September 21, 2017

Dawn Denham
Weston Solutions, Inc.
5599 San Felipe, Suite 700
Houston, Texas 77056
TEL: (713) 985-6610
FAX (713) 985-6703

Order No.: 1709161

RE: Federated Metals-Harvey Sampling

Dear Dawn Denham:

DHL Analytical, Inc. received 1 sample(s) on 9/19/2017 for the analyses presented in the following report.

Revision Number 1 for Work Order 1709161: This revision consists of changing the Test Name per the client's request. Please replace the original Data Report with this revision.

There were no problems with the analyses and all data met requirements of NELAC except where noted in the Case Narrative. All non-NELAC methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-17-19

Table of Contents

DHL ANALYTICAL
2300 Double Creek Dr. ■ Round Rock, TX 78664
Phone (512) 388-8222 ■ FAX (512) 388-8229
Web: www.dhlanalytical.com
E-Mail: login@dhlanalytical.com

№ 83770 CHAIN-OF-CUSTODY

CLIENT: Weston Solutions
ADDRESS: 5599 San Felipe, Suite 700
PHONE: 713-985-6600 FAX/E-MAIL: 713-985-6703
DATA REPORTED TO: Dawn Denham dawn.denham@westonsolutions.com
ADDITIONAL REPORT COPIES TO:

DATE: 9/18/17 PAGE 1 OF 1
PO #: DHL WORK ORDER #: 1709161
PROJECT LOCATION OR NAME: Hurricane Harvey - Federated Metals Sampling
CLENT PROJECT #: 02494.039.001.0001 COLLECTOR: M. Willis

Authorize 5% surcharge for TRRP Report? ☑ Yes ☐ No

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR O=OTHER
L=LIQUID SO=SOLID
SE=SEDIMENT

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
Federated W-2	01	9/18/17	0915	W	500mL Poly	1		1		1		Lead (Total) 6020A	Field Filtered

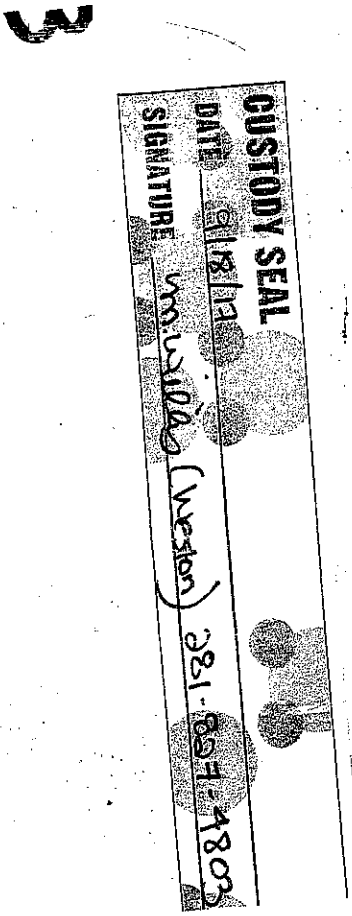
RELINQUISHED BY: (Signature) Meagan Wills (FedEx) DATE/TIME 9/18/17 @ 1000 RECEIVED BY: (Signature) FedEx 9/18/17 1000
RELINQUISHED BY: (Signature) FedEx DATE/TIME 9/19/17 0930 RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

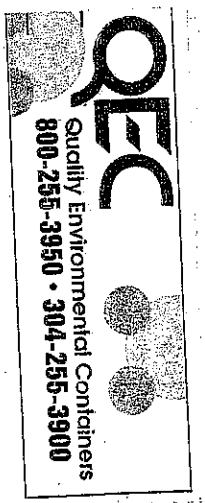
☐ DHL DISPOSAL @ $5.00 each ☐ Return

3

TURN AROUND TIME
RUSH ☐ CALL FIRST
1 DAY ☐ CALL FIRST
2 DAY ☐
NORMAL ☐
OTHER ☒ 72 hr.

LABORATORY USE ONLY:
RECEIVING TEMP: 4.2 THERM #: 78
CUSTODY SEALS: ☐ BROKEN ☒ INTACT ☐ NOT USED
CARRIER: ☐ LONE STAR ☒ FEDEX ☐ UPS ☐ OTHER
☐ COURIER DELIVERY
☐ HAND DELIVERED





ORIGIN ID:HOUH (713) 360-3950
DON FARKAS
WESTON SOLUTIONS
9075 KNIGHT RD

HOUSTON, TX 77054
UNITED STATES US

SHIP DATE: 18SEP17
ACTWGT: 5.00 LB MAN
CAD: 0966014/CAFE3011

BILL SENDER

TO JENNIFER BARKER
DHL ANALYTICAL
2300 DOUBLE CREEK DRIVE

ROUND ROCK TX 78664
(512) 388-8222
REF: WON 02444.034.001.0001

FedEx Express

TRK# 0201 7257 0835 9584

TUE - 19 SEP 10:30
PRIORITY OVERNIGHT

A8 BSMA

78664
TX-US AUS

TT V3.02.10

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name **Weston Solutions, Inc.** Date Received: **9/19/2017**

Work Order Number **1709161** Received by **JMW**

Checklist completed by: _____ 9/19/2017 Reviewed by _____ 9/19/2017
Signature | Date | Initials | Date

Carrier name FedEx 1day

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☑	No ☐	Not Present ☐
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	4.2 °C
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH<2 acceptable upon receipt?	Yes ☑	No ☐	NA ☐ LOT # 8086
	Adjusted? no		Checked by CC
Water - ph>9 (S) or ph>12 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted? _____		Checked by _____

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Page 1 of 1

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist: Reportable Data

Project Name: Federated Metals-Harvey Sampling	**LRC Date:** 9/21/2017
Reviewer Name: Angie O'Donnell	**Laboratory Work Order:** 1709161
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
		Chain-of-Custody (C-O-C)					
R1	OI	**1)** Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	**X**				**R1-01**
		2) Were all departures from standard conditions described in an exception report?			**X**		
R2	OI	**Sample and Quality Control (QC) Identification**					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	**X**				
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	**X**				
R3	OI	**Test Reports**					
		1) Were all samples prepared and analyzed within holding times?	**X**				
		2) Other than those results < MQL, were all other raw values bracketed by calibration standards?	**X**				
		3) Were calculations checked by a peer or supervisor?	**X**				
		4) Were all analyte identifications checked by a peer or supervisor?	**X**				
		5) Were sample detection limits reported for all analytes not detected?	**X**				
		6) Were all results for soil and sediment samples reported on a dry weight basis?			**X**		
		7) Were % moisture (or solids) reported for all soil and sediment samples?			**X**		
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per EPA Method 5035?			**X**		
		9) If required for the project, TICs reported?			**X**		
R4	O	**Surrogate Recovery Data**					
		1) Were surrogates added prior to extraction?			**X**		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			**X**		
R5	OI	**Test Reports/Summary Forms for Blank Samples**					
		1) Were appropriate type(s) of blanks analyzed?	**X**				
		2) Were blanks analyzed at the appropriate frequency?	**X**				
		3) Where method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	**X**				
		4) Were blank concentrations < MDL?	**X**				
		5) For analyte(s) detected in a blank sample, was the concentration, unadjusted for sample specific factors, in all associated field samples, **greater** than 10 times the concentration in the blank sample?			**X**		
R6	OI	**Laboratory Control Samples (LCS):**					
		1) Were all COCs included in the LCS?	**X**				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	**X**				
		3) Were LCSs analyzed at the required frequency?	**X**				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	**X**				
		5) Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	**X**				
		6) Was the LCSD RPD within QC limits (if applicable)?	**X**				
R7	OI	**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data**					
		1) Were the project/method specified analytes included in the MS and MSD?	**X**				
		2) Were MS/MSD analyzed at the appropriate frequency?	**X**				
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	**X**				
		4) Were MS/MSD RPDs within laboratory QC limits?	**X**				
R8	OI	**Analytical Duplicate Data**					
		1) Were appropriate analytical duplicates analyzed for each matrix?			**X**		
		2) Were analytical duplicates analyzed at the appropriate frequency?			**X**		
		3) Were RPDs or relative standard deviations within the laboratory QC limits?			**X**		
R9	OI	**Method Quantitation Limits (MQLs):**					
		1) Are the MQLs for each method analyte included in the laboratory data package?	**X**				
		2) Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	**X**				
		3) Are unadjusted MQLs and DCSs included in the laboratory data package?	**X**				
R10	OI	**Other Problems/Anomalies**					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	**X**				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference affects on the sample results?	**X**				
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	**X**				

Laboratory Name: DHL Analytical, Inc.

Laboratory Review Checklist (continued): Supporting Data

Project Name:	**LRC Date:**
Reviewer Name: Angie O'Donnell	**Laboratory Work Order:**
Prep Batch Number(s): See Prep Dates Report	**Run Batch:** See Analytical Dates Report

#[1]	A[2]	Description	Yes	No	NA[3]	NR[4]	ER#[5]
S1	OI	**Initial Calibration (ICAL)**					
		1) Were response factors and/or relative response factors for each analyte within QC limits?	**X**				
		2) Were percent RSDs or correlation coefficient criteria met?	**X**				
		3) Was the number of standards recommended in the method used for all analytes?	**X**				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	**X**				
		5) Are ICAL data available for all instruments used?	**X**				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	**X**				
S2	OI	**Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):**					
		1) Was the CCV analyzed at the method-required frequency?	**X**				
		2) Were percent differences for each analyte within the method-required QC limits?	**X**				
		3) Was the ICAL curve verified for each analyte?	**X**				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	**X**				
S3	O	**Mass Spectral Tuning:**					
		1) Was the appropriate compound for the method used for tuning?	**X**				
		2) Were ion abundance data within the method-required QC limits?	**X**				
S4	O	**Internal Standards (IS):**					
		1) Were IS area counts and retention times within the method-required QC limits?	**X**				
S5	OI	**Raw Data (NELAC Section 5.5.10)**					
		1) Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	**X**				
		2) Were data associated with manual integrations flagged on the raw data?	**X**				
S6	O	**Dual Column Confirmation**					
		1) Did dual column confirmation results meet the method-required QC?			**X**		
S7	O	**Tentatively Identified Compounds (TICs):**					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			**X**		
S8	I	**Interference Check Sample (ICS) Results:**					
		1) Were percent recoveries within method QC limits?	**X**				
S9	I	**Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions**					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?		**X**			**S9-01**
S10	OI	**Method Detection Limit (MDL) Studies**					
		1) Was a MDL study performed for each reported analyte?	**X**				
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	**X**				
S11	OI	**Proficiency Test Reports:**					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	**X**				
S12	OI	**Standards Documentation**					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	**X**				
S13	OI	**Compound/Analyte Identification Procedures**					
		1) Are the procedures for compound/analyte identification documented?	**X**				
S14	OI	**Demonstration of Analyst Competency (DOC)**					
		1) Was DOC conducted consistent with NELAC Chapter 5 – Appendix C?	**X**				
		2) Is documentation of the analyst's competency up-to-date and on file?	**X**				
S15	OI	**Verification/Validation Documentation for Methods** (NELAC Chapter 5)					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	**X**				
S16	OI	**Laboratory Standard Operating Procedures (SOPs):**					
		1) Are laboratory SOPs current and on file for each method performed?	**X**				

1 Items identified by the letter "R" should be included in the laboratory data package submitted to the TCEQ in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2 O = organic analyses; I = inorganic analyses (and general chemistry, when applicable).
3 NA = Not applicable.
4 NR = Not Reviewed.
5 ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Data Package Signature Page – RG-366/TRRP-13

This data package consists of:

This signature page, the laboratory review checklist, and the following reportable data:

R1 Field chain-of-custody documentation;
R2 Sample identification cross-reference;
R3 Test reports (analytical data sheets) for each environmental sample that includes:
  a) Items consistent with NELAC Chapter 5,
  b) dilution factors,
  c) preparation methods,
  d) cleanup methods, and
  e) if required for the project, tentatively identified compounds (TICs).
R4 Surrogate recovery data including:
  a) Calculated recovery (%R), and
  b) The laboratory's surrogate QC limits.
R5 Test reports/summary forms for blank samples;
R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  a) LCS spiking amounts,
  b) Calculated %R for each analyte, and
  c) The laboratory's LCS QC limits.
R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  a) Samples associated with the MS/MSD clearly identified,
  b) MS/MSD spiking amounts,
  c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  d) Calculated %Rs and relative percent differences (RPDs), and
  e) The laboratory's MS/MSD QC limits
R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  a) The amount of analyte measured in the duplicate,
  b) The calculated RPD, and
  c) The laboratory's QC limits for analytical duplicates.
R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix;
R10 Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in the Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory is not accredited under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge that all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information or data affecting the quality of the data has been knowingly withheld.

This laboratory was last inspected by TCEQ on March 27, 2017. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name: John DuPont
Official Title: General Manager

Signature

09/21/17

Date

Name: Scott Schroeder
Official Title: Technical Director

DHL Analytical, Inc. **Date:** *21-Sep-17*

CLIENT: Weston Solutions, Inc.
Project: Federated Metals-Harvey Sampling
Lab Order: 1709161

CASE NARRATIVE

The samples were analyzed using the methods outlined in the following references:

Method SW6020A - Metals Analysis

Exception Report R1-01

The samples were received and log in performed on 9/19/2017. A total of 1 sample was received and analyzed. The sample arrived in good condition and was properly packaged.

Exception Report S9-01

For Metals Analysis, the RPD of Lead for the Serial Dilution (1709161-01 SD) was above the method control limit. This is flagged accordingly in the QC Summary Report. This analyte was within method control limits in the associated Post Digestion Spike. No further corrective action was taken.

DHL Analytical, Inc.

Date: *21-Sep-17*

CLIENT: Weston Solutions, Inc.
Project: Federated Metals-Harvey Sampling
Lab Order: 1709161

Work Order Sample Summary

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
1709161-01	Federated W-2		09/18/17 09:15 AM	9/19/2017

Lab Order: 1709161
Client: Weston Solutions, Inc.
Project: Federated Metals-Harvey Samplin

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1709161-01A	Federated W-2	09/18/17 09:15 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/20/17 09:49 AM	82466

Lab Order: 1709161
Client: Weston Solutions, Inc.
Project: Federated Metals-Harvey Samplin

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1709161-01A	Federated W-2	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	82466	1	09/20/17 02:17 PM	ICP-MS4_170920C

DHL Analytical, Inc.

Date: *21-Sep-17*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	Federated W-2
Project:	Federated Metals-Harvey Sampling	**Lab ID:**	1709161-01
Project No:	02444.034.001.0001	**Collection Date:**	09/18/17 09:15 AM
Lab Order:	1709161	**Matrix:**	AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
TRACE METALS: ICP-MS - WATER		**SW6020A**					Analyst: **RO**
Lead	0.00132	0.000300	0.00100		mg/L	1	09/20/17 02:17 PM
IS: Bismuth	91.0	0	70-200		%REC	1	09/20/17 02:17 PM

Qualifiers:

- ND - Not Detected at the SDL
- J - Analyte detected between SDL and RL
- B - Analyte detected in the associated Method Blank
- DF- Dilution Factor
- N - Parameter not NELAC certified
- See Final Page of Report for MQLs and MDLs
- S - Spike Recovery outside control limits
- C - Sample Result or QC discussed in Case Narrative
- RL - Reporting Limit (MQL adjusted for moisture and sample size)
- SDL - Sample Detection Limit
- E - TPH pattern not Gas or Diesel Range Pattern

DHL Analytical, Inc.

Date: *21-Sep-17*

CLIENT: Weston Solutions, Inc.
Work Order: 1709161
Project: Federated Metals-Harvey Sampling

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_170807E

Sample ID **DCS1-81788**	Batch ID: **81788**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **DCS**	Run ID: **ICP-MS4_170807E**	Analysis Date: **8/7/2017 11:00:00 AM**	Prep Date: **8/4/2017**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.000499	0.00100	0.000500	0	99.8	80	120	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAC certified

CLIENT: Weston Solutions, Inc.
Work Order: 1709161
Project: Federated Metals-Harvey Sampling

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_170920C**

The QC data in batch 82466 applies to the following samples: 1709161-01A

Sample ID	**MB-82466**	Batch ID:	**82466**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**MBLK**	Run ID:	**ICP-MS4_170920C**	Analysis Date:	**9/20/2017 2:09:00 PM**	Prep Date:	**9/20/2017**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	<0.000300	0.00100								
IS: Bismuth	0.200		0.200		97.0	70	200			

Sample ID	**LCS-82466**	Batch ID:	**82466**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCS**	Run ID:	**ICP-MS4_170920C**	Analysis Date:	**9/20/2017 2:11:00 PM**	Prep Date:	**9/20/2017**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.200	0.00100	0.200	0	100	80	120			
IS: Bismuth	0.200		0.200		94.9	70	200			

Sample ID	**LCSD-82466**	Batch ID:	**82466**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**LCSD**	Run ID:	**ICP-MS4_170920C**	Analysis Date:	**9/20/2017 2:13:00 PM**	Prep Date:	**9/20/2017**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.201	0.00100	0.200	0	100	80	120	0.283	15	
IS: Bismuth	0.200		0.200		93.4	70	200	0	0	

Sample ID	**1709161-01A SD**	Batch ID:	**82466**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**SD**	Run ID:	**ICP-MS4_170920C**	Analysis Date:	**9/20/2017 2:19:00 PM**	Prep Date:	**9/20/2017**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.00168	0.00500	0	0.00132				24.7	10	R
IS: Bismuth	1.00		0.200		93.9	70	200	0	0	

Sample ID	**1709161-01A PDS**	Batch ID:	**82466**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**PDS**	Run ID:	**ICP-MS4_170920C**	Analysis Date:	**9/20/2017 2:21:00 PM**	Prep Date:	**9/20/2017**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.198	0.00100	0.200	0.00132	98.3	80	120			
IS: Bismuth	0.200		0.200		89.0	70	200			

Sample ID	**1709161-01A MS**	Batch ID:	**82466**	TestNo:	**SW6020A**	Units:	**mg/L**
SampType:	**MS**	Run ID:	**ICP-MS4_170920C**	Analysis Date:	**9/20/2017 2:23:00 PM**	Prep Date:	**9/20/2017**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.203	0.00100	0.200	0.00132	101	80	120			
IS: Bismuth	0.200		0.200		88.4	70	200			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAC certified

CLIENT: Weston Solutions, Inc.
Work Order: 1709161
Project: Federated Metals-Harvey Sampling

ANALYTICAL QC SUMMARY REPORT

RunID: **ICP-MS4_170920C**

Sample ID **1709161-01A MSD** Batch ID: **82466** TestNo: **SW6020A** Units: **mg/L**
SampType: **MSD** Run ID: **ICP-MS4_170920C** Analysis Date: **9/20/2017 2:25:00 PM** Prep Date: **9/20/2017**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.203	0.00100	0.200	0.00132	101	80	120	0.441	15	
IS: Bismuth	0.200		0.200		88.2	70	200	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAC certified

CLIENT: Weston Solutions, Inc.
Work Order: 1709161
Project: Federated Metals-Harvey Sampling

ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4_170920C

Sample ID **ICV-170920**	Batch ID: **R94265**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **ICV**	Run ID: **ICP-MS4_170920C**	Analysis Date: **9/20/2017 10:21:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.0950	0.00100	0.100	0	95.0	90	110			
IS: Bismuth	0.200		0.200		101	70	200			

Sample ID **LCVL-170920**	Batch ID: **R94265**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_170920C**	Analysis Date: **9/20/2017 10:25:00 AM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.000975	0.00100	0.00100	0	97.5	70	130			
IS: Bismuth	0.200		0.200		102	70	200			

Sample ID **CCV5-170920**	Batch ID: **R94265**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_170920C**	Analysis Date: **9/20/2017 1:47:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.197	0.00100	0.200	0	98.5	90	110			
IS: Bismuth	0.200		0.200		95.9	70	200			

Sample ID **LCVL5-170920**	Batch ID: **R94265**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_170920C**	Analysis Date: **9/20/2017 1:53:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.00119	0.00100	0.00100	0	119	70	130			
IS: Bismuth	0.200		0.200		97.0	70	200			

Sample ID **CCV6-170920**	Batch ID: **R94265**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **CCV**	Run ID: **ICP-MS4_170920C**	Analysis Date: **9/20/2017 2:27:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.200	0.00100	0.200	0	99.9	90	110			
IS: Bismuth	0.200		0.200		90.5	70	200			

Sample ID **LCVL6-170920**	Batch ID: **R94265**	TestNo: **SW6020A**	Units: **mg/L**
SampType: **LCVL**	Run ID: **ICP-MS4_170920C**	Analysis Date: **9/20/2017 2:31:00 PM**	Prep Date:

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.00105	0.00100	0.00100	0	105	70	130			
IS: Bismuth	0.200		0.200		93.9	70	200			

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAC certified

DHL Analytical, Inc.

Date: *21-Sep-17*

CLIENT: Weston Solutions, Inc.
Work Order: 1709161
Project: Federated Metals-Harvey Sampling

MQL SUMMARY REPORT

TestNo: SW6020A	MDL	MQL
Analyte	**mg/L**	**mg/L**
Lead	0.000300	0.00100

Qualifiers: MQL -Method Quantitation Limit as defined by TRRP
MDL -Method Detection Limit as defined by TRRP

ICP-MS4
For

DHL Work Order
1709161

ICP-MS4_170920C
For

DHL Work Order
1709161

Lab Data Review Check List
EPA Method 6020A / 200.8 - Trace Metals by ICP-MS

PROJECT AND BATCH NUMBERS ARE LISTED ON THE RUN LOG	Run ID: ICP-MS4_170920C SOP: MET-ICP-MS-02			
Review Item	**Yes**	**No**	**N/A**	**2nd Level Review**
Data Folder Contents 1. Is the Prep Batch Report included? ***Check the Prep Start/End Dates, Sample Amounts, Bottle #s***	X			x
2. Are the reagents and spikes listed on the Prep Batch Report current with a valid expiration date? ***All standard/QC sample preparations shall be documented in LIMS***	X			
3. Is the Run Log and instrument sequence included? ***Check the Test Code, Sample Type, Batch ID, and Analysis Date/Time***	X			

Daily Demonstration of Performance

QC items that do not meet method/SOP/project requirements will be described on the run log. All variances that impact data quality will be described in the Variance/Comment Section on page 2.

Review Item	Frequency	Limits	Pass	Fail (List Batch/Sample) **See Run Log**	2nd Level Review
Tune	Before ICAL	RSD ≤ 5% / Peak Width@10% <0.9amu	X		x
Initial Calibration Curve (ICAL) (Blank + Multi-Level CAL STDS)	Prior to samples and when ICV fails	R^2 ≥ 0.99 (DoD) R ≥ 0.998 (6020A)	X		

Note: LCVLs and ICSA/ICSAB are N/A for Method 200.8 or project-specific exceptions.

Review Item	Frequency	Limits	Pass	Fail	N/A	Review
P/A Factor - Performed at least Monthly or After maintenance	After Instrument Maintenance or monthly	Increasing trend	X			x
ICSA (N/A for Method 200.8+U)	After calibration & every 12 hours	< RL (except Mn & Zn)	X			
ICSAB (N/A for Method 200.8+U)	After calibration & every 12 hours	80-120% (correct for ICSA result)	X			
ICV (Second Source Verification)	After ICAL	90-110%	X			
ICB	After calibration	< MDL	X			
CCV	Every 10 samples	90-110%	X			
CCB	Every 10 samples	< MDL (ALL + DoD)	X			
Internal Standards	Every sample and QC sample	> 70% (6020A) 60-125% (200.8) 30-120% (DoD)		X		
LCVL (6020A test code)	After ICAL, every 10 samples and end of run	70-130%	X			
LCVL (DoD)	DAILY	80-120%			X	
LCVL (All metals test codes except 200.8/6020A)	After ICAL and end of run	70-130%			X	
Method Blank (MB)	Every Batch	< MDL / <½ RL (DoD) or <1/10 the sample/reg limit	X			
Filter/TCLP/SPLP Blank	Filter-Dissolved only TCLP / SPLP	< MDL / <½ RL (DoD) or <1/10 the sample/reg limit			X	
Lab Control Sample (LCS)	Every Batch	80-120%	X			
Lab Control Sample Dup (LCSD)	Every Batch	80-120%	X			
LCSD - RPD	Every LCS/LCSD	15 (H2O) / 20 (Soil)	X			
Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	Every Batch	70-130 / 80-120 (6020A)		X		
MSD - RPD	Every MS/MSD	15 (H2O) / 20 (Soil)		X		
Dilution Test (SD) - RPD	Every Batch	10		X		
Post Digestion Spike (PDS)	Every Batch	75-125 / 80-120 (6020A)	X			

Lab Data Review Check List
EPA Method 6020 / 6020A / 200.8 - Trace Metals by ICP-MS

Review Item	Criteria	Yes	No	N/A	2nd Level Review
Sample Analysis 1. Are all sample hold times met?	6 months	X			x
2. Are all samples with concentrations > the highest standard used for calibration diluted and reanalyzed?	All results > high point of ICAL must be diluted		X		
3. Are ALL reported analytes and reported results > MDL highlighted by the analyst?		X	**Confirm with analyst if LIMS result does not match Labcore**		

VARIANCE REPORT

QC items that do not meet method/SOP/project requirements will be described on the run log. All variances that impact data quality will be described in this section.

NON-CONFORMANCES / VARIANCE	Criteria	Yes	No	N/A	2nd Level
1. Are all non-conformances and corrective actions included and noted?	All deviations from the method and SOP that affect data quality	X			x
2. Does the variance require approval by the Technical Director/General Manager/QA Manager?		X			

TECHNICAL DIRECTOR / QA MANAGER APPROVAL
SIGNATURE AND DATE STAMP:

Description and Corrective Actions of QC items that do not meet method/SOP/project requirements:

****INCLUDE VARIANCE ITEM / REASON / CORRECTIVE ACTION / IMPACT ON DATA****

VARIANCE ITEM	REASON	CORRECTIVE ACTION
__ CCV out of control (± 10%)	__ Carryover from previous run	__ Reanalyze QC to confirm
__ CCB out of control (> MDL / >½ RL)	__ Cross contamination	__ Recalibrate
__ MB out of control (> RL / >½ RL)	__ Lab Artifact	__ Reprep/Reanalyze sample
__ LCS __ LCSD out of control (± 20%)	__ Prep Spike error (describe)	__ Reprep/Reanalyze Batch
__ MS __ MSD out of control (± 20%)	__ Matrix Effect	__ Reanalyze Batch/Sample/QC
__ RPD out of control for LCS/LCSD/MS/MSD (15/25)	__ High Levels of Target Metals	__ Verify reagents are clean
__ Post Digestion Spike out of control (See Method)	__ Insufficient sample for QC	__ Reanalyze sample to confirm
__ Serial Dilution out of control (see Method)	__ Digestion/Prep Error	__ Sample results ND w/ dilution
__ Internal Standard(s) out of control (see Method)	__ Analytical Error	__ Client notified and approved
__ No MS/MSD prepared - LCS/LCSD used instead	__ Client Request	__ Flag data / Case narrative
__ Missing QC (other than MS/MSD)		__ Accept data
__ QC sample(s) was mis-spiked		__ Cal Std high and sample ND
__ ICSA/ICSAB missing or out of control (± 20%)		
__ LCVL out of control (± 30%)	__ Other (describe below)	__ Other (describe below)
__ Sample(s) analyzed outside of HT		
__ Other (describe below)		

General Comments and Impact on Data:

Analyst: _____ Date of Completion: 09/20/2017

Second-Level Review: Janice Whitt Date Stamp: 9/21/2017

REVIEWED BY
By Janice Whitt at 9:48:05 AM, 9/21/2017

Method 200.8/6020A Calibration Curve – ICP-MS

CAL LEVEL	RUN LOG ID		LIMS CAL STD ID	Prep Date	
MET CAL 1	BLANK STD 1		---	09/20/2017	
MET CAL 2	L2-	170920	MET-L2CAL- 170918	09/20/2017	CAL2 - CAL6
MET CAL 3	L-	170920	MET-LCAL- 170918	09/20/2017	MADE FRESH DAILY
MET CAL 4	10X-	170920	MET-LCAL10X- 170918	09/20/2017	
MET CAL 5	5X-	170920	MET-LCAL5X- 170918	09/20/2017	
MET CAL 6	2X-	170920	MET-MCAL- 170918	09/20/2017	
MET CAL 7	H-	170920	MET-HCAL-170918	09/18/2017	
MET CAL 8	H2-	170920	MET-H2CAL-170918	09/18/2017	

Metal	MET CAL 2	MET CAL 3	MET CAL 4	MET CAL 5	MET CAL 6	MET CAL 7	MET CAL 8
	MET-L2CAL (10X OF LCAL)	MET-LCAL (50X OF HCAL)	MET-LCAL10X (10X OF HCAL)	MET-LCAL5X (5X OF HCAL)	MET-MCAL (2X OF HCAL)	MET-HCAL (SEE BELOW)	MET-H2CAL (SEE BELOW)
Aluminum	20	200	1000	2000	5000	10,000	---
Antimony	1	10	50	100	250	500	---
Arsenic	1	10	50	100	250	500	2000
Barium	1	10	50	100	250	500	2000
Beryllium	1	10	50	100	250	500	2000
Boron	1	10	50	100	250	500	2000
Cadmium	1	10	50	100	250	500	2000
Calcium	20	200	1000	2000	5000	10,000	2000
Chromium	1	10	50	100	250	500	2000
Cobalt	1	10	50	100	250	500	2000
Copper	1	10	50	100	250	500	2000
Iron	20	200	1000	2000	5000	10,000	---
Lead	1	10	50	100	250	500	2000
Lithium	1	10	50	100	250	500	2000
Magnesium	20	200	1000	2000	5000	10,000	2000
Manganese	1	10	50	100	250	500	2000
Molybdenum	1	10	50	100	250	500	2000
Nickel	1	10	50	100	250	500	2000
Potassium	20	200	1000	2000	5000	10,000	25,000
Selenium	1	10	50	100	250	500	2000
Silver	1	10	50	100	250	500	---
Sodium	20	200	1000	2000	5000	10,000	25,000
Strontium	1	10	50	100	250	500	2000
Thallium	1	10	50	100	250	500	2000
Tin	1	10	50	100	250	500	2000
Titanium	1	10	50	100	250	500	2000
Uranium	1	10	50	100	250	500	2000
Vanadium	1	10	50	100	250	500	2000
Zinc	1	10	50	100	250	500	2000

MET CAL 7: MET-HCAL-170918

STOCK	Amount Used	Final Volume (mL)	Final Conc (µg/L)
AL PRIMARY STD 1000 PPM	500 µL	50	10,000
FE PRIMARY STD 1000 PPM	500 µL	50	10,000
2500 PPM NATURALS SPIKE	200 µL	50	10,000
50 PPM CUSTOM+Sr,Sn,Ti,	500 µL	50	2000
Sb + Ag 50 PPM	500 µL	50	2000

MET CAL 8: MET-H2CAL-170918

STOCK	Amount Used	Final Volume (mL)	Final Conc (µg/L)
1000 PPM STRONTIUM STD	100 µL	50	2000
1000 PPM TIN STD	100 µL	50	2000
1000 PPM TITANIUM STD	100 µL	50	2000
1000 PPM URANIUM STD	100 µL	50	2000
1000 PPM BORON STD	100 µL	50	2000
1000 PPM LITHIUM STD	100 µL	50	2000
1000 PPM MOLYBDENUM	100 µL	50	2000
500 PPM CUSTOM MIX STD	200 µL	50	2000
2500 PPM NATURALS SPIKE	500 µL	50	25,000

Analyst/Date: 09/20/2017

Second-Level Review/Date:

REVIEWED BY
By Janice Whitt at 9:03:18 AM, 9/21/2017

DHL Analytical, Inc.

Run ID: ICP-MS4_170920C **Run No.:** 94265

Analytical Run Date: 9/20/2017 **InstrumentID:** ICP-MS4

Analyst: Ryan Oliver

SampID	DF	TestCode	SampType	Batch ID	Analysis Date/Time	Q	Comments
BLANK STD 1	1	6020A_W	CAL	R94265	9/20/2017 9:54:00 AM		
L2-170920	1	6020A_W	CAL	R94265	9/20/2017 9:56:00 AM		
L-170920	1	6020A_W	CAL	R94265	9/20/2017 9:58:00 AM		
10X-170920	1	6020A_W	CAL	R94265	9/20/2017 10:00:00 AM		
5X-170920	1	6020A_W	CAL	R94265	9/20/2017 10:02:00 AM		
2X-170920	1	6020A_W	CAL	R94265	9/20/2017 10:03:00 AM		
H-170920	1	6020A_W	CAL	R94265	9/20/2017 10:05:00 AM		
H2-170920	1	6020A_W	CAL	R94265	9/20/2017 10:07:00 AM		
ICSA-170920	1	6020A_W	ICSA	R94265	9/20/2017 10:13:00 AM		
ICSAB-170920	1	6020A_W	ICSB	R94265	9/20/2017 10:15:00 AM		
ICV-170920	1	6020A_W	ICV	R94265	9/20/2017 10:21:00 AM		
LCVL-170920	1	6020A_W	LCVL	R94265	9/20/2017 10:25:00 AM		
ICB-170920	1	6020A_W	ICB	R94265	9/20/2017 10:30:00 AM		
CCV4-170920	1	6020A_W	CCV	R94265	9/20/2017 1:04:00 PM		
LCVL4-170920	1	6020A_W	LCVL	R94265	9/20/2017 1:09:00 PM		
CCB4-170920	1	6020A_W	CCB	R94265	9/20/2017 1:11:00 PM		
MB-82405	5	6020A_S	MBLK	82405	9/20/2017 1:13:00 PM		
LCS-82405	5	6020A_S	LCS	82405	9/20/2017 1:15:00 PM		
LCSD-82405	5	6020A_S	LCSD	82405	9/20/2017 1:17:00 PM		
1709115-01B	5	6020A_S	SAMP	82405	9/20/2017 1:21:00 PM		
1709115-01B SD	25	6020A_S	SD	82405	9/20/2017 1:23:00 PM		
1709115-02B	5	6020A_S	SAMP	82405	9/20/2017 1:25:00 PM		
1709115-03B	5	6020A_S	SAMP	82405	9/20/2017 1:27:00 PM		
1709115-04B	5	6020A_S	SAMP	82405	9/20/2017 1:28:00 PM		
1709115-05B	5	6020A_S	SAMP	82405	9/20/2017 1:30:00 PM		
1709115-06B	5	6020A_S	SAMP	82405	9/20/2017 1:32:00 PM		
1709115-07B	5	6020A_S	SAMP	82405	9/20/2017 1:34:00 PM		
1709115-08B	5	6020A_S	SAMP	82405	9/20/2017 1:36:00 PM		
1709115-09B	5	6020A_S	SAMP	82405	9/20/2017 1:38:00 PM		
1709115-10B	5	6020A_S	SAMP	82405	9/20/2017 1:40:00 PM		

Std ID	Std Name	Type	Exp. Date
MET-CCV-170918	ICPMS CCV 200/5000 PPB	CCV	03/18/2018
MET-H2CAL-170918	ICPMS High Cal2 2000ppb std 8	CAL	03/18/2018
MET-HCAL-170918	ICPMS High Cal 500ppb/10ppm std	CAL	03/18/2018
MET-ICV-170918	ICPMS ICV 100 ppb	ICV	03/18/2018
MET-IS-170906	INTERNAL STANDARD 1 PPM	CAL	03/06/2018
MET-L2CAL-170918	ICPMS Low Cal2 1/20ppb std 2	CAL	03/18/2018
MET-LCAL-170918	ICPMS Low Cal 10/200ppb std 3	CAL	03/18/2018
MET-LCAL10X-1709	ICPMS Low Cal 50/1000ppb std 4	CAL	03/18/2018
MET-LCAL5X-17091	ICPMS Low Cal 100/2000ppb std 5	CAL	03/18/2018
MET-MCAL-170918	ICPMS Mid Cal 250/5000ppb std 6	CAL	03/18/2018
MET-PA-170417	ICPMS PA FACTOR SOLUTION	CAL	10/17/2017
MET-PDS-170814-1	10 PPM Ag+Sb PDS	CAL	02/14/2018
MET-PDS-170814-2	10 PPM CUSTOM PDS SOLUTION	PDS	02/14/2018
MET-PDS-170814-3	250 PPM Naturals+Al+Fe PDS	PDS	02/14/2018
MET-TUNECHK-170	100ppb TUNE CHECK SOLUTION	TUNE	02/21/2018

DHL Analytical, Inc.

Run ID: ICP-MS4_170920C **Run No.:** 94265

1709115-01B PDS	5	6020A_S	PDS	82405	9/20/2017 1:41:00 PM		
1709115-01B MS	5	6020A_S	MS	82405	9/20/2017 1:43:00 PM		S-flag Ba, Cr- High, Pb- Low
1709115-01B MSD	5	6020A_S	MSD	82405	9/20/2017 1:45:00 PM		S-flag Pb- Low; R-flag Ba, Cr
CCV5-170920	1	6020A_W	CCV	R94265	9/20/2017 1:47:00 PM		
LCVL5-170920	1	6020A_W	LCVL	R94265	9/20/2017 1:53:00 PM		
CCB5-170920	1	6020A_W	CCB	R94265	9/20/2017 1:58:00 PM		
1709115-08B	100	6020A_S	SAMP	82405	9/20/2017 2:00:00 PM		
1709115-09B	100	6020A_S	SAMP	82405	9/20/2017 2:02:00 PM		
1709120-02B	5	6020A_DW	SAMP	82386	9/20/2017 2:04:00 PM		
MB-82466	1	6020A_DW10	MBLK	82466	9/20/2017 2:09:00 PM		
LCS-82466	1	6020A_DW10	LCS	82466	9/20/2017 2:11:00 PM		
LCSD-82466	1	6020A_DW10	LCSD	82466	9/20/2017 2:13:00 PM		
1709161-01A	1	6020A_DW10	SAMP	82466	9/20/2017 2:17:00 PM		
1709161-01A SD	5	6020A_DW10	SD	82466	9/20/2017 2:19:00 PM		R-flag Pb; PDS passes
1709161-01A PDS	1	6020A_DW10	PDS	82466	9/20/2017 2:21:00 PM		
1709161-01A MS	1	6020A_DW10	MS	82466	9/20/2017 2:23:00 PM		
1709161-01A MSD	1	6020A_DW10	MSD	82466	9/20/2017 2:25:00 PM		
CCV6-170920	1	6020A_W	CCV	R94265	9/20/2017 2:27:00 PM		
LCVL6-170920	1	6020A_W	LCVL	R94265	9/20/2017 2:31:00 PM		
CCB6-170920	1	6020A_W	CCB	R94265	9/20/2017 2:33:00 PM		
MB-82465	1	6020A_DW	MBLK	82465	9/20/2017 2:54:00 PM		
MB-82393-FILTER	1	6020A_DW	MBLK	82465	9/20/2017 2:56:00 PM		Report with Larson samples only
LCS-82465	1	6020A_DW	LCS	82465	9/20/2017 2:58:00 PM		
LCSD-82465	1	6020A_DW	LCSD	82465	9/20/2017 3:00:00 PM		
1709153-01B	1	6020A_DW	SAMP	82465	9/20/2017 3:04:00 PM		
1709153-01B SD	5	6020A_DW	SD	82465	9/20/2017 3:06:00 PM		
1709153-02B	1	6020A_DW	SAMP	82465	9/20/2017 3:08:00 PM		
1709154-01B	1	6020A_DW	SAMP	82465	9/20/2017 3:10:00 PM		
1709154-02B	1	6020A_DW	SAMP	82465	9/20/2017 3:12:00 PM		
1709154-03B	1	6020A_DW	SAMP	82465	9/20/2017 3:14:00 PM		
1709154-04B	1	6020A_DW	SAMP	82465	9/20/2017 3:15:00 PM		
1709155-01B	1	6020A_DW	SAMP	82465	9/20/2017 3:17:00 PM		ISTD 209 Bi, 115 In- Low; Does not effect reported analytes
1709155-02B	1	6020A_DW	SAMP	82465	9/20/2017 3:19:00 PM		ISTD 209 Bi, 115 In- Low; Does not effect reported analytes
1709155-03B	1	6020A_DW	SAMP	82465	9/20/2017 3:21:00 PM		ISTD 209 Bi- Low; Does not effect reported analytes

Std ID	Std Name	Type	Exp. Date
MET-CCV-170918	ICPMS CCV 200/5000 PPB	CCV	03/18/2018
MET-H2CAL-170918	ICPMS High Cal2 2000ppb std 8	CAL	03/18/2018
MET-HCAL-170918	ICPMS High Cal 500ppb/10ppm std	CAL	03/18/2018
MET-ICV-170918	ICPMS ICV 100 ppb	ICV	03/18/2018
MET-IS-170906	INTERNAL STANDARD 1 PPM	CAL	03/06/2018
MET-L2CAL-170918	ICPMS Low Cal2 1/20ppb std 2	CAL	03/18/2018
MET-LCAL-170918	ICPMS Low Cal 10/200ppb std 3	CAL	03/18/2018
MET-LCAL10X-1709	ICPMS Low Cal 50/1000ppb std 4	CAL	03/18/2018
MET-LCAL5X-17091	ICPMS Low Cal 100/2000ppb std 5	CAL	03/18/2018
MET-MCAL-170918	ICPMS Mid Cal 250/5000ppb std 6	CAL	03/18/2018
MET-PA-170417	ICPMS PA FACTOR SOLUTION	CAL	10/17/2017
MET-PDS-170814-1	10 PPM Ag+Sb PDS	CAL	02/14/2018
MET-PDS-170814-2	10 PPM CUSTOM PDS SOLUTION	PDS	02/14/2018
MET-PDS-170814-3	250 PPM Naturals+Al+Fe PDS	PDS	02/14/2018
MET-TUNECHK-170	100ppb TUNE CHECK SOLUTION	TUNE	02/21/2018

DHL Analytical, Inc.

Run ID: ICP-MS4_170920C **Run No.:** 94265

1709155-04B	1	6020A_DW	SAMP	82465	9/20/2017 3:23:00 PM		ISTD 209 Bi, 115 In- Low; Does not effect reported analytes
1709153-01B PDS	1	6020A_DW	PDS	82465	9/20/2017 3:25:00 PM		
1709153-01B MS	1	6020A_DW	MS	82465	9/20/2017 3:27:00 PM		S-flag Ca, K- High
1709153-01B MSD	1	6020A_DW	MSD	82465	9/20/2017 3:29:00 PM		S-flag Ca, K- High
CCV7-170920	1	6020A_W	CCV	R94265	9/20/2017 3:35:00 PM		
LCVL7-170920	1	6020A_W	LCVL	R94265	9/20/2017 3:40:00 PM		
CCB7-170920	1	6020A_W	CCB	R94265	9/20/2017 3:44:00 PM		
1709125-01B	50	6020A_DW	SAMP	82465	9/20/2017 3:46:00 PM		
1709125-02B	50	6020A_DW	SAMP	82465	9/20/2017 3:48:00 PM		
1709125-03B	50	6020A_DW	SAMP	82465	9/20/2017 3:50:00 PM		
1709125-04B	50	6020A_DW	SAMP	82465	9/20/2017 3:51:00 PM		
CCV8-170920	1	6020A_W	CCV	R94265	9/20/2017 3:53:00 PM		
LCVL8-170920	1	6020A_W	LCVL	R94265	9/20/2017 3:58:00 PM		
CCB8-170920	1	6020A_W	CCB	R94265	9/20/2017 4:12:00 PM		

Std ID	Std Name	Type	Exp. Date
MET-CCV-170918	ICPMS CCV 200/5000 PPB	CCV	03/18/2018
MET-H2CAL-170918	ICPMS High Cal2 2000ppb std 8	CAL	03/18/2018
MET-HCAL-170918	ICPMS High Cal 500ppb/10ppm std	CAL	03/18/2018
MET-ICV-170918	ICPMS ICV 100 ppb	ICV	03/18/2018
MET-IS-170906	INTERNAL STANDARD 1 PPM	CAL	03/06/2018
MET-L2CAL-170918	ICPMS Low Cal2 1/20ppb std 2	CAL	03/18/2018
MET-LCAL-170918	ICPMS Low Cal 10/200ppb std 3	CAL	03/18/2018
MET-LCAL10X-1709	ICPMS Low Cal 50/1000ppb std 4	CAL	03/18/2018
MET-LCAL5X-17091	ICPMS Low Cal 100/2000ppb std 5	CAL	03/18/2018
MET-MCAL-170918	ICPMS Mid Cal 250/5000ppb std 6	CAL	03/18/2018
MET-PA-170417	ICPMS PA FACTOR SOLUTION	CAL	10/17/2017
MET-PDS-170814-1	10 PPM Ag+Sb PDS	CAL	02/14/2018
MET-PDS-170814-2	10 PPM CUSTOM PDS SOLUTION	PDS	02/14/2018
MET-PDS-170814-3	250 PPM Naturals+Al+Fe PDS	PDS	02/14/2018
MET-TUNECHK-170	100ppb TUNE CHECK SOLUTION	TUNE	02/21/2018

Sample List

Batch Folder C:\Agilent\ICPMH\1\DATA\170920.b

Acquisition Order

#	Sequence Flow
1	Calibration Standards
2	Unknown Samples
3	Blank Samples

Calibration Standards:

#	Skip	Sample Type	Sample Name	Comment	Vial#	Level	Total Dil.
1	Skip	CCB		CAL 6020A_W	1101		
2	Skip	CCB		CAL 6020A_W	1101		
3	Skip	CCB		CAL 6020A_W	1102		
4	Skip	CCB		CAL 6020A_W	1102		
5	Skip	CCB		CAL 6020A_W	1102		
6	Skip	CCB		CAL 6020A_W	1103		
7	Skip	CCB		CAL 6020A_W	1103		
8	Skip	CCB		CAL 6020A_W	1103		
9	Skip	CalBlk	BLANK STD 1	CAL 6020A_W	2101	1	
10	Skip	CalStd	L2-170920	CAL 6020A_W	2102	2	
11	Skip	CalStd	L-170920	CAL 6020A_W	2103	3	
12	Skip	CalStd	10X-170920	CAL 6020A_W	2104	4	
13	Skip	CalStd	5X-170920	CAL 6020A_W	2105	5	
14	Skip	CalStd	2X-170920	CAL 6020A_W	2106	6	
15	Skip	CalStd	H-170920	CAL 6020A_W	2107	7	
16	Skip	CalStd	H2-170920	CAL 6020A_W	2108	8	
17	Skip	ICB	BLANK	CCB 6020A_W	1101		
18	Skip	ICB	BLANK	CCB 6020A_W	1102		
19	Skip	ICSA	ICSA-170920	ICSA6020A_W	2109		
20	Skip	ICSB	ICSAB-170920	ICSB6020A_W	2110		
21	Skip	ICB	BLANK	CCB 6020A_W	1101		
22	Skip	ICB	BLANK	CCB 6020A_W	1102		
23	Skip	ICV	ICV-170920	ICV 6020A_W	2111		
24	Skip	ICB	ICB-170920	ICB 6020A_W	1101		
25	Skip	LLICV	LCVL-170920	LCVL6020A_W	2112		
26	Skip	ICB	ICB-170920	ICB 6020A_W	1102		
27	Skip	ICB	ICB-170920	ICB 6020A_W	1103		
28	Skip	PB	MB-82404	MBLK6020A_S	3101		5
29	Skip	LCS_S	LCS-82404	LCS 6020A_S	3102		5
30	Skip	LCS_S	LCSD-82404	LCSD6020A_S	3103		5
31	Skip	CCB	RINSE	CCB 6020A_W	1101		
32	Skip	AllRef	1709129-01A	SAMP6020A_S	3104		50
33	Skip	SD	1709129-01A SD	SD 6020A_S	3105		250
34	Skip	Sample	1709141-01A	SAMP6020A_S	3106		50
35	Skip	Sample	1709141-02A	SAMP6020A_S	3107		5
36	Skip	Sample	1709141-03A	SAMP6020A_S	3108		5
37	Skip	Sample	1709141-04A	SAMP6020A_S	3109		5
38	Skip	Sample	1709141-05A	SAMP6020A_S	3110		5
39	Skip	Sample	1709141-06A	SAMP6020A_S	3111		50
40	Skip	Sample	1709141-07A	SAMP6020A_S	3112		5
41	Skip	Sample	1709141-08A	SAMP6020A_S	3201		50
42	Skip	Sample	1709141-09A	SAMP6020A_S	3202		5000
43	Skip	CCB	RINSE	CCB 6020A_W	1102		
44	Skip	CCB	RINSE	CCB 6020A_W	1103		
45	Skip	PDS	1709129-01A PDS	PDS 6020A_S	3203		50
46	Skip	MS_S	1709129-01A MS	MS 6020A_S	3204		50
47	Skip	MS_S	1709129-01A MSD	MSD 6020A_S	3205		50
48	Skip	CCV	CCV1-170920	CCV 6020A_W	1207		

Sample List

49	Skip	CCB	CCB1-170920	CCB 6020A_W	1102	
50	Skip	LLCCV	LCVL1-170920	LCVL6020A_W	2112	
51	Skip	CCB	CCB1-170920	CCB 6020A_W	1103	
52	Skip	AllRef	1709129-01A	SAMP6020A_S	3206	5
53	Skip	SD	1709129-01A SD	SD 6020A_S	3207	25
54	Skip	PDS	1709129-01A PDS	PDS 6020A_S	3208	5
55	Skip	CCB	RINSE	CCB 6020A_W	1102	
56	Skip	CCB	RINSE	CCB 6020A_W	1103	
57	Skip	Sample	1709141-10A	SAMP6020A_S	3209	5000
58	Skip	Sample	1709141-11A	SAMP6020A_S	3210	5
59	Skip	Sample	1709141-12A	SAMP6020A_S	3211	5
60	Skip	Sample	1709133-02A	SAMP6020A_S	3212	5000
61	Skip	Sample	1709133-04A	SAMP6020A_S	3301	5000
62	Skip	Sample	1709133-06A	SAMP6020A_S	3302	5000
63	Skip	Sample	1709133-08A	SAMP6020A_S	3303	5000
64	Skip	Sample	1709133-10A	SAMP6020A_S	3304	5000
65	Skip	Sample	1709133-12A	SAMP6020A_S	3305	5000
66	Skip	CCV	CCV2-170920	CCV 6020A_W	1207	
67	Skip	CCB	CCB2-170920	CCB 6020A_W	1102	
68	Skip	LLCCV	LCVL2-170920	LCVL6020A_W	2112	
69	Skip	CCB	CCB2-170920	CCB 6020A_W	1103	
70	Skip	Sample	1709133-14A	SAMP6020A_S	3306	5000
71	Skip	CCV	CCV3-170920	CCV 6020A_W	1207	
72	Skip	CCB	CCB3-170920	CCB 6020A_W	1102	
73	Skip	LLCCV	LCVL3-170920	LCVL6020A_W	2512	
74	Skip	CCB	CCB3-170920	CCB 6020A_W	1103	
75		PB_W	MB-82403	MBLKTCLP_MET	2201	1
76		LCS_W	LCS-82403	LCS TCLP_MET	2202	1
77		LCS_W	LCSD-82403	LCSDTCLP_MET	2203	1
78		CCB	RINSE	CCB 6020A_W	1101	
79		AllRef	1709133-03A	SAMPTCLP_MET	2204	1
80		SD	1709133-03A SD	SD TCLP_MET	2205	5
81		SAMP_W	1709133-01A	SAMPTCLP_MET	2206	1
82		SAMP_W	1709133-05A	SAMPTCLP_MET	2207	1
83		SAMP_W	1709133-07A	SAMPTCLP_MET	2208	1
84		SAMP_W	1709133-09A	SAMPTCLP_MET	2209	1
85		SAMP_W	1709133-11A	SAMPTCLP_MET	2210	1
86		SAMP_W	1709133-13A	SAMPTCLP_MET	2211	1
87		SAMP_W	1709134-01A	SAMPTCLP_MET	2212	1
88		PDS	1709133-03A PDS	PDS TCLP_MET	2301	1
89		MS_W	1709133-03A MS	MS TCLP_MET	2302	1
90		MS_W	1709133-03A MSD	MSD TCLP_MET	2303	1
91		CCB	RINSE	CCB 6020A_W	1102	
92		CCB	RINSE	CCB 6020A_W	1103	
93		CCV	CCV4-170920	CCV 6020A_W	1207	
94		CCB	CCB4-170920	CCB 6020A_W	1102	
95		LLCCV	LCVL4-170920	LCVL6020A_W	2512	
96		CCB	CCB4-170920	CCB 6020A_W	1103	
97		PB	MB-82405	MBLK6020A_S	4101	5
98		LCS_S	LCS-82405	LCS 6020A_S	4102	5
99		LCS_S	LCSD-82405	LCSD6020A_S	4103	5
100		CCB	RINSE	CCB 6020A_W	1101	
101		AllRef	1709115-01A	SAMP6020A_S	4104	5
102		SD	1709115-01A SD	SD 6020A_S	4105	25
103		Sample	1709115-02A	SAMP6020A_S	4106	5
104		Sample	1709115-03A	SAMP6020A_S	4107	5
105		Sample	1709115-04A	SAMP6020A_S	4108	5
106		Sample	1709115-05A	SAMP6020A_S	4109	5
107		Sample	1709115-06A	SAMP6020A_S	4110	5

Sample List

108	Sample	1709115-07A	SAMP6020A_S	4111	5
109	Sample	1709115-08A	SAMP6020A_S	4112	5
110	Sample	1709115-09A	SAMP6020A_S	4201	5
111	Sample	1709115-10A	SAMP6020A_S	4202	5
112	PDS	1709115-01A PDS	PDS 6020A_S	4203	5
113	MS_S	1709115-01A MS	MS 6020A_S	4204	5
114	MS_S	1709115-01A MSD	MSD 6020A_S	4205	5
115	CCV	CCV5-170920	CCV 6020A_W	1207	
116	CCB	CCB5-170920	CCB 6020A_W	1102	
117	CCB	CCB5-170920	CCB 6020A_W	1103	
118	LLCCV	LCVL5-170920	LCVL6020A_W	2511	
119	CCB	CCB5-170920	CCB 6020A_W	1103	
120	Sample	1709115-08A	SAMP6020A_S	4301	100
121	Sample	1709115-09A	SAMP6020A_S	4302	100
122	SAMP_W	1709120-02B	SAMP6020A_DW	4303	5
123	CCB	RINSE	CCB 6020A_W	1102	
124	CCB	RINSE	CCB 6020A_W	1102	
125	PB_W	MB-82466	MBLK6020A_DW	2401	1
126	LCS_W	LCS-82466	LCS 6020A_DW	2402	1
127	LCS_W	LCSD-82466	LCSD6020A_DW	2403	1
128	CCB	RINSE	CCB 6020A_W	1102	
129	AllRef	1709161-01A	SAMP6020A_DW	2404	1
130	SD	1709161-01A SD	SD 6020A_DW	2405	5
131	PDS	1709161-01A PDS	PDS 6020A_DW	2406	1
132	MS_W	1709161-01A MS	MS 6020A_DW	2407	1
133	MS_W	1709161-01A MSD	MSD 6020A_DW	2408	1
134	CCV	CCV6-170920	CCV 6020A_W	1207	
135	CCB	CCB6-170920	CCB 6020A_W	1102	
136	LLCCV	LCVL6-170920	LCVL6020A_W	2511	
137	CCB	CCB6-170920	CCB 6020A_W	1102	
138	PB_W	MB-82465	MBLK6020A_DW	3101	1
139	PB_W	MB-82393-FILTER	MBLK6020A_DW	3102	1
140	LCS_W	LCS-82465	LCS 6020A_DW	3103	1
141	LCS_W	LCSD-82465	LCSD6020A_DW	3104	1
142	CCB	RINSE	CCB 6020A_W	1101	
143	AllRef	1709153-01B	SAMP6020A_DW	3105	1
144	SD	1709153-01B SD	SD 6020A_DW	3106	5
145	SAMP_W	1709153-02B	SAMP6020A_DW	3107	1
146	SAMP_W	1709154-01B	SAMP6020A_DW	3108	1
147	SAMP_W	1709154-02B	SAMP6020A_DW	3109	1
148	PB_W	MB-82465	MBLK6020A_DW	3101	1
149	PB_W	MB-82393-FILTER	MBLK6020A_DW	3102	1
150	LCS_W	LCS-82465	LCS 6020A_DW	3103	1
151	LCS_W	LCSD-82465	LCSD6020A_DW	3104	1
152	CCB	RINSE	CCB 6020A_W	1101	
153	AllRef	1709153-01B	SAMP6020A_DW	3105	1
154	SD	1709153-01B SD	SD 6020A_DW	3106	5
155	SAMP_W	1709153-02B	SAMP6020A_DW	3107	1
156	SAMP_W	1709154-01B	SAMP6020A_DW	3108	1
157	SAMP_W	1709154-02B	SAMP6020A_DW	3109	1
158	SAMP_W	1709154-03B	SAMP6020A_DW	3110	1
159	SAMP_W	1709154-04B	SAMP6020A_DW	3111	1
160	SAMP_W	1709155-01B	SAMP6020A_DW	3112	1
161	SAMP_W	1709155-02B	SAMP6020A_DW	3201	1
162	SAMP_W	1709155-03B	SAMP6020A_DW	3202	1
163	SAMP_W	1709155-04B	SAMP6020A_DW	3203	1
164	PDS	1709153-01B PDS	PDS 6020A_DW	3204	1
165	MS_W	1709153-01B MS	MS 6020A_DW	3205	1
166	MS_W	1709153-01B MSD	MSD 6020A_DW	3206	1

Sample List

167	CCB	RINSE	CCB 6020A_W	1102		
168	CCB	RINSE	CCB 6020A_W	1103		
169	CCV	CCV7-170920	CCV 6020A_W	1207		
170	CCB	CCB7-170920	CCB 6020A_W	1102		
171	LLCCV	LCVL7-170920	LCVL6020A_W	2511		
172	CCB	CCB7-170920	CCB 6020A_W	1102		
173	SAMP_W	1709125-01B	SAMP6020A_DW	3207		50
174	SAMP_W	1709125-02B	SAMP6020A_DW	3208		50
175	SAMP_W	1709125-03B	SAMP6020A_DW	3209		50
176	SAMP_W	1709125-04B	SAMP6020A_DW	3210		50
177	CCV	CCV8-170920	CCV 6020A_W	1207		
178	CCB	CCB8-170920	CCB 6020A_W	1102		
179	LLCCV	LCVL8-170920	LCVL6020A_W	2511		
180	CCB	CCB8-170920	CCB 6020A_W	1102		
181	CCB	CCB8-170920	CCB 6020A_W	1102		
182	CCB	CCB8-170920	CCB 6020A_W	1102		
183	CCB	CCB8-170920	CCB 6020A_W	1103		
184	CCB	CCB8-170920	CCB 6020A_W	1103		
185	CCB	CCB8-170920	CCB 6020A_W	1103		
186	CCB	CCB8-170920	CCB 6020A_W	1103		

Unknown Samples:

#	Skip	Sample Type	Sample Name	Comment	Vial#	Level	Total Dil.

Blank Samples:

#	Skip	Sample Type	Sample Name	Comment	Vial#	Level	Total Dil.

Periodic Block

#	Block Name	Period	Unit	Reset By

Sublist

DHL Analytical, Inc.

PREP BATCH REPORT

Prep Start Date: **9/20/2017 9:49:58 AM**
Digestion: **Start: 9/20/2017 11:00:00 AM / Stop: 9/20/2017 12:00:00 PM**
Prep End Date: **9/20/2017 12:25:46 PM**

Prep Batch **82466** Prep Code: **3005DISS_10** Technician: **Sydney Powers**

Prep Factor Units: **mL/mL**

Equipment List

Hot Block #3
Thermometer #60
Pipette #P-40-Spikes
Pipette #P-41 Samples

Sample ID	Matrix	pH	SampAmt	Fin Vol	Factor	Bottle #	Vessel	Cleanup
1709161-01A	Aqueous		50	50	1.000	1 of 1		
1709161-01A MS	Aqueous		50	50	1.000	of		
1709161-01A MSD	Aqueous		50	50	1.000	of		
1709161-01A PDS	Aqueous		50	50	1.000	of		
1709161-01A SD	Aqueous		50	50	1.000	of		
LCS-82466	Aqueous		50	50	1.000	of		
LCSD-82466	Aqueous		50	50	1.000	of		
MB-82466	Aqueous		50	50	1.000	of		

Number	Reagent Name	Amt	Units	Exp. Da
11490	Hydrochloric Acid (trace metal grade)	1	ml	12/15/2019
11594	Digestion Vessels	1	ml	01/10/2018
11661	Nitric Acid (Trace Metal Grade)	1	ml	04/05/2019

Spk ID	Spike Name	SampType	Amt (mL or g)	Exp. Date
MET-161107-1	AL PRIMARY STD 1000 PPM	LCS/MS/MSD	0.25	04/27/2018
MET-161107-4	FE PRIMARY STD 1000 PPM	LCS/MS/MSD	0.25	04/27/2018
MET-SPIKE-170803-3	2500 PPM Naturals Spike	LCS/MS/MSD	0.1	02/04/2018
MET-SPIKE-170815-1	Sb+Ag 50 PPM	LCS/MS/MSD	0.2	02/16/2018
MET-SPIKE-170815-2	50 PPM Custom+Sr,Sn,Ti,U,B,Li,Mo	LCS/MS/MSD	0.2	02/16/2018

REVIEWED BY
By Janice Whitt at 9:06:55 AM, 9/21/2017

Calibration Summary Report

Date Acquired 9/20/2017 9:54
Data Batch 170920.b

Level	Calibration File Name
1	009CALB.d
2	010CALS.d
3	011CALS.d
4	012CALS.d
5	013CALS.d
6	014CALS.d
7	015CALS.d
8	016CALS.d

Calibration Table

Ele	Corr Coef	Curve Equation
As	1.0000	y = 0.0010 * x + 9.3546E-005
Be	1.0000	y = 6.6220E-005 * x + 1.5381E-006
B	0.9999	y = 2.7301E-005 * x + 1.0924E-004
Na	1.0000	y = 9.0634E-004 * x + 0.0162
Mg	0.9999	y = 4.4057E-004 * x + 4.1346E-004
Al	0.9999	y = 1.4643E-004 * x + 8.3211E-004
K	0.9998	y = 3.6867E-004 * x + 0.0225
Ca	1.0000	y = 1.9007E-005 * x + 1.5659E-004
Ti	0.9999	y = 1.4135E-004 * x + 6.1177E-006
V	1.0000	y = 0.0051 * x + 0.0026
Cr	1.0000	y = 0.0064 * x + 4.7487E-004
Mn	1.0000	y = 0.0033 * x + 2.9720E-004
Fe	1.0000	y = 0.0050 * x + 0.0051
Co	1.0000	y = 0.0158 * x + 1.5299E-004
Ni	1.0000	y = 0.0042 * x + 0.0020
Cu	1.0000	y = 0.0114 * x + 0.0026
Zn	0.9999	y = 0.0015 * x + 7.1780E-004
Se	1.0000	y = 7.3249E-005 * x + 2.4035E-005
Sr	0.9998	y = 6.0245E-004 * x + 2.1225E-005
Mo	1.0000	y = 6.3847E-004 * x + 8.6388E-006
Ag	1.0000	y = 0.0021 * x + 5.9166E-006
Cd	1.0000	y = 2.7703E-004 * x + 1.2154E-006
Sn	1.0000	y = 5.6817E-004 * x + 3.3681E-005
Sb	0.9999	y = 7.1458E-004 * x + 2.4730E-005
Tl	0.9999	y = 0.0018 * x + 9.3023E-006
Ba	1.0000	y = 2.5491E-004 * x + 4.1050E-006
Pb	1.0000	y = 0.0023 * x + 9.0533E-005

REVIEWED BY
By Janice Whitt at 12:47:04 PM, 9/20/2017

Calibration Summary Report

Level 7 Cal

Ele	Conc	Calc	%Rec
As	500	511.86	102
Be	500	513.40	103
B	500	526.85	105
Na	10000	9874.72	99
Mg	10000	9766.30	98
Al	10000	9935.52	99
K	10000	9575.31	96
Ca	10000	10078.98	101
Ti	500	523.78	105
V	500	500.80	100
Cr	500	505.78	101
Mn	500	501.25	100
Fe	10000	10003.25	100
Co	500	516.59	103
Ni	500	516.55	103
Cu	500	511.26	102
Zn	500	522.76	105
Se	500	511.57	102
Sr	500	460.18	92
Mo	500	506.70	101
Ag	500	499.03	100
Cd	500	511.95	102
Sn	500	501.97	100
Sb	500	497.76	100
Tl	500	521.87	104
Ba	500	512.16	102
Pb	500	510.49	102

Level 8 Cal

Ele	Conc	Calc	%Rec
As	2000	1996.15	100
Be	2000	1994.51	100
B	2000	1991.07	100
Na	25000	25055.14	100
Mg	25000	25092.44	100
K	25000	25186.02	99
Ca	25000	24938.04	100
Ti	2000	1992.55	100
V	2000	2000.18	100
Cr	2000	1998.55	100
Mn	2000	1999.58	100
Co	2000	1996.01	100
Ni	2000	1994.55	100
Cu	2000	1996.03	100
Zn	2000	1992.30	100
Se	2000	1995.75	100
Sr	2000	2012.25	99
Mo	2000	1997.42	100
Cd	2000	1995.43	100
Sn	2000	1998.56	100
Tl	2000	1992.79	100
Ba	2000	1995.50	100
Pb	2000	1996.57	100

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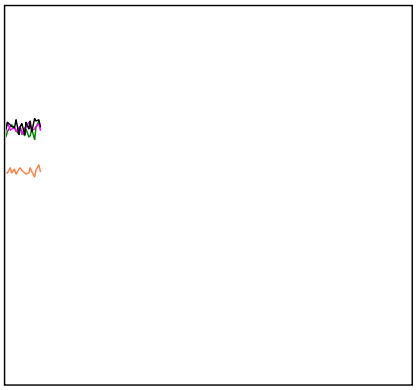
By Janice Whitt at 12:47:10 PM, 9/20/2017

Current Signal

[Helium]



Mass	Range	Count	Avg. Count	RSD [%]
63	500	177	199.5	9.00
59	20000	13581	13401.9	1.98
89	20000	11244	11264.4	1.43
140	50000	33613	33907.0	1.27
205	50000	34144	34208.2	1.81
156/140	1	0.574 %	0.577 %	9.25
51	200	98	124.4	14.68
56	5000	2800	2707.1	3.68
75	20	5	1.8	78.50
78	20	0	2.4	77.51
Integration Time [sec]		0.10		

Plasma Parameters

RF Power	1550	W	Nebulizer Pump	0.10	rps
RF Matching	1.90	V	S/C Temp	2	℃
Smpl Depth	9.0	mm	Gas Switch	Dilution Gas	
Carrier Gas	0.70	L/min	Makeup/Dilution Gas	0.40	L/min
Option Gas	0.0	%			

Lenses Parameters

Extract 1	0.0	V	Cell Entrance	-40	V
Extract 2	-150.0	V	Cell Exit	-60	V
Omega Bias	-60	V	Deflect	1.6	V
Omega Lens	7.0	V	Plate Bias	-60	V

Cell Parameters

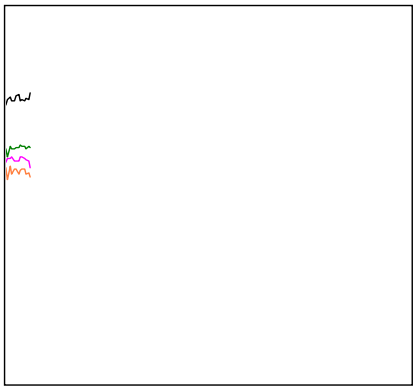
Use Gas	Yes		OctP RF	200	V
He Flow	5.0	mL/min	Energy Discrimination	3.0	V
OctP Bias	-18.0	V			

Meters

IF/BK Press	2.14E+2	Pa	Carrier Gas(BP)	3.34E+2	kPa	Forward Power	1549	W
Analyzer Press	1.47E-4	Pa	Reflected Power	6	W			

Current Signal

[No gas]



Mass	Range	Count	Avg. Count	RSD [%]
63	500	347	351.6	4.82
59	50000	31278	31204.2	1.33
89	100000	54620	56139.5	1.92
140	100000	57339	59298.3	1.28
205	50000	38497	37719.9	1.17
156/140	2	1.806 %	1.734 %	4.78
51	50000	46817	47281.7	1.29
56	500000	375963	375744.3	0.88
75	5000	4504	4516.9	1.71
78	2000	1603	1558.7	4.29
Integration Time [sec]		0.10		

Plasma Parameters

RF Power	1550	W	Nebulizer Pump	0.10	rps
RF Matching	1.90	V	S/C Temp	2	℃
Smpl Depth	9.0	mm	Gas Switch	Dilution Gas	
Carrier Gas	0.70	L/min	Makeup/Dilution Gas	0.40	L/min
Option Gas	0.0	%			

Lenses Parameters

Extract 1	0.0	V	Cell Entrance	-40	V
Extract 2	-150.0	V	Cell Exit	-60	V
Omega Bias	-60	V	Deflect	7.0	V
Omega Lens	7.0	V	Plate Bias	-60	V

Cell Parameters

Use Gas	No		OctP RF	200	V
He Flow	4.2	mL/min	Energy Discrimination	3.0	V
OctP Bias	-18.0	V			

Meters

IF/BK Press	2.12E+2	Pa	Carrier Gas(BP)	3.34E+2	kPa	Forward Power	1550	W
Analyzer Press	8.90E-5	Pa	Reflected Power	6	W			

US EPA Tune Check Sample Report

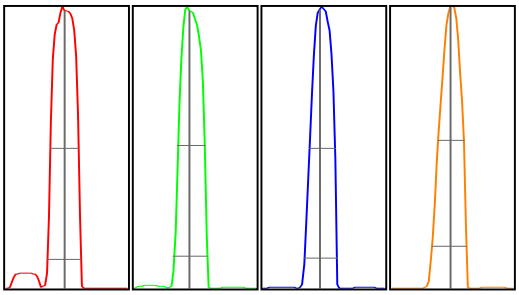
Batch Folder C:\Agilent\ICPMH\1\DATA\DHL Li+U TEMPLATE.b
Report Comment
Instrument Name ICPMS4 JP12361998

[No gas]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
7	93718	1.43	5.00	
59	172138	1.04	5.00	
115	283900	1.14	5.00	
205	215241	0.67	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
7	91596	93327	94285	94284	95097
59	169472	171267	172647	173361	173942
115	279056	282687	284170	287001	286586
205	217757	214684	214347	215086	214329

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
7	142011	7.00	6.9 - 7.1		0.819	0.850	
59	280091	58.90	58.9 - 59.1		0.802	0.850	
115	481814	114.95	114.9 - 115.1		0.783	0.850	
205	368304	205.00	204.9 - 205.1		0.833	0.850	

X% = 10 **Int Time [sec] =** 0.1 **Acq Time [sec] =** 135.05 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1550	W	Nebulizer Pump	0.10	rps
RF Matching	1.90	V	S/C Temp	2	℃
Smpl Depth	9.0	mm	Gas Switch	Dilution Gas	
Carrier Gas	0.70	L/min	Makeup/Dilution Gas	0.40	L/min
Option Gas	0.0	%			

Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Cell Entrance	-40	V
Extract 2	-150.0	V	Cell Exit	-60	V
Omega Bias	-60	V	Deflect	7.0	V
Omega Lens	7.0	V	Plate Bias	-60	V

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Cell Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	No		OctP RF	200	V
He Flow	0.0	mL/min	Energy Discrimination	3.0	V
OctP Bias	-18.0	V			

P/A Factor Tuning Report

Current Sample

Sample Name: LCVL3-170920
Data File: 073LCCV.d
Acquired: 9/20/2017 12:03:41 PM

Detector Parameters and P/A Factors

Discriminator: 4.5 mV
AnalogHV: 1737 V
PulseHV: 1613 V

Acquired: 9/20/2017 9:22:20 AM

Mass[u]	Element	P/A Factor
9	Be	0.115792
23	Na	0.124676
24	Mg	0.128378
27	Al	0.130479
39	K	0.131347
45	Sc	0.132311
47	Ti	0.131583
51	V	0.134166
52	Cr	0.137373
55	Mn	0.137441
56	Fe	0.127917
59	Co	0.139879
60	Ni	0.140103
63	Cu	0.142938
66	Zn	0.142092
72	Ge	0.141762
75	As	0.141544
88	Sr	0.142602
95	Mo	0.141744
111	Cd	0.145868
115	In	0.145445
118	Sn	0.145872
121	Sb	0.145790
137	Ba	0.145094
205	Tl	0.148744
206	[Pb]	0.150507
207	[Pb]	0.150837
208	Pb	0.151292
209	Bi	0.151140
238	U	0.151174
7	Li	Signal too low
11	B	Signal too low
44	Ca	Signal too low
78	Se	Signal too low
107	Ag	Signal too low

Created: 9/20/2017 12:04:47 PM

REVIEWED BY
By Janice Whitt at 12:47:19 PM, 9/20/2017

Calibration Blank Report

Date Acquired	9/20/2017 9:54	Sample Name	BLANK STD 1
Data Batch	170920.b	Comment	CAL 6020A_W
Data File Name	009CALB.d	Dilution	1

Mass	Name	IS	CPS	%RSD
9	Be	45	2	124.90
11	B	45	119	7.06
23	Na	45	17680	1.86
24	Mg	45	450	14.13
27	Al	45	906	7.27
39	K	45	24482	1.78
44	Ca	45	170	5.56
47	Ti	45	7	50.03
51	V	45	2827	4.68
52	Cr	45	517	1.71
55	Mn	45	323	11.15
56	Fe	45	5589	2.88
59	Co	72	114	39.12
60	Ni	72	1468	9.04
63	Cu	72	1927	2.95
66	Zn	72	537	8.61
75	As	72	70	14.86
78	Se	72	18	27.97
88	Sr	115	156	21.03
95	Mo	115	63	32.02
107	Ag	115	43	7.70
111	Cd	115	9	57.30
118	Sn	115	247	10.55
121	Sb	115	181	15.65
137	Ba	115	30	69.38
205	Tl	209	181	1.06
208	Pb	209	1762	2.29

QC ISTD Table

Mass	Name	CPS	%RSD
45	Sc	1088093	0.50
72	Ge	747674	0.21
115	In	7324583	0.46
209	Bi	19469673	0.95

Calibration Standard Report

Date Acquired	9/20/2017 9:56	Sample Name	L2-170920
Data Batch	170920.b	Comment	CAL 6020A_W
Data File Name	010CALS.d	Dilution	1

Mass	Name	IS	CPS	%RSD
9	Be	45	81	2.86
11	B	45	164	19.69
23	Na	45	37704	1.79
24	Mg	45	10028	3.17
27	Al	45	4595	1.39
39	K	45	32454	1.64
44	Ca	45	563	10.31
47	Ti	45	161	20.41
51	V	45	8422	2.07
52	Cr	45	7841	2.38
55	Mn	45	4039	3.99
56	Fe	45	124973	1.23
59	Co	72	11962	0.50
60	Ni	72	4752	1.66
63	Cu	72	10591	1.67
66	Zn	72	1636	3.83
75	As	72	900	2.79
78	Se	72	90	13.20
88	Sr	115	4263	1.99
95	Mo	115	4709	2.77
107	Ag	115	16004	0.88
111	Cd	115	2047	5.48
118	Sn	115	4307	4.05
121	Sb	115	5368	0.22
137	Ba	115	1952	6.46
205	Tl	209	34555	0.86
208	Pb	209	46378	0.21

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1094671	0.13	1088093	100.60	70	120	
72	Ge	757088	0.09	747674	101.26	70	120	
115	In	7262532	2.04	7324583	99.15	70	120	
209	Bi	19664714	0.49	19469673	101.00	70	120	

Calibration Standard Report

Date Acquired	9/20/2017 9:58	Sample Name	L-170920
Data Batch	170920.b	Comment	CAL 6020A_W
Data File Name	011CALS.d	Dilution	1

Mass	Name	IS	CPS	%RSD
9	Be	45	750	4.76
11	B	45	458	4.01
23	Na	45	217178	0.80
24	Mg	45	97071	0.88
27	Al	45	33282	0.45
39	K	45	105609	0.74
44	Ca	45	4578	1.90
47	Ti	45	1699	6.27
51	V	45	59221	0.89
52	Cr	45	73866	1.43
55	Mn	45	38769	1.86
56	Fe	45	1207579	0.65
59	Co	72	121021	0.45
60	Ni	72	34421	2.23
63	Cu	72	91924	1.36
66	Zn	72	12657	1.66
75	As	72	8022	1.11
78	Se	72	570	6.09
88	Sr	115	41245	2.01
95	Mo	115	47062	0.90
107	Ag	115	158228	0.50
111	Cd	115	21096	2.55
118	Sn	115	42053	1.27
121	Sb	115	52602	1.07
137	Ba	115	18931	0.81
205	Tl	209	339453	0.50
208	Pb	209	452183	0.26

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1097414	0.55	1088093	100.86	70	120	
72	Ge	760107	0.19	747674	101.66	70	120	
115	In	7307969	0.43	7324583	99.77	70	120	
209	Bi	19502219	1.09	19469673	100.17	70	120	

Calibration Standard Report

Date Acquired	9/20/2017 10:00	Sample Name	10X-170920
Data Batch	170920.b	Comment	CAL 6020A_W
Data File Name	012CALS.d	Dilution	1

Mass	Name	IS	CPS	%RSD
9	Be	45	3740	3.63
11	B	45	1903	6.59
23	Na	45	1008859	0.73
24	Mg	45	485711	0.97
27	Al	45	162438	0.95
39	K	45	417364	0.71
44	Ca	45	21464	0.95
47	Ti	45	8126	1.21
51	V	45	284632	0.94
52	Cr	45	362705	0.89
55	Mn	45	189342	0.43
56	Fe	45	5578307	0.82
59	Co	72	602337	0.39
60	Ni	72	167941	0.75
63	Cu	72	448665	0.42
66	Zn	72	60765	0.59
75	As	72	39831	1.22
78	Se	72	2879	2.16
88	Sr	115	204219	0.65
95	Mo	115	235341	1.37
107	Ag	115	784277	0.46
111	Cd	115	105803	0.35
118	Sn	115	210341	0.71
121	Sb	115	262851	0.31
137	Ba	115	96102	0.20
205	Tl	209	1708617	0.23
208	Pb	209	2257125	0.55

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1094660	0.97	1088093	100.60	70	120	
72	Ge	751035	0.28	747674	100.45	70	120	
115	In	7362720	0.53	7324583	100.52	70	120	
209	Bi	19298562	0.50	19469673	99.12	70	120	

Calibration Standard Report

Date Acquired	9/20/2017 10:02	Sample Name	5X-170920
Data Batch	170920.b	Comment	CAL 6020A_W
Data File Name	013CALS.d	Dilution	1

Mass	Name	IS	CPS	%RSD
9	Be	45	7503	0.73
11	B	45	3258	4.23
23	Na	45	1981135	0.74
24	Mg	45	959122	0.23
27	Al	45	321318	0.43
39	K	45	806937	0.42
44	Ca	45	42335	1.93
47	Ti	45	16191	1.25
51	V	45	563773	0.22
52	Cr	45	723090	0.35
55	Mn	45	374089	0.67
56	Fe	45	11226937	0.82
59	Co	72	1199980	0.47
60	Ni	72	334772	0.54
63	Cu	72	888776	0.56
66	Zn	72	120871	0.96
75	As	72	79512	0.53
78	Se	72	5718	0.71
88	Sr	115	405235	0.89
95	Mo	115	466628	0.37
107	Ag	115	1547616	0.16
111	Cd	115	209367	0.36
118	Sn	115	418245	0.48
121	Sb	115	522720	0.66
137	Ba	115	188757	0.63
205	Tl	209	3417241	0.53
208	Pb	209	4491452	0.05

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1090858	0.45	1088093	100.25	70	120	
72	Ge	744441	0.33	747674	99.57	70	120	
115	In	7317775	1.56	7324583	99.91	70	120	
209	Bi	19364198	0.08	19469673	99.46	70	120	

Calibration Standard Report

Date Acquired	9/20/2017 10:03	Sample Name	2X-170920
Data Batch	170920.b	Comment	CAL 6020A_W
Data File Name	014CALS.d	Dilution	1

Mass	Name	IS	CPS	%RSD
9	Be	45	19109	0.95
11	B	45	7946	1.00
23	Na	45	4928390	0.80
24	Mg	45	2399637	0.89
27	Al	45	817281	0.90
39	K	45	2008402	1.63
44	Ca	45	106318	1.39
47	Ti	45	39914	1.47
51	V	45	1370973	0.44
52	Cr	45	1743075	1.25
55	Mn	45	908005	1.60
56	Fe	45	26935705	3.31
59	Co	72	2892411	1.12
60	Ni	72	802182	1.08
63	Cu	72	2167290	0.94
66	Zn	72	296451	1.11
75	As	72	197206	0.18
78	Se	72	14051	1.06
88	Sr	115	1013804	0.28
95	Mo	115	1172616	0.67
107	Ag	115	3816841	0.62
111	Cd	115	516135	0.68
118	Sn	115	1044028	0.35
121	Sb	115	1298612	0.09
137	Ba	115	474881	0.43
205	Tl	209	8797842	0.44
208	Pb	209	11256636	0.96

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1087887	0.64	1088093	99.98	70	120	
72	Ge	740842	0.91	747674	99.09	70	120	
115	In	7139953	1.15	7324583	97.48	70	120	
209	Bi	19027548	2.09	19469673	97.73	70	120	

Calibration Standard Report

Date Acquired	9/20/2017 10:05	Sample Name	H-170920
Data Batch	170920.b	Comment	CAL 6020A_W
Data File Name	015CALS.d	Dilution	1

Mass	Name	IS	CPS	%RSD
9	Be	45	36548	0.37
11	B	45	15579	3.40
23	Na	45	9638499	1.88
24	Mg	45	4625744	0.13
27	Al	45	1564804	0.24
39	K	45	3818985	0.24
44	Ca	45	206105	0.29
47	Ti	45	79595	1.24
51	V	45	2748910	0.32
52	Cr	45	3503405	0.13
55	Mn	45	1802187	0.35
56	Fe	45	53641162	0.61
59	Co	72	5873208	2.01
60	Ni	72	1566318	0.26
63	Cu	72	4197843	0.21
66	Zn	72	573281	0.18
75	As	72	384004	0.29
78	Se	72	27044	1.47
88	Sr	115	1976222	0.46
95	Mo	115	2306018	0.15
107	Ag	115	7546198	0.72
111	Cd	115	1010932	0.22
118	Sn	115	2033132	0.29
121	Sb	115	2535517	0.14
137	Ba	115	930601	0.26
205	Tl	209	17132219	0.37
208	Pb	209	22061089	0.67

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1074980	0.30	1088093	98.79	70	120	
72	Ge	721235	0.69	747674	96.46	70	120	
115	In	7128531	1.11	7324583	97.32	70	120	
209	Bi	18712683	0.90	19469673	96.11	70	120	

Calibration Standard Report

Date Acquired	9/20/2017 10:07	Sample Name	H2-170920
Data Batch	170920.b	Comment	CAL 6020A_W
Data File Name	016CALS.d	Dilution	1

Mass	Name	IS	CPS	%RSD
9	Be	45	140618	0.31
11	B	45	57987	0.33
23	Na	45	24193041	0.55
24	Mg	45	11770100	0.45
27	Al	45	2868	10.70
39	K	45	9909871	0.91
44	Ca	45	504821	0.89
47	Ti	45	299860	0.75
51	V	45	10864674	1.33
52	Cr	45	13709186	0.70
55	Mn	45	7119240	0.23
56	Fe	45	57728	25.15
59	Co	72	22409768	0.72
60	Ni	72	5969179	1.32
63	Cu	72	16181090	1.38
66	Zn	72	2156300	0.50
75	As	72	1478799	0.23
78	Se	72	104142	0.55
88	Sr	115	8418091	0.81
95	Mo	115	8856280	0.73
107	Ag	115	4958	26.21
111	Cd	115	3838769	0.30
118	Sn	115	7885105	0.68
121	Sb	115	3846	11.53
137	Ba	115	3532298	0.40
205	Tl	209	64192411	0.77
208	Pb	209	84663321	0.45

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1064668	0.63	1088093	97.85	70	120	
72	Ge	712276	0.59	747674	95.27	70	120	
115	In	6944569	0.95	7324583	94.81	70	120	
209	Bi	18364195	1.76	19469673	94.32	70	120	

Interference Check Solution A (ICS-A) Report

Date Acquired	9/20/2017 10:13	Sample Name	ICSA-170920
Data Batch	170920.b	Comment	ICSA6020A_W
Data File Name	019ICSA.d	Dilution	1

Mass	Name	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	0.103	9	48.4	1.2	0.8	
11	B	4.629	254	23.4	30	30	
51	V	0.012	2875	0.7	10	10	
52	Cr	0.375	3127	5.4	8	5	
55	Mn	1.655	6305	1.3	8	10	
59	Co	0.429	4874	2.6	8	10	
60	Ni	0.504	2880	4.2	8	10	
63	Cu	0.398	5010	5.5	8	10	
66	Zn	2.451	3134	2.8	10	5	
75	As	0.211	221	6.5	4	5	
78	Se	0.591	47	32.7	2	5	
88	Sr	3.499	14518	1.3	10	10	
107	Ag	0.209	3061	2.2	0.8	2	
111	Cd	0.703	1337	14.4	1.2	1	
118	Sn	0.296	1375	5.0	10	10	
121	Sb	0.606	3121	0.8	4	2.5	
137	Ba	0.293	537	6.2	8	10	
205	Tl	0.225	6831	2.0	4	1.5	
208	Pb	0.336	14665	1.8	1.2	1	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1081380	0.90	1088093	99.38	70	120	
72	Ge	705526	0.99	747674	94.36	70	120	
115	In	6818850	0.97	7324583	93.10	70	120	
209	Bi	16939438	0.89	19469673	87.00	70	120	

Interference Check Solution AB (ICS-AB) Report

Date Acquired	9/20/2017 10:15	Sample Name	ICSAB-170920
Data Batch	170920.b	Comment	ICSB6020A_W
Data File Name	020ICSB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
51	V	45	39.479	226352	0.50	40	98.7	80	120	
52	Cr	45	20.662	148251	0.75	20	103.3	80	120	
55	Mn	45	19.392	72296	1.12	20	97.0	80	120	
59	Co	72	39.882	456446	1.12	40	99.7	80	120	
60	Ni	72	38.215	117944	1.06	40	95.5	80	120	
63	Cu	72	20.258	169211	1.56	20	101.3	80	120	
66	Zn	72	20.103	22688	1.06	20	100.5	80	120	
75	As	72	21.174	16054	2.08	20	105.9	80	120	
78	Se	72	21.539	1162	2.20	20	107.7	80	120	
107	Ag	115	18.581	271262	0.83	20	92.9	80	120	
111	Cd	115	10.635	20280	0.87	10	106.3	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1109772	1.31	1088093	101.99	70	120	
72	Ge	725863	1.03	747674	97.08	70	120	
115	In	6881178	1.74	7324583	93.95	70	120	
209	Bi	17190089	1.25	19469673	88.29	70	120	

Initial Calibration Verification (ICV) Report

Date Acquired	9/20/2017 10:21	Sample Name	ICV-170920
Data Batch	170920.b	Comment	ICV 6020A_W
Data File Name	023_ICV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	93.626	6965	1.16	100	93.6	90	110	
11	B	45	99.935	3187	4.80	100	99.9	90	110	
23	Na	45	2504.456	2567633	0.25	2500	100.2	90	110	
24	Mg	45	2490.145	1232630	0.43	2500	99.6	90	110	
27	Al	45	2343.812	386391	0.56	2500	93.8	90	110	
39	K	45	2462.685	1044982	0.39	2500	98.5	90	110	
44	Ca	45	2483.586	53195	0.56	2500	99.3	90	110	
47	Ti	45	100.480	15959	1.57	100	100.5	90	110	
51	V	45	95.206	548363	0.82	100	95.2	90	110	
52	Cr	45	98.084	710270	0.51	100	98.1	90	110	
55	Mn	45	95.591	359357	0.12	100	95.6	90	110	
56	Fe	45	2400.669	13454289	0.94	2500	96.0	90	110	
59	Co	72	95.765	1152626	0.06	100	95.8	90	110	
60	Ni	72	98.232	316528	0.60	100	98.2	90	110	
63	Cu	72	96.767	842692	0.52	100	96.8	90	110	
66	Zn	72	98.604	114915	0.73	100	98.6	90	110	
75	As	72	96.245	76495	0.55	100	96.2	90	110	
78	Se	72	97.414	5466	1.61	100	97.4	90	110	
88	Sr	115	94.616	431939	0.68	100	94.6	90	110	
95	Mo	115	95.308	461007	0.74	100	95.3	90	110	
107	Ag	115	95.899	1541110	0.62	100	95.9	90	110	
111	Cd	115	96.764	203067	0.83	100	96.8	90	110	
118	Sn	115	97.048	417930	0.56	100	97.0	90	110	
121	Sb	115	97.477	527820	0.87	100	97.5	90	110	
137	Ba	115	96.701	186750	0.38	100	96.7	90	110	
205	Tl	209	93.849	3238927	0.25	100	93.8	90	110	
208	Pb	209	95.002	4317322	0.62	100	95.0	90	110	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1123138	0.15	1088093	103.22	70	120	
72	Ge	763474	0.36	747674	102.11	70	120	
115	In	7574887	0.16	7324583	103.42	70	120	
209	Bi	19670448	0.37	19469673	101.03	70	120	

Low Level Calibration Verification (LLCV) Report

Date Acquired	9/20/2017 10:25	Sample Name	LCVL-170920
Data Batch	170920.b	Comment	LCVL6020A_W
Data File Name	025LICV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	1.104	84	18.00	1	110.4	70	130	
11	B	45	20.971	770	9.44	20	104.9	70	130	
23	Na	45	98.452	119147	0.36	100	98.5	70	130	
24	Mg	45	96.072	48278	0.25	100	96.1	70	130	
27	Al	45	98.749	17272	2.18	100	98.7	70	130	
39	K	45	97.749	66119	1.11	100	97.7	70	130	
44	Ca	45	99.951	2323	3.99	100	100.0	70	130	
47	Ti	45	5.091	820	10.38	5	101.8	70	130	
51	V	45	1.052	8995	4.27	1	105.2	70	130	
52	Cr	45	5.008	36981	1.50	5	100.2	70	130	
55	Mn	45	4.974	19125	0.53	5	99.5	70	130	
56	Fe	45	108.226	615562	0.51	100	108.2	70	130	
59	Co	72	4.937	60928	0.45	5	98.7	70	130	
60	Ni	72	4.997	17934	1.46	5	99.9	70	130	
63	Cu	72	4.934	45890	1.50	5	98.7	70	130	
66	Zn	72	4.782	6238	3.43	5	95.6	70	130	
75	As	72	5.054	4180	1.40	5	101.1	70	130	
78	Se	72	5.393	327	3.33	5	107.9	70	130	
88	Sr	115	4.900	22667	0.45	5	98.0	70	130	
95	Mo	115	5.052	24655	0.25	5	101.0	70	130	
107	Ag	115	1.956	31673	0.97	2	97.8	70	130	
111	Cd	115	1.006	2135	0.89	1	100.6	70	130	
118	Sn	115	5.128	22470	2.57	5	102.6	70	130	
121	Sb	115	1.912	10605	1.87	2	95.6	70	130	
137	Ba	115	5.057	9861	3.57	5	101.1	70	130	
205	Tl	209	1.041	36357	1.11	1	104.1	70	130	
208	Pb	209	0.975	46382	0.72	1	97.5	70	130	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1129597	0.37	1088093	103.81	70	120	
72	Ge	781399	0.15	747674	104.51	70	120	
115	In	7624335	0.97	7324583	104.09	70	120	
209	Bi	19804045	0.92	19469673	101.72	70	120	

Initial Calibration Blank (ICB) Report

Date Acquired	9/20/2017 10:30	Sample Name	ICB-170920
Data Batch	170920.b	Comment	ICB 6020A_W
Data File Name	027_ICB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	0.026	4	15.7	0.4	0.3	
11	B	45	1.396	167	14.0	10	10	
23	Na	45	0.552	18946	0.5	50	100	
24	Mg	45	0.321	628	9.9	50	100	
27	Al	45	-0.155	916	5.3	50	10	
39	K	45	2.666	26562	1.7	50	100	
44	Ca	45	-1.130	153	16.9	50	100	
47	Ti	45	-0.029	2	86.6	4	3	
51	V	45	0.062	3297	4.4	4	3	
52	Cr	45	0.004	569	11.0	2	2	
55	Mn	45	-0.039	190	4.6	2	3	
56	Fe	45	0.434	8257	2.3	50	50	
59	Co	72	0.004	169	21.3	2	3	
60	Ni	72	-0.059	1333	4.8	2	3	
63	Cu	72	-0.063	1448	8.2	2	2	
66	Zn	72	-0.192	331	18.7	4	2	
75	As	72	0.029	96	9.2	2	2	
78	Se	72	0.143	27	35.5	1	2	
88	Sr	115	-0.004	142	15.3	4	3	
95	Mo	115	0.111	609	10.7	2	2	
107	Ag	115	0.004	111	4.6	0.4	1	
111	Cd	115	0.003	16	49.5	0.4	0.3	
118	Sn	115	0.067	549	5.8	4	3	
121	Sb	115	0.006	224	15.7	2	0.8	
137	Ba	115	0.021	72	25.4	2	3	
205	Tl	209	0.040	1595	4.6	2	0.5	
208	Pb	209	-0.002	1737	6.0	0.4	0.3	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1131193	0.15	1088093	103.96	70	120	
72	Ge	777088	0.50	747674	103.93	70	120	
115	In	7671354	0.36	7324583	104.73	70	120	
209	Bi	20150115	0.04	19469673	103.49	70	120	

Continuing Calibration Verification (CCV) Report

Date Acquired	9/20/2017 13:04	Sample Name	CCV4-170920
Data Batch	170920.b	Comment	CCV 6020A_W
Data File Name	093_CCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	201.069	13508	0.80	200	100.5	90	110	
11	B	45	214.562	6054	5.41	200	107.3	90	110	
23	Na	45	4868.418	4492756	0.41	5000	97.4	90	110	
24	Mg	45	4826.976	2157812	0.55	5000	96.5	90	110	
27	Al	45	4960.479	737721	1.02	5000	99.2	90	110	
39	K	45	4759.430	1802904	0.94	5000	95.2	90	110	
44	Ca	45	4995.503	96484	0.41	5000	99.9	90	110	
47	Ti	45	209.116	29993	1.24	200	104.6	90	110	
51	V	45	202.150	1048684	0.50	200	101.1	90	110	
52	Cr	45	203.341	1329488	0.23	200	101.7	90	110	
55	Mn	45	202.562	687465	0.13	200	101.3	90	110	
56	Fe	45	5081.023	25715005	0.61	5000	101.6	90	110	
59	Co	72	201.201	2198231	0.46	200	100.6	90	110	
60	Ni	72	209.554	611424	0.29	200	104.8	90	110	
63	Cu	72	206.033	1626736	0.12	200	103.0	90	110	
66	Zn	72	207.099	218550	0.38	200	103.5	90	110	
75	As	72	202.067	145719	0.27	200	101.0	90	110	
78	Se	72	200.095	10174	1.40	200	100.0	90	110	
88	Sr	115	182.801	751409	0.74	200	91.4	90	110	
95	Mo	115	200.156	871844	0.94	200	100.1	90	110	
107	Ag	115	198.607	2874195	0.40	200	99.3	90	110	
111	Cd	115	201.891	381546	0.87	200	100.9	90	110	
118	Sn	115	200.327	776670	0.55	200	100.2	90	110	
121	Sb	115	200.326	976678	0.55	200	100.2	90	110	
137	Ba	115	203.639	354112	0.33	200	101.8	90	110	
205	Tl	209	207.065	6491022	0.30	200	103.5	90	110	
208	Pb	209	199.238	8222845	0.58	200	99.6	90	110	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1014478	0.60	1088093	93.23	70	120	
72	Ge	693065	0.25	747674	92.70	70	120	
115	In	6822228	1.42	7324583	93.14	70	120	
209	Bi	17867830	0.79	19469673	91.77	70	120	

Low Level Calibration Verification (LLCV) Report

Date Acquired	9/20/2017 13:09	Sample Name	LCVL4-170920
Data Batch	170920.b	Comment	LCVL6020A_W
Data File Name	095LCCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	0.862	60	10.41	1	86.2	70	130	
11	B	45	25.229	817	4.30	20	126.1	70	130	
23	Na	45	148.223	154113	0.51	100	148.2	70	130	Fail
24	Mg	45	98.725	44937	0.89	100	98.7	70	130	
27	Al	45	99.711	15794	2.20	100	99.7	70	130	
39	K	45	98.270	60103	1.21	100	98.3	70	130	
44	Ca	45	97.126	2050	3.46	100	97.1	70	130	
47	Ti	45	5.387	786	3.43	5	107.7	70	130	
51	V	45	0.953	7635	1.57	1	95.3	70	130	
52	Cr	45	5.125	34277	0.62	5	102.5	70	130	
55	Mn	45	5.066	17641	1.58	5	101.3	70	130	
56	Fe	45	108.078	556951	0.68	100	108.1	70	130	
59	Co	72	5.055	56189	1.31	5	101.1	70	130	
60	Ni	72	6.468	20504	1.95	5	129.4	70	130	
63	Cu	72	5.221	43633	0.59	5	104.4	70	130	
66	Zn	72	4.779	5614	1.32	5	95.6	70	130	
75	As	72	5.063	3772	1.04	5	101.3	70	130	
78	Se	72	4.844	267	4.95	5	96.9	70	130	
88	Sr	115	4.813	20613	2.60	5	96.3	70	130	
95	Mo	115	4.829	21821	2.05	5	96.6	70	130	
107	Ag	115	1.959	29371	2.13	2	98.0	70	130	
111	Cd	115	0.976	1917	12.21	1	97.6	70	130	
118	Sn	115	5.031	20408	1.43	5	100.6	70	130	
121	Sb	115	1.941	9960	1.98	2	97.0	70	130	
137	Ba	115	5.062	9134	0.59	5	101.2	70	130	
205	Tl	209	1.034	33006	0.46	1	103.4	70	130	
208	Pb	209	0.984	42803	0.99	1	98.4	70	130	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1023403	0.29	1088093	94.05	70	120	
72	Ge	703832	0.64	747674	94.14	70	120	
115	In	7056883	0.77	7324583	96.35	70	120	
209	Bi	18109695	1.35	19469673	93.01	70	120	

Continuing Calibration Blank (CCB) Report

Date Acquired	9/20/2017 13:11	Sample Name	CCB4-170920
Data Batch	170920.b	Comment	CCB 6020A_W
Data File Name	096_CCB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	0.001	2	91.7	0.4	0.3	
11	B	45	1.920	166	15.1	10	10	
23	Na	45	46.888	60169	1.3	50	100	
24	Mg	45	-0.200	333	14.0	50	100	
27	Al	45	-0.527	773	7.1	50	10	
39	K	45	4.101	24593	0.4	50	100	
44	Ca	45	0.392	168	6.1	50	100	
47	Ti	45	-0.036	1	173.2	4	3	
51	V	45	-0.043	2436	3.5	4	3	
52	Cr	45	-0.004	461	10.5	2	2	
55	Mn	45	-0.048	139	9.7	2	3	
56	Fe	45	0.165	6102	4.9	50	50	
59	Co	72	0.008	197	11.9	2	3	
60	Ni	72	1.052	4496	6.1	2	3	
63	Cu	72	-0.037	1522	3.3	2	2	
66	Zn	72	-0.241	248	25.0	4	2	
75	As	72	0.009	73	4.7	2	2	
78	Se	72	0.033	19	0.0	1	2	
88	Sr	115	0.004	162	17.1	4	3	
95	Mo	115	0.042	244	3.2	2	2	
107	Ag	115	0.012	214	19.6	0.4	1	
111	Cd	115	0.007	21	18.2	0.4	0.3	
118	Sn	115	0.011	278	8.7	4	3	
121	Sb	115	0.024	289	1.8	2	0.8	
137	Ba	115	0.019	62	34.4	2	3	
205	Tl	209	0.035	1326	8.0	2	0.5	
208	Pb	209	-0.005	1477	5.8	0.4	0.3	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1024262	0.26	1088093	94.13	70	120	
72	Ge	704433	0.51	747674	94.22	70	120	
115	In	6948900	0.46	7324583	94.87	70	120	
209	Bi	18537028	1.18	19469673	95.21	70	120	

Method Blank Report

Date Acquired	9/20/17 1:13 PM	Sample Name	MB-82405
Data Batch	170920.b	Comment	MBLK6020A_S
Data File Name	097_PB.d	Dilution	5

Mass	Name	IS	Conc (ppb)	CPS	%RSD	High Limit	Flag
9	Be	45	-0.014	1	86.60		
11	B	45	2.962	198	7.02		
23	Na	45	44.010	58396	1.11		
24	Mg	45	3.526	2046	1.55		
27	Al	45	2.997	1322	4.52		
39	K	45	9.519	27054	1.40		
44	Ca	45	14.793	455	3.61		
47	Ti	45	0.145	28	42.13		
51	V	45	-0.099	2178	0.62		
52	Cr	45	0.092	1109	5.42		
55	Mn	45	-0.003	298	12.97		
56	Fe	45	2.654	19116	2.54		
59	Co	72	0.002	129	20.75		
60	Ni	72	1.757	6549	3.09		
63	Cu	72	0.066	2337	4.53		
66	Zn	72	2.788	3472	5.76		
75	As	72	0.022	81	13.25		
78	Se	72	0.149	25	6.93		
88	Sr	115	0.035	300	19.66		
95	Mo	115	0.037	228	21.22		
107	Ag	115	0.009	177	24.53		
111	Cd	115	0.005	18	28.64		
118	Sn	115	4.712	19250	1.00		J
121	Sb	115	0.022	290	15.93		
137	Ba	115	0.046	112	9.07		
205	Tl	209	0.038	1393	8.29		
208	Pb	209	0.247	12224	0.58		

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1040226	0.46	1088093	95.60	70	120	
72	Ge	701063	0.42	747674	93.77	70	120	
115	In	7101873	0.95	7324583	96.96	70	120	
209	Bi	18516675	0.62	19469673	95.11	70	120	

Laboratory Control Sample (LCS) Report

Date Acquired	9/20/2017 13:15	Sample Name	LCS-82405
Data Batch	170920.b	Comment	LCS 6020A_S
Data File Name	098_LS.d	Dilution	5

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	198.737	13697	2.92	200	99.4	80	120	
11	B	45	208.445	6036	1.95	200	104.2	80	120	
23	Na	45	5292.426	5008347	1.57	1000	529.2	80	120	Fail
24	Mg	45	5234.617	2400059	0.47	1000	523.5	80	120	Fail
27	Al	45	1053.396	161364	0.07	1000	105.3	80	120	
39	K	45	5162.752	2004055	1.64	1000	516.3	80	120	Fail
44	Ca	45	5373.659	106453	2.28	1000	537.4	80	120	Fail
47	Ti	45	216.774	31889	1.15	200	108.4	80	120	
51	V	45	206.716	1099761	2.66	200	103.4	80	120	
52	Cr	45	208.610	1398768	3.16	200	104.3	80	120	
55	Mn	45	207.243	721334	2.86	200	103.6	80	120	
56	Fe	45	1049.745	5452858	2.46	1000	105.0	80	120	
59	Co	72	206.444	2277193	1.63	200	103.2	80	120	
60	Ni	72	215.172	633870	0.94	200	107.6	80	120	
63	Cu	72	210.443	1677854	0.56	200	105.2	80	120	
66	Zn	72	208.726	222438	0.89	200	104.4	80	120	
75	As	72	203.981	148563	1.65	200	102.0	80	120	
78	Se	72	200.653	10303	0.10	200	100.3	80	120	
88	Sr	115	204.446	862487	0.89	200	102.2	80	120	
95	Mo	115	208.343	931335	0.85	200	104.2	80	120	
107	Ag	115	202.446	3007130	0.11	200	101.2	80	120	
111	Cd	115	202.923	393616	0.11	200	101.5	80	120	
118	Sn	115	211.015	839712	0.40	200	105.5	80	120	
121	Sb	115	205.775	1029725	0.14	200	102.9	80	120	
137	Ba	115	205.909	367506	0.66	200	103.0	80	120	
205	Tl	209	210.996	6801957	0.87	200	105.5	80	120	
208	Pb	209	203.316	8629224	0.57	200	101.7	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1040571	0.73	1088093	95.63	70	120	
72	Ge	699961	1.57	747674	93.62	70	120	
115	In	7003120	1.79	7324583	95.61	70	120	
209	Bi	18376427	1.39	19469673	94.38	70	120	

Laboratory Control Sample (LCS) Report

Date Acquired	9/20/2017 13:17	Sample Name	LCSD-82405
Data Batch	170920.b	Comment	LCSD6020A_S
Data File Name	099_LS.d	Dilution	5

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	196.521	13656	3.76	200	98.3	80	120	
11	B	45	213.085	6217	1.52	200	106.5	80	120	
23	Na	45	5216.011	4976109	1.08	1000	521.6	80	120	Fail
24	Mg	45	5218.754	2412241	1.33	1000	521.9	80	120	Fail
27	Al	45	1052.288	162520	0.54	1000	105.2	80	120	
39	K	45	5110.924	2000374	0.84	1000	511.1	80	120	Fail
44	Ca	45	5341.225	106679	1.66	1000	534.1	80	120	Fail
47	Ti	45	215.350	31939	1.24	200	107.7	80	120	
51	V	45	205.840	1104044	2.76	200	102.9	80	120	
52	Cr	45	207.811	1404696	3.42	200	103.9	80	120	
55	Mn	45	205.467	720976	2.76	200	102.7	80	120	
56	Fe	45	1042.616	5459804	2.60	1000	104.3	80	120	
59	Co	72	208.729	2287219	2.12	200	104.4	80	120	
60	Ni	72	215.828	631592	0.93	200	107.9	80	120	
63	Cu	72	210.685	1668542	1.00	200	105.3	80	120	
66	Zn	72	209.439	221701	0.72	200	104.7	80	120	
75	As	72	206.398	149303	0.65	200	103.2	80	120	
78	Se	72	201.597	10282	0.81	200	100.8	80	120	
88	Sr	115	203.107	858629	0.53	200	101.6	80	120	
95	Mo	115	207.174	928102	0.30	200	103.6	80	120	
107	Ag	115	201.431	2998190	0.49	200	100.7	80	120	
111	Cd	115	202.879	394343	1.21	200	101.4	80	120	
118	Sn	115	210.896	840925	0.51	200	105.4	80	120	
121	Sb	115	205.361	1029746	0.17	200	102.7	80	120	
137	Ba	115	204.432	365631	0.72	200	102.2	80	120	
205	Tl	209	210.997	6871038	0.82	200	105.5	80	120	
208	Pb	209	202.285	8672746	0.68	200	101.1	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1049130	1.09	1088093	96.42	70	120	
72	Ge	695262	1.34	747674	92.99	70	120	
115	In	7016116	0.51	7324583	95.79	70	120	
209	Bi	18561936	0.64	19469673	95.34	70	120	

Dilution Sample (Dil) Report

Date Acquired	9/20/2017 13:23	Sample Name	1709115-01A SD
Data Batch	170920.b	Comment	SD 6020A_S
Data File Name	102_SD.d	Dilution	25

Mass	Name	IS	Conc	CPS	%RSD	Ref Value	%Rec	Low	High	Flag
9	Be	45	0.437	31	39.24	2.6	84.0	110	90	
11	B	45	10.311	397	19.00	36.3	142.1	110	90	
23	Na	45	157.661	161619	0.59	688.1	114.6	110	90	
24	Mg	45	3570.665	1598017	0.20	17398.0	102.6	110	90	Good
27	Al	45	9026.998	1343220	0.48	45045.6	100.2	110	90	Good
39	K	45	1785.487	691346	0.30	8663.0	103.1	110	90	Good
44	Ca	45	21727.342	419565	0.50	106363.3	102.1	110	90	Good
47	Ti	45	287.315	41252	0.45	1402.3	102.4	110	90	Good
51	V	45	15.542	83152	0.66	76.1	102.1	110	90	Good
52	Cr	45	11.651	76711	1.24	56.5	103.2	110	90	Good
55	Mn	45	459.084	1559381	0.38	2307.3	99.5	110	90	Good
56	Fe	45	13014.304	65927495	0.32	61997.0	105.0	110	90	Good
59	Co	72	9.737	106364	0.67	47.6	102.2	110	90	Good
60	Ni	72	11.080	33578	0.51	52.0	106.5	110	90	Good
63	Cu	72	69.736	551157	0.55	330.9	105.4	110	90	Good
66	Zn	72	273.566	288205	0.26	1284.2	106.5	110	90	Good
75	As	72	5.608	4102	1.03	27.5	101.9	110	90	Good
78	Se	72	2.507	144	7.60	11.4	110.3	110	90	
88	Sr	115	26.414	110880	0.74	131.6	100.3	110	90	Good
95	Mo	115	5.517	24569	1.28	27.9	98.9	110	90	Good
107	Ag	115	0.089	1348	2.53	0.4	122.9	110	90	
111	Cd	115	0.275	539	2.57	1.2	110.6	110	90	
118	Sn	115	5.974	23854	2.53	29.9	99.7	110	90	Good
121	Sb	115	1.154	5910	0.92	5.7	101.3	110	90	Good
137	Ba	115	58.324	103487	0.66	290.9	100.2	110	90	Good
205	Tl	209	0.156	5278	2.15	0.7	119.6	110	90	
208	Pb	209	64.454	2774497	0.08	332.2	97.0	110	90	Good

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1015562	0.30	1088093	93.33	70	120	
72	Ge	692302	0.58	747674	92.59	70	120	
115	In	6958867	0.81	7324583	95.01	70	120	
209	Bi	18628367	0.28	19469673	95.68	70	120	

Post Digestion Spike Sample (PDS) Report

Date Acquired	9/20/2017 13:41	Sample Name	1709115-01A PDS
Data Batch	170920.b	Comment	PDS 6020A_S
Data File Name	112_PDS.d	Dilution	5

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	191.745	13105	0.89	2.6	200	94.6	75	125	
11	B	45	229.728	6585	2.86	36.3	200	96.7	75	125	
23	Na	45	5635.578	5287807	0.82	688.1	5000	98.9	75	125	
24	Mg	45	21772.979	9900261	1.02	17398.0	5000	87.5	75	125	
27	Al	45	49045.196	7412219	1.03	45045.6	5000	80.0	75	125	
39	K	45	13440.037	5136754	0.18	8663.0	5000	95.5	75	125	
44	Ca	45	########	2200235	0.61	106363.3	5000	115.9	75	125	
47	Ti	45	1623.130	236786	0.12	1402.3	200	110.4	75	125	
51	V	45	279.696	1475063	0.11	76.1	200	101.8	75	125	
52	Cr	45	262.175	1743680	0.40	56.5	200	102.9	75	125	
55	Mn	45	2525.333	8715630	0.75	2307.3	200	109.0	75	125	
56	Fe	45	66657.437	343124697	0.73	61997.0	5000	93.2	75	125	
59	Co	72	249.828	2688131	0.39	47.6	200	101.1	75	125	
60	Ni	72	256.397	736485	0.09	52.0	200	102.2	75	125	
63	Cu	72	528.073	4103613	0.29	330.9	200	98.6	75	125	
66	Zn	72	1477.044	1532150	0.54	1284.2	200	96.4	75	125	
75	As	72	232.033	164790	0.62	27.5	200	102.3	75	125	
78	Se	72	207.790	10407	2.76	11.4	200	98.2	75	125	
88	Sr	115	339.840	1391584	0.18	131.6	200	104.1	75	125	
95	Mo	115	236.420	1025928	0.84	27.9	200	104.3	75	125	
107	Ag	115	194.705	2807256	0.18	0.4	200	97.2	75	125	
111	Cd	115	203.883	383870	0.31	1.2	200	101.3	75	125	
118	Sn	115	240.518	928965	0.45	29.9	200	105.3	75	125	
121	Sb	115	203.276	987362	0.54	5.7	200	98.8	75	125	
137	Ba	115	501.964	869629	0.06	290.9	200	105.5	75	125	
205	Tl	209	211.989	6555491	0.92	0.7	200	105.7	75	125	
208	Pb	209	541.127	22028167	0.66	332.2	200	104.5	75	125	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1032026	0.56	1088093	94.85	70	120	
72	Ge	682594	0.60	747674	91.30	70	120	
115	In	6796235	0.29	7324583	92.79	70	120	
209	Bi	17626873	0.86	19469673	90.54	70	120	

Matrix Spike Sample (MS) Report

Date Acquired	9/20/2017 13:43	Sample Name	1709115-01A MS
Data Batch	170920.b	Comment	MS 6020A_S
Data File Name	113_MSS.d	Dilution	5

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	185.829	12515	0.68	2.6	200	91.6	80	120	
11	B	45	219.147	6195	3.78	36.3	200	91.4	80	120	
23	Na	45	12722.659	11742625	0.77	688.1	1000	1203.5	80	120	Fail
24	Mg	45	45668.298	20459685	0.99	17398.0	1000	2827.0	80	120	Fail
27	Al	45	56294.857	8383193	0.87	45045.6	1000	1124.9	80	120	Fail
39	K	45	16322.706	6141918	0.80	8663.0	1000	766.0	80	120	Fail
44	Ca	45	########	2929818	0.21	106363.3	1000	4521.0	80	120	Fail
47	Ti	45	4176.404	600351	0.83	1402.3	200	1387.0	80	120	Fail
51	V	45	311.922	1620650	0.46	76.1	200	117.9	80	120	
52	Cr	45	323.949	2122840	0.18	56.5	200	133.7	80	120	Fail
55	Mn	45	1554.553	5286350	0.79	2307.3	200	-376.4	80	120	Fail
56	Fe	45	64875.345	329042671	0.89	61997.0	1000	287.8	80	120	Fail
59	Co	72	229.095	2403674	0.46	47.6	200	90.7	80	120	
60	Ni	72	351.841	984980	0.22	52.0	200	149.9	80	120	Fail
63	Cu	72	341.983	2591913	0.30	330.9	200	5.5	80	120	Fail
66	Zn	72	587.488	594499	0.27	1284.2	200	-348.3	80	120	Fail
75	As	72	220.439	152656	0.27	27.5	200	96.5	80	120	
78	Se	72	201.534	9841	0.99	11.4	200	95.1	80	120	
88	Sr	115	611.940	2451478	0.34	131.6	200	240.2	80	120	Fail
95	Mo	115	205.861	874041	0.69	27.9	200	89.0	80	120	
107	Ag	115	188.805	2663277	0.37	0.4	200	94.2	80	120	
111	Cd	115	196.021	361102	0.70	1.2	200	97.4	80	120	
118	Sn	115	222.515	840858	0.23	29.9	200	96.3	80	120	
121	Sb	115	177.088	841592	0.32	5.7	200	85.7	80	120	
137	Ba	115	643.172	1090167	0.38	290.9	200	176.1	80	120	Fail
205	Tl	209	207.195	6243180	0.45	0.7	200	103.3	80	120	
208	Pb	209	374.575	14858768	0.62	332.2	200	21.2	80	120	Fail

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1016920	0.75	1088093	93.46	70	120	
72	Ge	665575	0.16	747674	89.02	70	120	
115	In	6649711	0.98	7324583	90.79	70	120	
209	Bi	17176215	1.20	19469673	88.22	70	120	

Matrix Spike Sample (MS) Report

Date Acquired	9/20/2017 13:45	Sample Name	1709115-01A MSD
Data Batch	170920.b	Comment	MSD 6020A_S
Data File Name	114_MSS.d	Dilution	5

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	186.769	12572	1.72	2.6	200	92.1	80	120	
11	B	45	217.235	6138	1.41	36.3	200	90.5	80	120	
23	Na	45	5302.614	4900860	0.71	688.1	1000	461.5	80	120	Fail
24	Mg	45	21099.097	9448190	1.51	17398.0	1000	370.1	80	120	Fail
27	Al	45	45520.018	6775381	1.51	45045.6	1000	47.4	80	120	Fail
39	K	45	13622.243	5126437	4.12	8663.0	1000	495.9	80	120	Fail
44	Ca	45	########	2489880	0.39	106363.3	1000	2252.4	80	120	Fail
47	Ti	45	1700.882	244361	0.74	1402.3	200	149.3	80	120	Fail
51	V	45	269.989	1402346	0.71	76.1	200	96.9	80	120	
52	Cr	45	245.853	1610282	0.52	56.5	200	94.7	80	120	
55	Mn	45	1273.903	4329776	0.64	2307.3	200	-516.7	80	120	Fail
56	Fe	45	50220.167	254569217	0.91	61997.0	1000	#####	80	120	Fail
59	Co	72	213.469	2269252	0.81	47.6	200	82.9	80	120	
60	Ni	72	242.131	687196	0.77	52.0	200	95.0	80	120	
63	Cu	72	344.098	2642296	0.82	330.9	200	6.6	80	120	Fail
66	Zn	72	643.304	659515	0.35	1284.2	200	-320.4	80	120	Fail
75	As	72	219.970	154339	0.56	27.5	200	96.2	80	120	
78	Se	72	205.135	10149	1.87	11.4	200	96.9	80	120	
88	Sr	115	341.336	1386236	0.43	131.6	200	104.9	80	120	
95	Mo	115	205.587	884798	0.10	27.9	200	88.8	80	120	
107	Ag	115	191.865	2743563	0.37	0.4	200	95.8	80	120	
111	Cd	115	196.451	366835	0.28	1.2	200	97.6	80	120	
118	Sn	115	223.325	855489	0.40	29.9	200	96.7	80	120	
121	Sb	115	178.886	861760	0.40	5.7	200	86.6	80	120	
137	Ba	115	456.616	784540	0.63	290.9	200	82.9	80	120	
205	Tl	209	208.638	6402250	1.13	0.7	200	104.0	80	120	
208	Pb	209	396.340	16010279	0.21	332.2	200	32.1	80	120	Fail

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1016341	0.86	1088093	93.41	70	120	
72	Ge	674344	0.20	747674	90.19	70	120	
115	In	6740586	0.85	7324583	92.03	70	120	
209	Bi	17490041	0.29	19469673	89.83	70	120	

Continuing Calibration Verification (CCV) Report

Date Acquired	9/20/2017 13:47	Sample Name	CCV5-170920
Data Batch	170920.b	Comment	CCV 6020A_W
Data File Name	115_CCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	196.268	13123	1.16	200	98.1	90	110	
11	B	45	202.014	5679	4.00	200	101.0	90	110	
23	Na	45	4793.013	4402127	0.20	5000	95.9	90	110	
24	Mg	45	4817.810	2143369	0.63	5000	96.4	90	110	
27	Al	45	4928.789	729472	0.21	5000	98.6	90	110	
39	K	45	4738.835	1786557	0.58	5000	94.8	90	110	
44	Ca	45	5021.244	96514	0.41	5000	100.4	90	110	
47	Ti	45	209.989	29973	1.64	200	105.0	90	110	
51	V	45	202.118	1043517	0.86	200	101.1	90	110	
52	Cr	45	204.521	1330781	0.32	200	102.3	90	110	
55	Mn	45	203.334	686777	0.02	200	101.7	90	110	
56	Fe	45	5200.393	26192936	0.73	5000	104.0	90	110	
59	Co	72	202.516	2214799	0.42	200	101.3	90	110	
60	Ni	72	209.974	613277	0.84	200	105.0	90	110	
63	Cu	72	208.434	1647322	0.42	200	104.2	90	110	
66	Zn	72	208.540	220288	0.90	200	104.3	90	110	
75	As	72	204.365	147521	0.41	200	102.2	90	110	
78	Se	72	200.754	10219	1.46	200	100.4	90	110	
88	Sr	115	181.024	761428	0.53	200	90.5	90	110	
95	Mo	115	200.656	894355	0.45	200	100.3	90	110	
107	Ag	115	197.982	2931772	0.23	200	99.0	90	110	
111	Cd	115	199.734	386242	0.74	200	99.9	90	110	
118	Sn	115	198.369	786961	0.08	200	99.2	90	110	
121	Sb	115	199.312	994330	0.23	200	99.7	90	110	
137	Ba	115	202.422	360216	0.72	200	101.2	90	110	
205	Tl	209	204.948	6714586	0.93	200	102.5	90	110	
208	Pb	209	196.926	8494293	0.37	200	98.5	90	110	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1009598	0.40	1088093	92.79	70	120	
72	Ge	693775	0.88	747674	92.79	70	120	
115	In	6980906	1.14	7324583	95.31	70	120	
209	Bi	18674031	0.28	19469673	95.91	70	120	

Low Level Calibration Verification (LLCV) Report

Date Acquired	9/20/2017 13:53	Sample Name	LCVL5-170920
Data Batch	170920.b	Comment	LCVL6020A_W
Data File Name	118LCCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	0.956	65	7.94	1	95.6	70	130	
11	B	45	25.418	801	6.37	20	127.1	70	130	
23	Na	45	113.922	119195	0.73	100	113.9	70	130	
24	Mg	45	97.089	43078	1.24	100	97.1	70	130	
27	Al	45	97.977	15140	2.08	100	98.0	70	130	
39	K	45	95.968	57731	0.82	100	96.0	70	130	
44	Ca	45	104.248	2132	1.44	100	104.2	70	130	
47	Ti	45	5.101	726	11.07	5	102.0	70	130	
51	V	45	0.972	7537	2.46	1	97.2	70	130	
52	Cr	45	5.120	33376	1.19	5	102.4	70	130	
55	Mn	45	5.027	17061	2.17	5	100.5	70	130	
56	Fe	45	111.026	557475	0.25	100	111.0	70	130	
59	Co	72	5.162	56112	1.08	5	103.2	70	130	
60	Ni	72	5.296	16664	2.14	5	105.9	70	130	
63	Cu	72	5.379	43901	1.20	5	107.6	70	130	
66	Zn	72	5.192	5922	3.16	5	103.8	70	130	
75	As	72	5.184	3775	1.27	5	103.7	70	130	
78	Se	72	4.799	258	4.45	5	96.0	70	130	
88	Sr	115	4.795	20291	1.21	5	95.9	70	130	
95	Mo	115	4.955	22123	0.24	5	99.1	70	130	
107	Ag	115	2.028	30050	1.17	2	101.4	70	130	
111	Cd	115	1.025	1988	3.33	1	102.5	70	130	
118	Sn	115	5.114	20498	0.99	5	102.3	70	130	
121	Sb	115	2.075	10515	1.08	2	103.8	70	130	
137	Ba	115	5.030	8972	3.12	5	100.6	70	130	
205	Tl	209	1.006	33494	0.45	1	100.6	70	130	
208	Pb	209	1.193	53730	2.09	1	119.3	70	130	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	997443	0.47	1088093	91.67	70	120	
72	Ge	688272	0.33	747674	92.06	70	120	
115	In	6973814	1.05	7324583	95.21	70	120	
209	Bi	18880710	1.42	19469673	96.97	70	120	

Continuing Calibration Blank (CCB) Report

Date Acquired	9/20/2017 13:58	Sample Name	CCB5-170920
Data Batch	170920.b	Comment	CCB 6020A_W
Data File Name	119_CCB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	-0.013	1	86.6	0.4	0.3	
11	B	45	2.939	188	21.5	10	10	
23	Na	45	15.376	29946	0.9	50	100	
24	Mg	45	-0.158	341	14.2	50	100	
27	Al	45	-0.704	723	8.0	50	10	
39	K	45	1.715	22946	1.0	50	100	
44	Ca	45	0.207	159	26.9	50	100	
47	Ti	45	0.012	8	49.5	4	3	
51	V	45	-0.074	2202	5.7	4	3	
52	Cr	45	-0.020	341	7.8	2	2	
55	Mn	45	-0.037	173	8.4	2	3	
56	Fe	45	0.576	7944	4.6	50	50	
59	Co	72	-0.001	98	34.1	2	3	
60	Ni	72	0.013	1385	2.4	2	3	
63	Cu	72	0.023	1948	6.0	2	2	
66	Zn	72	-0.116	371	7.2	4	2	
75	As	72	0.004	67	2.2	2	2	
78	Se	72	0.128	23	36.9	1	2	
88	Sr	115	-0.011	102	10.0	4	3	
95	Mo	115	0.010	104	37.0	2	2	
107	Ag	115	0.012	227	8.9	0.4	1	
111	Cd	115	0.001	11	17.3	0.4	0.3	
118	Sn	115	0.017	304	9.1	4	3	
121	Sb	115	0.045	399	22.4	2	0.8	
137	Ba	115	0.011	48	4.0	2	3	
205	Tl	209	0.031	1180	2.7	2	0.5	
208	Pb	209	0.157	8508	1.1	0.4	0.3	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	992089	0.67	1088093	91.18	70	120	
72	Ge	685599	0.30	747674	91.70	70	120	
115	In	6997526	0.49	7324583	95.53	70	120	
209	Bi	18752655	1.32	19469673	96.32	70	120	

Method Blank Report

Date Acquired	9/20/17 2:09 PM	Sample Name	MB-82466
Data Batch	170920.b	Comment	MBLK6020A_DW
Data File Name	125_LRB.d	Dilution	1

Mass	Name	IS	Conc (ppb)	CPS	%RSD	High Limit	Flag
9	Be	45	-0.008	1	0.00		
11	B	45	2.231	171	21.55		
23	Na	45	16.949	31777	0.52		
24	Mg	45	1.974	1290	3.62		
27	Al	45	2.303	1176	10.47		
39	K	45	1.775	23275	1.95		
44	Ca	45	8.809	326	12.52		
47	Ti	45	0.059	14	93.26		
51	V	45	-0.080	2200	4.10		
52	Cr	45	0.764	5426	2.05		
55	Mn	45	0.153	814	3.80		
56	Fe	45	4.919	29829	0.80		
59	Co	72	0.004	148	22.82		
60	Ni	72	0.531	2923	5.12		
63	Cu	72	0.051	2201	3.12		
66	Zn	72	0.280	797	4.93		
75	As	72	-0.008	59	12.66		
78	Se	72	0.069	20	18.31		
88	Sr	115	0.031	280	17.78		
95	Mo	115	0.023	166	34.25		
107	Ag	115	0.008	162	15.56		
111	Cd	115	-0.004	0	#DIV/0!		
118	Sn	115	0.015	298	7.28		
121	Sb	115	0.018	267	12.31		
137	Ba	115	0.031	84	35.38		
205	Tl	209	0.009	489	11.62		
208	Pb	209	0.114	6671	4.52		

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1005286	0.23	1088093	92.39	70	120	
72	Ge	696859	0.46	747674	93.20	70	120	
115	In	7030202	0.71	7324583	95.98	70	120	
209	Bi	18884811	0.17	19469673	97.00	70	120	

Laboratory Control Sample (LCS) Report

Date Acquired	9/20/2017 14:11	Sample Name	LCS-82466
Data Batch	170920.b	Comment	LCS 6020A_DW
Data File Name	126_LFB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	201.163	13208	0.92	200	100.6	80	120	
11	B	45	203.571	5620	3.85	200	101.8	80	120	
23	Na	45	5269.576	4752033	2.78	5000	105.4	80	120	
24	Mg	45	5234.131	2286812	1.52	5000	104.7	80	120	
27	Al	45	5104.034	741814	0.84	5000	102.1	80	120	
39	K	45	5145.699	1903173	0.77	5000	102.9	80	120	
44	Ca	45	5397.748	101879	1.32	5000	108.0	80	120	
47	Ti	45	216.586	30361	1.54	200	108.3	80	120	
51	V	45	203.636	1032393	0.10	200	101.8	80	120	
52	Cr	45	204.064	1303836	0.58	200	102.0	80	120	
55	Mn	45	202.638	672051	0.91	200	101.3	80	120	
56	Fe	45	5154.197	25488908	1.67	5000	103.1	80	120	
59	Co	72	202.024	2164747	1.87	200	101.0	80	120	
60	Ni	72	209.197	598644	1.08	200	104.6	80	120	
63	Cu	72	208.814	1616932	0.79	200	104.4	80	120	
66	Zn	72	209.861	217197	0.90	200	104.9	80	120	
75	As	72	205.611	145420	0.60	200	102.8	80	120	
78	Se	72	206.147	10280	2.78	200	103.1	80	120	
88	Sr	115	201.837	825814	1.10	200	100.9	80	120	
95	Mo	115	205.353	890364	0.21	200	102.7	80	120	
107	Ag	115	203.240	2927821	0.19	200	101.6	80	120	
111	Cd	115	205.146	385914	0.59	200	102.6	80	120	
118	Sn	115	204.571	789479	0.32	200	102.3	80	120	
121	Sb	115	205.584	997722	0.26	200	102.8	80	120	
137	Ba	115	207.059	358434	0.13	200	103.5	80	120	
205	Tl	209	210.512	6822021	1.03	200	105.3	80	120	
208	Pb	209	199.949	8530661	0.49	200	100.0	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	991496	1.19	1088093	91.12	70	120	
72	Ge	679722	0.40	747674	90.91	70	120	
115	In	6790598	0.54	7324583	92.71	70	120	
209	Bi	18470678	0.66	19469673	94.87	70	120	

Laboratory Control Sample (LCS) Report

Date Acquired	9/20/2017 14:13	Sample Name	LCSD-82466
Data Batch	170920.b	Comment	LCSD6020A_DW
Data File Name	127_LFB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	203.817	13315	2.74	200	101.9	80	120	
11	B	45	219.439	6019	2.72	200	109.7	80	120	
23	Na	45	5201.379	4666876	1.68	5000	104.0	80	120	
24	Mg	45	5210.108	2264949	1.35	5000	104.2	80	120	
27	Al	45	5086.898	735668	2.11	5000	101.7	80	120	
39	K	45	5125.899	1886612	1.34	5000	102.5	80	120	
44	Ca	45	5321.504	99947	1.57	5000	106.4	80	120	
47	Ti	45	213.563	29787	0.50	200	106.8	80	120	
51	V	45	204.118	1029722	0.78	200	102.1	80	120	
52	Cr	45	206.167	1310803	0.84	200	103.1	80	120	
55	Mn	45	206.369	681090	0.64	200	103.2	80	120	
56	Fe	45	5182.603	25505802	1.35	5000	103.7	80	120	
59	Co	72	202.607	2184572	0.35	200	101.3	80	120	
60	Ni	72	210.502	606152	0.39	200	105.3	80	120	
63	Cu	72	209.168	1629850	0.24	200	104.6	80	120	
66	Zn	72	210.127	218833	0.09	200	105.1	80	120	
75	As	72	204.375	145451	0.69	200	102.2	80	120	
78	Se	72	205.020	10288	0.90	200	102.5	80	120	
88	Sr	115	198.567	824113	0.58	200	99.3	80	120	
95	Mo	115	202.165	889105	0.16	200	101.1	80	120	
107	Ag	115	201.307	2941541	0.18	200	100.7	80	120	
111	Cd	115	203.460	388237	0.53	200	101.7	80	120	
118	Sn	115	202.183	791455	0.36	200	101.1	80	120	
121	Sb	115	202.730	997974	0.40	200	101.4	80	120	
137	Ba	115	204.128	358422	0.76	200	102.1	80	120	
205	Tl	209	211.338	6742462	0.47	200	105.7	80	120	
208	Pb	209	200.516	8422133	0.27	200	100.3	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	986593	0.93	1088093	90.67	70	120	
72	Ge	683994	0.40	747674	91.48	70	120	
115	In	6887838	0.45	7324583	94.04	70	120	
209	Bi	18184590	0.58	19469673	93.40	70	120	

Sample Report

Date Acquired	9/20/17 2:17 PM	Sample Name	1709161-01A
Data Batch	170920.b	Comment	SAMP6020A_DW
Data File Name	129_ARF.d	Dilution	1

Mass	Name	IS	Conc (ppb)	CPS	%RSD	High Limit	Flag
9	Be	45	0.022	3	0.00	2000	
11	B	45	172.563	4850	1.62	2000	>RL
23	Na	45	26009.883	23725457	1.61	25000	OUTCAL
24	Mg	45	29502.135	13074911	0.19	25000	OUTCAL
27	Al	45	14.920	3034	3.46	10000	
39	K	45	534.845	220971	1.35	25000	>RL
44	Ca	45	67879.381	1298021	1.01	10000	OUTCAL
47	Ti	45	0.389	61	58.83	2000	
51	V	45	1.234	8942	2.58	2000	
52	Cr	45	0.036	713	6.54	2000	
55	Mn	45	6355.718	21377923	0.68	2000	OUTCAL
56	Fe	45	4.648	28483	0.63	10000	
59	Co	72	0.985	10453	1.01	2000	
60	Ni	72	15.387	44411	3.77	2000	>RL
63	Cu	72	1.546	13449	3.05	2000	
66	Zn	72	23.110	23885	1.97	2000	>RL
75	As	72	0.640	506	5.66	2000	
78	Se	72	0.114	22	19.80	2000	
88	Sr	115	504.198	2024623	0.55	2000	>RL
95	Mo	115	40.025	170377	1.20	2000	>RL
107	Ag	115	0.026	410	2.93	500	
111	Cd	115	0.323	606	10.76	2000	
118	Sn	115	0.127	707	5.36	2000	
121	Sb	115	1.304	6376	2.02	500	
137	Ba	115	99.383	168870	0.70	2000	>RL
205	Tl	209	0.145	4685	8.47	2000	
208	Pb	209	1.315	55416	1.57	2000	>RL

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1006085	1.66	1088093	92.46	70	120	
72	Ge	666721	2.16	747674	89.17	70	120	
115	In	6665082	1.07	7324583	91.00	70	120	
209	Bi	17720903	1.97	19469673	91.02	70	120	

Dilution Sample (Dil) Report

Date Acquired	9/20/2017 14:19	Sample Name	1709161-01A SD
Data Batch	170920.b	Comment	SD 6020A_DW
Data File Name	130_SD.d	Dilution	5

Mass	Name	IS	Conc	CPS	%RSD	Ref Value	%Rec	Low	High	Flag
9	Be	45	-0.003	1	43.30	0.0	-69.1	110	90	
11	B	45	38.655	1159	9.44	172.6	112.0	110	90	
23	Na	45	5405.940	4892022	0.47	26009.9	103.9	110	90	Good
24	Mg	45	6249.007	2740227	0.37	29502.1	105.9	110	90	Good
27	Al	45	3.408	1325	10.47	14.9	114.2	110	90	
39	K	45	112.744	63754	0.69	534.8	105.4	110	90	Good
44	Ca	45	13878.675	262676	0.06	67879.4	102.2	110	90	Good
47	Ti	45	0.044	12	78.69	0.4	56.2	110	90	
51	V	45	0.239	3798	3.07	1.2	96.8	110	90	Good
52	Cr	45	0.004	496	9.76	0.0	49.5	110	90	
55	Mn	45	1296.719	4315622	0.50	6355.7	102.0	110	90	Good
56	Fe	45	1.471	12411	0.74	4.6	158.2	110	90	
59	Co	72	0.213	2420	4.08	1.0	108.2	110	90	Good
60	Ni	72	3.254	10769	1.92	15.4	105.7	110	90	Good
63	Cu	72	0.329	4354	0.93	1.5	106.3	110	90	Good
66	Zn	72	4.786	5504	1.98	23.1	103.6	110	90	Good
75	As	72	0.157	177	5.15	0.6	122.5	110	90	
78	Se	72	0.119	23	19.92	0.1	519.1	110	90	
88	Sr	115	101.232	418427	0.78	504.2	100.4	110	90	Good
95	Mo	115	7.920	34740	0.65	40.0	98.9	110	90	Good
107	Ag	115	0.016	279	10.71	0.0	312.7	110	90	
111	Cd	115	0.070	141	15.19	0.3	108.2	110	90	Good
118	Sn	115	0.048	419	10.01	0.1	189.6	110	90	
121	Sb	115	0.264	1466	4.90	1.3	101.3	110	90	Good
137	Ba	115	19.942	34895	0.22	99.4	100.3	110	90	Good
205	Tl	209	0.054	1890	2.14	0.1	184.4	110	90	
208	Pb	209	0.337	15895	1.69	1.3	128.2	110	90	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	995176	0.40	1088093	91.46	70	120	
72	Ge	689008	0.21	747674	92.15	70	120	
115	In	6859570	1.26	7324583	93.65	70	120	
209	Bi	18288948	0.82	19469673	93.94	70	120	

Post Digestion Spike Sample (PDS) Report

Date Acquired	9/20/2017 14:21	Sample Name	1709161-01A PDS
Data Batch	170920.b	Comment	PDS 6020A_DW
Data File Name	131_PDS.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	198.951	12861	0.74	0.0	200	99.5	75	125	
11	B	45	374.247	10080	0.83	172.6	200	100.8	75	125	
23	Na	45	30466.381	26969011	1.39	26009.9	5000	89.1	75	125	
24	Mg	45	34136.346	14680479	0.53	29502.1	5000	92.7	75	125	
27	Al	45	4882.186	698618	0.33	14.9	5000	97.3	75	125	
39	K	45	5387.151	1960592	0.27	534.8	5000	97.0	75	125	
44	Ca	45	69730.067	1293877	0.49	67879.4	5000	37.0	75	125	Fail
47	Ti	45	209.545	28920	2.39	0.4	200	104.6	75	125	
51	V	45	205.796	1027237	0.79	1.2	200	102.3	75	125	
52	Cr	45	206.024	1296121	0.74	0.0	200	103.0	75	125	
55	Mn	45	6529.545	21314004	0.72	6355.7	200	86.9	75	125	
56	Fe	45	5020.614	24449407	1.30	4.6	5000	100.3	75	125	
59	Co	72	197.648	2059947	0.54	1.0	200	98.3	75	125	
60	Ni	72	214.998	598386	0.33	15.4	200	99.8	75	125	
63	Cu	72	198.344	1493973	0.17	1.5	200	98.4	75	125	
66	Zn	72	222.500	223951	0.73	23.1	200	99.7	75	125	
75	As	72	207.006	142404	0.15	0.6	200	103.2	75	125	
78	Se	72	202.650	9830	0.61	0.1	200	101.3	75	125	
88	Sr	115	667.124	2678882	0.39	504.2	200	81.5	75	125	
95	Mo	115	238.698	1015773	0.38	40.0	200	99.3	75	125	
107	Ag	115	192.440	2720908	0.41	0.0	200	96.2	75	125	
111	Cd	115	199.109	367630	0.25	0.3	200	99.4	75	125	
118	Sn	115	202.228	766019	0.35	0.1	200	101.1	75	125	
121	Sb	115	193.183	920183	1.16	1.3	200	95.9	75	125	
137	Ba	115	295.223	501592	0.96	99.4	200	97.9	75	125	
205	Tl	209	208.567	6340122	0.13	0.1	200	104.2	75	125	
208	Pb	209	197.957	7922445	0.26	1.3	200	98.3	75	125	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	976116	0.50	1088093	89.71	70	120	
72	Ge	661147	0.18	747674	88.43	70	120	
115	In	6665285	0.98	7324583	91.00	70	120	
209	Bi	17327475	0.98	19469673	89.00	70	120	

Matrix Spike Sample (MS) Report

Date Acquired	9/20/2017 14:23	Sample Name	1709161-01A MS
Data Batch	170920.b	Comment	MS 6020A_DW
Data File Name	132_MSW.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	198.585	12860	0.49	0.0	200	99.3	80	120	
11	B	45	385.377	10394	1.25	172.6	200	106.4	80	120	
23	Na	45	32091.777	28456590	0.81	26009.9	5000	121.6	80	120	Fail
24	Mg	45	36447.870	15702413	1.62	29502.1	5000	138.9	80	120	Fail
27	Al	45	5057.915	724994	0.55	14.9	5000	100.9	80	120	
39	K	45	5660.549	2062540	0.85	534.8	5000	102.5	80	120	
44	Ca	45	74016.816	1375796	0.65	67879.4	5000	122.7	80	120	Fail
47	Ti	45	212.746	29413	1.93	0.4	200	106.2	80	120	
51	V	45	206.860	1034321	1.24	1.2	200	102.8	80	120	
52	Cr	45	204.150	1286546	0.74	0.0	200	102.1	80	120	
55	Mn	45	6863.309	22441397	0.58	6355.7	200	253.8	80	120	Fail
56	Fe	45	5174.421	25241219	0.51	4.6	5000	103.4	80	120	
59	Co	72	201.523	2091939	0.57	1.0	200	100.3	80	120	
60	Ni	72	222.307	616225	0.79	15.4	200	103.5	80	120	
63	Cu	72	205.213	1539518	0.98	1.5	200	101.8	80	120	
66	Zn	72	229.320	229881	0.63	23.1	200	103.1	80	120	
75	As	72	212.676	145719	0.53	0.6	200	106.0	80	120	
78	Se	72	208.222	10060	1.19	0.1	200	104.1	80	120	
88	Sr	115	716.954	2827641	0.30	504.2	200	106.4	80	120	
95	Mo	115	251.107	1049566	0.72	40.0	200	105.5	80	120	
107	Ag	115	199.593	2771850	0.47	0.0	200	99.8	80	120	
111	Cd	115	204.566	370986	0.59	0.3	200	102.1	80	120	
118	Sn	115	208.127	774308	0.91	0.1	200	104.0	80	120	
121	Sb	115	212.553	994425	0.63	1.3	200	105.6	80	120	
137	Ba	115	308.029	514021	0.79	99.4	200	104.3	80	120	
205	Tl	209	214.388	6469809	2.62	0.1	200	107.1	80	120	
208	Pb	209	202.508	8046859	0.15	1.3	200	100.6	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	977812	0.68	1088093	89.86	70	120	
72	Ge	658513	0.73	747674	88.07	70	120	
115	In	6546214	0.18	7324583	89.37	70	120	
209	Bi	17203721	0.89	19469673	88.36	70	120	

Matrix Spike Sample (MS) Report

Date Acquired	9/20/2017 14:25	Sample Name	1709161-01A MSD
Data Batch	170920.b	Comment	MSD 6020A_DW
Data File Name	133_MSW.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	201.740	13076	0.55	0.0	200	100.9	80	120	
11	B	45	397.231	10720	2.16	172.6	200	112.3	80	120	
23	Na	45	32358.520	28717936	0.42	26009.9	5000	127.0	80	120	Fail
24	Mg	45	35645.879	15369785	0.43	29502.1	5000	122.9	80	120	Fail
27	Al	45	5077.797	728482	0.26	14.9	5000	101.3	80	120	
39	K	45	5672.666	2068751	0.20	534.8	5000	102.8	80	120	
44	Ca	45	74524.427	1386452	0.37	67879.4	5000	132.9	80	120	Fail
47	Ti	45	213.830	29587	1.41	0.4	200	106.7	80	120	
51	V	45	207.041	1036134	0.30	1.2	200	102.9	80	120	
52	Cr	45	204.704	1291187	0.46	0.0	200	102.3	80	120	
55	Mn	45	6844.635	22401045	0.84	6355.7	200	244.5	80	120	Fail
56	Fe	45	5196.467	25371268	0.21	4.6	5000	103.8	80	120	
59	Co	72	202.450	2101379	0.06	1.0	200	100.7	80	120	
60	Ni	72	222.997	618063	0.41	15.4	200	103.8	80	120	
63	Cu	72	206.470	1548774	0.37	1.5	200	102.5	80	120	
66	Zn	72	231.609	232149	0.22	23.1	200	104.2	80	120	
75	As	72	215.114	147371	0.60	0.6	200	107.2	80	120	
78	Se	72	214.412	10357	0.13	0.1	200	107.1	80	120	
88	Sr	115	713.030	2830509	0.35	504.2	200	104.4	80	120	
95	Mo	115	250.987	1055916	0.12	40.0	200	105.5	80	120	
107	Ag	115	199.350	2786547	0.14	0.0	200	99.7	80	120	
111	Cd	115	203.794	371997	0.36	0.3	200	101.7	80	120	
118	Sn	115	207.026	775247	0.58	0.1	200	103.4	80	120	
121	Sb	115	209.069	984522	0.07	1.3	200	103.9	80	120	
137	Ba	115	307.389	516299	0.35	99.4	200	104.0	80	120	
205	Tl	209	214.408	6457793	1.16	0.1	200	107.1	80	120	
208	Pb	209	203.403	8065586	0.34	1.3	200	101.0	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	978674	0.20	1088093	89.94	70	120	
72	Ge	658455	0.55	747674	88.07	70	120	
115	In	6589086	0.61	7324583	89.96	70	120	
209	Bi	17167277	0.27	19469673	88.17	70	120	

Continuing Calibration Verification (CCV) Report

Date Acquired	9/20/2017 14:27	Sample Name	CCV6-170920
Data Batch	170920.b	Comment	CCV 6020A_W
Data File Name	134_CCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	201.786	12972	0.44	200	100.9	90	110	
11	B	45	215.033	5804	1.64	200	107.5	90	110	
23	Na	45	4887.893	4315951	0.33	5000	97.8	90	110	
24	Mg	45	4901.604	2096574	0.23	5000	98.0	90	110	
27	Al	45	4983.136	709080	0.33	5000	99.7	90	110	
39	K	45	4767.493	1727931	0.35	5000	95.3	90	110	
44	Ca	45	5031.637	92986	0.81	5000	100.6	90	110	
47	Ti	45	209.876	28803	0.40	200	104.9	90	110	
51	V	45	203.676	1011008	0.52	200	101.8	90	110	
52	Cr	45	205.822	1287626	0.28	200	102.9	90	110	
55	Mn	45	208.984	678655	0.80	200	104.5	90	110	
56	Fe	45	5251.016	25427901	1.07	5000	105.0	90	110	
59	Co	72	202.128	2135626	0.40	200	101.1	90	110	
60	Ni	72	210.285	593359	0.25	200	105.1	90	110	
63	Cu	72	207.996	1588144	0.07	200	104.0	90	110	
66	Zn	72	208.277	212550	0.64	200	104.1	90	110	
75	As	72	203.506	141923	0.35	200	101.8	90	110	
78	Se	72	200.798	9874	0.37	200	100.4	90	110	
88	Sr	115	180.860	732250	0.40	200	90.4	90	110	
95	Mo	115	200.476	860026	0.89	200	100.2	90	110	
107	Ag	115	198.787	2833532	0.36	200	99.4	90	110	
111	Cd	115	202.788	377474	0.41	200	101.4	90	110	
118	Sn	115	198.813	759227	0.22	200	99.4	90	110	
121	Sb	115	199.037	955776	0.43	200	99.5	90	110	
137	Ba	115	200.900	344122	0.26	200	100.5	90	110	
205	Tl	209	211.980	6556226	0.62	200	106.0	90	110	
208	Pb	209	199.732	8132767	0.29	200	99.9	90	110	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	970680	0.12	1088093	89.21	70	120	
72	Ge	670251	0.42	747674	89.64	70	120	
115	In	6719854	1.28	7324583	91.74	70	120	
209	Bi	17628506	0.68	19469673	90.54	70	120	

Low Level Calibration Verification (LLCV) Report

Date Acquired	9/20/2017 14:31	Sample Name	LCVL6-170920
Data Batch	170920.b	Comment	LCVL6020A_W
Data File Name	136LCCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	1.021	67	6.51	1	102.1	70	130	
11	B	45	26.541	808	6.32	20	132.7	70	130	Fail
23	Na	45	109.970	112294	0.29	100	110.0	70	130	
24	Mg	45	100.289	43203	0.76	100	100.3	70	130	
27	Al	45	99.568	14930	2.87	100	99.6	70	130	
39	K	45	96.336	56201	0.67	100	96.3	70	130	
44	Ca	45	103.921	2065	5.44	100	103.9	70	130	
47	Ti	45	5.451	752	10.71	5	109.0	70	130	
51	V	45	1.008	7498	0.34	1	100.8	70	130	
52	Cr	45	5.124	32440	1.05	5	102.5	70	130	
55	Mn	45	5.344	17598	0.47	5	106.9	70	130	
56	Fe	45	109.676	534924	0.65	100	109.7	70	130	
59	Co	72	5.188	54328	0.41	5	103.8	70	130	
60	Ni	72	5.309	16088	1.04	5	106.2	70	130	
63	Cu	72	5.307	41751	0.43	5	106.1	70	130	
66	Zn	72	4.968	5480	2.06	5	99.4	70	130	
75	As	72	5.117	3591	0.64	5	102.3	70	130	
78	Se	72	5.283	273	3.24	5	105.7	70	130	
88	Sr	115	4.784	19553	0.36	5	95.7	70	130	
95	Mo	115	5.071	21865	2.29	5	101.4	70	130	
107	Ag	115	1.996	28550	3.22	2	99.8	70	130	
111	Cd	115	1.056	1978	3.20	1	105.6	70	130	
118	Sn	115	5.127	19844	0.39	5	102.5	70	130	
121	Sb	115	2.177	10641	0.82	2	108.8	70	130	
137	Ba	115	4.976	8571	5.56	5	99.5	70	130	
205	Tl	209	1.054	33988	1.61	1	105.4	70	130	
208	Pb	209	1.046	45800	0.57	1	104.6	70	130	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	968740	0.23	1088093	89.03	70	120	
72	Ge	663065	0.31	747674	88.68	70	120	
115	In	6734484	0.79	7324583	91.94	70	120	
209	Bi	18282891	1.15	19469673	93.90	70	120	

Continuing Calibration Blank (CCB) Report

Date Acquired	9/20/2017 14:33	Sample Name	CCB6-170920
Data Batch	170920.b	Comment	CCB 6020A_W
Data File Name	137_CCB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	0.071	6	16.7	0.4	0.3	
11	B	45	4.217	217	19.6	10	10	
23	Na	45	12.285	26412	1.8	50	100	
24	Mg	45	0.411	573	7.0	50	100	
27	Al	45	-0.380	749	10.3	50	10	
39	K	45	0.492	21878	0.6	50	100	
44	Ca	45	-0.061	150	4.0	50	100	
47	Ti	45	0.014	8	24.7	4	3	
51	V	45	-0.012	2448	7.4	4	3	
52	Cr	45	-0.008	407	8.9	2	2	
55	Mn	45	0.153	779	3.1	2	3	
56	Fe	45	0.367	6718	5.0	50	50	
59	Co	72	0.008	182	15.6	2	3	
60	Ni	72	0.025	1382	7.2	2	3	
63	Cu	72	-0.017	1592	2.1	2	2	
66	Zn	72	-0.265	211	15.8	4	2	
75	As	72	0.024	79	10.1	2	2	
78	Se	72	0.092	21	37.2	1	2	
88	Sr	115	0.009	180	19.5	4	3	
95	Mo	115	0.065	342	15.1	2	2	
107	Ag	115	0.022	360	7.9	0.4	1	
111	Cd	115	0.000	8	65.5	0.4	0.3	
118	Sn	115	0.050	421	5.7	4	3	
121	Sb	115	0.116	732	6.4	2	0.8	
137	Ba	115	0.020	62	12.4	2	3	
205	Tl	209	0.059	2043	1.3	2	0.5	
208	Pb	209	0.061	4194	5.6	0.4	0.3	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	964686	0.79	1088093	88.66	70	120	
72	Ge	668026	0.88	747674	89.35	70	120	
115	In	6792759	1.19	7324583	92.74	70	120	
209	Bi	18182403	1.24	19469673	93.39	70	120	

Method Blank Report

Date Acquired	9/20/17 2:54 PM	Sample Name	MB-82465
Data Batch	170920.b	Comment	MBLK6020A_DW
Data File Name	148_LRB.d	Dilution	1

Mass	Name	IS	Conc (ppb)	CPS	%RSD	High Limit	Flag
9	Be	45	0.013	2	49.49		
11	B	45	2.322	168	19.30		
23	Na	45	8.071	22902	0.74		
24	Mg	45	1.448	1022	11.14		
27	Al	45	1.180	977	1.81		
39	K	45	-0.122	21823	1.86		
44	Ca	45	4.127	228	11.77		
47	Ti	45	0.046	12	15.73		
51	V	45	-0.037	2344	1.24		
52	Cr	45	-0.033	254	22.78		
55	Mn	45	-0.035	174	19.14		
56	Fe	45	0.177	5849	3.43		
59	Co	72	-0.003	67	0.00		
60	Ni	72	-0.010	1277	4.62		
63	Cu	72	-0.014	1609	8.52		
66	Zn	72	-0.039	438	12.33		
75	As	72	-0.016	51	10.52		
78	Se	72	0.142	23	36.93		
88	Sr	115	0.012	197	4.48		
95	Mo	115	0.002	69	29.56		
107	Ag	115	0.010	183	35.07		
111	Cd	115	-0.003	2	173.21		
118	Sn	115	-0.002	226	11.29		
121	Sb	115	0.032	326	7.26		
137	Ba	115	0.017	58	29.04		
205	Tl	209	0.015	636	8.72		
208	Pb	209	0.025	2721	3.54		

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	971972	0.32	1088093	89.33	70	120	
72	Ge	664760	0.34	747674	88.91	70	120	
115	In	6877667	1.06	7324583	93.90	70	120	
209	Bi	18277118	0.32	19469673	93.87	70	120	

Method Blank Report

Date Acquired	9/20/17 2:56 PM	Sample Name	MB-82393-FILTER
Data Batch	170920.b	Comment	MBLK6020A_DW
Data File Name	149_LRB.d	Dilution	1

Mass	Name	IS	Conc (ppb)	CPS	%RSD	High Limit	Flag
9	Be	45	-0.018	0	173.21		
11	B	45	3.951	211	15.97		
23	Na	45	10.934	25436	0.33		
24	Mg	45	2.317	1395	6.78		
27	Al	45	9.076	2101	6.99		
39	K	45	1.842	22539	1.35		
44	Ca	45	23.674	590	4.01		
47	Ti	45	0.021	9	57.30		
51	V	45	-0.033	2360	8.44		
52	Cr	45	-0.012	384	7.87		
55	Mn	45	-0.009	260	14.10		
56	Fe	45	0.789	8824	2.54		
59	Co	72	-0.006	44	26.35		
60	Ni	72	-0.003	1315	6.22		
63	Cu	72	-0.003	1710	2.06		
66	Zn	72	0.199	687	11.96		
75	As	72	0.001	63	21.45		
78	Se	72	0.136	23	21.56		
88	Sr	115	0.137	714	2.57		
95	Mo	115	0.003	72	9.61		
107	Ag	115	0.008	162	15.69		
111	Cd	115	-0.004	0	#DIV/0!		
118	Sn	115	0.008	263	11.25		
121	Sb	115	0.089	609	0.32		
137	Ba	115	0.032	84	12.06		
205	Tl	209	0.012	562	12.68		
208	Pb	209	0.025	2665	5.30		

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	972413	0.38	1088093	89.37	70	120	
72	Ge	673379	0.39	747674	90.06	70	120	
115	In	6867563	0.79	7324583	93.76	70	120	
209	Bi	18099690	0.86	19469673	92.96	70	120	

Report with Larson samples only

Laboratory Control Sample (LCS) Report

Date Acquired	9/20/2017 14:58	Sample Name	LCS-82465
Data Batch	170920.b	Comment	LCS 6020A_DW
Data File Name	150_LFB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	205.869	12994	1.29	200	102.9	80	120	
11	B	45	211.013	5594	2.48	200	105.5	80	120	
23	Na	45	5200.177	4506969	0.61	5000	104.0	80	120	
24	Mg	45	5210.034	2187834	0.46	5000	104.2	80	120	
27	Al	45	5118.384	715035	0.33	5000	102.4	80	120	
39	K	45	5095.577	1811710	0.13	5000	101.9	80	120	
44	Ca	45	5299.965	96154	0.76	5000	106.0	80	120	
47	Ti	45	216.825	29214	1.15	200	108.4	80	120	
51	V	45	206.302	1005368	0.61	200	103.2	80	120	
52	Cr	45	208.656	1281570	0.21	200	104.3	80	120	
55	Mn	45	207.550	661736	1.00	200	103.8	80	120	
56	Fe	45	5341.105	25393670	0.80	5000	106.8	80	120	
59	Co	72	205.093	2132470	0.51	200	102.5	80	120	
60	Ni	72	212.086	588902	0.16	200	106.0	80	120	
63	Cu	72	210.533	1581910	0.23	200	105.3	80	120	
66	Zn	72	210.710	211611	0.69	200	105.4	80	120	
75	As	72	205.208	140832	0.23	200	102.6	80	120	
78	Se	72	200.889	9721	0.95	200	100.4	80	120	
88	Sr	115	199.017	790347	0.81	200	99.5	80	120	
95	Mo	115	204.899	862263	0.56	200	102.4	80	120	
107	Ag	115	202.776	2835244	0.21	200	101.4	80	120	
111	Cd	115	204.149	372757	0.22	200	102.1	80	120	
118	Sn	115	202.721	759356	0.22	200	101.4	80	120	
121	Sb	115	204.653	964004	0.38	200	102.3	80	120	
137	Ba	115	205.087	344580	0.26	200	102.5	80	120	
205	Tl	209	210.841	6464634	0.61	200	105.4	80	120	
208	Pb	209	200.199	8081537	0.23	200	100.1	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	953010	0.56	1088093	87.59	70	120	
72	Ge	659583	0.42	747674	88.22	70	120	
115	In	6590905	0.47	7324583	89.98	70	120	
209	Bi	17477285	0.89	19469673	89.77	70	120	

Laboratory Control Sample (LCS) Report

Date Acquired	9/20/2017 15:00	Sample Name	LCSD-82465
Data Batch	170920.b	Comment	LCSD6020A_DW
Data File Name	151_LFB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	208.120	13240	1.30	200	104.1	80	120	
11	B	45	215.545	5758	1.64	200	107.8	80	120	
23	Na	45	5219.712	4560062	0.30	5000	104.4	80	120	
24	Mg	45	5232.818	2214942	0.65	5000	104.7	80	120	
27	Al	45	5134.921	723064	0.48	5000	102.7	80	120	
39	K	45	5084.218	1822202	0.37	5000	101.7	80	120	
44	Ca	45	5289.910	96738	0.16	5000	105.8	80	120	
47	Ti	45	215.381	29254	2.15	200	107.7	80	120	
51	V	45	206.437	1014072	0.70	200	103.2	80	120	
52	Cr	45	208.826	1292894	0.41	200	104.4	80	120	
55	Mn	45	208.341	669564	0.92	200	104.2	80	120	
56	Fe	45	5308.670	25441579	1.07	5000	106.2	80	120	
59	Co	72	207.260	2137712	0.68	200	103.6	80	120	
60	Ni	72	214.877	591849	0.41	200	107.4	80	120	
63	Cu	72	213.011	1587688	0.38	200	106.5	80	120	
66	Zn	72	213.733	212916	0.64	200	106.9	80	120	
75	As	72	209.390	142550	0.39	200	104.7	80	120	
78	Se	72	208.979	10031	2.12	200	104.5	80	120	
88	Sr	115	199.984	799821	0.58	200	100.0	80	120	
95	Mo	115	205.263	869910	0.34	200	102.6	80	120	
107	Ag	115	204.046	2873179	0.66	200	102.0	80	120	
111	Cd	115	206.157	379087	0.63	200	103.1	80	120	
118	Sn	115	204.226	770374	0.64	200	102.1	80	120	
121	Sb	115	204.654	970809	0.52	200	102.3	80	120	
137	Ba	115	206.543	349477	0.21	200	103.3	80	120	
205	Tl	209	213.388	6595440	0.09	200	106.7	80	120	
208	Pb	209	201.824	8212626	0.24	200	100.9	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	960653	0.75	1088093	88.29	70	120	
72	Ge	654295	0.23	747674	87.51	70	120	
115	In	6637498	0.61	7324583	90.62	70	120	
209	Bi	17617513	0.75	19469673	90.49	70	120	

Dilution Sample (Dil) Report

Date Acquired	9/20/2017 15:06	Sample Name	1709153-01B SD
Data Batch	170920.b	Comment	SD 6020A_DW
Data File Name	154_SD.d	Dilution	5

Mass	Name	IS	Conc	CPS	%RSD	Ref Value	%Rec	Low	High	Flag
9	Be	45	0.013	2	65.47	0.0	-514.5	110	90	
11	B	45	49.761	1421	4.96	234.9	105.9	110	90	Good
23	Na	45	2154.763	1906575	0.34	10859.3	99.2	110	90	Good
24	Mg	45	488.301	208693	0.51	2398.6	101.8	110	90	Good
27	Al	45	4.264	1410	8.19	25.0	85.4	110	90	
39	K	45	3729.771	1353124	0.25	19246.5	96.9	110	90	Good
44	Ca	45	6580.302	121250	0.19	32429.9	101.5	110	90	Good
47	Ti	45	0.070	16	75.27	0.5	75.8	110	90	
51	V	45	0.248	3742	4.66	1.3	96.9	110	90	Good
52	Cr	45	-0.007	418	10.29	0.0	-222.3	110	90	
55	Mn	45	1.516	5195	4.73	7.4	101.8	110	90	Good
56	Fe	45	4.008	24329	2.83	18.1	110.6	110	90	
59	Co	72	0.063	761	4.98	0.3	92.1	110	90	Good
60	Ni	72	0.308	2169	2.09	1.4	113.4	110	90	
63	Cu	72	0.216	3350	4.31	0.8	139.1	110	90	
66	Zn	72	0.040	518	9.13	0.5	36.3	110	90	
75	As	72	0.464	384	6.38	2.2	107.5	110	90	Good
78	Se	72	0.214	26	23.12	0.5	227.8	110	90	
88	Sr	115	73.021	297190	0.88	366.1	99.7	110	90	Good
95	Mo	115	1.067	4660	2.11	5.0	106.5	110	90	Good
107	Ag	115	0.012	217	7.69	0.0	295.6	110	90	
111	Cd	115	0.000	9	43.25	0.0	32.1	110	90	
118	Sn	115	0.026	327	15.03	0.1	133.3	110	90	
121	Sb	115	0.220	1228	4.87	0.9	119.1	110	90	
137	Ba	115	28.376	48868	0.94	142.1	99.8	110	90	Good
205	Tl	209	0.034	1253	5.46	0.1	260.2	110	90	
208	Pb	209	0.031	2917	6.49	0.1	151.2	110	90	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	968223	0.41	1088093	88.98	70	120	
72	Ge	665861	0.62	747674	89.06	70	120	
115	In	6752537	1.27	7324583	92.19	70	120	
209	Bi	18017933	1.12	19469673	92.54	70	120	

Post Digestion Spike Sample (PDS) Report

Date Acquired	9/20/2017 15:25	Sample Name	1709153-01B PDS
Data Batch	170920.b	Comment	PDS 6020A_DW
Data File Name	164_PDS.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	183.698	13581	0.39	0.0	200	91.9	75	125	
11	B	45	429.754	13220	1.70	234.9	200	97.4	75	125	
23	Na	45	18375.562	18618752	7.31	10859.3	5000	150.3	75	125	Fail
24	Mg	45	7251.959	3567464	2.01	2398.6	5000	97.1	75	125	
27	Al	45	5248.985	858981	1.43	25.0	5000	104.5	75	125	
39	K	45	24712.603	10195542	1.50	19246.5	5000	109.3	75	125	
44	Ca	45	37683.155	799784	1.29	32429.9	5000	105.1	75	125	
47	Ti	45	216.786	34220	2.73	0.5	200	108.2	75	125	
51	V	45	206.345	1177975	1.42	1.3	200	102.5	75	125	
52	Cr	45	201.440	1449358	1.05	0.0	200	100.7	75	125	
55	Mn	45	205.160	766234	1.24	7.4	200	98.9	75	125	
56	Fe	45	4837.820	26943901	1.60	18.1	5000	96.4	75	125	
59	Co	72	199.183	2264105	0.93	0.3	200	99.4	75	125	
60	Ni	72	202.712	615417	1.02	1.4	200	100.7	75	125	
63	Cu	72	198.934	1634256	1.24	0.8	200	99.1	75	125	
66	Zn	72	205.595	225721	0.48	0.5	200	102.5	75	125	
75	As	72	214.303	160783	1.06	2.2	200	106.1	75	125	
78	Se	72	208.606	11035	0.64	0.5	200	104.1	75	125	
88	Sr	115	612.827	2536453	2.10	366.1	200	123.3	75	125	
95	Mo	115	206.065	903799	0.20	5.0	200	100.5	75	125	
107	Ag	115	185.094	2697286	0.34	0.0	200	92.5	75	125	
111	Cd	115	194.590	370296	0.33	0.0	200	97.3	75	125	
118	Sn	115	208.851	815355	0.50	0.1	200	104.4	75	125	
121	Sb	115	196.355	963946	0.75	0.9	200	97.7	75	125	
137	Ba	115	342.676	600062	0.62	142.1	200	100.3	75	125	
205	Tl	209	202.145	5457773	0.58	0.1	200	101.0	75	125	
208	Pb	209	200.698	7134024	0.70	0.1	200	100.3	75	125	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1116365	1.07	1088093	102.60	70	120	
72	Ge	721128	1.66	747674	96.45	70	120	
115	In	6869989	1.45	7324583	93.79	70	120	
209	Bi	15388984	0.56	19469673	79.04	70	120	

Matrix Spike Sample (MS) Report

Date Acquired	9/20/2017 15:27	Sample Name	1709153-01B MS
Data Batch	170920.b	Comment	MS 6020A_DW
Data File Name	165_MSW.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	182.731	12469	3.14	0.0	200	91.4	80	120	
11	B	45	424.372	12054	3.80	234.9	200	94.7	80	120	
23	Na	45	16902.571	15807524	3.17	10859.3	5000	120.9	80	120	Fail
24	Mg	45	7530.291	3419849	2.09	2398.6	5000	102.6	80	120	
27	Al	45	5337.752	806399	1.27	25.0	5000	106.3	80	120	
39	K	45	25628.770	9762036	2.48	19246.5	5000	127.6	80	120	Fail
44	Ca	45	38724.654	758701	0.19	32429.9	5000	125.9	80	120	Fail
47	Ti	45	218.496	31837	1.32	0.5	200	109.0	80	120	
51	V	45	206.019	1085839	2.13	1.3	200	102.4	80	120	
52	Cr	45	198.454	1318291	1.94	0.0	200	99.2	80	120	
55	Mn	45	208.054	717364	1.20	7.4	200	100.3	80	120	
56	Fe	45	4972.962	25568788	1.22	18.1	5000	99.1	80	120	
59	Co	72	199.857	2108430	0.40	0.3	200	99.8	80	120	
60	Ni	72	203.356	572974	0.16	1.4	200	101.0	80	120	
63	Cu	72	200.834	1531201	0.22	0.8	200	100.0	80	120	
66	Zn	72	206.654	210577	0.38	0.5	200	103.1	80	120	
75	As	72	217.816	151669	0.30	2.2	200	107.8	80	120	
78	Se	72	212.077	10412	0.94	0.5	200	105.8	80	120	
88	Sr	115	614.880	2416431	0.42	366.1	200	124.4	80	120	Fail
95	Mo	115	209.252	871529	0.49	5.0	200	102.1	80	120	
107	Ag	115	188.072	2602541	0.21	0.0	200	94.0	80	120	
111	Cd	115	196.878	355784	0.94	0.0	200	98.4	80	120	
118	Sn	115	207.020	767465	0.54	0.1	200	103.5	80	120	
121	Sb	115	212.037	988503	0.70	0.9	200	105.6	80	120	
137	Ba	115	357.386	594265	0.34	142.1	200	107.6	80	120	
205	Tl	209	206.539	5537668	0.20	0.1	200	103.2	80	120	
208	Pb	209	205.078	7240097	0.79	0.1	200	102.5	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1030623	0.98	1088093	94.72	70	120	
72	Ge	669234	0.46	747674	89.51	70	120	
115	In	6523018	0.67	7324583	89.06	70	120	
209	Bi	15289352	2.67	19469673	78.53	70	120	

Matrix Spike Sample (MS) Report

Date Acquired	9/20/2017 15:29	Sample Name	1709153-01B MSD
Data Batch	170920.b	Comment	MSD 6020A_DW
Data File Name	166_MSW.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	180.533	11685	1.56	0.0	200	90.3	80	120	
11	B	45	437.720	11784	3.34	234.9	200	101.4	80	120	
23	Na	45	16405.931	14547112	2.75	10859.3	5000	110.9	80	120	
24	Mg	45	7559.743	3255133	3.72	2398.6	5000	103.2	80	120	
27	Al	45	5345.399	765722	2.28	25.0	5000	106.4	80	120	
39	K	45	25476.644	9200949	1.18	19246.5	5000	124.6	80	120	Fail
44	Ca	45	38964.169	723949	0.77	32429.9	5000	130.7	80	120	Fail
47	Ti	45	223.448	30875	0.68	0.5	200	111.5	80	120	
51	V	45	206.566	1032280	2.75	1.3	200	102.6	80	120	
52	Cr	45	200.587	1263392	3.38	0.0	200	100.3	80	120	
55	Mn	45	211.716	692174	2.49	7.4	200	102.1	80	120	
56	Fe	45	5121.899	24972091	0.85	18.1	5000	102.1	80	120	
59	Co	72	199.817	2041506	0.99	0.3	200	99.7	80	120	
60	Ni	72	204.145	557058	1.50	1.4	200	101.4	80	120	
63	Cu	72	202.331	1493958	1.06	0.8	200	100.8	80	120	
66	Zn	72	206.538	203827	1.06	0.5	200	103.0	80	120	
75	As	72	214.720	144796	0.91	2.2	200	106.3	80	120	
78	Se	72	213.858	10168	1.85	0.5	200	106.7	80	120	
88	Sr	115	606.736	2330150	0.45	366.1	200	120.3	80	120	Fail
95	Mo	115	209.383	852206	0.38	5.0	200	102.2	80	120	
107	Ag	115	190.654	2578260	0.86	0.0	200	95.3	80	120	
111	Cd	115	198.069	349767	0.14	0.0	200	99.0	80	120	
118	Sn	115	207.749	752607	0.72	0.1	200	103.8	80	120	
121	Sb	115	211.310	962642	0.66	0.9	200	105.2	80	120	
137	Ba	115	356.379	579076	0.21	142.1	200	107.1	80	120	
205	Tl	209	204.536	5484317	1.62	0.1	200	102.2	80	120	
208	Pb	209	203.835	7196277	1.68	0.1	200	101.9	80	120	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	977300	0.45	1088093	89.82	70	120	
72	Ge	648118	0.48	747674	86.68	70	120	
115	In	6374411	0.68	7324583	87.03	70	120	
209	Bi	15285120	1.88	19469673	78.51	70	120	

Continuing Calibration Verification (CCV) Report

Date Acquired	9/20/2017 15:35	Sample Name	CCV7-170920
Data Batch	170920.b	Comment	CCV 6020A_W
Data File Name	169_CCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	184.709	10684	1.49	200	92.4	90	110	
11	B	45	212.174	5154	6.39	200	106.1	90	110	
23	Na	45	5109.238	4058919	0.09	5000	102.2	90	110	
24	Mg	45	4838.630	1862339	0.20	5000	96.8	90	110	
27	Al	45	5152.842	659767	0.04	5000	103.1	90	110	
39	K	45	4901.461	1598027	0.29	5000	98.0	90	110	
44	Ca	45	5076.996	84426	0.77	5000	101.5	90	110	
47	Ti	45	212.589	26252	2.49	200	106.3	90	110	
51	V	45	204.006	911215	0.22	200	102.0	90	110	
52	Cr	45	201.913	1136673	0.20	200	101.0	90	110	
55	Mn	45	205.493	600486	0.19	200	102.7	90	110	
56	Fe	45	5173.907	22545495	0.28	5000	103.5	90	110	
59	Co	72	197.484	1869652	0.21	200	98.7	90	110	
60	Ni	72	202.913	513081	0.58	200	101.5	90	110	
63	Cu	72	201.212	1376703	0.42	200	100.6	90	110	
66	Zn	72	205.224	187670	0.29	200	102.6	90	110	
75	As	72	206.861	129263	0.33	200	103.4	90	110	
78	Se	72	201.065	8860	0.92	200	100.5	90	110	
88	Sr	115	192.032	680838	0.19	200	96.0	90	110	
95	Mo	115	200.819	754503	0.35	200	100.4	90	110	
107	Ag	115	195.741	2443323	0.28	200	97.9	90	110	
111	Cd	115	201.614	328643	0.30	200	100.8	90	110	
118	Sn	115	206.400	690230	0.21	200	103.2	90	110	
121	Sb	115	210.485	885157	0.31	200	105.2	90	110	
137	Ba	115	213.206	319820	0.44	200	106.6	90	110	
205	Tl	209	198.259	5287189	0.38	200	99.1	90	110	
208	Pb	209	199.053	6988679	0.42	200	99.5	90	110	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	873479	0.60	1088093	80.28	70	120	
72	Ge	600579	0.65	747674	80.33	70	120	
115	In	5884820	1.45	7324583	80.34	70	120	
209	Bi	15199988	0.08	19469673	78.07	70	120	

Low Level Calibration Verification (LLCV) Report

Date Acquired	9/20/2017 15:40	Sample Name	LCVL7-170920
Data Batch	170920.b	Comment	LCVL6020A_W
Data File Name	171LCCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	0.990	58	18.70	1	99.0	70	130	
11	B	45	41.230	1061	4.93	20	206.1	70	130	Fail
23	Na	45	400.382	325825	0.69	100	400.4	70	130	Fail
24	Mg	45	99.249	37933	1.00	100	99.2	70	130	
27	Al	45	104.518	13867	2.13	100	104.5	70	130	
39	K	45	106.134	52962	0.79	100	106.1	70	130	
44	Ca	45	102.620	1811	6.68	100	102.6	70	130	
47	Ti	45	5.281	647	5.23	5	105.6	70	130	
51	V	45	1.150	7277	3.97	1	115.0	70	130	
52	Cr	45	5.086	28569	1.45	5	101.7	70	130	
55	Mn	45	5.116	14959	0.74	5	102.3	70	130	
56	Fe	45	108.818	470899	0.91	100	108.8	70	130	
59	Co	72	5.016	47323	1.21	5	100.3	70	130	
60	Ni	72	5.058	13865	1.02	5	101.2	70	130	
63	Cu	72	5.126	36384	1.96	5	102.5	70	130	
66	Zn	72	4.986	4954	1.30	5	99.7	70	130	
75	As	72	5.070	3207	5.15	5	101.4	70	130	
78	Se	72	5.072	236	10.27	5	101.4	70	130	
88	Sr	115	5.195	18529	2.83	5	103.9	70	130	
95	Mo	115	5.046	19000	0.88	5	100.9	70	130	
107	Ag	115	1.969	24600	1.39	2	98.4	70	130	
111	Cd	115	1.038	1698	5.68	1	103.8	70	130	
118	Sn	115	5.136	17364	2.54	5	102.7	70	130	
121	Sb	115	2.122	9064	2.28	2	106.1	70	130	
137	Ba	115	5.123	7702	3.25	5	102.5	70	130	
205	Tl	209	1.023	27452	0.76	1	102.3	70	130	
208	Pb	209	0.977	35723	1.52	1	97.7	70	130	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	859452	0.67	1088093	78.99	70	120	
72	Ge	597383	0.60	747674	79.90	70	120	
115	In	5881743	1.33	7324583	80.30	70	120	
209	Bi	15222951	1.00	19469673	78.19	70	120	

Continuing Calibration Blank (CCB) Report

Date Acquired	9/20/2017 15:44	Sample Name	CCB7-170920
Data Batch	170920.b	Comment	CCB 6020A_W
Data File Name	172_CCB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	-0.017	0	173.2	0.4	0.3	
11	B	45	15.261	447	12.9	10	10	FailAq FailSoil
23	Na	45	267.048	219450	1.5	50	100	FailAq FailSoil
24	Mg	45	-0.051	332	9.5	50	100	
27	Al	45	-0.851	601	9.2	50	10	
39	K	45	8.609	21812	1.2	50	100	
44	Ca	45	-0.650	123	24.5	50	100	
47	Ti	45	-0.006	4	43.4	4	3	
51	V	45	0.118	2718	1.7	4	3	
52	Cr	45	-0.013	331	20.2	2	2	
55	Mn	45	-0.030	168	5.7	2	3	
56	Fe	45	0.025	4471	5.2	50	50	
59	Co	72	-0.001	78	19.8	2	3	
60	Ni	72	-0.104	908	1.2	2	3	
63	Cu	72	-0.044	1237	3.7	2	2	
66	Zn	72	-0.284	170	28.5	4	2	
75	As	72	0.021	69	14.8	2	2	
78	Se	72	0.168	22	16.4	1	2	
88	Sr	115	0.024	216	5.0	4	3	
95	Mo	115	0.023	139	14.1	2	2	
107	Ag	115	0.013	196	12.9	0.4	1	
111	Cd	115	-0.002	4	43.4	0.4	0.3	
118	Sn	115	0.010	238	20.1	4	3	
121	Sb	115	0.063	418	7.7	2	0.8	
137	Ba	115	0.008	37	15.7	2	3	
205	Tl	209	0.025	817	7.8	2	0.5	
208	Pb	209	-0.014	899	3.9	0.4	0.3	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	849630	0.34	1088093	78.08	70	120	
72	Ge	594043	0.17	747674	79.45	70	120	
115	In	6016591	0.09	7324583	82.14	70	120	
209	Bi	15583229	0.56	19469673	80.04	70	120	

Continuing Calibration Verification (CCV) Report

Date Acquired	9/20/2017 15:53	Sample Name	CCV8-170920
Data Batch	170920.b	Comment	CCV 6020A_W
Data File Name	177_CCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	188.458	10535	0.70	200	94.2	90	110	
11	B	45	211.474	4965	1.42	200	105.7	90	110	
23	Na	45	4999.864	3838364	0.30	5000	100.0	90	110	
24	Mg	45	4906.482	1824788	0.13	5000	98.1	90	110	
27	Al	45	5157.277	638070	0.30	5000	103.1	90	110	
39	K	45	4886.637	1539513	0.22	5000	97.7	90	110	
44	Ca	45	5141.054	82611	1.24	5000	102.8	90	110	
47	Ti	45	217.605	25968	2.29	200	108.8	90	110	
51	V	45	205.818	888302	0.36	200	102.9	90	110	
52	Cr	45	205.349	1117046	0.48	200	102.7	90	110	
55	Mn	45	208.740	589403	0.15	200	104.4	90	110	
56	Fe	45	5261.178	22153226	0.80	5000	105.2	90	110	
59	Co	72	201.095	1840269	0.33	200	100.5	90	110	
60	Ni	72	206.543	504776	0.29	200	103.3	90	110	
63	Cu	72	204.516	1352537	0.26	200	102.3	90	110	
66	Zn	72	209.666	185321	0.51	200	104.8	90	110	
75	As	72	208.234	125780	0.76	200	104.1	90	110	
78	Se	72	205.636	8759	1.48	200	102.8	90	110	
88	Sr	115	200.727	668578	0.51	200	100.4	90	110	
95	Mo	115	211.333	745904	0.22	200	105.7	90	110	
107	Ag	115	206.768	2424760	0.25	200	103.4	90	110	
111	Cd	115	213.224	326528	0.81	200	106.6	90	110	
118	Sn	115	217.944	684681	0.32	200	109.0	90	110	
121	Sb	115	220.697	871892	0.34	200	110.3	90	110	Fail
137	Ba	115	224.587	316479	0.38	200	112.3	90	110	Fail
205	Tl	209	198.637	5409889	0.40	200	99.3	90	110	
208	Pb	209	199.411	7150168	0.33	200	99.7	90	110	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	844030	0.56	1088093	77.57	70	120	
72	Ge	580533	0.87	747674	77.65	70	120	
115	In	5527747	0.05	7324583	75.47	70	120	
209	Bi	15523438	0.44	19469673	79.73	70	120	

Low Level Calibration Verification (LLCV) Report

Date Acquired	9/20/2017 15:58	Sample Name	LCVL8-170920
Data Batch	170920.b	Comment	LCVL6020A_W
Data File Name	179LCCV.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	1.145	67	9.08	1	114.5	70	130	
11	B	45	29.655	796	5.58	20	148.3	70	130	Fail
23	Na	45	292.745	243817	0.52	100	292.7	70	130	Fail
24	Mg	45	99.206	38204	1.72	100	99.2	70	130	
27	Al	45	102.406	13705	2.63	100	102.4	70	130	
39	K	45	104.255	52764	1.92	100	104.3	70	130	
44	Ca	45	107.663	1908	6.31	100	107.7	70	130	
47	Ti	45	5.649	697	9.96	5	113.0	70	130	
51	V	45	1.127	7226	1.32	1	112.7	70	130	
52	Cr	45	5.067	28677	1.13	5	101.3	70	130	
55	Mn	45	5.126	15099	1.50	5	102.5	70	130	
56	Fe	45	109.213	476133	0.57	100	109.2	70	130	
59	Co	72	5.023	47712	0.70	5	100.5	70	130	
60	Ni	72	5.069	13985	3.76	5	101.4	70	130	
63	Cu	72	5.113	36543	0.24	5	102.3	70	130	
66	Zn	72	4.948	4953	3.89	5	99.0	70	130	
75	As	72	5.128	3264	2.34	5	102.6	70	130	
78	Se	72	5.362	251	7.34	5	107.2	70	130	
88	Sr	115	5.070	18784	2.23	5	101.4	70	130	
95	Mo	115	4.949	19346	1.07	5	99.0	70	130	
107	Ag	115	1.930	25041	0.42	2	96.5	70	130	
111	Cd	115	1.027	1745	5.08	1	102.7	70	130	
118	Sn	115	5.180	18177	1.13	5	103.6	70	130	
121	Sb	115	2.096	9296	1.06	2	104.8	70	130	
137	Ba	115	5.229	8164	0.21	5	104.6	70	130	
205	Tl	209	1.020	28669	1.33	1	102.0	70	130	
208	Pb	209	0.982	37610	0.90	1	98.2	70	130	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	865909	0.19	1088093	79.58	70	120	
72	Ge	601404	0.26	747674	80.44	70	120	
115	In	6106712	0.92	7324583	83.37	70	120	
209	Bi	15943698	0.33	19469673	81.89	70	120	

Continuing Calibration Blank (CCB) Report

Date Acquired	9/20/2017 16:12	Sample Name	CCB8-170920
Data Batch	170920.b	Comment	CCB 6020A_W
Data File Name	186_CCB.d	Dilution	1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	-0.023	0	#DIV/0!	0.4	0.3	
11	B	45	8.607	293	6.3	10	10	
23	Na	45	156.780	134937	0.2	50	100	FailAq FailSoil
24	Mg	45	-0.128	304	6.0	50	100	
27	Al	45	-0.002	709	1.4	50	10	
39	K	45	7.452	21514	1.2	50	100	
44	Ca	45	-1.362	111	21.1	50	100	
47	Ti	45	0.012	7	173.2	4	3	
51	V	45	0.038	2379	3.1	4	3	
52	Cr	45	-0.015	320	10.6	2	2	
55	Mn	45	-0.038	144	5.8	2	3	
56	Fe	45	-0.011	4329	3.3	50	50	
59	Co	72	-0.005	41	12.4	2	3	
60	Ni	72	-0.089	944	2.9	2	3	
63	Cu	72	-0.047	1216	7.0	2	2	
66	Zn	72	-0.217	231	20.0	4	2	
75	As	72	0.016	65	21.9	2	2	
78	Se	72	0.116	19	37.5	1	2	
88	Sr	115	0.011	162	10.5	4	3	
95	Mo	115	0.004	67	20.0	2	2	
107	Ag	115	0.010	158	6.1	0.4	1	
111	Cd	115	-0.003	2	173.2	0.4	0.3	
118	Sn	115	0.010	229	8.5	4	3	
121	Sb	115	0.029	264	19.3	2	0.8	
137	Ba	115	0.014	44	22.9	2	3	
205	Tl	209	0.008	380	14.5	2	0.5	
208	Pb	209	-0.023	577	11.9	0.4	0.3	

QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	852181	0.20	1088093	78.32	70	120	
72	Ge	594080	0.52	747674	79.46	70	120	
115	In	5834485	1.22	7324583	79.66	70	120	
209	Bi	15736787	1.09	19469673	80.83	70	120	