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College of Sciences & Mathematics www.astate.edu

January 4, 2017

Bruce Richart Berryville Waste Water Treatment 1000 W. Cedarvale Road Berryville, AR 72616

Dear Bruce,

Please find enclosed the results of the 7-day chronic tests using water collected from the Berryville wastewater treatment facilities during the week of December 11, 2017. No lethal nor sublethal effects were measured in *Ceriodaphnia dubia* exposed to the treated effluent dilutions.

All test conditions and acceptability criteria as suggested by our laboratory and the US EPA, with the exception of the control reproduction as mentioned above, were met during these tests.

If you have any questions regarding this particular test series, please feel free to call.

Sincerely,

fr 2 Bouldi

Jennifer L. Bouldin, PhD Director, Ecotoxicology Research Facility PO Box 847 Arkansas State University State University, AR 72467

		<pre>/ Ecotoxicology Res</pre>	earch	acility	Laboratory	Report
Facility Dire Phone:	ector / Lab Contact:	Je (870) 972-2570	ennifer Bo	ouldin		
Client:	Berryville Waste W 1000 W. Cedarvale Berryville, AR 7261	Road			Contact: Bruce Richart (479) 443-329 (479) 443-561	
NPDES Perr	mit #:	AR0021792		A (****	00.0000.4	
	npling Point/Type:		hr Comp		08-00034	
	Sample #	Sa	mpling T	imee	Received	
	1	12/10/17 0600 hrs to 12	2/11/17	0600 hrs	12/12/17 0905 hrs	Arrival Temp
	2	12/12/17 0600 hrs to 12	2/13/17		12/14/17 0909 hrs	0.5 °C
	3	12/14/17 0600 hrs to 12	2/15/17		12/16/17 0910 hrs	0.5 °C 0.5 °C
Test Method 7-Day Chron Organisms:		ewal, Cladoceran, EPA 82 < 24hrs	1/R-02/0	13, Section		
					Culture Source:	ASU ERF
Dilutions:	0%, 32%, 42%, 56%	%, 75%, 100%			Critical Dilution:	100%
Statistical M	ethod:	Toxcalc 5.0.25				
	C. dubia			_		
		ent toxicity		-		
DMR Code	lethality 22414 10	sublethality				
Result	100%	22414 P0				
	lethality	100% sublethality		-		
DMR Code	TLP3B	TGP3B				
Result	0	0				
	NOEC lethality	NOEC sublethal		-		
DMR Code	TOP3B	TPP3B				
Result	100%	100%				
DMR Code	CV%			-		
Result	TQP3B 38.8%					
rteaut	38.8% control survival		<u></u>			
	100%	control mean reproductio	on			
		17.6 critical mean reproductio	_			
	100%	21.1	n			
		MSDp				
		0.3858				
esults Sumn	nary:	Neither lethal nor subleth	al effects	were meas	ured to <i>C. dubia</i> at any effi	uent dilution.
A/Reference	Testing:	Data	attached	1		
eviewed By:		Junit .	2 1	uld.	y Research Facility	

Toxicity Test Performed: Effluent Sampling Point:	7-day Ceriodaphnia Berryville Waste W	<i>dubia</i> Survival and Reproduction ater Plant
Date Test Started:	12/12/17	C. dubia
Time Test Started:	1100	C. dubia
Date Test Terminated:	12/19/17	C. dubia
Time Test Terminated:	1300	C. dubia
Laboratory Analyst:	Cooper/Ruby	

I. Test Methods

A. Physical and Chemical Testing - APHA, <u>Standard Methods for the Examination of</u> Water and Wastewater; Vol. 21, 2005.

Test	<u>Method</u>
Alkalinity	2320B
Conductivity	2510B
Dissolved Oxygen (mg/L, DO)	4500-O-G
Hardness (mg/L CaCO ₃)	2340C
pH	4500-H ⁺ B
Temperature (°C)	2550B

B. Toxicity Testing – EPA 821/R-02/013: <u>Short Term Methods for Estimating the</u> Chronic Toxicity of Effluents to Freshwater Organisms

<u>Test</u>

Method

Cladoceran Survival and Reproduction Section 13

II. Test Organisms

 A. Name: Ceriodaphnia dubia (Cladoceran) Source: Laboratory Culture Age: <24 hours Life Stage: Neonate

B. Ceriodaphnia dubia

Test Chambers: 30 ml Solo cups Volume per Chamber: 15-20 ml Number of Organisms per Chamber: 1 Number of Replicates per Concentration: 10 Acclimation: Laboratory control water was added to cultures until >50% of the culture water consisted of control water. Food: Cladocera were fed *Selenastrum* (#ABS 112917) and yeast/cereal/trout chow mix (#YCT-ABS - 102017) one hour prior to test setup and once daily thereafter.

IV. Quality Assurance

A. Standard Toxicant: Sodium Chloride

B. Organism: Ceriodaphnia dubia Date and time of Reference Toxicant Test Start: 12/08/17 Terminated: 12/15/17 Time of Reference Toxicant Test Start: 1241 Terminated: 1141 Laboratory Analyst: Martin Dilution Water Used: Moderately Hard Synthetic Water #1005 Results: Survival and Reproduction within control limits

Survival	Reproduction
LOEC: 2.60 g/L NaCl	LOEC: 1.82 g/L NaCl
EC50: 2.11 g/L NaCl	IC25: 1.64 g/L NaCl

- V. Physical and Chemical Data See Attached
- VI. Survival and Growth Data See Attached
- VII. Statistical Methods See Attached
- VIII. NPDES Permit Results See Attached

SUMMARY REPORTING FORM WET Testing Ceriodaphnia dubia Survival and Reproduction

Permittee: Berryy	ville Waste Water I	Plant			NPDE	S No.: AR0021792
Composite 1: Composite 2: Composite 3:	Collected from Collected from Collected from	<u>Time</u> 0600 0600 0600	<u>Date</u> 12/10/17 12/12/17 12/14/17	to to to	<u>Time</u> 0600 0600 0600	<u>Date</u> 12/11/17 12/13/17 12/15/17
Test Initiated: 17 Time Terminated Dilution H ₂ O: M	1: 1300					Date: 12/12/17 Date: 12/19/17

		PERCEN	T SURV	VAL			
Time of		Ī	Percent E	fflue nt			
Reading	<u>Control</u>	<u>32%</u>	<u>42%</u>	<u>56%</u>	<u>80%</u>	<u>100%</u>	
24h	100	100	100	100	100	100	
48h	100	100	100	100	100	100	
7 day	100	100	100	100	100	100	

NUMBER OF YOUNG/FEMALE @ 7 DAYS Percent Effluent

REP	<u>0%</u>	<u>32%</u>	<u>42%</u>	<u>56%</u>	<u>74%</u>	<u>100%</u>
Α	13	19	25	22	23	3
В	10	29	18	34	22	21
С	11	15	23	23	15	26
D	17	25	21	22	23	21
Е	18	17	21	20	4	13
F	17	5	4	26	26	29
G	21	20	17	13	17	26
Н	23	22	10	22	22	28
I	23	19	21	17	16	17
J	23	26	29	24	26	27
Mean CV%*	17.6 28.2	19.7 34.1	18.9 38.4	22.3 24.7	19.4 34.4	21.1 38.8

*Coefficient of Variation% = Standard Deviation x 100/Mean

Ceriodaphnia dubia Survival and Reproduction

1. FISHER'S EXACT TEST: Is the mean survival for the critical dilution (100%) at 7 days significantly different (p=0.05) than the control survival?

__Yes <u>X</u>No

- DUNNETT'S PROCEDURE OR STEEL'S MANY-ONE RANK TEST AS APPROPRIATE: Is the mean number of young produced per female by the critical dilution (100%) significantly different (p=0.05) than the control's number of young per female?
 Yes X_No
- 3. If the NOEC for survival is less than the critical dilution, enter [1], otherwise enter [0] for parameter #TLP3B: <u>0</u>
- If the NOEC for reproduction is less than the critical dilution, enter [1], otherwise enter [0] for parameter #TGP3B: <u>0</u>
- 5. Report the NOEC value for survival, Parameter #TOP3B: NOEC survival <u>100%</u> effluent
- 6. Report the NOEC value for reproduction, Parameter #TPP3B: NOEC reproduction 100% effluent
- 7. Report the % coefficient of variation (largest of critical and control dilutions), Parameter #TQP3B: CV % reproduction <u>38.8%</u>(critical)

Whole Effluent Lethality Values for Ceriodaphnia dubia

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- Report the Whole Effluent Lethality values for the 30-Day average minimum, Parameter #22414: Daily Average Minimum NOEC: <u>100%</u>
- Report the Whole Effluent Lethality values for the 7-day minimum, Parameter #22414:
 7-Day Minimum NOEC: 100%

SUMMARY REPORTING FORM

WET Testing Ceriodaphnia dubia (Cladoceran)

CHEMICAL PARAMETERS CHART

Permittee: Berryville Waste Water T	reatment	Sample No. 1 Collected Ending Date:	12/11/17 Time: 0600
NPDES No.: AR0021792		Sample No. 2 Collected Ending Date:	12/13/17 Time: 0600
Contact: Bruce Richart		Sample No. 3 Collected Ending Date:	12/15/17 Time: 0600
Analyst: Cooper/Ruby	Test Begin: Date	: 12/12/17 Time: 1100 Test End: Date:	12/19/17 Time: 1300
Tindiyst. Cooper Ruoy	8		

		Ī	nitial Water	Chemistry f	or Chronic 7	Tests		
					TP – C. dubi			
Test day		0	1	2	3	4	5	6
Date		12/12/2017	12/13/2017	12/14/2017	12/15/2017	12/16/2017	12/17/2017	12/18/2017
H ₂ O #		MH1005	MH1005	MH1005	MH1005	MH1005	MH1005	MH1005
Temp (°C)	Control	23.9	23.0	22.9	22.8	23.0	22.9	23.4
1 mp (0)	32%	22.8	23.0	23.1	22.9	22.9	23.0	23.4
	42%	23.5	23.1	23.4	23.0	23.0	23.0	23.3
	56%	23.9	23.0	23.6	22.9	22.9	23.1	23.4
	75%	23.8	22.9	23.7	22.8	23.0	23.0	. 23:4
	100%	24.0	23.0	24.0	22.8	23.1	23.2	23.4
pН	Control	7.58	7.69	7.66	7.71	7.33	7.58	7.59
(Standard	32%	8.03	8.18	8.00	8.12	7.89	8.08	7.93
Units)	42%	8.09	8.24	8.07	8.18	7.99	8.13	7.96
,	56%	8.17	8.30	8.11	8.26	8.08	8.20	8.02
	75%	8.24	8.35	8.10	8.32	8.15	8.25	8.06
	100%	8.28	8.40	8.19	8.36	8.22	8.29	8.09
DO	Control	8.7	8.7	8.8	8.6	8.6	8.9	8.9
(mg/L)	32%	8.5	8.8	8.7	8.3	8.8	8.7	8.8
	42%	8.4	8.7	8.5	8.2	8.4	8.4	8.4
	56%	8.5	8.7	8.5	8.2	8.3	8.3	8.4
	75%	8.5	8.6	8.5	8.2	8.3	8.3	8.5
	100%	8.6	8.6	8.4	8.1	8.3	8.2	8.6
Cond	Control	269	267	269	270	. 270	269	267
$(\mu S/cm)$	32%	703	700	669	665	692	694	693
	42%	839	828	798	788	820	828	821
	56%	1022	1011	965	945	991	1003	995
	75%	1323	1252	1211	1165	1227	1240	1229
	100%	1657	1620	1540	1462	1588	1607	1584
Alk	Control	- 58		- 58		58		
(mg/L)	100%	282		320		280		
Hard	Control	90		90		90.81		
(mg/L)	100%	105		95		90		

SUMMARY REPORTING FORM

WET Testing *Ceriodaphnia dubia* (Cladoceran) CHEMICAL PARAMETERS CHART

Permittee:Berryville Waste Water TreatmentNPDES No.:AR0021792Contact:Bruce RichartAnalyst:Cooper/RubyTest Begin:

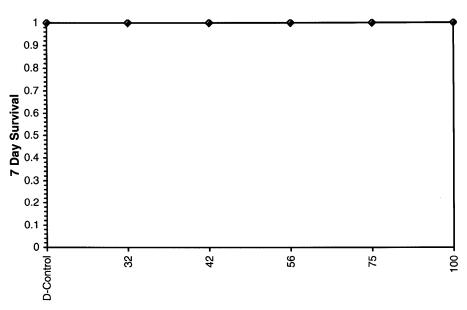
AttmentSample No. 1 Collected Ending Date:12/11/17 Time: 0600Sample No. 2 Collected Ending Date:12/13/17 Time: 0600Sample No. 3 Collected Ending Date:12/15/17 Time: 0600Test Begin: Date:12/12/17 Time: 1100 Test End: Date:12/19/17 Time: 1300

		1	Final Water	Chemistry f	or Chronic T	'ests		
		-	the second s		TP – C. dubi			
Test day		1	2	3	4	5	6	7
Date:		12/12/2017	12/13/2017	12/14/2017	12/15/2017	12/16/2017	12/17/2017	12/18/2017
H ₂ O #		MH1005	MH1005	MH1005	MH1005	MH1005	MH1005	MH1005
^z Temp (°C)	Control	, 22.8	22.6	22.9	23.8	23.7	24.2	24.3
	32%	22.9	23.0	23.0	23.3	23.3	23.9	24.4
	42%	22.9	23.2	* 23.2	22.9	23.7	23.3	24.3
	56%	22.9	23.1	23.0	23.8	23.6	24.1	24.2
	75%	22.9	23.5	22.9	23.2	23.2	23:7	24.2
	100%	23.0	23.7	23.0	23.8	23.5	24.2	24.3
pН	Control	8.23	8.08	8.11	7.76	8.12	7.80	8.00
(Standard	32%	8.60	8.32	8.58	8.19	8.62	8.30	8.51
Units)	42%	8.69	8.62	8.66	8.23	8.71	8.34	*8.60
	56%	8.71	8.69	8.66	8.34	8.74	8.45	8.65
	75% *	8.78	8.69	8.74	8.39	8.79	8.50	8.72
	100%	8.75	8.73	8.75	8.50	8.84	8.59	8.75
DO	Control	9.4	³⁰ .9.1	/8.9	9.0	8.9	8.8	8.8
(mg/L)	32%	9.7	8.7	9.2	8.9	9.0	8.7	8.5
	42%	9.8	9.6	9.3	9.0	9.1	8.9	- 8.6
	56%	9.9	9.6	9.4	8.9	9.2	8.9	8.6
	75%	9.8	9.5	9.3	8.9	9.2	8.9	8.6
	100%	8.9	9.4	9.4	8.9	9.3	8.9	8.6

			Cerioda	aphnia Sur	vival and	Reprod	uction Tes	t-7 Day S		
Start Date:	12/12/2017	7 11:00	Test ID:	Berryville			Sample ID	:	AR002179	2-NPDES Permit #
End Date:	12/19/2017	7 13:00	Lab ID:	ASU-ERF			Sample Ty	/pe:	EFF1-PO1	W
Sample Date:	12/11/2017	7	Protocol:	EPAF 02-I	EPA Fresh	nwater	Test Spec	ies:	CD-Cerioo	laphnia dubia
Comments:	Dec-17									
Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

				Not			Fisher's 1-Tailed			
Conc-%	Mean	N-Mean	Resp	Resp	Total	N	Exact P	Critical		
D-Control	1.0000	1.0000	0	10	10	10				
32	1.0000	1.0000	0	10	10	10	1.0000	0.0500		
42	1.0000	1.0000	0	10	10	10	1.0000	0.0500		
56	1.0000	1.0000	0	10	10	10	1.0000	0.0500		
75	1.0000	1.0000	0	10	10	10	1.0000	0.0500		
100	1.0000	1.0000	0	10	10	10	1.0000	0.0500		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	
Fisher's Exact Test	100	>100		1	

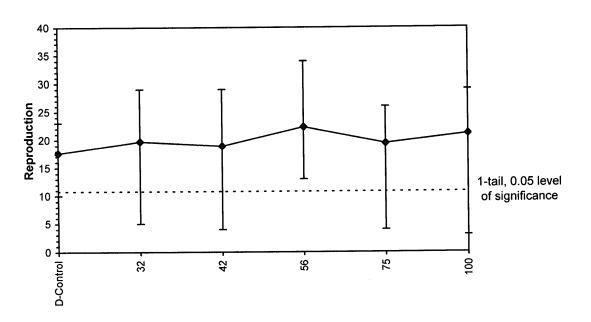


Dose-Response Plot

			Cerioda	phnia Sur	vival and	Reprod	uction Tes	t-Repro	duction	
Start Date:	12/12/2017	7 11:00	Test ID:	Berryville			Sample ID	•		2-NPDES Permit#
End Date:	12/19/2017	7 13:00		ASU-ERF			Sample Ty	•	EFF1-POT	
Sample Date:	12/11/2017	7	Protocol:	EPAF 02-E	EPA Fresh	water	Test Speci	les:	CD-Cerioo	laphnia dubia
Comments:	Dec-17									10
Conc-%	1	2	3	4	5	6		8	9	the second se
D-Control	13.000	10.000	11.000	17.000	18.000	17.000	21.000	23.000	23.000	23.000
32	19.000	29.000	15.000	25.000	17.000	5.000	20.000	22.000	19.000	26.000
42	25.000	18.000	23.000	21.000	21.000	4.000	17.000	10.000	21.000	29.000
56		34.000		22.000	20.000	26.000	13.000	22.000	17.000	24.000
75		22.000		23.000	4.000	26.000	17.000	22.000	16.000	26.000
100		21.000		21.000	13.000	29.000	26.000	28.000	17.000	27.000

			Transform: Untransformed					_		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
D-Control	17.600	1.0000	17.600	10.000	23.000	28.244	10			
32	19,700	1.1193	19.700	5.000	29.000	34.098	10	-0.707	2.287	6.790
42	18.900		18,900	4.000	29.000	38.434	10	-0.438	2.287	6.790
56	22.300		22.300	13.000	34.000	24.747	10	-1.583	2.287	6.790
75	19.400		19.400	4.000	26.000	34.381	10	-0.606	2.287	6.790
100	21.100	1.1989	21.100	3.000	29.000	38,790	10	-1.179	2.287	6.790

Auxiliary Tests		<u></u>			Statistic		Critical		Skew	Kurt
Kolmogorov D Test indicates nor	nal distribu	tion $(p > 0$	0.01)		0.9964		1.035		-0.8706	0.7807
Bartlett's Test indicates equal var			,		2.74953		15.0863			
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	6.7902	0.38581	27.5067	44.0889	0.68216	5, 54



Dose-Response Plot

CHRONIC TEST DATA SHEET Ceriodaphnia dubia

Project:		Beginning	Date: 1212	.17	Time:11	00	Test Species: <u>C. dubia</u>		
$\frac{\text{Berryville}}{\text{Dilution H}_2}$	0: <u>1005</u>	Ending	Date: 12	4917	Time:	1300	Age: <u>22</u>	thours	_
	Test Type	: (*)Stati	ic Renewal	() Flowt	hrough	Foxicant/E	ffluent:		
Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Neonates
Control	1	G	0	0	0	2	0	11	13
	2			1	Ø	2	8	0	10
	3				þ	2	0	9	11
	4				3	4	0	10	17
	5				ð	6	0	12.	18
	6				5	4	0	8	17
	7				١	6	0	14	21
	8				5	Ś	0	10	23
	9				6	8	О	9	23
	10				D	5	8	10	23
32%	1	0	0	0	١	5	1	12	19
	2		1	7	0	7	15	0	29
	3			0	1	5	0	9	15
	4				6	S	0	14	25
	5				3	Q	0	8	17
	6)	0	4	0	5
	7				0	0	9	11	20
	8				2	١	9	10	22
	9				0	2	8	9	19
	10				0	0	10	16	26
Date	121217	121317	121417-	121517	121617	121717	121817	121917	
Initials	aus	air	aur	Fil	PIC	RIC	RIC	RIC	

CHRONIC TEST DATA SHEET Ceriodaphnia dubia

	Beginning Date:	21217	Time: <u>\\00</u>	Test Species: <u>C.dubia</u>
$\frac{\text{Berryville}}{\text{Dilution H}_2\text{O:} 1005}$	Ending Date:	121917	Time: <u>1300</u>	Age: <u>224hours</u>
				\sim

Test Type: (*)Static Renewal () Flowthrough Toxicant/Effluent:

~		D 1		D 2	Derid	Day 5	Day 6	Day 7	Neonates
Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5			
42%	1	0	0	0	6	6	0	13	25
	2	(0	5	0	(3	18
	3				0	6	0	17	23
	4				4	6	11	0	21
	5				5	5	0	11	21
	6				4	0	Ð	0	Ч
	7				5	4	0	8	17
	8				3	5	0	2	10
	9				3	6	1	1(21
	10	\rightarrow		1	5	6	0	18	29
56%	1	Ø	0	C	3	5	0	14	22
	2		1	3	6	8	0)	13	34
	3			0	6	7	0	О	23
	4			1	3	7	0	12	22
	5				3	6	0	11	20
	6				4	7	0	15	26
	7				4	3	0	6	13
	8				6	6	Ø	10	22
	9				5	7	0	5	17
	10				2	0	8	14	24
Date	121217	121317	121417	121517	121617	121717	121817	121917	
Initials	aue	air	aur	pic	RIC	RIC	RIC	RIC	

CHRONIC TEST DATA SHEET Ceriodaphnia dubia

Project:		Beginning	, Date: 1217	<u></u>	Time:	100	Test Specie	es: <u>C.dubia</u>	<u>7</u>
Berryville Dilution H ₂	NH 0:1005	Ending	, Date: 12	4917	Time:	1300	Age: <u> </u>	1 hours	
	Test Type	: (*)Stat	ic Renewal	() Flowt	hrough	Toxicant/	ffluent:		
Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Neonates
75%	1	0	0	Ο	4	7	0	12	23
	2			0	3	7	0	12	22
	3			4	0	5	6	0	15
	4			2	0	10	11	0	23
	5			0	1	1	Ζ	0	4
	6				4	7	0	13	26
	7				D	7	0	10	17
	8				3	8	0	11	22
	9				3	6	0	7	16
	10	\mathbf{V}	-1	\checkmark	4	8	0	14	26
100%	1	0	0	3	0	0	0	0	3
	2		1	9	5	7	9	0	21
	3			О	4	11	0	11	26
	4			0	4	4	0	11	21
	5			24	0	þ	3	0	13
	6			0	7	11	11	0	29
	7			0	6	9	0	11	26
	8			0	4	10	0	14	28
	9			0	0	0	8	9	17
	10			2	3	9	0	13	27
Date	121217	121312	121417	121517	121617	121717	121817	121917	
Initials	aue	aur	aur	Ric	RIL	PIC	RIC	PLIC	

	[est Day:	0 .	. 1 .	2	- 3	. 4 .	1 5	6
a superior de la companya de la comp	Contraction of the second second second	12/217	121317	121417	121517	121617	121717	121817
H ₂ O	Batch #:		MITIOOS	MHIDOS	MH 1005	MH 1005	MH 1005	MHIOOS
Temp, (°C)	Control	23.9	23.0	22.9	22.8	23.0	22.9	23.4
	32%	22.8	23.0	23.1	22.9	22.9	23.0	23.4
	42%	23,5	23.1	23.4	23.0	23.0	23.0	23.3
	56%	23.9	23.0	23.4	22.9	22.9	23.1	23,4
	75%	23.8	22.9	23.7	22.8	23.0	23.0	23.4
	100%	24.0	23.0	24.0	21.8	23.1	23.2	23,4
pH ¹ 2	Control	7.48	7.69	7.44	7,71	7.33	7,58	7,59
	32%	8.03	8.18	8.00	8.12	7.89	808	7.93
	.42%	8.09	8.24	8.07	8.18	7.99	8,13	7,96
	56%	8.17	8.30	8.11	8.26	8,08	8.20	8.02
y	75%	8.24	8.35	8.14	8.32	8.15	<u>8.25</u>	8.06
	100%	8.28	8.40	8.19	836	8.22	8.29	8.09
DO (mg/L)	Control	8.7	8.7	8.8	8.6	8.6	8.9	8,9
	32%	8.5	8.8	8.7	8.3	8.8	8.7	8.8
	42%	8.4	8.7	8.5	8.2	8.4	8,4	814
	56%	8.5	8.7	8.5	8.2	8.3	8.3	8.4
	75%	8,5	8.6	8.5	8.2	8.3	8.3	8.5
	,100%	8.6	8.4	8.4	8.1	8.3	8.2	8.6
Cond. (µS/cm)	Control	269	267	269	270	270	269	267
	32%	507	700	469	665	692	694	693
	42%	839	828	798	788	820	828	821
	56%	1022	1011	965	945	991	1003	995
10 10 10 10 10 10 10 10 10 10 10 10 10 1	75%	1323	1252	1211	1165	1227	1240	1229
	100%	1657	1620	154D	1462	1588	1607	1584
Alk. (mg/L)	Control	58		58		58		
	100%	282		320		280		
-Hard. (mg/L)	Control	90		90		90		
	~100%	105		95		90		
Initials		aur/AA	-aur-	aur	Ric	RIC	PIC	RIC

Initial Water Chemistry for Chronic Tests Project: <u>Berryville - C. dubia</u>

	Fest Day:	1 *	2	3*	4	5	6	$\mathbb{C}[7_{\mathbb{R}}]^{\times \mathbb{C}}$
1.4.20	Date:	121317	121417	121517	121617	121717	121817	121912
'H ₂ C	The provide state and the second state of the	MH1005	MHIODS .	MHINOS	MH 1005	AH 1005	NH 100S	MH1005
Temp. (°C)	Control	22.8	22.6	22.9	23,8	23.7	24.2	24.3
	32%	22.9	23.0	23.0	23.3	23.3	23.9	24.4
	42%	22.9	23.2	23.2	22,9	23.7	23,3	24.3
and the second secon	56%	22.9	23 . 1	23.0	23.8	23.6	24.1	24.2
a server and a server and a server and a server	75%	22.9	23.5	22.9	23.2	23.2	23.7	24.2
and the second second	100%	23.0	23.7	23.0	23.8	23.5	24.2	24.3
pH	Control	8.23	8,08	8.11	7.76	8.12	7.80	8,00
	32%	8.40	8.32	8.58	8,19	8.62	8,30	8.51
	42%	8.49	8.42	8.66	8,23	8,71	8,34	8.60
	56%	8.71	8,63	8.66	8.34	8,74	8.45	8.65
a file	75%	8.78	8.69	8,74	8.39	8.79	8,50	8.72
	+100%	8.79	8,73	8,75	8.50	8,84	8,59	8,75
DO (mg/L)	Control	9.4	9.1	8.9	9.0	8.9	8,8	8.8
	32%	9.7	8.7	9.2	8.9	9.0	8.7	8.5
	42%	9.8	9.6	9.3	9.0	9.1	8.9	8.6
	56%	9,9	9.4	9.4	8.9	9.2	8.9	8.6
	75%	9,8	9.5	9.3	8.9	9.2	8.9	8.6
	. 100%	8.9	9,4	9.4	8.9	9.3	8.9	8.6
Initials		aur	and	RIC	RIC	pic	RIC	Ric

Final Water Chemistry for Chronic Tests Project: <u>Berryville - C. dubia</u>



SAMPLE CHECK IN

	Sample ID Number:
sheets with test data and file with the lab QA	or river water sample coming in for testing. Keep completed A/QC officer.
Date: 12/12/17 Sampling Date:	$\frac{11117}{1117}$ Arrival Time: <u>0907</u>
Field Identification Number:	$\frac{M_{11}}{2} \qquad \text{Arrival Time: } \underline{O907}$ $\underline{O907} \qquad Description: \underline{O7W} \qquad \text{applied}$
<u></u>	
Shipped by: Federal Express UPS	B Hand delivered by:
Drop-Off Location:ASU	J-ERF
Storage While Shipped: Corle	en trick
Analysis Requested:	i C dubi
Initial Water Chemistry Analysis:	
Sample Received by:	
Temperature (⁰ C): 0.5	
Date: 12/11/17	

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	N	12/12/17		
Refrigerated at 4°C	P	(2/12/17		
Field Record Received	₽?	(1121,)		
Sample Label Affixed Properly	P	(2/12/17		
Project Leader Informed	V	12/12/17	/	

Comments:



SAMPLE CHECK IN

Sample ID Number: <u>#2</u>
Fill out this information with each effluent or river water sample coming in for testing. Keep completed sheets with test data and file with the lab QA/QC officer.
Date: 121417 Sampling Date: 121317 Arrival Time: 0909
Field Identification Number: Description: POTW effluent
Shipped by: Federal Express UPS Hand delivered by:
Drop-Off Location:ASU-ERF
Storage While Shipped: Cooler w/ice
Analysis Requested: Chronic (. dubia
Initial Water Chemistry Analysis:
Sample Received by:EM
Temperature (°C): 0.5 Ice Present upon delivery: YES NO
Date:

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	EM	121417	-	
Refrigerated at 4°C	EM	121417	~	
Field Record Received	EM	121417		
Sample Label Affixed Properly	EM	121417		
Project Leader Informed	ем	121417		n 191 en de transferi

Comments: _____



SAMPLE CHECK IN

Sample ID Number:	Sample ID Number:	#3
-------------------	-------------------	----

Fill out this information with each effluent or river water sample coming in for testing. Keep completed sheets with test data and file with the lab QA/QC officer.

Date: 121617 Sampling Date: 121417 - 121517 Arrival Time: 0920
Field Identification Number: Description:Description:
Shipped by: Federal Express UPS Hand delivered by:
Drop-Off Location:ASU-ERF
Storage While Shipped: Woler while
Analysis Requested: Chronic C. duba
Initial Water Chemistry Analysis:
Sample Received by: <u>R</u> (C
Temperature (°C): Ice Present upon delivery: YES NO
Date: 121617

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	PLC	121617	X	
Refrigerated at 4°C	Ric		\times	
Field Record Received	RIC			\times
Sample Label Affixed Properly	RIC		\checkmark	
Project Leader Informed	RIC	K	\times	

Comments:



cotoxicology Research Facility Ecotoxicology Research Facility Advance State University

Arkansas State University 501 Iroquois Street State University, AR 72467 (870) 972-2570 Fax (870) 972-2577

CHAIN OF CUSTODY RECORD



Client Name				Phone: H79-4	6965 - 544-	33								<u></u>
	9		•	Fax: 479-4	- 443 - 5613	$\overline{\omega}$					Anal	yses (L	Analyses (List Below)	
Project # / Outfall #	Outfall #			PO# CREAT								SE		
BERNAUE	M/ZILE/M	/MB COT		Remarks:				CL3 =	<u> 213 = 20,00</u>	0				
Sampler	Sapple Geigen Marver	varr		Contact: BRUCE	12 REGIART			6			Chron C. dub	P. pro Chron		
Cont.#	Sample ID	Locé	Location	Sample	Sample	Sample Type	Type		Matrix					
	Number			Date	Time	Comp	Grab	Aqueous	Soil	Other				
		МВ	84	MB 00.1 12-10-17roll-11-17	0900-0900	X		X			X			
Ice pres	Ice present at delivery:	ery:		ou	Initials									
Temp:	Neland	ہ ئ	°C	Berneth										
	West Side		°C											
	Initials	A												
		<i>•</i>												
	Relinquished By (sign)	gn) (ng		Date	Time 11245		1. Received By (sign	(B) Dour			Uate レイ・イップ		0905	L
2. Relinc	2. Relinquished By (\$gn)	gn)	1	Date	Time	2. Rocei	2. Received By (sign)	ign)			Date		Time	



cortoxicology Research Facility Ecotoxicology Research Facility

CHAIN OF CUSTODY RECORD

Arkansas State University

501 Iroqois State University, AR 72467 (870) 972-2570 Fax (870) 972-2577

0909 Analyses (List Below) Time Time P. promelas Chronic Ľ 1714 Chronic C. dubia Date Date Other Matrix Soil tr' CLa= Lovo Aqueous Ź 1. Received By (sign) Z. Received By (sign) Grab Sample Type Comp 11:4S PO #: CRENET CARD 479-443-5613 Sample Contact: Bruce Richart **EMUnitials** 479-443-3292 Time Time Time la/i3/17 Date Remarks: g Sample Phone: Date Date Fax: 78 yes Location ပ္ပ Sympler (sign) Maynurd 5 MB004 A B B 1. Relinquished By (sign) Withdraw Mouvers 2. Relinquished By (sign) ċ ce present at delivery: Initials Sample ID Temp: Project # / Outfajl # Number **Berryville WMTP** BERRNIUE Client Name Cont.#



いて - 36,2 H - 11 W - 11 L - 20 **Ecotoxicology Research Facility** EcoToS Ecoloxicology Research Facility

Arkansas State University 501 Iroqois State University, AR 72467 (870) 972-2570 Fax (870) 972-2577

CHAIN OF CUSTODY RECORD



Client Name	Phone:	1e: 479-443-3292	3-3292								
Berryville WWTP	Fax:		13-5613						Analys	Analyses (List Below)	Below)
Project # / Outfal) #	# Od	PO #: CREDITT	REDIT CARD							se	
BERNITLE/MB001	Rem	Remarks:		, c	¢	(eic		
Sampler (sign) Manner		Contact: Bruce Richart	Richart	C	1, 7, 9, 1	CL _A = 20.10	0		Chron Chron	<u>Р. рго</u> Сћгоп	
Cont.# Sample ID // Location	on Sample		Sample	Sample Type	Type	_	Matrix				
Number	Date		Time	Comp	Grab ∣	Aqueous	Soil	Other			
MB	Har Ind	1700 BUG 17	COL 12/1/1700 13/13/10 0600-0600	X	¥ \	X			X		
	•	1 1									
									-		
Ice present at delivery: <u>X</u>	yes	00 <u>8161</u>	<u>elc</u> Initials								
Temp: 0.5 %	°C										
Initials (21							- -				
1, Religquished By (sign)	Date	- -		1. Received By (sign)	id By (sig	, (ui	-		Date	Time	e
Michael Warnerd	13/15/	15/17	11:45	Al	WEREAC	K, Conz	5		121617	_	0910
2. Relinquished By (sign)	Dafe	e (Time	2. Receive	ed By (siç) (ut			Date	Time	ЭС
										_	