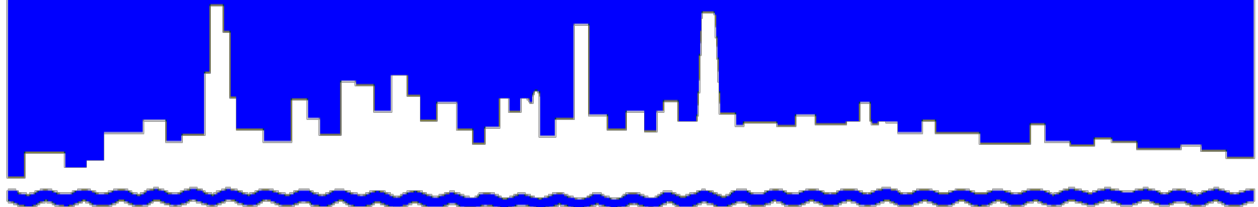


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 21-44

***RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia*
AND *Pimephales promelas* ON A NOVEMBER 2021 EFFLUENT
SAMPLE FROM THE CALUMET WATER RECLAMATION PLANT OF
THE METROPOLITAN WATER RECLAMATION DISTRICT OF
GREATER CHICAGO***

November 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 NOVEMBER 2021 EFFLUENT SAMPLE FROM THE CALUMET WATER RECLAMATION PLANT OF THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

By

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

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

November 2021

Protecting Our Water Environment



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Edward W. Podczewinski, P.E.
Director of Monitoring and Research

December 1, 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 eighth 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
Environmental Monitoring
and Research Manager
Monitoring and Research Department

AC:TM:NK:mb
Enclosure
cc: E. Podczewinski/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 NOVEMBER 2021 EFFLUENT SAMPLE FROM THE
CALUMET WATER RECLAMATION PLANT
OF THE 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 shall not be reproduced, except in full, without written approval of
EA Engineering, Science, and Technology, Inc., PBC*

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

24 November 2021

Date

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 15-16 November 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 15-16 November 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 100 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 95 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 1,916 mg/L NaCl, and acceptable control chart limits of 1,629-2,265 mg/L NaCl. The results of the *P. promelas* reference toxicant test was acceptable, with a 48-hour LC50 of 1,146 mg/L KCl, and acceptable control chart limits of 564-1,250 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: **AT1-840**

Collection Time and Date: 0600, 15 November 2021 to 0600, 16 November 2021

Receipt Time and Date: 0941, 17 November 2021

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

EA Test Number: **TN-21-701**

Test Initiation Time and Date: 1320, 17 November 2021

Test Completion Time and Date: 1305, 19 November 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-21-200

Test Date and Time: 1200, 4 November 2021 to 1119, 6 November 2021

Dilution Water: Moderately hard synthetic freshwater

48-hour LC50: 1,916 mg/L NaCl

Laboratory control chart acceptability range for 48-hour LC50: 1,629-2,265 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 November 2021
 EA Test Number: TN-21-701

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

<u>Water Quality Parameters on Test Solutions</u>	<u>Range</u>
Temperature (°C):	24.0 – 25.4
pH:	7.6 – 8.0
Dissolved Oxygen (mg/L):	8.1 – 9.4
Conductivity (µS/cm):	322 – 1,048

<u>Water Quality Parameters Measured on Sample Upon Receipt</u>	<u>Outfall 001 (AT1-840)</u>
Temperature (°C):	2.4
pH:	7.7
Total Residual Chlorine (mg/L):	<0.01
Alkalinity (mg/L as CaCO ₃):	164
Hardness (mg/L as CaCO ₃):	224
Conductivity (µS/cm):	978

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: **AT1-840**

Collection Time and Date: 0600, 15 November 2021 to 0600, 16 November 2021

Receipt Time and Date: 0941, 17 November 2021

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

EA Test Number: **TN-21-700**

Test Initiation Time and Date: 1335, 17 November 2021

Test Completion Time and Date: 1312, 21 November 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 at 48 Hours**

Organism Lot Information

Lot Number: FH1-11/12-13

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 Chemicals Lot#19430079 (Received 10/20/20)

EA Test Number: RT-21-202

Test Date and Time: 1316, 4 November 2021 to 1303, 6 November 2021

Dilution Water: Moderately hard synthetic freshwater

48-hour LC50: 1,146 mg/L KCl

Laboratory control chart acceptability range for 48-hour LC50: 564-1,250 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 November 2021
 EA Test Number: TN-21-700

<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>	<u>96-Hour Survival (percent)</u>
Lab Control	100	95
6.25	100	80
12.5	100	100
25	100	95
50	100	95
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):	24.0 – 26.0
pH:	7.6 – 8.5
Dissolved Oxygen (mg/L):	7.2 – 9.0
Conductivity (µS/cm):	322 – 971

ATTACHMENT I

Data Sheets and Statistics
(18 pages)

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



Client: MWRD GC Project No.: 4652-126-1
NPDES Number: IL0029061 Client Purchase Order Number: 3111991
City/State Collected: Chicago, IL

Sample Shipped By: (circle)
Fed. Ex. UPS Other: _____
Tracking #: 1Z 274 494 84 9224
9732

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-840		<input checked="" type="checkbox"/>	11/15/21 0600	11/16/21 0600	Calumet WRP Final Effluent	1 gallon

Sampled By: <u>Paula Brinkman Lowe</u>	Date/Time <u>11/16/21 0853</u>	Received By: <u>Brian Schmitt</u>	Date/Time <u>11/16/21 0856</u>
Sampler's Printed Name: <u>Paula Brinkman Lowe</u>	Title: <u>SERT</u>	Relinquished By: <u>Brian Schmitt</u>	Date/Time <u>11/16/21 0857</u>
Relinquished By: <u>Paula Brinkman Lowe</u>	Date/Time <u>11/16/21 0854</u>	Received By Laboratory: <u>Morgan C.</u>	Date/Time <u>0941 11/17/21</u>

Was Sample Chilled During Collection? Yes/No

Comments: _____

Sample Collection Parameters
Visual Description: Clear, Green
Temperature (°C): 7.0
pH: 7.16
TRC (mg/L): 0
Other: _____



SAMPLE CHECK-IN
FOR TESTING

Client: MWRD GC

EA Accession Number: ATI-840

Parameter	Acceptable Range	Measurement*	Meter	Date	Time	Initials
Temperature (°C)	≤4	2.4	T-22	11/17/21	0946	MT
Is ice present?	—	YES	N/A	↓	↓	↓
pH	6.0-9.0	7.7	681			
TRC (mg/L)	<0.01	20.01	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
Dissolved Oxygen (mg/L)	—					
Salinity (ppt)	—					



TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-701

TEST ORGANISM INFORMATION

Common Name: Water flea Adults Isolated (Time, Date): 11/16/21 1350
 Scientific Name: C. dubia Neonates Pulled & Fed (Time, Date): 11/17/21 1050
 Lot Number: N/A Acclimation: <24hrs Age: <24 hrs
 Source: EA Culture Water (T/S): 24.3 °C 0 ppt

TEST INITIATION

Date	Time	Initials	Activity
11/17/21	1045	MT	Dilutions Made
↓	↓	↓	Test Vessels Filled
	1327 1320	MT MT	Organisms Transferred
↓	1327	MT	Head Counts

TEST SET-UP

Sample Number: AT1-840

Dilution Number: 01-774

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	

Day 11/17/21



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019_TOX Beginning Date: 11/17/21 Time: 1320
 Client: MWRD Ending Date: 11/19/21 Time: 1305
 QC Test Number: TN-2A-701 TEST TYPE: Static Flowthrough
 Test Material: Effluent Renewal / Non-renewal
 Accession Number: ATV-840 Test Container: 30 ml cup
 Dilution Water: Mod Hard Salinity: 0 ppt
 Accession Number: ADV-774 Light Intensity: 50 - 100 fc Test Duration: 48 hrs

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

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	5	24.0	24.0	24.0	24.0	24.0	8.0	7.8	7.8	8.3	9.4	8.1					322	371	373	
	B	5	5	5	5	5																			
	C	5	5	5	5	5																			
	D	5	5	5	5	5																			
6.25%	A	5	5	5	5	5	24.0	24.1	23.1			8.0	7.8	7.8	8.4	9.4	8.3					362	387	393	
	B	5	5	5	5	5																			
	C	5	5	5	5	5																			
	D	5	5	5	5	5																			
12.5%	A	5	5	5	5	5	24.3	24.3	23.3			8.0	7.8	7.8	8.3	9.3	8.5					402	429	428	
	B	5	5	5	5	5																			
	C	5	5	5	5	5																			
	D	5	5	5	5	5																			
Meter Number																						1305			
Time																						1321	1355	1405	
Initials																						MT	MT	MT	

Camryn Valle



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019_TOX
 Client: MWRD
 QC Test Number: TN-21-101
 Test Material: Effluent
 Accession Number: AT-840
 Dilution Water: Mod Hard
 Accession Number: DK-774

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

Beginning Date: 11/17/21 Time: 1320
 Ending Date: 11/19/21 Time: 1305
 TEST TYPE: Static Flowthrough
 Renewal / Non-renewal
 Test Container: 30 ml cup
 Test Volume: 15 ml
 Test Duration: 48 hrs

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

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		24.6	24.2	25.3	7.9	7.7	7.8	8.3	9.0	8.5											
	B	5	5	5																					
	C	5	5	5																					
	D	5	5	5																					
50%	A	5	5	5		24.6	24.1	25.3	7.8	7.7	7.7	8.3	8.8	8.5											
	B	5	5	5																					
	C	5	5	5																					
	D	5	5	5																					
100%	A	5	5	5		25.1	24.2	25.4	7.7	7.6	7.7	8.3	8.8	8.5											
	B	5	5	5																					
	C	5	5	5																					
	D	5	5	5																					
Meter Number																									
Time																									
Initials																									

(C)MT 11/18/21



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-701

Date/Time/Initials

Comments/Activity



RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-701

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-21-701

Day	Testing Location	Date	Time	Initials
0	17	11/17/21	1329	MT
1	17	11/18/21	1145	MT
2	17	11/19/21	1311	MT
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
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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-21-701

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-21-700

TEST ORGANISM INFORMATION

Common Name: Fathead minnow Adults Isolated (Time, Date): _____
 Scientific Name: P. promelas Neonates Pulled & Fed (Time, Date): _____
 Lot Number: FH1 11/12-13 Acclimation: <24 hrs Age: 4-5 days
 Source: 146 EA Culture Water (T/S): 25.4 °C 0 ppt

(6) MT 11/23/21

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
11/17/21	1045	MT	Dilutions Made
	↓	↓	Test Vessels Filled
	1335	MT	Organisms Transferred
	↓	↓	Head Counts
	1345	MT	

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	11/17/21	1045	MT	AT1-840 LD1-774
1				
2	11/19/21	0935	MT	AT1-840 LD1-776
3				
4				
5				
6				

FEEDING

Food: <i>Artemia</i>			
Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0			
1			
2		1203 MT	3 drops
3			
4			
5			
6			



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70019.TOX
 Client: MWRD
 QC Test Number: TN-21-100
 Test Material: Effluent
 Accession Number: AT1-840
 Dilution Water: Mod Hard
 Accession Number: 601-774

TEST ORGANISM

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

TARGET VALUES

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

Beginning Date: 11/17/21 Time: 1335
 Ending Date: 11/21/21 Time: 1312
 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	9	24.0	24.5	24.0			8.0	7.9	8.4			8.3	7.9	9.0			322	318	326		
	B	10	10	10	10	10																				
6.25%	A	10	10	10	10	10	24.0	24.7	24.0			8.0	7.8	8.3			8.4	7.8	8.9			362	369	360		
	B	10	10	10	10	8																				
12.5%	A	10	10	10	10	10	24.3	24.8	24.4			8.0	7.8	8.3			8.3	7.8	8.6			402	407	400		
	B	10	10	10	10	10																				
25%	A	10	10	10	10	9	24.6	26.0	24.4			7.9	7.8	8.2			8.3	7.7	8.6			484	489	482		
	B	10	10	10	10	10																				
50%	A	10	10	10	10	10	24.6	26.0	24.5			7.8	7.7	8.1			8.3	7.3	8.6			647	654	631		
	B	10	10	10	10	9																682				
100%	A	10	10	10	10	10	25.1	26.0	24.6			7.7	7.8	7.9			8.3	7.3	8.7			969	954	957		
	B	10	10	10	10	10																				
Meter Number							680	680	681			680	680	681			680	680	681			680	680	681		
Time		1645	1407	1322	1517	1312	1056	1144	1003			1056	1144	1003			1056	1144	1003			1056	1144	1003		
Initials		AM	MT	MT	MT	AM	MT	MT	MT			MT	MT	MT			MT	MT	MT			MT	MT	MT		

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ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70019_TOX TEST ORGANISM: TEST ORGANISM Beginning Date: 11/17/21 Time: 1335
 Client: MWRD Common Name: Fathead minnow Ending Date: 11/21/21 Time: 1312
 QC Test Number: TN-21-100 Scientific Name: P. promelas TEST TYPE: Static Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal / Non-renewal
 Accession Number: AT1-840 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: LD1-774 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				
Control	A		25.5	24.7	24.5	25.9	7.9	7.7	8.5	8.4	7.9	7.5	8.0	8.1	326	331	333	334
	B																	
6.25%	A		25.7	24.7	25.7	26.0	7.8	7.7	8.4	8.3	7.8	7.8	7.7	7.9	369	371	368	368
	B																	
12.5%	A		25.8	25.2	25.9	26.0	7.8	7.7	8.4	8.3	7.8	7.8	7.3	7.6	407	408	408	406
	B																	
25%	A		26.0	25.5	26.0	26.0	7.8	7.7	8.3	8.2	7.7	7.7	7.3	7.7	489	485	488	487
	B																	
50%	A		26.0	25.6	26.0	26.0	7.7	7.6	8.3	8.1	7.3	7.7	7.2	7.7	652	637	641	640
	B																	
100%	A		26.0	25.6	26.0	26.0	7.8	7.6	8.1	8.1	7.3	7.6	7.2	7.6	954	964	971	968
	B																	
Meter Number			680	681	680	680	680	681	680	680	680	680	680	680	680	681	680	680
Time			1144	0943	1310	1303	1144	0943	1310	1303	1144	0943	1310	1303	1144	0943	1310	1303
Initials			MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT

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 12/21/21
 For MWRD



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-100

Date/Time/Initials

Comments/Activity



RANDOMIZATION CHART

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-700

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



TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-300

Day	Testing Location	Date	Time	Initials
0	17	11/17/21	1100	MT
1	17	11/18/21	1145	MT
2	17	11/19/21	0955	MT
3	17	11/20/21	1330	MT
4	17	11/21/21	1310	AG
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TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: 70019.TOX

Client: MWRD

QC Test Number: TN-21-700

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: 70019.TOX
 Author: Rachael Brooks EA Report Number: 869.5

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>Rachael Brooks</u>	<u>11/22/21</u>
2. Samples prepared and processed according to study plan requirements.	<u>Rachael Brooks</u>	<u>11/22/21</u>
3. Data collected using calibrated instruments and equipment.	<u>Rachael Brooks</u>	<u>11/22/21</u>
4. Calculations checked:		
- Hand calculations checked	<u>Rachael Brooks</u>	<u>11/22/21</u>
- Documented and verified statistical procedure used.	<u>Rachael Brooks</u>	<u>11/22/21</u>
5. Data input/statistical analyses complete and correct.	<u>James M Reddy</u>	<u>11/23/2021</u>
6. Reported results and facts checked against original sources.	<u>James M Reddy</u>	<u>11/23/2021</u>
7. Data presented in figures and tables correct and in agreement with text.	<u>James M Reddy</u>	<u>11/23/2021</u>
8. Results reviewed for compliance with study plan requirements.	<u>Rachael Brooks</u>	<u>11/22/21</u>

	<u>AUTHOR</u>	<u>DATE</u>
9. Commentary reviewed and resolved.	<u>Rachael Brooks</u>	<u>11/24/21</u>
10. All study plan and quality assurance/control requirements have been met and the report is approved:		
	<u>[Signature]</u> PROJECT MANAGER	<u>11/24/21</u> DATE
	<u>James M Reddy</u> QUALITY CONTROL OFFICER	<u>11/23/2021</u> DATE
	<u>[Signature]</u> SENIOR TECHNICAL OFFICER	<u>11/24/21</u> DATE