

ANALYTICAL REPORT

Job Number: 280-116336-2

Job Description: Leidos RFP# 001088 - Ravenna AAP-66

For:

Leidos, Inc.

Picatinny Arsenal

356 Ninth Avenue

Suite 106

Dover, NJ 07801

Attention: Rita Schmon-Stasik



Approved for release.
Donna R Rydberg
Senior Project Manager
11/14/2018 5:11 PM

Donna R Rydberg, Senior Project Manager
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11/14/2018

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

TestAmerica Laboratories, Inc.

TestAmerica Denver 4955 Yarrow Street, Arvada, CO 80002

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Definitions/Glossary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

CASE NARRATIVE

Client: Leidos, Inc.

Project: Leidos RFP# 001088 - Ravenna AAP-66

Report Number: 280-116336-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 10/31/2018 at 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 5 coolers at receipt time were 0.8° C, 0.9° C, 1.0° C, 4.5° C and 5.1° C.

This report only contains the results for the Hexavalent Chromium samples performed at the TestAmerica North Canton Laboratory. All other data will be found under SDG 280-116336-1.

HEXAVALENT CHROMIUM

Sample FBQmw-171-181001-GW (280-116336-1) was analyzed for hexavalent chromium in accordance with EPA SW-846 Method 7196A. The samples were analyzed on 10/30/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

Client Sample ID: FBQmw-171-181001-GW

Lab Sample ID: 280-116336-1

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Client Sample Results

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

Client Sample ID: FBQmw-171-181001-GW

Lab Sample ID: 280-116336-1

Date Collected: 10/30/18 13:25

Matrix: Water

Date Received: 10/31/18 13:19

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexavalent chromium	ND		0.020	0.0030	mg/L			10/30/18 17:15	1

Default Detection Limits

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

General Chemistry

Analyte	RL	MDL	Units	Method
Hexavalent chromium	0.020	0.0030	mg/L	7196A

QC Sample Results

Client: Leidos, Inc.
 Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 240-352669/3
Matrix: Water
Analysis Batch: 352669

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexavalent chromium	ND		0.020	0.0030	mg/L			10/30/18 09:24	1

Lab Sample ID: LCS 240-352669/4
Matrix: Water
Analysis Batch: 352669

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hexavalent chromium	0.250	0.226		mg/L		90	80 - 123

QC Association Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

General Chemistry

Analysis Batch: 352669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116336-1	FBQmw-171-181001-GW	Total/NA	Water	7196A	
MB 240-352669/3	Method Blank	Total/NA	Water	7196A	
LCS 240-352669/4	Lab Control Sample	Total/NA	Water	7196A	

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

Client Sample ID: FBQmw-171-181001-GW

Lab Sample ID: 280-116336-1

Date Collected: 10/30/18 13:25

Matrix: Water

Date Received: 10/31/18 13:19

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	50 mL	50 mL	352669	10/30/18 17:15	ACR	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: Leidos, Inc.
 Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

Method	Method Description	Protocol	Laboratory
7196A	Chromium, Hexavalent	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116336-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-116336-1	FBQmw-171-181001-GW	Water	10/30/18 13:25	10/31/18 13:19

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Canton Job No.: 280-116336-2

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
WCCHROME50PM2 00023	03/11/19	09/11/18	DIWATER, Lot 052014	1000 mL	WCKDICHROME62_00003	0.1414 g	Hexavalent chromium	49.9764 mg/L
.WCKDICHROME62_00003	06/06/19		Fisher, Lot 140919		(Purchased Reagent)		Hexavalent chromium	0.35344 g/g
WCCHROME50PPM 00025	03/11/19	09/11/18	DIWATER, Lot 052014	1000 mL	WCKDICHROME62_00004	0.1414 g	Hexavalent chromium	49.9764 mg/L
.WCKDICHROME62_00004	09/07/21		Fisher, Lot 126893		(Purchased Reagent)		Hexavalent chromium	0.35344 g/g

Reagent

WCKDICHROME62_00003



1 Reagent Lane
 Fair Lawn, NJ 07410
 201.796.7100 tel
 201.796.1329 fax

Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by SAI Global Certificate Number CERT - 0064970

This is to certify that units of the above mentioned lot number were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	P188	Quality Test / Release Date 2/25/2014	
Lot Number	140919		
Description	POTASSIUM DICHROMATE, A.C.S.		
Country of Origin	United States	* Suggested Retest Date	Feb-2019
Chemical Origin	Inorganic-non animal		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	FINE ORANGE-RED CRYSTALS
ASSAY	%	>= 99	99.9
CALCIUM	%	<= 0.003	0.0010
CHLORIDE	%	<= 0.001	<0.0010
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
INSOLUBLE MATTER	%	<= 0.005	0.002
IRON (Fe)	%	<= 0.001	0.0010
LOSS ON DRYING @ 105 C	%	<= 0.05	0.02
SODIUM (Na)	%	<= 0.02	0.001
SULFATE (SO4)	%	<= 0.005	0.002



Edgar E. Hara

Lab Manager Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.
 *Based on suggested storage condition.

Reagent

WCKDICHROME62_00004



1 Reagent Lane
 Fair Lawn, NJ 07410
 201.796.7100 tel
 201.796.1329 fax

Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by DNV Certificate number CERT-08052-2006-AQ-HOU-ANAB

This is to certify that units of the above mentioned lot number were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	P188	Mfg. Date	11/16/2012
Lot Number	126893		
Description	POTASSIUM DICHROMATE, A.C.S.		
Country of Origin	United States	Recommended Retest Date	Nov-2017
Chemical Origin	Inorganic-non animal		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	Fine, orange-red powder
ASSAY	%	>= 99	99.8
CALCIUM	%	<= 0.003	<0.0010
CHLORIDE	%	<= 0.001	<0.0010
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
INSOLUBLE MATTER	%	<= 0.005	0.004
IRON (Fe)	%	<= 0.001	0.0010
LOSS ON DRYING @ 105 C	%	<= 0.05	0.03
SODIUM (Na)	%	<= 0.02	0.005
SULFATE (SO4)	%	<= 0.005	0.003



Edgar E. Hara

Lab Manager Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job Number: 280-116336-2

SDG No.: _____

Project: Leidos RFP# 001088 - Ravenna AAP-66

Client Sample ID
FBQmw-171-181001-GW

Lab Sample ID
280-116336-1

Comments:

1B-IN
 INORGANIC ANALYSIS DATA SHEET
 GENERAL CHEMISTRY

Client Sample ID: FBQmw-171-181001-GW

Lab Sample ID: 280-116336-1

Lab Name: TestAmerica Canton

Job No.: 280-116336-2

SDG ID.: _____

Matrix: Water

Date Sampled: 10/30/2018 13:25

Reporting Basis: WET

Date Received: 10/31/2018 13:19

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Hexavalent chromium	ND	0.020	0.0030	mg/L			1	7196A

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116336-2

SDG No.: _____

Analyst: MMM Batch Start Date: 10/11/2018

Reporting Units: mg/L Analytical Batch No.: 349697

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
7	ICV	17:26	Hexavalent chromium	0.269	0.250	108	90-110		WCCHROME50PM2_0002
8	ICB	17:27	Hexavalent chromium	ND				3	

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

2-IN
 CALIBRATION QUALITY CONTROL
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116336-2
 SDG No.: _____
 Analyst: ACR Batch Start Date: 10/30/2018
 Reporting Units: mg/L Analytical Batch No.: 352669

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
1	CCV	09:22	Hexavalent chromium	0.242	0.250	97	90-110		WCCHROME50PPM_00025
2	CCB	09:23	Hexavalent chromium	ND					
9	CCV	09:30	Hexavalent chromium	0.242	0.250	97	90-110		WCCHROME50PPM_00025
10	CCB	09:31	Hexavalent chromium	ND					
17	CCV	14:51	Hexavalent chromium	0.250	0.250	100	90-110		WCCHROME50PPM_00025
21	CCB	17:15	Hexavalent chromium	ND					
20	CCV	17:15	Hexavalent chromium	0.250	0.250	100	90-110		WCCHROME50PPM_00025

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton

Job No.: 280-116336-2

SDG No.: _____

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 352669 Date: 10/30/2018 09:24							
7196A	MB 240-352669/3	Hexavalent chromium	ND		mg/L	0.020	1

7A-IN
 LAB CONTROL SAMPLE
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116336-2
 SDG No.: _____
 Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 352669 Date: 10/30/2018 09:25											
						LCS Source: WCCHROME50PM2_00023					
7196A	LCS 240-352669/4	Hexavalent chromium	0.226		mg/L	0.250	90	80-123			

Calculations are performed before rounding to avoid round-off errors in calculated results.

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton

Job Number: 280-116336-2

SDG Number: _____

Matrix: Water

Instrument ID: OSCAR

Method: 7196A

MDL Date: 04/25/2017 11:21

Analyte	Wavelength/ Mass	RL (mg/L)	MDL (mg/L)
Hexavalent chromium		0.02	0.003

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job Number: 280-116336-2
SDG Number: _____
Matrix: Water Instrument ID: OSCAR
Method: 7196A XMDL Date: 04/25/2017 11:21

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Hexavalent chromium		0.02	0.003

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116336-2

SDG No.: _____

Instrument ID: OSCAR Analysis Method: 7196A

Start Date: 10/30/2018 09:22 End Date: 10/30/2018 17:15

Lab Sample Id	D/F	Type	Time	Analytes																											
				C	r	6																									
CCV 240-352669/1	1		09:22	X																											
CCB 240-352669/2	1		09:23	X																											
MB 240-352669/3	1	T	09:24	X																											
LCS 240-352669/4	1	T	09:25	X																											
ZZZZZZ			09:26																												
ZZZZZZ			09:27																												
ZZZZZZ			09:28																												
ZZZZZZ			09:29																												
CCV 240-352669/9	1		09:30	X																											
CCB 240-352669/10	1		09:31	X																											
ZZZZZZ			10:46																												
ZZZZZZ			10:47																												
ZZZZZZ			10:48																												
CCV 240-352669/14			10:49																												
CCB 240-352669/15			10:50																												
ZZZZZZ			14:50																												
CCV 240-352669/17	1		14:51	X																											
CCB 240-352669/18			14:52																												
CCB 240-352669/21	1		17:15	X																											
ZZZZZZ			17:15																												
ZZZZZZ			17:15																												
ZZZZZZ			17:15																												
280-116336-1	1	T	17:15	X																											
CCV 240-352669/20	1		17:15	X																											

Prep Types: _____
T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Canton Job No.: 280-116336-2

SDG No.: _____

Batch Number: 349697 Batch Start Date: 10/11/18 17:20 Batch Analyst: Moser, Morgan

Batch Method: 7196A Batch End Date: 10/11/18 17:35

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	UnCorResp	WCCHROME50PM2 00023	WCCHROME50PPM 00025	
IC 240-349697/1		7196A		50 mL	50 mL	0 Absorbance			
IC 240-349697/2		7196A		50 mL	50 mL	0.004 Absorbance		0.005 mL	
IC 240-349697/3		7196A		50 mL	50 mL	0.008 Absorbance		0.01 mL	
IC 240-349697/4		7196A		50 mL	50 mL	0.084 Absorbance		0.1 mL	
IC 240-349697/5		7196A		50 mL	50 mL	0.191 Absorbance		0.25 mL	
IC 240-349697/6		7196A		50 mL	50 mL	0.369 Absorbance		0.5 mL	
ICV 240-349697/7		7196A		50 mL	50 mL	0.202 Absorbance	0.25 mL		
ICB 240-349697/8		7196A		50 mL	50 mL	0 Absorbance			

Batch Notes	
Acid Used for pH Adjustment ID	3715210
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3830583
Phosphoric Acid ID	3521890
Pipette/Syringe/Dispenser ID	E5

Basis	Basis Description

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Canton Job No.: 280-116336-2

SDG No.: _____

Batch Number: 352669 Batch Start Date: 10/30/18 09:22 Batch Analyst: Raymond, Anthony C

Batch Method: 7196A Batch End Date: 10/30/18 17:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	ColorBlk	UnCorResp	WCCHROME50PM2 00023	WCCHROME50PPM 00025
CCV 240-352669/1		7196A		50 mL	50 mL		0.182 Absorbance		0.25 mL
CCB 240-352669/2		7196A		50 mL	50 mL		0 Absorbance		
MB 240-352669/3		7196A		50 mL	50 mL		0 Absorbance		
LCS 240-352669/4		7196A		50 mL	50 mL		0.170 Absorbance	0.25 mL	
CCV 240-352669/9		7196A		50 mL	50 mL		0.182 Absorbance		0.25 mL
CCB 240-352669/10		7196A		50 mL	50 mL		0 Absorbance		
CCV 240-352669/17		7196A		50 mL	50 mL		0.188 Absorbance		0.25 mL
280-116336-D-1	FBQmw-171-181001 -GW	7196A	T	50 mL	50 mL	0 Absorbance	0 Absorbance		
CCV 240-352669/20		7196A		50 mL	50 mL		0.188 Absorbance		0.25 mL
CCB 240-352669/21		7196A		50 mL	50 mL		0 Absorbance		

Batch Notes	
Acid Used for pH Adjustment ID	3715210
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3863006
Pipette/Syringe/Dispenser ID	E1

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

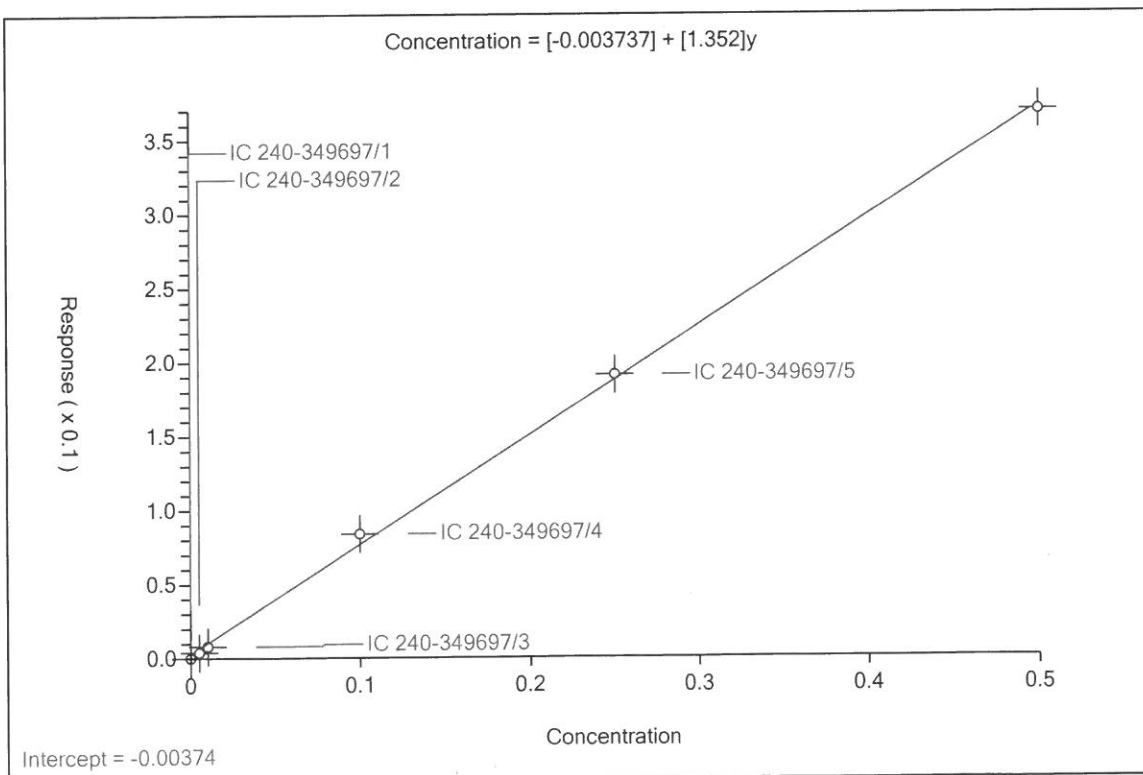
Calibration

Calib 349697-0 / Cr (VI)

Curve Type: Linear
 Weighting: None
 Origin: None
 Dependency: Concentration
 Calib Mode: ESTD
 Response Base: AREA
 RF Rounding: 0

Curve Coefficients	
Intercept:	-0.003737
Slope:	1.352
Error Coefficients	
Standard Error:	0.00659
Relative Standard Error:	42.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999 (0.999)

ID	Level	Concentration	Response	IS Amount	IS Response	RF	Used
1	IC 240-349697/1	0.0	0.0			NaN	Y
2	IC 240-349697/2	0.004998	0.004			0.800378	Y
3	IC 240-349697/3	0.009995	0.008			0.800378	Y
4	IC 240-349697/4	0.099953	0.084			0.840397	Y
5	IC 240-349697/5	0.249882	0.191			0.764361	Y
6	IC 240-349697/6	0.499764	0.369			0.738349	Y



Subcontract Data

Shipping and Receiving Documents

Chain of Custody Record



COC No.: **RVAAP-013-TA**

Page 1 of 1 Date: **10/30/18**

Name **Leidos**
 Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
 Phone Number: (330) 405-5802
 Project Manager: **Jed Thomas**
 Project: **RVAAP FWGW Sampling Event**
 Job/P.O. No.: **P010216426**
 Sampler (Signature) *[Signature]* (Printed Name) **Gabrielle Gromosky**

Laboratory Name: **Test America - Canton**
 Address: 4101 Shuffel St NW
 North Canton, OH 44720
 Phone: (330) 497-9396
 Fax:
 Contact:
 OBSERVATIONS, COMMENTS
 SPECIAL INSTRUCTIONS

Requested Parameters		Depth	Date	Time	Matrix
VOCs (1)(B)		NA	10/30/18	1455	W
SVOCs (2)(A)					
LL PAHs (3)(A)					
Explosives (6)(A)					
Pesticides (5)(A)					
PCBs (4)(A)					
TAL Metals (7)(C)	1				
Cyanide (8)(D)					
Alkalinity/Sulfate/Nitrate/Nitrite (10)(A)					
Sulfide (9)(E)					
Perchlorate (11)(A)					
Nitrocellulose (12)(A)					
Hexavalent Chromium (13)(A)					
Temperature Blank	1				
Total Number of Containers	1				

Relinquished by <i>[Signature]</i> Signature HARRIE ADAMS Printed Name Leidos Company	Date 10/30/18 Time 1000	Received by <i>[Signature]</i> Signature Brent Huff Printed Name Company	Date 10/30/18 Time 1550	Notes: A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool, 4C E. NaOH/Zn Acetate, pH>9, Cool, 4C 1. SW 8260 2. SW 8270 3. SW 8270S1M 4. SW 8082 5. SW 8081 6. SW 8330 7. SW 8010 8. SW 9012 9. SW 9034 10. SW 9056/SM2320 11. SW 6860 12. EPA 353.2 13. SW 7195
Relinquished by <i>[Signature]</i> Signature B. Huff Printed Name Company	Date 10/30 Time	Received by <i>[Signature]</i> Signature Joseph Phonda Printed Name JESSEN Company	Date 10/31/18 Time 0940	

Shipment Method: Courier	Temperature Blank	Lab: Leidos 8866 Commons Drive Twinsburg, OH 44087 (330) 405-5802
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Chain of Custody Record



COC No.: **RVAAP-018-TA**

Page 1 of 1

Date: **10/30/18**

Name Leidos
 Address: 8866 Commons Blvd, Suite 201, Twinsburg, OH 44087
 Phone Number: (330) 405-5802
 Project Manager: Jed Thomas
 Project: RVAAP FWGW Sampling Event
 Job/P.O. No.: P010216426
 Sampler (Signature) *[Signature]* (Printed Name) **RYAN LAUBACH**

Laboratory Name: Test America -Canton
 Address: 4101 Shuffel St NW
 North Canton, OH 44720
 Phone: (330) 497-9396
 Fax:
 Contact:

OBSERVATIONS, COMMENTS
SPECIAL INSTRUCTIONS

Requested Parameters	VOCS (1)(B)	SVOCs (Phthalates) (2)(A)	LL PAHs (3)(A)	Explosives (6)(A)	Pesticides (5)(A)	PCBs (4)(A)	TAL Metals (7)(C)	Cyanide (8)(D)	Alkalinity/Sulfate/Nitrate/Nitrite (10)(A)	Sulfide (9)(E)	Perchlorate (11)(A)	Nitrocellulose (12)(A)	Hexavalent Chromium (13)(A)	Temperature Blank	Total Number of Containers
	2	2	2	2	2	1	1								5

Relinquished by <i>[Signature]</i> Signature NEAELIE ADAMS Printed Name	Date 10/30/18	Time 1000	Received by <i>[Signature]</i> Signature GENT HOFF Printed Name See Attached Company FedEx	Date 10/30/18	Time 1550	Notes: A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool, 4C E. NaOH/Zn Acetate, pH>9, Cool 4C	Total Number of Containers: 5	Shipment Method: Courier
Relinquished by <i>[Signature]</i> Signature B. Hoff Printed Name	Date 10/30/18	Time 1645	Received by <i>[Signature]</i> Signature J. R. Henders Printed Name J. R. Henders Company	Date 10/30/18	Time 0940	Notes: 1. SW 8280 2. SW 8270 3. SW 8270S1M 4. SW 8092 5. SW 8081 6. SW 8330 7. SW 6010 8. SW 9012 9. SW 9034 10. SW 9056/SM2320 11. SW 6960 12. EPA 353.2 13. SW 7195	Temperature Blank	Lab: Leidos 8866 Commons Drive Twinsburg, OH 44087 (330) 405-5802

White: Laboratory Pink: Project Manager Yellow: Project QAO Gold: Field Project Manager

Chain of Custody Record



COC No.: **RVAAP-031-TA**
Date: **10/30/18**

Page 1 of 1

Name Leidos
Address: 8866 Commons Blvd, Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event
Job/P.O. No.: P010216426
Sampler (Signature) *Jackie Mitchell*
(Printed Name) Jackie Mitchell

Laboratory Name: Test America -Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

OBSERVATIONS, COMMENTS
SPECIAL INSTRUCTIONS

Requested Parameters		Total Number of Containers		Notes		Shipment Method:	
Requested Parameters	Total Number of Containers	Notes	Date	Time	Signature	Printed Name	Company
VOCs (1)(B)	1	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C	10/30/18	1550	<i>[Signature]</i>	Brent Huff	Leidos
SVOCs (2)(A)							
LL PAHs (3)(A)							
Explosives (6)(A)							
Pesticides (5)(A)							
PCBs (4)(A)							
TAL Metals (7)(C)							
Cyanide (8)(D)							
Alkalinity/Sulfate/Nitrate/Nitrite (10)(A)							
Sulfide (9)(E)							
Perchlorate (11)(A)							
Nitrocellulose (12)(A)							
Hexavalent Chromium (13)(A)							
Temperature Blank	1						
Total Number of Containers	1						

Temperature Blank
Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos
White: Laboratory
Pink: Project Manager
Yellow: Project QAO
Goldenrod: Field Project Manager

Chain of Custody Record



COC No.: **RVAAP-035-TA**

Page 1 of 1 Date: **10/30/18**

Name Leidos
 Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
 Phone Number: (330) 405-5802
 Project Manager: Jed Thomas
 Project: RVAAP FWGW Sampling Event
 Job/P.O. No.: P010216426
 Sampler (Signature) *Jessie Mitchell* (Printed Name) **Jessie Mitchell**

Laboratory Name: Test America - Canton
 Address: 4101 Shuffel St NW
 North Canton, OH 44720
 Phone: (330) 487-9396
 Fax:
 Contact:

OBSERVATIONS, COMMENTS
SPECIAL INSTRUCTIONS

Requested Parameters	Total Number of Containers
VOCs (1)(B)	1
SVOCs (2)(A)	
LL PAHs (3)(A)	
Explosives (5)(A)	
Pesticides (5)(A)	
PCBs (4)(A)	
TAL Metals (7)(C)	
Cyanide (8)(D)	
Alkalinity/Sulfate/Nitrate/Nitrite (10)(A)	
Sulfide (9)(E)	
Perchlorate (11)(A)	
Nitrocellulose (12)(A)	
Hexavalent Chromium (13)(A)	
Temperature Blank	
Total Number of Containers	1

Date	Time	Notes
10/30/18	1550	A. Cool, 4C B. HCl pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool, 4C E. NaOH/Zn Acetate, pH>9, Cool, 4C
10/30/18	1550	1. SW 8260 2. SW 8270 3. SW 8270SIM 4. SW 8082 5. SW 8081 6. SW 8330 7. SW 6010 8. SW 9012 9. SW 9034 10. SW 9056/SM2320 11. SW 5860 12. EPA 353.2 13. SW 7196

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix
	LL11mw-005-181001-GW	GW	N/A	10/30/18	1445	W

Relinquished by	Date	Time	Received by	Date	Time
<i>[Signature]</i>	10/30/18	1400	<i>[Signature]</i>	10/30	
Heather Adams			Joseph Deables		
Leidos			Company		
Relinquished by			Received by		
<i>[Signature]</i>			<i>[Signature]</i>		
Printed Name			Printed Name		
Company			Company		

Shipment Method: Courier

Temperature Blank

Lab: Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

White: Laboratory Pink: Project Manager Yellow: Project QAC Goldenrod: Field Project Manager

Chain of Custody Record



COC No.: **RVAAP-039-TA**

Page 1 of 1 Date: **10/29/18**

Name Leidos
 Address: 8866 Commons Blvd, Suite 201, Twinsburg, OH 44087
 Phone Number: (330) 405-5802
 Project Manager: Jed Thomas
 Project: RVAAP FWGW Sampling Event
 Job/P.O. No.: P010216426
 Sampler (Signature) *RL* (Printed Name) **Ryan Lammitt**

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix
	LL12mw-242-181001-GW	GW	NA	10/29/18	1525	W
<i>[Handwritten Signature]</i>						
Requested by	<i>[Signature]</i>	Date	10/29/18	Time	1000	
Printed Name	NEATKE ADAMS	Received by	<i>[Signature]</i>	Date	10/30	
Company	Leidos	Signature	<i>[Signature]</i>	Time	1645	
Requested by	<i>[Signature]</i>	Date	10/30	Time	0940	
Printed Name	Joseph Rhoades	Signature	<i>[Signature]</i>	Date	10/31/18	
Company	Leidos	Printed Name	Joseph Rhoades	Time	0940	
Company	Leidos	Company	<i>[Signature]</i>			

Laboratory Name: Test America -Canton
 Address: 4101 Shuffel St NW
 North Canton, OH 44720
 Phone: (330) 497-9396
 Fax:
 Contact:

OBSERVATIONS, COMMENTS
 SPECIAL INSTRUCTIONS
no 10/29/18
7 TURBIDITY > 50 NTU
TOOK FIELD FILTERED
w/ 5 MICRON FILTER
IN ADDITION TO AN UNFILTERED
BOTTLE. FOR TAL METALS

Total Number of Containers: **6**

Temperature Blank

Hexavalent Chromium (13)(A)

Nitrocellulose (12)(A)

Perchlorate (11)(A)

Sulfide (9)(C)

Nitrate (10)(A)

Cyanide (8)(D)

TAL Metals (7)(C) **2**

PCBs (4)(A)

Pesticides (5)(A)

Explosives (6)(A)

LL PAHs (3)(A)

SVOCs (Phthalates) (2)(A)

VOCs (1)(B)

Notes:
 A. Cool, 4C
 B. HCl, pH<2, Cool, 4C
 C. HNO3, pH<2, Cool, 4C
 D. NaOH, pH>12, Cool, 4C
 E. NaOH/Zn Acetate, pH>9, Cool, 4C
 1. SW 8260
 2. SW 8270
 3. SW 8270SIM
 4. SW 8082
 5. SW 8081
 6. SW 8330
 7. SW 6010
 8. SW 9012
 9. SW 9034
 10. SW 9056
 11. SW 6950
 12. EPA 353.2
 13. SW 7195

Shipment Method: Courier

Temperature Blank

Lab:
 Leidos
 8866 Commons Drive
 Twinsburg, OH 44087
 (330) 405-5802

Chain of Custody Record



COC No.: **RVAAP-063-TA**

Page 1 of 1

Date: **10/30/18**

Name Leidos
 Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
 Phone Number: (330) 405-5802
 Project Manager: Jed Thomas
 Project: RVAAP FWGW Sampling Event
 Job/P.O. No.: P010216426
 Sampler (Signature) *Jackie Mitchell* (Printed Name) **Jackie Mitchell**

Requested Parameters	NOCs (1)(B)	SVOCs (2)(A)	LL PAHs (3)(A)	Explosives (5)(A)	Pesticides (5)(A)	PCBs (4)(A)	TAL Metals (7)(C)	Cyanide (8)(D)	Nitrate (10)(A)	Sulfide (9)(E)	Perchlorate (11)(A)	Nitrocellulose (12)(A)	Hexavalent Chromium (13)(A)	Temperature Blank	Total Number of Containers
								1							1
<p>Relinquished by <i>[Signature]</i> Date 10/30/18 Time 1000</p> <p>Signature HANNAH ADAMS Printed Name</p> <p>Received by <i>[Signature]</i> Date 10/30/18 Time 1550</p> <p>Signature Brent Hoff Printed Name</p> <p>Company Leidos</p> <p>Relinquished by <i>[Signature]</i> Date 10/30 Time 1645</p> <p>Signature B. Hoff Printed Name</p> <p>Company Leidos</p> <p>Received by <i>[Signature]</i> Date 10/31/18 Time 0940</p> <p>Signature Joseph Rhoades Printed Name</p> <p>Company FA DEW</p>															
<p>Notes: A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool, 4C E. NaOH/Zn Acetate, pH>9, Cool, 4C</p>															
<p>Shipment Method: Courier</p> <p>Temperature Blank Leidos Lab: Leidos</p> <p>8866 Commons Drive Twinsburg, OH 44087 (330) 405-5802</p>															

Chain of Custody Record



COC No.: **RVAAP-064-TA**

Page 1 of 1

Date: **10/30/18**

Name Leidos
 Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
 Phone Number: (330) 405-5802
 Project Manager: Jed Thomas
 Project: RVAAP FWGW Sampling Event
 Job/P.O. No.: P010216426
 Sampler (Signature) *[Signature]* (Printed Name) **Gabrielle Gronowitsky**

Laboratory Name: Test America -Canton
 Address: 4101 Shuffel St NW
 North Canton, OH 44720
 Phone: (330) 497-9396
 Fax:
 Contact:

OBSERVATIONS, COMMENTS
SPECIAL INSTRUCTIONS

Requested Parameters		Total Number of Containers		Notes		Shipment Method	
Parameter	Requested	Temperature Blank	Total Number of Containers	Date	Time	Courier	Notes
VOCS (1)(B)			1	10/30/18	1550		A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C E. NaOH/Zn Acetate, pH=9, Cool 4C
SVOCs (2)(A)							
LL PAHs (3)(A)							
Explosives (6)(A)							
Pesticides (5)(A)							
PCBs (4)(A)							
TAL Metals (7)(C)							
Cyanide (8)(D)							
Nitrate (10)(A)							
Sulfide (9)(E)							
Perchlorate (11)(A)							
Nitrocellulose (12)(A)							
Hexavalent Chromium (13)(A)							
Matrix							
Site Type	Depth	Date	Time	Received by			
GW	NA	10/30/18	0934	Signature	<i>[Signature]</i>		
Laboratory No.	Sample ID	Received by					
NTAmw-117-181001-GW		Date	Time	Signature	<i>[Signature]</i>		
		10/30/18	1000	Printed Name	HEATHER ADAMS		
		Date	Time	Received by			
		10/30	1645	Signature	<i>[Signature]</i>		
		10/30	1645	Printed Name	Joseph Rhoads		
		Date	Time	Received by			
		10/30	1645	Signature	<i>[Signature]</i>		
		10/30	1645	Printed Name	Joseph Rhoads		
		Date	Time	Received by			
		10/30	1645	Signature	<i>[Signature]</i>		
		10/30	1645	Printed Name	Joseph Rhoads		
		Date	Time	Received by			
		10/30	1645	Signature	<i>[Signature]</i>		
		10/30	1645	Printed Name	Joseph Rhoads		

Temperature Blank
 Lab:
Leidos
 8866 Commons Drive
 Twinsburg, OH 44087
 (330) 405-5802

Chain of Custody Record



COC No.: **RVAAP-065-TA**
Date: **10/30/18**

Page 1 of 1

Name **Leidos**
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: **Jed Thomas**
Project: **RVAAP FWGW Sampling Event**
Job/P.O. No.: **P010216426**
Sampler (Signature) *[Signature]*
(Printed Name) **Gabrielle Cervonefsky**

Laboratory Name: **Test America -Canton**
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

OBSERVATIONS, COMMENTS
SPECIAL INSTRUCTIONS

Requested Parameters		Total Number of Containers
Hexavalent Chromium (13)(A)		1
Nitrocellulose (12)(A)		
Perchlorate (11)(A)		
Sulfide (9)(E)		
Nitrate (10)(A)		
Cyanide (8)(D)		
TAL Metals (7)(C)		
PCBs (4)(A)		
Pesticides (5)(A)		
Explosives (6)(A)		
LL PAHs (3)(A)		
SVOCs (2)(A)		
VOCs (1)(B)		

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix
NTAmw-118-181001-GW	GW	NA	10/30/18	1130	W	

Relinquished by *[Signature]* Date **10/31/18** Time **1000**

Signature **NEMIKE ADAMS**

Company **Leidos**

Relinquished by *[Signature]* Date **10/30** Time **1645**

Signature *[Signature]*

Printed Name **Joseph R. Roads**

Company **CA DEN**

Received by *[Signature]* Date **10/30/18** Time **1550**

Signature *[Signature]*

Printed Name **Brent Huff**

Company **Leidos**

Received by *[Signature]* Date **10/30/18** Time **0940**

Signature *[Signature]*

Printed Name **Joseph R. Roads**

Company **CA DEN**

Notes:
A. Cool, 4C
B. HCl, pH=2, Cool, 4C
C. HNO3, pH=2, Cool, 4C
D. NaOH, pH=12, Cool, 4C
E. NaOH/Zn Acetate, pH=9, Cool, 4C

1. SW 9260
2. SW 8270
3. SW 8270/SIM
4. SW 8062
5. SW 8081
6. SW 8330
7. SW 5010
8. SW 9012
9. SW 9034
10. SW 9056
11. SW 6860
12. EPA 353.2
13. SW 7196

Shipment Method: **Courier**

Temperature Blank

Lab: **Leidos**
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 280-116336-2

Login Number: 116336
List Number: 1
Creator: Lujan, Jacob P

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	