

Protecting Our Water Environment



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**



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.

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This report contains 8 pages plus 2 attachments

A handwritten signature in black ink, appearing to read 'Michael K. Chanov II', is positioned above a horizontal line.

Michael K. Chanov II
Laboratory Director

15 March 2021

Date

EA Project Number 70019.TOX



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

<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>
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)

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
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

<u>Water Quality Parameters Measured on Sample Upon Receipt</u>	<u>Outfall 001 (AT1-118)</u>
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

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

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

<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>	<u>96-Hour Survival (percent)</u>
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)

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
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)



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		Sample Description (including Site, Station Number, and Outfall Number)	Number/Volume of Container
			Start Date/Time	End Date/Time		
ATI-118		✓	2/24/21 0600	2/25/21 0600	Calumet WRP Final Effluent Discharge # 001	1 gal

Sampled By: <i>Nick Kellios</i>	Date/Time 2/25/21	Received By:	Date/Time
Sampler's Printed Name: Nick Kellios	Title: Aquatic Biologist	Relinquished By:	Date/Time
Relinquished By: Nick Kellios	Date/Time 2/25/21 0930	Received By Laboratory: <i>[Signature]</i>	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: 6.715
 TRC (mg/L): 0
 Other:



SAMPLE CHECK-IN
FOR TESTING.

Client: MWRD

EA Accession Number: AT1-118

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: <u>Water flea</u>	Adults Isolated (Time, Date): <u>2/25/21 1603</u>		
Scientific Name: <u>C. dubia</u>	Neonates Pulled & Fed (Time, Date): <u>2/26/21 1025</u>		
Lot Number: <u>N/A</u>	Acclimation: <u><24hrs</u>	Age: <u><24 hrs</u>	
Source: <u>EA</u>	Culture Water (T/S): <u>24.7</u> °C	<u>0</u> ppt	

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

TEST SET-UP		
Sample Number: <u>AT1-118</u>		
Dilution Number: <u>AD1-119</u>		
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: Water flea
 Common Name: C. dubia
 Scientific Name: C. dubia
 TARGET VALUES: Static Flowthrough
 Renewal / Non-renewal

Temp: 25±1 °C DO: >4.0 mg/L
 pH: 6.0 - 9.0 Salinity: 0 ppt
 Photoperiod: 16 L, 8 d Light Intensity: 50 - 100 fc
 Test Duration: 48 hrs

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

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			
Control	A	5	5	5	5	24.0	25.4	21.0			8.3	8.1	8.1			8.5	8.3	8.6			343	358	388	
	B	5	5	5	5																			
	C	5	5	5	5																			
	D	5	5	5	5																			
6.25%	A	5	5	5	5	24.0	25.4	21.0			8.3	8.0	8.1			8.6	8.4	8.5			484	499	527	
	B	5	5	5	5																			
	C	5	5	5	5																			
	D	5	5	5	5																			
12.5%	A	5	5	5	5	24.0	25.7	21.5			8.1	8.0	8.1			8.5	8.4	8.5			704	715	780	
	B	5	5	5	5																			
	C	5	5	5	5																			
	D	5	5	5	5																			
Meter Number																								
Time	1049	1315	1403			679	681	680			679	681	680			679	681	680			679	681	680	
Initials	UP	TP	M			TP	TP	AT			TP	TP	AT			TP	TP	AT			TP	TP	AT	



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019_TOX
 Client: MWRD
 QC Test Number: IN-21-127
 Test Material: Effluent
 Accession Number: AT1-118
 Dilution Water: Mod Hard
 Accession Number: Q1-119

TEST ORGANISM

Common Name: Water flea
 Scientific Name: C. dubia

TARGET VALUES

Temp: 25±1 °C DO: >4.0 mg/L
 pH: 6.0-9.0 Salinity: 0 ppt
 Photoperiod: 16 L, 8 d Light Intensity: 50-100 fc
 Test Container: 30 ml cup
 Test Volume: 15 ml
 Test Duration: 48 hrs

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

TEST TYPE: Static Flowthrough

Renewal / Non-renewal

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
25%	A	5	5	5	5	5	24.0	25.7	25.5	8.0	8.0	8.0	8.4	8.4	8.4	8.6	8.4	8.4	8.4	1161	1203
	B	5	5	5	5	5															
	C	5	5	5	5	5															
	D	5	5	5	5	5															
50%	A	5	5	5	5	5	24.0	25.8	25.5	7.8	8.6	8.0	8.4	8.7	8.7	8.5	8.4	8.7	1916	1929	2076
	B	5	5	5	5	5															
	C	5	5	5	5	5															
	D	5	5	5	5	5															
100%	A	5	5	5	5	5	25.3	25.8	25.7	7.6	7.9	8.0	8.4	8.7	8.7	8.5	8.4	8.7	3433	3566	3731
	B	5	5	5	5	5															
	C	5	5	5	5	5															
	D	5	5	5	5	5															
Meter Number																					
Time	1046	1315	1403			679	681	680								679	681	680			
Initials	UPD	RP	BT			RP	RP	BT								RP	RP	BT			



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	UAD
1	17B	2/27/21	1316	UAD
2	17B	2/28/21	1400	UAD
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
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25				
26				
27				
28				
29				
30				



TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-127

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: <u>Fathead minnow</u>	Adults Isolated (Time, Date): _____		
Scientific Name: <u>P. promelas</u>	Neonates Pulled & Fed (Time, Date): _____		
Lot Number: <u>FH1-2120-21</u>	Acclimation: <u><24 hrs</u>	Age: <u>5-6 days</u>	
Source: <u>EA</u>	Culture Water (T/S): <u>25.7</u> °C <u>0</u> ppt		

TEST SET-UP						
TEST INITIATION				CONCENTRATION SERIES		
Date	Time	Initials	Activity	Test Concentration	Volume Test Material	Final Volume
<u>2/26/21</u>	<u>1330</u>	<u>TP</u>		Control	0 ml	500 ml
			Dilutions Made	6.25%	31.25 ml	↓
			Test Vessels Filled	12.5%	62.5 ml	
			Organisms Transferred	25%	125 ml	
				50%	250 ml	
				100%	500 ml	
	<u>1525</u>					
	<u>1640</u>	<u>LAJ</u>	Head Counts			
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	<u>2/26/21</u>	<u>1330</u>	<u>TP</u>	<u>AT1-118</u> <u>LD1-119</u>	0			3 drops <u>1530 TP</u>
1					1			3 drops <u>1653 TP</u>
2	<u>2/28/21</u>	<u>1430</u>	<u>AT</u>	<u>AT1-118</u> <u>LD1-123</u>	2			3 drops <u>1545 AT</u>
3					3			3 drops <u>1600 AT</u>
4					4			
5					5			
6					6			



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019_TOX TEST ORGANISM: Fathead minnow Beginning Date: 2/26/21 Time: 1525
 Client: MWRD Common Name: Fathead minnow Ending Date: 3/2/21 Time: 1430
 QC Test Number: TN-21-126 Scientific Name: P. promelas TEST TYPE: Static Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal Non-renewal
 Accession Number: AT1-118 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: LOT-119 Photoperiod: 16 L, 8 d 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)				
		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	8.3	8.3	8.5	8.6	8.6	8.6	8.5	8.4	8.4	8.4	8.4	8.4	8.4	8.4	343	311			
	B	10	10	10	10	10	24.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	484	510			
6.25%	A	10	10	10	10	10	24.0	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	704	691				
	B	10	10	10	10	10	24.2	8.2	8.2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	1134	1081				
12.5%	A	10	10	10	10	10	24.0	8.1	8.1	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	1910	1818				
	B	10	10	10	10	10	24.4	8.1	8.1	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	3133	3078				
25%	A	10	10	10	10	10	24.0	8.0	8.0	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	679	680				
	B	10	10	10	10	10	24.4	8.0	8.0	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	1337	1453				
50%	A	10	10	10	10	10	24.0	8.0	8.0	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	
	B	10	10	10	10	10	24.4	8.0	8.0	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	
100%	A	10	10	10	10	10	24.0	8.0	8.0	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	
	B	10	10	10	10	10	24.4	8.0	8.0	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	
Meter Number							679	680	1337	1453	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	
Time		1640	1506	1440	1353	1430	1337	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	
Initials		UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	UPD	



ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70019.TOX TEST ORGANISM 2/26/21 Time: 1525
 Client: MWRD Common Name: Fathead minnow Ending Date: 3/2/21 Time: 1430
 QC Test Number: TN-21-126 Scientific Name: P. promelas TEST TYPE: Static Flowthrough
 Test Material: Effluent TARGET VALUES Renewal / Non-renewal
 Accession Number: A11-116 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: LD1-119 Photoperiod: 16 L 8 d 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)			
		24	48	72	96	24	48	72	96	24	48	72	96	24	48	72	96	24	48	72
Control	A					249	260	26.0	24.3	8.3	8.1	8.3	8.0	8.2	7.7	8.0	363	353	359	359
	B					219														
6.25%	A					251	25.2	26.0	25.2	8.1	8.2	7.9	8.2	8.1	7.9	7.9	481	486	515	510
	B																			
12.5%	A					260	25.9	26.0	25.5	8.0	8.1	7.9	8.1	7.9	7.0	7.0	698	695	723	706
	B																			
25%	A					260	26.0	26.0	25.7	8.0	8.0	7.9	8.0	8.0	6.8	6.8	1105	1117	1131	1110
	B																			
50%	A					260	26.0	26.0	25.5	7.9	7.9	7.8	8.0	8.0	6.9	6.9	1863	1871	1917	1879
	B																			
100%	A					260	26.0	26.0	25.7	7.8	7.9	7.7	7.8	7.8	6.7	6.7	5244	3261	3413	3319
	B																			
Meter Number						681	680	680	680	681	680	680	680	680	680	680	681	680	680	680
Time						1300	1410	1500	1500	1300	1410	1500	1500	1300	1410	1500	1300	1410	1500	1500
Initials						TP	AT	AT	AT	TP	AT	AT	AT	TP	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	1641	LAD
1	17B	2/27/21	1515	AD
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				
9				
10				
11				
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28				
29				
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:

Date	Sample #	ON AIR			OFF AIR		
		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

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

	<u>AUTHOR</u>	<u>DATE</u>
9. Commentary reviewed and resolved.	<u>[Signature]</u>	<u>3/15/2021</u>
10. All study plan and quality assurance/control requirements have been met and the report is approved:		
	<u>[Signature]</u>	<u>3/15/21</u>
	PROJECT MANAGER	DATE
	<u>Jess M Reddy</u>	<u>3/10/2021</u>
	QUALITY CONTROL OFFICER	DATE
	<u>[Signature]</u>	<u>3/15/21</u>
	SENIOR TECHNICAL OFFICER	DATE