



September 18, 2017

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

Order No.: 1709083

RE: Houston Scrap-Harvey Sampling

Dear Dawn Denham:

DHL Analytical, Inc. received 2 sample(s) on 9/13/2017 for the analyses presented in the following report.

Revision Number 1 for Work Order 1709083: This revision consists of correcting the Metals analyte list for the soil sample. 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,

A handwritten signature in red ink, appearing to read 'John DuPont'.

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

<b>Miscellaneous Documents .....</b>	<b>3</b>
<b>CaseNarrative 1709083 .....</b>	<b>10</b>
<b>WorkOrderSampleSummary 1709083 .....</b>	<b>11</b>
<b>PrepDatesReport 1709083 .....</b>	<b>12</b>
<b>AnalyticalDatesReport 1709083 .....</b>	<b>13</b>
<b>Analytical Report 1709083 .....</b>	<b>14</b>
<b>AnalyticalQCSummaryReport 1709083 .....</b>	<b>16</b>
<b>MQLSummaryReport 1709083 .....</b>	<b>26</b>
<b>CETAC2_HG Raw Data .....</b>	<b>27</b>
<b>ICP-MS4 Raw Data .....</b>	<b>66</b>
<b>Pmoist Raw Data .....</b>	<b>133</b>

CLIENT: Weston Solutions  
 ADDRESS: 5599 San Felipe, Suite 700, Houston, TX 77056  
 PHONE: (713) 985-6610 FAX/E-MAIL: \_\_\_\_\_  
 DATA REPORTED TO: Dawn Denham  
 ADDITIONAL REPORT COPIES TO: \_\_\_\_\_

DATE: 9/12/17 PAGE 1 OF 1  
 PO #: \_\_\_\_\_ DHL WORK ORDER #: 1709083  
 PROJECT LOCATION OR NAME: Harvey Superfund  
 CLIENT PROJECT #: 02444.034.001.000 COLLECTOR: Michael Kanock

Authorize 5% surcharge for TRRP Report?  
 Yes  No

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

**PRESERVATION**  
 HCl HNO<sub>3</sub> H<sub>2</sub>SO<sub>4</sub> NaOH ICE UNPRESERVED

**ANALYSES**  
 BTEX  MTBE  IMETHOD 80211  
 TPH 1005  TPH 1006  HOLD 1006   
 GRO (METHOD 8015)  DRO (METHOD 8105)   
 VOC 8260  VOC 624  VOC 8260/5035   
 SVOC 8270 (PAH) 8270 (HOLD) PAH  SVOC 8250  
 8270 PEST  625 PEST/PCB  808 PCB   
 8270 O-P PEST  8082 PCB  8270 PCB   
 8321 HERB  T PHOS, AMMONIA   
 METALS 6020  METALS 2008  DBS: METALS   
 PH  HEX CHROM  ALKALINITY  COD   
 CHLORIDE  ANIONS   
 TCLP-SVOC  VOCC  PEST  HERB   
 TCLP-METALS  RCRA 800 TX-11  P6   
 RC10 FLASHPOINT  DGAS   
 TDS  TSS  % MOISTURE  CYANIDE

Field Sample I.D. | DHL Lab # | Date | Time | Matrix | Container Type | # of Containers | HCl | HNO<sub>3</sub> | H<sub>2</sub>SO<sub>4</sub> | NaOH | ICE | UNPRESERVED | ANALYSES | FIELD NOTES

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	ICE	UNPRESERVED	ANALYSES	FIELD NOTES	
Scrap W-1	01	9/12/17	0830	W	500ml poly	1		X						X	See table in FSD for specific analytes
Scrap SO-1	02		0905	S	4oz glass	1				X	X		X		

RELINQUISHED BY: (Signature) _____	DATE/TIME <u>9/12/17 17:00</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	<b>TURN AROUND TIME</b> RUSH <input type="checkbox"/> CALL FIRST 1 DAY <input type="checkbox"/> CALL FIRST 2 DAY <input type="checkbox"/> NORMAL <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> 3 day	<b>LABORATORY USE ONLY:</b> RECEIVING TEMP: <u>4.5</u> THERM #: <u>73</u> CUSTODY SEALS: <input type="checkbox"/> BROKEN <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> NOT USED CARRIER: <input type="checkbox"/> LONE STAR <input checked="" type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> OTHER <input type="checkbox"/> COURIER DELIVERY <input type="checkbox"/> HAND DELIVERED
RELINQUISHED BY: (Signature) <u>Fed Ex</u>	DATE/TIME <u>9/13/17 9:15</u>	RECEIVED BY: (Signature) _____		
RELINQUISHED BY: (Signature) _____	DATE/TIME _____	RECEIVED BY: (Signature) _____		

DHL DISPOSAL @ \$5.00 each  Return 3

State Superfund Site	Soil COCs	Soil Analytical Methods	Water COCs	Water Analytical Methods
<del>Hall Street</del>	<del>Arsenic</del>	<del>SW6020A</del>	<del>1,2-Dichlorobenzene</del>	<del>SW8260C</del>
	<del>Barium</del>		<del>1,4-Dichlorobenzene</del>	
	<del>Cadmium</del>		<del>bis(2-chloroethyl)ether</del>	
	<del>Lead</del>	<del>Benzene</del>		
	<del>Selenium</del>	<del>Chlorobenzene</del>		
	<del>Dioxin/Furans</del>	<del>SW8280B</del>	<del>Arsenic</del>	
		<del>Lead</del>		
Houston Scrap	Antimony	SW6020A	Arsenic	SW6020A
	Arsenic		Cadmium	
	Beryllium		Lead	
	Lead		Beryllium	
			Mercury	SW7470A
<del>Hu-Mar Chemicals</del>	<del>p-chloroaniline</del>	<del>SW8270D</del>	<del>arsenic</del>	<del>SW6020A</del>
	<del>S-Ethyl dipropylthiocarbamate (EPTC)</del>	<del>8270D</del>	<del>vanadium</del>	<del>SW8260C</del>
			<del>1,2-dichlorobenzene</del>	
			<del>1,4-dichlorobenzene</del>	
			<del>benzene</del>	
			<del>p-chloroaniline</del>	<del>SW8270D</del>
<del>S-Ethyl dipropylthiocarbamate</del>				

ORIGIN ID: EIXA (727) 560-0426  
MICHAEL KANAREK  
5599 SAN FELIPE ST STE 700  
HOUSTON, TX 77056  
UNITED STATES US

SHIP  
ACTW  
CAD:  
DIMS:  
BILL TO

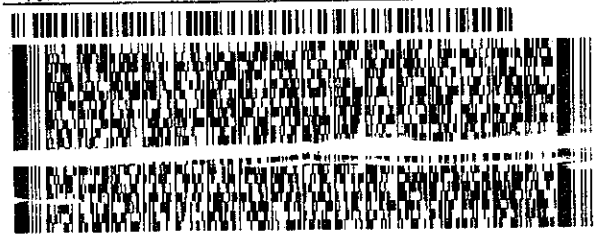
2152  
73

Part # 196297-433 FRT BXP 03/18

TO JENNIFER BARKER  
DHL ANALYTICAL  
2300 DOUBLE CREEK DR

ROUND ROCK TX 78664

(512) 388-8222 REF: INU: DEPT:  
PD:

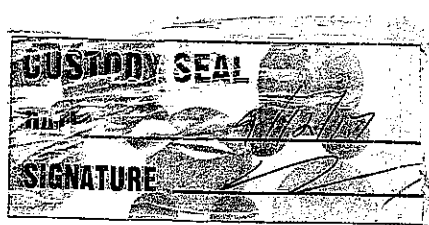


1 of 3  
TRK# 7877 0526 9662  
0201  
## MASTER ##

WED - 13 SEP 10:30A  
PRIORITY OVERNIGHT

A8 BSMA

78664  
TX-US AUS



Sample Receipt Checklist

Client Name Weston Solutions, Inc.

Date Received: 9/13/2017

Work Order Number 1709083

Received by EL

Checklist completed by: [Signature] 9/13/2017  
Signature Date

Reviewed by: [Initials] 9/13/2017  
Initials Date

Carrier name FedEx 1day

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping 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  4.5 °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 EL
- 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 \_\_\_\_\_

<b>Laboratory Name: DHL Analytical, Inc.</b>							
<b>Laboratory Review Checklist: Reportable Data</b>							
<b>Project Name:</b> Houston Scrap-Harvey Sampling				<b>LRC Date:</b> 9/15/2017			
<b>Reviewer Name:</b> Angie O'Donnell				<b>Laboratory Work Order:</b> 1709083			
<b>Prep Batch Number(s):</b> See Prep Dates Report				<b>Run Batch:</b> See Analytical Dates Report			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
		<b>Chain-of-Custody (C-O-C)</b>					
<b>R1</b>	OI	1) Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				<b>R1-01</b>
		2) Were all departures from standard conditions described in an exception report?			X		
<b>R2</b>	OI	<b>Sample and Quality Control (QC) Identification</b>					
		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				
<b>R3</b>	OI	<b>Test Reports</b>					
		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		
<b>R4</b>	O	<b>Surrogate Recovery Data</b>					
		1) Were surrogates added prior to extraction?			X		
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
<b>R5</b>	OI	<b>Test Reports/Summary Forms for Blank Samples</b>					
		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, <b>greater</b> than 10 times the concentration in the blank sample?			X		
<b>R6</b>	OI	<b>Laboratory Control Samples (LCS):</b>					
		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				
<b>R7</b>	OI	<b>Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data</b>					
		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		
<b>R8</b>	OI	<b>Analytical Duplicate Data</b>					
		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				
<b>R9</b>	OI	<b>Method Quantitation Limits (MQLs):</b>					
		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				
<b>R10</b>	OI	<b>Other Problems/Anomalies</b>					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				<b>R10-01</b>
		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				

<b>Laboratory Name: DHL Analytical, Inc.</b>							
<b>Laboratory Review Checklist (continued): Supporting Data</b>							
<b>Project Name:</b> Houston Scrap-Harvey Sampling				<b>LRC Date:</b> 9/15/2017			
<b>Reviewer Name:</b> Angie O'Donnell				<b>Laboratory Work Order:</b> 1709083			
<b>Prep Batch Number(s):</b> See Prep Dates Report				<b>Run Batch:</b> See Analytical Dates Report			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>S1</b>	OI	<b>Initial Calibration (ICAL)</b>					
		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				
<b>S2</b>	OI	<b>Initial and Continuing calibration Verification (ICCV and CCV) and Continuing Calibration blank (CCB):</b>					
		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				
<b>S3</b>	O	<b>Mass Spectral Tuning:</b>					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
<b>S4</b>	O	<b>Internal Standards (IS):</b>					
		1) Were IS area counts and retention times within the method-required QC limits?	X				
<b>S5</b>	OI	<b>Raw Data (NELAC Section 5.5.10)</b>					
		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				
<b>S6</b>	O	<b>Dual Column Confirmation</b>					
		1) Did dual column confirmation results meet the method-required QC?			X		
<b>S7</b>	O	<b>Tentatively Identified Compounds (TICs):</b>					
		1) If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
<b>S8</b>	I	<b>Interference Check Sample (ICS) Results:</b>					
		1) Were percent recoveries within method QC limits?	X				
<b>S9</b>	I	<b>Serial Dilutions, Post Digestion Spikes, and Method of Standard Additions</b>					
		1) Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
<b>S10</b>	OI	<b>Method Detection Limit (MDL) Studies</b>					
		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				
<b>S11</b>	OI	<b>Proficiency Test Reports:</b>					
		1) Was the lab's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
<b>S12</b>	OI	<b>Standards Documentation</b>					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
<b>S13</b>	OI	<b>Compound/Analyte Identification Procedures</b>					
		1) Are the procedures for compound/analyte identification documented?	X				
<b>S14</b>	OI	<b>Demonstration of Analyst Competency (DOC)</b>					
		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				
<b>S15</b>	OI	<b>Verification/Validation Documentation for Methods (NELAC Chapter 5)</b>					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
<b>S16</b>	OI	<b>Laboratory Standard Operating Procedures (SOPs):</b>					
		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

09/18/17  
Date

Name: Scott Schroeder  
Official Title: Technical Director

---

**CLIENT:** Weston Solutions, Inc.  
**Project:** Houston Scrap-Harvey Sampling  
**Lab Order:** 1709083

**CASE NARRATIVE**

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

- Method SW7470A - Mercury Analysis
- Method SW6020A - Metals Analysis
- Method D2216 - Percent Moisture Analysis

Exception Report R1-01

The samples were received and log in performed on 9/13/2017. A total of 2 samples were received and analyzed. The samples arrived in good condition and were properly packaged.

Exception Report R10-01

Per project specification, MS/MSDs are from workorder or project samples only.

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**CLIENT:** Weston Solutions, Inc.  
**Project:** Houston Scrap-Harvey Sampling  
**Lab Order:** 1709083

**Work Order Sample Summary**

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<b>Lab Smp ID</b>	<b>Client Sample ID</b>	<b>Tag Number</b>	<b>Date Collected</b>	<b>Date Recved</b>
1709083-01	Scrap W-1		09/12/17 08:30 AM	9/13/2017
1709083-02	Scrap SO-1		09/12/17 09:05 AM	9/13/2017

**Lab Order:** 1709083  
**Client:** Weston Solutions, Inc.  
**Project:** Houston Scrap-Harvey Sampling

**PREP DATES REPORT**

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1709083-01A	Scrap W-1	09/12/17 08:30 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	09/14/17 08:20 AM	82354
	Scrap W-1	09/12/17 08:30 AM	Aqueous	SW7470A	Mercury Aq Prep, Total	09/13/17 10:45 AM	82344
1709083-02A	Scrap SO-1	09/12/17 09:05 AM	Soil	D2216	Moisture Preparation	09/13/17 02:36 PM	82351
	Scrap SO-1	09/12/17 09:05 AM	Soil	SW3050B	Soil Prep Total Metals: ICP-MS	09/14/17 08:19 AM	82353

**Lab Order:** 1709083  
**Client:** Weston Solutions, Inc.  
**Project:** Houston Scrap-Harvey Sampling

**ANALYTICAL DATES REPORT**

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1709083-01A	Scrap W-1	Aqueous	SW7470A	Mercury Total: Aqueous	82344	1	09/14/17 10:43 AM	CETAC2_HG_170914 C
	Scrap W-1	Aqueous	SW6020A	Trace Metals: ICP-MS - Water	82354	1	09/15/17 12:58 PM	ICP-MS4_170915A
1709083-02A	Scrap SO-1	Soil	D2216	Percent Moisture	82351	1	09/14/17 08:40 AM	PMOIST_170913A
	Scrap SO-1	Soil	SW6020A	Trace Metals: ICP-MS - Solid	82353	5	09/15/17 11:07 AM	ICP-MS4_170915A

**DHL Analytical, Inc.**

**Date:** 18-Sep-17

**CLIENT:** Weston Solutions, Inc.  
**Project:** Houston Scrap-Harvey Sampling  
**Project No:** 02444.034.001.0001  
**Lab Order:** 1709083

**Client Sample ID:** Scrap W-1  
**Lab ID:** 1709083-01  
**Collection Date:** 09/12/17 08:30 AM  
**Matrix:** AQUEOUS

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
<b>TRACE METALS: ICP-MS - WATER</b>		<b>SW6020A</b>			Analyst: <b>RO</b>		
Arsenic	<0.00200	0.00200	0.00500		mg/L	1	09/15/17 12:58 PM
Beryllium	<0.000300	0.000300	0.00100		mg/L	1	09/15/17 12:58 PM
Cadmium	0.000767	0.000300	0.00100	J	mg/L	1	09/15/17 12:58 PM
Lead	0.000772	0.000300	0.00100	J	mg/L	1	09/15/17 12:58 PM
IS: Bismuth	92.8	0	70-200		%REC	1	09/15/17 12:58 PM
IS: Germanium	96.3	0	70-200		%REC	1	09/15/17 12:58 PM
IS: Indium	98.1	0	70-200		%REC	1	09/15/17 12:58 PM
IS: Scandium(2)	97.6	0	70-200		%REC	1	09/15/17 12:58 PM
<b>MERCURY TOTAL: AQUEOUS</b>		<b>SW7470A</b>			Analyst: <b>AH</b>		
Mercury	<0.0000800	0.0000800	0.000200		mg/L	1	09/14/17 10:43 AM

**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:** 18-Sep-17

**CLIENT:** Weston Solutions, Inc.  
**Project:** Houston Scrap-Harvey Sampling  
**Project No:** 02444.034.001.0001  
**Lab Order:** 1709083

**Client Sample ID:** Scrap SO-1  
**Lab ID:** 1709083-02  
**Collection Date:** 09/12/17 09:05 AM  
**Matrix:** SOIL

Analyses	Result	SDL	RL	Qual	Units	DF	Date Analyzed
<b>TRACE METALS: ICP-MS - SOLID</b>		<b>SW6020A</b>			Analyst: <b>RO</b>		
Antimony	1.54	0.531	1.06		mg/Kg-dry	5	09/15/17 11:07 AM
Arsenic	3.86	0.531	1.06		mg/Kg-dry	5	09/15/17 11:07 AM
Beryllium	0.801	0.106	0.319		mg/Kg-dry	5	09/15/17 11:07 AM
Lead	344	0.106	0.319		mg/Kg-dry	5	09/15/17 11:07 AM
IS: Bismuth	95.0	0	70-200		%REC	5	09/15/17 11:07 AM
IS: Germanium	94.9	0	70-200		%REC	5	09/15/17 11:07 AM
IS: Indium	96.5	0	70-200		%REC	5	09/15/17 11:07 AM
IS: Scandium(2)	101	0	70-200		%REC	5	09/15/17 11:07 AM
<b>PERCENT MOISTURE</b>		<b>D2216</b>			Analyst: <b>VA</b>		
Percent Moisture	9.45	0	0		WT%	1	09/14/17 08:40 AM

**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

**CLIENT:** Weston Solutions, Inc.

**ANALYTICAL QC SUMMARY REPORT**

**Work Order:** 1709083

**Project:** Houston Scrap-Harvey Sampling

**RunID:** CETAC2\_HG\_170707A

Sample ID	<b>DCS-81287</b>	Batch ID:	<b>81287</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>				
SampType:	<b>DCS</b>	Run ID:	<b>CETAC2_HG_170707A</b>	Analysis Date:	<b>7/7/2017 9:41:56 AM</b>	Prep Date:	<b>7/6/2017</b>				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury		0.000205	0.000200	0.000200	0	103	82	119	0	0	

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAC certified



CLIENT: Weston Solutions, Inc.

Work Order: 1709083

Project: Houston Scrap-Harvey Sampling

# ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2\_HG\_170914C

The QC data in batch 82344 applies to the following samples: 1709083-01A

Sample ID	<b>MB-82344</b>	Batch ID:	<b>82344</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>			
SampType:	<b>MBLK</b>	Run ID:	<b>CETAC2_HG_170914</b>	Analysis Date:	<b>9/14/2017 10:22:38 AM</b>	Prep Date:	<b>9/13/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury <0.0000800 0.000200

Sample ID	<b>LCS-82344</b>	Batch ID:	<b>82344</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>			
SampType:	<b>LCS</b>	Run ID:	<b>CETAC2_HG_170914</b>	Analysis Date:	<b>9/14/2017 10:24:54 AM</b>	Prep Date:	<b>9/13/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.00210 0.000200 0.00200 0 105 85 115

Sample ID	<b>LCSD-82344</b>	Batch ID:	<b>82344</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>			
SampType:	<b>LCSD</b>	Run ID:	<b>CETAC2_HG_170914</b>	Analysis Date:	<b>9/14/2017 10:27:10 AM</b>	Prep Date:	<b>9/13/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.00208 0.000200 0.00200 0 104 85 115 0.957 15

Sample ID	<b>1709083-01A SD</b>	Batch ID:	<b>82344</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>			
SampType:	<b>SD</b>	Run ID:	<b>CETAC2_HG_170914</b>	Analysis Date:	<b>9/14/2017 10:45:18 AM</b>	Prep Date:	<b>9/13/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury <0.000400 0.00100 0 0 0 0 10

Sample ID	<b>1709083-01A PDS</b>	Batch ID:	<b>82344</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>			
SampType:	<b>PDS</b>	Run ID:	<b>CETAC2_HG_170914</b>	Analysis Date:	<b>9/14/2017 10:47:35 AM</b>	Prep Date:	<b>9/13/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.00245 0.000200 0.00250 0 98.0 85 115

Sample ID	<b>1709083-01A MS</b>	Batch ID:	<b>82344</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>			
SampType:	<b>MS</b>	Run ID:	<b>CETAC2_HG_170914</b>	Analysis Date:	<b>9/14/2017 10:49:51 AM</b>	Prep Date:	<b>9/13/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.00207 0.000200 0.00200 0 104 80 120

Sample ID	<b>1709083-01A MSD</b>	Batch ID:	<b>82344</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>			
SampType:	<b>MSD</b>	Run ID:	<b>CETAC2_HG_170914</b>	Analysis Date:	<b>9/14/2017 10:52:08 AM</b>	Prep Date:	<b>9/13/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Mercury 0.00207 0.000200 0.00200 0 104 80 120 0 15

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

CLIENT: Weston Solutions, Inc.

Work Order: 1709083

Project: Houston Scrap-Harvey Sampling

## ANALYTICAL QC SUMMARY REPORT

RunID: CETAC2\_HG\_170914C

Sample ID	<b>ICV-170914</b>	Batch ID:	<b>R94151</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>
SampType:	<b>ICV</b>	Run ID:	<b>CETAC2_HG_170914</b>	Analysis Date:	<b>9/14/2017 9:55:26 AM</b>	Prep Date:	
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit HighLimit %RPD RPDLimit Qual
Mercury		0.00413	0.000200	0.00400	0	103	90 110

Sample ID	<b>CCV1-170914</b>	Batch ID:	<b>R94151</b>	TestNo:	<b>SW7470A</b>	Units:	<b>mg/L</b>
SampType:	<b>CCV</b>	Run ID:	<b>CETAC2_HG_170914</b>	Analysis Date:	<b>9/14/2017 10:54:26 AM</b>	Prep Date:	
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit HighLimit %RPD RPDLimit Qual
Mercury		0.00202	0.000200	0.00200	0	101	90 110

**Qualifiers:** B Analyte detected in the associated Method Blank  
J Analyte detected between MDL and RL  
ND Not Detected at the Method Detection Limit  
RL Reporting Limit  
J Analyte detected between SDL and RL

DF Dilution Factor  
MDL Method Detection Limit  
R RPD outside accepted control limits  
S Spike Recovery outside control limits  
N Parameter not NELAC certified

**CLIENT:** Weston Solutions, Inc.  
**Work Order:** 1709083  
**Project:** Houston Scrap-Harvey Sampling

## ANALYTICAL QC SUMMARY REPORT

**RunID: ICP-MS4\_170807E**

Sample ID: <b>DCS1-81788</b>	Batch ID: <b>81788</b>	TestNo: <b>SW6020A</b>	Units: <b>mg/L</b>							
SampType: <b>DCS</b>	Run ID: <b>ICP-MS4_170807E</b>	Analysis Date: <b>8/7/2017 11:00:00 AM</b>	Prep Date: <b>8/4/2017</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.000476	0.00100	0.000500	0	95.2	80	120	0	0	
Cadmium	0.000511	0.00100	0.000500	0	102	80	120	0	0	
Lead	0.000499	0.00100	0.000500	0	99.8	80	120	0	0	

Sample ID: <b>DCS2-81788</b>	Batch ID: <b>81788</b>	TestNo: <b>SW6020A</b>	Units: <b>mg/L</b>							
SampType: <b>DCS2</b>	Run ID: <b>ICP-MS4_170807E</b>	Analysis Date: <b>8/7/2017 11:02:00 AM</b>	Prep Date: <b>8/4/2017</b>							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00209	0.00500	0.00200	0	104	80	120	0	0	

<b>Qualifiers:</b>	<p>B Analyte detected in the associated Method Blank</p> <p>J Analyte detected between MDL and RL</p> <p>ND Not Detected at the Method Detection Limit</p> <p>RL Reporting Limit</p> <p>J Analyte detected between SDL and RL</p>	<p>DF Dilution Factor</p> <p>MDL Method Detection Limit</p> <p>R RPD outside accepted control limits</p> <p>S Spike Recovery outside control limits</p> <p>N Parameter not NELAC certified</p>
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**CLIENT:** Weston Solutions, Inc.  
**Work Order:** 1709083  
**Project:** Houston Scrap-Harvey Sampling

## ANALYTICAL QC SUMMARY REPORT

**RunID:** ICP-MS4\_170914A

Sample ID	DCS1-82336	Batch ID:	82336	TestNo:	SW6020A	Units:	mg/Kg			
SampType:	DCS	Run ID:	ICP-MS4_170914A	Analysis Date:	9/14/2017 10:43:00 AM	Prep Date:	9/13/2017			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	0.236	0.300	0.2500	0	94.2	80	120	0	0	
Lead	0.244	0.300	0.2500	0	97.5	80	120	0	0	

Sample ID	DCS2-82336	Batch ID:	82336	TestNo:	SW6020A	Units:	mg/Kg			
SampType:	DCS2	Run ID:	ICP-MS4_170914A	Analysis Date:	9/14/2017 10:45:00 AM	Prep Date:	9/13/2017			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	1.17	1.00	1.250	0	93.4	80	120	0	0	
Arsenic	1.16	1.00	1.250	0	92.5	80	120	0	0	

<b>Qualifiers:</b>	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: 1709083

Project: Houston Scrap-Harvey Sampling

# ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4\_170915A

The QC data in batch 82353 applies to the following samples: 1709083-02A

Sample ID	<b>MB-82353</b>	Batch ID:	<b>82353</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/Kg</b>
SampType:	<b>MBLK</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 10:56:00 AM</b>	Prep Date:	<b>9/14/2017</b>

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	<0.500	1.00								
Arsenic	<0.500	1.00								
Beryllium	<0.100	0.300								
Lead	<0.100	0.300								
IS: Bismuth	50.0		200.0		101	70	200			
IS: Scandium(2)	50.0		200.0		100	70	200			

Sample ID	<b>LCS-82353</b>	Batch ID:	<b>82353</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/Kg</b>
SampType:	<b>LCS</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 10:58:00 AM</b>	Prep Date:	<b>9/14/2017</b>

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	50.8	1.00	50.00	0	102	80	120			
Arsenic	49.6	1.00	50.00	0	99.2	80	120			
Beryllium	48.8	0.300	50.00	0	97.6	80	120			
Lead	50.0	0.300	50.00	0	100	80	120			
IS: Bismuth	50.0		200.0		98.6	70	200			
IS: Scandium(2)	50.0		200.0		100	70	200			

Sample ID	<b>LCSD-82353</b>	Batch ID:	<b>82353</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/Kg</b>
SampType:	<b>LCSD</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 11:00:00 AM</b>	Prep Date:	<b>9/14/2017</b>

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	50.4	1.00	50.00	0	101	80	120	0.829	25	
Arsenic	49.5	1.00	50.00	0	99.0	80	120	0.204	25	
Beryllium	48.7	0.300	50.00	0	97.4	80	120	0.182	25	
Lead	49.6	0.300	50.00	0	99.2	80	120	0.791	25	
IS: Bismuth	50.0		200.0		98.6	70	200	0	0	
IS: Scandium(2)	50.0		200.0		100	70	200	0	0	

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAC certified

CLIENT: Weston Solutions, Inc.

Work Order: 1709083

Project: Houston Scrap-Harvey Sampling

# ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4\_170915A

The QC data in batch 82354 applies to the following samples: 1709083-01A

Sample ID	<b>MB-82354</b>	Batch ID:	<b>82354</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/L</b>			
SampType:	<b>MBLK</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 12:46:00 PM</b>	Prep Date:	<b>9/14/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Arsenic	<0.00200	0.00500								
Beryllium	<0.000300	0.00100								
Cadmium	<0.000300	0.00100								
Lead	<0.000300	0.00100								
IS: Bismuth	0.200		0.200		103	70	200			
IS: Indium	0.200		0.200		104	70	200			

Sample ID	<b>LCS-82354</b>	Batch ID:	<b>82354</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/L</b>			
SampType:	<b>LCS</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 12:48:00 PM</b>	Prep Date:	<b>9/14/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Arsenic	0.199	0.00500	0.200	0	99.6	80	120			
Beryllium	0.190	0.00100	0.200	0	95.2	80	120			
Cadmium	0.194	0.00100	0.200	0	96.9	80	120			
Lead	0.191	0.00100	0.200	0	95.7	80	120			
IS: Bismuth	0.200		0.200		98.5	70	200			
IS: Indium	0.200		0.200		99.6	70	200			

Sample ID	<b>LCSD-82354</b>	Batch ID:	<b>82354</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/L</b>			
SampType:	<b>LCSD</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 12:50:00 PM</b>	Prep Date:	<b>9/14/2017</b>			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Arsenic	0.196	0.00500	0.200	0	98.1	80	120	1.56	15	
Beryllium	0.187	0.00100	0.200	0	93.6	80	120	1.71	15	
Cadmium	0.190	0.00100	0.200	0	95.2	80	120	1.83	15	
Lead	0.189	0.00100	0.200	0	94.5	80	120	1.17	15	
IS: Bismuth	0.200		0.200		98.2	70	200	0	0	
IS: Indium	0.200		0.200		101	70	200	0	0	

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAC certified

CLIENT: Weston Solutions, Inc.

Work Order: 1709083

Project: Houston Scrap-Harvey Sampling

# ANALYTICAL QC SUMMARY REPORT

RunID: ICP-MS4\_170915A

Sample ID	<b>ICV-170915</b>	Batch ID:	<b>R94175</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/L</b>
SampType:	<b>ICV</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 10:40:00 AM</b>	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.103	0.00250	0.100	0	103	90	110			
Arsenic	0.102	0.00500	0.100	0	102	90	110			
Beryllium	0.0995	0.00100	0.100	0	99.5	90	110			
Cadmium	0.101	0.00100	0.100	0	101	90	110			
Lead	0.0990	0.00100	0.100	0	99.0	90	110			
IS: Bismuth	0.200		0.200		99.9	70	200			

Sample ID	<b>LCVL-170915</b>	Batch ID:	<b>R94175</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/L</b>
SampType:	<b>LCVL</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 10:50:00 AM</b>	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00186	0.00250	0.00200	0	92.8	70	130			
Arsenic	0.00472	0.00500	0.00500	0	94.4	70	130			
Beryllium	0.00101	0.00100	0.00100	0	101	70	130			
Cadmium	0.000977	0.00100	0.00100	0	97.7	70	130			
Lead	0.000924	0.00100	0.00100	0	92.4	70	130			
IS: Bismuth	0.200		0.200		99.0	70	200			

Sample ID	<b>CCV1-170915</b>	Batch ID:	<b>R94175</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/L</b>
SampType:	<b>CCV</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 11:30:00 AM</b>	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.196	0.00500	0.200	0	98.1	90	110			
Beryllium	0.188	0.00100	0.200	0	93.8	90	110			
Lead	0.192	0.00100	0.200	0	95.9	90	110			
IS: Bismuth	0.200		0.200		97.9	70	200			
IS: Scandium(2)	0.200		0.200		99.1	70	200			

Sample ID	<b>LCVL1-170915</b>	Batch ID:	<b>R94175</b>	TestNo:	<b>SW6020A</b>	Units:	<b>mg/L</b>
SampType:	<b>LCVL</b>	Run ID:	<b>ICP-MS4_170915A</b>	Analysis Date:	<b>9/15/2017 11:35:00 AM</b>	Prep Date:	

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00478	0.00500	0.00500	0	95.6	70	130			
Beryllium	0.00105	0.00100	0.00100	0	104	70	130			
Lead	0.000911	0.00100	0.00100	0	91.1	70	130			
IS: Bismuth	0.200		0.200		99.6	70	200			
IS: Scandium(2)	0.200		0.200		99.7	70	200			

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAC certified

**CLIENT:** Weston Solutions, Inc.  
**Work Order:** 1709083  
**Project:** Houston Scrap-Harvey Sampling

## ANALYTICAL QC SUMMARY REPORT

**RunID: ICP-MS4\_170915A**

Sample ID <b>CCV3-170915</b>	Batch ID: <b>R94175</b>	TestNo: <b>SW6020A</b>	Units: <b>mg/L</b>							
SampType: <b>CCV</b>	Run ID: <b>ICP-MS4_170915A</b>	Analysis Date: <b>9/15/2017 12:36:00 PM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.196	0.00500	0.200	0	97.8	90	110			
Beryllium	0.184	0.00100	0.200	0	92.1	90	110			
Cadmium	0.190	0.00100	0.200	0	95.0	90	110			
Lead	0.190	0.00100	0.200	0	95.0	90	110			
IS: Bismuth	0.200		0.200		98.2	70	200			
IS: Indium	0.200		0.200		100	70	200			

Sample ID <b>LCVL3-170915</b>	Batch ID: <b>R94175</b>	TestNo: <b>SW6020A</b>	Units: <b>mg/L</b>							
SampType: <b>LCVL</b>	Run ID: <b>ICP-MS4_170915A</b>	Analysis Date: <b>9/15/2017 12:42:00 PM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00478	0.00500	0.00500	0	95.5	70	130			
Beryllium	0.000970	0.00100	0.00100	0	97.0	70	130			
Cadmium	0.000910	0.00100	0.00100	0	91.0	70	130			
Lead	0.000897	0.00100	0.00100	0	89.7	70	130			
IS: Bismuth	0.200		0.200		100	70	200			
IS: Indium	0.200		0.200		103	70	200			

Sample ID <b>CCV4-170915</b>	Batch ID: <b>R94175</b>	TestNo: <b>SW6020A</b>	Units: <b>mg/L</b>							
SampType: <b>CCV</b>	Run ID: <b>ICP-MS4_170915A</b>	Analysis Date: <b>9/15/2017 1:24:00 PM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.195	0.00500	0.200	0	97.4	90	110			
Beryllium	0.183	0.00100	0.200	0	91.7	90	110			
Cadmium	0.191	0.00100	0.200	0	95.4	90	110			
Lead	0.188	0.00100	0.200	0	94.1	90	110			
IS: Bismuth	0.200		0.200		97.6	70	200			
IS: Indium	0.200		0.200		97.7	70	200			

Sample ID <b>LCVL4-170915</b>	Batch ID: <b>R94175</b>	TestNo: <b>SW6020A</b>	Units: <b>mg/L</b>							
SampType: <b>LCVL</b>	Run ID: <b>ICP-MS4_170915A</b>	Analysis Date: <b>9/15/2017 1:46:00 PM</b>	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00467	0.00500	0.00500	0	93.4	70	130			
Beryllium	0.000847	0.00100	0.00100	0	84.7	70	130			
Cadmium	0.000924	0.00100	0.00100	0	92.4	70	130			
Lead	0.000876	0.00100	0.00100	0	87.6	70	130			
IS: Bismuth	0.200		0.200		99.3	70	200			
IS: Indium	0.200		0.200		97.0	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:** 1709083

**Project:** Houston Scrap-Harvey Sampling

## ANALYTICAL QC SUMMARY REPORT

**RunID:** PMOIST\_170913A

The QC data in batch 82351 applies to the following samples: 1709083-02A

Sample ID	<b>1709062-01A-DUP</b>	Batch ID:	<b>82351</b>	TestNo:	<b>D2216</b>	Units:	<b>WT%</b>				
SampType:	<b>DUP</b>	Run ID:	<b>PMOIST_170913A</b>	Analysis Date:	<b>9/14/2017 8:40:00 AM</b>	Prep Date:	<b>9/13/2017</b>				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Percent Moisture		74.3	0	0	75.56				1.66	30	

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAC certified

**CLIENT:** Weston Solutions, Inc.  
**Work Order:** 1709083  
**Project:** Houston Scrap-Harvey Sampling

**MQL SUMMARY REPORT**

TestNo: SW6020A	MDL	MQL
Analyte	mg/Kg	mg/Kg
Antimony	0.500	1.00
Arsenic	0.500	1.00
Beryllium	0.100	0.300
Lead	0.100	0.300

TestNo: SW6020A	MDL	MQL
Analyte	mg/L	mg/L
Arsenic	0.00200	0.00500
Beryllium	0.000300	0.00100
Cadmium	0.000300	0.00100
Lead	0.000300	0.00100

TestNo: SW7470A	MDL	MQL
Analyte	mg/L	mg/L
Mercury	0.0000800	0.000200

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

**CETAC2\_HG**

**For**

**DHL Work Order**

**1709083**

**CETAC2\_HG\_170914B**

**For**

**DHL Work Order**

**1709083**

**Lab Data Review Check List**  
**EPA Method 7470 / 7471 / 245.1 - Mercury**

<b>Project Number(s):</b>	<b>SEE RUN LOG FOR LIST OF SAMPLES</b>	<b>Run ID:</b>	<b>CETAC2_HG_170914B</b>			
<b>Batch Number(s):</b>	<b>SEE RUN LOG FOR BATCH ID</b>	<b>SOP:</b>	<b>METALS-Hg-01 and Hg-02</b>			
<b>Review Item</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>2nd Level Review</b>	
<b>Data Folder Contents</b>						
1. Is the Prep Batch Report included? <i>Check the Prep Start/End Dates, Sample Amounts, Bottle #s</i>		X				X
2. Are the reagents and spikes listed on the Prep Batch Report current with a valid expiration date? <i>All standard/QC sample preparations shall be documented in LIMS</i>		X				
3. Is the Run Log included? <i>Check the Test Code, Sample Type, Batch ID, and Analysis Date/Time</i>		X				
4. Does the Mercury Calibration Curve Sheet contain all the DHL ID #s for all standards used for calibration? <i>Check the DHL ID #</i>		X				
<b>Daily Demonstration of Performance</b>						
<b>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. See Run Log for Failures.</b>						
<b>Review Item</b>	<b>Frequency</b>	<b>Limits</b>	<b>Pass</b>	<b>Fail</b>	<b>N/A</b>	<b>2nd Level Review</b>
Initial Calibration Curve (ICAL) (Blank + 5 Standards)	Prior to samples and when ICV fails	$R^2 \geq 0.990$	X			X
ICV - (Second Source Calibration Verification)	Daily before sample analysis	95-105% (245.1)				
		90-110% (TCEQ+DoD)	X			
ICB	After calibration	<MDL	X			
CCV	Every 10 samples and End of Run	90-110% (245.1 and TCEQ+DoD)	X			
CCB	Every 10 samples and End of Run	<MDL (ALL + DoD)	X			
Method Blank (MB)	Every Batch	< MDL / <1/2 RL (DoD) or <1/10 the sample/reg limit	X			
Filter/TCLP/SPLP Blank	Filter-Dissolved only TCLP / SPLP	< MDL / <1/2 RL (DoD) or <1/10 the sample/reg limit			X	
Lab Control Sample (LCS) Lab Control Sample Dup (LCSD)	Every Batch	85-115% (Meets ALL criteria)	X			
LCSD - RPD	Every LCS/LCSD	15% (Aq-TCEQ) / 20% (DoD) 30% (Soil-TCEQ)	X			
Matrix Spike/ Matrix Spike Duplicate (MS/MSD) Check FSP for MS/MSD limits	Every Batch	85-115% (Aq-TCEQ) 80-120% (DoD+7471 Soil) 83-118% (Soil-TCEQ)*	X			
MSD - RPD	Every MS/MSD	See LCSD-RPD Limits	X			
Dilution Test (SD) - RPD	Every Batch	10%	X			
Post Digestion Spike (PDS)	Every Batch	85-115%	X			
*MS/MSD acceptance limits for Method 7471 Soils are wider than the TCEQ-QAPP. Refer to project-specific QAPPs for the acceptance limits.						

## Lab Data Review Check List

### EPA Method 7470 / 7471 / 245.1 - Mercury

Review Item	Criteria	Yes	No	N/A	2nd Level Review
<b>Sample Analysis</b>	pH <2; 28 Days 28 Days (TCLP)+28 Days	X			X
1. Are all sample hold times met?					
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			
<b>3. Are ALL reported analytes and reported results &gt; MDL highlighted by the analyst? (J flags are included)</b>		X	Return to analyst if NO		

### 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 Review
1. Are all non-conformances included and noted?	All deviations from the method and SOP that affect data quality				X
2. Are all corrective actions included?					
3. Does the variance require approval by the Technical Director/General Manager/QA Manager?					

**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
<input type="checkbox"/> CCV out of control ( $\pm 10\%$ )	<input type="checkbox"/> Carryover from previous run	<input type="checkbox"/> Reanalyze QC to confirm
<input type="checkbox"/> CCB out of control (> MDL / > 1/2 RL)	<input type="checkbox"/> Cross contamination	<input type="checkbox"/> Recalibrate
<input type="checkbox"/> MB out of control (> MDL / > 1/2 RL)	<input type="checkbox"/> Lab Artifact	<input type="checkbox"/> Reprep/Reanalyze sample
<input type="checkbox"/> LCS <input type="checkbox"/> LCSD out of control ( $\pm 15\%$ )	<input type="checkbox"/> Prep Spike error (describe)	<input type="checkbox"/> Reprep/Reanalyze Batch
<input type="checkbox"/> MS <input type="checkbox"/> MSD out of control (See LIMS)	<input type="checkbox"/> Matrix Effect	<input type="checkbox"/> Reanalyze Batch/Sample/QC
<input type="checkbox"/> RPD out of control for MS/MSD (15/20/30)	<input type="checkbox"/> High Levels of Mercury	<input type="checkbox"/> Verify reagents are clean
<input type="checkbox"/> No MS/MSD prepared - LCS/LCSD used instead	<input type="checkbox"/> Insufficient sample for QC	<input type="checkbox"/> Reanalyze sample to confirm
<input type="checkbox"/> Missing QC (other than MS/MSD)	<input type="checkbox"/> Prep Error	<input type="checkbox"/> Sample results ND w/ dilution
<input type="checkbox"/> QC sample(s) was mis-spiked	<input type="checkbox"/> Analytical Error	<input type="checkbox"/> Client notified and approved
	<input type="checkbox"/> Client Request	<input type="checkbox"/> Flag data / Case narrative
<input type="checkbox"/> Other (describe below)		<input type="checkbox"/> Accept data
	<input type="checkbox"/> Other (describe below)	<input type="checkbox"/> Other (describe below)

General Comments and Impact on Data:

Analyst: Alex Hughes Date: 09/14/17

Second-Level Review: Angie O'Connor Date: 9/15/2017

Run ID: CETAC2\_HG\_170914B

Run No.: 94150

Analytical Run Date: 9/14/2017

InstrumentID: CETAC2\_HG

Analyst: Alex Hughes

SampID	DF	TestCode	SampType	Batch ID	Analysis Date/Time	Q	Comments
ICV-170914	1	TCLP_HG	ICV	R94150	9/14/2017 9:55:26 AM		
ICB-170914	1	TCLP_HG	ICB	R94150	9/14/2017 9:57:44 AM		
MB-82344	1	TCLP_HG	MBLK	82344	9/14/2017 10:22:38 AM		
LCS-82344	1	TCLP_HG	LCS	82344	9/14/2017 10:24:54 AM		
LCSD-82344	1	TCLP_HG	LCSD	82344	9/14/2017 10:27:10 AM		
1709072-01A	1	TCLP_HG	SAMP	82344	9/14/2017 10:31:42 AM		
1709073-01A	1	TCLP_HG	SAMP	82344	9/14/2017 10:33:58 AM		
1709074-01A	1	TCLP_HG	SAMP	82344	9/14/2017 10:36:14 AM		
1709075-01A	1	TCLP_HG	SAMP	82344	9/14/2017 10:38:30 AM		
1709075-02A	1	TCLP_HG	SAMP	82344	9/14/2017 10:40:46 AM		
1709083-01A	1	TCLP_HG	SAMP	82344	9/14/2017 10:43:02 AM		DNR. QC REF ONLY.
1709083-01A SD	5	TCLP_HG	SD	82344	9/14/2017 10:45:18 AM		
1709083-01A PDS	1	TCLP_HG	PDS	82344	9/14/2017 10:47:35 AM		
1709083-01A MS	1	TCLP_HG	MS	82344	9/14/2017 10:49:51 AM		
1709083-01A MSD	1	TCLP_HG	MSD	82344	9/14/2017 10:52:08 AM		
CCV1-170914	1	TCLP_HG	CCV	R94150	9/14/2017 10:54:26 AM		
CCB1-170914	1	TCLP_HG	CCB	R94150	9/14/2017 10:56:44 AM		

Std ID	Std Name	Type	Exp. Date
HG-170821-CAL	1 PPM HG CAL	CAL	09/21/2017
HG-170821-SPIKE	500ppb Hg Spike for LCS/MS/MS	LCS/MS	09/21/2017
HG-170824-VER	1 PPM Hg VER	ICV	09/24/2017

**DHL Analytical, Inc.**

**PREP BATCH REPORT**

Prep Start Date: 9/13/2017 10:45:40 AM

Digestion:

Prep End Date:

Prep Batch **82344** Prep Code: **HG\_PREPW**

Technician: **Alex Hughes**

Prep Factor Units:  
mL/mL

**Equipment List**

Hot Block #6  
Thermometer #71  
PIPETTE# P-41 REAGENTS  
PIPETTE# P-40 SPIKE

Sample ID	Matrix	pH	SampAmt	Fin Vol	Factor	Bottle #	Vessel	Cleanup
1709053-01B	Aqueous		25	25	1.000	1 of 1		
1709072-01A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709073-01A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709074-01A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709075-01A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709075-02A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709083-01A	Aqueous	MS/MSD	25	25	1.000	1 of 1		
LCS-82344	Aqueous		25	25	1.000	of		
LCSD-82344	Aqueous		25	25	1.000	of		
MB-82344	Aqueous		25	25	1.000	of		

Number	Reagent Name	Amt	Units	Exp. D:	Spk ID	Spike Name	SampType	Amt (mL or g)	Exp. Date
9082	pH paper 0-3	1	paper	04/08/2025	HG-170821-SPIKE	500ppb Hg Spike for LCS/MS/MSD	LCS/MS/MSD	0.1	09/21/2017
10382	Potassium Persulfate	2	ml	11/05/2026					
10917	Sulfuric Acid (trace metal grade)	1.25	ml	06/23/2019					
11022	Potassium Permanganate	3.75	ml	01/03/2027					
11594	Digestion Vessels	50	ml	01/10/2018					
11661	Nitric Acid (Trace Metal Grade)	0.65	ml	04/05/2019					
11723	Sodium Chloride Hydroxylamine Hydro	1.5	ml	03/05/2018					

11:45 - 1:45

**REVIEWED**  
By Carlos Castro at 9:53:42 AM, 9/15/2017



**DHL Analytical, Inc.**

**PREP BATCH REPORT**

Prep Start Date: **9/13/2017 10:45:40 AM**  
 Digestion: **Start: 9/13/2017 11:45:00 AM / Stop: 9/13/2017 1:45:00 PM**  
 Prep End Date: **9/13/2017 4:00:00 PM**

Prep Factor Units:  
 mL/mL

Equipment List
Hot Block #6
Thermometer #71
PIPETTE# P-41 REAGENTS
PIPETTE# P-40 SPIKE

Prep Batch **82344** Prep Code: **HG\_PREPW** Technician: **Alex Hughes**

Sample ID	Matrix	pH	SampAmt	Fin Vol	Factor	Bottle #	Cleanup
1709053-01B	Aqueous		25	25	1.000	1 of 1	
1709072-01A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709073-01A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709074-01A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709075-01A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709075-02A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709083-01A	Aqueous		25	25	1.000	1 of 1	
1709083-01A MS	Aqueous		25	25	1.000	of	
1709083-01A MSD	Aqueous		25	25	1.000	of	
1709083-01A PDS	Aqueous		25	25	1.000	of	
1709083-01A SD	Aqueous		25	25	1.000	of	
LCS-82344	Aqueous		25	25	1.000	of	
LCSD-82344	Aqueous		25	25	1.000	of	
MB-82344	Aqueous		25	25	1.000	of	

Number	Reagent Name	Amt	Units	Exp. Date
9082	pH paper 0-3	1	paper	04/08/2025
10382	Potassium Persulfate	2	ml	11/05/2026
10917	Sulfuric Acid (trace metal grade)	1.25	ml	06/23/2019
11022	Potassium Permanganate	3.75	ml	01/03/2027
11594	Digestion Vessels	50	ml	01/10/2018
11661	Nitric Acid (Trace Metal Grade)	0.65	ml	04/05/2019
11723	Sodium Chloride Hydroxylamine Hydro	1.5	ml	03/05/2018

Spk ID	Spike Name	SampType	Amt (mL or g)	Exp. Date
HG-170821-SPIKE	500ppb Hg Spike for LCS/MS/MSD	LCS/MS/MSD	0.1	09/21/2017



**Method 7470/7471/245.1 Mercury Calibration Curve Sheet**  
**Standards Used for the Calibration Curve**

Run ID: CETAC2\_HG\_170914B

**Primary Source:**

**Hg Stock Standard (1000 ppm)**

Expiration Date: 1 year after opening

DHL ID#: MET-160209-6

Exp. Date: 10/9/2017

**CAL Stock Standard (1 ppm):**

Prepare: 50 µL of 1000 ppm to 50 mL 10% HNO<sub>3</sub>

Expiration Date: 1 month

DHL ID#: HG-170821-CAL

Exp. Date: 9/21/2017

**Daily CAL Standard (100 ppb):**

Prepare: 1 mL of 1 ppm CAL Stock to 9 mL 0.15% HNO<sub>3</sub> (#9997)

Expiration Date: Prepare Daily

**Second Source Verification Source:**

**Hg Stock Standard (1000 ppm)**

Expiration Date: 1 year after opening

DHL ID#: HG-160721

Exp. Date: 9/9/2017

**VER Stock Standard (1ppm):**

Prepare: 50 µL of 1000 ppm to 50 mL 10% HNO<sub>3</sub>

Expiration Date: 1 month

DHL ID#: HG-170824-VER

Exp. Date: 9/24/2017

**Daily VER Standard (100 ppb):**

Prepare: 1 mL of 1 ppm VER Stock to 9 mL 0.15% HNO<sub>3</sub> (#9997)

Expiration Date: Prepare Daily

**Reagents:**

SnCl<sub>2</sub> solution

DHL ID#: 11713

Soil Hg Blank (Calibration Blank)

DHL ID#: N/A

Water Hg Blank (Calibration Blank)

DHL ID#: 11717

Target Concentration	Preparation Instructions
5 ppb	1 mL of 100 ppb Daily CAL Standard to 20 mL Blank Solution
2 ppb	4 mL of 5 ppb to 10 mL Blank Solution
1 ppb	2 mL of 5 ppb to 10 mL Blank Solution
0.5 ppb	1 mL of 5 ppb to 10 mL Blank Solution
0.1 ppb	1 mL of 1 ppb to 10 mL Blank Solution
ICV (4 ppb)	1 mL of 100 ppb Daily VER Standard to 25 mL Blank Solution
CCV(2 ppb)	0.5 mL of 100 ppb Daily CAL Standard to 25 mL Blank Solution

Analyst: Alex Hughes

Date: 9/14/2017

Second-Level Review: Angie O'Donnan

Date: 9/15/2017

PIPETTORS USED: P-34 AND P-19

# CETAC2\_HG

Report Generated By CETAC QuickTrace

Analyst: CETAC

Worksheet file: C:\Program Files\QuickTrace\Worksheets\170914W.wsz

Date Started: 9/14/2017 8:35:13 AM

Comment:

## Results

Sample Name	Type	Date/Time	Conc (ppb)	$\mu$ Abs	%RSD	Flags	DF
Blank- 170914	STD	09/14/17 09:34:15 am	0.0000	206	4.95		1.00
Replicates				201.8 197.0 220.6	205.6		
0.1ppb- 170914	STD	09/14/17 09:36:31 am	0.1000	1273	0.27		1.00
Replicates				1271.9 1277.4 1269.6	1274.9		
0.5ppb- 170914	STD	09/14/17 09:38:47 am	0.5000	5626	0.20		1.00
Replicates				5625.8 5610.7 5632.3	5636.8		
1.0ppb- 170914	STD	09/14/17 09:41:04 am	1.0000	11068	0.08		1.00
Replicates				11079.1 11068.9 11059.9	11062.2		
2.0ppb- 170914	STD	09/14/17 09:43:21 am	2.0000	22056	0.21		1.00
Replicates				22015.2 22020.9 22076.4	22110.8		
5.0ppb- 170914	STD	09/14/17 09:45:38 am	5.0000	54614	0.10		1.00
Replicates				54553.3 54590.6 54625.4	54686.1		

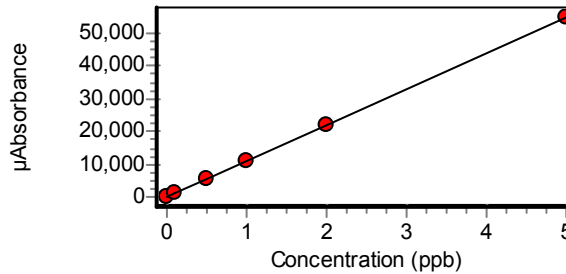
### Calibration 170914

Equation:  $A = 201.991 + 10887.370C$

R2: 1.00000

SEE: 44.8504

Flags:



ICV-170914	ICV	09/14/17 09:47:56 am	4.2500	46471	0.19		1.00
Replicates				46401.5 46406.3 46482.8	46594.4		
% Recovery				106.25			

Sample Name				Type	Date/Time	Conc (ppb)	μAbs	%RSD	Flags	DF
ICV-170914				ICV	09/14/17 09:55:26 am	4.1300	45169	0.08		1.00
Replicates	45152.0	45136.2	45166.5	45223.2						
% Recovery	103.26									
ICB-170914				ICB	09/14/17 09:57:44 am	-0.0040	159	11.17		1.00
Replicates	135.1	155.4	174.9	169.3						
MB-82343				MB	09/14/17 09:59:59 am	0.0026	231	3.16		1.00
Replicates	221.5	233.7	238.7	229.3						
LCS-82343				LCS	09/14/17 10:02:15 am	2.0600	22666	0.14		1.00
Replicates	22637.9	22647.3	22671.0	22706.8						
% Recovery	103.16									
LCSD-82343				LCS	09/14/17 10:04:31 am	2.0500	22523	0.16		1.00
Replicates	22484.2	22510.0	22531.0	22567.0						
% Recovery	102.51									
1709071-01A				UNK	09/14/17 10:06:47 am	0.0025	229	2.87		1.00
Replicates	238.1	225.1	228.6	223.4						
1709078-01A				UNK	09/14/17 10:09:04 am	0.0181	400	4.42		1.00
Replicates	405.8	397.9	376.3	418.3						
1709078-02A				UNK	09/14/17 10:11:19 am	0.0063	271	3.93		1.00
Replicates	272.1	282.4	271.1	256.6						
1709078-02A SD				UNK	09/14/17 10:13:35 am	0.0006	209	5.42		5.00
Replicates	204.5	210.2	223.5	196.7						
1709078-02A PDS				UNK	09/14/17 10:15:50 am	2.3700	26003	0.23		1.00
Replicates	25941.0	25973.2	26016.7	26082.0						
1709078-02A MS				MSK	09/14/17 10:18:06 am	2.0200	22246	0.19	N	1.00
Replicates	22189.8	22247.2	22251.5	22293.7						
% Recovery	-17.26									
1709078-02A MSD				MSDUP	09/14/17 10:20:22 am	2.0300	22297	0.14	D	1.00
Replicates	22262.7	22287.0	22300.5	22336.6						
% Recovery	-17.02	RPD 0.23								

Sample Name				Type	Date/Time	Conc (ppb)	μAbs	%RSD	Flags	DF
MB-82344				MB	09/14/17 10:22:38 am	0.0007	209	1.25		1.00
Replicates	212.6	207.5	210.0		206.8					
LCS-82344				LCS	09/14/17 10:24:54 am	2.1000	23049	0.16		1.00
Replicates	23018.1	23020.1	23068.0		23091.0					
% Recovery	104.93									
LCSD-82344				LCS	09/14/17 10:27:10 am	2.0800	22817	0.15		1.00
Replicates	22785.8	22803.6	22813.5		22867.0					
% Recovery	103.86									
1709053-01B				UNK	09/14/17 10:29:26 am	0.0003	206	4.91		1.00
Replicates	201.3	219.8	196.3		205.1					
1709072-01A				UNK	09/14/17 10:31:42 am	0.0062	269	3.05		1.00
Replicates	258.4	269.6	278.3		270.8					
1709073-01A				UNK	09/14/17 10:33:58 am	0.0054	260	4.29		1.00
Replicates	247.0	265.6	272.6		256.3					
1709074-01A				UNK	09/14/17 10:36:14 am	0.0024	229	5.15		1.00
Replicates	240.6	222.5	236.4		215.4					
1709075-01A				UNK	09/14/17 10:38:30 am	0.0037	242	1.11		1.00
Replicates	239.1	245.0	242.9		240.2					
1709075-02A				UNK	09/14/17 10:40:46 am	0.0048	255	7.02		1.00
Replicates	253.7	275.9	256.2		232.2					
1709083-01A				UNK	09/14/17 10:43:02 am	0.0049	256	3.55		1.00
Replicates	258.2	260.0	262.0		242.1					
1709083-01A SD				UNK	09/14/17 10:45:18 am	0.0013	216	5.06		5.00
Replicates	230.2	203.5	217.0		215.0					
1709083-01A PDS				UNK	09/14/17 10:47:35 am	2.4500	26910	0.22		1.00
Replicates	26833.0	26900.3	26934.8		26971.1					

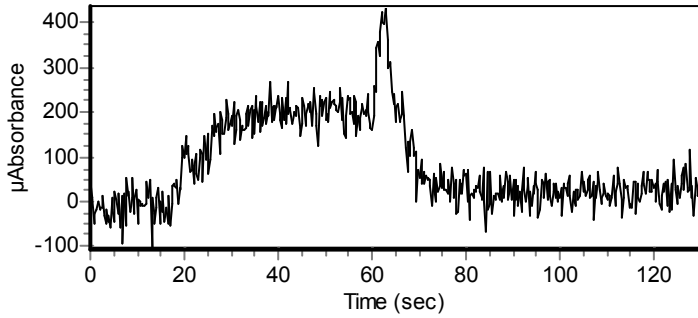
Sample Name				Type	Date/Time	Conc (ppb)	μAbs	%RSD	Flags	DF
1709083-01A MS				MSK	09/14/17 10:49:51 am	2.0700	22706	0.22	N	1.00
Replicates	22662.6	22668.5	22729.9	22763.7						
% Recovery	-19.30									
1709083-01A MSD				MSDUP	09/14/17 10:52:08 am	2.0700	22709	0.20	D	1.00
Replicates	22662.3	22689.2	22712.4	22770.7						
% Recovery	-19.29	RPD 0.01								
CCV1-170908				CCV	09/14/17 10:54:26 am	2.0200	22221	0.18		1.00
Replicates	22195.6	22186.6	22230.5	22272.5						
% Recovery	101.12									
CCB1-170908				CCB	09/14/17 10:56:44 am	-0.0047	151	5.71		1.00
Replicates	137.9	156.4	154.5	154.2						

# Sample Graphs

9/14/2017 9:34:15 AM

**Blank-**

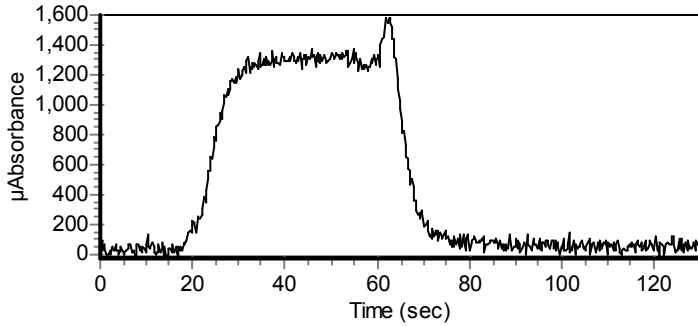
Concentrator(ppb) **0.0000**



9/14/2017 9:36:31 AM

**0.1ppb-**

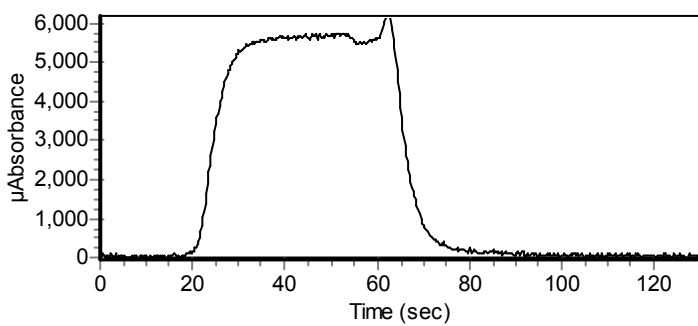
Concentrator(ppb) **0.1000**



9/14/2017 9:38:47 AM

**0.5ppb-**

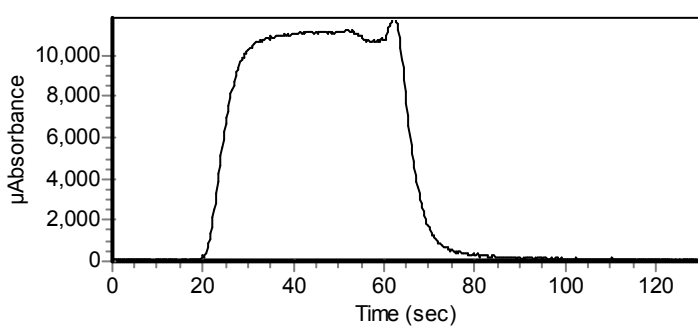
Concentrator(ppb) **0.5000**



9/14/2017 9:41:04 AM

**1.0ppb-**

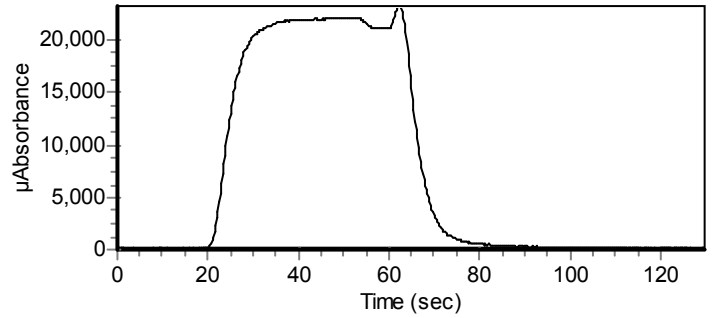
Concentrator(ppb) **1.0000**



9/14/2017 9:43:21 AM

**2.0ppb-**

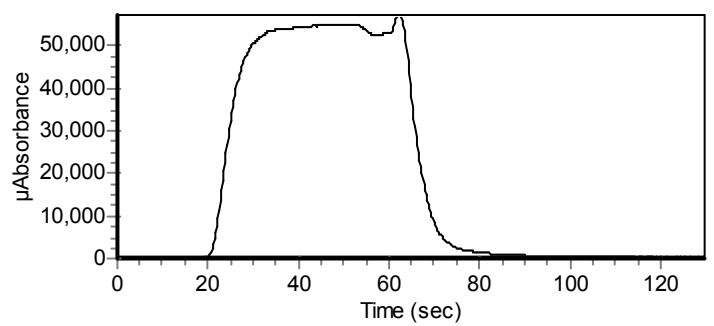
Concentrator(ppb) **2.0000**



9/14/2017 9:45:38 AM

**5.0ppb-**

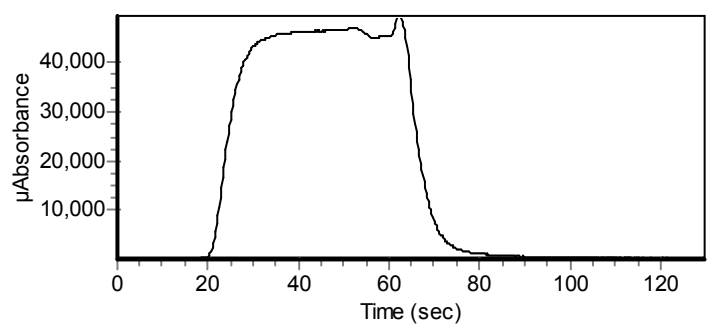
Concentrator(ppb) **5.0000**



9/14/2017 9:47:56 AM

**ICV-170914**

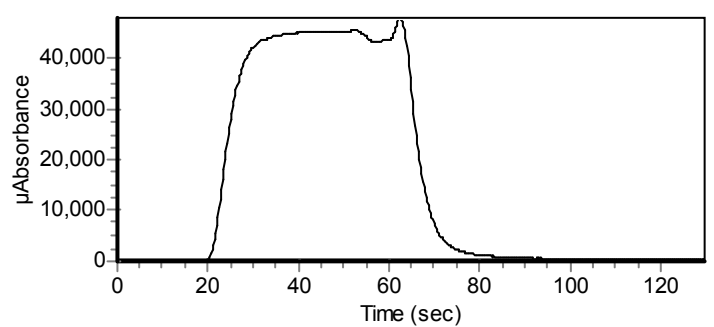
Concentrator(ppb) **4.2500**



9/14/2017 9:55:26 AM

**ICV-170914**

Concentrator(ppb) **4.1300**

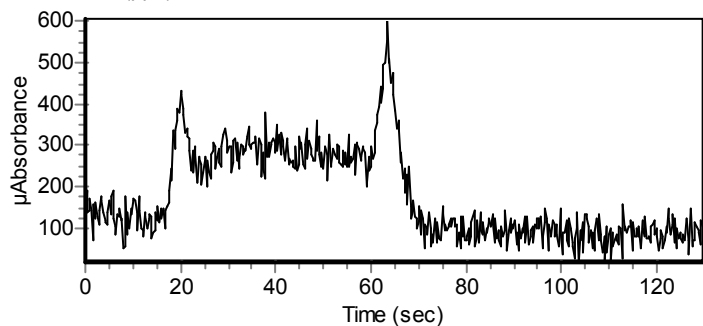


9/14/2017 9:57:44 AM

9/14/2017 10:06:47 AM

**ICB-170914**

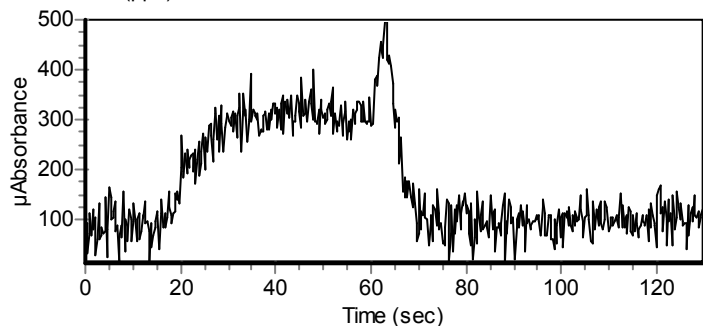
Concentration(ppb) **-0.0040**



9/14/2017 9:59:59 AM

**MB-82343**

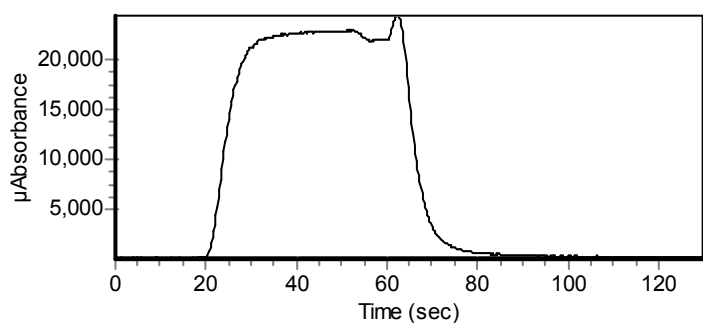
Concentration(ppb) **0.0026**



9/14/2017 10:02:15 AM

**LCS-82343**

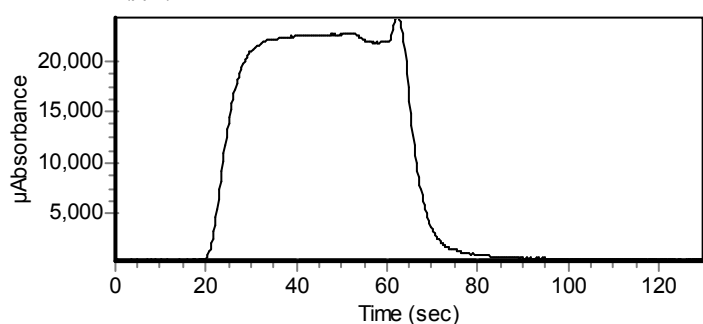
Concentration(ppb) **2.0600**



9/14/2017 10:04:31 AM

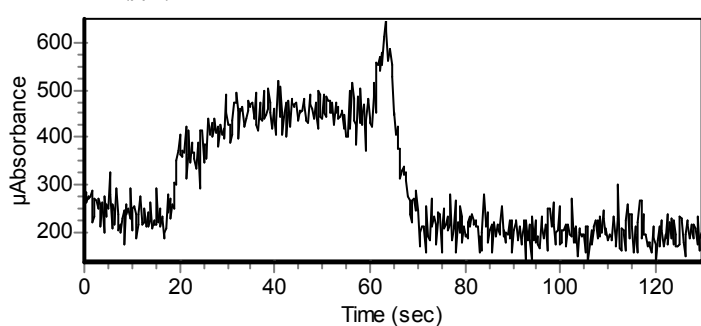
**LCS-82343**

Concentration(ppb) **2.0500**



**1709071-01A**

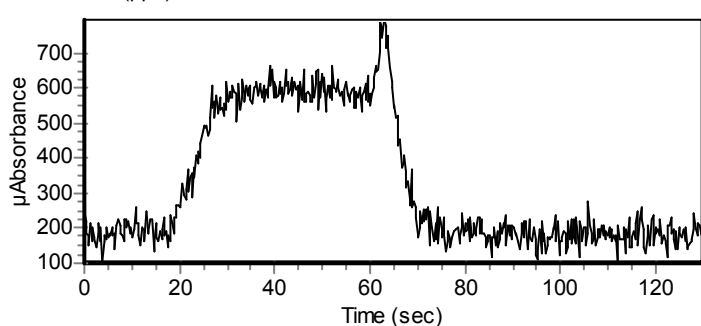
Concentration(ppb) **0.0025**



9/14/2017 10:09:04 AM

**1709078-01A**

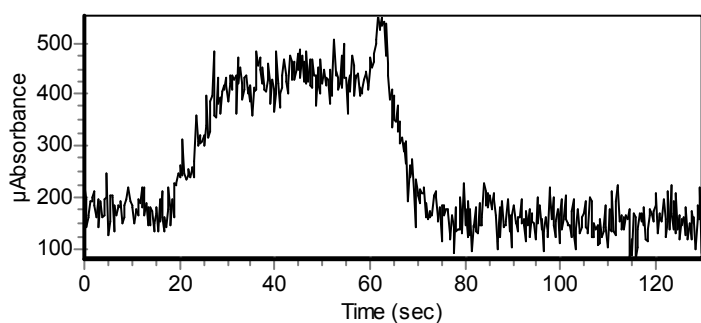
Concentration(ppb) **0.0181**



9/14/2017 10:11:19 AM

**1709078-02A**

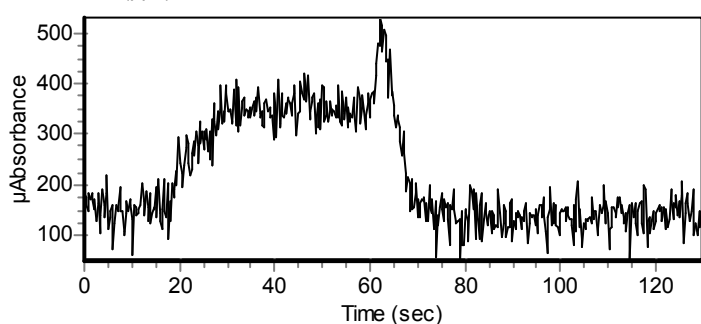
Concentration(ppb) **0.0063**



9/14/2017 10:13:35 AM

**1709078-02A SD**

Concentration(ppb) **0.0006**

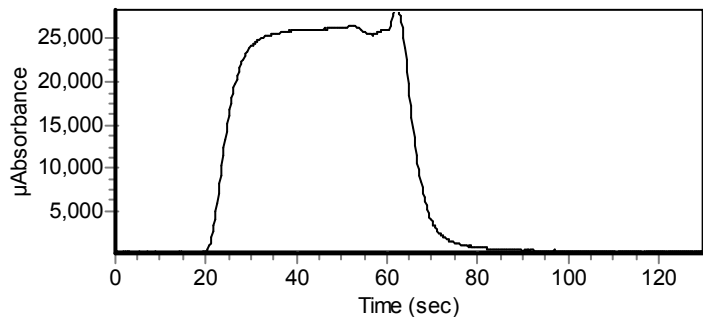




9/14/2017 10:15:50 AM

**1709078-02A PDS**

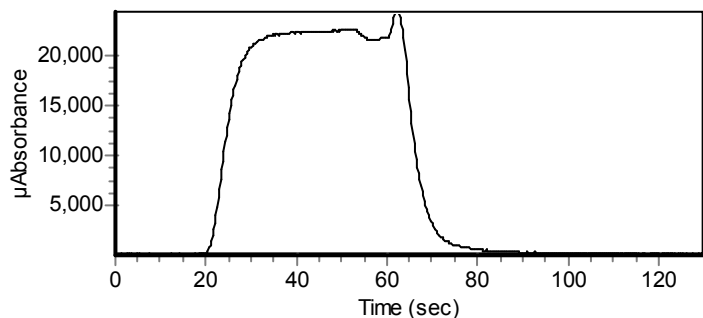
Concentrator(ppb) **2.3700**



9/14/2017 10:18:06 AM

**1709078-02A MS**

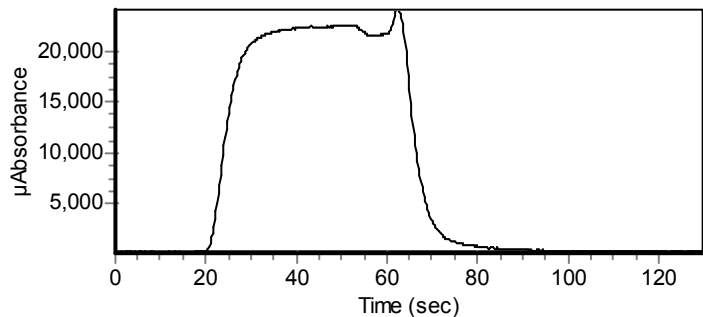
Concentrator(ppb) **2.0200**



9/14/2017 10:20:22 AM

**1709078-02A MSD**

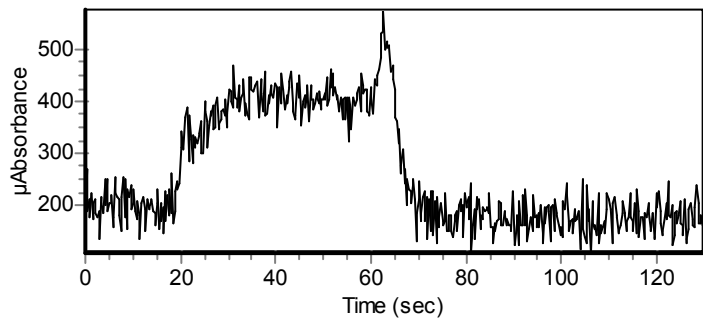
Concentrator(ppb) **2.0300**



9/14/2017 10:22:38 AM

**MB-82344**

Concentrator(ppb) **0.0007**

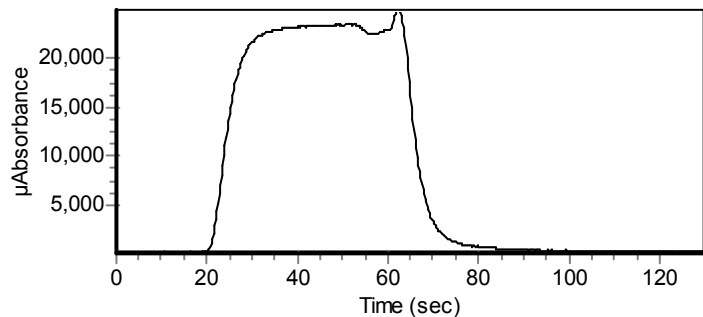


9/14/2017 11:06:24 AM

9/14/2017 10:24:54 AM

**LCS-82344**

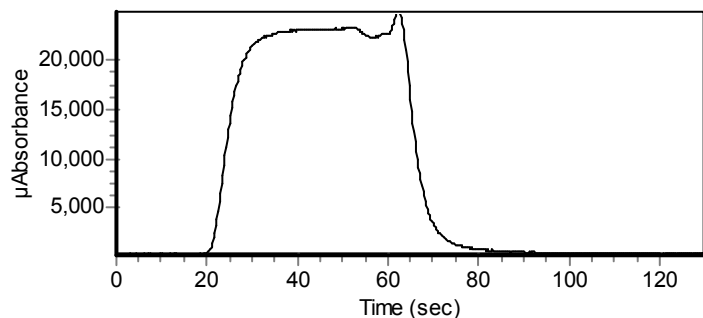
Concentrator(ppb) **2.1000**



9/14/2017 10:27:10 AM

**LCS-D-82344**

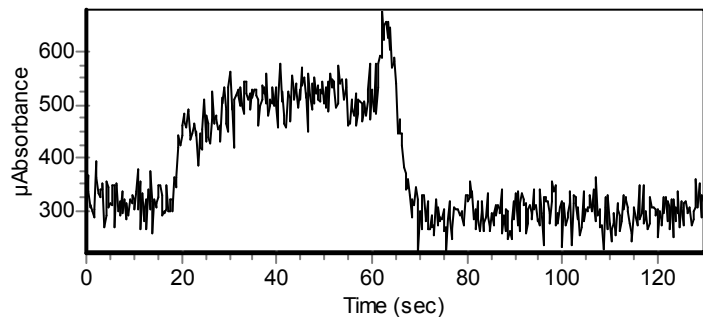
Concentrator(ppb) **2.0800**



9/14/2017 10:29:26 AM

**1709053-01B**

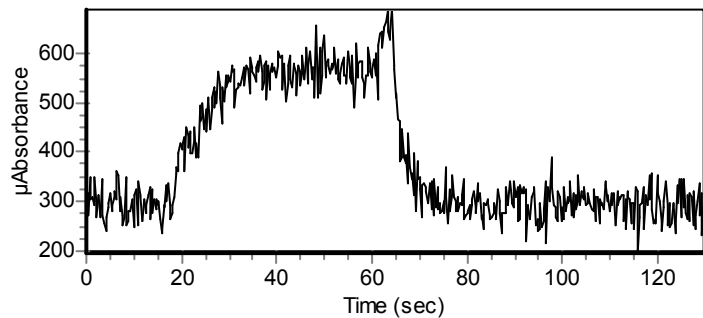
Concentrator(ppb) **0.0003**



9/14/2017 10:31:42 AM

**1709072-01A**

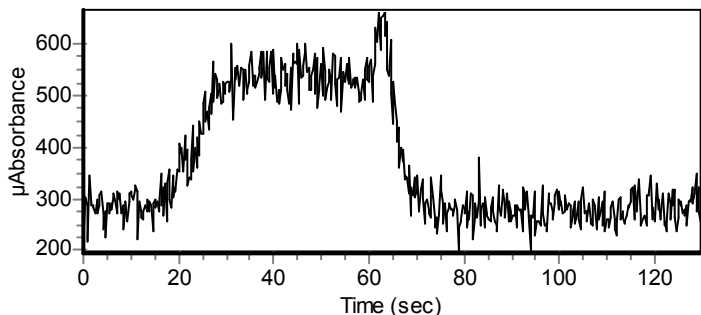
Concentrator(ppb) **0.0062**



9/14/2017 10:33:58 AM

1709073-01A

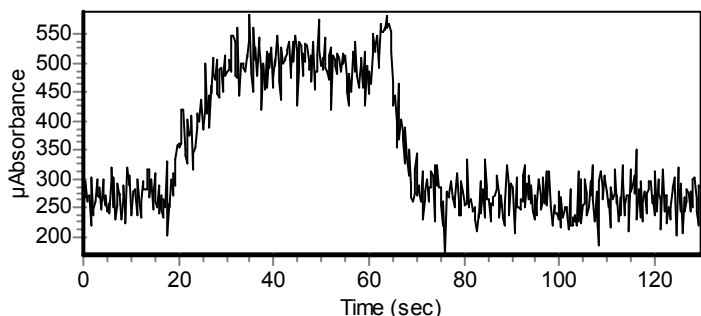
Concentrator(ppb) 0.0054



9/14/2017 10:36:14 AM

1709074-01A

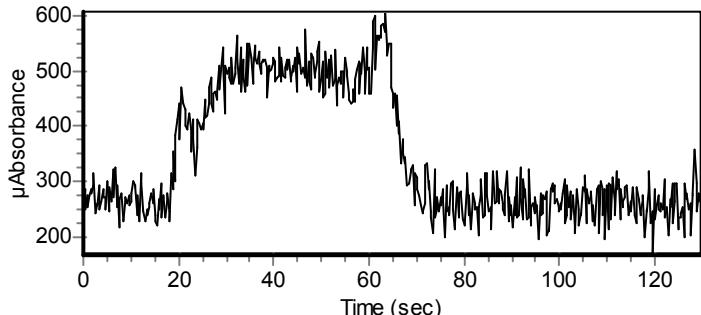
Concentrator(ppb) 0.0024



9/14/2017 10:38:30 AM

1709075-01A

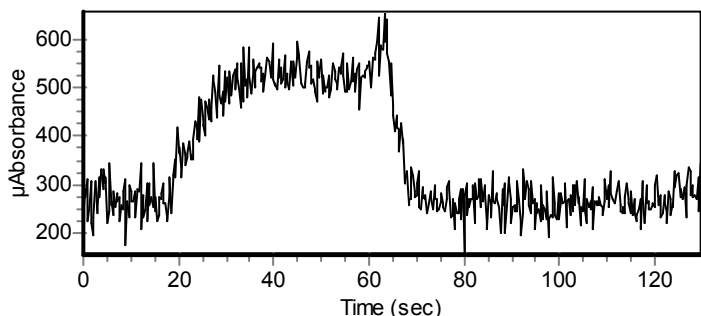
Concentrator(ppb) 0.0037



9/14/2017 10:40:46 AM

1709075-02A

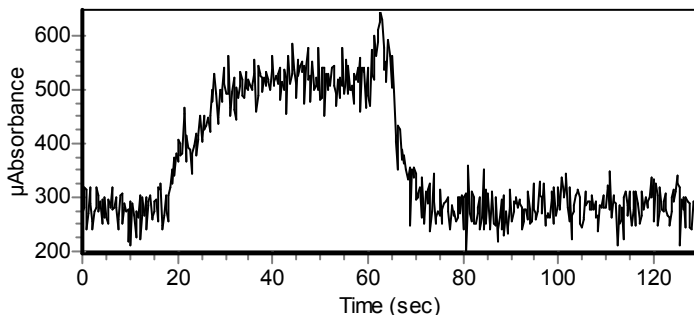
Concentrator(ppb) 0.0048



9/14/2017 10:43:02 AM

1709083-01A

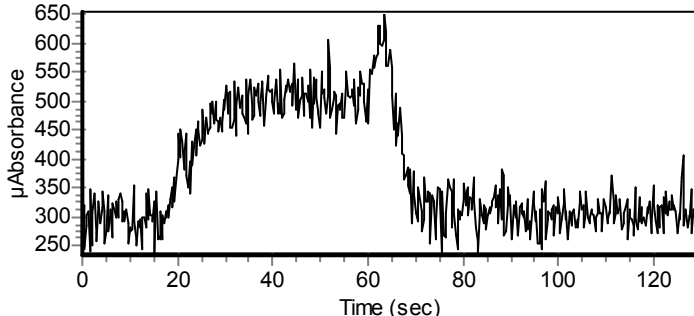
Concentrator(ppb) 0.0049



9/14/2017 10:45:18 AM

1709083-01A SD

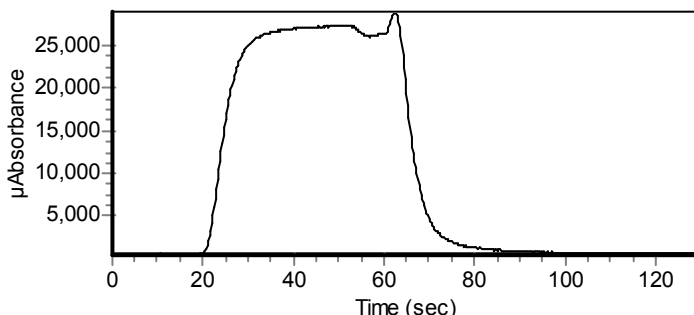
Concentrator(ppb) 0.0013



9/14/2017 10:47:35 AM

1709083-01A PDS

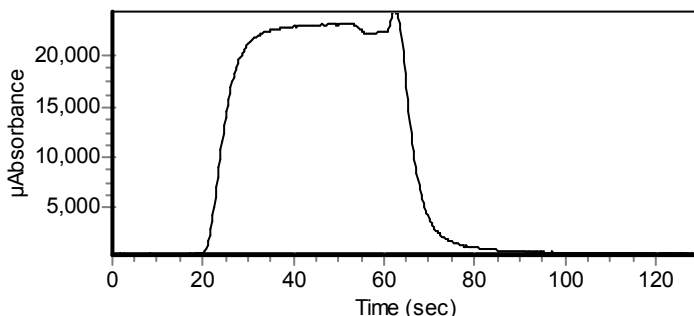
Concentrator(ppb) 2.4500



9/14/2017 10:49:51 AM

1709083-01A MS

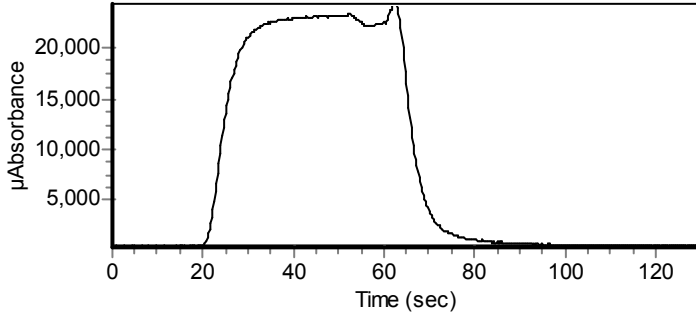
Concentrator(ppb) 2.0700



9/14/2017 10:52:08 AM

**1709083-01A MSD**

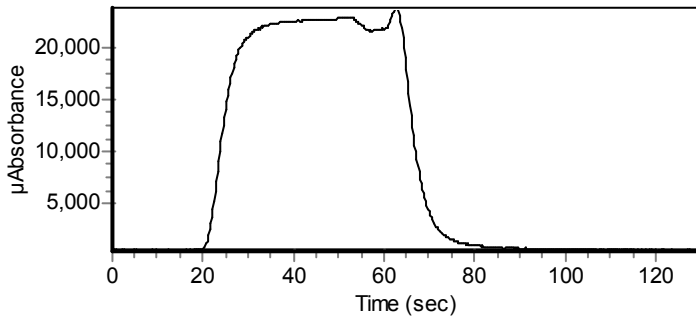
Concentration(ppb) **2.0700**



9/14/2017 10:54:26 AM

**CCV1-170908**

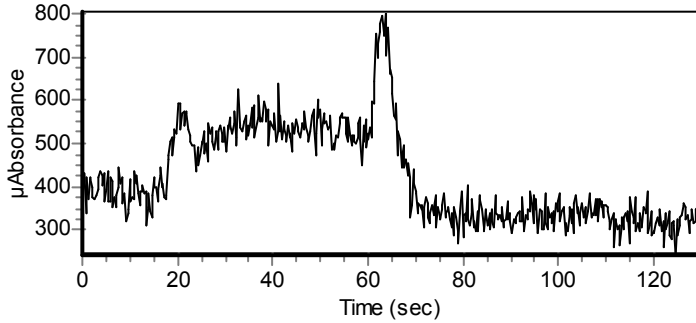
Concentration(ppb) **2.0200**



9/14/2017 10:56:44 AM

**CCB1-170908**

Concentration(ppb) **-0.0047**



# Analysis Parameters

## Instrument M-7600 Mercury Analyzer

### Conditions

Gas flow (mL/min)	Sample Uptake (s)	Rinse (s)	Read delay (s)	Replicates (#)	Replicate time (s)	Pump speed (%)	Wavelength (nm)
150	40.00	90.00	43.00	4	1.50	50	253.65

ASX Pump Rate (%)

20

### Instrumental Zero

Zero before first sample: No

Zero periodically: Yes  
Before each calibration

### Baseline Correction

#1 Start time (s)	#1 End time (s)	#2 Start time (s)	#2 End time (s)
10.00	15.00		

### Standby Mode

Enabled: Yes

Standby Options: pump slow, gas off, lamp off

### Autodilution

Enabled: No

Condition:

Tube # range:

If no autodilution tubes remaining

## Calibration

### Settings

Algorithm	Through blank	Weighted fit	Cal. Type	Racalibration rate	Reslope rate	Reslope standard
Linear	No	No	Normal	0	0	N/A

### Limits

Calibration slope		Reslope		Coeff. of Determinator
Lower (%)	Upper (%)	Lower (%)	Upper (%)	
20	150	75	125	0.99500

Error action: Flag and continue

## QC

GLP Override: Yes

### QC Tests

**CCB**

Concentration  
(ppb)  
0.0800

Failure flag: Q

Error action for manually inserted QC: Flag and continue

**ICB**

Concentration  
(ppb)  
0.0800

Failure flag: Z

Error action for manually inserted QC: Stop analysis

**CCV**

Concentration (ppb)	Low Limit %	High Limit %
2.0000	90.0000	110.0000

Failure flag: Q

Error action for manually inserted QC: Stop analysis

**ICV**

Concentration (ppb)	Low Limit %	High Limit %
4.0000	90.0000	110.0000

Failure flag: Q

Error action for manually inserted QC: Stop analysis

**LCS**

Concentration (ppb)	Low Limit %	High Limit %
2.0000	85.0000	115.0000

Failure flag: L

Error action for manually inserted QC: Flag and continue

**MSK**

Concentration (ppb)	Low Limit %	High Limit %
2.0000	80.0000	120.0000

Failure flag: N

Error action for manually inserted QC: Flag and continue

**MSDUP**

Concentration (ppb)	Low Limit %	High Limit %	RPD
0.0000	80.0000	120.0000	15.0000

Failure flag: D

Error action for manually inserted QC: Flag and continue

**MB**

Concentration  
(ppb)  
0.0800

Failure flag: Z

Error action for manually inserted QC: Flag and continue

**CETAC2\_HG\_170914C**

**For**

**DHL Work Order**

**1709083**

## Lab Data Review Check List

### EPA Method 7470 / 7471 / 245.1 - Mercury

<b>Project Number(s):</b>	SEE RUN LOG FOR LIST OF SAMPLES	<b>Run ID:</b>	CETAC2_HG_170914C			
<b>Batch Number(s):</b>	SEE RUN LOG FOR BATCH ID	<b>SOP:</b>	METALS-Hg-01 and Hg-02			
<b>Review Item</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>2nd Level Review</b>		
<b>Data Folder Contents</b>						
1. Is the Prep Batch Report included? <i>Check the Prep Start/End Dates, Sample Amounts, Bottle #s</i>	X			X		
2. Are the reagents and spikes listed on the Prep Batch Report current with a valid expiration date? <i>All standard/QC sample preparations shall be documented in LIMS</i>	X					
3. Is the Run Log included? <i>Check the Test Code, Sample Type, Batch ID, and Analysis Date/Time</i>	X					
4. Does the Mercury Calibration Curve Sheet contain all the DHL ID #s for all standards used for calibration? <i>Check the DHL ID #</i>	X					
<b>Daily Demonstration of Performance</b>						
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. See Run Log for Failures.						
<b>Review Item</b>	<b>Frequency</b>	<b>Limits</b>	<b>Pass</b>	<b>Fail</b>	<b>N/A</b>	<b>2nd Level Review</b>
Initial Calibration Curve (ICAL) (Blank + 5 Standards)	Prior to samples and when ICV fails	$R^2 \geq 0.990$	X			X
ICV - (Second Source Calibration Verification)	Daily before sample analysis	95-105% (245.1)				
		90-110% (TCEQ+DoD)	X			
ICB	After calibration	<MDL	X			
CCV	Every 10 samples and End of Run	90-110% (245.1 and TCEQ+DoD)	X			
CCB	Every 10 samples and End of Run	<MDL (ALL + DoD)	X			
Method Blank (MB)	Every Batch	< MDL / <1/2 RL (DoD) or <1/10 the sample/reg limit	X			
Filter/TCLP/SPLP Blank	Filter-Dissolved only TCLP / SPLP	< MDL / <1/2 RL (DoD) or <1/10 the sample/reg limit			X	
Lab Control Sample (LCS) Lab Control Sample Dup (LCSD)	Every Batch	85-115% (Meets ALL criteria)	X			
LCSD - RPD	Every LCS/LCSD	15% (Aq-TCEQ) / 20% (DoD) 30% (Soil-TCEQ)	X			
Matrix Spike/ Matrix Spike Duplicate (MS/MSD) Check FSP for MS/MSD limits	Every Batch	85-115% (Aq-TCEQ) 80-120% (DoD+7471 Soil) 83-118% (Soil-TCEQ)*	X			
MSD - RPD	Every MS/MSD	See LCSD-RPD Limits	X			
Dilution Test (SD) - RPD	Every Batch	10%	X			
Post Digestion Spike (PDS)	Every Batch	85-115%	X			
*MS/MSD acceptance limits for Method 7471 Soils are wider than the TCEQ-QAPP. Refer to project-specific QAPPs for the acceptance limits.						



## Lab Data Review Check List

### EPA Method 7470 / 7471 / 245.1 - Mercury

Review Item	Criteria	Yes	No	N/A	2nd Level Review
<b>Sample Analysis</b>					
1. Are all sample hold times met?	pH <2; 28 Days 28 Days (TCLP)+28 Days	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? (J flags are included)		X	Return to analyst if NO		

### 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 Review
1. Are all non-conformances included and noted?	All deviations from the method and SOP that affect data quality				X
2. Are all corrective actions included?					
3. Does the variance require approval by the Technical Director/General Manager/QA Manager?					

**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
<input type="checkbox"/> CCV out of control ( $\pm 10\%$ )	<input type="checkbox"/> Carryover from previous run	<input type="checkbox"/> Reanalyze QC to confirm
<input type="checkbox"/> CCB out of control ( $> MDL / > \frac{1}{2} RL$ )	<input type="checkbox"/> Cross contamination	<input type="checkbox"/> Recalibrate
<input type="checkbox"/> MB out of control ( $> MDL / > \frac{1}{2} RL$ )	<input type="checkbox"/> Lab Artifact	<input type="checkbox"/> Reprep/Reanalyze sample
<input type="checkbox"/> LCS <input type="checkbox"/> LCSD out of control ( $\pm 15\%$ )	<input type="checkbox"/> Prep Spike error (describe)	<input type="checkbox"/> Reprep/Reanalyze Batch
<input type="checkbox"/> MS <input type="checkbox"/> MSD out of control (See LIMS)	<input type="checkbox"/> Matrix Effect	<input type="checkbox"/> Reanalyze Batch/Sample/QC
<input type="checkbox"/> RPD out of control for MS/MSD (15/20/30)	<input type="checkbox"/> High Levels of Mercury	<input type="checkbox"/> Verify reagents are clean
<input type="checkbox"/> No MS/MSD prepared - LCS/LCSD used instead	<input type="checkbox"/> Insufficient sample for QC	<input type="checkbox"/> Reanalyze sample to confirm
<input type="checkbox"/> Missing QC (other than MS/MSD)	<input type="checkbox"/> Prep Error	<input type="checkbox"/> Sample results ND w/ dilution
<input type="checkbox"/> QC sample(s) was mis-spiked	<input type="checkbox"/> Analytical Error	<input type="checkbox"/> Client notified and approved
	<input type="checkbox"/> Client Request	<input type="checkbox"/> Flag data / Case narrative
<input type="checkbox"/> Other (describe below)	<input type="checkbox"/> Other (describe below)	<input type="checkbox"/> Accept data
		<input type="checkbox"/> Other (describe below)

General Comments and Impact on Data:

Analyst: Alex Hughes

Date: 09/14/17

Second-Level Review: [Signature]

Date:



Run ID: CETAC2\_HG\_170914C

Run No.: 94151

Analytical Run Date: 9/14/2017

InstrumentID: CETAC2\_HG

Analyst: Alex Hughes

SampID	DF	TestCode	SampType	Batch ID	Analysis Date/Time	Q	Comments
ICV-170914	1	HG_CTW	ICV	R94151	9/14/2017 9:55:26 AM		
ICB-170914	1	HG_CTW	ICB	R94151	9/14/2017 9:57:44 AM		
MB-82344	1	HG_CTW	MBLK	82344	9/14/2017 10:22:38 AM		
LCS-82344	1	HG_CTW	LCS	82344	9/14/2017 10:24:54 AM		
LCSD-82344	1	HG_CTW	LCSD	82344	9/14/2017 10:27:10 AM		
1709053-01B	1	HG_CTW	SAMP	82344	9/14/2017 10:29:26 AM		
1709083-01A	1	HG_CTW	SAMP	82344	9/14/2017 10:43:02 AM		
1709083-01A SD	5	HG_CTW	SD	82344	9/14/2017 10:45:18 AM		
1709083-01A PDS	1	HG_CTW	PDS	82344	9/14/2017 10:47:35 AM		
1709083-01A MS	1	HG_CTW	MS	82344	9/14/2017 10:49:51 AM		
1709083-01A MSD	1	HG_CTW	MSD	82344	9/14/2017 10:52:08 AM		
CCV1-170914	1	HG_CTW	CCV	R94151	9/14/2017 10:54:26 AM		
CCB1-170914	1	HG_CTW	CCB	R94151	9/14/2017 10:56:44 AM		

Std ID	Std Name	Type	Exp. Date
HG-170821-CAL	1 PPM HG CAL	CAL	09/21/2017
HG-170821-SPIKE	500ppb Hg Spike for LCS/MS/MS	LCS/MS	09/21/2017
HG-170824-VER	1 PPM Hg VER	ICV	09/24/2017

**DHL Analytical, Inc.**

**PREP BATCH REPORT**

Prep Start Date: 9/13/2017 10:45:40 AM

Digestion:

Prep End Date:

Prep Batch **82344** Prep Code: **HG\_PREPW**

Technician: **Alex Hughes**

Prep Factor Units:  
mL/mL

**Equipment List**

Hot Block #6  
Thermometer #71  
PIPETTE# P-41 REAGENTS  
PIPETTE# P-40 SPIKE

Sample ID	Matrix	pH	SampAmt	Fin Vol	Factor	Bottle #	Vessel	Cleanup
1709053-01B	Aqueous		25	25	1.000	1 of 1		
1709072-01A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709073-01A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709074-01A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709075-01A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709075-02A	Leachate		5 25	25	1.000	1 of 1		
	tclp extraction was done 9/9/2017.							
1709083-01A	Aqueous	MS/MSD	25	25	1.000	1 of 1		
LCS-82344	Aqueous		25	25	1.000	of		
LCSD-82344	Aqueous		25	25	1.000	of		
MB-82344	Aqueous		25	25	1.000	of		

Number	Reagent Name	Amt	Units	Exp. D:	Spk ID	Spike Name	SampType	Amt (mL or g)	Exp. Date
9082	pH paper 0-3	1	paper	04/08/2025	HG-170821-SPIKE	500ppb Hg Spike for LCS/MS/MSD	LCS/MS/MSD	0.1	09/21/2017
10382	Potassium Persulfate	2	ml	11/05/2026					
10917	Sulfuric Acid (trace metal grade)	1.25	ml	06/23/2019					
11022	Potassium Permanganate	3.75	ml	01/03/2027					
11594	Digestion Vessels	50	ml	01/10/2018					
11661	Nitric Acid (Trace Metal Grade)	0.65	ml	04/05/2019					
11723	Sodium Chloride Hydroxylamine Hydro	1.5	ml	03/05/2018					

11:45 - 1:45



**DHL Analytical, Inc.**

**PREP BATCH REPORT**

Prep Start Date: **9/13/2017 10:45:40 AM**  
 Digestion: **Start: 9/13/2017 11:45:00 AM / Stop: 9/13/2017 1:45:00 PM**  
 Prep End Date: **9/13/2017 4:00:00 PM**

Prep Factor Units:  
 mL/mL

Prep Batch **82344** Prep Code: **HG\_PREPW** Technician: **Alex Hughes**

Equipment List
Hot Block #6
Thermometer #71
PIPETTE# P-41 REAGENTS
PIPETTE# P-40 SPIKE

Sample ID	Matrix	pH	SampAmt	Fin Vol	Factor	Bottle #	Cleanup
1709053-01B	Aqueous		25	25	1.000	1 of 1	
1709072-01A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709073-01A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709074-01A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709075-01A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709075-02A	Leachate		5	25	5.000	1 of 1	
	tclp extraction was done 9/9/2017.						
1709083-01A	Aqueous		25	25	1.000	1 of 1	
1709083-01A MS	Aqueous		25	25	1.000	of	
1709083-01A MSD	Aqueous		25	25	1.000	of	
1709083-01A PDS	Aqueous		25	25	1.000	of	
1709083-01A SD	Aqueous		25	25	1.000	of	
LCS-82344	Aqueous		25	25	1.000	of	
LCSD-82344	Aqueous		25	25	1.000	of	
MB-82344	Aqueous		25	25	1.000	of	

Number	Reagent Name	Amt	Units	Exp. D:
9082	pH paper 0-3	1	paper	04/08/2025
10382	Potassium Persulfate	2	ml	11/05/2026
10917	Sulfuric Acid (trace metal grade)	1.25	ml	06/23/2019
11022	Potassium Permanganate	3.75	ml	01/03/2027
11594	Digestion Vessels	50	ml	01/10/2018
11661	Nitric Acid (Trace Metal Grade)	0.65	ml	04/05/2019
11723	Sodium Chloride Hydroxylamine Hydro	1.5	ml	03/05/2018

Spk ID	Spike Name	SampType	Amt (mL or g)	Exp. Date
HG-170821-SPIKE	500ppb Hg Spike for LCS/MS/MSD	LCS/MS/MSD	0.1	09/21/2017



**Method 7470/7471/245.1 Mercury Calibration Curve Sheet**  
**Standards Used for the Calibration Curve**

Run ID: CETAC2\_HG\_170914C

**Primary Source:**

**Hg Stock Standard (1000 ppm)**

Expiration Date: 1 year after opening

DHL ID#: MET-160209-6

Exp. Date: 10/9/2017

**CAL Stock Standard (1 ppm):**

Prepare: 50 µL of 1000 ppm to 50 mL 10% HNO<sub>3</sub>

Expiration Date: 1 month

DHL ID#: HG-170821-CAL

Exp. Date: 9/21/2017

**Daily CAL Standard (100 ppb):**

Prepare: 1 mL of 1 ppm CAL Stock to 9 mL 0.15% HNO<sub>3</sub> (#9997)

Expiration Date: Prepare Daily

**Second Source Verification Source:**

**Hg Stock Standard (1000 ppm)**

Expiration Date: 1 year after opening

DHL ID#: HG-160721

Exp. Date: 9/9/2017

**VER Stock Standard (1ppm):**

Prepare: 50 µL of 1000 ppm to 50 mL 10% HNO<sub>3</sub>

Expiration Date: 1 month

DHL ID#: HG-170824-VER

Exp. Date: 9/24/2017

**Daily VER Standard (100 ppb):**

Prepare: 1 mL of 1 ppm VER Stock to 9 mL 0.15% HNO<sub>3</sub> (#9997)

Expiration Date: Prepare Daily

**Reagents:**

SnCl<sub>2</sub> solution

DHL ID#: 11713

Soil Hg Blank (Calibration Blank)

DHL ID#: N/A

Water Hg Blank (Calibration Blank)

DHL ID#: 11717

Target Concentration	Preparation Instructions
5 ppb	1 mL of 100 ppb Daily CAL Standard to 20 mL Blank Solution
2 ppb	4 mL of 5 ppb to 10 mL Blank Solution
1 ppb	2 mL of 5 ppb to 10 mL Blank Solution
0.5 ppb	1 mL of 5 ppb to 10 mL Blank Solution
0.1 ppb	1 mL of 1 ppb to 10 mL Blank Solution
ICV (4 ppb)	1 mL of 100 ppb Daily VER Standard to 25 mL Blank Solution
CCV(2 ppb)	0.5 mL of 100 ppb Daily CAL Standard to 25 mL Blank Solution

Analyst:

*Alex Hughes*

Date: 9/14/2017

Second-Level Review:

*[Signature]*

Date:

PIPETTORS USED: P-34 AND P-19



# CETAC2\_HG

Report Generated By CETAC QuickTrace

Analyst: CETAC

Worksheet file: C:\Program Files\QuickTrace\Worksheets\170914W.wsz

Date Started: 9/14/2017 8:35:13 AM

Comment:

## Results

Sample Name	Type	Date/Time	Conc (ppb)	$\mu$ Abs	%RSD	Flags	DF
Blank- 170914	STD	09/14/17 09:34:15 am	0.0000	206	4.95		1.00
Replicates				201.8 197.0 220.6	205.6		
0.1ppb- 170914	STD	09/14/17 09:36:31 am	0.1000	1273	0.27		1.00
Replicates				1271.9 1277.4 1269.6	1274.9		
0.5ppb- 170914	STD	09/14/17 09:38:47 am	0.5000	5626	0.20		1.00
Replicates				5625.8 5610.7 5632.3	5636.8		
1.0ppb- 170914	STD	09/14/17 09:41:04 am	1.0000	11068	0.08		1.00
Replicates				11079.1 11068.9 11059.9	11062.2		
2.0ppb- 170914	STD	09/14/17 09:43:21 am	2.0000	22056	0.21		1.00
Replicates				22015.2 22020.9 22076.4	22110.8		
5.0ppb- 170914	STD	09/14/17 09:45:38 am	5.0000	54614	0.10		1.00
Replicates				54553.3 54590.6 54625.4	54686.1		

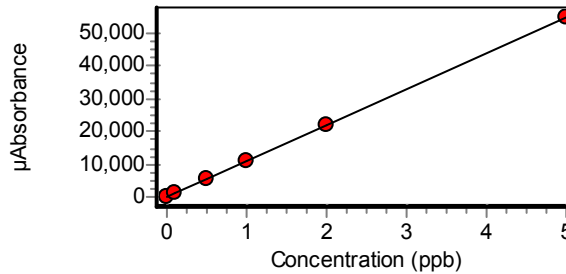
### Calibration 170914

Equation:  $A = 201.991 + 10887.370C$

R2: 1.00000

SEE: 44.8504

Flags:



ICV-170914	ICV	09/14/17 09:47:56 am	4.2500	46471	0.19		1.00
Replicates				46401.5 46406.3 46482.8	46594.4		
% Recovery				106.25			

Sample Name				Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags	DF
ICV-170914				ICV	09/14/17 09:55:26 am	4.1300	45169	0.08		1.00
Replicates	45152.0	45136.2	45166.5	45223.2						
% Recovery	103.26									
ICB-170914				ICB	09/14/17 09:57:44 am	-0.0040	159	11.17		1.00
Replicates	135.1	155.4	174.9	169.3						
MB-82343				MB	09/14/17 09:59:59 am	0.0026	231	3.16		1.00
Replicates	221.5	233.7	238.7	229.3						
LCS-82343				LCS	09/14/17 10:02:15 am	2.0600	22666	0.14		1.00
Replicates	22637.9	22647.3	22671.0	22706.8						
% Recovery	103.16									
LCSD-82343				LCS	09/14/17 10:04:31 am	2.0500	22523	0.16		1.00
Replicates	22484.2	22510.0	22531.0	22567.0						
% Recovery	102.51									
1709071-01A				UNK	09/14/17 10:06:47 am	0.0025	229	2.87		1.00
Replicates	238.1	225.1	228.6	223.4						
1709078-01A				UNK	09/14/17 10:09:04 am	0.0181	400	4.42		1.00
Replicates	405.8	397.9	376.3	418.3						
1709078-02A				UNK	09/14/17 10:11:19 am	0.0063	271	3.93		1.00
Replicates	272.1	282.4	271.1	256.6						
1709078-02A SD				UNK	09/14/17 10:13:35 am	0.0006	209	5.42		5.00
Replicates	204.5	210.2	223.5	196.7						
1709078-02A PDS				UNK	09/14/17 10:15:50 am	2.3700	26003	0.23		1.00
Replicates	25941.0	25973.2	26016.7	26082.0						
1709078-02A MS				MSK	09/14/17 10:18:06 am	2.0200	22246	0.19	N	1.00
Replicates	22189.8	22247.2	22251.5	22293.7						
% Recovery	-17.26									
1709078-02A MSD				MSDUP	09/14/17 10:20:22 am	2.0300	22297	0.14	D	1.00
Replicates	22262.7	22287.0	22300.5	22336.6						
% Recovery	-17.02	RPD 0.23								

Sample Name				Type	Date/Time	Conc (ppb)	μAbs	%RSD	Flags	DF
MB-82344				MB	09/14/17 10:22:38 am	0.0007	209	1.25		1.00
Replicates	212.6	207.5	210.0		206.8					
LCS-82344				LCS	09/14/17 10:24:54 am	2.1000	23049	0.16		1.00
Replicates	23018.1	23020.1	23068.0		23091.0					
% Recovery	104.93									
LCSD-82344				LCS	09/14/17 10:27:10 am	2.0800	22817	0.15		1.00
Replicates	22785.8	22803.6	22813.5		22867.0					
% Recovery	103.86									
1709053-01B				UNK	09/14/17 10:29:26 am	0.0003	206	4.91		1.00
Replicates	201.3	219.8	196.3		205.1					
1709072-01A				UNK	09/14/17 10:31:42 am	0.0062	269	3.05		1.00
Replicates	258.4	269.6	278.3		270.8					
1709073-01A				UNK	09/14/17 10:33:58 am	0.0054	260	4.29		1.00
Replicates	247.0	265.6	272.6		256.3					
1709074-01A				UNK	09/14/17 10:36:14 am	0.0024	229	5.15		1.00
Replicates	240.6	222.5	236.4		215.4					
1709075-01A				UNK	09/14/17 10:38:30 am	0.0037	242	1.11		1.00
Replicates	239.1	245.0	242.9		240.2					
1709075-02A				UNK	09/14/17 10:40:46 am	0.0048	255	7.02		1.00
Replicates	253.7	275.9	256.2		232.2					
1709083-01A				UNK	09/14/17 10:43:02 am	0.0049	256	3.55		1.00
Replicates	258.2	260.0	262.0		242.1					
1709083-01A SD				UNK	09/14/17 10:45:18 am	0.0013	216	5.06		5.00
Replicates	230.2	203.5	217.0		215.0					
1709083-01A PDS				UNK	09/14/17 10:47:35 am	2.4500	26910	0.22		1.00
Replicates	26833.0	26900.3	26934.8		26971.1					



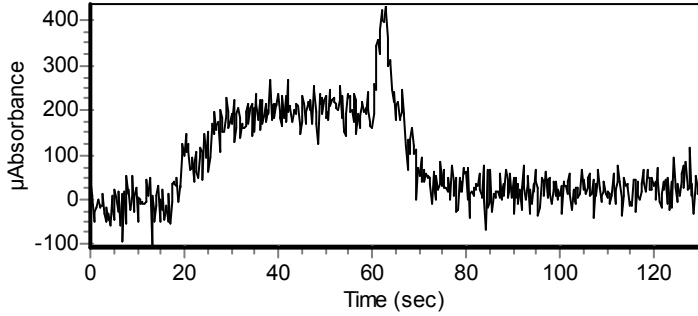
Sample Name				Type	Date/Time	Conc (ppb)	μAbs	%RSD	Flags	DF
1709083-01A MS				MSK	09/14/17 10:49:51 am	2.0700	22706	0.22	N	1.00
Replicates	22662.6	22668.5	22729.9	22763.7						
% Recovery	-19.30									
1709083-01A MSD				MSDUP	09/14/17 10:52:08 am	2.0700	22709	0.20	D	1.00
Replicates	22662.3	22689.2	22712.4	22770.7						
% Recovery	-19.29	RPD 0.01								
CCV1-170908				CCV	09/14/17 10:54:26 am	2.0200	22221	0.18		1.00
Replicates	22195.6	22186.6	22230.5	22272.5						
% Recovery	101.12									
CCB1-170908				CCB	09/14/17 10:56:44 am	-0.0047	151	5.71		1.00
Replicates	137.9	156.4	154.5	154.2						

# Sample Graphs

9/14/2017 9:34:15 AM

**Blank-**

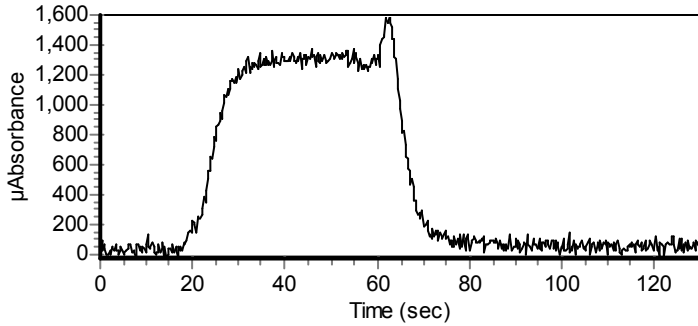
Concentrator(ppb) **0.0000**



9/14/2017 9:36:31 AM

**0.1ppb-**

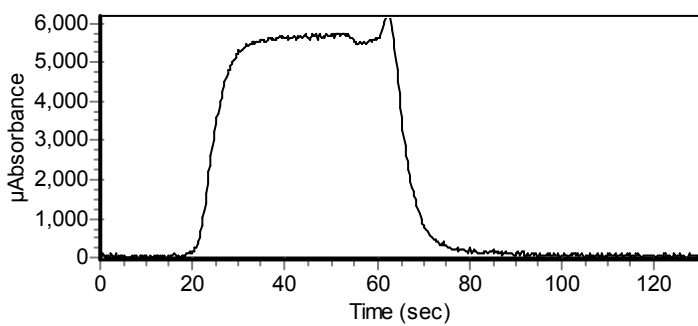
Concentrator(ppb) **0.1000**



9/14/2017 9:38:47 AM

**0.5ppb-**

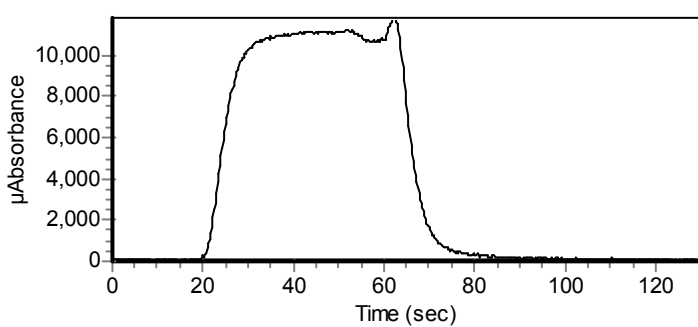
Concentrator(ppb) **0.5000**



9/14/2017 9:41:04 AM

**1.0ppb-**

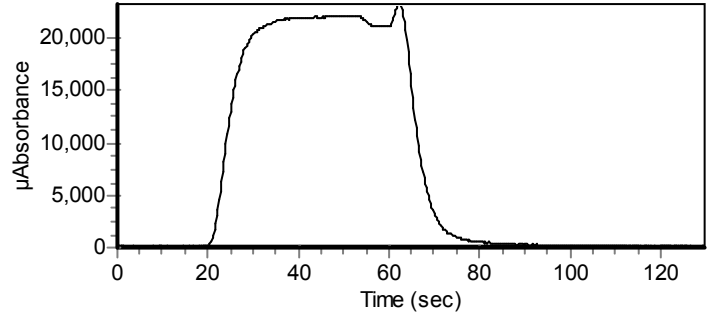
Concentrator(ppb) **1.0000**



9/14/2017 9:43:21 AM

**2.0ppb-**

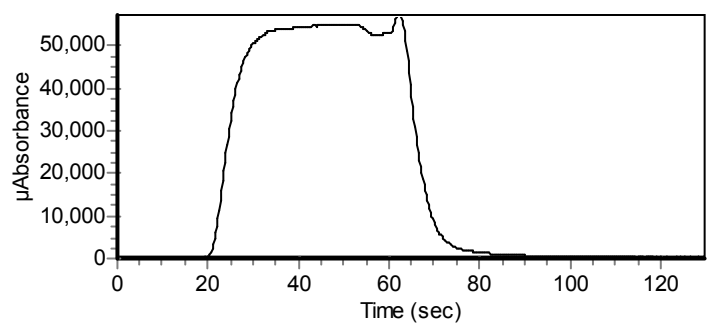
Concentrator(ppb) **2.0000**



9/14/2017 9:45:38 AM

**5.0ppb-**

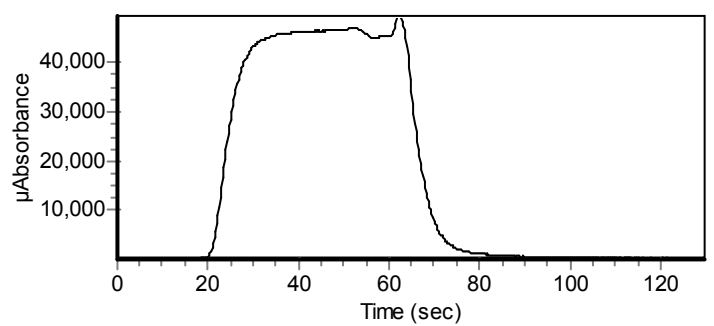
Concentrator(ppb) **5.0000**



9/14/2017 9:47:56 AM

**ICV-170914**

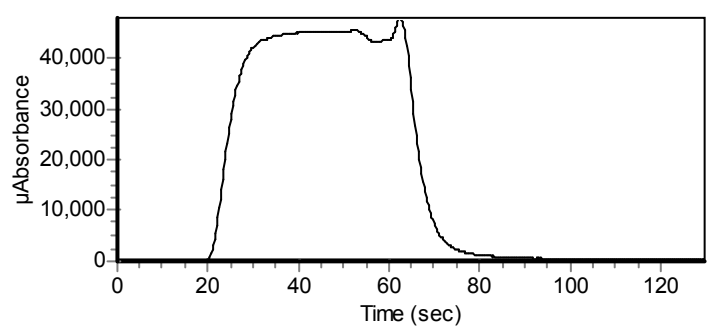
Concentrator(ppb) **4.2500**



9/14/2017 9:55:26 AM

**ICV-170914**

Concentrator(ppb) **4.1300**

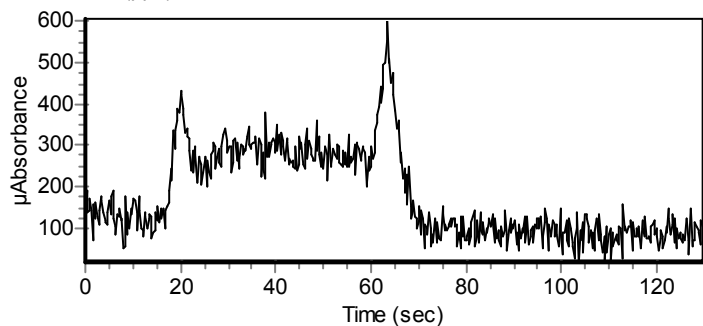


9/14/2017 9:57:44 AM

9/14/2017 10:06:47 AM

**ICB-170914**

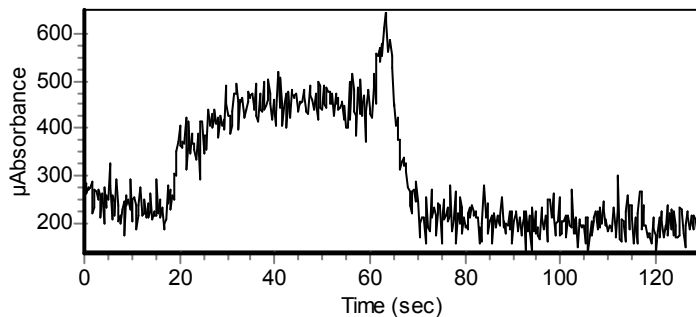
Concentrator(ppb) **-0.0040**



9/14/2017 9:59:59 AM

**1709071-01A**

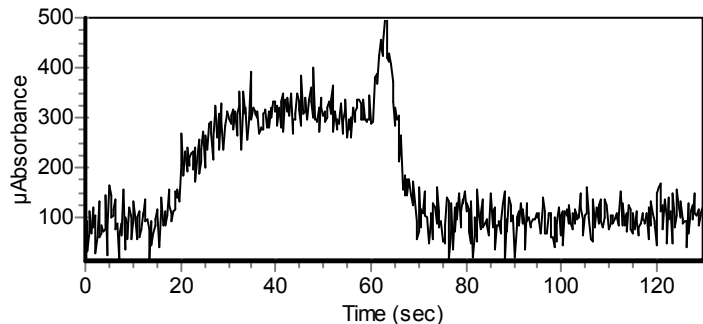
Concentrator(ppb) **0.0025**



9/14/2017 10:09:04 AM

**MB-82343**

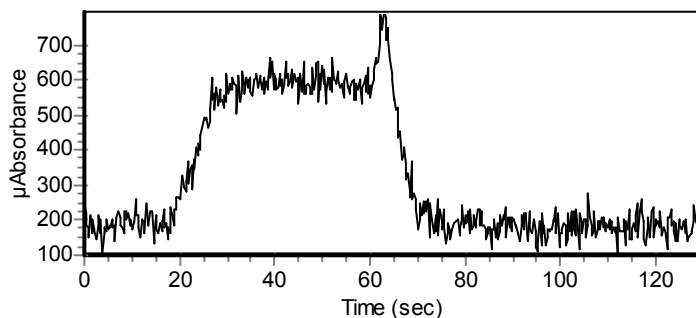
Concentrator(ppb) **0.0026**



9/14/2017 10:02:15 AM

**1709078-01A**

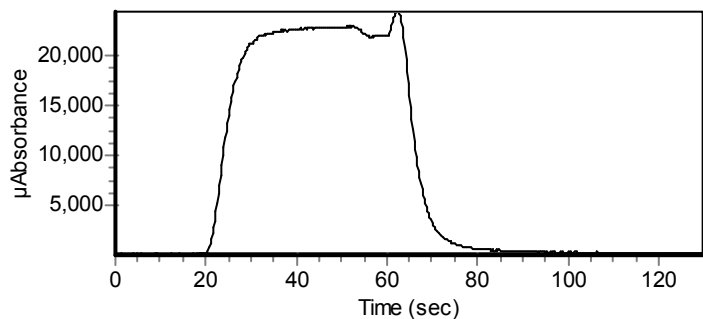
Concentrator(ppb) **0.0181**



9/14/2017 10:11:19 AM

**LCS-82343**

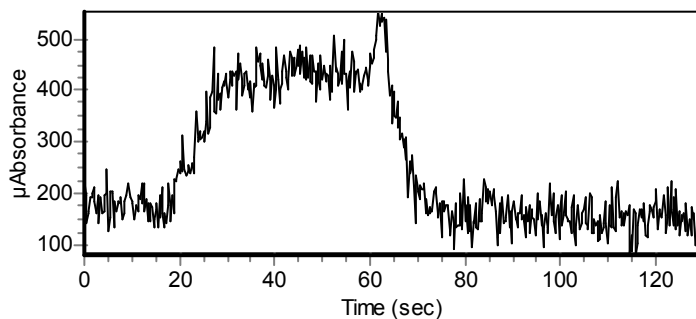
Concentrator(ppb) **2.0600**



9/14/2017 10:04:31 AM

**1709078-02A**

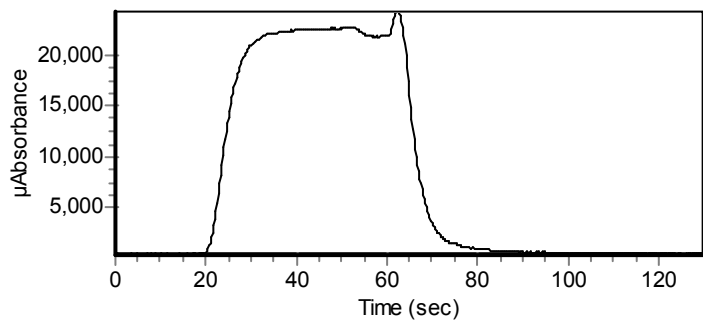
Concentrator(ppb) **0.0063**



9/14/2017 10:13:35 AM

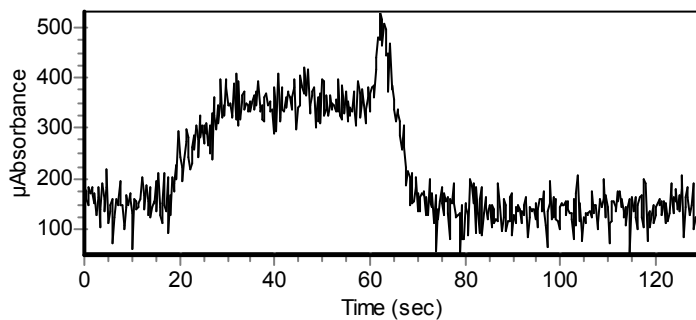
**LCS-82343**

Concentrator(ppb) **2.0500**



**1709078-02A SD**

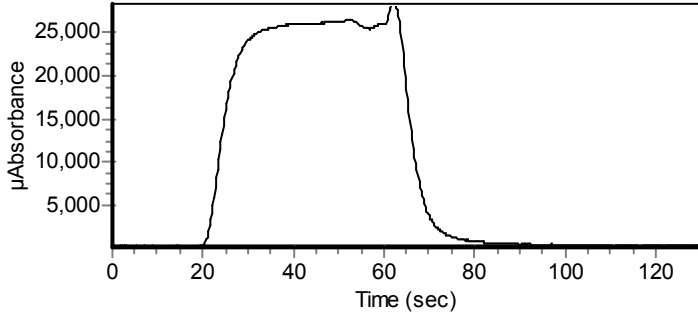
Concentrator(ppb) **0.0006**



9/14/2017 10:15:50 AM

**1709078-02A PDS**

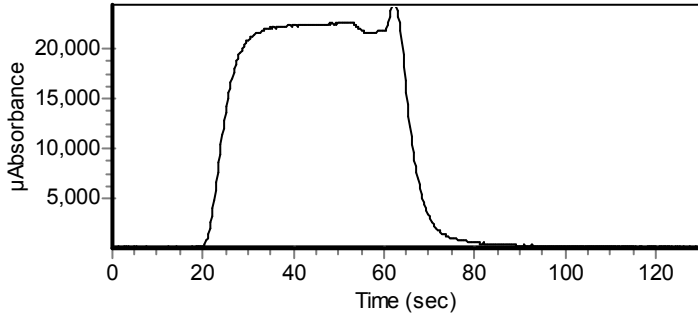
Concentrator(ppb) **2.3700**



9/14/2017 10:18:06 AM

**1709078-02A MS**

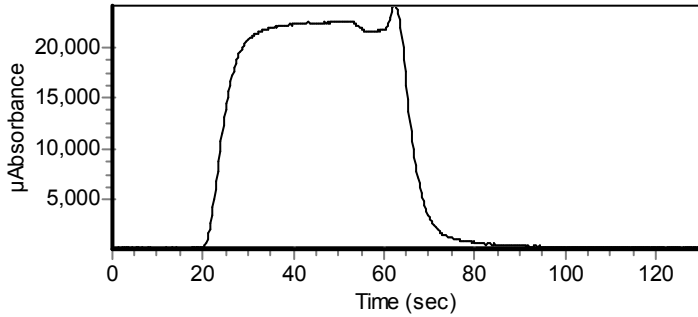
Concentrator(ppb) **2.0200**



9/14/2017 10:20:22 AM

**1709078-02A MSD**

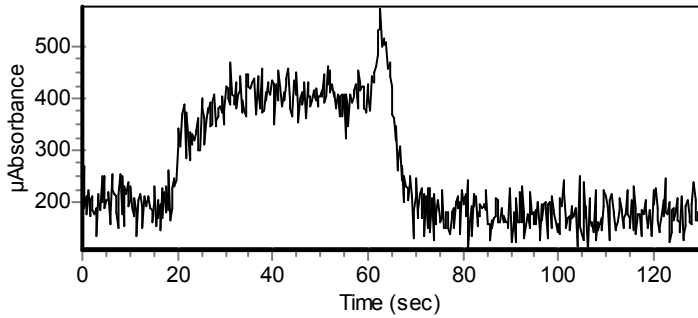
Concentrator(ppb) **2.0300**



9/14/2017 10:22:38 AM

**MB-82344**

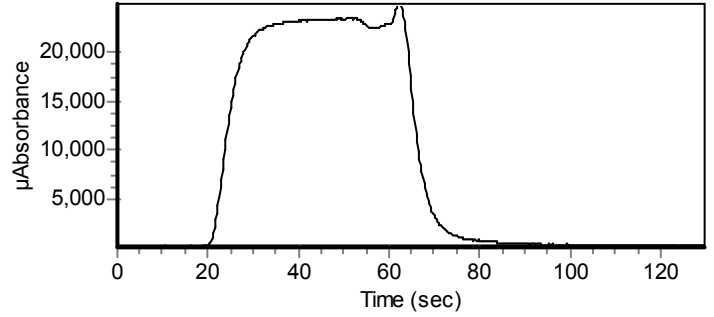
Concentrator(ppb) **0.0007**



9/14/2017 10:24:54 AM

**LCS-82344**

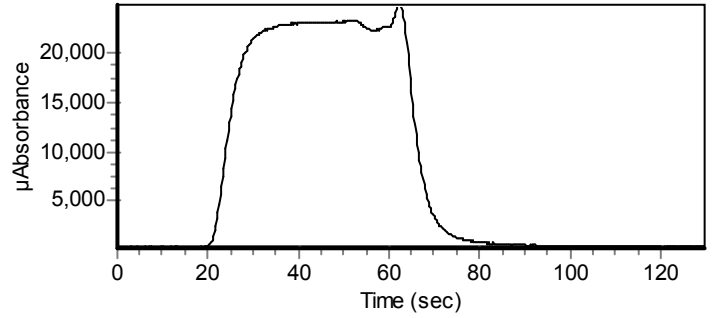
Concentrator(ppb) **2.1000**



9/14/2017 10:27:10 AM

**LCS-82344**

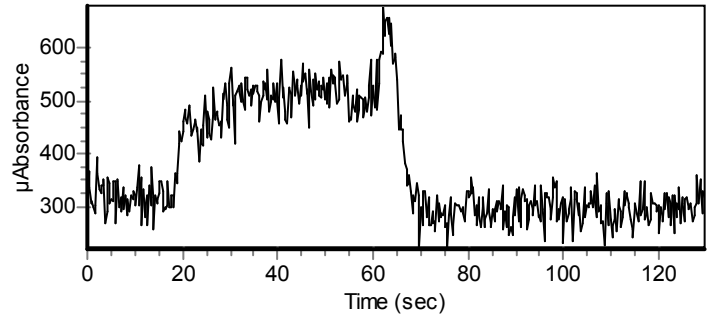
Concentrator(ppb) **2.0800**



9/14/2017 10:29:26 AM

**1709053-01B**

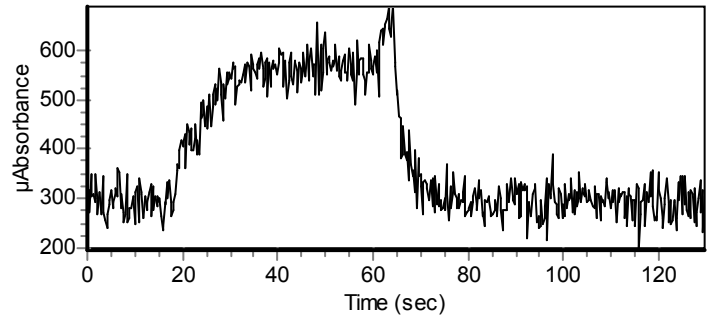
Concentrator(ppb) **0.0003**



9/14/2017 10:31:42 AM

**1709072-01A**

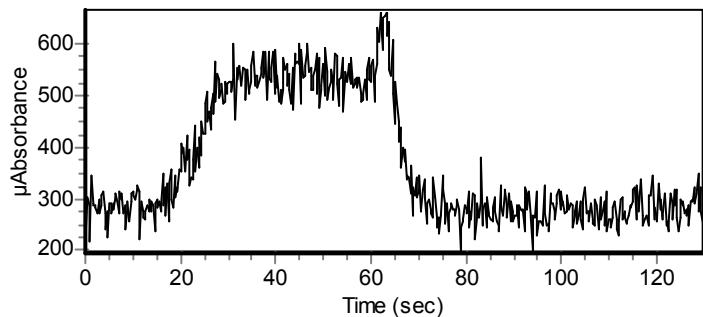
Concentrator(ppb) **0.0062**



9/14/2017 10:33:58 AM

1709073-01A

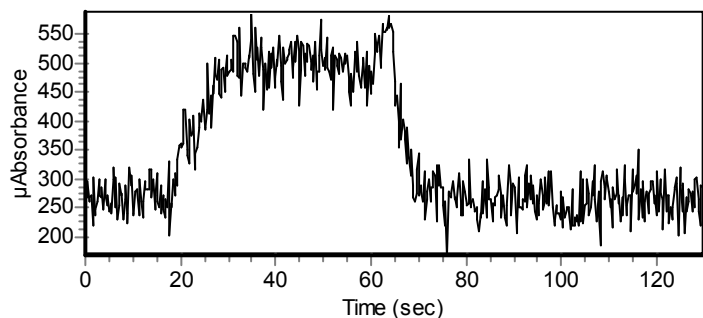
Concentration(ppb) 0.0054



9/14/2017 10:36:14 AM

1709074-01A

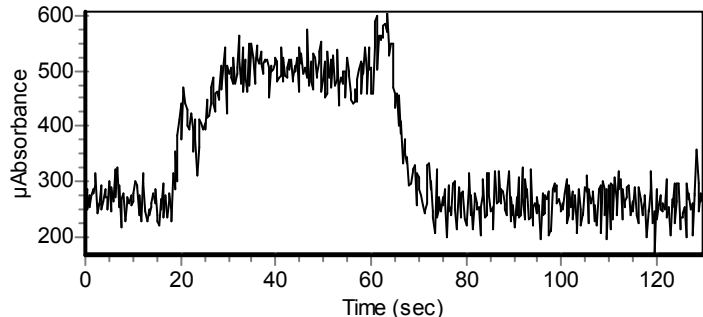
Concentration(ppb) 0.0024



9/14/2017 10:38:30 AM

1709075-01A

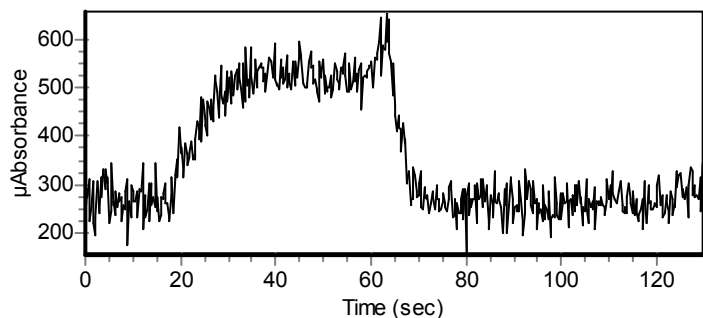
Concentration(ppb) 0.0037



9/14/2017 10:40:46 AM

1709075-02A

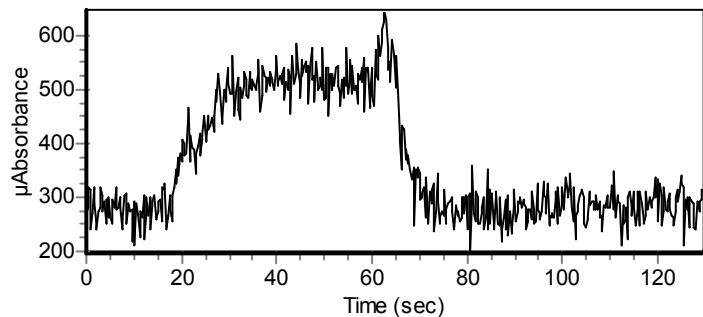
Concentration(ppb) 0.0048



9/14/2017 10:43:02 AM

1709083-01A

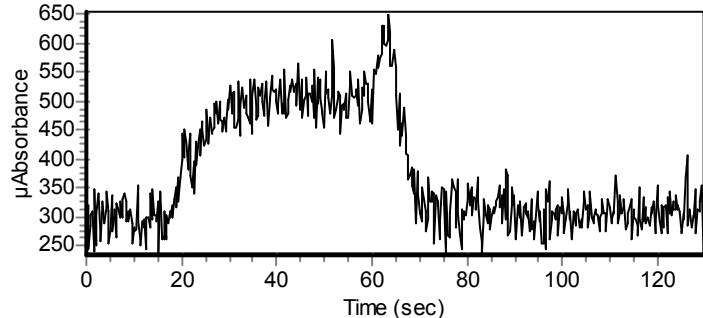
Concentration(ppb) 0.0049



9/14/2017 10:45:18 AM

1709083-01A SD

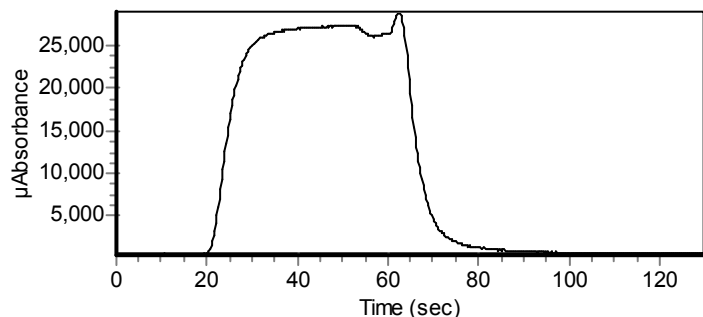
Concentration(ppb) 0.0013



9/14/2017 10:47:35 AM

1709083-01A PDS

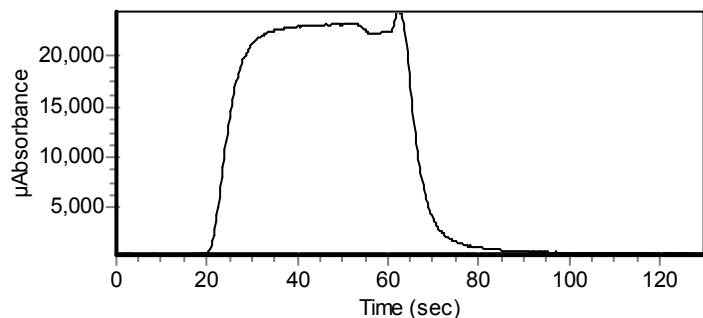
Concentration(ppb) 2.4500



9/14/2017 10:49:51 AM

1709083-01A MS

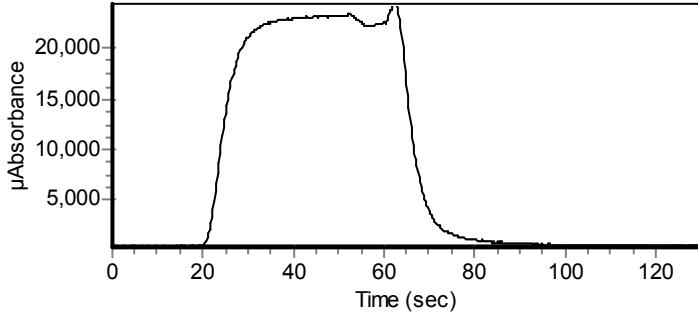
Concentration(ppb) 2.0700



9/14/2017 10:52:08 AM

**1709083-01A MSD**

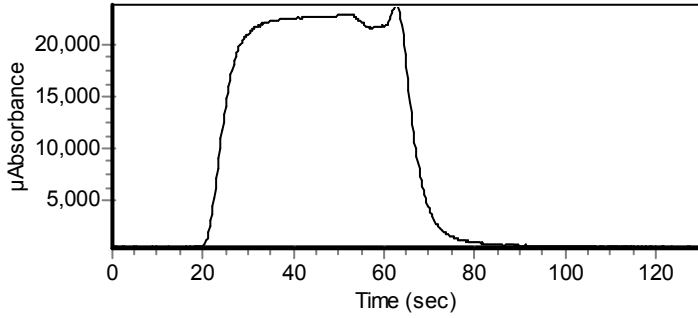
Concentration(ppb) **2.0700**



9/14/2017 10:54:26 AM

**CCV1-170908**

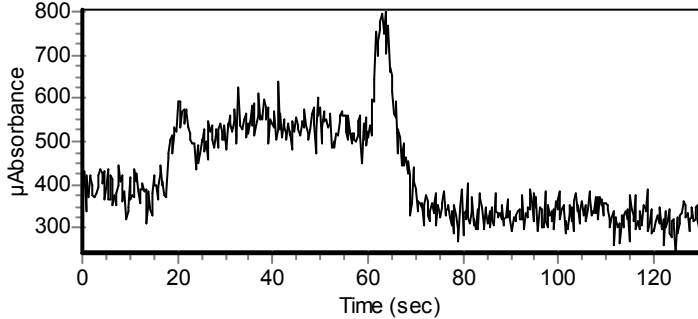
Concentration(ppb) **2.0200**



9/14/2017 10:56:44 AM

**CCB1-170908**

Concentration(ppb) **-0.0047**



# Analysis Parameters

## Instrument M-7600 Mercury Analyzer

### Conditions

Gas flow (mL/min)	Sample Uptake (s)	Rinse (s)	Read delay (s)	Replicates (#)	Replicate time (s)	Pump speed (%)	Wavelength (nm)
150	40.00	90.00	43.00	4	1.50	50	253.65

ASX Pump Rate (%)

20

### Instrumental Zero

Zero before first sample: No

Zero periodically: Yes  
Before each calibration

### Baseline Correction

#1 Start time (s)	#1 End time (s)	#2 Start time (s)	#2 End time (s)
10.00	15.00		

### Standby Mode

Enabled: Yes

Standby Options: pump slow, gas off, lamp off

### Autodilution

Enabled: No

Condition:

Tube # range:

If no autodilution tubes remaining

## Calibration

### Settings

Algorithm	Through blank	Weighted fit	Cal. Type	Racalibration rate	Reslope rate	Reslope standard
Linear	No	No	Normal	0	0	N/A

### Limits

Calibration slope		Reslope		Coeff. of Determinator
Lower (%)	Upper (%)	Lower (%)	Upper (%)	
20	150	75	125	0.99500

Error action: Flag and continue

## QC

GLP Override: Yes

### QC Tests

**CCB**

Concentration  
(ppb)  
0.0800

Failure flag: Q

Error action for manually inserted QC: Flag and continue

**ICB**

Concentration  
(ppb)  
0.0800

Failure flag: Z

Error action for manually inserted QC: Stop analysis

**CCV**

Concentration (ppb)	Low Limit %	High Limit %
2.0000	90.0000	110.0000

Failure flag: Q

Error action for manually inserted QC: Stop analysis

**ICV**

Concentration (ppb)	Low Limit %	High Limit %
4.0000	90.0000	110.0000

Failure flag: Q

Error action for manually inserted QC: Stop analysis

**LCS**

Concentration (ppb)	Low Limit %	High Limit %
2.0000	85.0000	115.0000

Failure flag: L

Error action for manually inserted QC: Flag and continue

**MSK**

Concentration (ppb)	Low Limit %	High Limit %
2.0000	80.0000	120.0000

Failure flag: N

Error action for manually inserted QC: Flag and continue

**MSDUP**

Concentration (ppb)	Low Limit %	High Limit %	RPD
0.0000	80.0000	120.0000	15.0000

Failure flag: D

Error action for manually inserted QC: Flag and continue



**MB**

Concentration  
(ppb)  
0.0800

Failure flag: Z

Error action for manually inserted QC: Flag and continue

**ICP-MS4**

**For**

**DHL Work Order**

**1709083**

**ICP-MS4\_170915A**

**For**

**DHL Work Order**

**1709083**

**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_170915A			
		SOP:	MET-ICP-MS-02			
Review Item	Yes	No	N/A	2nd Level Review		
<b>Data Folder Contents</b>						
1. Is the Prep Batch Report included? <i>Check the Prep Start/End Dates, Sample Amounts, Bottle #s</i>	X					
2. Are the reagents and spikes listed on the Prep Batch Report current with a valid expiration date? <i>All standard/QC sample preparations shall be documented in LIMS</i>	X				X	
3. Is the Run Log and instrument sequence included? <i>Check the Test Code, Sample Type, Batch ID, and Analysis Date/Time</i>	X					
<b>Daily Demonstration of Performance</b>						
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			
Initial Calibration Curve (ICAL) (Blank + Multi-Level CAL STDS)	Prior to samples and when ICV fails	R <sup>2</sup> ≥ 0.99 (DoD) R ≥ 0.998 (6020A)	X		X	
<b>Note: LCVLs and ICSA/ICSAB are N/A for Method 200.8 or project-specific exceptions.</b>						
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			
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		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
<b>Sample Analysis</b> 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			
<b>3. Are ALL reported analytes and reported results &gt; MDL highlighted by the analyst?</b>		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
<input type="checkbox"/> CCV out of control (± 10%)	<input type="checkbox"/> Carryover from previous run	<input type="checkbox"/> Reanalyze QC to confirm
<input type="checkbox"/> CCB out of control (> MDL / >½ RL)	<input type="checkbox"/> Cross contamination	<input type="checkbox"/> Recalibrate
<input type="checkbox"/> MB out of control (> RL / >½ RL)	<input type="checkbox"/> Lab Artifact	<input type="checkbox"/> Reprep/Reanalyze sample
<input type="checkbox"/> LCS <input type="checkbox"/> LCSD out of control (± 20%)	<input type="checkbox"/> Prep Spike error (describe)	<input type="checkbox"/> Reprep/Reanalyze Batch
<input type="checkbox"/> MS <input type="checkbox"/> MSD out of control (± 20%)	<input type="checkbox"/> Matrix Effect	<input type="checkbox"/> Reanalyze Batch/Sample/QC
<input type="checkbox"/> RPD out of control for LCS/LCSD/MS/MSD (15/25)	<input type="checkbox"/> High Levels of Target Metals	<input type="checkbox"/> Verify reagents are clean
<input type="checkbox"/> Post Digestion Spike out of control (See Method)	<input type="checkbox"/> Insufficient sample for QC	<input type="checkbox"/> Reanalyze sample to confirm
<input type="checkbox"/> Serial Dilution out of control (see Method)	<input type="checkbox"/> Digestion/Prep Error	<input type="checkbox"/> Sample results ND w/ dilution
<input type="checkbox"/> Internal Standard(s) out of control (see Method)	<input type="checkbox"/> Analytical Error	<input type="checkbox"/> Client notified and approved
<input type="checkbox"/> No MS/MSD prepared - LCS/LCSD used instead	<input type="checkbox"/> Client Request	<input type="checkbox"/> Flag data / Case narrative
<input type="checkbox"/> Missing QC (other than MS/MSD)		<input type="checkbox"/> Accept data
<input type="checkbox"/> QC sample(s) was mis-spiked		<input type="checkbox"/> Cal Std high and sample ND
<input type="checkbox"/> ICSA/ICSAB missing or out of control (± 20%)		
<input type="checkbox"/> LCVL out of control (± 30%)	<input type="checkbox"/> Other (describe below)	<input type="checkbox"/> Other (describe below)
<input type="checkbox"/> Sample(s) analyzed outside of HT		
<input type="checkbox"/> Other (describe below)		

**General Comments and Impact on Data:**

Analyst: *[Signature]* Date of Completion: 09/15/2017

Second-Level Review: *Janice Whitt* Date Stamp: 9/15/2017



## 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	---	09/15/2017	
MET CAL 2	L2-170915	MET-L2CAL- 170802	09/15/2017	CAL2 - CAL6  MADE FRESH DAILY
MET CAL 3	L-170915	MET-LCAL- 170802	09/15/2017	
MET CAL 4	10X-170915	MET-LCAL10X- 170802	09/15/2017	
MET CAL 5	5X-170915	MET-LCAL5X- 170802	09/15/2017	
MET CAL 6	2X-170915	MET-MCAL- 170802	09/15/2017	
MET CAL 7	H-170915	MET-HCAL-170802	08/02/2017	
MET CAL 8	H2-170915	MET-H2CAL-170802	08/02/2017	

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-170802**

**MET CAL 8: MET-H2CAL-170802**

STOCK	Amount Used	Final Volume (mL)	Final Conc (µg/L)	STOCK	Amount Used	Final Volume (mL)	Final Conc (µg/L)
AL PRIMARY STD 1000 PPM	500 µL	50	10,000	1000 PPM STRONTIUM STD	100 µL	50	2000
FE PRIMARY STD 1000 PPM	500 µL	50	10,000	1000 PPM TIN STD	100 µL	50	2000
2500 PPM NATURALS SPIKE	200 µL	50	10,000	1000 PPM TITANIUM STD	100 µL	50	2000
50 PPM CUSTOM+Sr,Sn,Ti	500 µL	50	2000	1000 PPM URANIUM STD	100 µL	50	2000
Sb + Ag 50 PPM	500 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:  09/15/2017

**REVIEWED BY**  
By Janice Whitt at 3:59:29 PM, 9/15/2017

Second-Level Review/Date:

Run ID: ICP-MS4\_170915A

Run No.: 94175

Analytical Run Date: 9/15/2017

InstrumentID: ICP-MS4

Analyst: Ryan Oliver

SampID	DF	TestCode	SampType	Batch ID	Analysis Date/Time	Q	Comments
BLANK STD 1	1	6020A_W	CAL	R94175	9/15/2017 10:13:00 AM		
L2-170915	1	6020A_W	CAL	R94175	9/15/2017 10:15:00 AM		
L-170915	1	6020A_W	CAL	R94175	9/15/2017 10:17:00 AM		
10X-170915	1	6020A_W	CAL	R94175	9/15/2017 10:19:00 AM		
5X-170915	1	6020A_W	CAL	R94175	9/15/2017 10:21:00 AM		
2X-170915	1	6020A_W	CAL	R94175	9/15/2017 10:23:00 AM		
H-170915	1	6020A_W	CAL	R94175	9/15/2017 10:24:00 AM		
H2-170915	1	6020A_W	CAL	R94175	9/15/2017 10:26:00 AM		
ICSA-170915	1	6020A_W	ICSA	R94175	9/15/2017 10:32:00 AM		
ICSAB-170915	1	6020A_W	ICSB	R94175	9/15/2017 10:34:00 AM		
ICV-170915	1	6020A_W	ICV	R94175	9/15/2017 10:40:00 AM		
LCVL-170915	1	6020A_W	LCVL	R94175	9/15/2017 10:50:00 AM		
ICB-170915	1	6020A_W	ICB	R94175	9/15/2017 10:54:00 AM		
MB-82353	5	6020A_S	MBLK	82353	9/15/2017 10:56:00 AM		
LCS-82353	5	6020A_S	LCS	82353	9/15/2017 10:58:00 AM		
LCSD-82353	5	6020A_S	LCSD	82353	9/15/2017 11:00:00 AM		
1709034-02C	5	6020A_S	SAMP	82353	9/15/2017 11:04:00 AM		
1709034-02C SD	25	6020A_S	SD	82353	9/15/2017 11:05:00 AM		R-flag Se, Zn; PDS passes
1709083-02A	5	6020A_S	SAMP	82353	9/15/2017 11:07:00 AM		
1709085-02A	5	6020A_S	SAMP	82353	9/15/2017 11:09:00 AM		
1709098-01A	5	6020A_S	SAMP	82353	9/15/2017 11:11:00 AM		
1709108-04B	5	6020A_S	SAMP	82353	9/15/2017 11:13:00 AM		
1709034-04C	5	6020A_S	SAMP	82353	9/15/2017 11:15:00 AM		
1709034-06C	5	6020A_S	SAMP	82353	9/15/2017 11:17:00 AM		
1709034-08C	5	6020A_S	SAMP	82353	9/15/2017 11:19:00 AM		
1709034-10C	5	6020A_S	SAMP	82353	9/15/2017 11:20:00 AM		
1709092-01A	5	6020A_S	SAMP	82353	9/15/2017 11:22:00 AM		
1709034-02C PDS	5	6020A_S	PDS	82353	9/15/2017 11:24:00 AM		
1709034-02C MS	5	6020A_S	MS	82353	9/15/2017 11:26:00 AM		
1709034-02C MSD	5	6020A_S	MSD	82353	9/15/2017 11:28:00 AM		

Std ID	Std Name	Type	Exp. Date
MET-CCV-170802	ICPMS CCV 200/5000 PPB	CCV	02/03/2018
MET-H2CAL-170802	ICPMS High Cal2 2000ppb std 8	CAL	02/03/2018
MET-HCAL-170802	ICPMS High Cal 500ppb/10ppm std	CAL	02/03/2018
MET-ICV-170802	ICPMS ICV 100 ppb	ICV	02/03/2018
MET-IS-170530	INTERNAL STANDARD 1 PPM	CAL	11/28/2017
MET-L2CAL-170802	ICPMS Low Cal2 1/20ppb std 2	CAL	02/03/2018
MET-LCAL-170802	ICPMS Low Cal 10/200ppb std 3	CAL	02/03/2018
MET-LCAL10X-1708	ICPMS Low Cal 50/1000ppb std 4	CAL	02/03/2018
MET-LCAL5X-17080	ICPMS Low Cal 100/2000ppb std 5	CAL	02/03/2018
MET-MCAL-170802	ICPMS Mid Cal 250/5000ppb std 6	CAL	02/03/2018
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	09/18/2017

Run ID: ICP-MS4\_170915A Run No.: 94175

CCV1-170915	1	6020A_W	CCV	R94175	9/15/2017 11:30:00 AM	
LCVL1-170915	1	6020A_W	LCVL	R94175	9/15/2017 11:35:00 AM	
CCB1-170915	1	6020A_W	CCB	R94175	9/15/2017 11:40:00 AM	
1709092-02A	5	6020A_S	SAMP	82353	9/15/2017 11:42:00 AM	
1709092-03A	5	6020A_S	SAMP	82353	9/15/2017 11:44:00 AM	
1709092-04A	5	6020A_S	SAMP	82353	9/15/2017 11:45:00 AM	
1709092-05A	5	6020A_S	SAMP	82353	9/15/2017 11:47:00 AM	
1709092-06A	5	6020A_S	SAMP	82353	9/15/2017 11:49:00 AM	
CCV2-170915	1	6020A_W	CCV	R94175	9/15/2017 11:51:00 AM	
LCVL2-170915	1	6020A_W	LCVL	R94175	9/15/2017 11:57:00 AM	
CCB2-170915	1	6020A_W	CCB	R94175	9/15/2017 12:03:00 PM	
CCV3-170915	1	6020A_W	CCV	R94175	9/15/2017 12:36:00 PM	
LCVL3-170915	1	6020A_W	LCVL	R94175	9/15/2017 12:42:00 PM	
CCB3-170915	1	6020A_W	CCB	R94175	9/15/2017 12:44:00 PM	
MB-82354	1	6020A_W	MBLK	82354	9/15/2017 12:46:00 PM	
LCS-82354	1	6020A_W	LCS	82354	9/15/2017 12:48:00 PM	
LCSD-82354	1	6020A_W	LCSD	82354	9/15/2017 12:50:00 PM	
1709087-01A	1	6020A_W	SAMP	82354	9/15/2017 12:54:00 PM	
1709087-01A SD	5	6020A_W	SD	82354	9/15/2017 12:56:00 PM	
1709083-01A	1	6020A_W	SAMP	82354	9/15/2017 12:58:00 PM	
1709084-01A	1	6020A_W	SAMP	82354	9/15/2017 1:00:00 PM	
1709085-01A	1	6020A_W	SAMP	82354	9/15/2017 1:02:00 PM	
1709099-01B	1	6020A_W	SAMP	82354	9/15/2017 1:04:00 PM	
1709100-01B	1	6020A_W	SAMP	82354	9/15/2017 1:05:00 PM	Int Std. Bi-low, does not effect reported compound. jw 9/15/2017
1709108-02B	1	6020A_W	SAMP	82354	9/15/2017 1:07:00 PM	
1709089-01B	1	6020A_W	SAMP	82354	9/15/2017 1:09:00 PM	DNR; Reran @ dilution
1709089-02B	1	6020A_W	SAMP	82354	9/15/2017 1:11:00 PM	DNR; Reran @ dilution
1709089-03B	1	6020A_W	SAMP	82354	9/15/2017 1:13:00 PM	DNR; Reran @ dilution
1709087-01A PDS	1	6020A_W	PDS	82354	9/15/2017 1:15:00 PM	
1709087-01A MS	1	6020A_W	MS	82354	9/15/2017 1:17:00 PM	S-flag Na- Low
1709087-01A MSD	1	6020A_W	MSD	82354	9/15/2017 1:19:00 PM	S-flag Na- Low
CCV4-170915	1	6020A_W	CCV	R94175	9/15/2017 1:24:00 PM	
LCVL4-170915	1	6020A_W	LCVL	R94175	9/15/2017 1:46:00 PM	S-flag Na; Associated samples are clsoer to CCV level; CCV/CCB pass
CCB4-170915	1	6020A_W	CCB	R94175	9/15/2017 1:48:00 PM	
1709087-01A	10	6020A_W	SAMP	82354	9/15/2017 1:50:00 PM	

Std ID	Std Name	Type	Exp. Date
MET-CCV-170802	ICPMS CCV 200/5000 PPB	CCV	02/03/2018
MET-H2CAL-170802	ICPMS High Cal2 2000ppb std 8	CAL	02/03/2018
MET-HCAL-170802	ICPMS High Cal 500ppb/10ppm std	CAL	02/03/2018
MET-ICV-170802	ICPMS ICV 100 ppb	ICV	02/03/2018
MET-IS-170530	INTERNAL STANDARD 1 PPM	CAL	11/28/2017
MET-L2CAL-170802	ICPMS Low Cal2 1/20ppb std 2	CAL	02/03/2018
MET-LCAL-170802	ICPMS Low Cal 10/200ppb std 3	CAL	02/03/2018
MET-LCAL10X-1708	ICPMS Low Cal 50/1000ppb std 4	CAL	02/03/2018
MET-LCAL5X-17080	ICPMS Low Cal 100/2000ppb std 5	CAL	02/03/2018
MET-MCAL-170802	ICPMS Mid Cal 250/5000ppb std 6	CAL	02/03/2018
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	09/18/2017



Run ID:

ICP-MS4\_170915A

Run No.: 94175

1709087-01A SD	50	6020A_W	SD	82354	9/15/2017 1:52:00 PM	
1709087-01A PDS	10	6020A_W	PDS	82354	9/15/2017 1:54:00 PM	
1709089-01B	50	6020A_W	SAMP	82354	9/15/2017 1:56:00 PM	
1709089-02B	50	6020A_W	SAMP	82354	9/15/2017 1:58:00 PM	
1709089-03B	50	6020A_W	SAMP	82354	9/15/2017 2:00:00 PM	
1709087-02A	10	6020A_W	SAMP	82354	9/15/2017 2:02:00 PM	
1709087-03A	10	6020A_W	SAMP	82354	9/15/2017 2:04:00 PM	
1709087-02A	1	6020A_W	SAMP	82354	9/15/2017 2:06:00 PM	
1709087-03A	1	6020A_W	SAMP	82354	9/15/2017 2:08:00 PM	
CCV5-170915	1	6020A_W	CCV	R94175	9/15/2017 2:13:00 PM	
LCVL5-170915	1	6020A_W	LCVL	R94175	9/15/2017 2:18:00 PM	
CCB5-170915	1	6020A_W	CCB	R94175	9/15/2017 2:28:00 PM	

Std ID	Std Name	Type	Exp. Date
MET-CCV-170802	ICPMS CCV 200/5000 PPB	CCV	02/03/2018
MET-H2CAL-170802	ICPMS High Cal2 2000ppb std 8	CAL	02/03/2018
MET-HCAL-170802	ICPMS High Cal 500ppb/10ppm std	CAL	02/03/2018
MET-ICV-170802	ICPMS ICV 100 ppb	ICV	02/03/2018
MET-IS-170530	INTERNAL STANDARD 1 PPM	CAL	11/28/2017
MET-L2CAL-170802	ICPMS Low Cal2 1/20ppb std 2	CAL	02/03/2018
MET-LCAL-170802	ICPMS Low Cal 10/200ppb std 3	CAL	02/03/2018
MET-LCAL10X-1708	ICPMS Low Cal 50/1000ppb std 4	CAL	02/03/2018
MET-LCAL5X-17080	ICPMS Low Cal 100/2000ppb std 5	CAL	02/03/2018
MET-MCAL-170802	ICPMS Mid Cal 250/5000ppb std 6	CAL	02/03/2018
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	09/18/2017

# Sample List

Batch Folder C:\Agilent\ICPMH\1\DATA\170915.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		CCB		CAL 6020A_W	1101		
2		CCB		CAL 6020A_W	1101		
3		CCB		CAL 6020A_W	1102		
4		CCB		CAL 6020A_W	1102		
5		CCB		CAL 6020A_W	1102		
6		CCB		CAL 6020A_W	1103		
7		CCB		CAL 6020A_W	1103		
8		CCB		CAL 6020A_W	1103		
9		CalBlk	BLANK STD 1	CAL 6020A_W	2101	1	
10		CalStd	L2-170915	CAL 6020A_W	2102	2	
11		CalStd	L-170915	CAL 6020A_W	2103	3	
12		CalStd	10X-170915	CAL 6020A_W	2104	4	
13		CalStd	5X-170915	CAL 6020A_W	2105	5	
14		CalStd	2X-170915	CAL 6020A_W	2106	6	
15		CalStd	H-170915	CAL 6020A_W	2107	7	
16		CalStd	H2-170915	CAL 6020A_W	2108	8	
17		ICB	BLANK	CCB 6020A_W	1101		
18		ICB	BLANK	CCB 6020A_W	1102		
19		ICSA	ICSA-170915	ICSA6020A_W	2109		
20		ICSB	ICSAB-170915	ICSB6020A_W	2110		
21		ICB	BLANK	CCB 6020A_W	1101		
22		ICB	BLANK	CCB 6020A_W	1102		
23		ICV	ICV-170915	ICV 6020A_W	2111		
24		ICB	ICB-170915	ICB 6020A_W	1101		
25		LLICV	LCVL-170915	LCVL6020A_W	2112		
26		ICB	ICB-170915	ICB 6020A_W	1102		
27		ICB	ICB-170915	ICB 6020A_W	1103		
28		PB	MB-82353	MBLK6020A_S	2201		5
29		LCS_S	LCS-82353	LCS 6020A_S	2202		5
30		LCS_S	LCSD-82353	LCSD6020A_S	2203		5
31		CCB	RINSE	CCB 6020A_W	1101		
32		AllRef	1709034-02C	SAMP6020A_S	2204		5
33		SD	1709034-02C SD	SD 6020A_S	2205		25
34		Sample	1709083-02A	SAMP6020A_S	2206		5
35		Sample	1709085-02A	SAMP6020A_S	2207		5
36		Sample	1709098-01A	SAMP6020A_S	2208		5
37		Sample	1709108-04B	SAMP6020A_S	2209		5
38		Sample	1709034-04C	SAMP6020A_S	2210		5
39		Sample	1709034-06C	SAMP6020A_S	2211		5
40		Sample	1709034-08C	SAMP6020A_S	2212		5
41		Sample	1709034-10C	SAMP6020A_S	2301		5
42		Sample	1709092-01A	SAMP6020A_S	2302		5
43		PDS	1709034-02C PDS	PDS 6020A_S	2303		5
44		MS_S	1709034-02C MS	MS 6020A_S	2304		5
45		MS_S	1709034-02C MSD	MSD 6020A_S	2305		5
46		CCV	CCV1-170915	CCV 6020A_W	1207		
47		CCB	CCB1-170915	CCB 6020A_W	1102		
48		LLCCV	LCVL1-170915	LCVL6020A_W	2112		

## Sample List

49	CCB	CCB1-170915	CCB 6020A_W	1103	
50	Sample	1709092-02A	SAMP6020A_S	2306	5
51	Sample	1709092-03A	SAMP6020A_S	2307	5
52	Sample	1709092-04A	SAMP6020A_S	2308	5
53	Sample	1709092-05A	SAMP6020A_S	2309	5
54	Sample	1709092-06A	SAMP6020A_S	2310	5
55	CCV	CCV2-170915	CCV 6020A_W	1207	
56	CCB	CCB2-170915	CCB 6020A_W	1102	
57	LLCCV	LCVL2-170915	LCVL6020A_W	2112	
58	CCB	CCB2-170915	CCB 6020A_W	1103	
59	PB_W	MB-82355	MBLKTCLP_MET	3101	1
60	PB_W	MB-82348-TCLP	MBLKTCLP_MET	3102	1
61	LCS_W	LCS-82355	LCS TCLP_MET	3103	1
62	LCS_W	LCSD-82355	LCSDTCLP_MET	3104	1
63	CCB	RINSE	CCB 6020A_W	1101	
64	AllRef	1709077-02A	SAMPTCLP_MET	3105	1
65	SD	1709077-02A SD	SD TCLP_MET	3106	5
66	SAMP_W	1709093-01A	SAMPTCLP_MET	3107	1
67	SAMP_W	1709094-01A	SAMPTCLP_MET	3108	1
68	SAMP_W	1709077-01A	SAMPTCLP_MET	3109	1
69	SAMP_W	1709048-01A	SAMPTCLP_MET	3110	1
70	PDS	1709077-02A PDS	PDS TCLP_MET	3111	1
71	MS_W	1709077-02A MS	MS TCLP_MET	3112	1
72	MS_W	1709077-02A MSD	MSD TCLP_MET	3201	1
73	CCB	RINSE	CCB 6020A_W	1102	
74	CCB	RINSE	CCB 6020A_W	1103	
75	CCV	CCV3-170915	CCV 6020A_W	1207	
76	CCB	CCB3-170915	CCB 6020A_W	1102	
77	LLCCV	LCVL3-170915	LCVL6020A_W	2512	
78	CCB	CCB3-170915	CCB 6020A_W	1103	
79	PB_W	MB-82354	MBLK6020A_W	4101	1
80	LCS_W	LCS-82354	LCS 6020A_W	4102	1
81	LCS_W	LCSD-82354	LCSD6020A_W	4103	1
82	CCB	RINSE	CCB 6020A_W	1101	
83	AllRef	1709087-01A	SAMP6020A_W	4104	1
84	SD	1709087-01A SD	SD 6020A_W	4105	5
85	SAMP_W	1709083-01A	SAMP6020A_W	4106	1
86	SAMP_W	1709084-01A	SAMP6020A_W	4107	1
87	SAMP_W	1709085-01A	SAMP6020A_W	4108	1
88	SAMP_W	1709099-01B	SAMP6020A_W	4109	1
89	SAMP_W	1709100-01B	SAMP6020A_W	4110	1
90	SAMP_W	1709108-02B	SAMP6020A_W	4111	1
91	SAMP_W	1709089-01B	SAMP6020A_W	4112	1
92	SAMP_W	1709089-02B	SAMP6020A_W	4201	1
93	SAMP_W	1709089-03B	SAMP6020A_W	4202	1
94	PDS	1709087-01A PDS	PDS 6020A_W	4203	1
95	MS_W	1709087-01A MS	MS 6020A_W	4204	1
96	MS_W	1709087-01A MSD	MSD 6020A_W	4205	1
97	CCB	RINSE	CCB 6020A_W	1102	
98	CCB	RINSE	CCB 6020A_W	1103	
99	CCV	CCV4-170915	CCV 6020A_W	1207	
100	CCB	CCB4-170915	CCB 6020A_W	1102	
101	CCB	CCB4-170915	CCB 6020A_W	1102	
102	CCB	CCB4-170915	CCB 6020A_W	1103	
103	CCB	CCB4-170915	CCB 6020A_W	1103	
104	LLCCV	LCVL4-170915	LCVL6020A_W	2512	
105	CCB	CCB4-170915	CCB 6020A_W	1103	
106	AllRef	1709087-01A	SAMP6020A_W	4301	1
107	SD	1709087-01A SD	SD 6020A_W	4302	50

## Sample List

108	PDS	1709087-01A PDS	PDS 6020A_W	4303	10
109	SAMP_W	1709089-01B	SAMP6020A_W	4304	50
110	SAMP_W	1709089-02B	SAMP6020A_W	4305	50
111	SAMP_W	1709089-03B	SAMP6020A_W	4306	50
112	SAMP_W	1709087-02A	SAMP6020A_W	4307	10
113	SAMP_W	1709087-03A	SAMP6020A_W	4308	10
114	SAMP_W	1709087-02A	SAMP6020A_W	4206	1
115	SAMP_W	1709087-03A	SAMP6020A_W	4207	1
116	CCB	RINSE	CCB 6020A_W	1102	
117	CCB	RINSE	CCB 6020A_W	1103	
118	CCV	CCV5-170915	CCV 6020A_W	1207	
119	CCB	CCB5-170915	CCB 6020A_W	1102	
120	LLCCV	LCVL5-170915	LCVL6020A_W	2511	
121	CCB	CCB5-170915	CCB 6020A_W	1102	
122	CCB	CCB5-170915	CCB 6020A_W	1102	
123	CCB	CCB5-170915	CCB 6020A_W	1102	
124	CCB	CCB5-170915	CCB 6020A_W	1103	
125	CCB	CCB5-170915	CCB 6020A_W	1103	

### Unknown Samples:

#	Skip	Sample Type	Sample Name	Comment	Vial#	Level	Total Dil.
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### Blank Samples:

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

#	Block Name	Period	Unit	Reset By
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### Sublist

DHL Analytical, Inc.

PREP BATCH REPORT

Prep Start Date: 9/14/2017 8:19:12 AM

Digestion:

Prep End Date:

Prep Batch 82353 Prep Code: 3050\_I

Technician: Sydney Powers

Prep Factor Units: mL/g

Equipment List
Thermometer #60
Pipette#-P-40
Pipette #P-41
Hot Block #4
Balance #28

Sample ID	Matrix	pH	SampAmt	Fin Vol	Factor	Bottle #	Vessel	Cleanup
1709034-02C MS/MSD	Soil		1.03	50	50.000	1 of 1		
1709034-04C	Soil		1.06	50	50.000	1 of 1		
1709034-06C	Soil		1.01	50	50.000	1 of 1		
1709034-08C	Soil		1.06	50	50.000	1 of 1		
1709034-10C	Soil		1.11	50	50.000	1 of 1		
1709083-02A	Soil		1.04	50	50.000	1 of 1		
1709085-02A	Soil		1.08	50	50.000	1 of 1		
1709092-01A	Soil		1.07	50	50.000	1 of 1		
1709092-02A	Soil		1.10	50	50.000	1 of 1		
1709092-03A	Soil		1.09	50	50.000	1 of 1		
1709092-04A	Soil		1.07	50	50.000	1 of 1		
1709092-05A	Soil		1.02	50	50.000	1 of 1		
1709092-06A	Soil		1.05	50	50.000	1 of 1		
1709098-01A	Soil		1.04	50	50.000	1 of 1		
LCS-82353	Soil		1	50	50.000	of		
LCSD-82353	Soil		1	50	50.000	of		
MB-82353	Soil		1	50	50.000	of		

1709034-02C MS 1.03  
 1709034-02C MSD 1.02

*Signature*  
 9/14/17

~~11:30-11:40~~  
 11:40-13:40  
 13:50-15:50  
 16:00-16:15

1709108-04B

1.11

Sample added to batch

Number	Reagent Name	Amt	Units	Exp. Dt	Spk ID	Spike Name	SampType	Amt (mL or g)	Exp. Date
11086	Hydrogen Peroxide, 30%	3	ml	01/19/2018	MET-161107-1	AL PRIMARY STD 1000 PPM	LCS/MS/MSD	0.25	04/27/2018
11328	Acid Cleaned Boiling Chips	1	gm	10/15/2017	MET-161107-4	FE PRIMARY STD 1000 PPM	LCS/MS/MSD	0.25	04/27/2018
11490	Hydrochloric Acid (trace metal grade)	5	ml	12/15/2019	MET-SPIKE-170803-3	2500 PPM Naturals Spike	LCS/MS/MSD	0.5	02/04/2018
11594	Digestion Vessels	1	vessel	01/10/2018	MET-SPIKE-170815-1	Sb+Ag 50 PPM	LCS/MS/MSD	1	02/16/2018
11661	Nitric Acid (Trace Metal Grade)	10	ml	04/05/2019	MET-SPIKE-170815-2	50 PPM Custom+Sr,Sn,Ti,U,B,Li,Mo	LCS/MS/MSD	1	02/16/2018

9:30-9:40  
 9:45-11:45  
 12:00-14:00  
 14:15-14:30

**REVIEWED BY**  
 By Janice Whitt at 4:00:56 PM, 9/15/2017

*Signature*  
 9/14/17

**DHL Analytical, Inc.**

**PREP BATCH REPORT**

Prep Start Date: **9/14/2017 8:19:12 AM**  
 Digestion: **Start: 9/14/2017 9:30:00 AM / Stop: 9/14/2017 4:15:00 PM**  
 Prep End Date: **9/14/2017 4:42:20 PM**

Prep Batch **82353** Prep Code: **3050\_I**

Technician: **Sydney Powers**

Prep Factor Units:  
**mL/g**

Equipment List
Thermometer #60
Pipette#-P-40
Pipette #P-41
Hot Block #4
Balance #28

Sample ID	Matrix	pH	SampAmt	Fin Vol	Factor	Bottle #	Vessel	Cleanup
1709034-02C	Soil		1.03	50	48.544	1 of 1		
1709034-02C MS	Soil		1.03	50	48.544	of		
1709034-02C MSD	Soil		1.02	50	49.020	of		
1709034-02C PDS	Soil		1.03	50	48.544	of		
1709034-02C SD	Soil		1.03	50	48.544	of		
1709034-04C	Soil		1.06	50	47.170	1 of 1		
1709034-06C	Soil		1.01	50	49.505	1 of 1		
1709034-08C	Soil		1.06	50	47.170	1 of 1		
1709034-10C	Soil		1.11	50	45.045	1 of 1		
1709083-02A	Soil		1.04	50	48.077	1 of 1		
1709085-02A	Soil		1.08	50	46.296	1 of 1		
1709092-01A	Soil		1.07	50	46.729	1 of 1		
1709092-02A	Soil		1.1	50	45.455	1 of 1		
1709092-03A	Soil		1.09	50	45.872	1 of 1		
1709092-04A	Soil		1.07	50	46.729	1 of 1		
1709092-05A	Soil		1.02	50	49.020	1 of 1		
1709092-06A	Soil		1.05	50	47.619	1 of 1		
1709098-01A	Soil		1.04	50	48.077	1 of 1		
1709108-04B	Soil		1.11	50	45.045	1 of 1		
LCS-82353	Soil		1	50	50.000	of		
LCSD-82353	Soil		1	50	50.000	of		
MB-82353	Soil		1	50	50.000	of		

Number	Reagent Name	Amt	Units	Exp. D:	Spk ID	Spike Name	SampType	Amt (mL or g)	Exp. Date
11086	Hydrogen Peroxide, 30%	3	ml	01/19/2018	MET-161107-1	AL PRIMARY STD 1000 PPM	LCS/MS/MSD	0.25	04/27/2018
11328	Acid Cleaned Boiling Chips	1	gm	10/15/2017	MET-161107-4	FE PRIMARY STD 1000 PPM	LCS/MS/MSD	0.25	04/27/2018
11490	Hydrochloric Acid (trace metal grade)	5	ml	12/15/2019	MET-SPIKE-170803-3	2500 PPM Naturals Spike	LCS/MS/MSD	0.5	02/04/2018
11594	Digestion Vessels	1	vessel	01/10/2018	MET-SPIKE-170815-1	Sb+Ag 50 PPM	LCS/MS/MSD	1	02/16/2018
11661	Nitric Acid (Trace Metal Grade)	10	ml	04/05/2019	MET-SPIKE-170815-2	50 PPM Custom+Sr,Sn,Ti,U,B,Li,Mo	LCS/MS/MSD	1	02/16/2018

**REVIEWED BY**  
 By Janice Whitt at 4:00:59 PM, 9/15/2017

**DHL Analytical, Inc.**

**PREP BATCH REPORT**

Prep Start Date: 9/14/2017 8:20:55 AM

Digestion:

Prep End Date:

Prep Batch 82354 Prep Code: 3005A

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
1709083-01A	Aqueous		50	50	1.000	1 of 1		
1709084-01A	Aqueous		50	50	1.000	1 of 1		
1709085-01A	Aqueous		50	50	1.000	1 of 1		
1709087-01A	MS/MSD		50	50	1.000	1 of 1		
1709087-02A	Aqueous		50	50	1.000	1 of 1		
1709087-03A	Aqueous		50	50	1.000	1 of 1		
1709089-01B	Aqueous		50	50	1.000	1 of 1		
1709089-02B	Aqueous		50	50	1.000	1 of 1		
1709089-03B	Aqueous		50	50	1.000	1 of 1		
1709099-01B	Aqueous		50	50	1.000	1 of 1		
1709100-01B	Aqueous		50	50	1.000	1 of 1		
LCS-82354	Aqueous		50	50	1.000	of		
LCSD-82354	Aqueous		50	50	1.000	of		
MB-82354	Aqueous		50	50	1.000	of		

1709108-02B 50 50 Sample added to batch 11:30-16:30

Number	Reagent Name	Amt	Units	Exp. Date	Spk ID	Spike Name	SampType	Amt (mL or g)	Exp. Date
11490	Hydrochloric Acid (trace metal grade)	1	ml	12/15/2019	MET-161107-1	AL PRIMARY STD 1000 PPM	LCS/MS/MSD	0.25	04/27/2018
11594	Digestion Vessels	1	ml	01/10/2018	MET-161107-4	FE PRIMARY STD 1000 PPM	LCS/MS/MSD	0.25	04/27/2018
11661	Nitric Acid (Trace Metal Grade)	1	ml	04/05/2019	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

8:45-13:45

**REVIEWED BY**  
By Janice Whitt at 4:01:42 PM, 9/15/2017

*Janice Whitt*  
9/14/17

**DHL Analytical, Inc.**

**PREP BATCH REPORT**

Prep Start Date: **9/14/2017 8:20:55 AM**  
 Digestion: **Start: 9/14/2017 8:45:00 AM / Stop: 9/14/2017 4:30:00 PM**  
 Prep End Date: **9/14/2017 4:40:01 PM**

Prep Factor Units:  
**mL/mL**

Prep Batch **82354** Prep Code: **3005A** Technician: **Sydney Powers**

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
1709083-01A	Aqueous		50	50	1.000	1 of 1		
1709084-01A	Aqueous		50	50	1.000	1 of 1		
1709085-01A	Aqueous		50	50	1.000	1 of 1		
1709087-01A	Aqueous		50	50	1.000	1 of 1		
1709087-01A MS	Aqueous		50	50	1.000	of		
1709087-01A MSD	Aqueous		50	50	1.000	of		
1709087-01A PDS	Aqueous		50	50	1.000	of		
1709087-01A SD	Aqueous		50	50	1.000	of		
1709087-02A	Aqueous		50	50	1.000	1 of 1		
1709087-03A	Aqueous		50	50	1.000	1 of 1		
1709089-01B	Aqueous		50	50	1.000	1 of 1		
1709089-02B	Aqueous		50	50	1.000	1 of 1		
1709089-03B	Aqueous		50	50	1.000	1 of 1		
1709099-01B	Aqueous		50	50	1.000	1 of 1		
1709100-01B	Aqueous		50	50	1.000	1 of 1		
1709108-02B	Aqueous		50	50	1.000	1 of 1		
LCS-82354	Aqueous		50	50	1.000	of		
LCSD-82354	Aqueous		50	50	1.000	of		
MB-82354	Aqueous		50	50	1.000	of		

Number	Reagent Name	Amt	Units	Exp. Date
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 4:01:45 PM, 9/15/2017*



# Calibration Summary Report

Date Acquired 9/15/2017 10:13

Data Batch 170915.b

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

## Calibration Table

Ele	Corr Coef	Curve Equation
As	1.0000	$y = 0.0010 * x + 7.3156E-005$
Be	1.0000	$y = 5.6311E-005 * x + 3.2017E-006$
B	1.0000	$y = 2.7014E-005 * x + 1.4393E-004$
Na	1.0000	$y = 8.8950E-004 * x + 0.0117$
Mg	1.0000	$y = 4.5827E-004 * x + 6.8230E-004$
Al	1.0000	$y = 1.6600E-004 * x + 0.0030$
K	1.0000	$y = 3.7298E-004 * x + 0.0219$
Ca	0.9999	$y = 2.2621E-005 * x + 2.1985E-004$
Ti	1.0000	$y = 1.5173E-004 * x + 5.3271E-006$
V	1.0000	$y = 0.0053 * x + 0.0015$
Cr	1.0000	$y = 0.0065 * x + 7.2060E-004$
Mn	1.0000	$y = 0.0036 * x + 2.4518E-004$
Fe	1.0000	$y = 0.0051 * x + 0.0122$
Co	1.0000	$y = 0.0157 * x + 3.1758E-004$
Ni	1.0000	$y = 0.0043 * x + 0.0092$
Cu	1.0000	$y = 0.0114 * x + 0.0011$
Zn	1.0000	$y = 0.0016 * x + 3.8393E-004$
Se	1.0000	$y = 7.8292E-005 * x + 2.3638E-005$
Sr	0.9999	$y = 6.4939E-004 * x + 4.4438E-005$
Mo	0.9999	$y = 6.6341E-004 * x + 1.1809E-005$
Ag	1.0000	$y = 0.0021 * x + 6.0912E-006$
Cd	1.0000	$y = 2.9286E-004 * x + 1.1432E-006$
Sn	1.0000	$y = 6.1354E-004 * x + 4.9535E-005$
Sb	1.0000	$y = 7.5183E-004 * x + 1.7406E-005$
Tl	1.0000	$y = 0.0018 * x + 1.4377E-005$
Ba	1.0000	$y = 2.7386E-004 * x + 7.7499E-006$
Pb	1.0000	$y = 0.0024 * x + 6.4623E-005$



# Calibration Summary Report

## Level 7 Cal

Ele	Conc	Calc	%Rec
As	500	494.78	99
Be	500	505.93	101
B	500	503.17	101
Na	10000	10036.69	100
Mg	10000	10012.74	100
Al	10000	9968.45	100
K	10000	9907.37	99
Ca	10000	9782.04	98
Ti	500	491.45	98
V	500	489.06	98
Cr	500	495.28	99
Mn	500	493.63	99
Fe	10000	9982.26	100
Co	500	506.19	101
Ni	500	499.77	100
Cu	500	502.58	101
Zn	500	507.70	102
Se	500	497.43	99
Sr	500	477.89	96
Mo	500	481.75	96
Ag	500	499.29	100
Cd	500	502.13	100
Sn	500	485.73	97
Sb	500	500.64	100
Tl	500	501.65	100
Ba	500	496.16	99
Pb	500	498.72	100

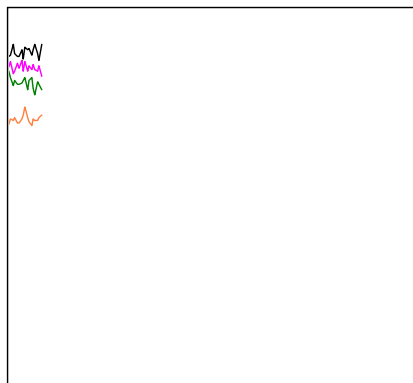
## Level 8 Cal

Ele	Conc	Calc	%Rec
As	2000	2001.25	100
Be	2000	1997.97	100
B	2000	1999.11	100
Na	25000	24974.86	100
Mg	25000	24984.29	100
K	25000	25036.65	100
Ca	25000	25115.64	100
Ti	2000	2002.20	100
V	2000	2003.48	100
Cr	2000	2001.33	100
Mn	2000	2001.89	100
Co	2000	1997.69	100
Ni	2000	1999.24	100
Cu	2000	1998.16	100
Zn	2000	1996.61	100
Se	2000	1999.72	100
Sr	2000	2007.46	100
Mo	2000	2006.30	100
Cd	2000	1999.36	100
Sn	2000	2004.80	100
Tl	2000	1999.89	100
Ba	2000	2001.66	100
Pb	2000	2000.81	100

REVIEWED BY  
By Janice Whitt at 4:01:53 PM, 9/15/2017

# Current Signal

[Helium]



Mass	Range	Count	Avg. Count	RSD [%]
63	500	231	274.2	6.74
59	20000	15716	16054.3	1.85
89	20000	14380	14131.9	1.71
140	50000	40946	42132.3	1.44
205	50000	45304	44230.7	1.57
156/140	1	0.432 %	0.410 %	7.21
51	100	82	76.4	12.65
56	5000	2214	2292.1	2.90
75	20	3	1.8	103.19
78	20	3	2.9	66.36
<b>Integration Time [sec]</b>		0.10		

## ## Plasma Parameters ##

RF Power	1550	W	Nebulizer Pump	0.10	rps
RF Matching	1.90	V	S/C Temp	2	°C
Smpl Depth	8.0	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	-180.0	V	Cell Exit	-58	V
Omega Bias	-80	V	Deflect	0.8	V
Omega Lens	8.1	V	Plate Bias	-60	V

## ## Cell Parameters ##

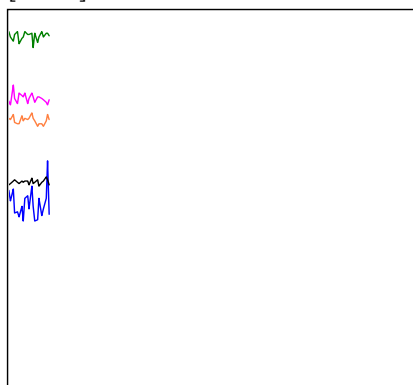
Use Gas	Yes		OctP RF	200	V
He Flow	5.0	mL/min	Energy Discrimination	3.0	V
OctP Bias	-19.0	V			

## Meters

IF/BK Press	2.16E+2	Pa	Carrier Gas(BP)	3.06E+2	kPa	Forward Power	1549	W
Analyzer Press	1.57E-4	Pa	Reflected Power	6	W			

# Current Signal

[No Gas]



Mass	Range	Count	Avg. Count	RSD [%]
63	500	229	243.4	7.83
59	20000	18686	18634.2	1.22
89	50000	35582	35446.6	1.42
140	50000	38148	38334.8	1.69
205	50000	26942	27267.5	1.19
156/140	2	1.694 %	1.684 %	7.11
51	20000	15615	15787.7	1.74
56	200000	187317	184571.7	1.09
75	2000	1344	1310.3	2.91
78	1000	766	747.7	5.12

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	°C
Smpl Depth	8.0	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	-180.0	V	Cell Exit	-58	V
Omega Bias	-80	V	Deflect	1.4	V
Omega Lens	8.1	V	Plate Bias	-60	V

## ## Cell Parameters ##

Use Gas	No		OctP RF	200	V
He Flow	5.0	mL/min	Energy Discrimination	3.0	V
OctP Bias	-19.0	V			

## Meters

IF/BK Press	2.14E+2	Pa	Carrier Gas(BP)	3.07E+2	kPa	Forward Power	1550	W
Analyzer Press	9.16E-5	Pa	Reflected Power	6	W			

# US EPA Tune Check Sample Report

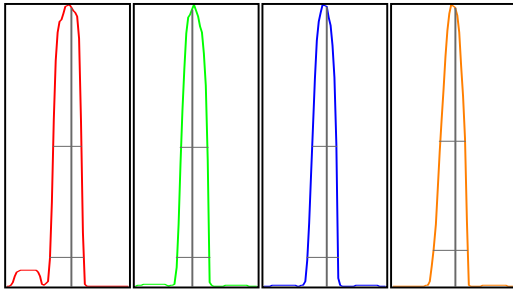
Batch Folder C:\Agilent\ICPMH\1\DATA\DHL Li+U TEMPLATE.b  
 Report Comment  
 Instrument Name ICPMS4 JP12361998

**[No Gas]**

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
7	61408	1.08	5.00	
59	99129	1.45	5.00	
115	171779	0.69	5.00	
205	152674	1.73	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
7	60430	61091	61712	61654	62154
59	97394	98287	99038	99784	101144
115	170564	170724	171651	173266	172688
205	157175	152529	151506	151840	150320

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
7	92502	7.10	6.9 - 7.1		0.823	0.850	
59	164712	58.95	58.9 - 59.1		0.779	0.850	
115	310214	115.05	114.9 - 115.1		0.739	0.850	
205	268334	205.05	204.9 - 205.1		0.826	0.850	

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

**Tune Parameters**

**## Plasma Parameters ##**

ParameterName	Value Unit	ParameterName	Value Unit
RF Power	1550 W	Nebulizer Pump	0.10 rps
RF Matching	1.90 V	S/C Temp	2 °C
Smpl Depth	8.0 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	-180.0 V	Cell Exit	-58 V
Omega Bias	-80 V	Deflect	1.4 V
Omega Lens	8.1 V	Plate Bias	-60 V

**## 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	-19.0 V		

**REVIEWED BY**  
By Janice Whitt at 4:01:59 PM, 9/15/2017

## P/A Factor Tuning Report

===== Current Sample =====

Sample Name: CCB5-170915  
 Data File: 125\_CCB.d  
 Acquired: 9/15/2017 2:28:33 PM

===== Detector Parameters and P/A Factors =====

Discriminator: 4.5 mV  
 AnalogHV: 1749 V  
 PulseHV: 1599 V

Acquired: 9/15/2017 9:45:42 AM

Mass[u]	Element	P/A Factor
9	Be	0.113003
23	Na	0.122552
24	Mg	0.126948
27	Al	0.129958
39	K	0.129614
45	Sc	0.131300
47	Ti	0.131591
51	V	0.133373
52	Cr	0.136613
55	Mn	0.137790
56	Fe	0.127408
59	Co	0.140729
60	Ni	0.143352
63	Cu	0.143655
66	Zn	0.144294
72	Ge	0.143603
75	As	0.142607
88	Sr	0.143128
95	Mo	0.142943
111	Cd	0.148672
115	In	0.147425
118	Sn	0.147647
121	Sb	0.147920
137	Ba	0.147565
205	Tl	0.153376
206	[Pb]	0.154559
207	[Pb]	0.154913
208	Pb	0.153893
209	Bi	0.155715
238	U	0.153388
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: 9/15/2017 2:30:06 PM

**REVIEWED BY**

By Janice Whitt at 4:02:04 PM, 9/15/2017

# Calibration Blank Report

Date Acquired 9/15/2017 10:13  
Data Batch 170915.b  
Data File Name 009CALB.d

Sample Name BLANK STD 1  
Comment CAL 6020A\_W  
Dilution 1

Mass	Name	IS	CPS	%RSD
9	Be	45	4	66.14
11	B	45	180	16.04
23	Na	45	14654	2.14
24	Mg	45	853	0.78
27	Al	45	3716	4.31
39	K	45	27409	0.93
44	Ca	45	275	4.31
47	Ti	45	7	50.03
51	V	45	1868	5.16
52	Cr	45	901	7.35
55	Mn	45	307	9.96
56	Fe	45	15248	8.19
59	Co	72	277	6.26
60	Ni	72	7984	4.29
63	Cu	72	1000	3.33
66	Zn	72	334	14.52
75	As	72	64	36.17
78	Se	72	21	16.49
88	Sr	115	389	8.59
95	Mo	115	103	3.23
107	Ag	115	53	21.65
111	Cd	115	10	57.75
118	Sn	115	433	8.03
121	Sb	115	152	11.02
137	Ba	115	68	15.02
205	Tl	209	351	10.24
208	Pb	209	1578	3.58

## QC ISTD Table

Mass	Name	CPS	%RSD
45	Sc	1250708	0.29
72	Ge	871265	0.22
115	In	8749493	0.75
209	Bi	24417425	0.76

# Calibration Standard Report

Date Acquired 9/15/2017 10:15  
 Data Batch 170915.b  
 Data File Name 010CAL.S.d

Sample Name L2-170915  
 Comment CAL 6020A\_W  
 Dilution 1

Mass	Name	IS	CPS	%RSD
9	Be	45	73	22.37
11	B	45	186	8.49
23	Na	45	35864	0.58
24	Mg	45	11593	2.99
27	Al	45	7190	1.98
39	K	45	36290	0.08
44	Ca	45	884	5.49
47	Ti	45	199	17.92
51	V	45	7978	2.62
52	Cr	45	8607	2.81
55	Mn	45	4218	1.12
56	Fe	45	144403	0.98
59	Co	72	13213	1.39
60	Ni	72	8887	4.46
63	Cu	72	10558	1.66
66	Zn	72	1781	2.68
75	As	72	901	3.99
78	Se	72	83	19.75
88	Sr	115	5270	0.16
95	Mo	115	5268	1.56
107	Ag	115	16455	0.22
111	Cd	115	2502	3.32
118	Sn	115	5282	2.08
121	Sb	115	6297	3.32
137	Ba	115	2338	3.19
205	Tl	209	39434	0.26
208	Pb	209	54048	0.82

## QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1248235	0.18	1250708	99.80	70	120	
72	Ge	864404	0.44	871265	99.21	70	120	
115	In	8713584	0.55	8749493	99.59	70	120	
209	Bi	24339058	0.32	24417425	99.68	70	120	



# Calibration Standard Report

Date Acquired 9/15/2017 10:17  
 Data Batch 170915.b  
 Data File Name 011CAL.S.d

Sample Name L-170915  
 Comment CAL 6020A\_W  
 Dilution 1

Mass	Name	IS	CPS	%RSD
9	Be	45	650	4.44
11	B	45	476	20.03
23	Na	45	226118	0.49
24	Mg	45	109996	0.32
27	Al	45	42337	0.72
39	K	45	114328	0.59
44	Ca	45	5395	1.98
47	Ti	45	1833	7.41
51	V	45	62521	0.91
52	Cr	45	77210	0.94
55	Mn	45	41887	0.14
56	Fe	45	1328508	0.09
59	Co	72	131584	0.07
60	Ni	72	40690	0.75
63	Cu	72	98119	0.31
66	Zn	72	14224	1.79
75	As	72	8516	0.55
78	Se	72	655	3.38
88	Sr	115	50639	0.86
95	Mo	115	50614	2.00
107	Ag	115	169828	0.71
111	Cd	115	24136	1.95
118	Sn	115	48390	0.81
121	Sb	115	60762	0.73
137	Ba	115	22381	1.23
205	Tl	209	393373	0.23
208	Pb	209	524931	0.61

## QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1237485	0.27	1250708	98.94	70	120	
72	Ge	860474	0.57	871265	98.76	70	120	
115	In	8627296	0.47	8749493	98.60	70	120	
209	Bi	24187184	0.80	24417425	99.06	70	120	

# Calibration Standard Report

Date Acquired 9/15/2017 10:19  
 Data Batch 170915.b  
 Data File Name 012CALS.d

Sample Name 10X-170915  
 Comment CAL 6020A\_W  
 Dilution 1

Mass	Name	IS	CPS	%RSD
9	Be	45	3491	2.55
11	B	45	1841	5.77
23	Na	45	1118337	0.84
24	Mg	45	572829	0.41
27	Al	45	208673	0.50
39	K	45	485581	0.34
44	Ca	45	27584	2.72
47	Ti	45	9304	1.21
51	V	45	317374	0.39
52	Cr	45	400305	0.47
55	Mn	45	219702	0.47
56	Fe	45	6409706	0.69
59	Co	72	685961	0.62
60	Ni	72	191708	0.39
63	Cu	72	508461	0.22
66	Zn	72	72207	0.81
75	As	72	44447	0.26
78	Se	72	3421	1.86
88	Sr	115	263580	0.62
95	Mo	115	265182	0.51
107	Ag	115	880356	0.68
111	Cd	115	126267	0.34
118	Sn	115	252981	0.88
121	Sb	115	319158	0.46
137	Ba	115	114658	0.10
205	Tl	209	2084678	0.56
208	Pb	209	2756131	0.19

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1223741	0.68	1250708	97.84	70	120	
72	Ge	849091	0.50	871265	97.46	70	120	
115	In	8506204	1.22	8749493	97.22	70	120	
209	Bi	23946791	1.12	24417425	98.07	70	120	

# Calibration Standard Report

Date Acquired 9/15/2017 10:21  
 Data Batch 170915.b  
 Data File Name 013CALS.d

Sample Name 5X-170915  
 Comment CAL 6020A\_W  
 Dilution 1

Mass	Name	IS	CPS	%RSD
9	Be	45	6918	0.75
11	B	45	3554	5.29
23	Na	45	2191793	0.11
24	Mg	45	1121032	0.33
27	Al	45	407182	0.21
39	K	45	923703	0.47
44	Ca	45	53060	2.78
47	Ti	45	18012	0.09
51	V	45	627690	0.69
52	Cr	45	786770	0.25
55	Mn	45	429678	0.61
56	Fe	45	12507167	0.95
59	Co	72	1344490	0.28
60	Ni	72	371789	0.72
63	Cu	72	992761	0.33
66	Zn	72	142038	0.48
75	As	72	87259	0.29
78	Se	72	6684	1.88
88	Sr	115	515705	0.31
95	Mo	115	526333	0.29
107	Ag	115	1737639	0.30
111	Cd	115	247000	0.39
118	Sn	115	499348	0.10
121	Sb	115	625371	0.50
137	Ba	115	225420	1.07
205	Tl	209	4085072	0.57
208	Pb	209	5448691	0.42

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1197123	0.47	1250708	95.72	70	120	
72	Ge	832821	0.38	871265	95.59	70	120	
115	In	8416150	0.74	8749493	96.19	70	120	
209	Bi	23429880	0.44	24417425	95.96	70	120	

# Calibration Standard Report

Date Acquired 9/15/2017 10:23  
 Data Batch 170915.b  
 Data File Name 014CALS.d

Sample Name 2X-170915  
 Comment CAL 6020A\_W  
 Dilution 1

Mass	Name	IS	CPS	%RSD
9	Be	45	16952	0.53
11	B	45	8163	2.11
23	Na	45	5333260	0.55
24	Mg	45	2741822	0.30
27	Al	45	999732	0.25
39	K	45	2241310	0.48
44	Ca	45	131491	1.71
47	Ti	45	45057	1.70
51	V	45	1533676	0.62
52	Cr	45	1919519	0.74
55	Mn	45	1052050	0.69
56	Fe	45	30407258	0.48
59	Co	72	3266991	0.49
60	Ni	72	896477	0.62
63	Cu	72	2394772	0.60
66	Zn	72	344438	0.35
75	As	72	213423	0.42
78	Se	72	16444	0.47
88	Sr	115	1270621	0.46
95	Mo	115	1307427	0.61
107	Ag	115	4248217	0.45
111	Cd	115	605069	0.59
118	Sn	115	1223347	0.65
121	Sb	115	1544737	0.69
137	Ba	115	554290	0.23
205	Tl	209	10371279	1.18
208	Pb	209	13491778	0.68

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1188502	0.13	1250708	95.03	70	120	
72	Ge	818511	0.11	871265	93.95	70	120	
115	In	8243314	0.85	8749493	94.21	70	120	
209	Bi	23189830	0.80	24417425	94.97	70	120	

# Calibration Standard Report

Date Acquired 9/15/2017 10:24  
 Data Batch 170915.b  
 Data File Name 015CALS.d

Sample Name H-170915  
 Comment CAL 6020A\_W  
 Dilution 1

Mass	Name	IS	CPS	%RSD
9	Be	45	33854	0.57
11	B	45	16321	1.10
23	Na	45	10621261	0.42
24	Mg	45	5452558	0.84
27	Al	45	1969665	0.29
39	K	45	4416485	0.41
44	Ca	45	263175	0.99
47	Ti	45	88605	1.21
51	V	45	3063489	0.33
52	Cr	45	3825343	0.11
55	Mn	45	2097540	0.09
56	Fe	45	60526866	0.55
59	Co	72	6536201	0.49
60	Ni	72	1759077	0.27
63	Cu	72	4709490	0.43
66	Zn	72	678440	0.21
75	As	72	424687	0.36
78	Se	72	32103	0.55
88	Sr	115	2535161	0.28
95	Mo	115	2610558	0.21
107	Ag	115	8369936	0.89
111	Cd	115	1201105	0.38
118	Sn	115	2434534	0.20
121	Sb	115	3074519	0.68
137	Ba	115	1109885	0.42
205	Tl	209	20580440	0.20
208	Pb	209	26849457	0.59

## QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1188147	0.32	1250708	95.00	70	120	
72	Ge	823834	0.54	871265	94.56	70	120	
115	In	8167907	0.35	8749493	93.35	70	120	
209	Bi	22846020	0.64	24417425	93.56	70	120	

# Calibration Standard Report

Date Acquired 9/15/2017 10:26  
 Data Batch 170915.b  
 Data File Name 016CAL.S.d

Sample Name H2-170915  
 Comment CAL 6020A\_W  
 Dilution 1

Mass	Name	IS	CPS	%RSD
9	Be	45	131794	0.31
11	B	45	63428	1.40
23	Na	45	26036036	0.85
24	Mg	45	13412482	0.40
27	Al	45	5202	9.51
39	K	45	10964266	0.58
44	Ca	45	665769	0.96
47	Ti	45	355863	0.48
51	V	45	12367398	0.44
52	Cr	45	15237028	0.24
55	Mn	45	8385521	0.25
56	Fe	45	75523	21.20
59	Co	72	25423776	1.07
60	Ni	72	6913209	1.04
63	Cu	72	18451454	1.46
66	Zn	72	2628807	0.23
75	As	72	1692852	0.22
78	Se	72	127141	0.27
88	Sr	115	10444814	0.77
95	Mo	115	10663561	1.04
107	Ag	115	5937	26.92
111	Cd	115	4690982	0.30
118	Sn	115	9855174	0.62
121	Sb	115	4676	9.49
137	Ba	115	4391835	0.15
205	Tl	209	80414012	0.82
208	Pb	209	105568657	0.46

## QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	Flag
45	Sc	1171386	0.23	1250708	93.66	70	120	
72	Ge	811979	0.52	871265	93.20	70	120	
115	In	8012001	0.93	8749493	91.57	70	120	
209	Bi	22391125	0.08	24417425	91.70	70	120	

# Interference Check Solution A (ICS-A) Report

Date Acquired 9/15/2017 10:32  
 Data Batch 170915.b  
 Data File Name 019ICSA.d

Sample Name ICSA-170915  
 Comment ICSA6020A\_W  
 Dilution 1

Mass	Name	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	0.103	11	51.6	1.2	0.8	
11	B	5.452	344	20.4	30	30	
51	V	0.057	2123	3.0	10	10	
52	Cr	0.346	3510	4.9	8	5	
55	Mn	1.709	7517	1.4	8	10	
59	Co	0.463	6027	3.8	8	10	
60	Ni	0.725	9737	3.7	8	10	
63	Cu	0.549	5872	3.0	8	10	
66	Zn	2.505	3534	9.7	10	5	
75	As	0.212	233	11.0	4	5	
78	Se	0.465	48	20.6	2	5	
88	Sr	3.489	18109	0.6	10	10	
107	Ag	0.212	3460	8.8	0.8	2	
111	Cd	0.676	1561	4.2	1.2	1	
118	Sn	0.330	1975	4.9	10	10	
121	Sb	0.632	3861	3.6	4	2.5	
137	Ba	0.344	799	14.4	8	10	
205	Tl	0.244	9330	5.8	4	1.5	
208	Pb	0.353	18486	4.1	1.2	1	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1182895	0.34	1250708	94.58	70	120	
72	Ge	794987	0.20	871265	91.25	70	120	
115	In	7837889	0.38	8749493	89.58	70	120	
209	Bi	20597515	1.03	24417425	84.36	70	120	

# Interference Check Solution AB (ICS-AB) Report

Date Acquired 9/15/2017 10:34  
 Data Batch 170915.b  
 Data File Name 020ICSB.d

Sample Name ICSAB-170915  
 Comment ICSB6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
51	V	45	39.487	249612	1.00	40	98.7	80	120	
52	Cr	45	20.651	160726	0.75	20	103.3	80	120	
55	Mn	45	19.338	82660	0.83	20	96.7	80	120	
59	Co	72	40.625	510612	0.29	40	101.6	80	120	
60	Ni	72	37.701	135898	1.20	40	94.3	80	120	
63	Cu	72	20.631	188971	0.56	20	103.2	80	120	
66	Zn	72	20.487	26931	1.00	20	102.4	80	120	
75	As	72	20.902	17511	0.64	20	104.5	80	120	
78	Se	72	20.296	1293	2.56	20	101.5	80	120	
107	Ag	115	19.068	309683	0.22	20	95.3	80	120	
111	Cd	115	10.256	23771	1.13	10	102.6	80	120	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1191154	0.21	1250708	95.24	70	120	
72	Ge	801518	0.31	871265	91.99	70	120	
115	In	7912095	0.63	8749493	90.43	70	120	
209	Bi	20724579	1.21	24417425	84.88	70	120	



# Initial Calibration Verification (ICV) Report

Date Acquired 9/15/2017 10:40  
 Data Batch 170915.b  
 Data File Name 023\_ICV.d

Sample Name ICV-170915  
 Comment ICV 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	99.461	7045	0.97	100	99.5	90	110	
11	B	45	103.911	3709	5.90	100	103.9	90	110	
23	Na	45	2603.276	2925915	0.78	2500	104.1	90	110	
24	Mg	45	2587.464	1491541	0.73	2500	103.5	90	110	
27	Al	45	2457.935	516678	0.81	2500	98.3	90	110	
39	K	45	2563.114	1229390	0.42	2500	102.5	90	110	
44	Ca	45	2432.736	69460	0.99	2500	97.3	90	110	
47	Ti	45	100.611	19199	2.29	100	100.6	90	110	
51	V	45	100.390	666873	0.54	100	100.4	90	110	
52	Cr	45	103.457	846219	0.48	100	103.5	90	110	
55	Mn	45	99.882	449323	0.19	100	99.9	90	110	
56	Fe	45	2490.020	15987243	0.88	2500	99.6	90	110	
59	Co	72	104.153	1419082	0.30	100	104.2	90	110	
60	Ni	72	103.440	390428	0.86	100	103.4	90	110	
63	Cu	72	105.316	1041941	0.70	100	105.3	90	110	
66	Zn	72	105.420	148887	0.52	100	105.4	90	110	
75	As	72	101.811	92246	0.38	100	101.8	90	110	
78	Se	72	101.441	6923	2.00	100	101.4	90	110	
88	Sr	115	96.946	554931	0.27	100	96.9	90	110	
95	Mo	115	94.866	554463	0.59	100	94.9	90	110	
107	Ag	115	103.832	1877139	0.24	100	103.8	90	110	
111	Cd	115	101.056	260695	0.74	100	101.1	90	110	
118	Sn	115	99.307	537117	0.41	100	99.3	90	110	
121	Sb	115	102.973	682084	0.32	100	103.0	90	110	
137	Ba	115	99.526	240157	1.33	100	99.5	90	110	
205	Tl	209	96.720	4236581	0.20	100	96.7	90	110	
208	Pb	209	98.951	5688546	0.31	100	99.0	90	110	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1257207	0.74	1250708	100.52	70	120	
72	Ge	869141	0.23	871265	99.76	70	120	
115	In	8808371	0.34	8749493	100.67	70	120	
209	Bi	24390963	0.70	24417425	99.89	70	120	

# Low Level Calibration Verification (LLCV) Report

Date Acquired 9/15/2017 10:50  
 Data Batch 170915.b  
 Data File Name 025LICV.d

Sample Name LCVL-170915  
 Comment LCVL6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	1.005	74	3.58	1	100.5	70	130	
11	B	45	18.202	787	5.87	20	91.0	70	130	
23	Na	45	93.470	117418	0.49	100	93.5	70	130	
24	Mg	45	91.384	52683	0.80	100	91.4	70	130	
27	Al	45	88.139	21790	2.15	100	88.1	70	130	
39	K	45	90.476	68900	1.53	100	90.5	70	130	
44	Ca	45	90.660	2811	1.56	100	90.7	70	130	
47	Ti	45	4.776	903	10.97	5	95.5	70	130	
51	V	45	0.916	7826	1.08	1	91.6	70	130	
52	Cr	45	4.744	39054	0.85	5	94.9	70	130	
55	Mn	45	4.789	21500	0.10	5	95.8	70	130	
56	Fe	45	102.763	664099	1.10	100	102.8	70	130	
59	Co	72	4.796	65517	0.55	5	95.9	70	130	
60	Ni	72	3.801	21987	1.91	5	76.0	70	130	
63	Cu	72	4.931	49662	1.43	5	98.6	70	130	
66	Zn	72	5.094	7502	2.84	5	101.9	70	130	
75	As	72	4.720	4331	2.06	5	94.4	70	130	
78	Se	72	4.887	353	4.73	5	97.7	70	130	
88	Sr	115	4.544	25947	2.13	5	90.9	70	130	
95	Mo	115	4.398	25376	0.76	5	88.0	70	130	
107	Ag	115	1.945	34639	2.15	2	97.3	70	130	
111	Cd	115	0.977	2488	5.15	1	97.7	70	130	
118	Sn	115	4.643	25106	2.22	5	92.9	70	130	
121	Sb	115	1.857	12247	2.41	2	92.9	70	130	
137	Ba	115	4.697	11210	1.13	5	93.9	70	130	
205	Tl	209	0.933	40844	1.16	1	93.3	70	130	
208	Pb	209	0.924	54162	0.20	1	92.4	70	130	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1237840	0.62	1250708	98.97	70	120	
72	Ge	867935	0.61	871265	99.62	70	120	
115	In	8662802	0.28	8749493	99.01	70	120	
209	Bi	24171187	0.59	24417425	98.99	70	120	

# Initial Calibration Blank (ICB) Report

Date Acquired 9/15/2017 10:54  
 Data Batch 170915.b  
 Data File Name 027\_ICB.d

Sample Name ICB-170915  
 Comment ICB 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	0.010	5	24.7	0.4	0.3	
11	B	45	1.206	218	3.2	10	10	
23	Na	45	1.741	16368	2.3	50	100	
24	Mg	45	-0.440	593	6.7	50	100	
27	Al	45	-4.780	2687	4.8	50	10	
39	K	45	-0.846	26653	1.6	50	100	
44	Ca	45	-1.225	237	11.9	50	100	
47	Ti	45	-0.005	6	124.9	4	3	
51	V	45	0.011	1911	2.2	4	3	
52	Cr	45	-0.043	542	6.1	2	2	
55	Mn	45	-0.023	200	12.0	2	3	
56	Fe	45	-0.666	10854	1.5	50	50	
59	Co	72	-0.008	160	8.3	2	3	
60	Ni	72	-0.719	5265	2.6	2	3	
63	Cu	72	-0.021	786	3.7	2	2	
66	Zn	72	0.258	691	4.3	4	2	
75	As	72	0.003	66	7.9	2	2	
78	Se	72	0.095	27	13.8	1	2	
88	Sr	115	0.001	392	14.5	4	3	
95	Mo	115	0.057	433	21.4	2	2	
107	Ag	115	0.003	108	48.1	0.4	1	
111	Cd	115	-0.002	6	34.7	0.4	0.3	
118	Sn	115	0.026	567	2.4	4	3	
121	Sb	115	-0.004	124	10.1	2	0.8	
137	Ba	115	0.009	89	24.1	2	3	
205	Tl	209	0.024	1399	7.2	2	0.5	
208	Pb	209	0.001	1602	5.4	0.4	0.3	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1233903	0.24	1250708	98.66	70	120	
72	Ge	862382	0.16	871265	98.98	70	120	
115	In	8674896	1.04	8749493	99.15	70	120	
209	Bi	24275692	0.93	24417425	99.42	70	120	

# Method Blank Report

Date Acquired 9/15/17 10:56 AM  
 Data Batch 170915.b  
 Data File Name 028\_PB.d

Sample Name MB-82353  
 Comment MBLK6020A\_S  
 Dilution 5

Mass	Name	IS	Conc (ppb)	CPS	%RSD	High Limit	Flag
9	Be	45	-0.005	4	41.66		
11	B	45	-0.246	172	22.60		
23	Na	45	10.219	26094	2.31		
24	Mg	45	2.571	2334	3.98		
27	Al	45	-0.975	3524	6.16		
39	K	45	7.231	30867	2.35		
44	Ca	45	13.984	673	11.81		
47	Ti	45	0.035	13	25.01		
51	V	45	-0.012	1793	10.89		
52	Cr	45	0.048	1297	7.13		
55	Mn	45	0.029	439	10.99		
56	Fe	45	2.362	30405	1.66		
59	Co	72	-0.002	247	16.61		
60	Ni	72	-0.563	5878	1.67		
63	Cu	72	0.052	1513	11.66		
66	Zn	72	1.130	1925	3.52		
75	As	72	0.011	73	16.09		
78	Se	72	0.078	26	15.34		
88	Sr	115	0.031	573	10.29		
95	Mo	115	0.067	499	10.03		
107	Ag	115	0.002	82	10.20		
111	Cd	115	0.001	12	56.76		
118	Sn	115	4.709	26015	2.07		J
121	Sb	115	-0.002	139	43.62		
137	Ba	115	0.018	113	17.65		
205	Tl	209	0.030	1669	3.30		
208	Pb	209	0.017	2592	2.03		

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1254099	0.27	1250708	100.27	70	120	
72	Ge	868311	0.21	871265	99.66	70	120	
115	In	8853886	0.92	8749493	101.19	70	120	
209	Bi	24774282	0.19	24417425	101.46	70	120	

# Laboratory Control Sample (LCS) Report

Date Acquired 9/15/2017 10:58  
 Data Batch 170915.b  
 Data File Name 029\_LS.d

Sample Name LCS-82353  
 Comment LCS 6020A\_S  
 Dilution 5

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	195.107	13795	0.82	200	97.6	80	120	
11	B	45	195.593	6814	3.35	200	97.8	80	120	
23	Na	45	4964.759	5557821	0.95	1000	496.5	80	120	Fail
24	Mg	45	4964.667	2856563	0.33	1000	496.5	80	120	Fail
27	Al	45	990.689	210162	0.53	1000	99.1	80	120	
39	K	45	5031.709	2383187	0.38	1000	503.2	80	120	Fail
44	Ca	45	4898.457	139364	0.79	1000	489.8	80	120	Fail
47	Ti	45	200.911	38268	1.22	200	100.5	80	120	
51	V	45	197.516	1308220	0.53	200	98.8	80	120	
52	Cr	45	201.396	1643782	0.62	200	100.7	80	120	
55	Mn	45	199.336	894972	0.57	200	99.7	80	120	
56	Fe	45	1012.338	6498315	0.31	1000	101.2	80	120	
59	Co	72	203.568	2758619	0.28	200	101.8	80	120	
60	Ni	72	204.485	759988	0.22	200	102.2	80	120	
63	Cu	72	205.995	2026267	0.15	200	103.0	80	120	
66	Zn	72	200.265	281052	0.66	200	100.1	80	120	
75	As	72	198.474	178816	0.28	200	99.2	80	120	
78	Se	72	195.728	13269	1.33	200	97.9	80	120	
88	Sr	115	196.344	1110387	0.58	200	98.2	80	120	
95	Mo	115	192.239	1110363	0.53	200	96.1	80	120	
107	Ag	115	205.885	3678665	0.28	200	102.9	80	120	
111	Cd	115	197.947	504669	0.62	200	99.0	80	120	
118	Sn	115	203.122	1085366	0.28	200	101.6	80	120	
121	Sb	115	203.201	1330133	0.02	200	101.6	80	120	
137	Ba	115	199.193	474966	0.47	200	99.6	80	120	
205	Tl	209	203.284	8786571	1.35	200	101.6	80	120	
208	Pb	209	199.995	11343287	0.49	200	100.0	80	120	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1255256	0.87	1250708	100.36	70	120	
72	Ge	864563	0.75	871265	99.23	70	120	
115	In	8705713	0.43	8749493	99.50	70	120	
209	Bi	24069973	1.29	24417425	98.58	70	120	

# Laboratory Control Sample (LCS) Report

Date Acquired 9/15/2017 11:00  
 Data Batch 170915.b  
 Data File Name 030\_LS.d

Sample Name LCSD-82353  
 Comment LCSD6020A\_S  
 Dilution 5

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	194.752	13717	1.33	200	97.4	80	120	
11	B	45	205.179	7110	2.03	200	102.6	80	120	
23	Na	45	4979.729	5552998	0.66	1000	498.0	80	120	Fail
24	Mg	45	4968.420	2847681	0.07	1000	496.8	80	120	Fail
27	Al	45	982.942	207735	1.01	1000	98.3	80	120	
39	K	45	4986.069	2352612	0.08	1000	498.6	80	120	Fail
44	Ca	45	4876.066	138189	1.11	1000	487.6	80	120	Fail
47	Ti	45	198.582	37683	2.14	200	99.3	80	120	
51	V	45	195.493	1289781	0.23	200	97.7	80	120	
52	Cr	45	198.522	1614062	0.71	200	99.3	80	120	
55	Mn	45	197.453	883092	0.59	200	98.7	80	120	
56	Fe	45	1010.144	6459150	0.49	1000	101.0	80	120	
59	Co	72	204.364	2757055	0.28	200	102.2	80	120	
60	Ni	72	203.655	753557	0.19	200	101.8	80	120	
63	Cu	72	205.867	2015965	0.45	200	102.9	80	120	
66	Zn	72	200.429	280019	0.25	200	100.2	80	120	
75	As	72	198.070	177651	0.35	200	99.0	80	120	
78	Se	72	193.780	13078	0.48	200	96.9	80	120	
88	Sr	115	194.132	1097531	0.25	200	97.1	80	120	
95	Mo	115	189.549	1094454	0.15	200	94.8	80	120	
107	Ag	115	204.359	3650058	0.52	200	102.2	80	120	
111	Cd	115	196.210	500074	0.19	200	98.1	80	120	
118	Sn	115	200.304	1069958	0.21	200	100.2	80	120	
121	Sb	115	201.523	1318690	0.40	200	100.8	80	120	
137	Ba	115	196.328	467964	0.77	200	98.2	80	120	
205	Tl	209	201.957	8733914	0.73	200	101.0	80	120	
208	Pb	209	198.419	11261501	0.14	200	99.2	80	120	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1250354	0.61	1250708	99.97	70	120	
72	Ge	860685	0.51	871265	98.79	70	120	
115	In	8703210	0.92	8749493	99.47	70	120	
209	Bi	24083685	0.83	24417425	98.63	70	120	

# Dilution Sample (Dil) Report

Date Acquired 9/15/2017 11:05  
 Data Batch 170915.b  
 Data File Name 033\_SD.d

Sample Name 1709034-02C SD  
 Comment SD 6020A\_S  
 Dilution 25

Mass	Name	IS	Conc	CPS	%RSD	Ref Value	%Rec	Low	High	Flag
9	Be	45	0.277	23	8.70	1.1	126.7	110	90	
11	B	45	19.207	811	8.71	68.5	140.2	110	90	
23	Na	45	256.372	293429	1.22	1183.5	108.3	110	90	Good
24	Mg	45	2950.645	1655687	0.55	13629.0	108.2	110	90	Good
27	Al	45	5850.394	1192195	0.26	27779.0	105.3	110	90	Good
39	K	45	1614.391	763734	0.83	7911.1	102.0	110	90	Good
44	Ca	45	251064.983	6950742	0.61	1212835.5	103.5	110	90	Good
47	Ti	45	68.357	12699	2.45	324.9	105.2	110	90	Good
51	V	45	16.516	108328	0.40	78.4	105.3	110	90	Good
52	Cr	45	6.944	56110	1.40	32.4	107.0	110	90	Good
55	Mn	45	385.299	1686436	0.08	1842.5	104.6	110	90	Good
56	Fe	45	4315.787	26963050	0.59	19552.3	110.4	110	90	
59	Co	72	3.034	39152	1.42	14.6	104.1	110	90	Good
60	Ni	72	6.579	30383	0.61	33.5	98.2	110	90	Good
63	Cu	72	2.853	27472	0.51	13.0	109.5	110	90	Good
66	Zn	72	21.386	28671	1.18	93.1	114.8	110	90	
75	As	72	1.827	1616	2.63	8.9	102.7	110	90	Good
78	Se	72	0.795	70	3.22	3.3	122.2	110	90	
88	Sr	115	425.096	2313683	0.84	2239.2	94.9	110	90	Good
95	Mo	115	0.237	1417	8.09	0.9	132.4	110	90	
107	Ag	115	0.022	427	13.69	0.0	234.1	110	90	
111	Cd	115	0.113	288	5.71	0.5	114.4	110	90	
118	Sn	115	1.521	8238	4.04	7.2	104.9	110	90	Good
121	Sb	115	0.078	638	4.86	0.4	108.4	110	90	Good
137	Ba	115	14.386	33075	1.04	70.0	102.8	110	90	Good
205	Tl	209	0.096	4186	3.72	0.4	132.1	110	90	
208	Pb	209	1.724	92415	0.58	8.4	102.1	110	90	Good

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1223827	0.30	1250708	97.85	70	120	
72	Ge	817835	0.22	871265	93.87	70	120	
115	In	8380211	1.21	8749493	95.78	70	120	
209	Bi	22399159	0.34	24417425	91.73	70	120	

# Sample Report

Date Acquired 9/15/17 11:07 AM  
 Data Batch 170915.b  
 Data File Name 034SMPL.d

Sample Name 1709083-02A  
 Comment SAMP6020A\_S  
 Dilution 5

Mass	Name	IS	Conc (ppb)	CPS	%RSD	High Limit	Flag
9	Be	45	3.016	218	1.65	2000	>RL
11	B	45	40.185	1549	4.36	2000	>RL
23	Na	45	347.291	403862	0.63	25000	>RL
24	Mg	45	12181.597	7032479	0.81	25000	>RL
27	Al	45	86744.985	18141778	1.07	10000	OUTCAL
39	K	45	8394.165	3971248	1.04	25000	>RL
44	Ca	45	38262.170	1090465	0.62	10000	OUTCAL
47	Ti	45	271.380	51871	1.80	2000	>RL
51	V	45	124.505	828221	1.01	2000	>RL
52	Cr	45	95.582	783389	1.23	2000	>RL
55	Mn	45	880.126	3964423	0.52	2000	>RL
56	Fe	45	58226.504	374205612	0.55	10000	OUTCAL
59	Co	72	21.873	283672	0.92	2000	>RL
60	Ni	72	60.905	221773	0.51	2000	>RL
63	Cu	72	108.912	1024872	0.97	2000	>RL
66	Zn	72	541.591	726246	0.96	2000	>RL
75	As	72	14.541	12583	1.02	2000	>RL
78	Se	72	6.684	452	7.39	2000	>RL
88	Sr	115	125.304	687398	1.06	2000	>RL
95	Mo	115	2.308	13030	1.63	2000	>RL
107	Ag	115	0.548	9540	2.36	500	>RL
111	Cd	115	0.970	2407	2.46	2000	>RL
118	Sn	115	11.369	59311	1.61	2000	>RL
121	Sb	115	5.816	37064	1.48	500	>RL
137	Ba	115	578.373	1337381	0.44	2000	>RL
205	Tl	209	0.776	32672	1.33	2000	>RL
208	Pb	209	1296.737	70887217	0.84	2000	>RL

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1259600	0.86	1250708	100.71	70	120	
72	Ge	826693	0.67	871265	94.88	70	120	
115	In	8442965	0.46	8749493	96.50	70	120	
209	Bi	23198902	0.71	24417425	95.01	70	120	



# Post Digestion Spike Sample (PDS) Report

Date Acquired 9/15/2017 11:24  
 Data Batch 170915.b  
 Data File Name 043\_PDS.d

Sample Name 1709034-02C PDS  
 Comment PDS 6020A\_S  
 Dilution 5

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	163.963	11422	1.87	1.1	200	81.4	75	125	
11	B	45	226.560	7746	4.45	68.5	200	79.0	75	125	
23	Na	45	6059.837	6680203	0.86	1183.5	5000	97.5	75	125	
24	Mg	45	17990.714	10196213	1.17	13629.0	5000	87.2	75	125	
27	Al	45	32808.248	6738601	1.28	27779.0	5000	100.6	75	125	
39	K	45	13144.823	6089870	0.62	7911.1	5000	104.7	75	125	
44	Ca	45	#####	34650367	0.19	1212835.5	5000	517.2	75	125	Fail
47	Ti	45	528.489	99167	0.65	324.9	200	101.8	75	125	
51	V	45	269.808	1759870	0.33	78.4	200	95.7	75	125	
52	Cr	45	220.564	1773592	1.18	32.4	200	94.1	75	125	
55	Mn	45	2049.338	9062302	0.11	1842.5	200	103.4	75	125	
56	Fe	45	24207.850	152751683	0.90	19552.3	5000	93.1	75	125	
59	Co	72	206.972	2539148	0.47	14.6	200	96.2	75	125	
60	Ni	72	218.215	733724	0.11	33.5	200	92.4	75	125	
63	Cu	72	190.099	1692882	0.21	13.0	200	88.5	75	125	
66	Zn	72	268.159	340581	0.68	93.1	200	87.5	75	125	
75	As	72	212.233	173096	0.18	8.9	200	101.7	75	125	
78	Se	72	192.969	11843	3.45	3.3	200	94.9	75	125	
88	Sr	115	2514.933	12749326	0.30	2239.2	200	137.9	75	125	Fail
95	Mo	115	188.146	974461	0.28	0.9	200	93.6	75	125	
107	Ag	115	173.559	2780708	0.57	0.0	200	86.8	75	125	
111	Cd	115	179.106	409467	0.41	0.5	200	89.3	75	125	
118	Sn	115	200.111	958814	0.11	7.2	200	96.4	75	125	
121	Sb	115	190.892	1120488	0.34	0.4	200	95.3	75	125	
137	Ba	115	264.735	566023	0.40	70.0	200	97.4	75	125	
205	Tl	209	203.089	6761329	0.89	0.4	200	101.4	75	125	
208	Pb	209	204.749	8945946	0.13	8.4	200	98.2	75	125	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1236622	0.31	1250708	98.87	70	120	
72	Ge	782651	0.30	871265	89.83	70	120	
115	In	7806276	0.08	8749493	89.22	70	120	
209	Bi	18540726	0.93	24417425	75.93	70	120	

# Matrix Spike Sample (MS) Report

Date Acquired 9/15/2017 11:26  
 Data Batch 170915.b  
 Data File Name 044\_MSS.d

Sample Name 1709034-02C MS  
 Comment MS 6020A\_S  
 Dilution 5

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	166.249	11538	0.39	1.1	200	82.6	80	120	
11	B	45	237.189	8072	1.61	68.5	200	84.3	80	120	
23	Na	45	6135.882	6738996	0.82	1183.5	1000	495.2	80	120	Fail
24	Mg	45	18657.700	10535266	0.39	13629.0	1000	502.9	80	120	Fail
27	Al	45	31997.574	6548084	0.54	27779.0	1000	421.9	80	120	Fail
39	K	45	13959.478	6441868	0.32	7911.1	1000	604.8	80	120	Fail
44	Ca	45	#####	34131899	0.46	1212835.5	1000	1184.6	80	120	Fail
47	Ti	45	547.177	102293	1.15	324.9	200	111.1	80	120	
51	V	45	275.550	1790622	0.58	78.4	200	98.6	80	120	
52	Cr	45	220.388	1765581	0.53	32.4	200	94.0	80	120	
55	Mn	45	2043.888	9004945	0.44	1842.5	200	100.7	80	120	
56	Fe	45	22219.039	139685199	0.55	19552.3	1000	266.7	80	120	Fail
59	Co	72	208.275	2543270	0.41	14.6	200	96.8	80	120	
60	Ni	72	223.690	748460	0.34	33.5	200	95.1	80	120	
63	Cu	72	194.037	1719858	0.36	13.0	200	90.5	80	120	
66	Zn	72	274.978	347600	0.71	93.1	200	90.9	80	120	
75	As	72	214.910	174460	0.50	8.9	200	103.0	80	120	
78	Se	72	200.285	12234	1.26	3.3	200	98.5	80	120	
88	Sr	115	2450.323	12384473	0.12	2239.2	200	105.5	80	120	
95	Mo	115	190.072	981468	0.06	0.9	200	94.6	80	120	
107	Ag	115	177.700	2838494	0.47	0.0	200	88.8	80	120	
111	Cd	115	179.740	409669	0.75	0.5	200	89.6	80	120	
118	Sn	115	200.654	958524	0.15	7.2	200	96.7	80	120	
121	Sb	115	180.239	1054784	0.19	0.4	200	89.9	80	120	
137	Ba	115	269.743	574980	0.64	70.0	200	99.9	80	120	
205	Tl	209	210.471	6930874	0.53	0.4	200	105.1	80	120	
208	Pb	209	209.810	9067331	0.28	8.4	200	100.7	80	120	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1232081	0.53	1250708	98.51	70	120	
72	Ge	779033	0.73	871265	89.41	70	120	
115	In	7782930	0.53	8749493	88.95	70	120	
209	Bi	18338151	0.68	24417425	75.10	70	120	

# Matrix Spike Sample (MS) Report

Date Acquired 9/15/2017 11:28  
 Data Batch 170915.b  
 Data File Name 045\_MSS.d

Sample Name 1709034-02C MSD  
 Comment MSD 6020A\_S  
 Dilution 5

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	164.842	11486	1.11	1.1	200	81.9	80	120	
11	B	45	236.262	8073	1.98	68.5	200	83.9	80	120	
23	Na	45	6134.995	6764831	1.17	1183.5	1000	495.2	80	120	Fail
24	Mg	45	18364.296	10411205	1.50	13629.0	1000	473.5	80	120	Fail
27	Al	45	28946.756	5947798	1.29	27779.0	1000	116.8	80	120	
39	K	45	13537.669	6272875	0.39	7911.1	1000	562.7	80	120	Fail
44	Ca	45	#####	34740910	0.42	1212835.5	1000	2873.9	80	120	Fail
47	Ti	45	533.659	100165	0.54	324.9	200	104.4	80	120	
51	V	45	270.891	1767425	0.42	78.4	200	96.2	80	120	
52	Cr	45	219.453	1765119	0.47	32.4	200	93.5	80	120	
55	Mn	45	2057.132	9099331	0.78	1842.5	200	107.3	80	120	
56	Fe	45	21109.801	133240581	0.32	19552.3	1000	155.7	80	120	Fail
59	Co	72	210.632	2563493	0.44	14.6	200	98.0	80	120	
60	Ni	72	224.027	747090	0.26	33.5	200	95.3	80	120	
63	Cu	72	195.748	1729289	0.46	13.0	200	91.4	80	120	
66	Zn	72	274.345	345661	0.55	93.1	200	90.6	80	120	
75	As	72	217.814	176234	0.69	8.9	200	104.5	80	120	
78	Se	72	200.579	12211	0.10	3.3	200	98.7	80	120	
88	Sr	115	2503.531	12753276	0.72	2239.2	200	132.2	80	120	Fail
95	Mo	115	190.987	993959	0.19	0.9	200	95.0	80	120	
107	Ag	115	178.651	2876116	0.63	0.0	200	89.3	80	120	
111	Cd	115	180.434	414496	0.40	0.5	200	90.0	80	120	
118	Sn	115	201.034	967895	0.25	7.2	200	96.9	80	120	
121	Sb	115	182.268	1075055	0.30	0.4	200	91.0	80	120	
137	Ba	115	267.576	574866	0.33	70.0	200	98.8	80	120	
205	Tl	209	213.494	7052622	0.45	0.4	200	106.6	80	120	
208	Pb	209	211.281	9159553	0.12	8.4	200	101.4	80	120	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1236977	0.36	1250708	98.90	70	120	
72	Ge	776439	0.43	871265	89.12	70	120	
115	In	7844200	0.44	8749493	89.65	70	120	
209	Bi	18396212	0.75	24417425	75.34	70	120	

# Continuing Calibration Verification (CCV) Report

Date Acquired 9/15/2017 11:30  
 Data Batch 170915.b  
 Data File Name 046\_CCV.d

Sample Name CCV1-170915  
 Comment CCV 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	187.600	13092	1.01	200	93.8	90	110	
11	B	45	193.275	6647	1.86	200	96.6	90	110	
23	Na	45	4733.776	5231483	0.63	5000	94.7	90	110	
24	Mg	45	4707.853	2673896	0.33	5000	94.2	90	110	
27	Al	45	4969.232	1025722	0.35	5000	99.4	90	110	
39	K	45	4757.132	2225495	0.67	5000	95.1	90	110	
44	Ca	45	5266.015	147862	6.14	5000	105.3	90	110	
47	Ti	45	196.146	36879	0.86	200	98.1	90	110	
51	V	45	191.878	1254482	0.11	200	95.9	90	110	
52	Cr	45	195.076	1571710	0.24	200	97.5	90	110	
55	Mn	45	194.547	862215	0.56	200	97.3	90	110	
56	Fe	45	5008.406	31674118	0.97	5000	100.2	90	110	
59	Co	72	197.094	2643417	0.63	200	98.5	90	110	
60	Ni	72	198.056	728763	0.72	200	99.0	90	110	
63	Cu	72	200.484	1951768	0.20	200	100.2	90	110	
66	Zn	72	198.621	275867	0.63	200	99.3	90	110	
75	As	72	196.104	174858	0.53	200	98.1	90	110	
78	Se	72	196.336	13172	0.72	200	98.2	90	110	
88	Sr	115	190.649	1074051	0.27	200	95.3	90	110	
95	Mo	115	184.428	1061155	0.20	200	92.2	90	110	
107	Ag	115	199.599	3552639	0.39	200	99.8	90	110	
111	Cd	115	192.305	488406	0.40	200	96.2	90	110	
118	Sn	115	190.372	1013344	0.25	200	95.2	90	110	
121	Sb	115	198.083	1291666	0.67	200	99.0	90	110	
137	Ba	115	192.386	456986	0.69	200	96.2	90	110	
205	Tl	209	195.238	8381200	0.55	200	97.6	90	110	
208	Pb	209	191.741	10802279	0.09	200	95.9	90	110	

## QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1238981	0.35	1250708	99.06	70	120	
72	Ge	855619	0.14	871265	98.20	70	120	
115	In	8672229	0.32	8749493	99.12	70	120	
209	Bi	23906243	0.84	24417425	97.91	70	120	

# Low Level Calibration Verification (LLCV) Report

Date Acquired 9/15/2017 11:35  
 Data Batch 170915.b  
 Data File Name 048LCCV.d

Sample Name LCVL1-170915  
 Comment LCVL6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	1.045	77	19.19	1	104.5	70	130	
11	B	45	21.687	910	3.26	20	108.4	70	130	
23	Na	45	96.188	121308	1.20	100	96.2	70	130	
24	Mg	45	91.142	52937	0.76	100	91.1	70	130	
27	Al	45	90.116	22361	0.37	100	90.1	70	130	
39	K	45	91.833	70043	0.41	100	91.8	70	130	
44	Ca	45	108.220	3327	5.39	100	108.2	70	130	
47	Ti	45	4.545	867	3.08	5	90.9	70	130	
51	V	45	0.928	7961	1.46	1	92.8	70	130	
52	Cr	45	4.739	39305	1.15	5	94.8	70	130	
55	Mn	45	4.750	21489	0.64	5	95.0	70	130	
56	Fe	45	102.820	669400	0.14	100	102.8	70	130	
59	Co	72	4.853	66316	0.39	5	97.1	70	130	
60	Ni	72	4.040	22879	1.68	5	80.8	70	130	
63	Cu	72	4.967	50045	0.92	5	99.3	70	130	
66	Zn	72	4.735	6999	2.22	5	94.7	70	130	
75	As	72	4.779	4386	1.49	5	95.6	70	130	
78	Se	72	4.931	356	6.47	5	98.6	70	130	
88	Sr	115	4.561	26363	1.48	5	91.2	70	130	
95	Mo	115	4.459	26044	0.48	5	89.2	70	130	
107	Ag	115	1.904	34312	0.59	2	95.2	70	130	
111	Cd	115	0.963	2482	2.41	1	96.3	70	130	
118	Sn	115	4.676	25589	0.68	5	93.5	70	130	
121	Sb	115	1.913	12764	1.14	2	95.7	70	130	
137	Ba	115	4.628	11182	1.93	5	92.6	70	130	
205	Tl	209	0.934	41134	1.65	1	93.4	70	130	
208	Pb	209	0.911	53775	0.76	1	91.1	70	130	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1247050	0.29	1250708	99.71	70	120	
72	Ge	868268	0.87	871265	99.66	70	120	
115	In	8768469	0.33	8749493	100.22	70	120	
209	Bi	24309971	0.85	24417425	99.56	70	120	

# Continuing Calibration Blank (CCB) Report

Date Acquired 9/15/2017 11:40  
 Data Batch 170915.b  
 Data File Name 049\_CCB.d

Sample Name CCB1-170915  
 Comment CCB 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	0.023	6	36.7	0.4	0.3	
11	B	45	1.189	221	13.9	10	10	
23	Na	45	4.755	20018	2.2	50	100	
24	Mg	45	-0.765	417	2.9	50	100	
27	Al	45	-3.144	3075	4.7	50	10	
39	K	45	0.314	27658	1.1	50	100	
44	Ca	45	4.599	407	4.8	50	100	
47	Ti	45	0.006	8	24.7	4	3	
51	V	45	0.023	2025	5.3	4	3	
52	Cr	45	-0.056	449	3.5	2	2	
55	Mn	45	-0.013	248	10.3	2	3	
56	Fe	45	-0.828	10003	2.7	50	50	
59	Co	72	-0.008	167	7.2	2	3	
60	Ni	72	-0.815	4917	2.3	2	3	
63	Cu	72	-0.020	797	5.5	2	2	
66	Zn	72	0.063	420	18.7	4	2	
75	As	72	0.009	71	4.8	2	2	
78	Se	72	0.128	29	25.8	1	2	
88	Sr	115	0.007	430	10.1	4	3	
95	Mo	115	0.026	256	6.4	2	2	
107	Ag	115	0.009	216	24.2	0.4	1	
111	Cd	115	-0.003	3	173.2	0.4	0.3	
118	Sn	115	0.022	557	5.8	4	3	
121	Sb	115	0.039	408	8.7	2	0.8	
137	Ba	115	0.005	81	17.1	2	3	
205	Tl	209	0.035	1885	6.1	2	0.5	
208	Pb	209	-0.002	1478	2.5	0.4	0.3	

## QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1255377	0.46	1250708	100.37	70	120	
72	Ge	863247	0.08	871265	99.08	70	120	
115	In	8796854	1.21	8749493	100.54	70	120	
209	Bi	24298126	0.31	24417425	99.51	70	120	

# Continuing Calibration Verification (CCV) Report

Date Acquired 9/15/2017 11:51  
 Data Batch 170915.b  
 Data File Name 055\_CCV.d

Sample Name CCV2-170915  
 Comment CCV 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	181.438	12584	0.48	200	90.7	90	110	
11	B	45	187.902	6428	1.72	200	94.0	90	110	
23	Na	45	4636.826	5092901	0.18	5000	92.7	90	110	
24	Mg	45	4636.922	2617364	0.18	5000	92.7	90	110	
27	Al	45	4923.584	1010005	0.99	5000	98.5	90	110	
39	K	45	4740.362	2204007	0.42	5000	94.8	90	110	
44	Ca	45	5101.077	142319	5.05	5000	102.0	90	110	
47	Ti	45	196.959	36804	0.67	200	98.5	90	110	
51	V	45	190.271	1236344	0.92	200	95.1	90	110	
52	Cr	45	192.395	1540557	0.37	200	96.2	90	110	
55	Mn	45	191.958	845497	0.23	200	96.0	90	110	
56	Fe	45	5010.145	31490074	0.13	5000	100.2	90	110	
59	Co	72	196.011	2623858	0.21	200	98.0	90	110	
60	Ni	72	195.944	719700	0.89	200	98.0	90	110	
63	Cu	72	198.174	1925626	0.91	200	99.1	90	110	
66	Zn	72	197.094	273225	0.48	200	98.5	90	110	
75	As	72	194.546	173137	0.42	200	97.3	90	110	
78	Se	72	195.165	13069	1.06	200	97.6	90	110	
88	Sr	115	189.830	1062559	0.06	200	94.9	90	110	
95	Mo	115	183.414	1048554	0.26	200	91.7	90	110	
107	Ag	115	197.285	3488890	0.20	200	98.6	90	110	
111	Cd	115	190.862	481633	0.74	200	95.4	90	110	
118	Sn	115	189.581	1002685	0.57	200	94.8	90	110	
121	Sb	115	196.232	1271388	0.47	200	98.1	90	110	
137	Ba	115	191.999	453121	0.30	200	96.0	90	110	
205	Tl	209	195.722	8202532	0.52	200	97.9	90	110	
208	Pb	209	191.594	10537657	0.21	200	95.8	90	110	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1231366	0.74	1250708	98.45	70	120	
72	Ge	853985	0.18	871265	98.02	70	120	
115	In	8616986	1.00	8749493	98.49	70	120	
209	Bi	23340146	1.32	24417425	95.59	70	120	

# Low Level Calibration Verification (LLCV) Report

Date Acquired 9/15/2017 11:57  
 Data Batch 170915.b  
 Data File Name 057LCCV.d

Sample Name LCVL2-170915  
 Comment LCVL6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	0.828	62	9.12	1	82.8	70	130	
11	B	45	18.219	796	13.00	20	91.1	70	130	
23	Na	45	94.857	120206	1.19	100	94.9	70	130	
24	Mg	45	89.276	52034	0.89	100	89.3	70	130	
27	Al	45	91.219	22660	1.10	100	91.2	70	130	
39	K	45	93.080	70845	1.15	100	93.1	70	130	
44	Ca	45	95.599	2980	6.07	100	95.6	70	130	
47	Ti	45	5.116	978	5.46	5	102.3	70	130	
51	V	45	0.957	8174	0.97	1	95.7	70	130	
52	Cr	45	4.653	38731	1.31	5	93.1	70	130	
55	Mn	45	4.712	21386	1.23	5	94.2	70	130	
56	Fe	45	102.598	670086	0.59	100	102.6	70	130	
59	Co	72	4.871	66355	1.33	5	97.4	70	130	
60	Ni	72	3.994	22640	2.49	5	79.9	70	130	
63	Cu	72	4.936	49582	1.22	5	98.7	70	130	
66	Zn	72	4.699	6927	2.28	5	94.0	70	130	
75	As	72	4.804	4395	1.22	5	96.1	70	130	
78	Se	72	4.795	345	1.80	5	95.9	70	130	
88	Sr	115	4.564	26508	1.19	5	91.3	70	130	
95	Mo	115	4.360	25594	0.62	5	87.2	70	130	
107	Ag	115	1.908	34566	2.59	2	95.4	70	130	
111	Cd	115	0.943	2445	2.52	1	94.3	70	130	
118	Sn	115	4.578	25185	1.07	5	91.6	70	130	
121	Sb	115	1.841	12353	0.34	2	92.1	70	130	
137	Ba	115	4.667	11332	0.55	5	93.3	70	130	
205	Tl	209	0.928	40239	0.79	1	92.8	70	130	
208	Pb	209	0.904	52536	1.24	1	90.4	70	130	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1250971	0.26	1250708	100.02	70	120	
72	Ge	865646	0.45	871265	99.36	70	120	
115	In	8812559	0.79	8749493	100.72	70	120	
209	Bi	23933410	1.39	24417425	98.02	70	120	



# Continuing Calibration Blank (CCB) Report

Date Acquired 9/15/2017 12:03  
 Data Batch 170915.b  
 Data File Name 058\_CCB.d

Sample Name CCB2-170915  
 Comment CCB 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	-0.023	2	137.8	0.4	0.3	
11	B	45	1.076	216	9.9	10	10	
23	Na	45	4.021	19061	1.7	50	100	
24	Mg	45	-0.847	367	9.2	50	100	
27	Al	45	-3.081	3066	4.7	50	10	
39	K	45	1.143	27846	1.3	50	100	
44	Ca	45	4.190	392	20.3	50	100	
47	Ti	45	-0.017	3	100.1	4	3	
51	V	45	0.032	2070	3.4	4	3	
52	Cr	45	-0.063	388	3.9	2	2	
55	Mn	45	-0.022	206	8.3	2	3	
56	Fe	45	-0.769	10307	2.1	50	50	
59	Co	72	-0.011	132	8.1	2	3	
60	Ni	72	-0.843	4837	0.8	2	3	
63	Cu	72	-0.035	649	8.4	2	2	
66	Zn	72	0.033	380	3.8	4	2	
75	As	72	-0.004	60	2.8	2	2	
78	Se	72	0.092	27	30.7	1	2	
88	Sr	115	0.004	414	14.7	4	3	
95	Mo	115	0.010	160	13.0	2	2	
107	Ag	115	0.006	154	15.2	0.4	1	
111	Cd	115	-0.002	4	43.4	0.4	0.3	
118	Sn	115	-0.007	397	23.4	4	3	
121	Sb	115	0.004	181	4.2	2	0.8	
137	Ba	115	-0.005	57	27.0	2	3	
205	Tl	209	0.022	1298	12.5	2	0.5	
208	Pb	209	-0.012	894	2.7	0.4	0.3	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1246401	0.52	1250708	99.66	70	120	
72	Ge	867599	0.34	871265	99.58	70	120	
115	In	8751818	0.07	8749493	100.03	70	120	
209	Bi	24080146	0.62	24417425	98.62	70	120	

# Continuing Calibration Verification (CCV) Report

Date Acquired 9/15/2017 12:36  
 Data Batch 170915.b  
 Data File Name 075\_CCV.d

Sample Name CCV3-170915  
 Comment CCV 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	184.206	12950	1.04	200	92.1	90	110	
11	B	45	191.785	6646	2.67	200	95.9	90	110	
23	Na	45	4773.292	5313747	0.60	5000	95.5	90	110	
24	Mg	45	4663.307	2668058	0.35	5000	93.3	90	110	
27	Al	45	4949.428	1029164	0.90	5000	99.0	90	110	
39	K	45	4788.420	2256407	0.75	5000	95.8	90	110	
44	Ca	45	4605.168	130289	0.40	5000	92.1	90	110	
47	Ti	45	195.588	37045	0.26	200	97.8	90	110	
51	V	45	191.205	1259267	0.32	200	95.6	90	110	
52	Cr	45	193.089	1567128	0.15	200	96.5	90	110	
55	Mn	45	194.174	866886	0.11	200	97.1	90	110	
56	Fe	45	5061.680	32246631	0.63	5000	101.2	90	110	
59	Co	72	198.509	2672300	0.41	200	99.3	90	110	
60	Ni	72	197.971	731176	0.37	200	99.0	90	110	
63	Cu	72	198.652	1941212	0.48	200	99.3	90	110	
66	Zn	72	198.802	277154	0.53	200	99.4	90	110	
75	As	72	195.695	175140	0.50	200	97.8	90	110	
78	Se	72	198.552	13371	1.18	200	99.3	90	110	
88	Sr	115	188.365	1075737	0.21	200	94.2	90	110	
95	Mo	115	181.255	1057171	0.69	200	90.6	90	110	
107	Ag	115	196.085	3537905	0.42	200	98.0	90	110	
111	Cd	115	190.052	489310	0.51	200	95.0	90	110	
118	Sn	115	187.776	1013255	0.41	200	93.9	90	110	
121	Sb	115	194.667	1286798	0.21	200	97.3	90	110	
137	Ba	115	190.479	458655	0.48	200	95.2	90	110	
205	Tl	209	193.953	8353146	0.38	200	97.0	90	110	
208	Pb	209	189.995	10739586	0.68	200	95.0	90	110	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1248080	0.24	1250708	99.79	70	120	
72	Ge	858855	0.83	871265	98.58	70	120	
115	In	8791246	0.57	8749493	100.48	70	120	
209	Bi	23986312	1.41	24417425	98.23	70	120	

# Low Level Calibration Verification (LLCV) Report

Date Acquired 9/15/2017 12:42  
 Data Batch 170915.b  
 Data File Name 077LCCV.d

Sample Name LCVL3-170915  
 Comment LCVL6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	0.970	73	7.51	1	97.0	70	130	
11	B	45	17.750	791	6.55	20	88.8	70	130	
23	Na	45	119.013	149203	0.70	100	119.0	70	130	
24	Mg	45	89.942	53170	1.08	100	89.9	70	130	
27	Al	45	90.070	22743	1.67	100	90.1	70	130	
39	K	45	93.306	71971	0.61	100	93.3	70	130	
44	Ca	45	91.113	2894	7.13	100	91.1	70	130	
47	Ti	45	4.841	939	1.82	5	96.8	70	130	
51	V	45	0.981	8452	3.00	1	98.1	70	130	
52	Cr	45	4.654	39293	2.03	5	93.1	70	130	
55	Mn	45	4.678	21539	1.46	5	93.6	70	130	
56	Fe	45	101.709	673968	1.16	100	101.7	70	130	
59	Co	72	4.840	66938	0.46	5	96.8	70	130	
60	Ni	72	4.074	23282	0.84	5	81.5	70	130	
63	Cu	72	4.954	50510	0.98	5	99.1	70	130	
66	Zn	72	4.982	7433	3.59	5	99.6	70	130	
75	As	72	4.777	4437	0.58	5	95.5	70	130	
78	Se	72	5.318	387	3.71	5	106.4	70	130	
88	Sr	115	4.563	27050	0.54	5	91.3	70	130	
95	Mo	115	4.341	26009	1.78	5	86.8	70	130	
107	Ag	115	1.874	34654	0.19	2	93.7	70	130	
111	Cd	115	0.910	2407	1.57	1	91.0	70	130	
118	Sn	115	4.597	25818	1.35	5	91.9	70	130	
121	Sb	115	1.857	12713	2.65	2	92.9	70	130	
137	Ba	115	4.555	11290	0.63	5	91.1	70	130	
205	Tl	209	0.926	41041	1.13	1	92.6	70	130	
208	Pb	209	0.897	53313	0.96	1	89.7	70	130	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1268963	0.23	1250708	101.46	70	120	
72	Ge	878724	0.95	871265	100.86	70	120	
115	In	8995132	0.82	8749493	102.81	70	120	
209	Bi	24478912	1.11	24417425	100.25	70	120	

# Continuing Calibration Blank (CCB) Report

Date Acquired 9/15/2017 12:44  
 Data Batch 170915.b  
 Data File Name 078\_CCB.d

Sample Name CCB3-170915  
 Comment CCB 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	0.003	4	35.3	0.4	0.3	
11	B	45	1.250	228	10.8	10	10	
23	Na	45	25.789	44412	0.3	50	100	
24	Mg	45	-0.912	339	7.9	50	100	
27	Al	45	-3.629	3036	3.4	50	10	
39	K	45	0.566	28354	1.9	50	100	
44	Ca	45	-0.808	258	7.6	50	100	
47	Ti	45	-0.035	0	#DIV/0!	4	3	
51	V	45	0.022	2061	4.3	4	3	
52	Cr	45	-0.056	459	14.8	2	2	
55	Mn	45	-0.020	222	7.7	2	3	
56	Fe	45	-1.022	8941	1.5	50	50	
59	Co	72	-0.003	234	12.9	2	3	
60	Ni	72	-0.886	4777	3.4	2	3	
63	Cu	72	-0.023	782	4.1	2	2	
66	Zn	72	0.060	427	12.3	4	2	
75	As	72	0.014	78	16.4	2	2	
78	Se	72	0.085	27	2.1	1	2	
88	Sr	115	-0.003	387	13.3	4	3	
95	Mo	115	0.021	234	21.3	2	2	
107	Ag	115	0.011	251	23.8	0.4	1	
111	Cd	115	-0.001	9	78.1	0.4	0.3	
118	Sn	115	0.001	453	6.0	4	3	
121	Sb	115	0.025	324	10.0	2	0.8	
137	Ba	115	0.000	71	13.5	2	3	
205	Tl	209	0.030	1667	3.1	2	0.5	
208	Pb	209	-0.013	866	5.3	0.4	0.3	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1281510	0.27	1250708	102.46	70	120	
72	Ge	885633	0.56	871265	101.65	70	120	
115	In	9038963	0.15	8749493	103.31	70	120	
209	Bi	24649887	0.19	24417425	100.95	70	120	

# Method Blank Report

Date Acquired 9/15/17 12:46 PM  
 Data Batch 170915.b  
 Data File Name 079\_LRB.d

Sample Name MB-82354  
 Comment MBLK6020A\_W  
 Dilution 1

Mass	Name	IS	Conc (ppb)	CPS	%RSD	High Limit	Flag
9	Be	45	0.003	4	93.26		
11	B	45	3.904	320	16.17		
23	Na	45	29.317	48517	0.13		
24	Mg	45	1.410	1706	6.09		
27	Al	45	6.411	5180	4.90		
39	K	45	2.024	29102	0.76		
44	Ca	45	22.828	945	3.78		
47	Ti	45	0.033	13	25.01		
51	V	45	0.048	2241	7.67		
52	Cr	45	-0.041	579	10.87		
55	Mn	45	-0.004	294	7.19		
56	Fe	45	-0.199	14350	1.17		
59	Co	72	-0.005	216	3.89		
60	Ni	72	-0.841	4943	5.22		
63	Cu	72	-0.003	989	7.15		
66	Zn	72	1.284	2181	5.04		
75	As	72	0.010	74	9.56		
78	Se	72	0.019	22	35.64		
88	Sr	115	0.124	1142	2.36		
95	Mo	115	0.024	256	7.18		
107	Ag	115	0.012	278	12.02		
111	Cd	115	-0.002	6	91.64		
118	Sn	115	0.013	523	15.46		
121	Sb	115	0.028	352	4.86		
137	Ba	115	0.024	131	7.34		
205	Tl	209	0.024	1445	2.24		
208	Pb	209	-0.009	1110	12.30		

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1283712	0.37	1250708	102.64	70	120	
72	Ge	884718	0.44	871265	101.54	70	120	
115	In	9128722	0.74	8749493	104.33	70	120	
209	Bi	25067441	1.07	24417425	102.66	70	120	

# Laboratory Control Sample (LCS) Report

Date Acquired 9/15/2017 12:48  
 Data Batch 170915.b  
 Data File Name 080\_LFB.d

Sample Name LCS-82354  
 Comment LCS 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	190.452	13336	1.46	200	95.2	80	120	
11	B	45	195.319	6738	3.14	200	97.7	80	120	
23	Na	45	4658.033	5165137	1.47	5000	93.2	80	120	
24	Mg	45	4596.806	2619537	0.71	5000	91.9	80	120	
27	Al	45	4983.419	1032071	0.70	5000	99.7	80	120	
39	K	45	4655.975	2186003	0.90	5000	93.1	80	120	
44	Ca	45	4564.881	128638	0.60	5000	91.3	80	120	
47	Ti	45	197.297	37220	1.19	200	98.6	80	120	
51	V	45	192.996	1265980	0.26	200	96.5	80	120	
52	Cr	45	195.103	1577150	0.43	200	97.6	80	120	
55	Mn	45	194.787	866142	0.82	200	97.4	80	120	
56	Fe	45	5055.539	32078908	0.40	5000	101.1	80	120	
59	Co	72	201.845	2688611	0.27	200	100.9	80	120	
60	Ni	72	200.694	733309	0.40	200	100.3	80	120	
63	Cu	72	203.399	1966594	0.15	200	101.7	80	120	
66	Zn	72	201.978	278606	0.45	200	101.0	80	120	
75	As	72	199.249	176445	0.56	200	99.6	80	120	
78	Se	72	198.817	13248	1.08	200	99.4	80	120	
88	Sr	115	191.472	1083657	0.68	200	95.7	80	120	
95	Mo	115	184.231	1064909	0.63	200	92.1	80	120	
107	Ag	115	198.467	3548722	0.53	200	99.2	80	120	
111	Cd	115	193.834	494549	0.61	200	96.9	80	120	
118	Sn	115	190.286	1017552	0.12	200	95.1	80	120	
121	Sb	115	196.596	1287866	0.11	200	98.3	80	120	
137	Ba	115	193.061	460694	0.10	200	96.5	80	120	
205	Tl	209	195.903	8460312	0.26	200	98.0	80	120	
208	Pb	209	191.307	10842401	0.52	200	95.7	80	120	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1243105	0.35	1250708	99.39	70	120	
72	Ge	849771	0.25	871265	97.53	70	120	
115	In	8712117	0.23	8749493	99.57	70	120	
209	Bi	24048774	0.72	24417425	98.49	70	120	

# Laboratory Control Sample (LCS) Report

Date Acquired 9/15/2017 12:50  
 Data Batch 170915.b  
 Data File Name 081\_LFB.d

Sample Name LCSD-82354  
 Comment LCSD6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	187.231	13196	0.94	200	93.6	80	120	
11	B	45	196.409	6819	1.47	200	98.2	80	120	
23	Na	45	4840.461	5401999	0.59	5000	96.8	80	120	
24	Mg	45	4765.561	2733496	0.11	5000	95.3	80	120	
27	Al	45	4929.519	1027673	0.90	5000	98.6	80	120	
39	K	45	4844.718	2288499	0.68	5000	96.9	80	120	
44	Ca	45	4679.556	132734	1.38	5000	93.6	80	120	
47	Ti	45	191.778	36418	0.89	200	95.9	80	120	
51	V	45	188.837	1246871	0.56	200	94.4	80	120	
52	Cr	45	191.389	1557300	0.14	200	95.7	80	120	
55	Mn	45	191.375	856565	0.38	200	95.7	80	120	
56	Fe	45	4979.224	31803532	0.59	5000	99.6	80	120	
59	Co	72	198.819	2652355	0.12	200	99.4	80	120	
60	Ni	72	198.969	728168	0.78	200	99.5	80	120	
63	Cu	72	200.901	1945398	0.77	200	100.5	80	120	
66	Zn	72	200.937	277595	0.48	200	100.5	80	120	
75	As	72	196.164	173985	0.58	200	98.1	80	120	
78	Se	72	199.058	13284	0.44	200	99.5	80	120	
88	Sr	115	186.890	1068449	0.98	200	93.4	80	120	
95	Mo	115	180.508	1053974	0.07	200	90.3	80	120	
107	Ag	115	195.805	3536654	0.31	200	97.9	80	120	
111	Cd	115	190.323	490523	0.65	200	95.2	80	120	
118	Sn	115	186.602	1007981	0.25	200	93.3	80	120	
121	Sb	115	192.918	1276593	0.47	200	96.5	80	120	
137	Ba	115	188.184	453616	0.28	200	94.1	80	120	
205	Tl	209	196.210	8450736	0.55	200	98.1	80	120	
208	Pb	209	189.085	10687596	0.32	200	94.5	80	120	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1251318	0.79	1250708	100.05	70	120	
72	Ge	851096	0.66	871265	97.69	70	120	
115	In	8800537	0.29	8749493	100.58	70	120	
209	Bi	23983768	0.56	24417425	98.22	70	120	

# Dilution Sample (Dil) Report

Date Acquired 9/15/2017 12:56  
 Data Batch 170915.b  
 Data File Name 084\_SD.d

Sample Name 1709087-01A SD  
 Comment SD 6020A\_W  
 Dilution 5

Mass	Name	IS	Conc	CPS	%RSD	Ref Value	%Rec	Low	High	Flag
9	Be	45	0.003	4	81.04	0.0	180.6	110	90	
11	B	45	397.465	13922	0.62	1864.4	106.6	110	90	Good
23	Na	45	14288.360	16277084	0.45	69006.5	103.5	110	90	Good
24	Mg	45	7582.302	4446825	0.35	36709.5	103.3	110	90	Good
27	Al	45	33.774	10976	3.30	168.0	100.5	110	90	Good
39	K	45	1790.636	882584	0.28	8709.6	102.8	110	90	Good
44	Ca	45	21680.417	627793	0.52	105556.6	102.7	110	90	Good
47	Ti	45	0.222	50	53.34	1.3	86.2	110	90	
51	V	45	0.338	4191	1.40	1.3	131.7	110	90	
52	Cr	45	-0.012	821	10.47	0.1	-54.2	110	90	
55	Mn	45	2.405	11317	1.05	11.7	102.8	110	90	Good
56	Fe	45	10.454	83849	1.21	53.7	97.4	110	90	Good
59	Co	72	0.023	599	6.96	0.2	74.8	110	90	
60	Ni	72	-0.085	7780	2.75	3.0	-14.1	110	90	
63	Cu	72	0.116	2178	3.10	0.6	93.0	110	90	Good
66	Zn	72	0.916	1652	6.05	3.7	123.1	110	90	
75	As	72	0.196	245	5.98	1.0	94.9	110	90	Good
78	Se	72	0.095	27	34.06	0.8	59.6	110	90	
88	Sr	115	282.352	1650917	0.39	1455.7	97.0	110	90	Good
95	Mo	115	0.573	3528	0.38	2.8	102.8	110	90	Good
107	Ag	115	0.020	424	8.83	0.0	245.4	110	90	
111	Cd	115	0.010	37	47.23	0.0	184.5	110	90	
118	Sn	115	0.012	514	8.10	0.1	47.8	110	90	
121	Sb	115	0.067	608	4.79	0.3	131.3	110	90	
137	Ba	115	9.675	23922	0.67	47.8	101.1	110	90	Good
205	Tl	209	0.042	2162	6.80	0.1	241.9	110	90	
208	Pb	209	0.205	13110	0.68	1.0	98.4	110	90	Good

## QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1279526	0.46	1250708	102.30	70	120	
72	Ge	883830	0.40	871265	101.44	70	120	
115	In	9001719	0.41	8749493	102.88	70	120	
209	Bi	23918638	0.57	24417425	97.96	70	120	



# Sample Report

Date Acquired 9/15/17 12:58 PM  
 Data Batch 170915.b  
 Data File Name 085\_WS.d

Sample Name 1709083-01A  
 Comment SAMP6020A\_W  
 Dilution 1

Mass	Name	IS	Conc (ppb)	CPS	%RSD	High Limit	Flag
9	Be	45	0.045	7	37.80	2000	
11	B	45	118.955	4098	1.05	2000	>RL
23	Na	45	43668.215	47424458	0.80	25000	OUTCAL
24	Mg	45	17255.908	9654036	1.20	25000	>RL
27	Al	45	295.143	63433	1.08	10000	>RL
39	K	45	578.754	290271	1.69	25000	>RL
44	Ca	45	117899.312	3255870	1.10	10000	OUTCAL
47	Ti	45	3.817	712	25.37	2000	J
51	V	45	4.947	33640	1.16	2000	J
52	Cr	45	0.258	2926	1.30	2000	
55	Mn	45	496.313	2166555	0.39	2000	>RL
56	Fe	45	754.374	4712624	0.98	10000	>RL
59	Co	72	2.055	27298	2.83	2000	
60	Ni	72	1.966	14712	1.19	2000	
63	Cu	72	2.026	20303	0.40	2000	J
66	Zn	72	4.351	6243	0.36	2000	J
75	As	72	1.352	1244	4.32	2000	
78	Se	72	0.663	63	4.47	2000	
88	Sr	115	705.527	3932826	0.27	2000	>RL
95	Mo	115	0.605	3545	1.98	2000	
107	Ag	115	0.013	283	23.17	500	
111	Cd	115	0.767	1938	4.13	2000	J
118	Sn	115	0.062	752	6.78	2000	
121	Sb	115	0.253	1780	6.08	500	
137	Ba	115	252.274	593050	0.54	2000	>RL
205	Tl	209	0.046	2182	2.11	2000	
208	Pb	209	0.772	42662	0.96	2000	J

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1220711	1.01	1250708	97.60	70	120	
72	Ge	839331	0.20	871265	96.33	70	120	
115	In	8583384	0.62	8749493	98.10	70	120	
209	Bi	22652082	0.47	24417425	92.77	70	120	

# Post Digestion Spike Sample (PDS) Report

Date Acquired 9/15/2017 13:15  
 Data Batch 170915.b  
 Data File Name 094\_PDS.d

Sample Name 1709087-01A PDS  
 Comment PDS 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	177.283	12002	1.00	0.0	200	88.6	75	125	
11	B	45	1987.245	64698	0.41	1864.4	200	61.4	75	125	Fail
23	Na	45	69313.152	74120388	0.86	69006.5	5000	6.1	75	125	Fail
24	Mg	45	39000.831	21482935	1.07	36709.5	5000	45.8	75	125	Fail
27	Al	45	4833.891	968096	0.82	168.0	5000	93.3	75	125	
39	K	45	13347.249	6009959	0.45	8709.6	5000	92.8	75	125	
44	Ca	45	#####	2830753	0.21	105556.6	5000	-29.0	75	125	Fail
47	Ti	45	195.634	35684	0.15	1.3	200	97.2	75	125	
51	V	45	195.449	1239605	0.56	1.3	200	97.1	75	125	
52	Cr	45	194.768	1522348	0.65	0.1	200	97.3	75	125	
55	Mn	45	201.813	867669	0.59	11.7	200	95.1	75	125	
56	Fe	45	4810.934	29518449	1.09	53.7	5000	95.1	75	125	
59	Co	72	197.578	2496244	0.54	0.2	200	98.7	75	125	
60	Ni	72	195.810	678797	0.45	3.0	200	96.4	75	125	
63	Cu	72	191.315	1754543	0.58	0.6	200	95.3	75	125	
66	Zn	72	194.459	254422	0.33	3.7	200	95.4	75	125	
75	As	72	203.213	170684	0.24	1.0	200	101.1	75	125	
78	Se	72	205.103	12962	2.38	0.8	200	102.2	75	125	
88	Sr	115	1598.153	8699415	1.34	1455.7	200	71.2	75	125	Fail
95	Mo	115	186.920	1039517	0.54	2.8	200	92.1	75	125	
107	Ag	115	185.856	3197319	0.29	0.0	200	92.9	75	125	
111	Cd	115	186.882	458750	0.21	0.0	200	93.4	75	125	
118	Sn	115	192.924	992574	0.46	0.1	200	96.4	75	125	
121	Sb	115	185.794	1171005	0.89	0.3	200	92.8	75	125	
137	Ba	115	238.000	546399	0.75	47.8	200	95.1	75	125	
205	Tl	209	197.908	7898996	0.44	0.1	200	98.9	75	125	
208	Pb	209	191.394	10025283	0.57	1.0	200	95.2	75	125	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1201989	0.79	1250708	96.10	70	120	
72	Ge	806009	0.64	871265	92.51	70	120	
115	In	8382044	0.41	8749493	95.80	70	120	
209	Bi	22226565	0.97	24417425	91.03	70	120	

# Matrix Spike Sample (MS) Report

Date Acquired 9/15/2017 13:17  
 Data Batch 170915.b  
 Data File Name 095\_MSW.d

Sample Name 1709087-01A MS  
 Comment MS 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	177.009	11891	1.67	0.0	200	88.5	80	120	
11	B	45	2035.512	65748	0.46	1864.4	200	85.6	80	120	
23	Na	45	72003.630	76399079	0.61	69006.5	5000	59.9	80	120	Fail
24	Mg	45	40902.892	22355338	1.19	36709.5	5000	83.9	80	120	
27	Al	45	4874.998	968676	0.68	168.0	5000	94.1	80	120	
39	K	45	13871.231	6196657	1.99	8709.6	5000	103.2	80	120	
44	Ca	45	#####	2963028	0.41	105556.6	5000	85.3	80	120	
47	Ti	45	199.479	36106	1.64	1.3	200	99.1	80	120	
51	V	45	193.525	1217922	0.79	1.3	200	96.1	80	120	
52	Cr	45	190.144	1474738	0.92	0.1	200	95.0	80	120	
55	Mn	45	202.479	863814	0.77	11.7	200	95.4	80	120	
56	Fe	45	4977.826	30303548	0.27	53.7	5000	98.5	80	120	
59	Co	72	196.836	2471885	0.21	0.2	200	98.3	80	120	
60	Ni	72	197.840	681628	0.24	3.0	200	97.4	80	120	
63	Cu	72	192.856	1758016	0.32	0.6	200	96.1	80	120	
66	Zn	72	192.934	250917	0.70	3.7	200	94.6	80	120	
75	As	72	203.791	170142	0.44	1.0	200	101.4	80	120	
78	Se	72	205.627	12917	0.68	0.8	200	102.4	80	120	
88	Sr	115	1666.840	9022461	1.04	1455.7	200	105.6	80	120	
95	Mo	115	188.485	1042336	0.33	2.8	200	92.8	80	120	
107	Ag	115	186.523	3190830	0.32	0.0	200	93.2	80	120	
111	Cd	115	186.566	455409	0.94	0.0	200	93.3	80	120	
118	Sn	115	190.320	973684	0.53	0.1	200	95.1	80	120	
121	Sb	115	198.973	1247017	0.41	0.3	200	99.4	80	120	
137	Ba	115	239.259	546208	0.33	47.8	200	95.7	80	120	
205	Tl	209	200.924	7991407	1.25	0.1	200	100.4	80	120	
208	Pb	209	193.476	10098521	0.14	1.0	200	96.2	80	120	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1192665	0.85	1250708	95.36	70	120	
72	Ge	801150	0.02	871265	91.95	70	120	
115	In	8335006	0.12	8749493	95.26	70	120	
209	Bi	22148302	0.89	24417425	90.71	70	120	

# Matrix Spike Sample (MS) Report

Date Acquired 9/15/2017 13:19  
 Data Batch 170915.b  
 Data File Name 096\_MSW.d

Sample Name 1709087-01A MSD  
 Comment MSD 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	178.188	11749	0.43	0.0	200	89.1	80	120	
11	B	45	2032.110	64424	0.51	1864.4	200	83.9	80	120	
23	Na	45	72627.548	75631073	1.20	69006.5	5000	72.4	80	120	Fail
24	Mg	45	41133.859	22066160	1.18	36709.5	5000	88.5	80	120	
27	Al	45	4948.637	965065	1.03	168.0	5000	95.6	80	120	
39	K	45	13797.233	6049446	1.35	8709.6	5000	101.8	80	120	
44	Ca	45	#####	2902522	0.91	105556.6	5000	81.0	80	120	
47	Ti	45	201.062	35716	1.35	1.3	200	99.9	80	120	
51	V	45	195.828	1209543	0.75	1.3	200	97.3	80	120	
52	Cr	45	191.343	1456467	0.52	0.1	200	95.6	80	120	
55	Mn	45	204.613	856693	0.45	11.7	200	96.5	80	120	
56	Fe	45	5038.206	30103004	1.31	53.7	5000	99.7	80	120	
59	Co	72	197.855	2454915	0.68	0.2	200	98.9	80	120	
60	Ni	72	197.957	673857	0.05	3.0	200	97.5	80	120	
63	Cu	72	192.912	1737458	0.13	0.6	200	96.1	80	120	
66	Zn	72	194.697	250175	1.03	3.7	200	95.5	80	120	
75	As	72	204.967	169074	0.19	1.0	200	102.0	80	120	
78	Se	72	203.504	12630	1.29	0.8	200	101.4	80	120	
88	Sr	115	1673.634	8845706	0.76	1455.7	200	109.0	80	120	
95	Mo	115	192.069	1037123	0.81	2.8	200	94.6	80	120	
107	Ag	115	191.004	3190496	0.56	0.0	200	95.5	80	120	
111	Cd	115	189.881	452576	1.41	0.0	200	94.9	80	120	
118	Sn	115	193.270	965470	0.21	0.1	200	96.6	80	120	
121	Sb	115	199.926	1223461	0.37	0.3	200	99.8	80	120	
137	Ba	115	242.541	540650	0.64	47.8	200	97.3	80	120	
205	Tl	209	202.527	7946969	0.60	0.1	200	101.2	80	120	
208	Pb	209	194.433	10012463	0.21	1.0	200	96.7	80	120	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1170531	0.69	1250708	93.59	70	120	
72	Ge	791565	0.48	871265	90.85	70	120	
115	In	8138614	0.18	8749493	93.02	70	120	
209	Bi	21850720	0.41	24417425	89.49	70	120	

# Continuing Calibration Verification (CCV) Report

Date Acquired 9/15/2017 13:24  
 Data Batch 170915.b  
 Data File Name 099\_CCV.d

Sample Name CCV4-170915  
 Comment CCV 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	183.346	12204	0.67	200	91.7	90	110	
11	B	45	208.019	6810	2.83	200	104.0	90	110	
23	Na	45	4764.114	5021300	0.22	5000	95.3	90	110	
24	Mg	45	4617.933	2501487	0.19	5000	92.4	90	110	
27	Al	45	4932.059	970977	0.59	5000	98.6	90	110	
39	K	45	4761.149	2124287	0.78	5000	95.2	90	110	
44	Ca	45	4611.525	123525	0.80	5000	92.2	90	110	
47	Ti	45	195.031	34974	0.21	200	97.5	90	110	
51	V	45	189.288	1180319	0.47	200	94.6	90	110	
52	Cr	45	192.261	1477377	0.32	200	96.1	90	110	
55	Mn	45	193.587	818274	0.66	200	96.8	90	110	
56	Fe	45	5063.581	30542191	1.05	5000	101.3	90	110	
59	Co	72	196.675	2522209	0.40	200	98.3	90	110	
60	Ni	72	197.062	693367	0.28	200	98.5	90	110	
63	Cu	72	197.644	1839825	0.43	200	98.8	90	110	
66	Zn	72	197.602	262430	0.82	200	98.8	90	110	
75	As	72	194.749	166044	0.96	200	97.4	90	110	
78	Se	72	198.853	12756	1.57	200	99.4	90	110	
88	Sr	115	186.834	1037079	0.25	200	93.4	90	110	
95	Mo	115	179.402	1017045	0.81	200	89.7	90	110	Fail
107	Ag	115	195.193	3423088	0.49	200	97.6	90	110	
111	Cd	115	190.845	477570	0.42	200	95.4	90	110	
118	Sn	115	187.494	983352	0.26	200	93.7	90	110	
121	Sb	115	194.054	1246778	0.17	200	97.0	90	110	
137	Ba	115	189.550	443621	0.22	200	94.8	90	110	
205	Tl	209	194.381	8316027	1.37	200	97.2	90	110	
208	Pb	209	188.186	10566685	0.26	200	94.1	90	110	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1181655	0.07	1250708	94.48	70	120	
72	Ge	818136	0.39	871265	93.90	70	120	
115	In	8544640	0.27	8749493	97.66	70	120	
209	Bi	23826392	0.91	24417425	97.58	70	120	

# Low Level Calibration Verification (LLCV) Report

Date Acquired 9/15/2017 13:46  
 Data Batch 170915.b  
 Data File Name 104LCCV.d

Sample Name LCVL4-170915  
 Comment LCVL6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	0.847	59	1.69	1	84.7	70	130	
11	B	45	27.132	1017	6.94	20	135.7	70	130	Fail
23	Na	45	138.439	156375	0.46	100	138.4	70	130	Fail
24	Mg	45	90.443	48851	0.72	100	90.4	70	130	
27	Al	45	90.597	20884	1.78	100	90.6	70	130	
39	K	45	88.932	63873	1.40	100	88.9	70	130	
44	Ca	45	88.800	2584	4.37	100	88.8	70	130	
47	Ti	45	4.923	872	7.31	5	98.5	70	130	
51	V	45	0.942	7485	2.82	1	94.2	70	130	
52	Cr	45	4.731	36491	1.52	5	94.6	70	130	
55	Mn	45	4.772	20070	1.62	5	95.4	70	130	
56	Fe	45	102.077	618040	0.49	100	102.1	70	130	
59	Co	72	4.769	60890	1.37	5	95.4	70	130	
60	Ni	72	3.910	20926	0.91	5	78.2	70	130	
63	Cu	72	4.824	45431	1.95	5	96.5	70	130	
66	Zn	72	4.876	6725	3.39	5	97.5	70	130	
75	As	72	4.668	4004	1.07	5	93.4	70	130	
78	Se	72	4.803	324	0.76	5	96.1	70	130	
88	Sr	115	4.404	24651	1.75	5	88.1	70	130	
95	Mo	115	4.339	24535	0.81	5	86.8	70	130	
107	Ag	115	1.864	32523	1.36	2	93.2	70	130	
111	Cd	115	0.924	2306	6.10	1	92.4	70	130	
118	Sn	115	4.537	24049	2.34	5	90.7	70	130	
121	Sb	115	1.827	11808	2.98	2	91.4	70	130	
137	Ba	115	4.559	10663	1.58	5	91.2	70	130	
205	Tl	209	0.889	39082	0.83	1	88.9	70	130	
208	Pb	209	0.876	51657	0.47	1	87.6	70	130	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1159557	0.21	1250708	92.71	70	120	
72	Ge	811154	0.28	871265	93.10	70	120	
115	In	8488328	0.80	8749493	97.02	70	120	
209	Bi	24256758	0.74	24417425	99.34	70	120	

# Continuing Calibration Blank (CCB) Report

Date Acquired 9/15/2017 13:48  
 Data Batch 170915.b  
 Data File Name 105\_CCB.d

Sample Name CCB4-170915  
 Comment CCB 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	-0.036	1	86.6	0.4	0.3	
11	B	45	7.018	386	2.8	10	10	
23	Na	45	47.633	62526	0.5	50	100	
24	Mg	45	-0.625	458	13.0	50	100	
27	Al	45	-3.335	2795	3.3	50	10	
39	K	45	-0.872	24959	1.2	50	100	
44	Ca	45	0.786	275	9.7	50	100	
47	Ti	45	-0.035	0	#DIV/0!	4	3	
51	V	45	0.067	2132	4.9	4	3	
52	Cr	45	-0.055	420	8.4	2	2	
55	Mn	45	-0.022	193	7.5	2	3	
56	Fe	45	-0.963	8418	3.9	50	50	
59	Co	72	-0.009	140	31.0	2	3	
60	Ni	72	-0.904	4309	3.7	2	3	
63	Cu	72	-0.029	662	6.7	2	2	
66	Zn	72	0.031	352	8.3	4	2	
75	As	72	-0.010	51	13.2	2	2	
78	Se	72	0.063	23	38.3	1	2	
88	Sr	115	0.005	408	5.3	4	3	
95	Mo	115	0.008	146	26.3	2	2	
107	Ag	115	0.007	179	8.6	0.4	1	
111	Cd	115	-0.003	3	100.1	0.4	0.3	
118	Sn	115	-0.025	292	6.3	4	3	
121	Sb	115	0.005	178	5.7	2	0.8	
137	Ba	115	0.001	68	17.3	2	3	
205	Tl	209	0.009	752	5.9	2	0.5	
208	Pb	209	-0.019	500	15.1	0.4	0.3	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1156037	0.18	1250708	92.43	70	120	
72	Ge	810543	0.70	871265	93.03	70	120	
115	In	8499538	0.29	8749493	97.14	70	120	
209	Bi	24261741	0.59	24417425	99.36	70	120	

# Dilution Sample (Dil) Report

Date Acquired 9/15/2017 13:52  
 Data Batch 170915.b  
 Data File Name 107\_SD.d

Sample Name 1709087-01A SD  
 Comment SD 6020A\_W  
 Dilution 50

Mass	Name	IS	Conc	CPS	%RSD	Ref Value	%Rec	Low	High	Flag
9	Be	45	-0.027	2	100.00	0.0	368.5	110	90	
11	B	45	47.042	1655	11.20	197.0	119.4	110	90	
23	Na	45	1455.989	1528121	1.03	7165.2	101.6	110	90	Good
24	Mg	45	765.327	410901	0.63	3796.8	100.8	110	90	Good
27	Al	45	0.724	3615	4.39	15.9	22.8	110	90	
39	K	45	183.760	105767	0.34	897.1	102.4	110	90	Good
44	Ca	45	2183.887	58023	1.80	10781.6	101.3	110	90	Good
47	Ti	45	0.040	13	90.16	0.1	188.1	110	90	
51	V	45	0.096	2336	4.80	0.2	261.9	110	90	
52	Cr	45	-0.054	431	3.81	0.0	598.5	110	90	
55	Mn	45	0.240	1292	9.99	1.2	98.1	110	90	Good
56	Fe	45	0.082	14747	2.06	4.9	8.3	110	90	
59	Co	72	-0.010	138	8.50	0.0	-694.1	110	90	
60	Ni	72	-0.800	4735	1.22	-0.5	836.0	110	90	
63	Cu	72	-0.005	893	6.11	0.0	-55.3	110	90	
66	Zn	72	0.295	709	5.49	0.6	259.7	110	90	
75	As	72	0.015	73	3.88	0.1	78.4	110	90	
78	Se	72	-0.069	15	35.94	0.1	-467.7	110	90	
88	Sr	115	27.865	155755	0.96	137.9	101.0	110	90	Good
95	Mo	115	0.058	431	2.36	0.3	106.1	110	90	Good
107	Ag	115	0.006	166	16.15	0.0	508.2	110	90	
111	Cd	115	-0.002	6	69.34	0.0	-792.2	110	90	
118	Sn	115	-0.024	298	10.58	0.0	608.0	110	90	
121	Sb	115	0.010	216	10.30	0.0	211.7	110	90	
137	Ba	115	0.953	2308	2.24	4.9	98.3	110	90	Good
205	Tl	209	0.007	657	4.34	0.0	525.6	110	90	
208	Pb	209	0.005	1885	1.77	0.1	30.2	110	90	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1169334	0.52	1250708	93.49	70	120	
72	Ge	822245	0.28	871265	94.37	70	120	
115	In	8586508	1.00	8749493	98.14	70	120	
209	Bi	24351121	0.39	24417425	99.73	70	120	



# Post Digestion Spike Sample (PDS) Report

Date Acquired 9/15/2017 13:54  
 Data Batch 170915.b  
 Data File Name 108\_PDS.d

Sample Name 1709087-01A PDS  
 Comment PDS 6020A\_W  
 Dilution 10

Mass	Name	IS	Conc	CPS	%RSD	Ref Conc	Spk Amt	%Rec	Low	High	Flag
9	Be	45	190.769	12174	0.86	0.0	200	95.4	75	125	
11	B	45	398.173	12349	3.56	197.0	200	100.6	75	125	
23	Na	45	12089.547	12196816	1.24	7165.2	5000	98.5	75	125	
24	Mg	45	8542.240	4435882	0.32	3796.8	5000	94.9	75	125	
27	Al	45	4915.006	927753	0.34	15.9	5000	98.0	75	125	
39	K	45	5851.540	2497505	0.27	897.1	5000	99.1	75	125	
44	Ca	45	15840.230	406207	0.18	10781.6	5000	101.2	75	125	
47	Ti	45	203.538	34995	0.70	0.1	200	101.7	75	125	
51	V	45	202.362	1209716	0.25	0.2	200	101.1	75	125	
52	Cr	45	205.341	1512789	0.64	0.0	200	102.7	75	125	
55	Mn	45	201.550	816815	0.77	1.2	200	100.2	75	125	
56	Fe	45	5046.572	29185344	1.39	4.9	5000	100.8	75	125	
59	Co	72	203.907	2502776	1.18	0.0	200	102.0	75	125	
60	Ni	72	201.851	679586	0.65	-0.5	200	101.2	75	125	
63	Cu	72	201.607	1796220	0.50	0.0	200	100.8	75	125	
66	Zn	72	206.682	262696	0.95	0.6	200	103.1	75	125	
75	As	72	205.232	167475	0.56	0.1	200	102.6	75	125	
78	Se	72	208.065	12774	1.15	0.1	200	104.0	75	125	
88	Sr	115	333.737	1788227	0.83	137.9	200	97.9	75	125	
95	Mo	115	185.776	1016800	0.48	0.3	200	92.8	75	125	
107	Ag	115	199.637	3379973	0.20	0.0	200	99.8	75	125	
111	Cd	115	197.074	476120	0.80	0.0	200	98.5	75	125	
118	Sn	115	199.966	1012473	0.19	0.0	200	100.0	75	125	
121	Sb	115	187.192	1161127	0.71	0.0	200	93.6	75	125	
137	Ba	115	202.967	458601	0.41	4.9	200	99.1	75	125	
205	Tl	209	199.250	8363421	0.58	0.0	200	99.6	75	125	
208	Pb	209	194.477	10712650	0.50	0.1	200	97.2	75	125	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1132957	0.16	1250708	90.59	70	120	
72	Ge	783051	0.32	871265	89.88	70	120	
115	In	8249466	0.72	8749493	94.29	70	120	
209	Bi	23374227	1.07	24417425	95.73	70	120	

# Continuing Calibration Verification (CCV) Report

Date Acquired 9/15/2017 14:13  
 Data Batch 170915.b  
 Data File Name 118\_CCV.d

Sample Name CCV5-170915  
 Comment CCV 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	184.956	11901	0.59	200	92.5	90	110	
11	B	45	199.211	6312	2.40	200	99.6	90	110	
23	Na	45	4710.855	4800377	1.77	5000	94.2	90	110	
24	Mg	45	4648.570	2434426	1.74	5000	93.0	90	110	
27	Al	45	4897.825	932243	2.20	5000	98.0	90	110	
39	K	45	4683.122	2020473	1.91	5000	93.7	90	110	
44	Ca	45	4512.325	116861	2.26	5000	90.2	90	110	
47	Ti	45	195.829	33945	1.78	200	97.9	90	110	
51	V	45	191.772	1155909	1.21	200	95.9	90	110	
52	Cr	45	194.039	1441333	0.95	200	97.0	90	110	
55	Mn	45	194.600	795158	0.82	200	97.3	90	110	
56	Fe	45	5101.926	29749150	0.50	5000	102.0	90	110	
59	Co	72	195.509	2448677	0.45	200	97.8	90	110	
60	Ni	72	195.709	672609	0.33	200	97.9	90	110	
63	Cu	72	198.174	1801831	0.75	200	99.1	90	110	
66	Zn	72	199.028	258179	1.27	200	99.5	90	110	
75	As	72	192.162	160021	0.78	200	96.1	90	110	
78	Se	72	197.523	12375	0.39	200	98.8	90	110	
88	Sr	115	182.083	1001904	0.59	200	91.0	90	110	
95	Mo	115	176.514	991983	0.32	200	88.3	90	110	Fail
107	Ag	115	194.305	3378068	0.45	200	97.2	90	110	
111	Cd	115	189.118	469175	1.05	200	94.6	90	110	
118	Sn	115	186.637	970406	0.78	200	93.3	90	110	
121	Sb	115	191.305	1218475	0.38	200	95.7	90	110	
137	Ba	115	188.379	437071	0.54	200	94.2	90	110	
205	Tl	209	192.855	8404695	0.69	200	96.4	90	110	
208	Pb	209	186.654	10675665	0.58	200	93.3	90	110	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1142345	0.65	1250708	91.34	70	120	
72	Ge	799139	1.35	871265	91.72	70	120	
115	In	8471318	1.21	8749493	96.82	70	120	
209	Bi	24269017	0.68	24417425	99.39	70	120	

# Low Level Calibration Verification (LLCV) Report

Date Acquired 9/15/2017 14:18  
 Data Batch 170915.b  
 Data File Name 120LCCV.d

Sample Name LCVL5-170915  
 Comment LCVL6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	Exp	%Rec	Low	High	Flag
9	Be	45	0.852	59	19.16	1	85.2	70	130	
11	B	45	24.858	934	6.38	20	124.3	70	130	
23	Na	45	123.877	139691	0.79	100	123.9	70	130	
24	Mg	45	91.793	48986	0.92	100	91.8	70	130	
27	Al	45	90.883	20693	1.11	100	90.9	70	130	
39	K	45	88.704	63025	0.77	100	88.7	70	130	
44	Ca	45	90.772	2605	6.30	100	90.8	70	130	
47	Ti	45	4.495	788	13.38	5	89.9	70	130	
51	V	45	0.994	7715	2.70	1	99.4	70	130	
52	Cr	45	4.640	35384	2.33	5	92.8	70	130	
55	Mn	45	4.797	19936	0.16	5	95.9	70	130	
56	Fe	45	103.146	617011	0.24	100	103.1	70	130	
59	Co	72	4.866	62159	0.75	5	97.3	70	130	
60	Ni	72	4.057	21443	0.79	5	81.1	70	130	
63	Cu	72	4.879	45964	0.27	5	97.6	70	130	
66	Zn	72	4.872	6723	3.30	5	97.4	70	130	
75	As	72	4.796	4114	1.37	5	95.9	70	130	
78	Se	72	4.764	322	8.88	5	95.3	70	130	
88	Sr	115	4.472	25279	0.49	5	89.4	70	130	
95	Mo	115	4.338	24773	0.47	5	86.8	70	130	
107	Ag	115	1.879	33127	1.81	2	94.0	70	130	
111	Cd	115	0.944	2379	2.19	1	94.4	70	130	
118	Sn	115	4.593	24584	2.12	5	91.9	70	130	
121	Sb	115	1.863	12156	2.64	2	93.1	70	130	
137	Ba	115	4.589	10841	2.42	5	91.8	70	130	
205	Tl	209	0.912	40742	1.34	1	91.2	70	130	
208	Pb	209	0.888	53229	0.87	1	88.8	70	130	

### QC ISTD Table

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1145903	0.24	1250708	91.62	70	120	
72	Ge	811588	0.40	871265	93.15	70	120	
115	In	8573990	0.87	8749493	97.99	70	120	
209	Bi	24668915	0.72	24417425	101.03	70	120	

# Continuing Calibration Blank (CCB) Report

Date Acquired 9/15/2017 14:28  
 Data Batch 170915.b  
 Data File Name 125\_CCB.d

Sample Name CCB5-170915  
 Comment CCB 6020A\_W  
 Dilution 1

Mass	Name	IS	Conc	CPS	%RSD	MDL S	MDL Aq	QC Flag
9	Be	45	-0.047	1	173.2	0.4	0.3	
11	B	45	7.314	390	3.4	10	10	
23	Na	45	29.301	43148	1.2	50	100	
24	Mg	45	-0.620	454	9.6	50	100	
27	Al	45	-3.288	2770	3.1	50	10	
39	K	45	-1.192	24520	1.6	50	100	
44	Ca	45	-0.730	232	25.6	50	100	
47	Ti	45	-0.022	2	86.6	4	3	
51	V	45	0.071	2135	1.6	4	3	
52	Cr	45	-0.058	389	12.5	2	2	
55	Mn	45	-0.015	219	16.0	2	3	
56	Fe	45	-1.045	7835	1.2	50	50	
59	Co	72	-0.011	116	10.9	2	3	
60	Ni	72	-0.868	4397	2.9	2	3	
63	Cu	72	-0.036	591	15.9	2	2	
66	Zn	72	0.045	367	4.2	4	2	
75	As	72	-0.012	49	9.2	2	2	
78	Se	72	-0.006	19	36.5	1	2	
88	Sr	115	-0.004	354	13.9	4	3	
95	Mo	115	0.004	124	10.8	2	2	
107	Ag	115	0.005	146	16.2	0.4	1	
111	Cd	115	-0.003	3	0.0	0.4	0.3	
118	Sn	115	-0.026	287	13.7	4	3	
121	Sb	115	0.013	229	3.7	2	0.8	
137	Ba	115	0.016	104	15.1	2	3	
205	Tl	209	0.008	698	8.2	2	0.5	
208	Pb	209	-0.019	516	12.2	0.4	0.3	

**QC ISTD Table**

Mass	Name	CPS	%RSD	Ref CPS	%Rec	Low	High	QC Flag
45	Sc	1142082	0.41	1250708	91.31	70	120	
72	Ge	803815	0.09	871265	92.26	70	120	
115	In	8531749	0.83	8749493	97.51	70	120	
209	Bi	24844603	0.71	24417425	101.75	70	120	

**Pmoist  
For**

**DHL Work Order  
1709083**

**PMOIST\_170913A**

**For**

**DHL Work Order**

**1709083**

Run ID: PMOIST\_170913A

Run No.: 94148

Analytical Run Date: 9/13/2017

InstrumentID: Pmoist

Analyst: Vikki Adler

SampID	DF	TestCode	SampType	Batch ID	Analysis Date/Time	Q	Comments
1709062-01A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709062-01A-DUP	1	PMOIST	DUP	82351	9/14/2017 8:40:00 AM		
1709062-02A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709062-03A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709070-01A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709070-02A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709070-03A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709070-04A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709070-05A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709070-06A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709080-01A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709083-02A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709085-02A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709092-01A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709092-02A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709092-03A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709092-04A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709092-05A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		
1709092-06A	1	PMOIST	SAMP	82351	9/14/2017 8:40:00 AM		

**DHL Analytical, Inc.**

**PREP BATCH REPORT**

Prep Start Date: **9/13/2017 2:36:57 PM**

Digestion: **Start: 9/13/2017 4:00:00 PM / Stop: 9/14/2017 8:40:00 AM**

Prep End Date: **9/14/2017 10:54:35 AM**

Prep Batch **82351** Prep Code: **PMOIST\_PREP**

Technician: **Vikki Adler**

Prep Factor Units:  
**mL/g**

<b>Equipment List</b>
Oven #2
Balance #20
Thermometer # 81

<b>Sample ID</b>	<b>Matrix</b>	<b>pH</b>	<b>SampAmt</b>	<b>Fin Vol</b>	<b>Factor</b>	<b>Bottle #</b>	<b>Vessel</b>	<b>Cleanup</b>
1709062-01A	Sediment		10	10	1.000	1 of 1		
Need DCS in each batch.								
1709062-01A-DUP	Sediment		10	10	1.000	of		
1709062-02A	Sediment		10	10	1.000	1 of 1		
chlordan reported if a-g pres								
1709062-03A	Sediment		10	10	1.000	1 of 1		
1709070-01A	Soil		10	10	1.000	1 of 1		
1709070-02A	Soil		10	10	1.000	1 of 1		
1709070-03A	Soil		10	10	1.000	1 of 1		
1709070-04A	Soil		10	10	1.000	1 of 1		
1709070-05A	Soil		10	10	1.000	1 of 1		
1709070-06A	Soil		10	10	1.000	1 of 1		
1709080-01A	Soil		10	10	1.000	1 of 1		
1709083-02A	Soil		10	10	1.000	1 of 1		
1709085-02A	Soil		10	10	1.000	1 of 1		
1709092-01A	Soil		10	10	1.000	1 of 1		
1709092-02A	Soil		10	10	1.000	1 of 1		
1709092-03A	Soil		10	10	1.000	1 of 1		
1709092-04A	Soil		10	10	1.000	1 of 1		
1709092-05A	Soil		10	10	1.000	1 of 1		
1709092-06A	Soil		10	10	1.000	1 of 1		





## Percent Moisture - Bench Sheet

Enter ALL weights into the DHL LIMS - Single Analyte Worksheet

Method Requirements: Samples dried to constant weight (12-16 hours) at oven temperature of 110 ± 5°C

Constant Weight is achieved if 2nd weight is <0.1% of 1st weight

$[(\text{Final Weight} - 2\text{nd Weight}) / (\text{Final Weight})] \times 100\%$

RUN ID:	PMOIST_170913A		
Date Started:	9/13/17	Date Ended:	9/14/17
Time Started:	16:00	Time Ended:	8:40
Analyst Start:	JA	Analyst End:	JA
Balance #	20	Balance #	20
Oven #	FISHER-2	Thermometer #	81 (08/22/17)
Initial Temperature	111.4	Correction Factor	0.0
		Final Temperature	111.0

Sample ID	Tare Wt (g)	Tare + Sample (g)	Final Wt (g)	2nd Weight	<0.1% (Y/N)
1709062-01A	1.04	11.35	3.56		
1709062-01A-DUP	1.04	11.98	3.85		
1709062-02A	1.02	11.29	4.97		
1709062-03A	1.05	14.77	4.90		
1709070-01A	1.04	11.73	9.80		
1709070-02A	1.02	11.58	10.16		
1709070-03A	1.02	11.51	10.27		
1709070-04A	1.03	13.98	12.80		
1709070-05A	1.02	12.10	10.90		
1709070-06A	1.03	12.62	11.50		
1709080-01A	1.01	11.10	8.27		
1709083-02A	1.01	13.71	12.51		
1709085-02A	1.01	11.89	10.88		
1709092-01A	1.00	14.14	12.43		
1709092-02A	1.04	12.87	11.44		
1709092-03A	1.07	16.04	14.25		
1709092-04A	1.07	12.53	11.06		
1709092-05A	1.04	12.16	10.84		
1709092-06A	1.04	12.00	10.55		

Data Folder Contents	Review Items	Check	2nd Level Review
<b>Hard Copies MUST match LIMS data</b>			
1. Is the Prep Batch Report included?	Prep Start/End Dates SampAmt=10, FinVol=10 20 field samples/batch, 1 DUP/batch	X	X
2. Is the Run Log included?	Test Code, Sample Type Batch ID, and Analysis Date/Time	X	
3. Is PMOIST bench sheet included?	Bench sheet vs. LIMS - Single Analyte Worksheet	X	
4. Is the RPD for the DUP ≤30%?	If RPD fails criteria, then state reason below:	X	
<b>Comments:</b>			

Analyst: *Janice Whitt* Date: 9-14-17

Second-Level Review: *Janice Whitt* Date: 9/14/2017

**REVIEWED BY**

By Janice Whitt at 11:05:33 AM, 9/14/2017