

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 17-18

***RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia*
AND *Pimephales promelas* ON A MAY 2017 EFFLUENT SAMPLE
FROM METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)***

June 2017

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, Illinois 60611-2803 (312) 751-5600

RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia* AND *Pimephales promelas* ON A MAY 2017 EFFLUENT SAMPLE FROM METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)

By

EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle, Suite 400
Hunt Valley, MD 21031

Protecting Our Water Environment

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CECIL LUE-HING RESEARCH AND DEVELOPMENT COMPLEX
6001 WEST PERSHING ROAD CICERO, ILLINOIS 60804-4112

Edward W. Podczerwinski, P.E.
Acting Director of Monitoring and Research

June 15, 2017

Mr. Brian Koch
WPC # 15
Illinois Environmental Protection Agency
1021 North Grand Avenue
P.O. Box 19276
Springfield, IL 62794-9276

Dear Mr. Koch:

Subject: Biomonitoring Report for 2017 – Acute Toxicity Test Results for the Stickney Water Reclamation Plant, National Pollutant Discharge Elimination System Permit Number IL0028053

The subject Biomonitoring Report including Acute Whole Effluent Toxicity test results for *Pimephales promelas* and *Ceriodaphnia dubia* is submitted in compliance with National Pollutant Discharge Elimination System Permit Number IL0028053, Special Condition 10. The report covers the monitoring done for samples collected in the nineteenth month before the expiration of the permit.

The subject report prepared by EA Engineering, Science, and Technology, Inc., PBC includes copies of all bench sheets, chain-of-custody forms, sample receipt, preparation forms, summary of final results and test information, and quality assurance record.

If you have any questions concerning this report, please contact Ms. Jennifer Wasik, Supervising Aquatic Biologist, at (708) 588-4063.

Very truly yours,

Albert Cox
Environmental Monitoring
and Research Manager
Monitoring and Research Department

AC:JW:NK:lf

Enclosures

cc: E. Podczerwinski/J. Murray
F. Costa/S. Carmody/H. Zhang
J. Wasik/N. Kollias



RESULTS OF ACUTE TOXICITY TESTING
WITH *Ceriodaphnia dubia* AND *Pimephales promelas*
ON A MAY 2017 EFFLUENT SAMPLE FROM
METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)

Prepared for:

Metropolitan Water Reclamation District of Greater Chicago
6001 W. Pershing Road
Cicero, Illinois 60804

Prepared by:

EA Engineering, Science, and Technology, Inc., PBC
231 Schilling Circle
Hunt Valley, Maryland 21031
For questions, please contact Wayne McCulloch
ph: 410-584-7000

Results relate only to the items tested or to the samples as received by the laboratory.

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EA Engineering, Science, and Technology, Inc., PBC*

This report contains 8 pages plus 2 attachments

A handwritten signature in black ink, reading 'Wayne L. McCulloch', is positioned above a horizontal line.

Wayne L. McCulloch
Laboratory Director

30 May 2017

Date

INTRODUCTION

At the request of Metropolitan Water Reclamation District (MWRD), EA Engineering, Science, and Technology performed acute toxicity testing on composite samples of Outfall 001 final effluent from MWRD's Stickney Water Reclamation Plant in Cicero, Illinois. The effluent composite sample was collected on 15-16 May 2017. The test organisms, *Ceriodaphnia dubia* (water flea) and *Pimephales promelas* (fathead minnow), were exposed to 100, 50, 25, 12.5 and 6.25 percent effluent, and a laboratory water control. The objective of this study was to assess the acute lethality of the effluent sample to the test species, expressed as a 48-hour (*C. dubia*), or 96-hour (*P. promelas*) median lethal concentration (LC50).

This toxicity testing was conducted following EA's standard operating procedures (EA 2013) which are in accordance with US EPA guidance (US EPA 2002). The results of the acute toxicity tests were analyzed using the ToxCalc statistical software package (Version 5.0, Tidepool Scientific Software) and followed US EPA guidance (US EPA 2002). Summaries of sample and test information are presented on pages 5-6 for *C. dubia* and on pages 7-8 for *P. promelas*. Copies of raw data sheets and statistics are included in Attachment I. The Report Quality Assurance Record is included as Attachment II.

SUMMARY OF RESULTS

The results of the acute toxicity tests indicated that the 15-16 May 2017 Outfall 001 effluent sample was not acutely toxic to *Ceriodaphnia dubia* or *Pimephales promelas*. The results of these toxicity tests comply with current NELAC standards.

The results of the *C. dubia* acute toxicity test are presented on page 6. After 48 hours, there was 100 percent survival in all of the effluent concentrations and in the dilution water control. The 48-hour *C. dubia* LC50 for this test was >100 percent effluent (<1.0 TU_a).

In the *P. promelas* acute toxicity test (page 8), at the end of 96 hours there was a minimum of 85 percent survival in all of the effluent concentrations. The laboratory control had 100 percent survival. The resulting 96-hour LC50 for *P. promelas* was >100 percent effluent (<1.0 TU_a).

In conformance with EA's quality assurance/quality control program, monthly reference toxicant tests using sodium chloride (NaCl) and potassium chloride (KCl) were performed on the in-house cultured test species. The results of the *C. dubia* reference toxicant test were acceptable, with a 48-hour LC50 of 1,980 mg/L NaCl, and acceptable control chart limits of 1,461-2,163 mg/L NaCl. The results of the *P. promelas* reference toxicant test were acceptable, with a 48-hour LC50 of 913 mg/L KCl, and acceptable control chart limits of 673-1,260 mg/L KCl.

REFERENCES

- EA. 2013. EA Ecotoxicology Laboratory Quality Assurance and Standard Operating Procedures Manual. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., Hunt Valley, Maryland.
- US EPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. EPA-821-R-02-012. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

SUMMARY OF SAMPLE/TEST INFORMATION

Test: ***Ceriodaphnia dubia* 48-hour static acute toxicity test**

Test Procedure: **EA Protocol CD-AC-04**

Acute assay with water flea (*Ceriodaphnia dubia*)

Client Name: **Metropolitan Water Reclamation District (MWRD)**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: AT7-173

Collection Time and Date: 0600, 15-16 May 2017

Receipt Time and Date: 1030, 17 May 2017

Dilution Water Description: **Moderately hard synthetic freshwater**

EA Test Number: **TN-17-146**

Test Initiation Time and Date: 1427, 17 May 2017

Test Completion Time and Date: 1525, 19 May 2017

Number of Replicates: **4**

Number of Organisms Per Replicate: **5**

Test Chamber: **30 ml cup**

Volume per Test Chamber: **15 ml**

Organism Lot Information

Lot Number: N/A

Source: EA's Culture Facility (Hunt Valley, Maryland)

Age: <24 hours old

Reference Toxicant Test Information

Reference Toxicant: Sodium chloride (NaCl)

EA Test Number: RT-17-067

48-hour LC50: 1,980 mg/L NaCl

Laboratory control chart acceptability range for 48-hour LC50: 1,461-2,163 mg/L NaCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: *Ceriodaphnia dubia* (water flea)
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 15-16 May 2017
 EA Test Number: TN-17-146

Test Concentration (percent effluent)	48-Hour Survival (percent)
Lab Control	100
6.25	100
12.5	100
25	100
50	100
100	100

48-Hour LC50 (percent effluent): >100 (TU_a <1.0)

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	24.3 – 26.0
pH:	7.8 – 8.3
Dissolved Oxygen (mg/L):	7.7 – 8.3
Conductivity (µS/cm):	331 – 1,089

Water Quality Parameters Measured on Sample Upon Receipt	Outfall 001 (AT7-173)
Temperature (°C):	3.1
pH:	8.1
Total Residual Chlorine (mg/L):	<0.01
Alkalinity (mg/L as CaCO ₃):	160
Hardness (mg/L as CaCO ₃):	240
Conductivity (µS/cm):	1,041

SUMMARY OF SAMPLE/TEST INFORMATION

Test: ***Pimephales promelas* 96-hour static renewal acute toxicity test**

Test Procedure: **EA Protocol FH-AC-04**

Acute assay with fathead minnows (*Pimephales promelas*)

Client Name: **Metropolitan Water Reclamation District (MWRD)**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: AT7-173

Collection Time and Date: 0600, 15-16 May 2017

Receipt Time and Date: 1030, 17 May 2017

Dilution Water Description: **Moderately hard synthetic freshwater**

EA Test Number: **TN-17-147**

Test Initiation Time and Date: 1507, 17 May 2017

Test Completion Time and Date: 1423, 21 May 2017

Number of Replicates: **2**

Number of Organisms Per Replicate: **10**

Test Chamber: **1-L beaker**

Volume per Test Chamber: **250 ml**

Organism Lot Information

Lot Number: FH7-5/15-16

Source: EA's Culture Facility (Hunt Valley, Maryland)

Age: 1-2 days old (hatched within a 24-hour period)

Reference Toxicant Test Information

Reference Toxicant: Potassium chloride (KCl)

EA Test Number: RT-17-074

48-hour LC50: 913 mg/L KCl

Laboratory control chart acceptability range for 48-hour LC50: 673-1,260 mg/L KCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: *Pimephales promelas* (fathead minnow)
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 15-16 May 2017
 EA Test Number: TN-17-147

<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>	<u>96-Hour Survival (percent)</u>
Lab Control	100	100
6.25	100	100
12.5	85	85
25	90	90
50	100	100
100	100	100

96-Hour LC50 (percent effluent): >100 (TU_a <1.0)

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
Temperature (°C):	24.2 – 25.9
pH:	7.6 – 8.3
Dissolved Oxygen (mg/L):	5.3 – 8.3
Conductivity (µS/cm):	317 – 1,058

ATTACHMENT I

Data Sheets
(16 pages)



EA Engineering, Science, and Technology

EA Ecotoxicology Laboratory
231 Schilling Circle
Hunt Valley, Maryland 21031
Telephone: 410-584-7000
Fax: 410-584-1057



Sample Shipped By: (circle)
Fed. Ex. UPS Other: _____
Tracking #: 1Z 288 682 01 9715 2806

Client: MWRDGC Project No.: _____
NPDES Number: 1L0028053 Client Purchase Order Number: 8008796
City/State Collected: Cicero, IL

PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

Accession Number (office use only)	Grab	Composite	Collection		Sample Description (including Site, Station Number, and Outfall Number)	Number/Volume of Container
			Start Date/Time	End Date/Time		
<u>AT7-173</u>		<u>X</u>	<u>5/15/17 0600</u>	<u>5/16/17 0600</u>	<u>Stateney WRP final effluent, outfall 001</u>	<u>1 gal</u>

Sampled By: <u>W. Kollie</u>	Date/Time <u>5/16/17 0845</u>	Received By:	Date/Time
Sampler's Printed Name: <u>Nick Kollie's</u>	Title: <u>Assistant Aquatic Biologist</u>	Relinquished By: <u>W. Kollie</u>	Date/Time <u>5/16/17 0900</u>
Relinquished By:	Date/Time	Received By Laboratory <u>M. J. [Signature]</u>	Date/Time <u>5/17/17 1030</u>

Was Sample Chilled During Collection? Yes No Comments:

Sample Collection Parameters
Visual Description: yellow
Temperature (°C): 5°C
pH: 7.12
TRC (mg/L): 0.5/L
Other:



SAMPLE CHECK-IN FOR TESTING

Client: MWRD

EA Accession Number: AT7-173

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	3.1	5/17/17	1030	MJ
Is ice present?	--	✓	↓	↓	↓
pH	6.0-9.0	8.1	↓	↓	↓
TRC (mg/L)	<0.01	20.01	↓	↓	↓
Visual Description	--	Clear	↓	↓	↓

*If outside acceptable range, contact project manager.

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✓)	Date	Time	Initials
Ammonia (preserve aliquot)	--				
Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Salinity (ppt)	--				

UPS# 122556820197152806



TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-146

TEST ORGANISM INFORMATION

Common Name: Water flea Adults Isolated (Time, Date): 5/16/17 1602
 Scientific Name: C. dubia Neonates Pulled & Fed (Time, Date): 5/17/17 1005
 Lot Number: N/A Acclimation: <24hrs Age: <24 hrs
 Source: EA Culture Water (T/S): 25.5 °C 0 ppt

TEST INITIATION

<u>Date</u>	<u>Time</u>	<u>Initials</u>	<u>Activity</u>
5/17/17	1405	MJ	Dilutions Made
↓	↓	↓	Test Vessels Filled
↓	1427	↓	Organisms Transferred
↓	1457	NM	Head Counts

TEST SET-UP

Sample Number: AT7-173

Dilution Number: LD7-195

<u>Test Concentration</u>	<u>Volume Test Material</u>	<u>Final Volume</u>
Control	0 ml	200 ml
6.25%	12.5 ml	↓
12.5%	25 ml	
25%	50 ml	
50%	100 ml	
100%	200 ml	



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-146

Test Material: Effluent

Accession Number: AT7-173

Dilution Water: Mod Hard

Accession Number: LD1-195

TEST ORGANISM

Common Name: Water flea

Scientific Name: C.dubia

TARGET VALUES

Temp: 25±1 °C

pH: 6.0 - 9.0

Photoperiod: 16 L, 8 d

Beginning Date: 5/17/17 Time: 1407

Ending Date: 5/19/17 Time: 1525

TEST TYPE: Static / Flowthrough
Renewal / Non-renewal

Test Container: 30 ml cup

Test Volume: 15 ml

Test Duration: 48 hrs

Concentration	Rep	Number of Live Organisms					Temperature (°C)					pH					Dissolved Oxygen (mg/L)					Conductivity (µS/cm) Salinity (ppt)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Control	A	5	5	5			24.4	24.7	25.9			8.3	7.9	8.1			8.0	7.7	8.0			331	356	365		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
6.25%	A	5	5	5			24.3	24.7	25.9			8.3	7.9	8.1			8.1	7.8	8.2			379	398	403		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
12.5%	A	5	5	5			24.4	24.7	26.0			8.2	7.9	8.1			8.2	7.9	8.3			418	437	441		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
Meter Number						678	679	679			678	679	679			678	679	679			678	679	679			
Time		1457	1327	1525			1412	1305	1519			1412	1305	1519			1412	1305	1519			1412	1305	1519		
Initials		MM	RJB	RJB			MM	RJB	RJB			MM	RJB	RJB			MM	RJB	RJB			MM	RJB	RJB		

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 X
Magna/pulex: 2021.0 _____

Fathead: 2000.0 _____
Trout: 2019.0 _____

Americamysis: 2007.0 _____
Cyprinodon: 2004.0 _____ OTHER: _____

Menidia: 2006.0 _____

12/02/08
ATS-T01



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-146

Test Material: Effluent

Accession Number: AT7-173

Dilution Water: Mod Hard

Accession Number: LD7-195

TEST ORGANISM

Common Name: Water flea

Scientific Name: C.dubia

TARGET VALUES

Temp: 25±1 °C

pH: 6.0 - 9.0

Photoperiod: 16L, 8d

Beginning Date: 5/17/17 Time: 1427

Ending Date: 5/19/17 Time: 1525

TEST TYPE: Static / Flowthrough

Renewal / Non-renewal

Test Container: 30 ml cup

Test Volume: 15 ml

Test Duration: 48 hrs

Concentration	Rep	Number of Live Organisms					Temperature (°C)					pH					Dissolved Oxygen (mg/L)					Conductivity (µS/cm) Salinity (ppt)											
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96							
25%	A	5	5	5			24.4	24.6	26.0			8.2	7.9	8.0			8.2	7.9	8.1			511	536	542									
	B	5	5	5																													
	C	5	5	5																													
	D	5	5	5																													
50%	A	5	5	5			24.4	24.7	26.1			8.1	7.9	8.0			8.2	7.9	8.1			682	709	714									
	B	5	5	5																													
	C	5	5	5																													
	D	5	5	5																													
100%	A	5	5	5			24.7	24.9	25.9			8.0	7.8	7.9			8.2	8.0	8.1			1037	1070	1089									
	B	5	5	5													8.3																
	C	5	5	5																													
	D	5	5	5																													
Meter Number							678	679	679						678	679	679						678	679	679								
Time		1457	1327	1525						1412	1305	1519						1412	1305	1519						1412	1305	1519					
Initials		MM	RJB	RJB						MJ	RJB	RJB						MJ	RJB	RJB						MJ	RJB	RJB					

5 litms (b)

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 X
Magnapulex: 2021.0 _____

Fathead: 2000.0 _____
Trout: 2019.0 _____

Americamysis: 2007.0 _____
Cyprinodon: 2004.0 _____
Menidia: 2006.0 _____
OTHER: _____



RANDOMIZATION CHART

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-~~17~~-146 5/17 WJ(6)

5	4	1	3	6	2
1	5	3	2	4	6
6	2	4	1	5	3
4	1	2	6	3	5



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-146

Date/Time/Initials

Comments/Activity



TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-146

Correction Explanations

- (a) Technician Error-Mathematical
- (b) Technician Error-Manual Data Recording
- (c) Technician Error-Head Count Observation
- (d) Technician Error-Overwrite
- (e) Technician Error-Missing Data
- (f) Technician Error-Lost Organism
- (g) Technician Error-Transcription Error
- (h) Technician Error-Other:
- (i) Meter Malfunction



TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-147

TEST ORGANISM INFORMATION

Common Name: Fathead minnow Adults Isolated (Time, Date): _____
 Scientific Name: P. promelas Neonates Pulled & Fed (Time, Date): _____
 Lot Number: FH7-5/15-16 Acclimation: <24 hrs Age: 1-2 days
 Source: EA Culture Water (T/S): 23.8 °C 0 ppt

TEST SET-UP

TEST INITIATION				CONCENTRATION SERIES		
Date	Time	Initials	Activity	Test Concentration	Volume Test Material	Final Volume
5/17/17 ↓ ↓ ↓	1405	MJ	Dilutions Made	Control	0ml	500ml ↓
	↓	↓	Test Vessels Filled	6.25%	31.25ml	
	1507	↓	Organisms Transferred	12.5%	62.5ml	
	↓	↓	Head Counts	25%	125ml	
	1513	RSB		50%	250ml	
				100%	500ml	

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION					FEEDING			
Day	Date	Time	Initials	Sample / Diluent	Food: <i>Artemia</i>			
					Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0	5/17/17	1405	MJ	AT7-173 LD7-195	0	-	-	-
1					1	-	-	-
2	5/19/17	1155	MJ	AT7-173 LD7-200	2	-	-	-
3					3	-	-	-
4					4			
5					5			
6					6			



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70005.15

TEST ORGANISM

Beginning Date: 5/17/17 Time: 1507

Client: MWRD

Common Name: Fathead minnow

Ending Date: 5/21/17 Time: 1423

QC Test Number: TN-17-147

Scientific Name: *P. promelas*

TEST TYPE: Static / Flowthrough

Test Material: Effluent

TARGET VALUES

Renewal / Non-renewal

Accession Number: AT7-113

Temp: 25±1 °C DO: >4.0 mg/L

Test Container: 1 L Beaker

Dilution Water: Mod Hard

pH: 6.0 - 9.0 Salinity: 0 ppt

Test Volume: 250 ml

Accession Number: LD7-195

Photoperiod: 16L, 8d Light Intensity: 50 - 100 fc

Test Duration: 96 hrs

Concentration	Rep	Number of Live Organisms					Temperature (°C)					pH					Dissolved Oxygen (mg/L)					Conductivity (µS/cm) Salinity (ppt)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Control	A	10	10	10	10	10	24.4		24.3			8.3		8.0			8.0		8.2			331		317		
	B	10	10	10	10	10																				
6.25%	A	10	10	10	10	10	24.3		24.5			8.3		7.9			8.1		8.2			379		364		
	B	10	10	10	10	10																				
12.5%	A	10	7	7	7	7	24.4		24.6			8.2		7.9			8.2		8.3			418		410		
	B	10	10	10	10	10																				
25%	A	10	8	8	8	8	24.4		24.7			8.2		7.9			8.2		8.3			511		491		
	B	10	10	10	10	10																				
50%	A	10	10	10	10	10	24.4		24.7			8.1		7.9			8.2		8.3			682		664		
	B	10	10	10	10	10																				
100%	A	10	10	10	10	10	24.7		25.0			8.0		7.7			8.3		8.3			1037		1046		
	B	10	10	10	10	10																				
Meter Number							678		679			678		679			678		679			678		679		
Time		1513	1437	1600	1453	1423	1412		1157			1412		1157			1412		1157			1412		1157		
Initials		RSB	RSB	RSB	JB	MS	MS		MS			MS		MS			MS		MS			MS		MS		

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 _____ Fathead: 2000.0 X
Magna/pulex: 2021.0 _____ Trout: 2019.0 _____

Americamysis: 2007.0 _____ Menidia: 2006.0 _____
Cyprinodon: 2004.0 _____ OTHER: _____



ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70005.15

TEST ORGANISM

Beginning Date: 5/17/17 Time: 1507

Client: MWRD

Common Name: Fathead minnow

Ending Date: 5/21/17 Time: 1423

QC Test Number: TN-17-147

Scientific Name: P. promelas

TEST TYPE: Static / Flowthrough

Test Material: Effluent

TARGET VALUES

Renewal / Non-renewal

Accession Number: AT7-173

Temp: 25±1 °C

DO: ≥4.0 mg/L

Test Container: 1 L Beaker

Dilution Water: Mod Hard

pH: 6.0 - 9.0

Salinity: 0 ppt

Test Volume: 250 ml

Accession Number: LD7-195

Photoperiod: 16L, 8d

Light Intensity: 50 - 100 fc

Test Duration: 96 hrs

Concentration	Rep	Number of Live Organisms					Temperature (°C)					pH					Dissolved Oxygen (mg/L)					Conductivity (µS/cm) Salinity (ppt)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Control	A							24.9	24.9	24.2	24.2		7.9	8.1	8.3	8.1		8.0	5.7	8.4	8.3		343	349	345	357
	B																									
6.25%	A							25.0	25.6	25.5	25.1		7.9	8.1	8.3	7.8		7.8	5.6	8.3	7.8		388	372	389	388
	B																									
12.5%	A							25.3	25.9	25.4	25.2		7.8	7.9	8.2	7.7		7.2	5.3	8.1	7.7		425	429	427	426
	B																									
25%	A							25.1	25.9	25.5	25.2		7.8	7.9	8.1	7.8		7.6	6.2	8.2	7.7		516	499	516	518
	B																									
50%	A							25.3	25.8	25.4	25.2		7.8	7.9	8.1	7.7		7.7	5.6	8.2	7.6		679	684	688	684
	B																									
100%	A							25.4	25.7	25.5	25.2		7.7	7.8	8.0	7.6		7.1	6.3	8.3	7.5		1014	1027	1058	1055
	B																									
Meter Number								678	678	679	679		678	678	679	679		678	678	679	679		678	678	679	679
Time								0840	0700	1240	0858		0840	0900	1240	0858		0840	0900	1240	0858		0840	0900	1240	0858
Initials								RSB	RSB	JB	MS		RSB	RSB	JB	MS		RSB	RSB	JB	MS		RSB	RSB	JB	MS

(S)RSB 5/19/17 (S)RSB 5/19/17



RANDOMIZATION CHART

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-147

5	4	1	3	6	2
1	5	3	2	4	6



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-147

Date/Time/Initials

Comments/Activity



TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-147

Correction Explanations

- (a) Technician Error-Mathematical
- (b) Technician Error-Manual Data Recording
- (c) Technician Error-Head Count Observation
- (d) Technician Error-Overwrite
- (e) Technician Error-Missing Data
- (f) Technician Error-Lost Organism
- (g) Technician Error-Transcription Error
- (h) Technician Error-Other:
- (i) Meter Malfunction



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-146/147

Aliquot of sample warmed to test temperature, then aerated if supersaturated:

Date	Sample #	ON AIR			OFF AIR		
		Initial DO (mg/L)	Time	Initials	Final DO (mg/L)	Time	Initials
5/17/17	AT7-173	9.6	1335	MJ	8.1	1345	MJ
5/19/17	AT7-173	9.5	0833	RSB	8.1	0843	NM

5/17
MJ(b)

ATTACHMENT II

Report Quality Assurance Record
(2 pages)



REPORT QUALITY ASSURANCE RECORD

Client: MWRD

Project Number: 70005-15

Author: Michael Charon

EA Report Number: 7530

REPORT CHECKLIST

<u>QA/QC ITEM</u>	<u>REVIEWER</u>	<u>DATE</u>
1. Samples collected, transported, and received according to study plan requirements.	<u>[Signature]</u>	<u>5/26/17</u>
2. Samples prepared and processed according to study plan requirements.	<u>[Signature]</u>	<u>5/26/17</u>
3. Data collected using calibrated instruments and equipment.	<u>[Signature]</u>	<u>5/26/17</u>
4. Calculations checked:		
- Hand calculations checked	<u>[Signature]</u>	<u>5/26/17</u>
- Documented and verified statistical procedure used.	<u>[Signature]</u>	<u>5/26/17</u>
5. Data input/statistical analyses complete and correct.	<u>[Signature]</u>	<u>5/26/17</u>
6. Reported results and facts checked against original sources.	<u>[Signature]</u>	<u>5/26/17</u>
7. Data presented in figures and tables correct and in agreement with text.	<u>[Signature]</u>	<u>5/26/17</u>
8. Results reviewed for compliance with study plan requirements.	<u>[Signature]</u>	<u>5/26/17</u>

	<u>AUTHOR</u>	<u>DATE</u>
9. Commentary reviewed and resolved.	<u>[Signature]</u>	<u>5/30/17</u>
10. All study plan and quality assurance/control requirements have been met and the report is approved:		
	<u>[Signature]</u>	<u>5/30/17</u>
	PROJECT MANAGER	DATE
	<u>[Signature]</u>	<u>5/26/17</u>
	QUALITY CONTROL OFFICER	DATE
	<u>[Signature]</u>	<u>5/30/17</u>
	SENIOR TECHNICAL REVIEWER	DATE