Pace Analytical®
National Center for Testing & Innovation

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August 30, 2023

Jim Knocke
Corrosion Innovations LLC
3500 South Richey Street, Suite 320
Houston, TX 77017

Biomonitoring Results
Pace National Identification #: L1537884-03

Attached are the results for toxicity test performed: September 21-23, 2022

A summary of the findings is presented below:

Test Species	*Ceriodaphnia dubia*	*Pimephales promelas*
EPA Method	EPA Method 2002.0	EPA Method 2000.0
Test Concentrations	0.4%, 0.8%, 1.6%, 3.2%, 6.4%	0.4%, 0.8%, 1.6%, 3.2%, 6.4%
Test Endpoint	48-hr LC50	48-hr LC50
Test Result	**0.0281**	**0.0282**
	Report Only	Report Only

Next Test Date	**Contact the lab if further testing is needed.**
Comments	**Corrosion Innovations** **(CHLOR * RID SP8 Rinse + CHLOR * RID SP8 (30:1) ratio** Revsion 2

If you have any questions or comments concerning the enclosed report, please do not hesitate to contact us.

Pace Analytical®
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Aquatic Biology Lab
615.773.6359
615.773.7544

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Acute or Chronic? Acute
Screen or Definitive? Definitive
Test Date: September 21-23, 2022
Lab Identification #: L1537884-03

TOXICITY TEST REPORT SHEET

1). Facility/Discharger	Corrosion Innovations LLC
2). Contact Person	Jim Knocke
email 1	jim@corrinnovations.com
3). Permit # or Project ID	Premera RP & Premera RP2 (30:1 ratio)
4). Report Address	3500 South Richey Street, Suite 320 Houston, TX 77017
5). Receiving Stream	
6). Laboratory Name	Pace National
7). Laboratory Contact (phone)	Cody Medley, Biology Supervisor 615.773.6359
8). Outfall(s) Tested	CHLOR * RID SP8 Rinse + CHLOR * RID SP8 (30:1) ratio

9). Test Species	#1 *Ceriodaphnia dubia*	#2 *Pimephales promelas*
10). Species Age	#1 Neonates, <24-hr	#2 9 days old
11). Test Conditions (Screen or Definitive?)	#1 Definitive	#2 Definitive

12). Dilution Water Type (synthetic, receiving stream)	Moderately Hard SDW
13). Aeration? (Before/During Test)	none
14). Dechlorination?	none
15). Original Chlorine Level	<0.2mg/L
16). Report prepared by	Mike Lowe, Scientist 2

Brandon E
signature of person performing final review

8-30-2023
date

Brandon Etheridge
name (typed or printed)

Sr. Biologist
title

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ADDITIONAL TOXICITY TEST INFORMATION

Copies of all bench sheets and statistical calculations and printouts obtained during the test are attached in the Appendix. Electronically entered data is entered in real time and digitally tracked to ensure traceability.

Methods/Instrumentation used in chemical analysis:

Dissolved Oxygen: YSI 5000 DO Meter/Probe (serial #01L0435)
pH: Beckman 390pH/Temp/mV/ISE Meter
pH/RDO/Conductivity: Thermo Scientific Orion VersaStar (serial #V 02105)
Water Bath: Lindberg/Blue, Model WB1140A-1 (serial #S01M-580360-SM)
Temperature: Thermometers calibrated to NIST certified thermometer
Alkalinity: Lachat
Hardness: Lachat
Total Residual Chlorine: Hach Pocket Colorimeter, Model #DR300 (serial #19110A002361)
Environmental Chambers: 25 degrees C + 1.0 degree - Thermo-Kool
Environmental Chambers (for Colorado tests): 20 degrees C ± 1.0 degree - Thermo Scientific Model 3759
Light Quality: Ambient Lab Illumination
Light Intensity: 50-100 ft-c - VWR Traceable Dual-Range Light Meter- Model 62344-944 (S/N 210158976)
Photoperiod: 16 hours light, 8 hours dark
Drying: Overnight at greater than 60 degrees Celsius in a Fisher Scientific Isotemp Oven, Model 655F
Mean Dry Weight: Determined using Mettler Toledo Balance, AT261 Delta Range
Reference Weights (Set #1): Class 1, TREOMNER, Inc., serial number 85035
Reference Weights (Set #2): Class 1, TREOMNER, Inc., serial number 67812
EPA Acute Manual Edition and Date: EPA-821-02-012 October 2002, Fifth Edition
EPA Chronic Manual Edition and Date: EPA-821-R-02-013 October 2002, Fourth Edition
This method is performed only by Assistant Biologists, Biologists, and Senior Biologists that have experience with aquatic toxicity testing. Laboratory Technicians, Chemists, and any other laboratory personnel that are not experienced with toxicity testing will not handle test organisms during a toxicity evaluation. Lab Techs, Chemists, and others may assist (under supervision) with the gathering of data during the evaluation (pH, DO, conductivity, alkalinity, hardness, etc.), but will not be allowed to do any work with the test organisms themselves. The following analysts have met Technical Training Qualifications and their initials (in parenthesis) can be found on the bench sheets in this report: **Brandon Etheridge (BE); Cody Medley (CM); Clarissa Moore (CGM); Nadlar Yakob (NY); Anthony Grist (AG); Cheyenne Wagoner (KCW); Hunter Holden (HH); Nalini Lamichhane (NL); Lizzie Orcutt (EO); Taylor Eustaquio (TE); Mike Lowe (ML); Nathan Hawkins (NH); Ashwaq Albeladi (AA); Rubalya Jesmin (RJ);**

Indicate below any other relevant information that may aid in the evaluation of this report. Include any deviations from EPA Methodology that were necessary for these tests as well as any sample manipulations which were performed, such as aeration, dechlorination with sodium thiosulfate (etc) and the justification for such manipulations or deviations. Attach additional pages as needed.

< no deviations to report >

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Facility/Discharger: Corrosion Innovations LLC
Lab Identification #: L1537884-03
Test Date: September 21-23, 2022

Toxicity Test Results

Results of a *Ceriodaphnia* (Genus) *dubia* (Species) 48-hour static acute (Type/Duration)

Conducted 9/21/2022 to 9/23/2022

Using Effluent from Outfall: CHLOR * RID SP8 Rinse + CHLOR * RID SP8 (30:1) ratio

Test Solution	Percent Surviving (time intervals used - days)								# of Young	
	0	1	2	3	4	5	6	7	Total	Mean
Control	100	95	95						not applicable	
0.0001%	100	100	100						not applicable	
0.001%	100	95	95						not applicable	
0.01%	100	100	95						not applicable	
0.1%	100	0	0						not applicable	
1.0%	100	0	0						not applicable	

Permit Limit: Report Only

LC_{50} Value: 0.0281

Confidence Limits
Upper Limit: 0.03537
Lower Limit: 0.02232

Statistical methods used to determine LC50: Spearman-Karber

INTERPRETATION OF RESULTS

Ceriodaphnia dubia (water flea) - **Acute toxicity was demonstrated.** At the end of the 48-hour exposure period, 100% mortality was demonstrated at the 0.1% and 1.0% concentrations. Spearman-Karber was used to calculate the 48-hour LC50 (concentration that will cause mortality to 50% of the organisms). The LC50 value being reported is 0.0281% of (CHLOR * RID SP8 Rinse + CHLOR * RID SP8 (30:1) ratio).

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Toxicity Test Results

Results of a *Pimephales* (Genus) *promelas* (Species) 48-hour static acute (Type/Duration)

Conducted 9/21/2022 to 9/23/2022 Using Effluent from Outfall:

CHLOR * RID SP8 Rinse + CHLOR * RID SP8 (30:1) ratio

Test Solution	Percent Surviving (time intervals used - days)								Dry Weight (mg)	
	0	1	2	3	4	5	6	7	Total	Mean
Control	100	100	100						not applicable	
0.0001%	100	100	100						not applicable	
0.001%	100	100	100						not applicable	
0.01%	100	95	95						not applicable	
0.1%	100	0	0						not applicable	
1.0%	100	0	0						not applicable	

Permit Limit: Report Only

LC_{50} Value: 0.0282

Confidence Limits
Upper Limit: 0.03528
Lower Limit: 0.02252

atistical methods used to determine LC50:
Spearman-Karber

INTERPRETATION OF RESULTS

Pimephales promelas (fathead minnow) - **Acute toxicity was demonstrated.** At the end of the exposure period, 100% mortality was demonstrated at the 0.1% and 1.0% concentrations. Spearman-Karber was used to calculate the 48-hour LC50 (concentration that will cause mortality to 50% of the organisms). The LC50 value being reported is 0.0282% of (CHLOR * RID SP8 Rinse + CHLOR * RID SP8 (30:1) ratio).