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www.erm.com

September 16, 2019

Mr. Les Arnold ALS Environmental 3352 128th Avenue Holland, MI 49424 ERM

Reference: 0501867.0152

Subject: Whole Effluent Toxicity Test Results

Dear Les,

Enclosed please find the final results of the following Chronic Toxicity Tests performed on samples of the ArcelorMittal Burns Harbor Outfall 011 effluent.

- 26 August 2019, Chronic Ceriodaphnia dubia Toxicity Test
- 26 August 2019, Chronic Pimephales promelas Toxicity Test

If you have any questions concerning this report or if I can be of any further assistance to you, please feel free to contact me at (616) 738-7308 or via e-mail at bruce.rabe@erm.com.

Yours sincerely,

Bruce A. Rabe

Director, Aquatic Toxicology Laboratory

Bom G. Rale

BAR:km

Enclosure: Whole Effluent Toxicity Test Report

cc: Amanda Grzybowski

Brandon Frye

File

Permittee/Lo	cation:			P	Permit nur	mber:		Outfall number:				
ArcelorMittal E	Burns Harl	or LLC		IN0000175				011				
250 West U.S	6. Hwy 12											
Burns Harbor,	, IN 46304											
Laboratory N	lame and	Contact:		F	Report <u>Du</u>	e Date:		Report Date:				
Environmenta	invironmental Resources Management							September 16, 2019				
3352 128th Av	enue											
Holland, MI 49	9424											
WETT	Monthly	Quarterly	Semi-		Annual	TRE	Post	First (per Reporting Frequency)?				
Reporting	_		annual	l			TRE					
Frequency								Re-take (per Reporting				
or Type:								Frequency)?				

Test Organism	Test Type	Endpoint	Units	Result	Pass/ Fail	Limit	Reporting
Ceriodaphnia	7-day	NOEC	%	100		N/A	Laboratory
dubia	Survival and	Survival	TUc	1.0		1.0	Report
	Reproduction	NOEC	%	100		N/A	
		Reproduction	TUc	1.0		1.0	
	Definitive	IC ₂₅	%	>100		N/A	
	_Static-	Reproduction	TU₀	1.0		1.0	
	Renewal	48 hr. LC ₅₀	%	>100		N/A	
			TUa	1.0		1.0	
		Toxicity (chronic)	TUc	1.0	Pass	1.0	Laboratory Report <u>and</u> NetDMR (Parameter Code 61426)
		Toxicity (acute)	TUa	1.0	Pass	1.0	Laboratory Report and NetDMR (Parameter Code 61425)
Pimephales	7-day Larval	NOEC	%	100		N/A	,
promelas	Survival and	Survival	TUc	1.0		1.0	
•	Growth	NOEC	%	100		N/A	
		Growth	TUc	1.0		1.0	Laboratory
	Definitive	IC ₂₅	%	>100		N/A	Report
	Static-	Growth	TUc	1.0		1.0	<u> </u>
	Renewal	00 1 1 0	%	>100		N/A	
		96 hr. LC ₅₀	TUa	1.0		1.0	
		Toxicity (chronic)	TUc	1.0	Pass	1.0	Laboratory Report <u>and</u> NetDMR (Parameter Code 61428)
		Toxicity (acute)	TUa	1.0	Pass	1.0	Laboratory Report <u>and</u> NetDMR (Parameter Code 61427)

FINAL REPORT

Chronic Toxicity Test Freshwater Invertebrate, Ceriodaphnia dubia EPA Test Method 1002.0

> Submitted To: ALS Environmental 3352 128th Avenue Holland, MI 49424

Sample: ArcelorMittal Burns Harbor, LLC - Outfall 011

Testing Period: 26 August – 2 September 2019

Laboratory I.D. Number: 082619-2



Conducted By:
Environmental Resources Management, Inc.
3352 128th Avenue
Holland, Michigan 49424



Test Overview



Permittee: ArcelorMittal Burns Harbor, LLC

Location: 250 West U.S. Hwy 12

Burns Harbor, IN 46304

Contact: Robert Maciel Telephone #: 219.787.2120

NPDES Permit #: IN0000175

Permit Requirements: Acute Toxicity Limit = 1.0 TUa

Chronic Toxicity Limit = 1.0 TUc

Test Sample: Outfall 011

Receiving Water: East Branch, Little Calumet River

Testing Date: 26 August – 2 September

2019

Sample Date(s): 26 August 2019

28 August 2019 30 August 2019

Test/Method: Daphnid, Ceriodaphnia dubia,

Survival and Reproduction Test EPA 821-R-02-013

Method 1002.0.

QC Objectives: Test data met all test

acceptability criteria, except

where noted below.

Data Qualifiers: None

DATA SUMMARY

Effluent Concentrations (%)	Survival (%)	Reproduction (Average Young/Female)
Control	100	27.3
6	100	25.7
13	100	29.3
25	80	24.4
50	100	36.7
100	90	36.4

TEST RESULTS

>100%
100%
>100%
>100%
31.9%
1.0
1.0

TEST CONCLUSION

In accordance with the NPDES permit requirements for ArcelorMittal Burns Harbor, LLC, this toxicity test did not exceed either the acute or the chronic toxicity limit.

Bru G. Rabe

Bruce A. Rabe
Director, Aquatic
Toxicology Laboratory

ERM Project No. 0501867.0152

Environmental Resources Management 3352 128th Avenue

Holland, Michigan 49424-9263

Phone: 616.399.3500 Fax: 616.399.3777



ERM Testing Method

Ceriodaphnia dubia – Survival and Reproduction Toxicity Test

Upon sample receipt, each effluent sample was analyzed for a suite of water quality parameters (Appendix A - Table 1). Where indigenous organisms were present, the sample was filtered through a 60 micron (µm) NITEX® screen. All samples were maintained at 0 – 6 degrees Celsius (°C) until needed for testing.

A series of five effluent concentrations and a control solution were established for testing. All test solutions were prepared by mixing appropriate volumes of dilution water and effluent in the test containers. Dilution water consisted of reconstituted moderately hard water. The control solution consisted of 100 percent dilution water.

Ceriodaphnia dubia used to initiate this test were obtained from individual, in-house cultures and were less than 24-hours old, and had an age range of 0 to 8 hours at test initiation. Test organisms used to initiate this test were released from adults which met acceptable performance criteria (i.e., ≥15 young/surviving female within 3 broods and obtained from a brood of at least 8 young) and were maintained in reconstituted moderately hard water prior to test initiation.

The Ceriodaphnia dubia test was conducted using 30-milliliter (mL) disposable polystyrene containers containing 15 mL of control water or test solution. One Ceriodaphnia dubia was added to each test chamber with ten replicate chambers per treatment. Each Ceriodaphnia dubia test chamber was fed a 0.2-mL suspension consisting of yeast-Cerophyll-trout chow (YCT) and green algae (Raphidocelis subcapitata) mixture daily.

The test solutions were renewed daily during the exposure by transferring the adult daphnid, by way of a wide bore pipette, into fresh control water or test solution.





Percent survival of exposed *Ceriodaphnia dubia* was determined by inspecting for adult mortality daily. Mortality was defined as no body or appendage movement after gentle prodding. Production of young was also determined by daily inspections and enumeration. When 60 percent of the surviving females in the control treatment produced three broods, mean reproduction was determined by calculating the average number of live young produced per female for each treatment.

The test was conducted at a temperature of $25 \pm 1^{\circ}$ C under fluorescent lighting with a photoperiod of 16 hours light and 8 hours dark. Water quality measurements were performed on all control and test solutions prior to test initiation and on selected treatments daily thereafter, as indicated in the raw data (Appendix A - Table 2).

Following termination of the chronic toxicity test, No Observed Effect Concentrations (NOEC) and Lowest Observed Effect Concentrations (LOEC) were determined for Ceriodaphnia dubia survival and reproduction, and a 25 percent Inhibition Concentration (IC₂₅) was determined for Ceriodaphnia dubia reproduction. An NOEC is defined as the highest effluent concentration that does not produce any observed adverse effect to the exposed test organism. An LOEC is defined as the lowest effluent concentration that does produce an observed adverse effect to the exposed test organism. An adverse effect is determined as a statistically significant difference between the control and a given effluent concentration. Significant differences in Ceriodaphnia dubia survival were determined using the Fisher's Exact Test.

Prior to the determination of any significant differences in *Ceriodaphnia dubia* reproduction, the data were evaluated for normal distribution and homogeneity characteristics. Depending on the result and the number of test replicates per concentration, an analysis of variance test was performed followed by one of the following mean comparison tests: Dunnett's Procedure, Bonferroni t-Test, Steel's Many-One Rank Test, Wilcoxon Rank Sum Test, or the T-Test. For reporting purposes, a chronic toxic unit (TUc) is calculated and is defined as the most conservative of either 100/NOEC based on the more sensitive test endpoint or 100/IC₂₅.

To evaluate acute toxicity, a 48-hour LC₅₀ and corresponding 95 percent confidence interval was also calculated, where possible. The LC₅₀ value estimate was determined by using one of the following statistical methods: graphical, Spearman-Karber, Trimmed Spearman-Karber, or Probit. The method selected for reporting test results was determined by the characteristics of the data; that is, the presence or absence of 0 and 100 percent mortality and the number of concentrations in which mortalities between 0 and 100 percent occurred. For reporting purposes, the 48-hour LC₅₀ value was converted to an acute toxic unit (TUa) by 100/LC₅₀. All statistical analyses were performed using the CETIS™ Version 1.9.4.3 software program.

The reference toxicant, sodium chloride, was used to monitor the sensitivity of the test organisms and the precision of the testing procedure. Chronic reference toxicant tests are performed at least monthly and the resulting IC25 are plotted to determine if the results are within prescribed limits (Appendix A - Standard Reference Toxicant Data). If the IC25 of a particular reference toxicant test does not fall within the expected range of \pm two standard deviations from the mean for a given test organism, the sensitivity of that organism and the overall credibility of the test system is suspect.

Reference:

USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th Ed. U.S. Environmental Protection Agency, Office of Water, Washington, D.C., EPA-821-R-02-013.

Case Narrative





1.0 TEST PERFORMANCE CRITERIA

The quality control results achieved laboratory specifications.

2.0 MODIFICATIONS TO ERM'S STANDARD TEST METHOD

Test was performed in accordance with ERM's standard test method (see page 3).

Appendix A Supporting Documents

- Raw Test Data
- Statistical Analysis (if necessary)
- Chain-of-Custody Forms
- Standard Reference Toxicant Data

Ceriodaphnia dubia - Chronic Toxicity Test Initial Water Quality and Test Solution Preparation

Table 1 Page 1 of 1

Permittee/Client:

ArcelorMittal Burns Harbor, LLC

Effluent/Location:

Outfall 011

Lab I.D.#: Beginning Date:

Ending Date:

082619-2 08126119 08/02/19

Time: (530 (600

Time:

Control/Dilution Water: **RMHW**

Organism Batch #: 300 103 19 146-1

4-16 Organism Age:

QC Review: QC Review Date:

Initial Water Quality:

Parameter	Units		Effluent		Sy	nthetic Wat	er
Sample #		1	2	3		4 <u>.</u>	-
Lab I.D.#/ Batch #		082619-2	08211-2	683019-2	99-19	-	ç <u></u>
Temperature	° C	5	5	2			
Dissolved Oxygen	mg / L	9. 9	5.8	6.7			
рН	S.U.	7.5	7.3	7.2	7.8	2	~
Conductivity	umhos/cm	444	459	464	315	_	******
Alkalinity	mg / L CaCO ₃	110	106	100	60	~	
Hardness	mg / L CaCO ₃	140	160	160	80	-	_
Total Ammonia	mg / L NH ₃	0,14	0.09	20:01			
Total Residual Chlorine	mg / L Cl ₂	10,01	20,01	20.01	(0.01	-	-
Total mls of 7.0 g/L							
Sodium Thiosulfate	mL/L	2				del tab	
added per liter		A	0.				
Initials		PA	M	Sim	KM	^	1

Test Solution Preparation:

Test Solution Prepared For Both Species.

Treatment	Effluent	Dilution	Test		Effluent	Synthet
(% Effluent)	(mL)	(mL)	Day	Initials	Sample #	Batch a
Control	0	1200	0	99-19 U	1 1	99-19
6%	72	1128	1	PH	1	99-10
13%	156	1044	2	RIA	d	99-10
25%	300	900	3	RWM	2	99-19
50%	600	600	4	pris	3	99-1
100%	1200	0	5	BH	3	99-1
			6	CW	3	99-1
			7			

Ceriodaphnia dubia - Chronic Toxicity Test **Water Quality Data**

Permittee/Client:

Water Quality Data:

25%

50%

100%

ArcelorMittal Burns Harbor, LLC

Effluent/Location: Lab I.D.#:

Outfall 011 082619-2

Dissolved Oxygen (mg/L) Day 3 Meter# 7 0 2 3 4 5 Treatment F F F F F F F (% Effluent) 7.4 8.0 7.9 8,0 1.9 8,6 Control 8, 8.1 8.0 9 6% 8.3 7,9 810 8.1 8.7 8 810 77 8.3 7,9 8,1 103 7.9 0 13% 7.8 60 82 80 7.0 810 8.0 2.5 7.9 8.0 8, 25% 8.1 4.3 8.4 R-0 7.9 810 7,6 8.1 8, 50% 7.7 7,0 80 610 7.0 8.1 100% 7.0 8.4 8.1 7.9 pH (S.U.) Day 10 10 0 Meter# 10 7 5 6 4 Treatment 0 3 F F (% Effluent) Т F F 7.9 7.8 1.8 7.8 1.8 Control 7,8 73 7.9 9 7.46 8.0 6% 7.8 8.0 18 8.0 8.0 8.0 7.5 13% 8 8.0 10 8.1 25% --7.7 8.1 811 7,9 50% 8.2 7.7 7.7 7.9 8.0 8.2 8.1 100% 79 7,0 Conductivity (umhos / cm) Day Meter# 7 6 4 5 Treatment 0 F F F F F 24/4 F F (% Effluent) 327 __ 309 317 -- 31 Control 320 325 324 6% 329 327 331 337 330 33 13% 350 ---<u> 354</u>

431 421 452 Temperature (°C) Day 3 3 Meter# 7 5 0 3 Treatment F F F F (% Effluent) 24 24 24 24 24 24 24 24 24 Control 24 24 24 21 24 LY 24 6% 24 24 JU 24 24 24 24 24 24 24 239 13% Ju 24 24 24 24 25% 24 24 24 ムグ 24 24 24 50% 24 24 25 JU 24 14 24 24 75 24 100%

463

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453

F = Final Chemistry

44.8

39.

467

Note: D.O. meter also used for temperature measurement unless otherwise noted.

344 367

I = Initial Chemistry

Ceriodaphnia dubia - Chronic Toxicity Test Survival and Reproduction Data

Permittee/Client:

ArcelorMittal Burns Harbor, LLC

Effluent/Location:

Outfall 011 082619-2 Lab I.D.#:

												Average	Number of Live	Average Young/
Treatment	Day					Repli	cate					Young/	Adults	Female
(% Effluent)	No.	1	2	3	4	5	6	7	8	9	10	Female	(% Sur.)	% CV
,			10		- 33								40	
	1		44	-									10	1 -
	2												10	
	3	1900	e		-	printer.	/	-	-	-	Maria.		10	THE STATE OF
Control	4	7	5	6	7	3	8	0	6	0	8		10	
	5	-	4-	12	10	8	10	12	11	-	10		10	
	6	12		-		4500	-	-	_	7	_		10	
	7	17	15	15	45	13	5	2	15	18	Tabere-		10	
Totals:		34	31	33	22-	24	23	20	32	31	23	27.3	((60))	19.5
Broods (% 3rd	Brood)	7	1	3	2	2	2	3	7	2	3	(100		
		The same	Name of Street						-					35
	1				_	-				-			10	
	2												10	
	3	Service	Mary	-	-	Management.	grinne	/ minus	21	_	granuta.		10	
6%	4	7	. 5	65	6	(43	5(1)	6	9	6	7		10	
	5	6	12	11	11	10	10	10	1.5	aliane.	13		10	
	6	·		402	-	>	****	4	Wages	11	-		10	100
	7	10	17	18	4	13	15	5	5	3	157000		10	70
Totals:		23	34	34	21	29	30	2	25	20	20	25.7	(100)	21.9
													10	10
	1												10	
	2				7.50		, nous	-		~			18	X.
1001	3	-	-0	-		4	-	timber to the same of the same	8	7	,			
13%	4	6	8	0	<u>(a)</u>	-	(0	5		9	9		10	
	5	10	11	10	117	10	13	14	11		12		10	
	6	res-mi		- Orton	4	4	-		10	-	A costs		10	2
	7	14	18		-	15	18			9	13	143	10	16.2
Totals:		30	37	27	24	29	37	24	29	25	31	29.3	(100)	10.6
	11								_				10	
	2											9 9	10	
	3			_		-	_	_		X	PARTICULAR .		9	
25%	4	7	Y	7	47	5	7	7	8	X	3		9	berrut
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		14	20	-	-		14		-		12		1	
	6	14		-)		18	×	-	X	-		8	
Totals:		14	12	10)	10	18	`×	8	×	70	24,4	8	44.7
Totals:	6	14		-)		39		-	X	-	24,4	8 (80)	44.7
Totals:	6 7	14		10)	10	18	× 19	8 26	× × 0	/p 31	24,4	8 (20)	44.7
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Totals:	6 7	14 35	12-	10 27	18	10 25	39	× 19	8 26	× × 0	/p 31	24,4	8 (20)	yu
Totals:	6 7	14 35	12-	10 27	18	70 25	39	× × 19	8 26 	××0	/b 31	24.4	8 (80)	yu
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50%	6 7 1 2 3 4 5 6 7	14 35 	7 12 24 7 14 20 47	7 10 27 	78	70 25 5(1) 10 14 29	18 39	× × 19 -	3 10 10 10 29	× × 0 · · · · · · · · · · · · · · · · ·	- /0 31 - - - - - - - - - - - - - - - - - -		10 10 10 10 10 10 10	
50%	6 7 1 2 3 4 5 6 7	14 35 	7 12 24 7 14 20 47	70 27 	78	70 25 5(1) 10 14 29	18 39	× × 19 14 17 39	3 10 10 10 29	× × 0 · · · · · · · · · · · · · · · · ·	- /0 31 - - - - - - - - - - - - - - - - - -		10 10 10 10 10 10 10 10 10 10 10 10 10 1	
50% Totals:	6 7 1 2 3 4 5 6 7	14 35 	- 12- 24 - 7 14 - 20 47	7 27 	78	70 25 5(1) 10 14 29	18 39	× × × 19 -	3 10 16 24	× × 0 -			10 10 10 10 10 10 10 10 10 10 10 10 10 1	
50%	6 7 1 2 3 4 5 6 7	14 35 8 5 15 24 47 7	12 24	7 10 27 	78	70 25 5(1) 10 14 29	18 39 	× × 19	3 10 16 24 24	× × 0 			10 10 10 10 10 10 10 10 10 10 10 10 10 1	
50% Totals:	6 7 1 2 3 4 5 6 7	14 35 	7 12 24 14 14 	7 27 	78	70 25 5(1) 10 14 29	18 39 	× × 19	3 10 10 10 29 29	X X 0 			10 10 10 10 10 10 10 10 10 10 10 10 10 9	20.
50% Totals:	6 7 1 2 3 4 5 6 7	14 35 8 5 15 24 47 7	12 24	7 10 27 	78	70 25 5(1) 10 14 29	18 39	× × 19	3 10 16 24 24 13	× × 0 			10 10 10 10 10 10 10 10 10 10 10 10 9	
50% Totals:	6 7 1 2 3 4 5 6 7	14 35 	7 12 24 14 14 	7 10 27 7 12 23 71 7 13	78	70 25 5(1) 10 14 29	18 39 	× × 19	3 10 10 10 29 29	X X 0 		36.7	10 10 10 10 10 10 10 10 10 10 10 10 10 9	

* = 4th BROOD EXCLUDED FROM TOTAL

Ceriodaphnia dubia - Chronic Toxicity Test Support Data

Table 3 Page 2 of 2

Permittee/Client:

ArcelorMittal Burns Harbor, LLC

Effluent/Location:

Outfall 011

Lab I.D.#:

082619-2

Brood Boa	rd Information:
------------------	-----------------

Replicate	1	2	3	4	5	6	7	8	9	10	Brood Board Date:	08/12/	19
Chamber Number	18	57	36	35	48	47	46	45	41	21	Young Age Range:	10-18	hours
		,		· · · · · · · · · · · · · · · · · · ·			•					3-16	04/03/19

Test Information:

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
YCT Batch #:	1919	17-19	17-19	17-19	17-19	17-19	17-19	
Algae Batch #:	18-19	14-19	18-19	18-19	18-19	18-19	18-19	-
Observation Time:	600 +5 30	1630	1430	1430	1600	1300	1300	1130
Initials:	Pro	SPR	RIV	RN	(M)	KM	RI	Sell
Date:	8/26/19	08/27/19	8-28-19	8-29-19	08/3/19	08/31/19	9-1-19	09/52/10

C 8126

Day	Date	Initials	Comments
	-		

Report Date: Test Code/ID: 04 Sep-19 10:33 (p 1 of 2) 4F96F16F / 13-3529-2271

	a /-u -	Survival and												ERI
Analysis ID: Analyzed:		967-6830 Sep-19 10:33		Endpoint: Analysis:		Survival Rate 2xK Contin		es		TIS Vers		CETISv1	1.9.4	
Batch ID:	17-5	546-6047		Test Type:	Rep	oroduction-S	urvival (7d)		Ar	alyst:	Lab	Tech		
Start Date:	26 A	ug-19 16:00	. 1	Protocol:	EP/	4/821/R-02-	013 (2002)		Di	luent:	Rec	onstituted \	Nater	
Ending Date	02 8	Sep-19 11:30		Species:	Cer	iodaphnia d	ubia		Br	ine:				
Test Length:	6d :	20h		Taxon:	Bra	nchiopoda			Sc	urce:	In-H	ouse Cultu	re	Age: <2
Sample ID:	00-3	804-3900	(Code:	244	80FC			Pr	oject:	WET	Γ Testing		
Sample Date	: 26 A	ug-19 06:08		Viaterial:	Indi	ustrial Efflue	nt		Sc	urce:	Arce	lorMittal B	urns Harbor	, LLC
Receipt Date	: 26 A	ug-19 12:00		CAS (PC):					St	ation:	Outf	all 011		
Sample Age:	10h	(5 °C)		Client:	Arc	elorMittal Bu	ırns Harbor,	LLC						
Data Transfo	rm		Alt Hy	/p					NOEL	LOEI		TOEL	TU	
Untransforme	d		C > T						100	>100		n/a	1	
Fisher Exact	/Bonf	erroni-Holm	Test											
Control	vs	Group		Test 9		P-Type	P-Value	Decision	, ,					
Lab Water		6		1.000		Exact	1.0000		ificant Effe					
		13		1.000		Exact	1.0000	-	ificant Eff					
		25		0.236		Exact	1.0000	_	ificant Eff					
		50		1.000		Exact	1.0000	_	ificant Eff					
		100		0.500	0	Exact	1.0000	Non-Sign	ificant Eff	ect				
Test Accepta	bility	Criteria	TA	C Limits										
Attribute		Test Stat	Lower	Uppe	r	Overlap	Decision							
Control Resp		1	8.0	>>		Yes	Passes C	riteria						
Data Summa	ıry													
Conc-%		Code	NR	R		NR+R	Prop NR	Prop R	%Effec	t				
0		L	10	0		10	1	0	0.0%					
6			10	0		10	1	0	0.0%					
13			10	0		10	1	0	0.0%					
25			8	2		10	8.0	0.2	20.0%					
50			10	0		10	1	0	0.0%					
100			9	11		10	0.9	0.1	10.0%					
7d Survival I	Rate D	Detail												
Conc-%		Code	Rep 1	Rep 2	2	Rep 3	Rep 4	Rep 5	Rep 6	Rep		Rep 8	Rep 9	Rep 10
0		L	1.0000	1.000	0	1.0000	1.0000	1.0000	1.0000	1.000		1.0000	1.0000	1.0000
3			1.0000	1.000	0	1.0000	1.0000	1.0000	1.0000	1.000	00	1.0000	1.0000	1.0000
13			1.0000	1.000	0	1.0000	1.0000	1.0000	1.0000	1.000	00	1.0000	1.0000	1.0000
25			1.0000	1.000	0	1.0000	1.0000	1.0000	1.0000	0.000	00	1.0000	0.0000	1.0000
50			1.0000	1.000	0	1.0000	1.0000	1.0000	1.0000	1.000	00	1.0000	1.0000	1.0000
100			1.0000	1.000	0	1.0000	1.0000	0.0000	1.0000	1.000	00	1.0000	1.0000	1.0000
7d Survival	Rate E	Binomials												
Conc-%		Code	Rep 1		2	Rep 3	Rep 4	Rep 5	Rep 6	Rep	7	Rep 8	Rep 9	Rep 10
0		L	1/1	1/1		1/1	1/1	1/1	1/1	1/1		1/1	1/1	1/1
6			1/1	1/1		1/1	1/1	1/1	1/1	1/1		1/1	1/1	1/1
13			1/1	1/1		1/1	1/1	1/1	1/1	1/1		1/1	1/1	1/1
			1/1	1/1		1/1	1/1	1/1	1/1	0/1		1/1	0/1	1/1
25								19.19	4.74	4.14		4.66	444	4.74
50 50			1/1	1/1		1/1	1/1	1/1	1/1	1/1		1/1	1/1	1/1

Report Date: Test Code/ID: 04 Sep-19 10:33 (p 2 of 2) 4F96F16F / 13-3529-2271

Ceriodaphnia 7-d Survival and Reproduction Test

ERM

Analyzed:

Analysis ID: 19-0967-6830 04 Sep-19 10:33

Analysis:

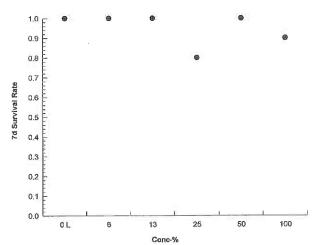
Endpoint: 7d Survival Rate STP 2xK Contingency Tables

CETIS Version: Status Level:

CETISv1.9.4

1

Graphics



Report Date: Test Code/ID: 04 Sep-19 10:34 (p 1 of 2) 4F96F16F / 13-3529-2271

	7-d Surv	ivai and	rioproc	uction 1 es								ERM
Analysis ID: Analyzed:	18-7421- 04 Sep-1			•	Reproduction Nonparametric	Control vs	Freatments		S Versions Level:		.9.4	
Batch ID:	17-5546-	6047	Te	est Type:	Reproduction-S	urvival (7d)		Anal	/st: L	ab Tech		
Start Date:	26 Aug-1	9 16:00	Pi	rotocol:	EPA/821/R-02-	013 (2002)		Dilue	nt: R	teconstituted V	Vater	
Ending Date:	02 Sep-1	9 11:30	S	oecies:	Ceriodaphnia d	ubia		Brine	: :			
Test Length:				exon:	Branchiopoda			Sour	ce: Ir	n-House Cultur	e	Age: <2
Sample ID:	00-3804-	3900	C	ode:	24480FC			Proje	ect: V	VET Testing		
Sample Date:	26 Aug-1	9 06:08	M	aterial:	ndustrial Efflue	ent		Sour	ce: A	rcelorMittal Bu	ırns Harbor,	LLC
Receipt Date:	26 Aug-1	9 12:00	C	AS (PC):				Stati	on: C	outfall 011		
Sample Age:	10h (5 °C	C)	C	lient:	ArcelorMittal Bu	ırns Harbor	LLC					
Data Transfor	rm		Alt Hyp)				NOEL	LOEL	TOEL	TU	PMSD
Untransformed	d		C > T					100	>100	n/a	1	31.89%
Steel Many-O	ne Rank	Sum Te	st							-		
		onc-%		Test S	at Critical	Ties Di	P-Type	P-Value	Decision	on(α:5%)		
Lab Water	6			95	75	3 18	Asymp	0.5278		gnificant Effect		
	13	3		115	75		Asymp	0.9697		gnificant Effect		
	25	5		100.5	75		Asymp	0.7129		gnificant Effect		
	50)		135	75		Asymp	0.9999		gnificant Effect		
	10	00		143	75	2 18	Asymp	1.0000	Non-Si	gnificant Effect	t 	
Test Acceptal	bility Crit	eria	TAC	Limits								
Attribute	Te	st Stat	Lower	Upper	Overlap	Decision						
Control Resp	27	.3	15	>>	Yes	Passes C	riteria					
ANOVA Table												
Source	Su	m Squa	res	Mean \$	Square	DF	F Stat	P-Value		on(α:5%)		
Between	14	34.73		286.94	7	5	3.968	0.0039	Signific	ant Effect		
	-	04.70										
	39	05.2		72.318	5	54	_					
	39			72.318	5	54 59						
Error Total	39 53	05.2		72.318	5							
Error Total Distributiona	39 53	05.2 39.93		72.318	5		Critical	P-Value	Decision	on(α:1%)		
Error Total Distributiona Attribute	39 53 I Tests Te	05.2 39.93 st	uality of \	72.318 Variance Te		59	Critical 15.09	P-Value 0.0074		on(α:1%) al Variances		
Error	39 53 I Tests Te Ba	05.2 39.93 st			est	59 Test Stat			Unequa	<u> </u>	ion	
Error Total Distributiona Attribute Variances Distribution	39 53 I Tests Te Ba Sh	05.2 39.93 st rtlett Equapiro-Wi		√ariance Te	est	59 Test Stat 15.82	15.09	0.0074	Unequa	al Variances	ion	
Error Total Distributiona Attribute Variances Distribution Reproduction	39 53 I Tests Te Ba Sh	05.2 39.93 st rtlett Equapiro-Wi		√ariance Te	est	59 Test Stat 15.82 0.8615	15.09 0.9459	0.0074 6.8E-06 Min	Unequa Non-No	al Variances ormal Distributi Std Err	CV%	%Effect
Error Total Distributiona Attribute Variances Distribution Reproductior Conc-%	39 53 I Tests Te Ba Sh	05.2 39.93 st rtlett Equapiro-Wi	ilk W No	√ariance Termality Tes	95% LCL 23.48	79 Test Stat 15.82 0.8615 95% UCL 31.12	15.09 0.9459 Median 27.5	0.0074 6.8E-06 Min 20	Unequa Non-No Max 34	al Variances ormal Distributi Std Err 1.687	CV% 19.54%	0.00%
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6	39 53 I Tests Te Ba Sh Summa	05.2 39.93 st rtlett Equapiro-Wi	Count 10 10	Variance Termality Tes Mean 27.3 25.7	95% LCL 23.48 21.68	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72	15.09 0.9459 Median 27.5 24	0.0074 6.8E-06 Min 20 20	Max 34	al Variances primal Distribut Std Err 1.687 1.777	CV% 19.54% 21.86%	0.00% 5.86%
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13	39 53 I Tests Te Ba Sh Summa	05.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10	Variance Termality Tes Mean 27.3 25.7 29.3	95% LCL 23.48 21.68 25.91	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69	15.09 0.9459 Median 27.5 24 29	0.0074 6.8E-06 Min 20 20 24	Max 34 34 37	Std Err 1.687 1.777 1.499	CV% 19.54% 21.86% 16.17%	0.00% 5.86% -7.33%
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25	39 53 I Tests Te Ba Sh Summa	05.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10	Mean 27.3 25.7 29.3 24.4	95% LCL 23.48 21.68 25.91 16.69	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11	15.09 0.9459 Median 27.5 24 29 25.5	0.0074 6.8E-06 Min 20 20 24 0	Max 34 34 37 39	Std Err 1.687 1.777 1.499 3.407	CV% 19.54% 21.86% 16.17% 44.15%	0.00% 5.86% -7.33% 10.62%
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25 50	39 53 I Tests Te Ba Sh Summa	05.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10 10	Variance Termality Tes Mean 27.3 25.7 29.3 24.4 36.7	95% LCL 23.48 21.68 25.91 16.69 31.45	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11 41.95	15.09 0.9459 Median 27.5 24 29 25.5 37.5	0.0074 6.8E-06 Min 20 20 24 0 28	Max 34 34 37 39 47	Std Err 1.687 1.777 1.499 3.407 2.319	CV% 19.54% 21.86% 16.17% 44.15% 19.98%	0.00% 5.86% -7.33% 10.62% -34.43%
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25 50	39 53 I Tests Te Ba Sh Summa	05.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10	Mean 27.3 25.7 29.3 24.4	95% LCL 23.48 21.68 25.91 16.69	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11	15.09 0.9459 Median 27.5 24 29 25.5	0.0074 6.8E-06 Min 20 20 24 0	Max 34 34 37 39	Std Err 1.687 1.777 1.499 3.407	CV% 19.54% 21.86% 16.17% 44.15%	0.00% 5.86% -7.33% 10.62% -34.43%
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25 50 100 Reproduction	39 53 I Tests Te Ba Sh Summa Co L	o5.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10 10 10 10	Variance Termality Tes Mean 27.3 25.7 29.3 24.4 36.7 36.4	95% LCL 23.48 21.68 25.91 16.69 31.45 26.76	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11 41.95 46.04	15.09 0.9459 Median 27.5 24 29 25.5 37.5 41.5	0.0074 6.8E-06 Min 20 20 24 0 28 0	Max 34 34 37 39 47	Std Err 1.687 1.777 1.499 3.407 2.319 4.261	CV% 19.54% 21.86% 16.17% 44.15% 19.98% 37.02%	0.00% 5.86% -7.33% 10.62% -34.43% -33.33%
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25 50 100 Reproduction	39 53 I Tests Te Ba Sh Summa Co L	05.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10 10 10 10 Rep 1	Mean 27.3 25.7 29.3 24.4 36.7 36.4 Rep 2	95% LCL 23.48 21.68 25.91 16.69 31.45 26.76	7est Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11 41.95 46.04	15.09 0.9459 Median 27.5 24 29 25.5 37.5 41.5	0.0074 6.8E-06 Min 20 20 24 0 28 0	Max 34 34 37 39 47 46	Std Err 1.687 1.777 1.499 3.407 2.319 4.261	CV% 19.54% 21.86% 16.17% 44.15% 19.98% 37.02%	0.00% 5.86% -7.33% 10.62% -34.43% -33.33%
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25 50 100 Reproduction Reproduction Conc-% 0 Conc-% 0	39 53 I Tests Te Ba Sh Summa Co L	o5.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10 10 10 10 10 10 34	Mean 27.3 25.7 29.3 24.4 36.7 36.4 Rep 2	95% LCL 23.48 21.68 25.91 16.69 31.45 26.76 Rep 3	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11 41.95 46.04 Rep 4 22	15.09 0.9459 Median 27.5 24 29 25.5 37.5 41.5 Rep 5	0.0074 6.8E-06 Min 20 20 24 0 28 0	Max 34 34 37 39 47 46 Rep 7	Std Err 1.687 1.777 1.499 3.407 2.319 4.261 Rep 8	CV% 19.54% 21.86% 16.17% 44.15% 19.98% 37.02% Rep 9	0.00% 5.86% -7.33% 10.62% -34.43% -33.33% Rep 10
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25 50 100 Reproduction Conc-% 0 6 6 13 6	39 53 I Tests Te Ba Sh Summa Co L	o5.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10 10 10 10 34 23	Mean 27.3 25.7 29.3 24.4 36.7 36.4 Rep 2 31 34	95% LCL 23.48 21.68 25.91 16.69 31.45 26.76 Rep 3 33 34	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11 41.95 46.04 Rep 4 22 21	15.09 0.9459 Median 27.5 24 29 25.5 37.5 41.5 Rep 5 24 29	0.0074 6.8E-06 Min 20 20 24 0 28 0	Max 34 34 37 39 47 46 Rep 7 20 21	Std Err 1.687 1.777 1.499 3.407 2.319 4.261 Rep 8 32 25	CV% 19.54% 21.86% 16.17% 44.15% 19.98% 37.02% Rep 9 31 20	0.00% 5.86% -7.33% 10.62% -34.43% -33.33% Rep 10 23 20
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25 50 100 Reproduction Conc-% 0 6 13 13 13 100 100 100 100 100 100 100 10	39 53 I Tests Te Ba Sh Summa Co L	o5.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10 10 10 10 34 23 30	Mean 27.3 25.7 29.3 24.4 36.7 36.4 Rep 2 31 34 37	95% LCL 23.48 21.68 25.91 16.69 31.45 26.76 Rep 3 33 34 27	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11 41.95 46.04 Rep 4 22 21 24	15.09 0.9459 Median 27.5 24 29 25.5 37.5 41.5 Rep 5 24 29 29	0.0074 6.8E-06 Min 20 20 24 0 28 0 Rep 6 23 30 37	Max 34 34 37 39 47 46 Rep 7 20 21 24	Std Err 1.687 1.777 1.499 3.407 2.319 4.261 Rep 8 32 25 29	CV% 19.54% 21.86% 16.17% 44.15% 19.98% 37.02% Rep 9 31 20 25	0.00% 5.86% -7.33% 10.62% -34.43% -33.33% Rep 10 23 20 31
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25 50 100 Reproduction Conc-% 0 6 13 25 100 Reproduction 0 6 13 25 50 100 Reproduction 25 50 100 Reproduction 25 50 100 50 60 13	39 53 I Tests Te Ba Sh Summa Co L	o5.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10 10 10 10 10 34 23 30 35	Variance Termality Tes Mean 27.3 25.7 29.3 24.4 36.7 36.4 Rep 2 31 34 37 24	95% LCL 23.48 21.68 25.91 16.69 31.45 26.76 Rep 3 33 34 27 27	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11 41.95 46.04 Rep 4 22 21 24 18	15.09 0.9459 Median 27.5 24 29 25.5 37.5 41.5 Rep 5 24 29 29 25	0.0074 6.8E-06 Min 20 20 24 0 28 0 Rep 6 23 30 37 39	Max 34 34 37 39 47 46 Rep 7 20 21 24 19	Std Err 1.687 1.777 1.499 3.407 2.319 4.261 Rep 8 32 25 29 26	CV% 19.54% 21.86% 16.17% 44.15% 19.98% 37.02% Rep 9 31 20 25 0	0.00% 5.86% -7.33% 10.62% -34.43% -33.33% Rep 10 23 20 31 31
Error Total Distributiona Attribute Variances Distribution Reproduction Conc-% 0 6 13 25 50 100 Reproduction Conc-% 0 6 13 13 100 Reproduction 100 Reproduction 100 Reproduction 100 100 100 100 100 100 100 100 100 10	39 53 I Tests Te Ba Sh Summa Co L	o5.2 39.93 st rtlett Equapiro-Wi	Count 10 10 10 10 10 10 10 34 23 30	Mean 27.3 25.7 29.3 24.4 36.7 36.4 Rep 2 31 34 37	95% LCL 23.48 21.68 25.91 16.69 31.45 26.76 Rep 3 33 34 27	79 Test Stat 15.82 0.8615 95% UCL 31.12 29.72 32.69 32.11 41.95 46.04 Rep 4 22 21 24	15.09 0.9459 Median 27.5 24 29 25.5 37.5 41.5 Rep 5 24 29 29	0.0074 6.8E-06 Min 20 20 24 0 28 0 Rep 6 23 30 37	Max 34 34 37 39 47 46 Rep 7 20 21 24	Std Err 1.687 1.777 1.499 3.407 2.319 4.261 Rep 8 32 25 29	CV% 19.54% 21.86% 16.17% 44.15% 19.98% 37.02% Rep 9 31 20 25	0.00% 5.86% -7.33% 10.62% -34.43% -33.33% Rep 10 23 20 31

Report Date: Test Code/ID: 04 Sep-19 10:34 (p 2 of 2) 4F96F16F / 13-3529-2271

Ceriodaphnia 7-d Survival and Reproduction Test

ERM

Analyzed:

Analysis ID: 18-7421-2304 04 Sep-19 10:33

Endpoint: Reproduction Analysis:

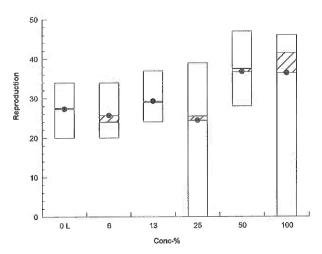
Nonparametric-Control vs Treatments

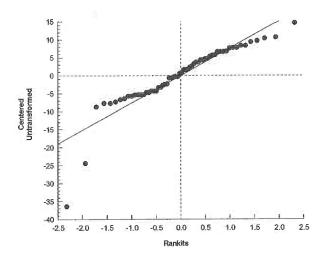
CETIS Version:

CETISv1.9.4

Status Level: 1

Graphics





Report Date: Test Code/ID: 04 Sep-19 10:34 (p 1 of 2) 4F96F16F / 13-3529-2271

Cerioda	aphnia	7-d Survival and	d Reproduc	tion Te	est								ERA
Analysi	is ID:	20-0346-2896	End	point:	Reproduction			С	ETIS Versi	on:	CETISv1	.9.4	
Analyze	ed:	04 Sep-19 10:33	Ana	lysis:	Linear Interpola	tion (ICPIN))	S	tatus Level	l:	1		
Batch I	D:	17-5546-6047	Test	Туре:	Reproduction-S	urvival (7d)		А	nalyst: I	Lab Te	ch		
Start D	ate:	26 Aug-19 16:00	Prot	ocol:	EPA/821/R-02-	013 (2002)		D	iluent:	Recons	stituted V	Vater	
Ending	Date:	02 Sep-19 11:30	Spe	cies:	Ceriodaphnia d	ubia		В	rine:				
Test Le	ngth:	6d 20h	Taxe	on:	Branchiopoda			S	ource:	In-Hou	se Cultu	re	Age: <2
Sample	D:	00-3804-3900	Cod	e:	24480FC			Р	roject:	WET T	esting		
Sample	Date:	26 Aug-19 06:08	Mate	erial:	Industrial Efflue	ent		s	ource:	Arceloi	Mittal Bu	ırns Harbor	, LLC
Receip	t Date:	26 Aug-19 12:00	CAS	(PC):				S	tation:	Outfall	011		
Sample	Age:	10h (5 °C)	Clie	nt:	ArcelorMittal Bu	ırns Harbor,	LLC						
Linear	Interpo	lation Options											
X Trans	sform	Y Transform	See	d	Resamples	Exp 95%	CL Me	thod		·			
Log(X+	1)	Linear	1261	1666	200	Yes	Tw	o-Point Int	erpolation				
Test Ac	ceptab	ility Criteria	TAC L	imits									
Attribu	te	Test Stat	Lower	Uppe	r Overlap	Decision							
Control	Resp	27.3	15	>>	Yes	Passes C	riteria						
Point E	stimate	es											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL							
IC5	>100	n/a	n/a	<1	n/a	n/a							
IC10	>100	n/a	n/a	<1	n/a	n/a							
IC15	>100	n/a	n/a	<1	n/a	n/a							
IC20	>100	n/a	n/a	<1	n/a	n/a							
IC25	>100	n/a	n/a	<1	n/a	n/a							
IC40	>100	n/a	n/a	<1	n/a	n/a							
IC50	>100	n/a	n/a	<1	n/a	n/a							
Reproc	luction	Summary				Cal	culated \	/ariate	1			Isotor	nic Variate
Conc-%	6	Code	Count	Mean	Min	Max	Std De	v CV%	%Effe	ct		Mean	%Effec
0		L	10	27.3	20	34	5.334	19.549				29.97	0.0%
6			10	25.7	20	34	5.618	21.869				29.97	0.0%
13			10	29.3	24	37	4.739	16.179				29.97	0.0%
25			10	24.4	0	39	10.77	44.159				29.97	0.0%
50			10	36.7	28	47	7.334	19.989				29.97	0.0%
100			10	36.4	0	46	13.48	37.029	% -33.33	3%		29.97	0.0%
Reproc	luction	Detail											
Conc-%	6	Code	Rep 1	Rep 2		Rep 4	Rep 5	Rep 6			Rep 8	Rep 9	Rep 10
0		L	34	31	33	22	24	23	20		32	31	23
			23	34	34	21	29	30	21		25	20	20
				~=	0.7	24	29	37	24	- 5	29	25	31
			30	37	27	24	29						
13			30 35	24	27	18	25	39	19		26	0	31
6 13 25 50										2			

Report Date: Test Code/ID: 04 Sep-19 10:34 (p 2 of 2) 4F96F16F / 13-3529-2271

Ceriodaphnia 7-d Survival and Reproduction Test

ERM

Analyzed:

Analysis ID: 20-0346-2896 04 Sep-19 10:33 Endpoint: Reproduction

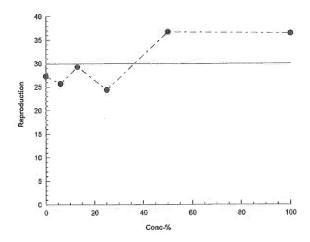
Analysis: Linear Interpolation (ICPIN) **CETIS Version:**

CETISv1.9.4

Status Level:

1

Graphics





FINAL AIR AIR OBCOTTO DE LA FINAL MINOCENTRA

					METERS Y	$OSU(19-1) = \frac{\text{Temp.}}{5} = 0.0 \text{ mg/L} = \frac{pH}{7} \text{ s.u.} = \frac{1}{7} \text{ [7] umhos}$	$\gamma_{\mathcal{S}}^{\mathrm{H}}$ s.u. Cond umbos	s.u. Cond umhos	Cond umhos	Cond	s.u. Cond umhos	Americamysis bahia Hyalella azteca
					ITY PARA BORATOR	PH.	PH 27	PH	Hď	hH.	PH	ss) ariegatus)
		ORM			NTER QUAI SIPT BY LA RM)	D.O. 0,5 mg/L	0.0. 9.0 mg/L	D.O. mg/L	D.O. mg/L	D.O. mg/L	D.O. mg/L	ynchus myki. Yprinodon v
AGEIN	9263 7	TODY F			INITIAL WATER QUALITY PARAMETERS UPON RECEIPT BY LABORATORY (filled in by ERM)	Temp. (° C)	Temp. D.O. S. (* C) O. Mg/L. SOn Ice.	Temp. (b.C). mg/L. c mg/L.	Temp. (°C)	Temp. (°C)		Rainbow Trout (Oncorhynchus mykiss) Sheepshead minnow (Cyprinodon variegatus)
LES MAI	3352 128 th Avenue Holland, Michigan 49424-9263 Phone: 616-399-3500 FAX: 616-399-3777	XICITY LAB CHAIN OF CUSTODY FORM *	,		SAMPLE ID NUMBER UPON RECEIPT BY (Filled in by ERM) (Elled in by ERM)	BU.19-1	6-119C30					Rainbow Sheepshe
OUR	and, Mic 0 FAX:	HAIN				n.s.	O 7/8m	s.u. mg/L	s.u. mg/L	s.u. mg/L	s.u. mg/L	t Species: Ceriodaphnia dubia Daphnia magna
AL KES	venue Holls 16-399-350	YLABC	SAMPLER	PHONE NUMBER:	FIELD PARAMETERS	s =Hq NH ₃ = m	PH= s. NH3= m	pH= s. NH3= m	pH= s NHs= m	PH= n	s =Hd NH3= n	Test Species: Ceriodaphnia du Daphnia magna
ENVIRONMENTAL RESOURCES MANAGEMENT	3352 128 th A Phone: 6	C TOXICIT	Irralor)		NUMBER AND SIZE OF CONTAINERS	1-25 grl	1-355-1					Test Type: Acute Chronic
LINVI		AQUATIC TO	Arc		GRAB OR COMP							ewater
•		AÇ	7		TIME (Begin End)	0618 0618	0600					aterial: Water/Wastewater Sediment
	•		AMBLA		DATE (Begin End)	03/25/19 f-15/19	SOR CORDIN CASTAGA	1				Test Material: Water Sedim
			CLIENT NAME:	ADDRESS:	SAMPLE DESCRIPTION (i.e. Outfall 001)	60 (man 2 120)	O I Osheh					ANALYSES REQUESTED [check

um/soquan

um/so/cm

um/soyum

um/soqum

umhos/cm

um/so/um

ACCEPTED BY: Signature /Organization TIME DATE RELINQUISHED BY: Signature / Organization

TIME

DATE

February 2018

Other (write in comments section)

Chironomus dilutus

Silverside minnow (Menidia beryllina)

Fathead minnow (Pimephales promelas)

Daphnia pulex

Other

Product

item(s)]

41579

ALS COC

COMMENT SECTION: 500

SAMPLE TRANSFERS

See Instructions for Sample Collection on Back of Sheet

082619-2 Cd Page 17 of 23

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Cincinnati, OH +1 513 733 5336

Everett, WA +1 425 356 2600

Holland, MI +1 616 399 6070

Chain of Custody Form

coc ID: 4157 þ Page

6

Houston, TX +1 281 530 5656 Middletown, PA +1 717 944 5541

South Charleston, WV +1 304 356 3168 York, PA +1 717 505 5280

Spring City, PA +1 610 948 4903 Salt Lake City, UT +1 801 266 7700

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082619-2 Cd Page 18 of 23

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ENVIRONMENTAL RESOURCES MANAGEMENT

3352 128th Avenue Holland, Michigan 49424-9263 Phone: 616- 399-3500 FAX: 616-399-3777

AQUATIC TOXICITY LAB CHAIN OF CUSTODY FORM *

		7 4 7	14+)		A ALLEN CALL	CALLALI OA CO	ナングイト	CAMANA			
CLIENT NAME:	MM	BH			SAMPLER						
ADDRESS:	7		,		PHONE NUMBER:						
SAMPLE DESCRIPTION (i.e. Outfall 001)	DATE (Begin End)	TIME (Begin End)	GRAB OR COMP	NUMBER AND SIZE OF CONTAINERS	FIELD PARAMETERS	SAMPLE ID NUMBER (Filled in by ERM)	INITIAL WATER OUPON RECEIPT B. (filled in by ERM)	INITIAL WATER QUALITY PARAME UPON RECEIPT BY LABORATORY (filled in by ERM)	TY PARAME ORATORY	TERS	
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ANALYSES REQUESTED [check item(s)]	Test Material: Water Sedim Produ	sterial: Water/Wastewater Sediment Product	ewafer	Test Type: Acute Chronic	Test Species: Ceriodaphnia dubia Daphnia magna Daphnia pulex Fathead minnow (bia w (Pimeph	Rainbow Trout (Oncorhynchus mykiss) Sheepshead minnow (Cyprinodon variegatus) Silverside minnow (Menidia beryllina) ales promelas)	ynchus mykiss) yprinodon vari ridia beryllina)	(write i	Americamysis bahia Hyalella azteca Chironomus dilutus in comments sectio	s bahia a filutus section)
COMMENT SECTION: See ALS COC 4201	CTION	ore A15	200	12011							
SAMPLE TRANSFERS	RANSFER	ro.							-		

See Instructions for Sample Collection on Back of Sheet

TIME

DATE

ACCEPTED BY: Signature /Organization

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DATE

RELINQUISHED BY: Signature / Organization

February 2018

082619-2 Cd Page 19 of 23

Middlerown, Ps. Salt Lake Gry, UT +1 717 944 5541 +1 801 266 7700	Darrie at the Collect #:	Request to									A B C D E F G H	X 08289-1	X 042514-7							Days (BD) Other Rest		*Cooler ID Cooler Temp QC Package: (Check!	C Level III Std UC H. C Level IV SW846/G
)11 anager:		week 2 A		O	۵	i m i m	. 0	I	-	7	# Bottles	- 20pl)	1. 2gal)							in Business	DE SED	100°S	
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ENVIRONMENTAL RESOURCES MANAGEMENT

3352 128th Avenue Holland, Michigan 49424-9263

Phone: 616-399-3500 FAX: 616-399-3777

AOUATIC TOXICITY LAB CHAIN OF CUSTODY FORM *

		X 4 7	A Y OTT T)		O TO 1 TET TET	4 60 40				
CLIENT NAME:	70/0/20		0 Hi		SAMPLER						
ADDRESS:					PHONE NUMBER:						
SAMPLE DESCRIPTION (i.e. Ouffall 001)	DATE (Begin End)	TIME (Begin End)	GRAB OR COMP	NUMBER AND SIZE OF CONTAINERS	FIELD PARAMETERS	SAMPLE ID INITIAL WATER C NUMBER (Filled in by ERM) (filled in by ERM)	INITIAL W UPON REC (filled in by I	INITIAL WATER QUALITY PARAMETERS UPON RECEIFT BY LABORATORY (filled in by ERM)	IY PARAMEI ORATORY	TERS	
00	813-1/4	0622 0622		152 × 2.540	n's =KN T/8m =SHN	1-60830	Temp. 2 (• C)	D.Og.	PH 2 s.r.	Cond umhos/cm	s/(III)
011	8/29	0604		1 x 2 3 5 2 1	pH= s.u. NHs= mg/L	L 08 3019. L	Temp. 2 (• C): □ On Ice.	D.O.	pH Cond	$\mathcal{N}_{\mathcal{N}}$ uminos/cm	s/cm
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					pH= s.u. NHs= mg/L	7	·Temp. (°C) □ On Ice	D.O. mg/L.	n.s.	Cond umhos/cm	s/cm
ANALYSES REQUESTED	Test Material: Water	terial: Water/Wastewater	ewater	Test Type: Acute	Test Species: Ceriodaphnia dubia		Rainbow Trout (Oncorhynchus mykiss)	tynchus mykiss)		Americamysis bahia	
[check item(s)]	Sec.	Sediment Product		Chronic Other	Daphnia magna Daphnia pulex Fathead minno	w (Pimephu	Sheepshead minnow (Cyprinodon variegatus) Silverside minnow (Menidia beryllina) ales promelas) — Other	Cyprinodon vari enidia beryllina)	egatus)((Other (write ii	egatus) — Hyalella azteca — Chironomus dilutus Other (write in comments section)	(f)
COMMENT SECTION: See ALS COC 42012	SCTION: 5	ce 415	Ch 202	7012							

See Instructions for Sample Collection on Back of Sheet

333

8/34/9

February 2018

TIME

DATE

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RELINQUISHED BY: Signature / Organization

SAMPLE TRANSFERS

Company Name

Send Report To

Phone Fax

e-Mail Address

082619-2 Cd Page 22 of 23

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Page

coc ID: 42012

Houston, TX +1 281 530 5656 Middletown, PA +1 717 944 5541

Salt Lake City, UT +1 801 266 7700

Spring City, PA +1 610 948 4903

South Charleston, WV +1 304 356 3168 York, PA +1 717 505 5280

Hold -492 calos/a ☐ TRRP Checklist ☐ TRRP Level IV 7 Parameter/Method Request for Analysis Results Due Date: OC Package: (Check One Box Below) *Kempsik sample ands on USIS/M of some time ☐ Level III Std QC/Raw Date
☐ Level IV SW846/CLP
☐ Other x ALS Work Order #: ☐ Level II Std QC g 01 80 900 ш ш 043019-Suc. 2-□ 2 BD ۵ □ Other o NE œ Cooler ID Turnaround Time in Business Days (BD) D3 BD ⋖ 4 O 0 ш LL. I 0 ALS Project Manager: # Bottles ERM Weck 2 9-5035 0890 3-4°C Pres. 90 90 Project Information CI 10 BD 7-Other Matrix Checked by (Laboratory); AMBA 6-NaHSO4 0622 Shipment Method Project Name Bill To Company euoyd XEX Invoice Attn City/State/Zip Address e-Mail Address Project Number 5-Na₂S₂O₃ X 8-28-19 8-24-19 Date Time: Time: 4-NaOH * 3-H,SO, 5 Date **Customer Information** Sample Description 2-HNO, AM SH 90 1740 Sampler(s) Please Print & 91 Logged by (Laboratory): Preservative Key:

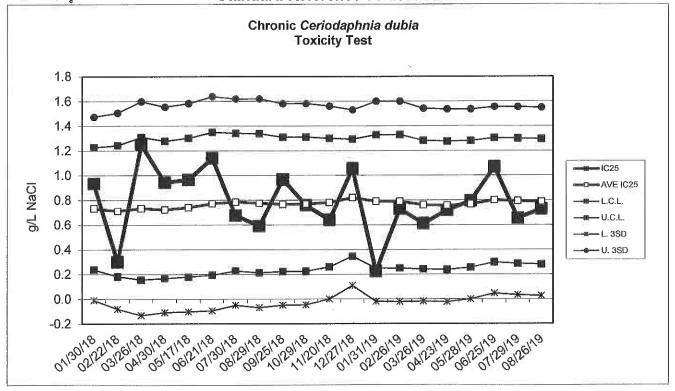
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Standard Reference Toxicant Data



Chronic Ceriodaphnia dubia Toxicity Test Data

Date	IC25	AVE IC25	CONTRO	OL LIMIT	Survival	CONTROL Reproduction	CV
	(g/L NaCl)	(g/L NaCl)	Lower	Upper	(%)	(ave. young)	(%)
01/30/18	0.93	0.7	0.24	1.23	100	25.5	36.3
02/22/18	0.30	0.7	0.18	1.24	100	17.8	35.0
03/26/18	1.25	0.7	0.16	1.31	90	32.5	38.5
04/30/18	0.94	0.7	0.17	1.28	100	32.0	25.5
05/17/18	0.97	0.7	0.18	1.30	100	30.0	38.6
06/21/18	1.14	0.8	0.19	1.35	80	35.2	8.2
07/30/18	0.68	0.8	0.23	1.34	100	25.5	16.3
08/29/18	0.59	0.8	0.21	1.34	100	30.1	26.2
09/25/18	0.97	0.8	0.22	1.31	100	27.6	26.7
10/29/18	0.76	0.8	0.22	1.31	100	32.7	24.8
11/20/18	0.64	0.8	0.26	1.30	100	34.8	15.2
12/27/18	1.06	0.8	0.35	1.29	100	26.8	43.7
01/31/19	0.23	0.8	0.25	1.33	100	34.7	14.9
02/26/19	0.73	0.8	0.25	1.33	100	27.9	9.3
03/26/19	0.61	8.0	0.24	1.28	100	40.2	9.9
04/23/19	0.72	0.8	0.24	1.28	100	36.1	25.4
05/28/19	0.79	8.0	0.26	1.28	100	37.6	3.1
06/25/19	1.07	8.0	0.30	1.30	100	29.4	26.7
07/29/19	0.65	0.8	0.29	1.30	100	33.7	14.6
08/26/19	0.73	8.0	0.28	1.29	100	30.4	23.5

FINAL REPORT

Chronic Toxicity Test Freshwater Vertebrate, Pimephales promelas EPA Test Method 1000.0

> Submitted To: ALS Environmental 3352 128th Avenue Holland, MI 49424

Sample: ArcelorMittal Burns Harbor, LLC - Outfall 011

Testing Period: 26 August – 2 September 2019

Laboratory I.D. Number: 082619-2



Conducted By:
Environmental Resources Management, Inc.
3352 128th Avenue
Holland, Michigan 49424



Test Overview



Permittee: ArcelorMittal Burns Harbor, LLC

Location: 250 West U.S. Hwy 12

Burns Harbor, IN 46304

Contact: Robert Maciel Telephone #: 219.787.2120

NPDES Permit #: IN0000175

Permit Requirements: Acute Toxicity Limit = 1.0 TUa

Chronic Toxicity Limit = 1.0 TUc

Test Sample: Outfall 011

Receiving Water: East Branch, Little Calumet River

Testing Date: 26 August – 2 September 2019

Sample Date(s): 26 August 2019

28 August 2019 30 August 2019

Test/Method: Fathead Minnow, Pimephales

promelas, Survival and Growth

Test EPA 821-R-02-013

Method 1000.0.

QC Objectives: Test data met all test

acceptability criteria, except

where noted below.

Data Qualifiers: See Case Narrative.

DATA SUMMARY

Effluent Concentrations	Survival (%)	Growth Average Wt./
(%)		Organism (mg)
Control	100	0.506
6	95	0.482
13	95	0.471
25	85	0.476
50	85* DQ	0.460
100	90	0.480

^{*} Significantly lower than the control (P=0.05)

TEST RESULTS

96-Hour LC ₅₀	>100%
NOEC (Survival)	100%
LOEC (Survival)	>100%
IC ₂₅	>100%
MSDp (Survival)	26.3%
TUa (100/LC ₅₀)	1.0
TUc (100/ NOEC or IC ₂₅)	1.0

TEST CONCLUSION

In accordance with the NPDES permit requirements for ArcelorMittal Burns Harbor, LLC, this toxicity test did not exceed either the acute or the chronic toxicity limit.

Bruce A. Rabe Director, Aquatic Toxicology Laboratory ERM Project No. 0501867.0152

Bonn G. Robe

Environmental Resources Management 3352 128th Avenue

Holland, Michigan 49424-9263 Phone: 616.399.3500

Fax: 616.399.3777



DQ See Data Qualifiers in Case Narrative

ERM Testing Method

Pimephales promelas – Survival and Growth Toxicity Test

Upon sample receipt, each effluent sample was analyzed for a suite of water quality parameters (Appendix A - Table 1). Where indigenous organisms were present, the sample was filtered through a 60 micron (µm) NITEX® screen. All samples were maintained at 0 – 6 degrees Celsius (°C) until needed for testing.

A series of five effluent concentrations and a control solution were established for testing. All test solutions were prepared by mixing appropriate volumes of dilution water and effluent in the test containers. Dilution water consisted of reconstituted moderately hard water. The control solution consisted of 100 percent dilution water.

Pimephales promelas used to initiate this test were obtained from in-house cultures and were less than 24-hours old at test initiation. Test organisms were maintained in reconstituted moderately hard water prior to test initiation.

The Pimephales promelas test was conducted using 300 to 500-milliliter (mL) disposable polypropylene containers containing 250 mL of control water or test solution. Ten fish were randomly added to each test chamber with four replicate chambers per treatment. Each Pimephales promelas test chamber was fed 0.2 mL of a concentrated suspension of less than 24-hour old live brine shrimp nauplii (Artemia sp.) two times per day. Test solutions were renewed daily during the exposure by replacing approximately 90 percent of the 24-hour old solution with fresh control water or appropriate test solution. Prior to test solution renewal, uneaten and dead brine shrimp, along with other debris, were removed from the bottom of the test chambers.

Percent survival of exposed *Pimephales promelas* was determined daily by enumeration of live organisms. Mortality was defined as no body movement after gentle prodding. At the termination of the chronic test, larvae in each test chamber were counted, dried, and weighed to the nearest 0.01 milligram (mg) on an analytical balance.





The test was conducted at a temperature of $25\pm 1^{\circ}\text{C}$ under fluorescent lighting with a photoperiod of 16 hours light and 8 hours dark. Water quality measurements were performed on all control and test solutions prior to test initiation and on selected treatments daily thereafter, as indicated in the raw data (Appendix A - Table 2).

Following termination of the chronic toxicity test, No Observed Effect Concentration (NOEC) and Lowest Observed Effect Concentration (LOEC) were determined for both *Pimephales promelas* survival and growth and a 25 percent Inhibition Concentration (IC25) was determined for Pimephales promelas growth. The NOEC is defined as the highest effluent concentration which does not produce any observed adverse effect to the exposed test organism whereas the LOEC is defined as the lowest effluent concentration which does produce an observed adverse effect to the exposed test organism. An adverse effect is determined as a statistically significant difference between the control and a given effluent concentration.

Prior to the determination of any significant differences in *Pimephales promelas* survival and growth, the data were evaluated for normal distribution and homogeneity characteristics. Depending on the result and the number of test replicates per concentration, an analysis of variance test was performed, followed by one of the following mean comparison tests: Dunnett's Procedure, Bonferroni t-Test, Steel's Many-One Rank Test, Wilcoxon Rank Sum Test, or the T-Test.

For reporting purposes, a chronic toxic unit (TUc) is calculated and is defined as the most conservative of either 100/NOEC based on the most sensitive test endpoint or 100/IC₂₅.

To evaluate acute toxicity, a 96-hour LC₅₀ and corresponding 95 percent confidence interval were also calculated, where possible. The LC₅₀ value estimate was determined by using one of the following statistical methods: graphical, Spearman-Karber, Trimmed Spearman-Karber, or Probit. The method selected for reporting test results was determined by the characteristics of the data; that is, the presence or absence of 0 and 100 percent mortality and the number of concentrations in which mortalities between 0 and 100 percent occurred. For reporting purposes, the 96-hour LC₅₀ value was converted to an acute toxic unit (TUa) by 100/LC₅₀. All statistical analyses were performed using the CETIS™ Version 1.9.4.3 software program.

The reference toxicant, sodium chloride, was used to monitor the sensitivity of the test organisms. Chronic reference toxicant tests are performed at least monthly and the resulting Inhibition Concentrations (IC25) are plotted to determine if the results are within prescribed limits (Appendix A - Standard Reference Toxicant Data). If the IC25 of a particular reference toxicant test does not fall within the expected range of \pm two standard deviations from the mean for a given test organism, the sensitivity of that organism and the overall credibility of the test system is suspect.

Reference:

USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th Ed. U.S. Environmental Protection Agency, Office of Water, Washington, D.C., EPA-821-R-02-013.

Case Narrative





1.0 TEST PERFORMANCE CRITERIA

The quality control results achieved laboratory specifications.

2.0 MODIFICATIONS TO ERM'S STANDARD TEST METHOD

Test was performed in accordance with ERM's standard test method (see page 3).

3.0 DATA QUALIFIERS

One of the organisms in replicate A of the 13 percent concentration was discovered stuck above the water line of the test chamber and was therefore not included in final totals or statistical analysis. Additionally, *Pimephales promelas* survival was significantly less than the control in the 50 percent effluent concentration, but not in the 100 percent effluent concentration. Therefore, the statistical difference observed in the 50 percent effluent concentration was deemed anomalous, and was not considered for determining an NOEC or LOEC value.

Appendix A Supporting Documents

- Raw Test Data
- Statistical Analysis (if necessary)
- Chain-of-Custody Forms
- Standard Reference Toxicant Data

Pimephales promelas - Chronic Toxicity Test **Initial Water Quality and Test Solution Preparation**

Table 1 Page 1 of 1

Permittee/Client: Effluent/Location: ArcelorMittal Burns Harbor, LLC

Outfall 011

Lab I.D.#:

082619-2

Beginning Date: **Ending Date:**

09-02-19

Time: Time:

Control/Dilution Water:

Organism Batch #:

Organism Age:

QC Review:

QC Review Date:

RMHW

149-15

624 WS KM 09/09/19

Initial Water Quality:

Parameter	Units	845	Effluent		Sy	nthetic Water	
Sample #		1	2	3			-
Lab I.D.#/ Batch #	==	082617-2	CP18/30	0830A-2	99-19	<i>-</i>	-
Temperature	° C	5	5	2	<u> </u>		
Dissolved Oxygen	mg/L	9.9	5.5	6.7			
рН	S.U.	78	7.3	7.2	7.8	6	-
Conductivity	umhos/cm	444	459	464	315		_
Alkalinity	mg / L CaCO ₃	110	106	100	60		How
Hardness	mg / L CaCO ₃	140	160	160	80	-	_
Total Ammonia	mg / L NH ₃	0118	0.09	20,01		-	
Total Residual Chlorine	mg / L Cl ₂	1007	10.01	20.01	20.0	7	
Total mls of 7.0 g/L				S)			
Sodium Thiosulfate added per liter	mL/L		0.4				
Initials		PA	PW	MY	KM	~	_

Test Solution Preparation:

Test Solution Prepared For Both Species.

est colution i reparation		28				1 2 32 3
Treatment	Effluent	Dilution	Test		Effluent	Synthetic
(% Effluent)	(mL)	(mL)	Day	Initials	Sample #	Batch #
Control	0	1200	0	/ th	1	00-10
6%	72	1128	1	KH		99-19
13%	156	1044	2	en	<u>a</u> _	99-19
25%	300	900	3	RWM	2	99-19
50%	600	600	4	ms	3	69-10
100%	1200	0	5	KH	13	99-10
			6	LA	3	99-19
			7	COST		

Pimephales promelas - Chronic Toxicity Test Water Quality Data

Table 2 Page 1 of 1

Permittee/Client:

ArcelorMittal Burns Harbor, LLC

Effluent/Location:

Outfall 011

Lab I.D.#:

082617-2

	Data:					Disso	lved Oxy	_	ng/L)					
Meter#	5	3	3	3	5	5	3 Da	ay द	5	3	3	3	.3	3
Treatment	0	-	1	2)	3		4	-		5	-3/1	6	7
% Effluent)	1	F		F		F	1	F	T	F		F	1	F
Control	7.8	6.8	8.3	7.0	79	62	814	65	8.0	6.6	8.2	66	8,2	7,5
6%	78	6.1	8.3	71	-0	5.8	8,4	6.4		6.3	8.2	611	83	70
13%	11:0	5.8	8.3	7.0	70	6.3	8,3	6.4	7.9	6.4	8.2	63	80	7
	7%	5.6	6.4 8.4	6.8	8,0	4.3	82	6.0		6.3	8.2	60	8.2	40
25%	79				800	6.3	62	6.2	7.9	6.2	8-1	6.1	8,2	70
50%	810	5.6	8.4	6.6	811	6.1	79	5.3	28	6.1	81	7.0	80	2
100%	811	5.5	8.4	Q.Z.	011	1001	117	017	18	4.1	0.1	110	0.0	lv
							pH (S							
Meter#	9	10	16	16	8	8	10	10	9	10	16	10	10	10
Treatment	Ò		1		2		3		1 /		5		6	7
% Effluent)	i	F		F		F	I	F		F	التريي	F		F
Control	7.8	7.4	7.9	7.3	7.8	73	7.4	7.4	7.8	7.3	7.8	7.4	7.8	7,4
6%		7.4		7.4		7.4		7.4		7.3		7,4		71
13%		7.5		7.4		7.5		7,5		7.4		7.4		7
25%		7.5		74		7.60		7.9		7.5		7,4		7
50%		7.5		7.5		2.10		7.6		7.7		7.5		7
100%	7.1	7.6	7.7	7.6	7,00	7 8	7.7	7.6	7.7	7.6	7.7	7.5	15	7.
		, , ,				1								1
				-	- 1								11	
						Cond	uctivity (/ cm)			<u>]</u>		<u> </u>
Motor #			l u	l	<u> </u>		D	umhos ay 	/ cm)		3	J	13	
Meter#	4		4				D:	ay	4		3 5	-	1.3	7
Treatment	0		4 1 1		2		D	ay 	/ cm)		-8	 F		7
Treatment (% Effluent)	0	F	1	F		 F	D: 3	ay F	4		5		6 I	7 F
Treatment (% Effluent) Control	0 1 31 8	F	320	F 	321	F	3 3 1 3/6	ay F	4 1 304	F	5 317	F_	318	7 F
Treatment % Effluent) Control 6%	0 1 318 324	F	320 321	F	321	F	Di 3 3 3 3 1 4 3 1 4 5 7 7	F	4 304 317	F	5 317 325	F	6 318 324	7 F
Treatment (% Effluent) Control 6% 13%	0 1 31 7 33 4 33 1	F	320 327 330	F	321 339 331	F	Di 33333163273337	F	304 317 327	F	5 317 325 331	F	318 324 337	7 F
Treatment % Effluent) Control 6% 13% 25%	0 1 317 334 331 345	F	320 327 330 344	F	321 321 331 343	F	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	F	309 317 327 344	F	5 317 325 331 350	F	318 324 331 351	7 F
Treatment % Effluent) Control 6% 13% 25% 50%	0 317 324 331 345 371	F	320 327 330 344 367	F	321 539 331 343 371	F	3 3 316 327 337 354 340	F	304 317 327 327 344 380	F	5 317 325 331 350 387	F	6 318 331 331 352 393	7 F
Treatment % Effluent) Control 6% 13% 25%	0 1 317 334 331 345	F	320 327 330 344	F	321 321 331 343	F	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	F	309 317 327 344	F	5 317 325 331 350	F	318 324 331 351	7 F
Treatment % Effluent) Control 6% 13% 25% 50%	0 317 324 331 345 371	F	320 327 330 344 367	F	321 539 331 343 371	F	33 316 327 337 354 360 463 emperat	F	309 317 327 327 344 380 457	F	5 317 325 331 350 387	F	6 318 331 331 352 393	
Treatment % Effluent) Control 6% 13% 25% 50% 100%	0 317 324 331 345 371	F	320 327 330 344 367	F	321 539 331 343 371	F	33 316 327 337 354 360 463 emperat	ay , , , , , , , , , , , , , , , , , ,	309 317 327 327 344 380 457	F	5 317 325 331 350 387	F	6 318 331 331 352 393	7 F
Treatment % Effluent) Control 6% 13% 25% 50% 100% Meter #	0 317 324 331 345 371	F	320 327 330 344 367 421	F	321 539 331 343 371	F T	33 1 31 6 327 337 354 340 463 empera	F	304 317 327 327 344 380 457	F	317 325 331 360 367 446	F	318 324 331 331 353	3
Treatment % Effluent) Control 6% 13% 25% 50% 100% Meter # Treatment	318 324 331 345 371 431	F	320 327 330 344 367 421	F	331 331 331 343 377 452	F T	3337 337 337 354 340 463 empera	F	309 317 327 344 380 457	F	5 317 325 331 350 367 440 3	F	318 324 337 337 352 393 467	7
Treatment % Effluent) Control 6% 13% 25% 50% 100% Meter # Treatment % Effluent)	318 324 331 345 371 431	F	320 327 330 344 367 421	F	331 331 331 343 377 452	F T	33 316 327 337 354 360 463 empera	F	309 317 327 344 380 457	F	5 317 325 331 360 367 440	F	318 324 337 337 352 36 6	3 7
Treatment % Effluent) Control 6% 13% 25% 50% 100% Meter # Treatment (% Effluent) Control	318 324 331 345 371 431	F	320 327 330 344 367 421	F	331 331 331 343 377 452	F	33 316 327 337 354 380 463 emperar D	F	303 317 327 344 380 457	F	5 317 325 331 350 367 440 3	F	318 324 337 337 337 467	3 7
Treatment % Effluent) Control 6% 13% 25% 50% 100% Meter # Treatment (% Effluent) Control 6%	318 331 331 331 345 371 431	3 F 25 25	320 327 330 344 367 421	3 F 24 Z4	331 331 331 343 377 452	F T	33 31 327 337 354 360 463 D	F	309 317 327 327 380 45) 5	F	5 317 325 331 360 387 448 3 5	F	318 324 337 337 337 467	3
Treatment % Effluent) Control 6% 13% 25% 50% 100% Meter # Treatment (% Effluent) Control 6% 13%	318 324 331 345 371 431	F	320 327 330 344 367 421 3	F	331 331 331 343 377 452	F	33 316 327 337 354 340 463 D	F	309 317 327 327 380 45)	F	5 317 325 331 360 387 448 5 1 24 24	3 F	318 324 337 337 352 36 6	3 3 1 2
Treatment % Effluent) Control 6% 13% 25% 50% 100% Meter # Treatment (% Effluent) Control 6% 13% 25%	0 1 318 304 331 345 371 431	3 F 25 25 25 25	320 327 330 344 367 421 3 1 24 24 24 24 24	3 F 24 24 24 24	331 331 331 343 377 452	F	Di 3 3 1 31 4 32 1 24 24 24 24 24	F	309 317 327 327 380 45) 5	F	5 317 325 331 360 367 440 5 1 24 24 24 24	F	318 324 331 331 352 461 36	3 3 1 2
Treatment % Effluent) Control 6% 13% 25% 50% 100% Meter # Treatment (% Effluent) Control 6% 13%	318 324 331 345 371 431	F	320 327 330 344 367 421 3	F	331 331 331 343 377 452	F	33 316 327 337 354 340 463 D	F	304 317 327 327 380 45) 129 24 24	F	5 317 325 331 360 387 448 5 	3 F	318 324 331 351 351 36 6 - 4 24 24	3 3 1 2

Note: D.O. meter also used for temperature measurement unless otherwise noted.

Pimephales promelas - Chronic Toxicity Test **Survival Data**

Table 3 Page 1 of 2

Permittee/Client:

ArcelorMittal Burns Harbor, LLC

Effluent/Location: Outfall 011

Lab I.D.#:

082619-2

Survival Data:

				# Li	ve O	gani	sms						# Li	ve Or	gani	sms			96 Hou	r Surviva	ai Summary
Treatment					Da	ay								Da	ау				Total	Live	%
(% Effluent)	Rep.	0	1	2	3	4	5	6	7	Rep.	0	1	2	3	4	5	6	7	Initial	Final	Surviva
Control	Α	10	0	10	10	10	10	iO	10	В	10	10	10	10	10	10	0	N	40	40	100
6%	Α	10	10	10	10	10	10	10	10	В	10	10	10	15	10	10	10	10	40	39	47.5
13%	Α	10	10	io	9/9	919	1/9	8/9	8/5	В	10	10	10	10	10	10	10	9	340	39/34	
25%	Α	10	10	10_	10	7	7	6	6	В	10	10	10	20	9	9	9	9	40	35	47.5
50%	Α	10	10	10	20	9	7	9	9	В	10	10	in	9	3	8	8	8	40	34	85
100%	Α	10	10	ID	10	4	8	8	8	В	10	10	ID	10	10	10	01	10	40	37	92,5
				# Li	ve O	rgani	sms					-	# Li	ve Or	gani	sms			7 Day	Surviva	l Summar
Treatment						-															
Healifiell					D.	ay								Da	ay				Tota	Live	%
(% Effluent)	Rep.	0	1	2	3	ay 4	5	6	7	Rep.	0	1	2	D:	ay 4	5	6	7	Tota Initial		
	Rep.	0	1	2		<u> </u>	5	6	7	Rep.	0	1	2	_	r -	5 10	6	7			Surviva 100
(% Effluent)			1 10		3	4			-		_	1 10		3	r -	_		0	Initial 40 40	Final 40 38	Surviva 100 95
(% Effluent) Control	С	10	_	10	3	4	10	10	10	D	10		10	3	r -	10	10	0	Initial 40 40	Final 40	Surviva 100 95
(% Effluent) Control 6%	C	10 10	10	10 10 10	3 /0 /0 /0 /0	10 10	10	10 10	10	D D	10 10	10	0	3	r -	10	10	0	Initial 40 40	Final 40 38	Surviva 100 95
(% Effluent) Control 6% 13%	C C	10 10 10	10	10 10 10	3 /0 /0 /0	10 10 10	10	10 10 10 9	10	D D D	10 10 10	10	0	3 10 4 1)	4 10 9 10	10	10 W 10 10 0	103	Initial 40 40 40	Final 40 38	Surviva 100 95
(% Effluent) Control 6% 13% 25%	C C C	10 10 10	10 10	10 10 10	3 /0 /0 /0 /0	10 10	10 10 10	10 10 10	10	D D D	10 10 10 10	10 10	10	3 10 4 1)	4 10 9 10 10	10 8 01	10 4 10	103	Initial 40 40 940 40	Final 40 38 37/34 34	Surviva 100 95 95

Test Information:

				7-0-1				
- X 8=	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Time:	1530	1530	1430	1400	1600	1330	1230	1530
Initials:	pm	kM	KM	20)	SPR	KM	RI	I KIN
Date:	08/26/19	08/27/19	08/28/19	08/29/19	08/30/19	08/31/19	9-1-19	9-2-17

Feeding:

2 2 2 3 3 3	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Batch #:	237-19	25-19	239-19	240-19	241-19	242-19	243-19	
nitials AM:		CH	RW	SPR	RH	KM	KM	-
nitials PM:	PM	SPR	an	fr	VA .	KM	KM	

Oven:

Oven.			
Date In	Time In	Initials	Date Out Time Out Initia
9-2-17	1530	100	09-03-19 1530 184

Comment Section:

					Comments					Initials	Date	Day
١,٠	"neited"	not	 1:00	weter	above	stack	Fish	Eps A	13%			
1			 						72		1	

Pimephales promelas - Chronic Toxicity Test Growth Data

Permittee/Client: Effluent/Location:

ArcelorMittal Burns Harbor, LLC

Eπiuent/Loc

Outfall 011 082619-2

Pan	Conc.	Replicate	Final Weight	Initial Weight	Larvae Weight	# of Initial	Avg. Wt./ Organism/ Replicate	Avg. Wt./ Organism/ Treatment	Avg. Wt./ Organism. Treatment
#	(% Effluent)		(mg)	(mg)	(mg)	Organisms	(mg)	(mg)	% CV
Date			9/4/2019	9/1/2019					
Analyst			rh	km					
1	Control	Α	26.31	21.11	5.20	10	0.520	7)	
2	Control	В	24.49	19.94	4.55	10	0.455		
3	Control	С	26.80	21.58	5.22	10	0.522		
4	Control	D	27.36	22.11	5.25	10	0.525	0.506	6.7
5	6%	Α	27.39	22.44	4.95	10	0.495		
6	6%	В	28.55	23.19	5.36	10	0.536		
7	6%	С	24.96	20.33	4.63	10	0.463		
8	6%	D	22.08	17.75	4.33	10	0.433	0.482	9.2
9	13%	Α	19.41	15.81	3.60	9	0.400		
10	13%	В	25.55	18.69	6.86	10	0.686		
11	13%	С	25.45	20.92	4.53	10	0.453		
12	13%	D	26.55	23.10	3.45	10	0.345	0.471	31.8
13	25%	Α	22.41	18.47	3.94	10	0.394		
14	25%	В	22.26	18.18	4.08	10	0.408		
15	25%	С	24.20	18.64	5.56	10	0.556		
16	25%	D	26.01	20.57	5.44	10	0.544	0.476	18.2
17	50%	Α	22.30	17.03	5.27	10	0.527		
18	50%	В	20.62	16.03	4.59	10	0.459	Y	
19	50%	С	24.21	20.05	4.16	10	0.416		
20	50%	D	25.72	21.35	4.37	10	0.437	0.460	10.5
21	100%	A	22.68	17.71	4.97	10	0.497		
22	100%	В	25.97	20.79	5.18	10	0.518		
23	100%	C	32.21	27.53	4.68	10	0.468		
24	100%	D	27.88	23.52	4.36	10	0.436	0.480	7.4

Quality A	ssurance				Final Wt. (mg
25	Blank	A	12.17	12.18	-0.01
26	Blank	В	10.77	10.77	0.00

^{*} Biomass data were transferred directly to the spreadsheet using the data transfer function of the analytical balance.

Report Date: Test Code/ID: 04 Sep-19 15:11 (p 1 of 2) 1AD8AA09 / 04-5040-6921

ramead Minn	ow 7-d Larval S	ourvival an	u Growth	1621							ERN
Analysis ID: Analyzed:	12-1626-0092 04 Sep-19 15:0			d Survival Rat arametric-Cor		tments		IS Version us Level:	: CETISv1	.9.4	
Batch ID:	02-9297-1643	Tes	st Type: G	Frowth-Surviva	l (7d)		Anal	yst: Lat	Tech		
Start Date:	26 Aug-19 15:3			PA/821/R-02-			Dilue	ent: Re	constituted V	later	
Ending Date:	02 Sep-19 15:3		ecies: P	imephales pro	melas		Brin	e:			
Test Length:				ctinopterygii			Sour	rce: In-	House Cultur	е	Age: <2
Sample ID:	18-4353-6291	Co	de : 6	DE221A3			Proje	ect: WE	ET Testing		
Sample Date:	26 Aug-19 06:0	8 Ma	terial: Ir	idustrial Efflue	ent		Sour	rce: Arc	celor/Vittal Bu	rns Harbor,	LLC
Receipt Date:	26 Aug-19 12:0	0 CA	S (PC):				Stati	ion: Ou	tfall 011		
Sample Age:	9h (5 °C)	Clic	ent: A	rcelorMittal Bu	ırns Harbor,	LLC					
Data Transfo		Alt Hyp					NOEL	LOEL	TOEL	TU	PMSD
Angular (Corre	ected)	C > T					100	>100	n/a	1	14.02%
Dunnett Multi	iple Comparisor	n Test									
Control	vs Conc-%		Test Sta			P-Type	P-Value	Decision	1		
Lab Water	6		0.8155	2.407	0.225 6	CDF	0.5051	_	nificant Effect		
	13		0.9202	2.407	0.225 6	CDF	0.4575	-	nificant Effect		
	25		2,279	2.407	0.225 6	CDF	0.0636	_	nificant Effect		
	50*		2.503	2.407	0.225 6	CDF	0.0416	Significa			
	100		1.687	2.407	0.225 6	CDF	0.1731	Non-Sigr	nificant Effect		
Test Acceptal	bility Criteria	TAC	Limits								
Attribute	Test Stat	Lower	Upper	Overlap	Decision						
Control Resp	1	0.8	>>	Yes	Passes C	riteria					
ANOVA Table											
Source	Sum Squ	iares	Mean S	quare	DF	F Stat	P-Value	Decision	<u> </u>		
Between	0.160598		0.03211	97	5	1.838	0.1560	Non-Sign	nificant Effect		
Error	0.314484		0.01747	13	18	_					
Total	0.475082				23						
Distributiona	Tests										
Attribute	Test				Test Stat		P-Value	Decision			
Variances		quality of V			2.157	4.248	0.1049	Equal Va			
Variances		ene Equality		e Test	0.7053	4.248	0.6269	Equal Va			
Distribution	Shapiro-V	Vilk W Norr	nality Test		0.929	0.884	0.0926	Normal (Distribution		
7d Survival R	late Summary										
Conc-%	Code	Count	Mean	95% LCL			Min	Max	Std Err	CV%	%Effect
0	L	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6		4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	5.00%
13		4	0.9472	0.8500	1.0000	0.9500	0.8889	1.0000	0.0306	6.45%	5.28%
25		4	0.8500	0.5744	1.0000	0.9000	0.6000	1.0000	0.0866	20.38%	15.00%
50		4	0.8500	0.7581	0.9419	0.8500	0.8000	0.9000	0.0289	6.79%	15.00%
100		4	0.9000	0.7701	1.0000	0.9000	0.8000	1.0000	0.0408	9.07%	10.00%
Angular (Con	rected) Transfor								AT		0.15
Conc-%	Code	Count	Mean	95% LCL			Min	Max	Std Err	CV%	%Effect
0	L	4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	0.00%
6		4	1.336	1.093	1.578	1.412	1.107	1.412	0.07622	11.41%	5.40%
13		4	1.326	1.168	1.484	1.331	1.231	1.412	0.04979	7.51%	6.09%
25		4	1.199	0.8453	1.553	1.249	0.8861	1.412	0.1112	18.54%	15.08%
50		4	1.178	1.048	1.308	1.178	1.107	1.249	0.04096	6.95%	16.57%
100		4	1.254	1.056	1.453	1.249	1.107	1.412	0.06231	9.93%	11.17%

Report Date: Test Code/ID: 04 Sep-19 15:11 (p 2 of 2) 1AD8AA09 / 04-5040-6921

Eathand	Minnow 7	d Lamai	Consistal	and C	Proudh	Toct
Fathead	Minnow 7	-d Larval	Survival	and (irowth	lest

ERM

Analysis ID:	12-1626-0092
Analyzed:	04 Sep-19 15:09

Endpoint: 7d Survival Rate Analysis:

Parametric-Control vs Treatments

CETIS Version: Status Level:

CETISv1.9.4

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	L	1.0000	1.0000	1.0000	1.0000	
6		1.0000	1.0000	1.0000	0.8000	
13		0.8889	0.9000	1.0000	1.0000	
25		0.6000	0.9000	0.9000	1.0000	
50		0.9000	0.8000	0.8000	0.9000	
100		0.8000	1.0000	0.9000	0.9000	

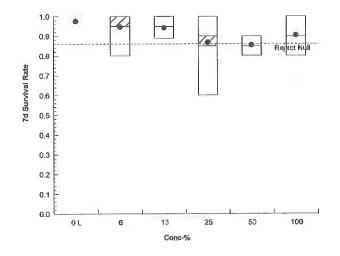
Angular (Corrected) Transformed Detail

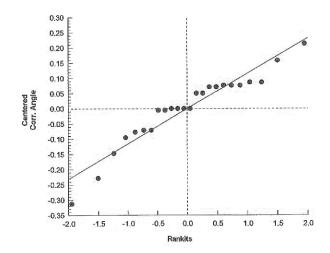
Code	Rep 1	Rep 2	Rep 3	Rep 4				
L	1.412	1.412	1.412	1.412				
	1.412	1.412	1.412	1.107				
	1.231	1.249	1.412	1.412				
	0.8861	1.249	1.249	1.412				
	1.249	1.107	1.107	1.249				
	1.107	1.412	1.249	1.249				
•		L 1.412 1.412 1.231 0.8861 1.249	L 1.412 1.412 1.412 1.412 1.231 1.249 0.8861 1.249 1.249 1.107	L 1.412 1.412 1.412 1.412 1.412 1.412 1.231 1.249 1.412 0.8861 1.249 1.249 1.249 1.107 1.107	L 1.412 1.412 1.412 1.412 1.412 1.412 1.412 1.107 1.231 1.249 1.412 1.412 0.8861 1.249 1.249 1.412 1.249 1.107 1.107 1.249	L 1.412 1.412 1.412 1.412 1.412 1.412 1.412 1.107 1.231 1.249 1.412 1.412 0.8861 1.249 1.249 1.412 1.249 1.107 1.107 1.249	L 1.412 1.412 1.412 1.412 1.412 1.412 1.107 1.231 1.249 1.412 1.412 0.8861 1.249 1.249 1.412 1.249 1.107 1.107 1.249	L 1.412 1.412 1.412 1.412 1.412 1.412 1.107 1.231 1.249 1.412 1.412 0.8861 1.249 1.249 1.412 1.249 1.107 1.107 1.249

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	
0	L	10/10	10/10	10/10	10/10	
6		10/10	10/10	10/10	8/10	
13		8/9	9/10	10/10	10/10	
25		6/10	9/10	9/10	10/10	
50		9/10	8/10	8/10	9/10	
100		8/10	10/10	9/10	9/10	

Graphics





Report Date: Test Code/ID: 04 Sep-19 15:11 (p 1 of 2) 1AD8AA09 / 04-5040-6921

Fathead Minn	ow 7-d La	ırval Su	ırvival ar	nd Growth Te	est							ERN
Analysis ID: Analyzed:	03-4273-7 04 Sep-19			•	an Dry Biom rametric-Con	-	ments		S Versio ıs Level:		9.4	
Batch ID:	02-9297-	1643	Te	st Type: Gr	owth-Surviva	l (7d)		Anal	yst: La	ab Tech		
Start Date:	26 Aug-19	9 15:30			A/821/R-02-0			Dilue	nt: R	econstituted W	ater	
Ending Date:	-		Sp	ecies: Pir	nephales pro	melas		Brine) :			
Test Length:			-		tinopterygii			Sour	ce: In	-House Culture	e	Age: <2
Sample ID:	18-4353-6	3291	Co	ode: 6D	E221A3			Proje	ect: V	/ET Testing		
Sample Date:	26 Aug-19	9 06:08	Ma	aterial: inc	lustrial Efflue	nt		Sour	ce: A	rcelorMittal Bu	rns Harbor,	LLC
Receipt Date:	26 Aug-19	9 12:00	CA	AS (PC):				Stati	on: O	utfall 011		
Sample Age:	9h (5 °C)		CI	ient: Ar	celorMittal Bu	ırns Harbor,	LLC					
Data Transfor	m		Alt Hyp					NOEL	LOEL	TOEL	TU	PMSD
Untransformed	d		C > T					100	>100	n/a	1	26.31%
Dunnett Multi	ple Comp	arison	Test	,								
Control	vs Co	nc-%		Test Stat	Critical	MSD DF	P-Type	P-Value	Decisio	on(α:5%)		
Lab Water	6			0.4299	2.407	0.133 6	CDF	0.6775	Non-Sig	gnificant Effect		
	13			0.6245	2.407	0.133 6	CDF	0.5923		gnificant Effect		
	25			0.5431	2.407	0.133 6	CDF	0.6287	Non-Sig	gnificant Effect		
	50			0.8282	2.407	0.133 6	CDF	0.4993		gnificant Effect		
	10	0		0.4661	2.407	0.133 6	CDF	0.6622	Non-Sig	gnificant Effect		
Test Acceptal	bility Crite	ria	TAC	Limits								
Attribute	Tes	t Stat		Upper	Overlap	Decision						
Control Resp	0.50	055	0.25	>>	Yes	Passes Ci	iteria					
ANOVA Table		Marrier 1										
		n Squa	res	Mean Sq	uare	DF	F Stat	P-Value	Decisio	on(α:5%)	-	
	Sur	n Squa 046284	res	Mean Sq 0.000925		DF 5	F Stat 0.1517	P-Value 0.9769		on(α:5%) gnificant Effect		
Source Between	Sur 0.00		res		7							
Source Between	9.00 0.10	046284	res	0.000925	7	5						
Source Between Error Total	0.00 0.10 0.11	046284 09864	res	0.000925	7	5 18						
Source Between Error Total	0.00 0.10 0.11	046284 09864 14493	ires	0.000925	7	5 18	0.1517		Non-Si			
Source Between Error Total Distributional	0.00 0.10 0.11 1 Tests	046284 09864 14493		0.000925	7 6	5 18 23	0.1517	0.9769	Non-Sig	gnificant Effect		
Source Between Error Total Distributional Attribute	0.00 0.10 0.11 1 Tests Tes	046284 09864 14493 st	uality of \	0.000925 0.006103	7 6	5 18 23 Test Stat	0.1517 	0.9769 P-Value	Non-Sig Decision	gnificant Effect on(α:1%)		
Source Between Error Total Distributional Attribute Variances	Sur 0.00 0.11 0.1 I Tests Tes Bar Sha	046284 09864 14493 st tlett Equapiro-W	uality of \ ilk W Nor	0.000925 0.006103 /ariance Test	7 6	5 18 23 Test Stat 10.24	0.1517 	0.9769 P-Value 0.0688	Non-Sig Decision	gnificant Effect on(α:1%) /ariances		
Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio	Sur 0.00 0.11 0.1 I Tests Tes Bar Sha	046284 09864 14493 st tlett Equapiro-Wi	uality of \ ilk W Nor	0.000925 0.006103 /ariance Test	7 6	5 18 23 Test Stat 10.24 0.9303	0.1517 Critical 15.09 0.884	0.9769 P-Value 0.0688	Non-Sig Decision	gnificant Effect on(α:1%) /ariances	CV%	
Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio Conc-%	Sur 0.00 0.11 0.1 I Tests Tes Bar Sha	046284 09864 14493 st tlett Equapiro-Wi	uality of \ ilk W Nor ary	0.000925 0.006103 /ariance Test mality Test	7 66	5 18 23 Test Stat 10.24 0.9303	0.1517 Critical 15.09 0.884	0.9769 P-Value 0.0688 0.0991	Decision Equal \	on(α:1%) /ariances Distribution Std Err 0.01686	CV% 6.67%	0.00%
Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio Conc-% 0	Sur 0.00 0.11 0.11 I Tests Tes Bar Sha omass-mg Cor	046284 09864 14493 st tlett Equapiro-Wi	uality of \ ilk W Nor ary Count	0.000925 0.006103 /ariance Test mality Test Mean	95% LCL	5 18 23 Test Stat 10.24 0.9303 95% UCL	0.1517 Critical 15.09 0.884	0.9769 P-Value 0.0688 0.0991 Min 0.455 0.433	Decision Equal Normal Max 0.525 0.536	on(α:1%) /ariances Distribution Std Err 0.01686 0.02207	CV% 6.67% 9.16%	0.00% 4.70%
Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio Conc-% 0 6 13	Sur 0.00 0.11 0.11 I Tests Tes Bar Sha omass-mg Cor	046284 09864 14493 st tlett Equapiro-Wi	uality of \ ilk W Nor ary Count 4	0.000925 0.006103 /ariance Test mality Test Mean 0.5055 0.4817 0.471	95% LCL 0.4518 0.4115 0.2324	5 18 23 Test Stat 10.24 0.9303 95% UCL 0.5592 0.552 0.7096	0.1517 Critical 15.09 0.884 Median 0.521 0.479 0.4265	0.9769 P-Value 0.0688 0.0991 Min 0.455 0.433 0.345	Decision Equal Normal Max 0.525 0.536 0.686	on(α:1%) /ariances Distribution Std Err 0.01686 0.02207 0.07498	CV% 6.67% 9.16% 31.84%	0.00% 4.70% 6.82%
Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio Conc-% 0 6 13 25	Sur 0.00 0.11 0.11 I Tests Tes Bar Sha omass-mg Cor	046284 09864 14493 st tlett Equapiro-Wi	uality of \ ilk W Nor ary Count 4 4 4 4	0.000925 0.006103 /ariance Test mality Test Mean 0.5055 0.4817 0.471 0.4755	95% LCL 0.4518 0.4115 0.2324 0.3381	5 18 23 Test Stat 10.24 0.9303 95% UCL 0.5592 0.552 0.7096 0.6129	0.1517 Critical 15.09 0.884 Median 0.521 0.479 0.4265 0.476	0.9769 P-Value 0.0688 0.0991 Min 0.455 0.433 0.345 0.394	Decision Equal Normal Max 0.525 0.536 0.686 0.556	on(α:1%) /ariances Distribution Std Err 0.01686 0.02207 0.07498 0.04318	CV% 6.67% 9.16% 31.84% 18.16%	0.00% 4.70% 6.82% 5.93%
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Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio Conc-% 0 6 13 25 50	Sur 0.00 0.11 0.11 I Tests Tes Bar Sha omass-mg Cor	046284 09864 14493 st tlett Equapiro-Wi	uality of \ ilk W Nor ary Count 4 4 4 4	0.000925 0.006103 /ariance Test mality Test Mean 0.5055 0.4817 0.471 0.4755	95% LCL 0.4518 0.4115 0.2324 0.3381	5 18 23 Test Stat 10.24 0.9303 95% UCL 0.5592 0.552 0.7096 0.6129	0.1517 Critical 15.09 0.884 Median 0.521 0.479 0.4265 0.476	0.9769 P-Value 0.0688 0.0991 Min 0.455 0.433 0.345 0.394	Decision Equal Normal Max 0.525 0.536 0.686 0.556	on(α:1%) /ariances Distribution Std Err 0.01686 0.02207 0.07498 0.04318	CV% 6.67% 9.16% 31.84% 18.16%	0.00% 4.70% 6.82% 5.93%
Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio Conc-% 0 6 13 25 50 100	Sur 0.00 0.11 0.11 I Tests Tes Bar Sha omass-mg Coo	046284 09864 14493 et tlett Equapiro-Wi	uality of Nilk W Nor ary Count 4 4 4 4	0.000925 0.006103 /ariance Test mality Test Mean 0.5055 0.4817 0.471 0.4755 0.4597	95% LCL 0.4518 0.4115 0.2324 0.3381 0.3831	5 18 23 Test Stat 10.24 0.9303 95% UCL 0.5592 0.552 0.7096 0.6129 0.5364	0.1517 Critical 15.09 0.884 Median 0.521 0.479 0.4265 0.476 0.448	0.9769 P-Value 0.0688 0.0991 Min 0.455 0.433 0.345 0.394 0.416	Decision Equal Normal Max 0.525 0.536 0.686 0.556 0.527	on(α:1%) /ariances Distribution Std Err 0.01686 0.02207 0.07498 0.04318 0.02407	CV% 6.67% 9.16% 31.84% 18.16% 10.47%	0.00% 4.70% 6.82% 5.93% 9.05%
Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio Conc-% 0 6 13 25 50 100 Mean Dry Bio	Sur 0.00 0.11 0.11 I Tests Tes Bar Sha omass-mg Coo	046284 09864 14493 st tlett Equapiro-Wi Summade	uality of Nilk W Nor ary Count 4 4 4 4	0.000925 0.006103 /ariance Test mality Test Mean 0.5055 0.4817 0.471 0.4755 0.4597	95% LCL 0.4518 0.4115 0.2324 0.3381 0.3831	5 18 23 Test Stat 10.24 0.9303 95% UCL 0.5592 0.552 0.7096 0.6129 0.5364	0.1517 Critical 15.09 0.884 Median 0.521 0.479 0.4265 0.476 0.448	0.9769 P-Value 0.0688 0.0991 Min 0.455 0.433 0.345 0.394 0.416	Decision Equal Normal Max 0.525 0.536 0.686 0.556 0.527	on(α:1%) /ariances Distribution Std Err 0.01686 0.02207 0.07498 0.04318 0.02407	CV% 6.67% 9.16% 31.84% 18.16% 10.47%	0.00% 4.70% 6.82% 5.93% 9.05%
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Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio Conc-% 0 6 13 25 50 100 Mean Dry Bio Conc-% 0 0 Conc-% 0 0 Conc-% 0 0 0	Sur 0.00 0.11 0.11 I Tests Tes Bar Sha omass-mg Cor L	046284 09864 14493 st tlett Equapiro-Wi Summade	uality of \ ilk W Nor ary Count 4 4 4 4 4 7 Rep 1	0.000925 0.006103 /ariance Test Mean 0.5055 0.4817 0.471 0.4755 0.4597 0.4797	95% LCL 0.4518 0.4115 0.2324 0.3381 0.423 Rep 3 0.522	5 18 23 Test Stat 10.24 0.9303 95% UCL 0.5592 0.552 0.7096 0.6129 0.5364 0.5365 Rep 4 0.525	0.1517 Critical 15.09 0.884 Median 0.521 0.479 0.4265 0.476 0.448	0.9769 P-Value 0.0688 0.0991 Min 0.455 0.433 0.345 0.394 0.416	Decision Equal Normal Max 0.525 0.536 0.686 0.556 0.527	on(α:1%) /ariances Distribution Std Err 0.01686 0.02207 0.07498 0.04318 0.02407	CV% 6.67% 9.16% 31.84% 18.16% 10.47%	0.00% 4.70% 6.82% 5.93% 9.05%
Source Between Error Total Distributional Attribute Variances Distribution Mean Dry Bio Conc-% 0 6 13 25 50 100 Mean Dry Bio Conc-% 0 0 6 6 13 6 6	Sur 0.00 0.11 0.11 I Tests Tes Bar Sha omass-mg Cor L	046284 09864 14493 st tlett Equapiro-Wi Summade	uality of \ ilk W Nor ary Count 4 4 4 4 4 7 Rep 1 0.52 0.495	0.000925 0.006103 /ariance Test mality Test Mean 0.5055 0.4817 0.471 0.4755 0.4597 0.4797 Rep 2 0.455 0.536	95% LCL 0.4518 0.4115 0.2324 0.3381 0.423 Rep 3 0.522 0.463	5 18 23 Test Stat 10.24 0.9303 95% UCL 0.5592 0.552 0.7096 0.6129 0.5364 0.5365 Rep 4 0.525 0.433	0.1517 Critical 15.09 0.884 Median 0.521 0.479 0.4265 0.476 0.448	0.9769 P-Value 0.0688 0.0991 Min 0.455 0.433 0.345 0.394 0.416	Decision Equal Normal Max 0.525 0.536 0.686 0.556 0.527	on(α:1%) /ariances Distribution Std Err 0.01686 0.02207 0.07498 0.04318 0.02407	CV% 6.67% 9.16% 31.84% 18.16% 10.47%	0.00% 4.70% 6.82% 5.93% 9.05%
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Report Date: Test Code/ID: 04 Sep-19 15:11 (p 2 of 2) 1AD8AA09 / 04-5040-6921

Fathead Minnow 7-d Larval Survival and Growth Test

ERM

Analyzed:

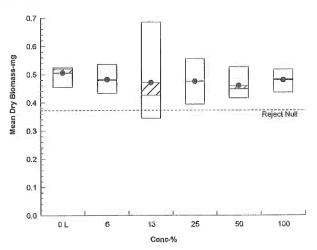
Analysis ID: 03-4273-7431 04 Sep-19 15:09 Endpoint: Mean Dry Biomass-mg Analysis:

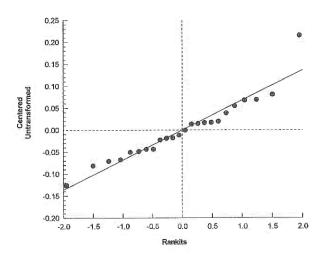
Parametric-Control vs Treatments

CETIS Version: Status Level:

CETISv1.9.4

Graphics





Report Date: Test Code/ID: 04 Sep-19 15:11 (p 1 of 2) 1AD8AA09 / 04-5040-6921

Fathea	d Minn	ow 7-d Larval Su	ırvival and	Growt	h Test								ERM
Analysi Analyze		08-5635-0722 04 Sep-19 15:09		point: lysis:	Mean Dry Biom Linear Interpola)		CETIS V Status L		CETISv 1	1.9.4	
Batch I	D:	02-9297-1643	Tes	Type:	Growth-Surviva	ıl (7d)			Analyst:	Lab	Tech		
Start D	ate:	26 Aug-19 15:30	Pro	tocol:	EPA/821/R-02-	013 (2002)			Diluent:	Reco	onstituted	Water	
Ending	Date:	02 Sep-19 15:30	Spe	cies:	Pimephales pro	omelas			Brine:				
Test Le	ngth:	7d 0h	Tax	on:	Actinopterygii				Source:	In-Ho	ouse Cultu	ure	Age: <24
Sample	ID:	18-4353-6291	Cod	e:	6DE221A3				Project:	WET	Testing		
Sample	Date:	26 Aug-19 06:08	Mat	erial:	Industrial Efflue	ent			Source:	Arce	lorMittal B	Burns Harbor,	LLC
Receip	t Date:	26 Aug-19 12:00	CAS	(PC):					Station:	Outfa	all 011		
Sample	Age:	9h (5 °C)	Clie	nt:	ArcelorMittal Br	urns Harbor,	LLC						
Linear	Interpo	lation Options											
X Trans	form	Y Transform	See	d	Resamples	Exp 95%	CL N	lethod					
Log(X+	1)	Linear	188	7872	200	Yes	T	wo-Point	Interpolat	ion			
Test Ad	ceptab	oility Criteria	TAC L	imits									
Attribu	te	Test Stat		Uppe	r Overlap	Decision							
Control		0.5055	0.25	>>	Yes	Passes C	riteria	-					
Point E	stimat	es											
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL							
IC5	6.927		n/a	14.44	n/a	n/a							
IC10	>100	n/a	n/a	<1	n/a	n/a							
IC15	>100	n/a	n/a	<1	n/a	n/a							
IC20	>100	n/a	n/a	<1	n/a	n/a							
IC25	>100	n/a	n/a	<1	n/a	n/a							
IC40	>100	n/a	n/a	<1	n/a	n/a							
IC50	>100	n/a	n/a	<1	n/a	n/a							
Mean [ry Bio	mass-mg Summ	ary			Cal	lculated	Variate				Isoton	ic Variate
Conc-%	6	Code	Count	Mean	Min	Max	Std D	ev CV	r% %	Effect		Mean	%Effect
0		L	4	0.505	5 0.455	0.525	0.0337	73 6.6	7% 0	.0%		0.5055	0.0%
6			4	0.481	7 0.433	0.536	0.0441	5 9.1	6% 4	.7%		0.4817	4.7%
13			4	0.471	0.345	0.686	0.15			.83%		0.4732	6.38%
25			4	0.475	0.394	0.556	0.0863			.94%		0.4732	6.38%
50			4	0.459		0.527	0.0481			.05%		0.4697	7.07%
100			4	0.479	0.436	0.518	0.0356	35 7.4	3% 5	.09%		0.4697	7.07%
Mean I	ry Bio	mass-mg Detail											
Conc-9	6	Code	Rep 1	Rep		Rep 4							
0		L	0.52	0.455		0.525							
6			0.495	0.536		0.433							
13			0.4	0.686		0.345							
25			0.394	0.408	0.556	0.544							
50			0.527	0.459	0.416	0.437							
100			0.497	0.518	0.468	0.436							

Report Date: Test Code/ID: 04 Sep-19 15:11 (p 2 of 2) 1AD8AA09 / 04-5040-6921

Fathead Minnow 7-d Larval Survival and Growth Test

ERM

Analyzed:

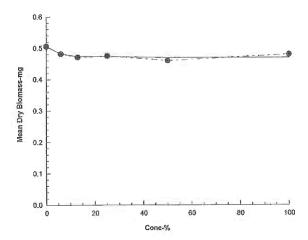
Analysis ID: 08-5635-0722 04 Sep-19 15:09

Analysis:

Endpoint: Mean Dry Biomass-mg Linear Interpolation (ICPIN) **CETIS Version:** Status Level:

CETISv1.9.4

Graphics





ENVIRONMENTAL RESOURCES MANAGEMENT

3352 128th Avenue Holland, Michigan 49424-9263 Phone: 616- 399-3500 FAX: 616-399-3777

AQUATIC TOXICITY LAB CHAIN OF CUSTODY FORM *

		SAMPLE ID INTTAL WATER QUALITY PARAMETERS NUMBER (Filled in by ERM) (filled in by ERM)	ODC19- Son Ice. 10.5 mgL T. s.u. H [] unitos/an	O.C. 11/2 Son Ice 0.00 mg/L 7.5 s.u. Cond mmhos/cm	Temp. (° C) mg/L s.u. cond umhos/cm	Temp. (c.C) mg/L s.u. cond umhös/cm	Temp. (c.C) mg/L s.u. cond unitos/cm	Temp. D.O. mg/L. s.u. cond unthos/cm	Rainbow Trout (Oncorhynchus mykiss) Sheepshead minnow (Cyprinodon variegatus) Silvasside minnow (Mendia benilina)	Other (write		
SAMPLER	PHONE NUMBER:	FIELD SAM PARAMETERS NUN (FILE	pH= s.u. ONH3= mg/L	pH= s.u. OK	pH= s.u. NHs= mg/L	J/gm =5Hg NH3= mg/L	pH= s.u. NH3= mg/L	pH= s.u. NH ₃ = mg/L	Test Species: Ceriodaphria dubia Daphria magna	Fathead mirrow (Pimephales promelas)		
Arcelor) st	i S	NUMBER AND FIN SIZE OF PA	1-2521 B		'A.Z	d Z	古艺	i Z	ic	Other	41579	
Are	,)	GRAB OR COMP	-						ewater		2000	
-		TIME (Begin End)	0618 0618	2000					aterial: Water/Wastewater Sediment	Product	ee Are	
AMBIN		DATE (Begin End)	93/25/19						Test Material: Water,	Prc	CTION: 5	
CLIENT NAME:	ADDRESS:	SAMPLE DESCRIPTION (i.e. Outfall 001)	00 (orang 05/12/19	01 \ Compan 8-5-49					ANALYSES REQUESTED [check	item(s)]	COMMENT SECTION: See ALS COC 41579	

See Instructions for Sample Collection on Back of Sheet

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February 2018

TIME

DATE

ACCEPTED BY: Signature /Organization

TIME

DATE

RELINQUISHED BY: Signature / Organization

Fort Collins, CO +1 970 490 1511

Cincinnati, OH +1 513 733 5336

Everett, WA +1 425 356 2600

Holland, MI +1 616 399 6070

coc ID: 41579 þ Page

ALS Project Manager:

Chain of Custody Form

Houston, TX +1 281 530 5656 Middletown, PA +1 717 944 5541

Salt Lake City, UT +1 801 266 7700

Parameter/Method Request for Analysis

Seb

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7

WET

AM BH

Project Name

Bill To Company Project Number

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Company Name

Project Information

Customer Information

Purchase Order Work Order

O m

ALS Work Order #:

South Charleston, WV +1 304 356 3168 York, PA +1 717 505 5280 Spring City, PA +1 610 948 4903

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19-2	110	Comp	* 8-35-19	8090	Aa	Ø		>	5-619-3					
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on:														
10														
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(D)	ill.				□ 10 BD	ŀ	C 5 8D	☐38D	□280	01189	0			
Relinquished by:	B	\$-36-19	Time	Received Mr.		1 (Epour		Notes:	* Kompanie supple ends on chically at some time - SIR OABS/A	OA OSIZOI	ly at sen	n hin	- 58F	ME0/10
Relinquished by:	4	Date:	Time:	Received by (Laboratory)		526 M-1200		Cooler ID	Cooler Temp	QC Package: (Che	QC Package: (Check One Box Below)	ine Bax Bell	(we	, and a
Legged by (Laboratory):			w	Che	oratory):					Level III	☐ Level III Std QC/Raw Date ☐ Level IV SW846/CLP	w Date	TRRP Level IV	evel IV
Preservative Key:	1-HCI	2-HNO3 3-H-SO4	4-NaOH 5-Na ₂ S ₂ O ₃	B-NaHSO,	7-Other	8-4°C	9-5035			Other			Mo.	

 Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
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 The Chain of Custody is a legal document. All information must be completed accurately. Note:

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ENVIRONMENTAL RESOURCES MANAGEMENT

3352 128th Avenue Holland, Michigan 49424-9263

Phone: 616-399-3500 FAX: 616-399-3777

AQUATIC TOXICITY LAB CHAIN OF CUSTODY FORM *

	*)								
CLIENT	WW	BN			SAMPLER						
ADDRESS:	7		-		PHONE NUMBER:						
SAMPLE DESCRIPTION (i.e. Ouffall 001)	DATE (Begin End)	TIME (Begin End)	GRAB OR COMP	NUMBER AND SIZE OF CONTAINERS	FIELD PARAMETERS	SAMPLE ID INITIAL WATER C NUMBER (Filled in by ERM) (filled in by ERM)	INITIAL WATER QUALITY PARAMETERS UPON RECEIPT BY LABORATORY (filled in by ERM)	R QUALITY F BY LABOR)	K PARAMET VATORY	ERS.	
100 state	04/21/19 03/03/4 \$ 17.19	0100	-	25,	pH= s.u. NH ₃ = mg/L	(10) Temp. D.O. 3 mg/L. 5 (°O) 7,3 mg/L.	S (C)	o. S mg/L	To Sea	Sond umbos/cm	ı d
PH1562 MENTED 110	PH-CET MWISO	0535 0888		255	pH= s.u. NH ₃ = mg/L		Temp. D.O.	o, mg/L	pH 13 s.u.	$\eta_{ m S}^{ m H}$ s.a. $\eta_{ m S}$ mithos/cm	Į.
				•	pH= s.u. NH₃= mg/L		Temp. (b.C) D.O. mg/L		pH s.u.	Cond umhos/cm	/cm
					$pH=s.u.$ $NH_3=mg/L$		Temp. (e C) D.O.	ıg/L	ъ.	Cond umhös/cm)
					pH= s.u. NH3= mg/L		Temp. D.O.	mg/L	pH. s.u.	Cond umhos/cm	Ð
•					pH= s.u. NH3= mg/L		21.3	D.O. mg/L	pH. s.u.	Cond umhos/cm	/m
ANALYSES REOUESTED	Test Material: Wafer	iterial: Wafer/Wastewater	ewater	Test Type: Acufe	Test Species: Ceriodaphnia dubia		Rainbow Trout (Oncorhynchus mykiss)	hus mykiss)	A	Americamysis bahia	
[check item(s)]	, w 4	Sediment Product		Chronic	Daphnia magna Daphnia pulex Fathead minno	(Pimephu	Sheepshead mirnow (Cyprinodon variegatus) Silverside minnow (Menidia beryllina) ales promelas)Other		(atus) H C ther (write in	sgatus) Hyalella azteca Chironomus dilutus Other (write in comments section)	ি
COMMENT SECTION: See ALS COC 42011	CTION:	ore ALS	200	12011							
SAMPLE TRANSFERS	ANSFERS	Ę									

* See Instructions for Sample Collection on Back of Sheet

February 2018

TIME

DATE

ACCEPTED BY: Signature /Organization

TIME

DATE

RELINQUISHED BY: Signature/Organization

Salt Lake Gry, UT +1 801 266 7700 ork Order #:	to FR							H 9			Resi	QC Package: (Check	Cone III Story I
+1 717 944 5541 Salt Lake City, +1 801 266 777 ALS Work Order R.	mete							C D E F	1-895000 062519-1		☐ Other ☐ ☐ 280 ☐	Cooler ID Cooler Temp OC Package: IChec	
17.1-	WET							ш	8 8		Days (BD)	X Confessive Su Cooler ID	
011 Aanager:	week 2 A	v	<u>а</u> ш .	u 0	I	-	7	# Bottles A	1-26al		urmaround Time in Business Days (BD)	1000	
COC ID: 42011 ALS Project Manager.	F	H						Pres.	000		urnaround Tin	My S	
ALS F	AMBH M	AMBH						Matrix	4 4 8		101	Received by (Laboratory):	Checked by (Laboratory):
Pro		pany	oice Attn Address	diZ/a	Phone	Fe	dress	Time	0610	5	Shipment Method	Received b	Checked by
	Project Name Project Number	Bill To Company	Invoice Attn Address	City/State/Zip			e-Mail Address	Date	*8-27-19 *8-27-19		Shipm	Time:	Time:
nation		+ 124							Comp			Pare: 08-19	Date:
S)	1.0.1	TIN DIT						Sample Description	0.00		- Sign	H	
	1		9	dZ	попе	Fax	Address		1124		Sampler(s) Please Print & Sign	Relinguished by:	boosed by (Laboratory):

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ENVIRONMENTAL RESOURCES MANAGEMENT

AQUATIC TOXICITY LAB CHAIN OF CUSTODY FORM * 3352 128th Avenue Holland, Michigan 49424-9263 Phone: 616-399-3500 FAX: 616-399-3777

		1 1) = = = = = = = = = = = = = = = = = = =			The state of the s		
CLIENT NAME:	Accelor	A	THO		SAMPLER			
ADDRESS:)		PHONE NUMBER:			
SAMPLE DESCRIPTION (i.e. Outfall 001)	DATE (Begin End)	TIME (Begin End)	GRAB OR COMP	NUMBER AND SIZE OF CONTAINERS	FIELD PARAMETERS	SAMPLE ID NUMBER (Filled in by ERM)	INITIAL WATER QUALITY PARAMETERS UPON RECEIPT BY LABORATORY (filled in by ERM)	3.5
100	8133/19	0% Z2 0% Z2		152 × 2.540	pH= s.u. NH₃= mg/L	1-610530	n.s. 2	Cond mnhos/cm
011	8/24	0604		14 +2.5ml	pH= s.u. NH3= mg/L	0838/A.L	D.O. pH	Cond $\psi_{\mathcal{O}}$ unitos/cm
					pH= s.u. NH3= mg/L		ns Hd	Cond umhos/cm
					pH= s.u. NHs= mS/L		D.O. p.H. s.u.	Cond unhos/cm
					pH= s.u. NHs= mg/L		r.s	Cond umhos/cm
		Tale mean		====	pH= s.u. NH ₃ = mg/L	7	pH s.u.	Cond umhos/cm
ANALYSES REQUESTED [check item(s)]	Test Material: Water Sedim Produ	aterial: Water/Wastewater Sediment Product	ewater	Test Type: Acute Chronic	Test Species: Ceriodaphnia dubia Daphnia magna Daphnia pulex Pathead minnow (Pimephu	out (Oncorhyncrus mykiss) minnow (Cyprinodon variegatus) innow (Menidia beryllina) Other (write i	Americamysis bahia Hyalella azteca Chironomus dilutus in comments section)
COMMENT SECTION: See ALS COC 42012	ECTION:	See ALS	Ch 202	7107				
SAMPLE TRANSFERS	RANSFERS	CC.					-	

See Instructions for Sample Collection on Back of Sheet

1330

8/34/9

February 2018

TIME

DATE

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TIME

DATE

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Fort Collins, CO +1 970 490 1511

Cincinnati, OH +1 513 733 5336

Everett, WA +1 425 356 2600

Holland, MI +1 616 399 6070

Chain of Custody Form

₽ Page ALS Project Manager:

coc ID: 42012

Houston, TX +1 281 530 5656 Middletown, PA +1 717 944 5541

ALS Work Order #:

Salt Lake City, UT +1 801 266 7700

Spring City, PA +1 610 948 4903

South Charleston, WV +1 304 356 3168 York, PA +1 717 505 5280

-51P 09/03/M Hold ☐ TRRP Checklist 7 Parameter/Method Request for Analysis Results Due Date: QC Package: (Check One Box Below) Homes: * Daniele ands on OSINIA of same time ☐ Level II Std QC
☐ Level III Std QC/Raw Date
☐ Level IV SW846/CLP
☐ Other I R ø 01.80 SVA u. ш 83019-P 043014-0280 ۵ D Other o NE m Cooler ID Turnaround Time in Business Days (BD) 380 4 a 0 ш H. m 0 Ø I 7 # Bottles Eliz 9-5035 Meck 0890 8-4"C Pres. 90 00 OH 01 D Project Information 6-NaHSO, 7-Other Matrix AB Checked by (Laboratory): AMBH 8000 Time Shipment Method Project Name Bill To Company Fax Address Phone Project Number Invoice Attn City/State/Zip e-Mail Address 5-Na₂S₂O₃ 8-28-19 x 8-29-19 Time: 4-NSOH X Date: 3-H,SO. EPT Dete: 200 Customer Information Sample Description 2-HNO. AM GH 90 Preservative Key: 1-HCI Sampler(s) Please Print & 96 Logged by (Laboratory): Fax Company Name Send Report To Phone Purchase Order City/State/Zip Work Order Address e-Mail Address Relinquished by:

082619-2 Pp Page 22 of 23

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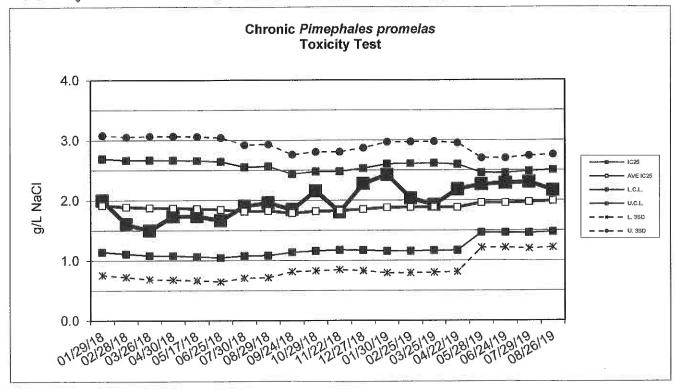
Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Environmental Resources Management

Standard Reference Toxicant Data



Chronic	Pimenhales	promolec	Toxicity	Toet Data
GHronic	rimeonales	oromeias	LOXIGILA	Test Data

				CONTROL			
Date	IC25	IC25 AVE IC25		CONTROL LIMIT		Growth	CV
	(g/L NaCI)	(g/L NaCl)	Lower	Upper	(%)	(mg)	(%)
01/29/18	2.0	1.9	1.1	2.7	97.5	0.39	4.8
02/28/18	1.6	1.9	1.1	2.7	92.5	0.44	10.7
03/26/18	1.5	1.9	1.1	2.7	97.5	0.47	3.5
04/30/18	1.7	1.9	1.1	2.7	95	0.45	11.4
05/17/18	1.7	1.9	1.1	2.7	100	0.54	10.8
06/25/18	1.7	1.8	1.0	2.6	95	0.56	17.8
07/30/18	1.9	1.8	1.1	2.6	97.5	0.43	4.3
08/29/18	2.0	1.8	1.1	2.6	100	0.58	9.4
09/24/18	1.8	1.8	1.1	2.4	97.5	0.46	8.2
10/29/18	2.2	1.8	1.2	2.5	97.5	0.45	7.7
11/22/18	1.8	1.8	1.2	2.5	95	0.65	5.2
12/27/18	2.3	1.8	1.2	2.5	97.5	0.64	7.4
01/30/19	2.4	1.9	1.2	2.6	100	0.53	10.5
02/25/19	2.0	1.9	1.2	2.6	95	0.53	10.2
03/25/19	1.9	1.9	1.2	2.6	97.5	0.63	6.0
04/22/19	2.2	1.9	1.2	2.6	100	0.57	2.0
05/28/19	2.3	2.0	1.5	2.5	100	0.68	10.4
06/24/19	2.3	2.0	1.5	2.5	92.5	0.48	11.0
07/29/19	2.3	2.0	1.5	2.5	100	0.51	5.6
08/26/19	2.2	2.0	1.5	2.5	100	0.38	15.0