

# Arkansas Analytical, Inc.

Toxicity Test Results  
City of DeQueen  
**NPDES PERMIT NUMBER: AR0021733**  
First Quarter 2022  
AFIN # 67-00023

Fathead Minnow, *Pimephales promelas*, Larval Survival and Growth Test  
Test 1000.0

*Ceriodaphnia dubia*, Survival and Reproduction Test  
Test 1002.0

Prepared for: **Mr. Clint Young**  
**City of DeQueen**  
**P.O. Box 730**  
**DeQueen, Arkansas 71832**

Prepared by: Arkansas Analytical, Inc.  
8100 National Drive  
Little Rock, Arkansas 72209  
**Lab Number K2202001**

Friday, February 18, 2022

## Plant location

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City of DeQueen. 1/8 mile south from intersection of Coulter Ave. and south of 9<sup>th</sup> Street on Philip Cox Blvd, in Section 36, Township 8 South, Range 32 West in Sevier County, Arkansas.

## Test Methods

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EPA Method 1000.0 *Pimephales promelas*, Larval survival and growth test

- Test chambers: 500 mL plastic cups
- Test solution volume: 250 mL
- Number of test organisms per chamber: 10
- Number of replicates per concentration: 5
- Test temperature 25°C ± 1°C
- Test concentrations: 0%, 32%, 42%, 56%, 80%, 100%
- Dilution water: Moderately hard synthetic
- No deviation from method

EPA Method 1002.0 *Ceriodaphnia dubia*, Survival and reproduction test

- Test chambers: 30 mL plastic cups
- Test solution volume: 15 mL
- Number of test organisms per chamber: 1
- Number of replicates per concentration: 10
- Test temperature 25°C ± 1°C
- Test concentrations: 0%, 32%, 42%, 56%, 80%, 100%
- Dilution water: Moderately hard synthetic
- No deviation from method

NOTE: Due to the inclement weather, analysts were unable to work February 3, 2022. As a result, the tests were not renewed or fed on Day 3. Additionally, the two renewal samples used in the tests (K2202001B and K2202001C) exceeded holding time.

## Reference Toxicant Data

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### REFERENCE TOXICANT (Potassium Chloride)

| <i>Ceriodaphnia dubia</i> 1/4/22 – 1/10/22 |              | <i>Pimephales promelas</i> 1/4/22 – 1/11/22 |              |
|--|--------------|---|--------------|
| NOEC Survival:                             | 500 ppm KCl  | NOEC Survival:                              | 500 ppm KCl  |
| LOEC Survival:                             | 1000 ppm KCl | LOEC Survival:                              | 1000 ppm KCl |
| NOEC Reproduction:                         | 250 ppm KCl  | NOEC Growth:                                | 500 ppm KCl  |
| LOEC Reproduction:                         | 500 ppm KCl  | LOEC Growth:                                | 1000 ppm KCl |

## Summary of Results

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### City of DeQueen

| <i>Ceriodaphnia dubia</i>                         |       | <i>Pimephales promelas</i>                    |       |
|---|-------|---|-------|
| NOEC Survival<br>Parameter: <b>TOP3B</b>          | 100%  | NOEC Survival<br>Parameter: <b>TOP6C</b>      | 100%  |
| Pass/Fail Survival<br>Parameter: <b>TLP3B</b>     | Pass  | Pass/Fail Survival<br>Parameter: <b>TLP6C</b> | Pass  |
| NOEC Reproduction<br>Parameter: <b>TPP3B</b>      | 100%  | NOEC Growth<br>Parameter: <b>TPP6C</b>        | 100%  |
| Pass/Fail Reproduction<br>Parameter: <b>TGP3B</b> | Pass  | Pass/Fail Growth<br>Parameter: <b>TGP6C</b>   | Pass  |
| %CV Reproduction<br>Parameter: <b>TQP3B</b>       | 39.0% | %CV Growth<br>Parameter: <b>TQP6C</b>         | 15.3% |
| PMSD Reproduction                                 | 30.0% | PMSD Growth                                   | 23.3% |

## Conclusion

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*Pimephales promelas*, (Method 1000.0): The permit issued to the City of DeQueen, specifies that the **critical dilution is 100% effluent**. The effluent samples **did not** exhibit lethal or sublethal effects at the critical dilution, and, as such, **passed** both portions of the test.

*Ceriodaphnia dubia*, (Method 1002.0): The permit issued to the City of DeQueen, specifies that the **critical dilution is 100% effluent**. The effluent samples **did not** exhibit lethal or sublethal effects at the critical dilution, and, as such, **passed** both portions of the test.

Biomonitoring Analysts: Melissa Bird, Jettie Parnell, Camille Foscue, Clint Wood

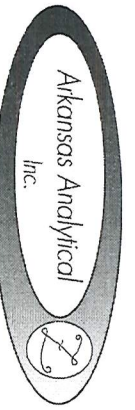
Reviewed by:

  
Melissa Bird

## Appendices

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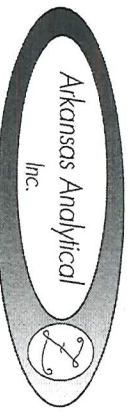
|                 |   |
|-----------------|---|
| Appendix A..... | Chains of custody                           |
| Appendix B..... | Fathead minnow data & statistics            |
| Appendix C..... | <i>Ceriodaphnia dubia</i> data & statistics |
| Appendix D..... | Water chemistry data                        |
| Appendix E..... | Reference toxicant control charts           |



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# CHAIN OF CUSTODY RECORD

| CLIENT INFORMATION               |                   | BILLING                                 |      | Project Description             |                   | Turnaround Time                     |                 | Preservation Codes:   |   |
|----------------------------------|-------------------|---|------|---------------------------------|-------------------|-------------------------------------|-----------------|---|---|
| City of DeQueen Wastewater Plant |                   | City of DeQueen Wastewater Plant        |      | Chronic Toxicity                |                   | 1 Day (100%)                        |                 | 1. Cool, 6 Degrees Centigrade   |   |
| 514 South 9th                    |                   | P.O. Box 730                            |      | 1st Quarter 2022                |                   | 2 Day (50%)                         |                 | 2. Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ), pH < 2                              |   |
| DeQueen, AR 71832                |                   | DeQueen, AR 71832                       |      | Reporting Information           |                   | 3 Day (25%)                         |                 | 3. Nitric Acid (HNO <sub>3</sub> ), pH < 2  |   |
| Attn: Clint Young                |                   | Telephone: 870-642-5231                 |      | Routine                         |                   | TEST PARAMETERS                     |                 | 4. Thiosulfate for Dechlorination   |   |
| Email: cyoung@cityofdequeen.com  |                   | Fax: 870-642-3117                       |      | Preservative Code: P            |                   | Bottle Type Code                    |                 | 5. Hydrochloric Acid(HCl)   |   |
| Bottle Type Code                 |                   | G = Glass; P = Plastic                  |      | V = Squirt; A = Amber           |                   | 6. Sodium Hydroxide (NaOH), pH > 12 |                 | Arkansas Analytical Work Order Number: K2202-001A                                       |   |
| Sampler(s) Signature             |                   | Sampler(s) Printed                      |      | SAMPLE COLLECTION               |                   | SAMPLE IDENTIFICATION/ DESCRIPTION  |                 | SAMPLE CONDITION UPON RECEIPT IN LAB  |   |
| Field Number                     | Dates             | Time/s                                  | Grab | Comp                            | Number of Bottles | Sample Matrix                       | Final Discharge | Outfall   | 1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
|                                  | 1-31-22 to 2-1-22 | 8:00 to 8:30                            |      | X                               | 4                 | Water                               |                 |   | 2. CONTAINERS CORRECT: <input type="checkbox"/> Yes <input type="checkbox"/> No       |
| 1. Relinquished by: (Signature)  |                   | Date/Time                               |      | 2. Received by: (Signature)     |                   | Date/Time                           |                 | 3. COC/LABELS AGREE: <input type="checkbox"/> Yes <input type="checkbox"/> No           |   |
|                                  |                   | 1-30-22<br>2-1-22<br>8:00 AM to 8:00 AM |      |                                 |                   | 2/1/22 11:35                        |                 | 4. RECEIVED ON ICE: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |
| 3. Relinquished by: (Signature)  |                   | Date/Time                               |      | 4. Received by lab: (Signature) |                   | Date/Time                           |                 | 5. TEMPERATURE ON RECEIPT: 3 °C   |   |
|                                  |                   | 2/1/22<br>1452                          |      | SYDNEY JAMES                    |                   |                                     |                 | 6. TEMPERATURE GUN ID: HHT#3  |   |
|                                  |                   |   |      |                                 |                   |                                     |                 | REMARKS / SAMPLE COMMENTS   |   |
|                                  |                   |   |      |                                 |                   |                                     |                 | P.O. # 2622   |   |



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# CHAIN OF CUSTODY RECORD

| CLIENT INFORMATION                                 |                         | BILLING                                |      | Project Description                                 |                   | Turnaround Time  |       | Preservation Codes:   |         |                           |  |
|--|-------------------------|--|------|---|-------------------|--|-------|---|---------|---------------------------|--|
| City of DeQueen Wastewater Plant                   |                         | City of DeQueen Wastewater Plant       |      | Chronic Toxicity                                    |                   | 1 Day (100%)   |       | 1. Cool, 6 Degrees Centigrade   |         |                           |  |
| 514 South 9th                                      |                         | P.O. Box 730                           |      | 1st Quarter 2022                                    |                   | 2 Day (50%)  |       | 2. Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ), pH < 2                            |         |                           |  |
| DeQueen, AR 71832                                  |                         | DeQueen, AR 71832                      |      | Reporting Information                               |                   | 3 Day (25%)  |       | 3. Nitric Acid (HNO <sub>3</sub> ), pH < 2  |         |                           |  |
| Attn: Clint Young                                  |                         | Telephone: 870-642-5231                |      | Routine   |                   | TEST PARAMETERS  |       | 4. Thiocyanate for Dechlorination   |         |                           |  |
|  |                         | Fax: 870-642-3117                      |      | Preservative Code:                                  |                   | 1  |       | 5. Hydrochloric Acid(HCl)   |         |                           |  |
|  |                         | Email: cyoung@cityofdequeen.com        |      | Bottle Type:  |                   | P  |       | 6. Sodium Hydroxide (NaOH), pH > 12   |         |                           |  |
| Sampler(s) Signature: <i>[Signature]</i>           |                         | Sampler(s) Printed: <i>Clint Young</i> |      | SAMPLE IDENTIFICATION / DESCRIPTION                 |                   | Chronic Toxicity (Ceriodaphnia Dubia, Pimephales Promelas) |       | Arkansas Analytical Work Order Number: <i>K2202-001B</i>                              |         |                           |  |
| Field Number                                       | SAMPLE COLLECTION Dates | Time/s                                 | Grab | Comp  | Number of Bottles | Sample Matrix  | Water | Final Discharge   | Outfall |                           |  |
|  | 2-1-22-2-2-22           | 8:00 to 8:00                           |      | X   | 4                 |  |       |   | X       |                           |  |
| 1. Relinquished by: (Signature) <i>[Signature]</i> |                         | Date/Time 8:00 A.M.                    |      | 2. Received by: (Signature) <i>[Signature]</i>      |                   | Date/Time 2/2/22 12:19                                     |       | SAMPLE CONDITION UPON RECEIPT IN LAB  |         | REMARKS / SAMPLE COMMENTS |  |
| 3. Relinquished by: (Signature) <i>[Signature]</i> |                         | Date/Time 2/2/22 15:15                 |      | 4. Received by lab: (Signature) <b>SYDNEY JAMES</b> |                   |  |       | 1. CUSTODY SEALS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |         | P.O. 2627                 |  |
|  |                         |  |      |   |                   |  |       | 2. CONTAINERS CORRECT: <input type="checkbox"/> Yes <input type="checkbox"/> No       |         |                           |  |
|  |                         |  |      |   |                   |  |       | 3. COCLABELS AGREE: <input type="checkbox"/> Yes <input type="checkbox"/> No          |         |                           |  |
|  |                         |  |      |   |                   |  |       | 4. RECEIVED ON ICE: <input type="checkbox"/> Yes <input type="checkbox"/> No          |         |                           |  |
|  |                         |  |      |   |                   |  |       | 5. TEMPERATURE ON RECEIPT: 1 °C   |         |                           |  |
|  |                         |  |      |   |                   |  |       | 6. TEMPERATURE GUN ID: HHT# 3   |         |                           |  |
|  |                         |  |      |   |                   |  |       | FOR COMPLETION BY LAB ONLY  |         |                           |  |



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# CHAIN OF CUSTODY RECORD

| CLIENT INFORMATION  |                         | BILLING                          |      | Project Description                               |                           | Turnaround Time  |                             | Preservation Codes:  |   |
|---|-------------------------|----------------------------------|------|---|---------------------------|------------------|-----------------------------|--|---|
| City of DeQueen Wastewater Plant  |                         | City of DeQueen Wastewater Plant |      | Chronic Toxicity                                  |                           | 1 Day (100%)     |                             | 1. Cool, 6 Degrees Centigrade                              |   |
| 514 South 9th   |                         | P.O. Box 730                     |      | 1st Quarter 2022                                  |                           | 2 Day (50%)      |                             | 2. Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ), pH < 2 |   |
| DeQueen, AR 71832   |                         | DeQueen, AR 71832                |      | Reporting Information                             |                           | 3 Day (25%)      |                             | 3. Nitric Acid (HNO <sub>3</sub> ), pH < 2                 |   |
| Attn: Clint Young   |                         | Telephone: 870-642-5231          |      | Routine   |                           | TEST PARAMETERS  |                             | 6. Sodium Hydroxide (NaOH), pH > 12                        |   |
| Fax: 870-642-3117   |                         | Email: cyoung@cityofdequeen.com  |      | Preservative Code: P                              |                           | Bottle Type Code |                             | G = Glass; P = Plastic                                     |   |
| Bottle Type:  |                         | V = Septum; A = Amber            |      | Arkansas Analytical Work Order Number: K2202-661C |                           |                  |                             |  |   |
| Field Number  | SAMPLE COLLECTION Dates | Time/s                           | Grab | Comp  | Number of Bottles         | Sample Matrix    | IDENTIFICATION/ DESCRIPTION | SAMPLE   |   |
|   | 2-2-22                  | 8:00 to 11:00 AM                 |      | X   | 4                         | Water            | Final Discharge Outfall     | Chronic Toxicity (Ceriodaphnia Dubia, Pimephales Promelas) | X |
| <p>1. Relinquished by: (Signature) _____ Date/Time: 2-2-22 11:00</p> <p>2. Received by: (Signature) _____ Date/Time: 2/2/22 12:19</p> <p>3. Relinquished by: (Signature) _____ Date/Time: 2/2/22 15:15</p> <p>4. Received by lab: (Signature) <b>SYDNEY JAMES</b></p> |                         |                                  |      |   |                           |                  |                             |  |   |
| SAMPLE CONDITION UPON RECEIPT IN LAB  |                         |                                  |      |   | REMARKS / SAMPLE COMMENTS |                  |                             |  |   |
| 1. CUSTODY SEALS: Yes ___ No ___<br>2. CONTAINERS CORRECT: Yes ___ No ___<br>3. COC/LABELS AGREE: Yes ___ No ___<br>4. RECEIVED ON ICE: Yes ___ No ___<br>5. TEMPERATURE ON RECEIPT: 1 °C<br>6. TEMPERATURE GUN ID: HHT# _____  |                         |                                  |      |   | P.O. 2627                 |                  |                             |  |   |
| FOR COMPLETION BY LAB ONLY  |                         |                                  |      |   |                           |                  |                             |  |   |

**CETIS Summary Report**

Report Date: 17 Feb-22 14:04 (p 1 of 2)  
 Test Code/ID: K2202001FH / 21-0098-9897

**Fathead Minnow 7-d Larval Survival and Growth Test**

Arkansas Analytical

|                               |                                   |  |
|-------------------------------|-----------------------------------|--|
| Batch ID: 13-2031-4991        | Test Type: Growth-Survival (7d)   | Analyst: Jettie Parnell  |
| Start Date: 01 Feb-22 15:39   | Protocol: EPA/821/R-02-013 (2002) | Diluent: Mod-Hard Synthetic Water                                  |
| Ending Date: 08 Feb-22 13:55  | Species: Pimephales promelas      | Brine: Not Applicable  |
| Test Length: 6d 22h           | Taxon: Actinopterygii             | Source: Aquatox, AR <span style="float: right;">Age: &lt;24</span> |
| Sample ID: 08-2544-3354       | Code: K2202001FH                  | Project: WET Quarterly Compliance Test (1Q)                        |
| Sample Date: 01 Feb-22 08:00  | Material: POTW Effluent           | Source: DeQueen (AR0021733)  |
| Receipt Date: 01 Feb-22 14:52 | CAS (PC):                         | Station:   |
| Sample Age: 8h (3 °C)         | Client: DeQueen                   |  |

**Sample Renewals**

| Renewal | Sample Code | Sample Date     | Receive Date    | Renewal Date    | Temp °C |
|---------|-------------|-----------------|-----------------|-----------------|---------|
| 1       | K2202001B   | 02 Feb-22 08:00 | 02 Feb-22 15:15 | 04 Feb-22 00:00 | 1       |
| 2       | K2202001C   | 02 Feb-22 11:00 | 02 Feb-22 15:15 | 07 Feb-22 00:00 | 1       |

**Multiple Comparison Summary**

| Analysis ID  | Endpoint           | Comparison Method                | ✓ NOEL | LOEL | TOEL | TU | PMSD  | S |
|--------------|--------------------|----------------------------------|--------|------|------|----|-------|---|
| 07-1984-8910 | 7d Survival Rate   | Dunnett Multiple Comparison Test | 100    | >100 | n/a  | 1  | 13.9% | 1 |
| 08-3478-7849 | Mean Dry Weight-mg | Dunnett Multiple Comparison Test | 100    | >100 | n/a  | 1  | 23.3% | 1 |

**Test Acceptability**

| Analysis ID  | Endpoint         | Attribute    | Test Stat | TAC Limits |       | Overlap | Decision        |
|--------------|------------------|--------------|-----------|------------|-------|---------|-----------------|
|              |                  |              |           | Lower      | Upper |         |                 |
| 07-1984-8910 | 7d Survival Rate | Control Resp | 0.96      | 0.8        | >>    | Yes     | Passes Criteria |

**7d Survival Rate Summary**

| Conc-% | Code | Count | Mean   | 95% LCL | 95% UCL | Min    | Max    | Std Err | Std Dev | CV%    | %Effect |
|--------|------|-------|--------|---------|---------|--------|--------|---------|---------|--------|---------|
| 0      | L    | 5     | 0.9600 | 0.8920  | 1.0000  | 0.9000 | 1.0000 | 0.0245  | 0.0548  | 5.71%  | 0.00%   |
| 32     |      | 5     | 0.8200 | 0.6160  | 1.0000  | 0.6000 | 1.0000 | 0.0735  | 0.1643  | 20.04% | 14.58%  |
| 42     |      | 5     | 0.9000 | 0.7758  | 1.0000  | 0.8000 | 1.0000 | 0.0447  | 0.1000  | 11.11% | 6.25%   |
| 56     |      | 5     | 0.9000 | 0.8122  | 0.9878  | 0.8000 | 1.0000 | 0.0316  | 0.0707  | 7.86%  | 6.25%   |
| 80     |      | 5     | 0.9600 | 0.8920  | 1.0000  | 0.9000 | 1.0000 | 0.0245  | 0.0548  | 5.71%  | 0.00%   |
| 100    |      | 5     | 0.9200 | 0.8161  | 1.0000  | 0.8000 | 1.0000 | 0.0374  | 0.0837  | 9.09%  | 4.17%   |

**Mean Dry Weight-mg Summary**

| Conc-% | Code | Count | Mean   | 95% LCL | 95% UCL | Min   | Max   | Std Err  | Std Dev | CV%    | %Effect |
|--------|------|-------|--------|---------|---------|-------|-------|----------|---------|--------|---------|
| 0      | L    | 5     | 0.3506 | 0.2842  | 0.417   | 0.283 | 0.43  | 0.02393  | 0.0535  | 15.26% | 0.00%   |
| 32     |      | 5     | 0.3178 | 0.1904  | 0.4452  | 0.185 | 0.462 | 0.0459   | 0.1026  | 32.29% | 9.36%   |
| 42     |      | 5     | 0.3252 | 0.2767  | 0.3737  | 0.282 | 0.357 | 0.01747  | 0.03906 | 12.01% | 7.24%   |
| 56     |      | 5     | 0.3196 | 0.2776  | 0.3616  | 0.284 | 0.356 | 0.01513  | 0.03384 | 10.59% | 8.84%   |
| 80     |      | 5     | 0.3344 | 0.2831  | 0.3857  | 0.285 | 0.378 | 0.01847  | 0.04129 | 12.35% | 4.62%   |
| 100    |      | 5     | 0.3344 | 0.3182  | 0.3506  | 0.312 | 0.345 | 0.005827 | 0.01303 | 3.90%  | 4.62%   |



# CETIS Summary Report

Report Date: 17 Feb-22 14:04 (p 2 of 2)  
Test Code/ID: K2202001FH / 21-0098-9897

## Fathead Minnow 7-d Larval Survival and Growth Test

Arkansas Analytical

### 7d Survival Rate Detail

| Conc-% | Code | Rep 1  | Rep 2  | Rep 3  | Rep 4  | Rep 5  |
|--------|------|--------|--------|--------|--------|--------|
| 0      | L    | 1.0000 | 0.9000 | 0.9000 | 1.0000 | 1.0000 |
| 32     |      | 1.0000 | 0.7000 | 0.6000 | 0.9000 | 0.9000 |
| 42     |      | 0.8000 | 1.0000 | 0.8000 | 0.9000 | 1.0000 |
| 56     |      | 0.9000 | 0.9000 | 0.8000 | 0.9000 | 1.0000 |
| 80     |      | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 1.0000 |
| 100    |      | 0.9000 | 0.8000 | 0.9000 | 1.0000 | 1.0000 |

### Mean Dry Weight-mg Detail

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 |
|--------|------|-------|-------|-------|-------|-------|
| 0      | L    | 0.358 | 0.283 | 0.43  | 0.328 | 0.354 |
| 32     |      | 0.333 | 0.185 | 0.265 | 0.344 | 0.462 |
| 42     |      | 0.282 | 0.354 | 0.283 | 0.35  | 0.357 |
| 56     |      | 0.35  | 0.321 | 0.287 | 0.356 | 0.284 |
| 80     |      | 0.373 | 0.378 | 0.303 | 0.285 | 0.333 |
| 100    |      | 0.312 | 0.335 | 0.345 | 0.341 | 0.339 |

### 7d Survival Rate Binomials

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 |
|--------|------|-------|-------|-------|-------|-------|
| 0      | L    | 10/10 | 9/10  | 9/10  | 10/10 | 10/10 |
| 32     |      | 10/10 | 7/10  | 6/10  | 9/10  | 9/10  |
| 42     |      | 8/10  | 10/10 | 8/10  | 9/10  | 10/10 |
| 56     |      | 9/10  | 9/10  | 8/10  | 9/10  | 10/10 |
| 80     |      | 10/10 | 10/10 | 9/10  | 9/10  | 10/10 |
| 100    |      | 9/10  | 8/10  | 9/10  | 10/10 | 10/10 |

**CETIS Summary Report**

Report Date: 18 Feb-22 11:06 (p 1 of 2)  
 Test Code/ID: K2202001CD / 14-0648-8562

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

Arkansas Analytical

|                               |                                       |   |
|-------------------------------|---------------------------------------|---|
| Batch ID: 16-3869-3782        | Test Type: Reproduction-Survival (7d) | Analyst: Jettie Parnell                     |
| Start Date: 01 Feb-22 15:37   | Protocol: EPA/821/R-02-013 (2002)     | Diluent: Mod-Hard Synthetic Water           |
| Ending Date: 07 Feb-22 14:21  | Species: Ceriodaphnia dubia           | Brine: Not Applicable                       |
| Test Length: 5d 23h           | Taxon: Branchiopoda                   | Source: In-House Culture Age: <24           |
| Sample ID: 20-8067-6486       | Code: K2202001CD                      | Project: WET Quarterly Compliance Test (1Q) |
| Sample Date: 01 Feb-22 08:00  | Material: POTW Effluent               | Source: DeQueen (AR0021733)                 |
| Receipt Date: 01 Feb-22 14:52 | CAS (PC):                             | Station:                                    |
| Sample Age: 8h (3 °C)         | Client: DeQueen                       |   |

**Sample Renewals**

| Renewal | Sample Code | Sample Date     | Receive Date    | Renewal Date    | Temp °C |
|---------|-------------|-----------------|-----------------|-----------------|---------|
| 1       | K2202001B   | 02 Feb-22 08:00 | 02 Feb-22 15:15 | 04 Feb-22 00:00 | 1       |
| 2       | K2202001C   | 02 Feb-22 11:00 | 02 Feb-22 15:15 | 07 Feb-22 00:00 | 1       |

**Multiple Comparison Summary**

| Analysis ID  | Endpoint         | Comparison Method                 | ✓ NOEL | LOEL | TOEL | TU | PMSD  | S |
|--------------|------------------|-----------------------------------|--------|------|------|----|-------|---|
| 10-8257-7821 | 7d Survival Rate | Fisher Exact/Bonferroni-Holm Test | 100    | >100 | n/a  | 1  | n/a   | 1 |
| 11-4138-7926 | Reproduction     | Dunnett Multiple Comparison Test  | 100    | >100 | n/a  | 1  | 30.0% | 1 |

**Test Acceptability**

| Analysis ID  | Endpoint         | Attribute    | Test Stat | TAC Limits |       | Overlap | Decision        |
|--------------|------------------|--------------|-----------|------------|-------|---------|-----------------|
|              |                  |              |           | Lower      | Upper |         |                 |
| 10-8257-7821 | 7d Survival Rate | Control Resp | 1         | 0.8        | >>    | Yes     | Passes Criteria |
| 11-4138-7926 | Reproduction     | Control Resp | 21.3      | 15         | >>    | Yes     | Passes Criteria |
| 11-4138-7926 | Reproduction     | PMSD         | 0.3001    | 0.13       | 0.47  | Yes     | Passes Criteria |

**7d Survival Rate Summary**

| Conc-% | Code | Count | Mean   | 95% LCL | 95% UCL | Min    | Max    | Std Err | Std Dev | CV%    | %Effect |
|--------|------|-------|--------|---------|---------|--------|--------|---------|---------|--------|---------|
| 0      | L    | 10    | 1.0000 | 1.0000  | 1.0000  | 1.0000 | 1.0000 | 0.0000  | 0.0000  | 0.00%  | 0.00%   |
| 32     |      | 10    | 1.0000 | 1.0000  | 1.0000  | 1.0000 | 1.0000 | 0.0000  | 0.0000  | 0.00%  | 0.00%   |
| 42     |      | 10    | 1.0000 | 1.0000  | 1.0000  | 1.0000 | 1.0000 | 0.0000  | 0.0000  | 0.00%  | 0.00%   |
| 56     |      | 10    | 1.0000 | 1.0000  | 1.0000  | 1.0000 | 1.0000 | 0.0000  | 0.0000  | 0.00%  | 0.00%   |
| 80     |      | 10    | 1.0000 | 1.0000  | 1.0000  | 1.0000 | 1.0000 | 0.0000  | 0.0000  | 0.00%  | 0.00%   |
| 100    |      | 10    | 0.9000 | 0.6738  | 1.0000  | 0.0000 | 1.0000 | 0.1000  | 0.3162  | 35.14% | 10.00%  |

**Reproduction Summary**

| Conc-% | Code | Count | Mean | 95% LCL | 95% UCL | Min | Max | Std Err | Std Dev | CV%    | %Effect |
|--------|------|-------|------|---------|---------|-----|-----|---------|---------|--------|---------|
| 0      | L    | 10    | 21.3 | 15.35   | 27.25   | 11  | 34  | 2.629   | 8.314   | 39.03% | 0.00%   |
| 32     |      | 10    | 12   | 7.207   | 16.79   | 4   | 23  | 2.119   | 6.7     | 55.83% | 43.66%  |
| 42     |      | 10    | 11.7 | 7.528   | 15.87   | 3   | 21  | 1.844   | 5.832   | 49.85% | 45.07%  |
| 56     |      | 10    | 15.4 | 11.63   | 19.17   | 9   | 24  | 1.668   | 5.275   | 34.25% | 27.70%  |
| 80     |      | 10    | 15.6 | 12.84   | 18.36   | 10  | 21  | 1.222   | 3.864   | 24.77% | 26.76%  |
| 100    |      | 10    | 16.2 | 11.51   | 20.89   | 9   | 28  | 2.075   | 6.563   | 40.51% | 23.94%  |

Average neonates per surviving female in 100%:  $\bar{X} = 17$   
 CV = 37.8%

**CETIS Summary Report**

Report Date: 18 Feb-22 11:06 (p 2 of 2)  
 Test Code/ID: K2202001CD / 14-0648-8562

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

**Arkansas Analytical**

**7d Survival Rate Detail**

| Conc-% | Code | Rep 1  | Rep 2  | Rep 3  | Rep 4  | Rep 5  | Rep 6  | Rep 7  | Rep 8  | Rep 9  | Rep 10 |
|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0      | L    | 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 |
| 80     |      | 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 | 0.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |

**Reproduction Detail**

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 0      | L    | 29    | 19    | 11    | 31    | 13    | 18    | 24    | 23    | 34    | 11     |
| 32     |      | 9     | 23    | 7     | 17    | 7     | 4     | 23    | 10    | 9     | 11     |
| 42     |      | 7     | 12    | 3     | 18    | 17    | 15    | 21    | 7     | 9     | 8      |
| 56     |      | 22    | 17    | 9     | 19    | 9     | 24    | 17    | 14    | 11    | 12     |
| 80     |      | 18    | 16    | 10    | 16    | 11    | 11    | 18    | 21    | 20    | 15     |
| 100    |      | 14    | 10    | 15    | 28    | 9     | 24    | 23    | 14    | 10    | 15     |

**7d Survival Rate Binomials**

| Conc-% | Code | Rep 1 | Rep 2 | Rep 3 | Rep 4 | Rep 5 | Rep 6 | Rep 7 | Rep 8 | Rep 9 | Rep 10 |
|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 0      | L    | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 32     |      | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 42     |      | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 56     |      | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 80     |      | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |
| 100    |      | 1/1   | 1/1   | 1/1   | 1/1   | 0/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1    |

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING

Fathead Minnow

Lab # / Sample ID h2202001

Test Start (Date/Time) 2/1/22-1539

Client: DeQueen

Test End (Date/Time) 2/8/22-1355

Day of Test

|                     |                   | 1    | 2    | 3   | 4    | 5     | 6    | 7    | notes    |
|---------------------|-------------------|------|------|-----|------|-------|------|------|----------|
| Control             | MHS 002           | 2/1  | 2/2  | 2/3 | 2/4  | 2/5   | 2/6  | 2/7  | MHS 003  |
| D.O. (mg/L)         | INITIAL           | 8.6  | 8.7  |     | 9.0  | 9.1   | 9.0  | 8.8  | Used 2/7 |
|                     | FINAL             | 7.8  | 8.7  |     | 8.3  | 7.3   | 7.6  | 8.0  |          |
| pH (s.u.)           | INITIAL           | 7.6  | 8.0  |     | 7.7  | 7.8   | 7.9  | 8.2  |          |
|                     | FINAL             | 7.7  | 7.6  |     | 7.7  | 7.6   | 7.7  | 7.8  |          |
| temp (C)            | INITIAL           | 22   | 20   |     | 21   | 21    | 20   | 22   |          |
|                     | FINAL             | 23   | 25   |     | 21   | 19    | 25   | 25   |          |
| ALKALINITY (mg/L)   |                   | 60   |      |     |      |       |      | 82   |          |
| HARDNESS (mg/L)     |                   | 84   |      |     |      |       |      | 96   |          |
| CONDUCTIVITY (umhc) |                   | 367  |      |     |      |       |      | 330  |          |
| CHLORINE (mg/L)     |                   | 0.05 |      |     |      |       |      | 0.05 |          |
| CONC:               | 32%               |      |      |     |      |       |      |      |          |
| D.O. (mg/L)         | INITIAL           | 8.6  | 8.6  |     | 8.9  | 9.3   | 8.8  | 8.7  |          |
|                     | FINAL             | 7.4  | 8.6  |     | 8.2  | 8.0   | 7.7  | 8.1  |          |
| pH (s.u)            | INITIAL           | 7.6  | 7.9  |     | 7.6  | 7.7   | 7.8  | 8.0  |          |
|                     | FINAL             | 7.7  | 7.7  |     | 7.8  | 7.8   | 7.7  | 7.8  |          |
| temp (C)            | INITIAL           | 23   | 20   |     | 22   | 19    | 20   | 22   |          |
|                     | FINAL             | 25   | 25   |     | 21   | 19    | 25   | 25   |          |
| CONC:               | 42%               |      |      |     |      |       |      |      |          |
| D.O. (mg/L)         | INITIAL           | 8.7  | 8.6  |     | 8.8  | 9.4   | 8.9  | 8.6  |          |
|                     | FINAL             | 7.7  | 8.6  |     | 8.2  | 7.7   | 7.3  | 8.2  |          |
| pH (mg/L)           | INITIAL           | 7.6  | 7.8  |     | 7.6  | 7.6   | 7.8  | 8.0  |          |
|                     | FINAL             | 7.7  | 7.7  |     | 7.8  | 7.7   | 7.7  | 7.8  |          |
| temp (C)            | INITIAL           | 23   | 20   |     | 23   | 19    | 20   | 22   |          |
|                     | FINAL             | 25   | 25   |     | 21   | 19    | 25   | 25   |          |
| CONC:               | 56%               |      |      |     |      |       |      |      |          |
| D.O. (mg/L)         | INITIAL           | 8.7  | 8.6  |     | 8.7  | 9.3   | 9.2  | 8.5  |          |
|                     | FINAL             | 7.2  | 8.5  |     | 8.2  | 7.9   | 6.8  | 8.1  |          |
| pH (s.u.)           | INITIAL           | 7.6  | 7.7  |     | 7.5  | 7.6   | 7.8  | 7.9  |          |
|                     | FINAL             | 7.7  | 7.8  |     | 7.9  | 7.8   | 7.7  | 7.9  |          |
| temp (C)            | INITIAL           | 23   | 20   |     | 23   | 20    | 19   | 23   |          |
|                     | FINAL             | 25   | 25   |     | 21   | 20    | 25   | 25   |          |
| CONC:               | 80%               |      |      |     |      |       |      |      |          |
| D.O. (mg/L)         | INITIAL           | 8.8  | 8.4  |     | 8.5  | 9.4   | 9.3  | 8.4  |          |
|                     | FINAL             | 7.2  | 8.5  |     | 8.2  | 7.9   | 6.5  | 8.2  |          |
| pH (s.u.)           | INITIAL           | 7.6  | 7.7  |     | 7.5  | 7.6   | 7.7  | 7.9  |          |
|                     | FINAL             | 7.7  | 7.8  |     | 7.9  | 7.9   | 7.7  | 7.9  |          |
| temp (C)            | INITIAL           | 24   | 20   |     | 24   | 20    | 20   | 23   |          |
|                     | FINAL             | 25   | 25   |     | 21   | 20    | 25   | 25   |          |
| CONC:               | 100%              |      |      |     |      |       |      |      |          |
| D.O. (mg/L)         | INITIAL           | 9.2  | 8.4  |     | 8.5  | 10.18 | 9.9  | 8.4  |          |
|                     | FINAL             | 7.3  | 8.5  |     | 8.2  | 7.6   | 6.9  | 8.1  |          |
| pH (s.u.)           | INITIAL           | 7.5  | 7.7  |     | 7.5  | 7.5   | 7.7  | 7.9  |          |
|                     | FINAL             | 7.7  | 7.8  |     | 7.9  | 7.9   | 7.7  | 7.9  |          |
| temp (C)            | INITIAL           | 24   | 20   |     | 24   | 19    | 21   | 23   |          |
|                     | FINAL             | 25   | 25   |     | 21   | 20    | 25   | 25   |          |
| CONC:               | 100% <sup>1</sup> | A    | A    |     | B    | B     | R    | C    |          |
| ALKALINITY (mg/L)   |                   | 90   | 90   |     | 124  | 124   | 124  | 108  |          |
| HARDNESS (mg/L)     |                   | 28   | 28   |     | 36   | 36    | 36   | 32   |          |
| CONDUCTIVITY (umhc) |                   | 595  | 595  |     | 648  | 648   | 648  | 652  |          |
| CHLORINE (mg/L)     |                   | 0.05 | 0.05 |     | 0.05 | 0.05  | 0.05 | 0.05 |          |

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING

Ceriodaphnia Dubia

Lab # / Sample ID *K2202001*

Test Start (Date/Time) *2/1/22-1537*

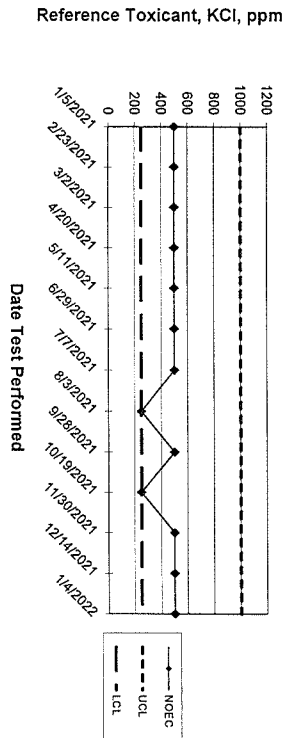
Client: *DeQueen*

Test End (Date/Time) *2/7/22-1421*

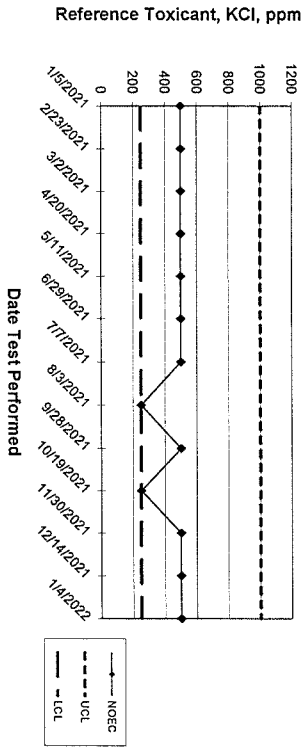
|                         |             | Day of Test     |                 |            |                 |                 |                 |                 |                         |
|-------------------------|-------------|-----------------|-----------------|------------|-----------------|-----------------|-----------------|-----------------|-------------------------|
|                         |             | 1               | 2               | 3          | 4               | 5               | 6               | 7               | notes/remarks           |
| <b>Control</b>          | MHS 002     | <i>2/1</i>      | <i>2/2</i>      | <i>2/3</i> | <i>2/4</i>      | <i>2/5</i>      | <i>2/6</i>      | <i>2/7</i>      | MHS 003 used <i>2/7</i> |
| D.O. (mg/L)             | INITIAL     | <i>8.6</i>      | <i>8.7</i>      |            | <i>9.0</i>      | <i>9.1</i>      | <i>9.0</i>      | <i>8.8</i>      |                         |
|                         | FINAL       | <i>8.4</i>      |                 |            | <i>9.0</i>      | <i>9.0</i>      | <i>9.0</i>      | <i>8.8</i>      |                         |
| pH (s.u.)               | INITIAL     | <i>7.6</i>      | <i>8.0</i>      |            | <i>7.7</i>      | <i>7.8</i>      | <i>7.9</i>      | <i>8.2</i>      |                         |
|                         | FINAL       | <i>7.6</i>      |                 |            | <i>8.1</i>      | <i>8.0</i>      | <i>8.0</i>      | <i>7.9</i>      |                         |
| temp (C)                | INITIAL     | <i>22</i>       | <i>20</i>       |            | <i>21</i>       | <i>21</i>       | <i>20</i>       | <i>22</i>       |                         |
|                         | FINAL       | <i>25</i>       |                 |            | <i>25</i>       | <i>25</i>       | <i>25</i>       | <i>25</i>       |                         |
| ALKALINITY (mg/L)       |             | <i>60</i>       |                 |            |                 |                 |                 | <i>82</i>       |                         |
| HARDNESS (mg/L)         |             | <i>84</i>       |                 |            |                 |                 |                 | <i>96</i>       |                         |
| CONDUCTIVITY (umhos/cm) |             | <i>307</i>      |                 |            |                 |                 |                 | <i>330</i>      |                         |
| CHLORINE (mg/L)         |             | <i>&lt;0.05</i> |                 |            |                 |                 |                 | <i>&lt;0.05</i> |                         |
| <b>CONC: 32%</b>        |             |                 |                 |            |                 |                 |                 |                 |                         |
| D.O. (mg/L)             | INITIAL     | <i>8.6</i>      | <i>8.6</i>      |            | <i>8.9</i>      | <i>9.3</i>      | <i>8.8</i>      | <i>8.7</i>      |                         |
|                         | FINAL       | <i>8.2</i>      |                 |            | <i>9.0</i>      | <i>9.1</i>      | <i>9.0</i>      | <i>7.6</i>      |                         |
| pH (s.u.)               | INITIAL     | <i>7.6</i>      | <i>7.9</i>      |            | <i>7.6</i>      | <i>7.7</i>      | <i>7.8</i>      | <i>8.0</i>      |                         |
|                         | FINAL       | <i>7.7</i>      |                 |            | <i>8.1</i>      | <i>8.0</i>      | <i>8.0</i>      | <i>7.8</i>      |                         |
| temp (C)                | INITIAL     | <i>23</i>       | <i>20</i>       |            | <i>22</i>       | <i>19</i>       | <i>20</i>       | <i>22</i>       |                         |
|                         | FINAL       | <i>25</i>       |                 |            | <i>25</i>       | <i>25</i>       | <i>25</i>       | <i>25</i>       |                         |
| <b>CONC: 42%</b>        |             |                 |                 |            |                 |                 |                 |                 |                         |
| D.O. (mg/L)             | INITIAL     | <i>8.7</i>      | <i>8.6</i>      |            | <i>8.8</i>      | <i>9.4</i>      | <i>8.9</i>      | <i>8.6</i>      |                         |
|                         | FINAL       | <i>8.1</i>      |                 |            | <i>9.1</i>      | <i>9.1</i>      | <i>9.0</i>      | <i>7.9</i>      |                         |
| pH (mg/L)               | INITIAL     | <i>7.6</i>      | <i>7.8</i>      |            | <i>7.6</i>      | <i>7.6</i>      | <i>7.8</i>      | <i>8.0</i>      |                         |
|                         | FINAL       | <i>7.8</i>      |                 |            | <i>8.1</i>      | <i>8.0</i>      | <i>8.0</i>      | <i>7.8</i>      |                         |
| temp (C)                | INITIAL     | <i>23</i>       | <i>20</i>       |            | <i>23</i>       | <i>19</i>       | <i>20</i>       | <i>22</i>       |                         |
|                         | FINAL       | <i>25</i>       |                 |            | <i>25</i>       | <i>25</i>       | <i>25</i>       | <i>25</i>       |                         |
| <b>CONC: 56%</b>        |             |                 |                 |            |                 |                 |                 |                 |                         |
| D.O. (mg/L)             | INITIAL     | <i>8.7</i>      | <i>8.6</i>      |            | <i>8.7</i>      | <i>9.3</i>      | <i>9.2</i>      | <i>9.5</i>      |                         |
|                         | FINAL       | <i>8.1</i>      |                 |            | <i>9.0</i>      | <i>9.1</i>      | <i>8.9</i>      | <i>8.1</i>      |                         |
| pH (s.u.)               | INITIAL     | <i>7.6</i>      | <i>7.7</i>      |            | <i>7.5</i>      | <i>7.6</i>      | <i>7.8</i>      | <i>7.9</i>      |                         |
|                         | FINAL       | <i>7.8</i>      |                 |            | <i>8.1</i>      | <i>8.0</i>      | <i>8.0</i>      | <i>7.9</i>      |                         |
| temp (C)                | INITIAL     | <i>23</i>       | <i>20</i>       |            | <i>23</i>       | <i>20</i>       | <i>19</i>       | <i>23</i>       |                         |
|                         | FINAL       | <i>25</i>       |                 |            | <i>25</i>       | <i>25</i>       | <i>25</i>       | <i>25</i>       |                         |
| <b>CONC: 80%</b>        |             |                 |                 |            |                 |                 |                 |                 |                         |
| D.O. (mg/L)             | INITIAL     | <i>8.8</i>      | <i>8.4</i>      |            | <i>8.5</i>      | <i>9.4</i>      | <i>9.3</i>      | <i>8.4</i>      |                         |
|                         | FINAL       | <i>8.2</i>      |                 |            | <i>9.0</i>      | <i>9.0</i>      | <i>8.9</i>      | <i>7.9</i>      |                         |
| pH (s.u.)               | INITIAL     | <i>7.6</i>      | <i>7.7</i>      |            | <i>7.5</i>      | <i>7.6</i>      | <i>7.7</i>      | <i>7.9</i>      |                         |
|                         | FINAL       | <i>7.8</i>      |                 |            | <i>8.1</i>      | <i>8.1</i>      | <i>8.0</i>      | <i>7.9</i>      |                         |
| temp (C)                | INITIAL     | <i>24</i>       | <i>20</i>       |            | <i>24</i>       | <i>20</i>       | <i>20</i>       | <i>23</i>       |                         |
|                         | FINAL       | <i>25</i>       |                 |            | <i>25</i>       | <i>25</i>       | <i>25</i>       | <i>25</i>       |                         |
| <b>CONC: 100%</b>       |             |                 |                 |            |                 |                 |                 |                 |                         |
| D.O. (mg/L)             | INITIAL     | <i>9.2</i>      | <i>8.4</i>      |            | <i>8.5</i>      | <i>10.2</i>     | <i>8.9</i>      | <i>8.4</i>      |                         |
|                         | FINAL       | <i>8.2</i>      |                 |            | <i>9.0</i>      | <i>9.0</i>      | <i>8.9</i>      | <i>8.0</i>      |                         |
| pH (s.u.)               | INITIAL     | <i>7.5</i>      | <i>7.7</i>      |            | <i>7.5</i>      | <i>7.5</i>      | <i>7.7</i>      | <i>7.9</i>      |                         |
|                         | FINAL       | <i>7.9</i>      |                 |            | <i>8.1</i>      | <i>8.1</i>      | <i>8.1</i>      | <i>8.0</i>      |                         |
| temp (C)                | INITIAL     | <i>24</i>       | <i>20</i>       |            | <i>24</i>       | <i>19</i>       | <i>21</i>       | <i>23</i>       |                         |
|                         | FINAL       | <i>25</i>       |                 |            | <i>25</i>       | <i>25</i>       | <i>25</i>       | <i>25</i>       |                         |
| CONC:                   | <i>100%</i> | <i>A</i>        | <i>A</i>        |            | <i>B</i>        | <i>B</i>        | <i>B</i>        | <i>C</i>        |                         |
| ALKALINITY (mg/L)       |             | <i>90</i>       | <i>90</i>       |            | <i>124</i>      | <i>124</i>      | <i>124</i>      | <i>108</i>      |                         |
| HARDNESS (mg/L)         |             | <i>28</i>       | <i>28</i>       |            | <i>36</i>       | <i>36</i>       | <i>36</i>       | <i>32</i>       |                         |
| CONDUCTIVITY (umhos/cm) |             | <i>595</i>      | <i>595</i>      |            | <i>648</i>      | <i>648</i>      | <i>648</i>      | <i>652</i>      |                         |
| CHLORINE (mg/L)         |             | <i>&lt;0.05</i> | <i>&lt;0.05</i> |            | <i>&lt;0.05</i> | <i>&lt;0.05</i> | <i>&lt;0.05</i> | <i>&lt;0.05</i> |                         |

*CF 2/7*

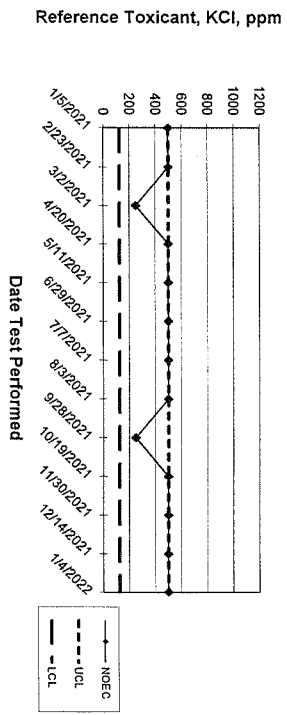
**ARKANSAS ANALYTICAL, INC.**  
**FATHEAD MINNOW SURVIVAL 7 Day**  
**QUALITY ASSURANCE**



**ARKANSAS ANALYTICAL, INC.**  
**FATHEAD MINNOW GROWTH 7 Day**  
**QUALITY ASSURANCE**



**ARKANSAS ANALYTICAL, INC.**  
**CERIODAPHRINA DUBIA SURVIVAL**  
**QUALITY ASSURANCE**



**ARKANSAS ANALYTICAL, INC.**  
**CERIODAPHRINA DUBIA REPRODUCTION**  
**QUALITY ASSURANCE**

