

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 17-51

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

December 2017

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

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

By:

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

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

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

December 8, 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:

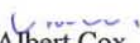
Subject: Biomonitoring Report for 2017 – Acute Toxicity Test Results for the Stickney Water Reclamation Plant, National Pollutant Discharge Elimination System Permit Number IL0028053

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 thirteenth month before the expiration of the permit.

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

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

Very truly yours,


Albert Cox
Environmental Monitoring
and Research Manager
Monitoring and Research Department

AC:JW:NK:lf

Enclosures

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

By certified mail



RESULTS OF ACUTE TOXICITY TESTING
WITH *Ceriodaphnia dubia* AND *Pimephales promelas*
ON A NOVEMBER 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 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 written over a horizontal line.

Michael K. Chanov II
Laboratory Director

4 December 2017

Date

INTRODUCTION

At the request of Metropolitan Water Reclamation District (MWRD), EA Engineering, Science, and Technology performed acute toxicity testing on composite samples of Outfall 001 final effluent from MWRD's Stickney Water Reclamation Plant in Cicero, Illinois. The effluent composite sample was collected on 19-20 November 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 19-20 November 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 95 percent survival in all of the effluent concentrations. The laboratory control had 100 percent survival. The resulting 96-hour LC50 for *P. promelas* was >100 percent effluent (<1.0 TU_a).

In conformance with EA's quality assurance/quality control program, monthly reference toxicant tests using sodium chloride (NaCl) and potassium chloride (KCl) were performed on the in-house cultured test species. The results of the *C. dubia* reference toxicant test were acceptable, with a 48-hour LC50 of 1,980 mg/L NaCl, and acceptable control chart limits of 1,562-2,148 mg/L NaCl. The results of the *P. promelas* reference toxicant test were acceptable, with a 48-hour LC50 of 1,084 mg/L KCl, and acceptable control chart limits of 914-1,381 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: AT7-582

Collection Time and Date: 0600, 19-20 November 2017

Receipt Time and Date: 1049, 21 November 2017

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

EA Test Number: **TN-17-460**

Test Initiation Time and Date: 1338, 21 November 2017

Test Completion Time and Date: 1142, 23 November 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-17-187

Test Date and Time: 1056, 2 November 2017 to 1057, 4 November 2017

Dilution Water: Moderately hard synthetic freshwater

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

Laboratory control chart acceptability range for 48-hour LC50: 1,562-2,148 mg/L NaCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: *Ceriodaphnia dubia* (water flea)
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 19-20 November 2017
 EA Test Number: TN-17-460

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

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 – 25.2
pH:	8.2 – 8.7
Dissolved Oxygen (mg/L):	8.1 – 8.8
Conductivity (µS/cm):	323 – 808

<u>Water Quality Parameters Measured on Sample Upon Receipt</u>	<u>Outfall 001 (AT7-582)</u>
Temperature (°C):	2.2
pH:	7.9
Total Residual Chlorine (mg/L):	<0.01
Alkalinity (mg/L as CaCO ₃):	142
Hardness (mg/L as CaCO ₃):	200
Conductivity (µS/cm):	855

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: AT7-582

Collection Time and Date: 0600, 19-20 November 2017

Receipt Time and Date: 1049, 21 November 2017

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

EA Test Number: **TN-17-461**

Test Initiation Time and Date: 1630, 21 November 2017

Test Completion Time and Date: 1540, 25 November 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: FH7-11/18-19

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

Age: 2-3 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-17-195

Test Date and Time: 1605, 1 November 2017 to 1530, 3 November 2017

Dilution Water: Moderately hard synthetic freshwater

48-hour LC50: 1,084 mg/L KCl

Laboratory control chart acceptability range for 48-hour LC50: 914-1,381 mg/L KCl

SUMMARY OF SAMPLE/TEST INFORMATION (continued)

Test Species: ***Pimephales promelas* (fathead minnow)**
 Sample Description: Outfall 001 Final Effluent – MWRD
 Sample Date: 19-20 November 2017
 EA Test Number: TN-17-461

<u>Test Concentration (percent effluent)</u>	<u>48-Hour Survival (percent)</u>	<u>96-Hour Survival (percent)</u>
Lab Control	100	100
6.25	100	100
12.5	100	100
25	100	100
50	100	100
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 – 25.6
pH:	7.5 – 8.7
Dissolved Oxygen (mg/L):	7.0 – 8.5
Conductivity (µS/cm):	317 – 806

ATTACHMENT I

Data Sheets
(16 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 #: 1Z288 682 84958 2122

Client: MWRDGL Project No.: _____
 NPDES Number: IL0028053 Client Purchase Order Number: 8008796
 City/State Collected: _____

PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

Accession Number (office use only)	Grab	Composite	Collection		Sample Description (including Site, Station Number, and Outfall Number)	Number/Volume of Container
			Start Date/Time	End Date/Time		
<u>AT7-892</u>		<input checked="" type="checkbox"/>	<u>11/29/17 0600</u>	<u>11/20/17 0600</u>	<u>St. Lawrence Final Effluent Outfall 001</u>	<u>1 gal</u>

Sampled By: <u>Nick Kallias</u>	Date/Time <u>11/20/17 0845</u>	Received By:	Date/Time
Sampler's Printed Name: <u>Nick Kallias</u>	Title: <u>Aquatic Biologist</u>	Relinquished By:	Date/Time
Relinquished By: <u>Nick Kallias</u>	Date/Time <u>11/20/17 0845</u>	Received By Laboratory: <u>[Signature]</u>	Date/Time <u>11/21/17 1049</u>

Was Sample Chilled During Collection? Yes No Comments: _____

Sample Collection Parameters

Visual Description: Clear Green
 Temperature (°C): 6.6
 pH: _____
 TRC (mg/L): 0 mg/L
 Other: _____



SAMPLE CHECK-IN FOR TESTING

Client: MWRD

EA Accession Number: AT7-582 Final Eff

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	2.2	11/21/17	1049	NM
Is ice present?	--	✓	↓	↓	↓
pH	6.0-9.0	7.9	↓	↓	↓
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: IN-17460

TEST ORGANISM INFORMATION

Common Name: <u>Water flea</u>	Adults Isolated (Time, Date): <u>11/20/17 1642</u>
Scientific Name: <u>C. dubia</u>	Neonates Pulled & Fed (Time, Date): <u>11/21/17 1300</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>23.7</u> °C <u>0</u> ppt

TEST INITIATION

<u>Date</u>	<u>Time</u>	<u>Initials</u>	<u>Activity</u>
11/21/17	1256	NM	Dilutions Made
↓	↓	↓	Test Vessels Filled
	1338		Organisms Transferred
	1426	MJ	Head Counts

TEST SET-UP

Sample Number: AT7-532

Dilution Number: LD7-5M

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



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70005.15 Beginning Date: 11/21/17 Time: 1338
 Client: MWRD Ending Date: 11/22/17 Time: 1412
 QC Test Number: TN-17-460 TEST TYPE: Static / Flowthrough
 Test Material: Effluent Renewal / Non-renewal
 Accession Number: A17-582 Test Container: 30 ml cup
 Dilution Water: Mod Hard pH: 6.0 - 9.0 Salinity: 0 Test Volume: 15 ml
 Accession Number: 0D7-514 Photoperiod: 16 L 8 d Light Intensity: 50 - 100 fc Test Duration: 48 hrs

TARGET VALUES

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	
Control	A	5	5	5	5	24.6	24.8	24.0	8.7	8.3	8.4	8.3	8.2	8.6	323	334	387
	B	5	5	5	5												
	C	5	5	5	5												
	D	5	5	5	5												
6.25%	A	5	5	5	5	21.4	21.7	24.0	8.5	8.3	8.4	8.3	8.3	8.7	355	364	393
	B	5	5	5	5												
	C	5	5	5	5												
	D	5	5	5	5												
12.5%	A	5	5	5	5	24.4	24.9	24.0	8.4	8.3	8.4	8.3	8.2	8.8	385	394	411
	B	5	5	5	5												
	C	5	5	5	5												
	D	5	4	4	4												
Meter Number		678	078	678													
Time		1426	1453	1472													
Initials		MJS	MJS	JBS													



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70005.15 Beginning Date: 11/21/17 Time: 1338
 Client: MWRD Common Name: Water flea Ending Date: 11/23/17 Time: 1142
 QC Test Number: IN-17460 Scientific Name: C. dubia TEST TYPE: Static / Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal / Non-renewal
 Accession Number: AT7-562 Temp: 25±1 °C DO: >4.0 mg/L Test Container: 30 ml cup
 Dilution Water: Mod Hard pH: 6.0 - 9.0 Salinity: 0 ppt Test Volume: 15 ml
 Accession Number: LD7-514 Photoperiod: 16L, 8d Light Intensity: 50 - 100 fc 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	
25%	A	5	5	5	5	24.7	25.0	24.0	8.3	8.3	8.1	8.3	8.2	8.5	44	440	464
	B	5	5	5	5												
	C	5	5	5	5												
	D	5	5	5	5												
50%	A	5	5	5	5	24.4	25.2	24.1	8.3	8.3	8.3	8.7	8.2	8.6	55	555	572
	B	5	5	5	5												
	C	5	5	5	5												
	D	5	5	5	5												
100%	A	5	5	5	5	24.5	25.2	24.0	8.2	8.2	8.3	8.3	8.1	8.6	78	783	808
	B	5	5	5	5												
	C	5	5	5	5												
	D	5	4	4	4												
Meter Number																	
Time		1426	1433	1142		678	678	678	678	678	678	678	678	678	678	678	678
Initials		MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-400

Date/Time/Initials

Comments/Activity



RANDOMIZATION CHART

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-460

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-17-460

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-17-461

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>FH7-11/18-19</u>	Acclimation: <u><24 hrs</u>	Age: <u>2-3 days</u>	
Source: <u>EA</u>	Culture Water (T/S): <u>25.4</u> °C <u>0</u> ppt		

TEST SET-UP						
TEST INITIATION				CONCENTRATION SERIES		
Date	Time	Initials	Activity	Test Concentration	Volume Test Material	Final Volume
11/21/17	1256	NM	Dilutions Made	Control	0ml	500ml
↓	↓	↓	Test Vessels Filled	6.25%	31.25ml	↓
↓	1630	MJ	Organisms Transferred	12.5%	62.5ml	↓
↓	1645	NM	Head Counts	25%	125ml	↓
↓				50%	250ml	↓
↓				100%	500ml	↓
Comments:						

INTERMEDIATE DILUTION PREPARATION AND FEEDING							
DILUTION PREPARATION					FEEDING		
Day	Date	Time	Initials	Sample / Diluent	Day	Time, Initials, Amount	Time, Initials, Amount
0	11/21/17	1256	NM	AT7-582 LD7-519	0		1640 NM 3 drops
1					1		1607 EB 3 drops
2	11/23/17	1100	JB	AT7-582 LD7-519	2		1200 JB 3 drops
3					3		1300 JB 3 drops
4					4		
5					5		
6					6		



ACUTE TOXICITY TEST DATA SHEET

Project Number: 70005.15 Beginning Date: 11/21/07 Time: 1630
 Client: MWRD Common Name: Fathead minnow Ending Date: 11/25/17 Time: 1540
 QC Test Number: IN-17-461 Scientific Name: P. promelas TEST TYPE: Static / Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal / Non-renewal
 Accession Number: AT7-582 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: 607-514 Photoperiod: 16L:8d Light Intensity: 50 - 100 fc Test Duration: 96 hrs

Concentration	Rep	Number of Live Organisms					Temperature (°C)					pH					Dissolved Oxygen (mg/L)					Conductivity (µS/cm) Salinity (ppt)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Control	A	10	10	10	10	10	24.6	24.5	24.5	24.5	24.5	8.7	8.3	8.0	8.0	8.3	8.3	8.3	8.3	8.3	8.3	322	317	317	317	317
	B	10	10	10	10	10																				
6.25%	A	10	10	10	10	10	24.4	24.4	24.4	24.4	24.4	8.5	8.3	8.2	8.2	8.3	8.3	8.3	8.3	8.3	355	347	347	347	347	
	B	10	10	10	10	10																				
12.5%	A	10	10	10	10	10	24.9	24.3	24.3	24.3	24.3	8.4	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	385	372	372	372	372	
	B	10	10	10	10	10																				
25%	A	10	10	10	10	10	24.3	24.3	24.3	24.3	24.3	8.3	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	441	432	432	432	432	
	B	10	10	10	10	10																				
50%	A	10	10	10	10	10	24.4	24.3	24.3	24.3	24.3	8.3	8.1	8.3	8.3	8.3	8.3	8.3	8.3	8.3	551	531	531	531	531	
	B	10	10	10	10	10																				
100%	A	10	10	10	10	10	24.5	24.4	24.4	24.4	24.4	8.2	8.1	8.3	8.3	8.3	8.3	8.3	8.3	8.3	787	760	760	760	760	
	B	10	10	10	9	9																				
Meter Number						6781	678	678	678	678	678	678	678	678	678	678	678	678	678	678	078	678	678	678	678	
Time		1046	1547	1118	1255	1540	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	
Initials		MM	GB	GB	JB	JA	JA	JA	JA	JA	JA	JA	JA	JA	JA	JA	JA	JA	JA	JA	MM	MM	MM	MM	MM	



ACUTE TOXICITY TEST DATA SHEET - OLD SOLUTIONS

Project Number: 70005.15 TEST ORGANISM: 70005.15 Beginning Date: 11/21/17 Time: 1630
 Client: MWRD Common Name: Fathead minnow Ending Date: 11/25/17 Time: 1540
 QC Test Number: TN-17-461 Scientific Name: P. promelas TEST TYPE: Static / Flowthrough
 Test Material: Effluent TARGET VALUES: Renewal / Non-renewal
 Accession Number: AT1-562 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: 571 - 514 Photoperiod: 16L 8d Light Intensity: 50 - 100 fc Test Duration: 96 hrs

Concentration	Rep	Number of Live Organisms				Temperature (°C)				pH				Dissolved Oxygen (mg/L)				Conductivity (µS/cm)			
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Control	A					24.8	24.0	24.0	25.2	8.2	8.3	7.9	7.6	8.3	7.9	8.5	332	334	344	388	
	B																				
6.25%	A					25.3	24.2	24.0	25.5	8.2	8.3	7.9	7.6	7.9	8.2	8.1	351	357	375	413	
	B																				
12.5%	A					25.4	24.6	24.4	25.5	8.1	8.2	7.7	7.6	8.0	7.5	8.0	384	404	434		
	B																				
25%	A					25.4	24.9	25.3	25.2	8.1	8.1	7.6	7.7	8.0	7.3	7.5	438	438	440	474	
	B																				
50%	A					25.3	25.0	25.3	25.4	8.1	8.1	7.6	7.7	7.9	7.2	7.6	548	548	537	590	
	B																				
100%	A					25.5	25.0	25.2	25.6	8.1	8.0	7.5	7.7	7.6	7.1	7.0	705	762	760	806	
	B																				
Meter Number						1178	678	679	679	1178	678	679	679	1178	678	679	679	679	679	679	679
Time						1535	1101	1108	0844	1535	1101	1108	0844	1535	1101	1108	0844	1535	1101	1108	0844
Initials						918	575	575	575	918	575	575	575	918	575	575	575	918	575	575	575

11/28
575
575



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-461/460

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
11/21/17	AT7-582	10.4	1132	CB	4.38.2	1143	CB
11/23/17	AT7-582	9.8	1003	JB	7.9	1013	JB

exp(b)
11/21



TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70005.15

Client: MWRD

QC Test Number: TN- 17-461

Date/Time/Initials

Comments/Activity



RANDOMIZATION CHART

Project Number: 70005.15

Client: MWRD

QC Test Number: TN-17-461

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-17-4661

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: Michael Chanor

EA Report Number: 7637

REPORT CHECKLIST

<u>QA/QC ITEM</u>	<u>REVIEWER</u>	<u>DATE</u>
1. Samples collected, transported, and received according to study plan requirements.	<u>[Signature]</u>	<u>11/29/17</u>
2. Samples prepared and processed according to study plan requirements.	<u>[Signature]</u>	<u>11/29/17</u>
3. Data collected using calibrated instruments and equipment.	<u>[Signature]</u>	<u>11/29/17</u>
4. Calculations checked:		
- Hand calculations checked	<u>[Signature]</u>	<u>11/29/17</u>
- Documented and verified statistical procedure used.	<u>[Signature]</u>	<u>11/29/17</u>
5. Data input/statistical analyses complete and correct.	<u>[Signature]</u>	<u>12/4/17</u>
6. Reported results and facts checked against original sources.	<u>[Signature]</u>	<u>12/4/17</u>
7. Data presented in figures and tables correct and in agreement with text.	<u>[Signature]</u>	<u>12/4/17</u>
8. Results reviewed for compliance with study plan requirements.	<u>[Signature]</u>	<u>11/29/17</u>

	<u>AUTHOR</u>	<u>DATE</u>
9. Commentary reviewed and resolved.	<u>[Signature]</u>	<u>12/4/17</u>
10. All study plan and quality assurance/control requirements have been met and the report is approved:		
	<u>[Signature]</u>	<u>12/4/17</u>
	PROJECT MANAGER	DATE
	<u>[Signature]</u>	<u>12/4/17</u>
	QUALITY CONTROL OFFICER	DATE
	<u>[Signature]</u>	<u>12/4/17</u>
	SENIOR TECHNICAL REVIEWER	DATE

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

The WET Laboratory Chain-of-Custody

SAMPLE COLLECTION			SAMPLE TYPE	SAMPLE LOCATION	SAMPLE Temp °C	ON-SITE SAMPLE STORAGE (0.1-6 °C) YES/NO	PRINT NAME & SIGNATURE
DATE	TIME	BY					
11/19/17	0600	C. ROLLY	Grab	Final Effluent	13.6	<input checked="" type="checkbox"/> YES/NO	COLIN ROLLY C. Rolly
11/19/17	1200	M. SPACES	Grab	Final Effluent	13.8	<input checked="" type="checkbox"/> YES/NO	MIKE SPACES Mike Spaces
11/19/17	1800	C. Valdes	Grab	Final Effluent	14.2	<input checked="" type="checkbox"/> YES/NO	Camille Valdes Camille Valdes
11/19/17	2400	M. Arambula	Grab	Final Effluent	14.1	<input checked="" type="checkbox"/> YES/NO	Miguel Arambula Miguel Arambula
11/20/17	0600	M. Arambula	Grab	Final Effluent	14.5	<input checked="" type="checkbox"/> YES/NO	Miguel Arambula Miguel Arambula

Note: Sample container should be rinsed and should be filled completely leaving no air space between contents & lid. Preserve samples on ice or refrigerator (0.1-6°C) immediately after collection. Transport samples in ice-packed coolers to the WET Laboratory. The WET laboratory is located in Room LE-100, Lue-Hing R&D Complex.

Indicate if the final effluent was chlorinated/dechlorinated: Yes / No / NA.

SAMPLES RELINQUISHED BY: Name Matthew Bryan Signature: Matthew Bryan Date/Time: 11/20/17 0753
 SAMPLES TRANSPORTED TO WET LAB. BY Name _____ Signature: _____ Date/Time: _____

FOR WET LABORATORY USE ONLY:

Sample Received by: Name Nick Kollias Signature Nick Kollias Date/Time 11/20/17 0755

- Samples received with prescribed holding time (within 4 h of collection)? (Not Applicable, if chronic test)
 - Samples logged in by Nick Kollias Date 11/20/17 Time 0800
 - Each sample container labeled with a unique ID?
 - Were collection times for effluent and receiving water within 1 h of each other?
 - Did samples have sufficient volume for analysis?
 - Samples accepted
- Special Observations _____

- Yes / No / (NA)
- Yes / No
- Yes / No
- Yes / No / (NA)
- Yes / No
- Yes / No

LIMS #	Sample Type/ID	Temp °C	pH	Residual Chlorine (mg/L) Initials	Sodium-thio-sulfate Added YES/NO	Sample Custodian Signature
8095998	BMOUTST A	4.3	7.10	0	Indicate Total _____ ml of 5% Sodium-thio-sulfate added, Initial _____	<u>Nick Kollias</u>
8095998	BMOUTST B	4.2	7.28	Total Ammonia (mg-L) ALD Results	_____ Final Residual Cl ₂ reading = _____ mg/l	
8095998	BMOUTST C	4.0	7.23		Initial <u>NK</u>	
8095998	BMOUTST D	5.0	7.23			
8095998	BMOUTST E	9.0	7.28	< 0.10		

Note: Set aside one cubitainer for metals and chemical analyses

Sample Received By: Trace Metals Peter C. Name Peter Cashaw Signature Peter Cashaw Date 11-20-17 Time 0923
 Lachat Peter c. Name Peter Cashaw Signature Peter Cashaw Date 11-20-17 Time 0923
 Materials Peter Name Peter Cashaw Signature Peter Cashaw Date 11-20-17 Time 0923
 Sample aliquot received by Peter Cashaw Name Peter Cashaw Signature Peter Cashaw Date 11-20-17 Time 0923

Sample Release for Disposal

Sample released for disposal following analysis on (Date) 12/5/17 by Nick Kollias

Samples Discarded by Nick Kollias Date/Time 12/5/17 1000