03917	0.01612 0.0117 0.000379	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751	1.241 0.2031 0.03961	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707	1.243 0.1974 0.03917	0.01612 0.0117 0.000379	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707	1.243 0.1974 0.03917	0.01612 0.0117 0.000379	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961 0.5238	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707	1.243 0.1974 0.03917	0.01612 0.0117 0.000379	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961 0.5238	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707 0.5236	1.243 0.1974 0.03917 0.5236	0.01612 0.0117 0.000379 0	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707 0.5236	1.243 0.1974 0.03917	0.01612 0.0117 0.000379 0	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961 0.5238	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707 0.5236	1.243 0.1974 0.03917 0.5236	0.01612 0.0117 0.000379 0	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961 0.5238	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707 0.5236	1.243 0.1974 0.03917 0.5236	0.01612 0.0117 0.000379 0	3.01% 15.34% 2.2%	87.78% 97.24%
- 2 -	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961 0.5238	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707 0.5236	1.243 0.1974 0.03917 0.5236	0.01612 0.0117 0.000379 0	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961 0.5238	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707 0.5236	1.243 0.1974 0.03917 0.5236	0.01612 0.0117 0.000379 0	3.01% 15.34% 2.2%	87.78% 97.24%
	5 5 5	1.196 0.1706 0.03856	1.152 0.1381 0.03751 0.5234	1.241 0.2031 0.03961 0.5238	1.195 0.1665 0.03882 0.5236	1.146 0.1325 0.03707 0.5236	1.243 0.1974 0.03917 0.5236	0.01612 0.0117 0.000379 0	3.01% 15.34% 2.2%	87.78% 97.24%
	17-7885-6687 16 Nov-20 12:1 rm ected) iple Comparisor vs C-µg/L 2.5 5* 10* Sum Squ 5.349535 0.0259053 5.375441 I Tests Test Bartlett E Shapiro-N t Rate Summary Control Type Lab Control rrected) Transfor Control Type	17-7885-6687 I 16 Nov-20 12:10 I rm Zeta ected) NA iple Comparison Test I vs C-µg/L 2.5 5* 10* I Sum Squares 5.349535 0.02590531 5.375441 If Tests Test Bartlett Equality of Shapiro-Wilk W N t Rate Summary Control Type Control Type Count 1ab Control 5 5 5	16 Nov-20 12:10Analysis:ParmZetaAltHypected)NAC > Tiple Comparison TestTest Stat2.5-1.8465*7.87810*48.182.5-1.8465*7.87810*48.182.5-1.8465*7.87810*48.18Mean Squ5.3495351.7831780.025905310.0016195.3754410.0016195.375441TestTestE trestBartlett Equality of Variance Shapiro-Wilk W Normalityt Rate SummaryControl TypeCountMeanLab Control50.969450.92936505050505050.2936505 <td>Interval 17-7885-6687 16 Nov-20 12:10Development R Analysis:Interval 12:10Analysis:Parametric-ConrmZetaAlt HypTrialsected)NAC > TNAiple Comparison TestvsC-µg/LTest StatCritical2.5-1.8462.2275*7.8782.22710*48.182.22751.7831782.2270.025905310.0016190825.3754415.375441TestTest StatBartlett Equality of Variance3.431Shapiro-Wilk W Normality0.9598t Rate SummaryControl TypeCountMean95% LCLLab Control50.98110.960450.029360.0187650050</td> <td>17-7885-6687 16 Nov-20 12:10 Endpoint: Analysis: Development Rate Parametric-Control vs Treat rm Zeta Alt Hyp Trials Seed ected) NA C > T NA NA iple Comparison Test Test Stat Critical MSD DF 2.5 -1.846 2.227 0.057 8 5^* 7.878 2.227 0.057 8 10^* 48.18 2.227 0.057 8 Sum Squares Mean Square DF DF 5.349535 1.783178 3 0.02590531 0.001619082 16 5.375441 Test Test Stat Critical MS I Tests Test Test Stat Critical Bartlett Equality of Variance 3.431 11.34 Shapiro-Wilk W Normality 0.9598 0.866 t Rate Summary Control 5 0.9694 0.9572 0.9816 Lab Control 5 0.8654 0.8348 0.896 5 0.9991 0.9604 1 5</td> <td>17-7885-6687 16 Nov-20 12:10 Endpoint: Analysis: Development Rate Parametric-Control vs Treatments rm Zeta Alt Hyp Trials Seed rm Zeta Alt Hyp Trials Seed ected) NA C > T NA NA iple C-µg/L Test Stat Critical MSD DF P-Value 2.5 -1.846 2.227 0.057 8 0.0001 10* 48.18 2.227 0.057 8 <0.0001</td> 10* 48.18 2.227 0.057 8 <0.0001	Interval 17-7885-6687 16 Nov-20 12:10Development R Analysis:Interval 12:10Analysis:Parametric-ConrmZetaAlt HypTrialsected)NAC > TNAiple Comparison TestvsC-µg/LTest StatCritical2.5-1.8462.2275*7.8782.22710*48.182.22751.7831782.2270.025905310.0016190825.3754415.375441TestTest StatBartlett Equality of Variance3.431Shapiro-Wilk W Normality0.9598t Rate SummaryControl TypeCountMean95% LCLLab Control50.98110.960450.029360.0187650050	17-7885-6687 16 Nov-20 12:10 Endpoint: Analysis: Development Rate Parametric-Control vs Treat rm Zeta Alt Hyp Trials Seed ected) NA C > T NA NA iple Comparison Test Test Stat Critical MSD DF 2.5 -1.846 2.227 0.057 8 5^* 7.878 2.227 0.057 8 10^* 48.18 2.227 0.057 8 Sum Squares Mean Square DF DF 5.349535 1.783178 3 0.02590531 0.001619082 16 5.375441 Test Test Stat Critical MS I Tests Test Test Stat Critical Bartlett Equality of Variance 3.431 11.34 Shapiro-Wilk W Normality 0.9598 0.866 t Rate Summary Control 5 0.9694 0.9572 0.9816 Lab Control 5 0.8654 0.8348 0.896 5 0.9991 0.9604 1 5	17-7885-6687 16 Nov-20 12:10 Endpoint: Analysis: Development Rate Parametric-Control vs Treatments rm Zeta Alt Hyp Trials Seed rm Zeta Alt Hyp Trials Seed ected) NA C > T NA NA iple C-µg/L Test Stat Critical MSD DF P-Value 2.5 -1.846 2.227 0.057 8 0.0001 10* 48.18 2.227 0.057 8 <0.0001	17-7885-6687 16 Nov-20 12:10 Endpoint: Analysis: Development Rate Parametric-Control vs Treatments CETI Offic rm Zeta Alt Hyp Trials Seed PMSD ected) NA C > T NA NA NA 2.24% iple Comparison Test Test Stat Critical MSD DF P-Value P-Type 2.5 -1.846 2.227 0.057 8 0.0001 CDF 5* 7.878 2.227 0.057 8 <0.0001	17-7885-6687 16 Nov-20 12:10 Endpoint: Analysis: Development Rate Parametric-Control vs Treatments CETIS Version: Official Results: rm Zeta Alt Hyp Trials Seed PMSD NOEL ected) NA C > T NA NA 2.24% 2.5 spice C-µg/L Test Stat Critical MSD DF P-Value P-Type Decision(c 2.5 -1.846 2.227 0.057 8 0.9955 CDF Non-Significant 0° 48.18 2.227 0.057 8 0.0001 CDF Significant 10° 48.18 2.227 0.057 8 0.0001 CDF Significant 0.02590531 0.001619082 16 5 349535 1.783178 3 1101 <0.0001	17-7885-6687 16 Nov-20 12:10 Endpoint: Analysis: Development Rate Parametric-Control vs Treatments CETIS Version: Official Results: CETISV1. Yes rm Zeta Alt Hyp Trials Seed PMSD NOEL LOEL ected) NA C > T NA NA 2.24% 2.5 5 iple Comparison Test vs C-µg/L Test Stat Critical MSD DF P-Value P-Type Decision(α:5%) 2.5 -1.846 2.227 0.057 8 0.0001 CDF Significant Effect 5* 7.878 2.227 0.057 8 <0.0001	17-7885-6687 16 Nov-20 12:10 Endpoint: Analysis: Development Rate Parametric-Control vs Treatments CETIS Version: Official Results: CETISV1.8.7 Yes rm Zeta Alt Hyp Trials Seed PMSD NOEL LOEL TOEL ected) NA C > T NA NA 2.24% 2.5 5 3.536 tiple Comparison Test vs C-ug/L Test Stat Critical MSD DF P-Value P-Type Decision(α:5%) 2.5 -1.846 2.227 0.057 8 0.0001 CDF Non-Significant Effect 10° 48.18 2.227 0.057 8 0.0001 CDF Significant Effect 10° 48.18 2.227 0.057 8 0.0001 CDF Significant Effect 5.349535 1.783178 3 1101 <0.0001

C-µg/L

CETIS™ v1.8.7.20

Rank|ts

CETIS Analytical Report

Report Date: Test Code:

16 Nov-20 12:11 (p 3 of 4)
201028msdv 09-4043-4676

Bivalve Larva	al Survival and D	evelopme	nt Test						Nautilus	Environn	nental (CA
Analysis ID: Analyzed:	17-2684-3616 16 Nov-20 12:1		d point: Sur alysis: Nor	vival Rate	Control vs T	reatments		S Version: ial Results:	CETISv1. Yes	8.7	
Data Transfo	orm	Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	τυ
Angular (Corr	ected)	NA	C > T	NA	NA		3.11%	20	40	28.28	
Steel Many-C	One Rank Sum Te	est									
Control	vs C-µg/L		Test Stat	Critical	Ties DF	P-Value	P-Type	Decision(a:5%)		
Lab Control	2.5		29	17	1 8	0.8870	Asymp	Non-Signif	icant Effect		
	5		29.5	17	2 8	0.9089	Asymp	Non-Signif	ficant Effect		
	10		29	17	1 8	0.8870	Asymp	Non-Signif	icant Effect		
	20		22.5	17	2 8	0.3541	Asymp	Non-Signif	icant Effect		
ANOVA Table	e										
Source	Sum Squ	ares	Mean Squ	lare	DF	F Stat	P-Value	Decision(α:5%)		
Between	0.0262787	79	0.0065696	598	4	1.058	0.4030	Non-Signif	ficant Effect		
			0.000044	0#	20						
Error	0.1242299	9	0.0062114	90	20						
Error Total	0.1242299		0.0062114	.90	24	→					
	0.1505087		0.0062114	.90		→ 					
Total	0.1505087		0.0062114	Test Stat	24	P-Value	Decision	(α:1%)			
Total Distributiona	0.1505087 al Tests Test				24	P-Value 0.9943	Decision Equal Var				
Total Distributiona Attribute	0.1505087 al Tests Test Bartlett E	7	/ariance	Test Stat	24 Critical		Equal Var		on		
Total Distributiona Attribute Variances	0.1505087 al Tests Test Bartlett E Shapiro-\	7 quality of V	/ariance	Test Stat 0.2223	24 Critical 13.28	0.9943	Equal Var	iances	on		
Total Distributiona Attribute Variances Distribution	0.1505087 al Tests Test Bartlett E Shapiro-\	7 quality of V	/ariance	Test Stat 0.2223	24 Critical 13.28	0.9943	Equal Var	iances	on Std Err	CV%	%Effec
Total Distributiona Attribute Variances Distribution Survival Rate	0.1505087 al Tests Test Bartlett E Shapiro-N e Summary	7 quality of V Wilk W Nor	′ariance mality	Test Stat 0.2223 0.8429	24 Critical 13.28 0.8877	0.9943 0.0013	Equal Var Non-norm	iances al Distributio		CV% 1.99%	%Effec 0.0%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L	0.1505087 al Tests Test Bartlett E Shapiro-V e Summary Control Type	7 iquality of ∖ Wilk W Nor Count	/ariance mality Mean	Test Stat 0.2223 0.8429 95% LCL	24 Critical 13.28 0.8877 95% UCL	0.9943 0.0013 Median	Equal Var Non-norm Min	iances al Distributio Max	Std Err		0.0% -0.36%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0	0.1505087 al Tests Test Bartlett E Shapiro-V e Summary Control Type	7 Guality of V Wilk W Nor Count 5	Variance mality Mean 0.986	Test Stat 0.2223 0.8429 95% LCL 0.9616	24 Critical 13.28 0.8877 95% UCL 1	0.9943 0.0013 Median 1	Equal Var Non-norm Min 0.9591	iances al Distributio Max 1	Std Err 0.008791	1.99%	0.0%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 2.5	0.1505087 al Tests Test Bartlett E Shapiro-V e Summary Control Type	7 Guality of V Wilk W Nor Count 5 5 5	/ariance mality <u>Mean</u> 0.986 0.9895	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9602	24 Critical 13.28 0.8877 95% UCL 1 1	0.9943 0.0013 Median 1 1	Equal Var Non-norm Min 0.9591 0.9474	iances al Distributio Max 1 1	Std Err 0.008791 0.01053	1.99% 2.38%	0.0% -0.36% -0.59% -0.47%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 2.5 5	0.1505087 al Tests Test Bartlett E Shapiro-V e Summary Control Type	7 Guality of V Wilk W Nor Count 5 5 5 5 5	/ariance mality <u>Mean</u> 0.986 0.9895 0.9918	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9602 0.9691	24 Critical 13.28 0.8877 95% UCL 1 1 1 1	0.9943 0.0013 Median 1 1 1	Equal Var Non-norm Min 0.9591 0.9474 0.9591	Max 1 1 1 1 1	Std Err 0.008791 0.01053 0.008187	1.99% 2.38% 1.85%	0.0% -0.36% -0.59% -0.47% 1.42%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 2.5 5 10	0.1505087 al Tests Test Bartlett E Shapiro-V e Summary Control Type	7 Guality of V Wilk W Nor Count 5 5 5 5 5 5 5	/ariance mality 0.986 0.9895 0.9918 0.9906	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9602 0.9691 0.9647	24 Critical 13.28 0.8877 95% UCL 1 1 1 1 1 1	0.9943 0.0013 Median 1 1 1 1	Equal Var Non-norm 0.9591 0.9474 0.9591 0.9532	Max 1 1 1 1 1 1 1 1	Std Err 0.008791 0.01053 0.008187 0.009357	1.99% 2.38% 1.85% 2.11%	-0.36% -0.59% -0.47%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 2.5 5 10 20 40	0.1505087 al Tests Test Bartlett E Shapiro-V e Summary Control Type	7 Guality of V Wilk W Nor 5 5 5 5 5 5 5 5 5 5 5 5	/ariance mality 0.986 0.9895 0.9918 0.9906 0.9719 0	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9602 0.9691 0.9647 0.9505	24 Critical 13.28 0.8877 95% UCL 1 1 1 1 0.9933	0.9943 0.0013 Median 1 1 1 1 1 0.9708	Equal Var Non-norm 0.9591 0.9474 0.9591 0.9532 0.9532	Max 1 1 1 1 1 1 1 1 1	Std Err 0.008791 0.01053 0.008187 0.009357 0.007714	1.99% 2.38% 1.85% 2.11%	0.0% -0.36% -0.59% -0.47% 1.42%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 2.5 5 10 20 40	0.1505087 al Tests Bartlett E Shapiro-V e Summary Control Type Lab Control	7 Guality of V Wilk W Nor 5 5 5 5 5 5 5 5 5 5 5 5	/ariance mality 0.986 0.9895 0.9918 0.9906 0.9719 0	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9602 0.9691 0.9647 0.9505	24 Critical 13.28 0.8877 95% UCL 1 1 1 1 0.9933	0.9943 0.0013 Median 1 1 1 1 1 0.9708	Equal Var Non-norm 0.9591 0.9474 0.9591 0.9532 0.9532	Max 1 1 1 1 1 1 1 1 1	Std Err 0.008791 0.01053 0.008187 0.009357 0.007714	1.99% 2.38% 1.85% 2.11%	0.0% -0.36% -0.59% -0.47% 1.42% 100.0%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 2.5 5 10 20 40 Angular (Cor	0.1505087 al Tests Bartlett E Shapiro-V e Summary Control Type Lab Control	7 Gquality of V Wilk W Nor 5 5 5 5 5 5 5 5 5 5 5 5 5	/ariance mality 0.986 0.9895 0.9918 0.9906 0.9719 0 nary	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9602 0.9691 0.9647 0.9505 0	24 Critical 13.28 0.8877 95% UCL 1 1 1 0.9933 0	0.9943 0.0013 Median 1 1 1 0.9708 0	Equal Var Non-norm 0.9591 0.9474 0.9591 0.9532 0.9532 0	iances al Distributio Max 1 1 1 1 1 1 0	Std Err 0.008791 0.01053 0.008187 0.009357 0.007714 0	1.99% 2.38% 1.85% 2.11% 1.78%	0.0% -0.36% -0.59% -0.47% 1.42%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 2.5 5 10 20 40 Angular (Cor C-µg/L	0.1505087 al Tests Test Bartlett E Shapiro-N e Summary Control Type Lab Control	7 Guality of V Wilk W Nor 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	⁷ ariance mality <u>Mean</u> 0.986 0.9895 0.9918 0.9906 0.9719 0 nary <u>Mean</u>	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9602 0.9691 0.9647 0.9505 0 95% LCL	24 Critical 13.28 0.8877 95% UCL 1 1 1 0.9933 0 95% UCL	0.9943 0.0013 Median 1 1 1 1 0.9708 0 Median	Equal Var Non-norm 0.9591 0.9474 0.9591 0.9532 0.9532 0 Min	Max 1 1 1 1 1 1 1 1 0 Max	Std Err 0.008791 0.01053 0.008187 0.009357 0.007714 0 Std Err	1.99% 2.38% 1.85% 2.11% 1.78%	0.0% -0.36% -0.59% -0.47% 1.42% 100.0%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 2.5 5 10 20 40 Angular (Cor C-µg/L 0	0.1505087 al Tests Test Bartlett E Shapiro-N e Summary Control Type Lab Control	7 Equality of V Wilk W Nor 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	/ariance mality 0.986 0.9895 0.9918 0.9906 0.9719 0 mary Mean 1.473	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9602 0.9691 0.9647 0.9505 0 95% LCL 1.37	24 Critical 13.28 0.8877 95% UCL 1 1 1 0.9933 0 95% UCL 1.575	0.9943 0.0013 Median 1 1 1 1 1 0.9708 0 Median 1.533	Equal Var Non-norm 0.9591 0.9474 0.9591 0.9532 0.9532 0 Min 1.367	Max 1 1 1 1 1 1 1 0 Max 1.533	Std Err 0.008791 0.01053 0.008187 0.009357 0.007714 0 Std Err 0.03698	1.99% 2.38% 1.85% 2.11% 1.78% CV% 5.61% 5.79% 4.94%	0.0% -0.36% -0.59% -0.47% 1.42% 100.0% -0.0% -1.44% -1.81%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 2.5 5 10 20 40 Angular (Cor C-µg/L 0 2.5	0.1505087 al Tests Test Bartlett E Shapiro-N e Summary Control Type Lab Control	7 Equality of V Wilk W Nor 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	/ariance mality 0.986 0.9895 0.9918 0.9906 0.9719 0 nary Mean 1.473 1.494	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9691 0.9647 0.9505 0 95% LCL 1.37 1.387	24 Critical 13.28 0.8877 95% UCL 1 1 1 1 0.9933 0 95% UCL 1.575 1.601	0.9943 0.0013 Median 1 1 1 1 1 0.9708 0 Median 1.533 1.533	Equal Var Non-norm 0.9591 0.9474 0.9591 0.9532 0.9532 0 Min 1.367 1.339	Max 1 1 1 1 1 1 1 1 0 Max 1.533 1.533	Std Err 0.008791 0.01053 0.008187 0.009357 0.007714 0 Std Err 0.03698 0.03865	1.99% 2.38% 1.85% 2.11% 1.78% CV % 5.61% 5.79%	0.0% -0.36% -0.59% -0.47% 1.42% 100.0% -0.0% -1.44% -1.81% -1.62%
Total Distributiona Attribute Variances Distribution Survival Rate C-µg/L 0 20 40 Angular (Cor C-µg/L 0 2.5 5 10 20 40 Angular (Sor C-µg/L 0 2.5 5 5 10 20 40 C-µg/L 0 2.5 5 5 10 20 40 C-µg/L 0 2.5 5 5 10 20 40 Cor C-µg/L 0 2.5 5 5 10 20 40 Cor Cor Cor Cor C-µg/L 0 2.5 5 5 10 20 40 Cor Cor Cor Cor Cor Cor Cor Cor	0.1505087 al Tests Test Bartlett E Shapiro-N e Summary Control Type Lab Control	7 Equality of V Wilk W Nor 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	/ariance mality Mean 0.986 0.9895 0.9918 0.9906 0.9719 0 nary Mean 1.473 1.494 1.499	Test Stat 0.2223 0.8429 95% LCL 0.9616 0.9691 0.9647 0.9505 0 95% LCL 1.37 1.387 1.408	24 Critical 13.28 0.8877 95% UCL 1 1 1 1 0.9933 0 95% UCL 1.575 1.601 1.591	0.9943 0.0013 Median 1 1 1 1 1 0.9708 0 Median 1.533 1.533 1.533	Equal Var Non-norm 0.9591 0.9474 0.9591 0.9532 0.9532 0 0 Min 1.367 1.339 1.367	iances al Distributio Max 1 1 1 1 1 1 0 Max 1.533 1.533 1.533	Std Err 0.008791 0.01053 0.008187 0.009357 0.007714 0 Std Err 0.03698 0.03865 0.0331	1.99% 2.38% 1.85% 2.11% 1.78% CV% 5.61% 5.79% 4.94%	0.0% -0.36% -0.59% -0.47% 1.42% 100.0%

Analyst: JU QA: Ac Ill6/20

CETIS Ana	lytical Report			Report Date: Test Code:	16 Nov-20 12:11 (p 4 of 4) 201028msdv 09-4043-4676
Bivalve Larva	al Survival and Develo	pment Test			Nautilus Environmental (CA)
Analysis ID: Analyzed:	17-2684-3616 16 Nov-20 12:10	Endpoint: Analysis:	Survival Rate Nonparametric-Control vs Treatm	CETIS Version: ents Official Results:	CETISv1.8.7 Yes
Graphics			0.12 0.00 0.00 0.00 0.00 0.00 0.00 0.00		0 00000 0000

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C-µg/L

_ QA:<u>AUN/14</u>/20

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ETIS A	nalytical Repo	rt					-	ort Date: Code:			11 (p 1 of 3 9-4043-467
Bivalve La	rval Survival and De	evelopment Te	est						Nautilus	s Environi	mental (CA)
Analysis II Analyzed:	D: 02-6542-7057 16 Nov-20 12:10	•	Endpoint: Combined Development Rate Analysis: Linear Interpolation (ICPIN)					IS Version: ial Results:	CETISv1 Yes	.8.7	
Linear Inte	erpolation Options										
X Transfor	m Y Transform	Seed	Resa	amples	Exp 95%	CL Meth	od				
Linear	Linear	163891	1000)	Yes	Two-	Point Interp	olation			
Point Estir	mates										
	g/L 95% LCL	95% UCL									
	.816 5.634	5.988							· · · ·		
	.269 7.148	7.383									
Combined	Development Rate	Summary			Calcu	lated Varia	te(A/B)				
C-µg/L	Control Type	Count M	ean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	в
0	Lab Control	5 0.	9557	0.9415	0.9734	0.006515	0.01457	1.52%	0.0%	851	890
2.5		5 0.	971	0.9064	0.9946	0.01672	0.03738	3.85%	-1.61%	859	884
5			8582	0.8298	0.8962	0.01131	0.02528	2.95%	10.2%	781	910
10		5 0.	02901	0.01744	0.03846	0.003663	0.00819	28.23%	96.96%	26	895
20		5 0		0	0	0	0		100.0%	0	866
40		5 0		0	0	0	0		100.0%	0	855
Graphics 10 07 08 07 08 07 08 07 08 07 08 07 08 07 08 07 08 07 08 07 08 07 08 07 08 07 08 08 08 08 08 08 08 08 08 08				<u>eu-Maisseuto-0</u> 25 40							

CETIS	6 Anal	ytical Repo	ort						rt Date: Code:			11 (p 2 of 3 9-4043-467
Bivalve	e Larval	Survival and D	evelopmer	nt Test						Nautilus	s Environ	mental (CA)
Analys Analyz		12-0840-2779 16 Nov-20 12:1		-	Development F Linear Interpola				S Version: ial Results:	CETISv1 Yes	.8.7	
Linear	Interpo	lation Options										
X Trans	sform	Y Transform	See	d	Resamples	Exp 95%	CL Meth	od				
Linear		Linear	196		1000	Yes		Point Interpo	plation			
Point Estimates					4					· · · · · · · · · · · · · · · · · · ·		
Level	μg/L	95% LCL	95% UCL									
EC25	5.798	5.642	5.954									
EC50	7.257	7.156	7.362									
Develo	pment l	Rate Summary				Calcul	ated Variat	te(A/B)				
C-µg/L	C	ontrol Type	Count	Mean	Min	Мах	Std Err	Std Dev	CV%	%Effect	А	в
0	La	ab Control	5	0.9694	0.9548	0.9817	0.004391	0.009818	1.01%	0.0%	851	878
2.5			5	0.9811	0.9568	0.9946	0.007456	0.01667	1.7%	-1.21%	859	875
5			5	0.8654	0.8298	0.8962	0.01103	0.02466	2.85%	10.73%	781	903
10			5	0.0293	6 0.01744	0.03846	0.003818	0.008538	29.08%	96.97%	26	887
20			5	0	0	0	0	0		100.0%	0	842
40			5	0	0	0	0	0		100.0%	0	5
Graphi												
	، ل بب	5 10 1	5 20	-1l	1							
	-	, 10 1	, "Д С-ру/L		*							

Analyst: JL QA: AKU /16/20

nalysis ID: nalyzed: inear Interpol	Survival and D 15-7574-6891	evelopmer	t Test				100	t Code:			9-4043-467
nalyzed: inear Interpol									Nautilu	s Environ	mental (CA)
	16 Nov-20 12:1		Endpoint: Survival Rate Analysis: Linear Interpolation (ICPIN)			• • • •		FIS Version: cial Results:	CETISv1 Yes	.8.7	-
	ation Options										·····
Transform	Y Transform	See	d	Resamples	Exp 95% (CL Meth	od				
inear	Linear		0855	1000	Yes		Point Inter	polation			
oint Estimate			•								
evel µg/L		95% UCL									
C25 24.73	24.32	25.06							<u></u>		
C50 29.82	29.54	30.04									
urvival Rate S				<u></u>	Calcul	ated Variat	o(A/B)				
	ontrol Type	Count	Mean	Min		Std Err	Std Dev	CV%	%Effect	A	в
	ab Control	5	0.986	0.9591	1	0.008791	0.01966	1.99%	0.0%	843	855
.5		5	0.9895			0.01053	0.02354	2.38%	-0.36%	846	855
		5	0.9918			0.008187	0.01831	1.85%	-0.59%	848	855
0		5	0.9906			0.009357	0.02092	2.11%	-0.47%	847	855
0		5	0.9719			0.007714	0.01725	1.78%	1.42%	831	855
0		5	0	0	0	0	0		100.0%	0	855
10 00 00 10 00 00 10 00 00 10 00 00 10 00 10 10 00 10 00	•										

Quality Control Data

Bivalve Larval Survival and Development Test Nautilus Environmental (CA) Test Type: Development-Survival Organism: Mytilus galloprovincialis (Bay Mussel Material: Copper chloride Protocol: EPA/600/R-95/136 (1995) Endpoint: Combined Development Rate Source: Reference Toxicant-REF **Bivaive Larval Survival and Development Test** 25 20 -39 +2s 15 EC50-µg/1. Copper chloride 10 -29 -3s 0 06 Aug-20— 20 Oct-20 05 Feb-20--25 Feb-20-17 Mar-20-11 Jun-20--02-IUC ES -02-ILC 0E 11 Aug-20-23 Oct-20-28 Apr-20-12 May-20-15 Jul-20-22 Sep-20-28 Oct-20-08 Jan-20 22 Jan-20-04 Feb-20-06 Apr-20-15 Apr-20-15 Sep-20-

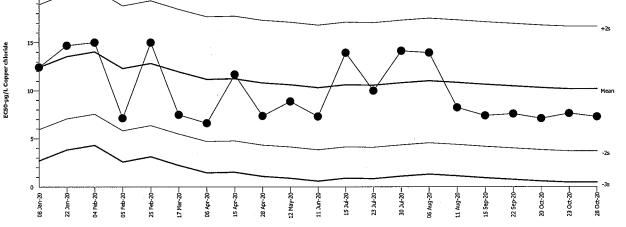
Mean:	10.12	Count:	20	-2s Warning Limit:	3.636	-3s Action Limit:	0.3937
Sigma:	3.242	CV:	32.00%	+2s Warning Limit:	16.6	+3s Action Limit:	19.85

			_			-	<u>.</u> .				
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2020	Jan	8	13:40	12.34	2.22	0.6847			07-8444-5322	01-1422-4896
2			22	13:25	14.72	4.6	1.419			02-1152-2212	07-1224-7163
3		Feb	4	16:30	14.68	4.556	1.405			19-9078-6483	21-0369-4045
4			5	13:10	7.103	-3.017	-0.9306			06-6849-2235	04-8167-3886
5			25	14:15	14.58	4.461	1.376			09-2101-6353	02-3593-4650
6		Mar	17	14:20	7.408	-2.712	-0.8366			14-6169-3689	18-9939-7640
7		Apr	6	17:15	6.537	-3.583	-1.105			02-0082-4673	13-2096-3831
8			15	13:25	11.68	1.563	0.4821			16-4614-0901	11-3098-9850
9			28	13:25	7.292	-2.828	-0.8724			06-8086-6028	13-2749-2065
10		May	12	16:15	8.819	-1.301	-0.4013			12-3773-8150	00-4087-7530
11		Jun	11	15:45	7.306	-2.814	-0.8681			20-6521-9403	10-1893-3875
12		Jul	15	13:55	14.16	4.042	1.247			17-4780-3294	11-0488-5403
13			23	15:00	9.974	-0.1456	-0.04492			06-0741-6264	07-6012-8216
14			30	15:35	14.17	4.045	1.248			00-9901-5729	19-4020-2576
15		Aug	6	15:40	14.13	4.005	1.235			01-4440-0014	02-9592-9535
16			11	14:30	8.085	-2.035	-0.6276			21-4043-5119	05-6052-3343
17		Sep	15	0:00	7.365	-2.755	-0.8498			19-9833-0655	18-5101-1090
18			22	14:40	7.405	-2.715	-0.8375			04-0347-9113	09-6026-9613
19		Oct	20	14:25	7.1	-3.02	-0.9314			08-8652-5764	17-2783-6415
20			23	13:45	7.548	-2.572	-0.7932			09-8413-3498	19-3049-9702
21			28	15:50	7.269	-2.851	-0.8794			09-4043-4676	02-6542-7057

Analyst: JU QA: JKII/16/20

CETIS™ v1.8.7.20

Bivalve Larval Survival and Development Test Nautilus Environmental (CA) Test Type: Development-Survival Organism: Mytilus galloprovincialis (Bay Mussel Copper chloride Material: Protocol: EPA/600/R-95/136 (1995) Endpoint: Development Rate Reference Toxicant-REF Source: **Bivalve Larval Survival and Development Test** 25 20 +3s



			ean: gma:	10.18 3.242		ount: V:	20 31.80%	-2s Warni +2s Warni	•		-3s Action Limit: +3s Action Limit:	
Quali	ity Con	trol Dat	a									
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	
1	2020	Jan	8	13:40	12.43	2.249	0.6937			07-8444-5322	06-2499-4329	
2			22	13:25	14.68	4.501	1.388			02-1152-2212	04-4145-0874	
3		Feb	4	16:30	15.01	4.828	1.489			19-9078-6483	06-3219-7963	
4			5	13:10	7.132	-3.048	-0.9401			06-6849-2235	20-3119-3253	
5			25	14:15	15	4.82	1.487			09-2101-6353	13-1093-9538	
6		Mar	17	14:20	7.489	-2.691	-0.8301			14-6169-3689	12-6636-5212	
7		Apr	6	17:15	6.609	-3.571	-1.101			02-0082-4673	11-5300-1558	
8			15	13:25	11.68	1.503	0.4636			16-4614-0901	19-2371-7781	
9			28	13:25	7.365	-2.815	-0.8683			06-8086-6028	17-1633-3832	
10		May	12	16:15	8.876	-1.304	-0.4021			12-3773-8150	04-4023-9067	
11		Jun	11	15:45	7.306	-2.874	-0.8866			20-6521-9403	18-5947 - 9043	
12		Jul	15	13:55	13.94	3.759	1.16			17-4780-3294	14-0926-7215	

	12-3773-8150	04-4023-9067
	20-6521-9403	18-5947-9043
	17-4780-3294	14-0926-7215
)	06-0741-6264	12-5816-3058
	00-9901-5729	02-7058-2757
	01-4440-0014	13-7910-6508
	21-4043-5119	01-1240-7098
	19-9833-0655	03-7616-5506
	04-0347-9113	01-0437-7711
	08-8652-5764	06-9681-8469
	09-8413-3498	17-5257-3346
	09-4043-4676	12-0840-2779

Analyst: JUL QA: HUILIA

Bivalve Larval Survival and Development Test Nautilus Environmental (CA) Test Type: Development-Survival Organism: Mytilus galloprovincialis (Bay Mussel Copper chloride Material: Protocol: EPA/600/R-95/136 (1995) Endpoint: Survival Rate Reference Toxicant-REF Source: **Bivalve Larval Survival and Development Test** 38 +39 34 32-EC50-µg/L Copper chloride 30 28 26 24 22 17 Mar-20-06 Apr-20--15 Apr-20— 28 Apr-20--02-IUC EZ 11 Aug-20-15 Sep-20-23 Oct-20-28 Oct-20-05 Feb-20-11 Jun-20--02-Inc OE 22 Sep-20-27 Nov-19 06 Aug-20-20 Oct-20--02-nsC 22 12 May-20-05 Dec-19 Dec-19-D8 Jan-2

Mean:	29.52	Count:	20	-2s Warning Limit:	25.11	-3s Action Limit:	22.9
Sigma:	2.207	CV:	7.48%	+2s Warning Limit:	33.94	+3s Action Limit:	36.14

Quality	Control	Data
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	•										
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2019	Nov	27	20:00	29.07	-0.4533	-0.2054			12-9914-0499	00-1104-7300
2		Dec	5	13:15	28.21	-1.306	-0.5916			04-7411-4445	20-5035-4724
3			11	13:35	29.18	-0.3407	-0.1544			10-8800-1613	02-9848 <b>-</b> 3585
4	2020	Jan	8	13:40	29.6	0.08106	0.03673			07-8444-5322	01-5655-1706
5			22	13:25	29.76	0.2356	0.1068			02-1152-2212	19-4150-8988
6		Feb	5	13:10	29.83	0.3063	0.1388			06-6849-2235	07-0404-6516
7		Mar	17	14:20	26.48	-3.038	-1.377			14-6169-3689	14-2151-4803
8		Apr	6	17:15	29.18	-0.3432	-0.1555			02-0082-4673	12-2147-8498
9			15	13:25	30	0.48	0.2175			16-4614-0901	00-5465-8677
10			28	13:25	29.9	0.376	0.1703			06-8086-6028	08-1083-2165
11		May	12	16:15	29.85	0.331	0.15			12-3773-8150	18-0143-0286
12		Jun	11	15:45	35.5	5.979	2.709	(+)		20-6521-9403	17-6494-5506
13		Jul	23	15:00	28.98	-0.5402	-0.2448			06-0741-6264	11-2012-0880
14			30	15:35	35.02	5.498	2.491	(+)		00-9901-5729	18-8992-7280
15		Aug	6	15:40	29.92	0.4032	0.1827			01-4440-0014	05-9348-7696
16		_	11	14:30	27.06	-2.461	-1.115			21-4043-5119	16-7506-8565
17		Sep	15	0:00	28.73	-0.7943	-0.3599			19-9833-0655	01-9900-7404
18			22	14:40	28.86	-0.6564	-0.2974			04-0347-9113	03-4439-9784
19		Oct	20	14:25	27.4	-2.124	-0.9624			08-8652-5764	01-6350-7777
20			23	13:45	27.94	-1.578	-0.7152			09-8413-3498	02-1232-2390
21			28	15:50	29.82	0.2995	0.1357			09-4043-4676	15-7574-6891

Analyst: JM QA: 1/1/16/20

## **CETIS Test Data Worksheet**

Report Date: Test Code:

### Bivalve Larval Survival and Development Test

Nautilus	Environmenta	al (CA)

tart Date: Ind Date: ample Date	30 C	Oct-20 Oct-20 Oct-20		Protocol:	Mytilus galloprovi EPA/600/R-95/13 Copper chloride	6 (1995)		Sample Code: 201028msdv Sample Source: Reference Toxicant Sample Station: Copper Chloride
C-µg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
			1			164	144	NM 11/13/20
			2			172	167	
			3			181	179	
			4			166	Ð	
			5			178	154	
			6			0	0	Cells lysed Cells lysed
			7			0	0	Cells lyset
			8			190	163	
			9			174	173	
			10			166	161	
. é			11			188	156	
			12			0	0	Cells lysec
			13			172	3	
			14			164	161	
			15			182	0	
· ·			16			186	185	
			17			183	177	
			18			177	169	
			19			188	183	
			20			163	0	
			21			166	0	
			22			163	6	
			23			0	0	Cells 14sed
	1		24			188	5	
	1		25			183	164	
			26			182	5	
			27			0	0	Cells lysed
			28			182	7	
			29			162	155	
			30			165	0	

Analyst: NM QA: ACII/16/20

## **CETIS Test Data Worksheet**

Report Date: Test Code:

27 Oct-20 11:37 (p 1 of 1) 09-4043-4676/201028msdv

Bivalve Larval Survival and Development Te
--------------------------------------------

Bivalve Larv	al Sur	vival a	and De	evelopment Test				· · ·	Nautilus Environmental (CA)	
Start Date: End Date: Sample Date	30 0	Dct-20 Dct-20 Dct-20		Protocol: E	lytilus galloprovi PA/600/R-95/13 opper chloride			Sample Code:201028msdvSample Source:Reference ToxicantSample Station:Copper Chloride		
C-µg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal		Notes	
0	LC	1	19							
0	LC	2	17			-				
0	LC	3	10			152	150	RT 10/3	0/20	
0	LC	4	18							
0	LC	5	14							
2.5		1	29							
2.5		2	9							
2.5		3	3			166	166	PT		
2.5		4	2				<del>_</del>			
2.5		5	16							
5		1	5							
5		2	8							
5		3	11			170	153	er		
5		4	1				•	•		
5		5	25							
10		1	24 .							
10		2	28							
10		3	26			179	13	AT		
10		4	22							
10		5	13							
20		1	20							
20		2	21							
20		3	15			176	0	ET .		
20		4	4							
20		5	30							
40		1	6							
40		2	12							
40		3	27			0	0	21		
40		4	23							
40		5	7							

QC : RT

Analyst: PT QA: AC11 11/20

## Marine Chronic Bioassay

DM-014

Client: Internal

Sample ID: CuCl₂

Test No.: 201028msdv

## Water Quality Measurements

Test Species:	M. galloprov	incialis
Start Date/Time:	10/28/2020	1550
End Date/Time:	10/30/2020	1500

Concentration		Salinity		Т	emperatu	re	Diss	solved Ox	ygen		рН	
(μg/L)		(ppt)			(°C)			(mg/L)			(pH units	
	0	24	48	0	24	48	0	24	48	0	24	48
Lab Control	32.2	31.9	31.7	14.6	14.5	15.4	8.7	8.6	8.3	8.04	801	8.04
2.5	32.4	32.0	32.1	14.4	14.3	15.1	8,9	8,8	8.4	8.06	803	8.05
5	325	32.0	32.1	14.3	14.3	15.1	8,9	88	8.4	8,09	8.03	8.06
10	32.4	32,1	32.1	14.5	14.6	153	8.8	86	83	8.10	8.05	8,07
20	32.4	32.1	32.1	14.4	145	15.Z	88	8.7	8.4	8.11	8.06	8.07
40	32.5	32.1	32.0	14.4	14.4	15.2	8,8	87	8.4	8.12	8:06	8.06
L		1		<u> </u>	·	<u> </u>		I		L	·	י ו
			0	24	48	1	High	conc. mad	de (µg/L):	4	0	4

		0	24	40	$\square$	
Technician Initials:	WQ Readings:	PT	RT	RT	Vol. Cu stock added (mL): 1.8	
	Dilutions made by:				Final Volume (mL): 500	
	*				Cu stock concentration (µg/L):	
Environmental Cham	ıber:	. 9.				
Comments:	0 hrs:					
	24 hrs:					
	48 hrs:					
QC Check:	ACS 11/3/2020				Final Review: ACU/16/20	
	· · · · · · · · · · · · · · · · · · ·					_

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

# Marine Chronic Bioassay DM-013

Client/Sample:	Internal/Cull2
Test No.:	201028 msdv
Test Species:	Mytilus galloprovincialis
Animal Source/Batc	h Tank: Tanlor / 58.5C
Date Received:	7/16/2020
Test Chambers:	30 mL glass shell vials
Sample Volume:	10 mL

### Larval Development Worksheet

Start Date/Time:	10/28/2020	1550	
End Date/Time:	10/30/2020	1500	<u> </u>
Technician Initials:	RT/EG	, <b>t</b>	

#### Spawn Information

First Gamete Release Time:

1055

Sex	Number Spawning
Male	9+
Female	5

Sex	Beaker Number(s)	Condition (sperm motility, egg density, color, shape, etc.)
Male	3,4,5,8	average density good notility
Female 1	2	good density, yellow, mostly round
Female 2	4	average density, pay yellow, nostly round
Female 3	-	

Egg Fertilization Time: 1215

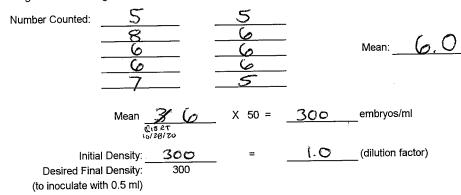
Stock(s) chosen for testing: _____

#### Embryo Stock Selection

Stock Number	% of embryos at 2-cell division stage
Female 1	99
Female 2	99
Female 3	-

### Embryo Inoculum Preparation

Target count on Sedgwick-Rafter slide for desired density is 6 embryos



Prepare the embryo inoculum according to the calculated dilution factor. For example, if the dilution factor is 2.25, use 100 ml of existing stock (1 part) and 125 ml of dilution water (1.25 parts).

Time Ze	ro Control Cou	ints		
TØ Vial No.	No. Dividing	Total	% Dividing	Mean % Dividing
TØA	151	152	99,3%	
ТØВ	188	189	99.5%	
тøс	197	197	(00.0%	994
TØD	169	170	99.4%	
TØ E	160	162	98.8%	
TØ F	160	101	99.47.	
<u>x</u> =	171			

48-h QC: 166 170 = 97.6%

Comments:

QC Check:

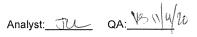
Ars 11/3/2020

Enthalpy Analytical. 4340 Vandever Avenue. San Diego, CA 92120.

Final Review: <u>AC11/16/26</u>

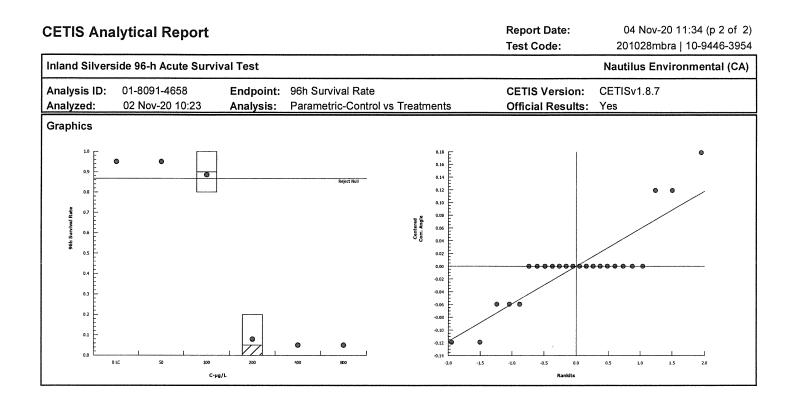
Inland Silverside Acute Survival Test

CETIS Sun	nmary Repo	rt			Report D Test Cod		04 Nov-20 11:34 (p 1 of 1) 201028mbra   10-9446-3954									
Inland Silvers	ide 96-h Acute S	Survival Te	est							Nautilus	s Environm	ental (CA)				
Batch ID: Start Date: Ending Date: Duration:	20-5415-1393 28 Oct-20 16:38 01 Nov-20 15:4 95h	5 Pro 0 Spo	st Type: otocol: ecies: urce:	Survival (96h) EPA/821/R-02- Menidia beryllir Aquatic Indicate	na			Analyst: Diluent: Brine: Age:		uted Natural Seawater t Applicable d						
Sample ID: Sample Date: Receive Date: Sample Age:	: 28 Oct-20	8 Oct-20Material:8 Oct-20Source:7hStation:			ial: Copper chloride ce: Reference Toxicant					rnal						
Comparison Summary																
Analysis ID	Endpoint		NOEL		TOEL	PMSD	TU		thod							
01-8091-4658	96h Survival Ra	te	100	200	141.4	13.3%		Du	nnett N	Iultiple Com	parison Tes	t				
Point Estimat	e Summary															
Analysis ID	Endpoint		Level	µg/L	95% LCL	95% UCL	TU	Me	thod	hod						
10-4215-8111	96h Survival Ra	ite	EC50	0 136.6 121.8 153.2				Sp	earmai	n-Kärber						
Test Acceptat	oility															
Analysis ID	Endpoint		Attrib	ute	Test Stat	TAC Limi	Ov	erlap	Decision							
01-8091-4658	96h Survival Ra	te	Contro	ol Resp	1	0.9 - NL		Ye	s	Passes Acceptability Criteria						
10-4215-8111	96h Survival Ra	te	Contro	ol Resp	1	0.9 - NL		Ye	s	Passes Acceptability Criteria						
96h Survival I	Rate Summary															
C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Мах	ste	d Err	Std Dev	CV%	%Effect				
0	Lab Control	4	1	1	1	1	1	0		0	0.0%	0.0%				
50		4	1	1	1	1	1	0		0	0.0%	0.0%				
100		4	0.9	0.7163	1	0.8	1		)5774	0.1155	12.83%	10.0%				
200		4	0.05	0	0.2091	0	0.2	0.0	)5	0.1	200.0%	95.0%				
400 800		4 4	0 0	0 0	0 0	0 0	0 0	0 0		0 0		100.0% 100.0%				
96h Survival I	Data Datail	4	0	0	0	0		0		0		100.078				
		Pop 4	Don 1	Don 2	Bon 4											
С-µg/L 0	Control Type	Rep 1	Rep 2	Rep 3	Rep 4		******									
50		1	1	1	1											
100		1	0.8	0.8	1											
200		0	0.0	0	0.2											
400		0	0													
800		0	0	0	0											
L		-		-	-											



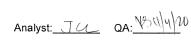
Inland Silverside 96-h Acute Survival Test       Nautilus E         Analysis ID:       01-8091-4658       Endpoint:       96h Survival Rate       CETIS Version:       CETIS V1.8.7         Analyzed:       02 Nov-20 10:23       Analysis:       Parametric-Control vs Treatments       Official Results:       Yes	Report Date:         04 Nov-20 11:34 (p 1 o           Test Code:         201028mbra   10-9446-3							
	Invironm	ental (CA)						
	7							
Data Transform Zeta Alt Hyp Trials Seed PMSD NOEL LOEL T	TOEL	TU						
	141.4							
Dunnett Multiple Comparison Test								
Control vs C-μg/L Test Stat Critical MSD DF P-Value P-Type Decision(α:5%)								
Lab Control 50 0 2.287 0.147 6 0.7500 CDF Non-Significant Effect								
100 1.852 2.287 0.147 6 0.1028 CDF Non-Significant Effect								
200* 16.49 2.287 0.147 6 <0.0001 CDF Significant Effect								
ANOVA Table								
Source Sum Squares Mean Square DF F Stat P-Value Decision(α:5%)								
Between 3.162353 1.054118 3 127.5 <0.0001 Significant Effect								
Error 0.09923882 0.008269902 12								
Total 3.261592 15								
Distributional Tests								
Attribute Test Test Stat Critical P-Value Decision(α:1%)								
Variances Mod Levene Equality of Variance 3.667 5.953 0.0439 Equal Variances								
Variances Levene Equality of Variance 17 5.953 0.0001 Unequal Variances	•							
Distribution Shapiro-Wilk W Normality 0.8711 0.8408 0.0283 Normal Distribution								
96h Survival Rate Summary								
on our manage our many	-							
	CV%	%Effect						
C-µg/L Control Type Count Mean 95% LCL 95% UCL Median Min Max Std Err C	0.0%	%Effect 0.0%						
C-µg/LControl TypeCountMean95% LCL95% UCLMedianMinMaxStd ErrC0Lab Control41111100								
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0	0.0%	0.0%						
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1	0.0% 0.0%	0.0% 0.0%						
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1	0.0% 0.0% 12.83%	0.0% 0.0% 10.0%						
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1           200         4         0.05         0         0.2091         0         0         0.2         0.05         2	0.0% 0.0% 12.83%	0.0% 0.0% 10.0% 95.0%						
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1           200         4         0.05         0         0.2091         0         0         0.2         0.05         2           400         0         0         0         0         0         0         0         0	0.0% 0.0% 12.83%	0.0% 0.0% 10.0% 95.0% 100.0%						
C-µg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1           200         4         0.05         0         0.2091         0         0.2         0.05         2           400         4         0.0         0         0         0         0         0         0         2         0.05         2           400         4         0.0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0 <t< td=""><td>0.0% 0.0% 12.83%</td><td>0.0% 0.0% 10.0% 95.0% 100.0%</td></t<>	0.0% 0.0% 12.83%	0.0% 0.0% 10.0% 95.0% 100.0%						
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1           200         4         0.05         0         0.2091         0         0.2         0.05         2           400         4         0.0         0         0         0         0         0         0         2         0.05         2           400         4         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0 <td< td=""><td>0.0% 0.0% 12.83% 200.0%</td><td>0.0% 0.0% 10.0% 95.0% 100.0%</td></td<>	0.0% 0.0% 12.83% 200.0%	0.0% 0.0% 10.0% 95.0% 100.0%						
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1           200         4         0.05         0         0.2091         0         0.2         0.05         2           400         4         0         0         0         0         0         0         0         2         0.05         2           400         4         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	0.0% 0.0% 12.83% 200.0%	0.0% 0.0% 10.0% 95.0% 100.0% 100.0%						
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1           200         4         0.95         0         0.2091         0         0.2         0.055         2           400         4         0.05         0         0.2091         0         0         0.2         0.05         2           400         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	0.0% 0.0% 12.83% 200.0% CV% 0.0%	0.0% 0.0% 10.0% 95.0% 100.0% 100.0% %Effect 0.0%						
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1           200         4         0.05         0         0.2091         0         0         0.22         0.05         2           400         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0 <td>0.0% 0.0% 12.83% 200.0% CV% 0.0% 0.0%</td> <td>0.0% 0.0% 10.0% 95.0% 100.0% 100.0% <b>%Effect</b> 0.0% 0.0% 8.85% 78.81%</td>	0.0% 0.0% 12.83% 200.0% CV% 0.0% 0.0%	0.0% 0.0% 10.0% 95.0% 100.0% 100.0% <b>%Effect</b> 0.0% 0.0% 8.85% 78.81%						
C-μg/L         Control Type         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         C           0         Lab Control         4         1         1         1         1         1         0         0           50         4         1         1         1         1         1         0         0           100         4         0.9         0.7163         1         0.9         0.8         1         0.05774         1           200         4         0.05         0         0.2091         0         0         0.22         0.05         2           400         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0 <td>0.0% 0.0% 12.83% 200.0% 200.0% 0.0% 0.0% 11.21%</td> <td>0.0% 0.0% 10.0% 95.0% 100.0% 100.0% <b>%Effect</b> 0.0% 0.0% 8.85%</td>	0.0% 0.0% 12.83% 200.0% 200.0% 0.0% 0.0% 11.21%	0.0% 0.0% 10.0% 95.0% 100.0% 100.0% <b>%Effect</b> 0.0% 0.0% 8.85%						

Analyst: Ja QA: 1/2 1/4/20



	Analytical Re	port					-	ort Date: Code:	04 Nov-20 11:34 (p 1 of 201028mbra   10-9446-39				
Inland Sil	verside 96-h Acut	e Survival Te	est						Nautilu	s Enviro	nmental (CA)		
Analysis Analyzed			•	6h Survival f ntrimmed Sj	Rate pearman-Kär		S Version: ial Results:	CETISv1 Yes	.8.7				
Spearma	n-Kärber Estimate	S											
Threshold	d Option	Threshold	Trim Mu		Sigma		EC50	95% LCL	95% UCL				
Control Th	reshold	0	0.00% 2.135		0.02496		136.6	121.8	153.2				
96h Survi	val Rate Summar	у			Calcu	lated Varia	te(A/B)						
C-µg/L Control Type		Count	Mean	Min	Max Std Err		Std Dev	CV%	%Effect	A	в		
0	Lab Control	4	1	1	1	0	0	0.0%	0.0%	20	20		
50		4	1	1	1	0	0	0.0%	0.0%	20	20		
100		4	0.9	0.8	1	0.05774	0.1155	12.83%	10.0%	18	20		
200		4	0.05	0	0.2	0.05	0.1	200.0%	95.0%	1	20		
400		4	0	0	0	0	0		100.0%	0	20		
800		4	0	0	0	0	0		100.0%	0	20		
Graphics													
0.0	0 100 200	300 400	500 600	700 800									
		C-µg/L											





nland Silve	erside 96-h Acute Survival Te	st				Nautilus Environmer	ntal (CA
	Survival (96h) EPA/821/R-02-012 (2002)		Menidia beryllina 96h Survival Rate	(Inland Silverside)	Material: Source:	Copper chloride Reference Toxicant-REF	
		In	land Silverside 96-h Acut	e Survival Test			
	400.0						
	342.9-					+35	
	285.7-		<b>R</b>			+25	
iper chloride	228.6-						
EC50-µg/L Copper chloride	171.4					Mean	
ŭ	114.3					-25	
	57.1					-35	
	21 Feb-18 22 Feb-18 22 Feb-18 07 Mar-18 28 Mar-18 28 Mar-18 28 Mar-18	17 17-11-12-12-12-12-12-12-12-12-12-12-12-12-	21 Feb-19	04 Jun-19	11 Dec-19	06 Aug-20 12 Aug-20 23 Sep-20 17 Sep-20 28 Oct-20	
	21 F 22 F 28 M 14 J	17. 22 A	21 12 23 24 10 10 10 10 10 10 10 10 10 10 10 10 10	04.) 01.]	11 D 27 F	06 Aug- 12 Aug- 02 Sep- 17 Sep- 28 Oct-	

Mean: Sigma:	185.7 46.61	Count: CV:	-2s Warning Limit: +2s Warning Limit:	-3s Action Limit: +3s Action Limit:	
Quality Control Data					**************************************

Deter	<b>V</b>		<b>D</b>	<b>-</b>		<b>D</b>	<u>.</u> .			-	
Point		Month	Day	lime	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2018	Feb	21	12:25	187.2	1.478	0.03171			20-0148-6736	18-8740-2809
2			22	17:20	266.7	81.01	1.738			21-2244-9573	15-2512-9013
3		Mar	7	16:25	189.3	3.65	0.0783			06-3891-7579	03-5981-6406
4			28	17:15	141.4	-44.28	-0.95			18-3798-9831	05-5342-2351
5		Jun	14	14:35	200	14.3	0.3068			01-9952-0614	00-3575-1747
6		Jul	17	14:30	214.4	28.65	0.6148			11-1445-3115	12-3693-5336
7		Aug	22	16:25	237.8	52.14	1.119			08-6172-7555	12-4329-0617
8	2019	Jan	3	16:50	207.9	22.15	0.4753			16-0506-4055	11-1190-1934
9		Feb	21	16:05	143.5	-42.22	-0.9058			10-4228-2556	08-7111-9529
10			27	16:25	135.8	-49.93	-1.071			14-0947-0420	00-4247-8099
11		May	9	19:10	263.9	78.2	1.678			03-9779-6453	09-3747-7536
12		Jun	4	14:50	177.8	-7.945	-0.1705			00-2136-1210	01-4264-5145
13		Jul	1	15:55	223.6	37.92	0.8135			04-4319-5710	17-4098-1084
14		Oct	30	14:45	114.9	-70.83	-1.52			05-0159-0485	07-6888-5964
15		Dec	11	16:30	156.9	-28.78	-0.6175			11-0566-6524	14-4935-0865
16	2020	Feb	27	17:15	136.4	-49.34	-1.059			00-2639-4829	10-5059-8408
17		Aug	6	16:00	254.9	69.21	1.485			13-3377-6823	09-5433-0150
18			12	15:20	148.4	-37.34	-0.8012			02-5307-3356	11-5066-6205
19		Sep	2	15:25	141.4	-44.28	-0.95			09-8373-9144	18-7650-2455
20			17	14:45	172	-13.74	-0.2948			07-8442-4358	02-9347-5784
21		Oct	28	16:35	136.6	-49.1	-1.053			10-9446-3954	10-4215-8111

Analyst: JM QA: 15 11 4 28

## Marine Acute Bioassay Static-Renewal Conditions

## Water Quality Measurements & Test Organism Survival

Client:	Intern	al	Test Sp	ecies: M. beryllina				Те	ch Initi	als	
Sample ID:	CuCl ₂		Start Date/	Time: 10/28/2020	1635		0	24	48	72	96
Test No.:	20102	28mbra	End Date/	Time: 11/1/2020	1540	Counts:	üf	PT	4R	DM	As
						Readings:	10 -	PT	RT	PA	KL
		1				Dilutions made by:	NS		P7		
						High conc. made (µg/L):	800		200		
						Vol. Cu stock added (mL):	15.0		3,8		
			Cu stock concentr	ration (μg/L): <u>07</u>	000	Final Volume (mL):	2000		2000		
				/							
Companyation in a	Dend	Number of Live	Salinity	Temperatur	e	Dissolved Oxygen			рН		

Concentration (µg/L)	Rand #			ber o ganis	f Live ms	•		1	Salinit (ppt)				Ter	npera (°C)	ture			Disso	lved C (mg/L		n	pH (units)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Lab Control	4	5	5	3	5	5	30,1	303	244	10.4	31.0	24.0	24.3	24.1	72 24. Z	24.4	7.3	5.8	6.8	5.2	4.3	8.04	7.83	1 50Z	777	7.72
	10	5	5	5	5	S			30.7					24.S					5.0		E			1.7A		
	5	5	5	5	5	5.																				
	9	5	5	5	5	5																				
50	23	5	S	5	5	5	29.9	30.2	24.2	30.5	30.9	24.9	24.2	24.1	24,5	24.4	7.1	5.9	68	5.2	4.3	9.04	7.63	1 8.04	777	7.7
	18	5	5	5	5	S			r 30.8					247					5.0					279		
	3	5	5	5	5	5																				
	6	5	5	5	5	5								5 .												
100	19	5	5	$\leq$	5	5	29,8	30.0	29.3	30.0	30.1	25,3	Z4.6	24.2	24,7-	24.7	7.2	5.5	6.9	5.0	4.4	8.03	7.90	8.05	775	7.71
	14	5	4	4	Ч	4			30.0					25.1					4.8				1	7.70		
	2	5	4	4	4	4																				
	17	5	5	S	5	\$																				
200	20	5	2	0	Ebrower	-	29,9	30.1	29.3	30.1	30.7	25 <i>.</i> S	24.4	24.1	24.6	24,4	7.2	55	7.0	5.3	5.4	8.03	7.81	\$.04	788	7.90
	11	5	0	1000	-	-			30.7					24.7					4.9	8				1.87		
	7	5	0	-	1	-																				
	22	5	Tillinger	1	Ĵ	1	27.8																			
400	8	5	0			1	1	30. Z	i		-	24.2	24.3	i	-	-100	7.4	5.9	i 	-	-	8.03	7.92			-
	15	5	0						ſ					f					f					f		
	1	5	0																							
	21	5	0	/																						
800	13	5	0			1	29,7	Z9, <b>B</b>	-	-	-	24.6	24.8	i	-	1	7.2	5.9	i 			8.00	7.89	-		-
	16	5	0						f					f			12		f 🦟					-		
	24	5	0																							
	12	5	0	1																						
Rand # QC: Initial Counts QC'd by Initiated by	1 1	$\sqrt{1}$	ĪH	<b>A</b>				(h) ( d i la far an i an	Er	viron	menta	l Cha	mber:	Ä	linnacented	<u>kan kana kana kana kana kana kana kana </u>			5	hoori one con			<b>L</b>		nin (initialian)	
Animal Source/Date F		d.	-	An	in	àr	Ind	ica							7			-					Fee	ding Ti	mes	
Animal Source/Date F				10	127	120	<u>9 10</u>	ila	ICI.			at Initi										0	24	48	72	96
Animal Acclimation G	ualifier	s (cir	rcle al	l that	apply	y):				G	22 /	Q23	1 (	224		ne										
Comments:		i = initial reading in fresh test solution f = final reading in test chamber prior to renowed (a) (b) (d) A (c) (b) (d) a number of (c)													0010											
	~	i = initial reading in fresh test solution, f = final reading in test chamber prior to renewal (a) Q1 4 ts  0/24/1070 PM: [720] Organisms fed prior to initiation, circle one (y) (n) Q21 crganisms experienced (B) B/H II  1/20 CG (B) H(S II /1/2020 73PPT shift and 73°C G/H II /1/2020 Shift during the Final Review: V5 N/4/20 andever Avenue. San Diego, CA 92120. First 24 hrs. of a(Climation, G2 10   28   20																								
	(2	101	1841	,11)1	120		G	DGH8	AT S	11/1/20	20		>3	PPT	sh	ift	an	d 7	30	C			1	١.		
QC Check:	<u>Ar s</u>	Let	11/1	201	0								Shi	FtC	luri	ina	th	10	Fir	nal Re	view:	V	2 101	yric	)	
Enthalpy Analytical. 43	40 Vano	lever	Aveni	ue. Sa	an Die	go, C	4 9212	0.					fir	75 Clin	24 Nat	hr	\$. ( \. c	=f il 10	0/20	2/2	2					