

May 17, 2019

Tom Myers City of Siloam Springs 975 Anderson Avenue Siloam Springs, AR 72761

RE: Project: WET TEST

Pace Project No.: 60301930

Dear Tom Myers:

Enclosed are the analytical results for sample(s) received by the laboratory on May 07, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Tichod many

Richard Mannz richard.mannz@pacelabs.com (913)599-5665 PM Lab Management

Enclosures







CERTIFICATIONS

Project: WET TEST Pace Project No.: 60301930

Southeast Kansas Certification IDs

808 West McKay, Frontenac, KS 66763 Arkansas Certification #: 18-016-0

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10426

Louisiana Certification #: 03055 Oklahoma Certification #: 9935 Texas Certification #: T104704407 Utah Certification #: KS00021

REPORT OF LABORATORY ANALYSIS





SAMPLE SUMMARY

Project: WET TEST Pace Project No.: 60301930

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60301930001	CITY OF SILOAM SPRINGS	Water	05/06/19 09:00	05/07/19 08:00

REPORT OF LABORATORY ANALYSIS

(913)599-5665



SAMPLE ANALYTE COUNT

Project: WET TEST Pace Project No.: 60301930

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory	
60301930001	CITY OF SILOAM SPRINGS	EPA 821/R-02/013	MEB	1	PASI-SE	_

REPORT OF LABORATORY ANALYSIS



ANALYTICAL RESULTS

Project: WET TEST Pace Project No.: 60301930

Date: 05/17/2019 10:21 AM

Sample: CITY OF SILOAM SPRINGS	Lab ID: 6	60301930001	Collected:	05/06/	19 09:00	Received:	05/07/19 08:00	Matrix: Water	
Parameters	Results	Units	Report	Limit	DF	Prepared	Analyzed	CAS No.	Qual
Chronic Toxicity Analytical Method: EPA 821/R-02/013									
Toxicity, Chronic	Complete			1.0	1		05/07/19 11:3	35	



QUALIFIERS

Project: WET TEST Pace Project No.: 60301930

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

Date: 05/17/2019 10:21 AM

PASI-SE Pace Analytical Services - SE Kansas



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: WET TEST Pace Project No.: 60301930

Date: 05/17/2019 10:21 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60301930001	CITY OF SILOAM SPRINGS	EPA 821/R-02/013	584778		



Sample Condition Upon Receipt



Client Name: Siloam Styras		
Courier: FedEx □ UPS □ VIA ☑ Clay □	PEX 🗆 ECI 🗆	Pace □ Xroads □ Client □ Other □
Teaching at	ice Shipping Label Us	The state of the s
Custody Seal on Cooler/Box Present: Yes ₩ No □	Seals intact: Yes	
Packing Material: Bubble Wrap □ Bubble Bags		,
- 10-	of Ice Wer Blue N	7
Cooler Temperature (°C): As-read Corr. Fac	\mathcal{L}	Date and initials of person
Temperature should be above freezing to 6°C	.or come	examining contents:
Chain of Custody present:	1x√yes □No □N/A	3///9
Chain of Custody relinquished:	₩es □No □N/A	0.00
Samples arrived within holding time:	DYes □No □N/A	
Short Hold Time analyses (<72hr):	Yes ONO ON/A	
Rush Turn Around Time requested:	□Yes VNo □N/A	
Sufficient volume:	YZYes □No □N/A	
Correct containers used:	Yes □No □N/A	
Pace containers used:	Yes ONO ON/A	
Containers intact:	Yes ONO ON/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☐N/A	
Filtered volume received for dissolved tests?	□Yes □No ₩/A	
Sample labels match COC: Date / time / ID / analyses	Yes 🗆 No 🗆 N/A	
Samples contain multiple phases? Matrix:	□Yes No □N/A	
Containers requiring pH preservation in compliance?	☐Yes ☐No 🏋Ñ/A	List sample IDs, volumes, lot #'s of preservative and the
(HNO₃, H₂SO₄, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)		date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
Trip Blank present:	□Yes □No □N/A	
Headspace in VOA vials (>6mm):	□Yes □No □N/A	
Samples from USDA Regulated Area: State:	□Yes □No □M/A	
Additional labels attached to 5035A / TX1005 vials in the field?		1
Client Notification/ Resolution: Copy COC to	Client? Y / N	Field Data Required? Y / N
Person Contacted: Date/Tii		Field Data Required? Y / N
Comments/ Resolution:		
Project Manager Review:		11
, The stage of the	Date	*

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Page:

Pace Analytical *

Samples Intacl Pace Project No./ Lab I.D. DRINKING WATER F-ALL-Q-020rev.08, 12-Oct-2007 90301930 SAMPLE CONDITIONS Scub-co Cooler (Y/N) Custody Sealed OTHER (N/Y) eol по БеуівовЯ ☐ GROUND WATER 000 J° ni qmeT Residual Chlorine (Y/V) 8,00 AR REGULATORY AGENCY TIME 12019 RCRA Requested Analysis Filtered (Y/N) 5/1/19 DATE Site Location STATE NPDES NPDES DATE Signed / 6 UST DOP ACCEPTED BY / AFFILIATION 040000 Chronic WET Test Analysis Test 1 N /A Other Methanol Wyers Mon) Richard Mannz COSSSEV Preservatives NaOH Pace Quote
Reference:
Pace Project Richard
Managet:
Pace Profile #: 10809 HCI HNO Invoice Information: 15:30 orm company Name: OS2H TIME Unpreserved Section C 'ddress' # OF CONTAINERS SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER: 1 SAMPLE TEMP AT COLLECTION DATE Silvamsprings, Om 20.6 TIME COMPOSITE END/GRAB 2/1/18 DATE COLLECTED RELINQUISHED BY / AFFILIATION (Swer Case 5/5/19 10:00 TIME COMPOSITE Tom Mycus Required Project Information: COPY TO MY RENS @ Report To: Tom Myers SAMPLE TYPE (G=GRAB C=COMP) Purchase Order No.: **AMATRIX CODE** (see valid codes to left) Project Number Section B Valid Matrix Codes DRINKING WATER WY
WASTERMATER WW
PRODUCT SCIUSOLID OL
WIFE WPE
WIFE WPE
WIFE WPE
TISSUE IS Sormas tnyers @ Silvansprings ADDITIONAL COMMENTS return samples to the Frontenac Lab on ice! (A-Z, 0-97,-) Sample IDs MUST BE UNIQUE 975 Anderson Avenue City of Siloam Springs Siloam Springs, AR SAMPLE ID Fax samples have a 24 hour hold time! Required Client Information B Required Client Information: Phone: 479-228-0934 Requested Due Date/TAT: Section D Page 9 of 47 ţ, 7 Company: 9 თ Address: 9 7 æ 3 4 2 8 # Mat

Date: Sociation this form viriate arcepting Pace's NET 30 day payment terms and agreeing to late charges of 1,5% per month for any invoices not paid within 30 days.



Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219

> Phone: 913.599.5665 Fax: 913.599.1759

May 16, 2019

Tom Myers City of Siloam Springs 975 Anderson Avenue Siloam Springs, AR

Re:

Lab Project Number: 60301930

Client Project ID:

Wet Test

Dear:

Enclosed are the analytical results for sample(s) received by the laboratory. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any question concerning this report, please feel free to contact me.

Sincerely,

Tim Harrell

Tim.Harrell@pacelabs.com

- Honel

Technical Director

Enclosures



Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219

> Phone: 913.599.5665 Fax: 913.599.1759

CHRONIC TOXICITY TEST FOR City of Siloam Springs

PERMIT # AR0020273 AFIN # 04-00106

PERFORMED ON:

Pimephales promelas

and

Ceriodaphnia dubia

PREPARED FOR:

City of Siloam Springs Attn: Tom Myers 975 Anderson Avenue Siloam Springs, AR 1-479-228-0934

PREPARED BY:
Pace Analytical Services, Inc.
808 West McKay
Frontenac, KS 66763
1-620-235-0003

May 16, 2019



Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219

Phone: 913.599.5665 Fax: 913.599.1759

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Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219

> Phone: 913.599.5665 Fax: 913.599.1759

SUMMARY

A Chronic Whole Effluent Toxicity Test using the 7-day chronic fathead minnows (<u>Pimephales promelas</u>), static renewal larval survival and growth test, and three brood 7-day chronic Cladoceran (<u>Ceriodaphnia dubia</u>), static renewal survival and reproduction test, was conducted on effluent discharge water collected at the City of Siloam Springs effluent discharge from May 6, 2019 to May 10, 2019. All the test methods followed are as listed in <u>EPA 821-R-02-013</u>, "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms."

Statistically significant (p<0.05) mortality is determined by Dunnet's procedure using average percent survival of each test concentration versus the average survival of the controls. If significant mortality occurs, median lethal concentrations are calculated using effluent concentrations and their corresponding percent mortality data. The the 95% confidence intervals are calculated where appropriate by the Spearman-Karber method. Statistical analysis is accomplished by following steps in <u>EPA 821-R-02-013</u>, February 2002 and by use of Toxstat version 3.4.

In minnow section of testing, it was observed that the effluent had no significant effect on the survival of the larvae at the 100% concentration. No significant mortality was observed in the other effluent concentrations after the 7-day exposure period. The No Observed Effect Concentration (NOEC) was determined to be 100% for survival. No significant reduction in growth was observed in the 100% effluent concentration. The Toxic Units is <1. The IC25 is >100. The NOEC for growth in effluent was determined to be 100%. The PMSD was 15.6.

In Cladoceran section of testing, it was observed that the effluent had no significant effect on the survival of the organisms in the 100% effluent concentration. No significant mortality was observed in the other effluent concentrations after the 7-day exposure period. The No Observed Effect Concentration (NOEC) was determined to be 100% for survival. No significant reduction in reproduction was observed in the 100% effluent concentrations. The Toxic Units is <1. The IC25 is >100. The NOEC for reproduction in effluent was determined to be 100%. The PMSD was 16.0.

The chronic toxicity exhibited by the fathead minnows and the <u>Ceriodaphnia</u> treated by the effluent sampled from May 6 to May 10 from the City of Siloam Springs effluent discharge, is acceptable as described in <u>EPA 821-R-02-013</u>.



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> Phone: 913.599.5665 Fax: 913.599.1759

INTRODUCTION

Pace Analytical was contracted to perform this chronic toxicity test on effluent from the City of Siloam Springs effluent discharge. Chronic toxicity was measured using the <u>Pimephales promelas</u> at larval for survival and growth test and the <u>Ceriodaphnia dubia</u> survival and reproduction test described in <u>EPA 821-R-02-013</u>, "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms." The raw data of the study is stored at Pace Analytical Services, INC. 808 West McKay, Frontenac, KS 66763.

TEST MATERIAL

City of Siloam Springs personnel collected sampling of the effluent. A sample of the effluent was delivered to Pace by commercial carrier on 5-7-19. Subsequent samples followed by delivery on 5-9-19 and on 5-11-19. All samples were stored at \leq 6° Celsius. Moderately Hard Synthetic Water was used as a control and also to make the required dilutions in the test as described in EPA 821-R-02-013.

TEST METHODS

Pace used EPA test method 1000.0 for conducting the Fathead Minnow, Pimephales promelas, Larval Survival and Growth Test. EPA test method 1002.0 was used for conducting the Cladoceran, Ceriodaphnia dubia, Survival and Reproduction Test. The tests were conducted to estimate the NOEC, and LOEC for survival, growth, and reproduction of these test species.

The <u>Pimephales</u> and <u>Ceriodaphnia</u> tests were initiated on 5-7-19 and carried out until 5-14-19. The Pimephales tests were conducted in 500 ml plastic jars with 250 ml of test solution. Eight larvae were placed in each of at least 5 replicates to make a total of 40 larvae per sample concentration. The <u>Ceriodaphnia</u> tests were carried out in 35ml vials containing 25 ml of test solution. One Neonate was placed in each of 10 replicates to make a total of 10 neonates per sample concentration.

TEST ORGANISMS

The organisms used in these tests were cultured at Pace under controlled temperature and photoperiod conditions and/or were purchased from an external supplier. Pace maintains records of all culture techniques used in producing organisms.



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> Phone: 913.599.5665 Fax: 913.599.1759

RESULTS



Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219

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TABLE 1

Permittee: City of Siloam Springs Effluent discharge.

Date Sampled

No. 1: 5-6-19 9:00

No. 2: 5-8-19

9:00

No. 3: 5-10-19

9:00

Test Initiated: 11:35

Date: 5-7-19

Dilution Water used: Moderately Hard Synthetic Water

FATHEAD MINNOW LARVAE GROWTH AND SURVIVAL (Pimephales promelas)

DATA TABLE FOR GROWTH OF FATHEAD MINNOWS

DATA TABLE FOR GROWITH OF TARTIES WINGTON							
Effluent Concentration	Averag		eight in Mi te Chamb	lligrams in ers		Mean Dry Weight	CV% *
(%)	Α	В	С	D	Е	(mg)	
Control 0%	0.427	0.319	0.396	0.452	0.407	0.400	12.53
Dilution 1 32%	0.478	0.395	0.321	0.391	0.451	0.407	14.92
Dilution 2 42%	0.437	0.418	0.371	0.396	0.419	0.408	6.22
Dilution 3 56%	0.469	0.414	0.348	0.373	0.427	0.406	11.63
Dilution 4 75%	0.457	0.429	0.375	0.435	0.409	0.421	7.34
Dilution 5 100%	0.392	0.391	0.419	0.445	0.422	0.414	5.49

^{*} Coefficient of Variation = Standard Deviation X 100 / Mean



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Permittee: City of Siloam Springs Effluent discharge.

FATHEAD MINNOW SURVIVAL

Conc. %	Pe	Percent Survival in Replicate Chambers					Mean Percent Survival		
	Α	В	С	D	E	24hr	48hr	7 day	
Control 0%	100	87.5	100	100	100	100	100	97.5	4.79
Dilution 1 32%	100	100	87.5	100	100	100	100	97.5	4.79
Dilution 2 42%	100	100	100	100	100	100	100	100	0.00
Dilution 3 56%	100	100	87.5	100	100	100	100	97.5	4.79
Dilution 4 75%	100	100	87.5	100	100	100	100	97.5	4.79
Dilution 5 100%	100	100	100	100	100	100	100	100	0.00



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Permittee: City of Siloam Springs Effluent discharge.

CERIODAPHNIA SURVIVAL AND REPRODUCTION

DATA TABLE FOR CERIODAPHNIA YOUNG PRODUCTION

Replicate	Control	Dilution 1	Dilution 2	Dilution 3	Dilution 4	Dilution 5
·	0% .	32%	42%	56%	75%	100%
1	16	25	26	19	24	18
2	23	24	25	25	16	25
3	19	23	23	25	23	28
4	21	26	20	20	18	21
5	24	18	17	21	23	24
6	21	20	24	29	25	19
7	20	23	20	29	26	24
8	19	25	23	26	24	26
9	26	25	24	23	25	17
10	24	17	24	19	22	25
Mean	21.3	22.6	22.6	23.6	22.6	22.7
SD	2.983	3.169	2.757	3.806	3.204	3.713
CV %	14.01	14.02	12.20	16.13	14.18	16.36



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> Phone: 913.599.5665 Fax: 913.599.1759

Permittee: City of Siloam Springs Effluent discharge.

CERIODAPHNIA MEAN PERCENT SURVIVAL

	Percent Effluent (%)							
Time Elapsed	Control 0%	Dilution 1 32%	Dilution 2 42%	Dilution 3 56%	Dilution 4 75%	Dilution 5 100%		
24 hrs	100	100	100	100	100	100		
48 hrs	100	100	100	100	100	100		
7-day	100	100	100	100	100	100		
SD	0.000	0.000	0.000	0.000	0.000	0.000		
CV %	0.00	0.00	0.00	0.00	0.000	0.000		



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TABLE 2 SUMMARY OF TEST CONDITIONS FOR THE FATHEAD MINNOW (Pimephales promelas) LARVAL SURVIVAL AND GROWTH TEST

1. Test type	Static renewal
2. Temperature	25 degrees Celsius
3. Light quality	Ambient laboratory light
4. Light intensity	Ambient laboratory levels
5. Photoperiod	16 hr light, 8 hr dark
6. Test chamber size	500 ml
7. Test solution volume	250 ml
8. Renewal of test concentrations	Daily
9. Age of test organism	< 24 hours
10. No. larvae/chamber	8
11. No. replicates/concentration	5
12. No. larvae/concentration	40
13. Feeding regime	Feed 0.15 g newly hatched brine shrimp nauplii two times daily. Larvae are not fed 12 hours prior to termination of test.
14. Cleaning	Siphon daily, immediately before test solution renewal
15. Aeration	None



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TABLE 2 (CONT.)

17.222	(30111.)
16. Dilution Water	Moderately Hard Synthetic Water prepared with MILLI-Q deionized water and reagent grade chemicals
17. Effluent concentrations	0%, 32%, 42%, 56%, 75%, 100%
18. Test duration	7 days
19. Endpoints	Survival and growth
20. Test acceptability	80% or greater survival in the controls, Average dry weight in controls >0.25 mg, Coefficient of variation in the control must not exceed 40%.

TABLE 2 (CONT.) SUMMARY OF TEST CONDITIONS FOR THE CLADOCERAN (Ceriodaphnia dubia) SURVIVAL AND REPRODUCTION TEST

1. Test type	Static renewal
2. Temperature	25 degrees Celsius
3. Light quality	Ambient laboratory light
4. Light intensity	Ambient laboratory levels
5. Photoperiod	16 hr light, 8 hr dark
6. Test chamber size	30 ml
7. Test solution volume	25 ml



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TABLE 2 (CONT.)

8. Renewal of test concentrations	Daily
9. Age of test organism	< 24 hours
10. No. larvae/chamber	1
11. No. replicates/concentration	10
12. No. larvae/concentration	10
13. Feeding regime	Feed 0.1 ml YCT and 0.1 ml of Algae daily. Larvae are not fed 12 hours prior to termination of test.
14. Cleaning	Siphon daily, immediately before test solution renewal
15. Aeration	None
16. Dilution Water	Moderately Hard Synthetic Water prepared with MILLI-Q deionized water and reagent grade chemicals
17. Effluent concentrations	0%, 32%, 42%, 56%, 75%, 100%
18. Test duration	Until 60% or more surviving control females have three broods or a maximum of 8 days.
19. Endpoints	Survival and Reproduction
20. Test acceptability	80% or greater survival in the controls, Average reproduction rate of 15 young / adult. Coefficient of variation in the control must not exceed 40%.



Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219

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TABLE 2 (SECTION 2)

BIOMONITORING CHRONIC TOXICITY REPORT FATHEAD MINNOW (Pimephales promelas) CHEMICAL PARAMETERS CHART

Permittee: City of Siloam Springs Effluent discharge.

ANALYSTS: Pace Analytical Services, Inc.

Timothy Harrell Mike Bollin

SAMPLE NO. 1 COLLECTED: DATE: 5-6-18

SAMPLE NO. 2 COLLECTED: DATE: 5-8-18

SAMPLE NO. 3 COLLECTED: DATE: 5-10-18

TABLE 2 (SECTION 2) INITIAL WATER QUALITY EFFLUENT CONCENTRATION

	Control	100%
PH	7.62	7.75
D.O.	8.20	7.90
Temp	25.0	25.0
Alk	62	112
Hard	90	124
Cond	330	523
Chlorine	<0.1	<0.1

* D.O. is reported as mg/L
Alkalinity is reported as mg/L CaCO3
Hardness is reported as mg/L CaCO3
Conductance is reported as umhos
Ammonia is reported as mg/L
Chlorine is reported as mg/L



Pace Analytical Services, Inc. 9608 Loiret Blvd.

Leпexa, KS 66219 Phone: 913.599.5665 Fax: 913.599.1759

TEST WATER QUALITY

24-Hour Water Quality Measurements

24-11001 Water Qua	my wiedearemente		1-4
Effluent	PH	D.O.	Temperature
Concentration (%)		(mg/l)	(C)
0% Control	7.78	7.70	24.7
32% Effluent	7.78	6.60	24.8
42% Effluent	7.77	6.30	24.8
56% Effluent	7.76	5.80	24.8
75% Effluent	7.76	5.10	24.8
100% Effluent	7.75	4.60	24.8

48-Hour Water Quality Measurements

40-110ul Water Qua	nty Measurements		
Effluent	PH	D.O.	Temperature
Concentration (%)		(mg/l)	(C)
0% Control	7.73	7.10	24.9
32% Effluent	7.75	6.90	24.9
42% Effluent	7.79	6.70	24.9
56% Effluent	7.82	6.50	24.9
75% Effluent	7.90	6.40	24.9
100% Effluent	7.99	6.30	24.9



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Lenexa, KS 66219

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FINAL WATER QUALITY

EFFLUENT CONCENTRATION

	Control	100%
рН	7.67	7.69
D.O.	7.70	6.50
Temp	25.2	25.0
Alk	64	110
Hard	94	128
Cond	411	588

D.O. is reported as mg/L
 Alkalinity is reported as mg/L CaCO3
 Hardness is reported as mg/L CaCO3
 Conductance is reported as umhos



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TEST VALIDITY

The <u>Pimephales promelas</u> control survival rate was 97.5%. The mean dry weight (growth) of the <u>Pimephales promelas</u> was determined at 0.400 mg/organism in the controls. The percent coefficient of variation (%CV) values for the fathead minnow control for survival and growth were 4.79 and 12.53. The <u>Ceriodaphnia dubia</u> survival rates were 100 in the control. The <u>Ceriodaphnia in the control produced an average of 21.3 young over the seven-day exposure period. Percent CV values for <u>Ceriodaphnia dubia</u> control survival and reproduction was 0.00 and 14.01. Control data met or exceeded all criteria set out by <u>EPA 821-R-02-013</u> for test acceptance.</u>

CONCLUSIONS

The No Observed Effect Concentration (NOEC) for <u>Pimephales promelas</u> was 100% for survival and 100% for growth. The No Observed Effect Concentration (NOEC) for <u>Ceriodaphnia dubia</u> was 100% for Survival and 100% for Reproduction. The tests were ran using a synthetic control against effluent concentrations of 32%, 42%, 56%, 75%, and 100%. The effluent sampled on 5-6-19, 5-8-19, and 5-10-19 exhibited acceptable chronic toxicity in <u>Pimephales promelas</u> and in <u>Ceriodaphnia dubia</u> during the exposure period as described in EPA 821-R-02-013.



Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219

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Phone: 913.599.5665 Fax: 913.599.1759

APPENDIX C

REFERENCE TOXICANTS

The absence of significant control mortality during this test indicated the health of the organisms and indicated that any significant mortality in the test concentrations was not due to contaminants or variations in testing conditions.

Reference toxicity testing is routinely performed by staff members in our biomonitoring - bioassay laboratory.

Start: 4/16/19 11:40

End: 4/23/19 11:20

Pimephales promelas Reference Toxicant (NaCl) Avg. # of Live Organisms/replicate Concentration of Toxicant 0 hrs 24 hrs 48 hrs 7 days 0 8 2 10 g/l 40 20 4 40 30 8 g/l 24 38 35 40 6 g/l

4 g/l 40 40 40 2 g/l 40 40 40 IC25 (4.94 g/l Sodium Chloride)

Survival NOEC: 4.0 g/l

Reference Toxicant (NaCl) <u>Ceriodaphnia Dubia</u>

Concentration	*	Avg. # of Live Org	ganisms/replicate	9
of Toxicant				
	0 hrs	24 hrs	48 hrs	7 days
2.5 g/l	10	4	0	0
2.0 g/l	10	10	7	11
1.5 g/l	10	10	10	10
1.0 g/l	10	10	10	10
0.5 g/l	10	10	10	10

IC25 (1.21 g/l Sodium Chloride)

Survival NOEC: 1.5 g/l

Submitted By: Timothy Harrell, Technical Director

60301930 Siloam Springs FATHEAD SURVIVAL

File: 6301930A Transform: ARC SINE(SQUARE ROOT(Y))

Chi-square test for normality: actual and expected frequencies

		127			
INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED OBSERVED	2.010	7.260 0	11.460 26	7.260	2.010

Calculated Chi-Square goodness of fit test statistic = 36.9480 Table Chi-Square value (alpha = 0.01) = 13.277

Data FAIL normality test. Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normal data and should not be performed.

60301930 Siloam Springs FATHEAD SURVIVAL

File: 6301930A Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's test for normality

D = 0.043

W = 0.596

Critical W (P = 0.05) (n = 30) = 0.927 Critical W (P = 0.01) (n = 30) = 0.900

Data FAIL normality test. Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normal data and should not be performed.

60301930 Siloam Springs FATHEAD SURVIVAL

File: 6301930A Transform: ARC SINE(SQUARE ROOT(Y))

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	XAM	MEAN
1 2 3 4 5	CONTROL 32% 42% 56% 75% 100%	5 5 5 5 5 5 5	0.991 0.991 1.107 0.991 0.991 1.107	1.107 1.107 1.107 1.107 1.107	1.084 1.084 1.107 1.084 1.084 1.107

60301930 Siloam Springs FATHEAD SURVIVAL

File: 6301930A Transform: ARC SINE(SQUARE ROOT(Y))

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

1 CONTROL 0.003 0.052 0.023 4.79 2 32% 0.003 0.052 0.023 4.79 3 42% 0.000 0.000 0.000 0.000 4 56% 0.003 0.052 0.023 4.79 4 56% 0.003 0.052 0.023 4.79 5 75% 0.003 0.052 0.023	GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
6 100% 0.000 0.000 0.000	1 2 3 4 5	32% 42% 56% 75%	0.003 0.000 0.003 0.003	0.052 0.000 0.052 0.052	0.023 0.000 0.023	4.79 0.00 4.79

60301930 Siloam Springs FATHEAD SURVIVAL

File: 6301930A Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	<u>-</u> 5	0.004	0.001	0.400
Within (Error)	24	0.043	0.002	
Total	29 .	0.047		

Critical F value = 2.62 (0.05,5,24) Since F < Critical F FAIL TO REJECT Ho: All equal

60301930 Siloam Springs FATHEAD SURVIVAL

Transform: ARC SINE(SQUARE ROOT(Y)) File: 6301930A

DUNNETT'S TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
-	CONTROL	1.084	0.780		
Τ.	• • • • • • • • • • • • • • • • • • • •	_ : : :	0.780	0.000	
2	32%	1.084	• • • • •		
2	428	1.107	0.800	-0.866	
3	56%	1.084	0.780	0.000	
4	7.0/		0.780	0.000	
5	75%	1.084			
6	100%	1.107	0.800	-0.866	

Dunnett table value = 2.36 (1 Tailed Value, P=0.05, df=24,5)

60301930 Siloam Springs FATHEAD SURVIVAL

File: 6301930A Transform: ARC SINE(SQUARE ROOT(Y))

Ι	OUNNETT'S TEST -	TABLE 2 O	F 2 Ho	:Control<	Treatment
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1 2 3 4 5	CONTROL 32% 42% 56% 75% 100%	5 5 5 5 5 5	0.054 0.054 0.054 0.054 0.054	7.0 7.0 7.0 7.0 7.0	0.000 -0.020 0.000 0.000 -0.020

60301930 Siloam Springs FATHEAD GROWTH

Transform: NO TRANSFORMATION File: 6301930B

Shapiro Wilk's test for normality

D = 0.042

W = 0.973

Critical W (P = 0.05) (n = 30) = 0.927

Critical W (P = 0.01) (n = 30) = 0.900

Data PASS normality test at P=0.01 level. Continue analysis.

60301930 Siloam Springs FATHEAD GROWTH

File: 6301930B Transform: NO TRANSFORMATION

Bartlett's test for homogeneity of variance

Calculated B1 statistic = 5.49

Table Chi-square value = 15.09 (alpha = 0.01, df = 5) Table Chi-square value = 11.07 (alpha = 0.05, df = 5)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

60301930 Siloam Springs FATHEAD GROWTH

File: 6301930B Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX 	MEAN	
1 2 3 4 5	CONTROL 32% 42% 56% 75% 100%	5 5 5 5 5 5	0.319 0.321 0.371 0.348 0.375 0.391	0.452 0.478 0.437 0.469 0.457 0.445	0.400 0.407 0.408 0.406 0.421 0.414	

60301930 Siloam Springs FATHEAD GROWTH

File: 6301930B Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

1 CONTROL 0.003 0.050 0.022 12.53 2 32% 0.004 0.061 0.027 14.92 3 42% 0.001 0.025 0.011 6.22 4 56% 0.002 0.047 0.021 11.63 5 75% 0.001 0.031 0.014 7.34 6 100% 0.001 0.023 0.010 5.49	GRP	IDENTIFICATION	V <i>I</i>	ARIANCE	SD	SEM	C.V. %
	1 2 3 4 5	32% 42% 56% 75%	*:	0.004 0.001 0.002 0.001	0.061 0.025 0.047 0.031	0.027 0.011 0.021 0.014	14.92 6.22 11.63 7.34

60301930 Siloam Springs FATHEAD GROWTH

File: 6301930B Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F		
Between	5	0.001	0.000	0.145		
Within (Error)	24	0.042	0.002			
Total	29	0.043				

Critical F value = 2.62 (0.05, 5, 24)

Since F < Critical F FAIL TO REJECT Ho: All equal

60301930 Siloam Springs FATHEAD GROWTH

File: 6301930B Transform: NO TRANSFORMATION

	DUNNETT'S TEST	TABLE 1 OF 2	Ho:Control <t< th=""><th>reatment </th></t<>	reatment
GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT SIG
1 2 3 4 5	CONTROL 32% 42% 56% 75% 100%	0.400 0.407 0.408 0.406 0.421 0.414	0.400 0.407 0.408 0.406 0.421 0.414	-0.264 -0.302 -0.226 -0.784 -0.513
Dunne	ett table value = 2.36	(1 Tailed V	Value, P=0.05, df=24,	5)

60301930 Siloam Springs FATHEAD GROWTH
File: 6301930B Transform: NO TRANSFORMATION

File: 6301930B	Transform: 210			
DUNNETT'S TEST	- TABLE 2	OF 2 Ho	:Control<	Treatment
GROUP IDENTIFICATIO	NUM OF N REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1 CON 2 3 4 5	TROL 5 32% 5 42% 5 56% 5 75% 5	0.063 0.063 0.063 0.063 0.063	15.6 15.6 15.6 15.6 15.6	-0.007 -0.008 -0.006 -0.021 -0.014

FISHER'S EXACT TEST

	NUMBER OF			
IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS	
CONTROL	10	0	10	
32%	10	0	10	
TOTAL	20	0	20	

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10. Since b is greater than 6 there is no significant difference between CONTROL and TREATMENT at the 0.05 level.

FISHER'S EXACT TEST

Fl	SHER'S EXACT	======== 1F91	===============		
=======================================	NUMBER OF				
IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS		
CONTROL	10	0	10		
42%	10	0	10		
TOTAL	20	0	20		

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10. Since b is greater than 6 there is no significant difference between CONTROL and TREATMENT at the 0.05 level.

FISHER'S EXACT TEST

	EISHER S EVACT	1201			
=======================================	NUMBER OF				
IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS		
CONTROL	10	0	10		
56%	10	0	10 Page 34 of 47		

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10. Since b is greater than 6 there is no significant difference between CONTROL and TREATMENT at the 0.05 level.

FISHER'S EXACT TEST

TIEK D Huner	=========	=======================================
=	NUMBE	R OF
ALIVE	DEAD	TOTAL ANIMALS
10	0	10
10	0	10
20	0	20
	ALIVE 10 10	ALIVE DEAD 10 0 10 0

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10. Since b is greater than 6 there is no significant difference between CONTROL and TREATMENT at the 0.05 level.

FISHER'S EXACT TEST

. F.7	SHER'S EXACT	=====	=======================================
=======================================		NUMBE	
IDENTIFICATION	ALIVE	DEAD	TOTAL ANIMALS
CONTROL	10	0	10
100%	10	0	10
TOTAL	20 ========	0	20

CRITICAL FISHER'S VALUE (10,10,10) (p=0.05) IS 6. b VALUE IS 10. Since b is greater than 6 there is no significant difference between CONTROL and TREATMENT at the 0.05 level.

SUMMARY OF FISHER'S EXACT TESTS

GROUP	IDENTIFICATION	EXPOSED	DEAD	(P=.05)
	·CONTROL	10	0	
1	32%	10	0	
2	42%	10	0	
3	56%	10	0	
4	75%	10	0	
5	100%	10	0	

60301930 Siloam Springs CERIODAPHNIA DUBIA SURVIVA File: 6301930D Transform: NO TRANSFORM

File: 6301930D

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N 	MIN	MAX	MEAN	
1	CONTROL	10	1.000	1.000	1.000	
2	32%	10	1.000	1.000	1.000	
3	42%	10	1.000	1.000	1.000	
4	56%	10	1.000	1.000	1.000	
5	75%	10	1.000	1.000	1.000	
6	100%	10	1.000	1.000	1.000	

60301930 Siloam Springs CERIODAPHNIA DUBIA SURVIVA

File: 6301930D Transform: NO TRANSFORM

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	CONTROL	0.000	0.000	0.000	0.00
2	32%	0.000	0.000	0.000	0.00
3	42%	0.000	0.000	0.000	0.00
4	56%	0.000	0.000	0.000	0.00
5	75%	0.000	0.000	0.000	0.00
6	100%	0.000	0.000	0.000	0.00

60301930 Siloam Springs CERIODAPHNIA DUBIA REPRODU File: 6301930E Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

-					
INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED OBSERVED	4.020	14.520 13	22.920 19	14.520 22	4.020

Calculated Chi-Square goodness of fit test statistic = 7.1905
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

60301930 Siloam Springs CERIODAPHNIA DUBIA REPRODU File: 6301930E Transform: NO TRANSFORMATION

Bartlett's test for homogeneity of variance Calculated B1 statistic = 1.35

Table Chi-square value = 15.09 (alpha = 0.01, df = 5) Table Chi-square value = 11.07 (alpha = 0.05, df = 5)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

60301930 Siloam Springs CERIODAPHNIA DUBIA REPRODU File: 6301930E Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN	
1	CONTROL	10	16.000	26.000	21.300	
2	32%	10	17.000	26.000	22.600	
3	42%	10	17.000	26.000	22.600	
4	56%	10	19.000	29.000	23.600	
5	75%	10	16.000	26.000	22.600	
6	100%	10	17.000	28.000	22.700	

60301930 Siloam Springs CERIODAPHNIA DUBIA REPRODU File: 6301930E Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	CONTROL	8.900	2.983	0.943	14.01
2	32%	10.044	3.169	1.002	14.02
3	428	7.600	2.757	0.872	12.20
4	56%	14.489	3.806	1.204	16.13
5	75%	10.267	3.204	1.013	14.18
6	100%	13.789	3.713	1.174	16.36

60301930 Siloam Springs CERIODAPHNIA DUBIA REPRODU File: 6301930E Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	26.933	5.387	0.497
Within (Error)	54	585.800		
Total	59	612.733		

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

60301930 Siloam Springs CERIODAPHNIA DUBIA REPRODU File: 6301930E Transform: NO TRANSFORMATION

TRANSFORMED MEAN CALCULATED IN MEAN ORIGINAL UNITS T STAT SIG GROUP IDENTIFICATION _____ ---------- ----------------CONTROL 21.300 32% 22.600 42% 22.600 56% 23.600 21.300 -0.883 22.600 22.600 -0.883 23.600 -1.561 22.600 -0.883 22.700 -0.950 3 75% 22.600 100% 22.700 5 6

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

60301930 Siloam Springs CERIODAPHNIA DUBIA REPRODU File: 6301930E Transform: NO TRANSFORMATION

	DUNNETT'S TEST -	TABLE 2 C)F 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%	10	3.403	16.0	-1.300
3	42%	10	3.403	16.0	-1.300
4	56%	10	3.403	16.0	-2.300
5	75%	10	3.403	16.0	-1.300
6	100%	10	3.403	16.0	-1.400

Conc. Tested						
	0 (8)	32	42	56 	75 1	100
Response 2 Response 3 Response 4 Response 5 Response 6 Response 7 Response 8 Response 9	16 23 19 21 24 21 20 19 26 24	25 24 23 26 18 20 23 25 25	26 25 23 20 17 24 20 23 24 24	19 25 25 20 21 29 29 26 23	24 16 23 18 23 25 26 24 25 22	18 25 28 21 24 19 24 26 17 25

*** Inhibition Concentration Percentage Estimate ***

Toxicant/Effluent: Siloam Springs

Test Start Date: 5/7/19 Test Ending Date: 5/14/19

Test Species: Dubia

7 Day Test Duration:

DATA FILE:

D11111 1 -					
Conc.	Number Replicates	Concentration	Response Means	Std. Dev.	Pooled Response Means
1 2 3 4 5	10 10 10 10 10 10	0.000 32.000 42.000 56.000 75.000	21.300 22.600 22.600 23.600 22.600 22.700	2.983 3.169 2.757 3.806 3.204 3.713	22.567 22.567 22.567 22.567 22.567 22.567

^{***} No Linear Interpolation Estimate can be calculated from the input data since none of the (possibly pooled) group response means were less than 75% of the control response mean.

Game ID	1 .	2	3	4	5	6
Conc. ID		32	42	56	75 	100
Conc. Tested Response 1 Response 2 Response 3 Response 4 Response 5	.427 .319 .396 .452 .407	.478 .395 .321 .391 .451	.437 .418 .371 .396 .419	.469 .414 .348 .373 .427	.457 .429 .375 .435 .409	.392 .391 .419 .445 .422
	Concentrat	ion Percer	ntage Estim	nate ***		

*** Inhibition Concentration Percentage Estimate ***

Toxicant/Effluent: Siloam Springs
Test Start Date: 5/7/19 Test End Test Ending Date: 5/14/19

Test Species: Fathead

7 Day Test Duration:

Test Du DATA Fl Conc.	LE: Number	Concentration	Response Means	Std. Dev.	Pooled Response Means
ID 1 2 3 4 5	Replicates 5 5 5 5 5 5	0.000 32.000 42.000 56.000 75.000 100.000	0.400 0.407 0.408 0.406 0.421 0.414	0.050 0.061 0.025 0.047 0.031 0.023	0.409

*** No Linear Interpolation Estimate can be calculated from the input data since none of the (possibly pooled) group response means were less than 75% of the control response mean.

CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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			'samples	10 11 12	9 8 7	6 5	4 2 2 1	Section D	2		lien	Pace
			samples have a 24 hour hold time!	P			ity	Section D Required Client Information SAMPLE ID (A-Z, 0-9 /-) Sample IDs MUST BE UNIQUE	479-228-0934 ed Due Date/TAT:	975 Anderson Avenue Siloam Springs, AR Trayers Q Silo	Information: City of Siloam Springs	Pace Analytical
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PLER:	Ë	ATURE						# OF CONTAINERS Unpreserved	\dashv	Pace Profile #:	Attention: Company Name:	The Chain-of-Custody is a LEGAL DOCUMENT. Section C
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F-ALL-Q-020rev.08, 12-Oct-2007	Red	ceived on ce (Y/N)		SAMPL				Pace Project No.J Lab I.D.			DRINKIN	Q.
08, 12-Oc	Cus	tody Seale poler (Y/N)	d	SAMPLE CONDITIONS				193c			DRINKING WATER	W
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SIGNATURE of SAMPLER;

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

	*samp	10 10 9 8	7 6 5 4 3	N 4 ITEM		Requested D	18	Company: Address:	Pa Section A Required Clier
	ADDITIONAL COMMENTS samples have a 24 hour hold time! return samples to the Frontenac Lab on ice!			city of Silbam St	Required Client Information Required Client Information Required Client Information Provision AMTRIX DEMNISOR WATER WASTE WATER PRODUCT SOIUSOLID OIL (A-Z, 0-91,-) Sample IDS MUST BE UNIQUE TISSUE Valid Matrix Common AMTRIX MATRIX PROPUCT SOIUSOLID OIL AR OTHER TISSUE	Requested Due Date/TAT:	Siloam Springs, AK NA 46 FS @ S / 169 97 510 118 45 ATO. 228 0.0934 Fax	975 Anderson Avenue	Pace Analytical WWW pacellabs com Section A Required Client Information:
SAMPLER NAM PRINT N SIGNAT	Tom Myers Monthy	RELINQUISHED BY / AFFILIATION		0 C \$\frac{5}{7}\frac{1}{19}1000000000000000000000000000000000000	ATRIX CODE (see valid codes to left) AMPLE TYPE (G=GRAB C=COMP) START AMPLE TYPE (G=GRAB C=COMP)	Project Number:	Purchase Order No Project Name:	CODY TO: TYM YOURS @ Siloam Springs.	Section B Required Project Information: Report To: Tom Myers
SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: 16 Mg A1 40 # 5 SIGNATURE of SAMPLER: MM	2/8/19 15:45 Mes More	ADCEPTED BY		1 0	SAMPLE TEMP AT COLLECTION # OF CONTAINERS Unpreserved H ₂ SO ₄ HNO ₃ HCI NaOH Na ₂ S ₂ O ₃ Methanol Other TCE Analysis Test Y/ N	7 1	Reference: Pace Project Richard Mannz Manager: Pace Profile # 10809	3	The Chain-of-Custody is a LEGAL DOCUMENT Section C Invoice Information: Attention:
DATE Signed On Ice (Y/N) F-ALL-Q-020rev.08, 12-Oct-2007 Samples Intac (Y/N)	1 1	ATION DATE TIME SAMPLE CONDITIONS			Residual Chlorine (Y/N) Pace Project No./ Lab I.D.	Requested Analysis Filtered (1117)	Site Location AR STATE: AR	T NPDES T GROUND WATER T DRINKING WATER T UST T RCRA T OTHER	18

Sample Condition Upon Receipt

MOD SCHOOL WWW	1
Page 45 of 47	

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		Comments/ Resolution:
		Person Contacted:
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Language NOLL	OC to Client? Y / N.	Client Notification/ Resolution: Copy Co
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2	1	Samples from USDA Regulated Area: State:
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	AND ON□ SBX□	
	7	Trip Blank present:
	AND ON Sey	dura vera apinoi lunisseio d
	OND S9Y	Potassium iodide test strip turns blue/purple? (Preserve)
	□Yes □No	Cyanne water strip turns dark? (Record only)
a " e	VIII TAKE	Cyanide water sample checks: (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)
		(HNO ₅ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)
		Containers requiring pH preservation in compliance?
babba added	AND TOND SAV	Parithies contain march
ist sample IDs, volumes, lot #'s of preservative and the		Samples contain multiple phases? Matrix:
	VINI JA	Sample labels match COC: Date / time / ID / analyses
	AND OND \$3X	Principal Annual Services
· 1	AND ON SAY	Filtered volume received for dissolved tests?
2	7	Sand84 ni nescrit elioe 8001/2001XT / A8503 bevreearqnU
	AND OND SAY	Containers infact:
	AND OND SAYS	(4.5)
	- J	Pace containers used:
	AND OND 29Y	Correct containers used:
	AINO ONO SAIX	
w - *w - 1	I	Sufficient volume:
4 4	AND OND 29Y	PURCHY HIPL USD)
	AIN ON SAY	ush Turn Around Time requested:
-		hort Hold Time analyses (<72hr):
and the second s	AND OND SAY	
	AND OND SAYD	:smples arrived within holding time:
		hain of Custody relinquished:
	AIN ON SSY	hain of Custody present:
-111	AIN ON SEX	
308Q: 17VI	***	So of grides above freezing to 6°C
-611.615	¥()	1
Z_2 examining contents:	Corrected_	poler Temperature (°C): As-read 2 Corr. Facto
Date and initials of person	ce (We) Blue None	TO BOAT
		a dolyv significant
None ♥ Other □		stody Seal on Cooriel And I soon is a Supplemental and in the supplemental and
	Seals intact: Yes	th build #:
≯on □ sə,	Shipping Label Used?	urier: Feura D ere
		LIVELD TOTALLY TOTALLY TOTALLY
☐ Xroads ☐ Client ☐ Other ☐	X 🗆 ECI 🗆 bace	ent Name: SUDUM Institute
		() () () ()
		#

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

			return samples	even sadums.		12	11	10	9	co	7	cn	(h	4	3	2	1 60	ITEN		The state of the s	Section D	Requested Due Date/TAT:	hore ' 479-228	Tmyers !	Silc	Address: 975	Company City	Section A		
			return samples to the Frontenac Lab on ice	samples have a 24 hour hold time!	ADDITIONAL COMMENTS											,	12 to 2		SAMPLE ID (A-Z, 0-9 /-) Sample ID3 MUST BE UNIQUE)	легТАТ:	-0934 Fax	Tryets OSilogn Springs.	Siloam Springs, AR	975 Anderson Avenue	City of Siloam Springs	maion:	11 to 12 to	
			o on ice!		DIMMENTS		31										Silvan Spri		WIPE AJA OTHER TISSUE	5 AT	Valid Matrix Codes			Springs . Co		Je	ें क	M		
				1													prings			ST WWW	ĬĬ	Total Control	School Number		Purchase Order No.	сору То	Report To Tom Myers	Section B Required Project Information.		
				Tom	RELIN	F	1	1	1	Ŧ	1	1	1		1	-	J.M.M.	+	TRIX CODE (6				S.		er No.		om Myer	ject Inform		
					QUISHED	-	+	+	+	+	+	t	1		1	1	_	-		US WOC							3	nation.		
SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: 70 MA		`	4 2 h W	RELINQUISHED BY / AFFILIATION	-	-	+	1	+	1			1			Walla Gillis	TIME		SCMPOSITE START	COLLECTED										
	LER NAME			50	5.4	CHON	-											010.00	1		COMPOSITE END/GRAB	CTED								
	T		10/10	1	DA											1.00														
			19		119		16		16 J		DATE	ń		1			SAMPLE TEMP AT COLLECTION	1	+	Pag	O ₂	D P	Ado	Con	invo	>				
	R			1		_											_		OF CONTAINER				Pace Profile #:	Pace Project	Pace Quols	Address	Company Name	Invoice Information Attention:		
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4					71/18	DATE	-	+	+	+	+	+	+	+	+						_	S FIII	STATE:	Site Location	17	NPDES	REGULATORY AGENCY			
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1					20	TIME	-	+	+	+	+	+	+	+	1	I					_	-	11	AR	18	GROUND WATER	СҮ	Г		
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Гетр	rin °C				-		L	+	+	+	+	+	+	+	+	+	+		Kasiddai Oilid	Auto Circle			1	III	7	9				
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Ice ((Y/N)					AMP													e P						OTHER	DR!				
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	er (Y/I				3	3	NE LEGA												No.				1			Ğ ₩			1	
	les Ini	tact		24	K	CHO	SNC												Pace Project No./ Lab I.D.							TER				

*Important Note: By signing this form you are accepting Paco's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid willian 30 days.

Sample Condition Upon Receipt



	ets (roject Manager Review:
				omments/ Resolution:
			:əu	erson Contacted: Date/Tin
Field Data Required? Y / N	N	1) X		lient Motification/ Resolution: Copy COC to C
	ANN	0N□	S∋Y□	ddifional labels attached to 5035X / XX 1005 vials in the field?
	ANDRE	on□	SəY	samples from USDA Regulated Area: State:
	YARKS.	oN□	∆es	(mm8<) alsiv AOV ni sacepace
	AND	on□	Xes	rip Blank present:
		oN□	S∌\□	otassium iodide test strip turns blue/purple? (Preserve)
		oN□	S∌√□	ead acetate strip turns dark? (Record only)
				yanide water sample checks:
				HVO ₃ , H ₂ SO ₄ , HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide) Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)
List sample IDs, volumes, lot #'s of preservative and the date/time added	V/DFS	ON□	√es	Sontainers requiring pH preservation in compliance?
	A∖N□	°NX	S∌Y□ \	Samples contain multiple phases? Matrix:
ı	A\N 🗆	. ON []	sax	sample labels match COC: Date / time / ID / analyses
	ANN	oN□	\$9_	iltered volume received for dissolved tests?
	AIM	oN□	S∋.∖□	Inpreserved 5035A / TX1005/1006 soils frozen in 48hrs?
	A/N 🗌	oN□	Sə	Sontainers intact:
	A/N 🗆	oN□	50)X	sce containers used:
	A\N□	oN□	Say	Sorrect containers used:
76	A/N 🗌	oN□	Say	jufficient volume:
	AIN	·*	_Yes	Sush Turn Around Time requested:
•	AIN	oN□	Sax	
*	A\N 🗌	oN□	Say	Samples arrived within holding time:
	A\N 🗆	oN□	SOL	Chain of Custody relinquished:
00:2/01/	A/N 🗆	oN□	5000	Chain of Custody present:
6// 11/-5				O°6 of gnisaeri evode ad bluode estuteraque
nosted to slittini bate and initials of person	Correct			Sooler Temperature (°C): As-read S_O Corr. Factor
	ioN ən	iia 🍕	(M) .90	Thermometer Used: T-243
None ▼ Other □	_ me			acking Material: Bubble Wrap □ Bubble Bags □
□ ON >	Xes ₹	intact:	Seals	Custody Seal on Cooler/Box Present: Yes ☐ No ☐
Acs □ No K	oesU lee	na rap	iiqqiA2	Fracking #: Pace
Pace Client Other			□ X	