

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

REFERENCE TOXICANT

TOXICITY TESTING REPORT

SAMPLE DATE: August 31, 2016

TEST DATE: August 31, 2016

TEST NUMBER: 1608RT2A.C

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

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

RESULT:

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

EC₅₀ = 134 $\mu\text{g/L}$ (Survival)

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

IC₂₅ = 25.2 $\mu\text{g/L}$ (Reproduction)

Rea Mara A Crinklaw
Analyst

Rea Mara A Crinklaw
Signature

Water Biologist II
Title

12/5/16
Date

Kay Yamamoto
Supervisor

Kay M. Yamamoto
Signature

Water Biologist III
Title

12/7/16
Date

CETIS Summary Report

Report Date: 24 Oct-16 15:32 (p 1 of 2)

Test Code: 1608RT2A.C | 04-2198-2948

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

Batch ID: 01-5339-4724	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw
Start Date: 31 Aug-16 15:30	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water
Ending Date: 08 Sep-16 11:56	Species: Ceriodaphnia dubia	Brine:
Duration: 7d 20h	Source: In-House Culture	Age: <8h 8/31/16 (08:10-15:10)

Sample ID: 09-3780-0038	Code: Cu RT	Client: Watershed Protection Division
Sample Date: 31 Aug-16 11:05	Material: Copper chloride	Project: MS4
Receive Date: 31 Aug-16 11:05	Source: Reference Toxicant	
Sample Age: 4h	Station: Reference Toxicant	

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	Cu RT	01 Sep-16 12:50	01 Sep-16 12:50	01 Sep-16 14:14	
2	Cu RT	02 Sep-16 10:00	02 Sep-16 10:00	02 Sep-16 10:40	
3	Cu RT	03 Sep-16 11:10	03 Sep-16 11:10	03 Sep-16 11:45	
4	Cu RT	04 Sep-16 08:55	04 Sep-16 08:55	04 Sep-16 08:55	
5	Cu RT	05 Sep-16 13:35	05 Sep-16 13:35	05 Sep-16 14:30	
6	Cu RT	06 Sep-16 13:24	06 Sep-16 13:24	06 Sep-16 14:15	
7	Cu RT	07 Sep-16 12:21	07 Sep-16 12:21	07 Sep-16 13:49	

Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Survival for Day 1 was 100% for all concentrations. Neonates used for the test were harvested from Master Culture #4 because the broodboard did not produce enough babies. Blocking by known parentage was not feasible.

Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
08-7900-5473	7d Survival Rate	100	>100	N/A	N/A		Fisher Exact/Bonferroni-Holm Test
07-1664-7882	Reproduction	25	50	35.36	32.8%		Steel Many-One Rank Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
19-3434-0384	7d Survival Rate	EC5	64.67	6.043	103.5		Linear Interpolation (ICPIN)
		EC10	83.56	58.48	107.2		
		EC15	101.2	63.23	111		
		EC20	105.3	68.36	114.9		
		EC25	109.7	73.9	119		
		EC40	123.7	100	132		
		EC50	134	112.3	141.5		
01-9086-3175	Reproduction	IC5	1.766	0.4442	20.11		Linear Interpolation (ICPIN)
		IC10	6.651	1.086	26.2		
		IC15	14.29	2.012	27.96		
		IC20	19.27	3.35	29.73		
		IC25	25.21	5.282	31.42		
		IC40	31.23	23.28	37.86		
		IC50	36	29.51	43.12		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
08-7900-5473	7d Survival Rate	Control Resp	0.8	0.8 - NL	Yes	Passes Acceptability Criteria
19-3434-0384	7d Survival Rate	Control Resp	0.8	0.8 - NL	Yes	Passes Acceptability Criteria
01-9086-3175	Reproduction	Control Resp	17.2	15 - NL	Yes	Passes Acceptability Criteria
07-1664-7882	Reproduction	Control Resp	17.2	15 - NL	Yes	Passes Acceptability Criteria
07-1664-7882	Reproduction	PMSD	0.328	0.13 - 0.47	Yes	Passes Acceptability Criteria

CETIS Summary Report

Report Date: 24 Oct-16 15:32 (p 2 of 2)
Test Code: 1608RT2A.C | 04-2198-2948

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	0.8	0.6426	0.9574	0	1	0.1333	0.4216	52.7%	0.0%
12.5		10	0.9	0.7819	1	0	1	0.1	0.3162	35.14%	-12.5%
25		10	1	1	1	1	1	0	0	0.0%	-25.0%
50		10	1	1	1	1	1	0	0	0.0%	-25.0%
100		10	0.8	0.6426	0.9574	0	1	0.1333	0.4216	52.7%	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	17.2	15.12	19.28	9	25	1.763	5.574	32.41%	0.0%
12.5		10	15	11.47	18.53	0	34	2.989	9.452	63.01%	12.79%
25		10	13	11.57	14.43	8	19	1.211	3.83	29.46%	24.42%
50		10	4.6	2.91	6.29	0	11	1.431	4.526	98.4%	73.26%
100		10	2.8	1.923	3.677	0	7	0.7424	2.348	83.84%	83.72%
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	0	1	0	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	0	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	0	0	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	11	24	16	25	18	23	14	19	13	9
12.5		9	20	10	8	15	14	0	34	24	16
25		18	17	12	19	10	11	13	8	13	9
50		0	8	10	10	2	1	11	1	2	1
100		4	7	3	3	4	0	0	0	5	2
200		0	0	0	0	0	0	0	0	0	0

CETIS Analytical Report

Report Date: 24 Oct-16 15:32 (p 1 of 2)

Test Code: 1608RT2A.C | 04-2198-2948

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 08-7900-5473
Analyzed: 08 Sep-16 15:54

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

CETIS Version: CETISv1.8.1
Official Results: Yes

Batch ID: 01-5339-4724
Start Date: 31 Aug-16 15:30
Ending Date: 08 Sep-16 11:56
Duration: 7d 20h

Test Type: Reproduction-Survival (7d)
Protocol: EPA/821/R-02-013 (2002)
Species: Ceriodaphnia dubia
Source: In-House Culture

Analyst: Rea Mara Crinklaw
Diluent: Hard Synthetic Water
Brine:
Age: <8h 8/31/16 (08:10-15:10)

Sample ID: 09-3780-0038
Sample Date: 31 Aug-16 11:05
Receive Date: 31 Aug-16 11:05
Sample Age: 4h

Code: Cu RT
Material: Copper chloride
Source: Reference Toxicant
Station: Reference Toxicant

Client: Watershed Protection Division
Project: MS4

Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Survival for Day 1 was 100% for all concentrations. Neonates used for the test were harvested from Master Culture #4 because the broodboard did not produce enough babies. Blocking by known parentage was not feasible.

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	0.709	1.0000	Non-Significant Effect

Test Acceptability Criteria

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

Data Summary

Conc-µg/L	Control Type	No-Resp	Resp	Total
0	Dilution Water	8	2	10
12.5		9	1	10
25		10	0	10
50		10	0	10
100		8	2	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	0	1	0	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	0	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	0	0	1	1

CETIS Analytical Report

Report Date: 24 Oct-16 15:32 (p 2 of 2)
Test Code: 1608RT2A.C | 04-2198-2948

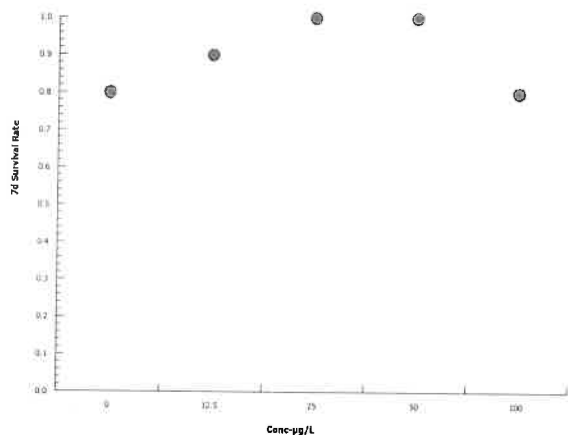
Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 08-7900-5473 Endpoint: 7d Survival Rate
Analyzed: 08 Sep-16 15:54 Analysis: STP 2x2 Contingency Tables

CETIS Version: CETISv1.8.1
Official Results: Yes

Graphics



Concentration-response relationship is all or nothing,
12/5/16 RC

CETIS Analytical Report

Report Date: 24 Oct-16 15:32 (p 1 of 2)

Test Code: 1608RT2A.C | 04-2198-2948

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Analysis ID: 07-1664-7882	Endpoint: Reproduction	CETIS Version: CETISv1.8.1									
Analyzed: 08 Sep-16 15:55	Analysis: Nonparametric-Control vs Treatments	Official Results: Yes									
Batch ID: 01-5339-4724	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 31 Aug-16 15:30	Protocol: EPA/821/R-02-013 (2002)	Diluent: Hard Synthetic Water									
Ending Date: 08 Sep-16 11:56	Species: Ceriodaphnia dubia	Brine:									
Duration: 7d 20h	Source: In-House Culture	Age: <8h	8/31/16 (08:10-15:10)								
Sample ID: 09-3780-0038	Code: Cu RT	Client: Watershed Protection Division									
Sample Date: 31 Aug-16 11:05	Material: Copper chloride	Project: MS4									
Receive Date: 31 Aug-16 11:05	Source: Reference Toxicant										
Sample Age: 4h	Station: Reference Toxicant										
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Survival for Day 1 was 100% for all concentrations. Neonates used for the test were harvested from Master Culture #4 because the broodboard did not produce enough babies. Blocking by known parentage was not feasible.											
Test Note: Concentration-response relationship is all or nothing for survival and ideal for reproduction.											
Data Transform	Zeta	Alt Hyp	MC Trials								
Untransformed	0	C > T	Not Run								
			NOEL								
			25								
			LOEL								
			50								
			TOEL								
			35.36								
			TU								
			PMSD								
			32.8%								
Steel Many-One Rank Test											
Control	vs	Conc-µg/L	Test Stat								
Dilution Water		12.5	94								
		25	82								
		50*	58.5								
		100*	55								
			Critical								
			76								
			76								
			76								
			76								
			DF								
			18								
			18								
			18								
			18								
			Ties								
			4								
			5								
			1								
			0								
			P-Value								
			0.4489								
			0.1213								
			0.0008								
			0.0003								
			Decision(α:5%)								
			Non-Significant Effect								
			Non-Significant Effect								
			Significant Effect								
			Significant Effect								
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap								
Control Resp	17.2	15 - NL	Yes								
PMSD	0.328	0.13 - 0.47	Yes								
			Decision								
			Passes Acceptability Criteria								
			Passes Acceptability Criteria								
Auxiliary Tests											
Attribute	Test	Test Stat	Critical								
Extreme Value	0	3.493	3.128								
			P-Value								
			0.0095								
			Decision(α:5%)								
			Outlier Detected								
ANOVA Table											
Source	Sum Squares	Mean Square	DF								
Between	1654.88	413.72	4								
Error	1449.6	32.21333	45								
Total	3104.48	445.9333	49								
			F Stat								
			12.84								
			P-Value								
			<0.0001								
			Decision(α:5%)								
			Significant Effect								
Distributional Tests											
Attribute	Test	Test Stat	Critical								
Variances	Bartlett Equality of Variance	17.42	13.28								
Distribution	Shapiro-Wilk W Normality	0.9531	0.9367								
			P-Value								
			0.0016								
			0.0456								
			Decision(α:1%)								
			Unequal Variances								
			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	17.2	15.08	19.32	9	25	1.763	5.574	32.41%	0.0%
12.5		10	15	11.4	18.6	0	34	2.989	9.452	63.01%	12.79%
25		10	13	11.54	14.46	8	19	1.211	3.83	29.46%	24.42%
50		10	4.6	2.878	6.322	0	11	1.431	4.526	98.4%	73.26%
100		10	2.8	1.907	3.693	0	7	0.7424	2.348	83.84%	83.72%

CETIS Analytical Report

Report Date: 24 Oct-16 15:32 (p 2 of 2)
Test Code: 1608RT2A.C | 04-2198-2948

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

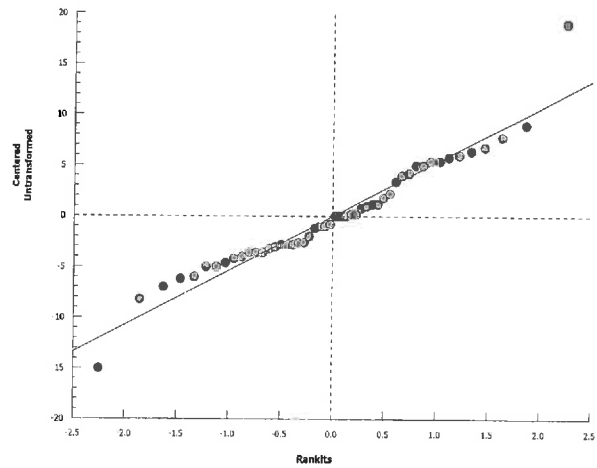
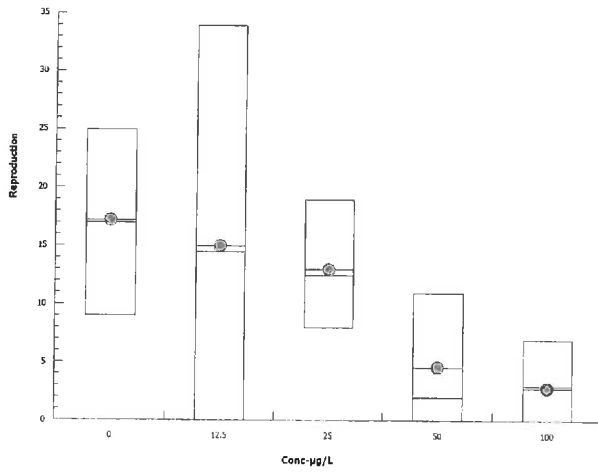
Analysis ID: 07-1664-7882
Analyzed: 08 Sep-16 15:55
Endpoint: Reproduction
Analysis: Nonparametric-Control vs Treatments

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	11	24	16	25	18	23	14	19	13	9
12.5		9	20	10	8	15	14	0	34	24	16
25		18	17	12	19	10	11	13	8	13	9
50		0	8	10	10	2	1	11	1	2	1
100		4	7	3	3	4	0	0	0	5	2

Graphics



Concentration-response relationship is ideal. 12/1/16 Re

CETIS Analytical Report

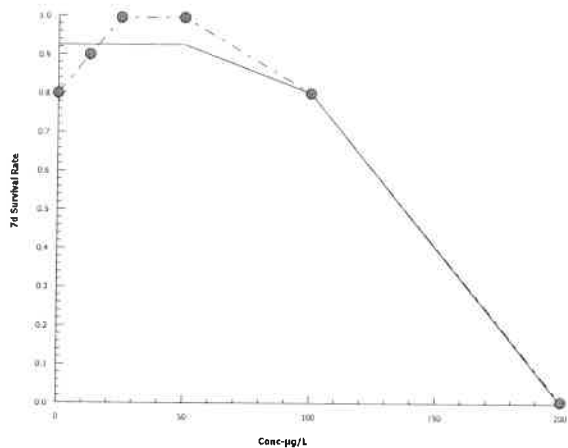
Report Date: 24 Oct-16 15:32 (p 1 of 4)

Test Code: 1608RT2A.C | 04-2198-2948

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 19-3434-0384		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 08 Sep-16 15:55		Analysis: Linear Interpolation (ICPIN)		Official Results: Yes							
Batch ID: 01-5339-4724		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 31 Aug-16 15:30		Protocol: EPA/821/R-02-013 (2002)		Diluent: Hard Synthetic Water							
Ending Date: 08 Sep-16 11:56		Species: Ceriodaphnia dubia		Brine:							
Duration: 7d 20h		Source: In-House Culture		Age: <8h 8/31/16 (08:10-15:10)							
Sample ID: 09-3780-0038		Code: Cu RT		Client: Watershed Protection Division							
Sample Date: 31 Aug-16 11:05		Material: Copper chloride		Project: MS4							
Receive Date: 31 Aug-16 11:05		Source: Reference Toxicant									
Sample Age: 4h		Station: Reference Toxicant									
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Survival for Day 1 was 100% for all concentrations. Neonates used for the test were harvested from Master Culture #4 because the broodboard did not produce enough babies. Blocking by known parentage was not feasible.											
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	1.42E+09	200	Yes	Two-Point Interpolation						
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	0.8	0.8 - NL	Yes	Passes Acceptability Criteria							
Point Estimates											
Level	µg/L	95% LCL	95% UCL								
EC5	64.67	6.043	103.5								
EC10	83.56	58.48	107.2								
EC15	101.2	63.23	111								
EC20	105.3	68.36	114.9								
EC25	109.7	73.9	119								
EC40	123.7	100	132								
EC50	134	112.3	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	0.8	0	1	0.1333	0.4216	52.7%	0.0%	8	10
12.5		10	0.9	0	1	0.1	0.3162	35.14%	-12.5%	9	10
25		10	1	1	1	0	0	0.0%	-25.0%	10	10
50		10	1	1	1	0	0	0.0%	-25.0%	10	10
100		10	0.8	0	1	0.1333	0.4216	52.7%	0.0%	8	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	0	1	0	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	0	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	0	0	1	1
200		0	0	0	0	0	0	0	0	0	0

Ceriodaphnia 7-d Survival and Reproduction Test		Hyperion Treatment Plant Laboratory
Analysis ID: 19-3434-0384	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.8.1
Analyzed: 08 Sep-16 15:55	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 24 Oct-16 15:32 (p 3 of 4)

Test Code: 1608RT2A.C | 04-2198-2948

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 01-9086-3175 Endpoint: Reproduction CETIS Version: CETISv1.8.1
 Analyzed: 08 Sep-16 15:55 Analysis: Linear Interpolation (ICPIN) Official Results: Yes

Batch ID: 01-5339-4724 Test Type: Reproduction-Survival (7d) Analyst: Rea Mara Crinklaw
 Start Date: 31 Aug-16 15:30 Protocol: EPA/821/R-02-013 (2002) Diluent: Hard Synthetic Water
 Ending Date: 08 Sep-16 11:56 Species: Ceriodaphnia dubia Brine:
 Duration: 7d 20h Source: In-House Culture Age: <8h 8/31/16 (08:10-15:10)

Sample ID: 09-3780-0038 Code: Cu RT Client: Watershed Protection Division
 Sample Date: 31 Aug-16 11:05 Material: Copper chloride Project: MS4
 Receive Date: 31 Aug-16 11:05 Source: Reference Toxicant
 Sample Age: 4h Station: Reference Toxicant

Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Survival for Day 1 was 100% for all concentrations. Neonates used for the test were harvested from Master Culture #4 because the broodboard did not produce enough babies. Blocking by known parentage was not feasible.

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	948679575	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits	Overlap	Decision
Control Resp	17.2	15 - NL	Yes	Passes Acceptability Criteria

Point Estimates

Level	µg/L	95% LCL	95% UCL
IC5	1.766	0.4442	20.11
IC10	6.651	1.086	26.2
IC15	14.29	2.012	27.96
IC20	19.27	3.35	29.73
IC25	25.21	5.282	31.42
IC40	31.23	23.28	37.86
IC50	36	29.51	43.12

Reproduction Summary

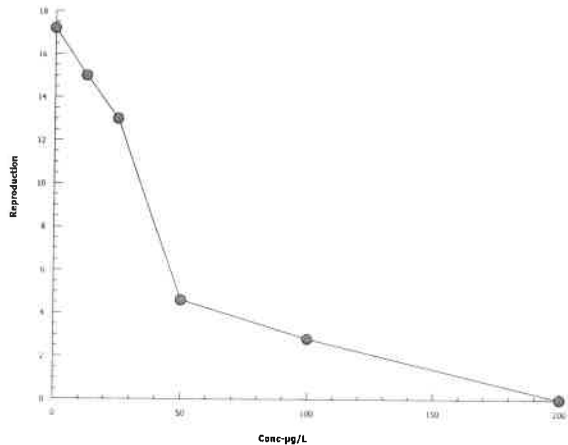
Conc-µg/L	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	17.2	9	25	1.763	5.574	32.41%	0.0%
12.5		10	15	0	34	2.989	9.452	63.01%	12.79%
25		10	13	8	19	1.211	3.83	29.46%	24.42%
50		10	4.6	0	11	1.431	4.526	98.4%	73.26%
100		10	2.8	0	7	0.7424	2.348	83.84%	83.72%
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	11	24	16	25	18	23	14	19	13	9
12.5		9	20	10	8	15	14	0	34	24	16
25		18	17	12	19	10	11	13	8	13	9
50		0	8	10	10	2	1	11	1	2	1
100		4	7	3	3	4	0	0	0	5	2
200		0	0	0	0	0	0	0	0	0	0

Ceriodaphnia 7-d Survival and Reproduction Test		Hyperion Treatment Plant Laboratory
Analysis ID: 01-9086-3175	Endpoint: Reproduction	CETIS Version: CETISv1.8.1
Analyzed: 08 Sep-16 15:55	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

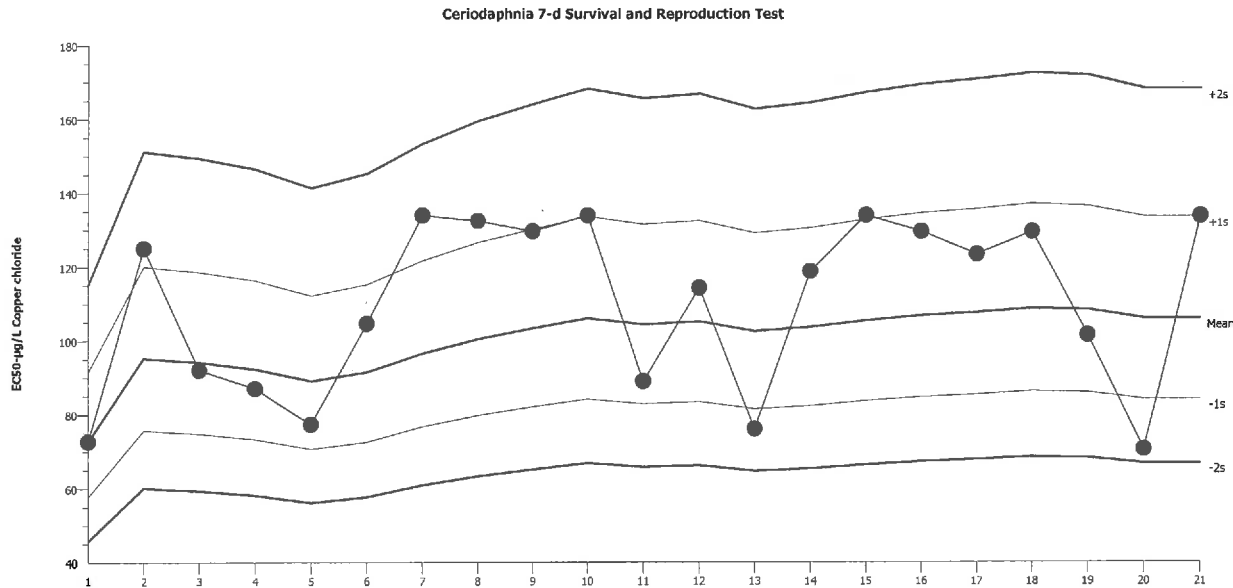
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

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

Endpoint: 7d Survival Rate

Source: Reference Toxicant-REF



Mean: 106.3

Count: 20

-1s Warning Limit: 84.4

-2s Action Limit: 67.01

Sigma: N/A

CV: 25.90%

+1s Warning Limit: 133.9

+2s Action Limit: 168.6

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2014	Jun	30	72.68	-33.59	-1.647	(-)		06-0761-4351	18-6783-6461
2		Jul	9	125	18.73	0.7037			16-0469-4842	15-3888-6832
3			30	92.11	-14.16	-0.6199			08-2521-3015	17-5387-7916
4		Aug	6	87.1	-19.17	-0.8624			20-4489-2324	09-0974-8319
5			20	77.39	-28.89	-1.375	(-)		16-0871-7892	05-0751-2276
6		Sep	10	104.7	-1.53	-0.06286			18-4543-0680	03-4688-9946
7			25	134	27.75	1.006	(+)		06-3219-2673	19-3020-8539
8		Oct	2	132.6	26.31	0.9587			01-8463-4480	11-5042-8629
9			23	129.7	23.47	0.8648			04-7355-7343	15-1897-0561
10		Nov	13	134	27.75	1.006	(+)		13-9213-9561	07-1032-9840
11		Dec	4	89.13	-17.14	-0.7625			11-6677-0498	02-1926-0405
12	2015	Jan	22	114.5	8.189	0.3218			01-5526-0247	07-4843-8959
13		Jun	17	76.22	-30.05	-1.441	(-)		20-9387-7144	01-1636-6576
14		Dec	14	119	12.69	0.4889			15-8925-6767	02-2142-4772
15	2016	Jan	21	134.1	27.86	1.009	(+)		18-3843-6965	17-3443-6664
16		Feb	1	129.7	23.47	0.8648			11-0794-9751	09-9142-3700
17			18	123.6	17.36	0.656			08-3683-2844	13-1421-5523
18		Mar	7	129.7	23.47	0.8648			03-8131-3022	08-3988-9211
19		Apr	4	101.8	-4.519	-0.1884			20-8785-7541	14-5275-7464
20		Jul	28	70.77	-35.5	-1.762	(-)		11-3245-2063	20-4501-7131
21		Aug	31	134	27.75	1.006	(+)		04-2198-2948	19-3434-0384

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Test Type: Reproduction-Survival (7d)

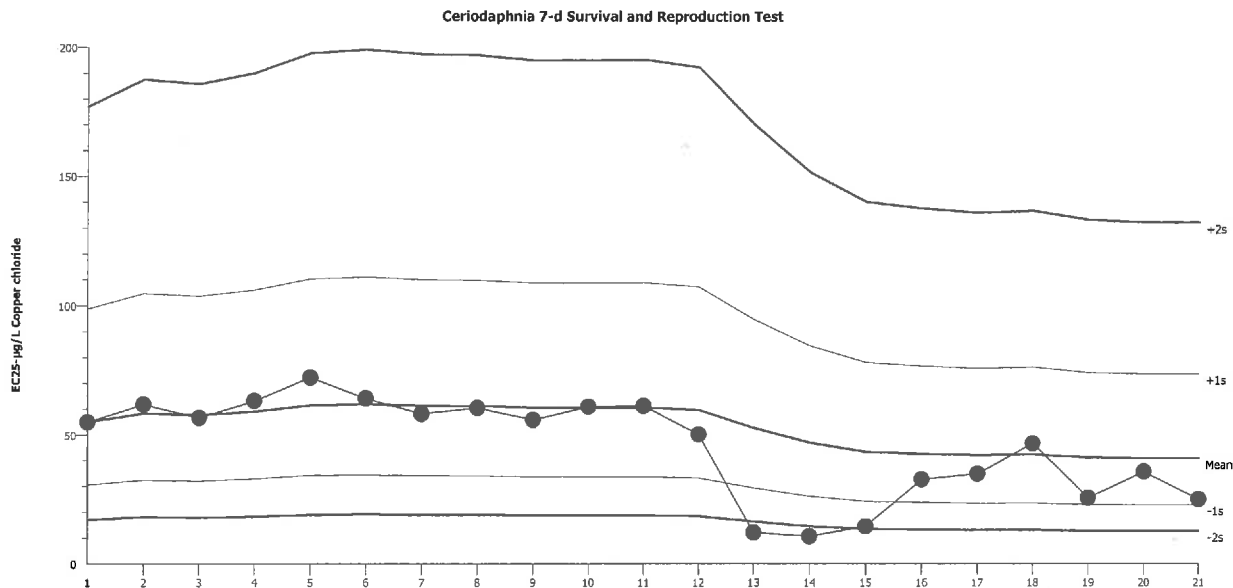
Organism: Ceriodaphnia dubia (Water Flea)

Material: Copper chloride

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

Endpoint: Reproduction

Source: Reference Toxicant-REF



Mean: 41.22

Count: 20

-1s Warning Limit: 22.98

-2s Action Limit: 12.81

Sigma: N/A

CV: 79.40%

+1s Warning Limit: 73.94

+2s Action Limit: 132.6

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2014	Jul	9	55.02	13.8	0.4942			16-0469-4842	10-7996-3946
2			30	61.86	20.63	0.6946			08-2521-3015	15-7457-6759
3		Aug	6	56.72	15.5	0.5463			20-4489-2324	03-9351-7731
4			20	63.25	22.03	0.7328			16-0871-7892	17-0446-0542
5		Sep	10	72.32	31.1	0.9622			18-4543-0680	03-4166-9317
6			25	64.22	23	0.7589			06-3219-2673	21-1622-8372
7		Oct	2	58.26	17.03	0.592			01-8463-4480	18-8913-5934
8			15	60.52	19.3	0.6573			12-4387-4309	03-5555-5323
9			23	55.98	14.76	0.5239			04-7355-7343	01-6198-9739
10		Nov	13	61.11	19.89	0.674			13-9213-9561	00-4240-2427
11		Dec	4	61.4	20.18	0.682			11-6677-0498	05-2928-7744
12	2015	Jan	22	50.33	9.102	0.3415			01-5526-0247	05-9407-7070
13		Jun	17	12.13	-29.1	-2.094	(-)	(-)	20-9387-7144	17-7691-6079
14		Dec	14	10.71	-30.52	-2.308	(-)	(-)	15-8925-6767	02-6642-1182
15	2016	Jan	21	14.62	-26.61	-1.775	(-)		18-3843-6965	14-9842-1935
16		Feb	1	32.9	-8.321	-0.3859			11-0794-9751	03-7350-2523
17			18	35.1	-6.127	-0.2754			08-3683-2844	04-0850-8624
18		Mar	7	46.92	5.693	0.2214			03-8131-3022	11-6058-4627
19		Apr	4	25.73	-15.5	-0.807			20-8785-7541	21-2139-2262
20		Jul	28	35.91	-5.311	-0.2361			11-3245-2063	13-6804-5542
21		Aug	31	25.21	-16.01	-0.8418			04-2198-2948	01-9086-3175

CETIS Test Data Worksheet

Report Date:

30 Aug-16 14:10 (p 1 of 2)

Test Code:

04-2198-2948/1608RT2A.C

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 31 Aug-16 1530 Species: Ceriodaphnia dubia
End Date: 08 Sep-16 1150 Protocol: EPA/821/R-02-013 (2002)
Sample Date: 31 Aug-16 Material: Copper chloride

Sample Code: 37E5B166
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	8d
0	D	1	41	1	0	0	0	4	7	0X	—	11		—
0	D	2	57	1	0	0	0	4	[4	1]	0	23		15
0	D	3	10	1	0	0	0	0	6	0	10X	16		—
0	D	4	3	1	0	0	0	4	10	0	11	25		(15)
0	D	5	47	1	0	0	0	0	0	1	10	18		7
0	D	6	12	1	0	0	0	0	0	3	12	23		8
0	D	7	21	1	0	0	0	4	4	0	6	14		(11)(6)
0	D	8	2	1	0	0	0	0	0	1	7	19		11
0	D	9	44	1	0	0	0	2	0	1	10X	13		0
0	D	10	5	1	0	0	0	2	3	0	4	9		(9)
12.5		1	40	1	0	0	0	0	2	1	6	9		0
12.5		2	18	1	0	0	0	4	6	0	10	20		(10)
12.5		3	24	1	0	0	0	2	0	0	8	10		0
12.5		4	46	1	0	0	0	0	1	1	6	8		0
12.5		5	35	1	0	0	0	0	2	4	9	15		0
12.5		6	59	1	0	0	0	4	0	1	9	21		(13)
12.5		7	55	1	0	0	0	0	X	—	—	0		—
12.5		8	17	1	0	0	0	4	0	0	13	34		17
12.5		9	56	1	0	0	0	0	3	0	6	24		15
12.5		10	7	1	0	0	0	2	3	0	11	16		(8)
25		1	36	1	0	0	0	0	3	4	11	17		0
25		2	23	1	0	0	0	0	3	9	5	17		0
25		3	54	1	0	0	0	4	3	0	5	12		0
25		4	28	1	0	0	0	0	3	10	6	19		0
25		5	38	1	0	0	0	0	2	1	7	10		0
25		6	11	1	0	0	0	2	4	0	5	16		(3)
25		7	48	1	0	0	0	1	0	0	4	8		0
25		8	53	1	0	0	0	2	5	0	0	8		1
25		9	29	1	0	0	0	2	0	3	8	13		0
25		10	45	1	0	0	0	0	5	1	3	9		0
50		1	19	1	0	0	0	0	0	0	0	0	N	0
50		2	39	1	0	0	0	2	[1	1]	4	8		0
50		3	52	1	0	0	0	0	0	0	10	10		0
50		4	6	1	0	0	0	4	2	0	4	10		0
50		5	16	1	0	0	0	2	0	0	0	2		0
50		6	50	1	0	0	0	0	1	0	0	1		0
50		7	30	1	0	0	0	0	6	5	0	11		0
50		8	60	1	0	0	0	1	0	0	0	1		0
50		9	42	1	0	0	0	2	0	0	0	2		0
50		10	58	1	0	0	0	1	0	0	0	1		0
100		1	34	1	0	0	0	0	2	2	0	4		0
100		2	37	1	0	0	0	0	0	3	4	7		0
100		3	14	1	0	0	0	0	0	2	0	3		1
100		4	22	1	0	0	0	0	1	1	1	3		0
100		5	32	1	0	0	0	0	0	0	0	4		4
100		6	43	1	0	0	0	0	0	0	0	0	N	0
100		7	20	1	0	0	0	0	0	0	0	0		0X

CETIS Test Data Worksheet

Report Date:

30 Aug-16 14:10 (p 2 of 2)

Test Code:

04-2198-2948/1608RT2A.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	49	1	0	0	0	0	0	0	0X	0	
100		9	33	1	0	0	0	0	0	5	0	5	
100		10	8	1	0	0	0	0	0	0	2	2	
200		1	1	1	0	0	0	X	X	X	X	0	
200		2	25	1	0	0	0	X	X	X	X	0	
200		3	31	1	0	0	X	X	X	X	X	0	
200		4	13	1	0	0	X	X	X	X	X	0	
200		5	27	1	0	0	0	X	X	X	X	0	
200		6	15	1	0	0	0	X	X	X	X	0	
200		7	26	1	0	0	0	X	X	X	X	0	
200		8	51	1	0	0	0	X	X	X	X	0	
200		9	4	1	0	0	X	X	X	X	X	0	
200		10	9	1	0	0	X	X	X	X	X	0	

8/31

9/1

9/2

9/3

9/4

9/5

9/6

9/7

9/8

Food Added: 1520 1400 1015 1125 8.5 1332 1400 1253
 Pc Pc Pc Pc Ag DL Pc Pc

Transferred: 1530 1414 1040 1145 855 1430 1415 1349
 Pc Pc Pc Pc Ag DL Pc Pc

Survival data not entered into CETIS.
 Started with 28 survival in CETIS.

End
 @
 11:56

Pc

Kamy

CETIS Measurement Worksheet

Report Date: 30 Aug-16 14:10 (p 1 of 2)
Test Code: 1608RT2A.C | 04-2198-2948

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 31 Aug-16 Species: Ceriodaphnia dubia Sample Code: 37E5B166
End Date: 07 Sep-16 Protocol: EPA/821/R-02-013 (2002) Sample Source: Reference Toxicant
Sample Date: 31 Aug-16 Material: Copper chloride Sample Station: Reference Toxicant

Alkalinity (CaCO₃)-mg/L

Conc-µg/L	Code	Reading 1
0	D	112 - see Reconstituted Water Prep logbook (8/23/16 AS)
200		AE - not measured
Measure Time:		
Instrument ID:		
Analyst:		

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	623	599	613	615	602	599	610	595
12.5		604	602	603	608	597	600	604	606
25		603	602	601	604	596	601	602	603
50		604	602	600	602	594	599	600	600
100		602	603	600	596	591	588	595	595
200		595	596	589	592				
Measure Time:		1407	1250	1000	1110	1045	1335	1324	1221
Instrument ID:		#2	#2	#2	#2	#2	#2	#2	#2
Analyst:		Re	Re	Re	Re	Re	Re	Re	Re

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	7.41	7.40	7.73	7.79	7.60	7.36	7.33	7.26
12.5		7.70	7.68	7.73	7.78	7.68	7.54	7.64	7.59
25		7.78	7.82	7.76	7.84	7.68	7.61	7.75	7.69
50		7.80	7.79	7.73	7.81	AE	7.65	7.80	7.77
100		7.87	7.88	7.77	7.85	7.80	7.69	7.87	7.88
200		7.80	7.86	7.85					
Measure Time:		1542	1110	1240	1045	1527	1604	1612	1630
Instrument ID:		#2	#2	#2	#2	#2	#2	#2	#2
Analyst:		Re	Re	Re	Re	Re	Re	Re	Re

Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	7.64	7.67	7.50	7.92	7.87	7.43	7.68	7.81
12.5		7.80	7.83	7.85	7.95	7.86	7.83	7.75	7.87
25		7.88	7.91	7.93	7.95	7.87	7.88	7.77	7.87
50		7.90	7.96	7.96	7.92	7.87	7.88	7.76	7.86
100		7.90	7.72	8.00	7.90	7.87	7.90	7.78	7.88
200		7.91	7.98	8.02	7.91				
Measure Time:		1407	1250	1000	1110	1045	1335	1324	1221
Instrument ID:		#2	#2	#2	#2	#2	#2	#2	#2
Analyst:		Re	Re	Re	Re	Re	Re	Re	Re

Hardness (CaCO₃)-mg/L

Conc-µg/L	Code	Reading 1
0	D	176 - See Reconstituted Water Prep logbook (8/23/16 AS)
200		AE - not measured
Measure Time:		
Instrument ID:		
Analyst:		

CETIS Measurement Worksheet

Report Date:

30 Aug-16 14:10 (p 2 of 2)

Test Code:

1608RT2A.C | 04-2198-2948

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 31 Aug-16

Species: Ceriodaphnia dubia

Sample Code: 37E5B166

End Date: 07 Sep-16

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

Sample Source: Reference Toxicant

Sample Date: 31 Aug-16

Material: Copper chloride

Sample Station: Reference Toxicant

Final pH		9/1	9/2	9/3	9/4	9/5	9/6	9/7	9/8
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	8.38	8.33	8.40	8.21	8.40	8.44	8.33	8.18
12.5		8.45	8.42	8.43	8.43	8.48	8.50	8.39	8.25
25		8.41	8.44	8.44	8.47	8.50	8.52	8.39	8.25
50		8.41	8.45	8.45	8.46	AE	8.52	8.39	8.27
100		8.43	8.47	8.47	8.45	8.51	8.53	8.41	8.31
200		8.43	8.48	8.47					
Measure Time:		1542	1110	1210	1045	1527	1604	1612	1630
Instrument ID:		#2	#2	#2	#2	#2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC	PC

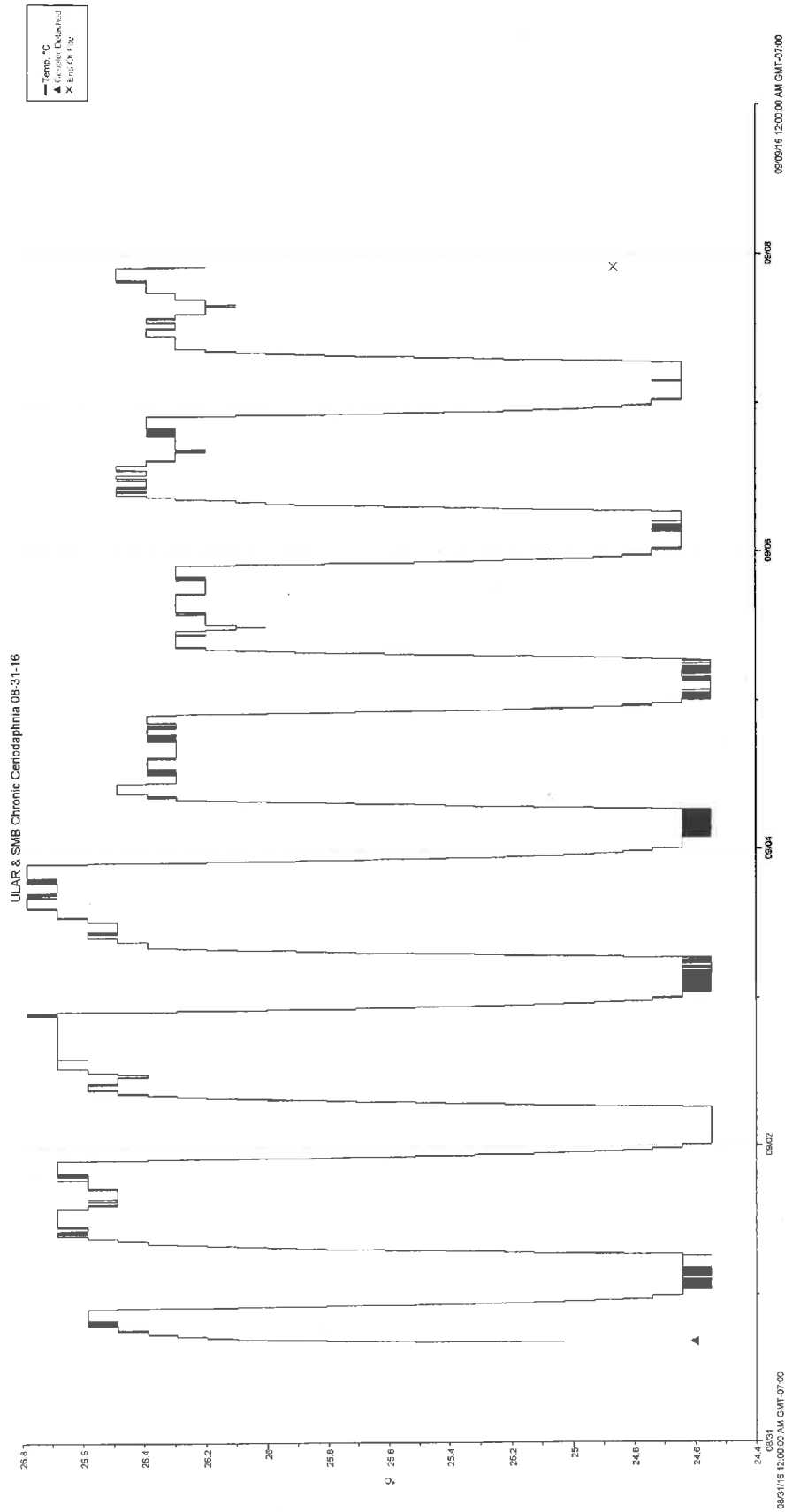
Initial pH		9/1	9/2	9/3	9/4	9/5	9/6	9/7	9/8
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	8.26	8.44	8.26	8.19	8.86	8.83	8.50	8.34
12.5		8.39	8.51	8.31	8.23	8.41	8.60	8.57	8.38
25		8.38	8.53	8.35	8.27	8.45	8.61	8.52	8.40
50		8.37	8.53	8.39	8.32	8.46	8.59	8.52	8.42
100		8.36	8.54	8.42	8.35	8.48	8.59	8.52	8.43
200		8.39	8.54	8.44	8.37				
Measure Time:		1407	1250	1000	1110	1045	1335	1324	1221
Instrument ID:		#3	#2	#2	#2	#2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC	PC

Final Temperature-°C		9/1	9/2	9/3	9/4	9/5	9/6	9/7	9/8
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	24.6	25.3	25.3	24.5	24.5	25.2	25.2	25.0
12.5		24.3	25.2	25.1	24.4	24.3	25.0	24.9	24.8
25		24.3	25.1	25.1	24.4	24.4	24.9	24.7	24.8
50		24.3	25.1	25.0	24.4	AE	24.8	24.6	25.1
100		24.4	25.1	24.9	24.4	24.5	24.7	24.5	24.6
200		24.6	25.2	25.0					
Measure Time:		1542	1110	1210	1045	1527	1604	1612	1630
Instrument ID:		#2	#2	#2	#2	#2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC	PC

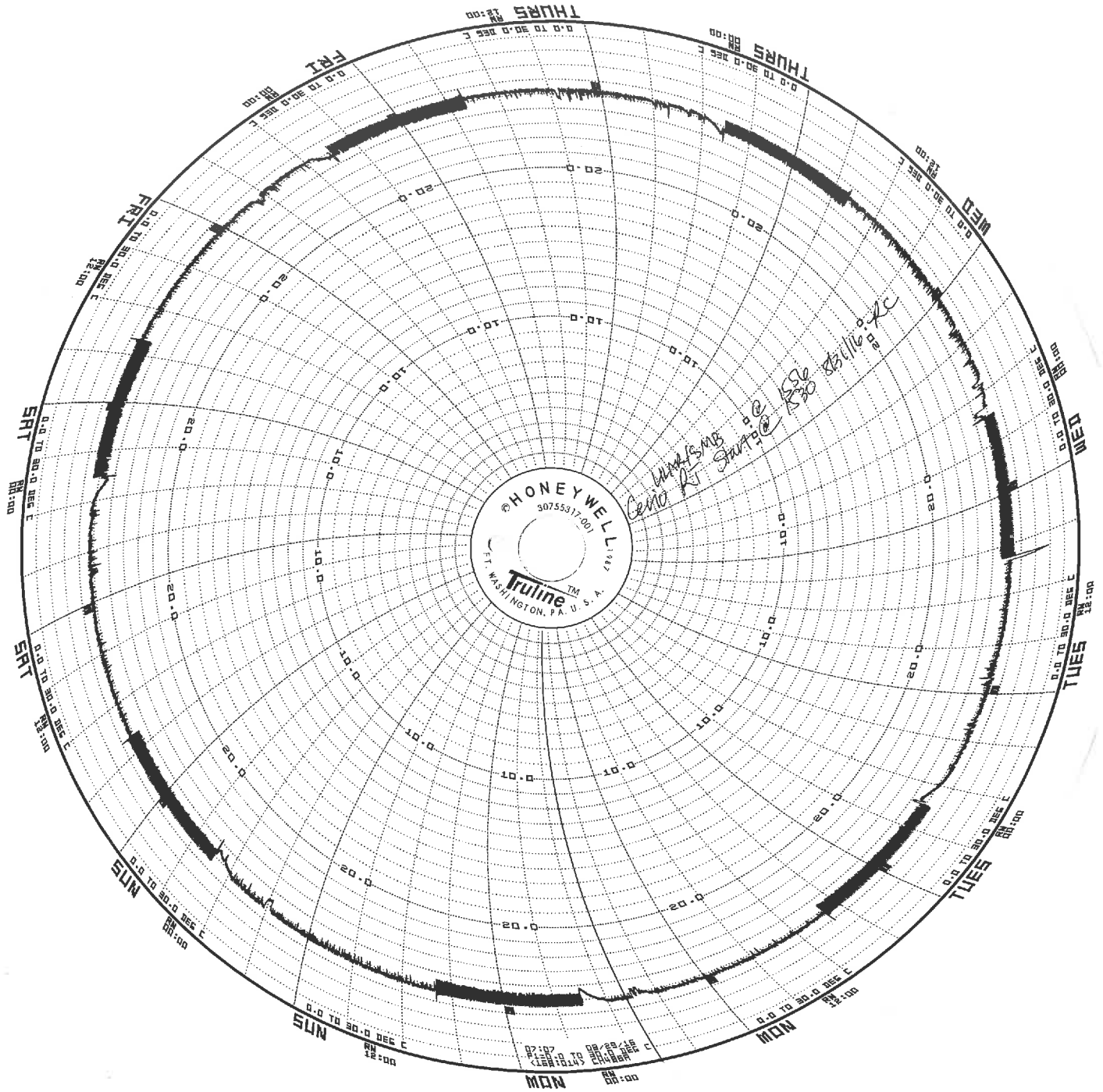
9/8/16 24.7
24.6

Initial Temperature-°C		9/1	9/2	9/3	9/4	9/5	9/6	9/7	9/8
Conc-µg/L	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	25.0	25.1	25.5	25.1	24.4	24.2	25.0	24.8
12.5		24.9	25.0	25.3	25.3	24.5	24.0	25.2	24.8
25		24.9	24.9	25.3	25.3	24.6	24.1	25.1	25.0
50		24.9	24.9	25.3	25.1	24.6	24.0	24.9	24.8
100		24.9	25.2	25.3	25.0	24.6	24.0	24.8	24.7
200		24.9	25.0	25.2	24.9				
Measure Time:		1407	1250	1000	1110	1045	1335	1324	1221
Instrument ID:		#3	#2	#2	#2	#2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC	PC

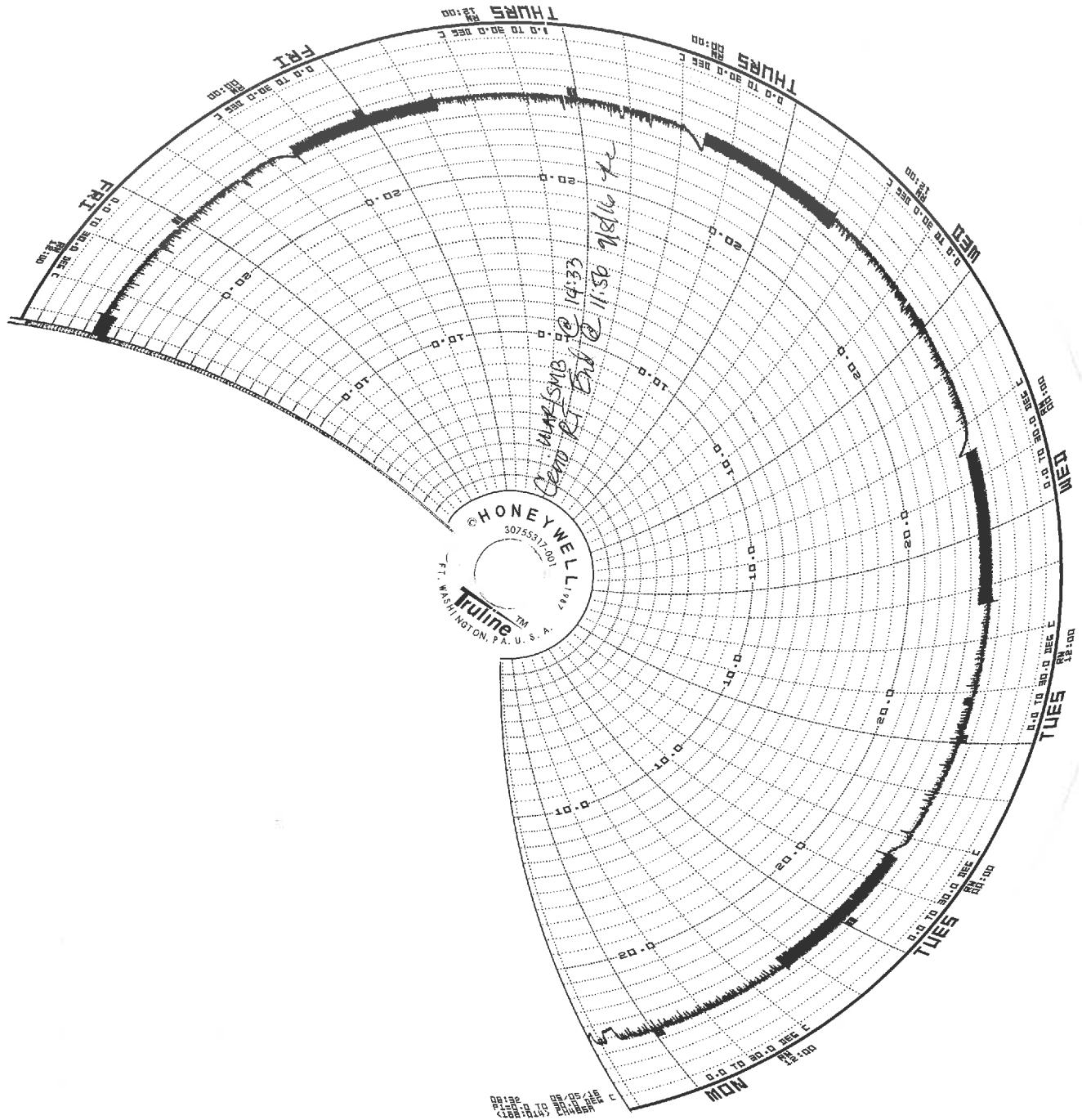
PC Kmy



Test: 1608RT2A.C, 1608072A,B,D.C
Date: 8/31/16 (15:30) - 9/8/16 (14:33)



Test: 1608RT2A.C, 1608072A, B, D.C
 Date: 8/31/16 (15:30) - 9/18/16 (14:33)



Test: 1608RT 2A.C, 1608072A, B, D.C
 Date: 8/31/16 (15:30) - 9/8/16 (14:33)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: August 30, 2016

TEST DATE: August 31, 2016

TEST NUMBER: 1608072A.C

TEST MATERIAL: Station LAR02WAS

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

REFERENCE TOXICANT TEST: 1608RT2A.C

RESULT:

Survival
Reproduction

Pass, 12.5% effect
Pass, -29.9% effect

Rea Mara A Crinklaw

Analyst
Rea Mara A Crinklaw

Signature

Water Biologist II

Title
12/5/16

Date

Kay Yamamoto

Supervisor
Kay M. Yamamoto

Signature

Water Biologist III

Title
12/7/16

Date

CETIS Summary Report

Report Date: 18 Nov-16 15:15 (p 1 of 1)
Test Code: 1608072A.C | 14-6618-5338

Ceriodaphnia 7-d Survival and Reproduction Test				Hyperion Treatment Plant Laboratory							
Batch ID:	06-3025-4205	Test Type:	Reproduction-Survival (7d)	Analyst:	Rea Mara Crinklaw						
Start Date:	31 Aug-16 15:56	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Mod-Hard Synthetic Water						
Ending Date:	07 Sep-16 14:33	Species:	Ceriodaphnia dubia	Brine:							
Duration:	6d 23h	Source:	In-House Culture	Age:	1-9h 8/31/16 (0704-1430)						
Sample ID:	00-6455-0102	Code:	480507	Client:	Watershed Protection Division						
Sample Date:	30 Aug-16 13:20	Material:	Stormwater Monitoring Sample	Project:	MS4						
Receive Date:	30 Aug-16 16:00	Source:	Stormwater (STORMWATER)								
Sample Age:	27h (20.2 °C)	Station:	LAR02WAS								
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	480507	30 Aug-16 13:20	30 Aug-16 16:00	01 Sep-16 14:59	20.2						
2	480507	30 Aug-16 13:20	30 Aug-16 16:00	02 Sep-16 10:55	20.2						
3	480507	30 Aug-16 13:20	30 Aug-16 16:00	03 Sep-16 12:00	20.2						
4	480507	30 Aug-16 13:20	30 Aug-16 16:00	04 Sep-16 09:30	20.2						
5	480507	30 Aug-16 13:20	30 Aug-16 16:00	05 Sep-16 14:52	20.2						
6	480507	30 Aug-16 13:20	30 Aug-16 16:00	06 Sep-16 14:52	20.2						
7	480507	30 Aug-16 13:20	30 Aug-16 16:00	07 Sep-16 14:08	20.2						
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Day 1 data are the same as Day 2.											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
19-1514-5973	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
05-2134-3101	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					
19-1514-5973	7d Survival Rate	Control Resp	0.8	0.8 - NL	Yes	Passes Acceptability Criteria					
05-2134-3101	Reproduction	Control Resp	14.7	15 - NL	Yes	Below Acceptability Criteria *OK					
7d Survival Rate Summary * Avg. young/surviving female = 147/8 = 18.4											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	0.8	0.6426	0.9574	0	1	0.1333	0.4216	52.7%	0.0%
100		10	0.7	0.5196	0.8804	0	1	0.1528	0.483	69.01%	12.5%
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	14.7	11.43	17.97	0	26	2.769	8.757	59.57%	0.0%
100		10	19.1	13.87	24.33	0	37	4.426	14	73.28%	-29.93%
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	0	0	1	1
100		0	1	1	1	1	1	0	0	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	17	16	15	20	26	20	0	0	22	11
100		0	30	23	20	31	24	0	0	26	37

CETIS Analytical Report

Report Date: 18 Nov-16 15:15 (p 1 of 4)
Test Code: 1608072A.C | 14-6618-5338

Ceriodaphnia 7-d Survival and Reproduction Test					Hyperion Treatment Plant Laboratory						
Analysis ID: 05-2134-3101	Endpoint: Reproduction	CETIS Version: CETISv1.8.1		Official Results: Yes							
Analyzed: 08 Sep-16 16:04	Analysis: Parametric Bioequivalence-Two Sample										
Batch ID: 06-3025-4205	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 31 Aug-16 15:56	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water									
Ending Date: 07 Sep-16 14:33	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 23h	Source: In-House Culture	Age: 1-9h	8/31/16 (0704-1430)								
Sample ID: 00-6455-0102	Code: 480507	Client: Watershed Protection Division									
Sample Date: 30 Aug-16 13:20	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 30 Aug-16 16:00	Source: Stormwater (STORMWATER)										
Sample Age: 27h (20.2 °C)	Station: LAR02WAS										
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Day 1 data are the same as Day 2.											
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*	1.652	0.8726	12		0.0622	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	14.7	15 - NL	Yes	Below Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	1.681	2.708	1.0000	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	96.8	96.8	1	0.7103	0.4104	Non-Significant Effect					
Error	2453	136.2778	18								
Total	2549.8	233.0778	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	2.555	6.541	0.1786	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.8896	0.866	0.0265	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	14.7	11.37	18.03	0	26	2.769	8.757	59.57%	0.0%
100		10	19.1	13.78	24.42	0	37	4.426	14	73.28%	-29.93%

CETIS Analytical Report

Report Date: 18 Nov-16 15:15 (p 2 of 4)
 Test Code: 1608072A.C | 14-6618-5338

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

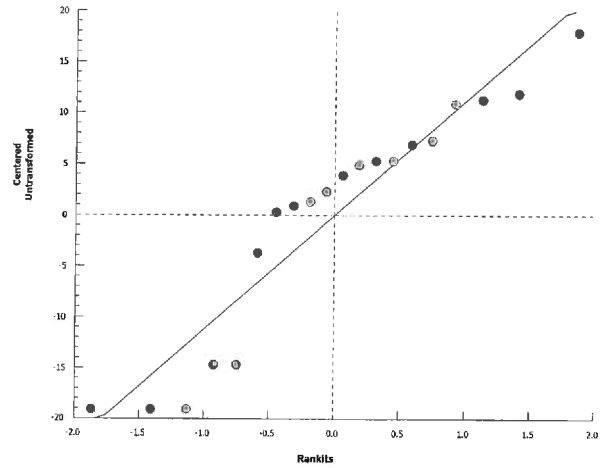
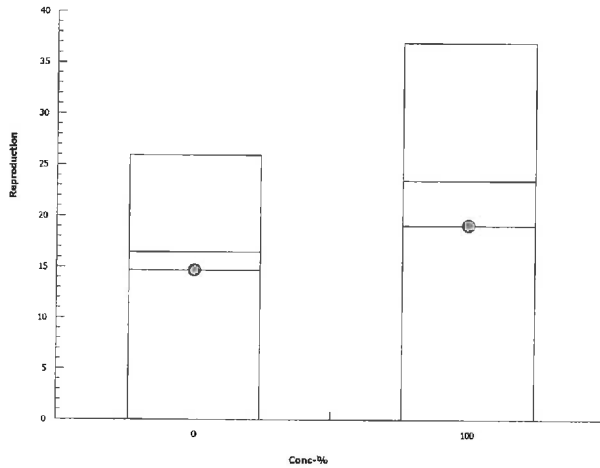
Analysis ID: 05-2134-3101
 Analyzed: 08 Sep-16 16:04
 Endpoint: Reproduction
 Analysis: Parametric Bioequivalence-Two Sample

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	17	16	15	20	26	20	0	0	22	11
100		0	30	23	20	31	24	0	0	26	37

Graphics



CETIS Analytical Report

Report Date: 18 Nov-16 15:15 (p 3 of 4)
Test Code: 1608072A.C | 14-6618-5338

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 19-1514-5973		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 08 Sep-16 16:03		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 06-3025-4205		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 31 Aug-16 15:56		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 07 Sep-16 14:33		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 23h		Source: In-House Culture		Age: 1-9h 8/31/16 (0704-1430)							
Sample ID: 00-6455-0102		Code: 480507		Client: Watershed Protection Division							
Sample Date: 30 Aug-16 13:20		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 30 Aug-16 16:00		Source: Stormwater (STORMWATER)									
Sample Age: 27h (20.2 °C)		Station: LAR02WAS									
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Day 1 data are the same as Day 2.											
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				
Dilution Water		100*	1.917	0.8662	15		0.0372				
							Decision(α:20%)				
							Non-Significant Effect				
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	0.8	0.8 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01370778	0.01370778	1	0.2432	0.6278	Non-Significant Effect					
Error	1.014376	0.05635422	18								
Total	1.028084	0.070062	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.313	6.541	0.6920	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.6333	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	0.8	0.6396	0.9604	0	1	0.1333	0.4216	52.7%	0.0%
100		10	0.7	0.5163	0.8837	0	1	0.1528	0.483	69.01%	12.5%
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	0.9425	0.8585	1.026	0.5236	1.047	0.06981	0.2208	23.42%	0.0%
100		10	0.8901	0.7939	0.9863	0.5236	1.047	0.07998	0.2529	28.41%	5.56%

CETIS Analytical Report

Report Date: 18 Nov-16 15:15 (p 4 of 4)
Test Code: 1608072A.C | 14-6618-5338

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 19-1514-5973
Analyzed: 08 Sep-16 16:03

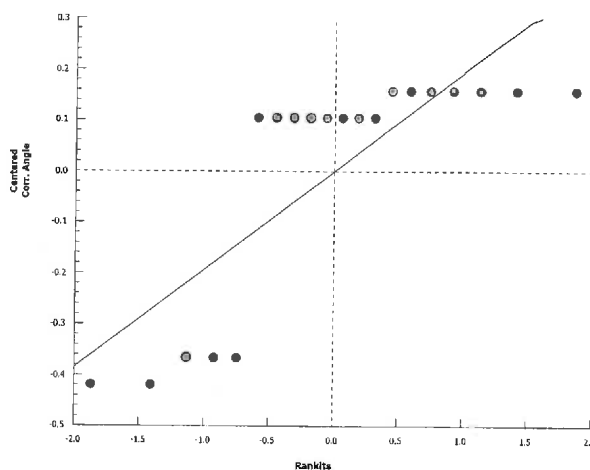
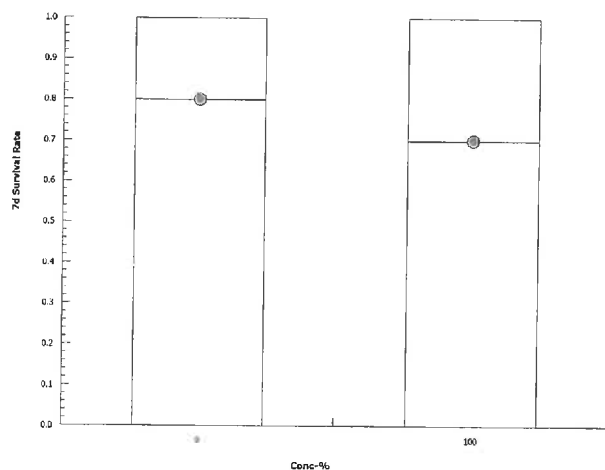
Endpoint: 7d Survival Rate
Analysis: Parametric Bioequivalence-Two Sample

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	0	0	1	1
100		0	1	1	1	1	1	0	0	1	1

Graphics



CETIS Test Data Worksheet

Report Date: 30 Aug-16 13:50 (p 1 of 1)
Test Code: 14-6618-5338/1608072A.C

Ceriodaphnia 7-d Survival and Reproduction Test												Hyperion Treatment Plant Laboratory	
Start Date: 31 Aug-16		Species: Ceriodaphnia dubia		Sample Code: 3D8F4D6									
End Date: 07 Sep-16		Protocol: EPA/821/R-02-013 (2002)		Sample Source: Stormwater									
Sample Date: 30 Aug-16		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	17	1	0	0	0	0	1	0	4	17	8d
0	D	2	30	1	0	0	0	1	0	0	6	16	12
0	D	3	6	1	0	0	0	[1	1]	3	9	15	9
0	D	4	4	1	0	0	0	4	0	0	7	20	(12)
0	D	5	23	1	0	0	0	0	0	1	12	26	9
0	D	6	35	1	0	0	0	4	0	0	5	20	13
0	D	7	29	1	0	0	0	0 X				0	11
0	D	8	19	1	0 X							0	
0	D	9	33	1	0	0	0	[2	1]	0	8	11	11
0	D	10	8	1	0	0	0	1	0	1	9	14	(4)
100		1	41	1	0	0	0 * X	X	X	X	X	0	(17)
100		2	48	1	0	0	0	4	10	0	16	30	(12)
100		3	40	1	0	0	0	4	7	12	0	23	(11)
100		4	31	1	0	0	0	4	4	0	12	20	(17)
100		5	9	1	0	0	0	3	10	0	18	31	(10)
100		6	45	1	0	0	0	2	7	0	15	22	
100		7	42	1	0 X							0	
100		8	46	1	0 X							0	
100		9	34	1	0	0	0	4	11	11	0	26	(13)
100		10	5	1	0	0	0	0	8	0	13	37	16
				8/31	9/11	9/12	9/13	9/14	9/15	9/16	9/17		

Food Added: 1520 1400 1015 1125 815 1331 1400 1253
Rc Rc Pb Pb Mg PL Rc Rc

Transferred: 1556 1459 1055 1200 930 1452 1452 1408
Rc Rc Pb Pb Mg PL Rc Rc

* 9/3 - animal dead, a piece of algae is stuck to animal.

CETIS Measurement Worksheet

Report Date: 30 Aug-16 13:50 (p 1 of 2)
Test Code: 1608072A.C | 14-6618-5338

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 31 Aug-16 Species: Ceriodaphnia dubia Sample Code: 3D8F4D6
End Date: 07 Sep-16 Protocol: EPA/821/R-02-013 (2002) Sample Source: Stormwater
Sample Date: 30 Aug-16 Material: Stormwater Monitoring Sample Sample Station: LAR02WAS

Alkalinity (CaCO₃)-mg/L

Conc-%	Code	Reading 1
0	D	AE - not measured.
100		152
Measure Time: 1148		
Instrument ID: Titrate		
Analyst: Rc		

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	326	316	336	329	318	330	326	325
100		1082	1057	1064	1054	1051	1051	1078	1084
Measure Time:		1441	1300	1000	1115	1045	1340	1332	1230
Instrument ID:		#2	#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	7.44	7.85	7.83	7.79	7.85	7.48	7.41	7.41
100		7.52	7.76	7.63	7.70	7.82	7.51	7.63	7.65
Measure Time:		1556	1115	1215	1045	1532	1610	1622	1640
Instrument ID:		#2	#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	7.60	7.48	7.81	7.68	7.59	7.77	7.53	7.48
100		8.15	8.34	8.32	8.37	8.59	8.88	8.22	8.42
Measure Time:		1441	1300	1000	1115	1045	1340	1332	1230
Instrument ID:		#2	#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc

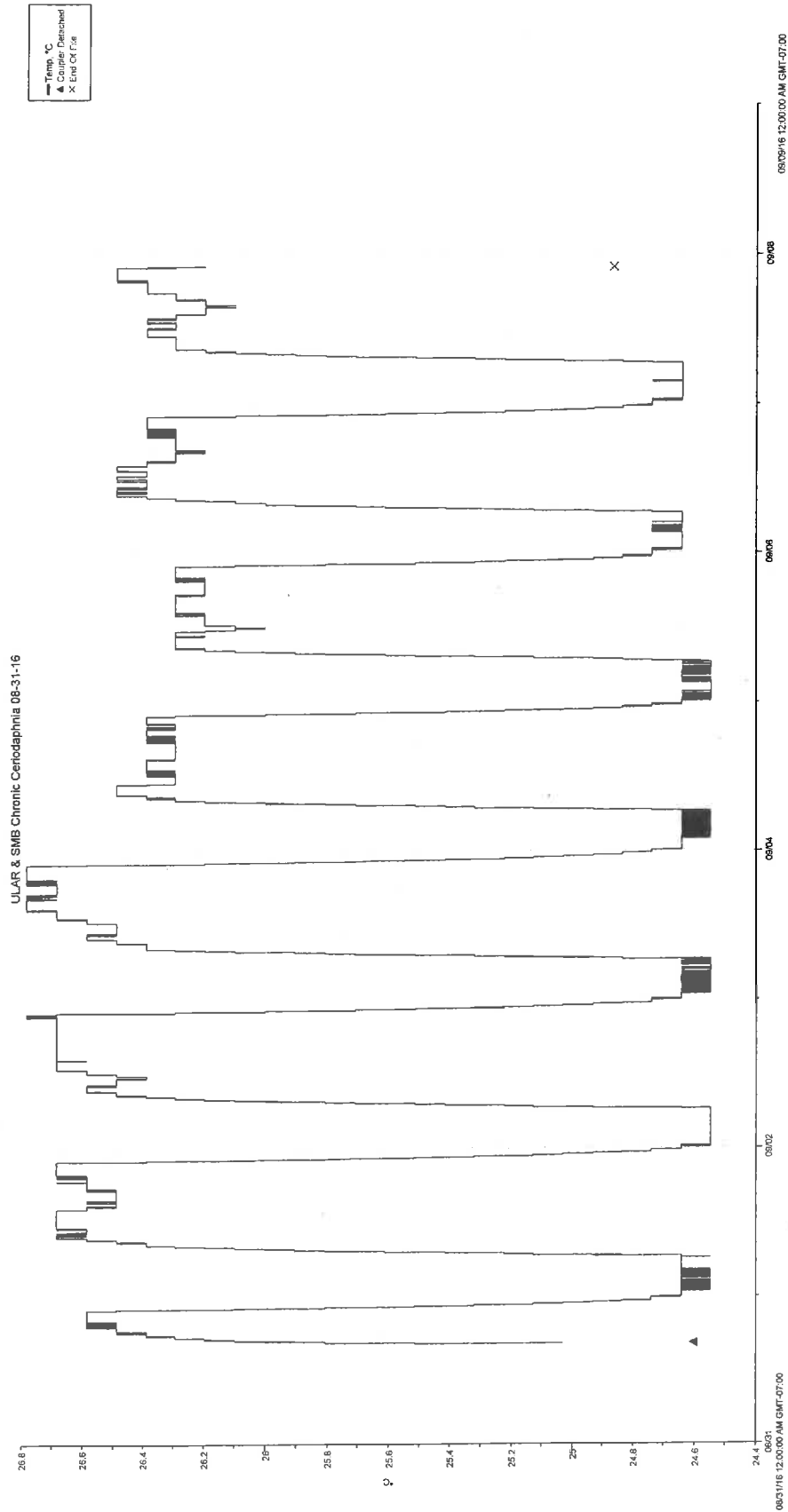
Conc-%	Code	Reading 1
0	D	AE - not measured.
100		216
Measure Time: 1202		
Instrument ID: Titrate		
Analyst: Rc		

Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	8.09	8.27	8.33	8.39	8.29	8.34	8.15	7.91
100		8.51	8.55	8.54	8.48	8.56	8.58	8.46	8.40
Measure Time:		1556	1115	1215	1045	1532	1610	1622	1640
Instrument ID:		#2	#2	#2	#2	#2	#2	#2	#2
Analyst:		Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc

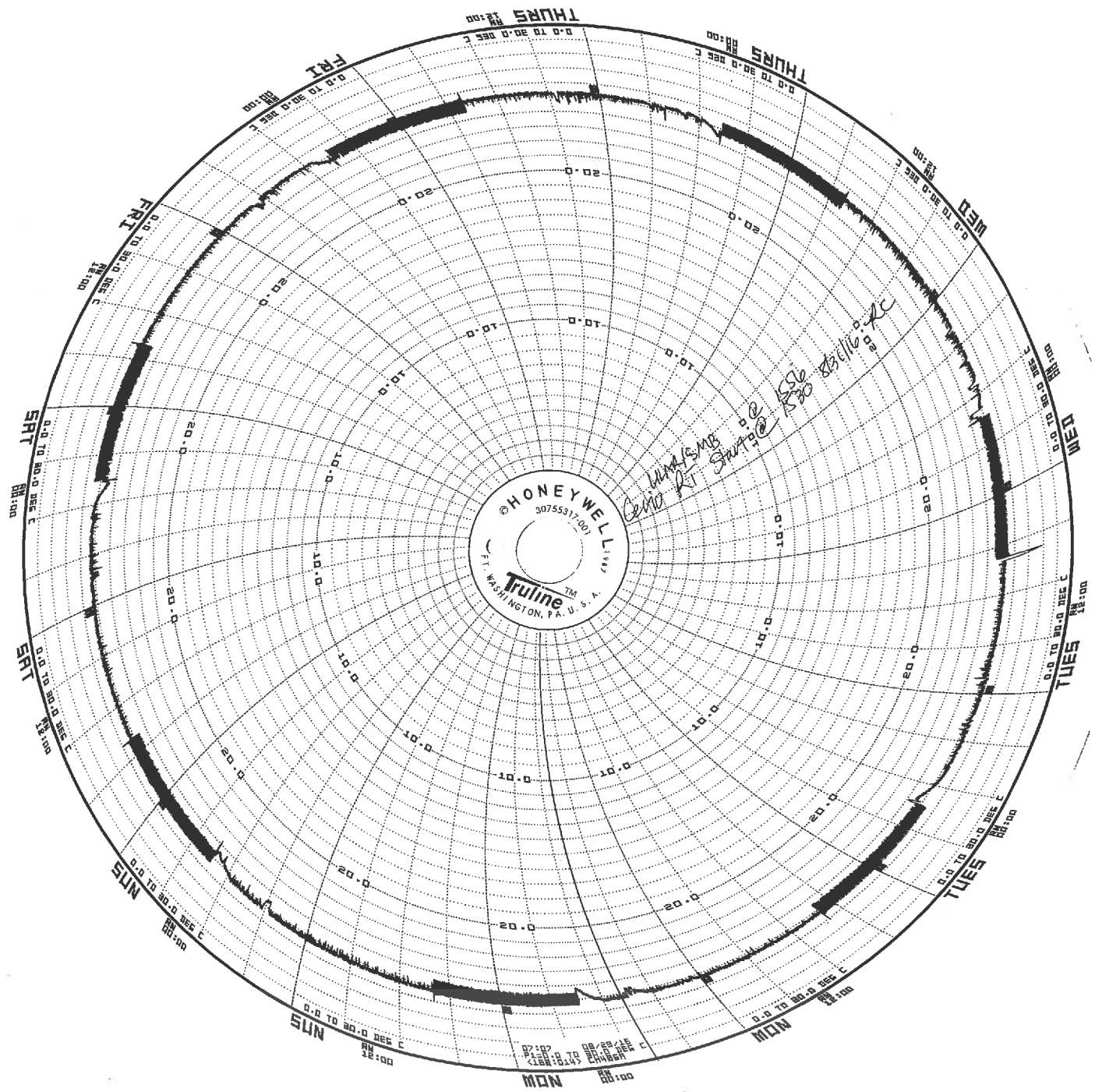
CETIS Measurement Worksheet

Report Date: 30 Aug-16 13:50 (p 2 of 2)
 Test Code: 1608072A.C | 14-6618-5338

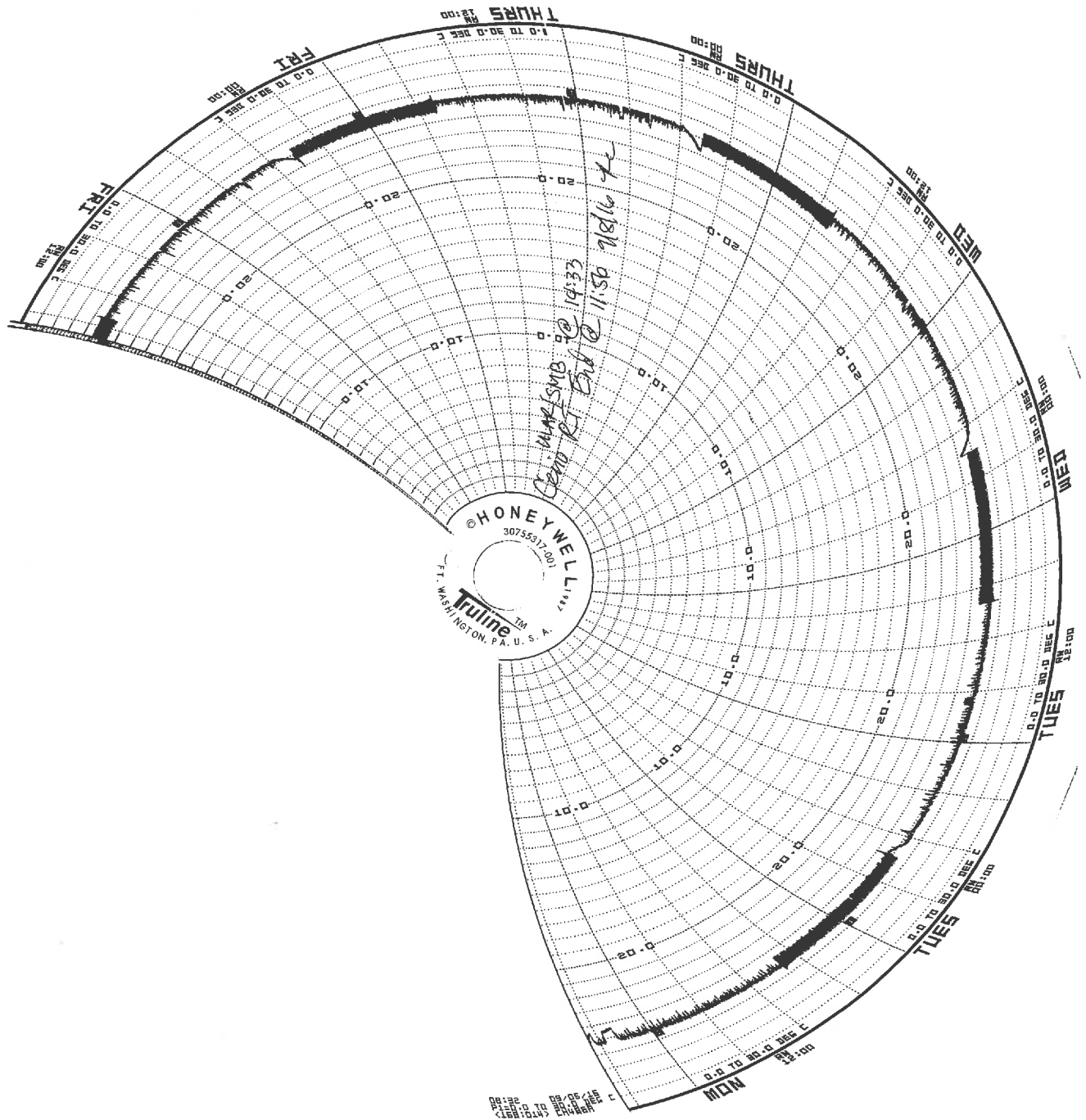
Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory
Start Date:		31 Aug-16		Species:		Ceriodaphnia dubia		Sample Code:		3D8F4D6
End Date:		07 Sep-16		Protocol:		EPA/821/R-02-013 (2002)		Sample Source:		Stormwater
Sample Date:		30 Aug-16		Material:		Stormwater Monitoring Sample		Sample Station:		LAR02WAS
Initial pH										
Conc.-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8	
0	D	8.31	8.32	8.08	8.33	8.35	8.64	8.50	8.47	
100		8.83	9.06	8.91	8.86	8.85	8.79	8.64	8.42	
Measure Time:		1441	1300	1600	1115	1045	1340	1332	1230	
Instrument ID:		#3	#2	#2	#2	#2	2	#2	#2	
Analyst:		PC	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	Reading 8	
0	D	24.8	25.2	24.9	24.6	24.4	25.2	25.1	24.9	
100		24.8	25.3	25.3	24.4	24.6	25.1	24.9	24.7	
Measure Time:		1556	1115	1215	1045	1532	1610	1622	1640	
Instrument ID:		#2	#2	#2	#2	2	#2	#2	#2	
Analyst:		PC	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	Reading 8	
0	D	24.8	25.3	25.2	25.1	24.4	24.0	25.1	25.2	
100		24.6	25.1	25.2	25.0	24.2	25.0	24.8	24.8	
Measure Time:		1441	1300	1000	1115	1045	1340	1332	1230	
Instrument ID:		#3	#2	#2	#2	#2	2	#2	#2	
Analyst:		PC	PC	PC	PC	PC	PC	PC	PC	



Test: 1608RT2A.C, 1608072A,B,D.C
Date: 8/31/16 (15:30) - 9/8/16 (14:33)



Test: 1608RT2A.C, 1608072A, B, D.C
 Date: 8/31/16 (15:30) - 9/8/16 (14:33)



Test: 1608RT2A.C, 1608072A, B, D.C
Date: 8/31/16 (15:30) - 9/1/16 (14:33)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: August 30, 2016

TEST DATE: August 31, 2016

TEST NUMBER: 1608072B.C

TEST MATERIAL: Station LAR04TUJ

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

REFERENCE TOXICANT TEST: 1608RT2A.C

RESULT:

Survival
Reproduction

Pass, -25% effect
Pass, -57.8% effect

Rea Mara A Crinklaw

Analyst

Rea Mara A Crinklaw

Signature

Water Biologist II

Title

12/5/16

Date

Kay Yamamoto

Supervisor

Kay M. Yamamoto

Signature

Water Biologist III

Title

12/7/16

Date

CETIS Summary Report

Report Date: 18 Nov-16 16:14 (p 1 of 1)
Test Code: 1608072B.C | 06-1816-2255

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Batch ID: 06-3025-4205	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 31 Aug-16 15:56	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water									
Ending Date: 07 Sep-16 14:33	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 23h	Source: In-House Culture	Age: 1-9h	8/31/16 (0704-1430)								
Sample ID: 20-5666-9249	Code: 480506	Client: Watershed Protection Division									
Sample Date: 30 Aug-16 08:20	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 30 Aug-16 16:00	Source: Stormwater (STORMWATER)										
Sample Age: 32h (18.9 °C)	Station: LAR04TUJ										
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	480506	30 Aug-16 08:20	30 Aug-16 16:00	01 Sep-16 14:59	18.9						
2	480506	30 Aug-16 08:20	30 Aug-16 16:00	02 Sep-16 10:55	18.9						
3	480506	30 Aug-16 08:20	30 Aug-16 16:00	03 Sep-16 12:00	18.9						
4	480506	30 Aug-16 08:20	30 Aug-16 16:00	04 Sep-16 09:30	18.9						
5	480506	30 Aug-16 08:20	30 Aug-16 16:00	05 Sep-16 15:00	18.9						
6	480506	30 Aug-16 08:20	30 Aug-16 16:00	06 Sep-16 14:08	18.9						
7	480506	30 Aug-16 08:20	30 Aug-16 16:00	06 Sep-16 14:52	18.9						
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Day 1 data are the same as Day 2.											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
02-7303-6035	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
13-1762-9097	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					
02-7303-6035	7d Survival Rate	Control Resp	0.8	0.8 - NL	Yes	Passes Acceptability Criteria					
13-1762-9097	Reproduction	Control Resp	14.7	15 - NL	Yes	Below Acceptability Criteria <i>OK</i>					
7d Survival Rate Summary <i>* Avg. young/surviving female = 14.7/8 = 18.4</i>											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	0.8	0.6426	0.9574	0	1	0.1333	0.4216	52.7%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	-25.0%
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	14.7	11.43	17.97	0	26	2.769	8.757	59.57%	0.0%
100		10	23.2	21.31	25.09	17	30	1.597	5.051	21.77%	-57.82%
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	0	0	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	17	16	15	20	26	20	0	0	22	11
100		28	18	25	24	18	17	29	30	18	25

CETIS Analytical Report

Report Date: 18 Nov-16 16:14 (p 1 of 4)
Test Code: 1608072B.C | 06-1816-2255

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 13-1762-9097		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 08 Sep-16 16:21		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 06-3025-4205		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 31 Aug-16 15:56		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 07 Sep-16 14:33		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 23h		Source: In-House Culture		Age: 1-9h		8/31/16 (0704-1430)					
Sample ID: 20-5666-9249		Code: 480506		Client: Watershed Protection Division							
Sample Date: 30 Aug-16 08:20		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 30 Aug-16 16:00		Source: Stormwater (STORMWATER)									
Sample Age: 32h (18.9 °C)		Station: LAR04TUJ									
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Day 1 data are the same as Day 2.											
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*	4.647	0.8647	16		0.0001	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	14.7	15 - NL	Yes	Below Acceptability Criteria							
Auxiliary Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	2.113	2.708	0.5136	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	361.25	361.25	1	7.07	0.0160	Significant Effect					
Error	919.7	51.09444	18								
Total	1280.95	412.3445	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	3.006	6.541	0.1167	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9289	0.866	0.1471	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	14.7	11.37	18.03	0	26	2.769	8.757	59.57%	0.0%
100		10	23.2	21.28	25.12	17	30	1.597	5.051	21.77%	-57.82%

CETIS Analytical Report

Report Date: 18 Nov-16 16:14 (p 2 of 4)

Test Code: 1608072B.C | 06-1816-2255

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 13-1762-9097

Endpoint: Reproduction

CETIS Version: CETISv1.8.1

Analyzed: 08 Sep-16 16:21

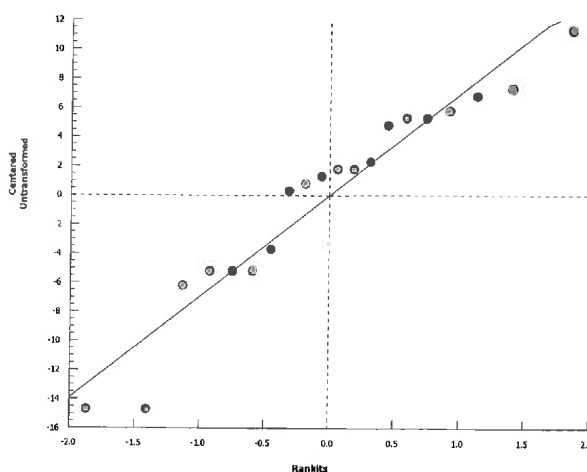
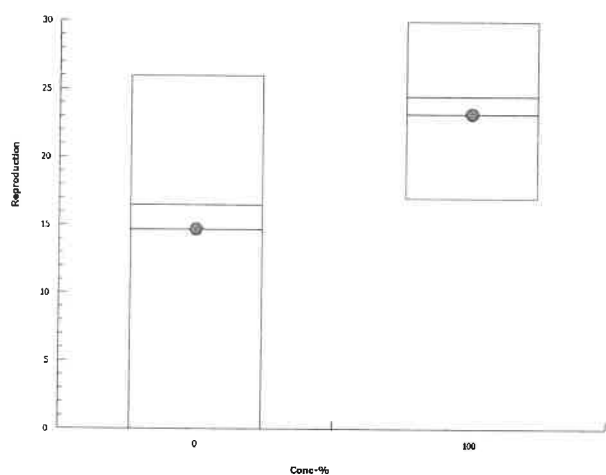
Analysis: Parametric Bioequivalence-Two Sample

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	17	16	15	20	26	20	0	0	22	11
100		28	18	25	24	18	17	29	30	18	25

Graphics



CETIS Analytical Report

Report Date: 18 Nov-16 16:14 (p 3 of 4)
Test Code: 1608072B.C | 06-1816-2255

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 02-7303-6035		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 08 Sep-16 16:21		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 06-3025-4205		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 31 Aug-16 15:56		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 07 Sep-16 14:33		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 23h		Source: In-House Culture		Age: 1-9h 8/31/16 (0704-1430)							
Sample ID: 20-5666-9249		Code: 480506		Client: Watershed Protection Division							
Sample Date: 30 Aug-16 08:20		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 30 Aug-16 16:00		Source: Stormwater (STORMWATER)									
Sample Age: 32h (18.9 °C)		Station: LAR04TUJ									
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Day 1 data are the same as Day 2.											
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*	6.5	0.8834	9		<0.0001	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	0.8	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	0.8	0.6396	0.9604	0	1	0.1333	0.4216	52.7%	0.0%
100		10	1	1	1	1	1	0	0	0.0%	-25.0%
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	0.9425	0.8585	1.026	0.5236	1.047	0.06981	0.2208	23.42%	0.0%
100		10	1.047	1.047	1.047	1.047	1.047	0	0	0.0%	-11.11%

CETIS Analytical Report

Report Date: 18 Nov-16 16:14 (p 4 of 4)
 Test Code: 1608072B.C | 06-1816-2255

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 02-7303-6035
 Analyzed: 08 Sep-16 16:21

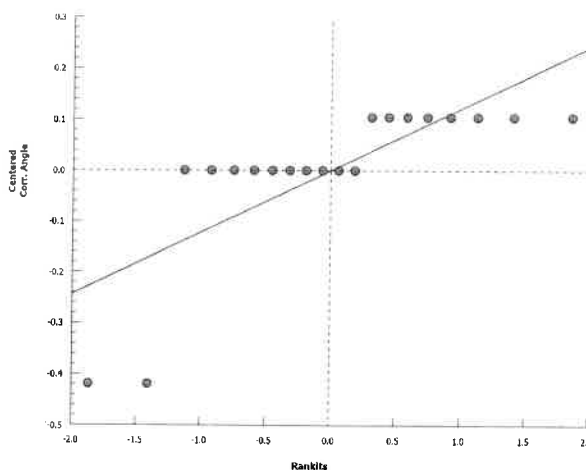
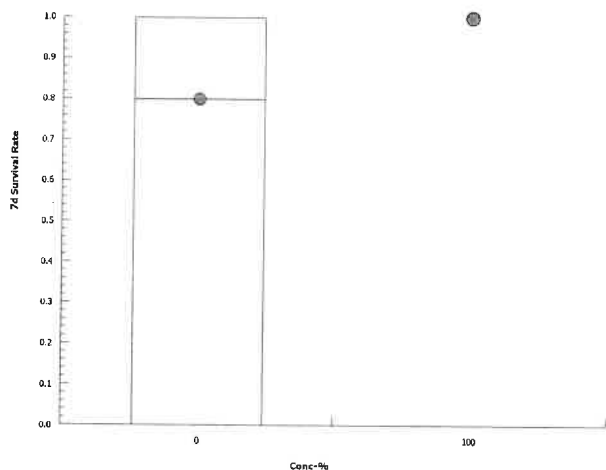
Endpoint: 7d Survival Rate
 Analysis: Parametric Bioequivalence-Two Sample

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	0	0	1	1
100		1	1	1	1	1	1	1	1	1	1

Graphics



CETIS Test Data Worksheet

Report Date: 30 Aug-16 13:51 (p 1 of 1)
Test Code: 06-1816-2255/1608072B.C

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory				
Start Date:	31 Aug-16	Species:	Ceriodaphnia dubia	Sample Code:	7A964841									
End Date:	07 Sep-16	Protocol:	EPA/821/R-02-013 (2002)	Sample Source:	Stormwater									
Sample Date:	30 Aug-16	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		1	0	0	0	0	1	0	4	17	
0	D	2		1	0	0	0	1	0	0	6	16	
0	D	3		1	0	0	0	[1	1]	3	10	15	
0	D	4		1	0	0	0	4	0	0	7	20	
0	D	5		1	0	0	0	0	0	1	12	26	
0	D	6		1	0	0	0	4	0	0	5	20	
0	D	7		1	0	0	0	0X				0	
0	D	8		1	0X							0	
0	D	9		1	0	0	0	[2	1]	0	8	22	
0	D	10		1	0	0	0	1	0	1	9	11	
100		1	43	1	0	0	0	4	8	0	16	28	
100		2	16	1	0	0	0	4	6	0	8	18	
100		3	7	1	0	0	0	4	5	0	16	25	
100		4	37	1	0	0	0	4	4	0	16	24	
100		5	50	1	0	0	0	2	8	0	8	18	
100		6	39	1	0	0	0	2	0	10	5	17	
100		7	1	1	0	0	0	2	8	0	19	29	
100		8	18	1	0	0	0	4	10	0	16	20	
100		9	21	1	0	0	0	4	5	0	9	18	
100		10	22	1	0	0	0	4	7	0	14	25	

8/31 9/1 9/2 9/3 9/4 9/5 9/6 9/7

Food Added: 1520 1400 1015 1125 815 1331 1400 1253
Fc Fc PG RA Ay OL Fc Fc

Transferred: 1536 1459 1055 1200 930 1500 1452 1408
Fc Fc PG RA Ay OL Fc Fc

8d
12
9
(12)
9
13
11
11
(4)
(19)
(15)
(16)
(15)
(19)
(17)
(16)
(14)
(14)
(15)
918
End @ 1433 Fc

CETIS Measurement Worksheet

Report Date: 30 Aug-16 13:51 (p 1 of 2)
Test Code: 1608072B.C | 06-1816-2255

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date: 31 Aug-16		Species: Ceriodaphnia dubia				Sample Code: 7A964841					
End Date: 07 Sep-16		Protocol: EPA/821/R-02-013 (2002)				Sample Source: Stormwater					
Sample Date: 30 Aug-16		Material: Stormwater Monitoring Sample				Sample Station: LAR04TUJ					

Alkalinity (CaCO3)-mg/L									
Conc-%	Code	Reading 1							
0	D	AB	-not measured						
100		116							
Measure Time:		1148							
Instrument ID:		Titrate							
Analyst:		TC							

Conductivity-µmhos									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	326	316	336	329	318	336	326	325
100		1024	1012	995	987	1008	1016	1014	1020
Measure Time:		1441	1300	1005	1115	1045	1340	1332	1230
Instrument ID:		#2	#2	#2	#2	#2	2	#2	#2
Analyst:		TC	TC	RB	RB	Ang	DL	TC	TC

Final Dissolved Oxygen-mg/L									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	7.44	7.85	7.83	7.79	7.65	7.48	7.41	7.41
100		7.38	7.78	7.62	7.79	7.61	7.58	7.60	7.70
Measure Time:		1556	1115	1215	1045	1532	1610	1622	1640
Instrument ID:		#2	#2	#2	#2	2	#2	#2	#2
Analyst:		TC	TC	RB	RB	Ang	DL	TC	TC

Initial Dissolved Oxygen-mg/L									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	7.60	7.48	7.81	7.68	7.59	7.77	7.53	7.48
100		8.15	8.36	8.37	8.53	8.39	8.36	8.38	8.91
Measure Time:		1441	1300	1005	1115	1045	1340	1332	1230
Instrument ID:		#2	#2	#2	#2	#2	2	#2	#2
Analyst:		TC	TC	RB	RB	Ang	DL	TC	TC

Hardness (CaCO3)-mg/L									
Conc-%	Code	Reading 1							
0	D	AE	-not measured						
100		156							
Measure Time:		1202							
Instrument ID:		Titrate							
Analyst:		TC							

Final pH									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	8.09	8.27	8.33	8.39	8.29	8.34	8.15	7.91
100		8.49	8.56	8.54	8.56	8.54	8.56	8.45	8.43
Measure Time:		1536	1115	1215	1045	1532	1610	1622	1640
Instrument ID:		#2	#2	#2	#2	2	#2	#2	#2
Analyst:		TC	RB	RB	Ang	DL	TC	TC	TC

CETIS Measurement Worksheet

Report Date: 30 Aug-16 13:51 (p 2 of 2)
Test Code: 1608072B.C | 06-1816-2255

Ceriodaphnia 7-d Survival and Reproduction Test

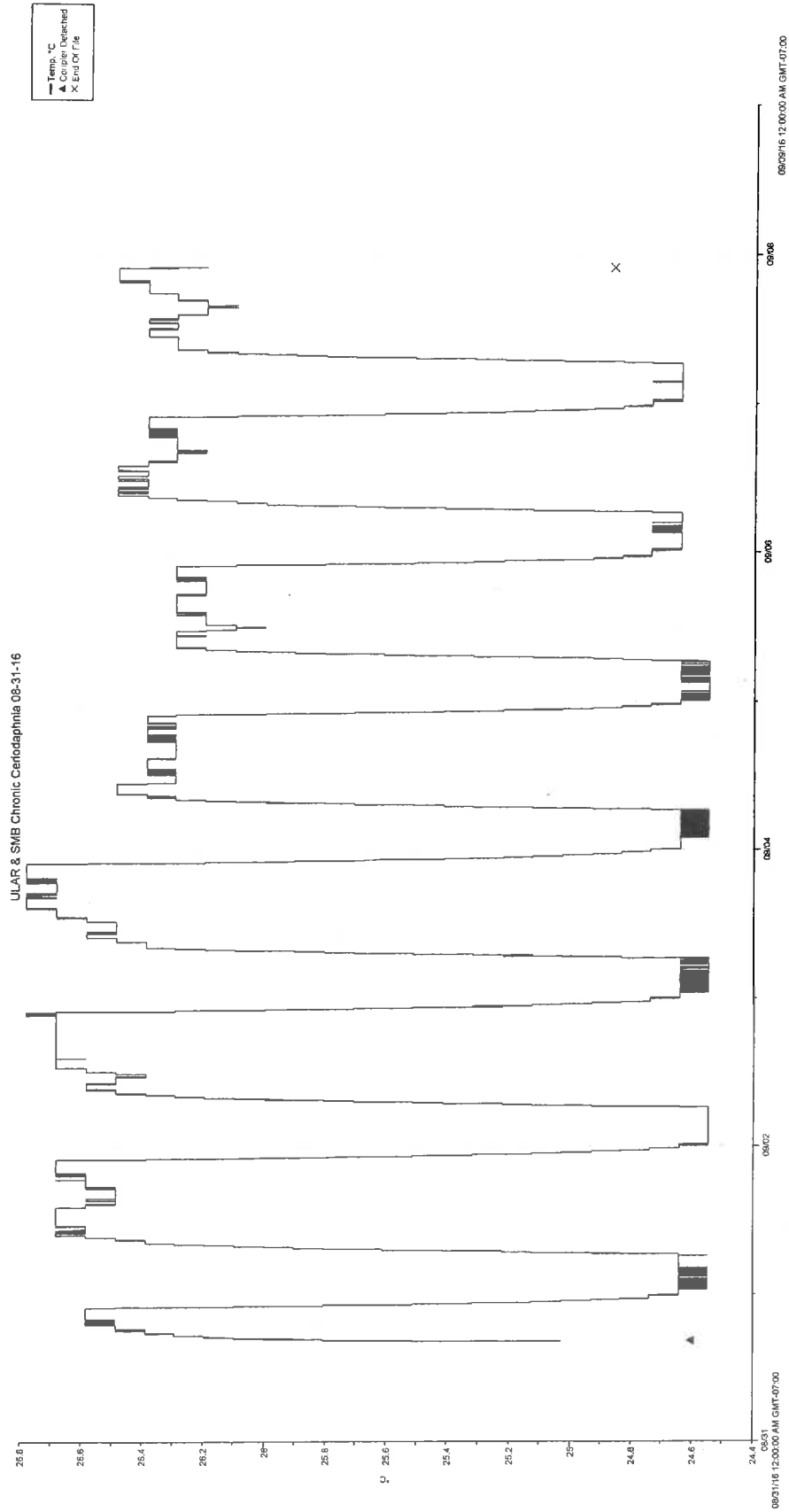
Hyperion Treatment Plant Laboratory

Start Date: 31 Aug-16 Species: Ceriodaphnia dubia Sample Code: 7A964841
End Date: 07 Sep-16 Protocol: EPA/821/R-02-013 (2002) Sample Source: Stormwater
Sample Date: 30 Aug-16 Material: Stormwater Monitoring Sample Sample Station: LAR04TUJ

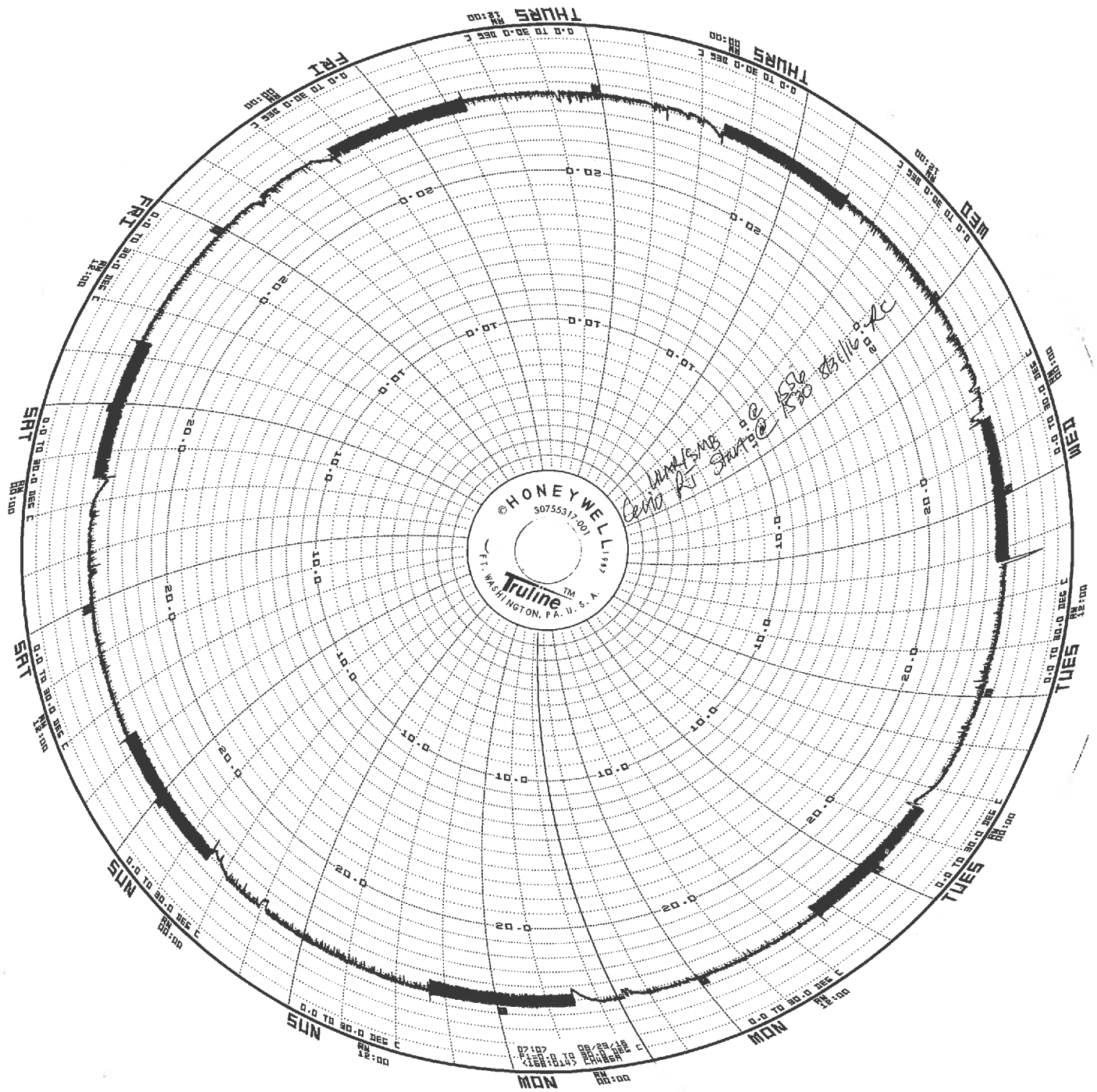
Initial pH		8/31	9/1	9/2	9/3	9/4	9/5	9/6	9/7
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	8.36	8.32	8.08	8.33	8.35	8.64	8.50	8.47
100		24.17	8.68	8.71	8.67	8.69	8.60	8.52	8.30
Measure Time:		1441	1300	1005	1115	1045	1340	1332	1230
Instrument ID:		#3	#2	#2	#2	#2	2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC	PC

Final Temperature-°C		9/1	9/2	9/3	9/4	9/5	9/6	9/7	9/8
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	24.8	25.2	24.9	24.6	24.4	25.2	25.1	24.9
100		24.8	25.2	25.0	24.1	24.7	25.0	24.8	24.6
Measure Time:		1556	1115	1215	1045	1532	1610	1622	1640
Instrument ID:		#2	#2	#2	#3	2	#2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC	PC

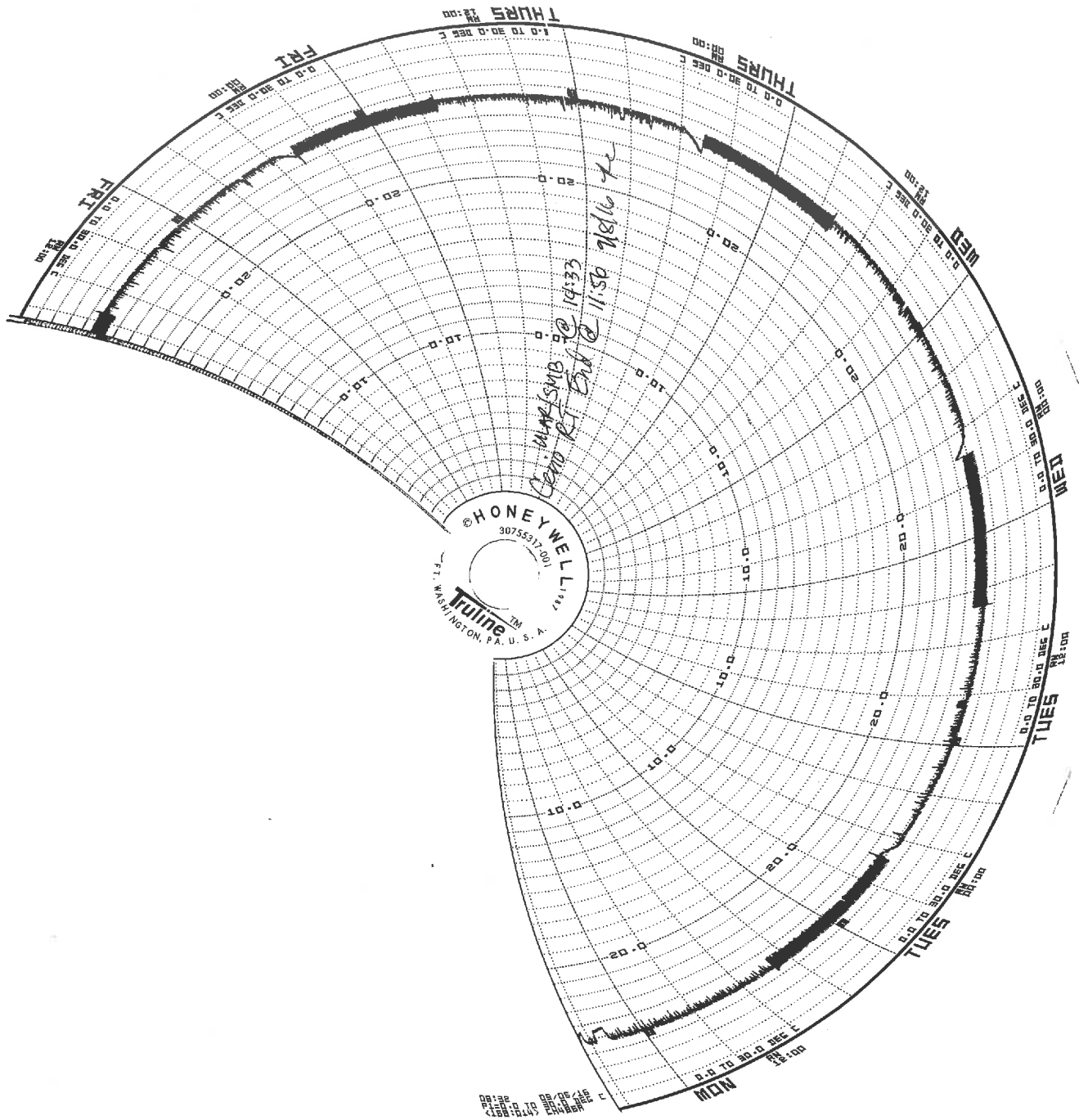
Initial Temperature-°C		8/31	9/1	9/2	9/3	9/4	9/5	9/6	9/7
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0	D	24.8	25.3	25.2	25.1	24.4	24.0	25.1	25.2
100		8.83	25.1	25.2	25.0	24.2	24.0	24.8	24.7
Measure Time:		1441	1300	1005	1115	1045	1340	1332	1230
Instrument ID:		#3	#2	#2	#2	#2	2	#2	#2
Analyst:		PC	PC	PC	PC	PC	PC	PC	PC



Test: 1608RT2A.C, 1608072A,B,D.C
Date: 8/31/16 (15:30) - 9/8/16 (14:33)



Test: 1608RT2A.C, 1608072A, B, D.C
Date: 8/31/16 (15:30) - 9/8/16 (14:33)



Test: 1608RT 2A.C, 1608072A, B, D.C
Date: 8/31/16 (15:30) - 9/18/16 (14:33)

ENVIRONMENTAL MONITORING DIVISION
BUREAU OF SANITATION
CITY OF LOS ANGELES

STORMWATER MONITORING PROGRAM

TOXICITY TESTING REPORT

SAMPLE DATE: August 31, 2016

TEST DATE: August 31, 2016

TEST NUMBER: 1608072D.C

TEST MATERIAL: Station RW-SMB-2

TEST SPECIES: *Ceriodaphnia dubia*

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

TEST TYPE: Chronic

REFERENCE TOXICANT TEST: 1608RT2A.C

RESULT:

Survival
Reproduction

Pass, -12.5% effect
Fail, 17.7% effect

Rea Mara A Crinklaw
Analyst

Rea Mara A Crinklaw
Signature

Water Biologist II
Title

12/5/16
Date

Kay Yamamoto
Supervisor

Kay M. Yamamoto
Signature

Water Biologist III
Title

12/7/16
Date

CETIS Summary Report

Report Date: 26 Oct-16 16:00 (p 1 of 1)
Test Code: 1608072D.C | 15-8662-8670

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Batch ID: 06-3025-4205	Test Type: Reproduction-Survival (7d)	Analyst: Rea Mara Crinklaw									
Start Date: 31 Aug-16 15:56	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water									
Ending Date: 07 Sep-16 14:33	Species: Ceriodaphnia dubia	Brine:									
Duration: 6d 23h	Source: In-House Culture	Age: 1-9h	8/31/16 (0704-1430)								
Sample ID: 12-8415-5701	Code: 481501	Client: Watershed Protection Division									
Sample Date: 31 Aug-16 10:05	Material: Stormwater Monitoring Sample	Project: MS4									
Receive Date: 31 Aug-16 13:53	Source: Stormwater (STORMWATER)										
Sample Age: 6h (18.8 °C)	Station: RW-SMB-2										
Sample Renewals											
Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C						
1	481501	31 Aug-16 10:05	31 Aug-16 13:53	01 Sep-16 14:59	18.8						
2	481501	31 Aug-16 10:05	31 Aug-16 13:53	02 Sep-16 10:55	18.8						
3	481501	31 Aug-16 10:05	31 Aug-16 13:53	03 Sep-16 12:00	18.8						
4	481501	31 Aug-16 10:05	31 Aug-16 13:53	04 Sep-16 09:30	18.8						
5	481501	31 Aug-16 10:05	31 Aug-16 13:53	05 Sep-16 15:09	18.8						
6	481501	31 Aug-16 10:05	31 Aug-16 13:53	06 Sep-16 14:52	18.8						
7	481501	31 Aug-16 10:05	31 Aug-16 13:53	07 Sep-16 14:08	18.8						
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Day 1 data are the same as Day 2.											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
06-9660-1004	7d Survival Rate	100	>100	N/A	N/A	1	TST-Welch's t Test				
18-5502-3096	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					
06-9660-1004	7d Survival Rate	Control Resp	0.8	0.8 - NL	Yes	Passes Acceptability Criteria					
18-5502-3096	Reproduction	Control Resp	14.7	15 - NL	Yes	Below Acceptability Criteria * OK					
7d Survival Rate Summary * Avg. young/surviving female = 147/8 = 18.4											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	0.8	0.6426	0.9574	0	1	0.1333	0.4216	52.7%	0.0%
100		10	0.9	0.7819	1	0	1	0.1	0.3162	35.14%	-12.5%
Reproduction Summary											
Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	14.7	11.43	17.97	0	26	2.769	8.757	59.57%	0.0%
100		10	12.1	8.772	15.43	0	29	2.818	8.913	73.66%	17.69%
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	0	0	1	1
100		1	1	1	1	1	1	1	0	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	17	16	15	20	26	20	0	0	22	11
100		6	20	11	29	8	2	12	0	13	20

CETIS Analytical Report

Report Date: 26 Oct-16 16:00 (p 1 of 4)
Test Code: 1608072D.C | 15-8662-8670

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 18-5502-3096		Endpoint: Reproduction		CETIS Version: CETISv1.8.1							
Analyzed: 08 Sep-16 16:05		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 06-3025-4205		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 31 Aug-16 15:56		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 07 Sep-16 14:33		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 23h		Source: In-House Culture		Age: 1-9h		8/31/16 (0704-1430)					
Sample ID: 12-8415-5701		Code: 481501		Client: Watershed Protection Division							
Sample Date: 31 Aug-16 10:05		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 31 Aug-16 13:53		Source: Stormwater (STORMWATER)									
Sample Age: 6h (18.8 °C)		Station: RW-SMB-2									
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Day 1 data are the same as Day 2.											
Data Transform	Zeta	Alt Hyp	MC Trials	TST b	Test Result						
Untransformed	0	C*b > T	Not Run	0.75	Sample fails reproduction endpoint						
TST-Welch's t Test											
Control	vs	Conc-%	Test Stat	Critical	DF	MSD	P-Value	Decision(α:20%)			
Dilution Water		100	0.3071	0.8647	16		0.3814	Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	14.7	15 - NL	Yes	Below Acceptability Criteria <i>✓ OK</i>							
Auxiliary Tests <i>* Avg. young / surviving female = $\frac{147}{8} = 18.4$</i>											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)						
Extreme Value	0	1.965	2.708	0.8001	No Outliers Detected						
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	33.8	33.8	1	0.433	0.5188	Non-Significant Effect					
Error	1405	78.05556	18								
Total	1438.8	111.8556	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.036	6.541	0.9589	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.9704	0.866	0.7642	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	14.7	11.37	18.03	0	26	2.769	8.757	59.57%	0.0%
100		10	12.1	8.71	15.49	0	29	2.818	8.913	73.66%	17.69%

CETIS Analytical Report

Report Date: 26 Oct-16 16:00 (p 2 of 4)
 Test Code: 1608072D.C | 15-8662-8670

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 18-5502-3096
 Analyzed: 08 Sep-16 16:05

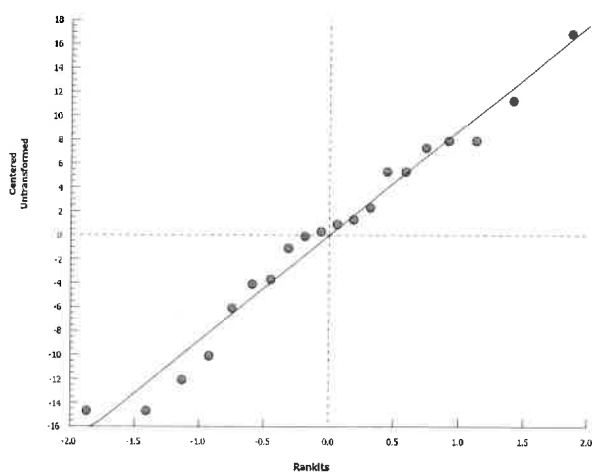
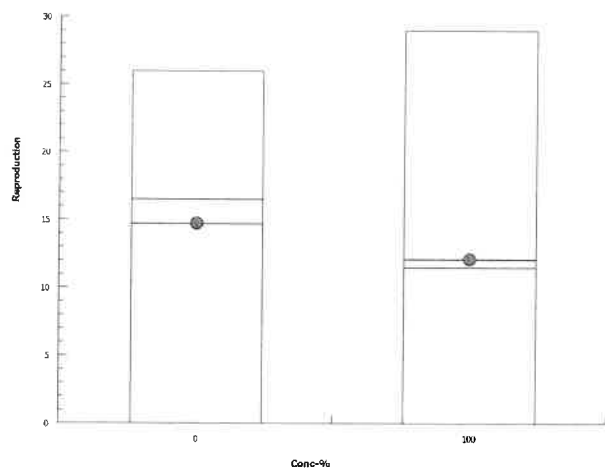
Endpoint: Reproduction
 Analysis: Parametric Bioequivalence-Two Sample

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	17	16	15	20	26	20	0	0	22	11
100		6	20	11	29	8	2	12	0	13	20

Graphics



CETIS Analytical Report

Report Date: 26 Oct-16 16:00 (p 3 of 4)

Test Code: 1608072D.C | 15-8662-8670

Ceriodaphnia 7-d Survival and Reproduction Test						Hyperion Treatment Plant Laboratory					
Analysis ID: 06-9660-1004		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.1							
Analyzed: 08 Sep-16 16:05		Analysis: Parametric Bioequivalence-Two Sample		Official Results: Yes							
Batch ID: 06-3025-4205		Test Type: Reproduction-Survival (7d)		Analyst: Rea Mara Crinklaw							
Start Date: 31 Aug-16 15:56		Protocol: EPA/821/R-02-013 (2002)		Diluent: Mod-Hard Synthetic Water							
Ending Date: 07 Sep-16 14:33		Species: Ceriodaphnia dubia		Brine:							
Duration: 6d 23h		Source: In-House Culture		Age: 1-9h 8/31/16 (0704-1430)							
Sample ID: 12-8415-5701		Code: 481501		Client: Watershed Protection Division							
Sample Date: 31 Aug-16 10:05		Material: Stormwater Monitoring Sample		Project: MS4							
Receive Date: 31 Aug-16 13:53		Source: Stormwater (STORMWATER)									
Sample Age: 6h (18.8 °C)		Station: RW-SMB-2									
Batch Note: Test ended on Day 8. Survival data entered into CETIS represent Day 2 - Day 8. Day 1 data are the same as Day 2.											
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*	3.889	0.862	18		0.0005	Non-Significant Effect			
Test Acceptability Criteria											
Attribute	Test Stat	TAC Limits	Overlap	Decision							
Control Resp	0.8	0.8 - NL	Yes	Passes Acceptability Criteria							
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	0.01370778	0.01370778	1	0.36	0.5560	Non-Significant Effect					
Error	0.6853892	0.03807718	18								
Total	0.699097	0.05178496	19								
Distributional Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variances	Variance Ratio F	1.778	6.541	0.4043	Equal Variances						
Distribution	Shapiro-Wilk W Normality	0.5442	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	0.8	0.6396	0.9604	0	1	0.1333	0.4216	52.7%	0.0%
100		10	0.9	0.7797	1	0	1	0.1	0.3162	35.14%	-12.5%
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	0.9425	0.8585	1.026	0.5236	1.047	0.06981	0.2208	23.42%	0.0%
100		10	0.9948	0.9319	1.058	0.5236	1.047	0.05236	0.1656	16.64%	-5.56%

CETIS Analytical Report

Report Date: 26 Oct-16 16:00 (p 4 of 4)

Test Code: 1608072D.C | 15-8662-8670

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Analysis ID: 06-9660-1004

Endpoint: 7d Survival Rate

CETIS Version: CETISv1.8.1

Analyzed: 08 Sep-16 16:05

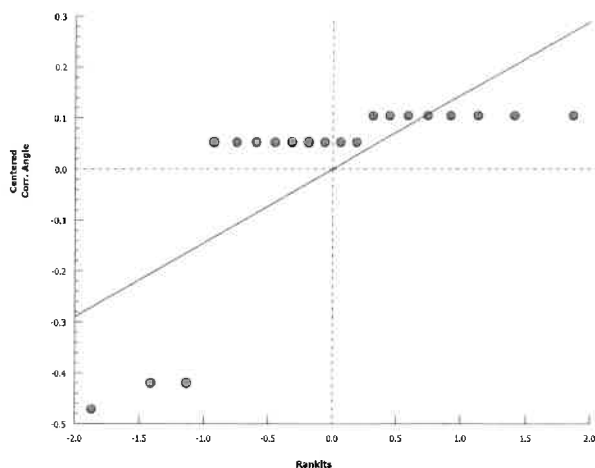
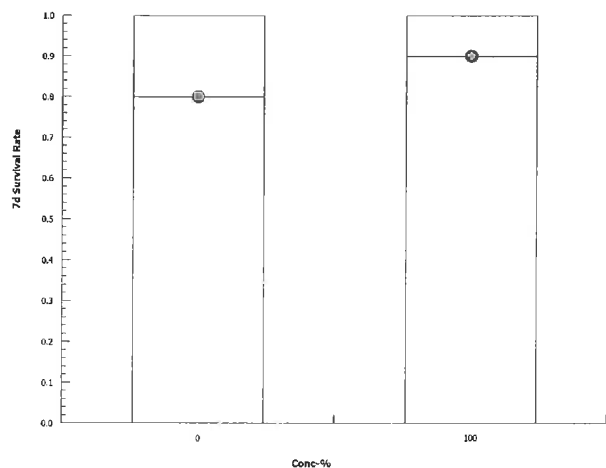
Analysis: Parametric Bioequivalence-Two Sample

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	0	0	1	1
100		1	1	1	1	1	1	1	0	1	1

Graphics



CETIS Test Data Worksheet

Report Date: 30 Aug-16 13:52 (p 1 of 1)
Test Code: 15-8662-8670/1608072D.C

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

Start Date: 31 Aug-16 ¹⁵⁵⁶
End Date: 07 Sep-16 ¹⁴³³
Sample Date: 31 Aug-16
Species: Ceriodaphnia dubia
Protocol: EPA/821/R-02-013 (2002)
Material: Stormwater Monitoring Sample

Sample Code: 4C8AA935
Sample Source: Stormwater
Sample Station: RW-SMB-2

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male
0		1		1	0	0	0	0	1	0	4	17	8d
0		2		1	0	0	0	1	0	0	6	16	12
0		3		1	0	0	0	[1	1]	3	10	15	9
0		4		1	0	0	0	4	0	0	7	20	(12)
0		5		1	0	0	0	0	0	1	12	26	9
0		6		1	0	0	0	4	0	0	5	20	13
0		7		1	0	0	0	0X				0	11
0		8		1	0X							0	
0		9		1	0	0	0	[2	1]	0	8	22	11
0		10		1	0	0	0	1	0	1	9	11	11
100		1	15	1	0	0	0	2	0	3	1	15	10
100		2	24	1	0	0	0	2	7	11	0	20	(10)
100		3	2	1	0	0	0	[1	1]	2	7	11	(15)
100		4	11	1	0	0	0	0	5	0	11	29	13
100		5	12	1	0	0	0	0	1	0	7	8	0
100		6	25	1	0	0	0	0	0	1	1	2	0
100		7	28	1	0	0	0	2	2	0	8	12	(13)
100		8	3	1	0X							0	
100		9	32	1	0	0	0	4	0	0	0	13	9
100		10	49	1	0	0	0	0	4	0	6	20	10
				8/31	9/1	9/2	9/3	9/4	9/5	9/6	9/7		9/8

Food Added: 1520 ¹⁴⁰⁰ 1015 ¹¹²⁵ 815 ¹³³¹ 1400 ¹²⁵³
 ^{Re} ^{Re} ^{Re} ^{Re} ^{Re} ^{Re} ^{Re}

Transferred: 1556 ¹⁴⁵⁹ 1055 ¹²⁰⁰ 930 ¹⁵⁰⁹ 1452 ¹⁴⁰⁸
 ^{Re} ^{Re} ^{Re} ^{Re} ^{Re} ^{Re} ^{Re}

} 1d survival data not entered in CETIS, started with 2d survival in CETIS.

Ceriodaphnia 7-d Survival and Reproduction Test										Hyperion Treatment Plant Laboratory	
Start Date: 31 Aug-16		Species: Ceriodaphnia dubia				Sample Code: 4C8AA935					
End Date: 07 Sep-16		Protocol: EPA/821/R-02-013 (2002)				Sample Source: Stormwater					
Sample Date: 31 Aug-16		Material: Stormwater Monitoring Sample				Sample Station: RW-SMB-2					

Alkalinity (CaCO3)-mg/L									
Conc-%	Code	Reading 1							
0		AE	not measured						
100		252							
Measure Time:		1148	} 10/26/16						
Instrument ID:		titrate							
Analyst:		rc							

Conductivity-umhos									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0		326	316	336	329	318	336	326	325
100		1379	1414	1385	1391	1413	1417	1421	1438
Measure Time:		1441	1300	1005	1115	1045	1340	1332	1230
Instrument ID:		#2	#2	#2	#2	#2	2	#2	#2
Analyst:		rc	rc	rc	rc	rc	DL	rc	rc

Final Dissolved Oxygen-mg/L									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0		7.44	7.85	7.83	7.79	7.65	7.48	7.41	7.41
100		7.64	7.86	7.78	7.81	7.67	7.59	7.62	7.74
Measure Time:		1556	1115	1245	1045	1532	1610	1622	1640
Instrument ID:		#2	#2	#2	#2	2	#2	#2	#2
Analyst:		rc	rc	rc	rc	DL	rc	rc	rc

Initial Dissolved Oxygen-mg/L									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0		7.60	7.48	7.81	7.68	7.59	7.77	7.53	7.48
100		8.51	8.37	8.39	8.45	8.62	8.55	8.42	8.80
Measure Time:		1441	1300	1005	1115	1045	1340	1332	1230
Instrument ID:		#2	#2	#2	#2	#2	2	#2	#2
Analyst:		rc	rc	rc	rc	rc	DL	rc	rc

Hardness (CaCO3)-mg/L									
Conc-%	Code	Reading 1							
0		AE	not measured						
100		484							
Measure Time:		1202	} 10/26/16						
Instrument ID:		titrate							
Analyst:		rc							

Final pH									
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0		8.09	8.27	8.33	8.39	8.29	8.34	8.15	7.91
100		8.76	8.78	8.76	8.81	8.79	8.78	8.66	8.43
Measure Time:		1556	1115	1245	1045	1532	1610	1622	1640
Instrument ID:		#2	#2	#2	#2	2	#2	#2	#2
Analyst:		rc	rc	rc	rc	DL	rc	rc	rc

CETIS Measurement Worksheet

Report Date: 30 Aug-16 13:52 (p 2 of 2)
 Test Code: 1608072D.C | 15-8662-8670

Ceriodaphnia 7-d Survival and Reproduction Test

Hyperion Treatment Plant Laboratory

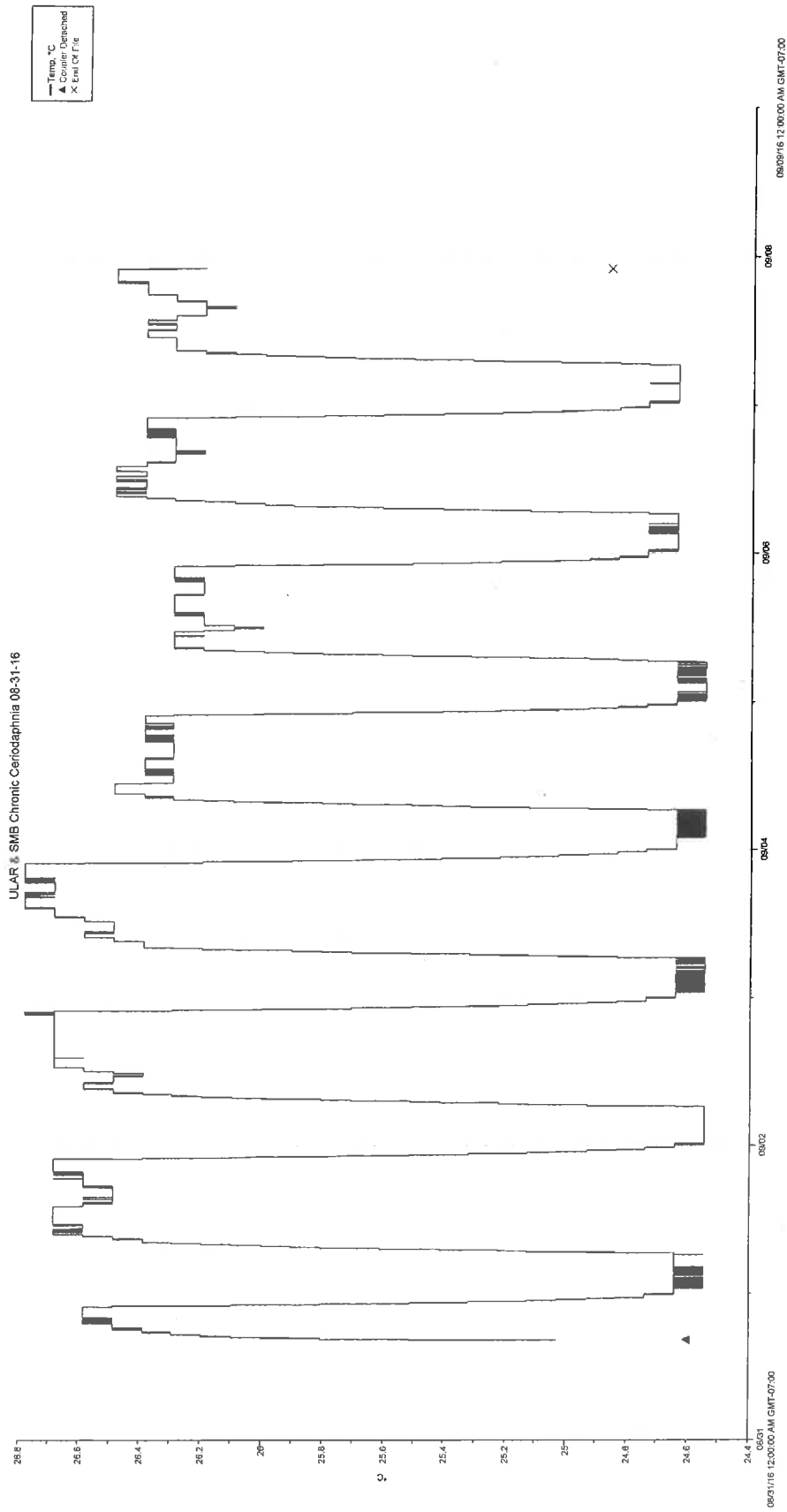
Start Date: 31 Aug-16 Species: Ceriodaphnia dubia Sample Code: 4C8AA935
 End Date: 07 Sep-16 Protocol: EPA/821/R-02-013 (2002) Sample Source: Stormwater
 Sample Date: 31 Aug-16 Material: Stormwater Monitoring Sample Sample Station: RW-SMB-2

Initial pH		8/31	9/1	9/2	9/3	9/4	9/5	9/6	9/7
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0		8.36	8.32	8.08	8.33	8.35	8.64	8.50	8.47
100		8.82	8.81	8.75	8.70	8.74	8.75	8.66	8.54
Measure Time:		1441	1300	1005	1115	1045	1340	1332	1230
Instrument ID:		#3	#2	#2	#2	#2	2	#2	#2
Analyst:		Re	Re	Re	Re	Re	DL	Re	Re

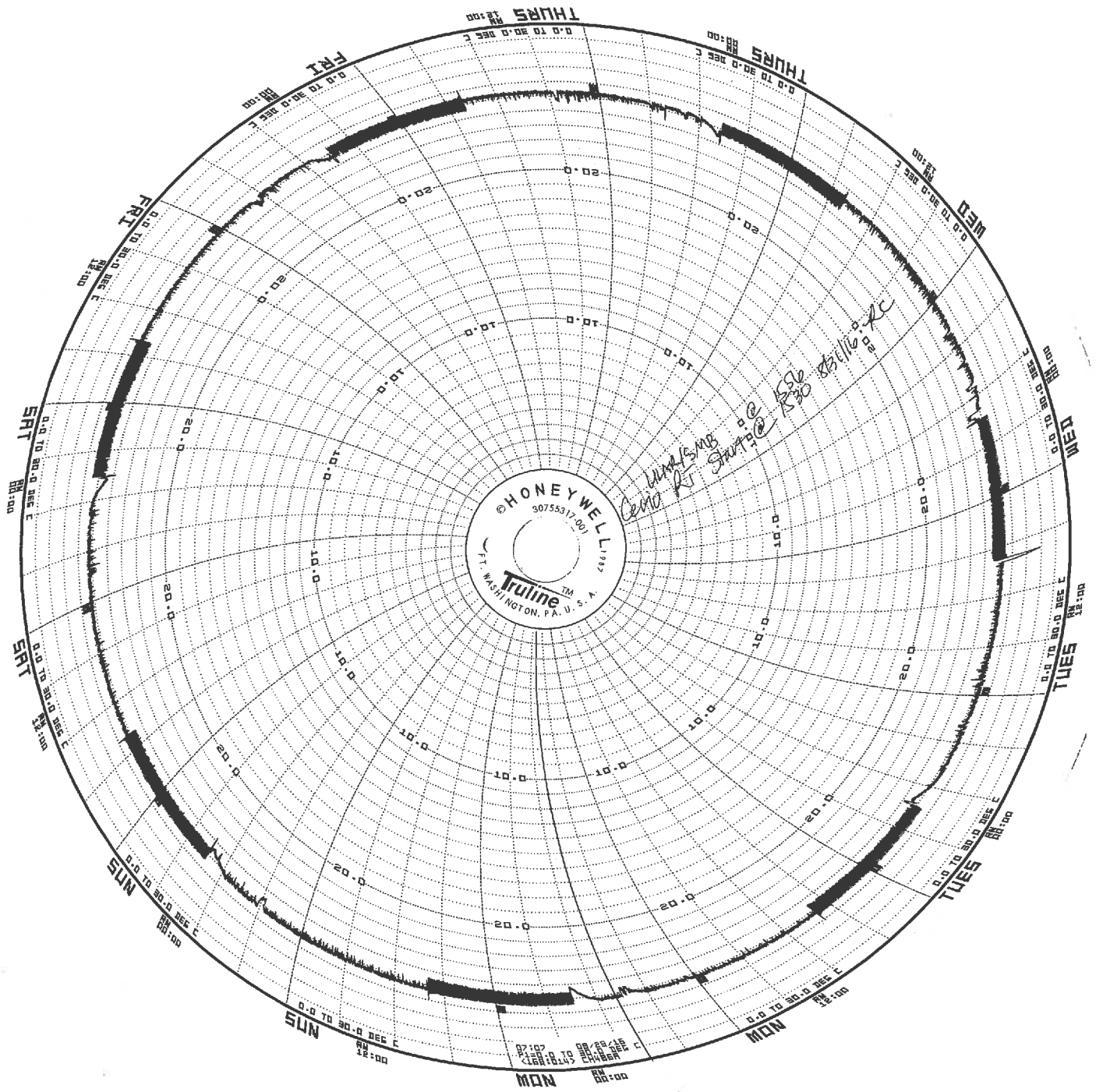
Final Temperature-°C		9/1	9/2	9/3	9/4	9/5	9/6	9/7	9/8
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0		24.8	25.2	24.9	24.6	24.4	25.2	25.1	24.9
100		24.8	25.4	24.9	24.0	24.7	24.8	24.8	24.5
Measure Time:		1556	1115	1215	1045	1532	1610	1622	1640
Instrument ID:		#2	#2	#2	#2	2	#2	#2	#2
Analyst:		Re	Re	Re	Re	DL	Re	Re	Re

Re 9/8/10

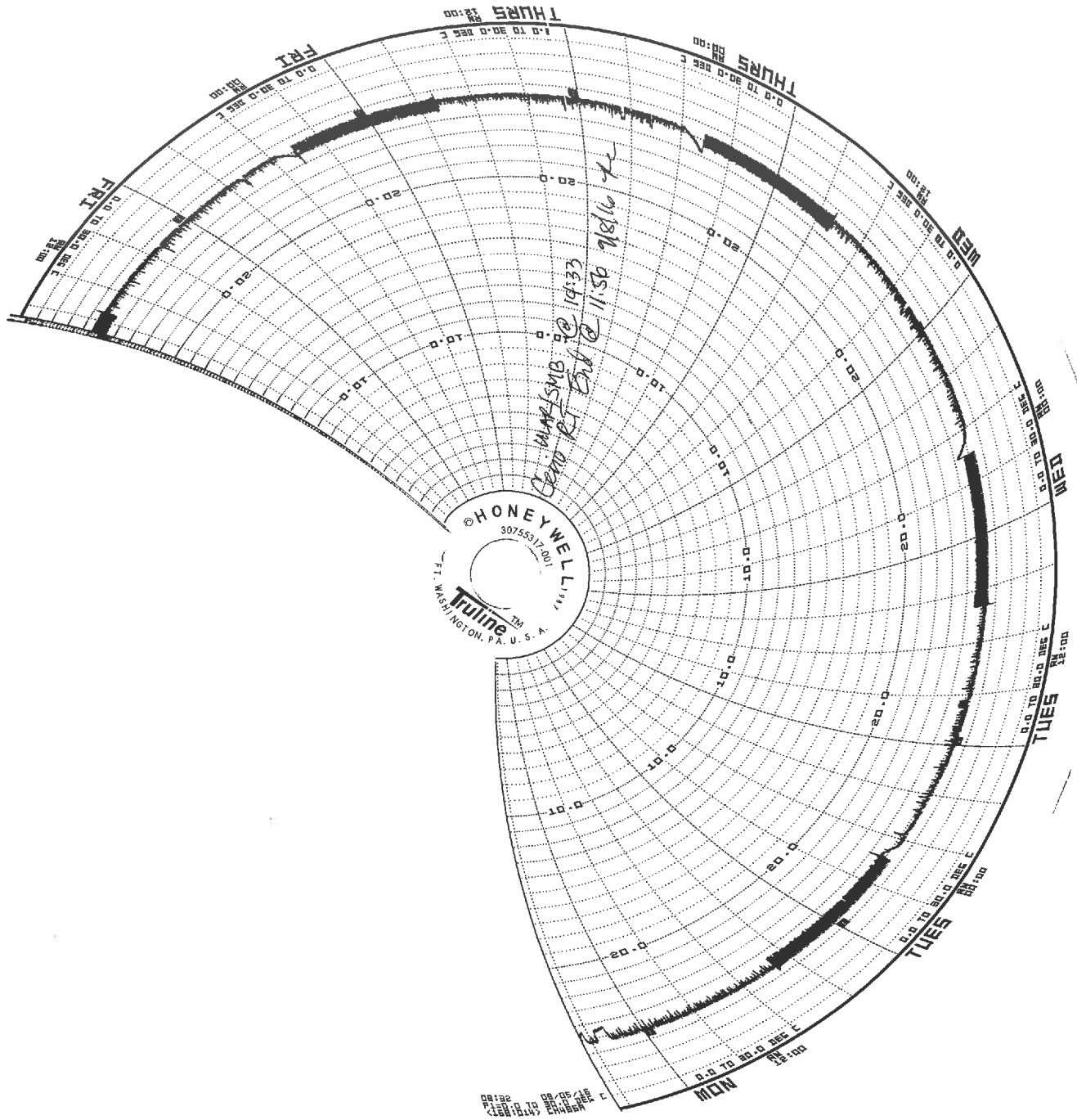
Initial Temperature-°C		8/31	9/1	9/2	9/3	9/4	9/5	9/6	9/7
Conc-%	Code	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6	Reading 7	Reading 8
0		24.8	25.3	25.2	25.1	24.4	24.0	25.1	25.2
100		24.3	25.0	25.2	24.9	24.1	24.0	24.8	24.8
Measure Time:		1441	1300	1005	1115	1045	1340	1332	1230
Instrument ID:		#3	#2	#2	#2	#2	2	#2	#2
Analyst:		Re	Re	Re	Re	Re	DL	Re	Re



Test: 1608RT2A.C, 1608072A,B,D.C
Date: 8/31/16 (15:30) - 9/1/16 (14:33)



Test: 1608RT2A.C, 1608072A,B,D.C
Date: 8/31/16 (15:30) - 9/18/16 (14:33)



Test: 1608RT2A.C, 1608072A, B, D.C
Date: 8/31/16 (15:30) - 9/8/16 (14:33)