



Ecotoxicology Research Facility

ARKANSAS STATE  
UNIVERSITY

P.O. Box 847  
State University, AR 72467  
Tel. 870-972-2570  
Fax 870-972-2577  
<http://ecotox.astate.edu/>

College of Sciences & Mathematics  
[www.astate.edu](http://www.astate.edu)

May 15, 2014

Jonathan Kopp  
Walnut Ridge Wastewater Treatment Plant  
216 Southwest 4<sup>th</sup> Street  
Walnut Ridge, AR 72476

Dear Jon,

Please find enclosed the results of the 7-day chronic tests using water collected from Walnut Ridge's plant facilities during the week of May 5, 2014. Neither lethal nor sublethal effects were measured in *Pimephales promelas* exposed to the critical flow concentration (100%) or other treated dilutions from this outfall. However, sublethal effects were measured in all effluent concentrations  $\geq 42\%$ .

We will need to schedule a monthly repeat *C. dubia* test for June and July.

Please call if you have any questions regarding this particular test series or any other tests conducted in the past.

Sincerely,

A handwritten signature in cursive script that reads "Jennifer L. Bouldin".

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



Toxicity Test Performed: 7-day *Pimephales promelas* Survival and Growth  
 Effluent Sampling Point: Walnut Ridge WWT Plant  
 Date Test Started: 05/05/14 *P. promelas*  
 Time Test Started: 1600 *P. promelas*  
 Date Test Terminated: 05/12/14 *P. promelas*  
 Time Test Terminated: 1615 *P. promelas*  
 Laboratory Analyst: Kennon/Bouldin

Toxicity Test Performed: 7-day *Ceriodaphnia dubia* Survival and Reproduction  
 Effluent Sampling Point: Walnut Ridge WWT Plant  
 Date Test Started: 05/05/14 *C. dubia*  
 Time Test Started: 1455 *C. dubia*  
 Date Test Terminated: 05/13/14 *C. dubia*  
 Time Test Terminated: 1330 *C. dubia*  
 Laboratory Analyst: Griffin/Bouldin

## 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 <sub>3</sub> )	2340C
pH	4500-H <sup>+</sup> 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>
Fathead Minnow Survival and Growth	Section 11
Cladoceran Survival and Reproduction	Section 13

## II. Test Organisms

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

B. Name: *Ceriodaphnia dubia* (Cladoceran)

Source: Laboratory Culture

Age: <24 hours

Life Stage: Neonate

### III. External Factors

#### A. Incubator

Temperature (°C)

Average: Average: 24.8

Range: 24.0 – 25.0

Light Cycle: 16 hours light/ 8 hours dark

Light Intensity: 100 footcandles

Control Water: Moderately Hard Synthetic Water (#912)

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#### B. *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.

#### C. *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 041514) and yeast/cereal/trout chow mix (#YCT 031914-10 & 11) one hour prior to test setup and once daily thereafter.

## IV. Quality Assurance

## A. Standard Toxicant: Sodium Chloride

B. Organism: *Pimephales promelas*

Date of Reference Toxicant Test

Start: 05/01/14

Terminated: 05/08/14

Time of Reference Toxicant Test

Start: 1515

Terminated: 1505

Laboratory Analyst: Kennon

Dilution Water Used: Moderately Hard Synthetic Water #911/912

Results: Survival LOEC Growth within control limits

Survival

Growth

LOEC: 5.63 g/L NaCl

LOEC: 4.22 g/L NaCl

EC50: 4.61 g/L NaCl

IC25: 4.43 g/L NaCl

C. Organism: *Ceriodaphnia dubia*

Date and time of Reference Toxicant Test

Start: 05/01/14

Terminated: 05/08/14

Time of Reference Toxicant Test

Start: 1615

Terminated: 1635

Laboratory Analyst: Kennon

Dilution Water Used: Moderately Hard Synthetic Water #911/912

Results: Survival and Reproduction within control limits

SurvivalReproduction

LOEC: 1.82 g/L NaCl

LOEC: 1.82 g/L NaCl

EC50: 1.82 g/L NaCl

IC25: 1.13 g/L NaCl

V. Physical and Chemical Data - See Attached

VI. Survival and Growth Data - See Attached

VII. Statistical Methods - See Attached

**SUMMARY REPORTING FORM**

**WET Testing**

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

Permittee: Walnut Ridge WWT Plant

NPDES No.: AR0046566

		<u>Time</u>	<u>Date</u>		<u>Time</u>	<u>Date</u>
Composite 1:	Collected from	0900	05/04/14	to	0900	05/06/14
Composite 2:	Collected From	0900	05/06/14	to	0900	05/07/14
Composite 3:	Collected From	0900	05/08/14	to	0900	05/09/14

Test Initiated: 1600

Date: 05/05/14

Time Terminated: 1615

Date: 05/12/14

Dilution H<sub>2</sub>O: MH 912

**DATA TABLE FOR SURVIVAL**

Effluent Conc. %	Replicate Chambers					Mean % Survival			CV%
	A	B	C	D	E	24h	48h	7days	
<b>Control</b>	100	100	100	87.5	87.5	100	97.5	95	7.6
<b>32</b>	100	87.5	100	100	100	100	100	97.5	6.1
<b>42</b>	87.5	100	100	100	100	100	100	97.5	6.1
<b>56</b>	100	100	100	100	100	100	100	100	0.0
<b>80</b>	100	100	87.5	100	100	100	100	97.5	6.1
<b>100</b>	100	100	87.5	100	87.5	100	100	95	7.6

**DATA TABLE FOR GROWTH**

Effluent Conc %	Replicate Chambers (mg)					Mean Dry Weight (mg) CV%	
	A	B	C	D	E		
<b>Control</b>	0.3137	0.3775	0.3600	0.3986	0.5143	<b>0.3928</b>	<b>19.0</b>
<b>32</b>	0.5212	0.4586	0.3425	0.5213	0.3812	<b>0.4450</b>	<b>18.3</b>
<b>42</b>	0.4557	0.4187	0.4300	0.5625	0.4413	<b>0.4616</b>	<b>12.6</b>
<b>56</b>	0.3425	0.4100	0.5025	0.4525	0.4275	<b>0.4270</b>	<b>13.7</b>
<b>80</b>	0.3637	0.4250	0.5486	0.4725	0.3975	<b>0.4415</b>	<b>16.3</b>
<b>100</b>	0.4700	0.4188	0.4129	0.5187	0.4371	<b>0.4515</b>	<b>9.7</b>

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 critical and control dilutions), Parameter #TQP6C: CV % growth  19.0%  (control)

## 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%

## SUMMARY REPORTING FORM

### WET Testing

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

Permittee: Walnut Ridge WWT Plant

Sample No. 1 Collected Ending Date: 05/05/14 Time: 0900

NPDES No.: AR0046566

Sample No. 2 Collected Ending Date: 05/07/14 Time: 0900

Contact: Jon Kopp

Sample No. 3 Collected Ending Date: 05/09/14 Time: 0900

Analyst: Kennon/Bouldin

Test Begin: Date: 05/05/14 Time: 1600 Test End: Date: 05/12/14 Time: 1615

#### Initial Water Chemistry for Chronic Tests

Project: Walnut Ridge – *P. promelas*

Test day		0	1	2	3	4	5	6
Date		5/5/2014	5/6/2014	5/7/2014	5/8/2014	5/9/2014	5/10/2014	5/11/2014
H <sub>2</sub> O #		MH 912	MH 912	MH 912	MH 912	MH 912	MH 912	MH 912
Temp (°C)	Control	22.3	23.0	22.5	24.0	24.0	23.1	23.4
	32%	22.5	23.0	22.8	24.0	24.0	23.1	23.5
	42%	22.7	23.0	22.8	23.7	24.0	23.1	23.5
	56%	22.5	23.0	22.5	23.7	24.0	23.1	23.5
	80%	23.0	23.0	22.8	23.8	24.0	23.1	23.6
	100%	23.0	23.1	23.0	23.8	24.3	23.1	23.6
pH (Standard Units)	Control	7.74	7.78	7.92	7.83	7.83	7.93	7.92
	32%	7.57	7.57	7.64	7.77	7.76	7.87	7.76
	42%	7.52	7.51	7.62	7.78	7.74	7.86	7.77
	56%	7.43	7.42	7.50	7.76	7.71	7.83	7.76
	80%	7.52	7.35	7.47	7.64	7.61	7.64	7.57
	100%	7.47	7.23	7.43	7.52	7.48	7.64	7.59
DO (mg/L)	Control	8.4	8.4	8.1	8.7	9.0	9.0	8.3
	32%	8.4	8.3	8.3	8.5	8.9	8.8	8.5
	42%	8.3	8.2	8.2	8.5	8.8	8.8	8.3
	56%	8.0	8.1	8.2	8.4	8.7	8.9	8.2
	80%	8.0	8.0	8.1	8.4	8.6	9.1	8.4
	100%	8.0	7.8	8.2	8.3	8.6	8.8	8.2
Cond (µS/cm)	Control	332	334	359	359	359	361	359
	32%	356	357	403	404	422	416	426
	42%	363	363	419	418	437	437	447
	56%	372	373	441	439	464	465	464
	80%	390	391	476	475	511	511	510
	100%	405	406	507	506	551	551	550
Alk (mg/L)	Control	58		58		58		
	100%	58		80		82		
Hard (mg/L)	Control	100		100		100		
	100%	120		200		170		



## SUMMARY REPORTING FORM

### WET Testing

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

Permittee: Walnut Ridge WWT Plant

Sample No. 1 Collected Ending Date: 05/05/14 Time: 0900

NPDES No.: AR0046566

Sample No. 2 Collected Ending Date: 05/07/14 Time: 0900

Contact: Jon Kopp

Sample No. 3 Collected Ending Date: 05/09/14 Time: 0900

Analyst: Kennon/Bouldin

Test Begin: Date: 05/05/14 Time: 1600 Test End: Date: 05/12/14 Time: 1615

Final Water Chemistry for Chronic Tests								
Project: Walnut Ridge – <i>P. promelas</i>								
Test day		1	2	3	4	5	6	7
Date		5/6/2014	5/7/2014	5/8/2014	5/9/2014	5/10/2014	5/11/2014	5/12/2014
H <sub>2</sub> O #		MH 912	MH 912	MH 912	MH 912	MH 912	MH 912	MH 912
Temp (°C)	Control	22.0	22.8	23.5	21.5	22.8	23.0	22.5
	32%	22.0	23.0	23.0	21.5	22.7	23.1	22.8
	42%	22.0	22.2	23.5	21.7	22.6	23.0	22.8
	56%	22.0	22.2	23.2	21.7	22.8	23.0	21.8
	80%	22.0	22.8	23.0	21.7	22.6	23.1	22.0
	100%	22.0	23.0	23.0	22.0	22.7	23.1	22.0
pH (Standard Units)	Control	7.68	7.27	7.41	7.52	7.68	7.26	7.40
	32%	7.53	7.21	7.35	7.47	7.64	7.33	7.34
	42%	7.55	7.22	7.26	7.45	7.56	7.41	7.34
	56%	7.51	7.20	7.29	7.46	7.53	7.34	7.34
	80%	7.47	7.16	7.24	7.43	7.46	7.36	7.34
	100%	7.43	7.12	7.23	7.40	7.45	7.34	7.35
DO (mg/L)	Control	7.6	6.2	7.4	7.7	8.4	6.1	6.9
	32%	7.0	5.9	7.0	7.4	8.0	6.0	6.3
	42%	7.3	6.1	6.5	7.6	7.8	6.5	6.3
	56%	7.4	5.8	6.7	7.3	7.8	5.9	6.0
	80%	7.5	5.9	6.5	7.4	7.4	5.7	5.9
	100%	7.5	5.7	6.7	7.1	7.2	5.6	5.7

**SUMMARY REPORTING FORM**  
**WET Testing**  
*Ceriodaphnia dubia* Survival and Reproduction

Permittee: Walnut Ridge WWT Plant

NPDES No.: AR0046566

		<u>Time</u>	<u>Date</u>		<u>Time</u>	<u>Date</u>
Composite 1:	Collected from	0900	05/04/14	to	0900	05/06/14
Composite 2:	Collected From	0900	05/06/14	to	0900	05/07/14
Composite 3:	Collected From	0900	05/08/14	to	0900	05/09/14

Test Initiated: 1455

Date: 05/05/14

Time Terminated: 1330

Date: 05/13/14

Dilution H<sub>2</sub>O: MH 912

**PERCENT SURVIVAL**  
Percent Effluent

Time of Reading	Control	<u>32%</u>	<u>42%</u>	<u>56%</u>	<u>80%</u>	<u>100%</u>
24h	100	100	100	100	100	100
48h	100	70	70	70	60	80
7 day	80	60	60	60	60	70

**NUMBER OF YOUNG/FEMALE @ 7 DAYS**  
Percent Effluent

REP	<u>0%</u>	<u>32%</u>	<u>42%</u>	<u>56%</u>	<u>80%</u>	<u>100%</u>
A	22	X/0	X/0	11	10	5
B	18	16	12	14	X/0	10
C	14	X/0	17	X/0	X/0	13
D	13	16	X/0	X/0	X/0	11
E	14	14	X/0	X/0	6	X/0
F	X/0	X/0	11	8	9	12
G	17	18	11	19	X/0	0
H	X/0	0	X/9	0	11	X/0
I	17	X/0	27	4	15	12
J	22	20	6	X/0	8	X/1
<b>Mean</b>	<b>17.1</b>	<b>8.4</b>	<b>9.3</b>	<b>5.6</b>	<b>5.9</b>	<b>6.4</b>
<b>CV%*</b>	<b>20.3</b>	<b>107.0</b>	<b>91.8</b>	<b>125.5</b>	<b>94.4</b>	<b>89.4</b>

\*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  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  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: 1

5. ~~Report the NOEC value for survival, Parameter #TOP3B:~~

NOEC survival 100 % effluent

6. Report the NOEC value for reproduction, Parameter #TPP3B:

NOEC reproduction 32 % effluent

7. Report the % coefficient of variation (largest of critical and control dilutions), Parameter #TQP3B:

CV % reproduction 89.4% (critical)

### **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%

**CHRONIC TOXICITY SUMMARY FORM**  
**WET Testing *Ceriodaphnia dubia* (Cladoceran)**  
**CHEMICAL PARAMETERS CHART**

Permittee: Walnut Ridge WWT Plant

Sample No. 1 Collected Ending Date: 05/05/14 Time: 0900

NPDES No.: AR0046566

Sample No. 2 Collected Ending Date: 05/07/14 Time: 0900

Contact: Jon Kopp

Sample No. 3 Collected Ending Date: 05/09/14 Time: 0900

Analyst: Griffin/Bouldin

Test Begin: Date: 05/05/14 Time: 1455 Test End: Date: 05/13/14 Time: 1330

Initial Water Chemistry for Chronic Tests									
Project: Walnut Ridge – <i>C. dubia</i>									
Test day		0	1	2	3	4	5	6	7
Date		5/5/2014	5/6/2014	5/7/2014	5/8/2014	5/9/2014	5/10/2014	5/11/2014	5/12/2014
H <sub>2</sub> O #		MH 912	MH 912	MH 912	MH 912	MH 912	MH 912	MH 912	MH 912
Temp (°C)	Control	22.3	23.0	22.5	24.0	24.0	23.1	23.4	22.5
	32%	22.5	23.0	22.8	24.0	24.0	23.1	23.5	22.5
	42%	22.7	23.0	22.8	23.7	24.0	23.1	23.5	22.6
	56%	22.5	23.0	22.5	23.7	24.0	23.1	23.5	22.6
	80%	23.0	23.0	22.8	23.8	24.0	23.1	23.6	22.6
	100%	23.0	23.1	23.0	23.8	24.3	23.1	23.6	22.6
pH (Standard Units)	Control	7.74	7.78	7.92	7.83	7.83	7.93	7.92	7.87
	32%	7.57	7.57	7.64	7.77	7.76	7.87	7.76	7.76
	42%	7.52	7.51	7.62	7.78	7.74	7.86	7.77	7.74
	56%	7.43	7.42	7.50	7.76	7.71	7.83	7.76	7.71
	80%	7.52	7.35	7.47	7.64	7.61	7.64	7.57	7.65
	100%	7.47	7.23	7.43	7.52	7.48	7.64	7.59	7.60
DO (mg/L)	Control	8.4	8.4	8.1	8.7	9.0	9.0	8.3	8.5
	32%	8.4	8.3	8.3	8.5	8.9	8.8	8.5	8.6
	42%	8.3	8.2	8.2	8.5	8.8	8.8	8.3	8.6
	56%	8.0	8.1	8.2	8.4	8.7	8.9	8.2	8.6
	80%	8.0	8.0	8.1	8.4	8.6	9.1	8.4	8.6
	100%	8.0	7.8	8.2	8.3	8.6	8.8	8.2	8.8
Cond (µS/cm)	Control	332	334	359	359	359	361	359	360
	32%	356	357	403	404	422	416	426	418
	42%	363	363	419	418	437	437	447	439
	56%	372	373	441	439	464	465	464	464
	80%	390	391	476	475	511	511	510	513
	100%	405	406	507	506	551	551	550	552
Alk (mg/L)	Control	58		58		58			
	100%	58		80		82			
Hard (mg/L)	Control	100		100		100			
	100%	120		200		170			

**CHRONIC TOXICITY SUMMARY FORMWET Testing *Ceriodaphnia dubia* (Cladoceran)**  
**CHEMICAL PARAMETERS CHART**

Permittee: Walnut Ridge WWT Plant

Sample No. 1 Collected Ending Date: 05/05/14 Time: 0900

NPDES No.: AR0046566

Sample No. 2 Collected Ending Date: 05/07/14 Time: 0900

Contact: Jon Kopp

Sample No. 3 Collected Ending Date: 05/09/14 Time: 0900

Analyst: Griffin/Bouldin

Test Begin: Date: 05/05/14 Time: 1455 Test End: Date: 05/13/14 Time: 1330

Final Water Chemistry for Chronic Tests									
Project: Walnut Ridge - <i>C. dubia</i>									
Test day		1	2	3	4	5	6	7	8
Date:		5/6/2014	5/7/2014	5/8/2014	5/9/2014	5/10/2014	5/11/2014	5/12/2014	5/13/2014
H <sub>2</sub> O #		MH 912	MH 912	MH 912	MH 912	MH 912	MH 912	MH 912	MH 912
Temp (°C)	Control	23.2	23.0	24.5	24.6	23.1	23.2	22.6	24.5
	32%	23.0	23.0	24.5	24.6	23.1	23.2	22.6	24.5
	42%	23.0	23.0	24.7	24.7	23.2	23.3	22.6	24.5
	56%	23.0	23.0	24.5	24.0	23.2	23.3	22.8	24.6
	80%	23.0	23.0	24.5	24.0	23.1	23.2	22.7	24.5
	100%	23.1	23.0	24.5	24.0	23.1	23.2	22.6	24.6
pH (Standard Units)	Control	7.94	7.84	7.77	7.99	7.86	8.05	7.85	7.98
	32%	8.07	8.52	8.11	8.77	7.92	8.22	7.76	8.59
	42%	7.88	8.21	7.96	9.07	8.00	8.38	8.07	8.99
	56%	7.96	8.22	8.01	8.57	8.01	8.17	8.03	8.92
	80%	7.95	8.11	7.98	8.94	7.99	8.32	8.01	8.87
	100%	7.83	8.19	8.00	8.55	7.96	8.16	7.85	8.33
DO (mg/L)	Control	8.2	8.8	9.3	9.9	9.5	9.0	9.1	9.3
	32%	8.1	8.8	9.6	10.4	9.3	9.4	8.6	9.2
	42%	8.5	8.6	9.5	11.5	9.3	9.7	9.1	9.2
	56%	8.6	8.7	9.7	11.0	9.4	9.7	9.2	9.9
	80%	8.5	8.7	9.7	11.2	9.2	9.7	8.9	9.8
	100%	8.0	8.8	9.7	10.7	9.2	9.6	8.5	9.6

**Larval Fish Growth and Survival Test-7 Day Survival**

Start Date: 5/5/2014 16:00    Test ID: May-14    Sample ID: NPDES Permit #AR0046566  
 End Date: 5/12/2014 16:15    Lab ID: ASU ERF    Sample Type: EFF1-POTW  
 Sample Date: 5/4/2014    Protocol: EPAF 02-EPA Freshwater    Test Species: PP-Pimephales promelas  
 Comments: 2nd Quarter WET Testing

Conc-%	1	2	3	4	5
D-Control	1.0000	1.0000	1.0000	0.8750	0.8750
32	1.0000	0.8750	1.0000	1.0000	1.0000
42	0.8750	1.0000	1.0000	1.0000	1.0000
56	1.0000	1.0000	1.0000	1.0000	1.0000
80	1.0000	1.0000	0.8750	1.0000	1.0000
100	1.0000	1.0000	0.8750	1.0000	0.8750

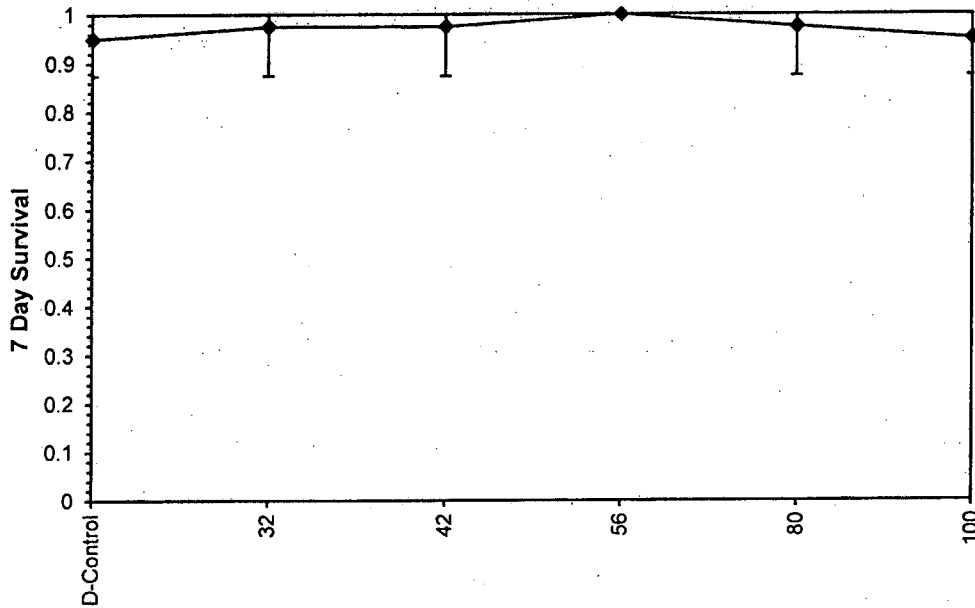
Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
D-Control	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5		
32	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	30.00	16.00
42	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	30.00	16.00
56	1.0000	1.0526	1.3931	1.3931	1.3931	0.000	5	32.50	16.00
80	0.9750	1.0263	1.3564	1.2094	1.3931	6.055	5	30.00	16.00
100	0.9500	1.0000	1.3196	1.2094	1.3931	7.623	5	27.50	16.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.77379	0.9	-1.05342	-0.36442

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**

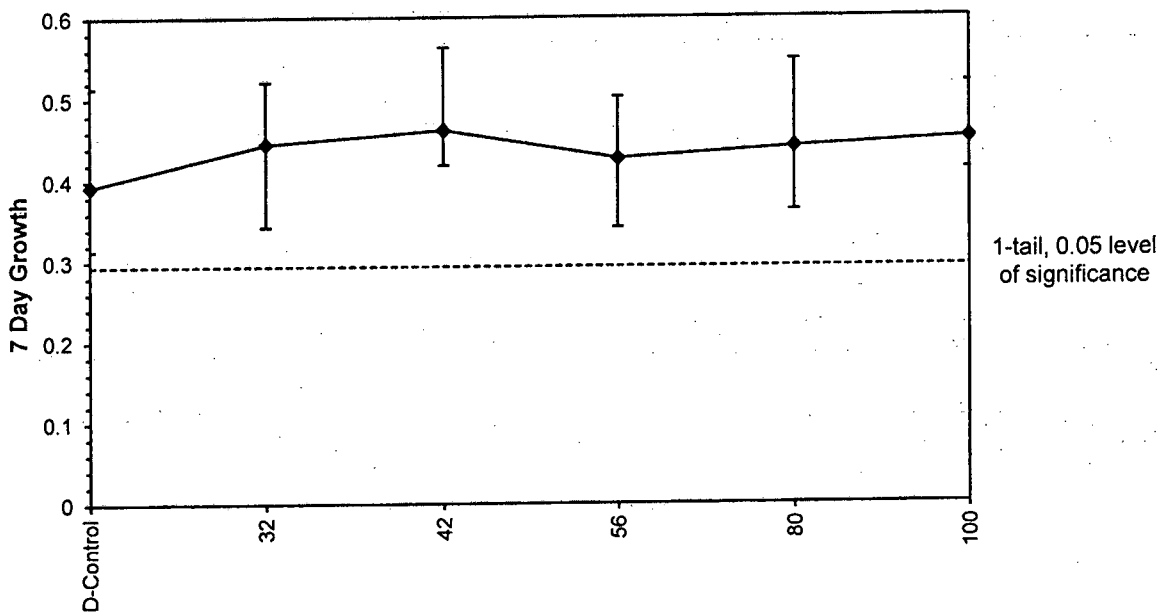
Start Date: 5/5/2014 16:00      Test ID: May-14      Sample ID: NPDES Permit #AR0046566  
 End Date: 5/12/2014 16:15      Lab ID: ASU.ERF      Sample Type: EFF1-POTW  
 Sample Date: 5/4/2014      Protocol: EPAF 02-EPA Freshwater      Test Species: PP-Pimephales promelas  
 Comments: 2nd Quarter WET Testing

Conc-%	1	2	3	4	5
D-Control	0.3137	0.3775	0.3600	0.3986	0.5143
32	0.5212	0.4586	0.3425	0.5213	0.3812
42	0.4557	0.4187	0.4300	0.5625	0.4413
56	0.3425	0.4100	0.5025	0.4525	0.4275
80	0.3637	0.4250	0.5486	0.4725	0.3975
100	0.4700	0.4188	0.4129	0.5187	0.4371

Conc-%	Mean	N-Mean	Transform: Untransformed					N	t-Stat	1-Tailed Critical	MSD
			Mean	Min	Max	CV%					
D-Control	0.3928	1.0000	0.3928	0.3137	0.5143	19.029	5				
32	0.4450	1.1327	0.4450	0.3425	0.5213	18.252	5	-1.251	2.360	0.0984	
42	0.4616	1.1752	0.4616	0.4187	0.5625	12.568	5	-1.651	2.360	0.0984	
56	0.4270	1.0870	0.4270	0.3425	0.5025	13.746	5	-0.820	2.360	0.0984	
80	0.4415	1.1238	0.4415	0.3637	0.5486	16.287	5	-1.167	2.360	0.0984	
100	0.4515	1.1494	0.4515	0.4129	0.5187	9.678	5	-1.407	2.360	0.0984	

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution ( $p > 0.01$ )	0.95236	0.9	0.42394	-0.57807						
Bartlett's Test indicates equal variances ( $p = 0.89$ )	1.7053	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	0.09839	0.25048	0.00295	0.00435	0.64345	5, 24

**Dose-Response Plot**



**CHRONIC TEST DATA SHEET**  
*Pimephales promelas*

Project: Walnut Ridge Beginning Date: 050514 Time: 1600 Test Species: P. promelas  
Dilution H<sub>2</sub>O: MH912 Ending Date: 051214 Time: 1615 Age: 24 hrs  
<sup>L</sup>  
<sub>9</sub>

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

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	8/0	8/0	WR#1
	2	8/0	8/0	8/0	8/0	8/0	8/0	8/0	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	8/1	4
	5	8/0	7/0	7/0	7/0	7/0	7/0	7/0	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 <sup>8/1</sup> MA	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	8/1	7/0	7/0	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	8/0	8/0	8/0	8/0	8/0	8/0	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	8/1	7/0	20
Date		050614	050714	050814	050914	051014	051114	051214	051214
Initials		MG	MK	MK	SV	9	9	MK KE	MKFF



**CHRONIC TEST DATA SHEET**  
*Pimephales promelas*

Project: Walnut Ridge Beginning Date: 050514 Time: 1600 Test Species: P.promelas  
Dilution H<sub>2</sub>O: MH912 Ending Date: 051214 Time: 1615 Age: <sup>L</sup>~~24~~ 24 hrs

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

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Pan #
80%	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	8/1	7/0	7/0	7/0	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	8/1	7/0	7/0	28
	4	8/0	8/0	8/0	8/0	8/0	8/0	8/0	29
	5	8/0	8/0	8/0	8/1	7/0	7/0	7/0	30
Date		050614	050714	050814	050914	051014	051114	051214	051214
Initials		MG	MK	MK	SV	JS	P	MK	MK

050514

AF: 1045 05/04  
BF: 1045 05/05

042014 T: 3, 4, 5, 12, 13, 15, 18, 19, 24  
042714 T: 4, 5, 7, 9, 12, 14, 17, 18, 19, 22 A+B  
042814 T: 4, 9, 10, 12, 13, 14, 15, 17, 19  
042914 T: 6, 7, 11, 15, 19  
043014 T: 4, 5, 6, 12, 17, 18, 19, 20, 24

UCE

**Ceriodaphnia Survival and Reproduction Test-7 Day Survival**

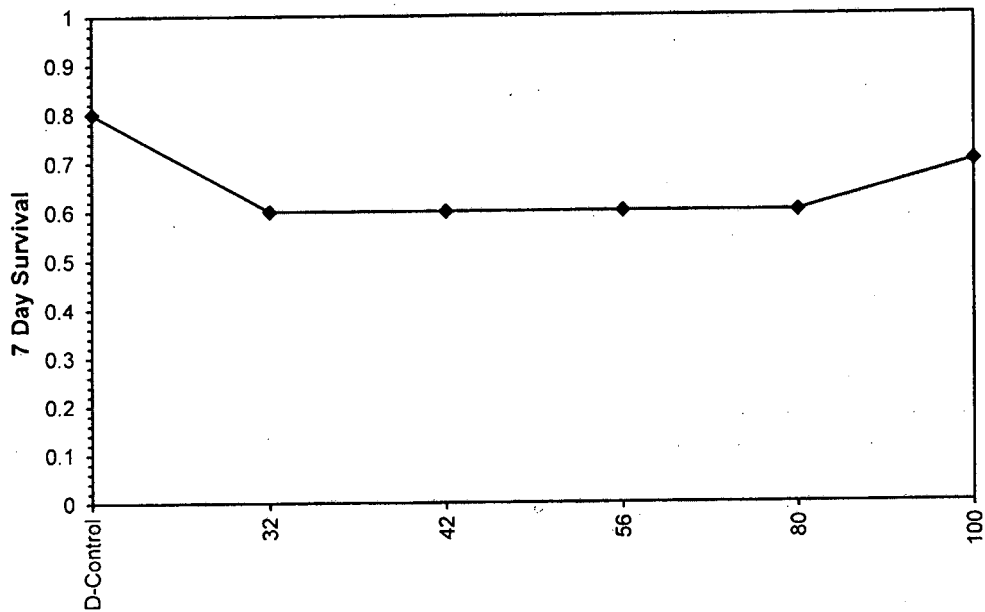
Start Date: 5/5/2014 14:55      Test ID: May-14      Sample ID: NPDES Permit #AR0046566  
 End Date: 5/13/2014 13:30      Lab-ID: ASU-ERF      Sample Type: EFF1-POTW  
 Sample Date: 5/4/2014      Protocol: EPAF 02-EPA Freshwater      Test Species: CD-Ceriodaphnia dubia  
 Comments: 2nd Quarter WET Testing

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	1.0000
32	0.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000
42	0.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	0.0000	1.0000	1.0000
56	1.0000	1.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000
80	1.0000	0.0000	0.0000	0.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000	1.0000	0.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
D-Control	0.8000	1.0000	2	8	10	10		
32	0.6000	0.7500	4	6	10	10	0.3142	0.0500
42	0.6000	0.7500	4	6	10	10	0.3142	0.0500
56	0.6000	0.7500	4	6	10	10	0.3142	0.0500
80	0.6000	0.7500	4	6	10	10	0.3142	0.0500
100	0.7000	0.8750	3	7	10	10	0.5000	0.0500

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

**Dose-Response Plot**



**Ceriodaphnia Survival and Reproduction Test-Reproduction**

Start Date: 5/5/2014 14:55      Test ID: May-14      Sample ID: NPDES Permit #AR0046566  
 End Date: 5/13/2014 13:30      Lab ID: ASU-ERF      Sample Type: EFF1-POTW  
 Sample Date: 5/4/2014      Protocol: EPAF 02-EPA Freshwater      Test Species: CD-Ceriodaphnia dubia  
 Comments: 2nd Quarter WET Testing

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	22.000	18.000	14.000	13.000	14.000	17.000	17.000	22.000		
32	0.000	16.000	0.000	16.000	14.000	0.000	18.000	0.000	0.000	20.000
42	0.000	12.000	17.000	0.000	0.000	11.000	11.000	9.000	27.000	6.000
56	11.000	14.000	0.000	0.000	0.000	8.000	19.000	0.000	4.000	0.000
80	10.000	0.000	0.000	0.000	6.000	9.000	0.000	11.000	15.000	8.000
100	5.000	10.000	13.000	11.000	0.000	12.000	0.000	0.000	12.000	1.000

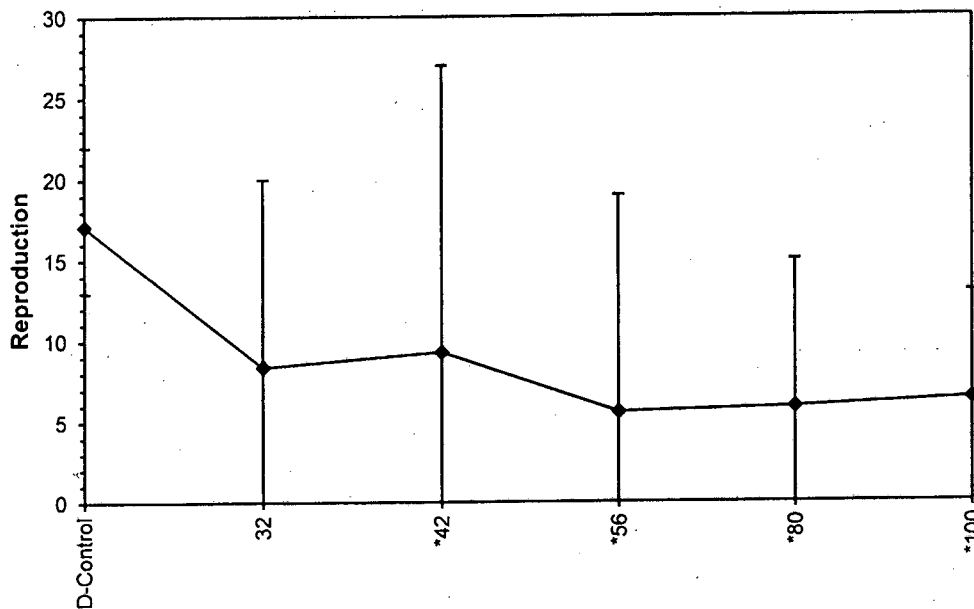
Conc-%	Mean	N-Mean	Transform: Untransformed					N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%				
D-Control	17.125	1.0000	17.125	13.000	22.000	20.333	8			
32	8.400	0.4905	8.400	0.000	20.000	106.952	10	74.50	68.00	
*42	9.300	0.5431	9.300	0.000	27.000	91.808	10	67.00	68.00	
*56	5.600	0.3270	5.600	0.000	19.000	125.481	10	63.00	68.00	
*80	5.900	0.3445	5.900	0.000	15.000	94.352	10	58.00	68.00	
*100	6.400	0.3737	6.400	0.000	13.000	89.365	10	55.50	68.00	

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.19883	1.035	0.41128	-0.58835
Bartlett's Test indicates equal variances (p = 0.17)	7.7493	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Wilcoxon Rank Sum Test	32	42	36.6606	3.125

**Dose-Response Plot**



**CHRONIC TEST DATA SHEET**  
*Ceriodaphnia dubia*

Project: Walnut Ridge Beginning Date: 050514 Time: 1455 Test Species: C. dubia  
Dilution H<sub>2</sub>O: MH912 Ending Date: 057314 Time: 1330 Age: 224h

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

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8 Neonates		
Control	1	0	0	0	4	0	9	0	9	22	
	2				0	0	5	5	8	18	
	3				0	0	4	3	7	14	
	4				0	0	4	9	0	13	
	5				0	0	8	4	2	14	
	6				3	0	7	0	X/0	-	
	7			↓	3	0	6	8	0	17	
	8			X/0	-----						-
	9			0	0	0	6	7	4	17	
	10	↓	↓	0	0	0	7	7	8	22	
32%	1	0	X/0	-----							
	2		0	0	0	0	0	7	9	16	
	3		0	X/0	-----						
	4		0	0	3	0	8	5	0	16	
	5		0	0	1	0	5	8	0	14	
	6		X/0	-----							
	7		0	0	0	5	0	5	8	18	
	8		0	0	0	0	0	0	0	0	
	9		X/0	-----							
	10	↓	0	0	0	8	0	5	7	20	
Date		050614	050714	050814	050914	051014	051114	051214	051314		
Initials		MG	MG	MG	MG	P	P	P	P		

**CHRONIC TEST DATA SHEET**

*Ceriodaphnia dubia*

Project: Walnut Ridge Beginning Date: <sup>04</sup>050514 Time: 1455 Test Species: C. dubia  
Dilution H<sub>2</sub>O: MH912 Ending Date: 051314 Time: 1330 Age: 24h

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

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Neonates	
42%	1	0	X/0	_____							X/0
	2	↓	0	0	1	0	0	2	9	12	
	3	↓	0	0	0	0	7	5	5	17	
	4	↓	X/0	_____							X/0
	5	↓	X/0	_____							X/0
	6	↓	0	0	0	0	1	0	10	11	
	7	↓	0	↓	0	0	0	6	5	11	
	8	↓	0	↓	3	0	6	X/0	-	X/9	
	9	↓	0	↓	4	0	8	8	7	27	
	10	↓	0	↓	0	0	0	0	6	6	
56%	1	0	0	0	0	3	0	<del>X/0</del> 0	8	11	
	2	↓	0	0	3	0	7	4	0	14	
	3	↓	X/0	_____							X/0
	4	↓	0	0	0	0	0	X/0	-	X/0	
	5	↓	X/0	_____							X/0
	6	↓	0	0	2	0	6	0	0	8	
	7	↓	0	0	0	4	0	<del>8</del> 8	7	19	
	8	↓	0	0	0	0	0	0	0	0	
	9	↓	0	0	0	0	0	4	0	4	
	10	↓	X/0	_____							X/0
Date		050614	050714	050814	050914	051014	051114	051214	051314		
Initials		MG	MG	MG	MG	JP	JP	JP	JP	JP	

**CHRONIC TEST DATA SHEET**

*Ceriodaphnia dubia*

Project: Walnut Ridge Beginning Date: 050514 Time: 1455 Test Species: C. dubia  
 Dilution H<sub>2</sub>O: M+1912 Ending Date: 051314 Time: 1330 Age: 424h

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

Conc.	Rep	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8 Neonates		
80%	1	0	0	0	0	2	0	1	7	10	
	2		X/0	—————							X/0
	3		X/0	—————							X/0
	4		X/0	—————							X/0
	5		0	0	2	0	0	0	4	6	
	6		0	0	1	1	0	4	3	9	
	7		X/0	—————							X/0
	8		0	0	0	0	1	2	8	11	
	9		0	0	0	1	0	8	6	15	
	10	↓	0	0	0	0	1	3	5	8	
100%	1	0	0	0	1	0	4	0	0	5	
	2		0	↓	0	0	7	2	1	10	
	3		0	↓	0	0	0	3	10	13	
	4		0	↓	0	2	0	2	7	11	
	5		X/0	—————							X/0
	6		0	0	0	3	2	2	5	12	
	7		0	0	0	0	0	0	0	0	
	8		X/0	—————							X/0
	9		0	0	1	0	8	3	0	12	
	10	↓	0	0	1	X/0	—————			X/1	
Date		050614	050714	050814	050914	051014	051114	051214	051314		
Initials		LMF	LMQ	LMQ	LMQ	JB	P	P	P		

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

Test Day:		0	1	2	3	4	5	6	
Date:		050514	050614	050714	050814	050914	051014	051114	051214
H <sub>2</sub> O Batch#:		MH912	MH912	MH912	MH912	MH912	MH912	MH912	MH912
Temp: (°C)	Control	22.3	22.3	22.5	24.0	24.0	23.1	23.4	22.5
	32%	22.5	23.0	22.8	24.0	24.0	23.1	23.5	22.5
	42%	22.7	23.0	22.8	23.7	24.0	23.1	23.5	22.6
	56%	22.5	23.0	22.5	23.7	24.0	23.1	23.5	22.6
	80%	23.0	23.0	22.8	23.0	24.0	23.1	23.6	22.6
	100%	23.0	23.1	23.0	23.8 MK 7.83	24.3	23.1	23.6	22.6
pH	Control	7.74	7.78	7.92	7.77	7.83	7.93	7.92	7.87
	32%	7.57	7.57	7.64	7.77	7.76	7.87	7.76	7.76
	42%	7.52	7.51	7.62	7.78	7.74	7.86	7.77	7.74
	56%	7.43	7.42	7.50	7.76	7.71	7.83	7.76	7.71
	80%	7.52	7.35	7.47	7.64	7.61	7.64	7.57	7.65
	100%	7.47	7.23	7.43	7.52	7.48	7.64	7.59	7.60
DO (mg/L)	Control	8.4	8.4	8.1	8.7	9.0	9.0	8.3	8.5
	32%	8.4	8.3	8.3	8.5	8.9	8.8	8.5	8.6
	42%	8.3	8.2	8.2	8.5	8.8	8.8	8.3	8.6
	56%	8.0	8.1	8.2	8.4	8.7	8.9	8.2	8.6
	80%	8.0	8.0	8.1	8.4	8.6	9.1	8.4	8.6
	100%	8.0	7.8	8.2	8.3	8.6	8.8	8.2	8.8
Cond: (µS/cm)	Control	332	334	359	359	359	361	359	360
	32%	356	357	403	404	422	416	426	418
	42%	363	363	419	418	437	437	447	439
	56%	372	373	441	439	464	465	464	464
	80%	390	391	476	475	511	511	510	513
	100%	405	406	507	506	551	551	550	552
Alk. (mg/L)	Control	58		58		58			
	100%	58		80		82			
Hard (mg/L)	Control	100		100		100			
	100%	120		200		170			
Initials		MG	MG	MG	MK MG	MG	J	J	J

Final Water Chemistry for Chronic Tests  
Project: Walnut Ridge - *P. promelas*

Test Day:		1	2	3	4	5	6	7
Date:		050614	050714	050814	050914	051014	051114	051214
H <sub>2</sub> O Batch #:		MH912	MH912	MH912	MH912	MH912	MH912	MH912
Temp. (°C)	Control	22.0	22.8	23.5	21.5	22.8	23.0	22.5
	32%	22.0	23.0	23.0	21.5	22.7	23.1	22.8
	42%	22.0	22.2	23.5	21.7	22.6	23.0	22.8
	56%	22.0	22.2	23.2	21.7	22.8	23.0	21.8
	80%	22.0	22.8	23.0	21.7	22.6	23.1	22.0
	100%	22.0	23.0	23.0	22.0	22.7	23.1	22.0
pH	Control	7.68	7.27	7.41	7.52	<del>7.26</del> 7.18	7.26	7.40
	32%	7.53	7.21	7.35	7.47	7.64	7.33	7.34
	42%	7.55	7.22	7.26	7.45	7.56	7.41	7.34
	56%	7.51	7.20	7.29	7.46	7.53	7.34	7.34
	80%	7.47	7.16	7.24	7.43	7.46	7.36	7.34
	100%	7.43	7.12	7.23	7.40	7.45	7.34	7.35
DO <sub>1</sub> (mg/L)	Control	7.0	6.2	7.4	7.7	8.4	6.1	6.9
	32%	7.0	5.9	7.0	7.4	8.0	6.0	6.3
	42%	7.3	6.1	6.5	7.6	7.8	6.5	6.3
	56%	7.4	5.8	6.7	7.3	7.8	5.9	6.0
	80%	7.5	5.9	6.5	7.4	7.4	5.7	5.9
	100%	7.5	5.7	6.7	7.1	7.2	5.6	5.7
Initials		MG/SV	MW	MK MW	SV	8	90	MK 8

8  
5/2/14  
MH 912

8



Final Water Chemistry for Chronic Tests  
Project: Walnut Ridge - *C. dubia*

Test Day:		1	2	3	4	5	6	7
Date:		05/06/14	05/07/14	05/08/14	05/09/14	05/10/14	05/11/14	05/12/14
H <sub>2</sub> O Batch#:		MH912	MH912	MH912	MH912	MH912	MH912	MH912
Temp: (°C)	Control	23.2	23.0	24.5	24.6	23.1	23.2	22.6
	32%	23.0	23.0	24.5	24.6	23.1	23.2	22.6
	42%	23.0	23.0	24.7	24.7	23.2	23.2	22.6
	56%	23.0	23.0	24.5	24.0	23.2	23.2	22.6
	80%	23.0	23.0	24.5	24.0	23.1	23.2	22.7
	100%	23.1	23.0	24.5	24.0	23.1	23.2	22.6
pH	Control	7.94	7.94	7.77	7.99	7.86	8.05	7.85
	32%	8.07	8.52	8.11	8.77	7.92	8.22	7.76
	42%	7.88	8.2	7.96	9.07	8.00	8.38	8.07
	56%	7.96	8.22	8.01	8.57	8.01	8.17	8.03
	80%	7.95	8.11	7.98	8.94	7.99	8.32	8.01
	100%	7.83	8.19	8.00	8.55	7.96	8.16	7.85
DO (mg/L)	Control	8.2	8.9	9.3	9.9	9.5	9.0	9.1
	32%	8.1	8.9	9.6	10.4	9.3	9.4	8.6
	42%	8.5	8.6	9.5	11.5	9.3	9.7	9.1
	56%	8.6	8.7	9.7	11.0	9.4	9.7	9.2
	80%	8.5	8.7	9.7	11.2	9.2	9.7	8.9
	100%	8.0	8.8	9.7	10.7	9.2	9.6	8.5
Initials		MG/SV	MG	MG	MG	P	P	P

07/13/14  
MH912  
24.5  
24.5  
24.5  
24.6  
24.5  
24.6  
7.98  
8.59  
8.99  
8.92  
8.87  
8.33  
9.3  
9.2  
9.2  
9.9  
9.8  
9.6  
P



**EcoTox**

Ecotoxicology Research Facility

**SAMPLE CHECK IN**

Sample ID Number: WR 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: 050514 Sampling Date: 05/4-5/14 Arrival Time: 1130

Field Identification Number: \_\_\_\_\_ Description: effluent

Shipped by: Federal Express \_\_\_\_\_ UPS \_\_\_\_\_ Hand delivered by: WR personnel

Drop-Off Location: ASU-ERF

Storage While Shipped: cooler w/ice

Analysis Requested: chronic Cd, Cu, Pb + P promelas

Initial Water Chemistry Analysis:

Sample Received by: UMG

Temperature (°C): 1.0 Ice Present upon delivery:  YES  NO

Date: 050514

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	UMG	050514	✓	
Refrigerated at 4°C	↓	↓	✓	
Field Record Received				✓
Sample Label Affixed Properly	↓	↓	✓	
Project Leader Informed	↓	↓	✓	

Comments: \_\_\_\_\_

\_\_\_\_\_



Ecotoxicology Research Facility

**SAMPLE CHECK IN**

Sample ID Number: WR2

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: 050714 Sampling Date: 05/6-7/14 Arrival Time: 1110

Field Identification Number: \_\_\_\_\_ Description: Effluent

Shipped by: Federal Express \_\_\_\_\_ UPS \_\_\_\_\_ Hand delivered by: WR personnel

Drop-Off Location: ASU-ERF

Storage While Shipped: cooler w/ice

Analysis Requested: Chronic Cd, Cu, Cr + Pb, Ni, Mn, As

Initial Water Chemistry Analysis:

Sample Received by: SV

Temperature (°C): 0.8 Ice Present upon delivery:  YES  NO

Date: 050714

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	<u>LMCS</u>	<u>050714</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Refrigerated at 4°C	<u>↓</u>	<u>↓</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Field Record Received	<u>↓</u>	<u>↓</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample Label Affixed Properly	<u>↓</u>	<u>↓</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Project Leader Informed	<u>↓</u>	<u>↓</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Comments: \_\_\_\_\_

\_\_\_\_\_



Ecotoxicology Research Facility

**SAMPLE CHECK IN**

Sample ID Number: WR3

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: 050914 Sampling Date: 05/8-9/14 Arrival Time: 1120

Field Identification Number: \_\_\_\_\_ Description: effluent

Shipped by: Federal Express \_\_\_\_\_ UPS \_\_\_\_\_ Hand delivered by: WR personnel

Drop-Off Location: ASU-ERF

Storage While Shipped: COOLER w/ ICE

Analysis Requested: Chronic Cytotoxicity + Proliferation

Initial Water Chemistry Analysis:

Sample Received by: UMG

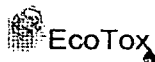
Temperature (°C): 1.5 Ice Present upon delivery:  YES  NO

Date: 050914

Quality Assurance	Initial	Date	Yes	No
Chain of Custody	UMG	050914	<input checked="" type="checkbox"/>	
Refrigerated at 4°C	↓	↓	<input checked="" type="checkbox"/>	
Field Record Received	↓	↓		<input checked="" type="checkbox"/>
Sample Label Affixed Properly	↓	↓	<input checked="" type="checkbox"/>	
Project Leader Informed	↓	↓	<input checked="" type="checkbox"/>	

Comments: \_\_\_\_\_

\_\_\_\_\_



Ecotoxicology Research Facility

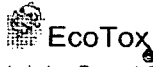
### Ecotoxicology Research Facility

Arkansas State University  
2645 Caddo Drive  
State University, AR 72467  
(870) 972-2570 Fax (870) 972-2577

# CHAIN OF CUSTODY RECORD



Client Name <b>Walnut Ridge Wastewater Treatment</b>			Phone: <b>(870) 886-2312</b>			Analyses (List Below)					
Project #			Fax:								
Sampler (sign) <i>[Signature]</i>			PO #:			Chronic C. dubia	Chronic P. promelas				
Remarks:			Contact: <b>Jonathan Kopp</b>								
Cont.#	Sample ID Number	Location	Sample Date	Sample Time	Sample Type		Matrix				
					Comp	Grab	Aqueous	Soil	Other		
			5-4 5-5	9am - 9am	<input checked="" type="checkbox"/>						
Ice present at delivery:		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No									
Temp:		1.0 °C		Initials							
1. Relinquished By (sign) <i>[Signature]</i>		Date 5-5-14		Time		1. Received By (sign) <i>Melanie Giffen</i>		Date 050514		Time 1130	
2. Relinquished By (sign)		Date		Time		2. Received By (sign)		Date		Time	



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2645 Caddo Drive  
State University, AR 72467  
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# CHAIN OF CUSTODY RECORD



Client Name <b>Walnut Ridge Wastewater Treatment</b>		Phone: <b>(870) 886-2312</b>					Analyses (List Below)			
Project #		Fax:					Chronic C. dubia	Chronic P. promelas		
Sampler (sign) 		PO #:								
Remarks:		Contact: <b>Jonathan Kopp</b>								
Cont.#	Sample ID Number	Location	Sample Date	Sample Time	Sample Type		Matrix			
					Comp	Grab	Aqueous	Soil	Other	
			5-6	5-7	9am - 9am	<input checked="" type="checkbox"/>				
Ice present at delivery:		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No								
Temp:		<u>0.8</u> °C <u>SV</u> Initials								
1. Relinquished By (sign) 		Date	Time		1. Received By (sign) 			Date	Time	
		5-7-14	11:00 AM					050714	1110	
2. Relinquished By (sign)		Date	Time		2. Received By (sign)			Date	Time	



Ecotoxicology Research Facility

### Ecotoxicology Research Facility

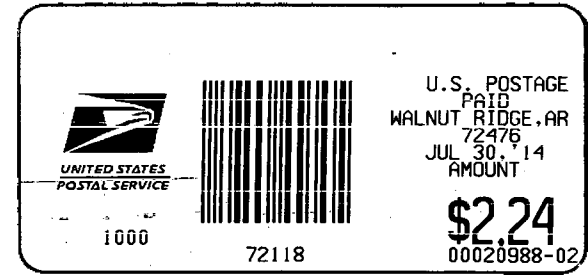
Arkansas State University  
2645 Caddo Drive  
State University, AR 72467  
(870) 972-2570 Fax (870) 972-2577

# CHAIN OF CUSTODY RECORD



Client Name <b>Walnut Ridge Wastewater Treatment</b>		Phone: (870) 886-2312					Analyses (List Below)			
Project #		Fax:					Chronic <i>C. dubia</i>	Chronic <i>P. promelas</i>		
Sampler (sign) 		PO #:								
Remarks:		Contact: Jonathan Kopp								
Cont.#	Sample ID Number	Location	Sample Date	Sample Time	Sample Type		Matrix			
					Comp	Grab	Aqueous	Soil	Other	
			5-8 5-9	9am-9am	✓					
Ice present at delivery:		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>								
Temp:		1.5°C		Initials						
1. Relinquished By (sign) 		Date 5-9-14		Time 11:00 AM		1. Received By (sign) 		Date 050914		Time 1120
2. Relinquished By (sign)		Date		Time		2. Received By (sign)		Date		Time

City Water Works  
216 S.W. 4th  
Walnut Ridge AR  
72476



ADEQ  
Water Division - Enforcement Branch  
5301 Northshore Drive  
North Little Rock, AR 72118