

ENVIRONMENTAL MONITORING DIVISION  
BUREAU OF SANITATION  
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: August 20, 2018

TEST DATE: August 22, 2018

TEST NUMBER: 1808072A.C

TEST MATERIAL: Station LAR04TUJ

TEST SPECIES: *Ceriodaphnia dubia*

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


TEST TYPE: Chronic

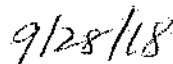
REFERENCE TOXICANT TEST: 1808RT2A.C

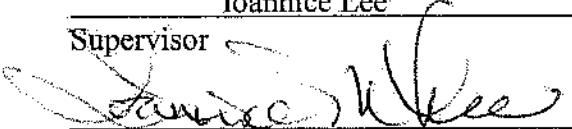
RESULT:

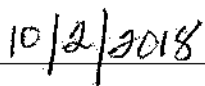
Survival  
Reproduction

Pass, 20% effect  
Pass, -12.8% effect

Rea Mara A Crinklaw  
\_\_\_\_\_  
Analyst:  
  
\_\_\_\_\_  
Signature

Water Biologist III  
\_\_\_\_\_  
Title  
  
\_\_\_\_\_  
Date

Ioannice Lee  
\_\_\_\_\_  
Supervisor  
  
\_\_\_\_\_  
Signature

Acting Laboratory Manager I  
\_\_\_\_\_  
Title  
  
\_\_\_\_\_  
Date

# CETIS Summary Report

Report Date: 24 Sep-18 15:33 (p 1 of 1)  
Test Code: 1808072A.C | 00-1365-2865

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Batch ID: 10-8054-5022	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 22 Aug-18 16:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water									
Ending Date: 29 Aug-18 12:00	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 20h	Source: In-House Culture	Age: <8h 8/22/18 (08:58-14:10)									
Sample ID: 16-6906-6769	Code: 3096207	Client: Watershed Protection Division									
Sample Date: 20 Aug-18 09:10	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 21 Aug-18 08:53	Source: Stormwater (STORMWATER)										
Sample Age: 55h (9.9 °C)	Station: LAR04TUJ	Batch: 1088; HBN: 59766									
<b>Sample Renewals</b>											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3096207	20 Aug-18 09:10	21 Aug-18 08:53	23 Aug-18 15:50	9.9						
2	3096207	20 Aug-18 09:10	21 Aug-18 08:53	24 Aug-18 11:10	9.9						
3	3096207	20 Aug-18 09:10	21 Aug-18 08:53	25 Aug-18 12:45	9.9						
4	3096207	20 Aug-18 09:10	21 Aug-18 08:53	26 Aug-18 12:36	9.9						
5	3096207	20 Aug-18 09:10	21 Aug-18 08:53	27 Aug-18 12:26	9.9						
6	3096207	20 Aug-18 09:10	21 Aug-18 08:53	28 Aug-18 10:45	9.9						
<b>Sample Note:</b> Holding time < 72 hrs.											
<b>Comparison Summary</b>											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
19-8746-4727	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
15-7842-0802	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
16-3885-3226		100	>100	N/A	N/A	1	TST-Welch's t Test				
<b>Test Acceptability</b>											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
19-8746-4727	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
15-7842-0802	Reproduction	Control Resp	38.7	15 - NL	Yes	Passes Acceptability Criteria					
16-3885-3226	Reproduction	Control Resp	38.7	15 - NL	Yes	Passes Acceptability Criteria					
<b>7d Survival Rate Summary</b>											
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	0.8	0.6426	0.9574	0	1	0.1333	0.4216	52.7%	20.0%
<b>Reproduction Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	38.7	38.17	39.23	36	41	0.4485	1.418	3.66%	0.0%
100		9	43.67	42.41	44.92	39	49	1.118	3.354	7.68%	-12.83%
<b>7d Survival Rate Detail</b>											
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	0	1	1	1	0	1
<b>Reproduction Detail</b>											
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	38	38	36	40	38	41	39	38	40	39
100		42	48	43	49	45	41	39	41	outlier	45

# CETIS Analytical Report

Report Date: 24 Sep-18 15:33 (p 1 of 6)  
Test Code: 1808072A.C | 00-1365-2865

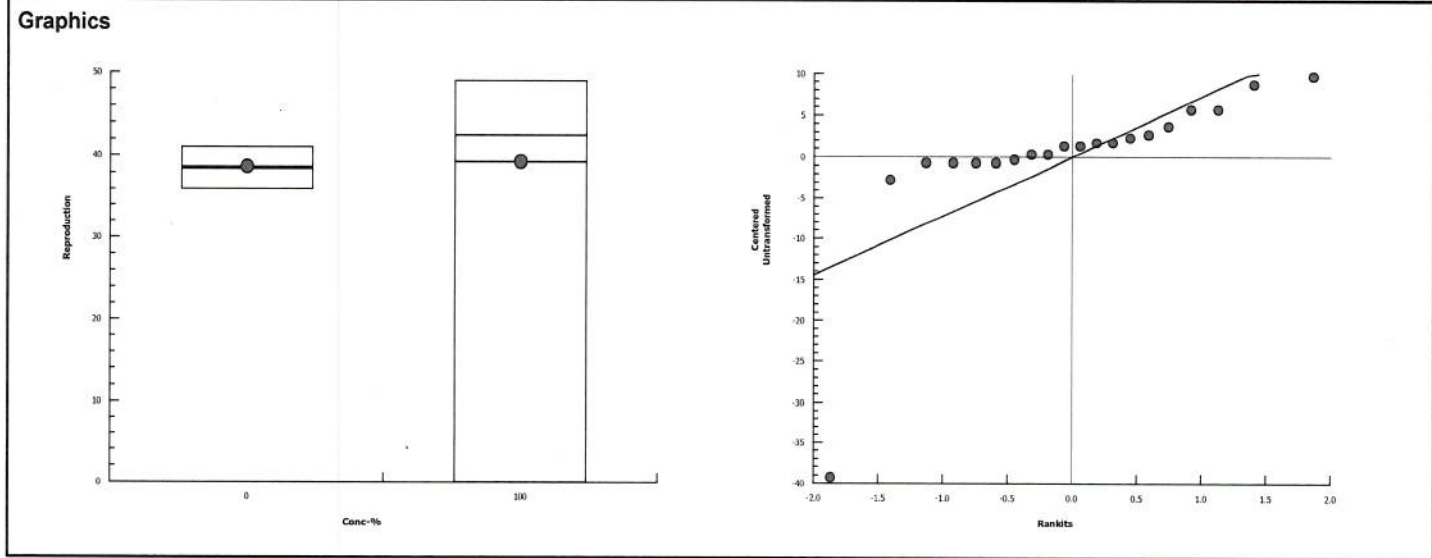
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 16-3885-3226		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 20 Sep-18 15:27		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 10-8054-5022		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 22 Aug-18 16:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 29 Aug-18 12:00		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 20h		Source: In-House Culture		Age: <8h		8/22/18 (08:58-14:10)					
Sample ID: 16-6906-6769		Code: 3096207		Client: Watershed Protection Division							
Sample Date: 20 Aug-18 09:10		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 21 Aug-18 08:53		Source: Stormwater (STORMWATER)									
Sample Age: 55h (9.9 °C)		Station: LAR04TUJ									
Sample Note: Holding time < 72 hrs.											
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*	2.287	0.8834	9		0.0240	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	38.7	15 - NL	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	4.011	2.708	<0.0001	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.8	1.8	1	0.01776	0.8955	Non-Significant Effect					
Error	1824.2	101.3444	18								
Total	1826	103.1444	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	99.78	6.541	<0.0001	Unequal Variances						
Distribution	Shapiro-Wilk W Normality	0.5423	0.866	<0.0001	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	38.7	38.16	39.24	36	41	0.4485	1.418	3.66%	0.0%
100		10	39.3	33.91	44.69	0	49	4.48	14.17	36.05%	-1.55%

# CETIS Analytical Report

Report Date: 24 Sep-18 15:33 (p 2 of 6)  
 Test Code: 1808072A.C | 00-1365-2865

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory	
Analysis ID: 16-3885-3226		Endpoint: Reproduction		CETIS Version: CETISv1.8.1	
Analyzed: 20 Sep-18 15:27		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	38	38	36	40	38	41	39	38	40	39
100		42	48	43	49	45	41	39	41	0	45





# CETIS Analytical Report

Report Date: 24 Sep-18 15:33 (p 3 of 6)  
Test Code: 1808072A.C | 00-1365-2865

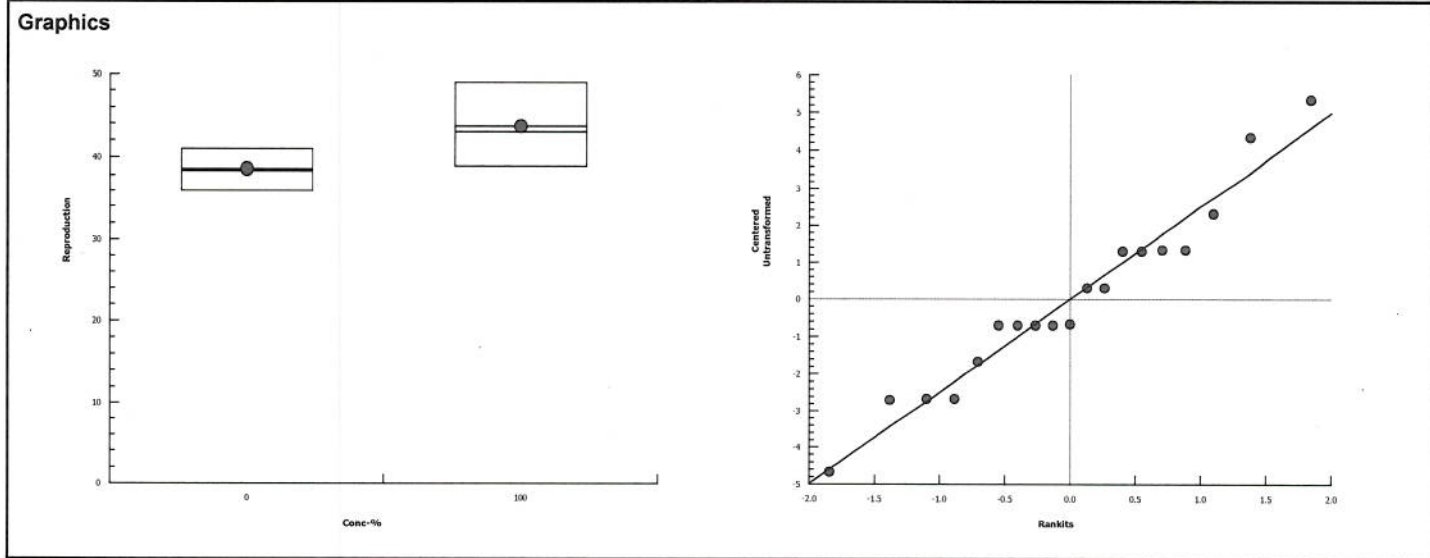
Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 15-7842-0802		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 20 Sep-18 15:27		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 10-8054-5022		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 22 Aug-18 16:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 29 Aug-18 12:00		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 20h		Source: In-House Culture		Age: <8h 8/22/18 (08:58-14:10)							
Sample ID: 16-6906-6769		Code: 3096207		Client: Watershed Protection Division							
Sample Date: 20 Aug-18 09:10		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 21 Aug-18 08:53		Source: Stormwater (STORMWATER)									
Sample Age: 55h (9.9 °C)		Station: LAR04TUJ									
Sample Note: *Holding time < 72 hrs.											
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*	12.54	0.8834	9		<0.0001 Non-Significant Effect				
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	38.7	15 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	116.8474	116.8474	1	18.38	0.0005	Significant Effect					
Error	108.1	6.358823	17								
Total	224.9474	123.2062	18								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	5.594	6.693	0.0185	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9627	0.8605	0.6256	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	38.7	38.16	39.24	36	41	0.4485	1.418	3.66%	0.0%
100		9	43.67	42.39	44.94	39	49	1.118	3.354	7.68%	-12.83%

# CETIS Analytical Report

Report Date: 24 Sep-18 15:33 (p 4 of 6)  
Test Code: 1808072A.C | 00-1365-2865

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory			
Analysis ID:	15-7842-0802	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1		
Analyzed:	20 Sep-18 15:27	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	38	38	36	40	38	41	39	38	40	39
100		42	48	43	49	45	41	39	41	Outlier	45



# CETIS Analytical Report

Report Date: 24 Sep-18 15:33 (p 5 of 6)

Test Code: 1808072A.C | 00-1365-2865

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 19-8746-4727		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 20 Sep-18 15:27		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 10-8054-5022		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 22 Aug-18 16:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 29 Aug-18 12:00		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 20h		Source: In-House Culture		Age: <8h		8/22/18 (08:58-14:10)					
Sample ID: 16-6906-6769		Code: 3096207		Client: Watershed Protection Division							
Sample Date: 20 Aug-18 09:10		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 21 Aug-18 08:53		Source: Stormwater (STORMWATER)									
Sample Age: 55h (9.9 °C)		Station: LAR04TUJ									
Sample Note: Holding time < 72 hrs.											
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*	2.25	0.8834	9		0.0255	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	0.05483114	0.05483114	1	2.25	0.1510	Non-Significant Effect					
Error	0.4386491	0.02436939	18								
Total	0.4934802	0.07920053	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Mod Levene Equality of Variance	2.25	8.285	0.1510	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.6038	0.866	<0.0001	Non-normal Distribution						
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	0.8	0.6396	0.9604	0	1	0.1333	0.4216	52.7%	20.0%
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	0.9425	0.8585	1.026	0.5236	1.047	0.06981	0.2208	23.42%	10.0%

# CETIS Analytical Report

Report Date: 24 Sep-18 15:33 (p 6 of 6)

Test Code: 1808072A.C | 00-1365-2865

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 19-8746-4727  
Analyzed: 20 Sep-18 15:27

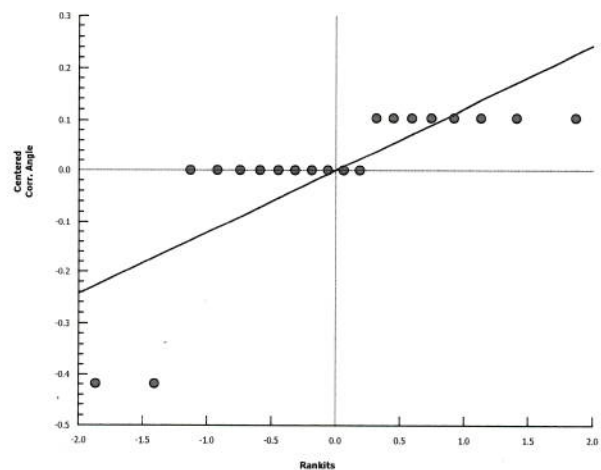
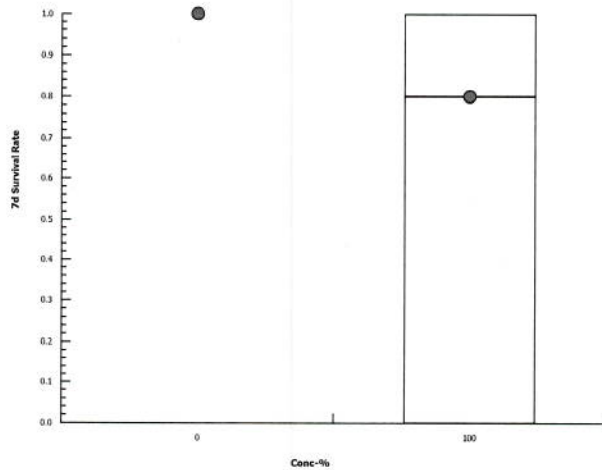
Endpoint: 7d Survival Rate  
Analysis: Parametric Bioequivalence-Two Sample

CETIS Version: CETISv1.8.1  
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	0	1	1	1	0	1

### Graphics





# CETIS Test Data Worksheet

TUJ

Report Date: 22 Aug-18 13:00 (p 1 of 1)  
Test Code: 00-1365-2865/1808072A.C

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

Start Date: 22 Aug-18 *1625* Species: Ceriodaphnia dubia Sample Code: 637BF011  
End Date: 29 Aug-18 *1200* Protocol: EPA/821/R-02-013 (2002) Sample Source: Stormwater  
Sample Date: 20 Aug-18 Material: Stormwater Monitoring Sample Sample Station: LAR04TUJ

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1	38	1	0	0	0	5	0	13	20	38	
0	D	2	3	1	0	0	0	4	0	12	22	38	
0	D	3	13	1	0	0	0	6	13	0	17	36	
0	D	4	22	1	0	0	0	7	15	0	18	40	
0	D	5	26	1	0	0	0	4	14	0	20	38	
0	D	6	35	1	0	0	0	5	12	0	24	41	
0	D	7	36	1	0	0	0	6	13	0	20	39	
0	D	8	4	1	0	0	0	8	0	13	17	38	
0	D	9	9	1	0	0	0	4	0	15	21	40	
0	D	10	6	1	0	0	0	6	0	14	19	39	
100		1	2	1	0	0	0	6	0	14	22	42	
100		2	14	1	0	0	0	8	16	0	24	48	
100		3	29	1	0	0	0	8	13	0	22	43	
100		4	20	1	0	0	0	7	16	0	26	49	
100		5	19	1	0	0	0	6	14	0	25X	45	
100		6	11	1	0	0	0	5	15	0	21	41	
100		7	33	1	0	0	0	5	12	0	22	39	
100		8	27	1	0	0	0	8	14	0	19	41	
100		9	31	1	0	0	0	0X	X	X	X	0* outlier per	
100		10	21	1	0	0	0	5	0	17	23	45	CETIS

8/22 8/23 8/24 8/25 8/26 8/27 8/28 8/29

Fed : 1435 RE 1530 RE 1041 PC 1234 PC 0930 (DL) 1207 PC 1035 PC  
End @ 1200 PC

Transferred : 1625 PC 1530 PC 1110 PC 1245 PC 1236 PC 1226 PC 1045 PC

# CETIS Measurement Worksheet

Report Date: 22 Aug-18 13:00 (p.1 of 2)  
Test Code: 1808072A.C | 00-1365-2865

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date: 22 Aug-18		Species: Ceriodaphnia dubia				Sample Code: 637BF011					
End Date: 29 Aug-18		Protocol: EPA/821/R-02-013 (2002)				Sample Source: Stormwater					
Sample Date: 20 Aug-18		Material: Stormwater Monitoring Sample				Sample Station: LAR04TUJ					

Alkalinity (CaCO3)-mg/L									
Conc-%	Code	Reading 1							
0	D	AE	not measured 9/24/18 RC						
100		112							
Measure Time:		see attached worksheet.							
Instrument ID:									
Analyst:									

Conductivity-umhos									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	
0	D	253	334	321	306	317	282	322	
100		806	816	794	794	793	701	797	
Measure Time:		1436	1245	1025	1200	0930	1020	1010	
Instrument ID:		#2	#2	#2	#2	#2	#2	#4	
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	7.49	7.86	8.15	8.33	7.85	7.87	7.61	7.87
100		7.78	7.92	8.10	8.23	7.88	7.62	8.10	
Measure Time:		1553	1120	1317	1236	1448	1140	1043	
Instrument ID:		#3	#3	#3	#3	#3	#3	#3	
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	7.63	7.71	8.03	7.89	8.04	8.17	7.85	
100		8.14	8.05	8.47	8.90	8.97	8.65	8.60	
Measure Time:		1436	1245	1025	1200	0930	1020	1010	
Instrument ID:		#3	#3	#3	#3	#3	#3	#3	
Analyst:		RC	RC	RC	RC	RC	RC	RC	

Hardness (CaCO3)-mg/L									
Conc-%	Code	Reading 1							
0	D	AE	not measured 9/24/18 RC						
100		122							
Measure Time:		see attached worksheet							
Instrument ID:									
Analyst:									

Final pH									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	
0	D	7.72	7.74	7.94	7.71	7.64	7.58	7.61	
100		7.95	7.92	8.08	7.96	7.94	7.88	7.95	
Measure Time:		1553	1120	1317	1236	1448	1140	1043	
Instrument ID:		#1	#1	#1	#1	#1	#2	#2	
Analyst:		RC	RC	RC	RC	RC	RC	RC	

# CETIS Measurement Worksheet

Report Date: 22 Aug-18 13:00 (p 2 of 2)  
Test Code: 1808072A.C | 00-1365-2865

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date:		22 Aug-18		Species:		Ceriodaphnia dubia		Sample Code:		637BF011	
End Date:		29 Aug-18		Protocol:		EPA/821/R-02-013 (2002)		Sample Source:		Stormwater	
Sample Date:		20 Aug-18		Material:		Stormwater Monitoring Sample		Sample Station:		LAR04TUJ	
Initial pH											
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	7.85	7.86	7.95	7.86	8.06	7.77	7.67			
100		7.75	7.90	7.85	7.74	7.85	7.67	7.79			
Measure Time:		1436	1245	1025	1200	0930	1020	1010			
Instrument ID:		#1	#1	#1	#1	#1	#1	#2			
Analyst:		RC	RC	RC	RC	RC	RC	RC			
Final Temperature-°C											
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	25.0	25.3	25.3	24.9	25.6	25.7	25.9			
100		25.2	25.1	25.3	24.7	25.5	25.4	25.8			
Measure Time:		1553	1120	1317	1236	1448	1140	1043			
Instrument ID:		#1	#1	#1	#1	#1	#2	#2			
Analyst:		RC	RC	RC	RC	RC	RC	RC			
Initial Temperature-°C											
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	25.4	25.4	25.2	25.3	25.2	25.4	24.8			
100		25.1	25.5	24.9	24.9	24.6	25.2	24.7			
Measure Time:		1436	1245	1025	1200	0930	1020	1010			
Instrument ID:		#1	#1	#1	#1	#1	#1	#2			
Analyst:		RC	RC	RC	RC	RC	RC	RC			

## Alkalinity

Date/Time: 8/31/18 / 1030Project: NPDESAnalyst: RODELINDA ESTIVATitrant: H<sub>2</sub>SO<sub>4</sub>Factor: 20 per 50ml

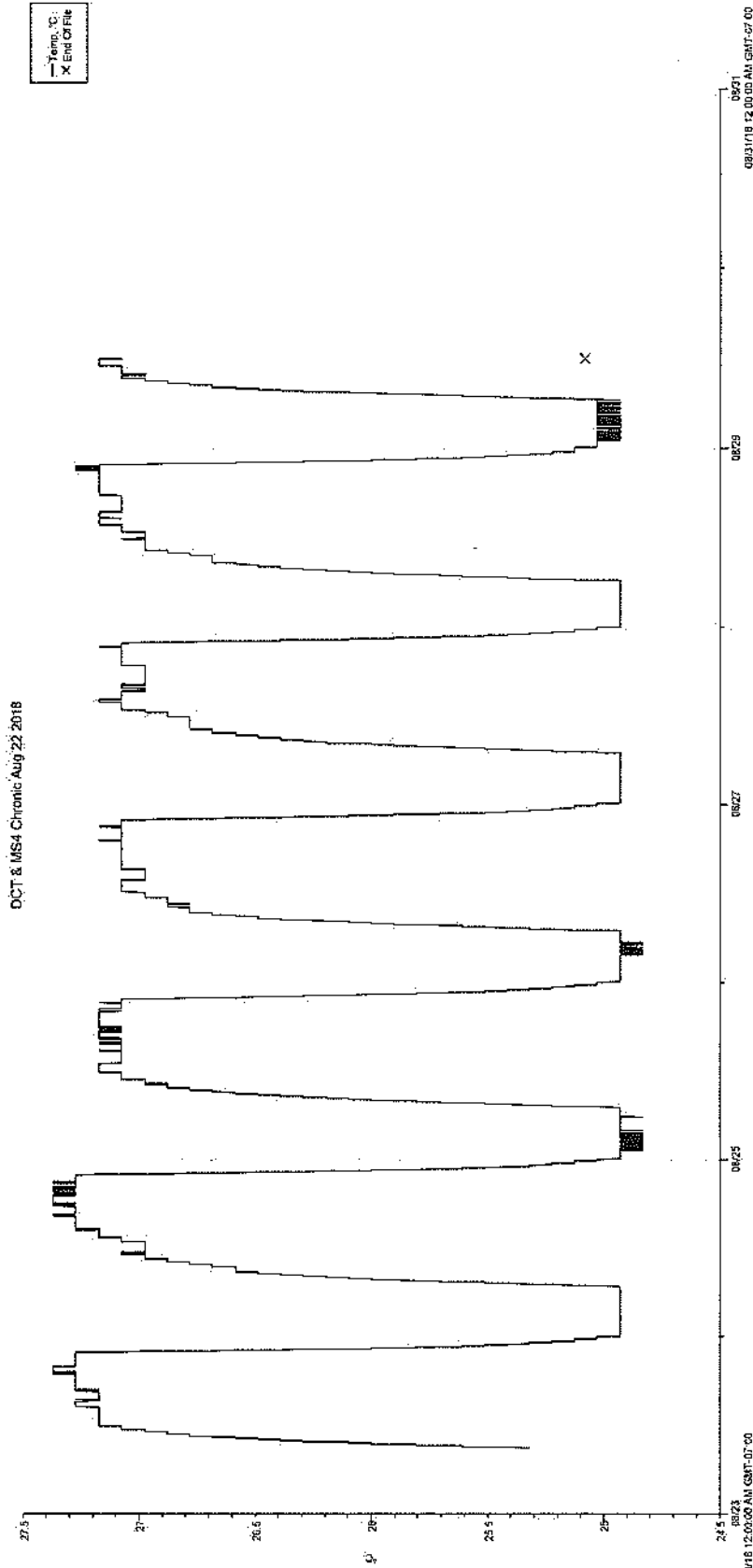
Sample	Sample Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
DW	50ml	5.7ml	114
[200 ug/L]	50ml	5.7ml	114
DCT eff 8/20/18	50ml	5.5ml	110
DCT eff 8/22/18	50ml	5.3ml	106
DCT eff 8/26/18	50ml	5.4ml	108
TUJ	50ml	5.6ml	112
WAS	50ml	6.8ml	136
SMB	50ml	13.3ml	266



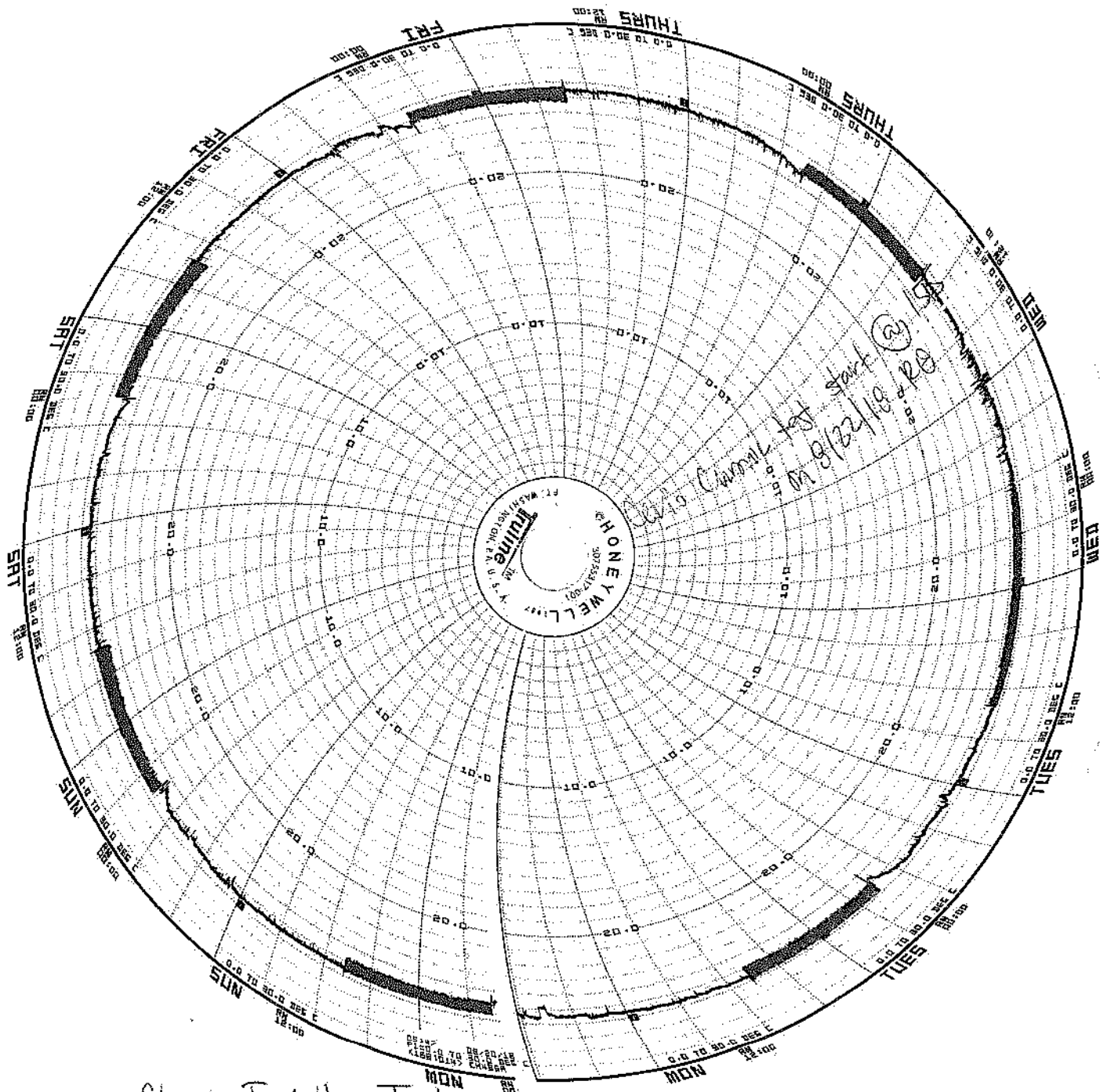
## Hardness

Date/Time: 8/31/18, 1030Project: NPPESAnalyst: RODELINDA ESTIVATitrant: EDTAFactor: 20 per 50 ml

Sample	Sample Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
DW	50ml	8.1ml	162
[200ug/L]	50ml	8.3ml	166
DCTeff 8/20/18	50ml	4.5ml	90
DCTeff 8/22/18	50ml	4.8ml	96
DCTeff 8/26/18	50ml	4.7ml	94
TuJ	50ml	6.1ml	122
WAS	50ml	8.9ml	178
SMB	50ml	20.2ml	404



Ceriodaphnia Chronic Toxicity Test  
Test start: Wednesday, August 22, 2018  
Test end: Wednesday, August 29, 2018



Ceriodaphnia Chronic Toxicity Test  
 Test start : Wednesday, Aug 22, 2018  
 Test end : Wednesday, Aug 29, 2018  
 RT — 1808RTZA,C  
 DCTeff — 180806ZA,C  
 MS4 — 180807ZA-C.C

Pg 1 of 2





ENVIRONMENTAL MONITORING DIVISION  
BUREAU OF SANITATION  
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: August 21, 2018

TEST DATE: August 22, 2018

TEST NUMBER: 1808072B.C

TEST MATERIAL: Station LAR02WAS

TEST SPECIES: *Ceriodaphnia dubia*

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

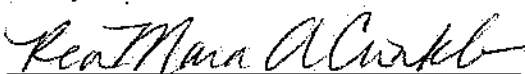
TEST TYPE: Chronic

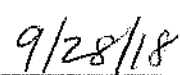
REFERENCE TOXICANT TEST: 1808RT2A.C

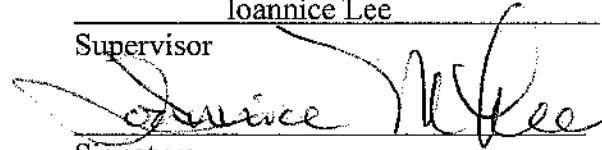
RESULT:

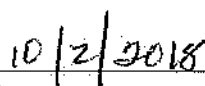
Survival  
Reproduction

Pass, 0% effect  
Pass, 0% effect

Rea Mara A Crinklaw  
\_\_\_\_\_  
Analyst  
  
\_\_\_\_\_  
Signature

Water Biologist III  
\_\_\_\_\_  
Title  
  
\_\_\_\_\_  
Date

Ioannice Lee  
\_\_\_\_\_  
Supervisor  
  
\_\_\_\_\_  
Signature

Acting Laboratory Manager I  
\_\_\_\_\_  
Title  
  
\_\_\_\_\_  
Date

# CETIS Summary Report

Report Date: 28 Sep-18 15:35 (p 1 of 1)  
 Test Code: 1808072B.C | 15-9919-8272

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Batch ID: 10-8054-5022	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 22 Aug-18 16:25	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water									
Ending Date: 29 Aug-18 12:00	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 20h	Source: In-House Culture	Age: <8h	8/22/18 (08:58 - 14:10)								
Sample ID: 06-7470-6226	Code: 3102606	Client: Watershed Protection Division									
Sample Date: 21 Aug-18 09:00	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 21 Aug-18 13:45	Source: Stormwater (STORMWATER)										
Sample Age: 31h (15.4 °C)	Station: LAR02WAS		Batch: 1088; HBN: 59766								
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3102606	21 Aug-18 09:00	21 Aug-18 13:45	23 Aug-18 15:50	15.4						
2	3102606	21 Aug-18 09:00	21 Aug-18 13:45	24 Aug-18 11:10	15.4						
3	3102606	21 Aug-18 09:00	21 Aug-18 13:45	25 Aug-18 12:45	15.4						
4	3102606	21 Aug-18 09:00	21 Aug-18 13:45	26 Aug-18 12:36	15.4						
5	3102606	21 Aug-18 09:00	21 Aug-18 13:45	27 Aug-18 12:26	15.4						
6	3102606	21 Aug-18 09:00	21 Aug-18 13:45	28 Aug-18 10:45	15.4						
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
20-8439-5377	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
00-6835-6218	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					
20-8439-5377	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
00-6835-6218	Reproduction	Control Resp	38.7	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	38.7	38.17	39.23	36	41	0.4485	1.418	3.66%	0.0%
100		10	38.7	37.14	40.26	33	45	1.317	4.165	10.76%	0.0%
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	38	38	36	40	38	41	39	38	40	39
100		34	41	37	40	38	33	42	45	43	34

## CETIS Analytical Report

Report Date: 28 Sep-18 15:35 (p 1 of 4)  
 Test Code: 1808072B.C | 15-9919-8272

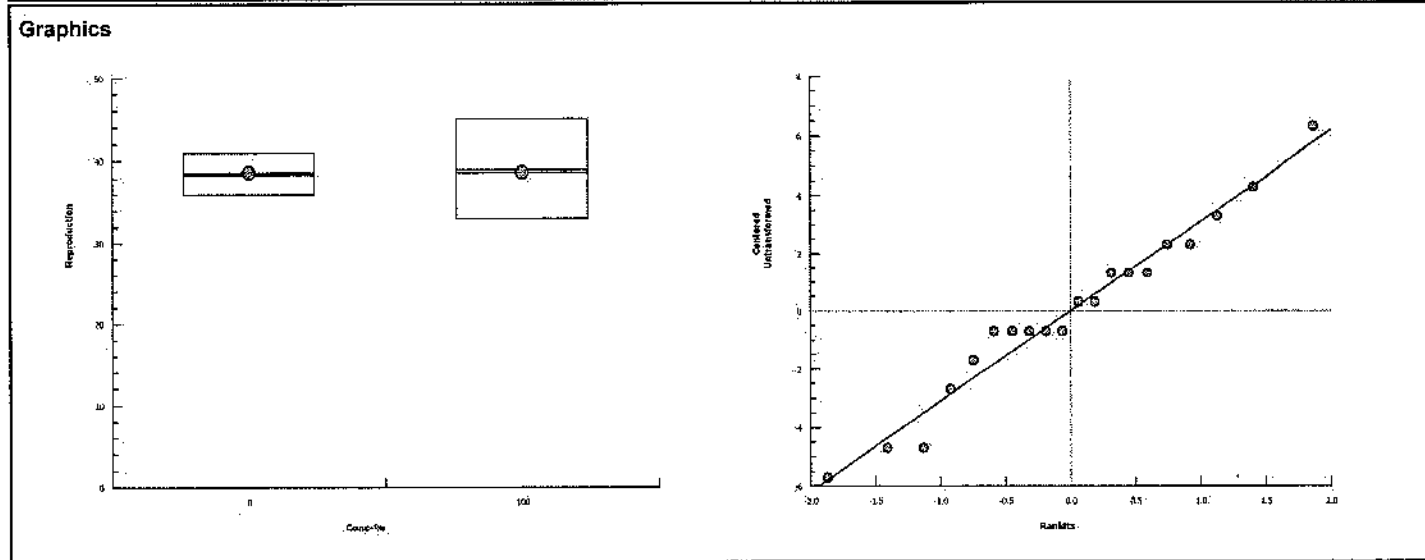
Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID: 00-6835-6218	Endpoint: Reproduction	CETIS Version: CETISv1.8.1		Official Results: Yes							
Analyzed: 24 Sep-18 13:01	Analysis: Parametric Bioequivalence-Two Sample										
Batch ID: 10-8054-5022	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw		Diluent: Mod-Hard Synthetic Water							
Start Date: 22 Aug-18 16:25	Protocol: EPA/821/R-02-013 (2002)	Brine:		Age: <8h 8/22/18 (08:58-14:10)							
Ending Date: 29 Aug-18 12:00	Species: Ceriodaphnia dubia										
Duration: 6d 20h	Source: In-House Culture										
Sample ID: 06-7470-6226	Code: 3102606	Client: Watershed Protection Division		Project: MS4							
Sample Date: 21 Aug-18 09:00	Material: Stormwater Monitoring Sample										
Receive Date: 21 Aug-18 13:45	Source: Stormwater (STORMWATER)										
Sample Age: 31h (15.4 °C)	Station: LAR02WAS										
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*	7.118	0.8791	10		<0.0001	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	38.7	15 - NL	Yes	Passes Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.081	2.708	0.5679	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0	0	1	0	1.0000	Non-Significant Effect					
Error	174.2	9.677778	18								
Total	174.2	9.677778	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	8.624	6.541	0.0037	Unequal Variances						
Distribution	Shapiro-Wilk W Normality	0.9711	0.866	0.7784	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	38.7	38.16	39.24	36	41	0.4485	1.418	3.66%	0.0%
100		10	38.7	37.12	40.28	33	45	1.317	4.165	10.76%	0.0%

# CETIS Analytical Report

Report Date: 28 Sep-18 15:35 (p 2 of 4)  
Test Code: 1808072B.C | 15-9919-8272

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory	
Analysis ID:	00-6835-6218	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1
Analyzed:	24 Sep-18 13:01	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	38	38	36	40	38	41	39	38	40	39
100		34	41	37	40	38	33	42	45	43	34





# CETIS Analytical Report

Report Date: 28 Sep-18 15:35 (p 3 of 4)  
Test Code: 1808072B.C | 15-9919-8272

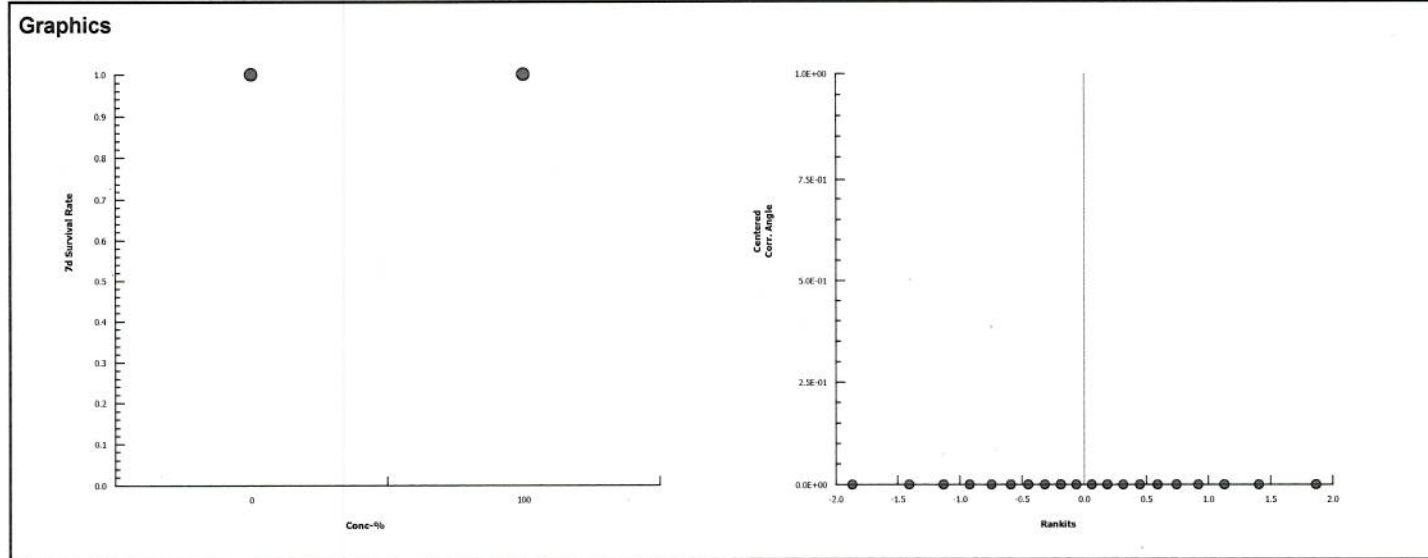
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 20-8439-5377		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 24 Sep-18 13:01		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 10-8054-5022		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 22 Aug-18 16:25		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 29 Aug-18 12:00		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 20h		Source: In-House Culture		Age: <8h		8/22/18 (08:58-14:10)					
Sample ID: 06-7470-6226		Code: 3102606		Client: Watershed Protection Division							
Sample Date: 21 Aug-18 09:00		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 21 Aug-18 13:45		Source: Stormwater (STORMWATER)									
Sample Age: 31h (15.4 °C)		Station: LAR02WAS									
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 Sep-18 15:35 (p 4 of 4)  
 Test Code: 1808072B.C | 15-9919-8272

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID:	20-8439-5377	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.1						
Analyzed:	24 Sep-18 13:01	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

WAS

Report Date:

22 Aug-18 13:07 (p 1 of 1)

Test Code:

15-9919-8272/1808072B.C

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 22 Aug-18 1625 Species: Ceriodaphnia dubia  
End Date: 29 Aug-18 1200 Protocol: EPA/821/R-02-013 (2002)  
Sample Date: 21 Aug-18 Material: Stormwater Monitoring Sample

Sample Code: 28373332  
Sample Source: Stormwater  
Sample Station: LAR02WAS

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	0	13	20	38	
0	D	2		1	0	0	0	4	0	12	22	38	
0	D	3		1	0	0	0	6	13	0	17	36	
0	D	4		1	0	0	0	7	15	0	18	40	
0	D	5		1	0	0	0	4	14	0	20	38	
0	D	6		1	0	0	0	5	12	0	24	41	
0	D	7		1	0	0	0	6	13	0	20	39	
0	D	8		1	0	0	0	8	0	13	17	38	
0	D	9		1	0	0	0	4	0	15	21	40	
0	D	10		1	0	0	0	6	0	14	19	39	
100		1	40	1	0	0	0	5	9	0	20	34	
100		2	7	1	0	0	0	7	0	13	21	41	
100		3	30	1	0	0	0	5	13	0	19	37	
100		4	15	1	0	0	0	6	12	4	22	40	
100		5	1	1	0	0	0	6	13	0	19	38	
100		6	16	1	0	0	0	4	10	0	19	33	
100		7	5	1	0	0	0	6	0	15	21	42	
100		8	25	1	0	0	0	9	15	0	21	45	
100		9	18	1	0	0	0	7	0	14	22	43	
100		10	23	1	0	0	0	4	11	0	19	34	

Shared Controls with 1808072A.C

8/22 8/23 8/24 8/25 8/26 8/27 8/28 8/29

End @

Fed

: 1435 1530 1041 1234 0930 1207 1035 1200  
RE RE RE RE (DL) RE RE RE

Transferred

: 1625 1550 1110 1245 1236 1226 1045  
RE RE RE RE RE RE RE

RE

RE

# CETIS Measurement Worksheet

Report Date: 22 Aug-18 13:07 (p 1 of 2)  
Test Code: 1808072B.C | 15-9919-8272

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory		
Start Date: 22 Aug-18		Species: Ceriodaphnia dubia		Sample Code: 28373332				
End Date: 29 Aug-18		Protocol: EPA/821/R-02-013 (2002)		Sample Source: Stormwater				
Sample Date: 21 Aug-18		Material: Stormwater Monitoring Sample		Sample Station: LAR02WAS				
Alkalinity (CaCO3)-mg/L								
Conc-%	Code	Reading 1	} see attached worksheet					
0	D	At - not measured 9/28/18 PC						
100		136						
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	313	334	321	306	317	282	322
100		966	983	957	961	960	830	956
Measure Time:		1436	1245	1025	1200	0930	1020	1010
Instrument ID:		#2	#2	#2	#2	#2	#1	#4
Analyst:		PC	PC	PC	PC	PC	PC	RA
Final Dissolved Oxygen-mg/L								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.49	7.86	8.15	8.33	7.65	7.87	7.87
100		7.75	7.91	8.08	8.17	8.00	7.96	8.20
Measure Time:		1553	1120	1317	1236	1448	1140	1043
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		PC	PC	PC	PC	PC	RA	PC
Initial Dissolved Oxygen-mg/L								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.63	7.71	8.03	7.89	8.04	8.17	7.85
100		8.62	8.05	8.88	9.19	9.29	8.94	8.84
Measure Time:		1436	1245	1025	1200	0930	1020	1010
Instrument ID:		#3	#3	#3	#3	#3	#3	#3
Analyst:		PC	PC	PC	PC	PC	PC	RA
Hardness (CaCO3)-mg/L								
Conc-%	Code	Reading 1	} see attached worksheet					
0	D	At - not measured 9/28/18 PC						
100		178						
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	7.12	7.74	7.94	7.71	7.64	7.58	7.61
100		8.03	8.01	8.17	8.08	8.01	8.04	8.04
Measure Time:		1553	1120	1317	1236	1448	1140	1043
Instrument ID:		#1	#1	#1	#1	#1	#2	#2
Analyst:		PC	PC	PC	PC	PC	RA	PC

# CETIS Measurement Worksheet

Report Date: 22 Aug-18 13:07 (p 2 of 2)  
 Test Code: 1808072B.C | 15-9919-8272

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date:		22 Aug-18		Species:		Ceriodaphnia dubia		Sample Code:		28373332	
End Date:		29 Aug-18		Protocol:		EPA/821/R-02-013 (2002)		Sample Source:		Stormwater	
Sample Date:		21 Aug-18		Material:		Stormwater Monitoring Sample		Sample Station:		LAR02WAS	

Initial pH		8/22	8/23	8/24	8/25	8/26	8/27	8/28
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.85	7.86	7.95	7.86	8.06	7.77	7.67
100		7.83	8.00	7.94	7.85	7.94	7.83	7.92
Measure Time:		1436	1245	1025	1200	0930	1020	1010
Instrument ID:		#1	#1	#1	#1	#1	#1	#2
Analyst:		KC	KC	KC	KC	KC	KC	RA

Final Temperature-°C		8/23	8/24	8/25	8/26	8/27	8/28	8/29
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	25.0	25.3	25.3	24.9	25.6	25.7	25.9
100		25.5	25.3	25.3	25.2	25.5	25.2	25.9
Measure Time:		1553	1120	1317	1236	1448	1140	1043
Instrument ID:		#1	#1	#1	#1	#1	#2	#2
Analyst:		KC	KC	KC	KC	KC	RA	KC

Initial Temperature-°C		8/22	8/23	8/24	8/25	8/26	8/27	8/28
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	25.4	25.4	25.2	25.3	25.2	25.4	24.8
100		25.0	25.4	24.9	24.7	24.6	25.1	24.6
Measure Time:		1436	1245	1025	1200	0930	1020	1010
Instrument ID:		#1	#1	#1	#1	#1	#1	#2
Analyst:		KC	KC	KC	KC	KC	KC	RA



## Alkalinity

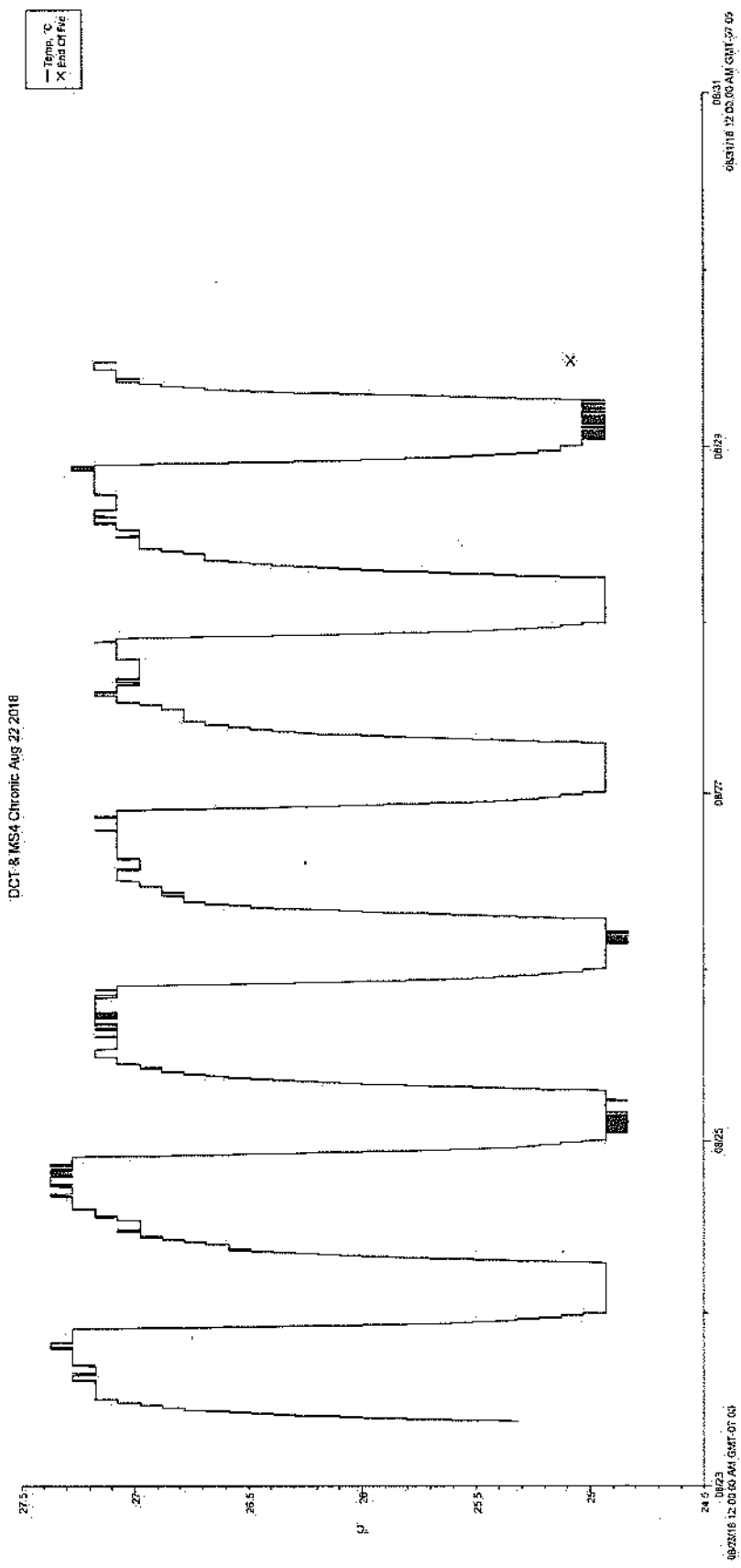
Date/Time: 8/31/18 / 1030Project: NPDESAnalyst: RODELINDA ESTIVATitrant: H<sub>2</sub>SO<sub>4</sub>Factor: 20 per 50ml

Sample	Sample Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
DW	50ml	5.7ml	114
[200 ug/L]	50ml	5.7ml	114
DCT eff 8/20/18	50ml	5.5ml	110
DCT eff 8/22/18	50ml	5.3ml	106
DCT eff 8/26/18	50ml	5.4ml	108
TUJ	50ml	5.6ml	112
WAS	50ml	6.8ml	136
SMB	50ml	13.3ml	266

## Hardness

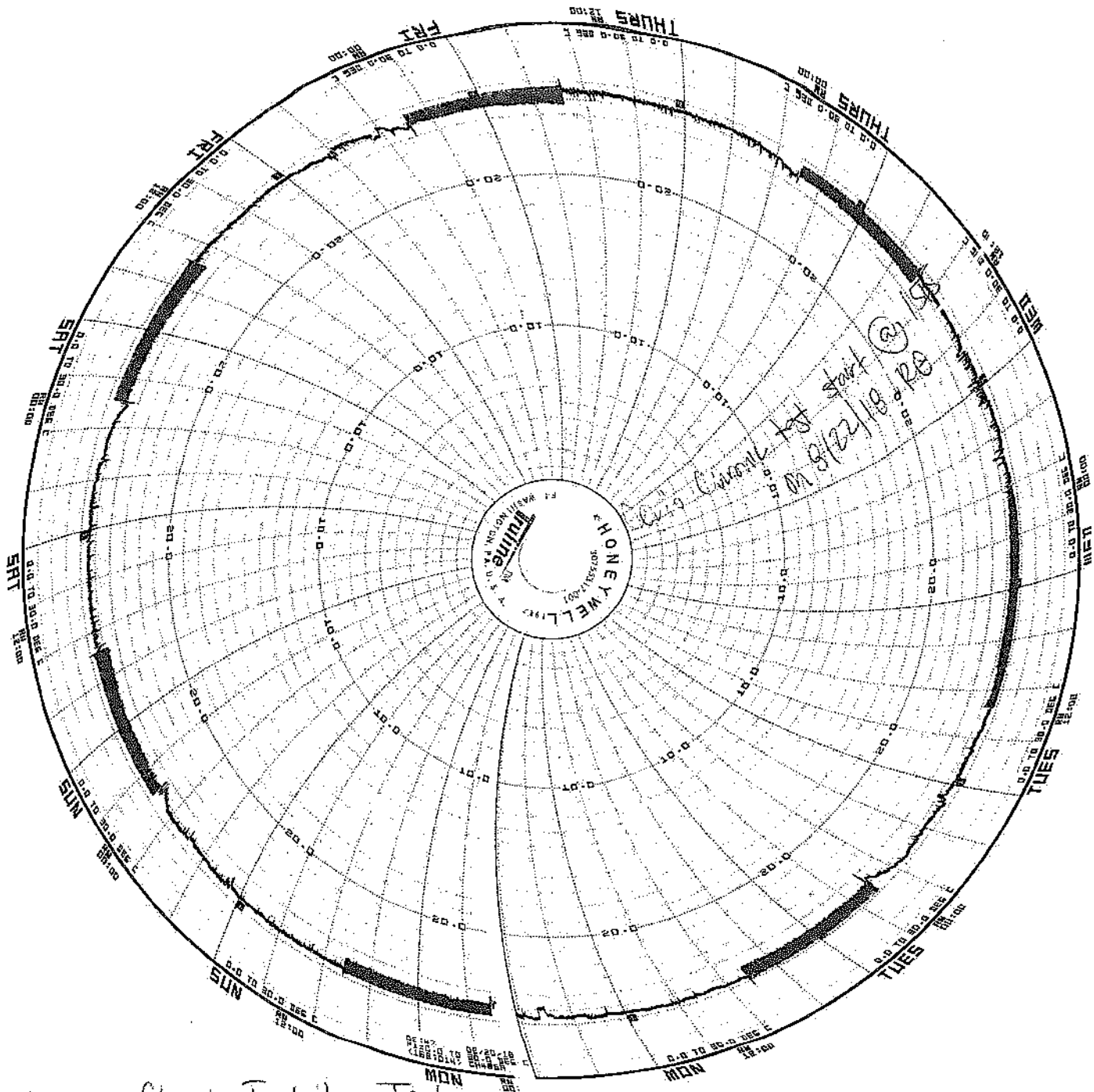
Date/Time: 8/31/18, 1030Project: NPPESAnalyst: RODELINE ESTIVATitrant: EDTAFactor: 20 per 50 ml

Sample	Sample Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
DW	50ml	8.1ml	162
[200ug/L]	50ml	8.3ml	166
DCT eff 8/20/18	50ml	4.5ml	90
DCT eff 8/22/18	50ml	4.8ml	96
DCT eff 8/26/18	50ml	4.7ml	94
TuJ	50ml	6.1ml	122
WAS	50ml	8.9ml	178
SMB	50ml	20.2ml	404



DCT & MS4 Chronic Aug 22 2018

Carvedaphnia Chronic Toxicity Test  
 Test start: Wednesday, August 22, 2018  
 Test end: Wednesday, August 29, 2018



Ceriodaphnia Chronic Toxicity Test  
 Test start : Wednesday, Aug 22, 2018  
 Test end : Wednesday, Aug 29, 2018  
 RT — 1808RTZA,C  
 DCTeff — 180806ZA,C  
 MS4 — 180807ZA-C.C

Pg 1 of 2





ENVIRONMENTAL MONITORING DIVISION  
BUREAU OF SANITATION  
CITY OF LOS ANGELES

REFERENCE TOXICANT

TOXICITY TESTING REPORT

SAMPLE DATE: August 22, 2018

TEST DATE: August 22, 2018

TEST NUMBER: 1808RT2A.C

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

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

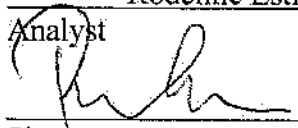
RESULT:

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


NOEC = 12.5  $\mu\text{g/L}$  (Reproduction)

EC<sub>50</sub> = 35.4  $\mu\text{g/L}$  (Survival)

IC<sub>25</sub> = 19.4  $\mu\text{g/L}$  (Reproduction)

\_\_\_\_\_  
Rodeline Estiva  
Analyst  
  
\_\_\_\_\_  
Signature

\_\_\_\_\_  
Water Biologist II  
Title  
September 5, 2018  
\_\_\_\_\_  
Date

\_\_\_\_\_  
Rea Crinklaw  
Supervisor  
  
\_\_\_\_\_  
Signature

\_\_\_\_\_  
Water Biologist III  
Title  
9/11/18  
\_\_\_\_\_  
Date

# CETIS Summary Report

Report Date: 12 Sep-18 10:57 (p 1 of 2)  
Test Code: 1808RT2A.C | 11-5251-4189

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory	
Batch ID:	20-6254-4092	Test Type:	Reproduction-Survival (7d)	Analyst:	Rodeline Estiva
Start Date:	22 Aug-18 15:40	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Hard Synthetic Water
Ending Date:	29 Aug-18 07:50	Species:	Ceriodaphnia dubia	Brine:	
Duration:	6d 16h	Source:	In-House Culture	Age:	<8hr 8/22/18 (0850-1410)
Sample ID:	07-8425-5864	Code:	Cu RT	Client:	Donald C. Tillman WRP RE 9/12/18
Sample Date:	22 Aug-18 10:10	Material:	Copper chloride	Project:	NPDES
Receive Date:	22 Aug-18 10:10	Source:	Reference Toxicant		
Sample Age:	6h	Station:	Reference Toxicant		

Sample Renewals					
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	Cu RT	22 Aug-18 10:10	22 Aug-18 10:10	23 Aug-18 10:40	
2	Cu RT	22 Aug-18 10:10	22 Aug-18 10:10	24 Aug-18 11:13	
3	Cu RT	22 Aug-18 10:10	22 Aug-18 10:10	25 Aug-18 13:08	
4	Cu RT	22 Aug-18 10:10	22 Aug-18 10:10	26 Aug-18 10:26	
5	Cu RT	22 Aug-18 10:10	22 Aug-18 10:10	27 Aug-18 12:38	
6	Cu RT	22 Aug-18 10:10	22 Aug-18 10:10	28 Aug-18 09:50	

Batch Note: Batch 1085 HBN 58010

Sample Note: Ideal concentration-response relationship for reproduction and all or nothing for survival. RE 9/12/2018

Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
16-3727-8760	7d Survival Rate	25	50	35.36	N/A		Fisher Exact/Bonferroni-Holm Test
10-1567-4790	Reproduction	12.5	25	17.68	18.5%		Steel Many-One Rank Test
19-2995-5196		12.5	25	17.68	16.2%		Wilcoxon/Bonferroni Adj Test

Point Estimate Summary							
Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
02-6103-0961	7d Survival Rate	EC5	25.89	25.89	25.89		Linear Interpolation (ICPIN)
		EC10	26.81	26.81	26.81		
		EC15	27.76	27.76	27.76		
		EC20	28.75	28.75	28.75		
		EC25	29.77	29.77	29.77		
		EC40	33.04	33.04	33.04		
		EC50	35.41	35.41	35.41		
07-5888-1093	Reproduction	IC5	2.603	1.011	13.49		Linear Interpolation (ICPIN)
		IC10	11.98	3.043	15.76		
		IC15	14.45	7.128	20.56		
		IC20	16.75	13.15	25.37		
		IC25	19.4	14.87	26.48		
		IC40	26.71	20.34	30.1		
		IC50	29.68	24.07	32.77		

Test Acceptability						
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
02-6103-0961	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
16-3727-8760	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
07-5888-1093	Reproduction	Control Resp	39.4	15 - NL	Yes	Passes Acceptability Criteria
10-1567-4790	Reproduction	Control Resp	39.4	15 - NL	Yes	Passes Acceptability Criteria
19-2995-5196	Reproduction	Control Resp	39.4	15 - NL	Yes	Passes Acceptability Criteria
10-1567-4790	Reproduction	PMSD	0.185	0.13 - 0.47	Yes	Passes Acceptability Criteria
19-2995-5196	Reproduction	PMSD	0.1617	0.13 - 0.47	Yes	Passes Acceptability Criteria

# CETIS Summary Report

Report Date: 12 Sep-18 10:57 (p 2 of 2)  
Test Code: 1808RT2A.C | 11-5251-4189

## 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		9	1	1	1	1	1	0	0	0.0%	0.0%
50		10	0	0	0	0	0	0	0		100.0%
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	10	39.4	37.67	41.13	34	49	1.462	4.624	11.74%	0.0%
12.5		10	35.4	34.09	36.71	27	39	1.108	3.502	9.89%	10.15%
25		9	26.11	22.19	30.03	8	37	3.498	10.49	40.19%	33.73%
50		10	0	0	0	0	0	0	0		100.0%
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	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1		1	1	1	1	1
50		0	0	0	0	0	0	0	0	0	0
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	37	35	41	39	41	39	44	49	35	34
12.5		34	36	36	39	39	27	33	37	36	37
25		31	17	37	31		8	28	37	32	14
50		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

*BO*

*RC*

# CETIS Summary Report

Report Date: 05 Sep-18 10:23 (p 2 of 2)  
Test Code: 1808RT2A.C | 11-5251-4189

## 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		9	1	1	1	1	1	0	0	0.0%	0.0%
50		10	0	0	0	0	0	0	0		100.0%
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	10	39.4	37.67	41.13	34	49	1.462	4.624	11.74%	0.0%
12.5		10	35.4	34.09	36.71	27	39	1.108	3.502	9.89%	10.15%
25		9	26.11	22.19	30.03	8	37	3.498	10.49	40.19%	33.73%
50		10	0	0	0	0	0	0	0		100.0%
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	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1		1	1	1	1	1
50		0	0	0	0	0	0	0	0	0	0
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	37	35	41	39	41	39	44	49	35	34
12.5		34	36	36	39	39	27	33	37	36	37
25		31	17	37	31		8	28	37	32	14
50		0	0	0	0	0	0	0	0	0	0
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: 04 Sep-18 09:48 (p 1 of 4)  
Test Code: 1808RT2A.C | 11-5251-4189

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 10-1567-4790	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 29 Aug-18 8:23	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes
Batch ID: 20-6254-4092	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 22 Aug-18 15:15	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 29 Aug-18 10:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 19h	Source: In-House Culture	Age: <8hr 8/22/18 (0858-1410)
Sample ID: 07-8425-5864	Code: 2EBECB78	Client: Donald C. Tillman WRP
Sample Date: 22 Aug-18 10:10	Material: Copper chloride	Project: NPDES
Receive Date: 22 Aug-18 10:10	Source: Reference Toxicant	
Sample Age: 5h	Station: Reference Toxicant	

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run	12.5	25	17.68		18.5%

### Steel Many-One Rank Test

Control	vs. Conc-µg/L	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
Dilution Water	12.5	81.5	79	18	3	0.0674	Non-Significant Effect
	25*	62	79	18	1	0.0011	Significant Effect

### Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	39.4	15 - NL	Yes	Passes Acceptability Criteria
PMSD	0.185	0.13 - 0.47	Yes	Passes Acceptability Criteria

### Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	0	2.985	2.908	0.0353	Outlier Detected

### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1368.067	684.0333	2	10.28	0.0005	Significant Effect
Error	1797.3	66.56667	27			
Total	3165.367	750.6	29			

### Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	16.41	9.21	0.0003	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.9481	0.9031	0.1501	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	39.4	37.64	41.16	34	49	1.462	4.624	11.74%	0.0%
12.5		10	35.4	34.07	36.73	27	39	1.108	3.502	9.89%	10.15%
25		10	23.5	18.6	28.4	0	37	4.075	12.89	54.84%	40.36%
50		10	0	0	0	0	0	0	0		100.0%
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: 04 Sep-18 09:48 (p 2 of 4)  
Test Code: 1808RT2A.C | 11-5251-4189

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

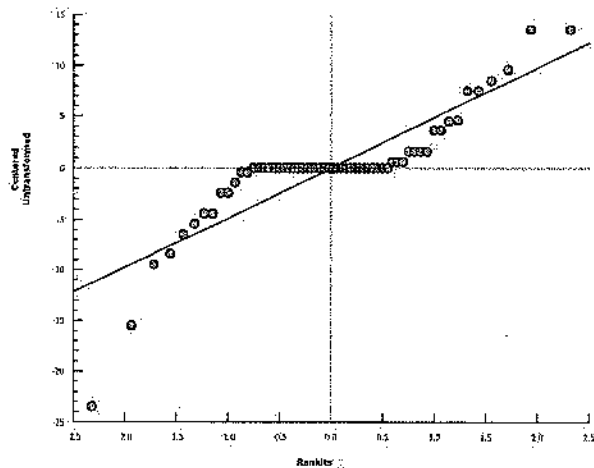
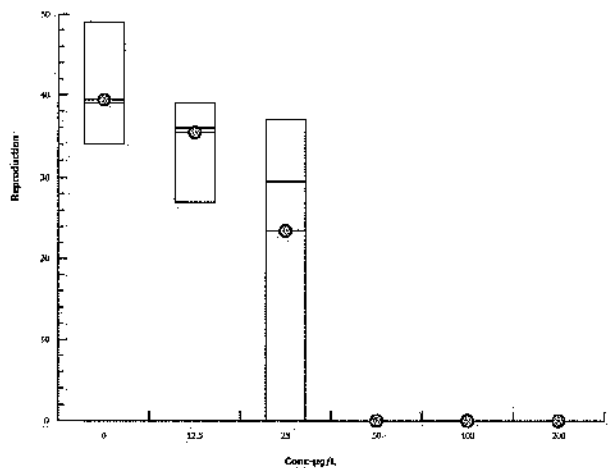
Analysis ID: 10-1567-4790  
Analyzed: 29 Aug-18 8:23  
Endpoint: Reproduction  
Analysis: Nonparametric-Control vs Treatments

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	37	35	41	39	41	39	44	49	35	34
12.5		34	36	36	39	39	27	33	37	36	37
25		31	17	37	31	0	8	28	37	32	14
50		0	0	0	0	0	0	0	0	0	0
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: 04 Sep-18 09:48 (p 3 of 4)  
Test Code: 1808RT2A.C | 11-5251-4189

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 19-2995-5196	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 29 Aug-18 8:23	Analysis: Nonparametric-Multiple Comparison	Official Results: Yes
Batch ID: 20-6254-4092	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 22 Aug-18 15:15	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 29 Aug-18 10:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 19h	Source: In-House Culture	Age: <8hr 8/22/18 (0858-1410)
Sample ID: 07-8425-5864	Code: 2EBECB78	Client: Donald C. Tillman WRP
Sample Date: 22 Aug-18 10:10	Material: Copper chloride	Project: NPDES
Receive Date: 22 Aug-18 10:10	Source: Reference Toxicant	
Sample Age: 5h	Station: Reference Toxicant	

Data Transform	Zeta	Alt Hyp	MC Trials	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	10000 Trials	12.5	25	17.68		16.2%

### Wilcoxon/Bonferroni Adj Test

Control	vs	Conc-µg/L	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
Dilution Water		12.5	81.5		18	3	0.0672	Non-Significant Effect
		25*	52		17	1	0.0008	Significant Effect

### Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	39.4	15 - NL	Yes	Passes Acceptability Criteria
PMSD	0.1617	0.13 - 0.47	Yes	Passes Acceptability Criteria

### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	871.0008	435.5004	2	9.566	0.0008	Significant Effect
Error	1183.689	45.5265	26			
Total	2054.69	481.0269	28			

### Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	10.98	9.21	0.0041	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.9512	0.9004	0.1972	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	39.4	37.64	41.16	34	49	1.462	4.624	11.74%	0.0%
12.5		10	35.4	34.07	36.73	27	39	1.108	3.502	9.89%	10.15%
25		9	26.11	22.12	30.1	8	37	3.498	10.49	40.19%	33.73%
50		10	0	0	0	0	0	0	0		100.0%
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: 04 Sep-18 09:48 (p 4 of 4)  
Test Code: 1808RT2A.C | 11-5251-4189

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

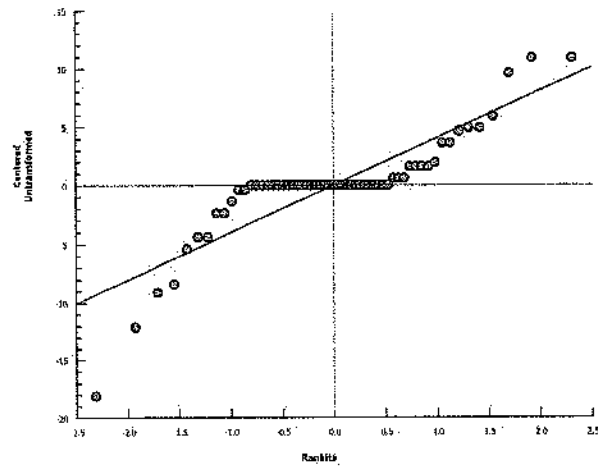
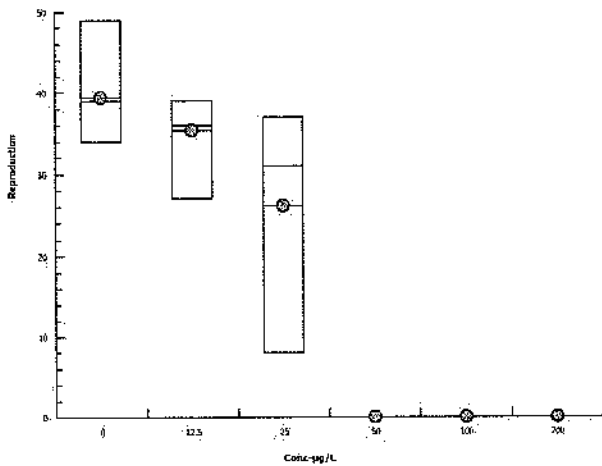
Analysis ID: 19-2995-5196 Endpoint: Reproduction  
Analyzed: 29 Aug-18 8:23 Analysis: Nonparametric-Multiple Comparison

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	37	35	41	39	41	39	44	49	35	34
12.5		34	36	36	39	39	27	33	37	36	37
25		31	17	37	31	Outlier	8	28	37	32	14
50		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

### Graphics



Ideal concentration-response relationship — reproduction,  
PE 9/5/2018

# CETIS Analytical Report

Report Date: 04 Sep-18 09:48 (p 1 of 2)

Test Code: 1808RT2A.C | 11-5251-4189

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 16-3727-8760	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 29 Aug-18 8:21	Analysis: STP 2x2 Contingency Tables	Official Results: Yes
Batch ID: 20-6254-4092	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 22 Aug-18 15:15	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 29 Aug-18 10:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 19h	Source: In-House Culture	Age: <8hr 8/22/18 (0853-1410)
Sample ID: 07-8425-5864	Code: 2EBECB78	Client: Donald C. Tillman WRP
Sample Date: 22 Aug-18 10:10	Material: Copper chloride	Project: NPDES
Receive Date: 22 Aug-18 10:10	Source: Reference Toxicant	
Sample Age: 5h	Station: Reference Toxicant	

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	5.41E-06	<0.0001	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		0	10	10
100		0	10	10
200		0	10	10

### 7d Survival Rate Detail

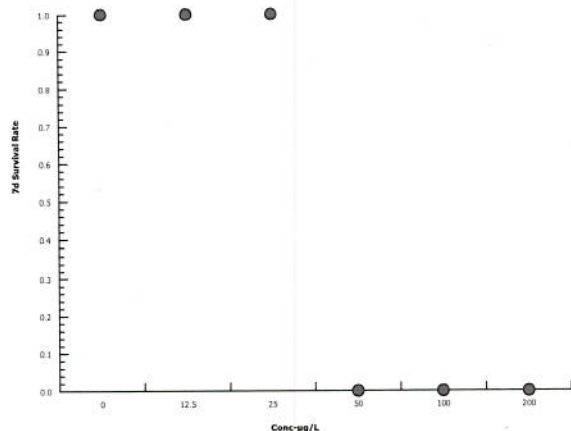
Conc-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
50		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 16-3727-8760  
Analyzed: 29 Aug-18 8:21Endpoint: 7d Survival Rate  
Analysis: STP 2x2 Contingency TablesCETIS Version: CETISv1.8.1  
Official Results: Yes

## Graphics



~~Ideal concentration-response relationship - survival~~

~~RE 9/5/2018~~ RE

All or nothing concentration-response relationship - survival



## CETIS Analytical Report

 Report Date: 04 Sep-18 09:48 (p.1 of 4)  
 Test Code: 1808RT2A.C | 11-5251-4189

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 02-6103-0961	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 29 Aug-18 8:31	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 20-6254-4092	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 22 Aug-18 15:15	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 29 Aug-18 10:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 19h	Source: In-House Culture	Age: <8hr 8/22/18 (0858-1410)
Sample ID: 07-8425-5864	Code: ZEBECB78	Client: Donald C. Tillman WRP
Sample Date: 22 Aug-18 10:10	Material: Copper chloride	Project: NPDES
Receive Date: 22 Aug-18 10:10	Source: Reference Toxicant	
Sample Age: 5h	Station: Reference Toxicant	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	320383456	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	25.89	25.89	25.89
EC10	26.81	26.81	26.81
EC15	27.76	27.76	27.76
EC20	28.75	28.75	28.75
EC25	29.77	29.77	29.77
EC40	33.04	33.04	33.04
EC50	35.41	35.41	35.41

## 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	0	0	0	0		100.0%	0	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		0	0	0	0	0	0	0	0	0	0
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: 04 Sep-18 09:48 (p 2 of 4)  
Test Code: 1808RT2A.C | 11-5251-4189

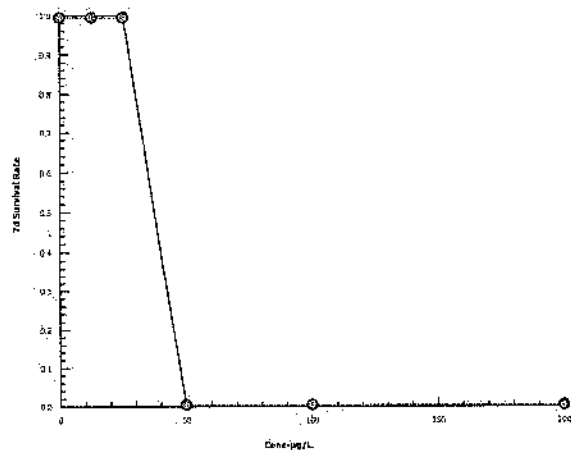
## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 02-6103-0961      Endpoint: 7d Survival Rate  
Analyzed: 29 Aug-18 8:31      Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.1  
Official Results: Yes

### Graphics



## CETIS Analytical Report

 Report Date: 04 Sep-18 09:48 (p 3 of 4)  
 Test Code: 1808RT2A.C | 11-5251-4189

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 07-5888-1093	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 29 Aug-18 8:24	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 20-6254-4092	Test Type: Reproduction-Survival (7d)	Analyst: Rodeline Estiva
Start Date: 22 Aug-18 15:15	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 29 Aug-18 10:15	Species: Ceriodaphnia dubia	Brine:
Duration: 6d 19h	Source: In-House Culture	Age: <8hr 8/22/18 (0858-1410)
Sample ID: 07-8425-5864	Code: 2EBECB78	Client: Donald C. Tillman WRP
Sample Date: 22 Aug-18 10:10	Material: Copper chloride	Project: NPDES
Receive Date: 22 Aug-18 10:10	Source: Reference Toxicant	
Sample Age: 5h	Station: Reference Toxicant	

## Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	859822168	200	Yes	Two-Point Interpolation

## Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	39.4	15 - NL	Yes	Passes Acceptability Criteria

## Point Estimates

Level	µg/L	95% LCL	95% UCL
IC5	2.603	1.011	13.49
IC10	11.98	3.043	15.76
IC15	14.45	7.128	20.56
IC20	16.75	13.15	25.37
IC25	19.4	14.87	26.48
IC40	26.71	20.34	30.1
IC50	29.68	24.07	32.77

## Reproduction Summary

## Calculated Variate

Conc-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	39.4	34	49	1.462	4.624	11.74%	0.0%
12.5		10	35.4	27	39	1.108	3.502	9.89%	10.15%
25		9	26.11	8	37	3.498	10.49	40.19%	33.73%
50		10	0	0	0	0	0		100.0%
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	37	35	41	39	41	39	44	49	35	34
12.5		34	36	36	39	39	27	33	37	36	37
25		31	17	37	31	8	28	37	32	14	
50		0	0	0	0	0	0	0	0	0	0
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: 04 Sep-18 09:48 (p 4 of 4)  
Test Code: 1808RT2A.C | 11-5251-4189

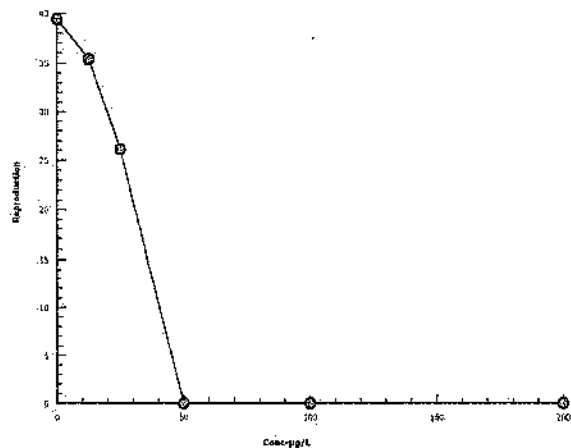
## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 07-5888-1093      Endpoint: Reproduction  
Analyzed: 29 Aug-18 8:24      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)

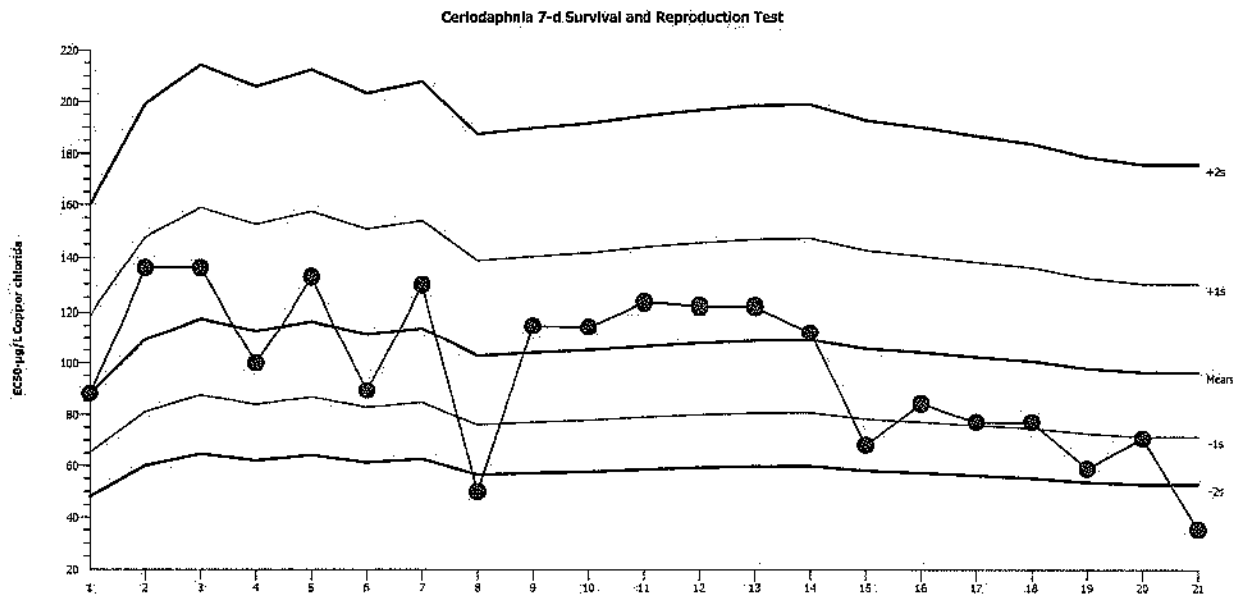
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

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

Endpoint: 7d Survival Rate

Source: Reference Toxicant-REF



Mean: 96.45

Count: 20

-1s Warning Limit: 71.42

-2s Action Limit: 52.92

Sigma: N/A

CV: 35.00%

+1s Warning Limit: 130.1

+2s Action Limit: 175.6

## Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	May	25	87.85	-8.593	-0.3112			16-2272-5797	20-6787-6120
2		Jun	6	136.1	39.69	1.149	(+)		00-1105-6011	07-1957-9297
3			22	136.1	39.69	1.149	(+)		10-7002-0112	10-9615-6318
4		Jul	12	100	3.552	0.1206			13-9476-5989	08-1211-5310
5			27	132.6	36.13	1.061	(+)		00-3533-4104	07-3102-4627
6		Aug	9	89.13	-7.319	-0.2632			05-1646-5416	02-7143-5836
7			23	129.7	33.29	0.9887			18-0928-7994	14-9065-9379
8		Sep	6	50	-46.45	-2.191	(-)	(-)	04-1283-5528	07-2201-0667
9			20	114.9	18.46	0.5838			09-2547-5700	02-6449-6736
10		Oct	18	114.5	18.01	0.571			14-7896-4665	17-5474-2245
11		Nov	15	123.5	27.02	0.8235			09-2671-6353	07-5336-3496
12		Dec	13	121.9	25.5	0.7822			19-3949-3034	10-6518-1710
13	2018	Jan	4	121.9	25.5	0.7822			17-7500-8361	05-5922-1635
14		Feb	7	112.3	15.83	0.5067			04-8492-7543	17-6325-1645
15		Mar	2	68.1	-28.35	-1.161	(-)		11-4862-8707	06-1686-5917
16			15	84.14	-12.31	-0.4552			20-9677-0547	14-4393-4243
17		Apr	19	77.17	-19.28	-0.7435			18-2737-1194	07-4972-9760
18		May	16	77.17	-19.28	-0.7435			05-4955-8978	09-0510-7297
19		Jun	13	58.82	-37.63	-1.649	(-)		16-1570-3305	01-3881-0040
20		Jul	12	70.77	-25.68	-1.032	(-)		05-0138-0333	09-5921-7712
21		Aug	22	35.41	-61.03	-3.341	(-)	(-)	11-5251-4189	02-6103-0961

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

Organism: Ceriodaphnia dubia (Water Flea)

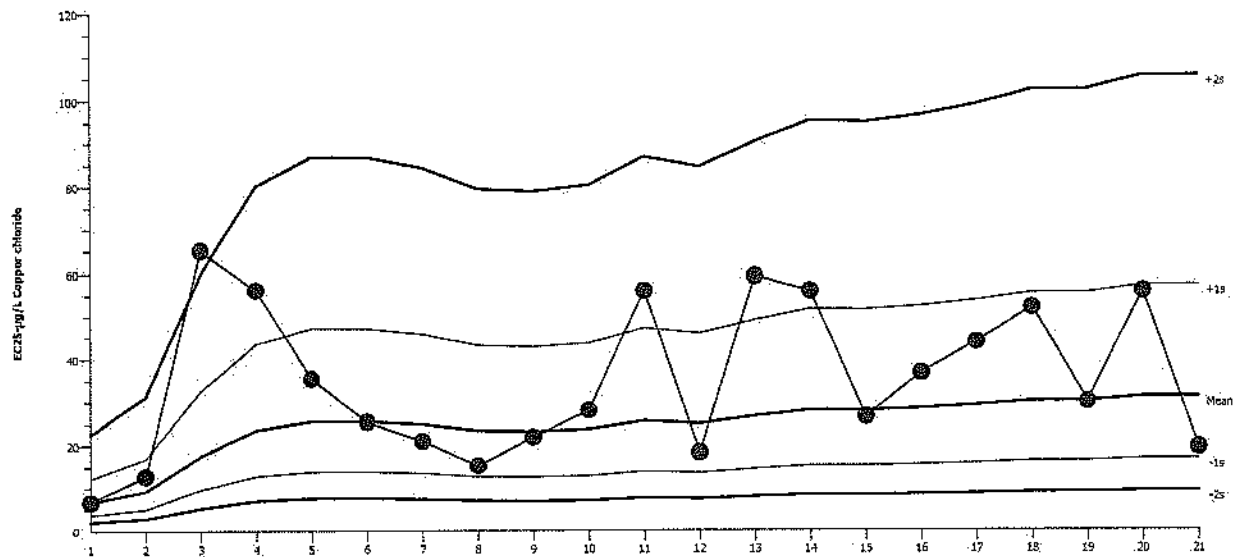
Material: Copper chloride

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

Endpoint: Reproduction

Source: Reference Toxicant-REF

Ceriodaphnia 7-d Survival and Reproduction Test



Mean: 31.03

Count: 20

-1s Warning Limit: 16.85

-2s Action Limit: 9.15

Sigma: N/A

CV: 84.10%

+1s Warning Limit: 57.13

+2s Action Limit: 105.2

## Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	May	25	6.656	-24.38	-2.522	(-)	(-)	16-2272-5797	04-1379-9830
2		Jun	6	12.78	-18.25	-1.453	(-)		00-1105-6011	17-2178-2673
3			22	65.16	34.13	1.215	(+)		10-7002-0112	00-8698-9715
4		Jul	12	56.24	25.21	0.974			13-9476-5989	15-6562-8470
5			27	35.41	4.383	0.2164			00-3533-4104	15-5816-8081
6		Aug	9	25.45	-5.584	-0.3249			05-1646-5416	12-8828-7274
7			23	20.93	-10.1	-0.6449			18-0928-7994	01-4455-3838
8		Sep	6	15.28	-15.76	-1.161	(-)		04-1283-5528	07-4663-1403
9			20	21.83	-9.202	-0.5762			09-2547-5700	05-2225-6686
10		Oct	18	27.98	-3.053	-0.1696			14-7896-4665	10-2719-4408
11		Nov	15	55.96	24.93	0.966			09-2671-6353	12-1707-6477
12		Dec	13	18.28	-12.75	-0.8666			19-3949-3034	15-1089-9957
13	2018	Jan	4	59.22	28.19	1.058	(+)		17-7500-8361	03-9405-5395
14		Feb	7	55.8	24.77	0.9611			04-8492-7543	19-3721-5481
15		Mar	2	26.44	-4.588	-0.2621			11-4862-8707	08-2696-1620
16			15	36.61	5.582	0.271			20-9677-0547	09-0026-7515
17		Apr	19	43.76	12.73	0.5631			18-2737-1194	03-8342-1801
18		May	16	51.99	20.96	0.8452			05-4955-8978	06-0129-1380
19		Jun	13	29.96	-1.071	-0.05754			16-1570-3305	06-3152-2418
20		Jul	12	55.75	24.72	0.9597			05-0138-0333	18-3627-7518
21		Aug	22	19.4	-11.63	-0.7696			11-5251-4189	07-5888-1093



# CETIS Test Data Worksheet



Report Date: 20 Aug-18 09:46 (p 1 of 2)  
Test Code: 11-5251-4189/1808RT2A.C

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 22 Aug-18 1540 Species: Ceriodaphnia dubia  
End Date: 29 Aug-18 750 Protocol: EPA/821/R-02-013 (2002)  
Sample Date: 22 Aug-18 1010 Material: Copper chloride

Sample Code: 2EBECB78  
Sample Source: Reference Toxicant  
Sample Station: Reference Toxicant

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	59	1	0	0	0	6	11	0	20	37	
0	D	2	44	1	0	0	0	5	12	0	18	35	
0	D	3	21	1	0	0	0	7	14	0	20	41	
0	D	4	33	1	0	0	0	7	13	0	19	39	
0	D	5	19	1	0	0	0	6	12	0	23	41	
0	D	6	20	1	0	0	0	6	13	0	20	37	
0	D	7	36	1	0	0	0	7	13	0	24	44	
0	D	8	37	1	0	0	0	8	15	0	26	49	
0	D	9	32	1	0	0	0	5	0	11	29	35	
0	D	10	58	1	0	0	0	6	13	11	19	34	
12.5		1	31	1	0	0	0	5	0	12	17	34	
12.5		2	18	1	0	0	0	5	11	0	20	36	
12.5		3	48	1	0	0	0	5	11	0	20	36	
12.5		4	46	1	0	0	0	5	14	0	20	39	
12.5		5	40	1	0	0	0	5	13	0	24	39	
12.5		6	6	1	0	0	0	4	7	0	16	27	
12.5		7	1	1	0	0	0	6	12	0	15	33	
12.5		8	39	1	0	0	0	4	0	13	20	37	
12.5		9	47	1	0	0	0	4	14	0	18	36	
12.5		10	52	1	0	0	0	6	12	0	19	37	
25		1	60	1	0	0	0	5	12	0	14	31	
25		2	5	1	0	0	0	0	6	11	0	17	
25		3	2	1	0	0	0	6	13	18	0	37	
25		4	55	1	0	0	0	4	10	0	5	31	
25		5	42	1	0	0	0	0	0	0	0	0	
25		6	53	1	0	0	0	0	1	7	0	8	
25		7	13	1	0	0	0	6	12	0	10	28	
25		8	29	1	0	0	0	6	0	12	18	37	
25		9	41	1	0	0	0	4	0	10	18	32	
25		10	12	1	0	0	0	0	4	10	0	14	
50		1	3	1	0	0	0	0	0	0	0	0	
50		2	24	1	0	0	0	0	0	0	0	0	
50		3	25	1	0	0	0	0	0	0	0	0	
50		4	30	1	0	0	0	0	0	0	0	0	
50		5	23	1	0	0	0	0	0	0	0	0	
50		6	4	1	0	0	0	0	0	0	0	0	
50		7	8	1	0	0	0	0	0	0	0	0	
50		8	22	1	0	0	0	0	0	0	0	0	
50		9	56	1	0	0	0	0	0	0	0	0	
50		10	34	1	0	0	0	0	0	0	0	0	
100		1	50	1	0	0	0	0	0	0	0	0	
100		2	27	1	0	0	0	0	0	0	0	0	
100		3	28	1	0	0	0	0	0	0	0	0	
100		4	17	1	0	0	0	0	0	0	0	0	
100		5	38	1	0	0	0	0	0	0	0	0	
100		6	49	1	0	0	0	0	0	0	0	0	
100		7	43	1	0	0	0	0	0	0	0	0	

Outlier per Cetis 8/29/18

RT

## CETIS Test Data Worksheet

 Report Date: 20 Aug-18 09:46 (p 2 of 2)  
 Test Code: 11-5251-4189/1808RT2A.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	14	1	0 X	X	X	X	X	X	X	0	
100		9	9	1	0 X	X	X	X	X	X	X	0	
100		10	54	1	0 X	X	X	X	X	X	X	0	
200		1	15	1	0 X	X	X	X	X	X	X	0	
200		2	11	1	0 X	X	X	X	X	X	X	0	
200		3	57	1	0 X	X	X	X	X	X	X	0	
200		4	45	1	0 X	X	X	X	X	X	X	0	
200		5	35	1	0 X	X	X	X	X	X	X	0	
200		6	7	1	0 X	X	X	X	X	X	X	0	
200		7	51	1	0 X	X	X	X	X	X	X	0	
200		8	26	1	0 X	X	X	X	X	X	X	0	
200		9	16	1	0 X	X	X	X	X	X	X	0	
200		10	10	1	0 X	X	X	X	X	X	X	0	

Date:

 8/22/18 8/23/18 8/24/18 8/25/18 8-26-18 8/27/18 8/28/18 8/29/18  
 1540 750

feed:

 1435 1000 1041 1234 0942 1207 930  
 RD RD RC RC RC RC RD

transfer:

 1040 1113 1302 1024 1238 950  
 RD RC RC RC RC RD



# CETIS Measurement Worksheet

RT

Report Date: 20 Aug-18 09:46 (p 1 of 2)  
Test Code: 1808RT2A.C | 11-5251-4189

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 22 Aug-18 Species: Ceriodaphnia dubia Sample Code: 2EBECB78  
End Date: 29 Aug-18 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant  
Sample Date: 22 Aug-18 Material: Copper chloride Sample Station: Reference Toxicant

Alkalinity (CaCO <sub>3</sub> )-mg/L 8/31/18		
Conc-µg/L	Code	Reading 1
0	D	114
200		114
Measure Time: 1030		
Instrument ID: TITRATE		
Analyst: RE		

Conductivity-µmhos 8/22 8/23 8/24 8/25 8-26 8/27 8/28								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	614	597	603	602	597	529	585
12.5		606	600	602	602	597	535	587
25		605	599	602	596	578	526	575
50		604	599					
100		604	597					
200		584	571					
Measure Time:		1330	945	1005	1219	0842	1033	900
Instrument ID:		#2	#2	#2	#2	2	#1	#4
Analyst:		RE	RE	RE	RE	RE	RE	RE

Final Dissolved Oxygen-mg/L 8/22 8/24 8/25 8-26 8/27 8/28 8/29								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.43	7.88	8.03	8.19	7.89	7.74	7.76
12.5		7.83	7.98	8.09	8.31	7.97	8.07	8.22
25		7.90	8.02	8.14	8.26	8.03	8.18	8.31
50		7.95						
100		8.00						
200		8.07						
Measure Time:		1230	1125	1332	1030	1454	1025	755
Instrument ID:		#3	#3	#3	3	#3	#3	#3
Analyst:		RE	RE	RE	RE	RE	RE	RE

Initial Dissolved Oxygen-mg/L 8/22 8/23 8/24 8/25 8-26 8/27 8/28								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	8.05	7.86	8.02	8.31	8.25	8.22	8.06
12.5		8.08	8.15	8.15	8.26	8.31	8.25	8.28
25		8.10	8.20	8.24	8.25	8.31	8.29	8.35
50		8.12	8.26					
100		8.15	8.24					
200		8.15	8.25					
Measure Time:		1330	945	1005	1219	0842	1033	900
Instrument ID:		#3	#3	#3	#3	3	#3	#3
Analyst:		RE	RE	RE	RE	RE	RE	RE

Hardness (CaCO <sub>3</sub> )-mg/L 8/31/18		
Conc-µg/L	Code	Reading 1
0	D	162
200		166
Measure Time: 1030		
Instrument ID: TITRATE		
Analyst: RE		

# CETIS Measurement Worksheet

RT

Report Date: 20 Aug-18 09:46 (p 2 of 2)  
Test Code: 1808RT2A.C | 11-5251-4189

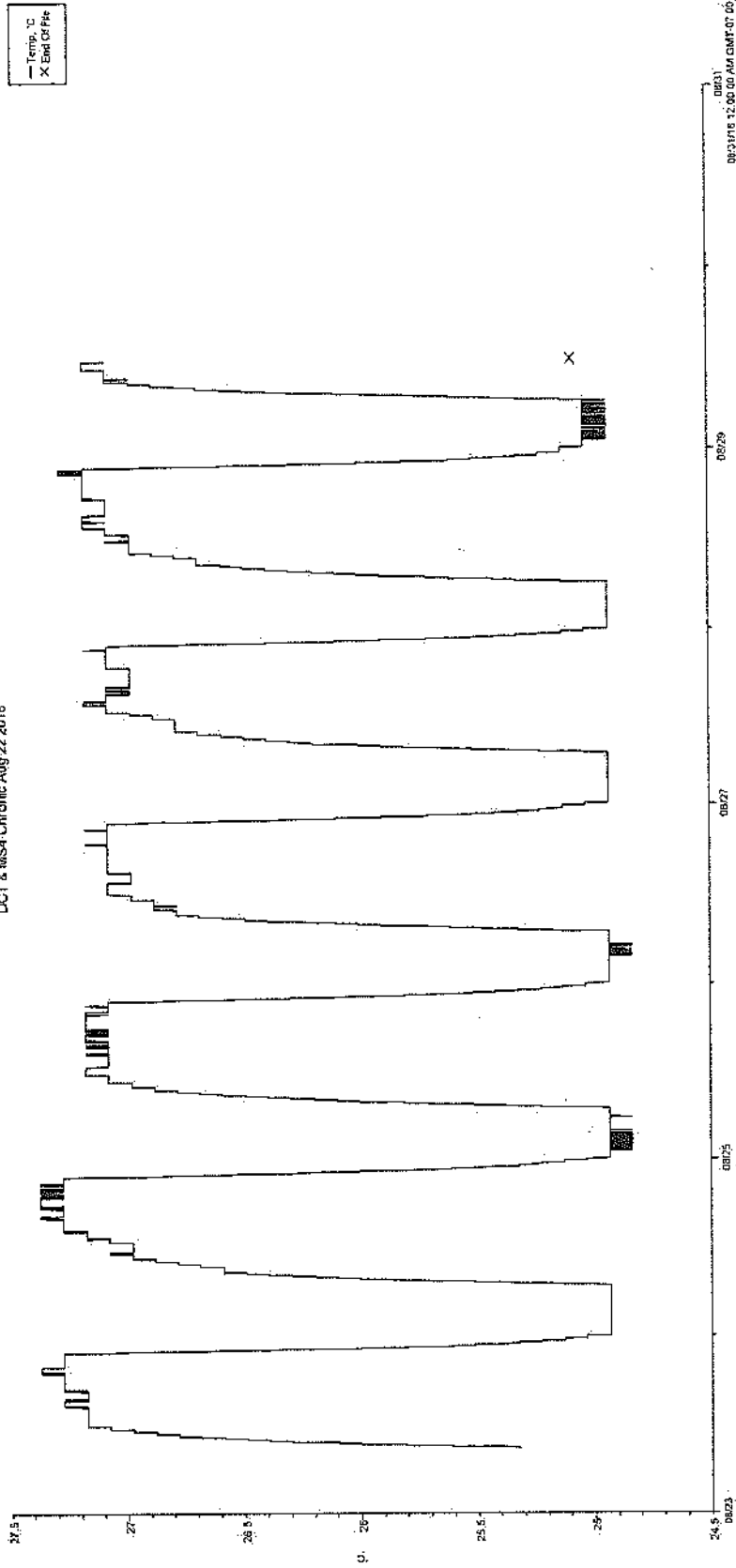
## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 22 Aug-18 Species: Ceriodaphnia dubia Sample Code: 2EBECB78  
End Date: 29 Aug-18 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant  
Sample Date: 22 Aug-18 Material: Copper chloride Sample Station: Reference Toxicant

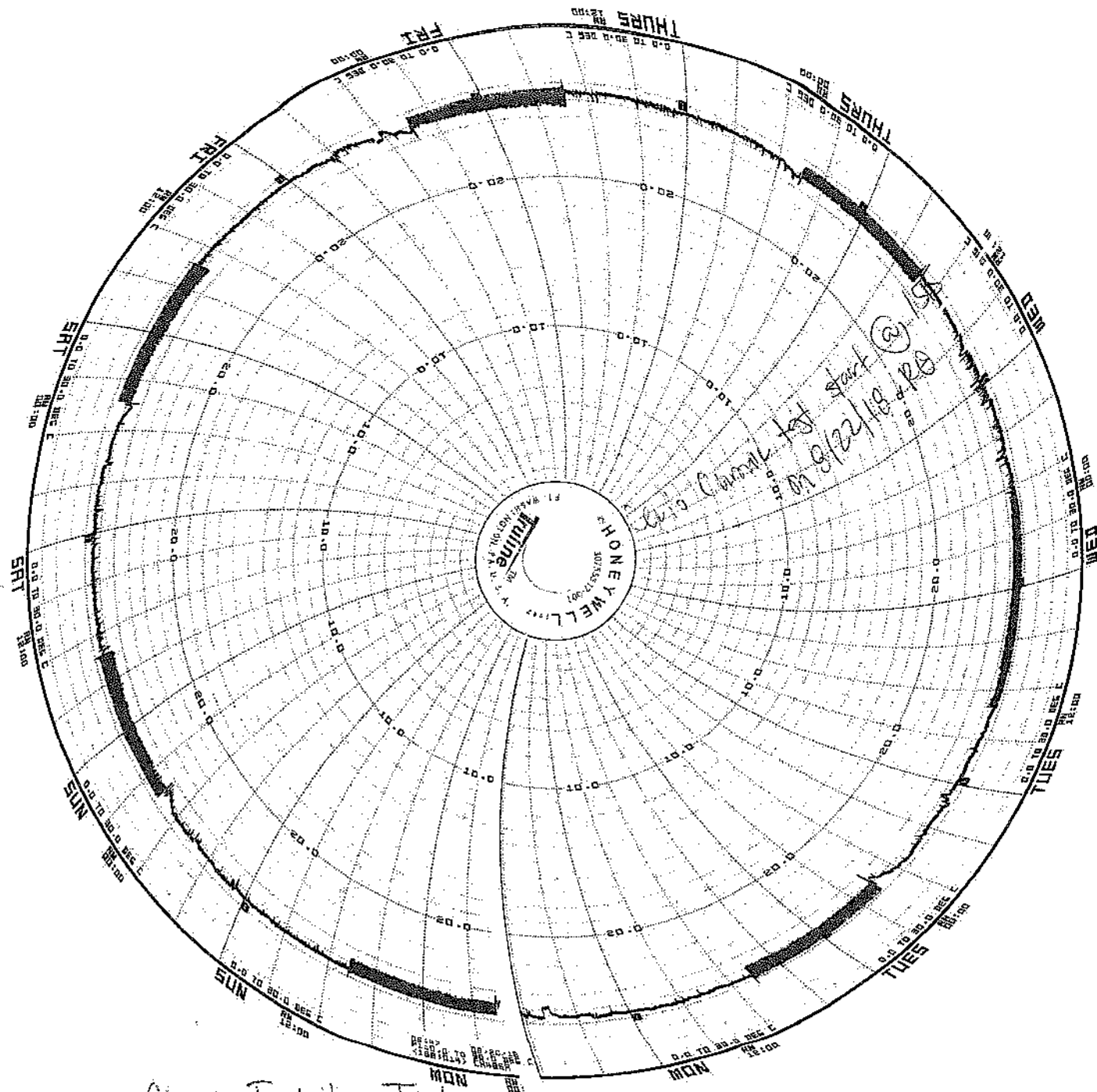
Final pH								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.97	8.06	8.15	8.08	8.03	7.96	7.85
12.5		8.05	8.10	8.19	8.13	8.10	8.06	8.00
25		8.03	8.10	8.18	8.08	8.11	8.08	8.01
50		8.03						
100		8.03						
200		8.05						
Measure Time:		1225	1125	1332	1036	1454	1025	755
Instrument ID:		#1	#1	#1	#1	#1	#2	#2
Analyst:		RA	RC	RC	DL	RC	RA	RA
Initial pH								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.83	7.98	8.06	8.13	8.14	8.06	7.73
12.5		7.72	8.01	8.07	8.15	8.14	8.05	7.84
25		7.70	8.01	8.07	8.15	8.14	8.04	7.89
50		7.68	8.01					
100		7.67	8.02					
200		7.63	8.00					
Measure Time:		1330	945	1005	1219	0842	1033	900
Instrument ID:		#1	#1	#1	#1	#1	#1	#2
Analyst:		RA	RA	RC	RC	DL	RC	RA
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	25.4	25.7	24.2	25.7	25.2	24.6
12.5		25.4	25.1	25.4	24.0	25.7	24.8	24.9
25		25.4	25.3	25.6	24.0	25.7	25.0	25.1
50		25.4						
100		25.3						
200		25.3						
Measure Time:		1225	1125	1332	1036	1454	1025	755
Instrument ID:		#1	#1	#1	#1	#1	#2	#2
Analyst:		RA	RC	RC	DL	RC	RA	RA
Initial Temperature-°C								
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	25.8	25.0	24.9	25.4	25.0	25.5	25.3
12.5		25.8	25.1	24.9	25.4	25.0	25.3	25.4
25		25.8	25.1	24.9	25.4	24.8	25.2	25.2
50		25.7	25.0					
100		25.7	24.9					
200		25.6	24.8					
Measure Time:		1330	945	1005	1219	0842	1033	900
Instrument ID:		#1	#1	#1	#1	#1	#1	#2
Analyst:		RA	RA	RC	RC	DL	RC	RA

DCT & MS4 Chronic Aug 22 2018



Ceriodaphnia Chronic Toxicity Test  
Test start: Wednesday, August 22, 2018  
Test end: Wednesday, August 29, 2018





Ceriodaphnia Chronic Toxicity Test  
 Test start : Wednesday, Aug 22, 2018  
 Test end : Wednesday, Aug 29, 2018  
 RT — 1808RTZA.C  
 DCTeff — 180806ZA.C

Pg 1 of 2





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: 1811072A.C

TEST MATERIAL: Station LAR04TUJ

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, 10.4% 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 11:47 (p 1 of 1)  
Test Code: 1811072A.C | 09-4803-0106

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: 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: 02-1619-0633	Code: 3291814	Client: Watershed Protection Division									
Sample Date: 22 Nov-18 03:05	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 22 Nov-18 08:05	Source: Stormwater (STORMWATER)	Batch 1116; HBN 69941									
Sample Age: 35h (16.9 °C)	Station: LAR04TUJ										
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3291814	22 Nov-18 03:05	22 Nov-18 08:05	24 Nov-18 12:28	16.9						
2	3291814	22 Nov-18 03:05	22 Nov-18 08:05	25 Nov-18 12:42	16.9						
3	3291814	22 Nov-18 03:05	22 Nov-18 08:05	26 Nov-18 13:08	16.9						
4	3291814	22 Nov-18 03:05	22 Nov-18 08:05	27 Nov-18 11:57	16.9						
5	3291814	22 Nov-18 03:05	22 Nov-18 08:05	28 Nov-18 10:31	16.9						
6	3291814	22 Nov-18 03:05	22 Nov-18 08:05	29 Nov-18 12:41	16.9						
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				
08-7611-9719	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
09-5976-6958	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					
08-7611-9719	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
09-5976-6958	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	28.5	26.22	30.78	16	38	1.934	6.115	21.45%	10.38%
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		32	26	16	32	38	33	23	29	26	30



# CETIS Analytical Report

Report Date: 28 Dec-18 11:46 (p 1 of 4)  
Test Code: 1811072A.C | 09-4803-0106

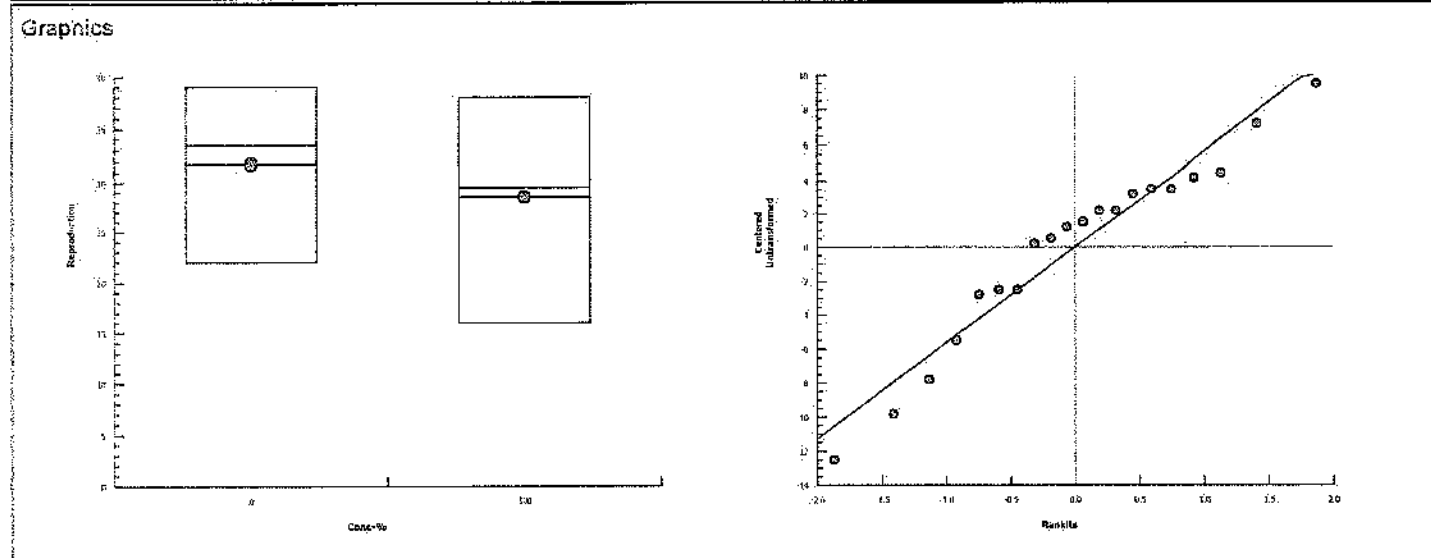
Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID: 09-5976-6958		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 03 Dec-18 9:37		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 17-1558-0949		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 23 Nov-18 14:04		Protocol: EPA/821/R-02-013 (2002)		Diluent: 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: 02-1619-0633		Code: 3291814		Client: Watershed Protection Division							
Sample Date: 22 Nov-18 03:05		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 22 Nov-18 08:05		Source: Stormwater (STORMWATER)									
Sample Age: 35h (16.9 °C)		Station: LAR04TUJ									
<b>Batch Note:</b> 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					
<b>TST-Welch's t Test</b>											
Control	vs	Conc.-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100*	2.013	0.8662	15		0.0312	Non-Significant Effect			
<b>Test Acceptability Criteria</b>											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	31.8	15 - NL	Yes	Passes Acceptability Criteria							
<b>Auxiliary Tests</b>											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.239	2.708	0.3390	No Outliers Detected						
<b>ANOVA Table</b>											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	54.45	54.45	1	1.655	0.2145	Non-Significant Effect					
Error	592.1	32.89444	18								
Total	646.55	87.34444	19								
<b>Distributional Tests</b>											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.317	6.541	0.6887	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9494	0.866	0.3586	Normal Distribution						
<b>Reproduction Summary</b>											
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	28.5	26.17	30.83	16	38	1.934	6.115	21.45%	10.38%

# CETIS Analytical Report

Report Date: 28 Dec-18 11:46 (p 2 of 4)  
Test Code: 1811072A.C | 09-4803-0106

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory	
Analysis ID:	09-5976-6958	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1	
Analyzed:	03 Dec-18 9:37	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		32	26	16	32	38	33	23	29	26	30



## CETIS Analytical Report

Report Date: 28 Dec-18 11:46 (p 3 of 4)  
 Test Code: 1811072A.C | 09-4803-0106

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 08-7611-9719	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1									
Analyzed: 03 Dec-18 9:37	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: 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: 02-1619-0633	Code: 3291814	Client: Watershed Protection Division									
Sample Date: 22 Nov-18 03:05	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 22 Nov-18 08:05	Source: Stormwater (STORMWATER)										
Sample Age: 35h (16.9 °C)	Station: LAR04TUJ										
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%

RC

RA

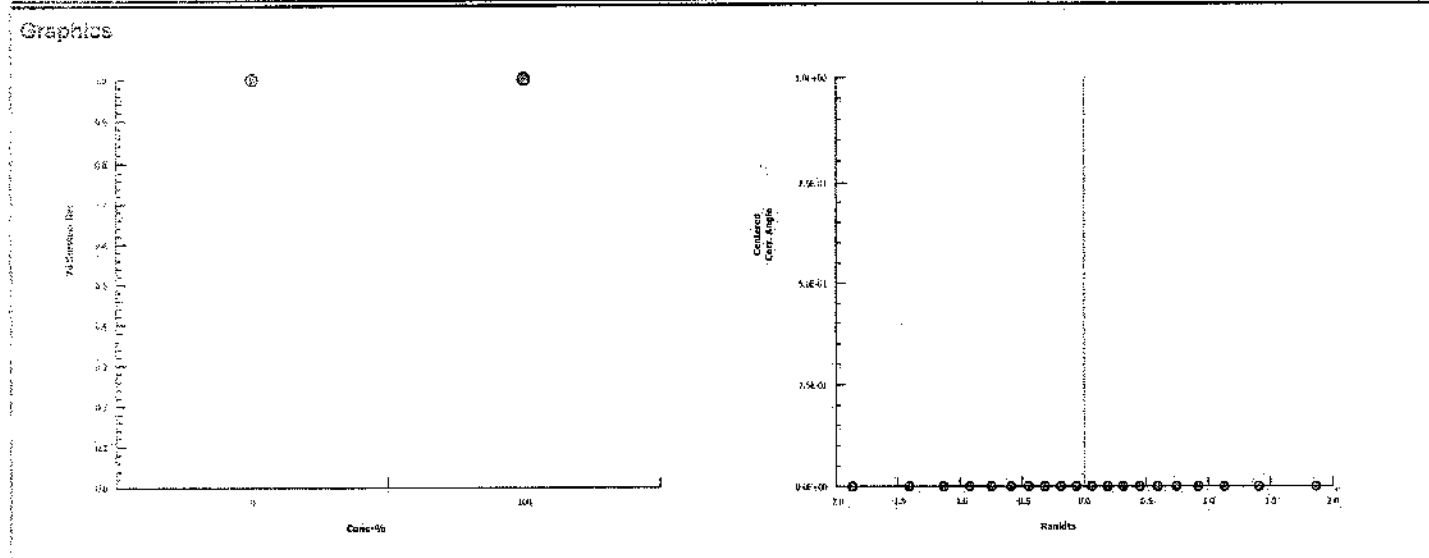


# CETIS Analytical Report

Report Date: 28 Dec-18 11:47 (p 4 of 4)  
 Test Code: 1811072A.C | 09-4803-0106

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory	
Analysis ID: 08-7811-9719	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1				
Analyzed: 03 Dec-18 9:37	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 10:59 (p 1 of 1)  
Test Code: 09-4803-0106/1811072A.C

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory				
Start Date:	23 Nov-18	1404	Species:	Ceriodaphnia dubia	Sample Code:	CE2CEA9						
End Date:	30 Nov-18	1518	Protocol:	EPA/821/R-02-013 (2002)	Sample Source:	Stormwater						
Sample Date:	21 Nov-18		Material:	Stormwater Monitoring Sample	Sample Station:	LAR04TUJ						

Conc-%	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	5	8	0	22	35	
0	D	2	44	1	0	0	0	4	9	0	19	32	
0	D	3	30	1	0	0	0	3	9	10	0	22	
0	D	4	4	1	0	0	0	6	0	13	20	39	
0	D	5	57	1	0	0	0	4	7	0	13	24	
0	D	6	56	1	0	0	0	3	11	0	22	36	
0	D	7	71	1	0	0	0	5	9	20	0	34	
0	D	8	53	1	0	0	0	5	0	12	16	33	
0	D	9	49	1	0	0	0	4	10	0	15	29	
0	D	10	17	1	0	0	0	4	0	15	15	34	
100		1	2	1	0	0	0	5	9	0	18	32	
100		2	59	1	0	0	0	3	8	15	0	26	
100		3	50	1	0	0	0	4	7	5	0	16	
100		4	72	1	0	0	0	5	11	0	16	32	
100		5	29	1	0	0	0	5	0	13	20	38	
100		6	39	1	0	0	0	4	10	0	19	33	
100		7	35	1	0	0	0	4	7	0	12	23	
100		8	68	1	0	0	0	4	8	17	0	29	
100		9	75	1	0	0	0	3	0	8	15	26	
100		10	65	1	0	0	0	4 <sup>11-27-18</sup> <sub>32</sub> (3)	0	9	18	30	

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  
 Transferred: 1404 1228 1242 1308 1157 1031 1241  
 End @ 1518

# CETIS Measurement Worksheet

Report Date: 21 Nov-18 10:59 (p 1 of 2)  
 Test Code: 1811072AC | 09-4803-0106

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

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

Sample Code: CE2CEA9  
 Sample Source: Stormwater  
 Sample Station: LAR04TUJ

### Alkalinity (CaCO<sub>3</sub>)-mg/L

Conc-%	Code	Reading 1
0	D	60
100		48
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		198	193	192	198	191	187	196
Measure Time:		1218	1052	1145	1107	1037	0925	1135
Instrument ID:		#3	#3	#3	#3	2	2	2
Analyst:		fc	fc	fc	fc	DL	DL	DL

### 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		6.54	7.01	7.26	7.85	7.54	7.01	7.11
Measure Time:		1239	1314	1327	1436	1038	1545	1730
Instrument ID:		#4	#4	#4	4	4	4	#4
Analyst:		fc	fc	fc	DL	DL	DL	fc

### Initial Dissolved Oxygen-mg/L

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.43	7.60	7.68	7.80	7.76	7.75	7.92
100		7.59	7.13	5.16	5.32	6.22	6.90	7.92 (7.1)
Measure Time:		1218	1052	1145	1107	1037	0925	1135
Instrument ID:		#4	#4	#4	#4	4	4	4
Analyst:		fc	fc	fc	fc	DL	DL	DL

### Hardness (CaCO<sub>3</sub>)-mg/L

Conc-%	Code	Reading 1
0	D	88
100		68
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	8.0	7.82	7.84	7.60 (7.96)
100		7.28	7.06	7.33	7.61	7.49	7.39	7.59
Measure Time:		1239	1314	1327	1436	1038	1545	1730
Instrument ID:		#3	#3	#3	3	3	#3	#3
Analyst:		fc	fc	fc	DL	DL	DL	fc



# CETIS Measurement Worksheet

Report Date: 21 Nov-18 10:59 (p 2 of 2)  
 Test Code: 1811072A C | 09-4803-0106

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date:		23 Nov-18		Species:		Ceriodaphnia dubia		Sample Code:		CE2CEA9	
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:		LAR04TUJ	
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		7.28	6.87	6.66	6.70	6.96	6.91	7.05			
Measure Time:		12:18	10:52	11:45	11:07	10:37	09:25	11:35			
Instrument ID:		#3	#3	#3	#3	3	3	3			
Analyst:		fc	fc	fc	fc	DL	DL	DL			
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		25.7	25.5	25.1	25.1	24.9	25.2	25.1			
Measure Time:		12:39	13:14	13:27	14:36	10:38	15:45	17:30			
Instrument ID:		#3	#3	#3	3	3	#3	#3			
Analyst:		fc	fc	fc	DL	DL	DL	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		24.7	24.1	25.0	24.6	24.2	24.5	25.3			
Measure Time:		12:18	10:52	11:45	11:07	10:37	09:25	11:35			
Instrument ID:		#3	#3	#3	#3	3	3	3			
Analyst:		fc	fc	fc	fc	DL	DL	DL			

fc

DL

## Alkalinity

Date/Time: 2/4/10, 1300Project: MS4 1st Flush CelioAnalyst: 102Titrant: H<sub>2</sub>SO<sub>4</sub>Factor: 20 @ 50 ml

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

## Hardness

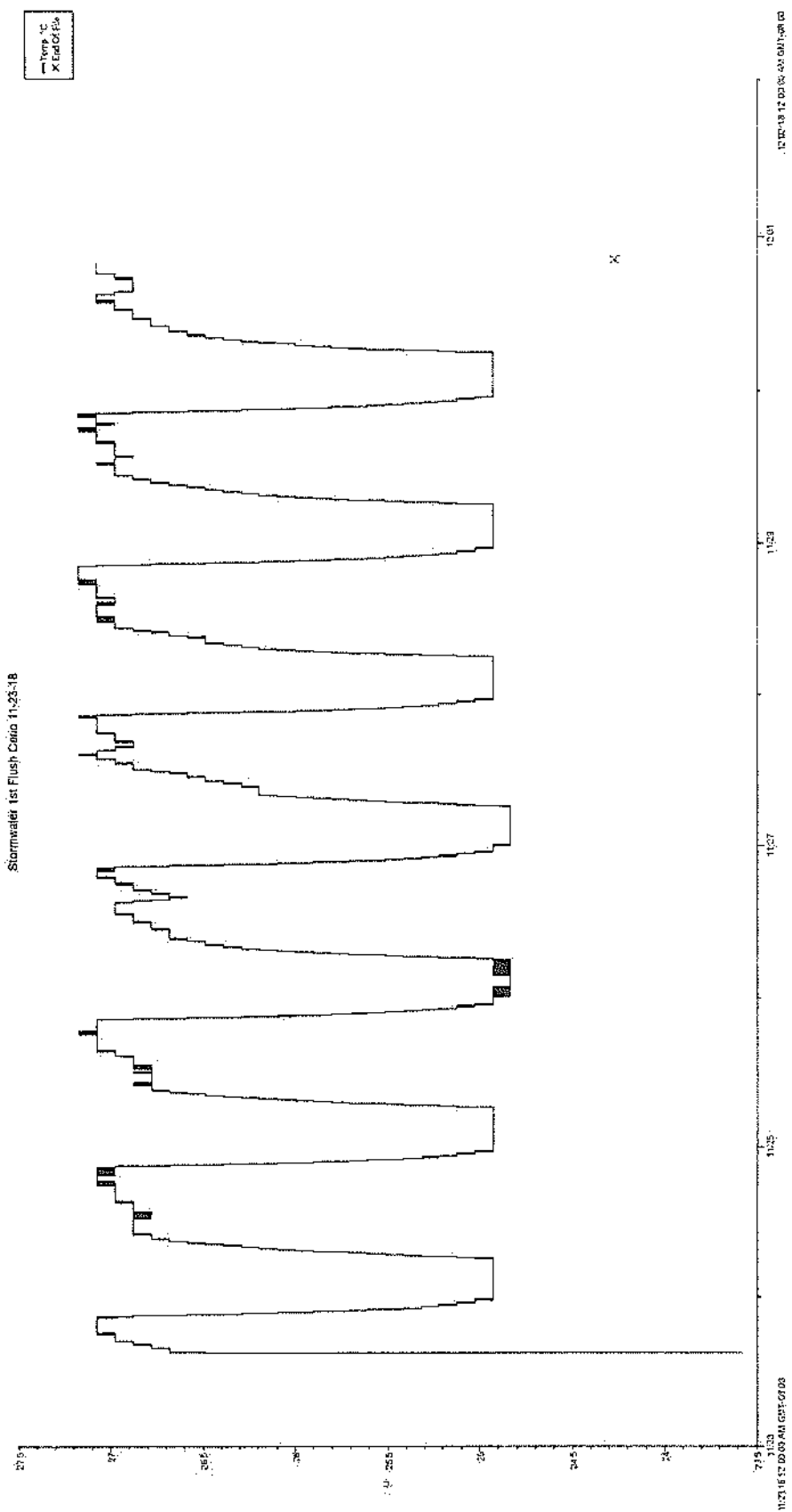
Date/Time: 12/4/18, 1300Project: M54 1st FlushAnalyst: 102

Cenit

Titrant: EDTAFactor: 200.50 mL

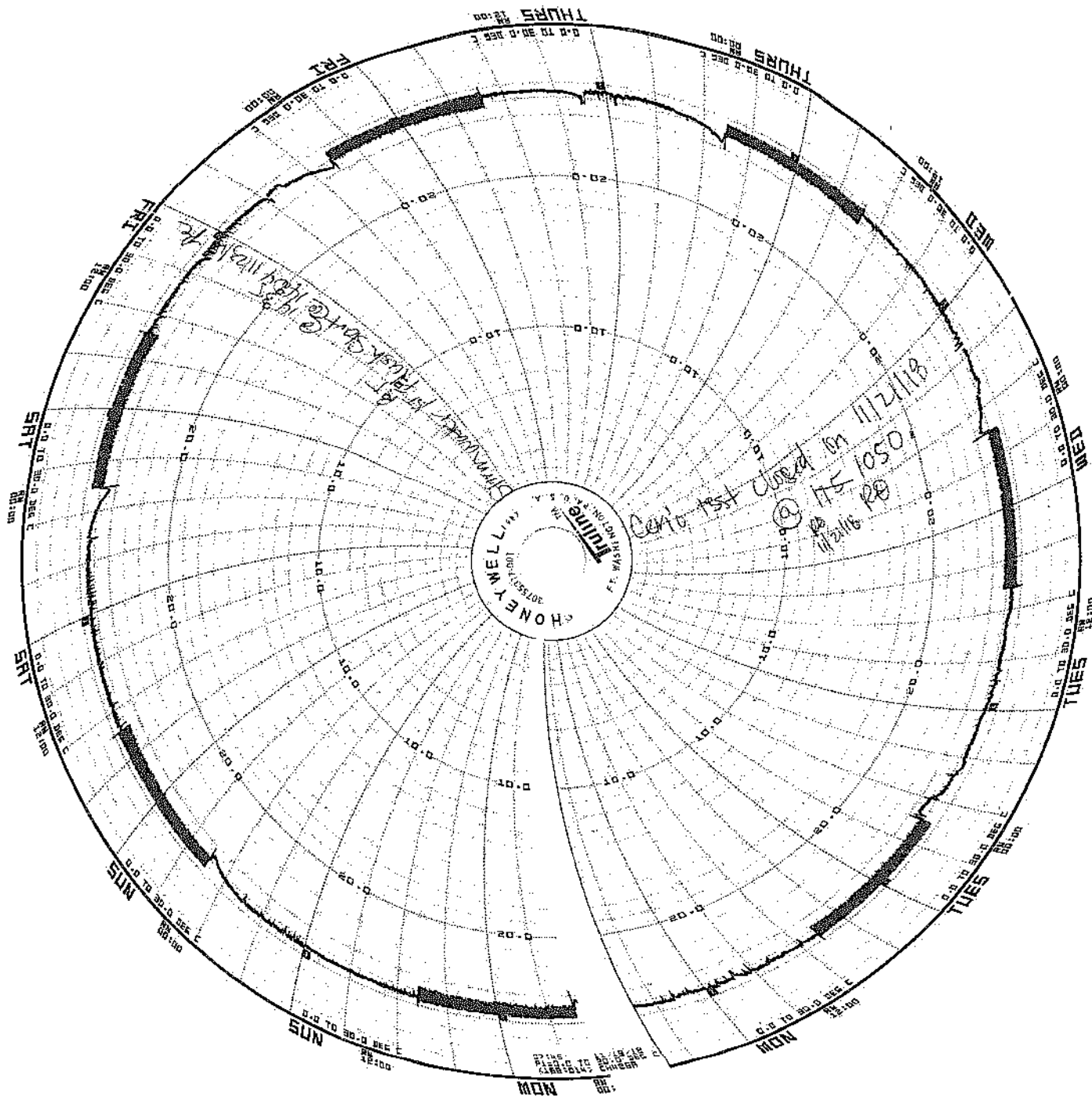
Sample	Sample Amount (mL)	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
M5FW	25	2.2	48 <sup>102 12/4/18</sup> (88)
[200] CH	1	4.5	180
TWJ		1.7	60
WAS		3.6	144
RHSLA		0.7	20
DOM		0.6	24
SMB		5.6	224
NAT	25	1.2	48
SAW	25	1.2	48



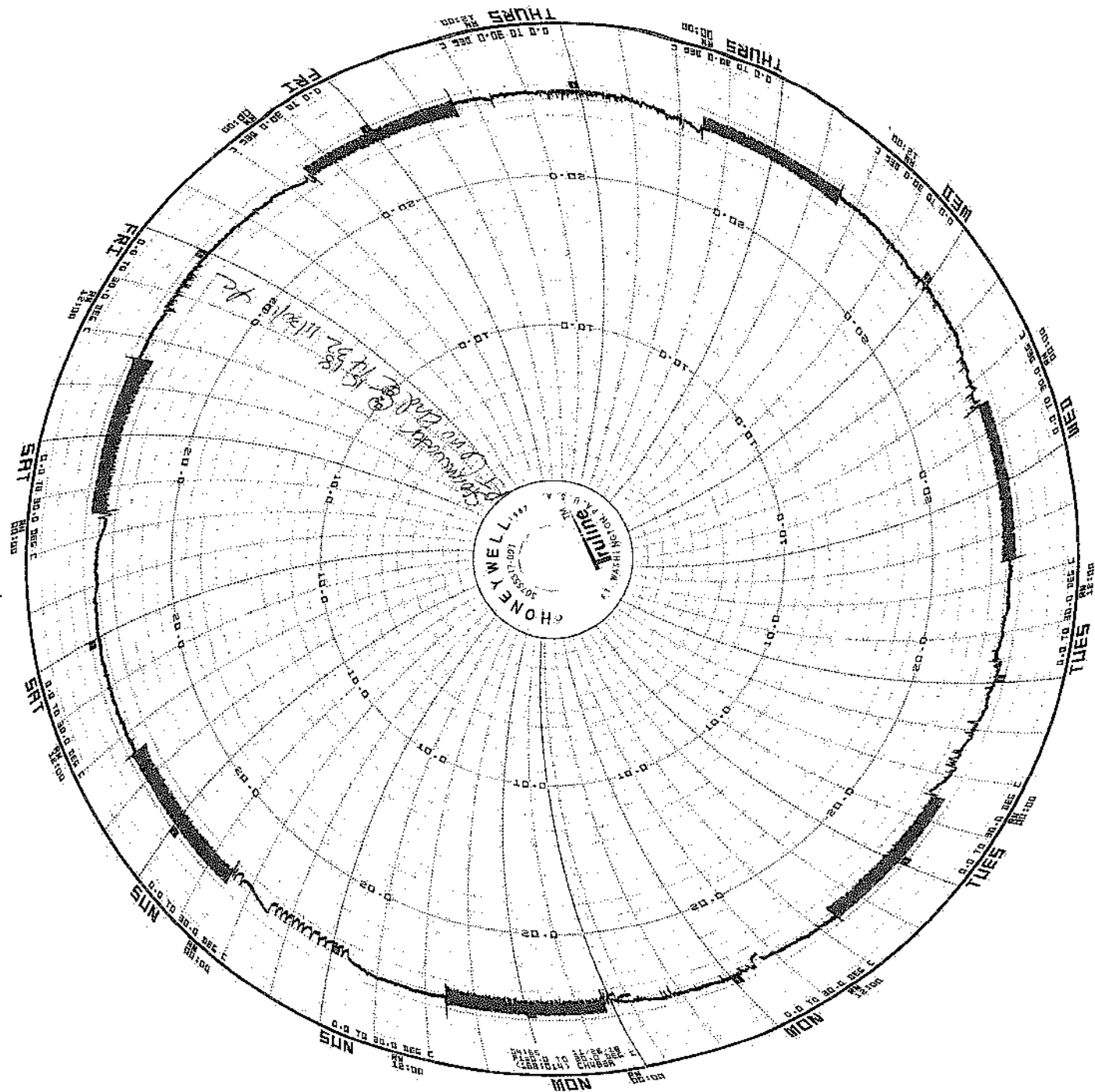


Test: 1811RT2B.C, 1811072A.C - G.C

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: November 22, 2018

TEST DATE: November 23, 2018

TEST NUMBER: 1811072B.C

TEST MATERIAL: Station LAR02WAS

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, 1.89% effect

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: 28 Dec-18 11:31 (p 1 of 1)  
Test Code: 1811072B.C | 12-1462-4721

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>Med</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: 01-2750-7376	Code: 3291813	Client: Watershed Protection Division									
Sample Date: 22 Nov-18 05:15	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 22 Nov-18 08:05	Source: Stormwater (STORMWATER)										
Sample Age: 33h (16.6 °C)	Station: LAR02WAS		<i>Batch 1116; HBN 69941</i>								
<b>Sample Renewals</b>											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3291813	22 Nov-18 05:15	22 Nov-18 08:05	24 Nov-18 12:28	16.6						
2	3291813	22 Nov-18 05:15	22 Nov-18 08:05	25 Nov-18 12:42	16.6						
3	3291813	22 Nov-18 05:15	22 Nov-18 08:05	26 Nov-18 13:08	16.6						
4	3291813	22 Nov-18 05:15	22 Nov-18 08:05	27 Nov-18 11:57	16.6						
5	3291813	22 Nov-18 05:15	22 Nov-18 08:05	28 Nov-18 10:41	16.6						
6	3291813	22 Nov-18 05:15	22 Nov-18 08:05	29 Nov-18 12:41	16.6						
<b>Batch Note:</b> 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.											
<b>Comparison Summary</b>											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
05-7076-0749	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
05-6862-7405	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
<b>Test Acceptability</b>											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
05-7076-0749	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
05-6862-7405	Reproduction	Control Resp	31.8	15 - NL	Yes	Passes Acceptability Criteria					
<b>7d Survival Rate Summary</b>											
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%
<b>Reproduction Summary</b>											
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	31.2	28.91	33.49	21	40	1.943	6.143	19.69%	1.89%
<b>7d Survival Rate Detail</b>											
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
<b>Reproduction Detail</b>											
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		37	37	40	26	37	29	21	29	28	28



# CETIS Analytical Report

Report Date: 28 Dec-18 11:31 (p 1 of 4)  
Test Code: 1811072B.C | 12-1462-4721

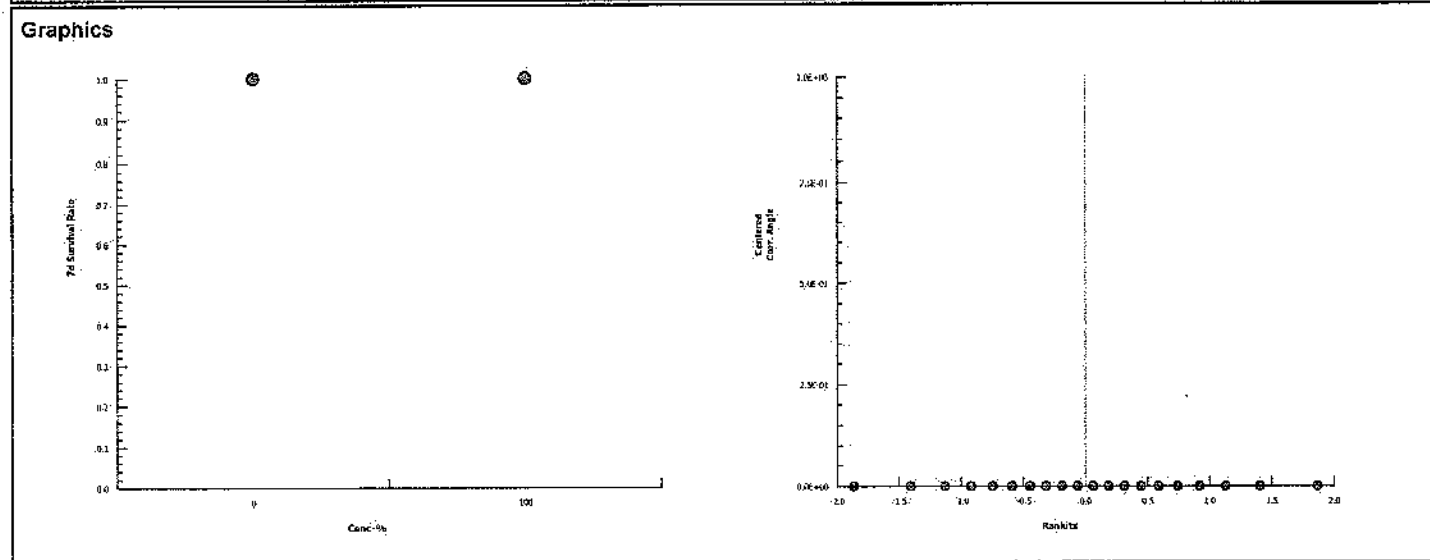
Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 05-7076-0749	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1									
Analyzed: 03 Dec-18 9:42	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes									
Batch ID: 17-1558-0949	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>Med</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 (09:30-13:35)</i>									
Sample ID: 01-2750-7376	Code: 3291813	Client: Watershed Protection Division									
Sample Date: 22 Nov-18 05:15	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 22 Nov-18 08:05	Source: Stormwater (STORMWATER)										
Sample Age: 33h (16.6 °C)	Station: LAR02WAS										
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 11:31 (p 2 of 4)  
Test Code: 1811072B:C | 12-1462-4721

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory	
Analysis ID:	05-7076-0749	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.1	
Analyzed:	03 Dec-18 9:42	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 Analytical Report

Report Date: 28 Dec-18 11:31 (p 3 of 4)  
 Test Code: 1811072B.C | 12-1462-4721

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID: 05-6862-7405		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 03 Dec-18 9:42		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: 01-2750-7376		Code: 3291813		Client: Watershed Protection Division							
Sample Date: 22 Nov-18 05:15		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 22 Nov-18 08:05		Source: Stormwater (STORMWATER)									
Sample Age: 33h (16.6 °C)		Station: LAR02WAS									
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*	3.172	0.8662	15		0.0032	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	1.822	2.708	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	1.8	1.8	1	0.05444	0.8182	Non-Significant Effect					
Error	595.2	33.06667	18								
Total	597	34.86666	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.329	6.541	0.6789	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9566	0.866	0.4777	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	31.2	28.86	33.54	21	40	1.943	6.143	19.69%	1.89%

# CETIS Analytical Report

Report Date: 28 Dec-18 11:31 (p 4 of 4)  
 Test Code: 1811072B.C | 12-1462-4721

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

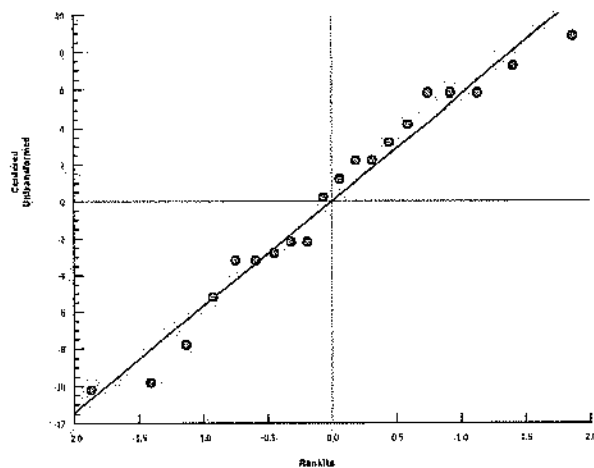
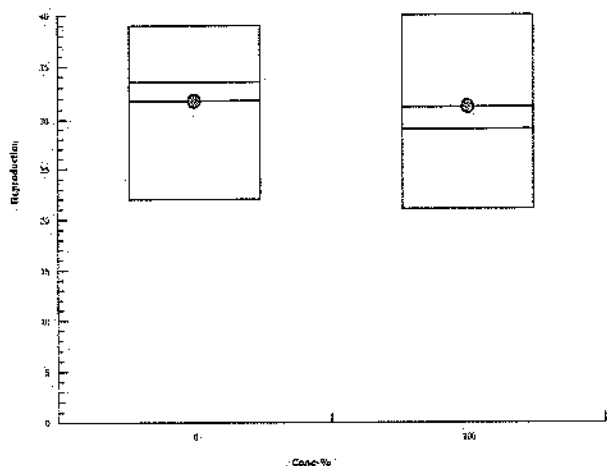
Analysis ID: 05-6862-7405      Endpoint: Reproduction  
 Analyzed: 03 Dec-18 9:42      Analysis: Parametric Bioequivalence-Two Sample

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	35	32	22	39	24	36	34	33	29	34
100		37	37	40	26	37	29	21	29	28	28

### Graphics



# CETIS Test Data Worksheet

Report Date: 21 Nov-18 11:00 (p 1 of 1)  
Test Code: 12-1462-4721/1811072B.C

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

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

Sample Code: 7999BB0  
Sample Source: Stormwater  
Sample Station: LAR02WAS

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	32	1	0	0	0	3	10	11	23	37	
100		2	64	1	0	0	0	5	0	0	22	37	
100		3	62	1	0	0	0	5	0	16	19	40	
100		4	14	1	0	0	0	4	9	13	0	26	
100		5	23	1	0	0	0	5	11	0	21	37	
100		6	74	1	0	0	0	2	12	15	0	29	
100		7	3	1	0	0	0	6	0	6	1	21	
100		8	46	1	0	0	0	5	0	8	16	29	
100		9	22	1	0	0	0	5	8	15	0	28	
100		10	78	1	0	0	0	3	8	17	0	28	

11/23 11/24 11/25 11/26 11/27 11/28 11/29 11/30  
End @ 1518 TC

Food Added: 1358 1109 1210 1241 1018 0842 1127  
TC TC TC TC TC TC TC  
Transferred: 1404 1228 1242 1308 1157 1041 1241  
TC TC TC TC TC TC TC



# CETIS Measurement Worksheet

Report Date: 21 Nov-18 11:00 (p 1 of 2)  
Test Code: 1811072B.C | 12-1462-4721

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 23 Nov-18 Species: Ceriodaphnia dubia Sample Code: 7999BB0  
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: LAR02WAS

### Alkalinity (CaCO<sub>3</sub>)-mg/L

Conc-%	Code	Reading 1
0	D	60
100		96
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		560	534	548	553	418	556	576
Measure Time:		1218	1052	1145	1107	1037	0925	1135
Instrument ID:		#3	#3	#3	#3	2	2	2
Analyst:		fc	fc	fc	fc	DL	DL	DL

### 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		6.50	6.80	7.12	7.09	7.23	6.67	6.75
Measure Time:		1239	1314	1327	1436	1030	1545	1730
Instrument ID:		#4	#4	#4	4	4	#4	#4
Analyst:		fc	fc	fc	DL	DL	DL	fc

### Initial Dissolved Oxygen-mg/L

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.43	7.60	7.68	7.80	7.78	7.75	7.92
100		5.31	4.98	5.41	5.86	6.33	6.66	6.96
Measure Time:		1218	1052	1145	1107	1037	0925	1135
Instrument ID:		#4	#4	#4	#4	2	4	4
Analyst:		fc	fc	fc	fc	DL	DL	DL

### Hardness (CaCO<sub>3</sub>)-mg/L

Conc-%	Code	Reading 1
0	D	88
100		144
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		7.51	7.27	7.52	7.72	7.62	7.54	7.68
Measure Time:		1239	1314	1327	1436	1030	1545	1730
Instrument ID:		#3	#3	#3	3	3	#3	#3
Analyst:		fc	fc	fc	DL	DL	DL	fc

# CETIS Measurement Worksheet

Report Date: 21 Nov-18 11:00 (p 2 of 2)  
 Test Code: 1811072B.C | 12-1462-4721

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory
Start Date: 23 Nov-18		Species: Ceriodaphnia dubia			Sample Code: 7999BB0			
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: LAR02WAS			
Initial pH								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	
0	D	7.79	7.60	7.88	7.83	8.08	7.97	
100		6.94	6.95	6.85	6.90	7.04	7.09	
Measure Time:		1218	1052	1145	1107	1037	0925	
Instrument ID:		#3	#3	#3	#3	3	3	
Analyst:		Re	Re	Re	Re	DL	DL	
Final Temperature-°C								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	
0	D	25.6	25.4	25.1	24.8	24.9	25.3	
100		25.6	25.4	25.0	25.2	24.9	25.0	
Measure Time:		1239	1314	1407	1430	1038	1545	
Instrument ID:		#3	#3	#3	3	3	#3	
Analyst:		Re	Re	Re	DL	DL	DL	
Initial Temperature-°C								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	
0	D	25.3	25.1	25.2	24.8	24.5	24.8	
100		24.5	25.2	24.8	24.5	24.2	24.4	
Measure Time:		1218	1052	1145	1107	1037	0925	
Instrument ID:		#3	#3	#3	#3	3	3	
Analyst:		Re	Re	Re	Re	DL	DL	

## Alkalinity

Date/Time: 2/4/10, 1300Project: MS4 1st Flush CEL10Analyst: 102Titrant: H<sub>2</sub>SO<sub>4</sub>Factor: 20 @ 50 mL

Sample	Sample (mL) Amount	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
MHSFW	25	1.5	60
[200] Cu		3.1	124
TUJ		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: 12/4/16, BOB

Project: MJ4 1st Flush

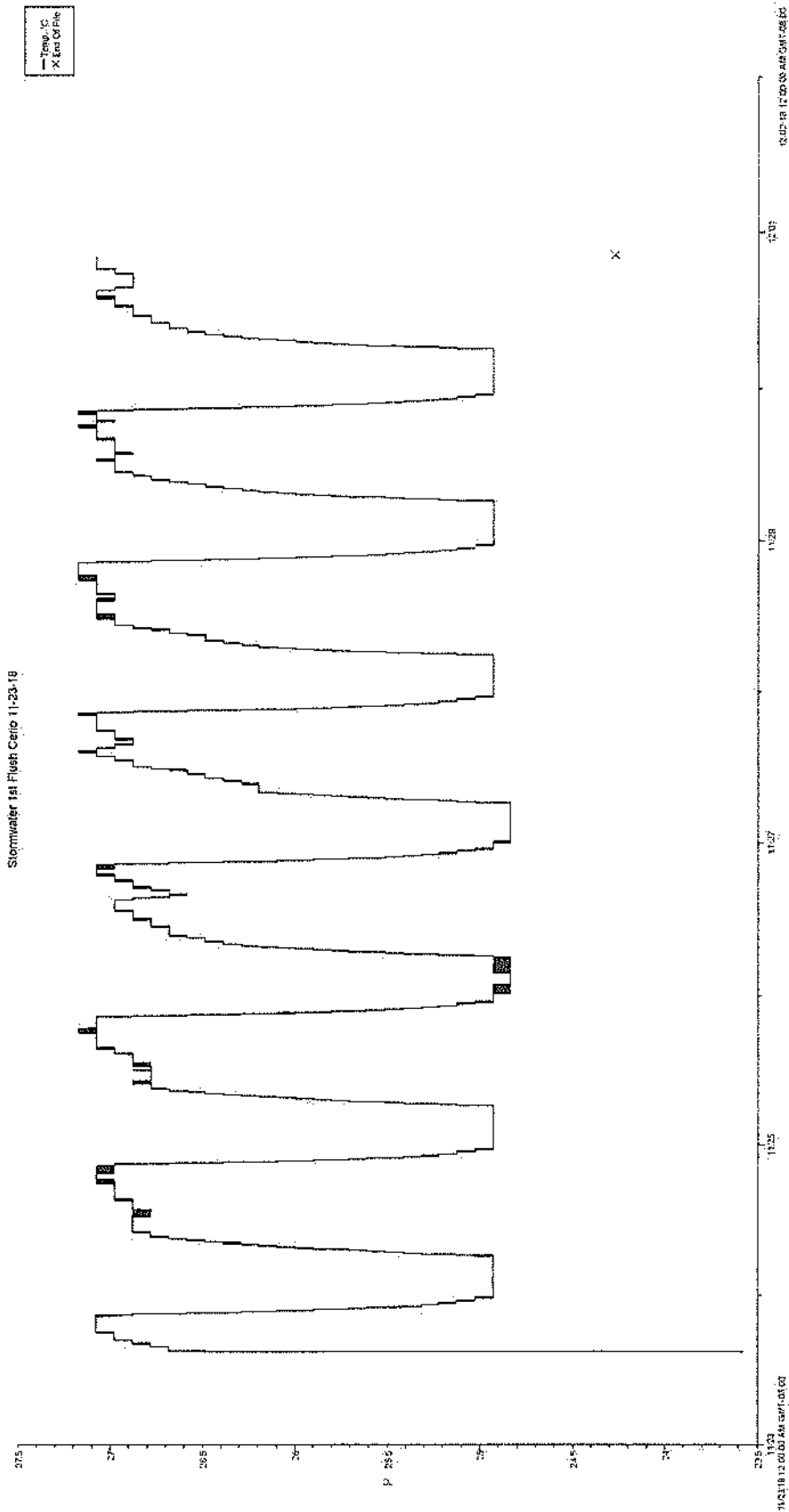
Analyst: 102

Cent

Titrant: EDTA

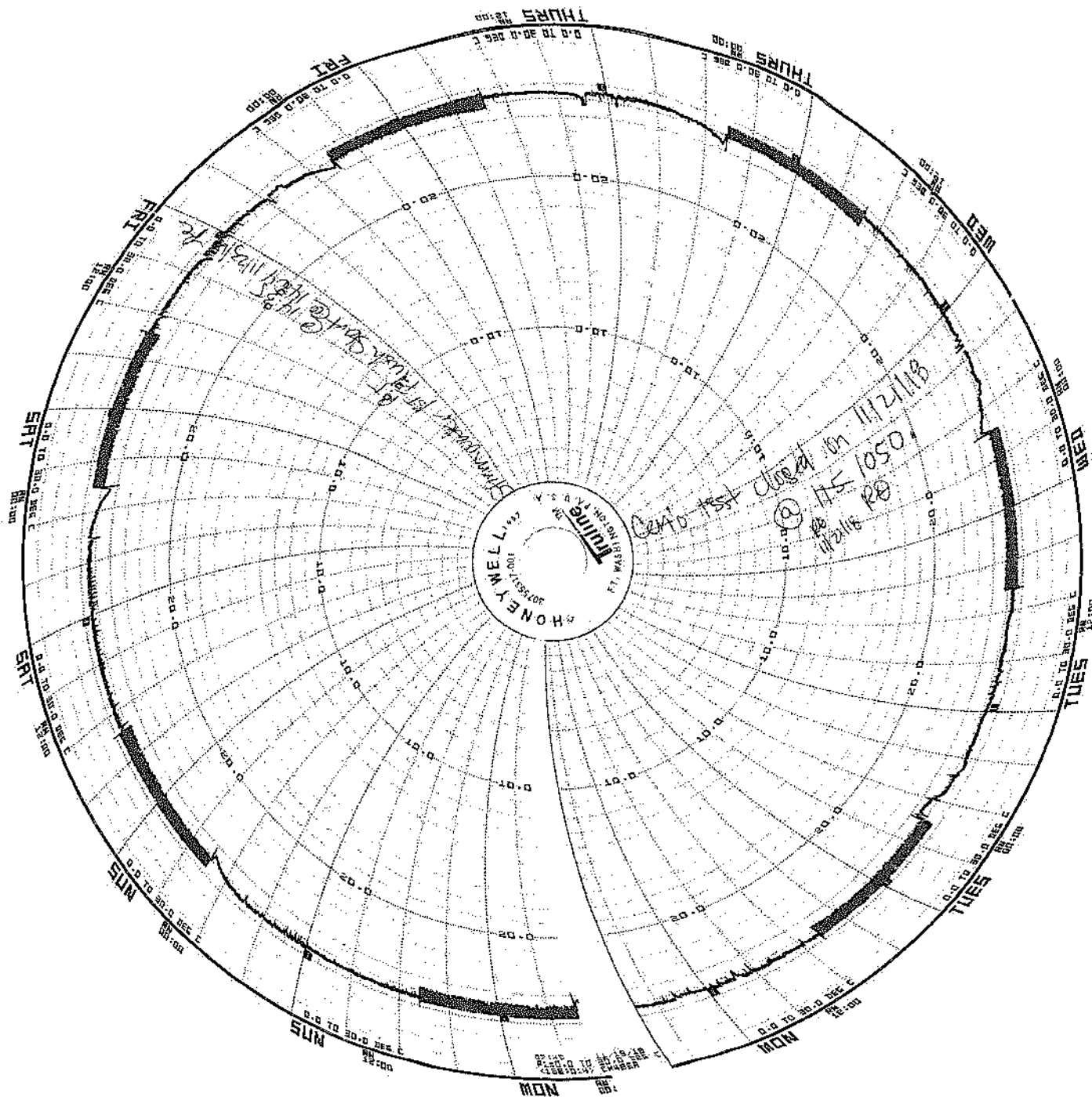
Factor: 20050 mL

Sample	Sample Amount (mL)	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
MJFW	25	2.2	44 <sup>12/4/16</sup> (88)
[200] CH	1	4.5	180
TUJ		1.7	68
WAS		3.6	144
PHLA		0.7	28
DOM		0.6	24
SMB		5.6	224
NAT	25	1.2	48
SAW	25	1.2	48

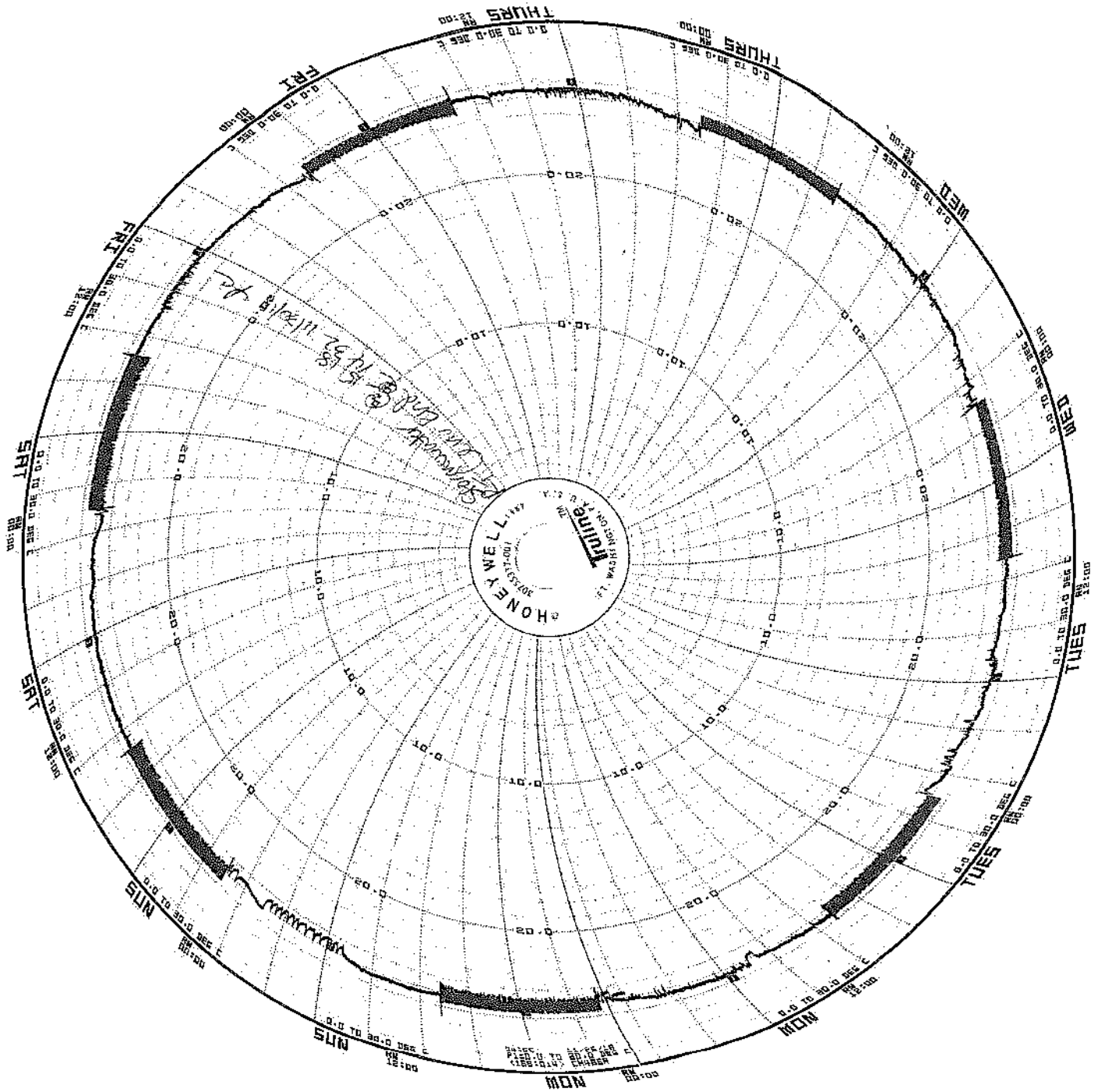


Test: 1811RT2-B.C, 1811072A.C - G.C

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: November 22, 2018

TEST DATE: November 23, 2018

TEST NUMBER: 1811072C.C

TEST MATERIAL: Station RHSLA

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

REFERENCE TOXICANT TEST: 1811RT2B.C

RESULT:

Survival

Pass, 20.0% effect

Reproduction

Pass, 13.5% 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 12:08 (p 1 of 1)  
Test Code: 1811072C.C | 14-1720-0834

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:	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:	13-1508-7566	Code:	3291817			Client:	Watershed Protection Division				
Sample Date:	22 Nov-18 02:10	Material:	Stormwater Monitoring Sample			Project:	MS4				
Receive Date:	22 Nov-18 08:05	Source:	Stormwater (STORMWATER)			Batch 1116; HBN 69941					
Sample Age:	36h (16.3 °C)	Station:	RHSLA								
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3291817	22 Nov-18 02:10	22 Nov-18 08:05	24 Nov-18 12:28	16.3						
2	3291817	22 Nov-18 02:10	22 Nov-18 08:05	25 Nov-18 12:42	16.3						
3	3291817	22 Nov-18 02:10	22 Nov-18 08:05	26 Nov-18 13:08	16.3						
4	3291817	22 Nov-18 02:10	22 Nov-18 08:05	27 Nov-18 11:57	16.3						
5	3291817	22 Nov-18 02:10	22 Nov-18 08:05	28 Nov-18 10:31	16.3						
6	3291817	22 Nov-18 02:10	22 Nov-18 08:05	29 Nov-18 12:41	16.3						
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				
05-2700-7976	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
03-2851-9042	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					
05-2700-7976	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
03-2851-9042	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	0.8	0.6426	0.9574	0	1	0.1333	0.4216	52.7%	20.0%
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	27.5	25.11	29.89	18	36	2.023	6.399	23.27%	13.52%
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		0	1	1	1	1	1	0	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		25	22	32	35	32	19	18	36	28	28



## CETIS Analytical Report

Report Date: 28 Dec-18 12:08 (p 1 of 4)  
 Test Code: 1811072C.C | 14-1720-0834

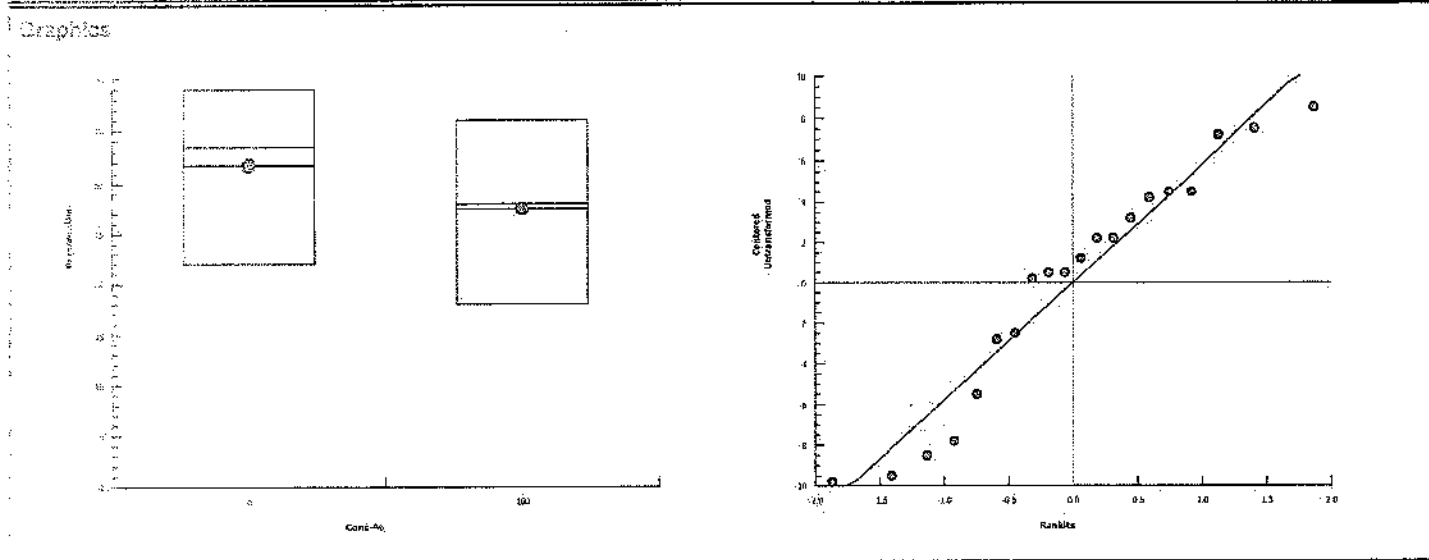
Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 03-2851-9042	Endpoint: Reproduction	CETIS Version: CETISv1.8.1									
Analyzed: 03 Dec-18 10:22	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes									
Batch ID: 17-1558-0949	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: 13-1508-7566	Code: 3291817	Client: Watershed Protection Division									
Sample Date: 22 Nov-18 02:10	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 22 Nov-18 08:05	Source: Stormwater (STORMWATER)										
Sample Age: 36h (16.3 °C)	Station: RHSLA										
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*	1.53	0.8662	15		0.0734	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	1.71	2.708	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	92.45	92.45	1	2.666	0.1199	Non-Significant Effect					
Error	624.1	34.67222	18								
Total	716.55	127.1222	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.442	6.541	0.5945	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9331	0.866	0.1775	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	27.5	25.07	29.93	18	36	2.023	6.399	23.27%	13.52%

# CETIS Analytical Report

Report Date: 28 Dec-18 12:08 (p 2 of 4)  
 Test Code: 1811072C.C | 14-1720-0834

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory			
Analysis ID: 03-2851-9042	Endpoint: Reproduction	CETIS Version: CETISv1.8.1					
Analyzed: 08 Dec-18 10:22	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		25	22	32	35	32	19	18	36	28	28



## CETIS Analytical Report

Report Date: 28 Dec-18 12:08 (p 3 of 4)  
 Test Code: 1811072C.C | 14-1720-0834

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 05-2700-7976	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1									
Analyzed: 03 Dec-18 10:22	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: 13-1508-7566	Code: 3291817	Client: Watershed Protection Division									
Sample Date: 22 Nov-18 02:10	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 22 Nov-18 08:05	Source: Stormwater (STORMWATER)										
Sample Age: 36h (16.3 °C)	Station: RHSLA										
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*	2.25	0.8834	9		0.0255	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	0.05483114	0.05483114	1	2.25	0.1510	Non-Significant Effect					
Error	0.4386491	0.02436939	18								
Total	0.4934802	0.07920053	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Mod Levene Equality of Variance	2.25	8.285	0.1510	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.6038	0.866	<0.0001	Non-normal Distribution						
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	0.8	0.6396	0.9604	0	1	0.1333	0.4216	52.7%	20.0%
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	0.9425	0.8585	1.026	0.5236	1.047	0.06981	0.2208	23.42%	10.0%

# CETIS Analytical Report

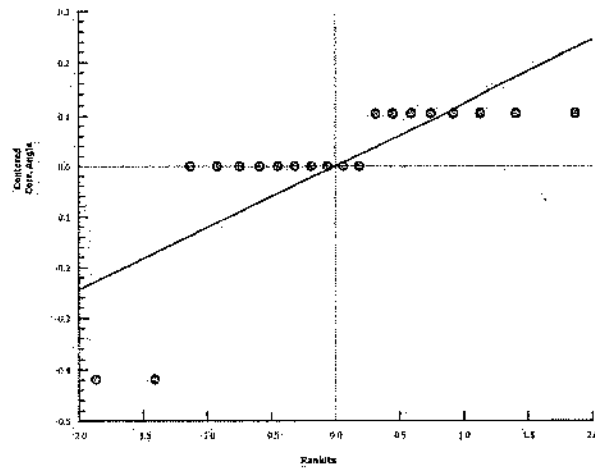
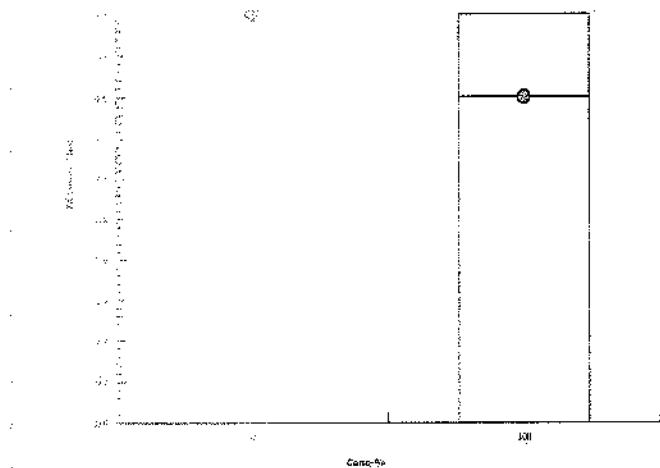
Report Date: 28 Dec-18 12:08 (p 4 of 4)  
 Test Code: 1811072C.C. | 14-1720-0834

Gastrophilia 7-c Survival and Reproduction Test				Hyperion Treatment Plant Laboratory	
Analysis ID: 08-2700-7976	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1			
Analyzed: 03 Dec-18 10:22	Analysis: Parametric Bioequivalence-Two Sample	Official Results: Yes			

## 7d Survival Rate Count

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Diston Water	1	1	1	1	1	1	1	1	1	1
100		0	1	1	1	1	1	0	1	1	1

## Survival





# CETIS Test Data Worksheet

Report Date: 21 Nov-18 11:01 (p 1 of 1)  
Test Code: 14-1720-0834/1811072C.C

Ceriodaphnia 7-d Survival and Reproduction Test									Hyperion Treatment Plant Laboratory				
Start Date:		23 Nov-18		Species:		Ceriodaphnia dubia		Sample Code:		4E62A4CE			
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:		RHSLA			
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	18	1	0	0	0	1	5	0	19 X	25	
100		2	16	1	0	0	0	1	3	0	19	22	
100		3	40	1	0	0	0	1	0	12	19	32	
100		4	7	1	0	0	0	5	0	9	21	35	
100		5	76	1	0	0	0	2	9	0	21	32	
100		6	58	1	0	0	0	4	9	6	0	19	
100		7	66	1	0	0	0	2	0	13	3X	18	
100		8	70	1	0	0	0	2	12	(21	1)	36	
100		9	9	1	0	0	0	0	10	18	0	28	
100		10	10	1	0	0	0	1	3	0	24	28	

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

Food Added:

1358 fc 1109 fc 1210 fc 1241 fc 1016 fc 0842 fc 1127 fc

Transferred:

1404 fc 1228 fc 1242 fc 1308 fc 1157 fc 1031 fc 1241 fc

End @ 1518 fc

# CETIS Measurement Worksheet

Report Date: 21 Nov-18 11:01 (p 1 of 2)  
Test Code: 1811072C.C | 14-1720-0834

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory		
Start Date: 23 Nov-18		Species: Ceriodaphnia dubia		Sample Code: 4E62A4CE				
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: RHSLA				

Alkalinity (CaCO <sub>3</sub> )-mg/L		
Conc-%	Code	Reading 1
0	D	60
100		24
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		74	65	60	38	88	75	89
Measure Time:		1218	1052	1145	1107	1037	0925	1135
Instrument ID:		#3	#3	#3	#3	2	2	2
Analyst:		Re	Re	Re	Re	OL	OL	OL

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		7.03	7.46	7.66	7.59	7.69	7.22	7.27
Measure Time:		1239	1314	1327	1436	1036	1545	1730
Instrument ID:		#4	#4	#4	4	4	#4	#4
Analyst:		Re	Re	Re	OL	OL	Re	Re

Initial Dissolved Oxygen-mg/L								
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.43	7.60	7.68	7.80	7.78	7.75	7.92
100		7.79	8.24	8.02	7.84	8.61	8.38	8.90
Measure Time:		1218	1052	1145	1107	1037	0925	1135
Instrument ID:		#4	#4	#4	#4	4	4	4
Analyst:		Re	Re	Re	Re	OL	OL	OL

Hardness (CaCO <sub>3</sub> )-mg/L		
Conc-%	Code	Reading 1
0	D	88
100		28
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		7.40	7.68	7.33	7.80	7.63	7.45	7.50
Measure Time:		1239	1314	1327	1436	1036	1545	1730
Instrument ID:		#3	#3	#3	3	3	#3	#3
Analyst:		Re	Re	Re	OL	OL	Re	Re



# CETIS Measurement Worksheet

Report Date: 21 Nov-18 11:01 (p 2 of 2)  
Test Code: 1811072C.C | 14-1720-0834

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date:		23 Nov-18		Species:		Ceriodaphnia dubia		Sample Code:		4E62A4CE	
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:		RHSLA	
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		7.32	7.32	7.11	7.10	7.23	7.20	7.26			
Measure Time:		1218	1052	1145	1107	1037	0925	1135			
Instrument ID:		#3	#3	#3	#3	3	3	3			
Analyst:		RC	RC	RC	RC	RL	RL	RL			
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		25.4	25.2	24.8	25.1	24.9	24.9	24.8			
Measure Time:		1239	1314	1327	1420	1038	1545	1730			
Instrument ID:		#3	#3	#3	3	3	#3	#3			
Analyst:		RC	RC	RC	RL	RL	RL	RC			
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	25.0	24.7	24.6	24.1	24.4	25.3			
Measure Time:		1218	1052	1145	1107	1037	0925	1135			
Instrument ID:		#3	#3	#3	#3	3	3	3			
Analyst:		RC	RC	RC	RC	RL	RL	RL			

## Alkalinity

Date/Time: 12/4/10, 1300Project: M34 Lt Fresh CelloAnalyst: 102Titrant: H<sub>2</sub>SO<sub>4</sub>Factor: 20 (50 mL)

Sample	Sample (mL) Amount	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
MHSPCW	25	1.5	60
[200] Cu		3.1	124
THJ		1.2	48
WAS		2.4	96
RHSLA		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: MJ4 1st Flush

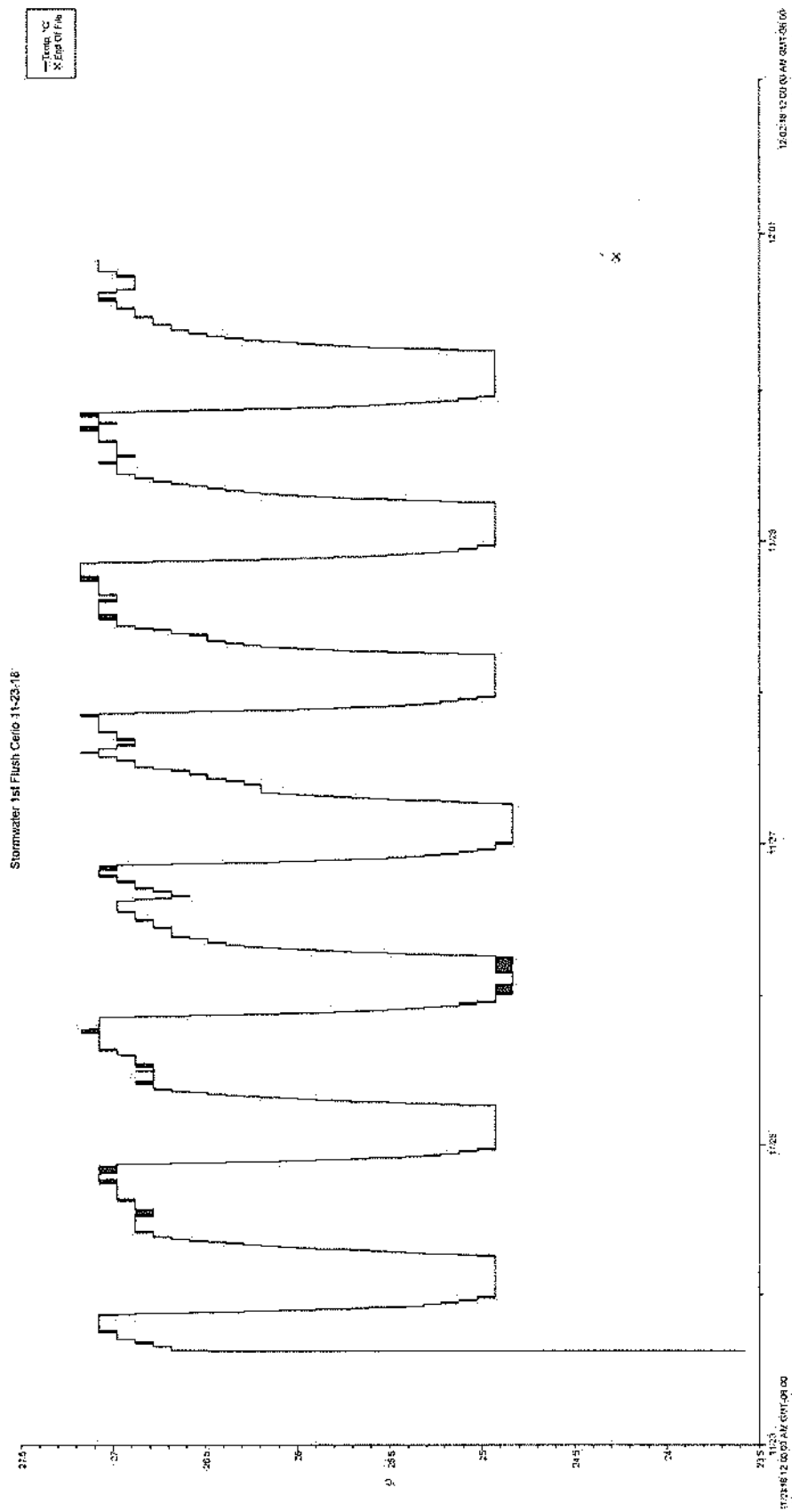
Analyst: 102

Cent

Titrant: EDTA

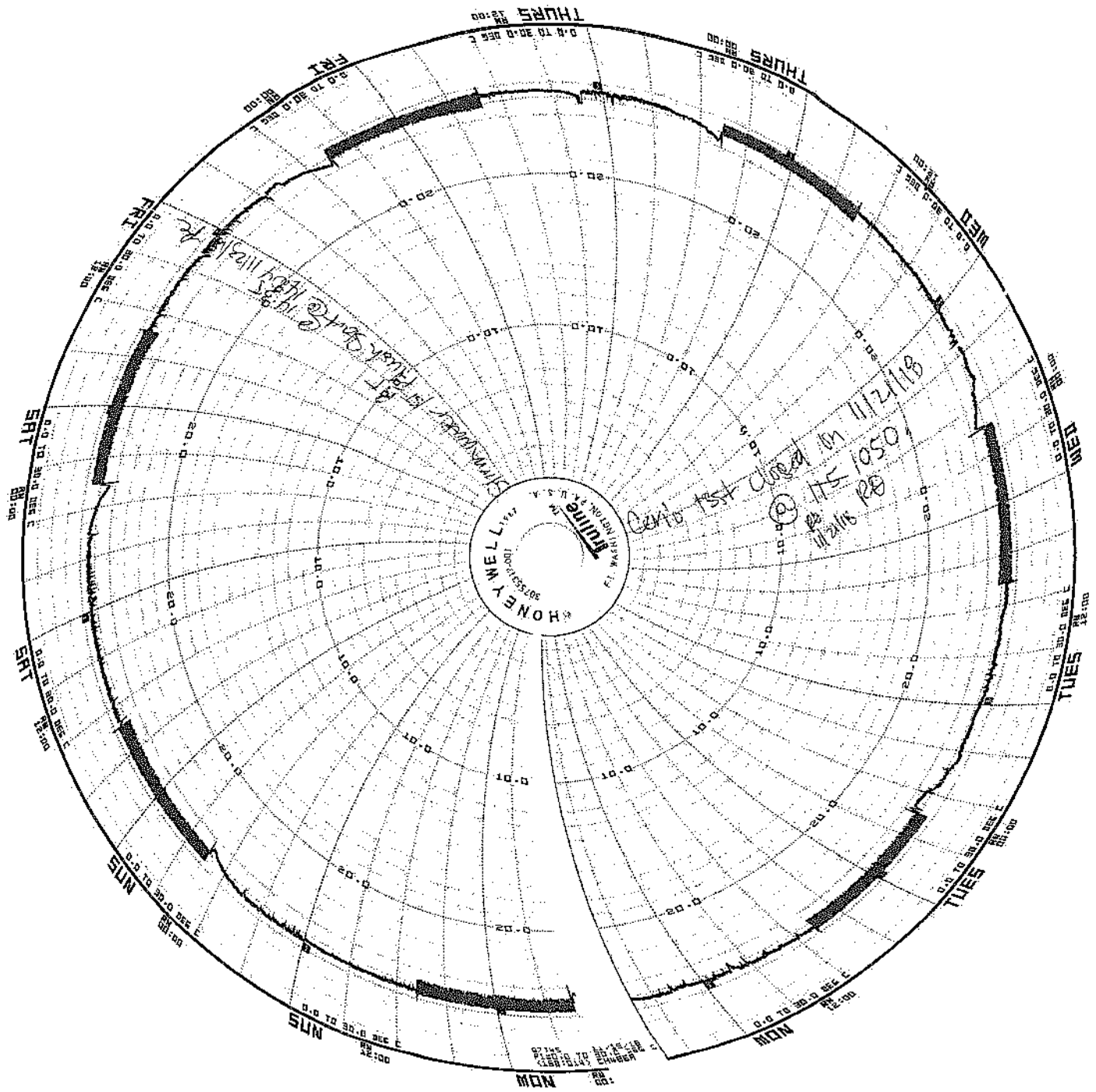
Factor: 20/50 mL

Sample	Sample Amount (mL)	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
MJFW	25	2.2	48 <sup>102 12/4/18</sup> (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

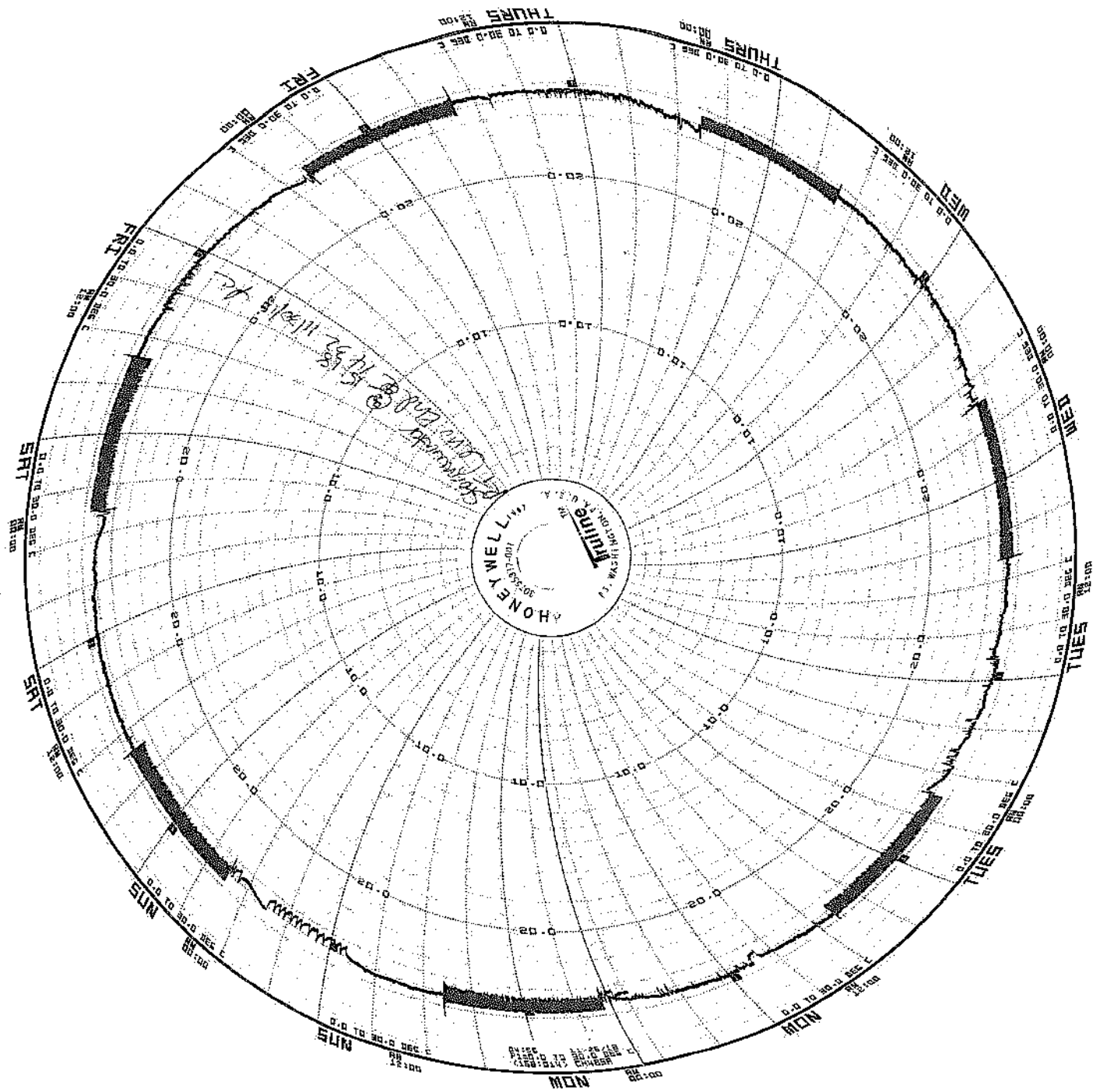


Test: 1811RT2.B.C, 1811072A.C - G.C

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)

EC<sub>50</sub> = 142  $\mu\text{g/L}$  (Survival)

IC<sub>25</sub> = 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:					
<b>Sample Renewals</b>							
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			
<b>Batch Note:</b> 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.							
<b>Test Note:</b> Concentration-response relationship is all or nothing for survival and ideal for reproduction.							
<b>Comparison Summary</b>							
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
<b>Point Estimate Summary</b>							
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		
<b>Test Acceptability</b>							
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

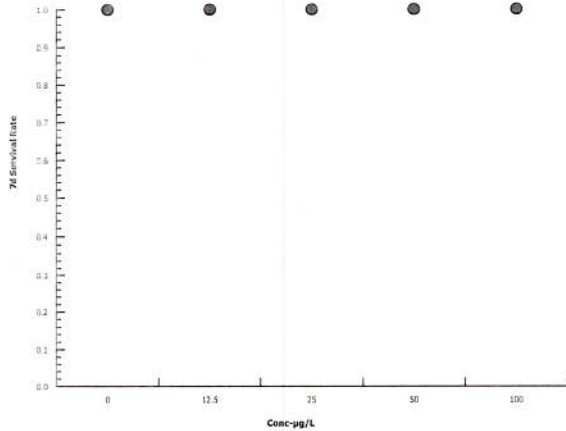
Hyperion Treatment Plant Laboratory

Analysis ID: 10-5688-4561  
Analyzed: 03 Dec-18 9:02

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

CETIS Version: CETISv1.8.1  
Official Results: Yes

### Graphics



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



# CETIS Analytical Report

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

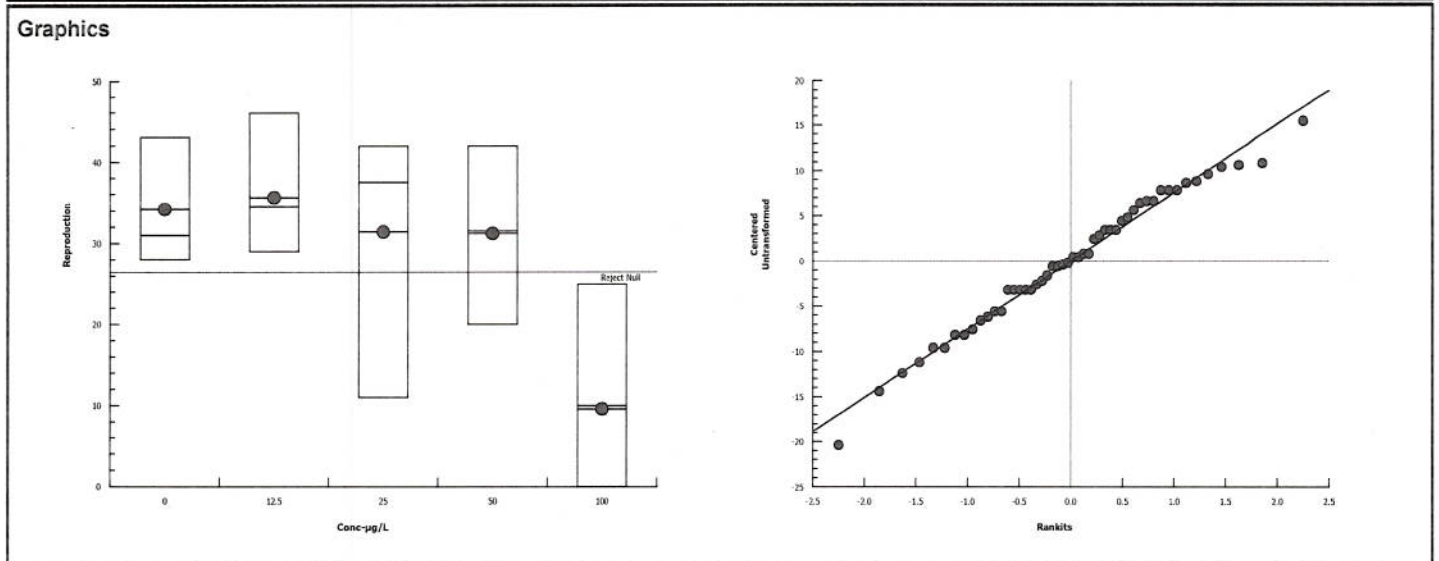
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 05-0217-4531		Endpoint: Reproduction				CETIS Version: CETISv1.8.1					
Analyzed: 03 Dec-18 9:02		Analysis: Parametric-Control vs Treatments				Official Results: Yes					
Batch ID: 17-1558-0949		Test Type: Reproduction-Survival (7d)				Analyst: Rea Mara Crinklaw		Diluent: Hard Synthetic Water			
Start Date: 23 Nov-18 14:34		Protocol: EPA/821/R-02-013 (2002)				Brine:		Age: <8h 11/23/18 (09:50 - 13:35)			
Ending Date: 30 Nov-18 14:32		Species: Ceriodaphnia dubia									
Duration: 7d		Source: In-House Culture									
Sample ID: 00-5008-1686		Code: Cu RT				Client: Donald C. Tillman WRP		Project: NPDES			
Sample Date: 23 Nov-18 11:35		Material: Copper chloride									
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

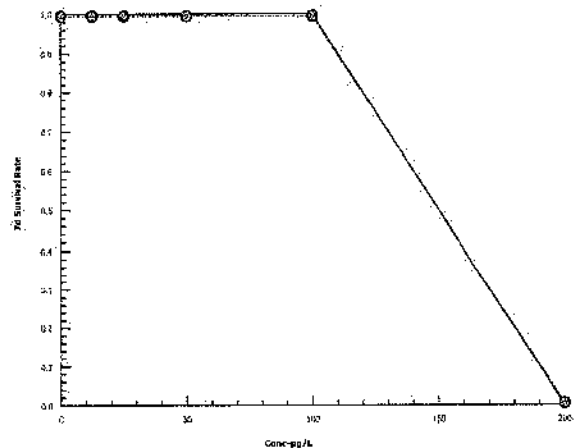
Hyperion Treatment Plant Laboratory

Analysis ID: 03-2855-8063  
 Analyzed: 03 Dec-18 9:02

Endpoint: 7d Survival Rate  
 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

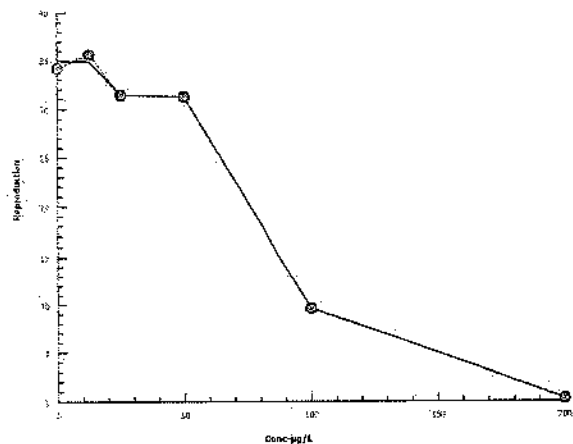
## Ceriodaphnia 7-d Survival and Reproduction Test

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)

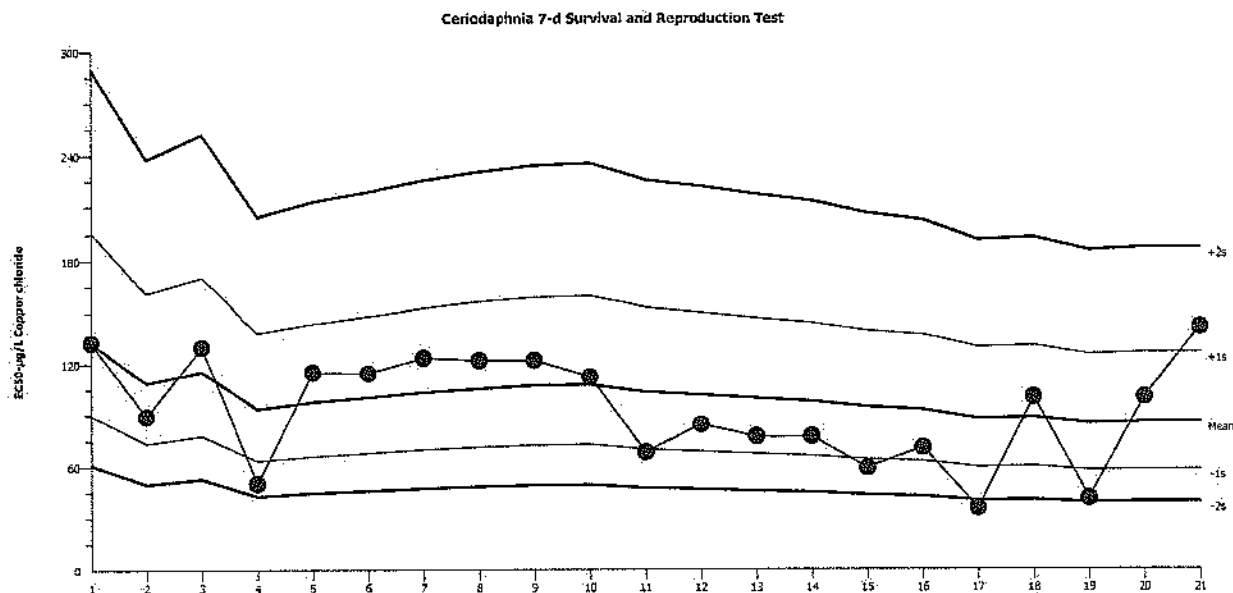
Organism: Ceriodaphnia dubia (Water Flea)

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)

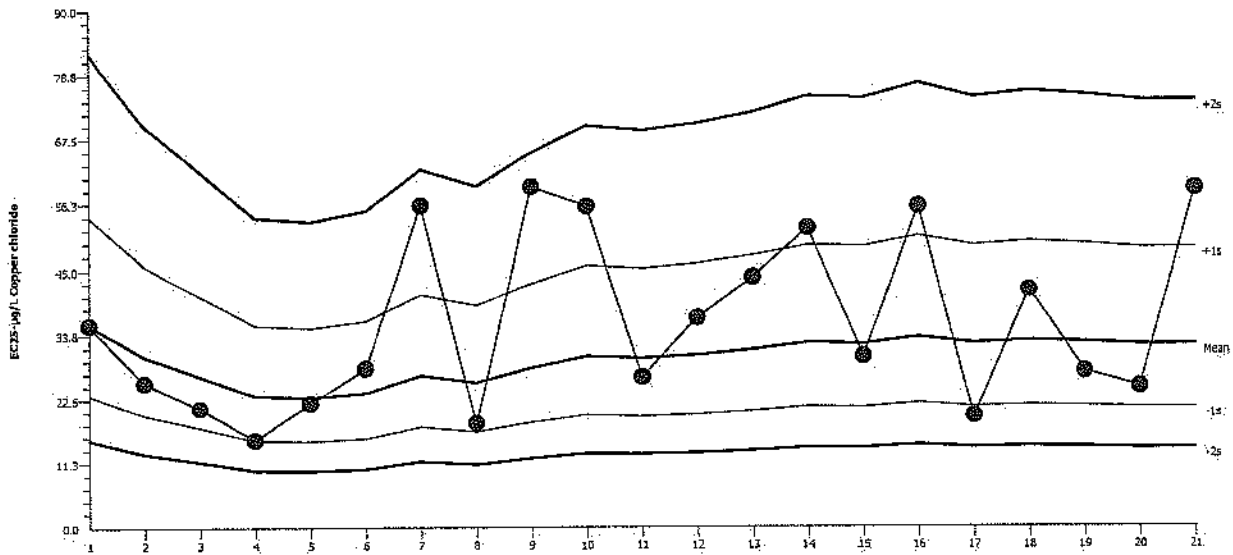
Material: Copper chloride

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	0	18	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	15	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	5	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	0	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  
fc

1109  
fc

1210  
fc

1241  
fc

1018  
DL

0842  
DL

1127  
DL

11/30  
@ 1430fc 11/30/18  
1432

Transferred:

1435  
fc

1124  
fc

1300  
fc

1323  
fc

1125  
DL

0927  
DL

1215  
DL

fc

RO



# 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 (CaCO<sub>3</sub>)-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

Conductivity-µmhos		11/23	11/24	11/25	11/26	11/27	11/28	11/29
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

Final Dissolved Oxygen-mg/L		11/23	11/24	11/25	11/26	11/27	11/28	11/29
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.43	7.57	7.66	7.48	7.99	7.42	7.64
12.5		7.52	7.66	7.74	7.59	7.93	7.46	7.61
25		7.59	7.62	7.85	7.63	7.86	7.51	7.59
50		7.58	7.45	7.79	7.70	7.83	7.49	7.61
100		7.54	7.85	7.85	7.73	7.75	7.51	7.69
200		7.42	7.49	8.03	7.80	7.78	7.52	—
Measure Time:		1232	1218	1330	1343	1034	1540	1725
Instrument ID:		#4	#4	#4	4	4	#4	#4
Analyst:		RC	RC	RC	RL	RL	RC	RC

Initial Dissolved Oxygen-mg/L		11/23	11/24	11/25	11/26	11/27	11/28	11/29
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	4	4
Analyst:		RC	RC	RC	RC	RL	RL	RL

### Hardness (CaCO<sub>3</sub>)-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	8.16	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	8.31
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	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: H<sub>2</sub>SO<sub>4</sub>Factor: 20 @ 50 mL

Sample	Sample (mL) Amount	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /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, 1300Project: M54 1st FlushAnalyst: RL

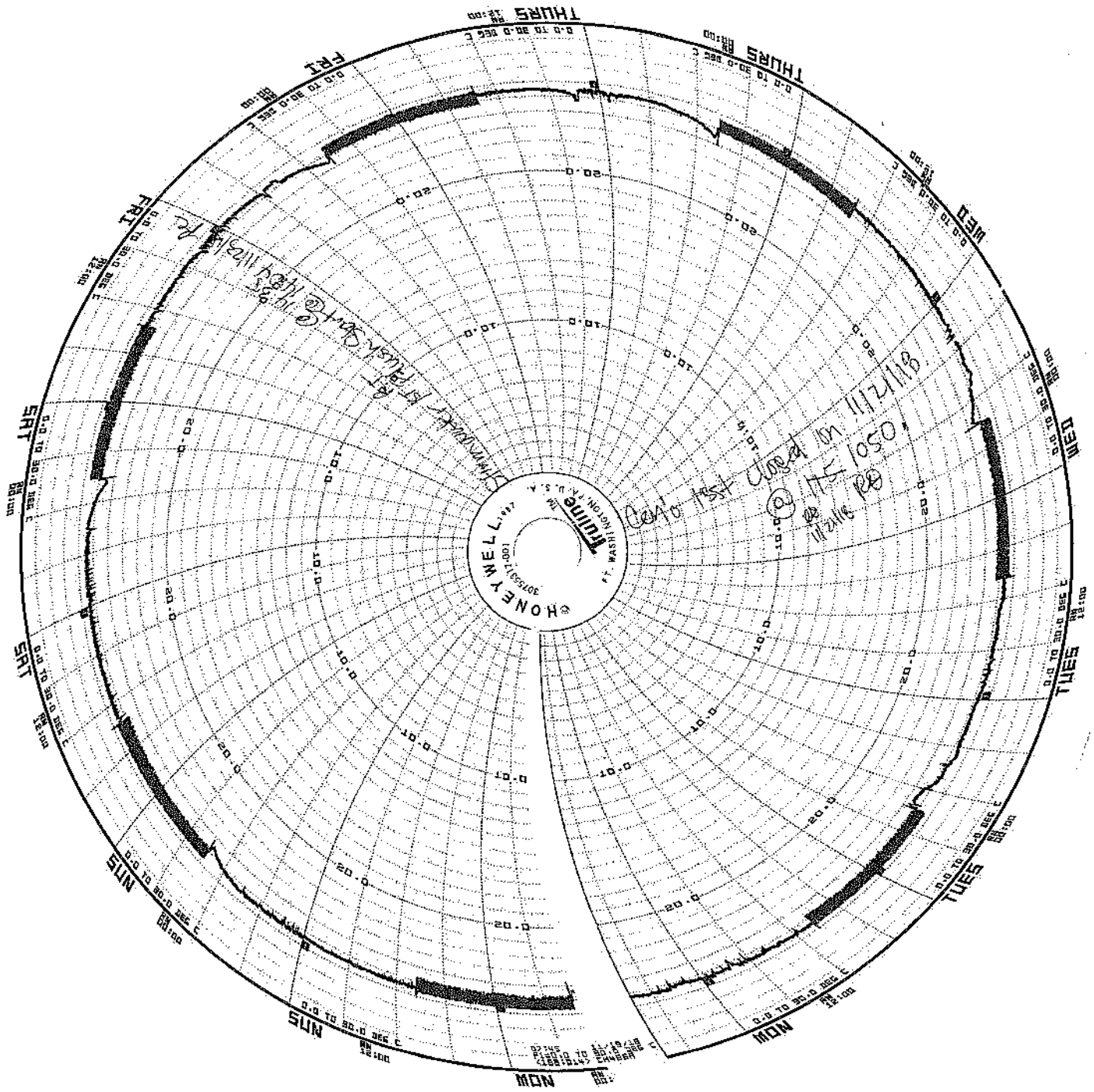
Certo

Titrant: EDTAFactor: 20050 mL

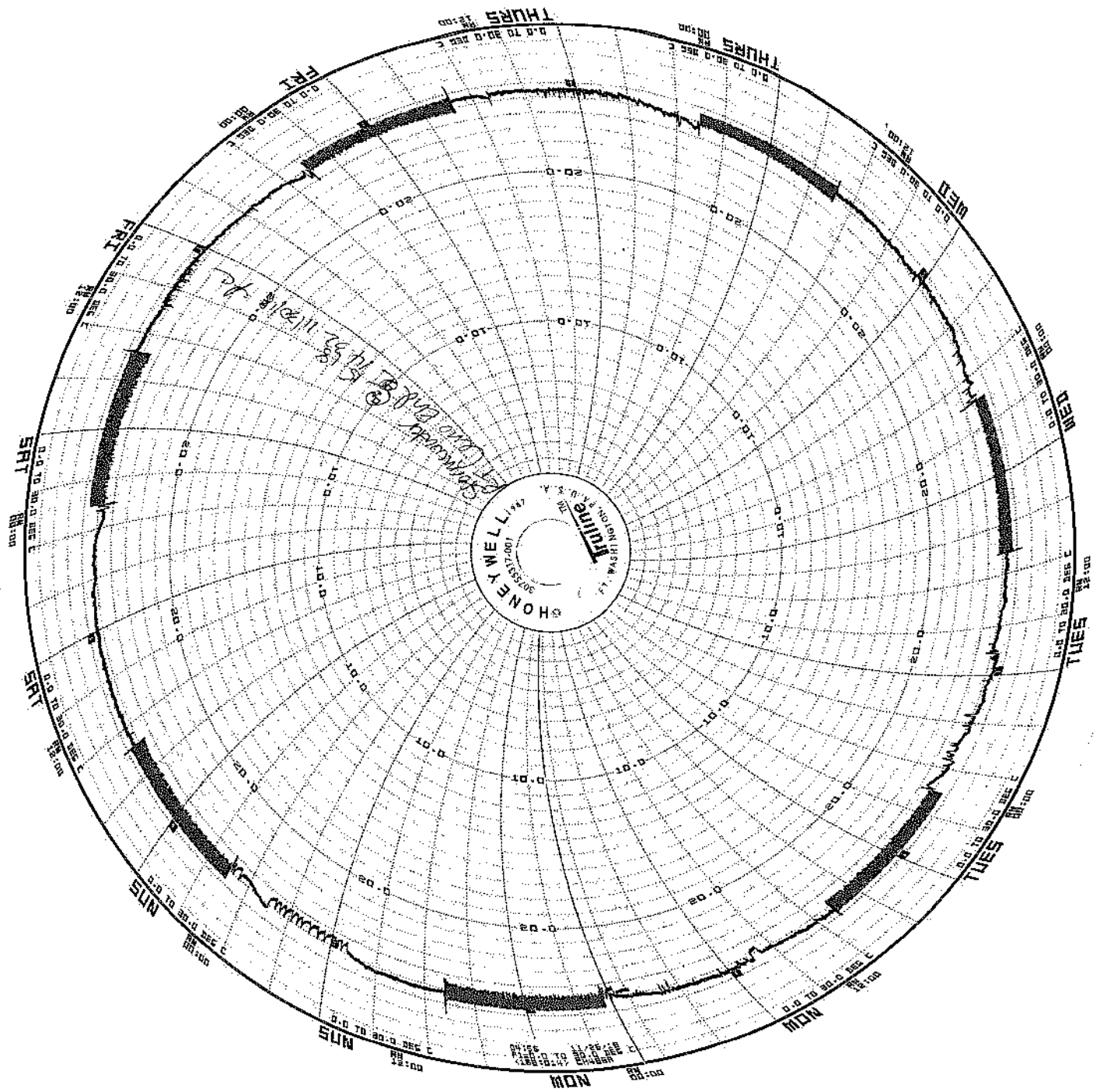
Sample	Sample Amount (mL)	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
MFW	25	2.2	48 <sup>RL 12/4/18</sup> (88)
[200] CU	1	4.5	180
TWJ	1	1.7	60
WAS	1	3.6	144
PLSLA	1	0.7	20
DOM	1	0.6	24
SMB	1	5.6	224
NAT	1	1.2	48
SAW	25	1.2	48







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: 1812072A.C

TEST MATERIAL: Station LAR04TUJ

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, 6.23% effect

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: 25 Feb-19 15:58 (p 1 of 1)  
Test Code: 1812072A.C | 02-5103-0489

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: 14-6530-2777	Code: 3581507	Client: Watershed Protection Division									
Sample Date: 06 Dec-18 05:02	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 06 Dec-18 10:00	Source: Stormwater (STORMWATER)										
Sample Age: 34h (9.7 °C)	Station: LAR04TUJ										
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3581507	06 Dec-18 05:02	06 Dec-18 10:00	08 Dec-18 11:37	9.7						
2	3581507	06 Dec-18 05:02	06 Dec-18 10:00	09 Dec-18 12:52	9.7						
3	3581507	06 Dec-18 05:02	06 Dec-18 10:00	10 Dec-18 12:30	9.7						
4	3581507	06 Dec-18 05:02	06 Dec-18 10:00	11 Dec-18 15:12	9.7						
5	3581507	06 Dec-18 05:02	06 Dec-18 10:00	12 Dec-18 14:14	9.7						
6	3581507	06 Dec-18 05:02	06 Dec-18 10:00	13 Dec-18 14:25	9.7						
Batch Note: Batch: 1124; HBN: 72477											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
13-2862-8213	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
03-5345-9386	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
06-1949-2544		100	>100	N/A	N/A	1	TST-Welch's t Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
13-2862-8213	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
03-5345-9386	Reproduction	Control Resp	38.9	15 - NL	Yes	Passes Acceptability Criteria					
06-1949-2544	Reproduction	Control Resp	42.44	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	39.8	37.54	42.06	27	46	1.914	6.052	15.21%	6.23%
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		27	44	41	43	42	39	43	46	42	31



# CETIS Analytical Report

Report Date: 25 Feb-19 15:58 (p 1 of 6)  
Test Code: 1812072A.C | 02-5103-0489

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID: 03-5345-9386		Endpoint: Reproduction			CETIS Version: CETISv1.8.1						
Analyzed: 27 Dec-18 10:55		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: 14-6530-2777		Code: 3581507			Client: Watershed Protection Division						
Sample Date: 06 Dec-18 05:02		Material: Stormwater Monitoring Sample			Project: MS4						
Receive Date: 06 Dec-18 10:00		Source: Stormwater (STORMWATER)									
Sample Age: 34h (9.7 °C)		Station: LAR04TUJ									
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*	2.905	0.8681	14		0.0058	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	3.203	2.708	0.0025	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.05	4.05	1	0.03868	0.8463	Non-Significant Effect					
Error	1884.5	104.6944	18								
Total	1888.55	108.7444	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	4.718	6.541	0.0303	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.8194	0.866	0.0017	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	39.8	37.5	42.1	27	46	1.914	6.052	15.21%	-2.31%

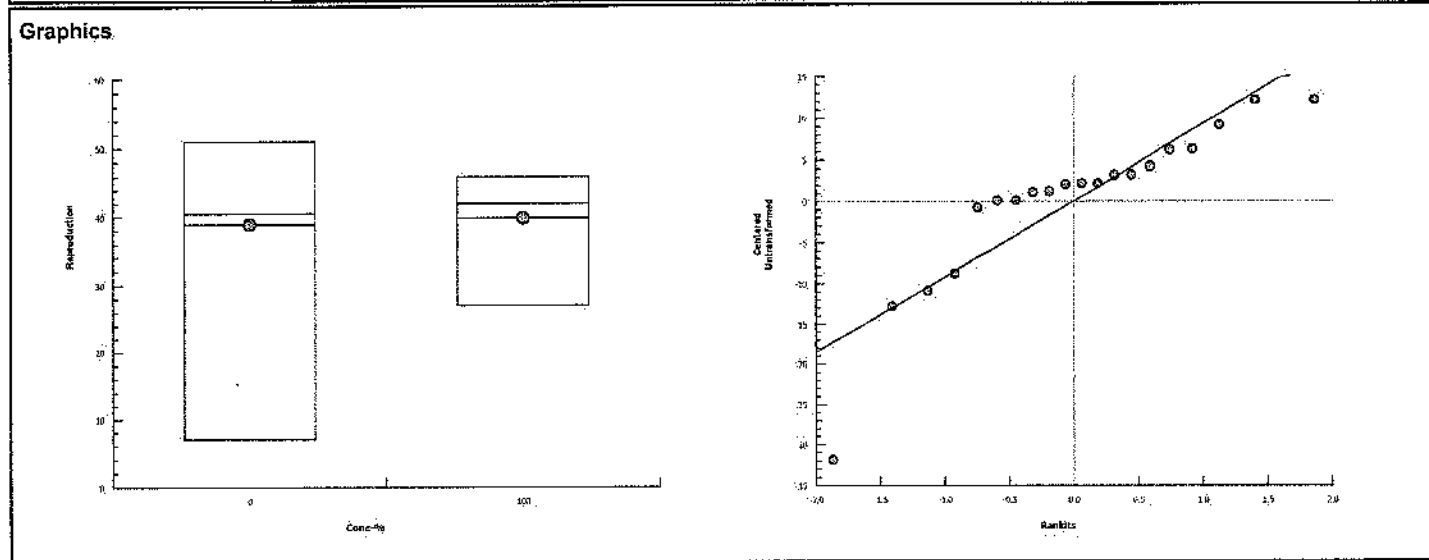


# CETIS Analytical Report

Report Date: 25-Feb-19 15:58 (p 2 of 6)  
 Test Code: 1812072A.C | 02-5103-0489

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory	
Analysis ID:	03-5345-9386	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.1
Analyzed:	27 Dec-18 10:55	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	7	41	39	51	48	40	51	45	39	28
100		27	44	41	43	42	39	43	46	42	31



# CETIS Analytical Report

Report Date: 25 Feb-19 15:58 (p 3 of 6)  
Test Code: 1812072A.C | 02-5103-0489

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 06-1949-2544		Endpoint: Reproduction				CETIS Version: CETISv1.8.1					
Analyzed: 27 Dec-18 10:55		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: 14-6530-2777		Code: 3581507				Client: Watershed Protection Division					
Sample Date: 06 Dec-18 05:02		Material: Stormwater Monitoring Sample				Project: MS4					
Receive Date: 06 Dec-18 10:00		Source: Stormwater (STORMWATER)									
Sample Age: 34h (9.7 °C)		Station: LAR04TUJ									
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*		3.016	0.8647	16		0.0041	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		33.12514	33.12514	1	0.747	0.3995	Non-Significant Effect				
Error		753.8222	44.34248	17							
Total		786.9473	77.46763	18							
Distributional Tests											
Attribute		Test	Test Stat	Critical	P-Value	Decision(α:1%)					
Variances		Variance Ratio F	1.448	6.693	0.5912	Equal Variances					
Distribution		Shapiro-Wilk W Normality	0.9173	0.8605	0.1009	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	39.8	37.5	42.1	27	46	1.914	6.052	15.21%	6.23%

# CETIS Analytical Report

Report Date: 25 Feb-19 15:58 (p 4 of 6)  
 Test Code: 1812072A.C | 02-5103-0489

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 06-1949-2544  
 Analyzed: 27 Dec-18 10:55

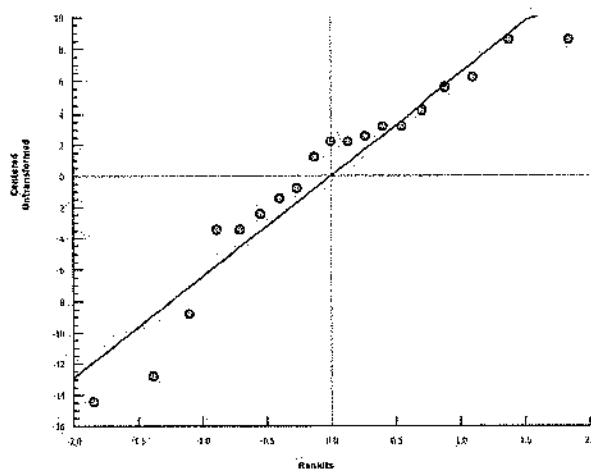
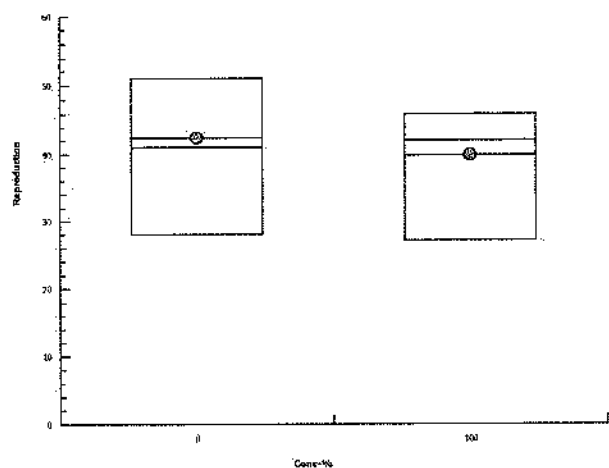
Endpoint: Reproduction  
 Analysis: Parametric Bioequivalence-Two Sample

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	Outlier	41	39	51	48	40	51	45	39	28
100		27	44	41	43	42	39	43	46	42	31

### Graphics



# CETIS Analytical Report

Report Date: 25 Feb-19 15:58 (p 5 of 6)  
Test Code: 1812072A.C | 02-5103-0489

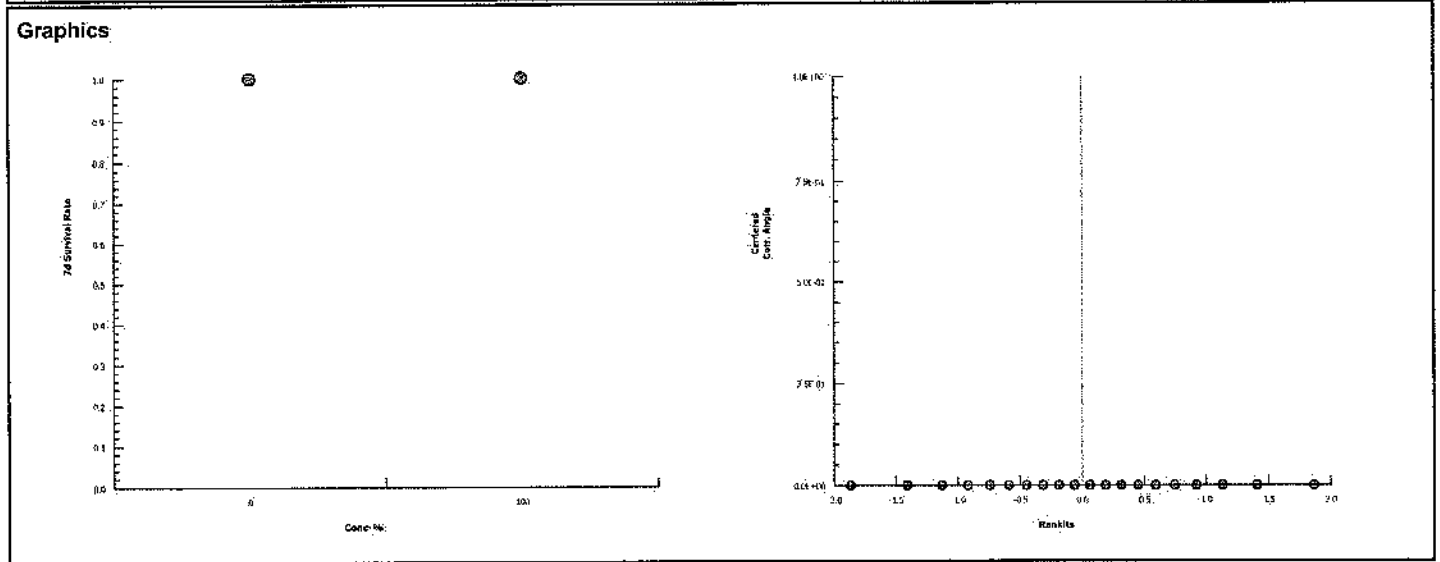
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 13-2862-8213		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 27 Dec-18 10:54		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 16-3034-3643		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: 14-6530-2777		Code: 3581507		Client: Watershed Protection Division							
Sample Date: 06 Dec-18 05:02		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 06 Dec-18 10:00		Source: Stormwater (STORMWATER)									
Sample Age: 34h (9.7 °C)		Station: LAR04TUJ									
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: 25 Feb-19 15:58 (p 6 of 6)  
 Test Code: 1812072A.C | 02-5103-0489

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID:	13-2862-8213	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.1						
Analyzed:	27 Dec-18 10:54	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 15:37 (p 1 of 1)  
Test Code: 02-5103-0489/1812072A.C

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory			
Start Date:	08 Dec-18	1525	Species:	Ceriodaphnia dubia	Sample Code:	5756BEF9							
End Date:	13 Dec-18	0843	Protocol:	EPA/821/R-02-013 (2002)	Sample Source:	Stormwater							
Sample Date:	05 Dec-18		Material:	Stormwater Monitoring Sample	Sample Station:	LAR04TUJ							

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0	D	1	25	1	0	0	0	0	1	6	0	7	* outlier per CETIS.
0	D	2	48	1	0	0	0	6	14	0	21	41	
0	D	3	27	1	0	0	0	8	16	0	15	39	
0	D	4	38	1	0	0	0	8	17	0	26	51	
0	D	5	7	1	0	0	0	7	19	0	22	48	
0	D	6	23	1	0	0	0	6	15	0	19	40	
0	D	7	5	1	0	0	0	8	0	19	24	51	
0	D	8	29	1	0	0	0	7	15	0	23	45	
0	D	9	32	1	0	0	0	8	14	0	17	39	
0	D	10	17	1	0	0	0	3	10	15	0	28	
100		1	11	1	0	0	0	4	0	9	14	27	
100		2	2	1	0	0	0	7	18	0	19	44	
100		3	19	1	0	0	0	8	16	0	17	41	
100		4	42	1	0	0	0	7	17	0	19	43	
100		5	1	1	0	0	0	8	17	0	17	42	
100		6	21	1	0	0	0	6	15	18	0	39	
100		7	15	1	0	0	0	9	13	0	21	43	
100		8	47	1	0	0	0	9	18	0	19	46	
100		9	43	1	0	0	0	5	15	0	22	42	
100		10	50	1	0	0	0	6	8	17	0	31	

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  
RC RC RC RC RC RC RC  
End @ 0843 RC

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

# CETIS Measurement Worksheet

Report Date: 05 Dec-18 15:37 (p 1 of 2)  
 Test Code: 1812072A.C | 02-5103-0489

Ceriodaphnia 7.0 Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date: 06 Dec-18			Species: Ceriodaphnia dubia			Sample Code: 5756BEF9					
End Date: 12 Dec-18			Protocol: EPA/821/R-02-013 (2002)			Sample Source: Stormwater					
Sample Date: 05 Dec-18			Material: Stormwater Monitoring Sample			Sample Station: LAR04TUJ					
Alkalinity (CaCO <sub>3</sub> )-mg/L											
Conc.-%	Code	Reading 1									
0	D	68	- see attached worksheet (1/7/19 12:16 DL)								
100		20	- see attached worksheet (1/31/19 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	330	326	316			
100		95	95	94	96	93	92	96			
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	7.44	7.86	7.55	7.79			
100		7.84	8.02	8.02	7.85	8.11	7.93	7.99			
Measure Time:			1222	1314	1254	1632	1530	1514	1235		
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		8.59	8.73	8.45	8.35	8.35	8.88	8.55			
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 (CaCO <sub>3</sub> )-mg/L											
Conc.-%	Code	Reading 1									
0	D	96	- see attached worksheet (1/7/19 12:16 DL)								
100		20	- see attached worksheet (1/31/19 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	7.51	7.48	7.44	7.53	7.40	7.08			
100		7.12	7.15	7.07	6.96	7.07	7.04	6.76			
Measure Time:			1222	1314	1254	1632	1530	1514	1235		
Instrument ID:			#3	#3	#3	#3	#3	#3	#3		
Analyst:			pc	pc	pc	pc	pc	pc	pc		



# CETIS Measurement Worksheet

Report Date: 05 Dec-18 15:37 (p 2 of 2)  
 Test Code: 1812072A.C | 02-5103-0489

Ceriodaphnia Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date: 06 Dec-18		Species: Ceriodaphnia dubia				Sample Code: 5756BEF9					
End Date: 06 Dec-18		Protocol: EPA/821/R-02-013 (2002)				Sample Source: Stormwater					
Sample Date: 06 Dec-18		Material: Stormwater Monitoring Sample				Sample Station: LAR04TUJ					
Initial pH											
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	7.76	7.88	7.76	7.39	7.34	7.59	7.69			
100		7.28	7.12	7.10	6.79	6.84	6.99	7.10			
Measure Time:		1101	1042	1215	1119	1115	1130	1244			
Instrument ID:		#2	#2	#2	#2	#2	#2	#2			
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc			
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		24.8	24.7	24.3	24.7	24.3	24.8	24.4			
Measure Time:		1222	1314	1256	1632	1550	1514	1235			
Instrument ID:		#2	#2	#2	#2	#2	#2	#2			
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc			
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		24.1	24.3	24.4	24.3	24.3	24.8	24.4			
Measure Time:		1101	1042	1215	1119	1115	1130	1244			
Instrument ID:		#2	#2	#2	#2	#2	#2	#2			
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc			

# Alkalinity

Date/Time: 1-7-19 / 1216

Analyst: 102

Titrant: H<sub>2</sub>SO<sub>4</sub>

Factor: 200 50mL

Project: LAG Chronic Pm  
Balboa Lake chronic sel  
MS4 chronic cenio

Sample	Sample (mL) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /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 <sup>102 1-7-19</sup>		3.2	128
Balboa Lake #5		3.4	136
MHSFW 12-7-18		3.0	120
[200 mg/L] RT 12-9-18	25	1.7	68

LAG

Balboa  
lake

MS4  
chronic  
cenio

mislabelled  
3/6/19  
Rc

## Hardness

Date/Time: 1-7-19 / 12:16Analyst: 102Titrant: EDTAFactor: 20 @ 50 mL

LAG chronic Dim

Project: Balboa Lake chronic selMS4 chronic Cento

Sample	Sample (mL Amount)	Titant Amount (ml)	Titant Amount x Factor (mg CaCO <sub>3</sub> /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  
RC

\* - ran twice, same results both times 102  
1-7-19



## Alkalinity

Date/Time: 1-31-19 / 1312Project: M4 CENCO  
LAG NPDESAnalyst: MLTitrant: 20 @ 50 ml  $\nearrow$  ML 1-31-19Factor: H2SO4

	Sample	Sample (ml) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO3/L)
M.S.4 CHRONIC CENCO	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	6.2 4.2	168
	LAG 3	25	6.5 4.1	164
	[40] SDS	25	4.5 2.9	116

## Hardness

Date/Time: 1-31-19 / 1312

MS4 CERIO  
Project: LAG1 NPDES

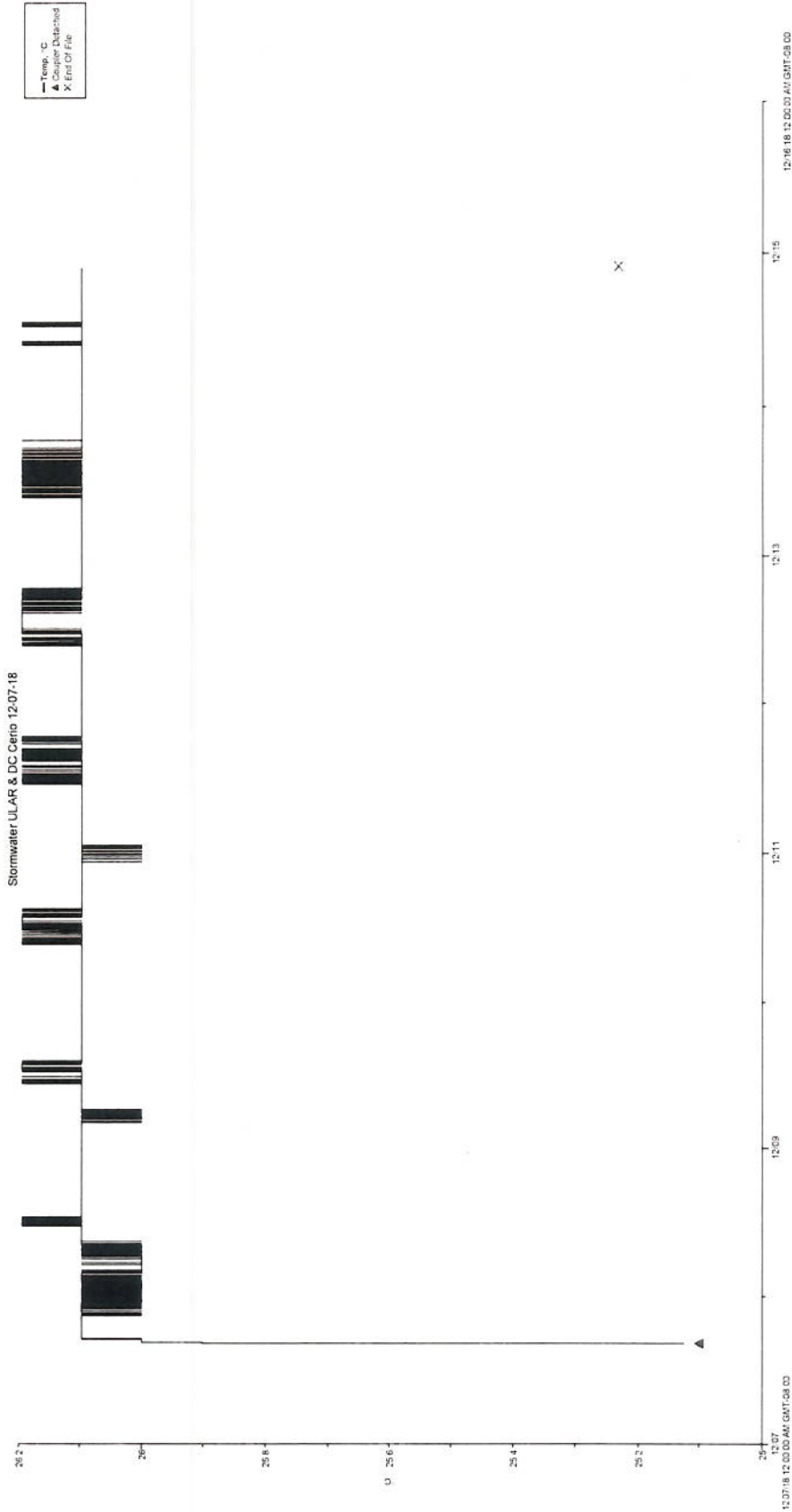
Analyst: ML

Titrant: EDTA

Factor: 20050 mL

Sample	Sample (mL) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
DOM	25	0.6	24
RHILA	25	0.4	16
WAS	25	0.6	24
TUJ	25	0.5	20
NAT	25	1.1	44
SAW	25	0.4	16
DMB-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



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.

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: 1812072B.C

TEST MATERIAL: Station LAR02WAS

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, 5.14% effect

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: 25 Feb-19 16:28 (p 1 of 1)  
Test Code: 1812072B.C | 15-1347-6718

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: 00-4843-9742	Code: 3581503	Client: Watershed Protection Division									
Sample Date: 06 Dec-18 09:17	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 06 Dec-18 13:45	Source: Stormwater (STORMWATER)										
Sample Age: 30h (9.8 °C)	Station: LAR02WAS										
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3581503	06 Dec-18 09:17	06 Dec-18 13:45	08 Dec-18 11:37	9.8						
2	3581503	06 Dec-18 09:17	06 Dec-18 13:45	09 Dec-18 12:52	9.8						
3	3581503	06 Dec-18 09:17	06 Dec-18 13:45	10 Dec-18 12:30	9.8						
4	3581503	06 Dec-18 09:17	06 Dec-18 13:45	11 Dec-18 15:12	9.8						
5	3581503	06 Dec-18 09:17	06 Dec-18 13:45	12 Dec-18 14:14	9.8						
6	3581503	06 Dec-18 09:17	06 Dec-18 13:45	13 Dec-18 14:25	9.8						
Batch Note: Batch: 1124; HBN: 72477											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
15-3837-4476	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
12-7594-3984	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					
15-3837-4476	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
12-7594-3984	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	10	38.9	33.99	43.81	7	51	4.157	13.14	33.79%	0.0%
100		10	36.9	32.3	41.5	13	47	3.891	12.31	33.35%	5.14%
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	7	41	39	51	48	40	51	45	39	28
100		13	41	42	45	47	39	43	44	40	15



# CETIS Analytical Report

Report Date: 25 Feb-19 16:28 (p 1 of 4)  
 Test Code: 1812072B.C | 15-1347-6718

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 12-7594-3984		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 27 Dec-18 11:04		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: 00-4843-9742		Code: 3581503		Client: Watershed Protection Division							
Sample Date: 06 Dec-18 09:17		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 06 Dec-18 13:45		Source: Stormwater (STORMWATER)									
Sample Age: 30h (9.8 °C)		Station: LAR02WAS									
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*	1.549	0.8633	17		0.0699	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	2.574	2.708	0.0926	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	20	20	1	0.1234	0.7295	Non-Significant Effect					
Error	2917.8	162.1	18								
Total	2937.8	182.1	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.141	6.541	0.8476	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.7888	0.866	0.0006	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	36.9	32.22	41.58	13	47	3.891	12.31	33.35%	5.14%

# CETIS Analytical Report

Report Date: 25 Feb-19 16:28 (p 2 of 4)  
 Test Code: 1812072B.C | 15-1347-6718

## Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 12-7594-3984  
 Analyzed: 27 Dec-18 11:04

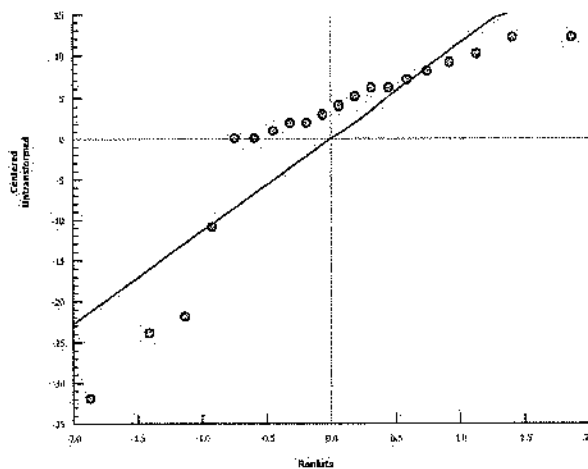
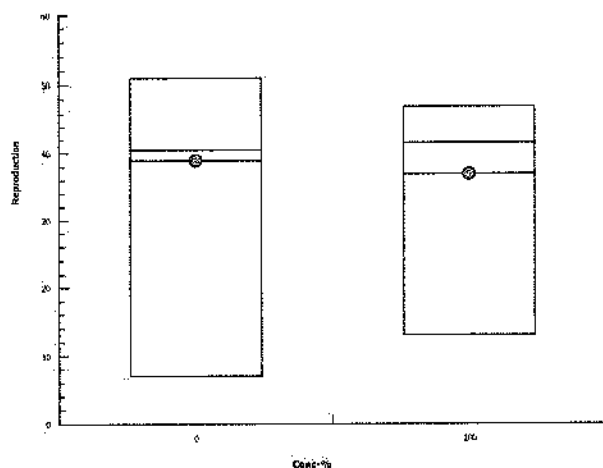
Endpoint: Reproduction  
 Analysis: Parametric Bioequivalence-Two Sample

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		13	41	42	45	47	39	43	44	40	15

### Graphics



# CETIS Analytical Report

Report Date: 25 Feb-19 16:28 (p 3 of 4)  
Test Code: 1812072B.C | 15-1347-6718

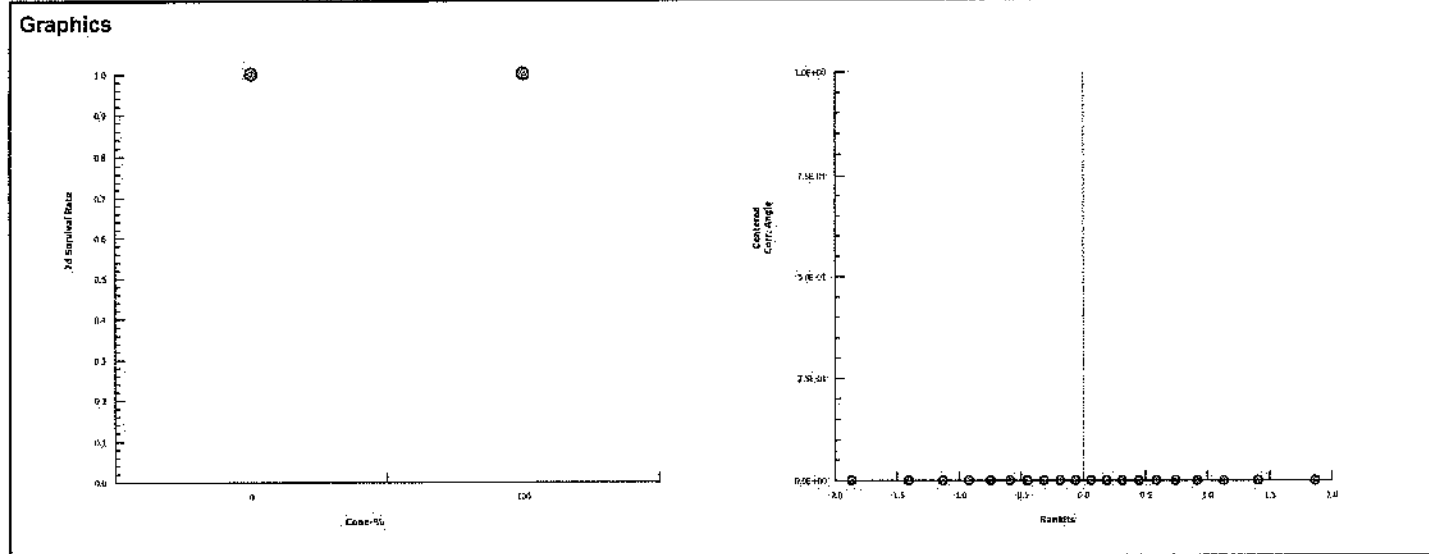
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 15-3837-4476		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 27 Dec-18 11:04		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 16-3034-3643		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: 00-4843-9742		Code: 3581503		Client: Watershed Protection Division							
Sample Date: 06 Dec-18 09:17		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 06 Dec-18 13:45		Source: Stormwater (STORMWATER)									
Sample Age: 30h (9.8 °C)		Station: LAR02WAS									
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: 25 Feb-19 16:28 (p 4 of 4)  
Test Code: 1812072B.C | 15-1347-6718

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory	
Analysis ID:	15-3837-4476	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.1	
Analyzed:	27 Dec-18 11:04	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 15:38 (p 1 of 1)  
Test Code: 15-1347-6718/1812072B.C

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory			
Start Date:	05 Dec-18	Species:	Ceriodaphnia dubia	Sample Code:	2E321BE								
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:	LAR02WAS								

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	6	1	0	0	0	0	3	10	0	13	
100		2	3	1	0	0	0	7	15	0	19	41	
100		3	9	1	0	0	0	8	15	0	19	42	
100		4	13	1	0	0	0	8	18	0	19	45	
100		5	20	1	0	0	0	6	20	0	21	47	
100		6	12	1	0	0	0	7	13	0	19	39	
100		7	22	1	0	0	0	10	12	0	21	43	
100		8	45	1	0	0	0	9	16	0	19	44	
100		9	30	1	0	0	0	7	18	0	15	40	
100		10	4	1	0	0	0	0	5	10	0	15	

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  
rc rc rc rc rc rc rc

Transferred: 1525 1137 1252 1230 1312 1414 1425  
rc rc rc rc rc rc rc

End @ 0843 rc



# CETIS Measurement Worksheet

Report Date: 05 Dec-18 15:38 (p 1 of 2)  
Test Code: 1812072B.C | 15-1347-6718

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory																																																								
Start Date: 06 Dec-18		Species: Ceriodaphnia dubia		Sample Code: 2E321BE																																																										
End Date: 13 Dec-18		Protocol: EPA/821/R-02-013 (2002)		Sample Source: Stormwater																																																										
Sample Date: 06 Dec-18		Material: Stormwater Monitoring Sample		Sample Station: LAR02WAS																																																										
<b>Alkalinity (CaCO<sub>3</sub>)-mg/L</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Conc-%</th> <th>Code</th> <th>Reading 1</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>D</td> <td>68 - see attached worksheet (1/7/19 12:16 DL)</td> </tr> <tr> <td>100</td> <td></td> <td>24 - see attached worksheet (1/31/19 13:12 DL)</td> </tr> <tr> <td colspan="3">Measure Time:</td> </tr> <tr> <td colspan="3">Instrument ID:</td> </tr> <tr> <td colspan="3">Analyst:</td> </tr> </tbody> </table>									Conc-%	Code	Reading 1	0	D	68 - see attached worksheet (1/7/19 12:16 DL)	100		24 - see attached worksheet (1/31/19 13:12 DL)	Measure Time:			Instrument ID:			Analyst:																																						
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<b>Conductivity-µmhos</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Conc-%</th> <th>Code</th> <th>Reading 1</th> <th>Reading 2</th> <th>Reading 3</th> <th>Reading 4</th> <th>Reading 5</th> <th>Reading 6</th> <th>Reading 7</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>D</td> <td>323</td> <td>319</td> <td>331</td> <td>320</td> <td>326</td> <td>326</td> <td>316</td> </tr> <tr> <td>100</td> <td></td> <td>82</td> <td>82</td> <td>83</td> <td>83</td> <td>85</td> <td>84</td> <td>84</td> </tr> <tr> <td colspan="2">Measure Time:</td> <td>1101</td> <td>1042</td> <td>1215</td> <td>1119</td> <td>1115</td> <td>1130</td> <td>1244</td> </tr> <tr> <td colspan="2">Instrument ID:</td> <td>#1</td> <td>#1</td> <td>#1</td> <td>#1</td> <td>#1</td> <td>#1</td> <td>#1</td> </tr> <tr> <td colspan="2">Analyst:</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> </tr> </tbody> </table>									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		82	82	83	83	85	84	84	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
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		82	82	83	83	85	84	84																																																						
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																																																						
<b>Final Dissolved Oxygen-mg/L</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Conc-%</th> <th>Code</th> <th>Reading 1</th> <th>Reading 2</th> <th>Reading 3</th> <th>Reading 4</th> <th>Reading 5</th> <th>Reading 6</th> <th>Reading 7</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>D</td> <td>7.92</td> <td>7.98</td> <td>7.98</td> <td>7.58</td> <td>7.86</td> <td>7.55</td> <td>7.79</td> </tr> <tr> <td>100</td> <td></td> <td>7.71</td> <td>8.00</td> <td>8.00</td> <td>7.92</td> <td>8.14</td> <td>8.00</td> <td>8.05</td> </tr> <tr> <td colspan="2">Measure Time:</td> <td>1042</td> <td>1314</td> <td>1256</td> <td>1032</td> <td>1550</td> <td>1514</td> <td>1244</td> </tr> <tr> <td colspan="2">Instrument ID:</td> <td>#3</td> <td>#3</td> <td>#3</td> <td>#3</td> <td>#3</td> <td>#3</td> <td>#3</td> </tr> <tr> <td colspan="2">Analyst:</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> </tr> </tbody> </table>									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		7.71	8.00	8.00	7.92	8.14	8.00	8.05	Measure Time:		1042	1314	1256	1032	1550	1514	1244	Instrument ID:		#3	#3	#3	#3	#3	#3	#3	Analyst:		PC	PC	PC	PC	PC	PC	PC
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100		8.61	8.87	8.50	8.57	8.38	8.88	8.64																																																						
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Analyst:		PC	PC	PC	PC	PC	PC	PC																																																						

# CETIS Measurement Worksheet

Report Date: 05 Dec-18 15:38 (p 2 of 2)  
 Test Code: 1812072B.C | 15-1347-6718

Ceriodaphnia 7-d Survival and Reproduction Test								Hyperion Treatment Plant Laboratory
Start Date: 06 Dec-18		Species: Ceriodaphnia dubia		Sample Code: 2E321BE				
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: LAR02WAS				
Initial pH								
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7
0	D	7.76	7.88	7.76	7.39	7.34	7.59	7.69
100		7.06	7.08	7.05	6.73	6.76	6.79	7.00
Measure Time:		1101	1042	1215	1119	1115	1130	1244
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC
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		24.7	24.6	24.1	24.8	24.5	24.5	24.0
Measure Time:		1104	1314	1250	1432	1550	1514	1244
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC
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		24.1	24.1	24.4	24.2	24.3	24.6	24.4
Measure Time:		1101	1042	1215	1119	1115	1130	1244
Instrument ID:		#2	#2	#2	#2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC



## Alkalinity

Date/Time: 1-7-19 / 1216Analyst: 102Titrant: H<sub>2</sub>SO<sub>4</sub>Factor: 200 50mLProject: LAG Chronic Pm  
Balboa Lake Chronic Sel  
MS4 Chronic Ceno

Sample	Sample (mL) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
SDS [40]	25	2.0	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
120 ppb Zn		1.8	72
Balboa Lake #1		3.1	124
Balboa Lake #4 <sup>12-7-19</sup>		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

mislabelled  
3/6/19  
RC

# Hardness

Date/Time: 1.7.19 / 12.16

Analyst: 102

Titrant: EDTA

Factor: 20 @ 50 mL

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

Sample	Sample (ml) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /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] RT 12.9.18	25	2.4	96

AG  
Chronic

Balboa  
Lake

MS4  
Chronic  
Ceno

mislabelled  
3/6/19  
Kc

\* - ran twice, same results both times DL  
1.7.19

# Alkalinity

Date/Time: 13119 / 1312

Project: MSH CENCO  
LAG NPDES

Analyst: RL

Titrant: 20 @ 50 ml  $\rightarrow$  13119

Factor: 1.504

Sample	Sample (ml) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
DOM	25	0.5	20
RHOLA	25	1.0	40
WAS	25	0.6	24
TWJ	25	0.5	20
NAT	25	1.1	44
SAW	25	0.6	24
SMUB-2	25	3.9	156
LAG 1	25	6.5 3.8	152
LAG 2	25	6.2 4.2	168
LAG 3	25	6.5 4.1	164
[40] SDS	25	4.5 2.9	116

CENCO

CHRONIC

MSH

NPDES

LAG



## Hardness

Date/Time: 1-31-19 / 1312

Project: msh CERIO  
LAG NPPES

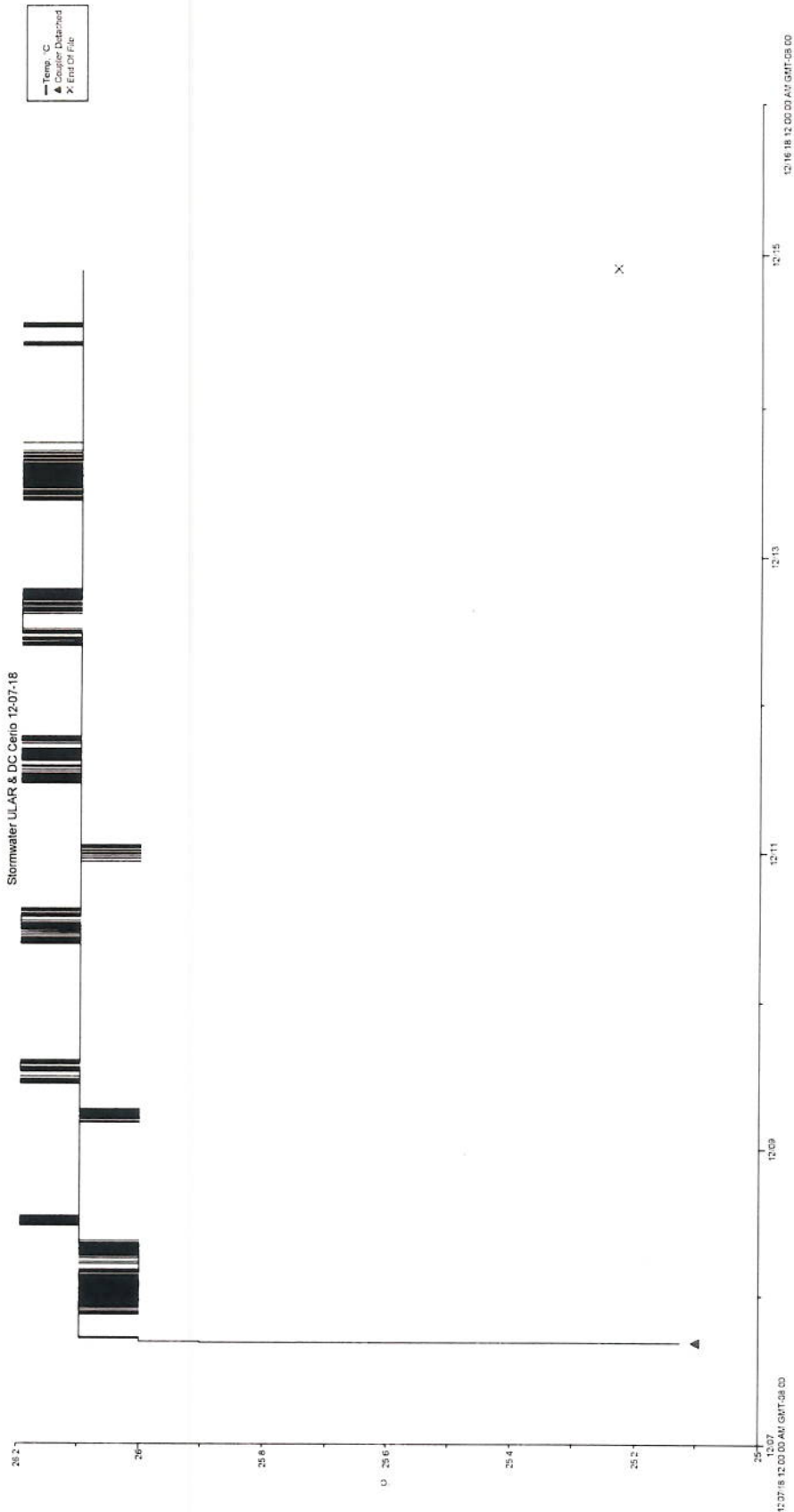
Analyst: RL

Titrant: EDTA

Factor: 20050 mL

Sample	Sample (mL) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
DOM	25	0.6	24
RHSLA	25	0.4	10
WAS	25	0.6	24
TUJ	25	0.5	20
NAT	25	1.1	44
SAW	25	0.4	16
DMB-2	25	<sup>m 1-31-19</sup> <del>725</del> 0.3	332
LAG1	25	6.5	260
LAG2	25	6.2	248
LAG3	25	6.5	260
[40] DDS	25	4.5	180

ran. twice



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.

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: 1812072C.C

TEST MATERIAL: Station RHSLA

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, -8.54% effect

Rea Mara A Crinklaw  
Analyst  
  
Signature

Water Biologist III  
Title  
2/26/19  
Date

Stacey Karnya  
Supervisor  
  
Signature

Acting Laboratory Manager I  
Title  
3-8-19  
Date

# CETIS Summary Report

Report Date: 26 Feb-19 09:50 (p 1 of 1)  
 Test Code: 1812072C.C | 00-3705-3535

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: 01-0325-0928	Code: 3581504	Client: Watershed Protection Division									
Sample Date: 06 Dec-18 03:53	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 06 Dec-18 13:45	Source: Stormwater (STORMWATER)										
Sample Age: 36h (9.4 °C)	Station: RHSLA										
<b>Sample Renewals</b>											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	3581504	06 Dec-18 03:53	06 Dec-18 13:45	08 Dec-18 11:37	9.4						
2	3581504	06 Dec-18 03:53	06 Dec-18 13:45	09 Dec-18 12:52	9.4						
3	3581504	06 Dec-18 03:53	06 Dec-18 13:45	10 Dec-18 12:30	9.4						
4	3581504	06 Dec-18 03:53	06 Dec-18 13:45	11 Dec-18 15:12	9.4						
5	3581504	06 Dec-18 03:53	06 Dec-18 13:45	12 Dec-18 14:14	9.4						
6	3581504	06 Dec-18 03:53	06 Dec-18 13:45	13 Dec-18 14:25	9.4						
Batch Note: Batch: 1124; HBN: 72477											
<b>Comparison Summary</b>											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
09-8512-4218	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
02-5358-6463	Reproduction	100	>100	N/A	N/A	1	TST-Welch's t Test				
06-6414-5878		100	>100	N/A	N/A	1	TST-Welch's t Test				
<b>Test Acceptability</b>											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
09-8512-4218	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria					
02-5358-6463	Reproduction	Control Resp	38.9	15 - NL	Yes	Passes Acceptability Criteria					
06-6414-5878	Reproduction	Control Resp	38.9	15 - NL	Yes	Passes Acceptability Criteria					
<b>7d Survival Rate Summary</b>											
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%
<b>Reproduction Summary</b>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	38.9	33.99	43.81	7	51	4.157	13.14	33.79%	0.0%
100		9	42.22	40.05	44.4	35	50	1.942	5.826	13.8%	-8.54%
<b>7d Survival Rate Detail</b>											
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
<b>Reproduction Detail</b>											
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			38	40	50	43	42	50	47	35	35



# CETIS Analytical Report

Report Date: 26 Feb-19 09:56 (p 1 of 6)  
Test Code: 1812072C.C | 00-3705-3535

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 19-2085-7623		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 26 Feb-19 9:55		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 12/1/18(0725-1500)							
Sample ID: 01-0325-0928		Code: 3581504		Client: Watershed Protection Division							
Sample Date: 06 Dec-18 03:53		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 06 Dec-18 13:45		Source: Stormwater (STORMWATER)									
Sample Age: 36h (9.4 °C)		Station: RHSLA									
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*	1.678	0.8647	16		0.0563	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	2.754	2.708	0.0399	Outlier Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.45	2.45	1	0.01343	0.9090	Non-Significant Effect					
Error	3282.5	182.3611	18								
Total	3284.95	184.8111	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.111	6.541	0.8779	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.7704	0.866	0.0003	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	38.2	32.93	43.47	2	50	4.381	13.85	36.27%	1.8%

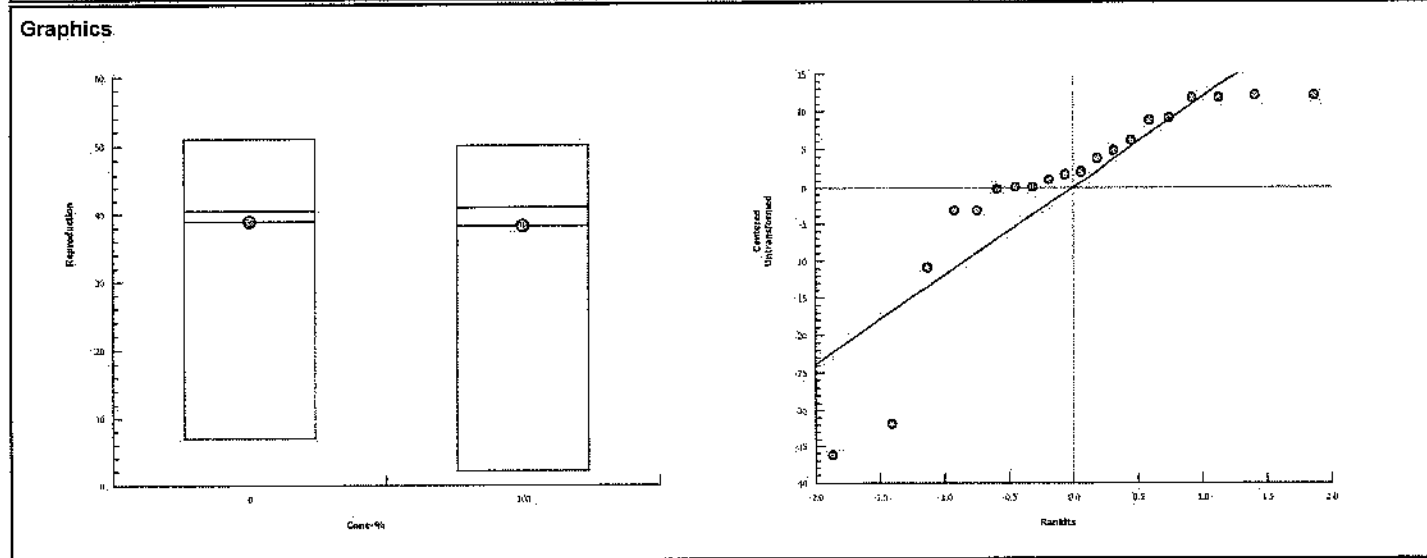


# CETIS Analytical Report

Report Date: 26 Feb-19 09:56 (p.2 of 6)  
 Test Code: 1812072C.C | 00-3705-3535

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID:	19-2085-7623	Endpoint:	Reproduction	CETIS Version:		CETISv1.8.1					
Analyzed:	26 Feb-19 9:55	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	7	41	39	51	48	40	51	45	39	28
100		2	38	40	50	43	42	50	47	35	35



## CETIS Analytical Report

Report Date: 26 Feb-19 09:56 (p 3 of 6)  
 Test Code: 1812072C.C | 00-3705-3535

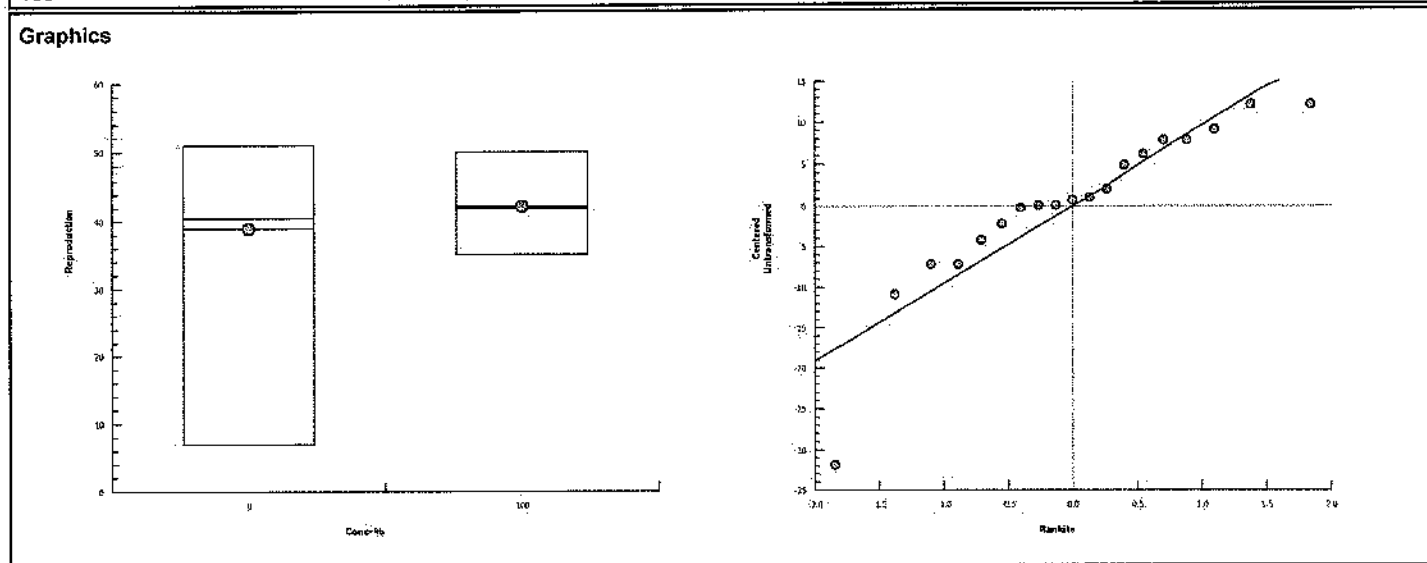
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 12-2333-9169		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 26 Feb-19 9:55		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 16-3034-3643		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: 01-0325-0928		Code: 3581504		Client: Watershed Protection Division							
Sample Date: 06 Dec-18 03:53		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 06 Dec-18 13:45		Source: Stormwater (STORMWATER)									
Sample Age: 36h (9.4 °C)		Station: RHSLA									
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*	3.552	0.8681	14		0.0016	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	38.9	15 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	52.28129	52.28129	1	0.4866	0.4949	Non-Significant Effect					
Error	1826.456	107.4386	17								
Total	1878.737	159.7198	18								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	5.09	7.339	0.0316	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.8543	0.8605	0.0079	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		9	42.22	40.01	44.44	35	50	1.942	5.826	13.8%	-8.54%

# CETIS Analytical Report

Report Date: 26 Feb-19 09:56 (p. 4 of 6)  
Test Code: 1812072C.C | 00-3705-3535

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID:	12-2333-9169	Endpoint:	Reproduction	CETIS Version:		CETISv1.8.1					
Analyzed:	26 Feb-19 9:55	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	7	41	39	51	48	40	51	45	39	28
100		Outlier	38	40	50	43	42	50	47	35	35



# CETIS Analytical Report

Report Date: 26 Feb-19 09:56 (p 5 of 6)  
 Test Code: 1812072C.C | 00-3705-3535

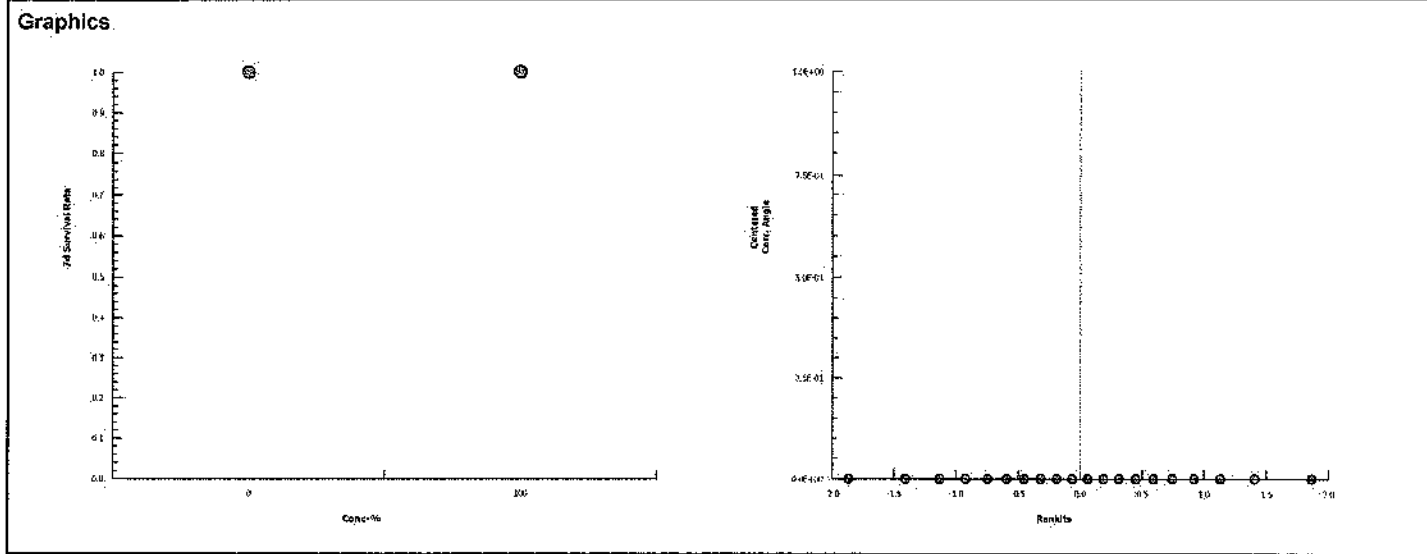
Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 09-6230-8846		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 26 Feb-19 9:55		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 16-3034-3643		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: 01-0325-0928		Code: 3581504		Client: Watershed Protection Division							
Sample Date: 06 Dec-18 03:53		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 06 Dec-18 13:45		Source: Stormwater (STORMWATER)									
Sample Age: 36h (9.4 °C)		Station: RHSLA									
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 09:56 (p 6 of 6)  
 Test Code: 1812072C.C | 00-3705-3535

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID:	09-6230-8846	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.1						
Analyzed:	26 Feb-19 9:55	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 15:39 (p 1 of 1)  
Test Code: 00-3705-3535/1812072C.C

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory				
Start Date: 12/06/18		Species: Ceriodaphnia dubia		Sample Code: 6277BF0										
End Date: 12/13/18		Protocol: EPA/821/R-02-013 (2002)		Sample Source: Stormwater										
Sample Date: 12/05/18		Material: Stormwater Monitoring Sample		Sample Station: RHSLA										
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	35	1	0	0	0	0	0	2	0	2	*out per	
100		2	18	1	0	0	0	9	0	13	16	38		
100		3	37	1	0	0	0	8	16	0	16	40		
100		4	36	1	0	0	0	9	18	23	0	50		
100		5	44	1	0	0	0	8	18	0	17	43		
100		6	24	1	0	0	0	7	15	0	20	42		
100		7	40	1	0	0	0	10	19	0	21	50		
100		8	39	1	0	0	0	9	18	0	20	47		
100		9	31	1	0	0	0	5	14	0	16	35		
100		10	49	1	0	0	0	6	0	11	18	35		

CETIS 1812072A.C

12/1 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 13/43  
 16/8 16/18 18/18 18/18 18/18 18/18 18/18

Transferred: 15/25 11/37 12/52 12/30 15/2 14/14 14/25  
 16/8 16/18 18/18 18/18 18/18 18/18 18/18

# CETIS Measurement Worksheet

Report Date: 05 Dec-18 15:39 (p 1 of 2)  
Test Code: 1812072C.C | 00-3705-3535

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory																																																							
Start Date: 06 Dec-18		Species: Ceriodaphnia dubia				Sample Code: 6277BF0																																																											
End Date: 14 Dec-18		Protocol: EPA/821/R-02-013 (2002)				Sample Source: Stormwater																																																											
Sample Date: 05 Dec-18		Material: Stormwater Monitoring Sample				Sample Station: RHSLA																																																											
<b>Alkalinity (CaCO<sub>3</sub>)-mg/L</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Conc-%</th> <th>Code</th> <th>Reading 1</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>D</td> <td>68 - see attached worksheet (1/7/19 12:16 DL)</td> </tr> <tr> <td>100</td> <td></td> <td>40 - see attached worksheet (1/31/19 13:12 DL)</td> </tr> <tr> <td colspan="3">Measure Time:</td> </tr> <tr> <td colspan="3">Instrument ID:</td> </tr> <tr> <td colspan="3">Analyst:</td> </tr> </tbody> </table>												Conc-%	Code	Reading 1	0	D	68 - see attached worksheet (1/7/19 12:16 DL)	100		40 - see attached worksheet (1/31/19 13:12 DL)	Measure Time:			Instrument ID:			Analyst:																																						
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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		66	65	65	64	66	65	65																																																									
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																																																									
<b>Final Dissolved Oxygen-mg/L</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Conc-%</th> <th>Code</th> <th>Reading 1</th> <th>Reading 2</th> <th>Reading 3</th> <th>Reading 4</th> <th>Reading 5</th> <th>Reading 6</th> <th>Reading 7</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>D</td> <td>7.92</td> <td>7.98</td> <td>7.98</td> <td>7.58</td> <td>7.86</td> <td>7.55</td> <td>7.79</td> </tr> <tr> <td>100</td> <td></td> <td>7.75</td> <td>7.95</td> <td>8.05</td> <td>7.96</td> <td>8.12</td> <td>8.09</td> <td>8.16</td> </tr> <tr> <td colspan="2">Measure Time:</td> <td>1222</td> <td>1314</td> <td>1256</td> <td>1632</td> <td>1550</td> <td>1514</td> <td>1244</td> </tr> <tr> <td colspan="2">Instrument ID:</td> <td>#3</td> <td>#3</td> <td>#3</td> <td>#3</td> <td>#3</td> <td>#3</td> <td>#3</td> </tr> <tr> <td colspan="2">Analyst:</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> </tr> </tbody> </table>												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		7.75	7.95	8.05	7.96	8.12	8.09	8.16	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
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		7.75	7.95	8.05	7.96	8.12	8.09	8.16																																																									
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																																																									
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Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7																																																									
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Conc-%	Code	Reading 1																																																															
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Measure Time:																																																																	
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Analyst:																																																																	
<b>Final pH</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Conc-%</th> <th>Code</th> <th>Reading 1</th> <th>Reading 2</th> <th>Reading 3</th> <th>Reading 4</th> <th>Reading 5</th> <th>Reading 6</th> <th>Reading 7</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>D</td> <td>7.52</td> <td>7.57</td> <td>7.48</td> <td>7.44</td> <td>7.53</td> <td>7.40</td> <td>7.08</td> </tr> <tr> <td>100</td> <td></td> <td>6.95</td> <td>7.05</td> <td>6.93</td> <td>6.91</td> <td>6.94</td> <td>6.96</td> <td>6.73</td> </tr> <tr> <td colspan="2">Measure Time:</td> <td>1222</td> <td>1314</td> <td>1256</td> <td>1632</td> <td>1550</td> <td>1514</td> <td>1244</td> </tr> <tr> <td colspan="2">Instrument ID:</td> <td>#2</td> <td>#2</td> <td>#2</td> <td>#2</td> <td>#2</td> <td>#2</td> <td>#2</td> </tr> <tr> <td colspan="2">Analyst:</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> <td>PC</td> </tr> </tbody> </table>												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		6.95	7.05	6.93	6.91	6.94	6.96	6.73	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
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		6.95	7.05	6.93	6.91	6.94	6.96	6.73																																																									
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 15:39 (p 2 of 2)  
Test Code: 1812072C.C | 00-3705-3535

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date: 06 Dec-18		Species: Ceriodaphnia dubia				Sample Code: 6277BF0					
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: RHSLA					
Initial pH											
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7			
0	D	7.76	7.88	7.76	7.39	7.34	7.59	7.69			
100		6.90	6.89	6.94	6.68	6.75	6.75	6.95			
Measure Time:		1101	1042	1215	1119	1115	1130	1244			
Instrument ID:		#2	#2	#2	#2	#2	#2	#2			
Analyst:		PC	PC	PC	PC	PC	PC	PC			
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	24.4	24.2	24.7	24.3	24.5	24.0			
Measure Time:		1222	1314	1259	1632	1550	1514	1244			
Instrument ID:		#2	#2	#2	#2	#2	#2	#2			
Analyst:		PC	PC	PC	PC	PC	PC	PC			
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		24.1	24.2	24.4	24.2	24.4	24.6	24.4			
Measure Time:		1101	1042	1215	1119	1115	1130	1244			
Instrument ID:		#2	#2	#2	#2	#2	#2	#2			
Analyst:		PC	PC	PC	PC	PC	PC	PC			

## Alkalinity

Date/Time: 1-7-19 / 1216Analyst: 102Titrant: H<sub>2</sub>SO<sub>4</sub>Factor: 200 50mLProject: LAG Chronic Pm  
Balboa Lake Chronic Rel  
MS4 Chronic Ceno

Sample	Sample (mL) Amount	Titrant Amount (mL)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
SDS [40]	25	2.0	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 <sup>102 1-7-19</sup>		3.2	128
Balboa Lake #5		3.4	136
MHSFW 12-7-18		3.0	120
[20] mg/L RT 12-9-18	25	1.7	68

mislabelled  
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 <sub>3</sub> /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  
RC

\* - ran twice, same results both times 10.1  
1.7.19



Alkalinity

Date/Time: 1-31-19 / 1312

Project: MS4 CENCO  
LAG NPDES

Analyst: RL

Titrant: 20 @ 50 ml  $\nearrow$  or 1-31-19

Factor: 1/50

Sample	Sample Amount (ml)	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
DOM	25	0.5	20
RHOLA	25	1.0	40
WAS	25	0.6	24
TWJ	25	0.5	20
NAT	25	1.1	44
SAW	25	0.6	24
SMUG-2	25	3.9	156
LAG 1	25	6.5 3.8	152
LAG 2	25	6.2 4.2	168
LAG 3	25	6.5 4.1	164
[40] SDS	25	4.5 2.9	116

CENCO

MS4 chronic

LAG NPDES

## Hardness

Date/Time: 1-31-19 / 1312

Project: MSH CERIO  
LAG1 NPDES

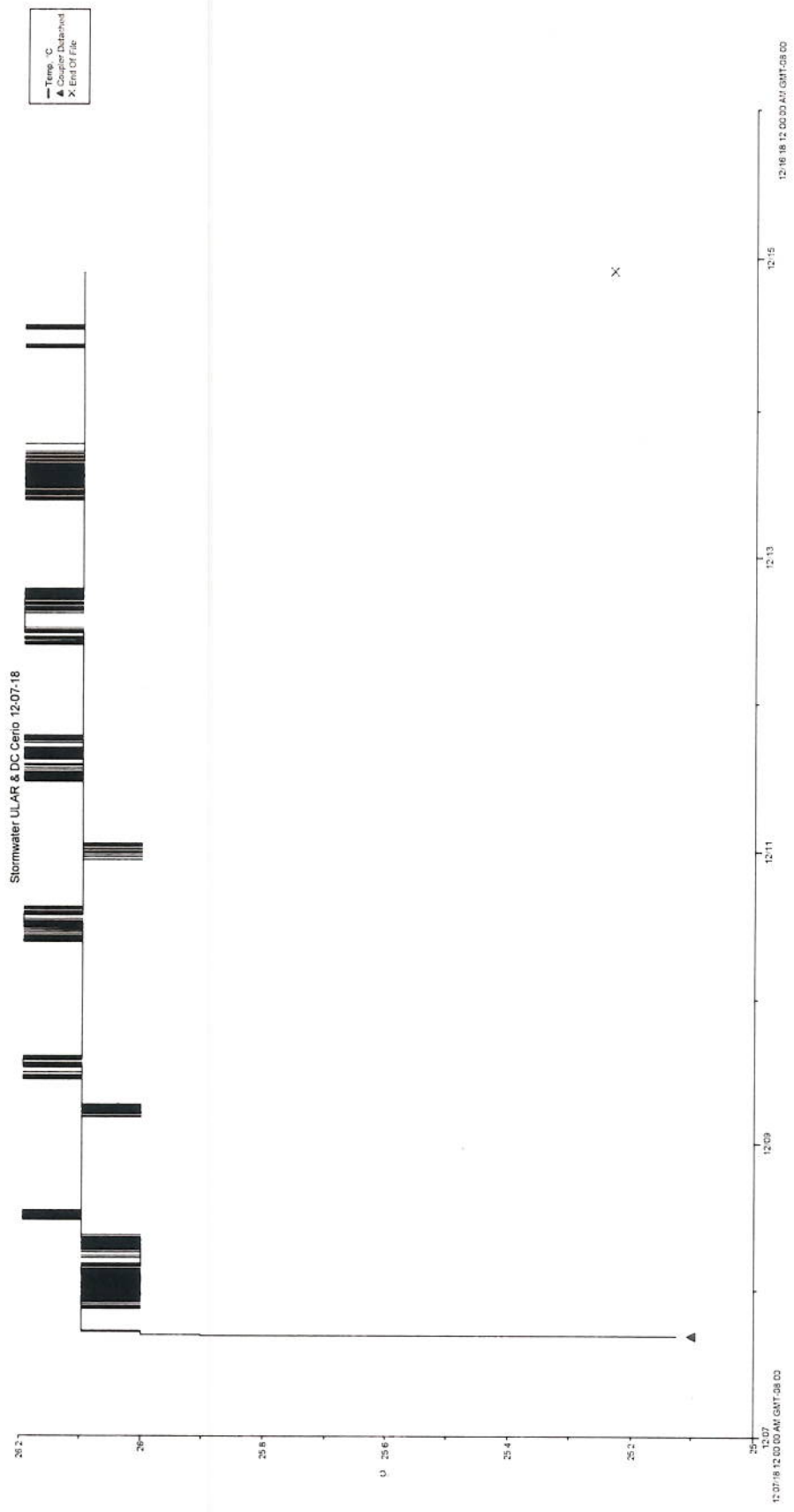
Analyst: RL

Titrant: EDTA

Factor: 20050 ml

Sample	Sample (mL) Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /L)
DOM	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 8.3	332
LAG1	25	6.5	260
LAG2	25	6.2	248
LAG3	25	6.5	260
[40] MDS	25	4.5	180

ran twice



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.

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)

EC<sub>50</sub> = 50  $\mu\text{g/L}$  (Survival)

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

IC<sub>25</sub> = 31.6  $\mu\text{g/L}$  (Reproduction)

Rea Mara A Crinklaw

Analyst



Signature

Water Biologist III

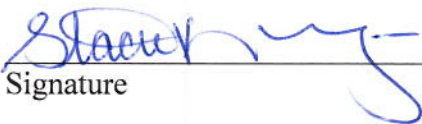
Title



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	EC50	50	38.61	100		Linear Interpolation (ICPIN)
		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		
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:										
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

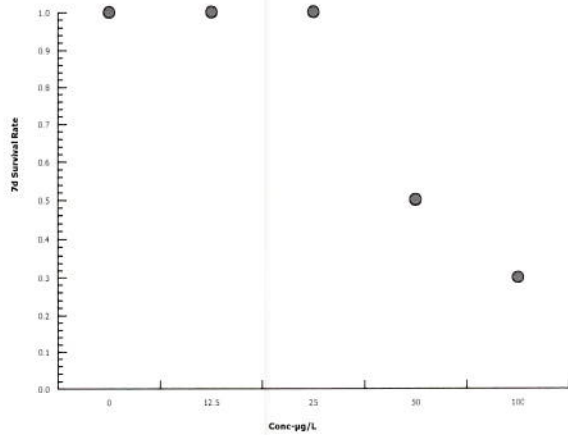
Hyperion Treatment Plant Laboratory

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

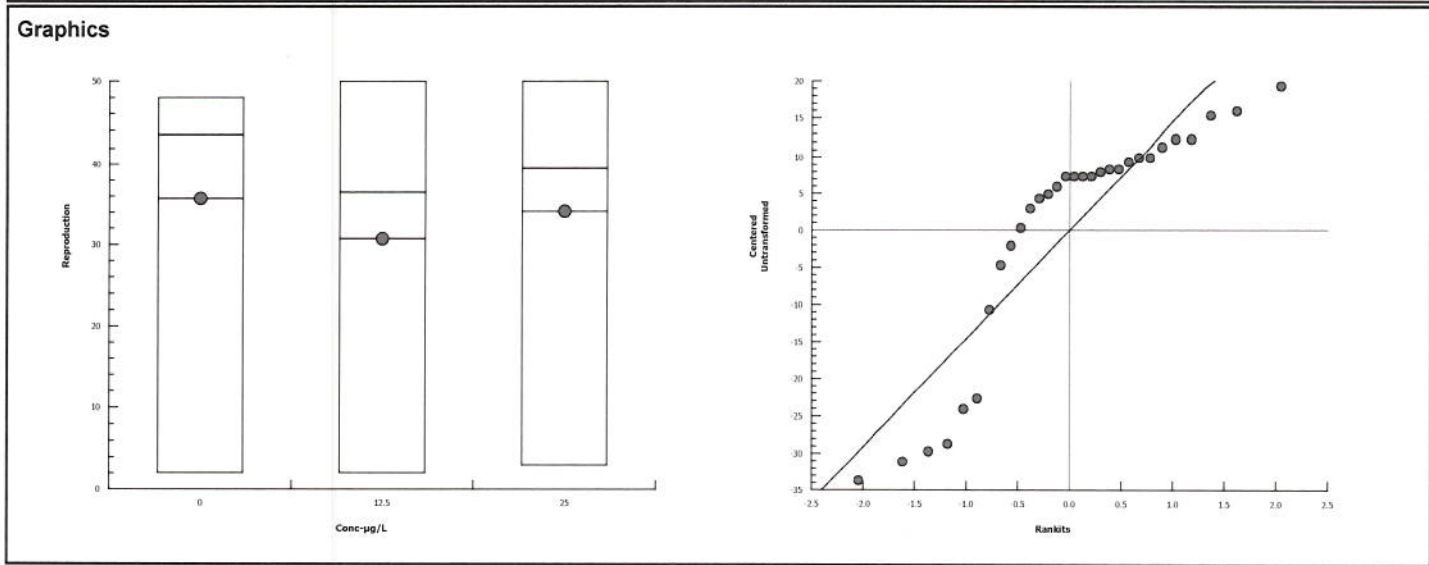
Report Date: 29 Jan-19 16:45 (p 1 of 2)  
 Test Code: 1812RT2A.C | 13-0104-5981

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

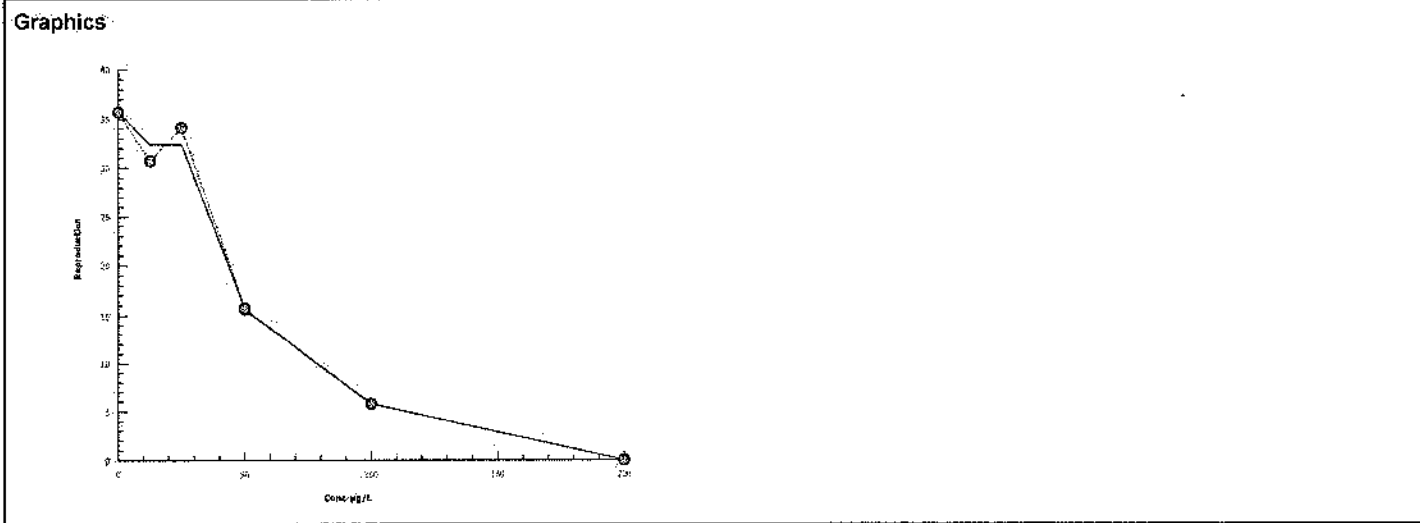
Report Date: 29 Jan-19 16:46 (p 1 of 4)  
 Test Code: 1812RT2A.C | 13-0104-5981

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	Exp 95% CL	Method						
Log(X+1)	Linear	1.078E+09	200	Yes	Two-Point Interpolation						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	35.7	15 - NL	Yes	Passes Acceptability Criteria							
Residual Analysis											
Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	Grubbs Extreme Value	2.49	3.2	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	CETIS Version: CETISv1.8.1	
Analyzed: 29 Jan-19 16:45	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes	



# 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

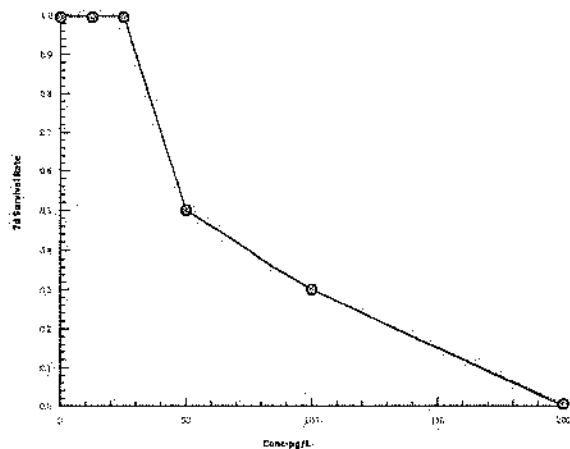
Hyperion Treatment Plant Laboratory

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



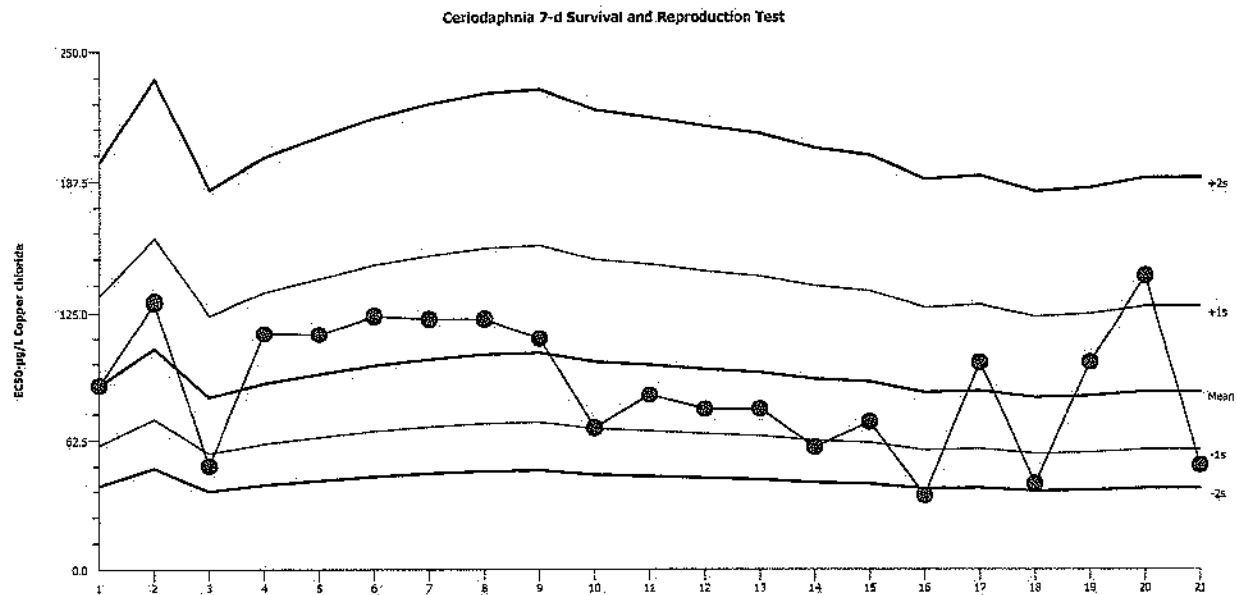
## Ceriodaphnia 7-d Survival and Reproduction Test

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)

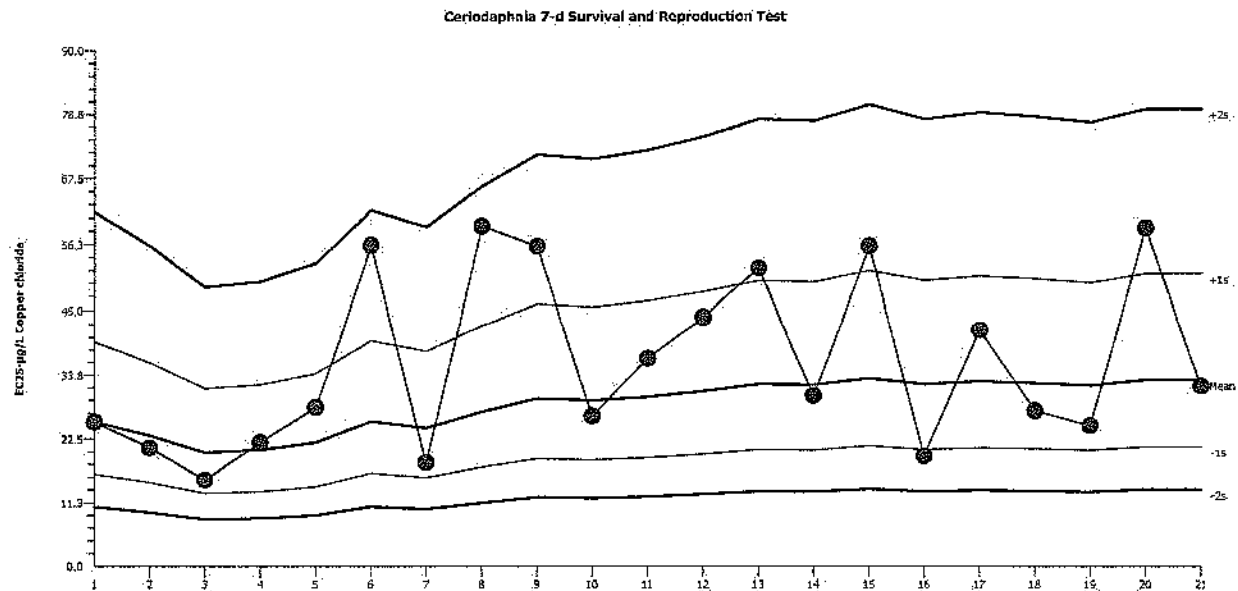
Organism: Ceriodaphnia dubia (Water Flea)

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

## 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	0	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	6	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 12/5 12/2 11/5 13/5 13/3  
 Pc Pc Pc Pc Pc Pc Pc  
 End @ 10:30  
 Pc

Transferred: 15/25 11/37 13/3 12/40 15/22 14/23 14/33  
 Pc Pc Pc Pc Pc Pc Pc  
 (12/12) 12/18/18



# 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 <sub>3</sub> )-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 <sub>3</sub> )-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: H<sub>2</sub>SO<sub>4</sub>Factor: 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 <sub>3</sub> /L)
SDS [40]	25	2.8	112
LAG 1		4.1	164
LAG 2		4.5	180
LAG 3		4.3	172
MHFW		2.0	80
32 ppb. Zn		1.9	76
128 ppb Zn		1.8	72
Balboa Lake #1		3.1	124
Balboa Lake #4 <sup>BL 1-7-19</sup>		3.2	128
Balboa Lake #5		3.4	136
MHFW 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 / 1216Analyst: 102Titrant: EDTAFactor: 20 @ 50 ml

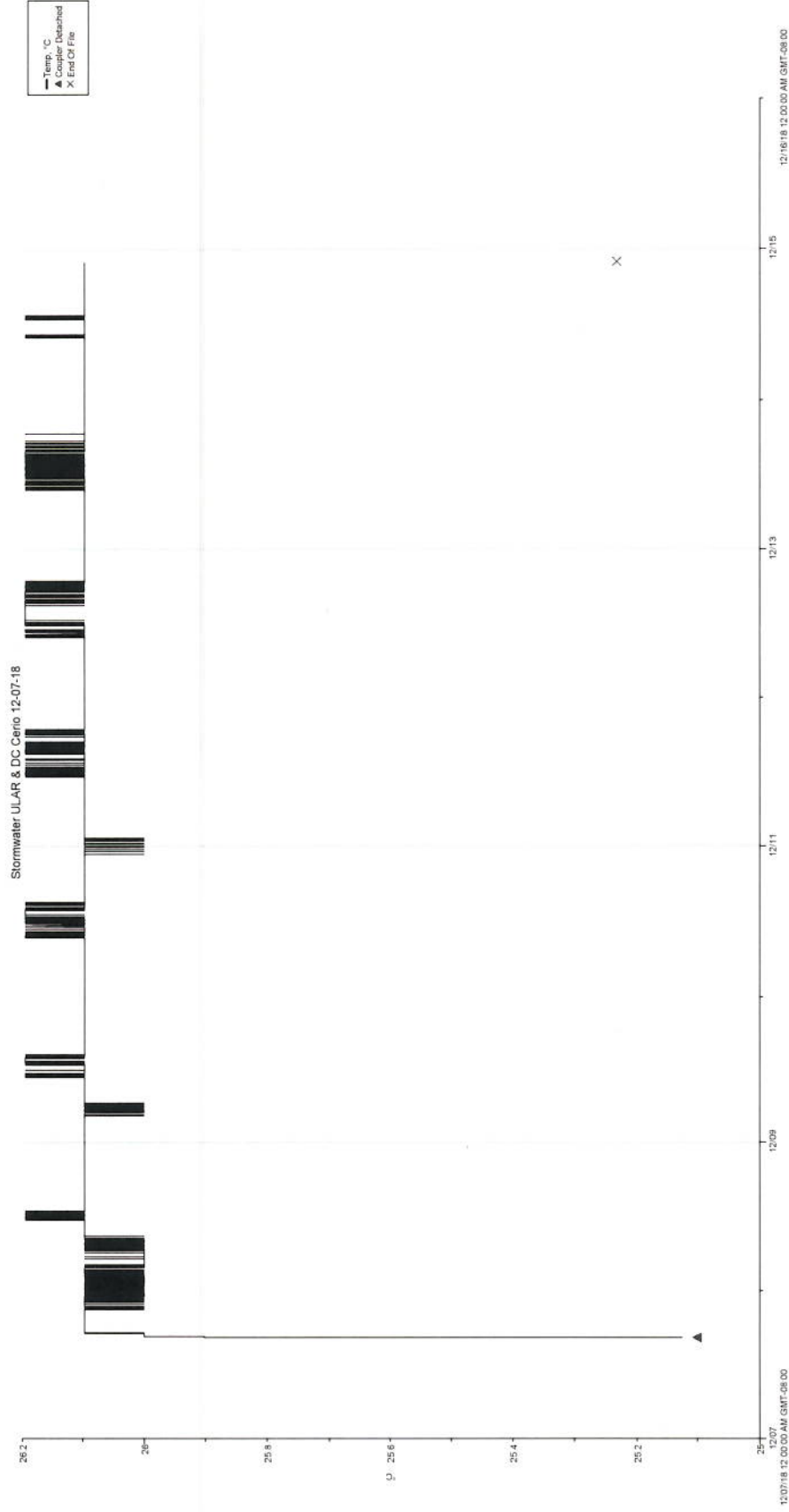
LAG chronic dim

Project: Balboa Lake chronic selMS4 chronic censo

Sample	Sample CmL Amount	Titrant Amount (ml)	Titrant Amount x Factor (mg CaCO <sub>3</sub> /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 <sup>f</sup>		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  
Re

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



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

Date: 12/14/18 (1525) - 12/14/18 (1030)

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