Metropolitan Water Reclamation District of Greater Chicago

MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 17-41

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

September 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 AN AUGUST 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

Monitoring and Research Department
Edward W. Podczerwinski, Acting Director

September 2017

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

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

September 15, 2017

Compliance Assurance Section CAS #19
Illinois Environmental Protection Agency
1021 North Grand Avenue
P.O. Box 19276
Springfield, IL 62794-9276

Dear Sir or Madam:

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 sixteenth 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,

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
By certified mail

RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia* AND *Pimephales promelas* ON AN AUGUST 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 Michael Chanov
ph: 410-584-7000

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

This report contains 8 pages plus 2 attachments

14 September 2017

Michael K. Chanov II
Laboratory Director

Date

EA Project Number 70005.15

ACCREDITED IN ACCORDANCE WITH nelac ID# E87550

EA Report Number 7581R

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 13-14 August 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 under the Section 10 biomonitoring requirements of Metropolitan Water Reclamation District's discharge permit number IL0028053.

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 13-14 August 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 a minimum of 95 percent survival in all of the effluent concentrations and 100 percent survival 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 80 percent survival in all of the effluent concentrations. The laboratory control had 90 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 1,562 - 2,135 mg/L NaCl. The results of the *P. promelas* reference toxicant test were acceptable, with a 48-hour LC50 of 1,183 mg/L KCl, and acceptable control chart limits of 681-1,208 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)**

Permit Number: **IL0028053**

Receiving Water: **Chicago Sanitary and Ship Canal**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: AT7-368

Collection Time and Date: 0600, 13-14 August 2017

Receipt Time and Date: 0926, 15 August 2017

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

EA Test Number: **TN-17-275**

Test Initiation Time and Date: 1112, 15 August 2017

Test Completion Time and Date: 1051, 17 August 2017

Number of Replicates: **4**

Number of Organisms Per Replicate: **5**

Test Chamber: **30 ml cup**

Volume per Test Chamber: **15 ml**

Feeding: **None**

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)
Reference Toxicant Information: Lab Chem Lot #F120-04 (Received 6/13/16)
EA Test Number: RT-17-120
Test Date and Time: 1328, 3 August 2017 to 1428, 5 August 2017
Dilution Water: Moderately hard synthetic freshwater
48-hour LC50: 1,980 mg/L NaCl
Laboratory control chart acceptability range for 48-hour LC50: 1,562-2,135 mg/L NaCl

Test Species:	***Ceriodaphnia dubia* (water flea)**
Sample Description:	Outfall 001 Final Effluent – MWRD
Sample Date:	13-14 August 2017
EA Test Number:	TN-17-275

Test Concentration (percent effluent)	48-Hour Survival (percent)
Lab Control	100
6.25	100
12.5	100
25	95
50	100
100	100

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

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	24.0 – 25.7
pH:	7.7 – 8.7
Dissolved Oxygen (mg/L):	7.8 – 8.2
Conductivity (µS/cm):	303 – 1,018

Water Quality Parameters Measured on Sample Upon Receipt	Outfall 001 (AT7-368)
Temperature (°C):	2.3
pH:	8.0
Total Residual Chlorine (mg/L):	<0.01
Alkalinity (mg/L as $CaCO_3$):	136
Hardness (mg/L as $CaCO_3$):	200
Conductivity (µS/cm):	986

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)**

Permit Number: **IL0028053**

Receiving Water: **Chicago Sanitary and Ship Canal**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: AT7-368

Collection Time and Date: 0600, 13-14 August 2017

Receipt Time and Date: 0926, 15 August 2017

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

EA Test Number: **TN-17-274**

Test Initiation Time and Date: 1539, 15 August 2017

Test Completion Time and Date: 1522, 19 August 2017

Number of Replicates: **2**

Number of Organisms Per Replicate: **10**

Test Chamber: **1-L beaker**

Volume per Test Chamber: **250 ml**

Feeding: **0.2 mL *Artemia* nauplii at 48 hours**

Organism Lot Information

Lot Number: FH7-8/10-11
Source: EA's Culture Facility (Hunt Valley, Maryland)
Age: 4-5 days old (hatched within a 24-hour period)

Reference Toxicant Test Information

Reference Toxicant: Potassium chloride (KCl)
Reference Toxicant Information: GFS Lot #C583408 (Received 5/22/16)
EA Test Number: RT-17-113
Test Date and Time: 1509, 3 August 2017 to 1445, 5 August 2017
Dilution Water: Moderately hard synthetic freshwater
48-hour LC50: 1,183 mg/L KCl
Laboratory control chart acceptability range for 48-hour LC50: 681-1,208 mg/L KCl

Test Species: ***Pimephales promelas*** **(fathead minnow)**

Sample Description: Outfall 001 Final Effluent – MWRD

Sample Date: 13-14 August 2017

EA Test Number: TN-17-274

Test Concentration (percent effluent)	48-Hour Survival (percent)	96-Hour Survival (percent)
Lab Control	100	90
6.25	100	95
12.5	95	90
25	95	80
50	100	100
100	100	95

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

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	24.0 – 26.0
pH:	7.7 – 8.6
Dissolved Oxygen (mg/L):	6.2 – 8.4
Conductivity (µS/cm):	303 – 992

ATTACHMENT I

Data Sheets
(16 pages)

Chain-of-Custody Record

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 84 9335 9650

Client: MWRDGC Project No.: _____

NPDES Number: IL0028053 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 Start Date/Time	Collection End Date/Time	Sample Description (including Site, Station Number, and Outfall Number)	Number/Volume of Container
~~AT7-308~~		~~X~~	~~8/13/17 0600~~	~~8/8/17 0600~~	~~Stickney WRP Final Effluent outfall 001~~	~~1 gal~~ MK 8:41 8/14/17
		X	8/13/17 0600	8/14/17 0600	Stickney WRP Final Effluent 001	1 gal

Sampled By:	Date/Time	Received By:	Date/Time
N. Kollias	8/14/17 8:41		
Sampler's Printed Name:	**Title:**	**Relinquished By:**	**Date/Time**
Nick Kollias	Aquatic Biologist		
Relinquished By:	**Date/Time**	**Received By Laboratory**	**Date/Time**
N. Kollias	8/14/17 8:45	Rich Murray	8/15/17 0926

Was Sample Chilled During Collection? Yes / No

Comments:

Sample Collection Parameters

- Visual Description: Clear, Green
- Temperature (°C): 9.3 °C
- pH: 7.14
- TRC (mg/L): 0.0 mg/L
- Other:

White-Report Production — Yellow-Laboratory — Pink-Client/Sampler

SAMPLE CHECK-IN
FOR TESTING

Client: MWRDGC

EA Accession Number: ATI-368

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	2.3	8/15/17	0926	NM
Is ice present?	---	✓	↓	↓	↓
pH	6.0-9.0	8.0	↓	↓	↓
TRC (mg/L)	<0.01	<0.01	↓	↓	↓
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)	--				

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-275

TEST ORGANISM INFORMATION

Common Name: Water flea

Scientific Name: *C. dubia*

Lot Number: N/A

Source: EA

Adults Isolated (Time, Date): 1557 8/14/17

Neonates Pulled & Fed (Time, Date): 0919 8/15/17

Acclimation: <24hrs Age: <24 hrs

Culture Water (T/S): 23.9 °C 0 ppt

TEST INITIATION

Date	Time	Initials	Activity
8/15/17	1042	JB	Dilutions Made
	1112		Test Vessels Filled
			Organisms Transferred
	1330	MJ	Head Counts

TEST SET-UP

Sample Number: AT7-368

Dilution Number: LD7-350

Test Concentration	Volume Test Material	Final Volume
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-17-275
Test Material: Effluent
Accession Number: AT7-365
Dilution Water: Mod Hard
Accession Number: LD7-350

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
DO: >4.0 mg/L
Salinity: 0 ppt
Light Intensity: 50 - 100 fc

Beginning Date: 8/15/17 Time: 1112
Ending Date: 8/17/17 Time: 1051
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			24.0	25.4	24.0			8.0	8.7	8.5			8.1	8.0	8.2			323	336	356		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
6.25%	A	5	5	5			24.3	25.5	24.4			8.0	8.7	8.6			8.1	8.0	8.2			347	352	367		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
12.5%	A	5	5	5			24.5	25.6	24.6			8.0	8.6	8.6			8.1	7.9	8.1			390	394	400		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
Meter Number							679	679	679			679	679	679			679	679	679			679	679	679		
Time		1330	1140	1051			1050	0945	0915			1050	0945	0915			1050	0945	0915			1050	0945	0915		
Initials		MS	HP	MJ			JB	HP	MJ			JB	HP	MJ			JB	HP	MJ			JB	HP	MJ		

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
Menidia: 2006.0
Cyprinodon: 2004.0
OTHER:

ACUTE TOXICITY TEST DATA SHEET

Project Number: 70005.15
Client: MWRD
QC Test Number: TN-17-275
Test Material: Effluent
Accession Number: ATT-368
Dilution Water: Mod Hard
Accession Number: LDT-350

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
DO: >4.0 mg/L
Salinity: 0 ppt
Light Intensity: 50 - 100 fc

Beginning Date: 8/15/17 Time: 1112
Ending Date: 8/17/17 Time: 1051
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			24.5	25.7	24.8			7.9	8.5	8.5			8.1	7.9	8.0			477	481	497		
	B	5	4	4																						
	C	5	5	5																						
	D	5	5	5																						
50%	A	5	5	5			24.5	25.7	24.8			7.8	8.4	8.4			8.1	7.9	8.0			646	650	669		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
100%	A	5	5	5			24.5	25.7	24.8			7.7	8.3	8.3			8.1	7.8	7.9			975	985	1018		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
Meter Number							679	679	679			679	679	679			679	679	679			679	679	679		
Time		1330	1140	1051			1050	0945	0915			1050	0945	0915			1050	0945	0915			1050	0945	0915		
Initials		MS	MP	MS			SB	MP	MS			SB	MP	MS			SB	MP	MS			SB	MP	MS		

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
Menidia: 2006.0
Cyprinodon: 2004.0
OTHER:

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-275

Date/Time/Initials	Comments/Activity

RANDOMIZATION CHART

Project Number: 70005.15

Client: MWRD

QC Test Number: TN- 17-275

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 CORRECTION BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-275

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- 17-274

TEST ORGANISM INFORMATION

Common Name: Fathead minnow

Scientific Name: *P. promelas*

Lot Number: FHT-8/10-11

Source: EA

Adults Isolated (Time, Date): _____

Neonates Pulled & Fed (Time, Date): _____

Acclimation: <24 hrs Age: 4-5 days

Culture Water (T/S): 24.8 °C 0 ppt

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
8/15/17	1042	JB	Dilutions Made
			Test Vessels Filled
	1539	MJ	Organisms Transferred
	1551	JB	Head Counts

CONCENTRATION SERIES

Test Concentration	Volume Test Material	Final Volume
Control	0ml	500ml
6.25%	31.25ml	
12.5%	62.5ml	
25%	125ml	
50%	250ml	
100%	500ml	

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	8/15/17	1042	JB	AT7-368 / LD7-330
1				
2	8/17/17	1415	RJB	AT7-368 / LD7-351
3				
4				
5				
6				

FEEDING

Food: *Artemia*

Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0			
1			
2			
3			
4			
5			
6			

ACUTE TOXICITY TEST DATA SHEET

Project Number: 70005.15
Client: MWRD
QC Test Number: TN- 17-274
Test Material: Effluent
Accession Number: AT7-368
Dilution Water: Mod Hard
Accession Number: LD7-350

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: *P. promelas*

TARGET VALUES
Temp: 25±1 °C
pH: 6.0 - 9.0
Photoperiod: 16 ℓ, 8 d
DO: >4.0 mg/L
Salinity: 0 ppt
Light Intensity: 50 - 100 fc

Beginning Date: 8/15/17 Time: 1539
Ending Date: 8/19/17 Time: 1522
TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Test Container: 1 L Beaker
Test Volume: 250 ml
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	9	9	24.0		24.8			8.0		8.5			8.1		8.1			303		310		
	B	10	10	10	10	9																				
6.25%	A	10	10	10	10	9	24.3		24.9			8.0		8.5			8.1		8.1			347		357		
	B	10	10	10	10	10																				
12.5%	A	10	9~~10~~	9	9	9	24.5		24.9			8.0		8.4			8.1		8.1			390		398		
	B	10	10~~9~~	10	10	9																				
25%	A	10	10	10	7	7	24.5		24.9			7.9		8.4			8.1		8.1			477		478		
	B	10	9~~10~~	9	9	9																				
50%	A	10	10~~9~~	10	10	10	24.5		25.0			7.8		8.3			8.1		8.1			646		637		
	B	10	10	10	10	10																				
100%	A	10	10	10	10	10	24.5		25.2			7.7		8.1			8.1		8.1			975		989		
	B	10	10	10	10	9																				
Meter Number		9116 MW(b)					679		679			679		679			679		679			679		679		
Time		1551	1525	1524	1439	1522	1050		1420			1050		1420			1050		1420			1050		1420		
Initials		JB	JB	MB	MB	BO	JB		RSB			~~AA~~ RSB		RSB			JB		RSB			JB		RSB		

8/16 MW(b)

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

Ceriodaphnia: 2002.0____ Fathead:2000.0__X__ Americamysis: 2007.0_____ Menidia:2006.0_____
Magna/pulex: 2021.0_____ Trout: 2019.0_____ Cyprinodon: 2004.0_____ OTHER: _____

ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70005.15
Client: MWRD
QC Test Number: TN-17-274
Test Material: Effluent
Accession Number: A17-368
Dilution Water: Mod Hard
Accession Number: D17-350

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: *P. promelas*
TARGET VALUES
Temp: 25±1 °C
pH: 6.0 - 9.0
Photoperiod: 16 ℓ, 8 d
DO: ≥4.0 mg/L
Salinity: 0 ppt
Light Intensity: 50 - 100 fc

Beginning Date: 8/15/17 Time: 1539
Ending Date: 8/19/17 Time: 1522
TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal
Test Container: 1 L Beaker
Test Volume: 250 ml
Test Duration: 96 hrs

Concentration	Rep	Number of Live Organisms 0	24	48	72	96	Temperature (°C) 0	24	48	72	96	pH 0	24	48	72	96	Dissolved Oxygen (mg/L) 0	24	48	72	96	Conductivity (µS/cm) Salinity (ppt) 0	24	48	72	96
Control	A							25.9	25.3	25.6	24.7		7.9	8.3	8.5	8.5		7.1	8.0	8.3	8.4		306	316	314	321
	B																									
6.25%	A							25.9	25.1	25.9	25.3		7.9	8.2	8.4	8.6		7.0	7.4	8.0	8.1		347	359	360	364
	B																									
12.5%	A							26.0	25.4	26.0	25.6		7.8	8.2	8.3	8.5		6.4	7.0	7.9	7.9		389	400	400	403
	B																									
25%	A							25.4	25.4	25.9	25.5		7.9	8.1	8.3	8.4		7.9	7.1	7.8	7.9		476	489	484	487
	B																									
50%	A							25.6	25.5	25.9	25.5		7.8	8.0	8.2	8.2		6.2	6.7	7.9	7.9		642	655	643	646
	B																									
100%	A							25.9	25.4	25.9	25.7		7.7	7.9	8.1	8.1		6.3	6.4	7.6	7.8		955	979	991	992
	B																									
Meter Number								678	679	678	678		678	679	678	678		678	679	678	678		678	679	68	678
Time								0820	0903	1254	0838		0820	0903	1254	0838		0820	0903	1254	0838		0820	0903	1254	0838
Initials								HP	MS	MS	MS		HP	MS	MS	MS		HP	MS	MS	MS		HP	MS	MS	MS

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15
Client: MWRD
QC Test Number: TN-17-274/275

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

		ON AIR			OFF AIR		
Date	Sample #	Initial DO (mg/L)	Time	Initials	Final DO (mg/L)	Time	Initials
8/15/17	AT7-368	9.7	0955	MJ	8.1	1005	MJ
8/17/17	AT7-368	9.1	1354	RSB	8.1	1404	RSB

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN- 17-274

Date/Time/Initials	Comments/Activity

RANDOMIZATION CHART

Project Number: 70005.15

Client: MWRD

QC Test Number: TN- 17-274

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

TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-274

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

ATTACHMENT II

Report Quality Assurance Record
(2 pages)

REPORT QUALITY ASSURANCE RECORD

Client: MWRD

Project Number: 70005.15

Author: Rachael Brooks

EA Report Number: 7581

REPORT CHECKLIST

QA/QC ITEM	REVIEWER	DATE
1. Samples collected, transported, and received according to study plan requirements.	Rachael Brooks	8/31/17
2. Samples prepared and processed according to study plan requirements.	Rachael Brooks	8/31/17
3. Data collected using calibrated instruments and equipment.	Rachael Brooks	8/31/17
4. Calculations checked: - Hand calculations checked	Rachael B	8/31/17
- Documented and verified statistical procedure used.	Rachael Brooks	8/31/17
5. Data input/statistical analyses complete and correct.	[illegible]	9/6/17
6. Reported results and facts checked against original sources.	[illegible]	9/6/17
7. Data presented in figures and tables correct and in agreement with text.	[illegible]	9/6/17
8. Results reviewed for compliance with study plan requirements.	Rachael B	8/31/17

QA/QC ITEM	AUTHOR	DATE
9. Commentary reviewed and resolved.	Rachael B	9/7/17

10. All study plan and quality assurance/control requirements have been met and the report is approved:

PROJECT MANAGER	[signature]	9/8/17 DATE
QUALITY CONTROL OFFICER	[signature]	9/6/17 DATE
SENIOR TECHNICAL REVIEWER	[signature]	9/8/17 DATE