Metropolitan Water Reclamation District of Greater Chicago

MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 21-10

RESULTS OF ACUTE TOXICITY TESTING WITH Ceriodaphnia dubia AND Pimephales promelas ON A FEBRUARY 2021 EFFLUENT SAMPLE FROM METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)

March 2021

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 FEBRUARY 2021 EFFLUENT SAMPLE FROM METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)

By

EA Engineering, Science, and Technology, Inc., PBC
231 Schilling Circle
Hunt Valley, MD 21031

Monitoring and Research Department
Edward W. Podczerwinski, Director **March 2021**

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

March 23, 2021

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

Subject: Biomonitoring Report for 2021 – Acute Toxicity Test Results for the Calumet Water Reclamation Plant, National Pollutant Discharge Elimination System Permit Number IL0028061

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 IL0028061, Special Condition 10. The report covers the monitoring done for samples collected in the seventeenth 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 Mr. Thomas Minarik, Principal Environmental Scientist, at (708) 588-4223.

Very truly yours,

Albert Cox

Albert Cox
Environmental Monitoring
and Research Manager
Monitoring and Research Department

AC:TM:NK:lf
Enclosure
cc: E. Podczerwinski/J. Murray
P. Connolly/H. Zhang
T. Minarik/N. Kollias
Via electronic mail

RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia* AND *Pimephales promelas* ON A FEBRUARY 2021 EFFLUENT SAMPLE FROM METROPOLITAN WATER RECLAMATION DISTRICT (MWRD)

Prepared for:

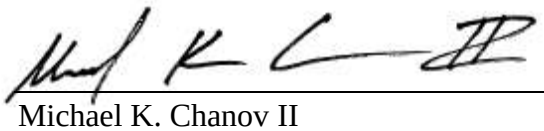
Metropolitan Water Reclamation District of Greater Chicago
6001 W. Pershing Road
Cicero, Illinois 60804

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



15 March 2021

Michael K. Chanov II
Laboratory Director

Date

EA Project Number 70019.TOX

ACCREDITED IN ACCORDANCE WITH nelac ID# E87550

EA Report Number 8505

INTRODUCTION

At the request of Metropolitan Water Reclamation District (MWRD), EA Engineering, Science, and Technology performed acute toxicity testing on a composite sample of Outfall 001 final effluent from MWRD's Calumet Water Reclamation Plant in Chicago, Illinois. The effluent composite sample was collected on 24-25 February 2021. 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 IL0028061.

This toxicity testing was conducted following EA's standard operating procedures (EA 2018) which are in accordance with US EPA guidance (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 (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 24-25 February 2021 Outfall 001 final 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 90 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 was acceptable, with a 48-hour LC50 of 1,980 mg/L NaCl, and acceptable control chart limits of 1,684-2,156 mg/L NaCl. The results of the *P. promelas* reference toxicant test was acceptable, with a 48-hour LC50 of 866 mg/L KCl, and acceptable control chart limits of 626-1,253 mg/L KCl.

REFERENCES

EA. 2018. 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., PBC, 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-05**
Acute assay with water flea (*Ceriodaphnia dubia*)

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

Permit Number: **IL0028061**

Receiving Water: **Little Calumet River**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: **AT1-118**

Collection Time and Date: 0600, 24 February 2021 to 0600, 25 February 2021
Receipt Time and Date: 0953, 26 February 2021

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

EA Test Number: **TN-21-127**

Test Initiation Time and Date: 1400, 26 February 2021
Test Completion Time and Date: 1403, 28 February 2021

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#F214-24 (Received 9/7/16)
EA Test Number: RT-21-023
Test Date and Time: 1359, 4 February 2021 to 1322, 6 February 2021
Dilution Water: Moderately hard synthetic freshwater
48-hour LC50: 1,980 mg/L NaCl
Laboratory control chart acceptability range for 48-hour LC50: 1,684-2,156 mg/L NaCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species:	***Ceriodaphnia dubia* (water flea)**
Sample Description:	Outfall 001 Final Effluent – MWRD
Sample Date:	24-25 February 2021
EA Test Number:	TN-21-127

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

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

Water Quality Parameters on Test Solutions	Range
Temperature (°C):	24.0 – 25.8
pH:	7.6 – 8.3
Dissolved Oxygen (mg/L):	8.2 – 8.6
Conductivity (µS/cm):	343 – 3,931

Water Quality Parameters Measured on Sample Upon Receipt	Outfall 001 (AT1-118)
Temperature (°C):	0.8
pH:	7.6
Total Residual Chlorine (mg/L):	<0.01
Alkalinity (mg/L as $CaCO_3$):	144
Hardness (mg/L as $CaCO_3$):	304
Conductivity (µS/cm):	3,375

SUMMARY OF SAMPLE/TEST INFORMATION

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

Test Procedure: **EA Protocol FH-AC-05**
Acute assay with fathead minnows (*Pimephales promelas*)

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

Permit Number: **IL0028061**

Receiving Water: **Little Calumet River**

Sample Description: **Outfall 001 Final Effluent**

EA Accession Number: **AT1-118**

Collection Time and Date: 0600, 24 February 2021 to 0600, 25 February 2021
Receipt Time and Date: 0953, 26 February 2021

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

EA Test Number: **TN-21-126**

Test Initiation Time and Date: 1525, 26 February 2021
Test Completion Time and Date: 1430, 2 March 2021

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 Daily**

Organism Lot Information

Lot Number: FH1-2/20-21
Source: EA's Culture Facility (Hunt Valley, Maryland)
Age: 5-6 days old (hatched within a 24-hour period)

Reference Toxicant Test Information

Reference Toxicant: Potassium chloride (KCl)
Reference Toxicant Information: LabChem #K085-18 (Received 10/20/20)
EA Test Number: RT-21-026
Test Date and Time: 1329, 3 February 2021 to 1338, 5 February 2021
Dilution Water: Moderately hard synthetic freshwater
48-hour LC50: 866 mg/L KCl
Laboratory control chart acceptability range for 48-hour LC50: 626-1,253 mg/L KCl

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

Sample Description: Outfall 001 Final Effluent – MWRD

Sample Date: 24-25 February 2021

EA Test Number: TN-21-126

Test Concentration (percent effluent)	48-Hour Survival (percent)	96-Hour Survival (percent)
Lab Control	100	100
6.25	90	90
12.5	100	100
25	100	100
50	95	95
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:	7.6 – 8.3
Dissolved Oxygen (mg/L):	6.6 – 8.6
Conductivity (µS/cm):	311 – 3,433

ATTACHMENT I

Data Sheets
(18 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 #: 122744748495610273

Client: MWRDGC Project No.: 4652-126-1

NPDES Number: IL0028061 Client Purchase Order Number: 3111991

City/State Collected: ~~Calumet, IL~~ Chicago, 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
AT1-118		✓	2/24/21 0600	2/25/21 0600	Calumet WRP Final Effluent Discharge #001	1 gal

Sampled By:	Date/Time	Received By:	Date/Time
[signature]	2/25/21		
Sampler's Printed Name: Nick Kallios	Title: Aquatic Biologist	Relinquished By:	Date/Time
Relinquished By: Nick Kallios	Date/Time 2/25/21 0930	Received By Laboratory: [signature]	Date/Time 2/26/21 0953

Was Sample Chilled During Collection? (Yes) No

Comments:

Sample Collection Parameters

Visual Description: clear, green
Temperature (°C): 6.0
pH: 7.15
TRC (mg/L): 0
Other:

SAMPLE CHECK-IN
FOR TESTING

Client: MWRD

EA Accession Number: ATI-118

Parameter	Acceptable Range	Measurement *	Meter	Date	Time	Initials
Temperature (°C)	≤4	0.8	680	2/26/21	0953	RSB
Is ice present?	---	yes	N/A	↓	↓	↓
pH	6.0-9.0	7.6	680			
TRC (mg/L)	<0.01	<0.01	AT-01			
Visual Description	---	clear	N/A			

If outside acceptable range, contact project manager.

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✓)	Meter	Date	Time	Initials
Ammonia (preserve aliquot)	--		N/A			

Parameter	Acceptable Range	Measurement *	Meter	Date	Time	Initials
Salinity (ppt)	--					

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-127

TEST ORGANISM INFORMATION

Common Name: Water flea

Scientific Name: *C. dubia*

Lot Number: N/A

Source: EA

Adults Isolated (Time, Date): 2125/21 1603

Neonates Pulled & Fed (Time, Date): 2/26/21 1025

Acclimation: <24hrs Age: <24 hrs

Culture Water (T/S): 24.7 °C 0 ppt

TEST INITIATION

Date	Time	Initials	Activity
2/26/21	1330	TP	Dilutions Made
↓	↓	↓	Test Vessels Filled
	1400		Organisms Transferred
	1648	UAD	Head Counts

TEST SET-UP

Sample Number: ATI- 118

Dilution Number: LDI- 119

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: 70019.TOX
Client: MWRD
QC Test Number: TN-21-127
Test Material: Effluent
Accession Number: AT1-118
Dilution Water: Mod Hard
Accession Number: LD1-119

TEST ORGANISM
Common Name: Water flea
Scientific Name: *C.dubia*

Beginning Date: 2/26/21 Time: 1400
Ending Date: 2/28/21 Time: 1403

TEST TYPE: (Static) Flowthrough
Renewal / (Non-renewal)

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

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)				
		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			8.3	8.1	8.1			8.5	8.3	8.6			343	358	388		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
6.25%	A	5	5	5			24.0	25.4	24.0			8.3	8.0	8.1			8.6	8.4	8.5			484	499	527		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
12.5%	A	5	5	5			24.0	25.7	24.5			8.1	8.0	8.1			8.5	8.4	8.5			704	715	750		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
Meter Number							679	681	680			679	681	680			679	681	680			679	681	680		
Time		1649	1315	1403			1337	1305	1400			1337	1305	1400			1337	1305	1400			1337	1305	1400		
Initials		LPD	TP	AM			TP	TP	AM			TP	TP	AM			TP	TP	AM			TP	TP	AM		

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
Menidia: 2006.0
OTHER:

ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019.TOX
Client: MWRD
QC Test Number: TN-21-127
Test Material: Effluent
Accession Number: ATI-118
Dilution Water: Mod Hard
Accession Number: DI-119

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: 2/26/21 Time: 1400
Ending Date: 3/2/21 Time: 1403
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)				
		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			24.0	25.1	24.5			8.0	8.0	8.0			8.6	8.4	8.4			1134	1161	1203		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
50%	A	5	5	5			24.0	25.8	24.5			7.8	8.6	8.0			8.5	8.4	8.2			1910	1929	2026		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	4																						
100%	A	5	5	5			25.3	25.8	24.7			7.6	7.9	8.0			8.5	8.4	8.2			3433	3566	3731		
	B	5	5	5																						
	C	5	5	5																						
	D	5	5	5																						
Meter Number							679	681	680			679	681	680			679	681	680			679	681	680		
Time		1648	1315	1403			1337	1305	1400			1337	1305	1400			1337	1305	1400			1337	1305	1400		
Initials		LMD	TP	AT			TP	TP	AT			TP	TP	AT			TP	TP	AT			TP	TP	AT		

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
Menidia: 2006.0
OTHER:

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-127

Date/Time/Initials	Comments/Activity

RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-127

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 - TESTING LOCATION

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-127

Day	Testing Location	Date	Time	Initials
0	17B	2/26/21	1649	LAD
1	17B	2/27/21	1316	TP
2	17B	2/28/21	1400	AT
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21127

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: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-126

TEST ORGANISM INFORMATION

Common Name: Fathead minnow

Scientific Name: *P. promelas*

Lot Number: FH1-2120-21

Source: EA

Adults Isolated (Time, Date): _____

Neonates Pulled & Fed (Time, Date): _____

Acclimation: <24 hrs Age: 5-6 days

Culture Water (T/S): 25-7 °C 0 ppt

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
2126121	1330	TP	Dilutions Made
			Test Vessels Filled
	1525		Organisms Transferred
	1640	UAD	Head Counts

CONCENTRATION SERIES

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

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	2126121	1330	TP	ATI-118 / LDI-119
1				
2	2/28/21	1430	AT	ATI-118 / LDI-183
3				
4				
5				
6				

FEEDING

Food: *Artemia*

Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0			3 drops 1530 TP
1			3 drops 1658 TP
2			3 drops 1545 AT
3			3 drops 1600 AT
4			
5			
6			

ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019.TOX
Client: MWRD
QC Test Number: TN-21-126
Test Material: Effluent
Accession Number: AT1 - 118
Dilution Water: Mod Hard
Accession Number: LDI - 119

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: 2/26/21 Time: 1525
Ending Date: 3/2/21 Time: 1430
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)				
		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	24.0		24.2			8.3		8.3			8.5		8.6			343		311		
	B	10	10	10	10	10																				
6.25%	A	10	10	10	10	10	24.0		24.2			8.3		8.2			8.6		8.5			484		510		
	B	10	10	8	8	8																				
12.5%	A	10	10	10	10	10	24.0		24.3			8.1		8.2			8.5		8.4			704		691		
	B	10	10	10	10	10																				
25%	A	10	10	10	10	10	24.0		24.4			8.0		8.1			8.6		8.4			1134		1051		
	B	10	10	10	10	10																				
50%	A	10	10	10	10	10	24.0		24.5			7.8		8.0			8.5		8.4			1910		1818		
	B	10	10	9	9	9																				
100%	A	10	10	10	10	9	25.3		25.0			7.6		7.9			8.5		8.4			3433		3298		
	B	10	10	10	10	10																				
Meter Number							679		680			679		680			679		680			679		680		
Time		1640	1506	1440	1503	1430	1337		1433			1337		1433			1337		1433			1337		1433		
Initials		LMD	LMD	AM	AM	DB	TP		AM			TP		AM			TP		AM			TP		AM		

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: 70019.TOX
Client: MWRD
QC Test Number: TN-21-126
Test Material: Effluent
Accession Number: AFI-118
Dilution Water: Mod Hard
Accession Number: AFI-119

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: 2/26/21 Time: 1525
Ending Date: 3/2/21 Time: 1430
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) (b) 0	24	48	72	96	pH 0	24	48	72	96	Dissolved Oxygen (mg/L) 0	24	48	72	96	Conductivity (µS/cm) (b) 0	24	48	72	96
Control	A							24.9	~~26.0~~ 24.9	26.0	24.3		8.3	8.3	8.1	8.3		8.2	8.2	7.7	8.0		363	~~353~~ 359	359	359
	B																									
6.25%	A							25.1	25.2	26.0	25.2		8.1	8.2	7.9	8.2		8.1	8.2	7.0	7.4		481	486	515	510
	B																									
12.5%	A							26.0	25.9	26.0	25.5		8.0	8.1	7.9	8.1		7.9	7.8	7.0	7.0		698	695	723	708
	B																									
25%	A							26.0	26.0	26.0	25.7		8.0	8.0	7.9	8.0		7.8	8.0	6.8	6.8		1105	1117	1131	1110
	B																									
50%	A							26.0	26.0	26.0	25.5		7.9	7.9	7.8	8.0		7.8	8.0	6.6	6.9		1863	1871	1917	1874
	B																									
100%	A							26.0	26.0	26.0	25.7		7.8	7.9	7.7	7.8		7.8	7.8	6.7	6.7		3249	3261	3413	3314
	B																									
Meter Number								681	680	680	680		681	680	680	680		681	680	680	680		681	680	680	680
Time								1300	1410	1500	0927		1300	1410	1500	0927		1300	1410	1500	0927		1300	1410	1500	0927
Initials								TP	AT	AT	AT		TP	AT	AT	AT		TP	AT	AT	AT		TP	AT	AT	AT

TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-126

Day	Testing Location	Date	Time	Initials
0	17B	2/26/21	1441	LAD
1	17B	2/27/21	1515	LAD
2	17B	2/28/21	1546	AJ
3	17B	3/1/21	1503	AJ
4	17B	3/2/21	0927	AJ
5				
6				
7				
8				
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30				

TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-126

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: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-126

Date/Time/Initials	Comments/Activity

RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN- 21-126

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

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-126, 127

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
2/26/21	AT1-118	9.7	1008	RSB	8.5	1018	RSB
2/28/21	AT1-118	9.3	1413	AT	8.3	1423	AT

ATTACHMENT II

Report Quality Assurance Record
(2 pages)

REPORT QUALITY ASSURANCE RECORD

Client: MWRD

Project Number: 70019.TOX

Author: Rachael Brooks

EA Report Number: 8505

REPORT CHECKLIST

QA/QC ITEM	REVIEWER	DATE
1. Samples collected, transported, and received according to study plan requirements.		3/2/2021
2. Samples prepared and processed according to study plan requirements.		3/2/2021
3. Data collected using calibrated instruments and equipment.		3/2/2021
4. Calculations checked: - Hand calculations checked		3/2/2021
- Documented and verified statistical procedure used.		3/2/2021
5. Data input/statistical analyses complete and correct.	Jessie M Redlin	3/10/2021
6. Reported results and facts checked against original sources.	Jessie M Redlin	3/10/2021
7. Data presented in figures and tables correct and in agreement with text.	Jessie M Redlin	3/10/2021
8. Results reviewed for compliance with study plan requirements.		3/2/2021

	AUTHOR	DATE
9. Commentary reviewed and resolved.		3/15/2021

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

PROJECT MANAGER	3/15/21 DATE
Jessie M Redlin QUALITY CONTROL OFFICER	3/10/2021 DATE
SENIOR TECHNICAL OFFICER	3/15/21 DATE