

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 25-05

***RESULTS OF ACUTE TOXICITY TESTING WITH Ceriodaphnia dubia
AND Pimephales promelas ON AN APRIL 2025 EFFLUENT SAMPLE
FROM THE JAMES C. KIRIE WATER RECLAMATION PLANT OF THE
METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER
CHICAGO***

May 2025

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

**RESULTS OF ACUTE TOXICITY TESTING WITH *Ceriodaphnia dubia* AND *Pimephales promelas* ON AN APRIL 2025 EFFLUENT SAMPLE FROM THE JAMES C. KIRIE
WATER RECLAMATION PLANT OF THE METROPOLITAN WATER
RECLAMATION DISTRICT OF GREATER CHICAGO**

By

**EnviroScience, Incorporated
5070 Stow Road
Stow, Ohio 44224**

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

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

Edward W. Podczerwinski, P.E.

Director of Monitoring and Research

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May 12, 2025

Illinois Environmental Protection Agency
Compliance Assurance Section CAS #19
2520 W. Iles Ave.
P.O. Box 19276
Springfield, IL 62794-9276

Subject: Biomonitoring Report for 2025 – Acute Toxicity Test Results for the
James C. Kirie Water Reclamation Plant, National Pollutant Discharge
Elimination System Permit Number IL0047741

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 IL0047741, Special Condition 11. The report covers the monitoring done for samples collected in the fifteenth month before the expiration of the permit.

The subject report prepared by EnviroScience, Inc., includes copies of all bench sheets, chain-of-custody forms, sample receipt, preparation forms, a summary of final results and test information, quality assurance record, and water quality results.

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:ek

Enclosure

cc: E. Podczerwinski/J. Murray

H. Zhang/T. Minarik/N. Kollias

Via electronic mail

RESULTS OF ACUTE TOXICITY TESTS

48 Hour - *Ceriodaphnia dubia* (water flea)
96 Hour - *Pimephales promelas* (fathead minnow)

Testing period: April 9-13, 2025
Sample collection dates: April 7-8, 2025
Report date: April 16, 2025

Conducted For:
KIRIE WRP
701 Oakton Street
Des Plains, IL 60018

IL0047741

Conducted and Prepared By:
ENVIROSCIENCE, INCORPORATED
5070 Stow Rd.
Stow, OH 44224
330-688-0111



_____, Aquatic Biologist

April 16, 2025

Mr. Nicholas Kollias
Kirie WRP
701 Oakton Street
Des Plaines, IL 60018

Dear Mr. Kollias:

Enclosed is a copy of EnviroScience's report for the following whole effluent toxicity (WET) tests that were initiated on April 9, 2025 with effluent collected from outfall 001:

- (1) 48-hour static acute bioassay using *Ceriodaphnia dubia* (water flea) and
- (1) 96-hour static acute bioassay using *Pimephales promelas* (fathead minnow).

The effluent sample was not shown to be toxic to either species. Acute Toxicity Units (TU_a) are listed below.

WET test endpoints for Kirie, 04/2025
sample collection period 04/07-08/25

Effluent:

<i>Ceriodaphnia dubia</i> (water flea)	48HR LC ₅₀ = >100% effluent;	TU _a = <1.0 (TU _a = 100/LC ₅₀)
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<i>Pimephales promelas</i> (fathead minnow)	96HR LC ₅₀ = >100% effluent;	TU _a = <1.0 (TU _a = 100/LC ₅₀)
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Please call me if you have any questions.

Sincerely,



Alexandria M. Tite, Aquatic Biologist

enclosures



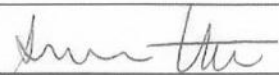
EnviroScience

5070 Stow Road
Stow, OH 44224

BIOMONITORING REPORT FORM FOR NPDES PERMIT REQUIREMENTS

Table 1. General Information

1. Facility: Kirie WRP
2. Address: 701 Oakton Street, Des Plains, Illinois 60018
3. NPDES Permit No.: IL0047741
4. Facility Contact: Nicholas Kollias 5. Phone No.: 708-588-4074
6. Testing Lab: EnviroScience, Inc., 5070 Stow Rd., Stow, OH 44224
7. Laboratory Contact: Alex Tite 8. Phone No.: 330-688-0111
9. Receiving Water(s) of Discharge: Higgins Creek
10. Outfall(s) Tested: 001
11. Test Species/Type: #1 Ceriodaphnia dubia (water flea) 48-hour definitive, static, non-renewal EPA 2002.0
#2 Pimephales promelas (fathead minnow) 96-hour definitive, static, non-renewal EPA 2000.0
12. Dechlorination?: no Original Chlorine Conc.: ≤0.02 mg/l
13. Report Contents:
- | | |
|-----------------------------------|---------|
| General information..... | Table 1 |
| Sampling information | Table 2 |
| Test dates and times..... | Table 3 |
| Initial chemistry | Table 4 |
| Test conditions | Table 5 |
| Test results Plant Effluent | Table 6 |
| Additional Information | Table 7 |
- Attachments
- Chain-of-Custody, bench sheets/data analysis
 - SRT control charts


 Signature of preparer

04/16/25
 Date

Alexandria M. Tite
 Name (typed or printed)

Aquatic Biologist
 Title

Table 2. Sampling summary.

Outfall	Sample Type	Volume Collected	Sample Collection		Comments
			Begin MM/DD/YY- Time	End or Grab MM/DD/YY- Time	
001	composite	1 gallon	04/07/25-0600	04/08/25-0600	

Table 3. Testing periods.

<i>Ceriodaphnia dubia</i> (water flea)		<i>Pimephales promelas</i> (fathead minnow)	
Start Date: MM/DD/YY	04/09/25	Start Date: MM/DD/YY	04/09/25
Start Time:	1310 hrs	Start Time:	1150 hrs
End Date: MM/DD/YY	04/11/25	End Date: MM/DD/YY	04/13/25
End Time:	1300 hrs	End Time:	1105 hrs

Notes: Sample receipt: 04/09/25-0955; 1.7 °C.

Table 4. Initial chemistry. DO = dissolved oxygen. TRC = total residual chlorine.

sample # (Plant Effluent)	collection date	DO mg/L	pH s.u.	conductivity µmho/cm	alkalinity mg/L CaCO ₃	hardness mg/L CaCO ₃	TRC mg/L	Ammonia mg/L
001	04/07-08/25	8.6	7.0	1228	204	352	<0.02	0.59

Methods or Instrumentation used in chemical analysis:

Dissolved Oxygen: APHA (1998, 20th ed.) 4500-O G., OX 4100L

pH: APHA (1998, 20th ed.) 4500-H⁺ B., Orion Star A211

Conductivity: APHA (1998, 20th ed.) 2510 B., Orion Star A212

Total Alkalinity: APHA (1998, 20th ed.) 2320 B.

Total Hardness: APHA (1998, 20th ed.) 2340 C.

Total Residual Chlorine: APHA (1998, 20th ed.) 4500-Cl D., HACH TitraLab AT1000

Table 5. Summary of toxicity test conditions for testing with *Ceriodaphnia dubia* and *Pimephales promelas*.

	<i>Ceriodaphnia dubia</i>	<i>Pimephales promelas</i>
1. Test dates:	04/09/25-1310 to 04/11/25-1300	04/09/25-1150 to 04/13/25-1105
2. Test type and duration:	static, non-renewal, 48 hours	static, non-renewal, 96-hours
3. Age and source of organisms:	<24 hours, EnviroScience 04/08/25-1600	8 days, ES 03/31/25-1545
4. Photoperiod/ Light quality:	16 hours light / 8 hours dark fluorescent light, 50-100fc	16 hours light / 8 hours dark fluorescent light, 50-100fc
5. Test temperature:	25±1 °C	25±1 °C
6. Feeding regime:	fed alga <i>Selenastrum capricornutum</i> and YAT prior to test only	fed <500 brine shrimp/vessel at 48-hours
7. Size of test vessel:	30 ml plastic cup	600 ml glass beaker
8. Volume and depth of test solutions:	15 ml and 24 mm	250 ml and 42 mm
9. No. of test organisms per vessel:	5	10
10. No. of vessels per solution:	4	2
11. Total no. of organisms per test level:	20	20
12. Test concentrations as % effluent:	6.25, 12.5, 25, 50, and 100	6.25, 12.5, 25, 50, and 100
13. Dilution and primary control water:	moderately hard reconstituted water, MHRW	moderately hard reconstituted water, MHRW
14. Secondary control:	moderately hard dilute mineral water, DMW	moderately hard dilute mineral water, DMW
15. Aeration:	none	none
16. Endpoints:	mortality - no movement with gentle prodding (LC ₅₀); plus behavioral effects such as atypical swimming (EC ₅₀)	mortality - no movement with gentle prodding (LC ₅₀); plus behavioral effects such as atypical swimming (EC ₅₀)
17. No. of consecutive tests conducted with an alternate source of primary control water:	NA	NA

Table 6. Percent cumulative mortality, LC ₅₀ , EC ₅₀ , and 95% confidence intervals for acute toxicity tests using <i>Ceriodaphnia dubia</i> and <i>Pimephales promelas</i> using effluent collected from Outfall 001 .						
Concentration	<i>C. dubia</i> (water flea) 04/09/25 to 04/11/25		<i>P. promelas</i> (fathead minnow) 04/09/25 to 04/13/25			
	24-hours % mortality	48-hours % mortality	24-hours % mortality	48-hours % mortality	72-hours % mortality	96-hours % mortality
MHRW lab water, diluent	0	0	10	10	10	10
DMW, lab water	0	0	10	10	10	15
6.25% effluent	0	0	5	5	5	5
12.5% effluent	0	0	0	0	0	0
25% effluent	0	0	10	10	10	10
50% effluent	0	0	10	10	10	10
100% effluent	0	0	5	5	5	5
LC ₅₀	>100% effluent	>100% effluent	>100% effluent	>100% effluent	>100% effluent	>100% effluent
95% C.I.						
EC ₅₀	>100% effluent	>100% effluent	>100% effluent	>100% effluent	>100% effluent	>100% effluent
95% C.I.						
TUa (100÷LC ₅₀)		<1.0				<1.0
Methods:	Cetis 2.1.6.					

Table 7. Additional Information:

Indicate below any other relevant information that may aid in the evaluation of this report. Include any deviations from current SOP that were necessary. Attach additional pages as needed.

7.1 Deviations/relevant information.

7.2 Terms.

LC₅₀ = median lethal concentration. A mathematical estimate of the effluent concentration that would kill 50% of the exposed specimens during the specified exposure period.

TU_a = Acute Toxicity Unit; $TU_a = 100 \div LC_{50}$ (usually 48-hour LC₅₀ for water fleas and 96-hour LC₅₀ for FHM)

ATTACHMENTS

Chain-of-Custody/Sample Submission
Bench sheets
Standard Reference Toxicant Control Charts



EnviroScience, Inc.
5070 Stow Road
Stow, OH 44224
Phone (330) 688-0111
Fax (330) 688-3858
1-800-940-4025

Client: Kirie
Address: 6001 West Pershing Road
Cicero, IL 60804
Contact: Nicholas Kollias
Phone: 708-588-4074
Permit #: IL

SAMPLE SUBMISSION AND CHAIN OF CUSTODY FORM

Test(s) to be performed:

- () Chronic Definitive
(☒) Acute Definitive
() 48 hr. Screening
() 24 hr. Stormwater
() Pass/Fail
- Test Species
(☒) P. promelas and C. dubia
() P. promelas
() C. dubia
() D. magna

Wastewater Type (Circle One)
Industrial Other
Municipal
Other

When listing a composite sample in the table below, please provide the start and end time of the composite period.

Start Date	Time	End Date	Time	Station No.	Sample Site	Sample Type		Number of Cubitainers	Chemistry			
						Comp	Grab		TRC	Cond	D.O.	pH
4/7/25	0600	4/8/25	0600	001	Kirie WPP Final Effluent	☒		1	0	1243	7.35	7.17

Comp. = Composite, D.O. = Dissolved Oxygen measured in mg/l, pH measured in s.u., Conductivity measured in uohm/cm

Sampling Collector's Information: please check all appropriate boxes

EnviroScience Personnel Only			
☒ Effluent	Collectors Name:	Pgula Brinkman Lowe	Collected By:
☐ Upstream	Collectors Signature:	Paula Brinkman Lowe	Collectors Signature:
☐ Near Field	M.G.D. =		
☐ Far Field	Weather Conditions:		

Plume Determined By What Method?

Comments:

Shipping Information			EnviroScience Use Only	
Received from:	Received by:	Date	Date Shipped	Client
MWR DGL			04/08/25	UWIL
			Time Shipped	Sample ID's
			10:30 am	UWIL 040725AF
			Method Shipped	Cond. Of Container
			FedEx	ged
			ES Vehicle	Temp. °C
				1.7

EnviroScience, Inc. Cooler Receipt Form (Form 7050-2 rev. 03/30/22)

Client Kirle

ES Sample ID KIR 040925 EFF

Cooler Received by: KB

Date Cooler Received and Opened 040925

Received from: FedEx ☒ UPS ☐ Client Drop Off ☐ ES Courier ☐

1. Were custody seals on the outside of cooler? Yes ☐ No ☒
Were custody seals signed, dated and intact? Yes ☐ No ☒
2. Did Chain of Custody (COC) accompany the samples? Yes ☒ No ☐
3. Were the COC's signed in the appropriate places? Yes ☒ No ☐
If No explain _____
4. Was the sample time and date filled in correctly? Yes ☒ No ☐
5. Sample Temperature upon receipt 1.7 °C
6. Did all sample container labels match the samples written on the COC? Yes ☒ No ☐
Were the sample containers in good condition? Yes ☒ No ☐
7. Was sufficient quantity received to perform indicated tests? Yes ☒ No ☐
8. Was this sample received within required holding time? Yes ☒ No ☐
9. EPA method code: 1000.0: ☐ 1002.0: ☐ 2000.0: ☒ 2002.0: ☒

Explain any discrepancies or client notifications that occurred regarding this sample: _____



EnviroScience
Excellence In Any Environment

5070 Stow Road
Stow, Ohio 44224
Phone (330) 688-0111; 1-800-940-4025
Fax (330) 688-3858



Acute, 48-hour, non-renewal Bioassay:

Project: KIRT 040925

No.: 1L0047741

Start Date: 040925 Time: 1310

End Date: 041125 Time: 1300

Organism: C. Dubia

Source: BB033025(A)

Hatch/Age: 040925 1600-241125

Diluent: MHR

Sample #: KIR1040925 EFF

test levels		Biological Parameters				Chemistry and Physical Parameters											
		n	Dead / Affected		Temperature (Celsius)			Dissolved Oxygen (mg/L)			pH (s.u.)			Conductivity (µmhos/cm)			
Rep			24 hr	48 hr	0	24	48	0	24	48	0	24	48	0	24	48	
MHR	A	5	0/0	0/0	24.0	24.3	25.1	8.6		8.6	7.4		7.3	240		348	
	B	5	0/0	0/0													
	C	5	0/0	0/0													
	D	5	0/0	0/0													
DMW	A	5	0/0	0/0	24.0	24.8	24.8	8.6		8.6	7.8		7.4	332		380	
	B	5	0/0	0/0													
	C	5	0/0	0/0													
	D	5	0/0	0/0													
6.25	A	5	0/0	0/0	24.0	24.7	24.8	8.6		8.5	7.2		7.3	355		382	
	B	5	0/0	0/0													
	C	5	0/0	0/0													
	D	5	0/0	0/0													
12.5	A	5	0/0	0/0	24.0	24.7	25.0	8.6		8.5	7.1		7.3	428		431	
	B	5	0/0	0/0													
	C	5	0/0	0/0													
	D	5	0/0	0/0													
25	A	5	0/0	0/0	24.0	24.7	24.8	8.6		8.5	7.0		7.4	560		551	
	B	5	0/0	0/0													
	C	5	0/0	0/0													
	D	5	0/0	0/0													
50	A	5	0/0	0/0	24.0	24.5	24.7	8.6		8.4	7.0		7.5	797		804	
	B	5	0/0	0/0													
	C	5	0/0	0/0													
	D	5	0/0	0/0													
100	A	5	0/0	0/0	24.0	24.6	24.8	8.6		8.3	7.0		7.8	1304		1261	
	B	5	0/0	0/0													
	C	5	0/0	0/0													
	D	5	0/0	0/0													
Time	1310		1325	1300	1310	1325	1300	1110		1310	1115		1330	1110		1310	
Tech	SM		KB	TM	SM	KB	TM	DA		CE	DA		CE	DA		CE	
					1	1	1	OX 4100L			Orion Star A211 A			Orion Star A212			
					ID or √ instrument used			✓		✓			✓	✓		✓	
					Other:			Orion Star A211 B			Other:						
											✓						

USEPA Method: 2002.0

Form 8010-5 rev. 01/09/25

JMS

CETIS Analytical Report

Report Date: 15 Apr-25 11:57 (p 1 of 2)
Test Code/ID: 6A0FE4FD / 17-7942-6557

Ceriodaphnia 48-h Acute Survival Test

EnviroScience

Analysis ID: 11-9837-7438	Endpoint: 48h Survival Rate	CETIS Version: CETIS v2.1.6
Analyzed: 15 Apr-25 11:57	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 15 Apr-25 0:00	MD5 Hash: 68E117461239090AA7E1427F0F536296	Editor ID: 007-869-049-5
Batch ID: 04-8126-0391	Test Type: Survival (48h)	Analyst:
Start Date: 09 Apr-25 13:10	Protocol: EPA/821/R-02-012 (2002)	Diluent: Upstream of Discharge
Ending Date: 11 Apr-25 13:00	Species: Ceriodaphnia dubia	Brine:
Test Length: 48h	Taxon: Branchiopoda	Source: In-House Culture Age:
Sample ID: 06-3759-0917	Code: 2600DD85	Project:
Sample Date: 08 Apr-25 06:00	Material: POTW Effluent	Source: Discharge Monitoring Report
Receipt Date: 09 Apr-25 09:55	CAS (PC):	Station: 001
Sample Age: 31h	Client: Kirie	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1056753	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
LC50	>100	---	---	<1	---	---

48h Survival Rate Summary

Calculated Variate(A/B)

Isotonic Variate

Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
12.5		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
25		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
50		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	20/20	1.0000	0.00%

48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	5/5	5/5	5/5	5/5
6.25		5/5	5/5	5/5	5/5
12.5		5/5	5/5	5/5	5/5
25		5/5	5/5	5/5	5/5
50		5/5	5/5	5/5	5/5
100		5/5	5/5	5/5	5/5

CETIS Analytical Report

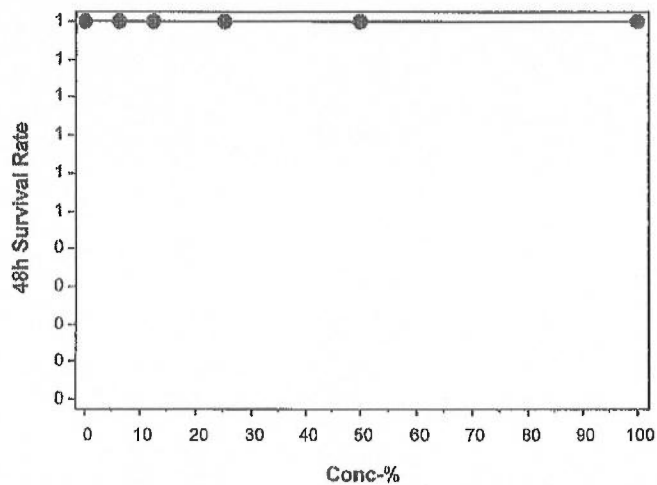
Report Date: 15 Apr-25 11:57 (p 2 of 2)
Test Code/ID: 6A0FE4FD / 17-7942-6557

Ceriodaphnia 48-h Acute Survival Test

EnviroScience

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Edit Date: 15 Apr-25 0:00	MD5 Hash: 68E117461239090AA7E1427F0F536296	Editor ID: 007-869-049-5

Graphics





ACUTE, 96 HOUR, NON- RENEWAL BIOASSAY:

Organism: Pimephales promelas (FHM)

Project: KIRI 040925

Source: FJ cultures

No.: 1L0047741

Hatch/Age: 030125 1545 8 days old

Start Date: 040925 Time: 1150

Diluent: MHK

End Date: 041325 Time: 1105

Sample #: KIRI 040925 EFF

Biological Parameters: # Mortalities / # Affected											
test levels→				MHK		DMW	6.25	12.5	25	50	100
0 hours set-up	Tech	CE	n	A	10	10	10	10	10	10	10
	Time	1150	n	B	10	10	10	10	10	10	10
24 hours	Tech	CE	A		1/1	1/1	1/1	0/0	0/0	2/2	1/1
	Time	1350	B		1/1	1/1	0/0	0/0	2/2	0/0	0/0
48 hours	Tech	WB	A		1/1	1/1	2/1	0/0	0/0	2/2	1/1
	Time	1240	B		1/1	1/1	0/0	0/0	2/2	0/0	0/0
72 hours	Tech	CE	A		1/1	1/1	1/1	0/0	0/0	2/2	1/1
	Time	0950	B		1/1	1/1	0/0	0/0	2/2	0/0	0/0
96 hours	Tech	JM	A		1/1	1/1	1/1	0/0	0/0	2/2	1/1
	Time	1105	B		1/1	2/2	0/0	0/0	2/2	0/0	0/0

Chemical and Physical Data											
		Tech	Time	Instr.#	MHK	DMW	6.25	12.5	25	50	100
Temp. °C	0 hr	CE	1150	11	24.0	24.0	24.0	24.0	24.0	24.5	24.0
	24 hr	CE	1350	10	24.0	24.0	24.0	24.0	24.0	24.0	24.0
	48 hr	WB	1240	11	24.0	24.0	24.0	24.0	24.0	24.0	24.0
	72 hr	CE	0950	6	24.0	24.0	24.0	24.0	24.0	24.0	24.0
	96 hr	JM	1105	11	24.0	24.0	24.0	24.0	24.0	24.0	24.0
cond. µmhos/cm	0 hr	DA	1110	A212	290	332	355	428	560	797	1304
	24 hr	JM	0930	A212	290	326	378	406	525	777	1290
	48 hr	CE	1015	A212	289	328	360	404	531	746	1296
	72 hr	DA	1000	A212	294	333	357	408	566	803	1275
	96 hr	PL	1115	A212	287	333	361	438	533	780	1286
DO mg/L	0 hr	DA	1110	OX 4100L	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	24 hr	JM	0930	OX 4100L	8.6	8.6	8.6	8.6	8.6	8.6	8.6
	48 hr	CE	1015	OX 4100L	7.7	7.7	7.6	7.5	7.5	7.3	7.4
	72 hr	DA	1000	OX 4100L	8.0	8.4	8.6	8.6	8.4	8.4	8.2
	96 hr	PL	1115	OX 4100L	8.5	8.5	8.5	8.4	8.4	8.3	8.3
pH s.u.	0 hr	DA	1115	#A211B	7.4	7.8	7.2	7.1	7.0	7.0	7.0
	24 hr	JM	1015	#A211A	7.1	7.2	7.1	7.1	7.1	7.3	7.5
	48 hr	CE	1040	#A211B	7.4	7.3	7.1	7.1	7.0	7.2	7.4
	72 hr	DA	1010	#A211B	7.4	7.3	7.2	7.3	7.3	7.4	7.6
	96 hr	PL	1115	#A211B	7.0	7.1	7.0	7.0	7.1	7.3	7.6

USEPA method 2000.0

Form 8040-6 rev. 01/09/2025

JM

CETIS Analytical Report

Report Date: 15 Apr-25 11:59 (p 1 of 2)
Test Code/ID: 19B37CE8 / 04-3119-3320

Fathead Minnow 96-h Acute Survival Test

EnviroScience

Analysis ID: 01-3052-1539	Endpoint: 96h Survival Rate	CETIS Version: CETIS v2.1.6
Analyzed: 15 Apr-25 11:59	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 15 Apr-25 0:00	MD5 Hash: C05424947910FCE9BB432D6C4E3ACBB5	Editor ID: 007-869-049-5
Batch ID: 13-8441-5120	Test Type: Survival (96h)	Analyst:
Start Date: 09 Apr-25 11:50	Protocol: EPA/821/R-02-012 (2002)	Diluent: Upstream of Discharge
Ending Date: 13 Apr-25 11:05	Species: Pimephales promelas	Brine:
Test Length: 95h	Taxon: Actinopterygii	Source: In-House Culture Age:
Sample ID: 05-5821-4711	Code: 2145AE37	Project:
Sample Date: 08 Apr-25 06:00	Material: POTW Effluent	Source: Discharge Monitoring Report
Receipt Date: 09 Apr-25 09:55	CAS (PC):	Station: 001
Sample Age: 30h	Client: Kirie	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	607070	1000	Yes	Two-Point Interpolation

Test Acceptability Criteria

TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	0.9	0.9	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	Tox Units	95% LCL	95% UCL
LC50	>100	---	---	<1	---	---

96h Survival Rate Summary

Calculated Variate(A/B)

Isotonic Variate

Conc-%	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	D	2	0.9000	0.9000	0.9000	0.9000	0.00%	0.00%	18/20	0.9500	0.00%
6.25		2	0.9500	0.9500	0.9000	1.0000	7.44%	-5.56%	19/20	0.9500	0.00%
12.5		2	1.0000	1.0000	1.0000	1.0000	0.00%	-11.11%	20/20	0.9500	0.00%
25		2	0.9000	0.9000	0.8000	1.0000	15.71%	0.00%	18/20	0.9167	3.51%
50		2	0.9000	0.9000	0.8000	1.0000	15.71%	0.00%	18/20	0.9167	3.51%
100		2	0.9500	0.9500	0.9000	1.0000	7.44%	-5.56%	19/20	0.9167	3.51%

96h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2
0	D	0.9000	0.9000
6.25		0.9000	1.0000
12.5		1.0000	1.0000
25		1.0000	0.8000
50		0.8000	1.0000
100		0.9000	1.0000

96h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2
0	D	9/10	9/10
6.25		9/10	10/10
12.5		10/10	10/10
25		10/10	8/10
50		8/10	10/10
100		9/10	10/10

CETIS Analytical Report

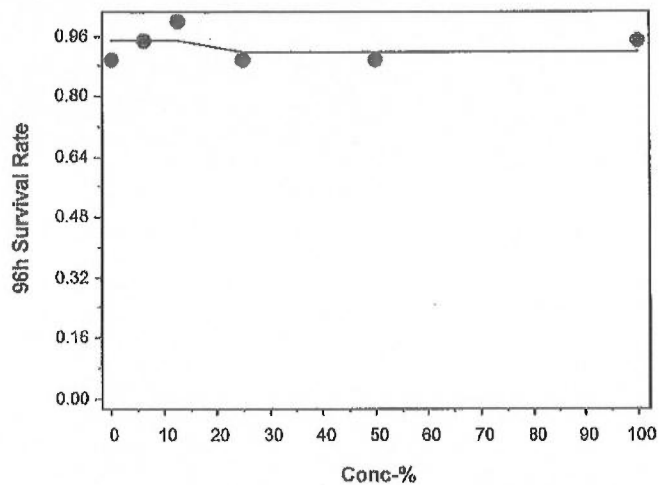
Report Date: 15 Apr-25 11:59 (p 2 of 2)
Test Code/ID: 19B37CE8 / 04-3119-3320

Fathead Minnow 96-h Acute Survival Test

EnviroScience

Analysis ID: 01-3052-1539	Endpoint: 96h Survival Rate	CETIS Version: CETIS v2.1.6
Analyzed: 15 Apr-25 11:59	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 15 Apr-25 0:00	MD5 Hash: C05424947910FCE9BB432D6C4E3ACBB5	Editor ID: 007-869-049-5

Graphics





Acute, Static Bioassay:

Initial Water Quality Checks (DO, pH, conductivity, chlorine, alkalinity, hardness) and Dilution Record

Client: KIRI 040925

Permit No.: 1L0047741

Date: 040925

Form 5000 rev. 01/09/25

Initial Water Quality Data:

Sample Id	D. Oxygen (mg/L-%sat) >4 & <100%?	pH (s.u) 6-9?	Conductivity (µmhos/cm)	TRC _i (mg/L) <0.02?	TRC _A (mg/L)	Alkalinity (mg/L CaCO ₃) MDL = 20 mg/l	Hardness-EDTA (mg/L CaCO ₃) MDL = 5 mg/l
MHRW batch# 040725	8.5	7.7	284	<0.02	NA	(2.7) 54	(2.5) 100
KIRI 040925 EFF	8.6	7.0	1228	<0.02		(10.2) 204	(8.8) 352
INITIALS →	DA	DA	DA	DA	D	DA	DA

Dilution Record:

SAMPLE ID	Composited ☐ Yes ☒ No	60µm Filtered ☐ Yes ☒ No	% DILUTION	INITIATION		RENEWAL ☒ No	
				Effluent (mL)	Final (mL)	Effluent (mL)	Final (mL)
KIRI 040925 EFF	☐ Yes ☒ No	☐ Yes ☒ No					
	☐ Yes ☒ No	☐ Yes ☒ No	6.25	62.5	1000		
	☐ Yes ☒ No	☐ Yes ☒ No	12.5	125			
	☐ Yes ☒ No	☐ Yes ☒ No	25	250			
Comments: Ammonia = 0.59			50	500			
Methods/Instrumentation: DO: APHA (1998) 4500-O G, OX4100L pH: APHA (1998) 4500-H B, Star A211 Conductivity: APHA (1998) 2510-B, Orion Star A212 Hardness: APHA (1998) 2340-C Alkalinity: APHA (1998) 2320-B TRC: APHA (1998) 4500-Cl D, TitraLab AT 1000 USEPA Methods: 2000.0; 2002.0			Dilution Water: ☐ Upstream ☒ MHR	☐ Upstream ☒ MHR			
			MHR Batch:	040725			

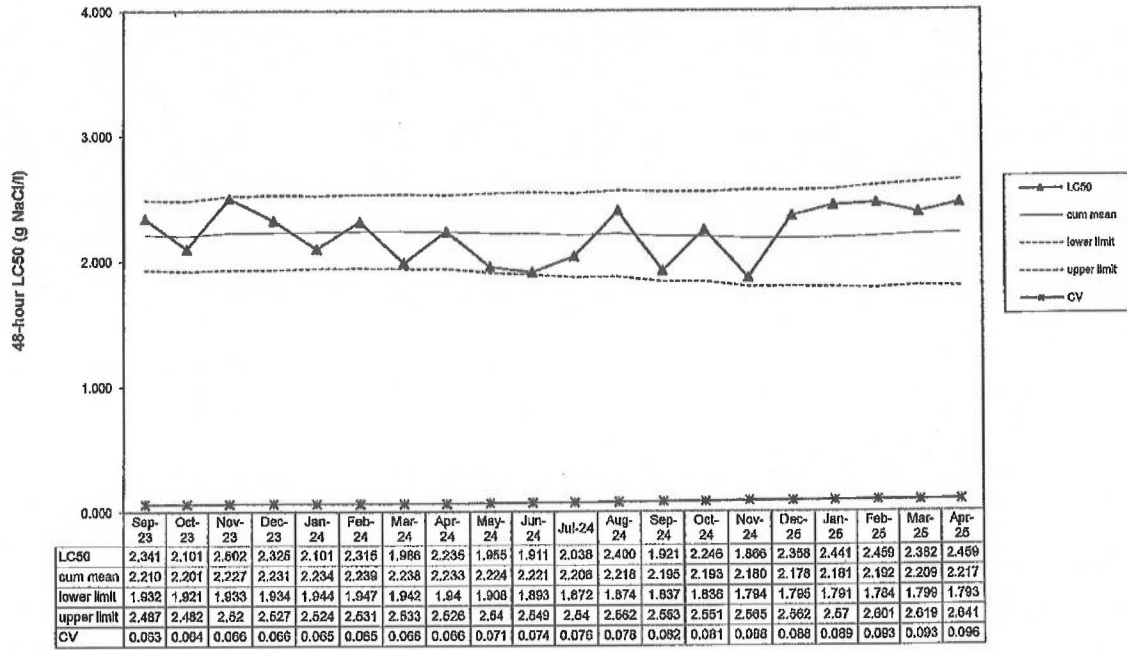
TRC_i = total residual chlorine, initial value

TRC_A = total residual chlorine, after dechlorination

Dechlorination procedure: Sodium thiosulfate is used to reduce Total Residual Chlorine by dosing with 6.7 mg Na₂S₂O₃ per mg TRC. A 6.7 mg/ml Na₂S₂O₃ solution is used; dose mL = X mg/L * liters in sample container being treated.

JMS

EnviroScience QC Chart - *Ceriodaphnia dubia*
Acute Toxicity endpoint - 25 C

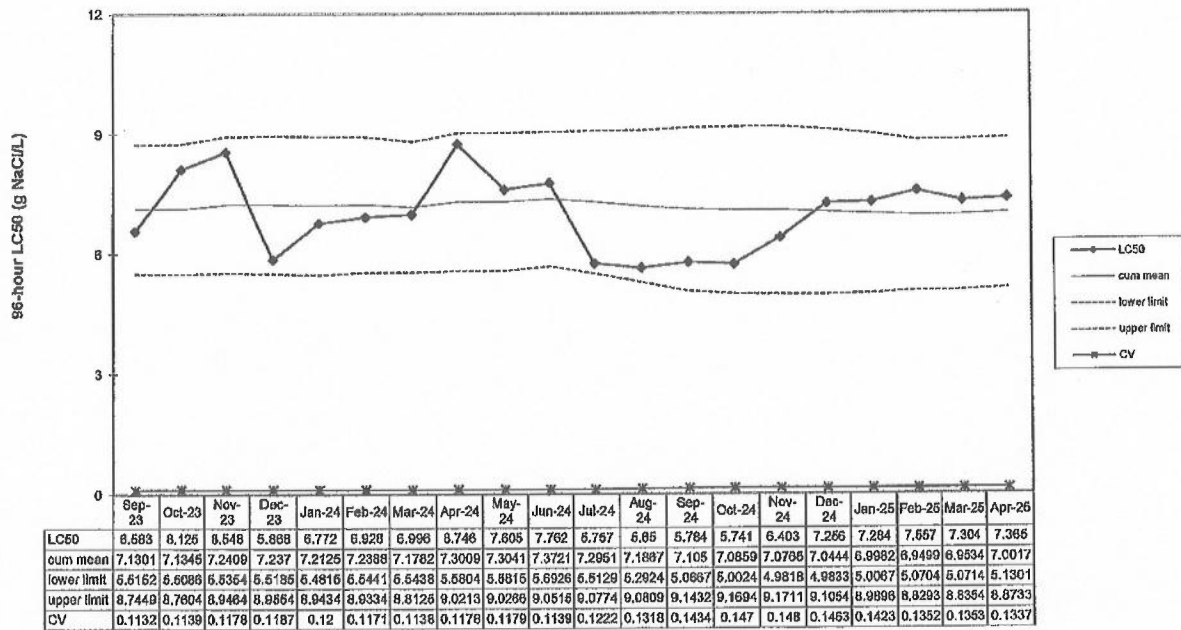


Test Date (MM.YY)

Tests conducted at Stow, OH facility

EnviroScience QC/SRT Chart rev. 04/11/25

EnviroScience QC Chart - *Pimephales promelas*
Acute Toxicity endpoint - 25 C



Test Date (MM.YY)

Tests conducted at Stow, OH facility

EnviroScience QC/SRT Chart rev. 04/11/25

The WET Sample Chain-of-Custody

SAMPLE COLLECTION			SAMPLE TYPE	SAMPLE LOCATION	SAMPLE Temp °C	ON-SITE SAMPLE STORAGE (0.1-6 °C)	PRINT NAME & SIGNATURE
DATE	TIME	PERSONNEL INITIALS					
4/7/2025	0600	RJY	Grab	outfall sample trough	57.5°C	YES/NO	Robert Joseph Young
4/7/2025	1200	DE	Grab	outfall sample trough	13°C	YES/NO	Robert Joseph Young
4/7/2025	1800	RJY	Grab	outfall sample trough	12°C	YES/NO	Robert Joseph Young
4/8/2025	0000	AS	Grab	outfall sample trough	13°C	YES/NO	Robert Joseph Young
4/8/2025	0600	SD	Grab	outfall sample trough	12°C	YES/NO	Robert Joseph Young

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 Maria Parker Signature: Maria Parker

Date/Time: 4/8/25 0715

SAMPLES TRANSPORTED TO WET LAB. BY Name Paul Brinkman Signature: Paul Brinkman

Date/Time: 4/8/25 0715

FOR WET LABORATORY USE ONLY:

Sample Received by: Name Jorge Abreu Signature: Jorge Abreu Date/Time: 4/8/25-0820

1. Samples received with prescribed holding time (within 4 h of collection)?

(Not Applicable, if chronic test)

2. Samples logged in by Jorge Abreu Date: 4/8/25 Time: 0820

3. Each sample container labeled with a unique ID?

4. Were collection times for effluent and receiving water within 1 h of each other?

5. Did samples have sufficient volume for analysis?

6. Samples accepted

Special Observations Ice in samples A, B (samples partially frozen)

1. Yes / No / (NA)

2. Yes / No

3. Yes / No

4. Yes / No (NA)

5. Yes / No

6. Yes / No

LIMS #	Sample Type/ID	Temp °C	pH	Residual Chlorine (mg/L) Initials	Sodium-thio-sulfate Added YES/NO	Sample Custodian Signature
9792544-A	BMOUT KR A	1.2	7.31	0	Indicate Total ml of 5% Sodium-thio-sulfate added, Initial	JA
9792544-B	BMOUT KR B	1.4	7.30	Total Ammonia (mg-L) ALD Results	JA Final	
9792544-C	BMOUT KR C	2.1	7.23	0.352	Residual Cl ₂ reading = N/A mg/l	
9792544-D	BMOUT KR D	2.0	7.21		Initial JA	
9792544-E	BMOUT KR E	2.7	7.18			

Note: Set aside one cubitainer for metals and chemical analyses

Sample Release for Disposal

Sample released for disposal following analysis on (Date)

4/8/25 by JA

Samples Discarded by

JA

Date/Time 4/8/25 11:00

From: Nick Kollias Office Location: Stickney

[illegible]

Container Type (specify vial, gallon, pint, or quart)	Case ID (copy from case label)
Gallon	25-001G
Vials	24-090V

Container Type (specify vial, gallon, pint, or quart)	Case ID (copy from case label)

ITEMS TRANSFERRED	RELINQUISHED BY			RECEIVED BY		
	FULL NAME or COOLER	DATE	TIME (Military)	FULL NAME or COOLER	DATE	TIME (Military)
Indicated above	Jorge Abreu	4/18/25	1000 0955	4/18/25 Cooler D	4/18/25	1000
Indicated above	Cooler D	4/9/25	0841	PARAKRAMSINH	4/9/25	0841
Indicated above	PARAKRAMSINH	4/9/25	1000	Alan Michalski	4/9/25	1000
Indicated above						
Indicated above						

\\hawk\M&R\120 EM&R Division\126 Aquatic Ecology\126 Biologists\WET Testing\2025\Kirie\ALD COCs

\\hawk\M&R\120_EM&R_Division\126_Aquatic_Ecology\126_Biologists\WET Testing\2025\Kirie\ALD COCs

Metropolitan Water Reclamation District of Greater Chicago
Custody Transfer Record for Environmental Monitoring and Research Division Samples
(STFORMSR)

To: CAL

Year: 2025

Collection Date:	4/8/2025
Collected By:	Nick Kollias
Preparation Date:	4/8/2025

From: Nick Kollias
Project Number/Support Request#: 4652-126-1, SR 06-25
Sample Type (grab/composite): Composite

Prepared By: Nick Kollias

For Lab Use Only

[illegible]

Chilling process of samples started immediately after collection: (Y) N

Relinquished By	Date	Time	Received By	Date	Time
Jorge Abreu	4/8/25	1000	COOPER D	4/8/25	1000
COOPER D	4/9/25	720	JC	4/9/25	720
JC	4/9/25	935	A. Wilson	4-9-25	11:15am

The relinquisher has read and fully understands the M&R Departments-Environmental Monitoring and Research Division's "Ethical and Legal Responsibilities - Version 1, dated March 13, 2019"

Additional Comments:

TABLE 8: WATER QUALITY RESULTS OF A JAMES C.KIRIE WATER RECLAMATION PLANT FINAL EFFLUENT COMPOSITE
SAMPLE COLLECTED APRIL 7 - APRIL 8, 2025, USED FOR WHOLE EFFLUENT TOXICITY TESTING

Sampling point	Analysis	Units	Result
BMOUTKR	Ag	mg/L	<0.00400
BMOUTKR	As	mg/L	<0.00200
BMOUTKR	Ba	mg/L	0.0329
BMOUTKR	Be	mg/L	<0.00200
BMOUTKR	Cd	mg/L	<0.00200
BMOUTKR	Cr	mg/L	<0.00400
BMOUTKR	Cu	mg/L	0.0026
BMOUTKR	Fe	mg/L	0.05324
BMOUTKR	Mn	mg/L	0.02254
BMOUTKR	Mo	mg/L	0.0041
BMOUTKR	Ni	mg/L	0.00647
BMOUTKR	Pb	mg/L	<0.00200
BMOUTKR	Sb	mg/L	<0.00200
BMOUTKR	Se	mg/L	<0.00400
BMOUTKR	Zn	mg/L	0.02077
BMOUTKR	NH3_N	mg/L	0.352
BMOUTKR	Al	mg/L	<1.00
BMOUTKR	Ca	mg/L	78.18
BMOUTKR	Hardness	mg/L	326
BMOUTKR	Mg	mg/L	31.78
BMOUTKR	CN	mg/L	<0.0050
BMOUTKR	ALKALINITY	mg/L	228.4
BMOUTKR	Cl	mg/L	209.488
BMOUTKR	Final Hg	ug/L	<0.500
BMOUTKR	1,1,1-Trichloroethane	ug/L	<5.000
BMOUTKR	1,1,2,2-Tetrachloroethane	ug/L	<5.000
BMOUTKR	1,1,2-Trichloroethane	ug/L	<5.000
BMOUTKR	1,1-Dichloroethane	ug/L	<5.000
BMOUTKR	1,1-Dichloroethylene	ug/L	<5.000
BMOUTKR	1,2,4-Trichlorobenzene	ug/L	<5.000
BMOUTKR	1,2-Dichlorobenzene	ug/L	<5.000
BMOUTKR	1,2-Dichloroethane	ug/L	<5.000
BMOUTKR	1,2-Dichloropropane	ug/L	<5.000
BMOUTKR	1,2-Diphenylhydrazine	ug/L	<5.000
BMOUTKR	1,3-Dichlorobenzene	ug/L	<5.000
BMOUTKR	1,3-Dichloropropylene	ug/L	<5.000
BMOUTKR	1,4-Dichlorobenzene	ug/L	<5.000
BMOUTKR	2,4,6-Trichlorophenol	ug/L	<10.000
BMOUTKR	2,4-Dichlorophenol	ug/L	<5.000
BMOUTKR	2,4-Dimethylphenol	ug/L	<10.000
BMOUTKR	2,4-Dinitrophenol	ug/L	<40.000
BMOUTKR	2,4-Dinitrotoluene	ug/L	<10.000
BMOUTKR	2,6-Dinitrotoluene	ug/L	<5.000
BMOUTKR	2-Chloroethyl vinyl ether	ug/L	<5.000
BMOUTKR	2-Chloronaphthalene	ug/L	<5.000

TABLE 8: WATER QUALITY RESULTS OF A JAMES C.KIRIE WATER RECLAMATION PLANT FINAL EFFLUENT COMPOSITE
SAMPLE COLLECTED APRIL 7 - APRIL 8, 2025, USED FOR WHOLE EFFLUENT TOXICITY TESTING

Sampling point	Analysis	Units	Result
BMOUTKR	2-Chlorophenol	ug/L	<10.000
BMOUTKR	2-Nitrophenol	ug/L	<10.000
BMOUTKR	3,3'-Dichlorobenzidine	ug/L	<15.000
BMOUTKR	3,4-Benzofluoranthene	ug/L	<10.000
BMOUTKR	4,4'-DDD	ug/L	<0.050
BMOUTKR	4,4'-DDE	ug/L	<0.130
BMOUTKR	4,4'-DDT	ug/L	<0.050
BMOUTKR	4,6-Dinitro-o-cresol	ug/L	<25.000
BMOUTKR	4-Bromophenyl phenyl ether	ug/L	<5.000
BMOUTKR	4-Chlorophenyl phenyl ether	ug/L	<5.000
BMOUTKR	4-Nitrophenol	ug/L	<20.000
BMOUTKR	Acenaphthene	ug/L	<5.000
BMOUTKR	Acenaphthylene	ug/L	<5.000
BMOUTKR	Acrolein	ug/L	<50.000
BMOUTKR	Acrylonitrile	ug/L	<10.000
BMOUTKR	Aldrin	ug/L	<0.050
BMOUTKR	Anthracene	ug/L	<5.000
BMOUTKR	Benzene	ug/L	<2.000
BMOUTKR	Benzo(a)anthracene	ug/L	<5.000
BMOUTKR	Benzo(a)pyrene	ug/L	<10.000
BMOUTKR	Benzo(g,h,i)perylene	ug/L	<10.000
BMOUTKR	Benzo(k)fluoranthene	ug/L	<5.000
BMOUTKR	Bis(2-chloro-iso-propyl)ether	ug/L	<10.000
BMOUTKR	Bis(2-chloroethoxy)methane	ug/L	<10.000
BMOUTKR	Bis(2-chloroethyl)ether	ug/L	<10.000
BMOUTKR	Bis(2-ethylhexyl)phthalate	ug/L	<18.000
BMOUTKR	Bromoform	ug/L	<5.000
BMOUTKR	Butyl benzyl phthalate	ug/L	<10.000
BMOUTKR	Carbon tetrachloride	ug/L	<5.000
BMOUTKR	Chlorobenzene	ug/L	<5.000
BMOUTKR	Chlorodibromomethane	ug/L	<2.000
BMOUTKR	Chloroethane	ug/L	<5.000
BMOUTKR	Chloroform	ug/L	<2.000
BMOUTKR	Chrysene	ug/L	<5.000
BMOUTKR	Di-n-butyl phthalate	ug/L	<10.000
BMOUTKR	Di-n-octyl phthalate	ug/L	<15.000
BMOUTKR	Dibenzo(a,h)anthracene	ug/L	<15.000
BMOUTKR	Dichlorobromomethane	ug/L	<2.000
BMOUTKR	Dieldrin	ug/L	<0.050
BMOUTKR	Diethyl phthalate	ug/L	<10.000
BMOUTKR	Dimethyl phthalate	ug/L	<5.000
BMOUTKR	Endosulfan I	ug/L	<0.050
BMOUTKR	Endosulfan II	ug/L	<0.050
BMOUTKR	Endosulfan sulfate	ug/L	<0.050
BMOUTKR	Endrin	ug/L	<0.050

TABLE 8: WATER QUALITY RESULTS OF A JAMES C.KIRIE WATER RECLAMATION PLANT FINAL EFFLUENT COMPOSITE
SAMPLE COLLECTED APRIL 7 - APRIL 8, 2025, USED FOR WHOLE EFFLUENT TOXICITY TESTING

Sampling point	Analysis	Units	Result
BMOUTKR	Endrin aldehyde	ug/L	<0.050
BMOUTKR	Ethylbenzene	ug/L	<2.000
BMOUTKR	Fluoranthene	ug/L	<5.000
BMOUTKR	Fluorene	ug/L	<5.000
BMOUTKR	Heptachlor	ug/L	<0.070
BMOUTKR	Heptachlor epoxide	ug/L	<0.050
BMOUTKR	Hexachlorobenzene	ug/L	<5.000
BMOUTKR	Hexachlorobutadiene	ug/L	<5.000
BMOUTKR	Hexachlorocyclopentadiene	ug/L	<25.000
BMOUTKR	Hexachloroethane	ug/L	<10.000
BMOUTKR	Indeno(1,2,3-cd)pyrene	ug/L	<15.000
BMOUTKR	Isophorone	ug/L	<10.000
BMOUTKR	Methyl bromide	ug/L	<5.000
BMOUTKR	Methyl chloride	ug/L	<5.000
BMOUTKR	Methylene chloride	ug/L	<5.000
BMOUTKR	N-Nitrosodi-n-propylamine	ug/L	<10.000
BMOUTKR	N-Nitrosodimethylamine	ug/L	<5.000
BMOUTKR	N-Nitrosodiphenylamine	ug/L	<5.000
BMOUTKR	Naphthalene	ug/L	<5.000
BMOUTKR	Nitrobenzene	ug/L	<10.000
BMOUTKR	PCB-1016	ug/L	<0.800
BMOUTKR	PCB-1221	ug/L	<0.800
BMOUTKR	PCB-1232	ug/L	<0.800
BMOUTKR	PCB-1242	ug/L	<0.800
BMOUTKR	PCB-1248	ug/L	<0.800
BMOUTKR	PCB-1254	ug/L	<0.800
BMOUTKR	PCB-1260	ug/L	<1.160
BMOUTKR	Pentachlorophenol	ug/L	<30.000
BMOUTKR	Phenanthrene	ug/L	<5.000
BMOUTKR	Phenol	ug/L	<5.000
BMOUTKR	Pyrene	ug/L	<5.000
BMOUTKR	Technical chlordane	ug/L	<0.500
BMOUTKR	Tetrachloroethylene	ug/L	<5.000
BMOUTKR	Toluene	ug/L	<2.000
BMOUTKR	Toxaphene	ug/L	<1.000
BMOUTKR	Trichloroethylene	ug/L	<5.000
BMOUTKR	Trichlorofluoromethane	ug/L	<5.000
BMOUTKR	Vinyl chloride	ug/L	<5.000
BMOUTKR	alpha-BHC	ug/L	<0.050
BMOUTKR	beta-BHC	ug/L	<0.070
BMOUTKR	delta-BHC	ug/L	<0.050
BMOUTKR	gamma-BHC (lindane)	ug/L	<0.050
BMOUTKR	p-Chloro-m-cresol	ug/L	<5.000
BMOUTKR	trans-1,2-Dichloroethylene	ug/L	<5.000