

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: July 11, 2018

TEST DATE: July 12, 2018

TEST NUMBER: 1807072B.C

TEST MATERIAL: Station DOM-RW-DC01

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

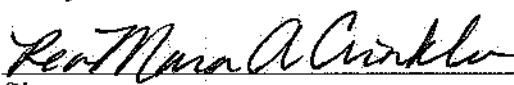
REFERENCE TOXICANT TEST: 1807RT2A.C

RESULT:

Survival
Reproduction

Pass, 0% effect
Pass, -6.79% effect

Rea Mara A Crinklaw

Analyst


Signature

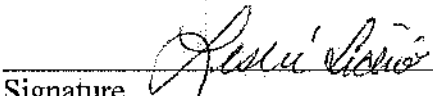
Water Biologist III

Title

9/13/18

Date

Leslie Sidio

Supervisor


Signature

Laboratory Manager I

Title

9/24/18

Date

CETIS Summary Report

Report Date: 13 Sep-18 15:28 (p 1 of 1)
Test Code: 1807072B.C | 20-8480-0093

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Batch ID: 20-0601-9976	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 12 Jul-18 15:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water									
Ending Date: 19 Jul-18 13:58	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 23h	Source: In-House Culture	Age: 1-9h	7/12/18/0655-1250								
Sample ID: 14-2286-4498	Code: 2903107	Client: Watershed Protection Division									
Sample Date: 11 Jul-18 08:45	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 11 Jul-18 13:33	Source: Stormwater (STORMWATER)										
Sample Age: 31h (19.8 °C)	Station: DOM-RW-DC01										
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	2903107	11 Jul-18 08:45	11 Jul-18 13:33	13 Jul-18 13:05	19.8						
2	2903107	11 Jul-18 08:45	11 Jul-18 13:33	14 Jul-18 13:55	19.8						
3	2903107	11 Jul-18 08:45	11 Jul-18 13:33	15 Jul-18 14:35	19.8						
4	2903107	11 Jul-18 08:45	11 Jul-18 13:33	16 Jul-18 12:38	19.8						
5	2903107	11 Jul-18 08:45	11 Jul-18 13:33	17 Jul-18 10:50	19.8						
6	2903107	11 Jul-18 08:45	11 Jul-18 13:33	18 Jul-18 09:35	19.8						
Batch Note: Batch: 1086; HBN: 58860											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
03-2356-0430	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
18-7934-9106	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
03-2356-0430	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
18-7934-9106	Reproduction	Control Resp	36.8	15 - NL	Yes	Passes Acceptability Criteria					
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	36.8	35.52	38.08	33	43	1.083	3.425	9.31%	0.0%
100		10	39.3	37.62	40.98	30	45	1.422	4.498	11.45%	-6.79%
7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1
Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	33	39	34	35	34	42	43	36	36	36
100		38	44	40	39	45	37	30	36	44	40

CETIS Analytical Report

Report Date: 13 Sep-18 15:28 (p 1 of 4)
Test Code: 1807072B.C | 20-8480-0093

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID: 18-7934-9106		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 13 Sep-18 12:51		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 20-0601-9976		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 12 Jul-18 15:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 19 Jul-18 13:58		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 23h		Source: In-House Culture		Age: 1-9h		7/12/18 (0655-1250)					
Sample ID: 14-2286-4498		Code: 2903107		Client: Watershed Protection Division							
Sample Date: 11 Jul-18 08:45		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 11 Jul-18 13:33		Source: Stormwater (STORMWATER)									
Sample Age: 31h (19.8 °C)		Station: DOM-RW-DC01									
Batch Note: Batch: 1086; HBN: 58860											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Untransformed	0	C*b > T	Not Run	0.75	Sample passes reproduction endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	7.142	0.8681	14		<0.0001	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	36.8	15 - NL	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.39	2.708	0.1965	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	31.25	31.25	1	1.955	0.1790	Non-Significant Effect					
Error	287.7	15.98333	18								
Total	318.95	47.23333	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.724	6.541	0.4294	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9363	0.866	0.2038	Normal Distribution						
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	36.8	35.5	38.1	33	43	1.083	3.425	9.31%	0.0%
100		10	39.3	37.59	41.01	30	45	1.422	4.498	11.45%	-6.79%

Rc

JS

CETIS Analytical Report

Report Date: 13 Sep-18 15:28 (p 2 of 4)
Test Code: 1807072B.C | 20-8480-0093

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 18-7934-9106
Analyzed: 13 Sep-18 12:51

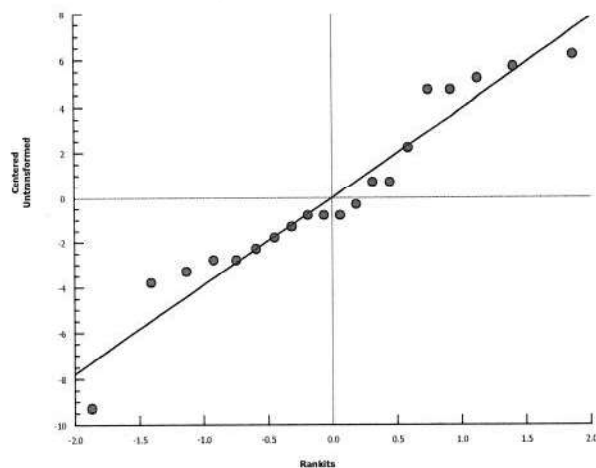
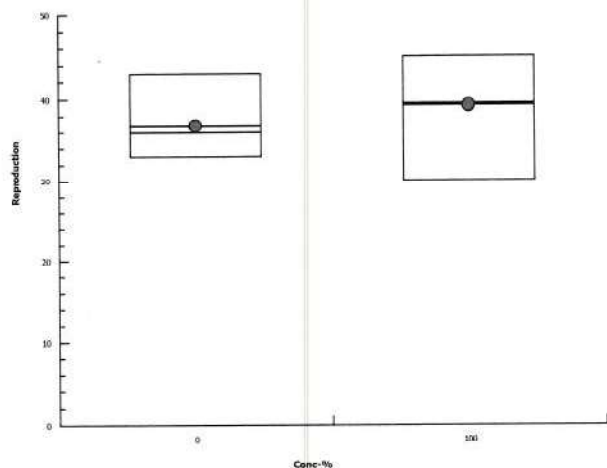
Endpoint: Reproduction
Analysis: Parametric Bioequivalence-Two Sample

CETIS Version: CETISv1.8.1
Official Results: Yes

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	33	39	34	35	34	42	43	36	36	36
100		38	44	40	39	45	37	30	36	44	40

Graphics



CETIS Analytical Report

Report Date: 13 Sep-18 15:28 (p 3 of 4)
 Test Code: 1807072B.C | 20-8480-0093

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 03-2356-0430		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 13 Sep-18 12:50		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 20-0601-9976		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 12 Jul-18 15:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 19 Jul-18 13:58		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 23h		Source: In-House Culture		Age: 1-9h		7/12/18/0655-1250					
Sample ID: 14-2286-4498		Code: 2903107		Client: Watershed Protection Division							
Sample Date: 11 Jul-18 08:45		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 11 Jul-18 13:33		Source: Stormwater (STORMWATER)									
Sample Age: 31h (19.8 °C)		Station: DOM-RW-DC01									
Batch Note: Batch: 1086; HBN: 58860											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Angular (Corrected)	0	C*b > T	Not Run	0.75	Sample passes 7d survival rate endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	0.2618				<0.2	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	65540	<0.0001	Significant Effect					
Error	0	0	18								
Total	0	0	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Mod Levene Equality of Variance	65540	8.285	<0.0001	Unequal Variances						
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%
100		10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%

RC

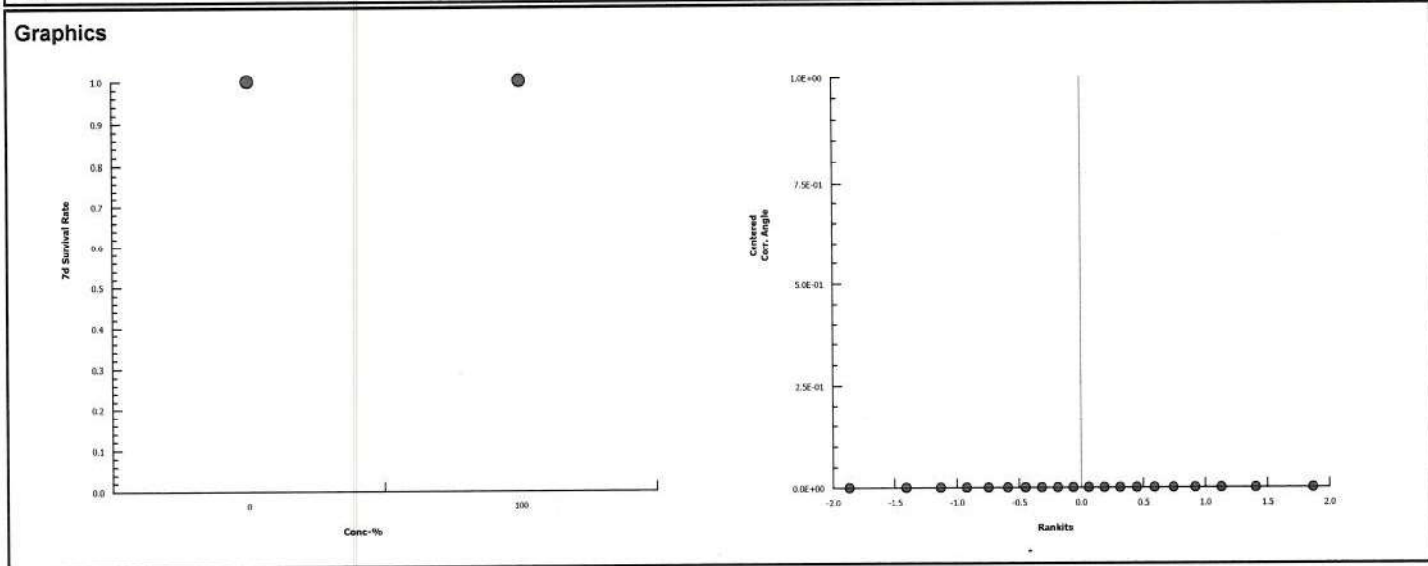
JF

CETIS Analytical Report

Report Date: 13 Sep-18 15:28 (p 4 of 4)
Test Code: 1807072B.C | 20-8480-0093

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 03-2356-0430		Endpoint: 7d Survival Rate				CETIS Version: CETISv1.8.1					
Analyzed: 13 Sep-18 12:50		Analysis: Parametric Bioequivalence-Two Sample				Official Results: Yes					

7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1



CETIS Test Data Worksheet

DOM

Report Date: 05 Jul-18 17:14 (p 1 of 1)
Test Code: 20-8480-0093/1807072B.C

Ceriodaphnia 7-d Survival and Reproduction Test Hyperion Treatment Plant Laboratory

Start Date: 12 Jul-18 <i>1325</i>	Species: Ceriodaphnia dubia	Sample Code: 54CF3072
End Date: 19 Jul-18 <i>1358</i>	Protocol: EPA/821/R-02-013 (2002)	Sample Source: Stormwater
Sample Date: 11 Jul-18	Material: Stormwater Monitoring Sample	Sample Station: DOM-RW-DC01

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1		1	0	0	0	5	11	0	17	33	
0	D	2		1	0	0	0	6	13	0	20	39	
0	D	3		1	0	0	0	5	12	0	17	34	
0	D	4		1	0	0	0	4	0	12	19	35	
0	D	5		1	0	0	0	5	13	0	16	34	
0	D	6		1	0	0	0	6	13	0	23	42	
0	D	7		1	0	0	0	6	15	0	22	43	
0	D	8		1	0	0	0	6	0	12	18	36	
0	D	9		1	0	0	0	5	13	0	18	36	
0	D	10		1	0	0	0	5	12	0	19	36	
100		1	19	1	0	0	0	6	12	0	20	38	
100		2	18	1	0	0	0	5	15	0	24	44	
100		3	10	1	0	0	0	5	13	0	22	40	
100		4	8	1	0	0	0	5	13	0	21	39	
100		5	13	1	0	0	0	5	0	18	21	45	
100		6	4	1	0	0	0	⑥ 4	0	11	20	37	
100		7	30	1	0	0	0	4	10	0	16	30	
100		8	3	1	0	0	0	6	12	0	18	36	
100		9	24	1	0	0	0	6	14	24	0	44	
100		10	17	1	0	0	0	6	13	0	21	40	

Date:	7/12	7/13	7/14	7/15	7/16	7/17	7/18	7/19
Feed:	1345 RE	1247 RE	1345 RE	1424 RE	1150 RE	1000 RE	820 RE	End @ 13:58 RE
Transfer:	1525 RE	1305 RE	1355 RE	1435 RE	1238 RE	1050 RE	935 RE	

CETIS Measurement Worksheet



Report Date: 05 Jul-18 17:14 (p 1 of 2)
Test Code: 1807072B.C | 20-8480-0093

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 12 Jul-18 Species: Ceriodaphnia dubia
End Date: 19 Jul-18 Protocol: EPA/821/R-02-013 (2002)
Sample Date: 11 Jul-18 Material: Stormwater Monitoring Sample

Sample Code: 54CF3072
Sample Source: Stormwater
Sample Station: DOM-RW-DC01

Alkalinity (CaCO₃)-mg/L

Conc.-%	Code	Reading 1
0	D	AE
100		158 - see attached worksheets.
Measure Time:		
Instrument ID:		
Analyst:		

Conductivity-µmhos

Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	347	351	353	324	324	349	353
100		1261	1284	1307	1278	1300	1302	1266
Measure Time:		1200	1220	1340	1345	1115	940	845
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		RC	RC	RC	RC	RC	RC	RC

Final Dissolved Oxygen-mg/L

Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.08	8.12	8.03	8.05	8.07	8.36	8.29
100		7.93	8.21	8.12	7.87	8.49	8.29	8.19
Measure Time:		1427	1400	1570	1545	1345	1300	1517
Instrument ID:		#1	#1	#1	#1	#1	#1	#1
Analyst:		RC	RC	RC	RC	RC	RC	RC

Initial Dissolved Oxygen-mg/L

Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.54	8.22	8.18	8.01	8.12	8.14	8.22
100		8.91	8.49	8.86	9.27	8.89	9.39	10.14
Measure Time:		1200	1220	1340	1345	1115	940	845
Instrument ID:		#1	#1	#1	#1	#1	#1	#1
Analyst:		RC	RC	RC	RC	RC	RC	RC

Hardness (CaCO₃)-mg/L

Conc.-%	Code	Reading 1
0	D	AE
100		376 - see attached worksheets.
Measure Time:		
Instrument ID:		
Analyst:		

Final pH

Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.84	7.82	7.76	7.82	7.62	7.73	8.06
100		7.86	7.88	8.07	7.93	7.78	7.79	7.93
Measure Time:		1427	1400	1570	1545	1345	1300	1517
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		RC	RC	RC	RC	RC	RC	RC

CETIS Measurement Worksheet



Report Date: 05 Jul-18 17:14 (p 2 of 2)
Test Code: 1807072B.C | 20-8480-0093

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory
Start Date: 12 Jul-18		Species: Ceriodaphnia dubia			Sample Code: 54CF3072			
End Date: 19 Jul-18		Protocol: EPA/821/R-02-013 (2002)			Sample Source: Stormwater			
Sample Date: 11 Jul-18		Material: Stormwater Monitoring Sample			Sample Station: DOM-RW-DC01			
Initial pH								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	
0	D	7.87	8.03	7.68	6.84	7.80	7.92	
100		7.92	7.99	8.06	8.17	8.17	8.23	
Measure Time:		1200	1220	1340	1345	1115	940	
Instrument ID:		#2	#2	#2	#2	#2	#2	
Analyst:		RC	RC	RC	RC	RC	RC	
Final Temperature-°C								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	
0	D	24.9	24.7	24.5	25.1	24.9	25.0	
100		24.4	24.8	24.1	24.3	25.0	25.0	
Measure Time:		1427	1400	1570	1545	1345	1300	
Instrument ID:		#2	#2	#2	#2	#2	#2	
Analyst:		RC	RC	RC	RC	RC	RC	
Initial Temperature-°C								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	
0	D	25.2	24.9	24.9	25.1	24.8	25.1	
100		24.8	24.4	25.0	24.1	24.3	25.0	
Measure Time:		1200	1220	1340	1345	1115	940	
Instrument ID:		#2	#2	#2	#2	#2	#2	
Analyst:		RC	RC	RC	RC	RC	RC	

Alkalinity

Date/Time: 7/23/2018 1230Project: NPOESAnalyst: RODEUNE ESTIVATitrant: H₂SO₄Factor: 20

Sample	Sample Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO ₃ /L)
DW	50ml	6.2ml	124
[200 mg/L] CuRT	50ml	5.6ml	112
DCT 7/10/18	50ml	5.3ml	106
DCT 7/12/18	50ml	5.2ml	104
DCT 7/15/18	50ml	5.4ml	108
BC	50ml	9.0ml	180
DOM	50ml	7.9ml	158

Date/Time: 7/25/2018, 830

Project: NPDOS

Analyst: RODFINE ESTIVA

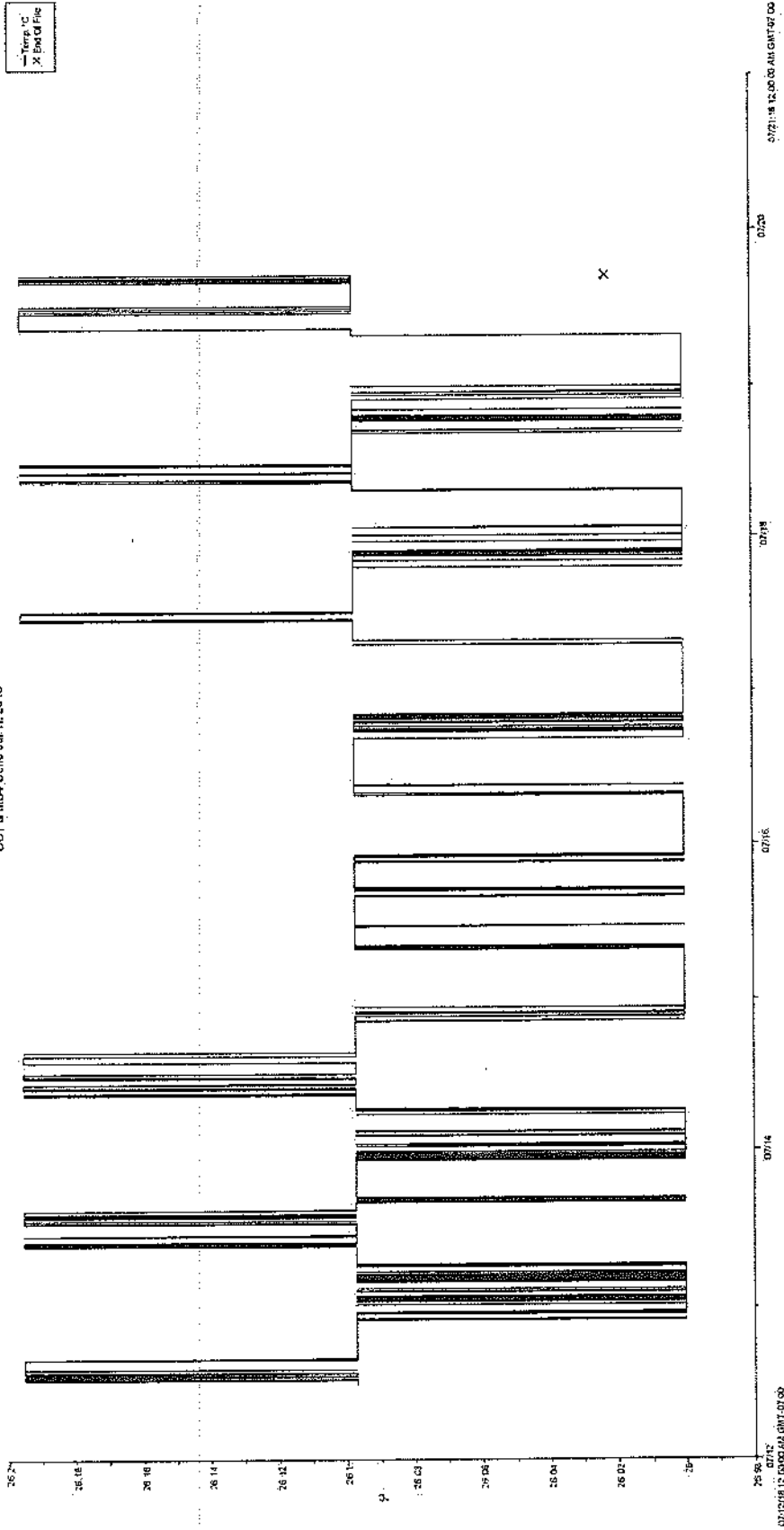
Titrant: EDTA

Factor: 20

[illegible]

DCT & MS4 Ceno Jul 12 2018

Temp °C
X End Of File



Caridodaphnia Chronic Toxicity Test

start: Thursday, July 12, 2018

end: Thursday, July 19, 2018

RT - ~~18~~^{RE 7/23} 1807RT2A,C

DCT eff - 1807062A,C

MS4 - 1807072A+B.C

*The temp chart recorder is broken and data is unavailable. RE 7/23/2018

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT

TOXICITY TESTING REPORT

SAMPLE DATE: July 12, 2018

TEST DATE: July 12, 2018

TEST NUMBER: 1807RT2A.C

TEST MATERIAL: Copper ($\text{CuCl}_2 \bullet 2\text{H}_2\text{O}$)

TEST SPECIES: *Ceriodaphnia dubia*

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

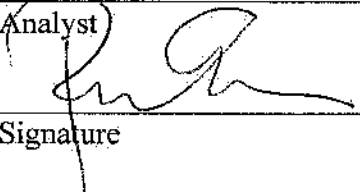
TEST TYPE: Chronic

RESULT:

NOEC = 50 $\mu\text{g/L}$ (Survival)
 EC_{50} = 70.8 $\mu\text{g/L}$ (Survival)

NOEC = 50 $\mu\text{g/L}$ (Reproduction)
 IC_{25} = 55.8 $\mu\text{g/L}$ (Reproduction)

Rodeline Estiva

Analyst



Signature

Water Biologist II

Title
July 23, 2018

Date

Rea Crinklaw

Supervisor


Signature

Water Biologist III

Title
8/6/18

Date

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

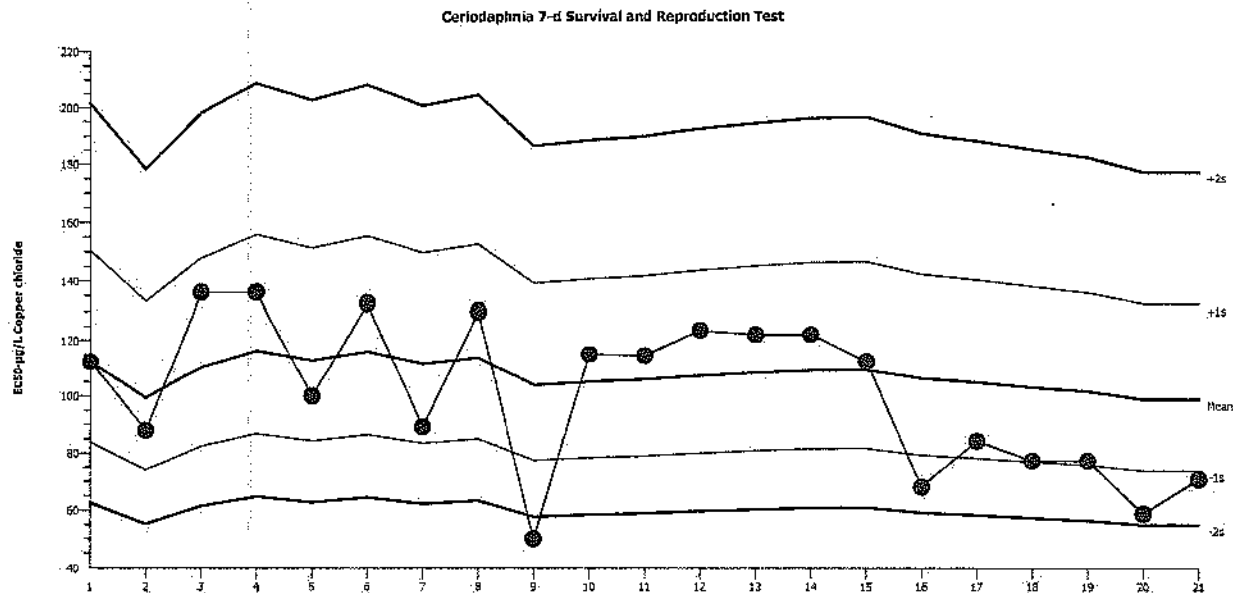
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

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

Endpoint: 7d Survival Rate

Source: Reference Toxicant-REF



Mean: 98.69

Count: 20

-1s Warning Limit: 73.63

-2s Action Limit: 54.96

Sigma: N/A

CV: 34.00%

+1s Warning Limit: 132.2

+2s Action Limit: 177.1

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	May	10	112.3	13.58	0.4409			04-6904-8294	00-0571-6326
2			25	87.85	-10.84	-0.3977			16-2272-5797	20-6787-6120
3		Jun	6	136.1	37.45	1.1	(+)		00-1105-6011	07-1957-9297
4			22	136.1	37.45	1.1	(+)		10-7002-0112	10-9615-6318
5		Jul	12	100	1.308	0.04503			13-9476-5989	08-1211-5310
6			27	132.6	33.89	1.009	(+)		00-3533-4104	07-3102-4627
7		Aug	9	89.13	-9.563	-0.3484			05-1646-5416	02-7143-5836
8			23	129.7	31.05	0.9351			18-0928-7994	14-9065-9379
9		Sep	6	50	-48.69	-2.325	(-)	(-)	04-1283-5528	07-2201-0667
10			20	114.9	16.21	0.52			09-2547-5700	02-6449-6736
11		Oct	18	114.5	15.77	0.5068			14-7896-4665	17-5474-2245
12		Nov	15	123.5	24.77	0.7857			09-2671-6353	07-5336-3496
13		Dec	13	121.9	23.25	0.7233			19-3949-3034	10-6518-1710
14	2018	Jan	4	121.9	23.25	0.7233			17-7500-8361	05-5922-1635
15		Feb	7	112.3	13.58	0.4409			04-8492-7543	17-6325-1645
16		Mar	2	68.1	-30.59	-1.269	(-)		11-4862-8707	06-1686-5917
17			15	84.14	-14.55	-0.5454			20-9677-0547	14-4393-4243
18		Apr	19	77.17	-21.52	-0.841			18-2737-1194	07-4972-9760
19		May	16	77.17	-21.52	-0.841			05-4955-8978	09-0510-7297
20		Jun	13	58.82	-39.88	-1.77	(-)		16-1570-3305	01-3881-0040
21		Jul	12	70.77	-27.92	-1.137	(-)		05-0138-0333	09-5921-7712

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

Organism: Ceriodaphnia dubia (Water Flea)

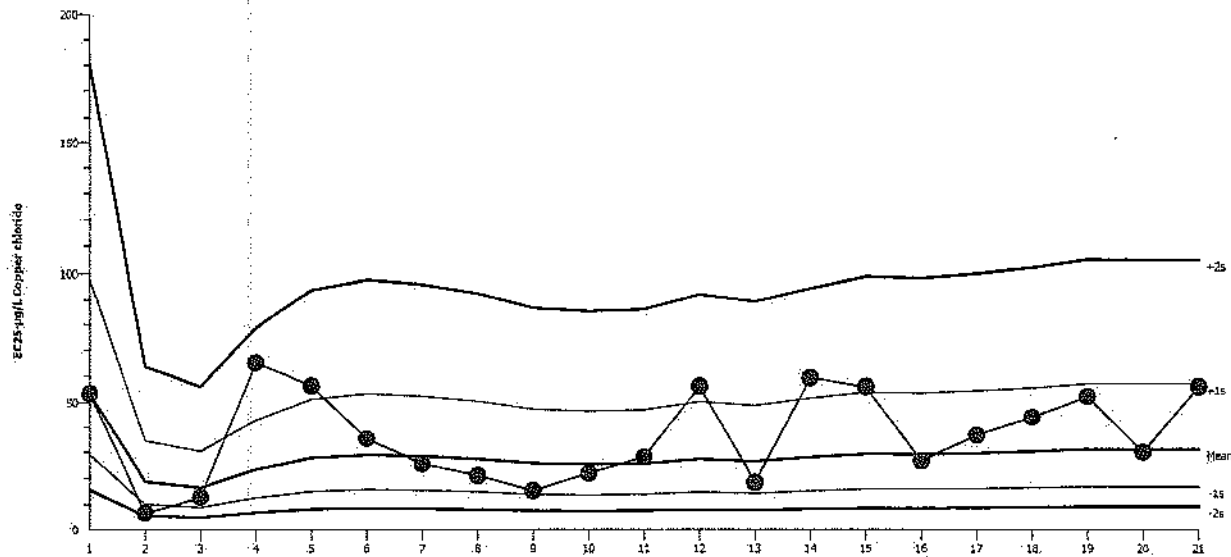
Material: Copper chloride

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

Endpoint: Reproduction

Source: Reference Toxicant-REF

Ceriodaphnia 7-d Survival and Reproduction Test



Mean: 30.97

Count: 20

-1s Warning Limit: 16.85

-2s Action Limit: 9.169

Sigma: N/A

CV: 83.70%

+1s Warning Limit: 56.89

+2s Action Limit: 104.5

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	May	10	53.41	-22.44	0.8959			04-6904-8294	08-3814-7144
2			25	6.656	-24.31	-2.527	(-)	(-)	16-2272-5797	04-1379-9830
3		Jun	6	12.78	-18.19	-1.455	(-)		00-1105-6011	17-2178-2673
4			22	65.16	34.19	1.223	(+)		10-7002-0112	00-8698-9715
5		Jul	12	56.24	25.27	0.9807			13-9476-5989	15-6562-8470
6			27	35.41	4.445	0.2204			00-3533-4104	15-5816-8081
7		Aug	9	25.45	-5.522	-0.3228			05-1646-5416	12-8828-7274
8			23	20.93	-10.04	-0.6438			18-0928-7994	01-4455-3838
9		Sep	6	15.28	-15.69	-1.162	(-)		04-1283-5528	07-4663-1403
10			20	21.83	-9.14	-0.5749			09-2547-5700	05-2225-6686
11		Oct	18	27.98	-2.991	-0.1669			14-7896-4665	10-2719-4408
12		Nov	15	55.96	25	0.9726			09-2671-6353	12-1707-6477
13		Dec	13	18.28	-12.69	-0.8663			19-3949-3034	15-1089-9957
14	2018	Jan	4	59.22	28.25	1.065	(+)		17-7500-8361	03-9405-5395
15		Feb	7	55.8	24.83	0.9677			04-8492-7543	19-3721-5481
16		Mar	2	26.44	-4.526	-0.2597			11-4862-8707	08-2696-1620
17			15	36.61	5.644	0.2752			20-9677-0547	09-0026-7515
18		Apr	19	43.76	12.79	0.5683			18-2737-1194	03-8342-1801
19		May	16	51.99	21.02	0.8514			05-4955-8978	05-0129-1380
20		Jun	13	29.96	-1.009	-0.05445			16-1570-3305	06-3152-2418
21		Jul	12	55.75	24.78	0.9663			05-0138-0333	18-3627-7518

CETIS Summary Report

Report Date: 23 Jul-18 10:50 (p 1 of 2)
Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Batch ID: 03-2168-1268	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 12 Jul-18 14:20	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 19 Jul-18 08:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age: <8 h. 7/12/18 (0715-1210)
Sample ID: 20-5762-1751	Code: 7AA4D0F7	Client: Donald C. Tillman WRP
Sample Date: 12 Jul-18 07:50	Material: Copper chloride	Project: NPDES
Receive Date: 12 Jul-18 07:50	Source: Reference Toxicant	
Sample Age: 6h	Station:	

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	Cu RT	12 Jul-18 07:50	12 Jul-18 07:50	13 Jul-18 14:08	
2	Cu RT	12 Jul-18 07:50	12 Jul-18 07:50	14 Jul-18 11:30	
3	Cu RT	12 Jul-18 07:50	12 Jul-18 07:50	15 Jul-18 14:52	
4	Cu RT	12 Jul-18 07:50	12 Jul-18 07:50	16 Jul-18 12:57	
5	Cu RT	12 Jul-18 07:50	12 Jul-18 07:50	17 Jul-18 10:35	
6	Cu RT	12 Jul-18 07:50	12 Jul-18 07:50	18 Jul-18 09:30	

Batch Note: Batch 1077 HBN 54108

Sample Note: Survival - ideal concentration-response relationship. Reproduction - interrupted concentration-response: non-significant effects bracketed by significant effects.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-6509-4346	7d Survival Rate	50	100	70.71	N/A		Fisher Exact/Bonferroni-Holm Test
13-8299-1709	Reproduction	50	100	70.71	23.9%		Steel Many-One Rank Test
12-2242-7780		50	100	70.71	16.7%		Wilcoxon/Bonferroni Adj Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
09-5921-7712	7d Survival Rate	EC5	51.77	51.77	51.77		Linear Interpolation (ICPIN)
		EC10	53.61	53.61	53.61		
		EC15	55.5	55.5	55.5		
		EC20	57.47	57.47	57.47		
		EC25	59.5	59.5	59.5		
		EC40	66.03	66.03	66.03		
		EC50	70.77	70.77	70.77		
18-3627-7518	Reproduction	IC5	3.131	1.281	51.01		Linear Interpolation (ICPIN)
		IC10	33.7	4.202	52.86		
		IC15	51.55	10.86	54.78		
		IC20	53.61	38.24	56.76		
		IC25	55.75	48.67	58.81		
		IC40	62.69	57.18	65.42		
		IC50	67.77	62.79	70.23		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
09-5921-7712	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
12-6509-4346	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
12-2242-7780	Reproduction	Control Resp	36.33	15 - NL	Yes	Passes Acceptability Criteria
13-8299-1709	Reproduction	Control Resp	32.7	15 - NL	Yes	Passes Acceptability Criteria
18-3627-7518	Reproduction	Control Resp	36.33	15 - NL	Yes	Passes Acceptability Criteria
12-2242-7780	Reproduction	PMSD	0.1666	0.13 - 0.47	Yes	Passes Acceptability Criteria
13-8299-1709	Reproduction	PMSD	0.2395	0.13 - 0.47	Yes	Passes Acceptability Criteria

CETIS Summary Report

Report Date: 23 Jul-18 10:50 (p 2 of 2)
Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

7d Survival Rate Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	9	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	0	0	0	0	0	0	0		100.0%
200		10	0	0	0	0	0	0	0		100.0%

Reproduction Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	9	36.33	35.14	37.53	30	39	1.067	3.202	8.81%	0.0%
12.5		10	30.7	28.39	33.01	19	39	1.955	6.183	20.14%	15.5%
25		10	35.3	34.2	36.4	31	41	0.9315	2.946	8.35%	2.84%
50		10	32.3	28.93	35.67	8	41	2.856	9.031	27.96%	11.1%
100		10	0	0	0	0	0	0	0		100.0%
200		10	0	0	0	0	0	0	0		100.0%

7d Survival Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1		1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	35	33	30	39	39	39		36	39	37
12.5		32	24	32	27	35	39	37	28	19	34
25		31	33	35	36	37	41	33	33	38	36
50		34	34	35	35	8	41	35	37	29	35
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

 Report Date: 23-Jul-18 10:50 (p 1 of 2)
 Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 12-6509-4346	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 19 Jul-18 12:37	Analysis: STP 2x2 Contingency Tables	Official Results: Yes
Batch ID: 03-2168-1268	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 12 Jul-18 14:20	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 19 Jul-18 08:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age: <8 h 7/12/18 (0715-1210)
Sample ID: 20-5762-1751	Code: 7AA4D0F7	Client: Donald C. Tillman WRP
Sample Date: 12 Jul-18 07:50	Material: Copper chloride	Project: NPDES
Receive Date: 12 Jul-18 07:50	Source: Reference Toxicant	
Sample Age: 6h	Station:	

Batch Note: Batch 1077 HBN 54108

Sample Note: Survival - ideal concentration-response relationship. Reproduction - interrupted concentration-response: non-significant effects bracketed by significant effects.

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU
Untransformed		C > T	Not Run	50	100	70.71	

Fisher Exact/Bonferroni-Holm Test

Control	vs	Conc-µg/L	Test Stat	P-Value	Decision(0.05)
Dilution Water		12.5	1	1.0000	Non-Significant Effect
		25	1	1.0000	Non-Significant Effect
		50	1	1.0000	Non-Significant Effect
		100	5.41E-06	<0.0001	Significant Effect
		200	5.41E-06	<0.0001	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

Data Summary

Conc-µg/L	Control Type	No-Resp	Resp	Total
0	Dilution Water	10	0	10
12.5		10	0	10
25		10	0	10
50		10	0	10
100		0	10	10
200		0	10	10

7d Survival Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 23 Jul-18 10:50 (p 2 of 2)
Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

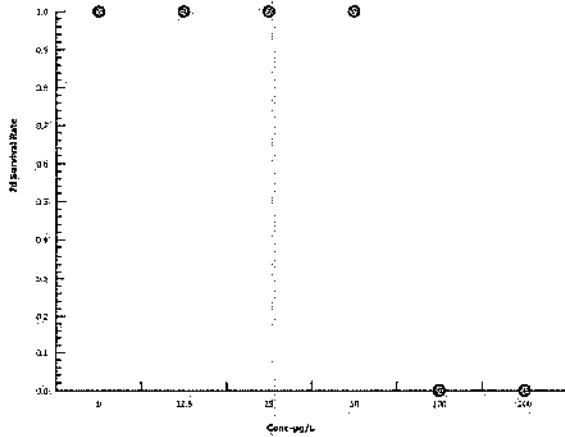
Hyperion Treatment Plant Laboratory

Analysis ID: 12-6509-4346
Analyzed: 19 Jul-18 12:37

Endpoint: 7d Survival Rate
Analysis: STP 2x2 Contingency Tables

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



Survival - ideal concentration-response relationship,
PE 7/23/2018

CETIS Analytical Report

Report Date: 23 Jul-18 10:49 (p 1 of 4)
Test Code: 1807RT2A.C | 05-0138-0333

Geriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 13-8299-1709	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 19 Jul-18 12:40	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes
Batch ID: 03-2168-1268	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 12 Jul-18 14:20	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 19 Jul-18 08:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age: <8 h 7/12/18 (0715-1210)
Sample ID: 20-5762-1751	Code: 7AA4D0F7	Client: Donald C. Tillman WRP
Sample Date: 12 Jul-18 07:50	Material: Copper chloride	Project: NPDES
Receive Date: 12 Jul-18 07:50	Source: Reference Toxicant	
Sample Age: 8h	Station:	

Batch Note: Batch 1077 HBN 54108

Sample Note: Survival - ideal concentration-response relationship: Reproduction - interrupted concentration-response: non-significant effects bracketed by significant effects.

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	50	100	70.71		23.9%

Steel Many-One Rank Test

Control	vs	Conc-µg/L	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
Dilution Water		12.5	83	77	18	3	0.1144	Non-Significant Effect
		25	98.5	77	18	4	0.5453	Non-Significant Effect
		50	92.5	77	18	2	0.3448	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	32.7	15 - NL	Yes	Passes Acceptability Criteria
PMSD	0.2395	0.13 - 0.47	Yes	Passes Acceptability Criteria

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	0	4.146	3.036	<0.0001	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	109.1	36.36666	3	0.5396	0.6583	Non-Significant Effect
Error	2426.4	67.4	36			
Total	2535.5	103.7667	39			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	14.51	11.34	0.0023	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.7249	0.9236	<0.0001	Non-normal Distribution

Reproduction Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	32.7	28.18	37.22	0	39	3.757	11.88	36.33%	0.0%
12.5		10	30.7	28.35	33.05	19	39	1.955	6.183	20.14%	6.12%
25		10	35.3	34.18	36.42	31	41	0.9315	2.946	8.35%	-7.95%
50		10	32.3	28.86	35.74	8	41	2.856	9.031	27.96%	1.22%
100		10	0	0	0	0	0	0	0		100.0%
200		10	0	0	0	0	0	0	0		100.0%

CETIS Analytical Report

Report Date: 23 Jul-18 10:49 (p 2 of 4)
Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 13-8299-1709
Analyzed: 19 Jul-18 12:40

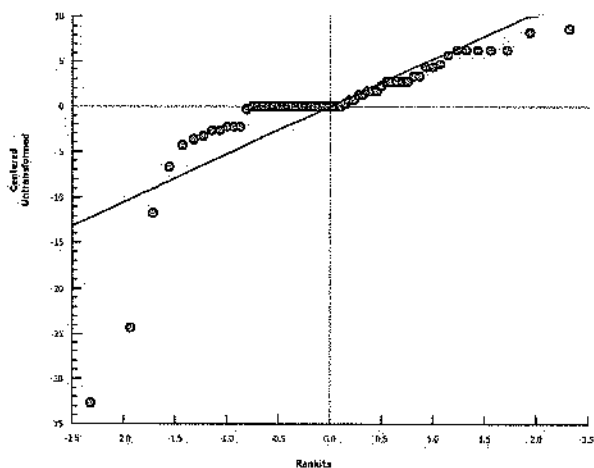
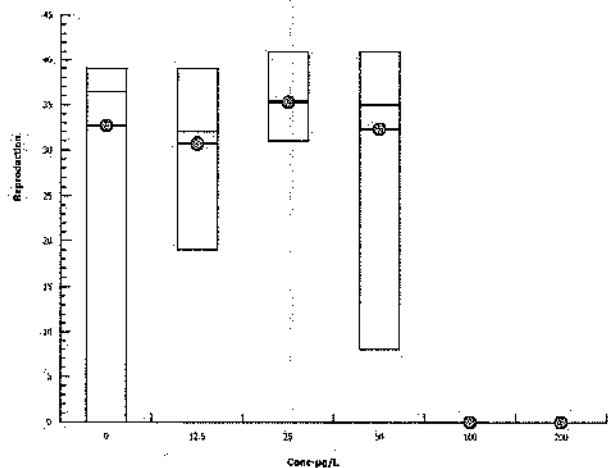
Endpoint: Reproduction
Analysis: Nonparametric-Control vs Treatments

CETIS Version: CETISv1.8.1
Official Results: Yes

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	35	33	30	39	39	39	0	36	39	37
12.5		32	24	32	27	35	39	37	28	19	34
25		31	33	35	36	37	41	33	33	38	36
50		34	34	35	35	8	41	35	37	29	35
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

Graphics



CETIS Analytical Report

 Report Date: 23 Jul-18 10:49 (p 3 of 4)
 Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 12-2242-7780	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 19 Jul-18 12:40	Analysis: Nonparametric-Multiple Comparison	Official Results: Yes
Batch ID: 03-2168-1268	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 12 Jul-18 14:20	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 19 Jul-18 08:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age: <8 h 7/12/18 (0715-1210)
Sample ID: 20-5762-1751	Code: 7AA4D0F7	Client: Donald C. Tillman WRP
Sample Date: 12 Jul-18 07:50	Material: Copper chloride	Project: NPDES
Receive Date: 12 Jul-18 07:50	Source: Reference Toxicant	
Sample Age: 6h	Station:	

Batch Note: Batch 1077 HBN 54108

 Sample Note: Survival - ideal concentration-response relationship, Reproduction - interrupted concentration-response: ~~non-significant effects~~
 bracketed by significant effects.

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	10000 Trials	50	100	70.71		16.7%

Wilcoxon/Bonferroni Adj Test

Control	vs	Conc-µg/L	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
Dilution Water		12.5*	73		17	3	0.0354	Significant Effect
		25	88.5		17	4	0.5430	Non-Significant Effect
		50	82.5		17	2	0.2391	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	36.33	15 - NL	Yes	Passes Acceptability Criteria
PMSD	0.1666	0.13 - 0.47	Yes	Passes Acceptability Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	197.1359	65.71197	3	1.857	0.1549	Non-Significant Effect
Error	1238.3	35.38	35			
Total	1435.436	101.092	38			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	13.69	11.34	0.0034	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.8203	0.9219	<0.0001	Non-normal Distribution

Reproduction Summary

Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	9	36.33	35.12	37.55	30	39	1.067	3.202	8.81%	0.0%
12.5		10	30.7	28.35	33.05	19	39	1.955	6.183	20.14%	15.5%
25		10	35.3	34.18	36.42	31	41	0.9315	2.946	8.35%	2.84%
50		10	32.3	28.86	35.74	8	41	2.856	9.031	27.96%	11.1%
100		10	0	0	0	0	0	0	0		100.0%
200		10	0	0	0	0	0	0	0		100.0%

CETIS Analytical Report

Report Date: 23 Jul-18 10:49 (p 4 of 4)
Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 12-2242-7780
Analyzed: 19 Jul-18 12:40

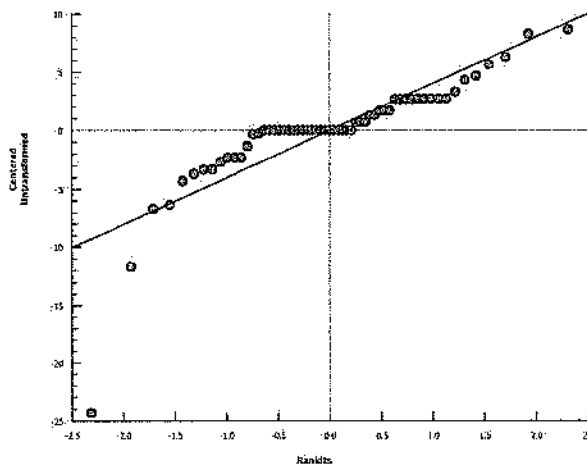
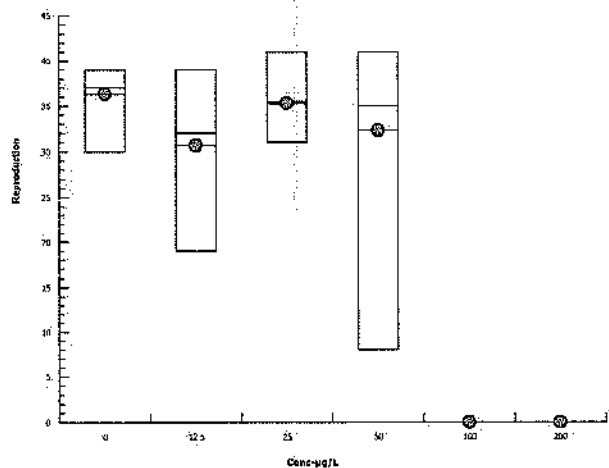
Endpoint: Reproduction
Analysis: Nonparametric-Multiple Comparison

CETIS Version: CETISv1.8.1
Official Results: Yes

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	35	33	30	39	39	39	Outlier	36	39	37
12.5		32	24	32	27	35	39	37	28	19	34
25		31	33	35	36	37	41	33	33	38	36
50		34	34	35	35	8	41	35	37	29	35
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

Graphics



reproduction - interrupted concentration-response: *the skulls* ~~not~~ significant effects bracketed by significant effects, *non-the skulls* RE 7/23/2018

CETIS Analytical Report

Report Date: 23 Jul-18 10:50 (p 1 of 4)
Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 18-3627-7518	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 19 Jul-18 12:42	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 03-2168-1268	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 12 Jul-18 14:20	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 19 Jul-18 08:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age: <8 h 7/12/18 (0715-1210)
Sample ID: 20-5762-1751	Code: 7AA4D0F7	Client: Donald C. Tillman WRP
Sample Date: 12 Jul-18 07:50	Material: Copper chloride	Project: NPDES
Receive Date: 12 Jul-18 07:50	Source: Reference Toxicant	
Sample Age: 6h	Station:	

Batch Note: Batch 1077 HBN 54108

Sample Note: Survival - ideal concentration-response relationship. Reproduction - interrupted concentration-response: non-significant effects bracketed by significant effects.

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1.97E+09	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	36.33	15 - NL	Yes	Passes Acceptability Criteria

Point Estimates

Level	µg/L	95% LCL	95% UCL
IC5	3.131	1.281	51.01
IC10	33.7	4.202	52.86
IC15	51.55	10.86	54.78
IC20	53.61	38.24	56.76
IC25	55.75	48.67	58.81
IC40	62.69	57.18	65.42
IC50	67.77	62.79	70.23

Reproduction Summary

Calculated Variate

Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	9	36.33	30	39	1.067	3.202	8.81%	0.0%
12.5		10	30.7	19	39	1.955	6.183	20.14%	15.5%
25		10	35.3	31	41	0.9315	2.946	8.35%	2.84%
50		10	32.3	8	41	2.856	9.031	27.96%	11.1%
100		10	0	0	0	0	0		100.0%
200		10	0	0	0	0	0		100.0%

Reproduction Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	35	33	30	39	39	39	36	39	37	
12.5		32	24	32	27	35	39	37	28	19	34
25		31	33	35	36	37	41	33	33	38	36
50		34	34	35	35	8	41	35	37	29	35
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 23 Jul-18 10:50 (p 2 of 4)
Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

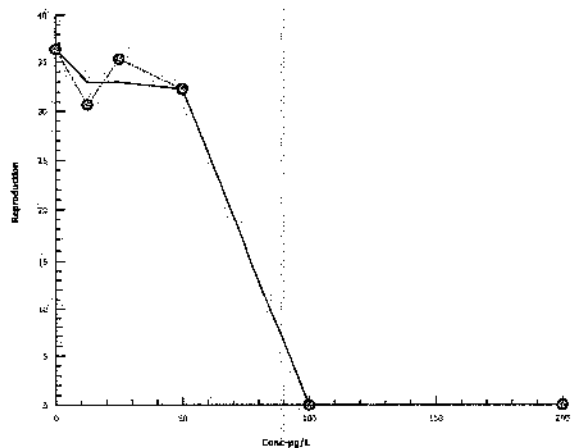
Hyperion Treatment Plant Laboratory

Analysis ID: 18-3627-7518
Analyzed: 19 Jul-18 12:42

Endpoint: Reproduction
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 23 Jul-18 10:50 (p 3 of 4)
Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 09-5921-7712	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 19 Jul-18 12:40	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 03-2168-1268	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 12 Jul-18 14:20	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 19 Jul-18 08:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 18h	Source: In-House Culture	Age: <8 h 7/12/18(0715-1210)
Sample ID: 20-5762-1751	Code: 7AA4D0F7	Client: Donald C. Tillman WRP
Sample Date: 12 Jul-18 07:50	Material: Copper chloride	Project: NPDES
Receive Date: 12 Jul-18 07:50	Source: Reference Toxicant	
Sample Age: 6h	Station:	

Batch Note: Batch 1077 HBN 54108

Sample Note: Survival - ideal concentration-response relationship. Reproduction - interrupted concentration-response: non-significant effects bracketed by significant effects.

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	759345605	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	51.77	51.77	51.77
EC10	53.61	53.61	53.61
EC15	55.5	55.5	55.5
EC20	57.47	57.47	57.47
EC25	59.5	59.5	59.5
EC40	66.03	66.03	66.03
EC50	70.77	70.77	70.77

7d Survival Rate Summary

Calculated Variate(A/B)

Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	1	1	1	0	0	0.0%	0.0%	10	10
25		10	1	1	1	0	0	0.0%	0.0%	10	10
50		10	1	1	1	0	0	0.0%	0.0%	10	10
100		10	0	0	0	0	0		100.0%	0	10
200		10	0	0	0	0	0		100.0%	0	10

7d Survival Rate Detail

Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 23 Jul-18 10:50 (p 4 of 4)
Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

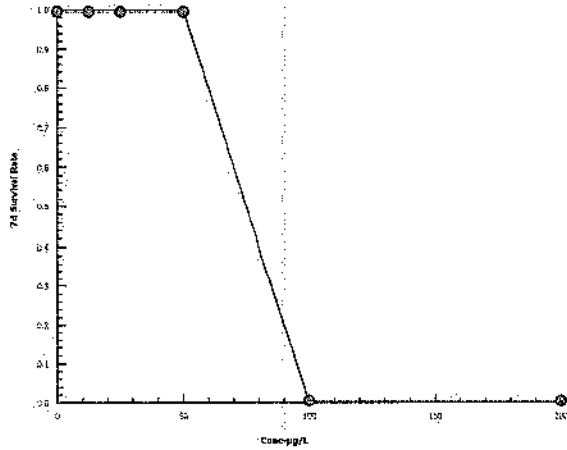
Hyperion Treatment Plant Laboratory

Analysis ID: 09-5921-7712
Analyzed: 19 Jul-18 12:40

Endpoint: 7d Survival Rate
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



CETIS Test Data Worksheet

RT

Report Date:

09 Jul-18 13:10 (p 1 of 2)

Test Code:

05-0138-0333/1807RT2A.C

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 12 Jul-18

Species: Ceriodaphnia dubia

Sample Code: 7AA4D0F7

End Date: 19 Jul-18

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

Sample Source: Reference Toxicant

Sample Date: 12 Jul-18

Material: Copper chloride

Sample Station:

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1	40	1	0	0	0	5	0	10	20	35	
0	D	2	30	1	0	0	0	5	0	10	18	33	
0	D	3	53	1	0	0	0	4	10	0	16	30	
0	D	4	38	1	0	0	0	6	0	14	19	39	
0	D	5	35	1	0	0	0	6	13	0	20	39	
0	D	6	17	1	0	0	0	4	13	0	22	39	
0	D	7	47	1	0	0	0	0	0	0	0	0	
0	D	8	15	1	0	0	0	6	12	0	18	36	
0	D	9	24	1	0	0	0	5	13	0	21	39	
0	D	10	25	1	0	0	0	6	12	0	19	37	
12.5		1	28	1	0	0	0	4	0	10	18	32	
12.5		2	14	1	0	0	0	4	8	0	12	24	
12.5		3	58	1	0	0	0	4	11	0	17	32	
12.5		4	12	1	0	0	0	4	8	0	15	27	
12.5		5	48	1	0	0	0	4	11	0	20	35	
12.5		6	5	1	0	0	0	4	14	0	21	39	
12.5		7	20	1	0	0	0	5	11	0	21	37	
12.5		8	46	1	0	0	0	4	9	0	15	28	
12.5		9	42	1	0	0	0	0	7	12	10	19	
12.5		10	41	1	0	0	0	7	11	0	16	34	
25		1	3	1	0	0	0	4	12	0	15	31	
25		2	52	1	0	0	0	4	11	0	15	33	
25		3	56	1	0	0	0	6	10	0	19	35	
25		4	44	1	0	0	0	6	11	0	19	36	
25		5	8	1	0	0	0	5	12	0	20	37	
25		6	13	1	0	0	0	6	12	0	23	41	
25		7	19	1	0	0	0	6	11	0	16	33	
25		8	4	1	0	0	0	4	9	0	20	33	
25		9	57	1	0	0	0	5	13	0	20	38	
25		10	39	1	0	0	0	4	10	0	20	36	
50		1	21	1	0	0	0	5	12	0	17	34	
50		2	29	1	0	0	0	4	10	0	19	34	
50		3	37	1	0	0	0	4	12	0	19	35	
50		4	11	1	0	0	0	5	13	0	17	35	
50		5	31	1	0	0	0	5	13	0	17	35	
50		6	16	1	0	0	0	6	12	0	20	8	
50		7	54	1	0	0	0	5	14	0	21	41	
50		8	7	1	0	0	0	5	14	0	18	35	
50		9	6	1	0	0	0	5	14	0	18	37	
50		10	50	1	0	0	0	6	10	0	19	35	
100		1	45	1	0	X	X	X	X	X	X	0	
100		2	26	1	0	X	X	X	X	X	X	0	
100		3	33	1	0	X	X	X	X	X	X	0	
100		4	49	1	0	X	X	X	X	X	X	0	
100		5	55	1	0	X	X	X	X	X	X	0	
100		6	23	1	0	X	X	X	X	X	X	0	
100		7	43	1	0	X	X	X	X	X	X	0	

outlier
N → per
Cetis

CETIS Test Data Worksheet



Report Date:

09 Jul-18 13:10 (p 2 of 2)

Test Code:

05-0138-0333/1807RT2A.C

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
100		8	34	1	0X	X	X	X	X	X	X	0	
100		9	18	1	0X	X	X	X	X	X	X	0	
100		10	59	1	0X	X	X	X	X	X	X	0	
200		1	2	1	0X	X	X	X	X	X	X	0	
200		2	36	1	0X	X	X	X	X	X	X	0	
200		3	51	1	0X	X	X	X	X	X	X	0	
200		4	9	1	0X	X	X	X	X	X	X	0	
200		5	60	1	0X	X	X	X	X	X	X	0	
200		6	27	1	0X	X	X	X	X	X	X	0	
200		7	32	1	0X	X	X	X	X	X	X	0	
200		8	22	1	0X	X	X	X	X	X	X	0	
200		9	1	1	0X	X	X	X	X	X	X	0	
200		10	10	1	0X	X	X	X	X	X	X	0	

Date:

7/12/18
1420

7/13

7/14

7/15

7/16

7/17

7/18

7/19

815 R0

feed:

1345

1247
R0

1050
R0

1424
R0

1150
R0

1000
R0

820
R0

transfer:

1408
R0

1130
R0

1452
R0

1257
R0

1035
R0

930
R0

CETIS Measurement Worksheet

RT

Report Date:

09 Jul-18 13:10 (p 1 of 2)

Test Code:

1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 12 Jul-18

Species: Ceriodaphnia dubia

Sample Code: 7AA4D0F7

End Date: 19 Jul-18

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

Sample Source: Reference Toxicant

Sample Date: 12 Jul-18

Material: Copper chloride

Sample Station:

Alkalinity (CaCO₃)-mg/L 7/13

Conc-µg/L	Code	Reading 1
0	D	124
200		112
Measure Time: 12:30		
Instrument ID: titrate		
Analyst: RE		

Conductivity-µmhos 7/12 7/13 7/14 7/15 7/16 7/17 7/18

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	632	631	602	621	621	628	647
12.5		628	604	606	632	623	632	635
25		628	606	604	632	621	631	632
50		625	603	589	621	609	600	614
100		625	628	—	—	—	—	—
200		607	620	—	—	—	—	—
Measure Time:		1145	1156	1035	1357	1134	925	830
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		RE	RE	RE	RE	RE	RE	RE

Final Dissolved Oxygen-mg/L 7/13 7/14 7/15 7/16 7/17 7/18 7/19

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.85	8.10	8.25	8.01	8.69	8.25	8.13
12.5		7.80	8.35	8.28	8.13	8.53	8.19	8.21
25		7.88	8.27	8.26	8.14	8.38	8.21	8.15
50		7.87	8.24	8.22	8.13	8.25	8.36	8.22
100		7.70	—	—	—	—	—	—
200		7.93	—	—	—	—	—	—
Measure Time:		1427	1405	1528	1557	1330	1250	1000
Instrument ID:		#1	#1	#1	#1	#1	#1	#1
Analyst:		RE	RE	RE	RE	RE	RE	RE

Initial Dissolved Oxygen-mg/L 7/13 7/14 7/15 7/16 7/17 7/18

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.23	8.35	8.17	8.28	8.14	8.58	8.29
12.5		8.44	8.47	8.23	8.11	8.20	8.56	8.34
25		8.45	8.52	8.30	8.14	8.24	8.56	8.35
50		8.43	8.57	8.39	8.11	8.22	8.58	8.34
100		8.43	8.60	—	—	—	—	—
200		8.38	8.53	—	—	—	—	—
Measure Time:		1145	1156	1035	1357	1134	925	830
Instrument ID:		#1	#1	#1	#1	#1	#1	#1
Analyst:		RE	RE	RE	RE	RE	RE	RE

Hardness (CaCO₃)-mg/L 7/25

Conc-µg/L	Code	Reading 1
0	D	190
200		AE*
Measure Time: 830		
Instrument ID: titrate		
Analyst: RE		

* Sample dumped. RE 7/25/18

CETIS Measurement Worksheet

RT

Report Date: 09 Jul-18 13:10 (p 2 of 2)

Test Code: 1807RT2A.C | 05-0138-0333

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 12 Jul-18

Species: Ceriodaphnia dubia

Sample Code: 7AA4D0F7

End Date: 19 Jul-18

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

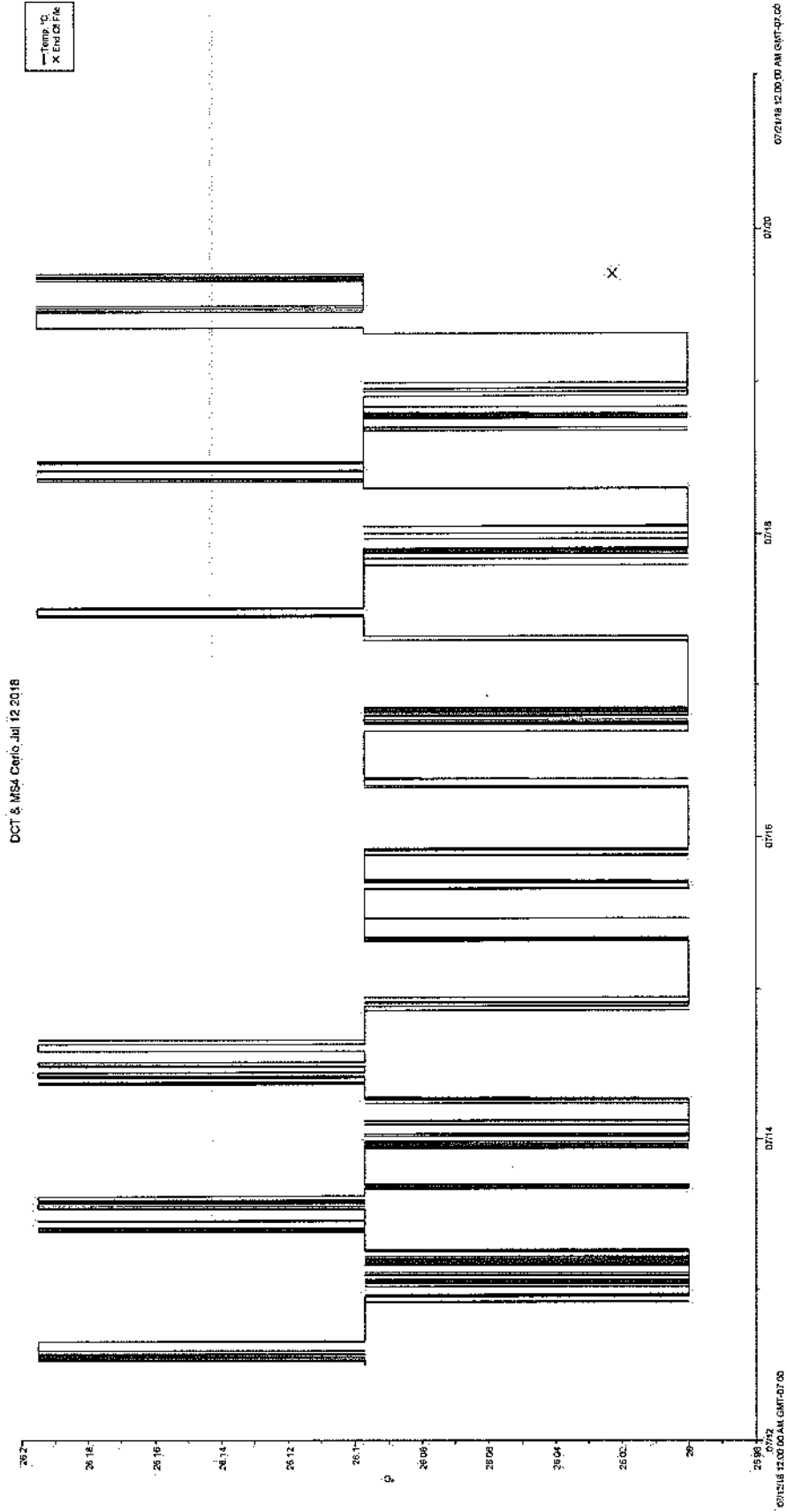
Sample Source: Reference Toxicant

Sample Date: 12 Jul-18

Material: Copper chloride

Sample Station:

Final pH		7/13	7/14	7/15	7/16	7/17	7/18	7/19
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.86	7.89	7.90	7.89	7.76	7.87	7.13
12.5		7.86	7.87	7.98	7.93	7.78	7.86	7.62
25		7.87	7.86	8.01	7.94	7.74	7.86	7.61
50		7.85	7.83	8.00	7.90	7.76	7.83	7.73
100		7.83	—	—	—	—	—	—
200		7.84	—	—	—	—	—	—
Measure Time:		1427	1405	1528	1557	1330	1250	1000
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		RC	RC	RC	RC	RC	RC	RC
Initial pH		7/12	7/13	7/14	7/15	7/16	7/17	7/18
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.96	8.06	7.49	8.17	8.02	8.11	7.94
12.5		7.92	7.99	7.64	8.15	8.02	8.11	7.96
25		7.91	7.98	7.71	8.14	8.05	8.11	7.98
50		7.90	8.01	7.78	8.12	8.05	8.11	7.99
100		7.86	7.98	—	—	—	—	—
200		7.91	8.00	—	—	—	—	—
Measure Time:		1145	1156	1035	1357	1134	925	830
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		RC	RC	RC	RC	RC	RC	RC
Final Temperature-°C		7/13	7/14	7/15	7/16	7/17	7/18	7/19
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	24.5	24.8	24.8	24.9	24.7	24.8	24.5
12.5		24.3	24.8	24.6	24.8	24.6	24.7	24.4
25		24.4	24.8	24.6	24.7	24.5	24.5	24.5
50		24.3	24.9	24.5	24.6	24.7	24.5	24.7
100		24.2	—	—	—	—	—	—
200		24.2	—	—	—	—	—	—
Measure Time:		1427	1405	1528	1557	1330	1250	1000
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		RC	RC	RC	RC	RC	RC	RC
Initial Temperature-°C		7/12	7/13	7/14	7/15	7/16	7/17	7/18
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	24.7	25.0	24.9	24.8	24.4	25.0	24.7
12.5		24.6	24.6	25.0	24.6	24.3	24.9	24.9
25		24.5	24.2	25.1	24.5	24.1	24.8	24.9
50		24.3	24.1	25.2	24.3	24.1	24.8	24.8
100		24.2	24.0	—	—	—	—	—
200		24.2	24.0	—	—	—	—	—
Measure Time:		1145	1156	1035	1357	1134	925	830
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		RC	RC	RC	RC	RC	RC	RC



Caridodaphnia Chronic Toxicity Test

start: Thursday, July 12, 2018

end: Thursday, July 19, 2018

RT - ^{re 1123} 1807RT2A,C

DCT eff - 1807062A,C

*The temp chart recorder is broken and data is unavailable. RE 7/23/2018

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

WPD
SEDIMENT TOXICITY
TOXICITY TESTING REPORT

SAMPLE DATE: September 5, 2018

TEST DATE: September 18, 2018

TEST NUMBER: 1809071F.E

TEST MATERIAL: Sediment Grab station 10874

TEST SPECIES: *Eohaustorius estuarius*

PROTOCOL: EPA/600/R-94/025 (1994)

TEST TYPE: Acute

REFERENCE TOXICANT TEST: 1809RT1A.E

RESULT: PERCENT SURVIVAL = 78 %

SQO TOXICITY: Moderate toxicity

CONTROL-ADJUSTED
SURVIVAL = 80 %

Angelika Moskova

Water Biologist II

Analyst (print name)

Title

Signature

Date

11/14/18

Rea Mara A. Crinklaw

Water Biologist III

Supervisor (print name)

Title

Signature

Date

11/16/18

CETIS Summary Report

Report Date: 30 Oct-18 11:14 (p 1 of 1)
Test Code: 1809071F.E | 01-3315-7803

Eohaustorius 10-d Survival and Reburial Sediment Test						Hyperion Treatment Plant Laboratory					
Batch ID:	16-8782-6402	Test Type:	Survival-Reburial	Analyst:	Angelika Moskova						
Start Date:	18 Sep-18 10:10	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater						
Ending Date:	28 Sep-18 08:45	Species:	Eohaustorius estuarius	Brine:	Not Applicable						
Duration:	9d 23h	Source:	Northwestern Aquatic Science, OR	Age:							
Sample ID:	05-4781-1820	Code:	3176302	Client:	Hyperion Treatment Plant						
Sample Date:	05 Sep-18 11:30	Material:	Sediment grab	Project:	NPDES						
Receive Date:	10 Sep-18 06:00	Source:	WPD (WATERSHED)								
Sample Age:	12d 23h (14.8 °C)	Station:	10874								
Batch Note: Batch #1101 HBN 62722											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
18-2796-9929	Survival Rate	<100	100	N/A	4.33%	>1	Unequal Variance t Two-Sample Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
18-2796-9929	Survival Rate	Control Resp	0.98	0.9 - NL	Yes	Passes Acceptability Criteria					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Reference Sed	5	0.98	0.9633	0.9967	0.9	1	0.02	0.04472	4.56%	0.0%
100		5	0.78	0.7587	0.8013	0.7	0.85	0.0255	0.05701	7.31%	20.41%
Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
	Reference Sed	0.9	1	1	1	1					
00		0.8	0.8	0.7	0.75	0.85					

CETIS Analytical Report

Report Date: 30 Oct-18 11:14 (p 1 of 2)
Test Code: 1809071F.E | 01-3315-7803

Eohaustorius 10-d Survival and Reburial Sediment Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 18-2796-9929	Endpoint: Survival Rate	CETIS Version: CETISv1.8.1									
Analyzed: 30 Oct-18 11:12	Analysis: Parametric-Two Sample	Official Results: Yes									
Batch ID: 16-8782-6402	Test Type: Survival-Reburial	Analyst: Angelika Moskova									
Start Date: 18 Sep-18 10:10	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater									
Ending Date: 28 Sep-18 08:45	Species: Eohaustorius estuarius	Brine: Not Applicable									
Duration: 9d 23h	Source: Northwestern Aquatic Science, OR	Age:									
Sample ID: 05-4781-1820	Code: 3176302	Client: Hyperion Treatment Plant									
Sample Date: 05 Sep-18 11:30	Material: Sediment grab	Project: NPDES									
Receive Date: 10 Sep-18 06:00	Source: WPD (WATERSHED)										
Sample Age: 12d 23h (14.8 °C)	Station: 10874										
Batch Note: Batch #1101 HBN 62722											
Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD						
Angular (Corrected)	0	C > T	Not Run	Sample fails survival rate endpoint	4.33%						
Unequal Variance t Two-Sample Test											
Control	vs. Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)				
Reference Sed	100*	6.373	1.895	7	0.09859	0.0002	Significant Effect				
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	0.98	0.9 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.2750065	0.2750065	1	40.62	0.0002	Significant Effect					
Error	0.0541613	0.006770163	8								
Total	0.3291678	0.2817767	9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.854	23.15	0.5646	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.8283	0.7411	0.0319	Normal Distribution						
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Reference Sed	5	0.98	0.963	0.997	0.9	1	0.02	0.04472	4.56%	0.0%
100		5	0.78	0.7583	0.8017	0.7	0.85	0.0255	0.05701	7.31%	20.41%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Reference Sed	5	1.417	1.381	1.452	1.249	1.459	0.04194	0.09379	6.62%	0.0%
100		5	1.085	1.059	1.111	0.9912	1.173	0.0308	0.06888	6.35%	23.41%

CETIS Analytical Report

Report Date: 30 Oct-18 11:14 (p 2 of 2)
Test Code: 1809071F.E | 01-3315-7803

Eohaustorius 10-d Survival and Reburial Sediment Test

Hyperion Treatment Plant Laboratory

Analysis ID: 18-2796-9929
Analyzed: 30 Oct-18 11:12

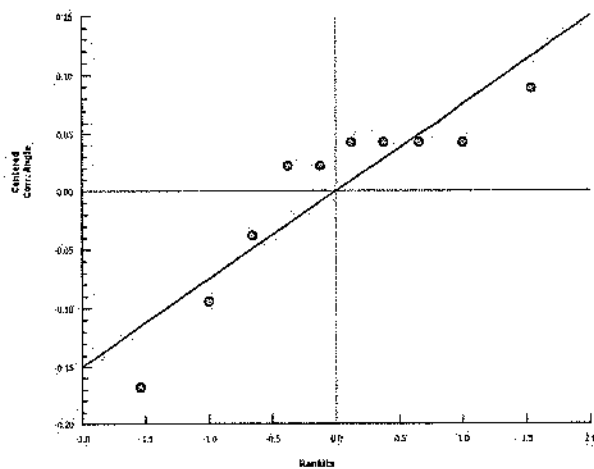
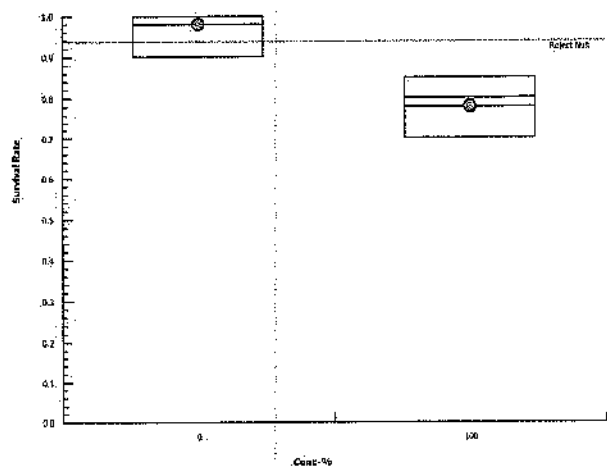
Endpoint: Survival Rate
Analysis: Parametric-Two Sample

CETIS Version: CETISv1.8.1
Official Results: Yes

Survival Rate Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Reference Sed	0.9	1	1	1	1
100		0.8	0.8	0.7	0.75	0.85

Graphics



CETIS Test Data Worksheet

Report Date: 18 Sep-18 06:46 (p 1 of 1)
 Test Code: 01-3315-7803/1809071F.E

Eohaustorius 10-d Survival and Reburial Sediment Test

Hyperion Treatment Plant Laboratory

Start Date: 18 Sep-18 1010
 d Date: 28 Sep-18 0845
 .mple Date: 05 Sep-18 11:30
 Species: Eohaustorius estuarius
 Protocol: EPA/600/R-94/025 (1994)
 Material: Sediment grab

Sample Code: 3176302
 Sample Source: WPD
 Sample Station: 10874 (25448)

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Reburied	Notes
0	RS	1	21	20	18		
0	RS	2	24	20	20		
0	RS	3	13	20	20		
0	RS	4	8	20	20		
0	RS	5	9	20	20		
100		1	25	20	16		
100		2	16	20	16		
100		3	32	20	14		
100		4	34	20	15		
100		5	5	20	17		

9-18
 1010
 Ang
 9/18/18

CETIS Measurement Worksheet

 Report Date: 18 Sep-18 06:46 (p 2 of 2)
 Test Code: 1809071F.E | 01-3315-7803

Eohaustorius 10-d Survival and Reburial Sediment Test

Hyperion Treatment Plant Laboratory

 Start Date: 18 Sep-18
 End Date: 28 Sep-18
 Sample Date: 05 Sep-18 11:30

 Species: Eohaustorius estuarius
 Protocol: EPA/600/R-94/025 (1994)
 Material: Sediment grab

 Sample Code: 3176302
 Sample Source: WPD
 Sample Station: 10874 (25448)

pH, Pore Water

Conc-%	Code	Reading 1
0	RS	7.45
100		7.53
Measure Time: —		
Instrument ID: #4		
Analyst: Ang		

Salinity-ppt		9.18	9.20	9.22	9.24	9.26	9.28
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
0	RS	33	33	33	33	33	33
100		33	33	33	33	33	33
Measure Time:		805	950	8.55	1310	1220	730
Instrument ID:		#4	#3	#3	#1	#4	#4
Analyst:		Ang	Ang	AS	Ang	Ang	RB

Salinity, Pore Water-ppt

Conc-%	Code	Reading 1
0	RS	33
100		32
Measure Time: —		
Instrument ID: #4		
Analyst: Ang		

Temperature-°C		9.18	9.19	9.20	9.21	9.22	9.23	9.24	9.25	9.26	9.27
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8	Reading 9	Reading 10
		Reading 11									
0	RS	14.4	14.5	15.0	14.9	15.0	14.9	14.7	14.8	14.9	14.9
		14.8									
100		14.5	14.5	14.9	14.9	14.9	14.8	14.8	14.8	14.8	14.8
		14.7									
Measure Time:		805	1230	950	1648	8.55	0956	1310	1250	1220	1500
Instrument ID:		#4	#4	#4	#4	#4	1	#2	#2	#4	#4
Analyst:		Ang	Ang	Ang	Ang	AS	DL	Ang	Ang	Ang	Ang

Temperature, Pore Water-°C

Conc-%	Code	Reading 1
0	RS	15.1
100		14.8
Measure Time: —		
Instrument ID: #4		
Analyst: Ang		

CETIS Measurement Worksheet

 Report Date: 18 Sep-18 06:46 (p 1 of 2)
 Test Code: 1809071F.E | 01-3315-7803

Eohaustorius 10-d Survival and Reburial Sediment Test

Hyperion Treatment Plant Laboratory

 Start Date: 18 Sep-18
 End Date: 28 Sep-18
 Sample Date: 05 Sep-18 11:30

 Species: Eohaustorius estuarius
 Protocol: EPA/600/R-94/025 (1994)
 Material: Sediment grab

 Sample Code: 3176302
 Sample Source: WPD
 Sample Station: 10874 (25448)

Dissolved Oxygen-mg/L							
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
0	RS	8.05	8.12	8.18	8.18	8.24	8.19
100		7.74	7.80	7.90	7.88	7.89	7.82
Measure Time:		805	950	1055	1310	1220	740
Instrument ID:		#1	#1	#1	#1	#1	#1
Analyst:		Ang	Ang	AS	Ang	Ang	RB

Total Ammonia (N)-mg/L			
Conc-%	Code	Reading 1	Reading 2
0	RS	1	0.15
100		2	1
Measure Time:		805	900
Instrument ID:		HACH	HACH
Analyst:		Ang	RB

Unionized Ammonia (N)-mg/L			
Conc-%	Code	Reading 1	Reading 2
0	RS	0.018	0.005
100		0.030	0.032
Measure Time:		—	—
Instrument ID:		HAMPSON	HAMPSON
Analyst:		Ang	Ang

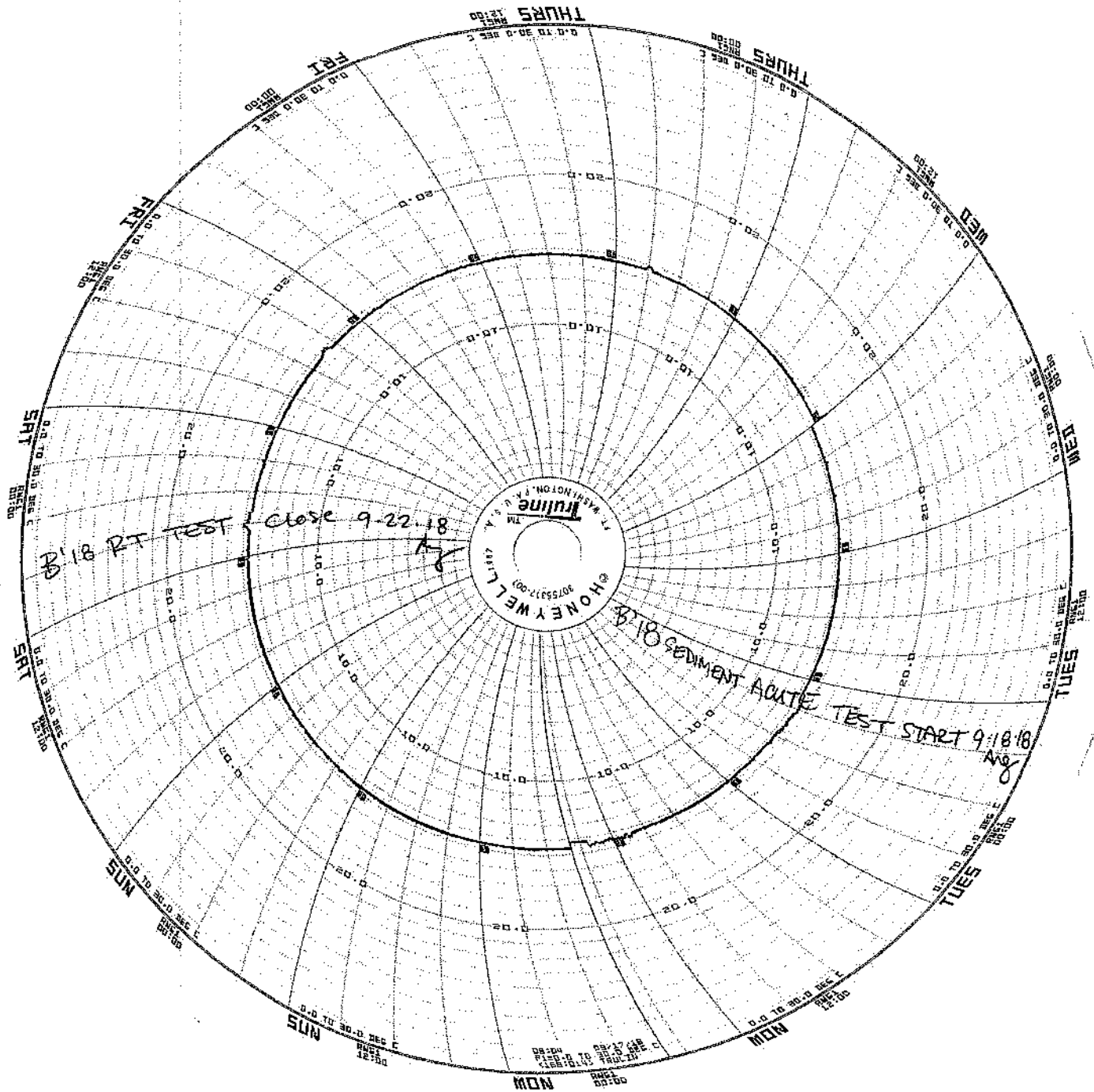
Total Ammonia (N), PW-mg/L		
Conc-%	Code	Reading 1
0	RS	1
100		23
Measure Time:		—
Instrument ID:		HACH
Analyst:		Ang

Unionized Ammonia (N), PW-mg/L		
Conc-%	Code	Reading 1
0	RS	0.006
100		0.108
Measure Time:		—
Instrument ID:		HAMPSON
Analyst:		Ang

pH											
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8	Reading 9	Reading 10
0	RS	7.94	8.02	7.87	8.03	8.03	8.30	7.96	7.88	7.71	8.01
100		7.79	7.98	7.93	8.07	8.04	8.36	8.00	7.99	7.84	8.41
Measure Time:		805	1230	950	1648	8:55	0156	1310	1250	1220	1300
Instrument ID:		#4	#4	#4	#4	#4	#4	#2	#2	#4	#4
Analyst:		Ang	Ang	Ang	PC	AS	Ang	Ang	Ang	Ang	Ang

NH4CAL-8_1809

Unionized Ammonia Calculation for Pressure of 1 atm													
Input 'Shaded' data													
		I		pK									
		1		9.26									
		2		9.27									
		3		9.28									
		4		9.29									
		5		9.30									
		6		9.32									
		7		9.33									
		8		9.34									
</													

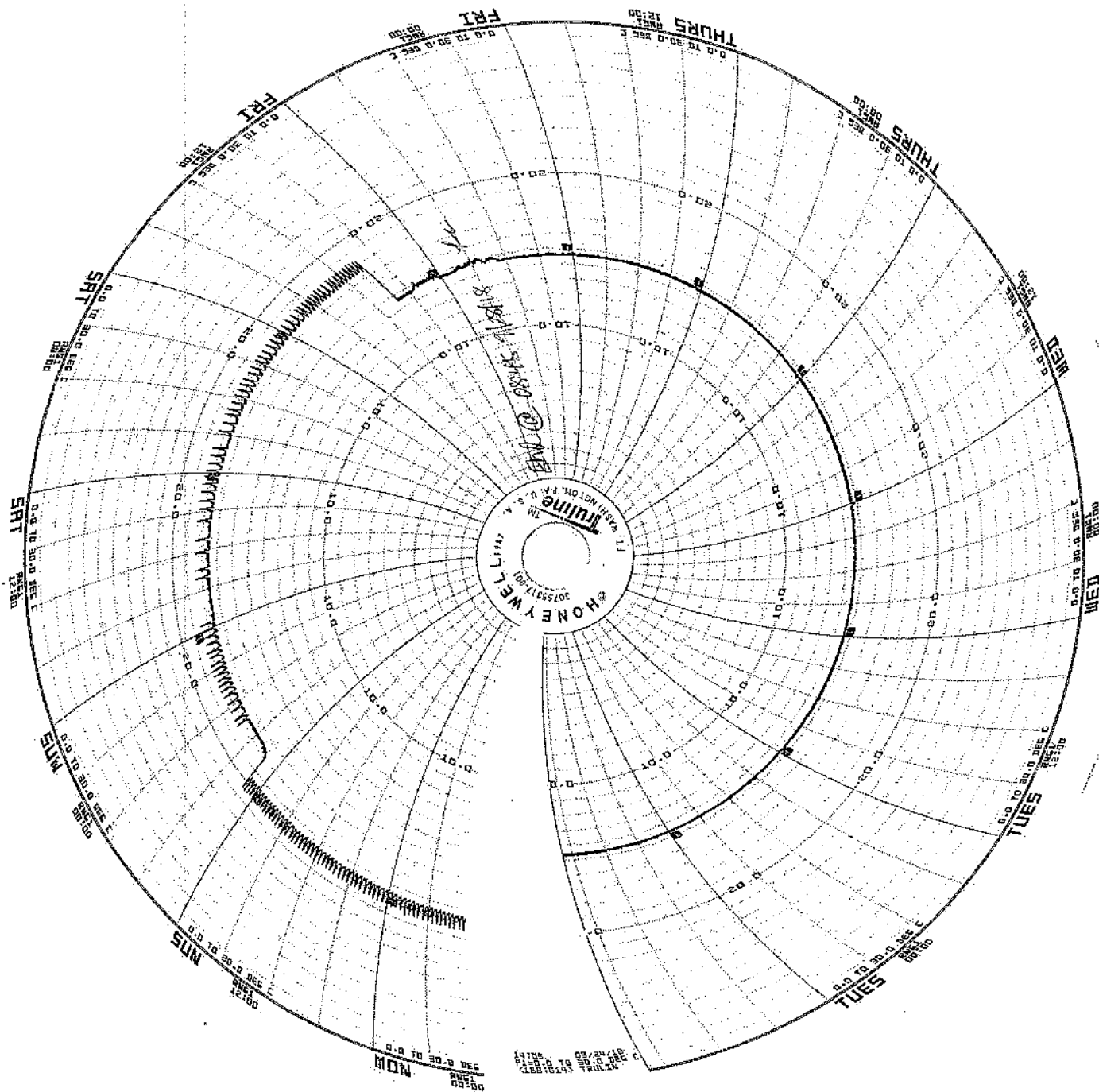


September 18, 2018 → September 22, 2018

1809 RTIA.E

September 18, 2018 → September 28, 2018

180907(A-G).E

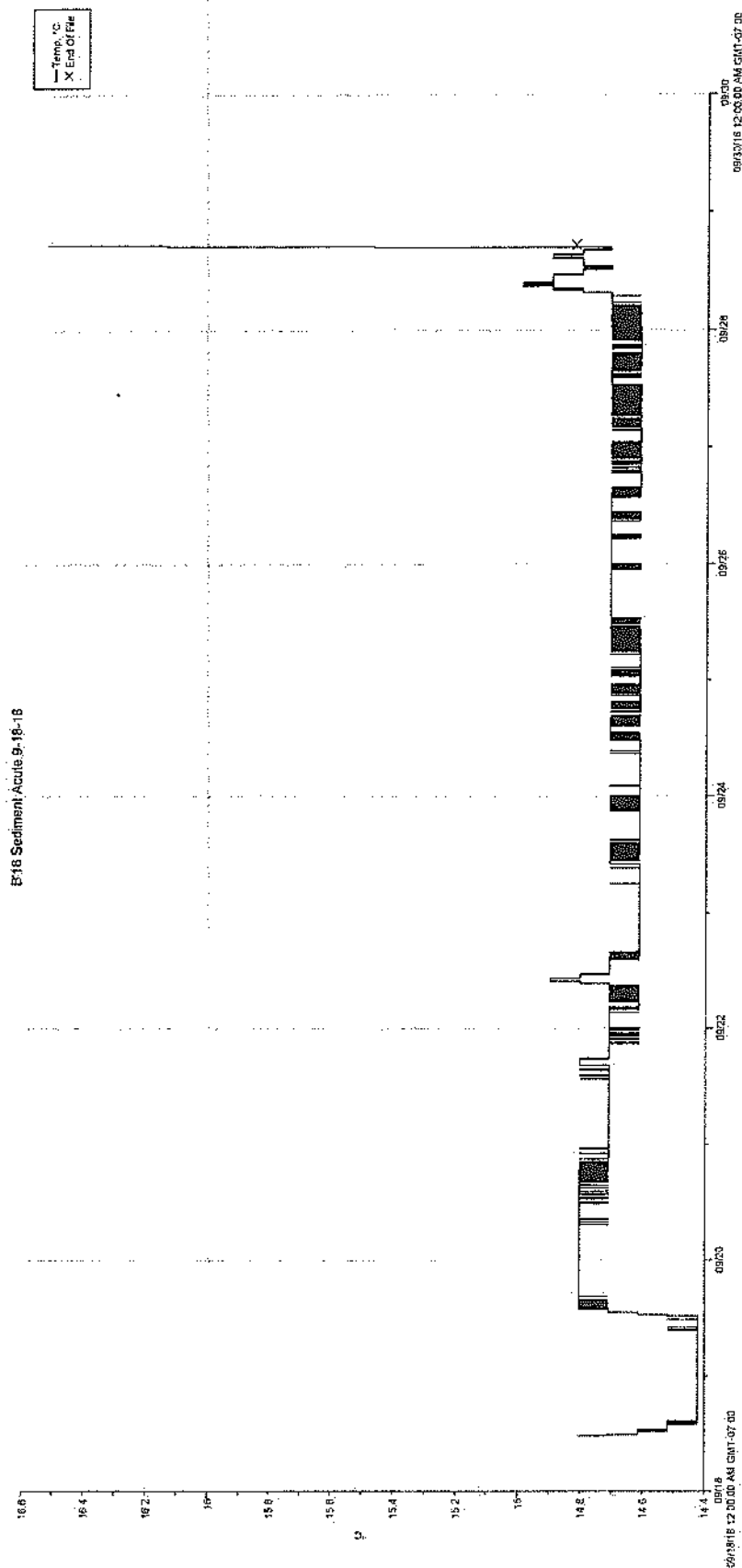


September 18, 2018 → September 22, 2018

180921A.E

September 18, 2018 → September 28, 2018

1809071 (A-G).E



September 18, 2018 → September 22, 2018

1809PT1A.E

September 18, 2018 → September 28, 2018

1809071(A-G).E

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

WPD
SEDIMENT TOXICITY

TOXICITY TESTING REPORT

SAMPLE DATE: September 5, 2018

TEST DATE: September 18, 2018

TEST NUMBER: 1809071E.E

TEST MATERIAL: Sediment Grab station 10760

TEST SPECIES: *Eohaustorius estuarius*

PROTOCOL: EPA/600/R-94/025 (1994)

TEST TYPE: Acute

REFERENCE TOXICANT TEST: 1809RT1A.E

RESULT: PERCENT SURVIVAL = 58 %

SQO TOXICITY: Moderate toxicity

CONTROL-ADJUSTED
SURVIVAL = 59 %

Angelika Moskova

Water Biologist II

Analyst (print name)

Title

Signature

Date

11/19/18

Rea Mara A. Crinklaw

Water Biologist III

Supervisor (print name)

Title

Signature

Date

11/19/18

CETIS Summary Report

Report Date: 30 Oct-18 11:22 (p 1 of 1)
Test Code: 1809071E.E | 12-5817-2007

Eohaustorius 10-d Survival and Reburial Sediment Test								Hyperion Treatment Plant Laboratory			
Batch ID:	16-8782-6402	Test Type:	Survival-Reburial	Analyst:	Angelika Moskova						
Start Date:	18 Sep-18 10:10	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater						
Ending Date:	28 Sep-18 09:30	Species:	Eohaustorius estuarius	Brine:	Not Applicable						
Duration:	9d 23h	Source:	Northwestern Aquatic Science, OR	Age:							
Sample ID:	13-8359-8471	Code:	3176301	Client:	Hyperion Treatment Plant						
Sample Date:	05 Sep-18 14:05	Material:	Sediment grab	Project:	NPDES						
Receive Date:	10 Sep-18 06:00	Source:	WPD (WATERSHED)								
Sample Age:	12d 20h (15.2 °C)	Station:	10760								
Batch Note: Batch #1101 HBN 62722											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
10-5249-4825	Survival Rate	<100	100	N/A	8.25%	>1	Unequal Variance t Two-Sample Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
10-5249-4825	Survival Rate	Control Resp	0.98	0.9 - NL	Yes	Passes Acceptability Criteria					
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Reference Sed	5	0.98	0.9633	0.9987	0.9	1	0.02	0.04472	4.56%	0.0%
100		5	0.58	0.5186	0.6414	0.4	0.75	0.07348	0.1643	28.33%	40.82%
Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
	Reference Sed	0.9	1	1	1	1					
00		0.45	0.55	0.75	0.75	0.4					

CETIS Analytical Report

Report Date: 30 Oct-18 11:22 (p 1 of 2)
Test Code: 1809071E.E | 12-5817-2007

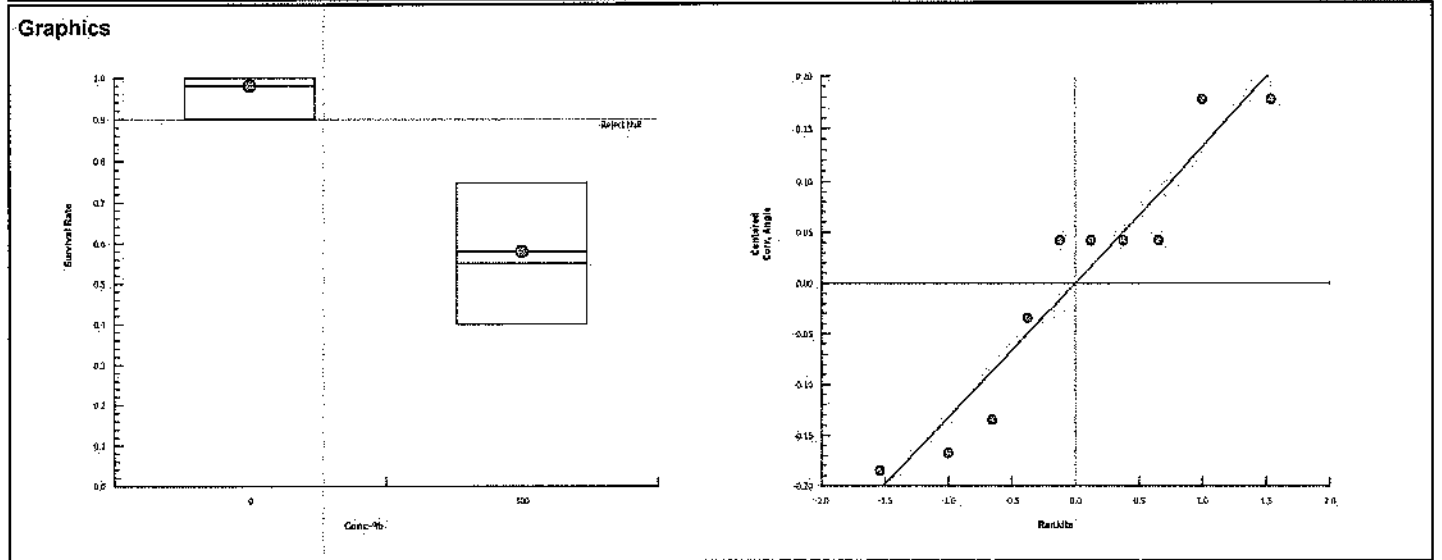
Eohaustorius 10-d Survival and Reburial Sediment Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 10-5249-4825	Endpoint: Survival Rate	CETIS Version: CETISv1.8.1									
Analyzed: 30 Oct-18 11:21	Analysis: Parametric-Two Sample	Official Results: Yes									
Batch ID: 16-8782-6402	Test Type: Survival-Reburial	Analyst: Angelika Moskova									
Start Date: 18 Sep-18 10:10	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater									
Ending Date: 28 Sep-18 09:30	Species: Eohaustorius estuarius	Brine: Not Applicable									
Duration: 9d 23h	Source: Northwestern Aquatic Science, OR	Age:									
Sample ID: 13-8359-8471	Code: 3176301	Client: Hyperion Treatment Plant									
Sample Date: 05 Sep-18 14:05	Material: Sediment grab	Project: NPDES									
Receive Date: 10 Sep-18 06:00	Source: WPD (WATERSHED)										
Sample Age: 12d 20h (15.2 °C)	Station: 10760										
Batch Note: Batch #1101 HBN 62722											
Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD						
Angular (Corrected)	0	C > T	Not Run	Sample fails survival rate endpoint	8.25%						
Unequal Variance t Two-Sample Test											
Control	vs Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)				
Reference Sed	100*	6.28	1.943	6	0.1692	0.0004	Significant Effect				
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	0.98	0.9 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.7475685	0.7475685	1	39.44	0.0002	Significant Effect					
Error	0.1516422	0.01895528	8								
Total	0.8992107	0.7665238	9								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	3.31	23.15	0.2730	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.8964	0.7411	0.2000	Normal Distribution						
Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Reference Sed	5	0.98	0.963	0.997	0.9	1	0.02	0.04472	4.56%	0.0%
100		5	0.58	0.5175	0.6425	0.4	0.75	0.07348	0.1643	28.33%	40.82%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Reference Sed	5	1.417	1.381	1.452	1.249	1.459	0.04194	0.09379	6.62%	0.0%
100		5	0.87	0.8051	0.9349	0.6847	1.047	0.07631	0.1706	19.61%	38.6%

CETIS Analytical Report

Report Date: 30 Oct-18 11:22 (p 2 of 2)
 Test Code: 1809071E.E | 12-5817-2007

Eohaustorius 10-d Survival and Reburial Sediment Test				Hyperion Treatment Plant Laboratory	
Analysis ID:	10-5249-4825	Endpoint:	Survival Rate	CETIS Version:	CETISv1.8.1
Analyzed:	30 Oct-18 11:21	Analysis:	Parametric-Two Sample	Official Results:	Yes

Survival Rate Detail						
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Reference Sed	0.9	1	1	1	1
100		0.45	0.55	0.75	0.75	0.4



CETIS Test Data Worksheet

Report Date: 18 Sep-18 06:46 (p 1 of 1)
Test Code: 12-5817-2007/1809071E.E

Eohaustorius 10-d Survival and Reburial Sediment Test

Hyperion Treatment Plant Laboratory

Start Date: 18 Sep-18 1010 Species: Eohaustorius estuarius
End Date: 28 Sep-18 Protocol: EPA/600/R-94/025 (1994)
Sample Date: 05 Sep-18 14:05 Material: Sediment grab

Sample Code: 3176301
Sample Source: WPD
Sample Station: 10760 (25447)

Conc-%	Code	Rep	Pos	# Exposed	# Survived	# Reburied	Notes
0	RS	1	21	20	18		
0	RS	2	24	20	20		
0	RS	3	13	20	20		
0	RS	4	8	20	20		
0	RS	5	9	20	20		
100		1	20	20	9		
100		2	12	20	11		
100		3	23	20	15		
100		4	30	20	15		
100		5	7	20	8		

9.18 RD
1010 930
Ang 9/28

CETIS Measurement Worksheet

Report Date: 18 Sep-18 06:46 (p 1 of 2)
Test Code: 1809071E.E | 12-5817-2007

Eohaustorius 10-d Survival and Reburial Sediment Test

Hyperion Treatment Plant Laboratory

Start Date: 18 Sep-18
End Date: 28 Sep-18
Sample Date: 05 Sep-18 14:05

Species: Eohaustorius estuarius
Protocol: EPA/600/R-94/025 (1994)
Material: Sediment grab

Sample Code: 3176301
Sample Source: WPD
Sample Station: 10760

Dissolved Oxygen-mg/L 9.18 9.20 9.22 9.24 9.26 9.28							
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
0	RS	8.03	8.12	8.18	8.18	8.24	8.19
100		7.24	7.79	7.94	7.81	7.72	7.48
Measure Time:		8:05	9:30	8:55	13:10	12:20	7:40
Instrument ID:		#1	#1	#1	#1	#1	#1
Analyst:		Ang	Ang	AS	Ang	Ang	RO

Total Ammonia (N)-mg/L 9.18 9.28			
Conc-%	Code	Reading 1	Reading 2
0	RS	0.15	0.15
100		0.12	0.12
Measure Time:		—	9:00
Instrument ID:		HACH	HACH
Analyst:		Ang	RO

Unionized Ammonia (N)-mg/L			
Conc-%	Code	Reading 1	Reading 2
0	RS	0.018	0.003
100		0.031	0.114
Measure Time:		—	—
Instrument ID:		HACH	HACH
Analyst:		Ang	Ang

Total Ammonia (N), PW-mg/L		
Conc-%	Code	Reading 1
0	RS	1
100		14
Measure Time:		—
Instrument ID:		HACH
Analyst:		Ang

Unionized Ammonia (N), PW-mg/L		
Conc-%	Code	Reading 1
0	RS	0.006
100		0.117
Measure Time:		—
Instrument ID:		HACH
Analyst:		Ang

pH 9.18 9.19 9.20 9.21 9.22 9.23 9.24 9.25 9.26 9.27											
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8	Reading 9	Reading 10
0	RS	7.94	8.02	7.87	8.03	8.05	8.30	7.96	7.88	7.71	8.01
100		7.99	7.98	7.96	8.02	8.05	8.45	8.16	8.20	8.18	8.53
Measure Time:		8:05	12:30	9:50	16:48	8:55	9:50	13:10	12:50	12:20	13:00
Instrument ID:		#4	#4	#4	#3	#3	#4	#2	#2	#4	#4
Analyst:		Ang	Ang	Ang	RL	AS	OL	Ang	Ang	Ang	Ang

CETIS Measurement Worksheet

Report Date: 18 Sep-18 06:46 (p 2 of 2)
Test Code: 1809071E.E | 12-5817-2007

Eohaustorius 10-d Survival and Reburial Sediment Test

Hyperion Treatment Plant Laboratory

Start Date: 18 Sep-18
End Date: 28 Sep-18
Sample Date: 05 Sep-18 14:05

Species: Eohaustorius estuarius
Protocol: EPA/600/R-94/025 (1994)
Material: Sediment grab

Sample Code: 3176301
Sample Source: WPD
Sample Station: 10760

pH, Pore Water

Conc-%	Code	Reading 1
0	RS	7.45
100		7.56
Measure Time: —		
Instrument ID: #4		
Analyst: Aug		

Salinity-ppt

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
0	RS	33	33	33	33	33	33
100		33	33	33	33	32	32
Measure Time:		8:05	9:50	8:55	13:10	12:20	7:30
Instrument ID:		#4	#5	#3	#1	#4	#4
Analyst:		Aug	Aug	AS	Aug	Aug	RD

Salinity, Pore Water-ppt

Conc-%	Code	Reading 1
0	RS	53
100		210
Measure Time: —		
Instrument ID: #4		
Analyst: Aug		

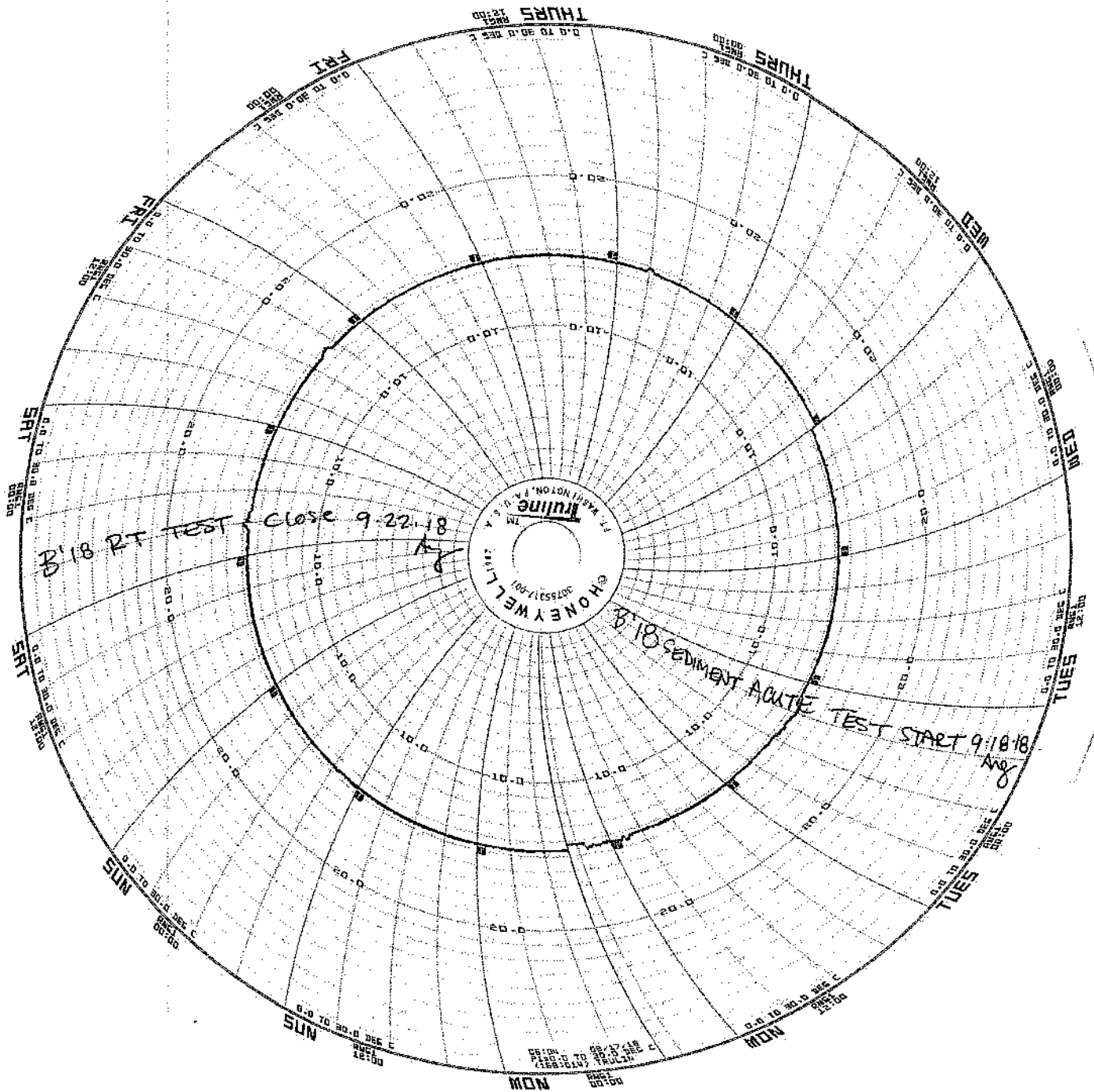
Temperature-°C

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8	Reading 9	Reading 10
		Reading 11				9/22 AS					
0	RS	14.4	14.5	15.0	14.9	14.6	14.9	14.7	14.8	14.9	14.9
		14.18				15.8					
100		14.5	14.3	14.7	14.7	14.6	14.7	14.6	14.6	14.7	14.6
		14.16									
Measure Time:		8:05	12:50	9:50	16:48	8:55	09:56	13:10	12:50	12:20	13:00
Instrument ID:		#4	#4	#4	#3	#3	#4	#2	#2	#4	#4
Analyst:		Aug	Aug	Aug	Re	AS	Re	Aug	Aug	Aug	Aug

Temperature, Pore Water-°C

Conc-%	Code	Reading 1
0	RS	15.1
100		15.2
Measure Time: —		
Instrument ID: #4		
Analyst: Aug		

Unionized Ammonia Calculation for Pressure of 1 atm												
Input 'Shaded' data												
Log Num	Beaker	Day	Dilution	Total Ammonia (mg/L)	Temp (C)	Salinity (ppt)	pH	Temp (K)	I	Rounded I	pK	Unionized Ammonia (mg/L)
RS	100	0	100	1	14.4	33.0	7.94	287.56	7.30	7	9.33	0.018
RS	100	10	100	0.15	14.8	33.0	7.99	287.96	7.30	7	9.33	0.003
pw-RS	0	100	100	1	15.1	33.0	7.45	288.26	7.30	7	9.33	0.006
25448	0	100	100	2	14.5	33.0	7.85	287.66	7.30	7	9.33	0.030
25448	10	100	100	1	14.7	33.0	8.18	287.86	7.30	7	9.33	0.032
pw-25448	0	100	100	23	14.8	32.0	7.33	287.96	7.09	7	9.33	0.108
25447	0	100	100	2	14.5	33.0	7.86	287.66	7.30	7	9.33	0.031
25447	10	100	100	1.23	14.6	32.0	8.67	287.76	7.09	7	9.33	0.114
pw-25447	0	100	100	14	15.2	26.0	7.56	288.36	5.82	6	9.32	0.117
C7	0	100	100	1	14.2	33.0	8.00	287.36	7.30	7	9.33	0.021
C7	10	100	100	0.26	14.5	35.0	8.14	287.66	7.73	8	9.34	0.007
pw-C7	0	100	100	4	16.7	34.0	7.63	289.86	7.52	8	9.34	0.042
10060	0	100	100	1	14.4	33.0	8.03	287.56	7.30	7	9.33	0.022
10060	10	100	100	0.19	14.7	34.0	8.10	287.86	7.52	8	9.34	0.005
pw-10060	0	100	100	6	16.7	34.0	7.66	289.86	7.52	8	9.34	0.068
10061	0	100	100	1	14.6	33.0	8.00	287.76	7.30	7	9.33	0.021
10061	10	100	100	0.13	14.8	34.0	8.12	287.96	7.52	8	9.34	0.004
pw-10061	0	100	100	8	15.8	34.0	7.40	289.96	7.52	8	9.34	0.050
10063	0	100	100	0	14.5	33.0	8.00	287.66	7.30	7	9.33	0.000
10063	10	100	100	0.08	14.7	34.0	8.08	287.86	7.52	8	9.34	0.002
pw-10063	0	100	100	5	16.7	34.0	7.30	289.86	7.52	8	9.34	0.025
10064	0	100	100	0	14.3	33.0	8.00	287.46	7.30	7	9.33	0.000
10064	10	100	100	2.11	14.6	34.0	8.12	287.76	7.52	8	9.34	0.058
pw-10064	0	100	100	8	16.8	34.0	7.62	289.96	7.52	8	9.34	0.083

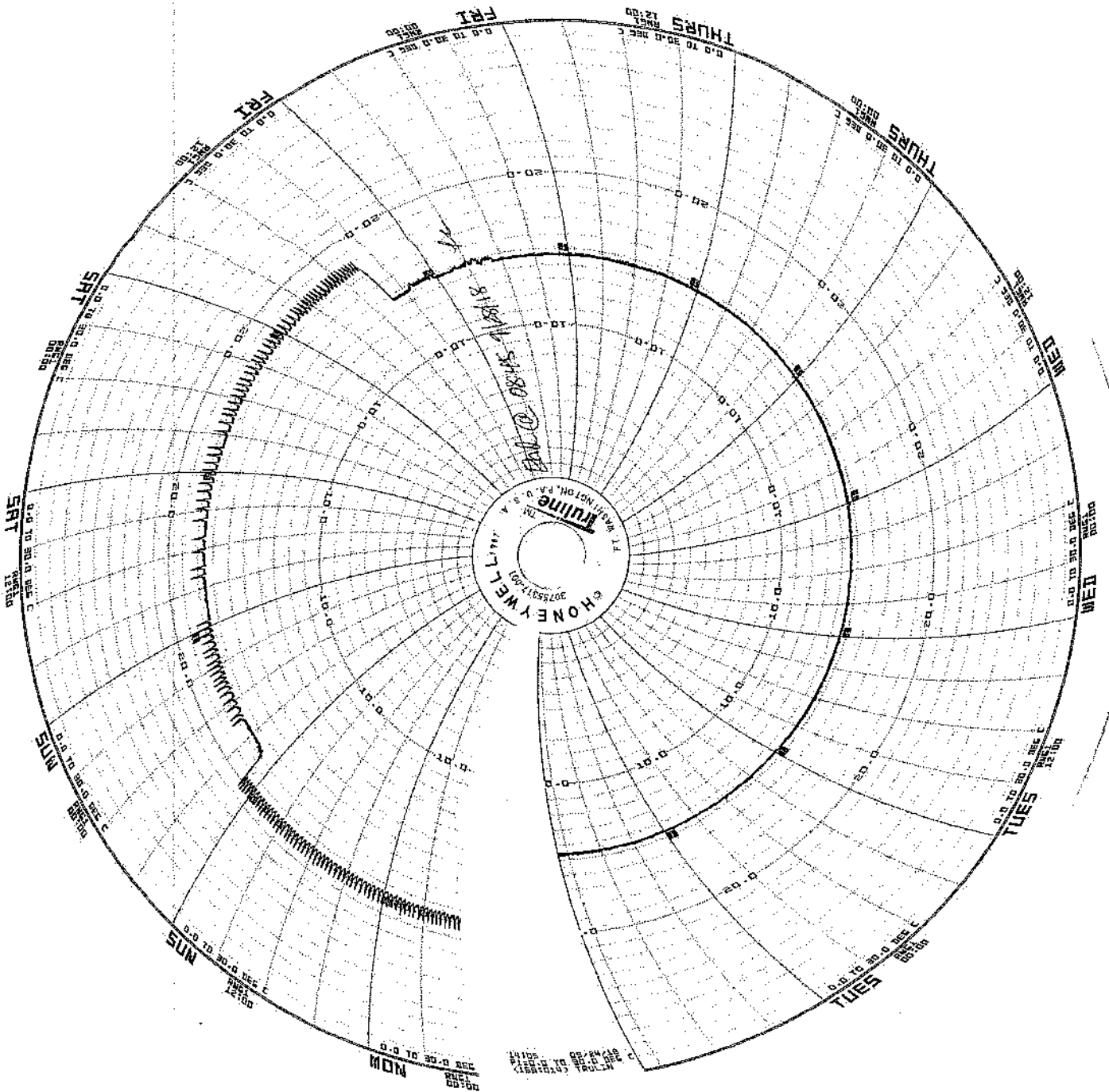


September 18, 2018 → September 22, 2018

1809 RT I.A.E

September 18, 2018 → September 28, 2018

1809071(A-G).E

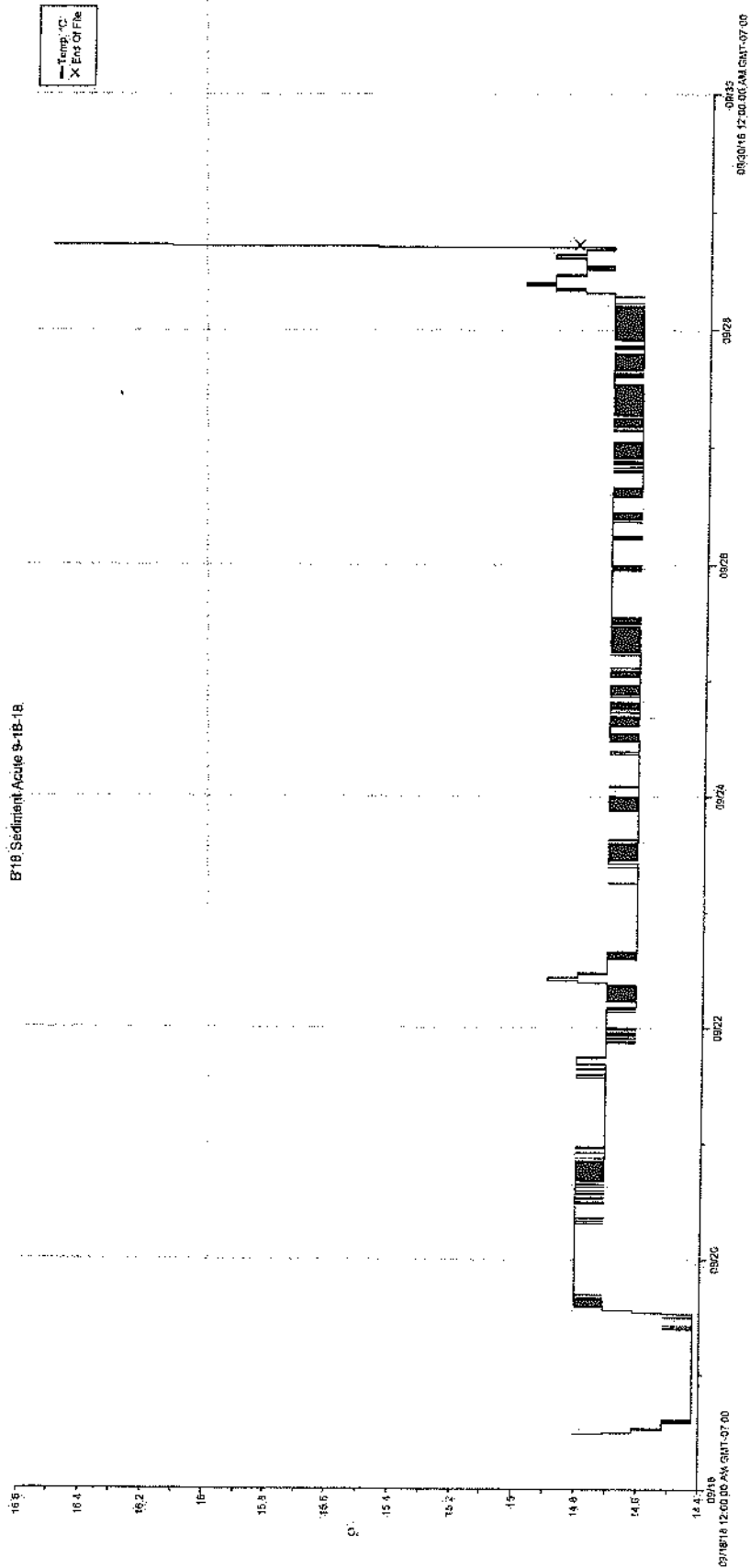


September 18, 2018 → September 22, 2018

1809071 A.E

September 18, 2018 → September 28, 2018

1809071 (A-G).E



September 18, 2018 → September 22, 2018

1809PT1A.E

September 18, 2018 → September 28, 2018

1809071(A-G).E

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT
TOXICITY TESTING REPORT

SAMPLE DATE: September 18, 2018

TEST DATE: September 18, 2018

TEST NUMBER: 1809RT1A.E

TEST MATERIAL: Unionized Ammonia

TEST SPECIES: *Eohaustorius estuarius*

PROTOCOL: EPA /600/R-94/025

TEST TYPE: Acute

RESULT: $EC_{50} = 3.23$ mg/L

Angelika Moskova

Water Biologist II

Analyst

(print name)

Title

Signature

Date

11/14/18

Rea Mara A. Crinklaw

Water Biologist III

Supervisor

(print name)

Title

Signature

Date

11/15/18

CETIS Summary Report

Report Date: 30 Oct-18 10:21 (p 1 of 1)
Test Code: 1809RT1A.E | 09-9408-5556

Eohaustorius 10-d Survival Reference Toxicant Test							Hyperion Treatment Plant Laboratory				
Batch ID:	03-6291-9054	Test Type:	Survival (10d)	Analyst:	Angelika Moskova						
Start Date:	18 Sep-18 10:10	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater						
Ending Date:	28 Sep-18 09:46	Species:	Eohaustorius estuarius	Brine:	Not Applicable						
Duration:	10d	Source:	Northwestern Aquatic Science, OR	Age:							
Sample ID:	17-1224-8983	Code:	NH4CL RT	Client:	Hyperion Treatment Plant						
Sample Date:	18 Sep-18 05:45	Material:	Unionized Ammonia (N)	Project:	NPDES						
Receive Date:	18 Sep-18 05:45	Source:	Reference Toxicant								
Sample Age:	4h	Station:	Reference Toxicant								
Batch Note: Interrupted dose response - RT.											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
08-0754-9722	4d Survival Rate	0.969	2.228	1.469	9.52%		Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	mg/L	95% LCL	95% UCL	TU	Method				
01-3150-5919	4d Survival Rate	EC10	0.9499	0.6443	1.21		Linear Regression (MLE)				
		EC15	1.201	0.8846	1.492						
		EC20	1.447	1.121	1.789						
		EC25	1.697	1.353	2.122						
		EC40	2.539	2.038	3.483						
		EC50	3.234	2.525	4.847						
4d Survival Rate Summary											
Conc-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	0	0	0.0%	0.0%
0.423		4	0.975	0.9563	0.9937	0.9	1	0.025	0.05	5.13%	2.5%
0.747		4	0.9	0.8695	0.9305	0.8	1	0.04082	0.08165	9.07%	10.0%
0.969		4	0.925	0.9063	0.9437	0.9	1	0.025	0.05	5.41%	7.5%
2.228		4	0.8	0.7695	0.8305	0.7	0.9	0.04082	0.08165	10.21%	20.0%
3.242		4	0.375	0.3392	0.4108	0.3	0.5	0.04787	0.09574	25.53%	62.5%
4d Survival Rate Detail											
Conc-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Dilution Water	1	1	1	1						
0.423		1	0.9	1	1						
0.747		0.8	1	0.9	0.9						
0.969		1	0.9	0.9	0.9						
2.228		0.7	0.8	0.9	0.8						
3.242		0.3	0.5	0.3	0.4						

CETIS Analytical Report

Report Date: 30 Oct-18 10:21 (p 1 of 2)
Test Code: 1809RT1A.E | 09-9408-5556

Eohaustorius 10-d Survival Reference Toxicant Test				Hyperion Treatment Plant Laboratory				
Analysis ID: 08-0754-9722	Endpoint: 4d Survival Rate	CETIS Version: CETISv1.8.1						
Analyzed: 30 Oct-18 10:18	Analysis: Parametric-Control vs Treatments	Official Results: Yes						
Batch ID: 03-6291-9054	Test Type: Survival (10d)	Analyst: Angelika Moskova						
Start Date: 18 Sep-18 10:10	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater						
Ending Date: 28 Sep-18 09:46	Species: Eohaustorius estuarius	Brine: Not Applicable						
Duration: 10d	Source: Northwestern Aquatic Science, OR	Age:						
Sample ID: 17-1224-8983	Code: NH4CL RT	Client: Hyperion Treatment Plant						
Sample Date: 18 Sep-18 05:45	Material: Unionized Ammonia (N)	Project: NPDES						
Receive Date: 18 Sep-18 05:45	Source: Reference Toxicant							
Sample Age: 4h	Station: Reference Toxicant							
Batch Note: Interrupted dose response - RT.								
Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run	0.969	2.228	1.469		9.52%
Dunnett Multiple Comparison Test								
Control	vs Conc-mg/L	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)	
Dilution Water	0.423	0.6332	2.407	6	0.1549	0.5884	Non-Significant Effect	
	0.747*	2.451	2.407	6	0.1549	0.0460	Significant Effect	
	0.969	1.899	2.407	6	0.1549	0.1235	Non-Significant Effect	
	2.228*	4.637	2.407	6	0.1549	0.0005	Significant Effect	
	3.242*	11.73	2.407	6	0.1549	<0.0001	Significant Effect	
Auxiliary Tests								
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)			
Extreme Value	0	1.959	2.802	1.0000	No Outliers Detected			
Control Trend	15	6		1.0000	Non-significant Trend in Controls			
ANOVA Table								
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)		
Between	1.542026	0.3084051	5	37.24	<0.0001	Significant Effect		
Error	0.1490664	0.008281468	18					
Total	1.691092	0.3166866	23					
Distributional Tests								
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)			
Variances	Mod Levene Equality of Variance	0.7106	4.248	0.6233	Equal Variances			
Distribution	Shapiro-Wilk W, Normality	0.9461	0.864	0.2229	Normal Distribution			

CETIS Analytical Report

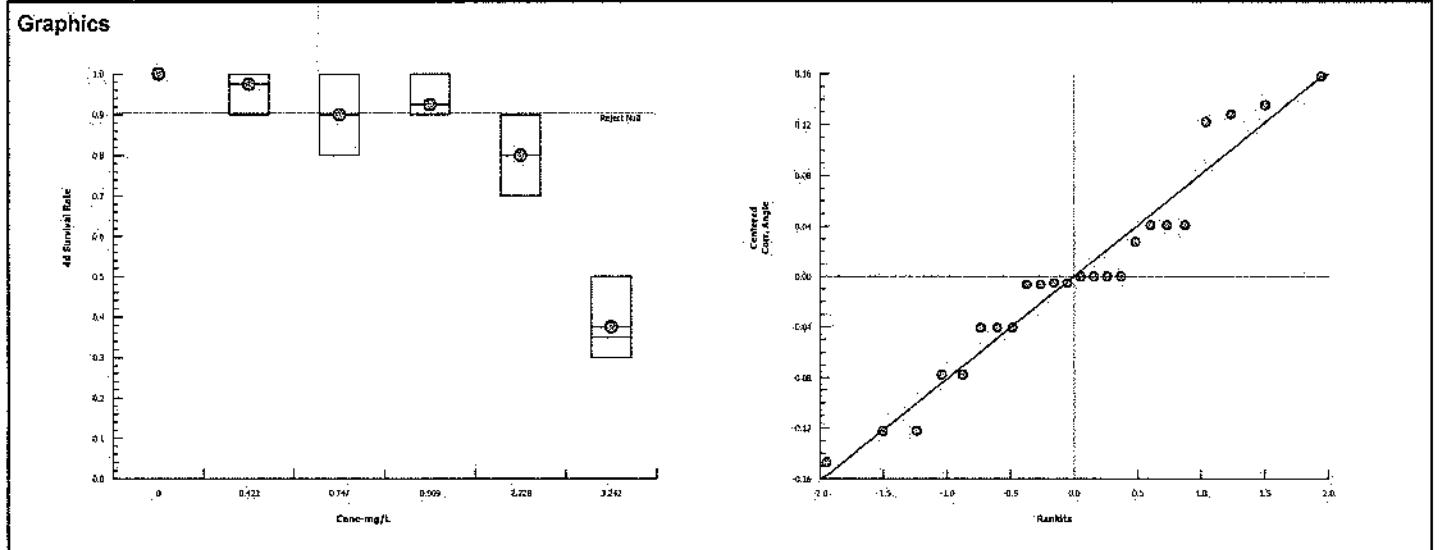
Report Date: 30 Oct-18 10:21 (p 2 of 2)
Test Code: 1809RT1A.E | 09-9408-5556

Eohaustorius 10-d Survival Reference Toxicant Test				Hyperion Treatment Plant Laboratory			
Analysis ID: 08-0754-9722	Endpoint: 4d Survival Rate	CETIS Version: CETISv1.8.1					
Analyzed: 30 Oct-18 10:18	Analysis: Parametric-Control vs Treatments	Official Results: Yes					

4d Survival Rate Summary											
Conc-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	0	0	0.0%	0.0%
0.423		4	0.975	0.956	0.994	0.9	1	0.025	0.05	5.13%	2.5%
0.747		4	0.9	0.8689	0.9311	0.8	1	0.04082	0.08165	9.07%	10.0%
0.969		4	0.925	0.906	0.944	0.9	1	0.025	0.05	5.41%	7.5%
2.228		4	0.8	0.7689	0.8311	0.7	0.9	0.04082	0.08165	10.21%	20.0%
3.242		4	0.375	0.3386	0.4114	0.3	0.5	0.04787	0.09574	25.53%	62.5%

Angular (Corrected) Transformed Summary											
Conc-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	1.412	1.412	1.412	1.412	1.412	0	0	0.0%	0.0%
0.423		4	1.371	1.34	1.402	1.249	1.412	0.04074	0.08149	5.94%	2.89%
0.747		4	1.254	1.207	1.302	1.107	1.412	0.06231	0.1246	9.94%	11.17%
0.969		4	1.29	1.259	1.321	1.249	1.412	0.04074	0.08149	6.32%	8.66%
2.228		4	1.114	1.073	1.154	0.9912	1.249	0.05277	0.1055	9.48%	21.13%
3.242		4	0.6573	0.6198	0.6949	0.5796	0.7854	0.04935	0.0987	15.01%	53.45%

4d Survival Rate Detail						
Conc-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	
0	Dilution Water	1	1	1	1	
0.423		1	0.9	1	1	
0.747		0.8	1	0.9	0.9	
0.969		1	0.9	0.9	0.9	
2.228		0.7	0.8	0.9	0.8	
3.242		0.3	0.5	0.3	0.4	



RT shows interrupted dose response

CETIS Analytical Report

Report Date: 30 Oct-18 10:21 (p 1 of 2)
Test Code: 1809RT1A.E | 09-9408-5556

Eohaustorius 10-d Survival Reference Toxicant Test							Hyperion Treatment Plant Laboratory			
Analysis ID: 01-3150-5919		Endpoint: 4d Survival Rate		CETIS Version: CETISv1.8.1						
Analyzed: 30 Oct-18 10:18		Analysis: Linear Regression (MLE)		Official Results: Yes						
Batch ID: 03-6291-9054		Test Type: Survival (10d)		Analyst: Angelika Moskova						
Start Date: 18 Sep-18 10:10		Protocol: EPA/600/R-94/025 (1994)		Diluent: Laboratory Seawater						
Ending Date: 28 Sep-18 09:46		Species: Eohaustorius estuarius		Brine: Not Applicable						
Duration: 10d		Source: Northwestern Aquatic Science, OR		Age:						
Sample ID: 17-1224-8983		Code: NH4CL RT		Client: Hyperion Treatment Plant						
Sample Date: 18 Sep-18 05:45		Material: Unionized Ammonia (N)		Project: NPDES						
Receive Date: 18 Sep-18 05:45		Source: Reference Toxicant								
Sample Age: 4h		Station: Reference Toxicant								
Batch Note: Interrupted dose response - RT.										
Linear Regression Options										
Model Function			Threshold Option		Threshold	Optimized	Pooled	Het Corr	Weighted	
Log-Normal [NED=A+B*log(X)]			Control Threshold		1E-08	Yes	No	No	Yes	
Regression Summary										
Iters	LL	QAICc	BIC	Mu	Sigma	Adj R2	F Stat	Critical	P-Value	Decision(α:5%)
4	-78.85	165.2	166.7	1.566	0.4152	0.476	5.441	3.682	0.0167	Significant Lack of Fit
Point Estimates										
Level	mg/L	95% LCL	95% UCL							
EC10	0.9499	0.6443	1.21							
EC15	1.201	0.8846	1.492							
EC20	1.447	1.121	1.789							
EC25	1.697	1.353	2.122							
EC40	2.539	2.038	3.483							
EC50	3.234	2.525	4.847							
Regression Parameters										
Parameter	Estimate	Std Error	95% LCL	95% UCL	t Stat	P-Value	Decision(α:5%)			
Threshold	2.34E-08	2.29E-05	-4.5E-05	4.48E-05	0.001022	0.9992	Non-Significant Parameter			
Slope	2.408	0.4077	1.609	3.207	5.907	<0.0001	Significant Parameter			
Intercept	3.772	0.1482	3.482	4.063	25.45	<0.0001	Significant Parameter			
ANOVA Table										
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)				
Model	21.0417	21.0417	1	19.26	0.0004	Significant				
Lack of Fit	7.810648	3.905324	2	5.441	0.0167	Significant				
Pure Error	10.76545	0.717697	15							
Residual	18.5761	1.092712	17							
Residual Analysis										
Attribute	Method		Test Stat	Critical	P-Value	Decision(α:5%)				
Goodness-of-Fit	Pearson Chi-Sq GOF		18.58	27.59	0.3534	Non-Significant Heterogeneity				
	Likelihood Ratio GOF		18.2	27.59	0.3764	Non-Significant Heterogeneity				
Extreme Value	Grubbs Extreme Value		2.082	2.708	0.5652	No Outliers Detected				
Variances	Bartlett Equality of Variance		3.534	9.488	0.4727	Equal Variances				
	Mod Levene Equality of Variance		0.2271	3.056	0.9190	Equal Variances				
Distribution	Shapiro-Wilk W Normality		0.9571	0.9044	0.4882	Normal Distribution				
	Anderson-Darling A2 Normality		0.4339	2.492	0.3061	Normal Distribution				
Control Trend	Mann-Kendall Trend		6		1.0000	Non-significant Trend in Controls				

CETIS Analytical Report

Report Date: 30 Oct-18 10:21 (p 2 of 2)
Test Code: 1809RT1A.E | 09-9408-5556

Eohaustorius 10-d Survival Reference Toxicant Test

Hyperion Treatment Plant Laboratory

Analysis ID: 01-3150-5919
Analyzed: 30 Oct-18 10:18

Endpoint: 4d Survival Rate
Analysis: Linear Regression (MLE)

CETIS Version: CETISv1.8.1
Official Results: Yes

4d Survival Rate Summary

Calculated Variate(A/B)

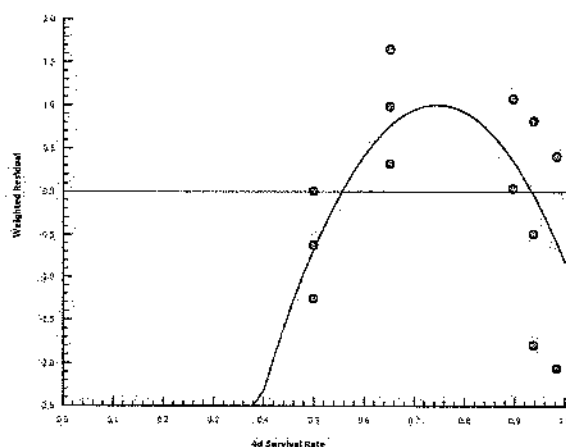
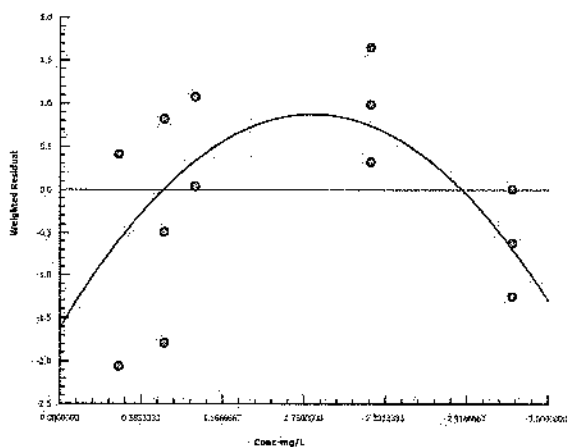
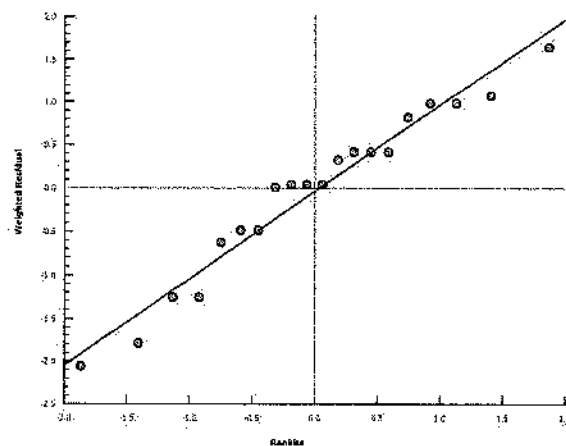
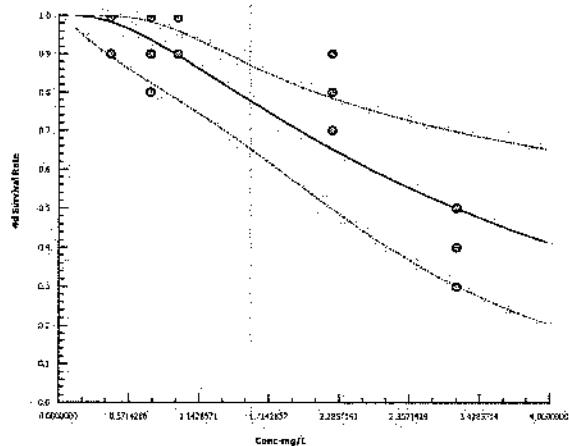
Conc-mg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	4	1	1	1	0	0	0.0%	0.0%	40	40
0.423		4	0.975	0.9	1	0.025	0.05	5.13%	2.5%	39	40
0.747		4	0.9	0.8	1	0.04082	0.08165	9.07%	10.0%	36	40
0.969		4	0.925	0.9	1	0.025	0.05	5.41%	7.5%	37	40
2.228		4	0.8	0.7	0.9	0.04082	0.08165	10.21%	20.0%	32	40
3.242		4	0.375	0.3	0.5	0.04787	0.09574	25.53%	62.5%	15	40

4d Survival Rate Detail

Conc-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	1	1	1	1
0.423		1	0.9	1	1
0.747		0.8	1	0.9	0.9
0.969		1	0.9	0.9	0.9
2.228		0.7	0.8	0.9	0.8
3.242		0.3	0.5	0.3	0.4

Graphics

Log-Normal [NED=A+B*log(X)]



Eohaustorius 10-d Survival Reference Toxicant Test

Hyperion Treatment Plant Laboratory

Test Type: Survival (10d)

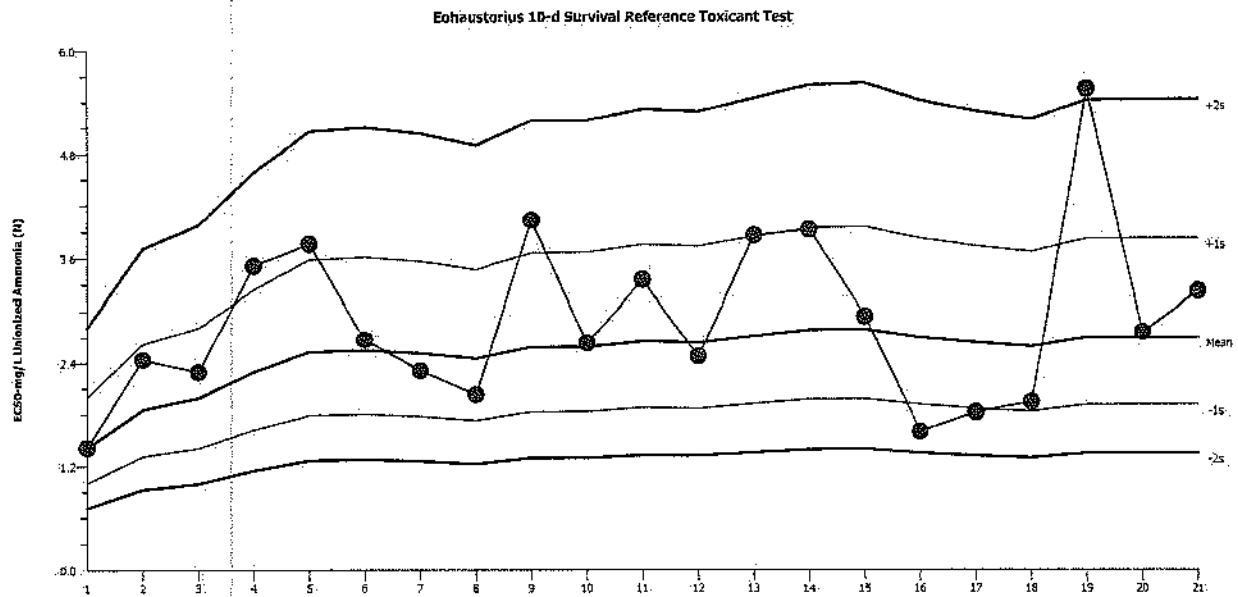
Organism: Eohaustorius estuarius (Amphipod)

Material: Unionized Ammonia (N)

Protocol: EPA/600/R-94/025 (1994)

Endpoint: 4d Survival Rate

Source: Reference Toxicant-REF



Mean: 2.714

Count: 20

-1s Warning Limit: 1.92

-2s Action Limit: 1.359

Sigma: N/A

CV: 41.30%

+1s Warning Limit: 3.835

+2s Action Limit: 5.42

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2013	Mar	3	1.413	-1.301	-1.887	(-)		00-6047-4759	07-8594-6362
2		Aug	1	2.44	-0.2735	-0.3071			00-1296-1726	11-7817-2274
3			15	2.296	-0.4176	-0.4831			12-0392-9446	06-7799-3996
4			30	3.513	0.7991	0.7462			16-8949-3347	14-4910-1336
5		Sep	19	3.764	1.05	0.9458			17-0027-4218	04-6368-5784
6		Oct	10	2.68	-0.03377	-0.03621			16-4635-8372	15-7450-7965
7			31	2.315	-0.3984	-0.459			12-1910-7837	11-4875-3901
8	2014	Jul	23	2.032	-0.6821	-0.8369			15-4342-6024	20-2173-7792
9	2015	Jun	29	4.039	1.325	1.149	(+)		09-9505-3853	00-6402-4780
10		Aug	11	2.642	-0.07162	-0.07732			19-2291-4772	18-4133-8013
11		Nov	16	3.359	0.6456	0.617			10-6237-5111	11-9473-0436
12	2016	Jul	8	2.487	-0.2262	-0.2516			12-3861-8349	14-7667-7844
13		Aug	9	3.865	1.151	1.022	(+)		10-6970-3228	16-4613-9557
14		Sep	19	3.932	1.219	1.072	(+)		04-7972-0466	06-7686-9493
15	2017	Aug	3	2.958	0.244	0.249			01-8072-9029	09-8810-9053
16		Oct	25	1.612	-1.102	-1.506	(-)		19-6863-8116	15-2031-4264
17	2018	Mar	5	1.833	-0.8806	-1.134	(-)		14-7055-8724	14-2648-8599
18		Jul	17	1.952	-0.7621	-0.9531			14-1863-9149	10-6546-4342
19			31	5.536	2.823	2.061	(+)	(+)	07-3030-5779	06-9669-2024
20		Aug	20	2.776	0.06213	0.06545			02-8216-8419	12-8260-7610
21		Sep	18	3.234	0.5206	0.5074			09-9408-5556	05-5813-3808

Hyperion Treatment Plant Laboratory

Eohaustorius 10-d Survival Reference Toxicant Test

Start Date: 18 Sep-18 10:00 Species: Eohaustorius estuarius
End Date: 28 Sep-18 Protocol: EPA/600/R-94/025 (1994)
Sample Date: 18 Sep-18 Material: Unionized Ammonia (N)

Sample Code: 660ED897
Sample Source: Reference Toxicant
Sample Station: Reference Toxicant

Conc-mg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	8d Survival	9d Survival	10d Survival
0	D	1	23	10	10	10	10	10	10	10	10	10	10	10
0	D	2	19	10	10	10	10	10	10	10	10	10	10	10
0	D	3	2	10	10	10	10	10	10	10	10	10	10	10
0	D	4	4*	10	10	10	10	10	10	10	10	10	10	10
15.6		1	24	10	10	10	10	10	10	10	10	10	10	10
15.6		2	6	10	10	10	10	10	10	10	10	10	10	10
15.6		3	8	10	10*	10	10	10	10	10	10	10	10	10
15.6		4	1*	10	10	10	10	10	10	10	10	10	10	10
31.2		1	22	10	10*	10	10	10	10	10	10	10	10	10
31.2		2	12	10	10	10	10	10	10	10	10	10	10	10
31.2		3	3	10	10	10	10	10	10	10	10	10	10	10
31.2		4	15*	10	10	10	10	10	10	10	10	10	10	10
62.5		1	13	10	10*	10	10	10	10	10	10	10	10	10
62.5		2	16	10	10	10	10	10	10	10	10	10	10	10
62.5		3	17	10	10	10	10	10	10	10	10	10	10	10
62.5		4	7*	10	10	10	10	10	10	10	10	10	10	10
125		1	10	10	8	8	8	8	8	8	8	8	8	8
125		2	5	10	9	9	9	9	9	9	9	9	9	9
125		3	11	10	10	10	10	10	10	10	10	10	10	10
125		4	14*	10	10*	10	10	10	10	10	10	10	10	10
250		1	21	10	6	6	6	6	6	6	6	6	6	6
250		2	9	10	7	7	7	7	7	7	7	7	7	7
250		3	18	10	7	7	7	7	7	7	7	7	7	7
250		4	20*	10	7	7	7	7	7	7	7	7	7	7

*9.19 neonates Aug
*9.19 neonates Aug
*9.19 neonates Aug
*9.19 neonates Aug
*9.19 neonates Aug
*9.20 neonates
*9.18 9.19 9.20 9.21 9.22
100 1230 1410 1446
Aug Aug Aug Aug Aug
pc/100 pc/100 pc/100 pc/100 pc/100

*9.18.18. RT STOCK @ 5:45 . Aug

CETIS Measurement Worksheet

Report Date: 18 Sep-18 06:17 (p 1 of 2)
Test Code: 1809RT1A.E | 09-9408-5556

Eohaustorius 10-d Survival Reference Toxicant Test

Hyperion Treatment Plant Laboratory

Start Date: 18 Sep-18
End Date: 28 Sep-18
Sample Date: 18 Sep-18

Species: Eohaustorius estuarius
Protocol: EPA/600/R-94/025 (1994)
Material: Unionized Ammonia (N)

Sample Code: 660ED897
Sample Source: Reference Toxicant
Sample Station: Reference Toxicant

Dissolved Oxygen-mg/L

Conc-mg/L	Code	Reading 1	Reading 2	Reading 3
0	D	8.19	7.92	7.97
15.6		8.18	7.93	7.96
31.2		8.18	8.02	7.93
62.5		8.19	7.99	8.02
125		8.21	8.00	8.03
250		8.20	7.92	8.07
Measure Time:		8:05	9:30	8:45
Instrument ID:		#1	#1	#1
Analyst:		Ag	Ag	AS

Total Ammonia (N)-mg/L

Conc-mg/L	Code	Reading 1	Reading 2
0	D	0	0
15.6		18	16
31.2		35	33
62.5		52	60
125		150	140
250		300	230
Measure Time:		8:05	09:46
Instrument ID:		HACH	HACH
Analyst:		Ag	RE/AG

Unionized Ammonia (N)-mg/L

Conc-mg/L	Code	Reading 1	Reading 2
0	D	0	0
15.6		0.423	0.287
31.2		0.747	0.609
62.5		0.969	1.035
125		2.228	1.815
250		3.242	2.759
Measure Time:			
Instrument ID:		HAMPSON	
Analyst:		Ag	Ag

pH

Conc-mg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5
0	D	8.09	8.07	8.05	7.98	7.90
15.6		8.05	8.03	8.01	7.96	7.92
31.2		8.01	8.01	8.00	7.97	7.93
62.5		7.95	7.95	7.95	7.96	7.90
125		7.85	7.85	7.85	7.84	7.81
250		7.72	7.74	7.78	7.81	7.74
Measure Time:		8:05	12:30	9:50	16:10	8:45
Instrument ID:		#4	#4	#4	#4(3)	#4
Analyst:		Ag	Ag	Ag	Ag	AS

CETIS Measurement Worksheet

Report Date: 18 Sep-18 06:17 (p 2 of 2)
 Test Code: 1809RT1A.E | 09-9408-5556

Eohaustorius 10-d Survival Reference Toxicant Test

Hyperion Treatment Plant Laboratory

Start Date: 18 Sep-18
 End Date: 28 Sep-18
 Sample Date: 18 Sep-18

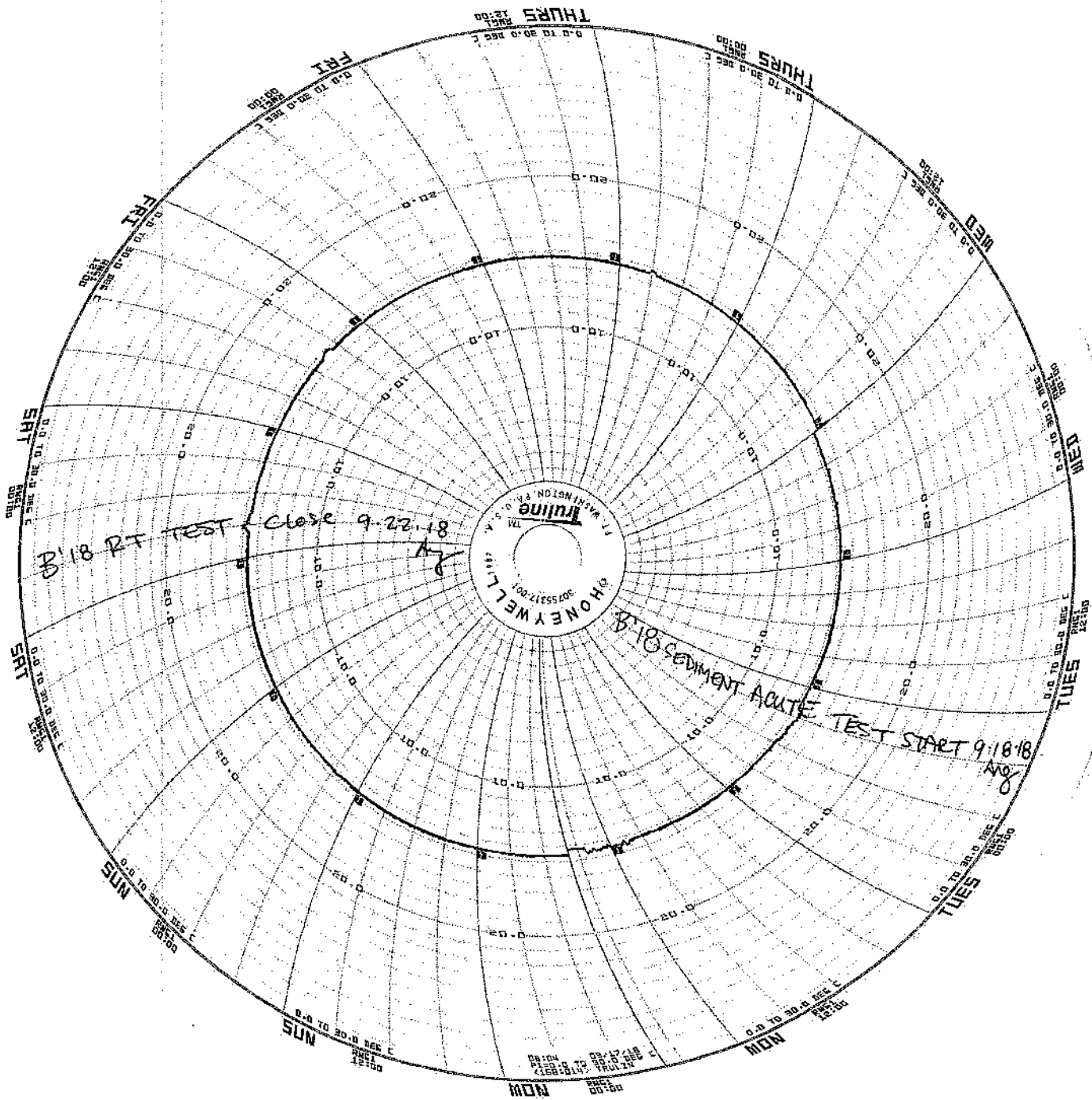
Species: Eohaustorius estuarius
 Protocol: EPA/600/R-94/025 (1994)
 Material: Unionized Ammonia (N)

Sample Code: 660ED897
 Sample Source: Reference Toxicant
 Sample Station: Reference Toxicant

Salinity-ppt		9.18	9.20	9.22
Conc-mg/L	Code	Reading 1	Reading 2	Reading 3
0	D	33	33	33
15.6		33	33	34
31.2		33	33	34
62.5		33	34	34
125		33	34	34
250		34	34	34
Measure Time:		8:05	9:30	8:45
Instrument ID:		#4	#3	#3
Analyst:		Ang	Ang	AS

Temperature-°C		9.18	9.19	9.20	9.21	9.22
Conc-mg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5
0	D	14.3	14.6	15.0	15.2	15.2
15.6		14.4	14.6	14.9	15.1	15.0
31.2		14.3	14.7	14.9	15.2	15.1
62.5		14.3	14.6	15.0	15.1	15.1
125		14.3	14.6	14.9	15.1	15.0
250		14.3	14.6	15.1	15.1	15.1
Measure Time:		8:05	12:30	9:30	16:10	8:45
Instrument ID:		#4	#4	#4	#4(3)	#4
Analyst:		Ang	Ang	Ang	Ang	AS

[illegible]

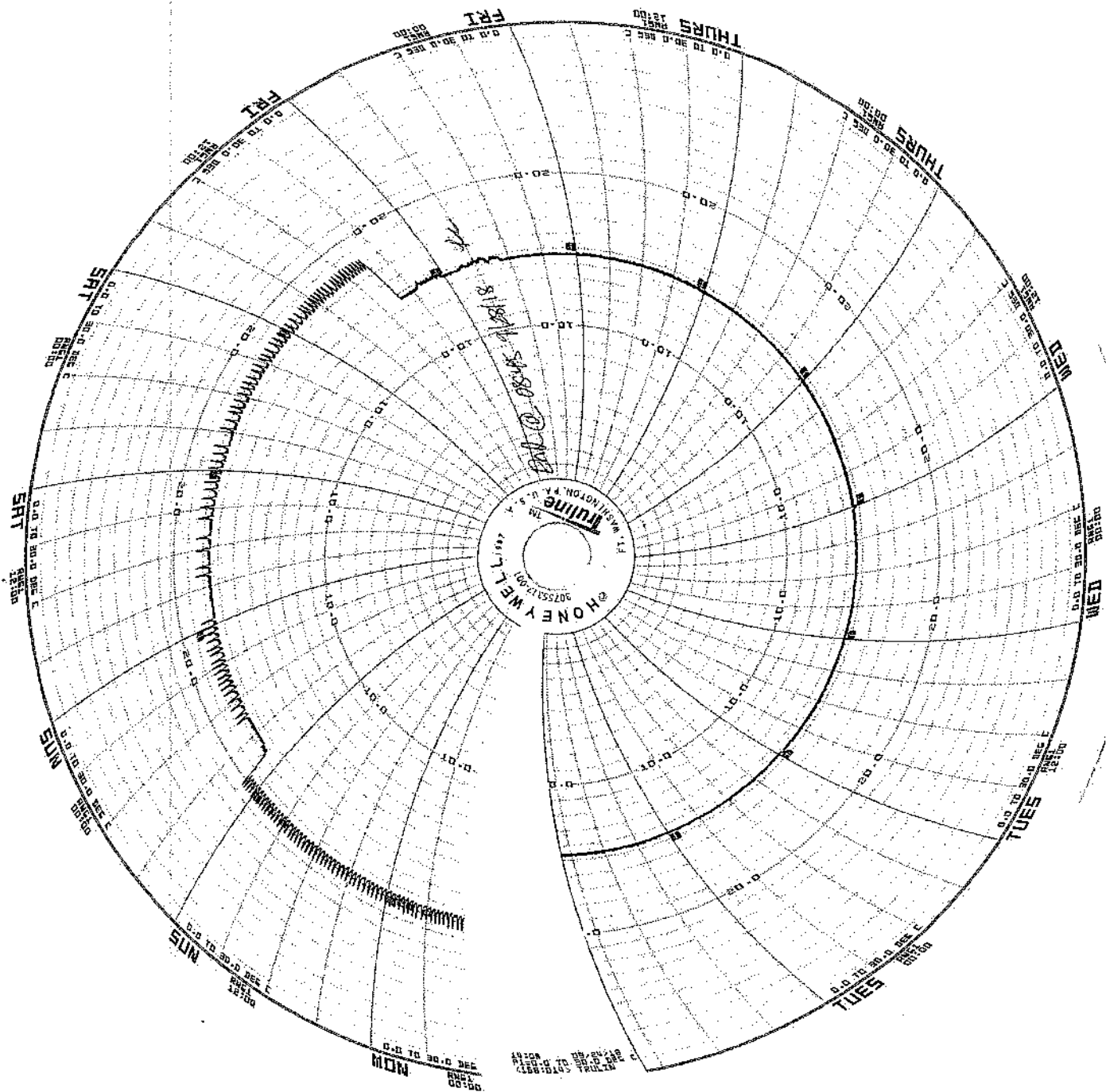


September 18, 2018 → September 22, 2018

1809 RT I.A.E

September 18, 2018 → September 28, 2018

1809071(A-G).E

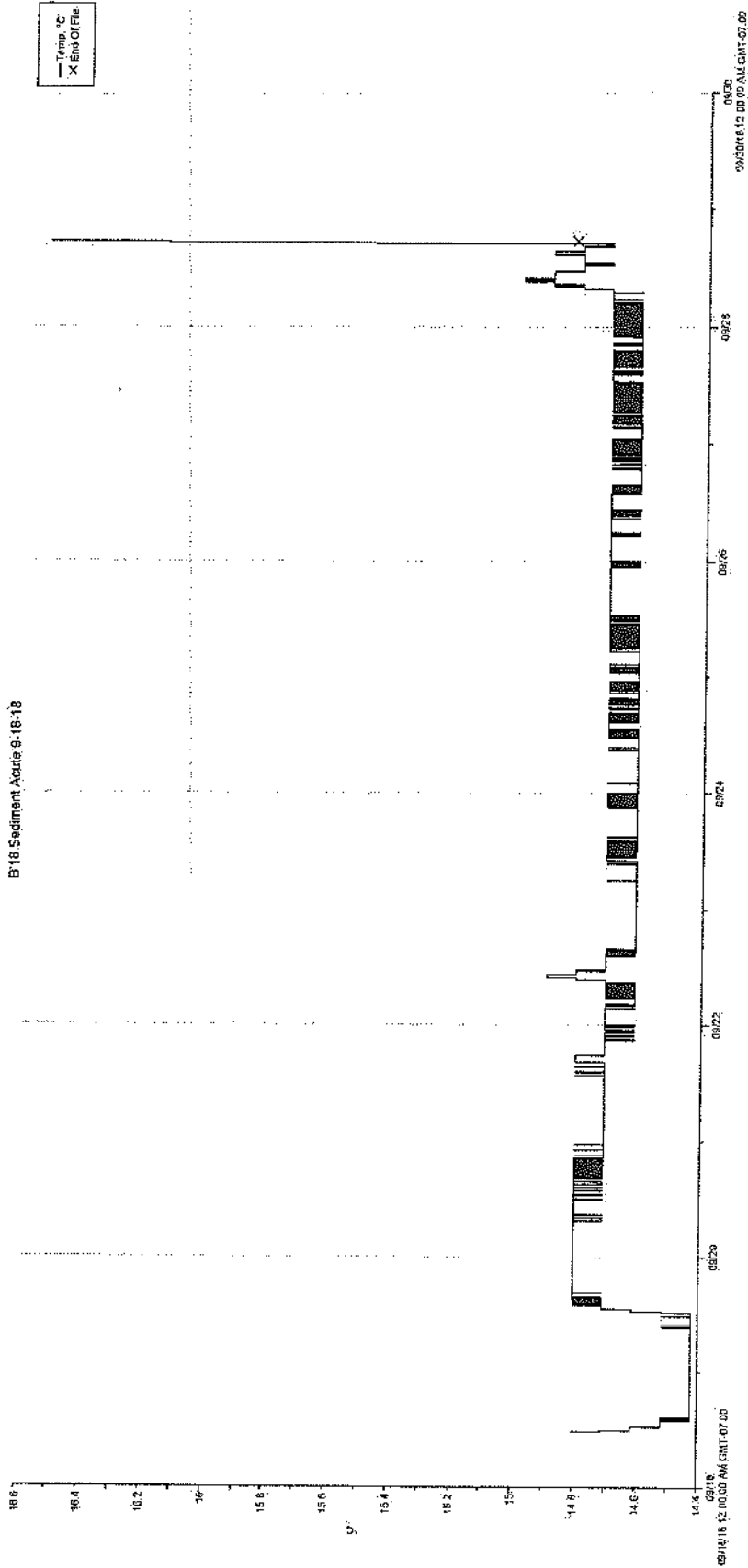


September 18, 2018 → September 22, 2018

1809RTIA.E

September 18, 2018 → September 28, 2018

1809071 (A-G).E



September 18, 2018 → September 22, 2018

1809PT1A.E

September 18, 2018 → September 28, 2018

1809071(A-G).E

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: November 22, 2018

TEST DATE: November 23, 2018

TEST NUMBER: 1811072G.C

TEST MATERIAL: Station DOM-RW-DC01

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

REFERENCE TOXICANT TEST: 1811RT2B.C

RESULT:

Survival
Reproduction

Pass, 0% effect
Pass, 7.55% effect

Rea Mara A Crinklaw
Analyst


Signature

Water Biologist III
Title

11/23/19
Date

Stacey Karnya
Supervisor


Signature

Acting Laboratory Manager I
Title

1-28-19
Date

CETIS Summary Report

Report Date: 28 Dec-18 16:10 (p 1 of 1)

Test Code: 1811072G.C | 13-4012-5766

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Batch ID: 17-1558-0949	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 23 Nov-18 14:04	Protocol: EPA/821/R-02-013 (2002)	Diluent: <i>Mod</i> Hard Synthetic Water									
Ending Date: 30 Nov-18 15:18	Species: Ceriodaphnia dubia	Brine:									
Duration: 7d 1h	Source: In-House Culture	Age: <8h 11/23/18 (09:50-13:35)									
Sample ID: 12-5816-9135	Code: 3290601	Client: Watershed Protection Division									
Sample Date: 22 Nov-18 04:50	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 22 Nov-18 08:05	Source: Stormwater (STORMWATER)										
Sample Age: 33h (16.2 °C)	Station: DOM-RW-DC01	<i>Batch 1116; HBN 169941</i>									
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3290601	22 Nov-18 04:50	22 Nov-18 08:05	24 Nov-18 12:28	16.2						
2	3290601	22 Nov-18 04:50	22 Nov-18 08:05	25 Nov-18 12:42	16.2						
3	3290601	22 Nov-18 04:50	22 Nov-18 08:05	26 Nov-18 13:08	16.2						
4	3290601	22 Nov-18 04:50	22 Nov-18 08:05	27 Nov-18 11:57	16.2						
5	3290601	22 Nov-18 04:50	22 Nov-18 08:05	28 Nov-18 10:31	16.2						
6	3290601	22 Nov-18 04:50	22 Nov-18 08:05	29 Nov-18 12:41	16.2						
Batch Note: Insufficient neonate production from the broodboards to use for the test. Neonates from Master Culture Beakers #2 & #4 (11/23/18 9:50 - 13:35) were used. Blocking by known parentage not performed.											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
07-2523-7813	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
19-3933-7501	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
07-2523-7813	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
19-3933-7501	Reproduction	Control Resp	31.8	15 - NL	Yes	Passes Acceptability Criteria					
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	31.8	29.81	33.79	22	39	1.685	5.329	16.76%	0.0%
100		10	29.4	25.98	32.82	11	40	2.899	9.168	31.18%	7.55%
7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1
Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	35	32	22	39	24	36	34	33	29	34
100		33	40	28	38	18	11	32	38	27	29

CETIS Analytical Report

Report Date: 28 Dec-18 16:10 (p 1 of 4)
 Test Code: 1811072G.C | 13-4012-5766

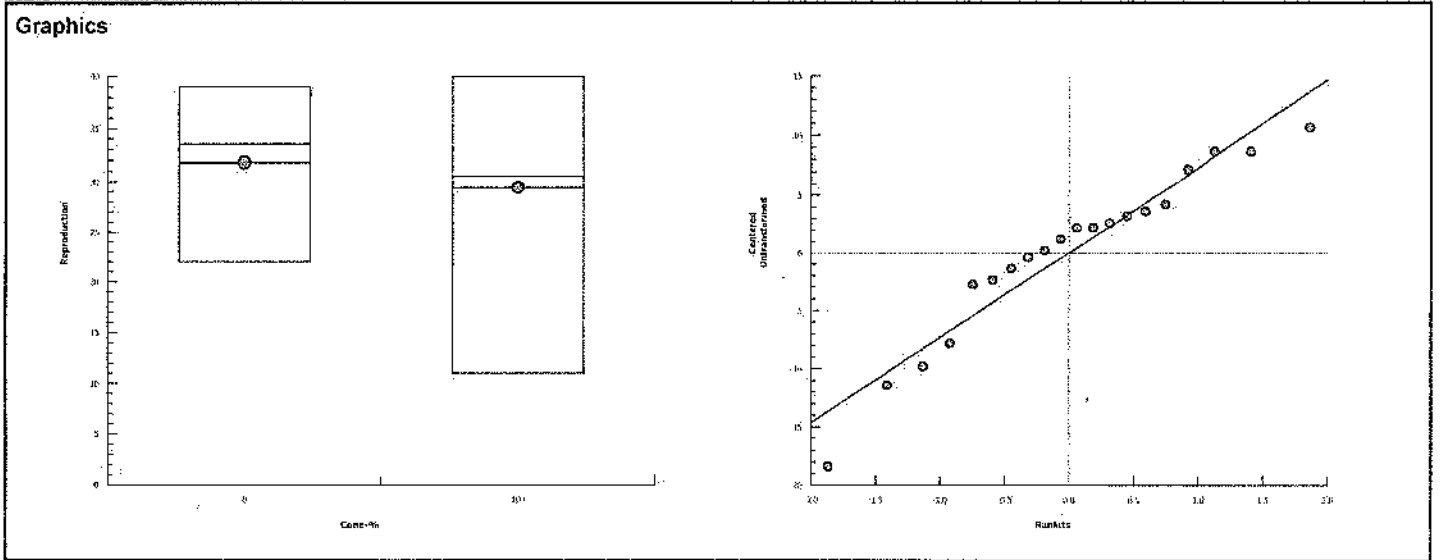
Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 19-3933-7501	Endpoint: Reproduction	CETIS Version: CETISv1.8.1									
Analyzed: 03 Dec-18 9:24	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes									
Batch ID: 17-1558-0949	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 23 Nov-18 14:04	Protocol: EPA/821/R-02-013 (2002)	Diluent: <i>Mid</i> Hard Synthetic Water									
Ending Date: 30 Nov-18 15:18	Species: Ceriodaphnia dubia	Brine:									
Duration: 7d 1h	Source: In-House Culture	Age: <8h <i>11/23/18 (09:50-13:35)</i>									
Sample ID: 12-5816-9135	Code: 3290601	Client: Watershed Protection Division									
Sample Date: 22 Nov-18 04:50	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 22 Nov-18 08:05	Source: Stormwater (STORMWATER)										
Sample Age: 33h (16.2 °C)	Station: DOM-RW-DC01										
Batch Note: Insufficient neonate production from the broodboards to use for the test. Neonates from Master Culture Beakers #2 & #4 (11/23/18 9:50 - 13:35) were used. Blocking by known parentage not performed.											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Untransformed	0	C*b > T	Not Run	0.75	Sample passes reproduction endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	1.755	0.8726	12		0.0524	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	31.8	15 - NL	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.521	2.708	0.1162	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	28.8	28.8	1	0.5123	0.4833	Non-Significant Effect					
Error	1012	56.22222	18								
Total	1040.8	85.02222	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	2.959	6.541	0.1217	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9345	0.866	0.1885	Normal Distribution						
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	31.8	29.77	33.83	22	39	1.685	5.329	16.76%	0.0%
100		10	29.4	25.91	32.89	11	40	2.899	9.168	31.18%	7.55%

CETIS Analytical Report

Report Date: 28 Dec-18 16:10 (p 2 of 4)
 Test Code: 1811072G.C | 13-4012-5766

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory	
Analysis ID:	19-3933-7501	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1	
Analyzed:	03 Dec-18 9:24	Analysis:	Parametric Bioequivalence-Two Sample	Official Results:	Yes	

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	35	32	22	39	24	36	34	33	29	34
100		33	40	28	38	18	11	32	38	27	29



CETIS Analytical Report

Report Date: 28 Dec-18 16:10 (p 3 of 4)
Test Code: 1811072G.C | 13-4012-5766

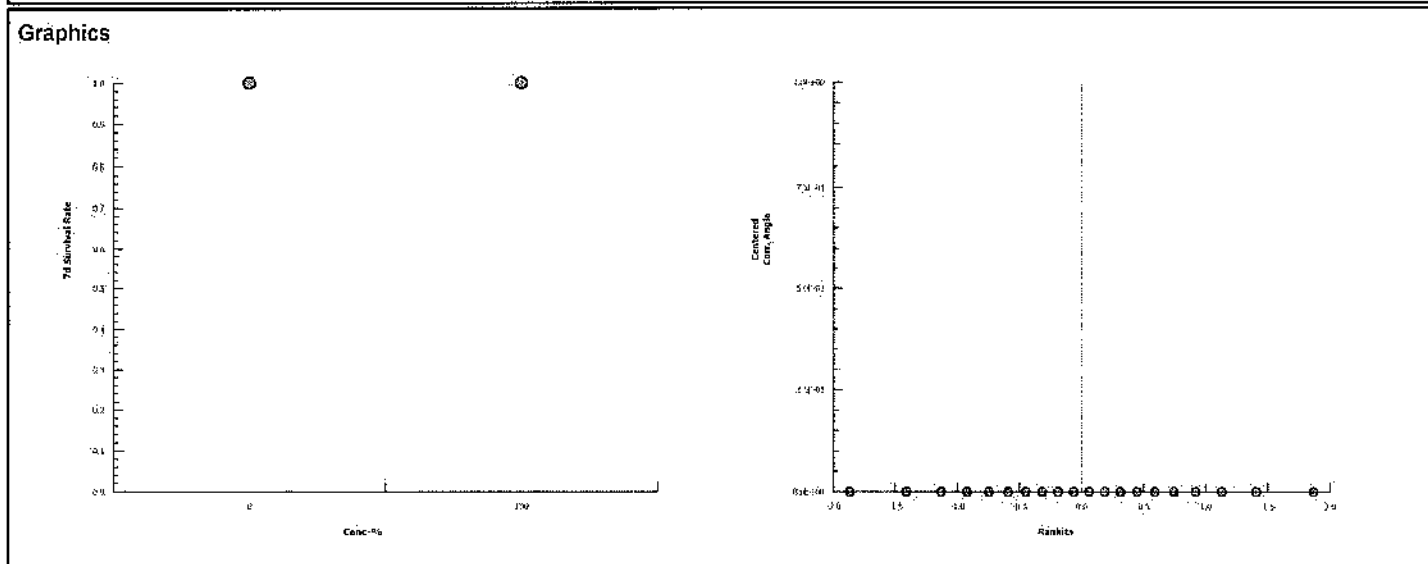
Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 07-2523-7813	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1									
Analyzed: 03 Dec-18 9:24	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes									
Batch ID: 17-1558-0949	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 23 Nov-18 14:04	Protocol: EPA/821/R-02-013 (2002)	Diluent: <i>Mod</i> Hard Synthetic Water									
Ending Date: 30 Nov-18 15:18	Species: Ceriodaphnia dubia	Brine:									
Duration: 7d 1h	Source: In-House Culture	Age: <8h	<i>11/23/18 (09:50-13:35)</i>								
Sample ID: 12-5816-9135	Code: 3290601	Client: Watershed Protection Division									
Sample Date: 22 Nov-18 04:50	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 22 Nov-18 08:05	Source: Stormwater (STORMWATER)										
Sample Age: 33h (16.2 °C)	Station: DOM-RW-DC01										
Batch Note: Insufficient neonate production from the broodboards to use for the test. Neonates from Master Culture Beakers #2 & #4 (11/23/18 9:50 - 13:35) were used. Blocking by known parentage not performed.											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Angular (Corrected)	0	C*b > T	Not Run	0.75	Sample passes 7d survival rate endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	0.2618				<0.2	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	65540	<0.0001	Significant Effect					
Error	0	0	18								
Total	0	0	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Mod Levene Equality of Variance	65540	8.285	<0.0001	Unequal Variances						
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%
100		10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%

CETIS Analytical Report

Report Date: 28 Dec-18 16:10 (p.4 of 4)
 Test Code: 1811072G.C | 13-4012-5766

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID:	07-2523-7813	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.1						
Analyzed:	03 Dec-18 9:24	Analysis:	Parametric Bioequivalence-Two Sample	Official Results:	Yes						

7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1



CETIS Test Data Worksheet

Report Date: 21 Nov-18 11:05 (p 1 of 1)
 Test Code: 13-4012-5766/1811072G.C

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 23 Nov-18 ¹⁴⁰⁴
 End Date: 30 Nov-18 ¹⁵¹⁸
 Sample Date: 21 Nov-18
 Species: Ceriodaphnia dubia
 Protocol: EPA/821/R-02-013 (2002)
 Material: Stormwater Monitoring Sample

Sample Code: 4AFE232F
 Sample Source: Stormwater
 Sample Station: DOM-RW-DC01

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1		1	0	0	0	5	8	0	22	35	
0	D	2		1	0	0	0	4	9	0	19	32	
0	D	3		1	0	0	0	3	9	10	0	22	
0	D	4		1	0	0	0	6	0	13	20	39	
0	D	5		1	0	0	0	4	7	0	13	24	
0	D	6		1	0	0	0	3	11	0	22	36	
0	D	7		1	0	0	0	5	9	20	0	34	
0	D	8		1	0	0	0	5	0	12	16	33	
0	D	9		1	0	0	0	4	10	0	15	29	
0	D	10		1	0	0	0	4	0	15	15	34	
100		1	80	1	0	0	0	5	0	9	19	33	
100		2	52	1	0	0	0	3	0	13	22	40	
100		3	55	1	0	0	0	5	(8	1)	14	28	
100		4	69	1	0	0	0	4	0	12	22	38	
100		5	45	1	0	0	0	4	0	6	0	18	
100		6	63	1	0	0	0	0	5	0	6	11	
100		7	33	1	0	0	0	2	7	0	23	32	
100		8	67	1	0	0	0	6	0	11	21	38	
100		9	13	1	0	0	0	1	6	0	20	21	
100		10	27	1	0	0	0	2	5	0	22	29	

stained controls
 See 1811072A.C

11/23 11/24 11/25 ^{11/25/18} 11/26 11/27 11/28 11/29 11/30

Food Added: 1358 _{pc} 1109 _{pc} ~~1210~~ _{pc} 1241 _{pc} 1018 _{pc} 0842 _{pc} 1127 _{pc}

Transferred: 1404 _{pc} 1228 _{pc} 1242 _{pc} 1308 _{pc} 1157 _{pc} 1031 _{pc} 1241 _{pc}

end
 @
 1518
 pc

CETIS Measurement Worksheet

Report Date: 21 Nov-18 11:05 (p 1 of 2)
Test Code: 1811072G.C | 13-4012-5766

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory	
Start Date: 23 Nov-18		Species: Ceriodaphnia dubia		Sample Code: 4AFE232F			
End Date: 30 Nov-18		Protocol: EPA/821/R-02-013 (2002)		Sample Source: Stormwater			
Sample Date: 21 Nov-18		Material: Stormwater Monitoring Sample		Sample Station: DOM-RW-DC01			

Alkalinity (CaCO3)-mg/L		
Conc-%	Code	Reading 1
0	D	60
100		20
Measure Time:		
Instrument ID:		
Analyst:		

} see attached worksheet

Conductivity-µmhos								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	302	297	302	305	294	298	303
100		129	109	127	106	105	109	118
Measure Time:		1218	1052	1145	1107	1037	0925	1135
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		fc	fc	fc	fc	fc	fc	fc

Final Dissolved Oxygen-mg/L								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.61	7.73	7.73	7.43	7.82	7.52	7.60
100		7.19	7.21	7.44	7.52	7.67	7.27	7.44
Measure Time:		1239	1314	1327	1436	1038	1545	1730
Instrument ID:		#4	#4	#4	4	4	#4	#4
Analyst:		fc	fc	fc	fc	fc	fc	fc

Initial Dissolved Oxygen-mg/L							
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
0	D	7.43	7.60	7.68	7.80	7.78	7.75
100		8.30	8.23	7.87	8.01	8.49	8.43
Measure Time:		1218	1052	1145	1107	1037	0925
Instrument ID:		#4	#4	#4	#4	4	4
Analyst:		fc	fc	fc	fc	fc	fc

Hardness (CaCO3)-mg/L		
Conc-%	Code	Reading 1
0	D	88
100		24
Measure Time:		
Instrument ID:		
Analyst:		

} see attached worksheet

Final pH								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.87	7.31	7.71	8.01	7.82	7.84	7.96
100		7.30	6.75	7.24	7.50	7.25	7.32	7.52
Measure Time:		1239	1314	1327	1436	1038	1545	1730
Instrument ID:		#3	#3	#3	3	3	#3	#3
Analyst:		fc	fc	fc	fc	fc	fc	fc

CETIS Measurement Worksheet

Report Date: 21 Nov-18 11:05 (p 2 of 2)
 Test Code: 1811072G.C | 13-4012-5766

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory
Start Date: 23 Nov-18		Species: Ceriodaphnia dubia			Sample Code: 4AFE232F			
End Date: 30 Nov-18		Protocol: EPA/821/R-02-013 (2002)			Sample Source: Stormwater			
Sample Date: 21 Nov-18		Material: Stormwater Monitoring Sample			Sample Station: DOM-RW-DC01			
Initial pH								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.79	7.60	7.88	7.83	8.08	7.97	8.06
100		7.15	7.03	6.88	6.85	6.82	7.03	7.22
Measure Time:		1218	1052	1145	1107	1037	0925	1135
Instrument ID:		#3	#3	#3	#3	3	3	3
Analyst:		fc	fc	fc	fc	BL	BL	BL
Final Temperature-°C								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	25.6	25.4	25.1	24.8	24.9	25.3	25.3
100		25.2	25.2	25.0	25.0	25.3	24.6	24.5
Measure Time:		1239	1314	1327	1436	1036	1545	1730
Instrument ID:		#3	#3	#3	3	3	#3	#3
Analyst:		fc	fc	fc	BL	BL	BL	fc
Initial Temperature-°C								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	25.3	25.1	25.2	24.8	24.5	24.8	25.1
100		24.5	24.9	24.5	24.5	24.0	24.5	25.3
Measure Time:		1218	1052	1145	1107	1037	0925	1135
Instrument ID:		#3	#3	#3	#3	3	3	3
Analyst:		fc	fc	fc	fc	BL	BL	BL

Alkalinity

Date/Time: 2/4/10, 1300Project: M34 1st Flush CelioAnalyst: 102Titrant: H₂SO₄Factor: 20 (50 ml)

Sample	Sample (ml) Amount	Titration Amount (ml)	Titration Amount x Factor (mg CaCO ₃ /L)
MH/FW	25	1.5	60
[200] Cu		3.1	124
TWJ		1.2	48
WAS		2.4	96
RASLA		0.6	24
DOM		0.5	20
SMB		2.6	104
NAT		0.9	36
SAW	25	1.0	40

Hardness

Date/Time: 12/4/18, 1300

Project: M54 1st Flush

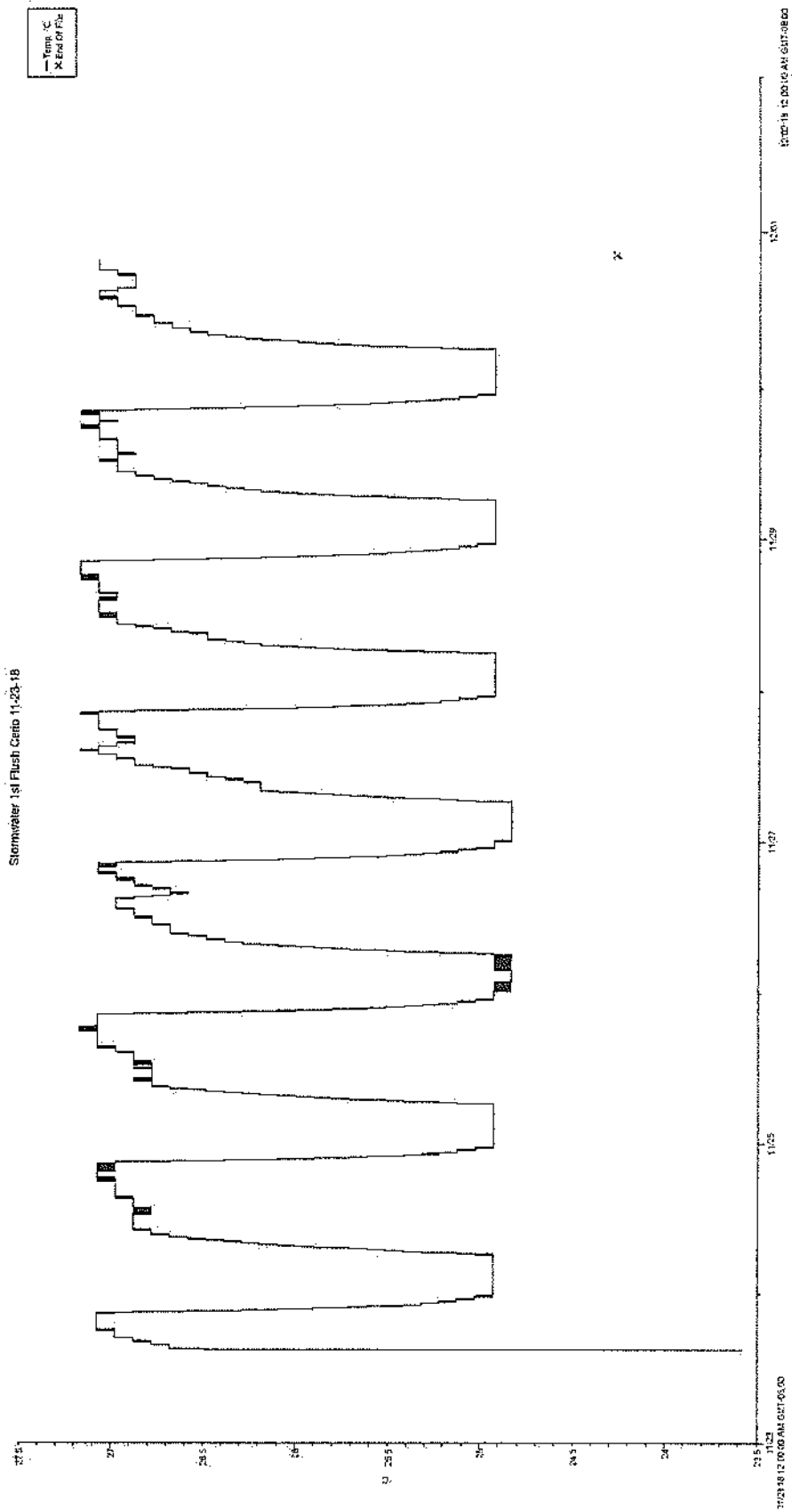
Analyst: 102

Cent

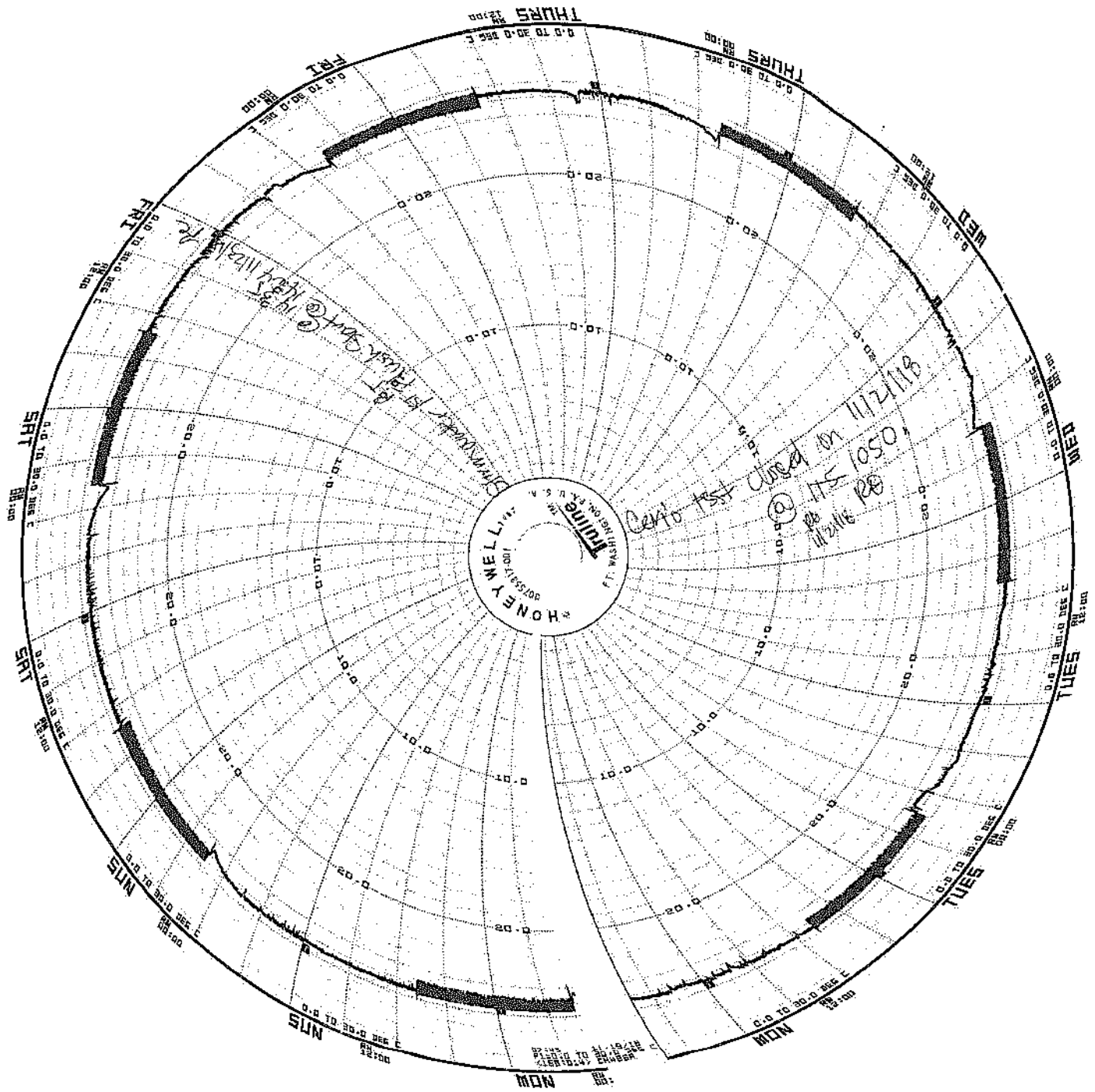
Titrant: EDTA

Factor: 20/50 mL

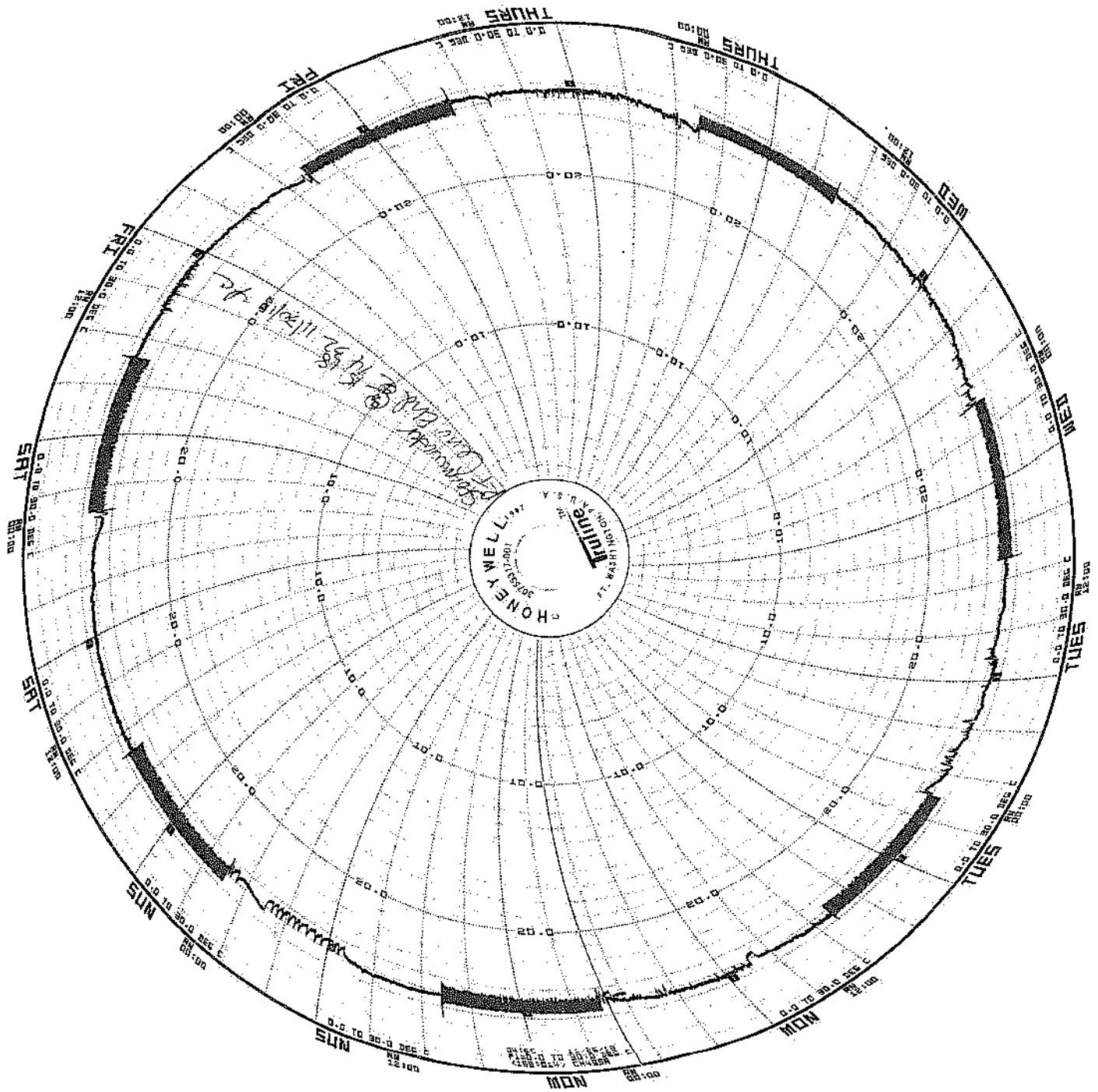
Sample	Sample Amount (mL)	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO ₃ /L)
MIFW	25	2.2	48 ^{102 12/4/18} 88
[200] CH	1	4.5	180
TWJ		1.7	68
WAS		3.6	144
PHLA		0.7	28
DOM		0.6	24
SMB		5.6	224
NAT	▽	1.2	48
SAW	25	1.2	48



Test: 1811RT2B.C, 1811072A.C - G.C
Date: 11/23/18(14:04) - 11/30/18(15:18)



Test: 1811RT2B.C, 1811072A-G.C
 Date: 11/23/18(14:04) - 11/30/18(15:18)



Test: 1811 RTZB.C, 1811072A-G.C
 Date: 11/23/18 (14:04) - 11/30/18 (15:18)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT

TOXICITY TESTING REPORT

SAMPLE DATE: November 23, 2018

TEST DATE: November 23, 2018

TEST NUMBER: 1811RT2B.C

TEST MATERIAL: Copper ($\text{CuCl}_2 \bullet 2\text{H}_2\text{O}$)

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

RESULT:

NOEC = 100 $\mu\text{g/L}$ (Survival)

NOEC = 50 $\mu\text{g/L}$ (Reproduction)

EC₅₀ = 142 $\mu\text{g/L}$ (Survival)

IC₂₅ = 58.8 $\mu\text{g/L}$ (Reproduction)

Rea Mara A Crinklaw

Analyst



Signature

Water Biologist III

Title

1/23/19

Date

Stacey Karnya

Supervisor



Signature

Acting Laboratory Manager I

Title

1-28-19

Date

CETIS Summary Report

Report Date: 27 Dec-18 15:00 (p 1 of 2)
Test Code: 1811RT2B.C | 07-8581-3240

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory			
Batch ID:	17-1558-0949	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw		
Start Date:	23 Nov-18 14:34	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Hard Synthetic Water		
Ending Date:	30 Nov-18 14:32	Species:	Ceriodaphnia dubia	Brine:			
Duration:	7d	Source:	In-House Culture	Age:	<8h 11/23/18 (09:50 - 13:35)		
Sample ID:	00-5008-1686	Code:	Cu RT	Client:	Donald C. Tillman WRP		
Sample Date:	23 Nov-18 11:35	Material:	Copper chloride	Project:	NPDES		
Receive Date:	23 Nov-18 11:35	Source:	Reference Toxicant				
Sample Age:	3h	Station:					
Sample Renewals							
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C		
1	Cu RT	23 Nov-18 11:35	23 Nov-18 11:35	24 Nov-18 11:24			
2	Cu RT	23 Nov-18 11:35	23 Nov-18 11:35	25 Nov-18 13:00			
3	Cu RT	23 Nov-18 11:35	23 Nov-18 11:35	26 Nov-18 13:23			
4	Cu RT	23 Nov-18 11:35	23 Nov-18 11:35	27 Nov-18 11:25			
5	Cu RT	23 Nov-18 11:35	23 Nov-18 11:35	28 Nov-18 09:22			
6	Cu RT	23 Nov-18 11:35	23 Nov-18 11:35	29 Nov-18 12:15			
Batch Note: Insufficient neonate production from the broodboards to use for the test. Neonates from Master Culture Beakers #2 & #4 (11/23/18 9:50 - 13:35) were used. Blocking by known parentage not performed.							
Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.							
Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-5688-4561	7d Survival Rate	100	>100	N/A	N/A		Fisher Exact/Bonferroni-Holm Test
05-0217-4531	Reproduction	50	100	70.71	22.7%		Dunnett Multiple Comparison Test
Point Estimate Summary							
Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
03-2855-8063	7d Survival Rate	EC5	103.5	103.5	103.5		Linear Interpolation (ICPIN)
		EC10	107.2	107.2	107.2		
		EC15	111	111	111		
		EC20	114.9	114.9	114.9		
		EC25	119	119	119		
		EC40	132	132	132		
		EC50	141.5	141.5	141.5		
21-2452-6843	Reproduction	IC5	17.72	4.635	52.41		Linear Interpolation (ICPIN)
		IC10	24.95	16.27	55.18		
		IC15	52.54	20.05	58.1		
		IC20	55.58	23.49	61.07		
		IC25	58.79	49.13	64.29		
		IC40	69.55	60.94	75.96		
		IC50	77.79	68.91	87.21		
Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision	
03-2855-8063	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria	
10-5688-4561	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria	
05-0217-4531	Reproduction	Control Resp	34.2	15 - NL	Yes	Passes Acceptability Criteria	
21-2452-6843	Reproduction	Control Resp	34.2	15 - NL	Yes	Passes Acceptability Criteria	
05-0217-4531	Reproduction	PMSD	0.2269	0.13 - 0.47	Yes	Passes Acceptability Criteria	

CETIS Summary Report

Report Date: 27 Dec-18 15:00 (p 2 of 2)
Test Code: 1811RT2B.C | 07-8581-3240

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory			
7d Survival Rate Summary:											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
200		10	0	0	0	0	0	0	0		100.0%
Reproduction Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	34.2	32.23	36.17	28	43	1.672	5.287	15.46%	0.0%
12.5		10	35.6	33.51	37.69	29	46	1.771	5.602	15.73%	-4.09%
25		10	31.4	27.13	35.67	11	42	3.612	11.42	36.38%	8.19%
50		10	31.2	28.38	34.02	20	42	2.384	7.54	24.17%	8.77%
100		10	9.6	6.755	12.44	0	25	2.409	7.619	79.36%	71.93%
200		10	0.3	0.1196	0.4804	0	1	0.1528	0.483	161.0%	99.12%
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1
200		0	0	0	0	0	0	0	0	0	0
Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	42	35	31	31	43	31	31	39	31	28
12.5		38	30	33	46	30	34	42	39	35	29
25		42	40	31	38	38	17	37	41	19	11
50		34	29	42	31	23	39	39	23	32	20
100		13	25	0	2	10	9	14	0	10	13
200		0	0	0	0	0	1	0	1	1	0

CETIS Analytical Report

Report Date: 27 Dec-18 15:00 (p 1 of 2)
 Test Code: 1811RT2B.C | 07-8581-3240

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 10-5688-4561	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1									
Analyzed: 03 Dec-18 9:02	Analysis: STP 2x2 Contingency Tables	Official Results: Yes									
Batch ID: 17-1558-0949	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 23 Nov-18 14:34	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water									
Ending Date: 30 Nov-18 14:32	Species: Ceriodaphnia dubia	Brine:									
Duration: 7d	Source: In-House Culture	Age: <8h 11/23/18 (09:50-13:35)									
Sample ID: 00-5008-1686	Code: Cu RT	Client: Donald C. Tillman WRP									
Sample Date: 23 Nov-18 11:35	Material: Copper chloride	Project: NPDES									
Receive Date: 23 Nov-18 11:35	Source: Reference Toxicant										
Sample Age: 3h	Station:										
Batch Note: Insufficient neonate production from the broodboards to use for the test. Neonates from Master Culture Beakers #2 & #4 (11/23/18 9:50 - 13:35) were used. Blocking by known parentage not performed.											
Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU				
Untransformed		C > T	Not Run	100	>100	N/A					
Fisher Exact/Bonferroni-Holm Test											
Control	vs	Conc-µg/L	Test Stat	P-Value	Decision(0.05)						
Dilution Water		12.5	1	1.0000	Non-Significant Effect						
		25	1	1.0000	Non-Significant Effect						
		50	1	1.0000	Non-Significant Effect						
		100	1	1.0000	Non-Significant Effect						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
Data Summary											
Conc-µg/L	Control Type	No-Resp	Resp	Total							
0	Dilution Water	10	0	10							
12.5		10	0	10							
25		10	0	10							
50		10	0	10							
100		10	0	10							
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

CETIS Analytical Report

Report Date: 27 Dec-18 15:00 (p 2 of 2)
 Test Code: 1811RT2B.C | 07-8581-3240

Ceriodaphnia 7-d Survival and Reproduction Test		Hyperion Treatment Plant Laboratory	
Analysis ID: 10-5688-4561	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1	
Analyzed: 03 Dec-18 9:02	Analysis: STP 2x2 Contingency Tables	Official Results: Yes	

Graphics

Conc-µg/L	7d Survival Rate
0	1.0
12.5	1.0
25	1.0
50	1.0
100	1.0

Concentration-response relationship is all or nothing,
 12/27/18 *Re*

CETIS Analytical Report

Report Date: 27 Dec-18 15:00 (p 1 of 2)
Test Code: 1811RT2B.C | 07-8581-3240

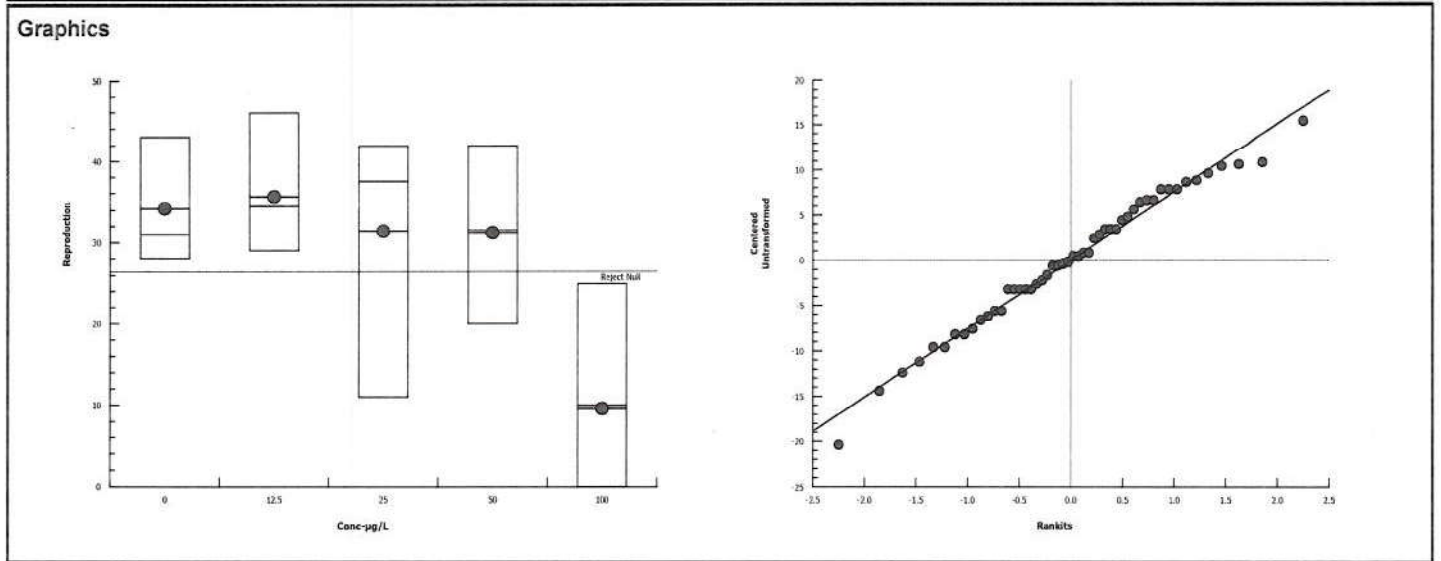
Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID: 05-0217-4531		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 03 Dec-18 9:02		Analysis: Parametric-Control vs Treatments		Official Results: Yes							
Batch ID: 17-1558-0949		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 23 Nov-18 14:34		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water							
Ending Date: 30 Nov-18 14:32		Species: Ceriodaphnia dubia		Brine:							
Duration: 7d		Source: In-House Culture		Age: <8h		11/23/18 (09:50 - 13:35)					
Sample ID: 00-5008-1686		Code: Cu RT		Client: Donald C. Tillman WRP							
Sample Date: 23 Nov-18 11:35		Material: Copper chloride		Project: NPDES							
Receive Date: 23 Nov-18 11:35		Source: Reference Toxicant									
Sample Age: 3h		Station:									
Batch Note: Insufficient neonate production from the broodboards to use for the test. Neonates from Master Culture Beakers #2 & #4 (11/23/18 9:50 - 13:35) were used. Blocking by known parentage not performed.											
Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Data Transform		Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD		
Untransformed		0	C > T	Not Run	50	100	70.71		22.7%		
Dunnett Multiple Comparison Test											
Control	vs	Conc-µg/L	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)			
Dilution Water		12.5	-0.401	2.222	18	7.759	0.9049	Non-Significant Effect			
		25	0.802	2.222	18	7.759	0.4647	Non-Significant Effect			
		50	0.8593	2.222	18	7.759	0.4388	Non-Significant Effect			
		100*	7.046	2.222	18	7.759	<0.0001	Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	34.2	15 - NL	Yes	Passes Acceptability Criteria							
PMSD	0.2269	0.13 - 0.47	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.727	3.128	0.2348	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4557.6	1139.4	4	18.7	<0.0001	Significant Effect					
Error	2742.4	60.94222	45								
Total	7300	1200.342	49								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Bartlett Equality of Variance	6.894	13.28	0.1416	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9849	0.9367	0.7664	Normal Distribution						
Reproduction Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	34.2	32.19	36.21	28	43	1.672	5.287	15.46%	0.0%
12.5		10	35.6	33.47	37.73	29	46	1.771	5.602	15.73%	-4.09%
25		10	31.4	27.05	35.75	11	42	3.612	11.42	36.38%	8.19%
50		10	31.2	28.33	34.07	20	42	2.384	7.54	24.17%	8.77%
100		10	9.6	6.702	12.5	0	25	2.409	7.619	79.36%	71.93%

CETIS Analytical Report

Report Date: 27 Dec-18 15:00 (p 2 of 2)
 Test Code: 1811RT2B.C | 07-8581-3240

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory	
Analysis ID:	05-0217-4531	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1
Analyzed:	03 Dec-18 9:02	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	42	35	31	31	43	31	31	39	31	28
12.5		38	30	33	46	30	34	42	39	35	29
25		42	40	31	38	38	17	37	41	19	11
50		34	29	42	31	23	39	39	23	32	20
100		13	25	0	2	10	9	14	0	10	13



Concentration-response relationship is ideal. 12/27/18 Re

CETIS Analytical Report

Report Date: 27 Dec-18 15:00 (p 1 of 4)

Test Code: 1811RT2B.C | 07-8581-3240

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 03-2855-8063		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 03 Dec-18 9:02		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Batch ID: 17-1558-0949		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 23 Nov-18 14:34		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water							
Ending Date: 30 Nov-18 14:32		Species: Ceriodaphnia dubia		Brine:							
Duration: 7d		Source: In-House Culture		Age: <8h 11/23/18 (09:50-13:35)							
Sample ID: 00-5008-1686		Code: Cu RT		Client: Donald C. Tillman WRP							
Sample Date: 23 Nov-18 11:35		Material: Copper chloride		Project: NPDES							
Receive Date: 23 Nov-18 11:35		Source: Reference Toxicant									
Sample Age: 3h		Station:									
Batch Note: Insufficient neonate production from the broodboards to use for the test. Neonates from Master Culture Beakers #2 & #4 (11/23/18 9:50 - 13:35) were used. Blocking by known parentage not performed.											
Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	265187057	200	Yes	Two-Point Interpolation						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
Point Estimates											
Level	µg/L	95% LCL	95% UCL								
EC5	103.5	103.5	103.5								
EC10	107.2	107.2	107.2								
EC15	111	111	111								
EC20	114.9	114.9	114.9								
EC25	119	119	119								
EC40	132	132	132								
EC50	141.5	141.5	141.5								
7d Survival Rate Summary											
		Calculated Variate(A/B)									
Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	1	1	1	0	0	0.0%	0.0%	10	10
25		10	1	1	1	0	0	0.0%	0.0%	10	10
50		10	1	1	1	0	0	0.0%	0.0%	10	10
100		10	1	1	1	0	0	0.0%	0.0%	10	10
200		10	0	0	0	0	0		100.0%	0	10
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 27 Dec-18 15:00 (p 2 of 4)
Test Code: 1811RT2B.C | 07-8581-3240

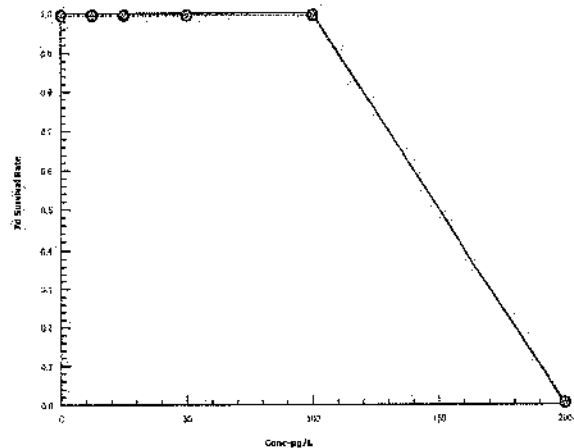
Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 03-2855-8063 Endpoint: 7d Survival Rate
Analyzed: 03 Dec-18 9:02 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 27 Dec-18 15:00 (p 3 of 4)
Test Code: 1811RT2B.C | 07-8581-3240

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 21-2452-6843		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 03 Dec-18 9:02		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Batch ID: 17-1558-0949		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 23 Nov-18 14:34		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water							
Ending Date: 30 Nov-18 14:32		Species: Ceriodaphnia dubia		Brine:							
Duration: 7d		Source: In-House Culture		Age: <8h 11/23/18 (09:50-13:35)							
Sample ID: 00-5008-1686		Code: Cu RT		Client: Donald C. Tillman WRP							
Sample Date: 23 Nov-18 11:35		Material: Copper chloride		Project: NPDES							
Receive Date: 23 Nov-18 11:35		Source: Reference Toxicant									
Sample Age: 3h		Station:									
Batch Note: Insufficient neonate production from the broodboards to use for the test. Neonates from Master Culture Beakers #2 & #4 (11/23/18 9:50 - 13:35) were used. Blocking by known parentage not performed.											
Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1.536E+09	200	Yes	Two-Point Interpolation						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	34.2	15 - NL	Yes	Passes Acceptability Criteria							
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value	2.991	3.2	0.1148	No Outliers Detected						
Point Estimates											
Level	µg/L	95% LCL	95% UCL								
IC5	17.72	4.635	52.41								
IC10	24.95	16.27	55.18								
IC15	52.54	20.05	58.1								
IC20	55.58	23.49	61.07								
IC25	58.79	49.13	64.29								
IC40	69.55	60.94	75.96								
IC50	77.79	68.91	87.21								
Reproduction Summary											
		Calculated Variate									
Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	Dilution Water	10	34.2	28	43	1.672	5.287	15.46%	0.0%		
12.5		10	35.6	29	46	1.771	5.602	15.73%	-4.09%		
25		10	31.4	11	42	3.612	11.42	36.38%	8.19%		
50		10	31.2	20	42	2.384	7.54	24.17%	8.77%		
100		10	9.6	0	25	2.409	7.619	79.36%	71.93%		
200		10	0.3	0	1	0.1528	0.483	161.0%	99.12%		
Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	42	35	31	31	43	31	31	39	31	28
12.5		38	30	33	46	30	34	42	39	35	29
25		42	40	31	38	38	17	37	41	19	11
50		34	29	42	31	23	39	39	23	32	20
100		13	25	0	2	10	9	14	0	10	13
200		0	0	0	0	0	1	0	1	1	0

CETIS Analytical Report

Report Date: 27 Dec-18 15:00 (p 4 of 4)
Test Code: 1811RT2B.C | 07-8581-3240

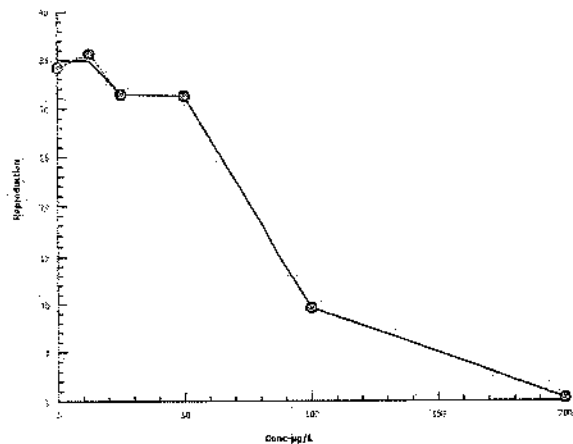
Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 21-2452-6843 Endpoint: Reproduction
Analyzed: 03 Dec-18 9:02 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

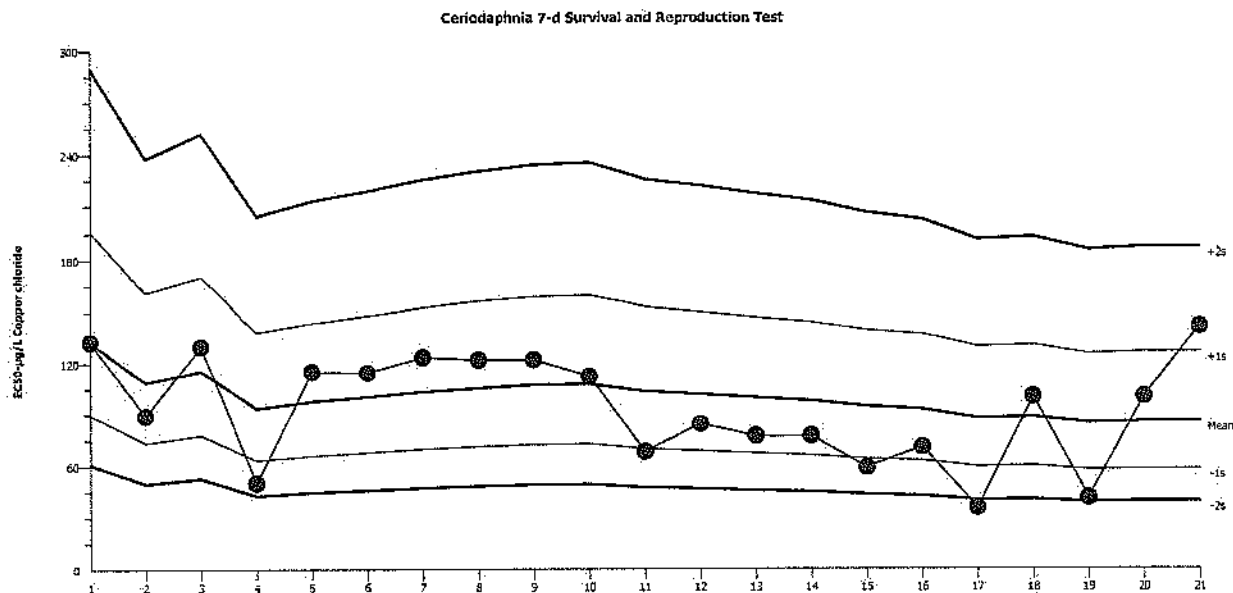
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

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

Endpoint: 7d Survival Rate

Source: Reference Toxicant-REF



Mean: 85.46

Count: 20

-1s Warning Limit: 57.8

-2s Action Limit: 39.1

Sigma: N/A

CV: 47.80%

+1s Warning Limit: 126.3

+2s Action Limit: 186.7

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Jul	27	132.6	47.12	1.124	(+)		00-3533-4104	07-3102-4627
2		Aug	9	89.13	3.673	0.1077			05-1646-5416	02-7143-5836
3			23	129.7	44.28	1.068	(+)		18-0928-7994	14-9065-9379
4		Sep	6	50	-35.46	-1.371	(-)		04-1283-5528	07-2201-0667
5			20	114.9	29.45	0.7577			09-2547-5700	02-6449-6736
6		Oct	18	114.5	29.01	0.7478			14-7896-4665	17-5474-2245
7		Nov	15	123.5	38.01	0.9416			09-2671-6353	07-5336-3496
8		Dec	13	121.9	36.49	0.9099			19-3949-3034	10-6518-1710
9	2018	Jan	4	121.9	36.49	0.9099			17-7500-8361	05-5922-1635
10		Feb	7	112.3	26.82	0.6984			04-8492-7543	17-6325-1645
11		Mar	2	68.1	-17.36	-0.581			11-4862-8707	06-1686-5917
12			15	84.14	-1.316	-0.03971			20-9677-0547	14-4393-4243
13		Apr	19	77.17	-8.286	-0.261			18-2737-1194	07-4972-9760
14		May	16	77.17	-8.286	-0.261			05-4955-8978	09-0510-7297
15		Jun	13	58.82	-26.64	-0.956			16-1570-3305	01-3881-0040
16		Jul	12	70.77	-14.69	-0.4825			05-0138-0333	09-5921-7712
17		Aug	22	35.41	-50.04	-2.254	(-)	(-)	11-5251-4189	02-6103-0961
18		Sep	12	100	14.54	0.4022			10-4359-2259	02-9718-5741
19		Oct	17	41.07	-44.39	-1.875	(-)		09-6713-5129	03-7900-4433
20		Nov	14	100	14.54	0.4022			16-4205-8005	13-0463-7350
21			23	141.5	56.03	1.29	(+)		07-8581-3240	03-2855-8063

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

Organism: Ceriodaphnia dubia (Water Flea)

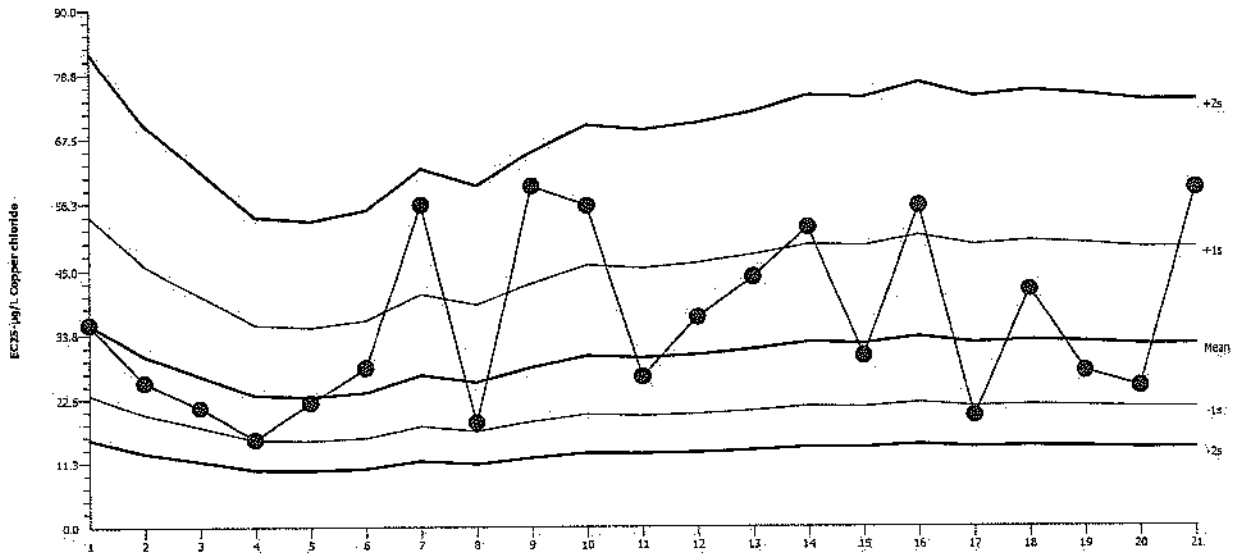
Material: Copper chloride

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

Endpoint: Reproduction

Source: Reference Toxicant-REF

Ceriodaphnia 7-d Survival and Reproduction Test



Mean: 31.88

Count: 20

-1s Warning Limit: 20.92

-2s Action Limit: 13.72

Sigma: N/A

CV: 52.50%

+1s Warning Limit: 48.63

+2s Action Limit: 74.15

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Jul	27	35.41	3.534	0.2492			00-3533-4104	15-5816-8081
2		Aug	9	25.45	-6.433	-0.5343			05-1646-5416	12-8828-7274
3			23	20.93	-10.95	-0.9974			18-0928-7994	01-4455-3838
4		Sep	6	15.28	-16.6	-1.744	(-)		04-1283-5528	07-4663-1403
5			20	21.83	-10.05	-0.898			09-2547-5700	05-2225-6686
6		Oct	18	27.98	-3.902	-0.3095			14-7896-4665	10-2719-4408
7		Nov	15	55.96	24.08	1.334	(+)		09-2671-6353	12-1707-6477
8		Dec	13	18.28	-13.6	-1.318	(-)		19-3949-3034	15-1089-9957
9	2018	Jan	4	59.22	27.34	1.468	(+)		17-7500-8361	03-9405-5395
10		Feb	7	55.8	23.92	1.327	(+)		04-8492-7543	19-3721-5481
11		Mar	2	26.44	-5.437	-0.4433			11-4862-8707	08-2696-1620
12			15	36.61	4.733	0.3282			20-9677-0547	09-0026-7515
13		Apr	19	43.76	11.88	0.751			18-2737-1194	03-8342-1801
14		May	16	51.99	20.11	1.159	(+)		05-4955-8978	05-0129-1380
15		Jun	13	29.96	-1.92	-0.1473			16-1570-3305	06-3152-2418
16		Jul	12	55.75	23.87	1.325	(+)		05-0138-0333	18-3627-7518
17		Aug	22	19.4	-12.48	-1.178	(-)		11-5251-4189	07-5888-1093
18		Sep	12	41.54	9.659	0.6275			10-4359-2259	01-2617-3703
19		Oct	17	27.3	-4.578	-0.3675			09-6713-5129	11-3265-6236
20		Nov	14	24.67	-7.213	-0.6081			16-4205-8005	10-8446-2066
21			23	58.79	26.91	1.451	(+)		07-8581-3240	21-2452-6843

CETIS Test Data Worksheet

Report Date:

22 Nov-18 14:13 (p 1 of 2)

Test Code:

07-8581-3240/1811RT2B.C

Ceriodaphnia 7-d Survival and Reproduction Test MC #29#4 → 11/23/18 Hyperion Treatment Plant Laboratory

Start Date: 23 Nov-18 1435 Species: Ceriodaphnia dubia (9:50-13:35) Sample Code: 2FC2F96
 End Date: 30 Nov-18 1432 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant
 Sample Date: 23 Nov-18 1135 Material: Copper chloride Sample Station:

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1	1	1	0	0	0	6	0	13	23	42	
0	D	2	12	1	0	0	0	4	10	21	0	35	
0	D	3	15	1	0	0	0	5	0	10	16	31	
0	D	4	8	1	0	0	0	4	10	0	17	31	
0	D	5	5	1	0	0	0	6	0	13	24	43	
0	D	6	25	1	0	0	0	4	9	0	18	31	
0	D	7	16	1	0	0	0	3	9	0	19	31	
0	D	8	42	1	0	0	0	6	0	15	18	39	
0	D	9	32	1	0	0	0	5	0	18	16	31	
0	D	10	22	1	0	0	0	4	7	0	17	28	
12.5		1	21	1	0	0	0	4	0	11	21	38	
12.5		2	55	1	0	0	0	4	0	10	15	30	
12.5		3	41	1	0	0	0	3	0	14	16	33	
12.5		4	44	1	0	0	0	6	0	16	24	46	
12.5		5	33	1	0	0	0	0	6	18	6	30	
12.5		6	18	1	0	0	0	4	0	10	20	34	
12.5		7	24	1	0	0	0	7	0	15	20	42	
12.5		8	37	1	0	0	0	6	0	13	20	39	
12.5		9	20	1	0	0	0	5	0	13	17	35	
12.5		10	10	1	0	0	0	4	9	0	16	29	
25		1	50	1	0	0	0	5	0	14	23	42	
25		2	47	1	0	0	0	5	0	15	20	40	
25		3	30	1	0	0	0	4	0	10	17	31	
25		4	58	1	0	0	0	5	12	0	21	38	
25		5	39	1	0	0	0	5	0	14	19	38	
25		6	46	1	0	0	0	4	0	1	12	17	
25		7	14	1	0	0	0	5	12	0	20	37	
25		8	3	1	0	0	0	5	0	12	24	41	
25		9	27	1	0	0	0	1	0	4	14	19	
25		10	26	1	0	0	0	0	6	4	1	11	
50		1	56	1	0	0	0	4	0	0	19	34	
50		2	9	1	0	0	0	3	9	0	17	29	
50		3	45	1	0	0	0	0	7	15	20	42	
50		4	29	1	0	0	0	0	0	11	15	31	
50		5	60	1	0	0	0	0	4	18	11	23	
50		6	11	1	0	0	0	0	0	12	19	39	
50		7	40	1	0	0	0	6	0	13	20	39	
50		8	17	1	0	0	0	5	0	9	9	23	
50		9	19	1	0	0	0	4	0	0	20	32	
50		10	4	1	0	0	0	6	0	0	8	20	
100		1	52	1	0	0	0	5	0	0	0	13	
100		2	43	1	0	0	0	5	0	0	11	25	
100		3	53	1	0	0	0	0	0	0	0	0	
100		4	6	1	0	0	0	2	0	0	0	2	
100		5	31	1	0	0	0	4	0	6	0	10	
100		6	2	1	0	0	0	5	2	0	0	9	
100		7	23	1	0	0	0	6	2	0	0	14	

CETIS Test Data Worksheet

Report Date:

22 Nov-18 14:13 (p 2 of 2)

Test Code:

07-8581-3240/1811RT2B.C

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
100		8	13	1	0	0	0	0	0	0	0	0	
100		9	38	1	0	0	0	3	0	4	3	10	
100		10	48	1	0	0	0	3	10	0	0	13	
200		1	59	1	0	0X	X	X	X	X	X	0	
200		2	35	1	0	0X	0	0X	X	X	X	0	
200		3	57	1	0	0	0X	X	X	X	X	0	
200		4	36	1	0	0X	X	X	X	X	X	0	
200		5	28	1	0	0	0X	X	X	X	X	0	
200		6	49	1	0	0	0	0	1	0X	X	1	
200		7	54	1	0	0	0	0X	X	X	X	0	
200		8	34	1	0	0	0	0	1	0X	X	1	
200		9	7	1	0	0	0	0	0	1X	X	1	
200		10	51	1	0	0	0	0	0	0X	X	0	

11/23 11/24 11/25 11/26 11/27 11/28 11/29 11/30

Food Added: 1358 1109 1210 1241 1018 0842 1127 1430 11/30/18
 Fe Fe Fe Fe DL DL DL @ 1430 1432

Transferred: 1435 1124 1300 1323 1125 0927 1215
 Fe Fe Fe Fe DL DL DL

CETIS Measurement Worksheet

Report Date: 22 Nov-18 14:13 (p 1 of 2)
Test Code: 1811RT2B.C | 07-8581-3240

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 23 Nov-18 Species: Ceriodaphnia dubia Sample Code: 2FC2F96
End Date: 30 Nov-18 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant
Sample Date: 23 Nov-18 Material: Copper chloride Sample Station:

Alkalinity (CaCO₃)-mg/L

Conc-µg/L	Code	Reading 1
0	D	120
200		124
Measure Time:		
Instrument ID:		
Analyst:		

see Reconstituted Water Prep. Logbook (11/21/18 AS)
see attached worksheet

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	579	556	557	543	579	579	580
12.5		589	564	563	560	565	593	589
25		591	563	564	560	561	536	519
50		590	562	563	561	540	589	477
100		591	561	563	560	534	575	548
200		582	553	545	553	491	378	575
Measure Time:		1218	1100	1140	1130	1024	0847	1130
Instrument ID:		#3	#3	#3	#3	2	2	2
Analyst:		RC	RC	RC	RC	RL	RL	RL

11-28-18 102
565

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
7.43	0	7.57	7.55	7.66	7.48	7.99	7.42	7.64
7.52	12.5	7.66	7.57	7.74	7.59	7.93	7.46	7.61
7.59	25	7.62	7.56	7.85	7.63	7.86	7.51	7.59
7.58	50	7.45	7.56	7.79	7.70	7.83	7.49	7.61
7.54	100	7.85	7.56	7.85	7.73	7.75	7.51	7.69
7.42	200	7.49	7.55	8.03	7.80	7.78	7.52	—
Measure Time:		1218	1330	1343	1432	1034	1540	1725
Instrument ID:		#4	#4	#4	4	4	#4	#4
Analyst:		RC	RC	RC	RL	RL	RC	RC

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.57	7.61	7.78	7.75	8.01	7.99	7.88
12.5		7.66	7.66	7.71	7.89	8.05	7.99	7.92
25		7.62	7.62	7.70	7.88	8.00	8.03	7.94
50		7.65	7.59	7.71	7.91	8.02	8.00	7.93
100		7.55	7.57	7.74	7.94	8.00	8.04	7.94
200		7.49	7.53	7.81	7.91	7.98	8.02	7.97
Measure Time:		1218	1100	1140	1130	1024	0847	1130
Instrument ID:		#4	#4	#4	#4	4	2	4
Analyst:		RC	RC	RC	RC	RL	RL	RL

Hardness (CaCO₃)-mg/L

Conc-µg/L	Code	Reading 1
0	D	172
200		180
Measure Time:		
Instrument ID:		
Analyst:		

see Reconstituted Water Prep. Logbook (11/21/18 AS)
see attached worksheet

CETIS Measurement Worksheet

Report Date: 22 Nov-18 14:13 (p 2 of 2)
Test Code: 1811RT2B.C | 07-8581-3240

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory
Start Date: 23 Nov-18		Species: Ceriodaphnia dubia		Sample Code: 2FC2F96				
End Date: 30 Nov-18		Protocol: EPA/821/R-02-013 (2002)		Sample Source: Reference Toxicant				
Sample Date: 23 Nov-18		Material: Copper chloride		Sample Station:				

Final pH								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.13	7.81	8.15	8.27	8.18	8.08	8.37
12.5		8.22	7.89	8.19	8.26	8.18	8.08	8.32
25		8.21	7.90	8.16	8.25	8.12	8.09	8.28
50		8.18	7.88	8.13	8.24	8.15	8.08	8.28
100		8.19	7.92	8.17	8.22	8.11	8.09	8.31
200		8.14	7.94	8.19	8.27	8.13	8.09	—
Measure Time:		1232	1330	1343	1432	1034	1540	1725
Instrument ID:		#3	#3	#3	3	3	#3	#3
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Initial pH								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.05	7.84	8.00	8.03	8.13	8.07	8.12
12.5		8.10	7.87	8.04	8.11	8.13	8.08	8.12
25		8.11	7.90	8.07	8.13	8.13	8.07	8.13
50		8.13	7.92	8.06	8.15	8.14	8.08	8.13
100		8.14	7.93	8.07	8.15	8.13	8.08	8.14
200		8.14	7.94	8.06	8.14	8.13	8.07	8.13
Measure Time:		1218	1100	1140	1130	1024	0847	1130
Instrument ID:		#3	#3	#3	#3	3	3	3
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Final Temperature-°C								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	25.5	25.7	25.4	25.1	24.3	25.3	25.2
12.5		25.4	25.7	25.2	25.0	24.7	25.1	25.0
25		25.3	25.5	25.1	25.0	24.7	25.0	24.9
50		25.3	25.5	25.1	24.9	24.9	24.9	24.9
100		25.2	25.5	25.1	25.1	24.9	24.8	24.7
200		25.1	25.6	25.0	25.0	24.9	24.5	—
Measure Time:		1232	1330	1343	1432	1034	1540	1725
Instrument ID:		#3	#3	#3	3	3	#3	#3
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Initial Temperature-°C								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	25.2	25.1	25.2	24.9	24.3	25.1	25.4
12.5		25.7	25.9	24.9	24.8	24.5	24.9	25.2
25		25.8	25.9	24.8	24.5	24.4	24.9	25.1
50		25.7	25.8	24.7	24.5	24.5	24.8	25.1
100		25.6	25.5	24.6	24.8	24.4	24.7	25.0
200		25.5	25.3	24.7	24.5	24.3	24.6	24.8
Measure Time:		1218	1100	1140	1130	1024	0847	1130
Instrument ID:		#3	#3	#3	#3	3	3	3
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Alkalinity

Date/Time: 2/4/10, 1300Project: MS4 1st Flush CelioAnalyst: 102Titrant: H₂SO₄Factor: 20 @ 50 mL

Sample	Sample (mL) Amount	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO ₃ /L)
MTHSPW	25	1.5	60
[200] Cu		3.1	124
THJ		1.2	48
WAS		2.4	96
R#5 LA		0.6	24
DOM		0.5	20
SMB		2.6	104
NAT		0.9	36
SAW	25	1.0	40

Hardness

Date/Time: 12/4/18, 1300

Project: M54 1st Flush

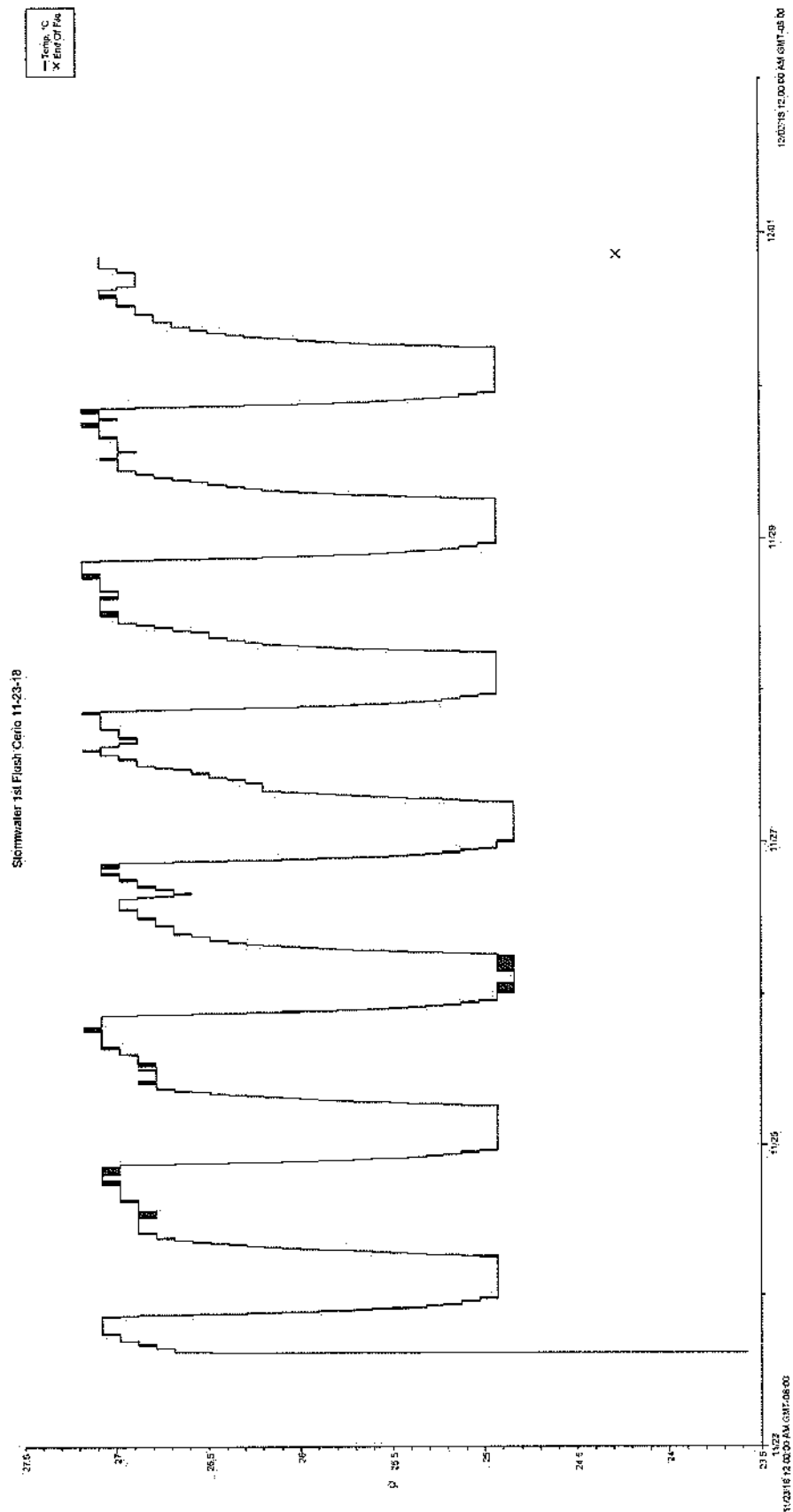
Analyst: 102

Card

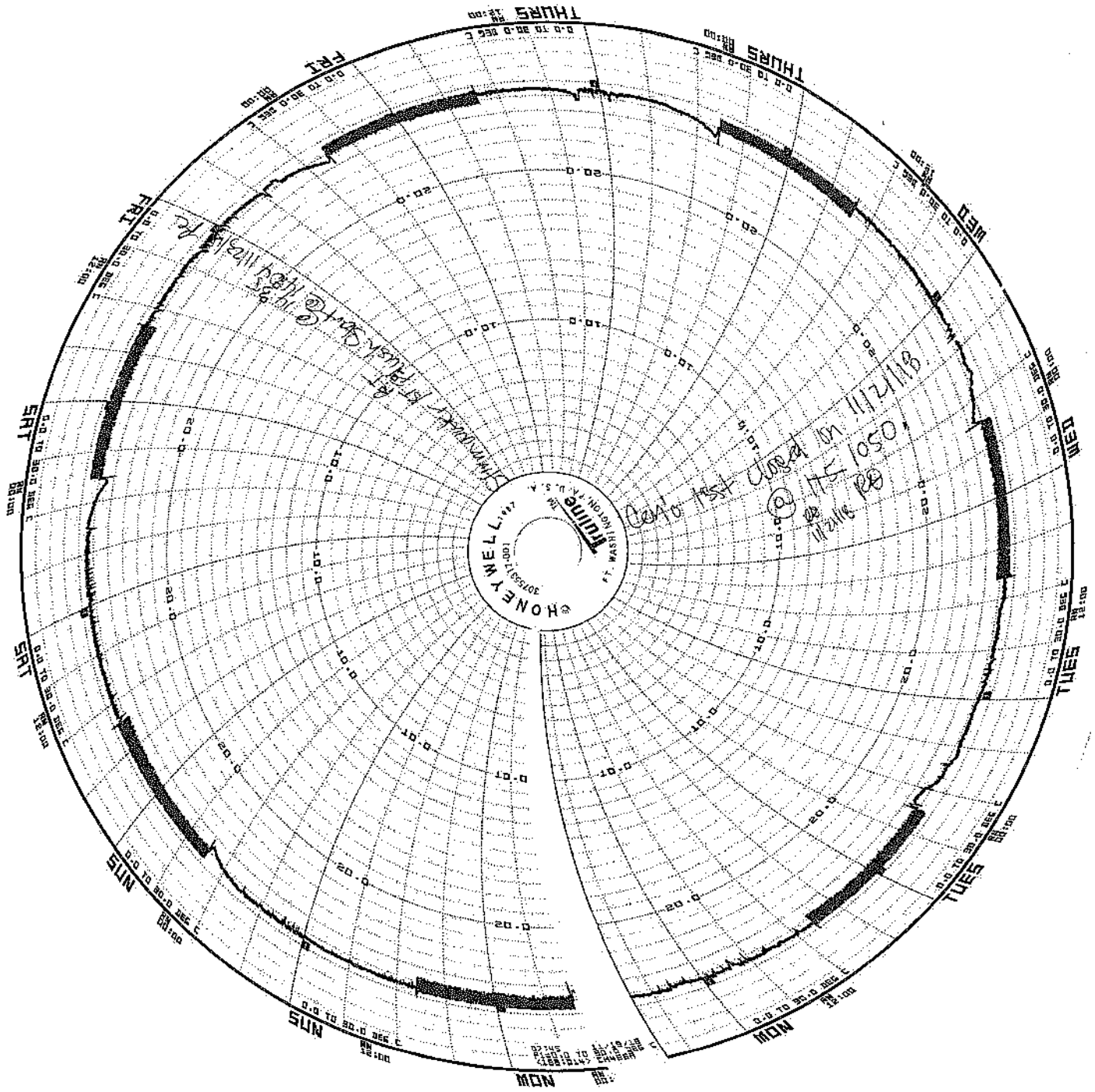
Titrant: EDTA

Factor: 200.50 mL

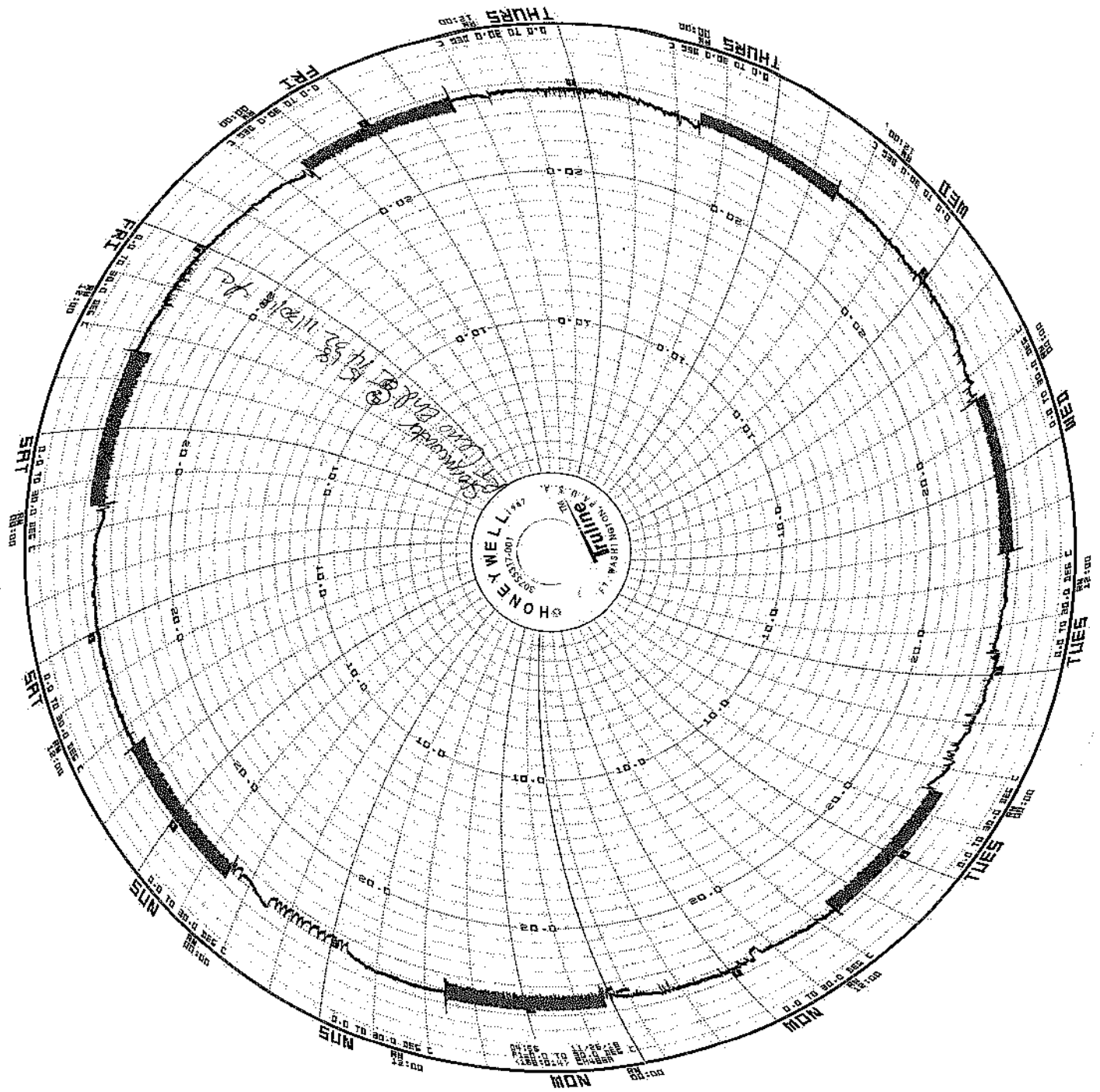
Sample	Sample Amount (mL)	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO ₃ /L)
MFW	25	2.2	48 ^{102 12/4/18} (88)
[200] CH	1	4.5	180
TWJ		1.7	60
WAS		3.6	144
PLSLA		0.7	20
DOM		0.6	24
SMB		5.6	224
NAT	▽	1.2	48
SAW	25	1.2	48



Test: 1811RT2B.C, 1811072A.C - G.C
Date: 11/23/18(14:04) - 11/30/18(15:18)



Test: 1811RT2B.C, 1811072A-G.C
 Date: 11/23/18(14:04) - 11/30/18(15:18)



Test: 1811 RTZB.C, 1811072A-G.C

Date: 11/23/18 (14:04) - 11/30/18 (15:18)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: December 06, 2018

TEST DATE: December 07, 2018

TEST NUMBER: 1812072D.C

TEST MATERIAL: Station DOM-RW-DC01

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

REFERENCE TOXICANT TEST: 1812RT2A.C

RESULT:

Survival
Reproduction

Pass, 0% effect
Pass, 18.2% effect

Rea Mara A Crinklaw

Analyst


Signature

Water Biologist III

Title

2/26/19
Date

Stacey Karnya

Supervisor


Signature

Acting Laboratory Manager I

Title

3/6/19
Date

CETIS Summary Report

Report Date: 26 Feb-19 13:58 (p 1 of 1)
Test Code: 1812072D.C | 21-0808-2194

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Batch ID: 16-3034-3643	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 07 Dec-18 15:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water									
Ending Date: 14 Dec-18 08:43	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 17h	Source: In-House Culture	Age: 1-9h	12/7/18 (0725-1500)								
Sample ID: 21-4521-7721	Code: 3576008	Client: Watershed Protection Division									
Sample Date: 06 Dec-18 06:12	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 06 Dec-18 10:00	Source: Stormwater (STORMWATER)										
Sample Age: 33h (5.5 °C)	Station: DOM-RW-DC01										
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3576008	06 Dec-18 06:12	06 Dec-18 10:00	08 Dec-18 11:37	5.5						
2	3576008	06 Dec-18 06:12	06 Dec-18 10:00	09 Dec-18 12:52	5.5						
3	3576008	06 Dec-18 06:12	06 Dec-18 10:00	10 Dec-18 12:30	5.5						
4	3576008	06 Dec-18 06:12	06 Dec-18 10:00	11 Dec-18 15:12	5.5						
5	3576008	06 Dec-18 06:12	06 Dec-18 10:00	12 Dec-18 14:14	5.5						
6	3576008	06 Dec-18 06:12	06 Dec-18 10:00	13 Dec-18 14:25	5.5						
Batch Note: Batch: 1124; HBN: 72477											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
17-2929-8831	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
08-9280-5040	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
17-4440-1329		100	>100	N/A	N/A	1	TST-Welch's t Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
17-2929-8831	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
08-9280-5040	Reproduction	Control Resp	42.44	15 - NL	Yes	Passes Acceptability Criteria					
17-4440-1329	Reproduction	Control Resp	38.9	15 - NL	Yes	Passes Acceptability Criteria					
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	9	42.44	39.73	45.16	28	51	2.427	7.282	17.16%	0.0%
100		10	34.7	32.59	36.81	25	41	1.789	5.658	16.31%	18.25%
7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1
Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water		41	39	51	48	40	51	45	39	28
100		25	35	37	39	40	37	35	41	33	25

CETIS Analytical Report

Report Date: 26 Feb-19 13:57 (p 1 of 6)
 Test Code: 1812072D.C | 21-0808-2194

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 17-4440-1329	Endpoint: Reproduction	CETIS Version: CETISv1.8.1									
Analyzed: 27 Dec-18 11:18	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes									
Batch ID: 16-3034-3643	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 07 Dec-18 15:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water									
Ending Date: 14 Dec-18 08:43	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 17h	Source: In-House Culture	Age: 1-9h 12/7/18 (0725-1500)									
Sample ID: 21-4521-7721	Code: 3576008	Client: Watershed Protection Division									
Sample Date: 06 Dec-18 06:12	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 06 Dec-18 10:00	Source: Stormwater (STORMWATER)										
Sample Age: 33h (5.5 °C)	Station: DOM-RW-DC01										
Batch Note: Batch: 1124; HBN: 72477											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Untransformed	0	C*b > T	Not Run	0.75	Sample passes reproduction endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	1.537	0.8681	14		0.0733	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	38.9	15 - NL	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	3.239	2.708	0.0019	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	88.2	88.2	1	0.8614	0.3656	Non-Significant Effect					
Error	1843	102.3889	18								
Total	1931.2	190.5889	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	5.397	6.541	0.0194	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.8272	0.866	0.0023	Non-normal Distribution						
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	38.9	33.9	43.9	7	51	4.157	13.14	33.79%	0.0%
100		10	34.7	32.55	36.85	25	41	1.789	5.658	16.31%	10.8%

CETIS Analytical Report

Report Date: 26 Feb-19 13:57 (p.2 of 6)
 Test Code: 1812072D.C | 21-0808-2194

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 17-4440-1329
 Analyzed: 27 Dec-18 11:18

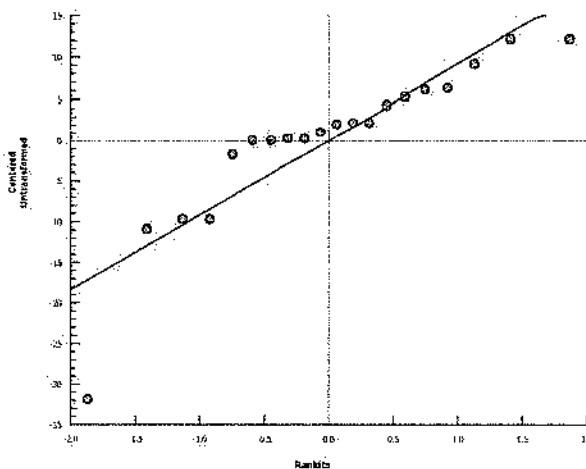
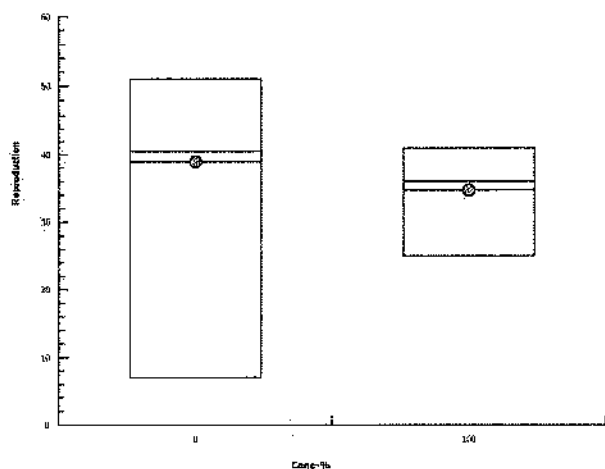
Endpoint: Reproduction
 Analysis: Parametric Bioequivalence-Two Sample

CETIS Version: CETISv1.8.1
 Official Results: Yes

Reproduction Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	7	41	39	51	48	40	51	45	39	28
100		25	35	37	39	40	37	35	41	33	25

Graphics



CETIS Analytical Report

Report Date: 26 Feb-19 13:57 (p 3 of 6)
Test Code: 1812072D.C | 21-0808-2194

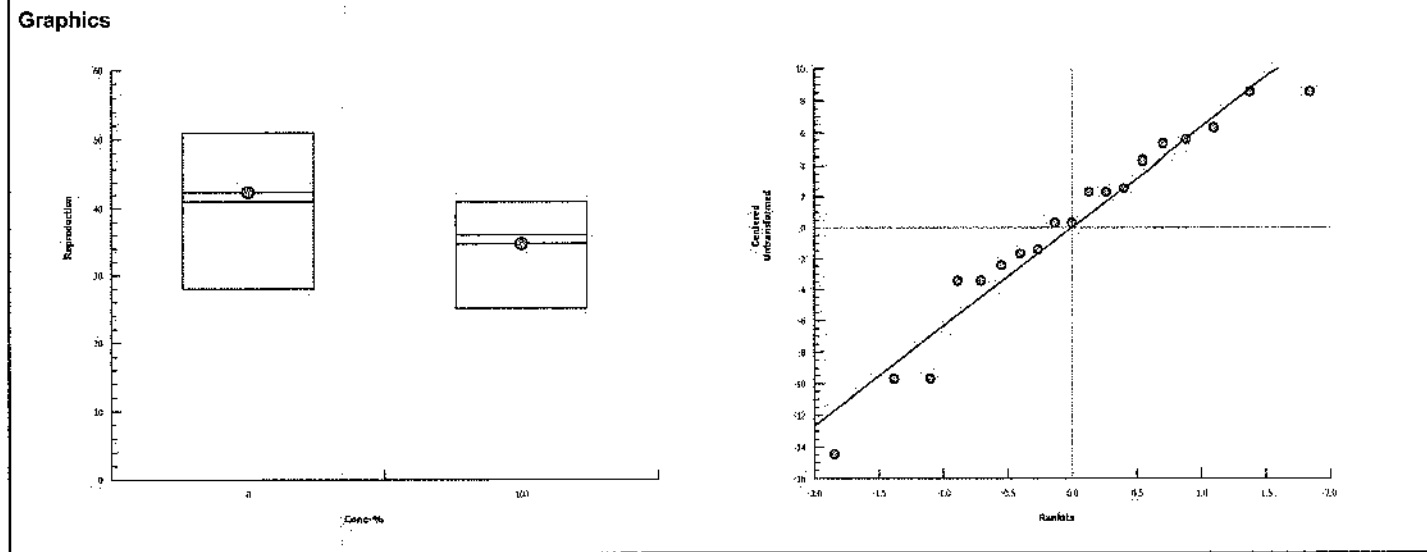
Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 08-9280-5040		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 27 Dec-18 11:18		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 16-3034-3643		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 07 Dec-18 15:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water							
Ending Date: 14 Dec-18 08:43		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 17h		Source: In-House Culture		Age: 1-9h 2/7/18 (0725-1500)							
Sample ID: 21-4521-7721		Code: 3576008		Client: Watershed Protection Division							
Sample Date: 06 Dec-18 06:12		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 06 Dec-18 10:00		Source: Stormwater (STORMWATER)									
Sample Age: 33h (5.5 °C)		Station: DOM-RW-DC01									
Batch Note: Batch: 1124; HBN: 72477											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Untransformed	0	C*b > T	Not Run	0.75	Sample passes reproduction endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value				
Dilution Water		100*	1.123	0.8647	16		0.1390				
Decision(α:20%) Non-Significant Effect											
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	42.44	15 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	284.0988	284.0988	1	6.78	0.0185	Significant Effect					
Error	712.3222	41.90131	17								
Total	996.421	326.0001	18								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.657	6.693	0.4674	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9407	0.8605	0.2713	Normal Distribution						
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	9	42.44	39.67	45.21	28	51	2.427	7.282	17.16%	0.0%
100		10	34.7	32.55	36.85	25	41	1.789	5.658	16.31%	18.25%

CETIS Analytical Report

Report Date: 26 Feb-19 13:57 (p 4 of 6)
 Test Code: 1812072D.C | 21-0808-2194

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory			
Analysis ID: 08-9280-5040		Endpoint: Reproduction		CETIS Version: CETISv1.8.1		Official Results: Yes	
Analyzed: 27 Dec-18 11:18		Analysis: Parametric Bioequivalence-Two Sample					

Reproduction Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	Outlier	41	39	51	48	40	51	45	39	28
100		25	35	37	39	40	37	35	41	33	25



CETIS Analytical Report

Report Date: 26 Feb-19 13:57 (p 5 of 6)
Test Code: 1812072D.C | 21-0808-2194

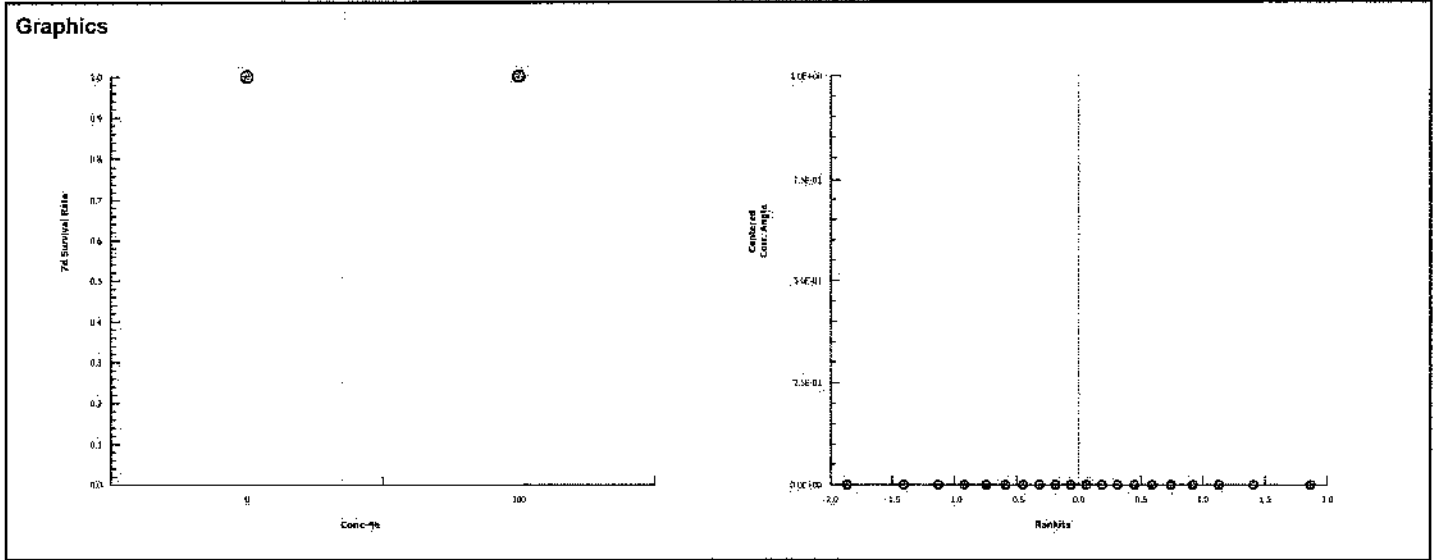
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 17-2929-8831		Endpoint: 7d Survival Rate				CETIS Version: CETISv1.8.1					
Analyzed: 27 Dec-18 11:17		Analysis: Parametric Bioequivalence-Two Sample				Official Results: Yes					
Batch ID: 16-3034-3643		Test Type: Reproduction-Survival (7d)				Analyst: Rea Mara Crinklaw					
Start Date: 07 Dec-18 15:25		Protocol: EPA/821/R-02-013 (2002)				Diluent: Hard Synthetic Water					
Ending Date: 14 Dec-18 08:43		Species: Ceriodaphnia dubia				Brine:					
Duration: 6d 17h		Source: In-House Culture				Age: 1-9h 12/7/18 (0725-1500)					
Sample ID: 21-4521-7721		Code: 3576008				Client: Watershed Protection Division					
Sample Date: 06 Dec-18 06:12		Material: Stormwater Monitoring Sample				Project: MS4					
Receive Date: 06 Dec-18 10:00		Source: Stormwater (STORMWATER)									
Sample Age: 33h (5.5 °C)		Station: DOM-RW-DC01									
Batch Note: Batch: 1124; HBN: 72477											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Angular (Corrected)	0	C*b > T	Not Run	0.75	Sample passes 7d survival rate endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	0.2618				<0.2	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	65540	<0.0001	Significant Effect					
Error	0	0	18								
Total	0	0	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Mod Levene Equality of Variance	65540	8.285	<0.0001	Unequal Variances						
7d Survival Rate Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	0.0%
Angular (Corrected) Transformed Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%
100		10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	0.0%

CETIS Analytical Report

Report Date: 26 Feb-19 13:57 (p 6 of 6)
 Test Code: 1812072D.C | 21-0808-2194

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID:	17-2929-8831	Endpoint:	7d Survival Rate	CETIS Version:		CETISv1.8.1					
Analyzed:	27 Dec-18 11:17	Analysis:	Parametric Bioequivalence-Two Sample	Official Results:		Yes					

7d Survival Rate Detail											
Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1



CETIS Test Data Worksheet

Report Date: 05 Dec-18 15:40 (p 1 of 1)
 Test Code: 21-0808-2194/1812072D.C

Ceriodaphnia 7d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory				
Start Date:	06 Dec-18	Species:	Ceriodaphnia dubia	Sample Code:	7FDD6CB9				
End Date:	13 Dec-18	Protocol:	EPA/821/R-02-013 (2002)	Sample Source:	Stormwater				
Sample Date:	08 Dec-18	Material:	Stormwater Monitoring Sample	Sample Station:	DOM-RW-DC01				

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1		1	0	0	0	0	1	6	0	7	
0	D	2		1	0	0	0	6	14	0	21	41	
0	D	3		1	0	0	0	8	16	0	15	39	
0	D	4		1	0	0	0	8	17	0	26	51	
0	D	5		1	0	0	0	7	19	0	22	48	
0	D	6		1	0	0	0	6	15	0	19	40	
0	D	7		1	0	0	0	8	0	19	24	51	
0	D	8		1	0	0	0	7	15	0	23	45	
0	D	9		1	0	0	0	8	14	0	17	39	
0	D	10		1	0	0	0	3	10	15	0	28	
100		1	33	1	0	0	0	4	9	0	12	25	
100		2	34	1	0	0	0	7	15	0	13	35	
100		3	8	1	0	0	0	6	0	15	16	37	
100		4	16	1	0	0	0	8	15	16	0	39	
100		5	28	1	0	0	0	7	15	0	18	40	
100		6	46	1	0	0	0	7	11	0	19	37	
100		7	41	1	0	0	0	6	13	0	16	35	
100		8	26	1	0	0	0	8	14	0	19	41	
100		9	10	1	0	0	0	5	10	0	18	33	
100		10	14	1	0	0	0	4	8	11	12	25	

divided controls
see 1812072A.C

*outlier per CETIS.

12/7 12/8 12/9 12/10 12/11 12/12 12/13 12/14

Food Added: 1515 1112 1235 1212 1145 1350 1343
 pc pc pc pc pc pc pc
 End @ 0843 pc

Transferred: 1525 1137 1252 1230 1512 1414 1425
 pc pc pc pc pc pc pc

CETIS Measurement Worksheet

Report Date: 05 Dec-18 15:40 (p 1 of 2)
Test Code: 1812072D.C | 21-0808-2194

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 06 Dec-18
End Date: 13 Dec-18
Sample Date: 05 Dec-18

Species: Ceriodaphnia dubia
Protocol: EPA/821/R-02-013 (2002)
Material: Stormwater Monitoring Sample

Sample Code: 7FDD6CB9
Sample Source: Stormwater
Sample Station: DOM-RW-DC01

Alkalinity (CaCO₃)-mg/L

Conc-%	Code	Reading 1
0	D	68 - see attached worksheet (11/7/19 12:16 DL)
100		20 - see attached worksheet (11/31/19 13:12 DL)
Measure Time:		
Instrument ID:		
Analyst:		

Conductivity-µmhos

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	323	319	331	320	326	326	316
100		70	68	67	67	68	67	68
Measure Time:		1101	1042	1215	1119	1115	1130	1244
Instrument ID:		#1	#1	#1	#1	#1	#1	#1
Analyst:		PC	PC	PC	PC	PC	PC	PC

Final Dissolved Oxygen-mg/L

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.92	7.98	7.98	7.58	7.86	7.55	7.79
100		7.84	7.93	8.04	7.98	8.08	8.13	8.15
Measure Time:		1222	1314	1256	1632	1550	1514	1244
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		PC	PC	PC	PC	PC	PC	PC

Initial Dissolved Oxygen-mg/L

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.28	8.03	8.01	8.08	8.15	8.38	7.94
100		8.53	8.93	8.48	8.52	8.37	8.78	8.67
Measure Time:		1101	1042	1215	1119	1115	1130	1244
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		PC	PC	PC	PC	PC	PC	PC

Hardness (CaCO₃)-mg/L

Conc-%	Code	Reading 1
0	D	96 - see attached worksheet (11/7/19 12:16 DL)
100		24 - see attached worksheet (11/31/19 13:12 DL)
Measure Time:		
Instrument ID:		
Analyst:		

Final pH

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.52	7.57	7.48	7.44	7.53	7.40	7.08
100		6.93	6.96	6.89	6.88	6.90	6.88	6.71
Measure Time:		1222	1314	1256	1632	1550	1514	1244
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC

CETIS Measurement Worksheet

Report Date: 05 Dec-18 15:40 (p 2 of 2)
Test Code: 1812072D.C | 21-0808-2194

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date: 06 Dec-18		Species: Ceriodaphnia dubia				Sample Code: 7FDD6CB9					
End Date: 13 Dec-18		Protocol: EPA/821/R-02-013 (2002)				Sample Source: Stormwater					
Sample Date: 05 Dec-18		Material: Stormwater Monitoring Sample				Sample Station: DOM-RW-DC01					
Initial pH											
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	7.76	7.88	7.74	7.39	7.34	7.59	7.69			
100		6.80	6.86	6.91	6.62	6.71	6.71	6.93			
Measure Time:		1101	1042	1215	1119	1115	1130	1244			
Instrument ID:		#2	#2	#2	#2	#2	#2	#2			
Analyst:		Kc	Kc	Kc	Kc	Kc	Kc	Kc			
Final Temperature-°C											
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	24.9	24.8	24.5	25.0	25.2	24.8	24.7			
100		24.4	24.3	24.2	24.7	24.2	24.6	24.0			
Measure Time:		1222	1314	1254	1432	1550	1514	1244			
Instrument ID:		#2	#2	#2	#2	#2	#2	#2			
Analyst:		Kc	Kc	Kc	Kc	Kc	Kc	Kc			
Initial Temperature-°C											
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	24.1	24.8	24.5	24.4	24.6	25.0	24.6			
100		24.4	24.4	24.6	24.2	24.5	24.6	24.4			
Measure Time:		1101	1042	1215	1119	1115	1130	1244			
Instrument ID:		#2	#2	#2	#2	#2	#2	#2			
Analyst:		Kc	Kc	Kc	Kc	Kc	Kc	Kc			

Alkalinity

Date/Time: 1-7-19 / 1216Analyst: 102Titrant: H₂SO₄Factor: 200 50mLProject: LAG chronic Pinn
Balboa Lake chronic sel
MS4 chronic cenio

Sample	Sample (mL) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO ₃ /L)
SDS [40]	25	2.8	112
LAG 1		4.1	164
LAG 2		4.5	180
LAG 3		4.3	172
MHSPW		2.0	80
32 ppb Zn		1.9	76
128 ppb Zn		1.8	72
Balboa Lake #1		3.1	124
Balboa Lake #4 ¹²⁻⁷⁻¹⁹		3.2	128
Balboa Lake #5		3.4	136
MHSPW 12-7-18		3.0	120
[200 mg/L] RT 12-9-18	25	1.7	68

LAG

Balboa
lakeMS4
chronic
ceniomislabeled
3/6/19
RC

Hardness

Date/Time: 1-7-19 / 12:16

Analyst: 102

Titrant: EDTA

Factor: 20 @ 50 mL

LAG chronic pim

Project: Balboa Lake chronic sel

MS4 chronic Ceno

AG
Chronic

Balboa
Lake

MS4
Chronic
Ceno

Sample	Sample (mL Amount)	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO ₃ /L)
SDS [40]	25	4.0	160
LAG 1		6.1	244
LAG 2		6.6	264
LAG 3		6.3	252
MHSFW		2.8	112
32 ppb Zn		2.5	100
128 ppb Zn		2.5	100
Balboa Lake #1		3.6	144
Balboa Lake #4		3.8	152
Balboa Lake #5		3.5	140
MHSFW 12-7-18	▽	4.7 *	188
[200 µg/L] AT 12-9-18	25	2.4	96

mislabelled
3/6/19
RC

* - ran twice, same results both times 10L
1-7-19

Alkalinity

Date/Time: 1-31-19 / 1312Project: M4 CEN'D
LAG NPDESAnalyst: RLTitrant: 20 @ 50 ml \rightarrow RL 1-31-19Factor: H₂SO₄

	Sample	Sample Amount (ml)	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO ₃ /L)
MS4 CHRONIC	DOM	25	0.5	20
	RHOLA	25	1.0	40
	WAS	25	0.6	24
	TUJ	25	0.5	20
	NAT	25	1.1	44
	SAW	25	0.6	24
LAG NPDES	SMUB-2	25	3.9	156
	LAG 1	25	6.5 3.8	152
	LAG 2	25	7.6 2.42	168
	LAG 3	25	6.5 4.1	164
	[40] SDS	25	4.5 2.9	116

Hardness

Date/Time: 1-31-19 / 1312Project: MS4 CENCO
LAG1 NPDESAnalyst: RLTitrant: EDTAFactor: 20050 mL

Sample	Sample (mL) Amount	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO ₃ /L)
DOW	25	0.6	24
RHSLA	25	0.4	16
WAS	25	0.6	24
TUJ	25	0.5	20
NAT	25	1.1	44
JAW	25	0.4	16
JMB-2	25	^{ml 1-31-19} 725 0.3	332
LAG1	25	6.5	260
LAG2	25	6.2	248
LAG3	25	6.5	260
[40] MDS	25	4.5	180

ran twice

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT

TOXICITY TESTING REPORT

SAMPLE DATE: December 06, 2018

TEST DATE: December 07, 2018

TEST NUMBER: 1812RT2A.C

TEST MATERIAL: Copper ($\text{CuCl}_2 \bullet 2\text{H}_2\text{O}$)

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

RESULT:

NOEC = 25 $\mu\text{g/L}$ (Survival)

NOEC = 25 $\mu\text{g/L}$ (Reproduction)

EC₅₀ = 50 $\mu\text{g/L}$ (Survival)

IC₂₅ = 31.6 $\mu\text{g/L}$ (Reproduction)

Rea Mara A Crinklaw

Analyst



Signature

Water Biologist III

Title



Date

Stacey Karnya

Supervisor



Signature

Acting Laboratory Manager I

Title



Date

CETIS Summary Report

Report Date: 29 Jan-19 16:46 (p 1 of 2)
Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory			
Batch ID: 16-3034-3643	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw					
Start Date: 07 Dec-18 15:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water					
Ending Date: 14 Dec-18 10:30	Species: Ceriodaphnia dubia	Brine:					
Duration: 6d 19h	Source: In-House Culture	Age: 1-9h	12/7/18 (0725-1500)				
Sample ID: 12-7247-7990	Code: Cu RT	Client: Watershed Protection Division					
Sample Date: 06 Dec-18 14:55	Material: Copper chloride	Project: NPDES					
Receive Date: 06 Dec-18 14:55	Source: Reference Toxicant						
Sample Age: 24h	Station:						
Sample Renewals							
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C		
1	Cu RT	06 Dec-18 14:55	06 Dec-18 14:55	08 Dec-18 12:12			
2	Cu RT	06 Dec-18 14:55	06 Dec-18 14:55	09 Dec-18 13:03			
3	Cu RT	06 Dec-18 14:55	06 Dec-18 14:55	10 Dec-18 12:40			
4	Cu RT	06 Dec-18 14:55	06 Dec-18 14:55	11 Dec-18 15:22			
5	Cu RT	06 Dec-18 14:55	06 Dec-18 14:55	12 Dec-18 14:23			
6	Cu RT	06 Dec-18 14:55	06 Dec-18 14:55	13 Dec-18 14:33			
Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
18-5180-1118	7d Survival Rate	25	50	35.36	N/A		Fisher Exact/Bonferroni-Holm Test
02-6831-3446	Reproduction	25	>25	N/A	40.6%		Steel Many-One Rank Test
Point Estimate Summary							
Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
08-0868-0487	7d Survival Rate	EC5	26.81	26.12	29.77		Linear Interpolation (ICPIN)
		EC10	28.75	27.28	35.41		
		EC15	30.82	28.5	42.09		
		EC20	33.04	29.77	50		
		EC25	35.41	31.09	54.55		
		EC40	43.57	35.41	79.43		
14-4764-0082	Reproduction	IC5	3.087	0.4886	27.96		Linear Interpolation (ICPIN)
		IC10	25.28	1.216	31.94		
		IC15	27.25	2.299	36.79		
		IC20	29.36	3.911	44.43		
		IC25	31.62	6.31	50.49		
		IC40	39.49	27.36	60.26		
IC50	45.76	34.12	70.33				
Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision	
08-0868-0487	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria	
18-5180-1118	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria	
02-6831-3446	Reproduction	Control Resp	35.7	15 - NL	Yes	Passes Acceptability Criteria	
14-4764-0082	Reproduction	Control Resp	35.7	15 - NL	Yes	Passes Acceptability Criteria	
02-6831-3446	Reproduction	PMSD	0.4062	0.13 - 0.47	Yes	Passes Acceptability Criteria	

CETIS Summary Report

 Report Date: 29 Jan-19 16:46 (p 2 of 2)
 Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory			
7d Survival Rate Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
25		10	1	1	1	1	1	0	0	0.0%	0.0%
50		10	0.5	0.3032	0.6968	0	1	0.1667	0.527	105.4%	50.0%
100		10	0.3	0.1196	0.4804	0	1	0.1528	0.483	161.0%	70.0%
200		10	0	0	0	0	0	0	0		100.0%
Reproduction Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	35.7	29.19	42.21	2	48	5.51	17.42	48.8%	0.0%
12.5		10	30.7	24.79	36.61	2	50	5.005	15.83	51.55%	14.01%
25		10	34.1	28.35	39.85	3	50	4.866	15.39	45.12%	4.48%
50		10	15.7	9.109	22.29	0	44	5.582	17.65	112.4%	56.02%
100		10	5.8	2.088	9.512	0	24	3.144	9.942	171.4%	83.75%
200		10	0	0	0	0	0	0	0		100.0%
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		0	1	1	0	1	0	1	1	0	0
100		0	1	0	0	0	0	1	1	0	0
200		0	0	0	0	0	0	0	0	0	0
Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	2	43	48	45	47	31	43	44	48	6
12.5		2	35	38	50	38	20	31	39	46	8
25		10	40	42	50	44	32	39	37	44	3
50		0	22	23	0	32	0	36	44	0	0
100		0	23	0	0	0	0	11	24	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 29 Jan-19 16:46 (p 1 of 2)
 Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory																			
Analysis ID: 18-5180-1118		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1																			
Analyzed: 29 Jan-19 16:44		Analysis: STP 2x2 Contingency Tables		Official Results: Yes																			
Batch ID: 16-3034-3643		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw																			
Start Date: 07 Dec-18 15:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water																			
Ending Date: 14 Dec-18 10:30		Species: Ceriodaphnia dubia		Brine:																			
Duration: 6d 19h		Source: In-House Culture		Age: 1-9h 12/7/18 (0725-1500)																			
Sample ID: 12-7247-7990		Code: Cu RT		Client: Watershed Protection Division																			
Sample Date: 06 Dec-18 14:55		Material: Copper chloride		Project: NPDES																			
Receive Date: 06 Dec-18 14:55		Source: Reference Toxicant																					
Sample Age: 24h		Station:																					
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Data Transform</th> <th>Zeta</th> <th>Alt Hyp</th> <th>MC Trials</th> <th>NOEL</th> <th>LOEL</th> <th>TOEL</th> <th>TU</th> </tr> </thead> <tbody> <tr> <td>Untransformed</td> <td></td> <td>C > T</td> <td>Not Run</td> <td>25</td> <td>50</td> <td>35.36</td> <td></td> </tr> </tbody> </table>								Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	Untransformed		C > T	Not Run	25	50	35.36	
Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU																
Untransformed		C > T	Not Run	25	50	35.36																	
Fisher Exact/Bonferroni-Holm Test																							
Control	vs	Conc-µg/L	Test Stat	P-Value	Decision(0.05)																		
Dilution Water		12.5	1	1.0000	Non-Significant Effect																		
		25	1	1.0000	Non-Significant Effect																		
		50	0.01625	0.0488	Significant Effect																		
		100	0.001548	0.0062	Significant Effect																		
Test Acceptability Criteria																							
Attribute	Test Stat	TAC Limits	Overlap	Decision																			
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria																			
Data Summary																							
Conc-µg/L	Control Type	No-Resp	Resp	Total																			
0	Dilution Water	10	0	10																			
12.5		10	0	10																			
25		10	0	10																			
50		5	5	10																			
100		3	7	10																			
7d Survival Rate Detail																							
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10												
0	Dilution Water	1	1	1	1	1	1	1	1	1	1												
12.5		1	1	1	1	1	1	1	1	1	1												
25		1	1	1	1	1	1	1	1	1	1												
50		0	1	1	0	1	0	1	1	0	0												
100		0	1	0	0	0	0	1	1	0	0												

CETIS Analytical Report

Report Date: 29 Jan-19 16:46 (p 2 of 2)

Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia 7-d Survival and Reproduction Test

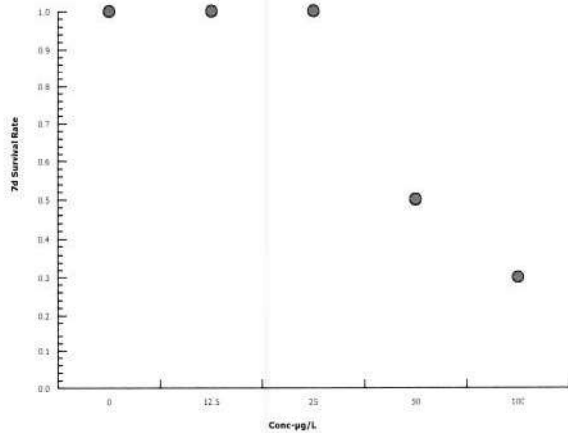
Hyperion Treatment Plant Laboratory

Analysis ID: 18-5180-1118
Analyzed: 29 Jan-19 16:44

Endpoint: 7d Survival Rate
Analysis: STP 2x2 Contingency Tables

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



Concentration-response relationship is ideal. 2/25/19 *fc*

CETIS Analytical Report

Report Date: 29 Jan-19 16:45 (p 1 of 2)
Test Code: 1812RT2A.C | 13-0104-5981

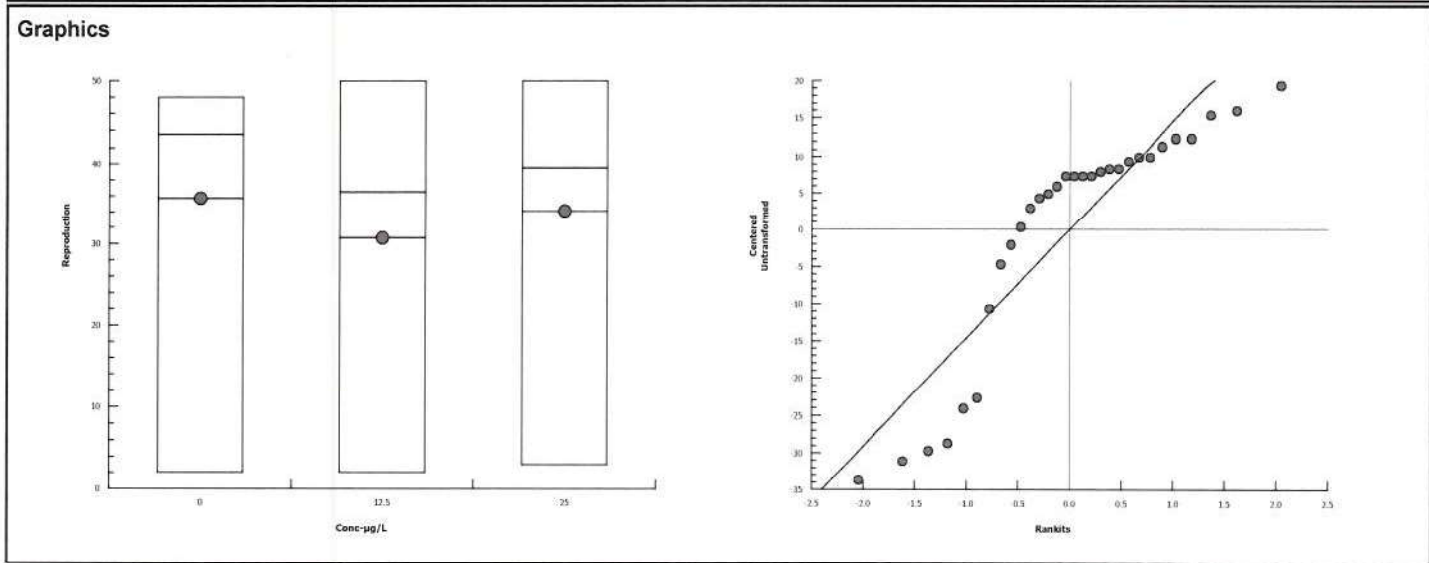
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 02-6831-3446		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 29 Jan-19 16:44		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Batch ID: 16-3034-3643		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 07 Dec-18 15:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water							
Ending Date: 14 Dec-18 10:30		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 19h		Source: In-House Culture		Age: 1-9h		12/7/18 (0725-1500)					
Sample ID: 12-7247-7990		Code: Cu RT		Client: Watershed Protection Division							
Sample Date: 06 Dec-18 14:55		Material: Copper chloride		Project: NPDES							
Receive Date: 06 Dec-18 14:55		Source: Reference Toxicant									
Sample Age: 24h		Station:									
Data Transform		Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD		
Untransformed		0	C > T	Not Run	25	>25	N/A		40.6%		
Steel Many-One Rank Test											
Control	vs	Conc-µg/L	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)			
Dilution Water		12.5	91	79	18	2	0.2350	Non-Significant Effect			
		25	94	79	18	1	0.3167	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	35.7	15 - NL	Yes	Passes Acceptability Criteria							
PMSD	0.4062	0.13 - 0.47	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.151	2.908	0.7766	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	130.4	65.2	2	0.2473	0.7826	Non-Significant Effect					
Error	7117.1	263.5963	27								
Total	7247.5	328.7963	29								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Bartlett Equality of Variance	0.1484	9.21	0.9285	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.8143	0.9031	0.0001	Non-normal Distribution						
Reproduction Summary											
Conc-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	35.7	29.07	42.33	2	48	5.51	17.42	48.8%	0.0%
12.5		10	30.7	24.68	36.72	2	50	5.005	15.83	51.55%	14.01%
25		10	34.1	28.25	39.95	3	50	4.866	15.39	45.12%	4.48%

CETIS Analytical Report

Report Date: 29 Jan-19 16:45 (p 2 of 2)
 Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory	
Analysis ID: 02-6831-3446	Endpoint: Reproduction	CETIS Version: CETISv1.8.1			
Analyzed: 29 Jan-19 16:44	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes			

Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	2	43	48	45	47	31	43	44	48	6
12.5		2	35	38	50	38	20	31	39	46	8
25		10	40	42	50	44	32	39	37	44	3



Concentration-response relationship is ideal. 2/25/19 ke

CETIS Analytical Report

Report Date: 29 Jan-19 16:46 (p 1 of 4)
Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 14-4764-0082	Endpoint: Reproduction	CETIS Version: CETISv1.8.1									
Analyzed: 29 Jan-19 16:45	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes									
Batch ID: 16-3034-3643	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 07 Dec-18 15:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water									
Ending Date: 14 Dec-18 10:30	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 19h	Source: In-House Culture	Age: 1-9h 12/7/18 (0725-1500)									
Sample ID: 12-7247-7990	Code: Cu RT	Client: Watershed Protection Division									
Sample Date: 06 Dec-18 14:55	Material: Copper chloride	Project: NPDES									
Receive Date: 06 Dec-18 14:55	Source: Reference Toxicant										
Sample Age: 24h	Station:										
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples								
Log(X+1)	Linear	1.078E+09	200								
		Exp 95% CL	Method								
		Yes	Two-Point Interpolation								
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap								
Control Resp	35.7	15 - NL	Yes								
Decision: Passes Acceptability Criteria											
Residual Analysis											
Attribute	Method	Test Stat	Critical								
Extreme Value	Grubbs Extreme Value	2.49	3.2								
		P-Value	Decision(α:5%)								
		0.6483	No Outliers Detected								
Point Estimates											
Level	µg/L	95% LCL	95% UCL								
IC5	3.087	0.4886	27.96								
IC10	25.28	1.216	31.94								
IC15	27.25	2.299	36.79								
IC20	29.36	3.911	44.43								
IC25	31.62	6.31	50.49								
IC40	39.49	27.36	60.26								
IC50	45.76	34.12	70.33								
Reproduction Summary											
		Calculated Variate									
Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	Dilution Water	10	35.7	2	48	5.51	17.42	48.8%	0.0%		
12.5		10	30.7	2	50	5.005	15.83	51.55%	14.01%		
25		10	34.1	3	50	4.866	15.39	45.12%	4.48%		
50		10	15.7	0	44	5.582	17.65	112.4%	56.02%		
100		10	5.8	0	24	3.144	9.942	171.4%	83.75%		
200		10	0	0	0	0	0		100.0%		
Reproduction Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	2	43	48	45	47	31	43	44	48	6
12.5		2	35	38	50	38	20	31	39	46	8
25		10	40	42	50	44	32	39	37	44	3
50		0	22	23	0	32	0	36	44	0	0
100		0	23	0	0	0	0	11	24	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 29 Jan-19 16:46 (p.2 of 4)
Test Code: 1812RT2A.C | 13-0104-5981

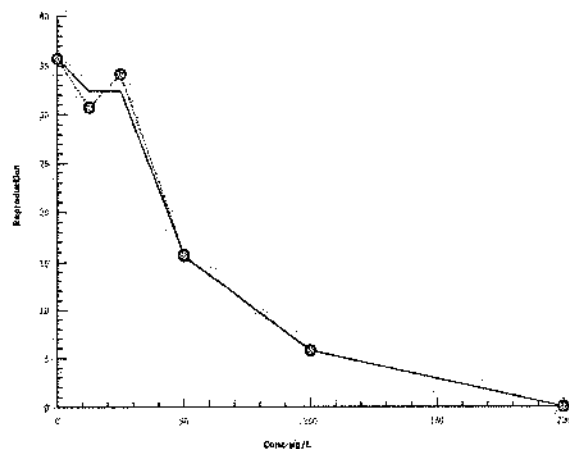
Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 14-4764-0082 Endpoint: Reproduction
Analyzed: 29 Jan-19 16:45 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 29 Jan-19 16:46 (p 3 of 4)
Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 08-0868-0487		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 29 Jan-19 16:44		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Batch ID: 16-3034-3643		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 07 Dec-18 15:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water							
Ending Date: 14 Dec-18 10:30		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 19h		Source: In-House Culture		Age: 1-9h 12/7/18 (0725-1500)							
Sample ID: 12-7247-7990		Code: Cu RT		Client: Watershed Protection Division							
Sample Date: 06 Dec-18 14:55		Material: Copper chloride		Project: NPDES							
Receive Date: 06 Dec-18 14:55		Source: Reference Toxicant									
Sample Age: 24h		Station:									
Linear Interpolation Options											
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method						
Log(X+1)	Linear	1.440E+09	200	Yes	Two-Point Interpolation						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria							
Point Estimates											
Level	µg/L	95% LCL	95% UCL								
EC5	26.81	26.12	29.77								
EC10	28.75	27.28	35.41								
EC15	30.82	28.5	42.09								
EC20	33.04	29.77	50								
EC25	35.41	31.09	54.55								
EC40	43.57	35.41	79.43								
EC50	50	38.61	100								
7d Survival Rate Summary											
		Calculated Variate(A/B)									
Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	1	1	1	0	0	0.0%	0.0%	10	10
25		10	1	1	1	0	0	0.0%	0.0%	10	10
50		10	0.5	0	1	0.1667	0.527	105.4%	50.0%	5	10
100		10	0.3	0	1	0.1528	0.483	161.0%	70.0%	3	10
200		10	0	0	0	0	0		100.0%	0	10
7d Survival Rate Detail											
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		0	1	1	0	1	0	1	1	0	0
100		0	1	0	0	0	0	1	1	0	0
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 29 Jan-19 16:46 (p 4 of 4)
Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia 7-d Survival and Reproduction Test

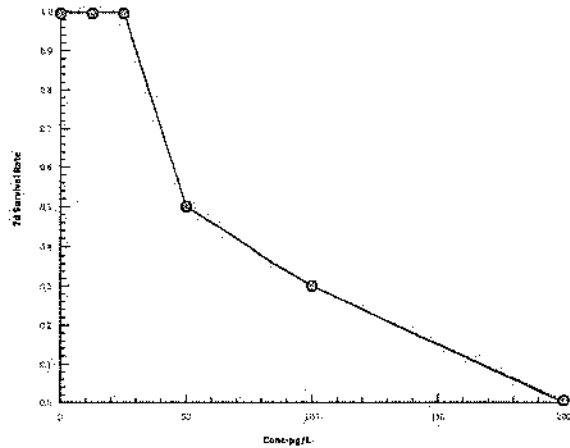
Hyperion Treatment Plant Laboratory

Analysis ID: 08-0868-0487
Analyzed: 29 Jan-19 16:44

Endpoint: 7d Survival Rate
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



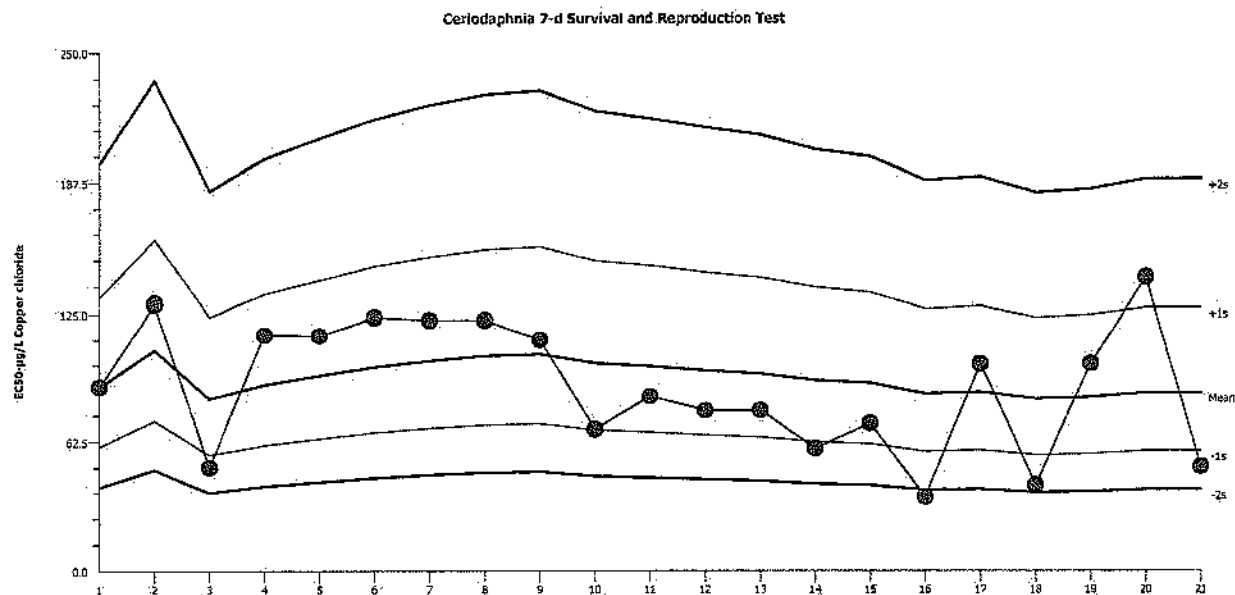
Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)
Protocol: EPA/821/R-02-013 (2002)

Organism: Ceriodaphnia dubia (Water Flea)
Endpoint: 7d Survival Rate

Material: Copper chloride
Source: Reference Toxicant-REF



Mean: 85.71

Count: 20

-1s Warning Limit: 57.75

-2s Action Limit: 38.91

Sigma: N/A

CV: 48.40%

+1s Warning Limit: 127.2

+2s Action Limit: 188.8

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Aug	9	89.13	3.416	0.09896			05-1646-5416	02-7143-5836
2			23	129.7	44.02	1.05	(+)		18-0928-7994	14-9065-9379
3		Sep	6	50	-35.71	-1.365	(-)		04-1283-5528	07-2201-0667
4			20	114.9	29.19	0.7422			09-2547-5700	02-6449-6736
5		Oct	18	114.5	28.75	0.7324			14-7896-4665	17-5474-2245
6		Nov	15	123.5	37.75	0.9242			09-2671-6353	07-5336-3496
7		Dec	13	121.9	36.23	0.8928			19-3949-3034	10-6518-1710
8	2018	Jan	4	121.9	36.23	0.8928			17-7500-8361	05-5922-1635
9		Feb	7	112.3	26.56	0.6836			04-8492-7543	17-6325-1645
10		Mar	2	68.1	-17.62	-0.5826			11-4862-8707	06-1686-5917
11			15	84.14	-1.573	-0.04689			20-9677-0547	14-4393-4243
12		Apr	19	77.17	-8.543	-0.2659			18-2737-1194	07-4972-9760
13		May	16	77.17	-8.543	-0.2659			05-4955-8978	09-0510-7297
14		Jun	13	58.82	-26.9	-0.9537			16-1570-3305	01-3881-0040
15		Jul	12	70.77	-14.94	-0.4851			05-0138-0333	09-5921-7712
16		Aug	22	35.41	-50.3	-2.238	(-)	(-)	11-5251-4189	02-6103-0961
17		Sep	12	100	14.29	0.3904			10-4359-2259	02-9718-5741
18		Oct	17	41.07	-44.64	-1.863	(-)		09-6713-5129	03-7900-4433
19		Nov	14	100	14.29	0.3904			16-4205-8005	13-0463-7350
20			23	141.5	55.77	1.269	(+)		07-8581-3240	03-2855-8063
21		Dec	6	50	-35.71	-1.365	(-)		13-0104-5981	04-4572-5308

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

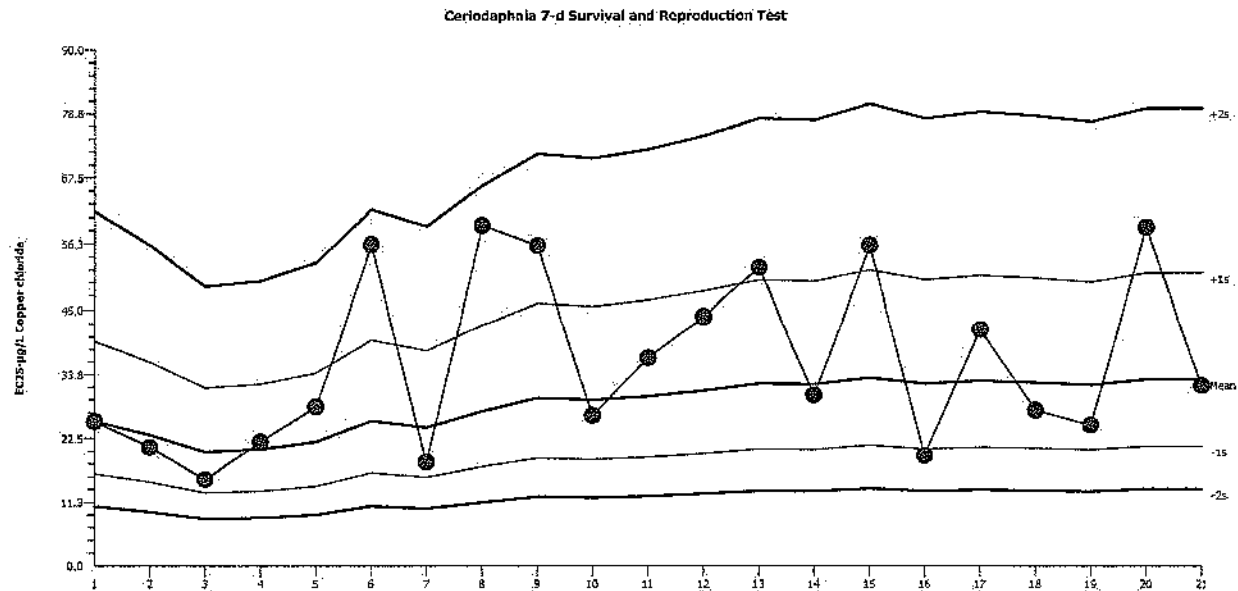
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

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

Endpoint: Reproduction

Source: Reference Toxicant-REF



Mean: 32.72

Count: 20

-1s Warning Limit: 21

-2s Action Limit: 13.49

Sigma: N/A

CV: 55.80%

+1s Warning Limit: 50.95

+2s Action Limit: 79.36

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Aug	9	25.45	-7.273	-0.5673			05-1646-5416	12-8828-7274
2			23	20.93	-11.79	-1.008	(-)		18-0928-7994	01-4455-3838
3		Sep	6	15.28	-17.44	-1.719	(-)		04-1283-5528	07-4663-1403
4			20	21.83	-10.89	-0.9135			09-2547-5700	05-2225-6686
5		Oct	18	27.98	-4.742	-0.3533			14-7896-4665	10-2719-4408
6		Nov	15	55.96	23.24	1.211	(+)		09-2671-6353	12-1707-6477
7		Dec	13	18.28	-14.44	-1.314	(-)		19-3949-3034	15-1089-9957
8	2018	Jan	4	59.22	26.5	1.339	(+)		17-7500-8361	03-9405-5395
9		Feb	7	55.8	23.08	1.205	(+)		04-8492-7543	19-3721-5481
10		Mar	2	26.44	-6.277	-0.4807			11-4862-8707	08-2696-1620
11			15	36.61	3.893	0.2537			20-9677-0547	09-0026-7515
12		Apr	19	43.76	11.04	0.6562			18-2737-1194	03-8342-1801
13		May	16	51.99	19.27	1.045	(+)		05-4955-8978	05-0129-1380
14		Jun	13	29.96	-2.76	-0.1989			16-1570-3305	06-3152-2418
15		Jul	12	55.75	23.03	1.203	(+)		05-0138-0333	18-3627-7518
16		Aug	22	19.4	-13.32	-1.18	(-)		11-5251-4189	07-5888-1093
17		Sep	12	41.54	8.82	0.5386			10-4359-2259	01-2617-3703
18		Oct	17	27.3	-5.418	-0.4085			09-6713-5129	11-3265-6236
19		Nov	14	24.67	-8.052	-0.6375			16-4205-8005	10-8446-2066
20			23	58.79	26.07	1.322	(+)		07-8581-3240	21-2452-6843
21		Dec	6	31.62	-1.097	-0.07697			13-0104-5981	07-2811-8193

LC

RA

CETIS Test Data Worksheet

Report Date:

05 Dec-18 15:40 (p 1 of 2)

Test Code:

13-0104-5981/1812RT2A.C

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 06 Dec-18

Species: Ceriodaphnia dubia

Sample Code: 4BD87926

End Date: 13 Dec-18

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

Sample Source: Reference Toxicant

Sample Date: 06 Dec-18

Material: Copper chloride

Sample Station:

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1	28	1	0	0	0	0	1	0	1	2	
0	D	2	18	1	0	0	0	9	16	0	18	43	
0	D	3	17	1	0	0	0	8	17	0	23	48	
0	D	4	14	1	0	0	0	9	15	0	21	45	
0	D	5	6	1	0	0	0	8	15	24	0	47	
0	D	6	38	1	0	0	0	8	15	0	8	31	
0	D	7	27	1	0	0	0	8	17	0	18	43	
0	D	8	40	1	0	0	0	9	18	0	17	44	
0	D	9	42	1	0	0	0	8	17	0	23	48	
0	D	10	50	1	0	0	0	0	16	0	0	6	
12.5		1	48	1	0	0	0	1	0	0	0	2	
12.5		2	35	1	0	0	0	7	0	16	12	35	
12.5		3	32	1	0	0	0	7	15	0	16	38	
12.5		4	57	1	0	0	0	8	20	22	0	50	
12.5		5	11	1	0	0	0	7	18	0	13	38	
12.5		6	33	1	0	0	0	5	6	0	9	20	
12.5		7	20	1	0	0	0	6	15	0	10	31	
12.5		8	55	1	0	0	0	9	14	0	16	39	
12.5		9	56	1	0	0	0	8	16	22	0	46	
12.5		10	59	1	0	0	0	5	0	3	0	8	
25		1	31	1	0	0	0	3	14	0	7	10	
25		2	53	1	0	0	0	7	14	19	0	40	
25		3	60	1	0	0	0	7	16	19	0	42	
25		4	58	1	0	0	0	8	16	26	0	50	
25		5	36	1	0	0	0	8	14	0	22	44	
25		6	41	1	0	0	0	4	9	0	19	32	
25		7	19	1	0	0	0	8	14	0	17	39	
25		8	21	1	0	0	0	6	14	0	17	37	
25		9	34	1	0	0	0	7	17	0	20	44	
25		10	47	1	0	0	0	2	0	0	1	3	
50		1	1	1	0	0	X	X	X	X	X	0	
50		2	25	1	0	0	0	5	12	0	5	22	
50		3	10	1	0	0	0	5	11	7	0	23	
50		4	12	1	0	0	0	X	X	X	X	0	
50		5	3	1	0	0	0	4	10	0	18	32	
50		6	2	1	0	0	0	X	X	X	X	0	
50		7	45	1	0	0	0	9	11	0	19	36	
50		8	52	1	0	0	0	9	16	19	0	44	
50		9	7	1	0	0	0	X	X	X	X	0	
50		10	16	1	0	0	0	X	X	X	X	0	
100		1	39	1	0	0	0	X	X	X	X	0	
100		2	43	1	0	0	0	0	4	7	12	23	
100		3	29	1	0	0	0	X	X	X	X	0	
100		4	49	1	0	0	0	X	X	X	X	0	
100		5	4	1	0	0	0	X	X	X	X	0	
100		6	54	1	0	0	0	X	X	X	X	0	
100		7	23	1	0	0	0	4	0	7	0	11	

CETIS Test Data Worksheet

Report Date:

05 Dec-18 15:40 (p 2 of 2)

Test Code:

13-0104-5981/1812RT2A.C

Conc-µg/L	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
100		8	24	1	0	0	0	4	0	9	11	24	
100		9	37	1	0X	X	X	X	X	X	X	0	
100		10	26	1	0X	X	X	X	X	X	X	0	
200		1	8	1	0X	X	X	X	X	X	X	0	
200		2	51	1	0X	X	X	X	X	X	X	0	
200		3	13	1	0X	X	X	X	X	X	X	0	
200		4	22	1	0X	X	X	X	X	X	X	0	
200		5	15	1	0X	X	X	X	X	X	X	0	
200		6	9	1	0X	X	X	X	X	X	X	0	
200		7	46	1	0X	X	X	X	X	X	X	0	
200		8	44	1	0X	X	X	X	X	X	X	0	
200		9	5	1	0X	X	X	X	X	X	X	0	
200		10	30	1	0X	X	X	X	X	X	X	0	

12/7 12/8 12/9 12/10 12/11 12/12 12/13 12/14

Food Added: 15/5 11/2 12/35 12/2 11/45 13/50 13/3
 Rc Rc Rc Rc Rc Rc Rc
 End @ 10:30
 Rc

Transferred: 15/25 11/37 13/3 12/40 15/22 14/23 14/33
 Rc Rc Rc Rc Rc Rc Rc

CETIS Measurement Worksheet

Report Date: 05 Dec-18 15:40 (p 1 of 2)
 Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia Survival and Reproduction Test						Hyperion Treatment Plant Laboratory	
Start Date: 06 Dec-18		Species: Ceriodaphnia dubia		Sample Code: 4BD87926			
End Date: 13 Dec-18		Protocol: EPA/821/R-02-013 (2002)		Sample Source: Reference Toxicant			
Sample Date: 06 Dec-18		Material: Copper chloride		Sample Station:			

Alkalinity (CaCO ₃)-mg/L		
Conc-µg/L	Code	Reading 1
0	D	120 - See Reconstituted Water Prep Logbook (11/21/18 AS)
200		120 - see attached worksheet.
Measure Time:		
Instrument ID:		
Analyst:		

Conductivity-µmhos								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	594	592	586	593	592	579	578
12.5		592	596	597	597	594	594	599
25		591	598	597	600	595	595	598
50		589	599	596	597	594	593	568
100		587	599	592	586	588	581	580
200		579	592					
Measure Time:		1053	1037	1225	1136	1130	1141	1259
Instrument ID:		#1	#1	#1	#1	#1	#1	#1
Analyst:		fc	fc	fc	fc	fc	fc	fc

Final Dissolved Oxygen-mg/L								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.67	7.97	7.97	7.85	7.89	7.88	8.03
12.5		7.79	8.11	8.09	7.93	8.07	8.20	8.17
25		7.82	8.18	8.13	7.98	8.08	8.21	8.24
50		7.81	8.14	8.11	8.03	8.08	8.18	8.19
100		8.02	8.15	7.76	8.04	7.97	8.16	8.22
200		7.87						
Measure Time:		1232	1324	1305	1641	1559	1523	1247
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		fc	fc	fc	fc	fc	fc	fc

Initial Dissolved Oxygen-mg/L								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.33	8.02	8.15	8.16	8.18	8.47	8.22
12.5		8.28	8.15	8.21	8.22	8.26	8.43	8.47
25		8.24	8.20	8.25	8.27	8.31	8.38	8.47
50		8.30	8.22	8.27	8.32	8.30	8.36	8.43
100		8.23	8.25	8.28	8.31	8.31	8.39	8.42
200		8.22	8.29					
Measure Time:		1053	1037	1225	1136	1130	1141	1259
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		fc	fc	fc	fc	fc	fc	fc

Hardness (CaCO ₃)-mg/L		
Conc-µg/L	Code	Reading 1
0	D	172 - See Reconstituted Water Prep Logbook (11/21/18 AS)
200		188 - see attached worksheet.
Measure Time:		
Instrument ID:		
Analyst:		

CETIS Measurement Worksheet

Report Date: 05 Dec-18 15:40 (p 2 of 2)
 Test Code: 1812RT2A.C | 13-0104-5981

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date: 06 Dec-18		Species: Ceriodaphnia dubia				Sample Code: 4BD87926					
End Date: 13 Dec-18		Protocol: EPA/821/R-02-013 (2002)				Sample Source: Reference Toxicant					
Sample Date: 06 Dec-18		Material: Copper chloride				Sample Station:					

Final pH		12/8 12/9 12/10 12/11 12/12 12/13 12/14						
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.77	7.92	7.76	7.72	7.72	7.76	7.66
12.5		7.82	7.92	7.83	7.82	7.79	7.82	7.76
25		7.84	7.95	7.84	7.84	7.80	7.85	7.77
50		7.85	7.96	7.83	7.85	7.82	7.84	7.79
100		7.88	7.95	7.76	7.84	7.78	7.83	7.77
200		7.89	—	—	—	—	—	—
Measure Time:		1232	1324	1305	1641	1559	1523	1247
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Initial pH		12/7 12/8 12/9 12/10 12/11 12/12 12/13						
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.80	7.98	7.92	7.78	7.77	7.84	7.86
12.5		7.80	8.02	7.98	7.84	7.86	7.88	7.96
25		7.81	8.01	8.00	7.88	7.91	7.91	7.98
50		7.86	8.01	8.01	7.88	7.93	7.92	7.98
100		7.90	8.02	8.00	7.87	7.89	7.92	7.99
200		7.92	8.00	—	—	—	—	—
Measure Time:		1053	1037	1225	1136	1130	1141	1259
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Final Temperature-°C		12/8 12/9 12/10 12/11 12/12 12/13 12/14						
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	24.9	24.8	24.6	25.1	25.2	24.7	24.9
12.5		24.8	24.8	24.5	25.1	25.1	24.6	24.7
25		24.8	24.8	24.5	25.1	24.9	24.6	24.6
50		24.7	24.7	24.5	25.0	24.9	24.4	24.8
100		24.6	24.7	24.5	25.1	24.9	24.3	24.9
200		24.6	—	—	—	—	—	—
Measure Time:		1232	1324	1305	1641	1559	1523	1247
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Initial Temperature-°C		12/7 12/8 12/9 12/10 12/11 12/12 12/13						
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	24.2	24.5	24.9	24.8	25.0	25.1	25.2
12.5		24.3	24.6	24.7	24.6	24.9	25.3	25.1
25		24.4	24.6	24.8	24.6	24.8	25.2	24.8
50		24.3	24.4	24.6	24.6	24.7	24.9	24.8
100		24.3	24.4	24.7	24.6	24.8	25.0	24.8
200		24.4	24.5	—	—	—	—	—
Measure Time:		1053	1037	1225	1136	1130	1141	1259
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc

Alkalinity

Date/Time: 1-7-19 / 1216Analyst: BLTitrant: H₂SO₄Factor: 200 50mLProject: LAG chronic Pinn
Balboa Lake chronic sel
MS4 chronic cenio

Sample	Sample (mL) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO ₃ /L)
SDS [40]	25	2.8	112
LAG 1		4.1	164
LAG 2		4.5	180
LAG 3		4.3	172
MHSFW		2.0	80
32 ppb. Zn		1.9	76
128 ppb Zn		1.8	72
Balboa Lake #1		3.1	124
Balboa Lake #4 ^{BL 1-7-19}		3.2	128
Balboa Lake #5		3.4	136
MHSFW 12-7-18		3.0	120
[200 µg/L] RT 12-9-18	25	1.7	68

LAG

Balboa
lakeMS4
chronic
ceniomislabelled
3/6/19
RC

Hardness

Date/Time: 1-7-19 / 1216

Analyst: 102

Titrant: EDTA

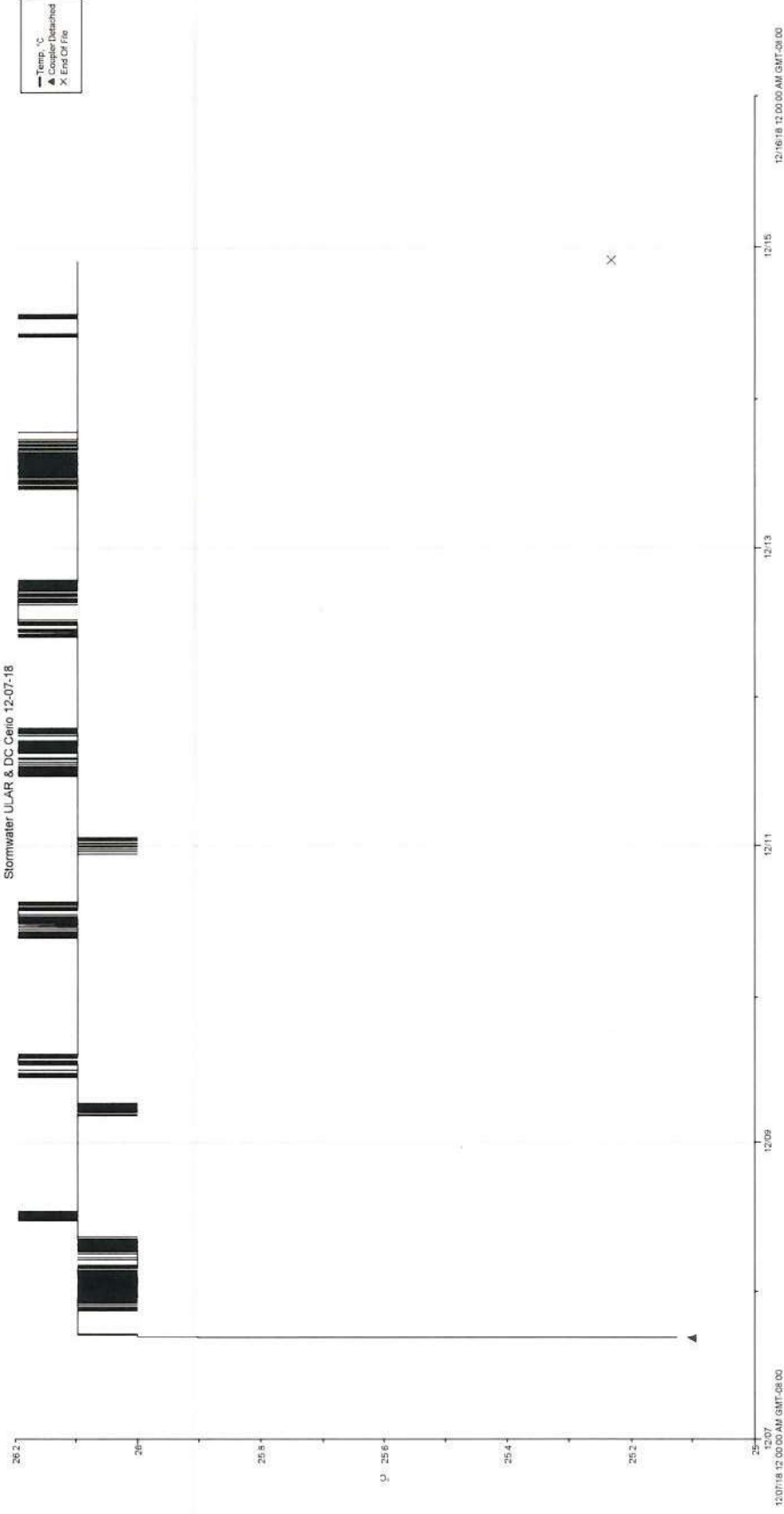
Factor: 20 @ 50 ml

Project: LAG chronic Dim
Balboa Lake chronic sel
MS4 chronic Ceno

Sample	Sample CmL Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO ₃ /L)
SDS [40]	25	4.0	160
LAG 1		6.1	244
LAG 2		6.6	264
LAG 3		6.3	252
MHSFW		2.8	112
32 ppb Zn		2.5	100
128 ppb Zn		2.5	100
Balboa Lake #1		3.6	144
Balboa Lake #4		3.8	152
Balboa Lake #5		3.5	140
MHSFW 12-7-18	▽	4.7 *	188
[200 µg/L] Pt 12-9-18	25	2.4	96

mislabelled
3/6/19
Re

* - ran twice, same results both times 101
1-7-19



Test: 1812RT 2A.C, 1812-072A-D.C

Date: 12/14/18

12/17/18(1525) - 12/14/18(1030)

* No chamber air temperature chart available. Chamber 483B chart recorder is broken.