

ANALYTICAL REPORT

Job Number: 240-97635-1

Job Description: Ravenna, OH

For:

Cardno GS, Inc
2496 Old Ivy Road
Suite 300

Charlottesville, VA 22903

Attention: Mr. Peter Chapman



Approved for release.
Patrick J McEntee
Manager of Project Management
6/28/2018 7:49 PM

Patrick J McEntee, Manager of Project Management
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0107
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06/28/2018

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 Canton 4101 Shuffel Street NW, North Canton, OH 44720

Tel (330) 497-9396 Fax (330) 497-0772 www.testamericainc.com

Table of Contents

Cover Title Page	1
Data Summaries	4
Definitions	4
Case Narrative	5
Detection Summary	6
Client Sample Results	7
Default Detection Limits	8
QC Sample Results	9
QC Association	10
Chronicle	11
Certification Summary	12
Method Summary	13
Sample Summary	14
Reagent Traceability	15
COAs	16
Inorganic Sample Data	20
General Chemistry Data	20
Gen Chem Cover Page	21
Gen Chem Sample Data	22
Gen Chem QC Data	24
Gen Chem ICV/CCV	24
Gen Chem Blanks	26
Gen Chem LCS/LCSD	27
Gen Chem MDL	28
Gen Chem Analysis Run Log	30
Gen Chem Prep Data	32

Table of Contents

Gen Chem Raw Data	34
Shipping and Receiving Documents	35
Client Chain of Custody	36
Sample Receipt Checklist	38

Definitions/Glossary

Client: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

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: Cardno GS, Inc

Project: Ravenna, OH

Report Number: 240-97635-1

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 6/26/2018 8:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.8° C.

Under client approval, Hexavalent chromium analysis was performed by TestAmerica Canton. TestAmerica Canton is not hold DoD accreditation; therefore, method EPA SW-846 Method 7196A is reported with standard data qualifiers applied.

HEXAVALENT CHROMIUM

Samples FBQmw-174-062518-GW (240-97635-1) and FBQmw-175-062518-GW (240-97635-2) were analyzed for hexavalent chromium in accordance with EPA SW-846 Method 7196A. The samples were analyzed on 06/26/2018.

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

Detection Summary

Client: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

Client Sample ID: FBQmw-174-062518-GW

Lab Sample ID: 240-97635-1

No Detections.

Client Sample ID: FBQmw-175-062518-GW

Lab Sample ID: 240-97635-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

Client Sample ID: FBQmw-174-062518-GW

Date Collected: 06/25/18 13:40

Date Received: 06/26/18 08:00

Lab Sample ID: 240-97635-1

Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexavalent chromium	ND		20	3.0	ug/L			06/26/18 08:49	1

Client Sample ID: FBQmw-175-062518-GW

Date Collected: 06/25/18 12:55

Date Received: 06/26/18 08:00

Lab Sample ID: 240-97635-2

Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexavalent chromium	ND		20	3.0	ug/L			06/26/18 08:48	1

Default Detection Limits

Client: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

General Chemistry

Analyte	RL	MDL	Units	Method
Hexavalent chromium	20	3.0	ug/L	7196A

QC Sample Results

Client: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 240-333472/3
Matrix: Water
Analysis Batch: 333472

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		20	3.0	ug/L			06/26/18 08:44	1

Lab Sample ID: LCS 240-333472/4
Matrix: Water
Analysis Batch: 333472

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hexavalent chromium	250	266		ug/L		106	80 - 123

QC Association Summary

Client: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

General Chemistry

Analysis Batch: 333472

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-97635-1	FBQmw-174-062518-GW	Total/NA	Water	7196A	
240-97635-2	FBQmw-175-062518-GW	Total/NA	Water	7196A	
MB 240-333472/3	Method Blank	Total/NA	Water	7196A	
LCS 240-333472/4	Lab Control Sample	Total/NA	Water	7196A	

Lab Chronicle

Client: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

Client Sample ID: FBQmw-174-062518-GW

Date Collected: 06/25/18 13:40

Date Received: 06/26/18 08:00

Lab Sample ID: 240-97635-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	333472	06/26/18 08:49	BLW	TAL CAN

Client Sample ID: FBQmw-175-062518-GW

Date Collected: 06/25/18 12:55

Date Received: 06/26/18 08:00

Lab Sample ID: 240-97635-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	333472	06/26/18 08:48	BLW	TAL CAN

Laboratory References:

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

Accreditation/Certification Summary

Client: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

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	07-31-18 *
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	07-31-18 *
Nevada	State Program	9	OH-000482008A	07-31-18 *
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	08-31-18 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

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

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

Method Summary

Client: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

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: Cardno GS, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-97635-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-97635-1	FBQmw-174-062518-GW	Water	06/25/18 13:40	06/26/18 08:00
240-97635-2	FBQmw-175-062518-GW	Water	06/25/18 12:55	06/26/18 08:00

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Canton Job No.: 240-97635-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
WCCHROME50PM2 00022	09/09/18	03/09/18	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 00024	09/09/18	03/09/18	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: 240-97635-1

SDG No.: _____

Project: Ravenna, OH

Client Sample ID	Lab Sample ID
<u>FBQmw-174-062518-GW</u>	<u>240-97635-1</u>
<u>FBQmw-175-062518-GW</u>	<u>240-97635-2</u>

Comments:

1B-IN
 INORGANIC ANALYSIS DATA SHEET
 GENERAL CHEMISTRY

Client Sample ID: FBQmw-174-062518-GW

Lab Sample ID: 240-97635-1

Lab Name: TestAmerica Canton

Job No.: 240-97635-1

SDG ID.: _____

Matrix: Water

Date Sampled: 06/25/2018 13:40

Reporting Basis: WET

Date Received: 06/26/2018 08:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Hexavalent chromium	ND	20	3.0	ug/L			1	7196A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: FBQmw-175-062518-GW

Lab Sample ID: 240-97635-2

Lab Name: TestAmerica Canton

Job No.: 240-97635-1

SDG ID.: _____

Matrix: Water

Date Sampled: 06/25/2018 12:55

Reporting Basis: WET

Date Received: 06/26/2018 08:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Hexavalent chromium	ND	20	3.0	ug/L			1	7196A

2-IN
 CALIBRATION QUALITY CONTROL
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-97635-1
 SDG No.: _____
 Analyst: JWW Batch Start Date: 06/12/2018
 Reporting Units: mg/L Analytical Batch No.: 331317

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
7	ICV	16:38	Hexavalent chromium	0.266	0.250	106	90-110		WCCHROME50PM2_0002
8	ICB	16:39	Hexavalent chromium	0.010				U	2

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.: 240-97635-1
 SDG No.: _____
 Analyst: BLW Batch Start Date: 06/26/2018
 Reporting Units: mg/L Analytical Batch No.: 333472

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
1	CCV	08:43	Hexavalent chromium	0.267	0.250	107	90-110		WCCHROME50PPM_00024
2	CCB	08:43	Hexavalent chromium	ND					
10	CCV	08:50	Hexavalent chromium	0.267	0.250	107	90-110		WCCHROME50PPM_00024
11	CCB	08:51	Hexavalent chromium	ND					

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.: 240-97635-1

SDG No.: _____

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 333472 Date: 06/26/2018 08:44							
7196A	MB 240-333472/3	Hexavalent chromium	ND		ug/L	20	1

7A-IN
 LAB CONTROL SAMPLE
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-97635-1

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 333472 Date: 06/26/2018 08:45			LCS Source: WCCHROME50PM2_00022								
7196A	LCS 240-333472/4	Hexavalent chromium	266		ug/L	250	106	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: 240-97635-1
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: 240-97635-1
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.: 240-97635-1
 SDG No.: _____
 Instrument ID: OSCAR Analysis Method: 7196A
 Start Date: 06/12/2018 16:33 End Date: 06/12/2018 16:45

Lab Sample Id	D/F	T y p e	Time	C r 6	Analytes																			
IC 240-331317/1	1		16:33	X																				
IC 240-331317/2	1		16:33	X																				
IC 240-331317/3	1		16:34	X																				
IC 240-331317/4	1		16:35	X																				
IC 240-331317/5	1		16:36	X																				
IC 240-331317/6	1		16:37	X																				
ICV 240-331317/7	1		16:38	X																				
ICB 240-331317/8	1		16:39	X																				
ZZZZZZ			16:39																					
ZZZZZZ			16:40																					
ZZZZZZ			16:41																					
ZZZZZZ			16:42																					
ZZZZZZ			16:43																					
CCV 240-331317/14			16:44																					
CCB 240-331317/15			16:45																					

Prep Types: _____
=

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-97635-1

SDG No.: _____

Instrument ID: OSCAR Analysis Method: 7196A

Start Date: 06/26/2018 08:43 End Date: 06/26/2018 12:01

Lab Sample Id	D/F	Type	Time	Analytes																									
				C	6																								
CCV 240-333472/1	1		08:43	X																									
CCB 240-333472/2	1		08:43	X																									
ZZZZZZ			08:43																										
ZZZZZZ			08:43																										
ZZZZZZ			08:43																										
ZZZZZZ			08:43																										
ZZZZZZ			08:43																										
ZZZZZZ			08:43																										
MB 240-333472/3	1	T	08:44	X																									
LCS 240-333472/4	1	T	08:45	X																									
ZZZZZZ			08:46																										
ZZZZZZ			08:47																										
ZZZZZZ			08:48																										
240-97635-2	1	T	08:48	X																									
240-97635-1	1	T	08:49	X																									
CCV 240-333472/10	1		08:50	X																									
CCB 240-333472/11	1		08:51	X																									
ZZZZZZ			12:00																										
CCV 240-333472/13			12:01																										
CCB 240-333472/14			12:01																										

Prep Types: _____
T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Canton Job No.: 240-97635-1

SDG No.: _____

Batch Number: 331317 Batch Start Date: 06/12/18 16:33 Batch Analyst: Weimer, Joshua W

Batch Method: 7196A Batch End Date: 06/12/18 16:46

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	UnCorResp	WCCHROME50PM2 00022	WCCHROME50PPM 00024	
IC 240-331317/1		7196A		50.0 mL	50.0 mL	0 Absorbance			
IC 240-331317/2		7196A		50.0 mL	50.0 mL	0.004 Absorbance		0.005 mL	
IC 240-331317/3		7196A		50.0 mL	50.0 mL	0.008 Absorbance		0.01 mL	
IC 240-331317/4		7196A		50.0 mL	50.0 mL	0.074 Absorbance		0.1 mL	
IC 240-331317/5		7196A		50.0 mL	50.0 mL	0.190 Absorbance		0.25 mL	
IC 240-331317/6		7196A		50.0 mL	50.0 mL	0.362 Absorbance		0.5 mL	
ICV 240-331317/7		7196A		50.0 mL	50.0 mL	0.195 Absorbance	0.25 mL		
ICB 240-331317/8		7196A		50.0 mL	50.0 mL	0 Absorbance			

Batch Notes	
Acid Used for pH Adjustment ID	3294428
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3628696

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.: 240-97635-1

SDG No.: _____

Batch Number: 333472 Batch Start Date: 06/26/18 08:43 Batch Analyst: Woodward, Bruce

Batch Method: 7196A Batch End Date: 06/26/18 12:05

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	ColorBlk	UnCorResp	WCCHROME50PM2 00022	WCCHROME50PPM 00024
CCV 240-333472/1		7196A		50 mL	50 mL		0.196 Absorbance		0.25 mL
CCB 240-333472/2		7196A		50 mL	50 mL		0 Absorbance		
MB 240-333472/3		7196A		50 mL	50 mL		0 Absorbance		
LCS 240-333472/4		7196A		50 mL	50 mL		0.195 Absorbance	0.25 mL	
240-97635-A-2	FBQmw-175-062518 -GW	7196A	T	50 mL	50 mL	0.046 Absorbance	0.041 Absorbance		
240-97635-A-1	FBQmw-174-062518 -GW	7196A	T	50 mL	50 mL	0.006 Absorbance	0.006 Absorbance		
CCV 240-333472/10		7196A		50 mL	50 mL		0.196 Absorbance		0.25 mL
CCB 240-333472/11		7196A		50 mL	50 mL		0 Absorbance		

Batch Notes	
Acid Used for pH Adjustment ID	3294428
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3666038
Filter ID	E9

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.

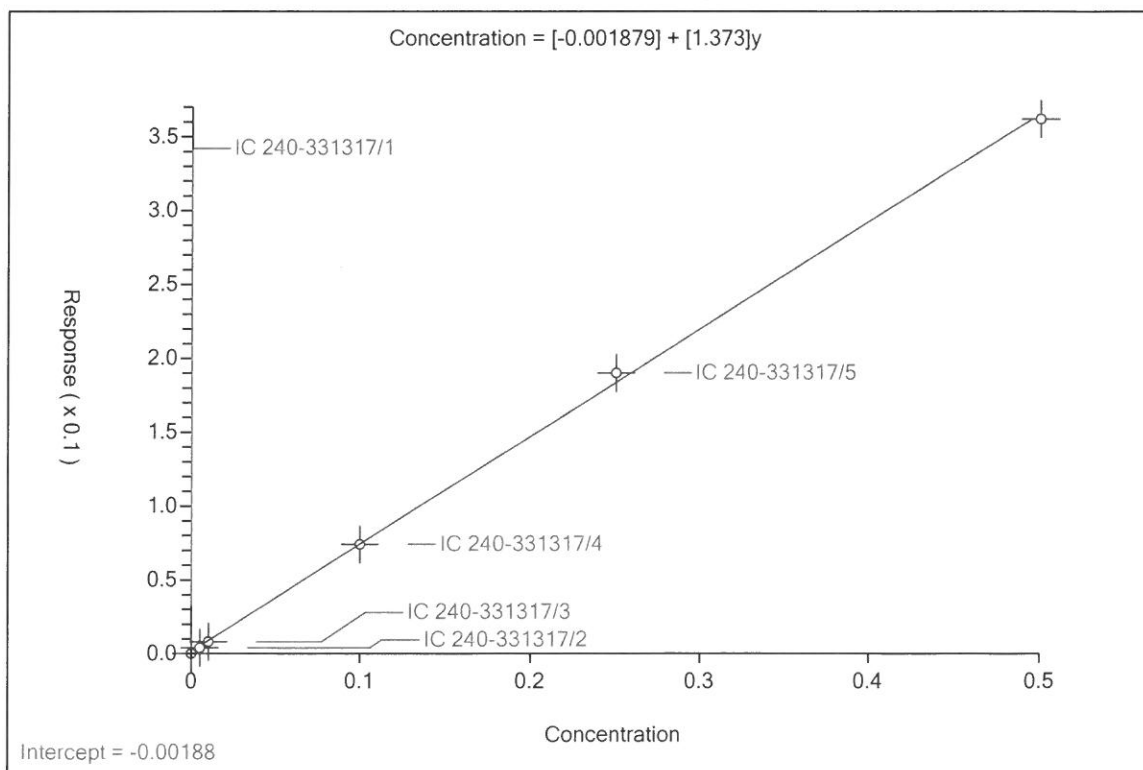
Calibration

Calib 331317-0 / Cr (VI)

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

Curve Coefficients	
Intercept:	-0.001879
Slope:	1.373
Error Coefficients	
Standard Error:	0.00526
Relative Standard Error:	16.9
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999 (0.999)

ID	Level	Concentration	Response	IS Amount	IS Response	RF	Used
1	IC 240-331317/1	0.0	0.0			NaN	Y
2	IC 240-331317/2	0.004998	0.004			0.800378	Y
3	IC 240-331317/3	0.009995	0.008			0.800378	Y
4	IC 240-331317/4	0.099953	0.074			0.74035	Y
5	IC 240-331317/5	0.249882	0.19			0.760359	Y
6	IC 240-331317/6	0.499764	0.362			0.724342	Y



Shipping and Receiving Documents

Cardno
Denver
stop

TestAmerica
4955 Yarrow Street
Avada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information Client Contact: Danyelle Phillips Company: Cardno TEC, Inc. Address: 1658 Cole Boulevard Suite 190 City: Golden State, Zip: CO 80401 Phone: 434-906-2085 Email: Danyelle.Phillips@cardno-qfs.com Project Name: Ravenna, OH - Site: Ravenna		Lab PM: McEntee, Patrick J E-Mail: patrick.mcenlee@testamericainc.com Sampler: KMB/KF Phone: 434-906-2085		Carrier Tracking Note: COC No: Page: Job #																																																																																											
Due Date Requested: TAT Requested (days): 20 Business Days PO #: 076003.009.011 WO #: 28014271 Project #: 28014271 SSCOW:		Analysis Requested <table border="1"> <tr> <th>Sample ID</th> <th>Sample Date</th> <th>Sample Time</th> <th>Sample Type (C=comp, G=grab)</th> <th>Matrix (None, Water, Overhead, In-Through, Auto)</th> <th>Field Filtered Sample (Yes or No)</th> <th>Form MS/MSD (Yes or No)</th> <th>9260B - VOCs</th> <th>92700 - SVOCs List 1</th> <th>92700 - SVOCs List 2</th> <th>92700 - SVOCs List 3</th> <th>92700 - SVOCs List 4</th> <th>92700 - SVOCs Full Suite</th> <th>92700 - SIM - PAHs (LV)</th> <th>92700 - PCBs</th> <th>9330B - Explosives/Propellants</th> <th>9061B - Pesticides (LV)</th> <th>9012B - Cyanide</th> <th>9010C/9020A/7470A - Total Metals</th> <th>9010C/9020A/7470A - Dissolved Metals</th> <th>9020A - Arsenic</th> <th>7196A - Hexavalent Chromium (24 HOUR HOLD TIME)</th> <th>220B - Alkalinity</th> <th>9056A - Anions (Chloride and Sulfate)</th> <th>9034 - Sulfide</th> <th>9056A - Nitrate (8 HOUR HOLD TIME)</th> <th>9880 - Perchlorate</th> <th>9010C - Phosphorus</th> <th>Total Number of Containers</th> <th>Special Instructions/Note:</th> </tr> <tr> <td>FBQMW-174-062518-GW</td> <td>06/25/18</td> <td>1340</td> <td>G</td> <td>W</td> <td>W</td> <td>W</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>QC dup</td> </tr> <tr> <td>FBQMW-175-062518-GW</td> <td>06/25/18</td> <td>1255</td> <td>G</td> <td>W</td> <td>W</td> <td>W</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>QC dup</td> </tr> </table>				Sample ID	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (None, Water, Overhead, In-Through, Auto)	Field Filtered Sample (Yes or No)	Form MS/MSD (Yes or No)	9260B - VOCs	92700 - SVOCs List 1	92700 - SVOCs List 2	92700 - SVOCs List 3	92700 - SVOCs List 4	92700 - SVOCs Full Suite	92700 - SIM - PAHs (LV)	92700 - PCBs	9330B - Explosives/Propellants	9061B - Pesticides (LV)	9012B - Cyanide	9010C/9020A/7470A - Total Metals	9010C/9020A/7470A - Dissolved Metals	9020A - Arsenic	7196A - Hexavalent Chromium (24 HOUR HOLD TIME)	220B - Alkalinity	9056A - Anions (Chloride and Sulfate)	9034 - Sulfide	9056A - Nitrate (8 HOUR HOLD TIME)	9880 - Perchlorate	9010C - Phosphorus	Total Number of Containers	Special Instructions/Note:	FBQMW-174-062518-GW	06/25/18	1340	G	W	W	W																							QC dup	FBQMW-175-062518-GW	06/25/18	1255	G	W	W	W																							QC dup
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Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III, IV, Other (specify)																																																																																													
Empty Kit Relinquished by: Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature]		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For: MONTHS																																																																																													
Relinquished by: Relinquished by: [Signature] Relinquished by: [Signature]		Received by: Received by: [Signature] Received by: [Signature]																																																																																													
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:																																																																																													



TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility


Login # : 97635

Client Carlix Site Name _____ Cooler unpacked by: POP
Cooler Received on 6-25-18 Opened on 6-26-18

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box _____ Client Cooler Box Other _____
Packing material used: Bubble Wrap _____ Foam _____ Plastic Bag _____ None _____ Other _____
COOLANT: Wet Ice Blue Ice _____ Dry Ice _____ Water _____ None _____

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0°C) Observed Cooler Temp. 1.8 °C Corrected Cooler Temp. 1.8 °C
 IR GUN #36 (CF -0.3°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN # 627 (CF -1.3°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ~ Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
 If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC740840
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Yes  NA Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
16. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: POP

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____

Login Sample Receipt Checklist

Client: Cardno GS, Inc

Job Number: 240-97635-1

Login Number: 97635
List Number: 1
Creator: Dolezal, Derren S

List Source: TestAmerica Canton

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ 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.	True	
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	Preservation labels on samples match COC
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	