



Ecotoxicology Research Facility



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November 3, 2016

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 October 22, 2016. No lethal or sublethal effects were measured in *Ceriodaphnia dubia* or *Pimephales promelas* exposed to the treated effluent dilutions.

All test conditions and acceptability criteria (other than mentioned above) as suggested by our laboratory and the US EPA were met during these tests.

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

Sincerely,

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

Facility Director / Lab Contact: Jennifer Bouldin
 Phone: (870) 972-2570

Client: Berryville Waste Water Treatment
 1000 W. Cedarvale Road
 Berryville, AR 72616

Contact: Bruce Richart
 (479) 443-3292
 (479) 443-5613 (f)

NPDES Permit #: AR0021792 AFIN#: 08-00034
 Effluent Sampling Point/Type: 24hr Composite

Samples Collected:

Sample #	Sampling Times	Received	Arrival Temp
1	10/23/16 0600 hrs to 10/24/16 0600 hrs	10/25/16 0920 hrs	2.0 °C
2	10/25/16 0600 hrs to 10/26/16 0600 hrs	10/27/16 0850 hrs	2.1 °C
3	10/27/16 0600 hrs to 10/28/16 0600 hrs	10/29/16 1105 hrs	1.1 °C

Test Methods:

7-Day Chronic Toxicity, Static renewal, Cladoceran, EPA 821/R-02/013, Section 13
 7-Day Chronic Toxicity, Static renewal, Fathead minnow, EPA 821/R-02/013, Section 11

Organisms: *C. dubia* <24hrs, *P. promelas* <24hrs Culture Source: ASU Ecotox

Dilutions: 0%, 32%, 42%, 56%, 75%, 100% Critical Dilution: 100%

Statistical Method: Toxcalc 5.0.25


<i>C. dubia</i>			<i>P. promelas</i>		
	whole effluent toxicity			whole effluent toxicity	
	lethality	sublethality		lethality	sublethality
DMR Code	22414 10	22414 P0	DMR Code	22414 10	22414 P0
Result	100%	100%	Result	100%	100%
DMR Code	lethality TGP3B	sublethality TLP3B	DMR Code	lethality TGP6C	sublethality TLP6C
Result	0	0	Result	0	0
DMR Code	NOEC lethality TOP3B	NOEC sublethal TPP3B	DMR Code	NOEC lethality TOP6C	NOEC sublethal TPP6C
Result	100%	100%	Result	100%	100%
DMR Code	CV% TQP3B		DMR Code	CV% TQP6C	
Result	39.0%		Result	18.7%	
	control survival 100%	control mean reproduction 22.3		control survival 95%	control mean weight 0.6897 mg
	critical dil. survival 100%	critical mean reproduction 19.7		critical dil. survival 100%	critical mean weight 0.7665 mg
	MSDp 0.3057			MSDp 0.1832	

Results Summary: No lethal or sublethal effects were measured to *P. promelas* or *C. dubia* exposed to treated effluent dilutions.

QA/Reference Testing:

Data attached

Reviewed By:


 Jennifer L. Bouldin, Director ASU Ecotoxicology Research Facility

Toxicity Test Performed: 7-day *Ceriodaphnia dubia* Survival and Reproduction
 Effluent Sampling Point: Berryville Waste Water Plant
 Date Test Started: 10/25/16 *C. dubia*
 Time Test Started: 1236 *C. dubia*
 Date Test Terminated: 11/01/16 *C. dubia*
 Time Test Terminated: 1240 *C. dubia*
 Laboratory Analyst: Sweeney/Nicholson

Toxicity Test Performed: 7-day *Pimephales promelas* Survival and Growth
 Effluent Sampling Point: Berryville Waste Water Plant
 Date Test Started: 10/25/16 *P. promelas*
 Time Test Started: 1300 *P. promelas*
 Date Test Terminated: 11/01/16 *P. promelas*
 Time Test Terminated: 1400 *P. promelas*
 Laboratory Analyst: Sanchez-Gonzales

I. Test Methods

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

<u>Test</u>	<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: Short Term Methods for Estimating the Chronic Toxicity of Effluents to Freshwater Organisms

<u>Test</u>	<u>Method</u>
Cladoceran Survival and Reproduction	Section 13
Fathead Minnow Survival and Growth	Section 11

II. Test Organisms

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

- B. Name: *Pimephales promelas* (Fathead minnow)
Source: Laboratory Culture
Age: <24 hours
Life Stage: Larval

III. External Factors

A. Incubator

Temperature (°C)

Average: 24.8

Range: 24.5-25.0

Light Cycle: 16 hours light/ 8 hours dark

Light Intensity: 100 footcandles

Control Water: Moderately Hard Synthetic Water (#977/978)

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 09052016) and yeast/cereal/trout chow mix (#YCT 09142016) one hour prior to test setup and once daily thereafter.

C. *Pimephales promelas*

Test Chambers: 250 ml storage dishes

Volume per Chamber: 200 ml

Number of Organisms per Chamber: 8

Number of Replicates per Concentration: 5

Acclimation: Laboratory control water was added to cultures until >50% of the culture water consisted of control water.

Food: Larval fish were fed 0.15ml of laboratory-cultured *Artemia* brine shrimp one hour prior to test setup and then 3X daily thereafter.

IV. Quality Assurance

A. Standard Toxicant: Sodium Chloride

B. Organism: *Ceriodaphnia dubia*

Date and time of Reference Toxicant Test

Start: 10/10/16

Terminated: 10/17/16

Time of Reference Toxicant Test

Start: 1615

Terminated: 1530

Laboratory Analyst: McCauley

Dilution Water Used: Moderately Hard Synthetic Water #976

Results: Survival and Reproduction within control limits

Survival

LOEC: 1.82 g/L NaCl

EC50: 1.73 g/L NaCl

Reproduction

LOEC: 0.89 g/L NaCl

IC25: 0.76 g/L NaCl

C. Organism: *Pimephales promelas*

Date of Reference Toxicant Test

Start: 10/05/16

Terminated: 10/12/16

Time of Reference Toxicant Test

Start: 1540

Terminated: 1600

Laboratory Analyst: McCauley

Dilution Water Used: Moderately Hard Synthetic Water #976

Results: Survival and Growth within control limits

Survival

LOEC: 5.63 g/L NaCl

EC50: 5.41 g/L NaCl

Growth

LOEC: >7.50 g/L NaCl

IC25: 5.19 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: Berryville Waste Water Plant

NPDES No.: AR0021792

		<u>Time</u>	<u>Date</u>	to	<u>Time</u>	<u>Date</u>
Composite 1:	Collected from	0600	10/23/16		0800	10/24/16
Composite 2:	Collected from	0600	10/25/16		0800	10/26/16
Composite 3:	Collected from	0600	10/27/16		0800	10/28/16

Test Initiated: 1236

Date: 10/25/16

Time Terminated: 1240

Date: 11/01/16

Dilution H₂O: MH 977/978

PERCENT SURVIVAL

Percent Effluent

<u>Time of Reading</u>	<u>Control</u>	<u>32%</u>	<u>42%</u>	<u>56%</u>	<u>75%</u>	<u>100%</u>
24h	100	100	100	100	100	100
48h	100	100	100	100	100	100
7 day	100	100	100	100	90	100

NUMBER OF YOUNG/FEMALE @ 7 DAYS

Percent Effluent

REP	<u>0%</u>	<u>32%</u>	<u>42%</u>	<u>56%</u>	<u>75%</u>	<u>100%</u>
A	25	26	37	25	X/17	18
B	29	24	24	26	18	22
C	31	29	24	30	21	27
D	21	28	25	8	18	24
E	22	25	21	25	27	23
F	32	23	23	7	28	18
G	29	34	34	17	25	22
H	12	28	25	21	21	21
I	16	23	17	32	13	9
J	6	23	21	29	9	13
Mean	22.3	26.3	25.1	22.0	19.7	19.7
CV%*	39.0	13.4	24.0	39.9	30.6	27.3

*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 X No

2. 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 #TGP3B: 0

4. If the NOEC for reproduction is less than the critical dilution, enter [1], otherwise enter [0] for parameter #TLP3B: 0

5. Report the NOEC value for survival, Parameter #TOP3B:
NOEC survival 100 % 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 39.0% (control)

Whole Effluent Lethality Values for *Ceriodaphnia dubia*

1. Report the Whole Effluent Lethality values for the 30-Day average minimum, Parameter #22414:
Daily Average Minimum NOEC: 100%

2. Report the Whole Effluent Lethality values for the 7-day minimum, Parameter #22414:
7-Day Minimum NOEC: 100%

WET Testing Summary Form
***Ceriodaphnia dubia* (Cladoceran)**
Chemical Parameters Chart

Permittee: Berryville Wastewater Plant Sample No. 1 Collected Ending Date: 10/24/16 Time: 0600
 NPDES No.: AR0021792 Sample No. 2 Collected Ending Date: 10/26/16 Time: 0600
 Contact: Bruce Richart Sample No. 3 Collected Ending Date: 10/28/16 Time: 0600
 Analyst: Sweeney/Nicholson Test Begin: Date: 10/25/16 Time: 1236 Test End: Date: 11/01/16 Time: 1240

Initial Water Chemistry for Chronic Tests								
Project: Berryville WWTP – <i>C. dubia</i>								
Test day		0	1	2	3	4	5	6
Date		10/25/2016	10/26/2016	10/27/2016	10/28/2016	10/29/2016	10/30/2016	10/31/2016
H ₂ O #		MH977	MH977	MH977	MH977	MH977	MH977	MH978
Temp (°C)	Control	22.8	22.6	23.2	22.2	22.0	20.5	23.4
	32%	22.0	22.7	23.5	22.0	22.0	21.0	23.2
	42%	23.0	23.8	23.0	22.0	22.0	21.0	23.5
	56%	23.0	23.8	23.0	22.5	22.1	21.0	23.5
	75%	23.0	24.0	23.8	22.5	22.1	21.0	23.2
	100%	23.0	24.0	24.0	22.5	22.1	21.0	23.6
pH (Standard Units)	Control	8.06	8.07	8.06	8.03	8.10	8.18	8.15
	32%	8.25	8.38	8.28	8.21	8.20	8.32	8.43
	42%	8.26	8.42	8.29	8.21	8.19	8.30	8.45
	56%	8.27	8.45	8.30	8.21	8.19	8.30	8.48
	75%	8.31	8.54	8.32	8.30	8.20	8.28	8.50
	100%	8.31	8.58	8.40	8.29	8.24	8.23	8.50
DO (mg/L)	Control	8.8	8.9	8.7	8.8	8.5	8.7	8.9
	32%	8.9	8.9	8.9	8.8	8.7	8.9	8.8
	42%	8.8	8.5	8.8	8.7	8.8	8.7	8.6
	56%	8.8	8.4	8.8	8.7	8.8	8.7	8.6
	75%	8.8	8.0	8.8	8.7	8.8	8.6	8.5
	100%	8.7	7.9	8.8	8.6	8.8	8.7	8.5
Cond (µS/cm)	Control	308	304	306	307	309	308	308
	32%	634	631	623	621	686	676	679
	42%	734	749	718	716	808	786	791
	56%	873	903	843	862	998	955	955
	75%	1071	1117	1050	1055	1228	1175	1180
	100%	1328	1420	1315	1295	1521	1509	1502
Alk (mg/L)	Control	62		62		62		60
	100%	276		286		300		
Hard (mg/L)	Control	90		90		90		100
	100%	200		220		200		

WET Testing Summary Form
***Ceriodaphnia dubia* (Cladoceran)**
Chemical Parameters Chart

Permittee: Berryville Wastewater Plant

Sample No. 1 Collected

Ending Date: 10/24/16 Time: 0600

NPDES No.: AR0021792

Sample No. 2 Collected

Ending Date: 10/26/16 Time: 0600

Contact: Bruce Richart

Sample No. 3 Collected

Ending Date: 10/28/16 Time: 0600

Analyst: Sweeney/Nicholson

Test Begin: Date: 10/25/16 Time: 1236 Test End: Date: 11/01/16 Time: 1240

Final Water Chemistry for Chronic Tests								
Project: Berryville WWTP – <i>C. dubia</i>								
Test day		1	2	3	4	5	6	7
Date		10/26/2016	10/27/2016	10/28/2016	10/29/2016	10/30/2016	10/31/2016	11/1/2016
H ₂ O #		MH977	MH977	MH977	MH977	MH977	MH977	MH978
Temp (°C)	Control	23.0	22.7	23.0	23.0	21.0	23.0	23.0
	32%	22.9	22.5	23.0	23.0	21.0	23.0	22.5
	42%	23.3	22.3	23.0	23.0	20.5	23.1	23.0
	56%	23.3	22.3	23.5	22.9	21.0	23.2	22.9
	75%	23.6	23.0	23.5	23.0	21.0	23.2	23.0
	100%	23.6	23.0	23.4	23.0	21.0	23.2	22.5
pH (Standard Units)	Control	8.37	8.47	8.39	8.20	7.90	8.39	8.17
	32%	8.66	8.75	8.77	8.87	8.77	8.98	8.99
	42%	8.70	8.84	8.84	8.83	8.85	9.06	8.97
	56%	8.75	8.86	8.85	8.92	8.86	9.09	9.06
	75%	8.78	8.87	8.94	8.92	8.95	9.07	9.05
	100%	8.83	8.93	8.98	8.97	8.98	9.18	9.10
DO (mg/L)	Control	9.1	9.4	8.9	9.1	8.9	8.9	8.8
	32%	9.3	9.3	8.9	9.6	9.2	9.6	9.1
	42%	9.5	9.7	9.1	9.9	9.4	9.8	9.4
	56%	9.6	9.7	9.2	9.8	9.5	10.0	9.6
	75%	9.6	9.7	9.2	9.8	9.5	9.9	9.7
	100%	9.6	9.6	9.2	9.8	9.6	10.1	9.7

SUMMARY REPORTING FORM
WET Testing
Fathead Minnow Larvae (*Pimephales promelas*) Survival and Growth

Permittee: Berryville Waste Water Plant

NPDES No.: AR0021792

		<u>Time</u>	<u>Date</u>		<u>Time</u>	<u>Date</u>
Composite 1:	Collected from	0600	10/23/16	to	0600	10/24/16
Composite 2:	Collected from	0600	10/25/16	to	0600	10/26/16
Composite 3:	Collected from	0600	10/27/16	to	0600	10/28/16

Test Initiated: 1300

Date: 10/25/16

Time Terminated: 1400

Date: 11/01/16

Dilution H₂O: MH 977/978

DATA TABLE FOR SURVIVAL

Effluent Conc. %	% Survival in Replicate Chambers					Mean % Survival			CV%
	A	B	C	D	E	24h	48h	7days	
	Control	87.5	87.5	100	100	100	100	97.5	
32	100	100	100	100	100	100	100	100	0
42	100	100	100	100	100	100	100	100	0
56	100	87.5	100	100	100	100	97.5	97.5	6.1
75	100	100	100	100	100	100	100	100	0
100	100	100	100	100	100	100	100	100	0

DATA TABLE FOR GROWTH

Effluent Conc %	Average Dry Weight in Replicate Chambers (mg)					Mean Dry Weight (mg)	CV%
	A	B	C	D	E		
Control	0.8043	0.7143	0.6963	0.6050	0.6288	0.6897	11.4
32	0.8275	0.6262	0.7025	0.6725	0.7425	0.7142	10.7
42	0.8100	0.7462	0.6162	0.6975	0.7488	0.7237	10.0
56	0.7025	0.6786	0.6162	0.6937	0.7075	0.6797	5.5
75	0.6500	0.7088	0.6637	0.6563	0.7975	0.6952	8.9
100	0.8612	0.6150	0.9663	0.6800	0.7100	0.7665	18.7

Coefficient of Variation = Standard Deviation x 100/Mean

Fathead Minnow Larvae (*Pimephales promelas*) Survival and Growth

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 X No

2. DUNNETT'S PROCEDURE OR STEEL'S MANY-ONE RANK TEST AS APPROPRIATE:

Is the mean growth by *P. promelas* in the critical dilution (100%) significantly different (p=0.05) than the growth in control exposures?

_____ Yes X No

3. If the NOEC for survival is less than the critical dilution, enter [1], otherwise enter [0] for parameter #TGP6C: 0

4. If the NOEC for growth is less than the critical dilution, enter [1], otherwise enter [0] for parameter #TLP6C: 0

5. Report the NOEC value for survival, Parameter #TOP6C:
NOEC survival 100 % effluent

6. Report the NOEC value for growth, Parameter #TPP6C:
NOEC growth 100 % effluent

7. Report the % coefficient of variation (largest of low flow and control dilutions), Parameter #TQP6C: CV % growth 18.7 % (critical)

Whole Effluent Lethality Values

1. Report the Whole Effluent Lethality values for the 30-Day average minimum, Parameter #22414:

Daily Average Minimum NOEC: 100%

2. Report the Whole Effluent Lethality values for the 7-day minimum, Parameter #22414:

7-Day Minimum NOEC: 100%

WET Testing Summary Form
Fathead Minnow Larvae (*Pimephales promelas*)
Chemical Parameters Chart

Permittee: Berryville Wastewater Plant

Sample No. 1 Collected Ending Date: 10/28/16 Time: 0600

NPDES No.: AR0021792

Sample No. 2 Collected Ending Date: 10/26/16 Time: 0600

Contact: Bruce Richart

Sample No. 3 Collected Ending Date: 10/28/16 Time: 0600

Analyst: Sanchez-Gonzales

Test Begin: Date: 10/25/16 Time: 1300 Test End: Date: 11/01/16 Time: 1400

Initial Water Chemistry for Chronic Tests								
Project: Berryville WWTP – <i>P. promelas</i>								
Test day		0	1	2	3	4	5	6
Date		10/25/2016	10/26/2016	10/27/2016	10/28/2016	10/29/2016	10/30/2016	10/31/2016
H ₂ O #		MH977	MH977	MH977	MH977	MH977	MH977	MH978
Temp (°C)	Control	22.8	22.6	23.2	22.2	22.0	20.5	23.4
	32%	22.0	22.7	23.5	22.0	22.0	21.0	23.2
	42%	23.0	23.8	23.0	22.0	22.0	21.0	23.5
	56%	23.0	23.8	23.0	22.5	22.1	21.0	23.5
	75%	23.0	24.0	23.8	22.5	22.1	21.0	23.2
	100%	23.0	24.0	24.0	22.5	22.1	21.0	23.6
pH (Standard Units)	Control	8.06	8.07	8.06	8.03	8.10	8.18	8.15
	32%	8.25	8.38	8.28	8.21	8.20	8.32	8.43
	42%	8.26	8.42	8.29	8.21	8.19	8.30	8.45
	56%	8.27	8.45	8.30	8.21	8.19	8.30	8.48
	75%	8.31	8.54	8.32	8.30	8.20	8.28	8.50
	100%	8.31	8.58	8.40	8.29	8.24	8.23	8.50
DO (mg/L)	Control	8.8	8.9	8.7	8.8	8.5	8.7	8.9
	32%	8.9	8.9	8.9	8.8	8.7	8.9	8.8
	42%	8.8	8.5	8.8	8.7	8.8	8.7	8.6
	56%	8.8	8.4	8.8	8.7	8.8	8.7	8.6
	75%	8.8	8.0	8.8	8.7	8.8	8.6	8.5
	100%	8.7	7.9	8.8	8.6	8.8	8.7	8.5
Cond (µS/cm)	Control	308	304	306	307	309	308	308
	32%	634	631	623	621	686	676	679
	42%	734	749	718	716	808	786	791
	56%	873	903	843	862	998	955	955
	75%	1071	1117	1050	1055	1228	1175	1180
	100%	1328	1420	1315	1295	1521	1509	1502
Alk (mg/L)	Control	62		62		62		60
	100%	276		286		300		
Hard (mg/L)	Control	90		90		90		100
	100%	200		220		200		

WET Testing Summary Form
Fathead Minnow Larvae (*Pimephales promelas*)
Chemical Parameters Chart

Permittee: Berryville Wastewater Plant

Sample No. 1 Collected Ending Date: 10/28/16 Time: 0600

NPDES No.: AR0021792

Sample No. 2 Collected Ending Date: 10/26/16 Time: 0600

Contact: Bruce Richart

Sample No. 3 Collected Ending Date: 10/28/16 Time: 0600

Analyst: Sanchez-Gonzales

Test Begin: Date: 10/25/16 Time: 1300 Test End: Date: 11/01/16 Time: 1400

Final Water Chemistry for Chronic Tests								
Project: Berryville WWTP– <i>P. promelas</i>								
Test day		1	2	3	4	5	6	7
Date		10/26/2016	10/27/2016	10/28/2016	10/29/2016	10/30/2016	10/31/2016	11/1/2016
H ₂ O #		MH977	MH977	MH977	MH977	MH977	MH977	MH978
Temp (°C)	Control	21.9	21.9	21.0	24.0	23.1	22.5	23.2
	32%	22.4	22.9	21.5	23.9	22.9	22.6	23.5
	42%	22.7	22.1	21.5	23.5	22.9	23.0	23.5
	56%	21.9	23.0	21.5	23.2	22.9	23.2	23.2
	75%	22.0	22.5	21.9	23.2	22.4	23.8	23.5
	100%	23.0	23.1	22.0	23.2	22.2	23.9	23.7
pH (Standard Units)	Control	7.80	7.47	7.58	7.45	7.64	7.55	7.64
	32%	8.18	7.92	7.87	7.42	8.05	7.97	8.00
	42%	8.27	8.11	8.04	8.09	8.13	8.11	8.08
	56%	8.38	8.28	8.04	8.12	8.21	8.27	8.23
	75%	8.41	8.38	8.35	8.25	8.32	8.39	8.37
	100%	8.53	8.50	8.48	8.43	8.46	8.49	8.42
DO (mg/L)	Control	8.5	7.6	6.4	6.5	7.1	6.6	7.0
	32%	8.4	7.0	6.0	6.1	6.8	6.4	6.7
	42%	8.2	6.8	5.7	6.4	6.9	6.3	6.4
	56%	8.2	6.9	5.7	6.4	6.7	6.4	6.4
	75%	8.2	7.0	6.2	6.2	6.5	6.6	6.5
	100%	7.9	6.9	6.4	6.3	6.5	6.6	6.5

Ceriodaphnia Survival and Reproduction Test-Reproduction

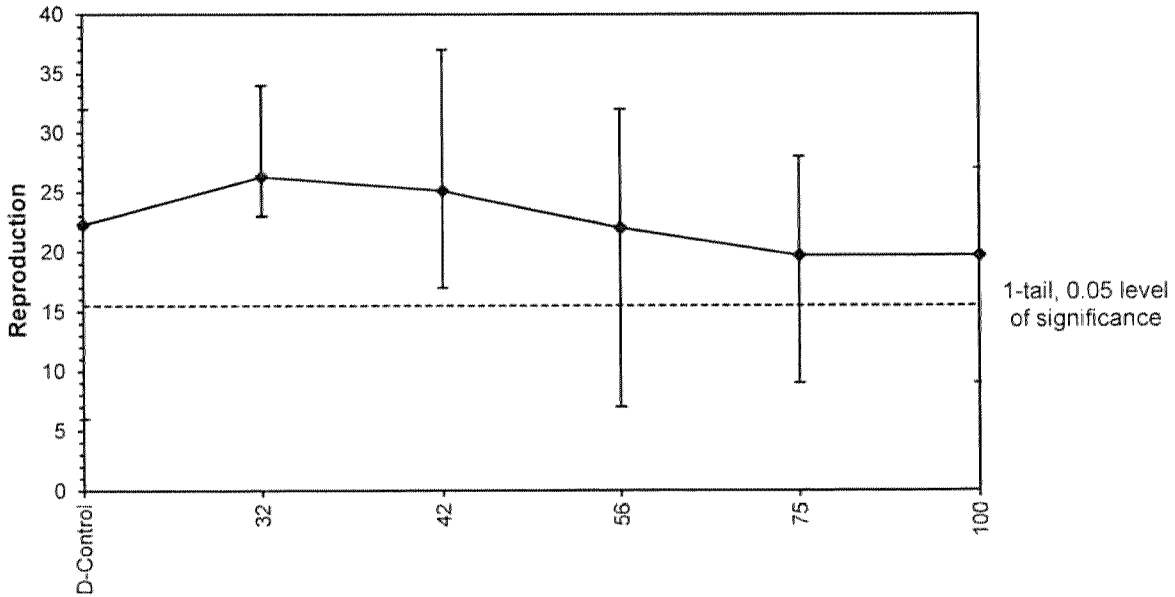
Start Date: 10/25/2016 12:36 Test ID: Berryville Sample ID: AR0021792-NPDES Permit #
 End Date: 11/1/2016 12:40 Lab ID: ASU ERF Sample Type: EFF1-POTW
 Sample Date: Protocol: EPAF 02-EPA Freshwater Test Species: CD-Ceriodaphnia dubia
 Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	25.000	29.000	31.000	21.000	22.000	32.000	29.000	12.000	16.000	6.000
32	26.000	24.000	29.000	28.000	25.000	23.000	34.000	28.000	23.000	23.000
42	37.000	24.000	24.000	25.000	21.000	23.000	34.000	25.000	17.000	21.000
56	25.000	26.000	30.000	8.000	25.000	7.000	17.000	21.000	32.000	29.000
75	17.000	18.000	21.000	18.000	27.000	28.000	25.000	21.000	13.000	9.000
100	18.000	22.000	27.000	24.000	23.000	18.000	22.000	21.000	9.000	13.000

Conc-%	Mean	N-Mean	Transform: Untransformed					t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%	N			
D-Control	22.300	1.0000	22.300	6.000	32.000	38.982	10			
32	26.300	1.1794	26.300	23.000	34.000	13.419	10	-1.342	2.287	6.817
42	25.100	1.1256	25.100	17.000	37.000	24.011	10	-0.939	2.287	6.817
56	22.000	0.9865	22.000	7.000	32.000	39.915	10	0.101	2.287	6.817
75	19.700	0.8834	19.700	9.000	28.000	30.555	10	0.872	2.287	6.817
100	19.700	0.8834	19.700	9.000	27.000	27.289	10	0.872	2.287	6.817

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Kolmogorov D Test indicates normal distribution ($p > 0.01$)	0.67271	1.035	-0.48197	0.08556						
Bartlett's Test indicates equal variances ($p = 0.12$)	8.84298	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	6.81653	0.30567	74.3367	44.4315	0.15687	5, 54

Dose-Response Plot



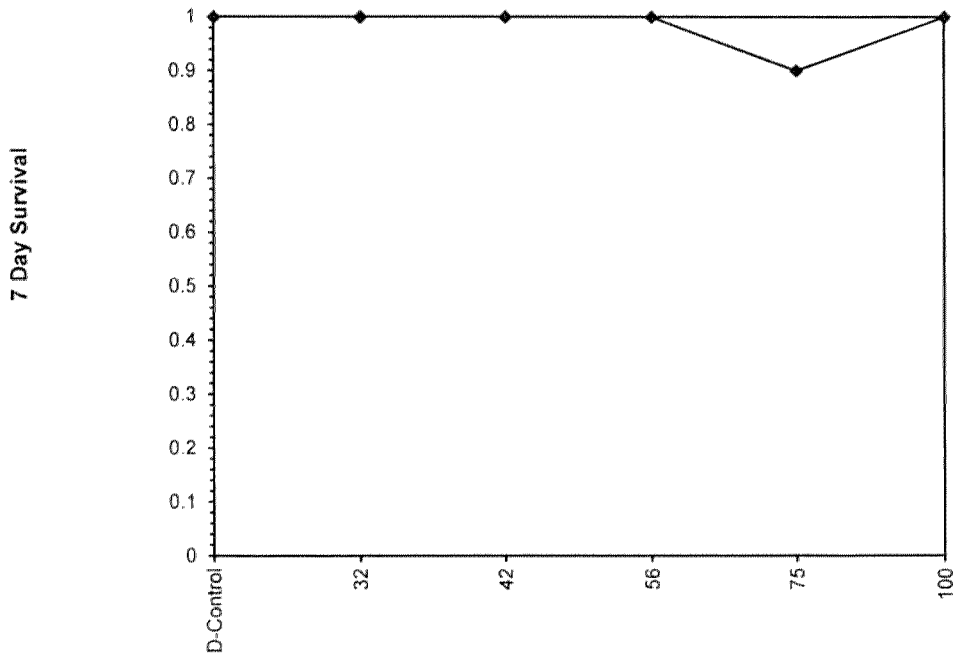
Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date: 10/25/2016 12:36 Test ID: Berryville Sample ID: AR0021792-NPDES Permit #
 End Date: 11/1/2016 12:40 Lab ID: ASU ERF Sample Type: EFF1-POTW
 Sample Date: Protocol: EPAF 02-EPA Freshwater Test Species: CD-Ceriodaphnia dubia
 Comments:

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	0.0000	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

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed 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	0.9000	0.9000	1	9	10	10	0.5000	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



CHRONIC TEST DATA SHEET
Ceriodaphnia dubia

Project: Berryville Beginning Date: 102516 Time: 1236 Test Species: C. dubia
 Dilution H₂O: MH977 Ending Date: 110116 Time: 1240 Age: <24 hours
MH978 B-ville
 Test Type: (*)Static Renewal () Flowthrough Toxicant/Effluent: B-ville

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Neonates
Control	1	0	0	0	3	0	8	14	25
	2	↓	↓	↓	3	2	10	14	29
	3				4	2	9	16	31
	4				5	8	0	8	21
	5				6	7	0	9	22
	6				4	9	9	10	32
	7				4	0	10	15	29
	8				0	4	8	0	12
	9				0	5	11	0	14
	10				0	6	0	0	6
32%	1				0	0	0	5	8
	2	↓	↓	↓	5	8	0	11	24
	3				5	0	9	15	29
	4				7	6	3	12	28
	5				7	7	0	11	25
	6				5	5	0	13	23
	7				3	0	12	19	34
	8				4	0	10	14	28
	9				0	0	9	14	23
	10				4	7	0	12	23
Date					102616	102716	102816	102916	103016
Initials		gs	den	den	f	f	gs	den	den

CHRONIC TEST DATA SHEET
Ceriodaphnia dubia

Project: Berryville Beginning Date: 102516 Time: 1236 Test Species: C. dubia

Dilution H₂O: MH977 Ending Date: _____ Time: _____ Age: 24 hours
MH978

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

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Neonates
42%	1	0	0	0	6	5	11	15	37
	2	↓	↓	↓	4	8	0	12	24
	3	↓	↓	↓	6	6	0	12	24
	4	↓	↓	↓	4	0	10	11	25
	5	↓	↓	↓	5	3	0	13	21
	6	↓	↓	↓	4	7	0	11	23
	7	↓	↓	↓	5	5	11	13	34
	8	↓	↓	↓	3	0	12	10	25
	9	↓	↓	↓	5	0	5	7	17
	10	↓	↓	↓	5	7	0	9	21
56%	1	0	0	0	5	8	2	10	25
	2	↓	↓	↓	4	9	0	13	26
	3	↓	↓	↓	3	6	9	12	30
	4	↓	↓	↓	0	0	3	5	8
	5	↓	↓	↓	4	7	0	14	25
	6	↓	↓	↓	1	6	0	0	7
	7	↓	↓	↓	1	0	0	14	17
	8	↓	↓	↓	3	0	8	10	21
	9	↓	↓	↓	6	5	7	14	32
	10	↓	↓	↓	5	8	0	14	29
Date		102616	102716	102816	102916	103016	103116	110116	110116
Initials		op	den	den	f	f	op	den	den

CHRONIC TEST DATA SHEET
Ceriodaphnia dubia

Project: Berryville Beginning Date: 102516 Time: 1236 Test Species: C. dubia

Dilution H₂O: MH977 Ending Date: 11 01 16 Time: 1240 Age: <24 hours
MH978

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

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Neonates
75%	1	0	0	0	5	3	9	X-1	X/17
	2	↓	↓	↓	1	0	8	9	18
	3	↓	↓	↓	4	6	0	11	21
	4	↓	↓	↓	3	0	10	5	18
	5	↓	↓	↓	6	10	0	11	27
	6	↓	↓	↓	6	8	7	7	28
	7	↓	↓	↓	4	3	8	10	25
	8	↓	↓	↓	3	0	10	8	21
	9	↓	↓	↓	4	0	2	7	13
	10	↓	↓	↓	1	2	0	6	9
100%	1	0	0	0	1	7	0	10	18
	2	↓	↓	↓	5	7	0	10	22
	3	↓	↓	↓	5	9	0	13	27
	4	↓	↓	↓	5	8	0	11	24
	5	↓	↓	↓	4	8	0	11	23
	6	↓	↓	↓	2	0	10	6	18
	7	↓	↓	↓	4	0	11	7	22
	8	↓	↓	↓	3	0	8	10	21
	9	↓	↓	↓	3	0	0	6	9
	10	↓	↓	↓	4	1	8	0	13
Date		102616	102716	102816	102916	103014	103116	110116	110116
Initials		gs	den	den	f	f	gs	den	den

Larval Fish Growth and Survival Test-7 Day Survival

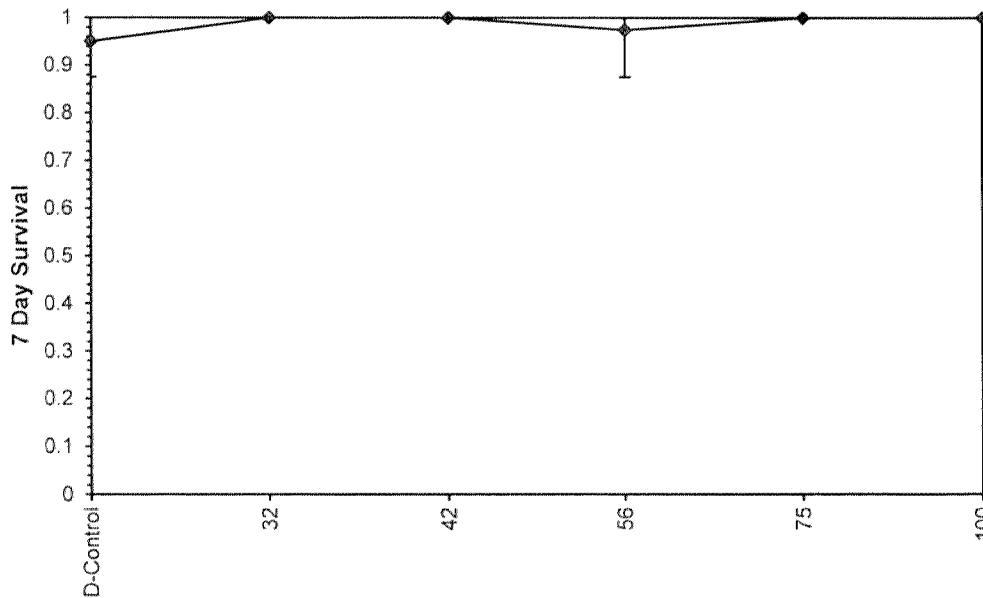
Start Date: 10/25/2016 13:00 Test ID: Berryville Sample ID: AR0021792-NPDES Permit #
 End Date: 11/1/2016 14:00 Lab ID: ASU ERF Sample Type: EFF1-POTW
 Sample Date: Protocol: EPAF 02-EPA Freshwater Test Species: PP-Pimephales promelas
 Comments:

Conc-%	1	2	3	4	5
D-Control	0.8750	0.8750	1.0000	1.0000	1.0000
32	1.0000	1.0000	1.0000	1.0000	1.0000
42	1.0000	1.0000	1.0000	1.0000	1.0000
56	1.0000	0.8750	1.0000	1.0000	1.0000
75	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%		
D-Control	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5	
32	1.0000	1.0526	1.3931	1.3931	1.3931	0.000	5	32.50
42	1.0000	1.0526	1.3931	1.3931	1.3931	0.000	5	32.50
56	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	30.00
75	1.0000	1.0526	1.3931	1.3931	1.3931	0.000	5	32.50
100	1.0000	1.0526	1.3931	1.3931	1.3931	0.000	5	32.50

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.71382	0.9	-1.46876	3.36952
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Growth

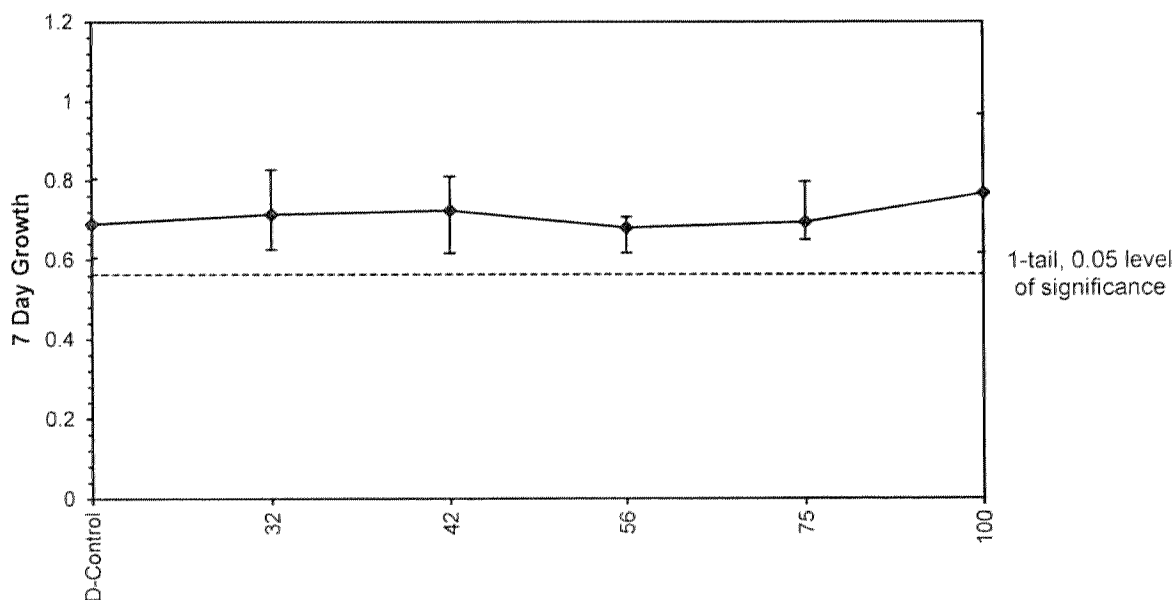
Start Date: 10/25/2016 13:00 Test ID: Berryville Sample ID: AR0021792-NPDES Permit #
 End Date: 11/1/2016 14:00 Lab ID: ASU ERF Sample Type: EFF1-POTW
 Sample Date: Protocol: EPAF 02-EPA Freshwater Test Species: PP-Pimephales promelas
 Comments:

Conc-%	1	2	3	4	5
D-Control	0.8043	0.7143	0.6963	0.6050	0.6288
32	0.8275	0.6262	0.7025	0.6725	0.7425
42	0.8100	0.7462	0.6162	0.6975	0.7488
56	0.7025	0.6786	0.6162	0.6937	0.7075
75	0.6500	0.7088	0.6637	0.6563	0.7975
100	0.8612	0.6150	0.9663	0.6800	0.7100

Conc-%	Mean	N-Mean	Transform: Untransformed					t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%	N			
D-Control	0.6897	1.0000	0.6897	0.6050	0.8043	11.386	5			
32	0.7142	1.0356	0.7142	0.6262	0.8275	10.674	5	-0.458	2.360	0.1263
42	0.7237	1.0493	0.7237	0.6162	0.8100	9.967	5	-0.636	2.360	0.1263
56	0.6797	0.9855	0.6797	0.6162	0.7075	5.464	5	0.187	2.360	0.1263
75	0.6952	1.0080	0.6952	0.6500	0.7975	8.866	5	-0.103	2.360	0.1263
100	0.7665	1.1113	0.7665	0.6150	0.9663	18.737	5	-1.434	2.360	0.1263

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution ($p > 0.01$)	0.97105	0.9	0.48523	0.34963						
Bartlett's Test indicates equal variances ($p = 0.23$)	6.93892	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	0.12634	0.18318	0.00493	0.00716	0.63699	5, 24

Dose-Response Plot



CHRONIC TEST DATA SHEET

Pimephales promelas

Project: Berryville Beginning Date: 10/25/16 Time: 1300 Test Species: P. promelas

Berryville

Dilution H₂O: ~~MH977~~ MH978 Ending Date: 11/01/16 Time: 1400 Age: < 24hrs

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

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Pan #
Control	1	8/0	8/0	8/0	8/0	8/0	7/0	7/0	1
	2	8/0	8/1	7/0	7/0	7/0	7/0	7/0	2
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	3
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	4
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	5
32%	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	6
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	7
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	8
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	9
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	10
42%	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	11
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	12
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	13
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	14
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	15
56%	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	16
	2	8/0	8/1	7/0	7/0	7/0	7/0	7/0	17
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	18
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	19
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	20
Date		10/26/16	10/27/16	10/28/16	10/29/16	10/30/16	10/31/16	11/01/16	
Initials		ISG	ISG	jm	ISG	ISG	LAAB	LAAB	

CHRONIC TEST DATA SHEET

Pimephales promelas

Project: Berryville Beginning Date: 102516 Time: 1300 Test Species: P.promelas

Berryville

Dilution H₂O: ~~MH977~~ MH978 Ending Date: 110116 Time: 1400 Age: < 24hrs

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

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Pan #
75%	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	21
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	22
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	23
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	24
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	25
100%	1	8/0	8/0	8/0	8/0	8/0	8/0	8/0	26
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	27
	3	8/0	8/0	8/0	8/0	8/0	8/0	8/0	28
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	29
	5	8/0	8/0	8/0	8/0	8/0	8/0	8/0	30
Date		102616	102716	102816	102916	103016	103116	110116	
Initials		ISG	ISG	Jan	ISG	ISG	VARB	VARB	

Initial Water Chemistry for Chronic Tests
 Project: Berryville - *C. dubia* / *P. promelas*

Test Day:		0	1	2	3	4	5	6
Date:		102516	102616	102716	102816	102916	103016	103116
H ₂ O Batch #:		MH977	MH977	MH977	MH977	MH977	MH977	MH978
Temp. (°C)	Control	22.8	22.6	23.2	22.2	22.0	20.5	23.4
	32%	22.0	22.7	23.5	22.0	22.0	21.0	23.2
	42%	23.0	23.8	23.0	22.0	22.0	21.0	23.5
	56%	23.0	23.8	23.0	22.5	22.1	21.0	23.5
	75%	23.0	24.0	23.8	22.5	22.1	21.0	23.2
	100%	23.0	24.0	24.0	22.5	22.1	21.0	23.6
pH	Control	8.00	8.07	8.00	8.03	8.10	8.18	8.15
	32%	8.25	8.38	8.28	8.21	8.20	8.32	8.43
	42%	8.26	8.42	8.29	8.21	8.19	8.30	8.45
	56%	8.27	8.45	8.30	8.21	8.19	8.30	8.48
	75%	8.31	8.54	8.32	8.30	8.20	8.29	8.50
	100%	8.31	8.58	8.40	8.29	8.24	8.23	8.50
DO (mg/L)	Control	8.87	8.9	8.7	8.8	8.5	8.7	8.9
	32%	8.9	8.9	8.9	8.8	8.7	8.9	8.8
	42%	8.8	8.5	8.8	8.7	8.8	8.7	8.6
	56%	8.8	8.4	8.8	8.7	8.8	8.7	8.6
	75%	8.8	8.0	8.8	8.7	8.8	8.6	8.5
	100%	8.7	7.9	8.8	8.6	8.8	8.7	8.5
Cond. (µS/cm)	Control	308	304	300	307	309	308	308
	32%	634	631	623	621	686	676	679
	42%	734	749	718	716	808	786	791
	56%	873	903	843	862	998	955	945
	75%	1071	1117	1050	1055	1228	1175	1180
	100%	1328	1420	1315	1295	1521	1509	1502
Alk. (mg/L)	Control	62		62		62		60
	100%	274		286		300		
Hard. (mg/L)	Control	90		90		90		100
	100%	200		220		200		
Initials		aw	aw/p	aw	g	f	f	aw

Final Water Chemistry for Chronic Tests
Project: Berryville - C. dubia

Test Day:		1	2	3	4	5	6	7
Date:		10/26/16	10/27/16	10/28/16	10/29/16	10/30/16	10/31/16	11/01/16
H ₂ O Batch #:		MH977	MH977	MH977	MH977	MH977	MH977	MH978
Temp. (°C)	Control	23.0	22.7	23.0	23.0	21.0	23.0	23.0
	32%	22.9	22.5	23.0	23.0	21.0	23.0	22.5
	42%	23.3	22.3	23.0	23.0	20.5	23.1	23.0
	56%	23.3	22.3	23.5	22.9	21.0	23.2	22.9
	75%	23.6	23.0	23.5	23.0	21.0	23.2	23.0
	100%	23.6	23.0	23.4	23.0	21.0	23.2	22.5
pH	Control	8.37	8.47	8.39	8.42	7.90	8.39	8.17
	32%	8.66	8.75	8.77	8.82	8.77	8.98	8.99
	42%	8.70	8.84	8.84	8.86	8.85	9.06	8.97
	56%	8.75	8.86	8.85	8.92	8.86	9.09	9.06
	75%	8.78	8.87	8.84	8.92	8.95	9.07	9.05
	100%	8.83	8.93	8.98	8.97	8.98	9.18	9.10
DO (mg/L)	Control	9.1	9.4	8.9	9.1	8.9	8.9	8.8
	32%	9.3	9.3	8.9	9.6	9.2	9.6	9.1
	42%	9.5	9.7	9.1	9.9	9.4	9.8	9.4
	56%	9.6	9.7	9.2	9.8	9.5	10.0	9.6
	75%	9.6	9.7	9.2	9.8	9.5	9.9	9.7
	100%	9.6	9.6	9.2	9.8	9.6	10.1	9.7
Initials		gs	den	den	ja	f	gs	den

Final Water Chemistry for Chronic Tests

Project: Berryville - *P. promelas*

Test Day:		1	2	3	4	5	6	7
Date:		10/26/16	10/27/16	10/28/16	10/29/16	10/30/16	10/31/16	11/01/16
H ₂ O Batch #:		MH977	MH977	MH977	MH977	MH977	MH977	
Temp. (°C)	Control	21.9	21.9	21.0	24.0	23.1	22.5	23.2
	32%	22.4	22.9	21.5	23.9	22.9	22.6	23.5
	42%	22.7	22.1	21.5	23.5	22.9	23.0	23.5
	56%	21.9	23.0	21.5	23.2	22.9	23.2	23.2
	75%	22.0	22.5	21.9	23.2	22.4	23.8	23.5
	100%	23.0	23.1	22.0	23.2	22.2	23.9	23.7
pH	Control	7.80	7.47	7.58	7.45	7.64	7.55	7.64
	32%	8.18	7.92	7.82	7.92	8.05	7.97	8.00
	42%	8.27	8.11	8.04	8.09	8.13	8.11	8.08
	56%	8.38	8.28	8.04	8.12	8.21	8.27	8.23
	75%	8.41	8.38	8.35	8.25	8.32	8.39	8.37
	100%	8.53	8.50	8.48	8.43	8.46	8.49	8.42
DO (mg/L)	Control	8.5	7.6	6.4	6.5	7.1	6.6	7.0
	32%	8.4	7.0	6.0	6.1	6.8	6.4	6.7
	42%	8.2	6.8	5.7	6.3 6.4	6.9	6.3	6.4
	56%	8.2	6.9	5.7	6.4	6.7	6.4	6.4
	75%	8.2	7.0	6.2	6.2	6.5	6.6	6.5
	100%	7.9	6.9	6.4	6.3	6.5	6.6	6.5
Initials		ISG	ISG	fr	ISG	ISG	VARB/	VARB

CHAIN OF CUSTODY RECORD



Client Name BERRYVILLE WWTP			Phone: 479-443-3292					Analyses (List Below)											
			Fax: 479-443-5613																
Project # / Outfall # BERRYVILLE / MB001			PO #: CREDIT CARD					<table border="1"> <tr> <td rowspan="2">Chronic <i>C. dubia</i></td> <td rowspan="2">Chronic <i>P. promelas</i></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>				Chronic <i>C. dubia</i>	Chronic <i>P. promelas</i>						
Chronic <i>C. dubia</i>	Chronic <i>P. promelas</i>																		
Sampler (sign) <i>Michael Maynard</i>			Remarks: CL₂ = 0.01																
			Contact: BRUCE RICHART																
Cont. #	Sample ID Number	Location	Sample Date	Sample Time	Sample Type		Matrix												
					Comp	Grab	Aqueous	Soil	Other										
		MB 001	10/23/16 - 10/24/16	0600 - 0600	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							
Ice present at delivery: <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <i>MM</i> Initials																			
Temp: <i>Noland</i> _____ °C																			
<i>Berryville West Side</i> 7.0 °C																			
Initials <i>MM</i>																			
1 Relinquished By (sign) <i>Michael Maynard</i>			Date 10/24/16		Time 10:15		1 Received By (sign) <i>Bruce Richart</i>			Date 10/25/16		Time 09:20							
2 Relinquished By (sign)			Date		Time		2 Received By (sign)			Date		Time							

CHAIN OF CUSTODY RECORD

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

Client Name BERRYVILLE WWTP		Phone: 479-443-3292		Analyses (List Below)								
Project # / Outfall # BERRYVILLE / MB001		Fax: 479-443-5613										
Sampler (sign) <i>Michael Maynard</i>		PO # CREDIT CARD										
Remarks CL₂ = 0.01		Contact: BRUCE RICHART		Chronic C. dubia	Chronic P. promelas							
Cont. #	Sample ID Number	Location		Sample Date	Sample Time	Sample Type		Matrix				
						Comp	Grab	Aqueous	Soil	Other		
		MB	001	10/25/16-10/24/16	0600-0600	X		X			X	X
Ice present at delivery: <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <i>ser</i> Initials												
Temp: Normal <i>Berryville</i> 2.1 °C												
Temp: West Side °C												
Initials <i>ser</i>												
1. Relinquished By (sign) <i>Michael Maynard</i>		Date 10/24/16	Time 09:15	1. Received By (sign) <i>Dulquan Necton</i>		Date 10/27	Time 8:50					
2. Relinquished By (sign)		Date	Time	2. Received By (sign)		Date	Time					

CHAIN OF CUSTODY RECORD



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

Client Name BERRYVILLE WWTP			Phone: 479-443-3292			Analyses (List Below)			
Project # / Outfall # BERRYVILLE / MB001			Fax: 479-443-5613						
Sampler (sign) <i>Michael Maynard</i>			PO #: CREDIT CARD						
Remarks: CL₂ = < 0.01			Contact: BRUCE RICHART			Chronic C. dubia	Chronic P. promelas		
Cont. #	Sample ID Number	Location	Sample Date	Sample Time	Sample Type		Matrix		
					Comp	Grab	Aqueous	Soil	Other
		MB 001	10/27/16-10/28/16	0600-0600	X		X		
Ice present at delivery: <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <i>JRN</i> Initials									
Temp: Noland		1.1	°C						
West Side			°C						
Initials		<i>f</i>							
1. Relinquished By (sign) <i>Michael Maynard</i>			Date 10/28/16	Time 09:20	1. Received By (sign) JRN			Date 10/29/16	Time 1105
2. Relinquished By (sign)			Date	Time	2. Received By (sign)			Date	Time



Ecotoxicology Research Facility

SAMPLE CHECK IN

Sample ID Number: Bville #1

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: 102516 Sampling Date: 1023/1024 Arrival Time: 0920
 Field Identification Number: MB001 Description: Composite

Shipped by: Federal Express UPS _____ Hand delivered by: _____

Drop-Off Location: ASU-ERF

Storage While Shipped: Cooler Ice

Analysis Requested: Chronic WET Testing

Initial Water Chemistry Analysis:

Sample Received by: Marla Moland

Temperature (°C): 2.0 Ice Present upon delivery: YES NO

Date: 102516

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	<u>zen</u>	<u>102516</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Refrigerated at 4°C	<u>zen</u>	↓	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Field Record Received	<u>zen</u>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample Label Affixed Properly	<u>zen</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Project Leader Informed	<u>zen</u>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Comments: _____



Ecotoxicology Research Facility

SAMPLE CHECK IN

Sample ID Number: B-ville #2

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: 10/27/16 Sampling Date: 1025/1026 Arrival Time: 8:50
 Field Identification Number: MB 001 Description: Composite

Shipped by: Federal Express _____ UPS _____ Hand delivered by: _____

Drop-Off Location: ASU-ERF

Storage While Shipped: Coolers w/ Ice

Analysis Requested: Chronic WET Testing

Initial Water Chemistry Analysis:

Sample Received by: Jen

Temperature (°C): 2.1 °C Ice Present upon delivery: YES NO

Date: 10/27/16

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	Jen	10/27/16	X	
Refrigerated at 4°C	Jen	↓	X	
Field Record Received	Jen	↓		X
Sample Label Affixed Properly	Jen	↓	X	
Project Leader Informed	Jen	↓	X	

Comments: _____



Ecotoxicology Research Facility

SAMPLE CHECK IN

Sample ID Number: B-ville # 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: 102916 Sampling Date: 102816 Arrival Time: 1105

Field Identification Number: _____ Description: _____

Shipped by: Federal Express _____ UPS _____ Hand delivered by: _____

Drop-Off Location: ASU-ERF

Storage While Shipped: Cooler w/ ice

Analysis Requested: Chronic WFT testing

Initial Water Chemistry Analysis:

Sample Received by: Jm

Temperature (°C): 1.1 Ice Present upon delivery: YES NO

Date: 102916

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	<u>Jm</u>	<u>102916</u>	<u>X</u>	
Refrigerated at 4°C	<u>Jm</u>	↓	<u>X</u>	
Field Record Received	<u>Jm</u>		<u>X</u>	<u>X</u>
Sample Label Affixed Properly	<u>Jm</u>		<u>X</u>	
Project Leader Informed	<u>J</u>		<u>X</u>	
	<u>J</u>		<u>X</u>	

Comments: _____
