

Arkansas Analytical, Inc.

Toxicity Test Results

Paragould Light, Water & Cable
NPDES PERMIT NUMBER: AR0033766
Fathead Minnow
Second Quarter 2022
AFIN # 28-00470

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

Prepared for: **Lisa Ellington**
401 Grant Lane
Paragould, Arkansas 72450

Prepared by: Arkansas Analytical, Inc.
8100 National Drive
Little Rock, Arkansas 72209
Lab Number K2206005

Wednesday, June 29, 2022

Plant location

City of Paragould. The facility is located at 401 Grant Lane, Paragould, AR 72450, approximately 1.4 miles south of U.S. Highway 412 and 0.4 miles west of Arkansas Highway 69 on Grant Lane in Greene County, Arkansas

Test Methods

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

Reference Toxicant Data

REFERENCE TOXICANT (Potassium Chloride)

<i>Ceriodaphnia dubia</i> 5/10/22-5/17/22		<i>Pimephales promelas</i> 5/10/22/-5/17/22	
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

Paragould Light, Water & Cable

<i>Pimephales promelas</i>	
NOEC Survival Parameter: TOP6C	100%
Pass/Fail Survival Parameter: TLP6C	Pass
NOEC Growth Parameter: TPP6C	100%
Pass/Fail Growth Parameter: TGP6C	Pass
%CV Growth Parameter: TQP6C	13.0%
PMSD Growth	17.5%
Chronic Toxicity NOEC Parameter: 51714	Lethality: 100% Sub-lethality: 100%

Conclusion

Pimephales promelas, (Method 1000.0): The permit issued to the Paragould Light, Water & Cable, 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, Samantha Denton, James Hogue

Reviewed by:



Melissa Bird

Appendices

Appendix A.....	Chains of custody
Appendix B.....	Fathead minnow data & statistics
Appendix C.....	Water chemistry data
Appendix D.....	Reference toxicant control charts



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CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		BILLING INFORMATION		Project Description		Turnaround Time		Preservation Codes:					
Paragould, Light, Water & Cable 401 Grant Lane Paragould, AR 72450		Paragould, Light, Water, & Cable P.O. Box 9 Paragould, AR 72450		Chronic Toxicity RETEST Reporting Information Telephone: 870-239-7795 Fax: 870-239-7791 Email: lellington@paragould.com		1 Day (100%) 2 Day (50%) 3 Day (25%) Routine		1. Cool, 4 Degrees Centigrade 2. Sulfuric Acid (H ₂ SO ₄), pH < 2 3. Nitric Acid (HNO ₃), pH < 2 4. Thiosulfate for Dechlorination 5. Hydrochloric Acid(HCl) 6. Sodium Hydroxide (NaOH), pH > 12					
PO #: 9522LE				Colin Hester		Preservative Code: 1 Bottle Type: P		TEST PARAMETERS					
Attn: Lisa Ellington								Bottle Type Code G = Glass; P = Plastic V = Septum; A = Amber					
NPDES Permit AR0033766								Arkansas Analytical Work Order Number: K2206-005A					
Sampler(s) Signature		Sampler(s) Printed		Sample		IDENTIFICATION/ DESCRIPTION		Chronic Toxicity (Pimephals)					
Field Number	DATE/s	Time/s	Grab	Number of Bottles	Sample Matrix			X					
	6/6/2022 to 6/7/2022	7:20 AM to 7:28 AM	X	2	Water	Effluent Outfall 001 -- Day 1		X					
1. Relinquished by: (Signature)		Date/Time		2. Received by: (Signature)		SAMPLE CONDITION UPON RECEIPT IN LAB		REMARKS / SAMPLE COMMENTS					
Steve Parker		6/7/22 9:00		URS		1. CUSTODY SEALS: Yes ___ No ___ 2. CONTAINERS CORRECT: Yes ___ No ___ 3. COC/LABELS AGREE: Yes ___ No ___ 4. RECEIVED ON ICE: Yes ___ No ___ 5. TEMPERATURE ON RECEIPT: 6°C 6. TEMPERATURE GUN ID: HHTFS							
3. Relinquished by: (Signature)		Date/Time		4. Received by lab: (Signature)		FOR COMPLETION BY LAB ONLY							
UPS		6/8/22, 1146		Sydney James									



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CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		BILLING INFORMATION		Project Description		Turnaround Time		Preservation Codes:					
Paragould, Light, Water & Cable 401 Grant Lane Paragould, AR 72450 PO #: 9522LE		Paragould, Light, Water, & Cable P.O. Box 9 Paragould, AR 72450		Chronic Toxicity RETEST Reporting Information Telephone: 870-239-7795 Fax: 870-239-7791 Email: lellington@paragould.com		1 Day (100%) 2 Day (50%) 3 Day (25%) Routine		1. Cool, 4 Degrees Centigrade 2. Sulfuric Acid (H ₂ SO ₄), pH < 2 3. Nitric Acid (HNO ₃), pH < 2 4. Thiosulfate for Dechlorination 5. Hydrochloric Acid (HCl) 6. Sodium Hydroxide (NaOH), pH > 12					
Attn: Lisa Ellington NPDES Permit AR0033766						Preservative Code: 1 Bottle Type: P							
 Sampler(s) Signature		COIN test Sampler(s) Printed						Chronic Toxicity (Pneophales Promelas) X					
Field Number	SAMPLE COLLECTION		Grab	Comp	Number of Bottles	Sample Matrix	IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS					
	Dates	Time/s						Bottle Type Code					
	6/7/2022 to 6/8/2022	8:04 AM to 7:36 AM	X		2	Water	Effluent Outfall 001 -- Day 2	G = Glass; P = Plastic V = Septum; A = Amber Arkansas Analytical Work Order Number: K2206-005B					
1. Relinquished by: (Signature) 		Date/Time 6/8/22 9:00	2. Received by: (Signature) UPS		SAMPLE CONDITION UPON RECEIPT IN LAB		REMARKS / SAMPLE COMMENTS						
3. Relinquished by: (Signature) UPS		Date/Time 6/9/22 1528	4. Received by lab: (Signature) Sydney James		1. CUSTODY SEALS: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 2. CONTAINERS CORRECT: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 3. COC/LABELS AGREE: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 4. RECEIVED ON ICE: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 5. TEMPERATURE ON RECEIPT: 12.6 6. TEMPERATURE GUN ID: HHT #5		1. CUSTODY SEALS: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 2. CONTAINERS CORRECT: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 3. COC/LABELS AGREE: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 4. RECEIVED ON ICE: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 5. TEMPERATURE ON RECEIPT: 12.6 6. TEMPERATURE GUN ID: HHT #5						
							FOR COMPLETION BY LAB ONLY						



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CHAIN OF CUSTODY RECORD

CLIENT INFORMATION		BILLING INFORMATION		Project Description		Turnaround Time		Preservation Codes:							
Paragould, Light, Water & Cable		Paragould, Light, Water, & Cable		Chronic Toxicity		1 Day (100%)		1. Cool, 4 Degrees Centigrade		4. Thiosulfate for Dechlorination					
401 Grant Lane		P.O. Box 9		RETEST		2 Day (50%)		2. Sulfuric Acid (H ₂ SO ₄), pH < 2		5. Hydrochloric Acid(HCl)					
Paragould, AR 72450		Paragould, AR 72450		Reporting Information		3 Day (25%)		3. Nitric Acid (HNO ₃), pH < 2		6. Sodium Hydroxide (NaOH), pH > 12					
PO #: 9522LE				Telephone: 870-239-7795		Routine		TEST PARAMETERS							
Attn: Lisa Ellington				Fax: 870-239-7791		Preservative Code:		1					Bottle Type Code		
NPDES Permit AR0033766				Email: lellington@paragould.com		Bottle Type:		P					G = Glass; P = Plastic V = Septum; A = Amber		
 Sampler(s) Signature		 Sampler(s) Printed											Arkansas Analytical Work Order Number: K2206-		
Field Number	Date/s	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	IDENTIFICATION/ DESCRIPTION							
	6/8/2022 to 6/9/2022		8:16 AM to 7:24 AM	X		4	Water	Effluent Outfall 001 -- Day 2 3		X			005C		
1. Relinquished by: (Signature)		Date/Time		2. Received by: (Signature)				SAMPLE CONDITION UPON RECEIPT IN LAB		REMARKS / SAMPLE COMMENTS					
 Steve Paulsen		6/9/22 9:00		 VRS				1. CUSTODY SEALS: Yes <input checked="" type="checkbox"/> No							
3. Relinquished by: (Signature)		Date/Time		4. Received by: (Signature)				2. CONTAINERS CORRECT: Yes <input checked="" type="checkbox"/> No							
 UPS		6/10/22 1522		 Sydney James				3. COC/LABELS AGREE: Yes <input checked="" type="checkbox"/> No							
								4. RECEIVED ON ICE: Yes <input checked="" type="checkbox"/> No							
								5. TEMPERATURE ON RECEIPT: 6°C							
								6. TEMPERATURE GUN ID: HHT #5							
										FOR COMPLETION BY LAB ONLY					

CETIS Summary Report

Report Date: 29 Jun-22 15:04 (p 1 of 2)
 Test Code/ID: K2206005FH / 19-5320-8216

Fathead Minnow 7-d Larval Survival and Growth Test

Arkansas Analytical

Batch ID: 10-1473-6157	Test Type: Growth-Survival (7d)	Analyst: Jettie Parnell
Start Date: 08 Jun-22 14:11	Protocol: EPA/821/R-02-013 (2002)	Diluent: Mod-Hard Synthetic Water
Ending Date: 15 Jun-22 13:47	Species: Pimephales promelas	Brine: Not Applicable
Test Length: 7d	Taxon: Actinopterygii	Source: Aquatox, AR Age: <24
Sample ID: 11-3933-8118	Code: K2206005FH	Project: WET Monthly Compliance Test (JUN)
Sample Date: 07 Jun-22 07:28	Material: POTW Effluent	Source: Paragould (AR0033766)
Receipt Date: 08 Jun-22 11:46	CAS (PC):	Station:
Sample Age: 31h (6 °C)	Client: Paragould	

Sample Renewals

Renewal	Sample Code	Sample Date	Receive Date	Renewal Date	Temp °C
1	K2206005B	08 Jun-22 07:36	09 Jun-22 15:28	09 Jun-22 00:00	12
2	K2206005C	09 Jun-22 07:24	10 Jun-22 15:22	10 Jun-22 00:00	6

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
10		5	0.9400	0.8720	1.0000	0.9000	1.0000	0.0245	0.0548	5.83%	6.00%
13		5	0.9600	0.8489	1.0000	0.8000	1.0000	0.0400	0.0894	9.32%	4.00%
17		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
23		5	0.9400	0.8720	1.0000	0.9000	1.0000	0.0245	0.0548	5.83%	6.00%
31		5	0.9800	0.9245	1.0000	0.9000	1.0000	0.0200	0.0447	4.56%	2.00%

Mean Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	L	5	0.3048	0.2788	0.3308	0.268	0.319	0.009357	0.02092	6.86%	0.00%
10		5	0.2634	0.2217	0.3051	0.218	0.3	0.01502	0.03358	12.75%	13.58%
13		5	0.249	0.2048	0.2932	0.205	0.289	0.01591	0.03557	14.29%	18.31%
17		5	0.2494	0.1919	0.3069	0.183	0.298	0.0207	0.04628	18.56%	18.18%
23		5	0.2754	0.2345	0.3163	0.254	0.332	0.01475	0.03297	11.97%	9.65%
31		5	0.277	0.2576	0.2964	0.255	0.293	0.006986	0.01562	5.64%	9.12%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	L	1.0000	1.0000	1.0000	1.0000	1.0000
10		1.0000	0.9000	0.9000	1.0000	0.9000
13		0.8000	1.0000	1.0000	1.0000	1.0000
17		1.0000	1.0000	1.0000	1.0000	1.0000
23		1.0000	0.9000	1.0000	0.9000	0.9000
31		1.0000	1.0000	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	0.316	0.268	0.309	0.319	0.312
10		0.293	0.218	0.256	0.3	0.25
13		0.205	0.279	0.224	0.248	0.289
17		0.283	0.258	0.225	0.183	0.298
23		0.277	0.254	0.332	0.255	0.259
31		0.293	0.291	0.275	0.271	0.255

CETIS Summary Report

Report Date: 29 Jun-22 15:04 (p 2 of 2)
Test Code/ID: K2206005FH / 19-5320-8216

Fathead Minnow 7-d Larval Survival and Growth Test

Arkansas Analytical

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	L	10/10	10/10	10/10	10/10	10/10
10		10/10	9/10	9/10	10/10	9/10
13		8/10	10/10	10/10	10/10	10/10
17		10/10	10/10	10/10	10/10	10/10
23		10/10	9/10	10/10	9/10	9/10
31		10/10	10/10	9/10	10/10	10/10

CHEMICAL DATA SHEET FOR CHRONIC TOXICITY TESTING

Fathead Minnow

Lab # / Sample ID *h2206005*

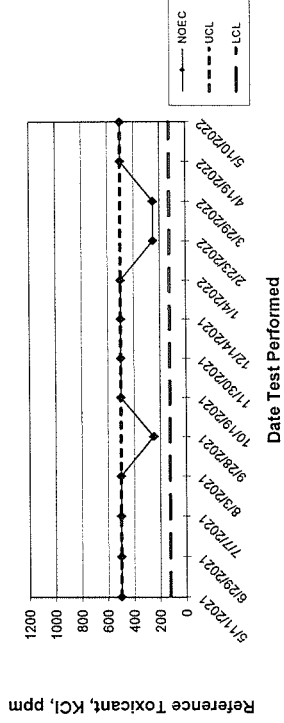
Test Start (Date/Time) *6/8/22-1411*

Client: *Paragold*

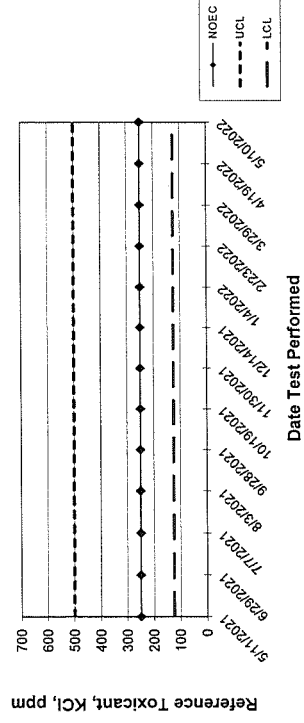
Test End (Date/Time) *6/15/22-1347*

		Day of Test							notes
		1	2	3	4	5	6	7	
Control	<i>MHS 020</i>	<i>6/8</i>	<i>6/9</i>	<i>6/10</i>	<i>6/11</i>	<i>6/12</i>	<i>6/13</i>	<i>6/14</i>	
D.O. (mg/L)	INITIAL	<i>7.8</i>	<i>8.5</i>	<i>8.6</i>	<i>8.6</i>	<i>8.5</i>	<i>8.4</i>	<i>8.6</i>	
	FINAL	<i>7.7</i>	<i>8.0</i>	<i>8.2</i>	<i>8.1</i>	<i>7.2</i>	<i>8.3</i>	<i>6.9</i>	
pH (s.u.)	INITIAL	<i>7.9</i>	<i>6.4</i>	<i>6.7</i>	<i>6.9</i>	<i>6.8</i>	<i>7.4</i>	<i>7.0</i>	
	FINAL	<i>8.0</i>	<i>7.9</i>	<i>7.2</i>	<i>7.8</i>	<i>7.6</i>	<i>7.6</i>	<i>8.2</i>	
temp (C)	INITIAL	<i>21</i>	<i>21</i>	<i>22</i>	<i>21</i>	<i>22</i>	<i>21</i>	<i>21</i>	
	FINAL	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	
ALKALINITY (mg/L)		<i>66</i>							
HARDNESS (mg/L)		<i>100</i>							
CONDUCTIVITY (umho)		<i>364</i>							
CHLORINE (mg/L)		<i><0.05</i>							
CONC: 32									
D.O. (mg/L)	INITIAL	<i>7.5</i>	<i>8.5</i>	<i>8.5</i>	<i>8.6</i>	<i>8.6</i>	<i>8.6</i>	<i>8.7</i>	
	FINAL	<i>7.6</i>	<i>7.8</i>	<i>8.1</i>	<i>8.0</i>	<i>8.1</i>	<i>8.3</i>	<i>7.0</i>	
pH (s.u.)	INITIAL	<i>7.5</i>	<i>6.7</i>	<i>6.9</i>	<i>7.5</i>	<i>7.5</i>	<i>7.9</i>	<i>7.6</i>	
	FINAL	<i>7.9</i>	<i>7.8</i>	<i>7.4</i>	<i>7.9</i>	<i>7.7</i>	<i>7.7</i>	<i>8.0</i>	
temp (C)	INITIAL	<i>21</i>	<i>21</i>	<i>22</i>	<i>21</i>	<i>22</i>	<i>21</i>	<i>21</i>	
	FINAL	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	
CONC: 42									
D.O. (mg/L)	INITIAL	<i>8.0</i>	<i>8.5</i>	<i>8.5</i>	<i>8.6</i>	<i>8.5</i>	<i>8.7</i>	<i>8.7</i>	
	FINAL	<i>7.5</i>	<i>7.7</i>	<i>8.15</i>	<i>7.9</i>	<i>7.9</i>	<i>8.1</i>	<i>7.0</i>	
pH (mg/L)	INITIAL	<i>7.5</i>	<i>6.9</i>	<i>7.0</i>	<i>7.9</i>	<i>7.7</i>	<i>7.6</i>	<i>7.6</i>	
	FINAL	<i>7.9</i>	<i>7.8</i>	<i>8.0</i>	<i>8.0</i>	<i>7.8</i>	<i>7.7</i>	<i>8.0</i>	
temp (C)	INITIAL	<i>21</i>	<i>21</i>	<i>23</i>	<i>21</i>	<i>22</i>	<i>21</i>	<i>21</i>	
	FINAL	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	
CONC: 56									
D.O. (mg/L)	INITIAL	<i>8.0</i>	<i>8.5</i>	<i>8.5</i>	<i>8.6</i>	<i>8.6</i>	<i>8.8</i>	<i>8.7</i>	
	FINAL	<i>7.3</i>	<i>7.5</i>	<i>8.2</i>	<i>7.9</i>	<i>7.8</i>	<i>8.0</i>	<i>7.1</i>	
pH (s.u.)	INITIAL	<i>7.5</i>	<i>7.1</i>	<i>7.1</i>	<i>7.9</i>	<i>7.8</i>	<i>7.6</i>	<i>7.6</i>	
	FINAL	<i>7.9</i>	<i>7.8</i>	<i>8.0</i>	<i>8.1</i>	<i>7.9</i>	<i>7.7</i>	<i>7.5</i>	
temp (C)	INITIAL	<i>21</i>	<i>21</i>	<i>24</i>	<i>21</i>	<i>22</i>	<i>21</i>	<i>21</i>	
	FINAL	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	
CONC: 80									
D.O. (mg/L)	INITIAL	<i>8.0</i>	<i>8.5</i>	<i>8.5</i>	<i>8.6</i>	<i>8.6</i>	<i>8.8</i>	<i>8.8</i>	
	FINAL	<i>7.4</i>	<i>7.6</i>	<i>8.2</i>	<i>7.9</i>	<i>7.9</i>	<i>8.0</i>	<i>7.0</i>	
pH (s.u.)	INITIAL	<i>7.5</i>	<i>7.2</i>	<i>7.2</i>	<i>8.0</i>	<i>7.9</i>	<i>7.9</i>	<i>7.7</i>	
	FINAL	<i>7.9</i>	<i>7.9</i>	<i>8.0</i>	<i>8.1</i>	<i>8.0</i>	<i>7.8</i>	<i>7.9</i>	
temp (C)	INITIAL	<i>21</i>	<i>21</i>	<i>25</i>	<i>21</i>	<i>22</i>	<i>21</i>	<i>21</i>	
	FINAL	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	
CONC: 100									
D.O. (mg/L)	INITIAL	<i>7.5</i>	<i>8.6</i>	<i>7.9</i>	<i>8.7</i>	<i>8.6</i>	<i>8.9</i>	<i>8.5</i>	
	FINAL	<i>7.3</i>	<i>7.6</i>	<i>8.2</i>	<i>8.0</i>	<i>7.9</i>	<i>8.1</i>	<i>7.0</i>	
pH (s.u.)	INITIAL	<i>7.5</i>	<i>7.3</i>	<i>7.3</i>	<i>8.0</i>	<i>7.9</i>	<i>7.7</i>	<i>7.6</i>	
	FINAL	<i>8.0</i>	<i>7.9</i>	<i>8.1</i>	<i>8.2</i>	<i>8.0</i>	<i>7.9</i>	<i>7.9</i>	
temp (C)	INITIAL	<i>21</i>	<i>21</i>	<i>25</i>	<i>21</i>	<i>22</i>	<i>21</i>	<i>21</i>	
	FINAL	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	<i>25</i>	
CONC: 100									
ALKALINITY (mg/L)		<i>162</i>	<i>140</i>	<i>98</i>	<i>162</i>	<i>140</i>	<i>98</i>		
HARDNESS (mg/L)		<i>82</i>	<i>66</i>	<i>56</i>	<i>82</i>	<i>66</i>	<i>56</i>		
CONDUCTIVITY (umho)		<i>586</i>	<i>306</i>	<i>378</i>	<i>586</i>	<i>306</i>	<i>378</i>		
CHLORINE (mg/L)		<i><0.05</i>							

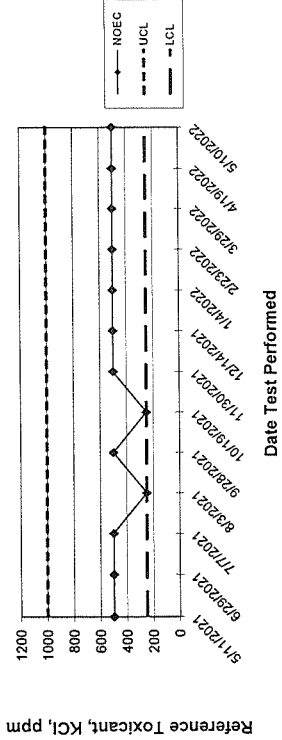
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