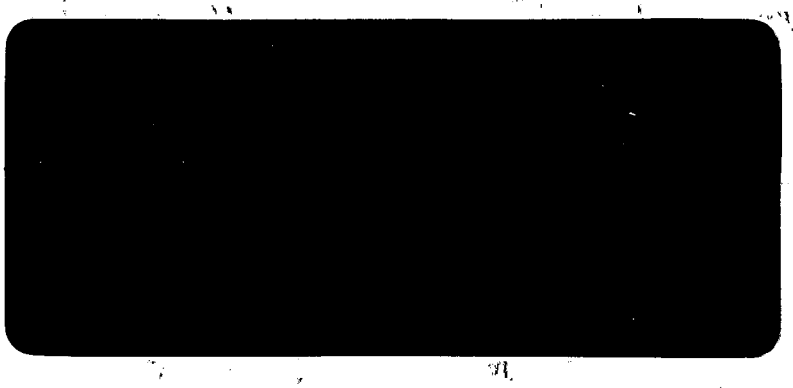
Environmental Analysis

Biomonitoring
Acute Toxicity
Chronic Toxicity
Storm Water 24 hr. Toxicity



Sorrells Research

8100 National Drive, Little Rock, AR 72209
(501) 562-8139

CITY OF WYNNE
PERMIT NO: AR0021903
CHRONIC BIOMONITORING

METHOD 1000.0 - PIMEPHALES PROMELAS
METHOD 1002.0 - CERIODAPHNIA DUBIA

Report Prepared by:
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October 10, 2012

Laboratory Number: 14940.0001, 0002, 0003

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INTRODUCTION AND SUMMARY

Chronic biomonitoring tests:

7 day fathead minnow larval survival and growth (method 1000.0) and 7 day ceriodaphnia dubia survival and reproduction (method 1002.0) were performed by Sorrells Research Associates for Wynne 24 hour composite samples of plant effluent for dates 09/09-10/12,09/11-12/12,09/13-14/12.

The samples were delivered to Sorrells lab in ice chest, cooled to 4 degrees c.

These samples were logged in as #14940.0001, 0002 and 0003. Chain of custody included in report.

Moderately hard 20% deionized mineral water was used as dilution water.

Testing was initiated 09/11/12 at 1430 hours and continued through 09/19/12 at 1430 hours.

The results of these tests are as follows:

TEST 1000.0 FATHEAD MINNOW

SURVIVAL - NOEL 100% Effluent

GROWTH - NOEL 100% Effluent

TEST 1002.0 CERIODAPHNIA DUBIA

SURVIVAL - NOEL 100% Effluent

REPRODUCTION - NOEL 100% Effluent

Fishers Exact Test statistics are included in this report for these observations. No other adjustments were made.

TEST ACCEPTANCE CRITERIA
FOR CONTROL

TEST METHOD	ORGANISM	CRITERIA	RESULTS	PASS/FAIL
1000	Pimephales promelas	Control surv. >or= 80 %	100%	PASS
1002	Ceriodaphnia dubia	Control surv. >or= 80 %	100%	PASS
1000	Pimephales promelas	Control wt. .25 mg or> per larvae.	.324	PASS
1002	Ceriodaphnia dubia	Control repro. 15 or> neonates per surviving female.	18.5	PASS
1000	Pimephales promelas	Control CV 40 % or <	**3.5**	PASS
1002	Ceriodaphnia Dubia	Control CV 40 % or <	**8.16**	PASS

NOTE: The test acceptance criteria is based upon the synthetic laboratory control. Laboratory control is moderately hard 20% deionized mineral water, as directed by EPA/600/4-91/002.

OUTLINED REPORT

PERMIT NO: AR0021903
PERMIT REQUIREMENTS:
PLANT LOCATION:
RECEIVING WATER BODY:

CLIENT: Wynne, City of
ADDRESS: P.O. Box 121 E. Merriman
Wynne, AR 72396

PLANT OPERATIONS

PRODUCT (S): n/a
RAW MATERIALS: n/a
OPERATING SCHEDULE:
SCHEMATIC OF WASTE TREATMENT:

RETENTION TIME:

VOLUME OF WASTE FLOW (MGD, CFS, GPM)

BIOMONITORING CHRONIC TOXICITY REPORT
CHEMICAL PARAMETER CHART

SOURCE OF EFFLUENT (AMBIENT) AND DILUTION WATER

EFFLUENT SAMPLES-

SAMPLING POINT: PLANT EFFLUENT

COLLECTION DATES/TIMES: 09/09-10/12 0700-0700 | 09/11-12/12 0700-0700 | 09/13-14/12 0700-0700

SAMPLING COLLECTION METHOD: COMPOSITE

PHYSICAL AND CHEMICAL DATA:

CONTROL	DATE **09/11/12**	DATE **09/13/12**	DATE **09/15/12**
DO (mg/l)	8.55	8.64	8.45
pH (S.U.)	7.40	7.27	7.28
Conductivity (umhos)	265	270	278
Alkalinity (mg/l)	57	62	64
Hardness (mg/l)	--	69	73
Res. Chlorine (mg/l)	0	0	0

56%	DATE **09/11/12**	DATE **09/13/12**	DATE **09/15/12**
DO (mg/l)	8.40	8.55	8.33
pH (S.U.)	7.59	7.44	7.35
Conductivity (umhos)	369	402	429
Alkalinity (mg/l)	02	02	02
Hardness (mg/l)	97	99	104

(Cont.)

PHYSICAL AND CHEMICAL DATA: **100% EFFLUENT**	DATE **09/11/12**	DATE **09/13/12**	DATE **09/15/12**
DO (mg/l)	8.40	8.41	8.26
pH (S.U.)	7.62	7.46	7.49
Conductivity (umhos)	455	521	556
Alkalinity (mg/l)	02	03	03
Hardness (mg/l)	117	104	110
Res. Chlorine (mg/l)	0	0	0
Temperature .c	25	25	25

DILUTION WATER SAMPLES -

SOURCE: 20% DMW

COLLECTION DATE: N/A TIME: N/A

PRETREATMENT: AERATED

Hardness is to be reported as mg/1 CaCO3
D.O. Dissolved Oxygen mg/1
Temperature degrees centigrade
pH standard units
Conductivity = us/cm
Chlorine Residual = mg/1

B57C212

Chemical Data For Daily Biomonitoring

Permitee Wynne Date 9-11-12 1430

Analyst AS/JTM Lab no. 14940.

Dilution Control

Day	1	2	3	4	5	6	7	notes
Temp	25.0	25.0	25.0	25.0	25.0	25.0		
pH	7.40	7.36	7.27	7.24	7.28	7.24		
D.O.	8.55	8.48	8.64	8.57	8.45	8.39		
Alk	57		62		64			
Hard.	spiked		~~73~~ 69		73			
Cond.	265	270	270		278			

Dilution 56

Day	1	2	3	4	5	6	7	notes
Temp	25.0	25.0	25.0	25.0	25.0	25.0		
pH	7.59	7.50	7.44	7.40	7.35	7.33		
D.O.	8.40	8.33	8.55	8.44	8.33	8.15		
Alk	2		2		2			
Hard.	97		99		104			
Cond.	369		402		429			

Dilution 100

Day	1	2	3	4	5	6	7	notes
Temp	25.0	25.0	25.0	25.0	25.0	25.0		
pH	7.62	7.56	7.46	7.43	7.49	7.45		
D.O.	8.40	8.20	8.41	8.30	8.26	8.10		
Alk	2		3		3			
Hard.	117		104		110			
Cond.	455		521		556			

0 C.05 0

DATA ANALYSIS

ACCORDING TO EPA/600/4-91/002.

STATISTICAL ANALYSES

TOXSTAT VERSION 3.3

TITLE: WYNNE 14940 CERIO REPS
FILE: 14940WCR
TRANSFORM: NO TRANSFORM NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	CONTROL	1	18.0000	18.0000
1	CONTROL	2	21.0000	21.0000
1	CONTROL	3	17.0000	17.0000
1	CONTROL	4	20.0000	20.0000
1	CONTROL	5	18.0000	18.0000
1	CONTROL	6	18.0000	18.0000
1	CONTROL	7	20.0000	20.0000
1	CONTROL	8	18.0000	18.0000
1	CONTROL	9	19.0000	19.0000
1	CONTROL	10	16.0000	16.0000
2	32.00	1	20.0000	20.0000
2	32.00	2	18.0000	18.0000
2	32.00	3	20.0000	20.0000
2	32.00	4	17.0000	17.0000
2	32.00	5	19.0000	19.0000
2	32.00	6	19.0000	19.0000
2	32.00	7	19.0000	19.0000
2	32.00	8	16.0000	16.0000
2	32.00	9	19.0000	19.0000
2	32.00	10	20.0000	20.0000
3	42.00	1	18.0000	18.0000
3	42.00	2	21.0000	21.0000
3	42.00	3	17.0000	17.0000
3	42.00	4	17.0000	17.0000
3	42.00	5	17.0000	17.0000
3	42.00	6	18.0000	18.0000
3	42.00	7	18.0000	18.0000
3	42.00	8	19.0000	19.0000
3	42.00	9	19.0000	19.0000
3	42.00	10	18.0000	18.0000
4	56.00	1	17.0000	17.0000
4	56.00	2	18.0000	18.0000
4	56.00	3	20.0000	20.0000
4	56.00	4	17.0000	17.0000
4	56.00	5	19.0000	19.0000
4	56.00	6	20.0000	20.0000
4	56.00	7	20.0000	20.0000
4	56.00	8	21.0000	21.0000
4	56.00	9	19.0000	19.0000
4	56.00	10	22.0000	22.0000
5	75.00	1	19.0000	19.0000
5	75.00	2	17.0000	17.0000
5	75.00	3	16.0000	16.0000
5	75.00	4	19.0000	19.0000
5	75.00	5	16.0000	16.0000
5	75.00	6	21.0000	21.0000
5	75.00	7	19.0000	19.0000
5	75.00	8	19.0000	19.0000
5	75.00	9	19.0000	19.0000
5	75.00	10	17.0000	17.0000

6	100.00	1	18.0000	18.0000
6	100.00	2	18.0000	18.0000
6	100.00	3	19.0000	19.0000
6	100.00	4	18.0000	18.0000
6	100.00	5	20.0000	20.0000
6	100.00	6	18.0000	18.0000
6	100.00	7	19.0000	19.0000
6	100.00	8	19.0000	19.0000
6	100.00	9	21.0000	21.0000
6	100.00	10	20.0000	20.0000

WYNNE 14940 CERIO REPS
File: 14940WCR Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	CONTROL	10	16.000	21.000	18.500
2	32.00	10	16.000	20.000	18.700
3	42.00	10	17.000	21.000	18.200
4	56.00	10	17.000	22.000	19.300
5	75.00	10	16.000	21.000	18.200
6	100.00	10	18.000	21.000	19.000

WYNNE 14940 CERIO REPS
File: 14940WCR Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM
1	CONTROL	2.278	1.509	0.477
2	32.00	1.789	1.337	0.423
3	42.00	1.511	1.229	0.389
4	56.00	2.678	1.636	0.517
5	75.00	2.622	1.619	0.512
6	100.00	1.111	1.054	0.333

WYNNE 14940 CERIO REPS
File: 14940WCR Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	9.750	1.950	0.976
Within (Error)	54	107.900	1.998	

Total	59	117.650

Critical F value = 2.45 (0.05,5,40)
Since F < Critical F FAIL TO REJECT Ho:All groups equal

WYNNE 14940 CERIO REPS
File: 14940WCR Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	CONTROL	18.500	18.500		
2	32.00	18.700	18.700	-0.316	
3	42.00	18.200	18.200	0.475	
4	56.00	19.300	19.300	-1.265	
5	75.00	18.200	18.200	0.475	
6	100.00	19.000	19.000	-0.791	

Dunnett table value = 2.31 (1 Tailed Value, P=0.05, df=40,5)

WYNNE 14940 CERIO REPS
File: 14940WCR Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	CONTROL	10			
2	32.00	10	1.460	7.9	-0.200
3	42.00	10	1.460	7.9	0.300
4	56.00	10	1.460	7.9	-0.800
5	75.00	10	1.460	7.9	0.300
6	100.00	10	1.460	7.9	-0.500

WYNNE 14940 CERIO REPS
File: 14940WCR Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	CONTROL	10	18.500	18.500	18.467
2	32.00	10	18.700	18.700	18.467
3	42.00	10	18.200	18.200	18.467
4	56.00	10	19.300	19.300	18.750
5	75.00	10	18.200	18.200	18.750
6	100.00	10	19.000	19.000	19.000

WYNNE 14940 CERIO REPS
File: 14940WCR Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
CONTROL	18.467				
32.00	18.467	0.053		1.68	k= 1, v=54
42.00	18.467	0.053		1.76	k= 2, v=54
56.00	18.750	0.395		1.79	k= 3, v=54
75.00	18.750	0.395		1.80	k= 4, v=54
100.00	19.000	0.791		1.80	k= 5, v=54

s = 1.414
Note: df used for table values are approximate when v > 20.

WYNNE 14940 CERIO REPS
File: 14940WCR Transform: NO TRANSFORM

STEELS MANY-ONE RANK TEST - Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	CONTROL	18.500				
2	32.00	18.700	111.00	75.00	10.00	
3	42.00	18.200	98.00	75.00	10.00	
4	56.00	19.300	118.50	75.00	10.00	
5	75.00	18.200	101.00	75.00	10.00	
6	100.00	19.000	116.00	75.00	10.00	

Critical values use k = 5, are 1 tailed, and alpha = 0.05

TITLE: WYNNE 14940 MINNOW WEIGHTS
FILE: 14940WMW
TRANSFORM: NO TRANSFORM NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	CONTROL	1	0.3340	0.3340
1	CONTROL	2	0.3260	0.3260
1	CONTROL	3	0.3080	0.3080
1	CONTROL	4	0.3290	0.3290
2	32.00	1	0.3400	0.3400
2	32.00	2	0.3100	0.3100
2	32.00	3	0.3130	0.3130
2	32.00	4	0.3310	0.3310
3	42.00	1	0.3220	0.3220
3	42.00	2	0.3430	0.3430
3	42.00	3	0.3110	0.3110
3	42.00	4	0.3120	0.3120
4	56.00	1	0.3030	0.3030
4	56.00	2	0.3350	0.3350
4	56.00	3	0.3150	0.3150
4	56.00	4	0.3300	0.3300
5	75.00	1	0.3180	0.3180
5	75.00	2	0.3250	0.3250
5	75.00	3	0.3100	0.3100
5	75.00	4	0.3400	0.3400
6	100.00	1	0.3220	0.3220
6	100.00	2	0.3280	0.3280
6	100.00	3	0.3140	0.3140
6	100.00	4	0.3260	0.3260

WYNNE 14940 MINNOW WEIGHTS
File: 14940WMW Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	CONTROL	4	0.308	0.334	0.324
2	32.00	4	0.310	0.340	0.324
3	42.00	4	0.311	0.343	0.322
4	56.00	4	0.303	0.335	0.321
5	75.00	4	0.310	0.340	0.323
6	100.00	4	0.314	0.328	0.323

WYNNE 14940 MINNOW WEIGHTS
File: 14940WMW Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM
1	CONTROL	0.000	0.011	0.006
2	32.00	0.000	0.014	0.007
3	42.00	0.000	0.015	0.007
4	56.00	0.000	0.015	0.007
5	75.00	0.000	0.013	0.006
6	100.00	0.000	0.006	0.003

WYNNE 14940 MINNOW WEIGHTS
File: 14940WMW Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.000	0.000	0.038
Within (Error)	18	0.003	0.000	
Total	23	0.003		

Critical F value = 2.77 (0.05,5,18)
Since F < Critical F FAIL TO REJECT Ho:All groups equal

WYNNE 14940 MINNOW WEIGHTS
File: 14940WMW Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	CONTROL	0.324	0.324		
2	32.00	0.324	0.324	0.083	
3	42.00	0.322	0.322	0.250	
4	56.00	0.321	0.321	0.390	
5	75.00	0.323	0.323	0.111	
6	100.00	0.323	0.323	0.195	

Dunnett table value = 2.41 (1 Tailed Value, P=0.05, df=18,5)

WYNNE 14940 MINNOW WEIGHTS
File: 14940WMW Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL

1	CONTROL	4			
2	32.00	4	0.022	6.7	0.001
3	42.00	4	0.022	6.7	0.002
4	56.00	4	0.022	6.7	0.003
5	75.00	4	0.022	6.7	0.001
6	100.00	4	0.022	6.7	0.002

WYNNE 14940 MINNOW WEIGHTS
File: 14940WMW Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	CONTROL	4	0.324	0.324	0.324
2	32.00	4	0.324	0.324	0.324
3	42.00	4	0.322	0.322	0.322
4	56.00	4	0.321	0.321	0.322
5	75.00	4	0.323	0.323	0.322
6	100.00	4	0.323	0.323	0.322

WYNNE 14940 MINNOW WEIGHTS
File: 14940WMW Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
CONTROL	0.324				
32.00	0.324	0.084		1.73	k= 1, v=18
42.00	0.322	0.238		1.82	k= 2, v=18
56.00	0.322	0.238		1.85	k= 3, v=18
75.00	0.322	0.238		1.86	k= 4, v=18
100.00	0.322	0.238		1.87	k= 5, v=18

s = 0.013
Note: df used for table values are approximate when v > 20.

WYNNE 14940 MINNOW WEIGHTS
File: 14940WMW Transform: NO TRANSFORM

STEELS MANY-ONE RANK TEST - Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	CONTROL	0.324				
2	32.00	0.324	19.00	10.00	4.00	
3	42.00	0.322	17.00	10.00	4.00	

4	56.00	0.321	18.00	10.00	4.00
5	75.00	0.323	17.00	10.00	4.00
6	100.00	0.323	15.50	10.00	4.00

Critical values use k = 5, are 1 tailed, and alpha = 0.05

TEST METHOD
1000.0

TEST METHOD USED: 1000.0
END POINT(S) OF TEST: NOEL 100%
DEVIATIONS FROM REFERENCE METHOD: None

DATE AND TIME TEST STARTED: 09/11/12 1430
DATE AND TIME TEST TERMINATED: 09/18/12 1430
TYPE OF TEST CHAMBERS: 600 ml
VOLUME OF SOLUTIONS USED/CHAMBER: 400 ml
NUMBER OF ORGANISMS/TEST CHAMBER: 10
NUMBER OF REPLICATE TEST CHAMBERS/TREATMENT: 4

TEST TEMPERATURE (MEAN): mean = 25

TEST ORGANISMS

SCIENTIFIC NAME: Pimephales promelas
AGE: Less than 24 hours
LIFE STAGE: Larvae
SOURCE: Aquatic BioSystems, Inc.
DISEASES AND TREATMENT: None
FEEDING REGIME: 2/day Brine Shrimp
ORGANISM HISTORY SHEETS ARE ATTACHED

RESULTS SUMMARY

FATHEAD MINNOW, PIMEPHALES PROMELAS, LARVAL SURVIVAL AND GROWTH TEST METHOD 1000.0

Larvae are exposed in a static renewal system for seven days to different concentrations of effluent or to receiving water. Test results are based on the survival and growth (increase in weight) of the larvae. Effluent dilution's chosen for this test were 32%, 42%, 56%, 75% and 100% in accordance with the NPDES permit. The low flow or "critical" dilution is specified in the NPDES Permit as 100% effluent.

NOEL(S) ARE AS FOLLOWS:

100%	Survival	100%	effluent
NOEL	Growth	100%	effluent

BIOMONITORING REPORT
FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL

DATA TABLE FOR FATHEAD MINNOW SURVIVAL

Effluent Conc. %	Percent Survival In				Mean Percent			CV%*
	A	B	C	D	24h	48h	7d	
Dilution Water	100	100	100	100	100	100	100	0.0
32%	100	100	100	100	100	100	100	0.0
42%	100	100	100	100	100	100	100	0.0
56%	100	100	100	100	100	100	100	0.0
75%	100	100	100	100	100	100	100	0.0
100%	100	100	100	100	100	100	100	0.0

*coefficient of variation = standard deviation x 100/mean
**ph unadjusted 100% effluent

1. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate: Is the mean survival at 7 days significantly different (p=0.5) than the control survival for the % effluent corresponding to:

a.) LOW FLOW OR CRITICAL DILUTION (100%): YES [ ] NO [**X**]
b.) 1/2 LOW FLOW OR 2 X CRITICAL DILUTION (56 %): YES [ ] NO [**X**]

2. Dunnett's Procedure:
Is the mean dry weight (growth) at 7 days effluent significantly different (p=0.05) than the control's dry weight (growth) for the % effluent corresponding to (significant non-lethal effects):

a.) LOW FLOW OR CRITICAL DILUTION (100%): YES [ ] NO [**X**]
b.) 1/2 LOW FLOW OR 2 X CRITICAL DILUTION (56 %): YES [ ] NO [**X**]

3. If you answered NO to 1.a) and 2.a) enter [0] otherwise enter [1]: **[0]**
4. If you answered NO to 1.b) and 2.b) enter [0] otherwise enter [1]: **[0]**
5. Enter response to item 3 on DMR Form, parameter # TEP6C.
6. Enter response to item 4 on DMR Form, parameter # TFP6C.
7. Enter percent effluent corresponding to each NOEL below and circle lowest number:

a.) NOEL survival =100% effluent
b.) NOEL growth = 100% effluent

FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL

(Pimephales promelas)

Permittee: Wynne, City of NPDES NO. AR0021903

Dilution water used: Receiving [ ] Reconstituted [X]

DATA TABLE FOR GROWTH

EFFLUENT CONC. %	AVERAGE DRY WEIGHT IN MILLIGRAMS IN REPLICATE CHAMBERS				MEAN DRY WEIGHT (MG)	CV%*
	A	B	C	D	7 days	
CONTROL	.334	.326	.308	.329	.324	3.5
32	.340	.310	.313	.331	.324	4.4
42	.322	.343	.311	.312	.322	4.6
56	.303	.335	.316	.330	.321	**4.5**
75	.318	.325	.310	.340	.323	3.9
100	.322	.328	.314	.326	.323	1.9

*Coefficient of variation = standard deviation X 100/mean

(Coef Of Var Statre 7Day Chronic Pimephales TQP6C = **4.5**)

TEST METHOD
1002.0

TEST METHOD USED: 1002.0
END POINT(S) OF TEST: NOEL 100 %
DEVIATIONS FROM REFERENCE METHOD: None

DATE AND TIME TEST STARTED: 09/11/12 1430
DATE AND TIME TEST TERMINATED: 09/19/12 1430
TYPE OF TEST CHAMBERS: 30 ml
VOLUME OF SOLUTIONS USED/CHAMBER: 15 ml
NUMBER OF ORGANISMS/TEST CHAMBER: 1
NUMBER OF REPLICATE TEST CHAMBERS/TREATMENT: 10

TEST TEMPERATURE (MEAN AND RANGE): 25

TEST ORGANISMS

SCIENTIFIC NAME: Ceriodaphnia dubia
AGE: Less than 24 hours
LIFE STAGE: Neonates
SOURCE: Aquatic BioSystems, Inc.
DISEASES AND TREATMENT: None
FEEDING REGIME: Daily
ORGANISM HISTORY SHEETS ARE ATTACHED

RESULTS SUMMARY
CLADOCERAN, CERIODAPHNIA DUBIA, SURVIVAL AND REPRODUCTION TEST
METHOD 1002.0

Ceriodaphnia are exposed in a static renewal system to different concentrations of effluent, and to receiving water until 60% of surviving control organisms have three broods of offspring (15 neonates per surviving female). Effluent dilutions for this test were 32%, 42%, 56%, 75%, and 100% in accordance with the NPDES Permit. The "critical" dilution is specified as 100% effluent. Test results are based on survival and reproduction. If the test is conducted as described, the control organism should produce three broods of young during a seven-day period.

BIOMONITORING REPORT
CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION

PERCENT SURVIVAL

Time of Reading	0%	32%	42%	56%	75%	100%
24h	100	100	100	100	100	100
48h	100	100	100	100	100	100
7 day	100	100	100	100	100	100

1. Fisher's Exact Test:

Is the mean survival at 7 days significantly different (p=0.05) than the control survival for the % effluent corresponding to (lethality):

a.) LOW FLOW OR CRITICAL DILUTION (100 %): YES [ ] NO [**X**]
b.) 1/2 LOW FLOW OR 2 X
CRITICAL DILUTION (56%): YES [ ] NO [**X**]

2. Dunnett's Procedure or Steel's Many-One Rank Test as appropriate:

Is the mean number of young produced per female significantly different (p=0.05) than the control's number of young per female for the % effluent corresponding to (significant non-lethal effects):

a.) LOW FLOW OR CRITICAL DILUTION (100%): YES [ ] NO [**X**]
b.) 1/2 LOW FLOW OR 2 X
CRITICAL DILUTION (56%): YES [ ] NO [**X**]

3. If you answered NO to 1.a) and 2.a) enter [0]
otherwise enter [1]: **[0]**

4. If you answered NO to 1.b) and 2.b) enter [0]
otherwise enter [1]: **[0]**

5. Enter response to item 3 on DMR Form, parameter #TEP3B.
6. Enter response to item 4 on DMR Form, parameter #TFP3B.
7. Enter percent effluent corresponding to each NOEL below and circle lowest number:

a.) NOEL survival = 100% effluent
b.) NOEL reproduction = 100% effluent

BIOMONITORING REPORT
CERIODAPHNIA DUBIA SURVIVAL AND REPRODUCTION

Permittee: Wynne, City of NPDES NO. AR0021903
Dilution water used: Receiving ( ) Reconstituted (X)

NUMBER OF YOUNG PRODUCED PER FEMALE @ 7 DAYS

PERCENT EFFLUENT (%)

REP	0 %	32%	42%	56%	75%	100%
A	18	20	18	17	19	18
B	21	18	21	18	17	18
C	17	20	17	20	16	19
D	20	17	17	17	19	18
E	18	19	17	19	16	20
F	18	19	18	20	21	18
G	20	19	18	20	19	19
H	18	16	19	21	19	19
I	19	19	19	19	19	21
J	16	20	18	22	17	20
*CV%	8.16	7.15	6.75	**8.48**	8.90	5.55
MEAN	18.5	18.7	18.2	19.3	18.2	19.0

*coefficient of variation = standard deviation x 100/mean

(Coef Of Var Statre 7Day Chronic Ceriodaphnia TQP3B = **8.48**)

STANDARD REFERENCE TOXICANTS

STANDARD TOXICANT USED AND SOURCE: SODIUM CHLORIDE
DATE AND TIME OF MOST RECENT TEST: 09/18/12 1430
DILUTION WATER USED IN TEST: 20% DMW
RESULTS(LC50 OR, NOEC AND/OR ECL): LC50 = 1473 FATHEAD MINNOW
RESULTS(LC50 OR, NOEC AND/OR ECL): LC50 = 743 CERIODAPHNIA
ACCEPTABLE PERFORMANCE, STUDY 29 = 100%
PHYSICAL AND CHEMICAL METHODS USED:

SPECIFIC CONDUCTANCE METHOD 2510 B
OXYGEN, DISSOLVED METHOD 4500- O G
CHLORINE, TOTAL RESIDUAL METHOD 4500- C I F
ALKALINITY, CACO3 METHOD 2320 B

SUMMARY OF REFERENCE TOXICANT (S) ARE AS FOLLOWS:

FATHEAD MINNOW

Standard Recovery FATHEAD MINNOW **90.4**%

CERIODAPHNIA

Standard Recovery CERODAPHNIA **101.2**%

APPENDIX 1A
TEST 1000.0

Permittee	Wynne 14940							
Effluent	Percent Survival In Rep. Chambers				Mean Percent Survival			CV%*
Conc.	A	B	C	D	24h	48h	7 days	*
CONTROL	100	100	100	100	100	100	**100**	**0.0**
32.00%	100	100	100	100	100	100	**100**	**0.0**
42.00%	100	100	100	100	100	100	**100**	**0.0**
56.00%	100	100	100	100	100	100	**100**	**0.0**
75.00%	100	100	100	100	100	100	**100**	**0.0**
100.00%	100	100	100	100	100	100	**100**	**0.0**

Permittee	Wynne 14940					
Effluent	Average Dry Weight (mg)				Mean Dry Weight (mg)	
Conc.	A	B	C	D	7 days	CV%*
CONTROL	0.334	0.326	0.308	0.329	**0.324**	**3.5**
32	0.340	0.310	0.313	0.331	**0.324**	**4.4**
42	0.322	0.343	0.311	0.312	**0.322**	**4.6**
56	0.303	0.335	0.316	0.330	**0.321**	**4.5**
75	0.318	0.325	0.310	0.340	**0.323**	**3.9**
100	0.322	0.328	0.314	0.326	**0.323**	**1.9**

Figure 2. Survival data for fathead minnow larval survival and growth te

Discharger: Wynne
Location: 14940
Test Dates: 9-11-12 1430
Analyst: DA / JTM

Conc:	Rep. No.	No. Survivors Day 1	2	3	4	5	6	7	Remarks
Control	1	10	10	10	10	10	10	10	
	2	10	10	10	10	10	10	10	
	3	10	10	10	10	10	10	10	
	4	10	10	10	10	10	10	10	
Conc:	5	10	10	10	10	10	10	10	
	6	10	10	10	10	10	10	10	
	7	10	10	10	10	10	10	10	
32	8	10	10	10	10	10	10	10	
Conc:	9	10	10	10	10	10	10	10	
	10	10	10	10	10	10	10	10	
	11	10	10	10	10	10	10	10	
42	12	10	10	10	10	10	10	10	
Conc:	13	10	10	10	10	10	10	10	
	14	10	10	10	10	10	10	10	
	15	10	10	10	10	10	10	10	
56	16	10	10	10	10	10	10	10	
Conc:	17	10	10	10	10	10	10	10	
	18	10	10	10	10	10	10	10	
	19	10	10	10	10	10	10	10	
75	20	10	10	10	10	10	10	10	
Conc:	21	10	10	10	10	10	10	10	
	22	10	10	10	10	10	10	10	
	23	10	10	10	10	10	10	10	
100	24	10	10	10	10	10	10	10	

Comments:

Discharge: Wynne
Location: 14940
Analyst:

Test Date(s): 9-11-12
Weighing Date:

Drying Temperature (°C):
Drying Time (h):

Conc:	Rep. No.	A Wgt. of boat (mg)	B Dry wgt: foil and larvae (mg)	B-A Total dry wgt of larvae (mg)	C No. of larvae	(B-A)/C Mean dry wgt of larvae (mg)	Remarks
Control	1	124084	124418	3.34	10	.334	
	2	124858	125184	3.26	10	.326	
	3	125110	125418	3.08	10	.308	
	4	123810	124139	3.29	10	.329	
Conc:	5	124318	124658	3.40	10	.340	
	6	123584	123894	3.10	10	.310	
	7	128336	128649	3.13	10	.313	
32	8	124238	124569	3.31	10	.331	
Conc:	9	123901	124123	3.22	10	.322	
	10	126775	127118	3.43	10	.343	
	11	125372	125683	3.11	10	.311	
42	12	128066	128378	3.12	10	.312	
Conc:	13	126511	126814	3.03	10	.303	
	14	126288	126623	3.35	10	.335	
	15	123392	123708	3.16	10	.316	
56	16	125129	125459	3.30	10	.330	
Conc:	17	126513	126831	3.18	10	.318	
	18	124696	125021	3.25	10	.325	
	19	129201	129511	3.10	10	.310	
75	20	129435	129775	3.40	10	.340	
Conc:	21	123580	123902	3.22	10	.322	
	22	124326	124654	3.28	10	.328	
	23	123681	123995	3.14	10	.314	
100	24	128402	128728	3.26	10	.326	

[1]Adapted from Hughes, et al., 1987.

Control 129286 129288

FIGURE 3 - FATHEAD MINNOW
page 14

APPENDIX 2A
TEST 1002.0

	Wynne 14940	CERIO	REPLICATE CONTAINERS					s.d.=	1.50923		CV% =	8.1580046	
control	DAY	1	2	3	4	5	6	7	8	9	10	#young	#adult	
temp:	1											0	10	0.00
temp:	2											0	10	0.00
temp:	3		1				1					2	10	0.20
temp:	4	3	1	2	3	3		4	2	4	3	25	10	2.50
temp:	5	3	2	1	2		4	1		1		14	10	1.40
temp:	6	6	7	7	6	5	4	7	7	7	8	64	10	6.40
temp:	7					2	3		1			6	10	0.60
temp:	8	6	10	7	9	8	6	8	8	7	5	74	10	7.40
	TOTAL	18	21	17	20	18	18	20	18	19	16	185	10	18.50
conc			REPLICATE CONTAINERS					s.d.=	1.33749		CV% =	7.1523717	
32.00	DAY	1	2	3	4	5	6	7	8	9	10	no. young	no. adults	
temp:	1											0	10	0.00
temp:	2											0	10	0.00
temp:	3											0	10	0.00
temp:	4	4	1	3	3	3	3	2	2	4	3	28	10	2.80
temp:	5		3	1		2			1			7	10	0.70
temp:	6	8	6	6	5	7	7	7	6	6	7	65	10	6.50
temp:	7		2	2			1				3	8	10	0.80
temp:	8	8	6	8	9	7	8	10	7	9	7	79	10	7.90
	TOTAL	20	18	20	17	19	19	19	16	19	20	187	10	18.70
CONC.			REPLICATE CONTAINERS					s.d.=	1.22927		CV% =	6.754245	
42.00	DAY	1	2	3	4	5	6	7	8	9	10	no. young	no. adults	
temp:	1											0	10	0.00
temp:	2											0	10	0.00
temp:	3							2				2	10	0.20
temp:	4	1	2	2	1	3	3	2	4	3	1	22	10	2.20
temp:	5	3	3		1				1		2	10	10	1.00
temp:	6	5	7	7	8	7	6	7	5	7	7	66	10	6.60
temp:	7	4		2			4		3		1	14	10	1.40
temp:	8	5	9	6	7	7	5	7	6	9	7	68	10	6.80
	TOTAL	18	21	17	17	17	18	18	19	19	18	182	10	18.20
CONC.			REPLICATE CONTAINERS					s.d.=	1.63639		CV% =	8.4787134	
56.00	DAY	1	2	3	4	5	6	7	8	9	10	no. young	no. adults	
temp:	1											0	10	0.00
temp:	2											0	10	0.00
temp:	3		1						1			2	10	0.20
temp:	4	4	3	4	2	2	4	4	3	1	4	31	10	3.10
temp:	5				1	3				2		6	10	0.60
temp:	6	5	5	7	7	5	6	7	8	6	6	62	10	6.20
temp:	7		1	2	1	3		2	1	1	2	13	10	1.30
temp:	8	8	8	7	6	6	10	7	8	9	10	79	10	7.90
	TOTAL	17	18	20	17	19	20	20	21	19	22	193	10	19.30
CONC.			REPLICATE CONTAINERS					s.d.=	1.61933		CV% =	8.897405	
75.00	DAY	1	2	3	4	5	6	7	8	9	10	no. young	no. adults	
temp:	1											0	10	0.00
temp:	2											0	10	0.00
temp:	3	1	1					2	2			6	10	0.60
temp:	4	2	3	2	2	4	3	1	1	3	2	23	10	2.30
temp:	5			1	2			1	3			7	10	0.70
temp:	6	8	7	5	6	7	7	6	5	7	8	66	10	6.60
temp:	7		1	3		1			2			7	10	0.70
temp:	8	8	5	5	9	4	11	9	6	9	7	73	10	7.30
	TOTAL	19	17	16	19	16	21	19	19	19	17	182	10	18.20
CONC.			REPLICATE CONTAINERS					s.d.=	1.05409		CV% =	5.5478555	
100.00	DAY	1	2	3	4	5	6	7	8	9	10	no. young	no. adults	
temp:	1											0	10	0.00
temp:	2											0	10	0.00
temp:	3			1			2		1			4	10	0.40
temp:	4	4		2	2	4	1	3	3	4	5	28	10	2.80
temp:	5		4	1			3					8	10	0.80
temp:	6	6	4	7	7	7	5	7	6	6	7	62	10	6.20
temp:	7		4	1		1	2		2			10	10	1.00
temp:	8	8	6	7	9	8	5	9	7	11	8	78	10	7.80
	TOTAL	18	18	19	18	20	18	19	19	21	20	190	10	19.00

Wynne 1494D · CMID · 9-11-12 · 1430

CONC.				REPLICATE CONTAINERS					s.d.=	0		CV% =	#DIV/0!	
control	DAY	1	2	3	4	5	6	7	8	9	10	no. youn	no. adults	young/adult
temp:	1											0	10	#DIV/0!
temp:	2											0	8	#DIV/0!
temp:	3						1					0	10	#DIV/0!
* 3 temp:	4	1	2	3	3			4	2	4	3	0	18	#DIV/0!
temp:	5	3	2	2		4		1		1		0	10	#DIV/0!
temp:	6	6	7	7	6	5	4	7	7	7	8	0	10	#DIV/0!
temp:	7					3	3					0		#DIV/0!
temp:	8	6	10	7	9	8	6	8	8	7	5	0	10	#DIV/0!
*	TOTAL	0	0	0	0	0	0	0	0	0	0	0	10	0.00

CONC.				REPLICATE CONTAINERS					s.d.=	0		CV% =	#DIV/0!	
32	DAY	1	2	3	4	5	6	7	8	9	10	no. youn	no. adults	young/adult
temp:	1											0	10	#DIV/0!
temp:	2											0	10	#DIV/0!
temp:	3											0	10	#DIV/0!
temp:	4	4	1	3	3	3	3	2	2	4	3	0	10	#DIV/0!
temp:	5		3	1		2			1			0	10	#DIV/0!
temp:	6	8	6	6	5	7	7	7	6	6	7	0	10	#DIV/0!
temp:	7		2	2			1				3	0	10	#DIV/0!
temp:	8	8	6	8	9	7	8	10	7	9	7	0	10	#DIV/0!
*	TOTAL	0	0	0	0	0	0	0	0	0	0	0	10	0.00

CONC.				REPLICATE CONTAINERS					s.d.=	0		CV% =	#DIV/0!	
42	DAY	1	2	3	4	5	6	7	8	9	10	no. youn	no. adults	young/adult
temp:	1											0	10	#DIV/0!
temp:	2											0	10	#DIV/0!
temp:	3							2				0	10	#DIV/0!
temp:	4	1	2	2	1	3	3	2	4	3	1	0	10	#DIV/0!
temp:	5	3	3		1				1		2	0	10	#DIV/0!
temp:	6	5	7	7	8	7	6	7	5	7	7	0	10	#DIV/0!
temp:	7	4		2			4		3		1	0	10	#DIV/0!
temp:	8	5	9	6	7	7	5	7	6	9	7	0	10	#DIV/0!
*	TOTAL	0	0	0	0	0	0	0	0	0	0	0	10	0.00

CONC.				REPLICATE CONTAINERS					s.d.=	0		CV% =	#DIV/0!	
56	DAY	1	2	3	4	5	6	7	8	9	10	no. youn	no. adults	young/adult
temp:	1											0	10	#DIV/0!
temp:	2											0	10	#DIV/0!
temp:	3								1			0	10	#DIV/0!
temp:	4	4	3	4	2	2	4	4	3	1	4	0	10	#DIV/0!
temp:	5				1	3				2		0	10	#DIV/0!
temp:	6	5	5	7	7	5	6	7	8	6	6	0	10	#DIV/0!
temp:	7		1	2	1	3		2	1	1	2	0	10	#DIV/0!
temp:	8	8	8	7	6	6	10	7	8	9	10	0	10	#DIV/0!
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	10	0.00

CONC.				REPLICATE CONTAINERS					s.d.=	0		CV% =	#DIV/0!	
75	DAY	1	2	3	4	5	6	7	8	9	10	no. youn	no. adults	young/adult
temp:	1											0	10	#DIV/0!
temp:	2											0	10	#DIV/0!
temp:	3							2	2			0	10	#DIV/0!
temp:	4	2	3	2	2	4	3	1	1	3	2	0	10	#DIV/0!
temp:	5			1	2			1	3			0	10	#DIV/0!
temp:	6	8	1	5	6	7	7	6	5	7	8	0	10	#DIV/0!
temp:	7		1	3					2			0	10	#DIV/0!
temp:	8	8	5	5	9	4	11	9	6	9	7	0	10	#DIV/0!
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	10	0.00

CONC.				REPLICATE CONTAINERS					s.d.=	0		CV% =	#DIV/0!	
100	DAY	1	2	3	4	5	6	7	8	9	10	no. youn	no. adults	young/adult
temp:	1											0	10	#DIV/0!
temp:	2											0	10	#DIV/0!
temp:	3			1			2		1			0	10	#DIV/0!
temp:	4	4		2	2	4	1	3	3	4	5	0	10	#DIV/0!
temp:	5		4	1			3					0	10	#DIV/0!
temp:	6	6	4	7	7	7	5	7	6	6	7	0	10	#DIV/0!
temp:	7		4	1		1	2		2			0	10	#DIV/0!
temp:	8	8	6	7	9	8	5	9	7	11	8	0	10	#DIV/0!
*	TOTAL	0	0	0	0	0	0	0	0	0	0	0	10	0.00

APPENDIX B
ORGANISM HISTORY

1300 Blue Spruce Drive, Suite C
Fort Collins, Colorado 80524

Toll Free: 800/331-5916
Tel: 970/484-5091 Fax:970/484-2514

ORGANISM HISTORY

DATE: 9/10/2012

SPECIES: *Pimephales promelas*

AGE: N/A

LIFE STAGE: Embryo

HATCH DATE: 9/10/2012

BEGAN FEEDING: N/A

FOOD: N/A

Water Chemistry Record:	Current	Range
TEMPERATURE:	23°C	--
SALINITY/CONDUCTIVITY:	--	--
TOTAL HARDNESS (as $CaCO_3$):	124 mg/l	--
TOTAL ALKALINITY (as $CaCO_3$):	95 mg/l	--
pH:	8.20	--

Comments:

Facility Supervisor

Rec'd 9-11-12
14940
14939

APPENDIX C
CHAINS OF CUSTODY

8100 NATIONAL DRIVE, LITTLE ROCK, AR 72209
(501) 562-8139 (800) 331-8139
FAX # (501) 562-7025

TURNAROUND TIME
RUSH 24HR. 48HR.
5 DAY REG.
OTHER:

FOR LAB/OFFICE USE ONLY
LAB # 14940.0018
CLIENT # 45023
P. O. #

STANDARD METHODS PRESERVATION PER EPA 40 CFR
C 4 = COOL TO 4.0 C
S<2 = SULFURIC ACID TO PH < 2
N<2 = NITRIC ACID TO PH > 2
T = THIOSULFATE
W = AZIDE MODIFICATION (4500-0 C)
P = MEMBRANE ELECTRODE (4500-0 G)
NaOH = Ph > 12

NAME OF COMPANY, CITY, OR PROJECT: WYNNE WATER UTILITIES

PROJECT NO:

SAMPLER(S) SIGNATURE/PRINT: Harrell Williams (HARRELL WILLIAMS)

SAMPLE NO.	SAMPLE COLLECTION LOCATION	START DATE/TIME	END DATE/TIME	COMP/GRAB	FIELD ANALYSIS PH	FIELD ANALYSIS TEMP	FLOW	CL2	D.O. (W) D.O. (P)	CONTAINER TYPE / PRESERVATIVE	ANALYSIS REQUIRED
	POST AERATION BASIN OUTFALL	9/9/12 7:00 AM	9/10/12 7:00 AM	COMP/24			0.782			6 - 1/2 GAL	BIO-MONITORING

METHOD OF SHIPMENT (CIRCLE)
FED-EX WALK-IN (SRA) UPS OTHER

TYPE OF SAMPLE(S): (CIRCLE)
WATER SOIL (W/W) SLUDGE OTHER

FIELD CALIBRATION RECORD
PH 7
PH 4
PH 10
D. O.

NOTES/COMMENTS/OBSERVATIONS
Turned Lab 8.0

FIELD ANALYSIS CONDUCTED BY: (SRA) CLIENT

RELINQUISHED BY: Harrell Williams DATE/TIME
RECEIVED BY: DATE/TIME 1420 9-10-12

RELINQUISHED BY: DATE/TIME
RECEIVED BY: DATE/TIME 1615 9-10-12

8100 NATIONAL DRIVE, LITTLE ROCK, AR 72209
(501) 562-8139 (800) 331-8139
FAX # (501) 562-7025

TURNAROUND TIME
RUSH 24HR. 48HR.
5 DAY REG.
OTHER:

FOR LAB/OFFICE USE ONLY
LAB # 14940-0002B
CLIENT # 45073
P. O. # _____

STANDARD METHODS PRESERVATION PER EPA 40 CFR
C 4 = COOL TO 4.0 C
S<2 = SULFURIC ACID TO PH < 2
N<2 = NITRIC ACID TO PH > 2
T = THIOSULFATE
W = AZIDE MODIFICATION (4500-0 C)
P = MEMBRANE ELECTRODE (4500-0 G)
NaOH = Ph > 12

NAME OF COMPANY, CITY, OR PROJECT: WYNNE WATER UTILITIES

PROJECT NO:

SAMPLER(S) SIGNATURE/PRINT: Harrell Williams (HARRELL WILLIAMS)

SAMPLE NO.	SAMPLE COLLECTION LOCATION	START DATE/TIME	END DATE/TIME	COMP/GRAB	FIELD ANALYSIS PH	FIELD ANALYSIS TEMP	FLOW	CL2	D.O. (W) D.O. (P)	CONTAINER TYPE PRESERVATIVE	ANALYSIS REQUIRED
	POST AERATION BASIN OUTFALL	9/11/12 7:00 AM	9/12/12 7:00 AM	COMP/24			0.749			6 - 1/2 GAL	BIO-MONITORING

METHOD OF SHIPMENT (CIRCLE)	FIELD CALIBRATION RECORD	NOTES/COMMENTS/OBSERVATIONS
FED-EX WALK-IN (SRA) UPS OTHER	PH 7	
	PH 4	Temp on Lab 6.8°
TYPE OF SAMPLE(S): (CIRCLE)	PH 10	
WATER SOIL (WW) SLUDGE OTHER	D. O.	
		FIELD ANALYSIS CONDUCTED BY: (SRA) CLIENT

RELINQUISHED BY: Harrell Williams DATE/TIME
RECEIVED BY: DATE/TIME 1355 9-12-12

RELINQUISHED BY: DATE/TIME
RECEIVED BY: DATE/TIME 1600 9-12-12

8100 NATIONAL DRIVE, LITTLE ROCK, AR 72209
(501) 562-8139 (800) 331-8139
FAX # (501) 562-7026

TURNAROUND TIME
RUSH 24HR. 48HR.
5 DAY REG.
OTHER:

FOR LAB/OFFICE USE ONLY
LAB # 14960-00038
CLIENT # 45023
P. O. # _____

STANDARD METHODS PRESERVATION PER EPA 40 CFR
C 4 = COOL TO 4.0 C
S<2 = SULFURIC ACID TO PH < 2
N<2 = NITRIC ACID TO PH > 2
T = THIOSULFATE
W = AZIDE MODIFICATION (4500-0 C)
P = MEMBRANE ELECTRODE (4500-0 G)
NaOH = Ph > 12

NAME OF COMPANY, CITY, OR PROJECT: WYNNE WATER UTILITIES

PROJECT NO:

SAMPLER(S) SIGNATURE/PRINT: Harrell Williams (HARRELL WILLIAMS)

SAMPLE NO.	SAMPLE COLLECTION LOCATION	START DATE/TIME	END DATE/TIME	COMP/GRAB	FIELD ANALYSIS PH	TEMP	FLOW	CL2	D.O. (W) D.O. (P)	CONTAINER TYPE PRESERVATIVE	ANALYSIS REQUIRED
	POST AERATION BASIN OUTFALL	9/13/12 7:00 AM	9/14/12 7:00 AM	COMP/24			1.066			6 - 1/2 GAL	BIO-MONITORING

METHOD OF SHIPMENT (CIRCLE)
FED-EX WALK-IN (SRA) UPS OTHER

TYPE OF SAMPLE(S): (CIRCLE)
WATER SOIL (WW) SLUDGE OTHER

FIELD CALIBRATION RECORD
PH 7
PH 4
PH 10
D. O.

NOTES/COMMENTS/OBSERVATIONS
Temp Lab 2.5°

FIELD ANALYSIS CONDUCTED BY: (SRA) CLIENT

RELINQUISHED BY: Harrell Williams DATE/TIME
RECEIVED BY: _____ DATE/TIME 1345 9-14-12

RELINQUISHED BY: _____ DATE/TIME
RECEIVED BY: _____ DATE/TIME 1545 9-14-12

APPENDIX D
LABORATORY CONTROL
CERIO CULTURE RECORD

DATE START	9/3/2012	Wynne 14940											
DATE END		*											
ANALYST		*											
WATER TYPE		*		day 8		day 14							
% SURVIVAL		*		100		100							
#YOUNG MEAN				17.9									
stnd DEV from mean		2.1497		14.637									

	REPLICATE NUMBER										No.	No.	Young/
DAY	1	2	3	4	5	6	7	8	9	10	Young	Adults	Adult
1											0	10	0
2											0	10	0
3		1				4			2		7	10	0.7
4	3	4	2	2	5		3	3	3	2	27	10	2.7
5			1				1			2	4	10	0.4
6	5	6	5	7	2	3	1	4	4	5	42	10	4.2
7					5		4	1			10	10	1
8	9	11	9	9	7	5	8	8	10	9	85	10	8.5
total8	17	22	17	18	19	12	17	16	19	18	175	10	17.5
9											0	10	0
10											0	10	0
11											0	10	0
12											0	10	0
13											0	10	0
14											0	10	0
total14											0	10	0

	REPLICATE NUMBER										No.	No.	Young/
DAY	11	12	13	14	15	16	17	18	19	20	Young	Adults	Adult
1											0	10	0
2											0	10	0
3		1					1				2	10	0.2
4	4	1	3		2	2	4	3	3	3	25	10	0
5		4		3		1					8	10	0.8
6	6	2	6	3	5	6	6	7	7	7	55	10	5.5
7		3		2				1			6	10	0.6
8	8	7	9	7	11	9	9	10	7	10	87	10	8.7
total8	18	18	18	15	18	18	20	21	17	20	183	10	18.3
9											0	10	0
10											0	10	0
11											0	10	0
12											0	10	0
13											0	10	0
14											0	10	0
total14	0	0	0	0	0	0	0	0	0	0	0	10	0

4-3-12 Ceriu

DATE START		*											
DATE END		*											
ANALYST		*											
WATER TYPE		*		day 8		day 14							
% SURVIVAL		*		#VALUE!		#VALUE!							
#YOUNG MEAN		.		0									
stnd DEV from mean		0		#DIV/0!									

	REPLICATE NUMBER										No.	No.	Young/
DAY	1	2	3	4	5	6	7	8	9	10	Young	Adults	Adult
1											0		######
2											0		######
3		1				4			2		0	10	######
4	3	4	2	2	5		3	3	3	2	0	10	######
5			1				1			2	0	10	######
6	5	6	5	7	2	3	1	4	4	5	0	10	######
7					5		4	1			0	10	######
8	9	11	9	9	7	5	8	8	10	9	0	10	######
total8	0	0	0	0	0	0	0	0	0	0	0		######
9											0		######
10											0		######
11											0		######
12											0		######
13											0		######
14											0		######
total14											0		######

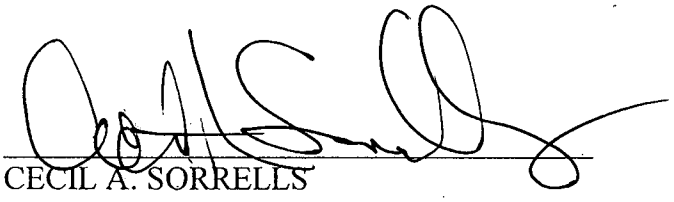
	REPLICATE NUMBER										No.	No.	Young/
DAY	11	12	13	14	15	16	17	18	19	20	Young	Adults	Adult
1											0		######
2											0		######
3		1					1				0	10	######
4	4	1	3		2	2	4	3	3	3	0	10	######
5		4		3		1					0	10	######
6	6	2	6	3	5	6	6	7	7	7	0	10	######
7		3		2				1			0	10	######
8	8	7	9	7	11	9	9	10	7	10	0	10	######
total8	0	0	0	0	0	0	0	0	0	0	0	10	0
9											0		######
10											0		######
11											0		######
12											0		######
13											0		######
14											0		######
total14	0	0	0	0	0	0	0	0	0	0	0	10	0

FIGURE 5

BIOMONITORING ANALYSIS
BY
SORRELLS RESEARCH ASSOCIATES, INC.

ANALYSIS

KLUGH E. SORRELLS, II
LABORATORY TECHNICIAN



CECIL A. SORRELLS
BIOMONITORING MANAGER/PRESIDENT

KLUGH E. SORRELLS, M.S.
QUALITY ASSURANCE OFFICER

SORRELLS RESEARCH
LABORATORY AND FIELD SERVICES

CHEMISTS
ECOLOGISTS
CONSULTANTS
PLANNERS

8100 National Drive
Little Rock, Arkansas 72209

Phone 501-562-8139
Fax 501-562-7025
Toll Free 1-800-331-8139

LABORATORY ANALYSIS

Date of Report: October 11, 2012
Date Received : September 10, 2012

For: WYNNE WATER UTILITIES
121 EAST MERRIMAN
WYNNE, AR 72396-
Job: NPDES MONITORING PERMIT NO: AR0021903 2/YR
Sample From: POST AERATION BASIN - 24HR COMP 09/09-10/12 0700-0700 BIO-MONITORING

ANALYTE		RESULT	UNITS	METHOD
Bioassay, Ceriodaphnia dubia, chronic	=	100.000	Rp_NOEC, %	1002.0
Bioassay, Fathead minnow, chronic	=	100.000	Gr_NOEC, %	1000.0
Bioassay, Ceriodaphnia dubia- chronic	=	100.000	Sv-NOEC, %	1002.0
Bioassay, Fathead minnow, chronic	=	100.000	Sv_NOEC, %	1000.0

STANDARD METHODS, 20TH ED.; EPA METHODS, 3RD ED.
Collected by:
CLIENT on 09/10/12 at 7:00
Analysis by :
SEE ATTACHED QUALITY ASSURANCE PAGE.
Sample preservation and Laboratory Analysis conducted according to EPA 40 CFR Part 136. Test/Analyst/Time/Coeff./Var./ QA plan filed with ADPC&E. Includes 10 % replication and 10 % recovery studies by random selection. Instruments maintained and calibrated and records kept.
See Attached.

Copies to:
MR. HARRELL WILLIAMS
OPERATOR
121 EAST MERRIMAN
WYNNE, AR 72396-

Laboratory Number: 14940.0001B | TKR Reviewed By: K. E. Sorrells, M.S. [ ]

SORRELLS RESEARCH
LABORATORY AND FIELD SERVICES

CHEMISTS
ECOLOGISTS
CONSULTANTS
PLANNERS

8100 National Drive
Little Rock, Arkansas 72209

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Fax 501-562-7025
Toll Free 1-800-331-8139

QUALITY ASSURANCE

September 10, 2012
The following QA represents SRA's Quality Assurance values for this report.

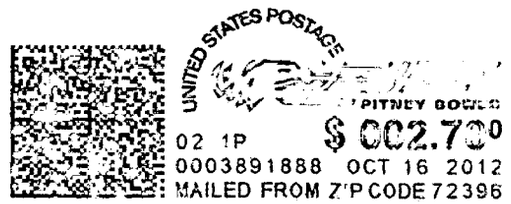
ANALYTE	ANALYST	BEG. DATE	BEG. TIME	FIN. DATE	FIN. TIME	S.D. %	SPK. REC.	#IN BAT
Bioassay, Ceriodaphnia du	CS/JM	09/11/12	1430	09/19/12	1430	0.00	0.0	2
Bioassay, Fathead minnow,	CS/JM	09/11/12	1430	09/18/12	1430	0.00	0.0	2

Field PH/TEMP/D.O. Sampler or Courier/ at time of sampling or pick up Sample preservation and laboratory analysis conducted according to EPA 40 CFR Part 136 TEST/ANALYST/TIME/COEF. VAR.* QA PLAN filed with ADPC&E. Intlude replication.

KES = K. E. Sorrells
JBS = James B. Sorrells
CAS = Cecil A. Sorrells
MKM = Mark Kyle McKenzie

KESII = K. E. Sorrells, II
TJS = Todd J. Sanders
JHD = J. Henry Dodson

Laboratory Number: 14940.0001B TKR



WYNNE WATER UTILITIES
121 E. MERRIMAN
WYNNE, AR 72396
(870) 238-2751
"Water is Life"

TO:

Arkansas Department of Environmental Quality
NPDES Enforcement Section
5301 Northshore Dr.
North Little Rock, Arkansas 72118-5317