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Data Validation Report for CH2M Hill Plateau Remediation Company

VSR11-044
Project WMA C

Chemical & Radiochemical Validation - Level C

Validation Performed By: Carl Schlosser **Date:** 4-27-2011

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Date: 27 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: WMA C
Subject: Volatile Organics - Sample Data Group (SDG) 20100064

INTRODUCTION

This memorandum presents the results of data validation for SDG 20100064 prepared by 222-S Laboratory. The sample validated along with the analytical method is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B23TM8	5/20/2010	Soil	C	8260B

Data validation was conducted in accordance with the CHPRC validation statement of work and the Field Sampling and Analysis Plan for Waste Management Area C, RPP-PLAN-40564, Rev. 2 (SAP). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested By Client

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preservation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirements for volatile organics are analysis within 14 days of sample collection. Sample preservation for soil samples requires freezing.

The sample was analyzed within the prescribed holding time and properly preserved.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable.

Trip Blanks

No trip blanks were submitted for validation.

Field Blanks

No field blanks were submitted for validation.

Equipment Blanks

No equipment blanks were submitted for validation.

- **Accuracy**

Accuracy is evaluated by reviewing surrogate results, matrix spike sample results, and laboratory control sample results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 70% to 130%.

Surrogates

All surrogate recoveries were acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable with the following exceptions.

Only nine 8260B MS/MSD analytes were reported. Reported analytes not represented in the MS/MSD were trans-1,3-dichloropropene and carbon disulfide. The sample results for these two analytes were non-detects and should be qualified as estimates and flagged "UJ."

The 4-methyl-2-pentanone (a.k.a. hexone), acetone and 2-butanone MSD recoveries were above the upper acceptance limit. The hexone and acetone results for sample B23TM8 were non-detects and should not be qualified. The acetone result for sample B23TM8 was a detect and should be qualified as an estimate and flagged "J."

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable with the following exceptions.

Only nine 8260B LCS analytes were reported. Reported analytes not represented in the LCS were trans-1,3-dichloropropene and carbon disulfide. The sample results for these two analytes were non-detects and should be qualified as estimates and flagged "UJ."

- **Precision**

Precision is evaluated by reviewing MS/MSD results, field duplicate sample results, and field split sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference (RPD) limits are ±30%. When duplicate RPDs exceed the limits and have associated results <5X the SAP required detection limits with differences <2X the required detection limits no precision infraction occurred.

MS/MSD Samples

All MS/MSD relative percent difference values were acceptable.

Field Duplicate Samples

No field duplicates were submitted for validation.

Field Split Samples

No field splits were submitted for validation.

- **Detection Limits**

Reported MDLs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs were below the CRDLs.

- **Completeness**

SDG 20100064 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Minor deficiencies leading to qualification of sample results as estimates were due to non-represented QC data and a high MSD recovery for acetone. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

GRP-GD-003, Rev. 0, Change 0, *Data Validation for Chemical Analyses*, August 2010

RPP-PLAN-40564, Rev. 2, *Field Sampling and Analysis Plan for Waste Management Area C*, December 2009

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers that may be applied by data validators in compliance with the CHPRC statement of work are as follows:

- **U** — The constituent was analyzed for, but was not detected. The data should be considered usable for decision-making purposes.

- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the RL. The data should be considered usable for decision-making purposes.

- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J+** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J-** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **N** — The analysis indicates the presence of an analyte that has been tentatively identified.

- **NJ** — The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

- **NJ+** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation.

- **NJ-** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation.

- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2

Summary of Data Qualification

Volatile Organics Data Qualification Summary			
SDG: 20100064	Reviewer: AQA	Project: WMA C	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
trans-1,3-Dichloropropene Carbon disulfide	UJ	B23TM8	Non-represented MS/MSD and LCS data
Acetone	J	B23TM8	High MSD recovery

Comments: None

Appendix 3

Annotated Laboratory Reports

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B23TM8
Sample Depth: 27-29

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000259			71-55-6	1,1,1-Trichloroethane	ug/kg	n/a	<0.0920	<0.0713	n/a	n/a	n/a	n/a	0.0713	n/a	U
S10V000259			79-00-5	1,1,2-Trichloroethane	ug/kg	n/a	<0.166	<0.129	n/a	n/a	n/a	n/a	0.129	n/a	U
S10V000259			79-34-5	1,1,2,2-Tetrachloroethane	ug/kg	n/a	<0.212	<0.164	n/a	n/a	n/a	n/a	0.164	n/a	U
S10V000259			75-35-4	1,1-Dichloroethene	ug/kg	96.6	<0.423	<0.328	n/a	n/a	n/a	n/a	0.328	n/a	U
S10V000259			107-06-2	1,2-Dichloroethane	ug/kg	n/a	<0.0538	<0.0417	n/a	n/a	n/a	n/a	0.0417	n/a	U
S10V000259			71-36-3	1-Butanol	ug/kg	102	<10.3	<7.98	n/a	n/a	n/a	n/a	7.98	n/a	U
S10V000259			108-10-1	Hexone	ug/kg	117	<1.71	<1.32	n/a	n/a	n/a	n/a	1.32	n/a	U
S10V000259			67-64-1	Acetone J	ug/kg	103	<2.20	3.86	n/a	n/a	n/a	n/a	1.71	n/a	J
S10V000259			71-43-2	Benzene	ug/kg	93.6	<0.147	<0.114	n/a	n/a	n/a	n/a	0.114	n/a	U
S10V000259			75-15-0	Carbon disulfide UJ	ug/kg	n/a	<0.161	<0.125	n/a	n/a	n/a	n/a	0.125	n/a	U
S10V000259			56-23-5	Carbon tetrachloride	ug/kg	n/a	<0.0934	<0.0724	n/a	n/a	n/a	n/a	0.0724	n/a	U
S10V000259			67-66-3	Chloroform	ug/kg	n/a	<0.131	<0.101	n/a	n/a	n/a	n/a	0.101	n/a	U
S10V000259			108-90-7	Chlorobenzene	ug/kg	95.9	<0.0864	<0.0670	n/a	n/a	n/a	n/a	0.0670	n/a	U
S10V000259			100-41-4	Ethylbenzene	ug/kg	n/a	<0.107	<0.0831	n/a	n/a	n/a	n/a	0.0831	n/a	U
S10V000259			1330-20-7	Xylenes (total)	ug/kg	n/a	<0.203	<0.158	n/a	n/a	n/a	n/a	0.158	n/a	U
S10V000259			78-93-3	2-Butanone	ug/kg	106	<1.96	<1.52	n/a	n/a	n/a	n/a	1.52	n/a	U
S10V000259			75-09-2	Methylenechloride	ug/kg	n/a	<0.0640	<0.0496	n/a	n/a	n/a	n/a	0.0496	n/a	U
S10V000259			127-18-4	Tetrachloroethene	ug/kg	n/a	<0.110	<0.0851	n/a	n/a	n/a	n/a	0.0851	n/a	U
S10V000259			108-88-3	Toluene	ug/kg	97.2	<0.0802	0.256	n/a	n/a	n/a	n/a	0.0622	n/a	J
S10V000259			10061-02-6	trans-1,3-Dichloropropene UJ	ug/kg	n/a	<0.271	<0.210	n/a	n/a	n/a	n/a	0.210	n/a	U
S10V000259			79-01-6	Trichloroethene	ug/kg	89.5	<0.121	<0.0938	n/a	n/a	n/a	n/a	0.0938	n/a	U
S10V000259			75-01-4	Vinyl chloride	ug/kg	n/a	<0.173	<0.134	n/a	n/a	n/a	n/a	0.134	n/a	U
S10V000259			156-59-2	cis-Dichloroethylene	ug/kg	n/a	<0.182	<0.141	n/a	n/a	n/a	n/a	0.141	n/a	U
S10V000259			156-60-5	trans-Dichloroethylene	ug/kg	n/a	<0.303	<0.235	n/a	n/a	n/a	n/a	0.235	n/a	U
S10V000259			76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ug/kg	n/a	<0.116	<0.0901	n/a	n/a	n/a	n/a	0.0901	n/a	U
S10V000259			79-46-9	2-Nitropropane	ug/kg	n/a	<0.588	<0.456	n/a	n/a	n/a	n/a	0.456	n/a	U
S10V000259			141-78-6	Ethyl acetate	ug/kg	n/a	<0.587	<0.455	n/a	n/a	n/a	n/a	0.455	n/a	U
S10V000259			60-29-7	Diethyl ether	ug/kg	n/a	<0.256	<0.199	n/a	n/a	n/a	n/a	0.199	n/a	U
S10V000259			75-69-4	Trichlorofluoromethane	ug/kg	n/a	<0.0940	<0.0729	n/a	n/a	n/a	n/a	0.0729	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
b - MS/MSD Outside Range
J - Estimated
a - LCS Outside Range
LS
4-27-2011
c - RPD Outside Range
B - Found in Blank

Data Summary Report

Sample Group: 20100064

Core Number: C7668

Customer Sample ID: B23TM8

Sample Depth: 27-29

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000259			95-47-6	o-Xylene	ug/kg	n/a	<0.0920	<0.0713	n/a	n/a	n/a	n/a	0.0713	n/a	U
S10V000259			179601-23-1	m,p-Xylene	ug/kg	n/a	<0.167	<0.130	n/a	n/a	n/a	n/a	0.130	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated
c - RPD Outside Range
B - Found in Blank
b - MS/MSD Outside Range
a - LCS Outside Range

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

222-S LABORATORY

FINAL ANALYTICAL REPORT FOR SAMPLES FROM WASTE MANAGEMENT AREA C FOR CORE HOLE C7668 IN SUPPORT OF RCRA SOIL CHARACTERIZATION

1.0 INTRODUCTION

This final report presents the results for the samples taken from Waste Management Area C between May 15, 2010 and June 8, 2010. The samples were analyzed in accordance with RPP-PLAN-40564, *Field Sampling and Analysis Plan for Sites P and L at Waste Management Area C* (FSAP); RPP-PLAN-38777, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C* (SAP); ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP); SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*; and the additional guidance given by the client's point of contact.

Because the 222-S Laboratory facility was designed to analyze hazardous and complex tank waste samples, most SW-846 test methods performed at the 222-S Laboratory contain deviations that are listed in an appendix in the analytical procedures. All other known deviations or variances from SW-846 are documented in this narrative. The following attachments are included in this report.

Attachment 1	Data Summary Report
Attachment 2	Sample Breakdown Diagrams
Attachment 3	Holding Time Report
Attachment 4	Additional Mercury and Organic Analyses QC Results
Attachment 5	Tentatively Identified Compounds (TIC) for Organic Analyses
Attachment 6	Geological Report
Attachment 7	Characterization Change Notices (CCN), and Correspondence
Attachment 8	Receipt Paperwork
Appendix 1	Analytical Report for Analysis Performed at the Waste Sampling and Characterization Facility (WSCF)

2.0 SAMPLE RECEIPT AND BREAKDOWN

2.1 SAMPLE RECEIPT

A total of nine core intervals and two surface grab samples from core hole C7668 along with seven field blanks, and six trip blanks were received by the 222-S Laboratory between May 15, 2010 and June 8, 2010. Due to an instrumentation issue, the volatile organic analysis samples for client sample numbers B25WN0 (I012), B23VB5 (Field Blank 10), and B23VC4 (Trip Blank 9) were delivered directly to WSCF for analysis. The samples were delivered in a cooler with ice or, in the case of the volatile organic samples, in a freezer. The temperatures of the temperature blanks were measured and recorded on the sample receipt check list and/or the chain of custody form.

2.2 SAMPLE BREAKDOWN

The laboratory received each core interval as a set of volatile organic analysis (VOA) samples and three liner samples when complete core recovery was obtained. The VOA samples were made from the shoe section of each core interval following SW-846 5035. The liner samples from each core interval were extruded, described, and composited by the Washington River Protection Solutions, Inc. (WRPS) geologist. The geologist's report is included in Attachment 6. Provided sufficient samples existed, the composite for each core interval was analyzed as described in the SAP and FSAP. Six core intervals (I001, I003, I004, I005, I006, and I007) had less than full recovery (see Attachment 2 and Attachment 8). There was no I002 for core hole C7668. Intervals I001 and I007 were extruded and composited in the normal manner. Interval I003 was combined with I004 to form a single composite, and Interval I005 was combined with I006 to form a single composite (see Attachment 7, CCN-WMAC-008). The surface samples were received as a single grab in a 500-mL jar and a set of VOA samples.

In addition to the grab and core samples, a water sample from interval I010 was delivered to the lab. This sample was from a small amount of standing water encountered on top of the sampler. CCN-WMAC-009 request that this sample be analyzed for ^{99}Tc.

C7668 CCN-WMAC-008 provided a priority list for the laboratory to follow for the intervals without enough sample to perform all analysis requested in the SAP and FSAP. For interval I001, the laboratory followed this instruction. For the combined interval of I004 and I005, the laboratory analyzed for ^{99}Tc using the Vadose water digest, which consumed the sample that was to be used for the radiochemistry analysis, which had a higher priority. The analyses which were not performed were gamma energy analysis % Water (GEA), ^{63}Ni, $^{89/90}$Sr, $^{238,239/240}$Pu, ^{241}Am, and $^{242,243/244}$Cm.This failure to follow the client's instruction has been addressed, and improvements in communications and better use of the Laboratory Information Management System will be made to avoid this in the future.

WRPS shipped subsamples of the composites to Test America Laboratories, Inc. (TAL) in St Louis, Missouri and Knoxville, Tennessee to be analyzed for dibutyl and monobutyl phosphate, total petroleum hydrocarbons (diesel and gasoline range), ethylene glycol, chlorinated pesticides, and polychlorinated biphenyls (Aroclors and congeners). TAL subsequently subcontracted the monobutyl and dibutyl phosphate analyses to Southwest Research Institute. The results of these analyses will be released in the final WRPS report.

3.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for those analytes requested in the SAP and FSAP. Secondary analytes are only reported if detected. The TIC from gas chromatography-mass spectrometry (GC/MS) analysis of semivolatile organic compounds (SVOC) is presented in Attachment 5. In addition to the required isotopes, all isotopes with positive GEA results were reported.

The "Det Limit" column in Attachment 1 contains the method detection limit (MDL) for non-radionuclide analyses, or the minimum detectable activity for radionuclides.

In Attachment 1, the column labeled "A#" indicates the aliquot class or the method used for sample preparation before analysis. For solid samples, the aliquot classes are defined as follows:

"A" indicates samples that were prepared by SW-846 3050B.

"E" indicates samples that were prepared by a strong acid digest.

"O" indicates samples that were extracted for organic analysis.

"S" indicates samples that were prepared by a distillation.

"W" indicates samples that were prepared by a standard water digest.

"WV" indicates samples that were prepared by a Vadose water digest.

Samples without a letter identifier in the "A#" column were analyzed directly with no separate preparation or with sample preparation performed as a part of the procedure steps.

The "Qual Flags" column in Attachment 1 contains data qualifier flags that are defined as follows:

"B" is used to indicate that the analyte was detected in the method or preparation blank and in the sample, and the result for the blank was greater than 5% of the reported sample result.

"J" indicates that the reported result should be considered an estimate because it is below the quantitation limit. The "J" flag is applied to sample concentrations that are greater than the MDL but less than the quantitation limit or sample activity with a counting uncertainty greater than 30%.

"N" indicates a TIC which has been named.

"T" indicates a TIC.

"U" indicates that the reported result is less than the calculated detection limit.

"a" indicates that the laboratory control sample (LCS) recovery was outside of the specified range in the QAPP or SAP.

"b" indicates that the matrix spike (MS) recovery was outside of the specified range in the QAPP or SAP.

"c" indicates that the relative percent difference (RPD) between the sample and the duplicate is greater than 30%.

Manual calculations using rounded results from the Data Summary Report (Attachment 1) or result calculation forms may differ slightly from the actual results derived from the raw data.

3.1 SAMPLE DIGESTIONS

3.1.1 Radiochemistry Strong Acid Digestion

Strong acid digestions with a hot plate for the heat source were performed using a mixture of concentrated nitric and hydrochloric acids. For each digest, approximately 1 to 10 g of sample

was digested depending on the analysis being performed. The digestate was then filtered and diluted to a final volume. This digestion was used for all radiochemical analyses except ^{3}H, ^{14}C, and ^{129}I. This digestion is a leach of the acid soluble species only.

3.1.2 SW-846 3050B - Acid Digestion-Heating Block

This acid digestion follows SW-846 3050B using a heating block and nitric and hydrochloric acids. An aliquot of approximately 5 g of sample was digested. All heating-block digestions were filtered and diluted to a final volume of 50 mL. In soil, this digestion is a leach of the acid soluble species only. This digestion was used for all inductively coupled plasma/mass spectrometry (ICP/MS) and inductively coupled plasma/atomic emission spectroscopy (ICP/AES) analyses except for ^{99}Tc and isotopic tin (^{117}Sn and ^{126}Sn) analysis. The digestion is modified for the ^{99}Tc analysis by using only nitric acid. This is done to eliminate the possibility of the formation a zinc-chlorine ion pair of mass 99. The laboratory believes this ion, when present, is responsible for low level false positives. A separate digestion for antimony was prepared using additional hydrochloric acid, as recommended in SW-846.

3.1.3 Water Digestion

A water digestion or leach was prepared for the anions by ion chromatography, ^{14}C, and ^{3}H analyses using approximately 0.25 to 4 g of sample diluted to 25 mL. Sonification was used, and the leachate was then filtered. In soil, this digestion is a leach of the water soluble species only.

3.1.4 Vadose Water Digestion

A 70-g sample of soil was leached using a ratio of one part water to one part soil. To maintain a one-to-one ratio, the amount of water added to the sample was adjusted based on the percent moisture of the soil. The slurries were placed on a shaker table for about 1 hour. They were then transferred to a centrifuge tube and centrifuged at 4,000 rpm for 30 minutes. An unfiltered aliquot was set aside for alkalinity analysis. The remainder was filtered using a disposable vacuum filtration system. The filtrates were transferred to a clean bottle and then analyzed for anions using IC nitrate analysis (intervals I005 to I010) and ^{99}Tc by ICP/MS analysis.

3.2 INORGANIC ANALYSES

3.2.1 Cyanide

The cyanide analysis by distillation and spectrophotometry was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 14 days. There was no required reporting limit in the SAP for cyanide. The target detection limit was 0.5 μg/g, which is lower than what the current laboratory method (lachet micro-distillation) can reach. There were no notable quality control (QC) issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.2.2 Sulfide

Sulfide analysis by distillation and ion selective electrode was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 7 days. There was no required reporting limit in the SAP for sulfide. The target detection limit was 5 µg/g. All sample results had adjusted MDLs of approximately 7 µg/g.

Batches 19830, 19631, 19885, 19967, and 20058: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19596: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required.

3.2.3 pH Analysis

The pH analysis was performed on the grab samples and liner composite samples except for sample B23TK8 (I001). This was due to insufficient sample. These analyses met all QC requirements in the FSAP, SAP, and QAPP. The FSAP lists a pH holding time requirement of "as soon as possible." All pH measurements were taken after the water leach was performed. The sampling to analysis time varied from 7 to 35 days (see Attachment 3). There is no correlation between pH results and days to analysis, and the results fall within an expected range for alkaline soils. This indicates that the variation in time has no apparent effect on the results.

3.2.4 Mercury

Analysis for Hg by cold-vapor graphic furnace/atomic absorption was performed on the digested subsamples of the grab samples and liner composite samples. All results met the QC requirements in the FSAP, SAP, and QAPP. All analyses met the holding time of 28 days. This analysis met the required and target detection limits.

3.2.5 Ion Chromatography – Ammonium

Analysis for ammonium was performed using a distillation preparation of the grab samples and the liner composite samples. The SAP lists an administrative holding time of 7 days. The laboratory believes that after distillation and preservation, the holding time is 28 days based on U.S. Environmental Protection Agency drinking water and waste water holding times for preserved samples. There is no regulatory holding time limit promulgated for ammonium in soil. All samples met these holding times. These analyses met the target detection limit listed in the SAP. There was no required reporting limit in the SAP or FSAP for ammonium.

Batch 19420: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19583: Laboratory personnel used an unknown and incorrect spike amount for the MS resulting in a high spike recovery of 247%. Since the project requirement is that one MS be performed per core hole, and five acceptable MSs exist, this MS was not reported (see

Attachment 7). All other QC requirements were met in this batch, including the post digestion spike.

Batches 19668, 19896, and 19938: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required. Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

Batches 19655 and 20024: Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

3.2.6 Ion Chromatography – Anions and Small Organic Acids

Ion chromatography analysis was performed on a standard water digest of subsamples from all grab samples and liner composite samples.

The laboratory met all of the required and target detection limits. For the standard water digest, all analyses were within the applicable holding time. The sample spikes used for the standard water digestions are predigestion spikes.

Batch 19599: The RPD for fluoride exceeded the required 30% at 32%. The laboratory believes this was due to sample inhomogeneity, which is indicated by high RPDs for the other anions in this sample. Additionally, a second duplicate sample from a separate Vadose project was analyzed in this batch, with acceptable duplicate RPDs. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. One sample result for nitrite has been flagged with a “B”.

Batch 19650: The RPD for nitrite exceeded the required 30% in the SAP and FSAP. However, since the result was below the quantitation limit, this criterion does not apply. The MS recovery for phosphate was below the ±25% requirement at 70%. The sample results have been flagged with a “b”. Since the post digestion spike was recovered at 99%, the laboratory believes that the low MS recovery was matrix related. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. All samples results for nitrite were flagged with a “B”.

Batch 20668: The results for nitrite, sulfate, and nitrate in the preparation blank were slightly above the MDL and below the quantitation limit. The blank is therefore acceptable. All but one nitrite and two nitrates were flagged with a “B”. The un-flagged results were more than 20 times the adjusted blank results. The blank result for sulfate was less than 5% of the lowest sulfate results, and therefore no flags were applied.

3.2.7 Inductively Coupled Plasma/Atomic Emission Spectroscopy

The ICP/AES analysis was performed on an acid-digest (SW-846 3050B) of all grab samples and liner composite samples. The ICP/AES analysis was unable to obtain the required detection limit for antimony, arsenic, cadmium, lead, selenium, silver, and thallium. These elements have been reported from separate ICP/MS analyses. Total uranium has not been reported by the ICP/AES analysis since it cannot meet the required detection limits in the SAP. The isotopic uranium analysis by ICP/MS met the required detection limit for ^{238}U, which is essentially total uranium. The overall data usability was not affected. For all other metals reported by ICP/AES, all target and required detection limits were met. SW-846 lists the holding time for ICP/AES metals as 6 months. All analyses met the holding times.

Batch 20821: The interference check standard-AB (ICSAB) had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. A result slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. Low levels of iron, sodium, chromium, and calcium were detected in the preparation blank, but reanalysis was not required since these levels were less than 5% of the lowest sample result. The MS recoveries for aluminum, calcium, iron, magnesium, phosphorous, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for sodium, sulfur, silicon, and zirconium exceeded the ±25 requirement in the SAP and FSAP. The laboratory believes this was due to matrix interference. The RPD for silicon exceeded the ±30% requirement at 40%. All sample results in this batch for silicon have been flagged with “c”. Reanalysis was not required since this is secondary element. It should be noted that silicon is not listed with other elements in SW-846 3050B, section 1.1, under “Scope and Application” for the method and does not perform consistently when using this digest.

Batch 20563: The ICSAB had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. Results slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. The LCS for calcium was recovered outside the ±20% requirement at 78.3%. Since two of the samples in this batch were exhausted and could not be reanalyzed, a decision was reached with the client to accept the data “as is” (see Attachment 7). The MS recoveries for aluminum, calcium, iron, magnesium, sodium, phosphorous, silicon, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for bismuth and zirconium exceeded the ±25 requirement at 56% and 19%, respectively. This could indicate that the results for elements are biased low. All sample results in this batch for bismuth and zirconium have been flagged with “b”. Reanalysis was not required since these are secondary elements. Silicon experienced an LCS failure, and reanalysis was not required for this secondary element.

3.2.8 Inductively Coupled Plasma/Mass Spectroscopy

The ICP/MS actinide and trace metal analyses were performed on the standard SW-846 3050 acid digestion of all grab samples and liner composite samples. The ICP/MS ^{126}Sn and ^{99}Tc analysis was performed on the sample digest without the addition of the hydrochloric acid. Hydrochloric acid is not used for ^{99}Tc analysis because of the potential formation of a ZnCl ion pair with mass 99. ICP/MS trace metal analysis for antimony was perform on the same digest with additional hydrochloric acid, which is required to keep antimony in solution. In addition to these acid digests, ICP/MS ^{99}Tc analysis was performed on a Vadose water digest of all solid samples except B23TK8 (I001) and directly on single water samples from interval I010. The I001 analysis was not performed due to lack of sample.

Direct is the most accurate type of calibration; however, standard material is not commercially available for all the isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument's mass-response curve, which is generated by using the intensity/concentration relationship for the available isotope standards. Results estimated in this manner are designated "semi-quantitative."

Table 1. Inductively Coupled Plasma-Mass Spectroscopy Standards and Spikes

Standard Type	Analytes Analyzed
Initial calibration verification (nondigested)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Acid digest standard (laboratory control standard)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Predigest spike (MS)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Post-digest spike	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
No standard or spike of either type	^{126}Sn, ^{230}Th, ^{233}U, ^{234}U, ^{236}U

3.2.8.1 Technetium-99 and Tin-126

The required detection limit listed in the SAP for ^{99}Tc was met. The target detection limit for ^{99}Tc was not met. There were no required or target detection limits for ^{126}Sn listed in the SAP. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Because there is no available source for ^{126}Sn, ^{117}Sn is used to monitor the chemical recovery for this analysis. Though not specifically requested in the SAP, ^{117}Sn is reported for the laboratory control sample LCS and MS in order to demonstrate method accuracy and presence of possible matrix interference.

Batch 20681: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 21058: The middle and closing continuing calibration blanks (CCB) contained ^{99}Tc just above the MDL. ^{99}Tc was detected in one sample bracketed by these CCBs. The other samples in the batch were non-detect. Since all results were below the quantitation limit, reanalysis was not required. The one positive result has been flagged with "B". The laboratory believes that these results most likely represent some type of interference. The RPD for ^{126}Sn exceeded the ±30 requirement in the SAP and FSAP at 39%. Since the results for ^{126}Sn were below the quantitation

limit, this criterion does not apply. The matrix spike for ^{117}Sn was recovered below the ±25% requirement. Similar results have been observed in other batches, and this appears to be a matrix interference issue. This batch was not reanalyzed, but others have been with no improvement. Tin results should be considered biased low at these levels. All samples in the batch have been flagged with a "b".

3.2.8.2 Technetium-99 (Vadose Water Digest)

The required and target detection limits listed in the SAP for ^{99}Tc were met. The SAP lists a holding time of 6 months for isotopic analytes. All analysis met this holding time.

Batch 21206 and 23804: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 23572: The middle CCB contained ^{99}Tc just above the MDL. ^{99}Tc was detected in two samples bracketed by the CCB. The other samples in the batch were non-detect. Since the blank result was below the quantitation limit, reanalysis was not required. One positive result, which was below the quantitation limit, has been flagged with "B". The other positive sample result was more than 20 times the adjusted blank result and was therefore not flagged. The laboratory believes that the blank result is most likely some type of interference.

3.2.8.3 Actinides

The required and target detection limits were met for all isotopes and in all samples. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Batch 20597: The result for ^{234}Th in the preparation blank was slightly above the MDL. Four of the six samples in the batch demonstrated a similar result and have been flagged with a "B". Since all results were below the quantitation limit, the blank was acceptable and reanalysis was not required.

Batch 21207: The RPD for U^{233} exceed the ±30% requirement in the SAP and FSAP; however, since the result was below the quantitation level, this criterion does not apply.

3.2.8.4 Trace Metals

Antimony, arsenic, cadmium, lead, selenium, silver, and thallium were analyzed by ICP/MS to obtain the required detection limits in the SAP. Except for the required detection limit for selenium, all required detection limits were met or the sample results were above the quantitation limit and the sample detection limit criteria do not apply. All target detection limits were met. The required detection limit for selenium was approximately an order of magnitude below the detection limit obtained by ICP/MS. The laboratory does not anticipate reaching this detection limit for future projects. The adjusted MDL for selenium was approximately 0.25 µg/g. SW-846 lists the holding time for metals as 6 months. All samples were analyzed within the holding time.

Batches 20672, 22361, and 22376: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20590: The first CCB had a result for antimony slightly above the MDL. All affected samples have been flagged with a "B". Since the blank result was below the quantitation limit, reanalysis was not required. The duplicate RPD for antimony was outside the ±30% requirement in the SAP and FSAP at 37%. The laboratory believes this was a result of sample inhomogeneity. Additionally, the sample result was well below the required detection limit. With customer agreement (see Attachment 7), all results were flagged with "c" and reported.

Batch 21747: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 7% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

Batch 22437: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 30% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

3.3 RADIOCHEMICAL ANALYSIS

The holding time listed in the SAP for radioactive isotopes is 6 months. The FSAP list the holding time as "none". SW-846 does not address holding times for radiochemical analytes. All radiochemical analyses met the 6-month holding time listed in the SAP. Holding time tables for these analytes have not been included in Attachment 3. With the exception of the ^{14}C and ^{3}H analyses, tracers and spikes are added prior to the digestion.

3.3.1 Gamma Energy Analysis

Gamma energy analysis was performed directly on approximately 60 mL of soil from the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The SAP requires the reporting of all isotopes with positive results above the minimum detectable activity (MDA); therefore, isotopes additional to those required in the SAP were reported when detected. The GEA analysis met all the required detection limits in the SAP. The laboratory was unable to meet any of the target detection limits. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.2 Strontium-89/90

Strontium-89/90 analysis was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. All of the sample analyses met the required and target detection limits. The FSAP and SAP requested ^{90}Sr, not $^{89/90}Sr$, be reported. The 222-S Laboratory only performs the latter analysis. Since the half-life for ^{89}Sr is approximately 51 days and ^{89}Sr has not been produced at Hanford for years, $^{89/90}Sr$ is essentially ^{90}Sr. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.3 Tritium

The ^{3}H analysis by liquid scintillation counting (LSC) was performed on the equipment blank and a water leach of all grab samples and liner composite samples. This method only measured the ^{3}H in the samples that could be dissolved in water. This analysis achieved the required and target detection limit in the FSAP.

Batch 20359: The laboratory failed to include an MS with this batch and did analyze a MS for C7668 as required. This was discussed with the client.

Batch 20794: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.4 Selenium-79

The ^{79}Se analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the target detection limit in the FSAP. No required detection limit was listed. No standard is currently available for ^{79}Se, and a cold carrier is used to monitor recovery and is measured gravimetrically. The ^{14}C LSC curve is used to determine the ^{79}Se results since their energies are similar. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum tracer/carrier recovery is 50%.

Batch 20850: The preparation blank demonstrated a positive result below the quantitation limit, as did the one sample in this batch. All results had very large counting uncertainties and were below the target detection limit. Because of these factors, reanalysis was not required. The associated results have been flagged with a “B”.

3.3.5 Carbon-14

The ^{14}C analysis by LSC was performed on a water leach of the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required detection limit in the FSAP but exceeded the target detection limit. This analysis will only detect water soluble forms of ^{14}C.

Batches 21604 and 22478: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.6 Nickel-63

The ^{63}Ni analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required and target detection limits in the FSAP. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum trace/carrier recovery is 50%.

Batch 21309: There were no notable issues with the batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20890: This duplicate for this batch was reanalyzed in batch 21309 along with the other sample that had a positive result for ^{63}Ni. All sample results were below the MDA in the reanalysis.

3.3.7 Iodine-129

Analysis for ^{129}I by low energy GEA was performed on an iodine-specific fusion digest of all grab samples and liner composite samples except for sample B23TK8 (I001) as explained in Section 2.2 of this report. The required and target detection limits in the SAP were met. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.8 Americium-241, Curium-243/244, and Curium-242

Analysis for ^{241}Am, $^{243/244}$Cm, and ^{242}Cm by alpha energy analysis (AEA) was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met. The SAP and FSAP requested ^{243}Cm and ^{244}Cm be reported separately. Since it is not possible to resolve these individual isotopes when using AEA, these isotopes have been reported as $^{243/244}$Cm.

3.3.9 Plutonium-238 and Plutonium-239/240

Plutonium isotopic (^{238}Pu and $^{239/240}$Pu) analysis by AEA was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met.

3.4 ORGANIC ANALYSES

3.4.1 Volatile Organic Analysis

The VOA by GC/MS was performed on field samples by purge and trap. Due to the instrumentation problem discussed in Section 2.1, the following samples were shipped from the 222-S Laboratory to WSCF for analysis by WRPS:

- Volatile organic samples: B23TM2, B25WM4, and B25WM7
- Field blanks: B23V99, B23VB3, and B23VB4
- Trip blanks: B23VC2 and B23VC3

These samples were received at the 222-S Laboratory prior to shipment to WSCF and were given 222-S Laboratory sample IDs, which appear in Attachment 2. These numbers are for tracking purposes only and will not be used to report results. The WSCF results for these samples are reported in Appendix I and were provided by WRPS. Sample B23V99 was analyzed by both the 222-S Laboratory and WSCF. Both sets of results have been reported (see Attachment 1 and Appendix 1).

Field sampling methods, sample containers, and preservation methods followed SW-846 5035.The soil samples were delivered in a freezer in pre-weighed VOA vials with magnetic stir bars and approximately 5 g of sample. After receipt, the VOA samples were stored in a freezer. For each sample interval, an additional high level sample preserved in methanol was also received. These were not used because none of the results for the frozen samples were above the calibration range. The exact weight of the sample and the tare weight of the VOA vials were recorded by sampling personnel and delivered with the samples. One equipment blank, eight field blanks, and seven trip blanks were also received and analyzed. The samples were preserved with either HCl or H_2SO_4 to a pH < 2.The holding time for all samples is 14 days. All samples analyzed at 222-S Laboratory met the required holding time.

The VOA met the target and required detection limits in the SAP. The SAP and FSAP requested m-xylene and p-xylene be reported separately. Since it is not possible to resolve these individual compounds when performing VOA by SW-846 8260C, these compounds have been reported as m+p xylene. The SAP and FSAP request that methanol be reported with this analysis; however, this compound is too polar to be purged and cannot be reported (see Attachment 7). Isobutanol, another poor purger, was reported as a semivolatile organic compound.

All but one of the field blanks and all trip blanks contained chloroform above the estimated quantification level. Since chloroform is a common chlorination byproduct, the laboratory believes the source of chloroform was the water used by sampling personnel to make the various blanks.

All laboratory blanks for the liquid sample batches contained acetone at a level slightly below the quantitation level, based on the low calibration. Some blanks were 30 to 50 times the MDL. Fortunately, the samples contained only a trace of acetone; most results were below the MDL and all were below the quantitation level. “B” flags have been applied when appropriate. For this reason, reanalysis was not required. The laboratory believes that this relatively high level of acetone in the method blanks was due to contamination in the hydrochloric acid used in the blanks. For analyses performed after these, acetone was only occasionally found in the blank and generally at a level below the quantitation level.

The LCS, MS, and matrix spike duplicat (MSD) recoveries were compared against the laboratory’s statistical process control (SPC) limits, as required by SW-846. The use of SPC limits is allowed in the FSAP, SAP, and QAPP.

Batch 19566: It is apparent from the following discussion that this batch should have been reanalyzed; however, due to a pending instrument outage and an expiring holding time, these are the only results available. With the exception of acetone, all QC failures indicate a high bias; the impact on the data is minimal. Toluene and 2-hexanone were detected in the sample and method

blanks above the MDL and below the quantitation limit. The sample results have been flagged with a “B”. Since the results were below the quantitation limit, reanalysis was not required. The MS failed high for acetone, 2-butanone, 2-hexanone, and hexone. The 2-hexanone result was slightly above the MDL. All results have been flagged with a “b”. Since the 2-hexanone result was below the quantitation limit and flagged with “J”, this result was not affected. All other results were below the MDL. The LCS for acetone failed high, again indicating a high bias, and the result has been flagged with an “a”. Two continuous calibration veritication standards (CCV) were analyzed with this batch; the closing CCV was normal with only two compounds slightly above the ±20% requirement. However, the first CCV had six primary analytes above this requirement. Since the acetone results were below the MDL, the LCS and CCVs are acceptable.

Batch 19680: The LCS recovery for acetone was above the upper limit of 136% at 172%. Due to the holding time limitation, reanalysis was not performed. Since the results for acetone were below the quantitation limit or below the MDL and flagged with a “J”, the data usability was not affected and reanalysis was unnecessary. The results have been flagged with an “a”. The method blank contained acetone as discussed above.

Batch 19878: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required. The method blank contained acetone as discussed above.

Batch 19881: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required.

3.4.2 Semivolatile Organic Analysis

The semivolatile organic analysis (SVOA) by GC/MS was performed on methylene chloride extractions of all grab samples and liner composite samples. All holding times were met.

The SVOA analysis met the required and target detection limits with two exceptions:

- The adjusted MDLs for cyclohexanone were above the 0.5 mg/kg target detection limit for most samples. This compound obtained detection limits between 0.5 mg/kg and 0.6 mg/kg.
- The adjusted MDLs for di-n-butyl-phthalate were above the target detection limit of 0.33 mg/kg. The analysis achieved a detection limit of between 0.5 mg/kg and 0.6 mg/kg for this compound.

LCS, MS, and MSD recoveries were compared against the laboratory’s SPC limits, as required by SW-846. The use of SPC limits is permitted in the FSAP, SAP, and QAPP.

The SAP and FSAP requested m-cresol and p- cresol be reported separately. Since it is not possible to resolve these individual compounds when performing SVOA by SW-846 8270C, these compounds have been reported as m+p cresol.

Batch 20093: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batches 19989, 19999, and 20019: Butylbenzylphthalate was detected in the method blank and samples at slightly above the MDL and below the quantitation limit. Therefore, the blank is acceptable and reanalysis was unnecessary. Sample results have been flagged with a "B".

3.4.3 Tentatively Identified Compounds

Unassigned peaks or TICs were treated as follows. Standards were obtained and analyzed for each secondary analyte identified in the SAP. This data was accumulated in the Hanford library. Following analysis, the largest TICs with instrument responses greater than 10% of the response of the nearest internal standard were evaluated and compared to the Hanford library. The estimated concentration of these TICs was calculated using measured response factors from the Hanford library compound list.

After comparison to the Hanford library, remaining unknowns were compared to National Institute of Standards and Technology (NIST) 02, *HP Mass Spectral (compound) Libraries*. The estimated concentration of compounds identified in the NIST library was calculated based on an arbitrary response factor of 1.0. If the compounds were not identified as a result of this comparison, they were reported as "unknown." Summaries of the SVOA and VOA TICs from the field samples and method blanks are provided in Attachment 5. TICs that were found in the field samples and were present in the associated batch method blank have been flagged with "B".

4.0 PROCEDURES

Table 2 lists the analytical procedures used for analysis of the Area C samples.

Table 2. Analytical Procedures

Analysis	Preparation Method	Analysis Procedure
Inorganic Analyses		
Cyanide	LA-695-103, Rev. J-0 (SW-846 9010C)	LA-695-103, Rev. J-0 (SW-846 9014)
Sulfide	LA-361-101, Rev. D-0 (SW-846 9030B)	LA-361-101, Rev. D-0 (SW-846 9215)
pH (solid)	LA-212-105, Rev. G-0 (SW-846 9045D)	LA-212-105, Rev. G-0 (SW-846 9045D)
Mercury – Cold Vapor Atomic Absorption	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)
Ammonia – IC	LA-544-112, Rev. E-0	LA-533-101, Rev. Q-0
Anions & Organic Acids – IC	LA-504-101, Rev. L-0	LA-533-115, Rev. J-0
Metals – ICP /AES	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-505-161, Rev. J-0-A (SW-846 6010C)

Analysis	Preparation Method	Analysis Procedure
^{99}Tc, ^{126}Sn – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1
^{99}Tc – ICP/MS	08-ATL-078 Vadose Water Digest	LA-506-102, Rev. F-1
Metals – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1 LA-506-103, Rev. A-0 (SW-846 6020A)
Actinides – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-1-2, Rev. F-1
Radiochemical Analyses		
GEA	Direct	LA-548-121, Rev. I-0
^{90}Sr – Separation/Beta counting (Solid)	LA-544-101, Rev. F-0	LA-220-101, Rev. J-0
^{3}H – LSC	LA-504-101, Rev. L-0	LA-218-111, Rev. G-0
^{14}C – LSC	LA-504-101, Rev. L-0	LA-348-104, Rev. H-0, I-0
^{79}Se – Separation/LSC	LA-544-101, Rev. F-0	LA-365-132, Rev. I-0
^{63}Ni – Separation/LSC	LA-544-101, Rev. F-0	LA-285-102, Rev. E-0
^{129}I – Separation/GEA	LA-378-105, Rev. C-0	LA-378-105, Rev. C-0
^{241}Am, $^{243/244,\ 242}$Cm – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
$^{239/240,\ 238}$Pu – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
Organic Analyses		
VOC – GC/MS	Direct	LA-523-118, Rev. G-O-A (SW-846 8260B)
SVOC – GC/MS	LA-523-138, Rev. F-0 (SW-846 3540C)	LA-523-135, Rev. D-0 (SW-846 8270C)

5.0 REFERENCES

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Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-113	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC		
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**	**AIR QUALITY** ☐	75 Days / 75 Days
C7668 - I007	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFV2-09-003	TFV2-09-000001	27-29 ft	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations	N/A		N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <-7C and >-20C	MEOH/Cool~4 C
TYPE OF CONTAINER	Gs	Gs
NO. OF CONTAINER(S)	5	3
VOLUME	40mL	40mL
SAMPLE ANALYSIS	VOA - 5035/8260 (LOW LEVEL) (TF);	VOA - 5035/8260 (HIGH LEVEL) (TF);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B23TM8	SOIL	5/20/10	1100	✓	✓

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Cphill C-pbell	5-20-10 1230	[illegible]	5.20.10 1230

SPECIAL INSTRUCTIONS

** All VOA samples will be collected using EPA Method 5035A.
** VOA sample bottle sets will include 3 bottles for high level analysis, 5 bottles for low level analysis, and 1 methanol process control sample.
** The laboratory is to use one of the low level VOA bottles for moisture content determination.
** VOA bottles will be labeled with an appended suffix of K, L, M, N, or P for low level and W, X, or Y for high level. These suffixes are for the purpose of providing bottle weights to the laboratories. These suffixes should not be included as part of the sample ID reported in the final data packages.

OCT 3
OCT 10
GRP# 20100064
SAM# 510V000259
1 260

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Appendix 5

Data Validation Supporting Documentation

Appendix A - Chemical Data Validation Checklist

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: WMA C			DATA PACKAGE: VSR11-044		
VALIDATOR: Carl Schloesslin		LAB: 222-S Lab		DATE: 4-27-2011	
			SDG: 20100064		
ANALYSES PERFORMED					
SW-846 8260 X		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX B23TM8 / Soil sample					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present?..... Yes (No) N/A

Comments: None

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

None

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments:

trans-1,3-dichloropropene and carbon disulfide not represented in the LCS and MS/MSD

4-methyl-2-pentanone MSD %R = 1479
acetone MSD %R = 131%
2-butanone MSD %R = 135%

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD RPD values acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

None

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Internal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

None

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses?..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E)..... Yes No N/A

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL?..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: None

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A

GPC check performed?..... Yes No N/A

GPC check recoveries acceptable?..... Yes No N/A

GPC calibration performed?..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired?..... Yes No N/A

Analytical batch QC given similar cleanup?..... Yes No N/A

Transcription/Calculation Errors?..... Yes No N/A

Comments:

Comments (attach additional sheets as necessary):

None

Appendix 6

Additional Documentation Requested By Client

Holding Time Report: VOA

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Analysis Date	Missed Holding Time
S10V000095	LIQUID	SW846-8260C	SW846-5030C	05/11/10 09:15	05/11/10 11:00	05/24/10 21:22	N
S10V000105	LIQUID	SW846-8260C	SW846-5030C	05/11/10 10:09	05/11/10 11:30	05/24/10 18:11	N
S10V000096	LIQUID	SW846-8260C	SW846-5030C	05/17/10 10:15	05/17/10 14:50	05/27/10 17:04	N
S10V000106	LIQUID	SW846-8260C	SW846-5030C	05/17/10 10:15	05/17/10 14:50	05/24/10 20:50	N
S10V000097	LIQUID	SW846-8260C	SW846-5030C	05/19/10 08:35	05/19/10 10:40	05/27/10 18:33	N
S10V000107	LIQUID	SW846-8260C	SW846-5030C	05/19/10 08:35	05/19/10 10:40	05/27/10 20:02	N
S10V000099	LIQUID	SW846-8260C	SW846-5030C	05/19/10 09:30	05/19/10 10:40	05/27/10 19:33	N
S10V000098	LIQUID	SW846-8260C	SW846-5030C	05/20/10 10:45	05/20/10 12:30	05/27/10 19:03	N
S10V000108	LIQUID	SW846-8260C	SW846-5030C	05/20/10 10:45	05/20/10 13:45	05/27/10 20:32	N
S10V000128	SOLID	SW846-8260C	SW846-5035A	05/11/10 09:15	05/11/10 11:00	05/25/10 00:33	N
S10V000142	SOLID	SW846-8260C	SW846-5035A	05/11/10 09:15	05/11/10 11:00	05/25/10 01:05	N
S10V000156	SOLID	SW846-8260C	SW846-5035A	05/17/10 10:50	05/17/10 14:50	05/27/10 14:06	N
S10V000190	SOLID	SW846-8260C	SW846-5035A	05/17/10 14:00	05/17/10 14:50	05/27/10 15:36	N
S10V000259	SOLID	SW846-8260C	SW846-5035A	05/20/10 11:00	05/20/10 12:30	05/27/10 16:35	N

LABCORE Completed Batch Report for Batch# 00019881

Analyst: Getz, Andrew

Book#:

Instrument: GCMSD3 (OHURA) for VOA

Method: VOA 222S #2, LA-523-118 Rev/Mod G-0-A

Specification: C Farm WMC 2010-1

Prep Batch:

Batch Comment: C Farm WMC 2010-1, VOA, Solid, Group 20100064

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	BLNK	S1006040060		0 0			1,1,1-Trichloroethane	SOLID		<9.2000E-02			0.092	ug/Kg			U
1	BLNK	S1006040060		0 0			1,1,2-Trichloroethane	SOLID		<1.6580E-01			0.1658	ug/Kg			U
1	BLNK	S1006040060		0 0			1,1,2,2-Tetrachloroethane	SOLID		<2.1160E-01			0.2116	ug/Kg			U
1	BLNK	S1006040060		0 0			1,1-Dichloroethene	SOLID		<4.2320E-01			0.4232	ug/Kg			U
1	BLNK	S1006040060		0 0			1,2-Dichloroethane	SOLID		<5.3799E-02			0.053799	ug/Kg			U
1	BLNK	S1006040060		0 0			1-Butanol	SOLID		<1.0292E+01			10.292	ug/Kg			U
1	BLNK	S1006040060		0 0			4-Methyl-2-pentanone	SOLID		<1.7080E+00			1.708	ug/Kg			U
1	BLNK	S1006040060		0 0			Acetone	SOLID		<2.1996E+00			2.1996	ug/Kg			U
1	BLNK	S1006040060		0 0			Benzene	SOLID		<1.4740E-01			0.1474	ug/Kg			U
1	BLNK	S1006040060		0 0			Carbon Disulfide	SOLID		<1.6080E-01			0.1608	ug/Kg			U
1	BLNK	S1006040060		0 0			Carbon Tetrachloride	SOLID		<9.3400E-02			0.0934	ug/Kg			U
1	BLNK	S1006040060		0 0			Chloroform	SOLID		<1.3080E-01			0.1308	ug/Kg			U
1	BLNK	S1006040060		0 0			Chlorobenzene	SOLID		<8.6400E-02			0.0864	ug/Kg			U
1	BLNK	S1006040060		0 0			Ethylbenzene	SOLID		<1.0720E-01			0.1072	ug/Kg			U
1	BLNK	S1006040060		0 0			Xylenes (total)	SOLID		<2.0320E-01			0.2032	ug/Kg			U
1	BLNK	S1006040060		0 0			2-Butanone	SOLID		<1.9644E+00			1.9644	ug/Kg			U
1	BLNK	S1006040060		0 0			Methylene Chloride	SOLID		<6.3999E-02			0.063999	ug/Kg			U
1	BLNK	S1006040060		0 0			Tetrachloroethene	SOLID		<1.0980E-01			0.1098	ug/Kg			U
1	BLNK	S1006040060		0 0			Toluene	SOLID		<8.0199E-02			0.080199	ug/Kg			U
1	BLNK	S1006040060		0 0			trans-1,3-Dichloropropene	SOLID		<2.7100E-01			0.271	ug/Kg			U
1	BLNK	S1006040060		0 0			Trichloroethene	SOLID		<1.2100E-01			0.121	ug/Kg			U
1	BLNK	S1006040060		0 0			Vinyl Chloride	SOLID		<1.7340E-01			0.1734	ug/Kg			U
1	BLNK	S1006040060		0 0			cis-Dichloroethylene	SOLID		<1.8160E-01			0.1816	ug/Kg			U
1	BLNK	S1006040060		0 0			trans-Dichloroethylene	SOLID		<3.0300E-01			0.303	ug/Kg			U
1	BLNK	S1006040060		0 0			112Trichloro-122Trifluoroethan	SOLID		<1.1620E-01			0.1162	ug/Kg			U
1	BLNK	S1006040060		0 0			2-Nitropropane	SOLID		<5.8800E-01			0.588	ug/Kg			U
1	BLNK	S1006040060		0 0			Ethyl acetate	SOLID		<5.8720E-01			0.5872	ug/Kg			U
1	BLNK	S1006040060		0 0			Diethyl ether	SOLID		<2.5620E-01			0.2562	ug/Kg			U
1	BLNK	S1006040060		0 0			Trichlorofluoromethane	SOLID		<9.3999E-02			0.093999	ug/Kg			U

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019881

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
1	BLNK	S1006040060		0 0			o-Xylene	SOLID		<9.2000E-02			0.092	ug/Kg			U
1	BLNK	S1006040060		0 0			m,p-Xylene	SOLID		<1.6740E-01			0.1674	ug/Kg			U
1	BLNK	S1006040060		0 0			2-Hexanone	SOLID		3.7820E+00			2.3642	ug/Kg			J
1	BLNK	S1006040060		0 0			Unknown-1	SOLID		8.4548418				ug/Kg			JT
Sample Sequence 2																	
2	LCS	S1006040061		0 0			1,1-Dichloroethene	SOLID	20	1.9314E+01			0.4232	ug/Kg	96.57	% Recovery	
2	LCS	S1006040061		0 0			1-Butanol	SOLID	200	2.0460E+02			10.292	ug/Kg	102.3	% Recovery	
2	LCS	S1006040061		0 0			4-Methyl-2-pentanone	SOLID	100	1.1731E+02			1.708	ug/Kg	117.31	% Recovery	
2	LCS	S1006040061		0 0			Acetone	SOLID	100	1.0275E+02			2.1996	ug/Kg	102.75	% Recovery	
2	LCS	S1006040061		0 0			Benzene	SOLID	20	1.8727E+01			0.1474	ug/Kg	93.635	% Recovery	
2	LCS	S1006040061		0 0			Chlorobenzene	SOLID	20	1.9171E+01			0.0864	ug/Kg	95.855	% Recovery	
2	LCS	S1006040061		0 0			2-Butanone	SOLID	100	1.0638E+02			1.9644	ug/Kg	106.38	% Recovery	
2	LCS	S1006040061		0 0			Toluene	SOLID	20	1.9430E+01			0.080199	ug/Kg	97.15	% Recovery	
2	LCS	S1006040061		0 0			Trichloroethene	SOLID	20	1.7897E+01			0.121	ug/Kg	89.485	% Recovery	
Sample Sequence 3																	
3	SAMPLE	S10V000156		0 0			1,1,1-Trichloroethane	SOLID	N/A	<1.0773E-01			0.10773	ug/Kg			U
3	SAMPLE	S10V000156		0 0			1,1,2-Trichloroethane	SOLID	N/A	<1.9414E-01			0.19414	ug/Kg			U
3	SAMPLE	S10V000156		0 0			1,1,2,2-Tetrachloroetha ne	SOLID	N/A	<2.4778E-01			0.24778	ug/Kg			U
3	SAMPLE	S10V000156		0 0			1,1-Dichloroethene	SOLID	N/A	<4.9555E-01			0.49555	ug/Kg			U
3	SAMPLE	S10V000156		0 0			1,2-Dichloroethane	SOLID	N/A	<6.2997E-02			0.062997	ug/Kg			U
3	SAMPLE	S10V000156		0 0			1-Butanol	SOLID	N/A	<1.2052E+01			12.052	ug/Kg			U
3	SAMPLE	S10V000156		0 0			4-Methyl-2-pentanone	SOLID	N/A	<2.0000E+00			2	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Acetone	SOLID	N/A	<2.5756E+00			2.5756	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Benzene	SOLID	N/A	<1.7260E-01			0.1726	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Carbon Disulfide	SOLID	N/A	<1.8829E-01			0.18829	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Carbon Tetrachloride	SOLID	N/A	<1.0937E-01			0.10937	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Chloroform	SOLID	N/A	<1.5316E-01			0.15316	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Chlorobenzene	SOLID	N/A	<1.0117E-01			0.10117	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Ethylbenzene	SOLID	N/A	<1.2553E-01			0.12553	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Xylenes (total)	SOLID	N/A	<2.3794E-01			0.23794	ug/Kg			U
3	SAMPLE	S10V000156		0 0			2-Butanone	SOLID	N/A	<2.3002E+00			2.3002	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Methylene Chloride	SOLID	N/A	<7.4941E-02			0.074941	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Tetrachloroethene	SOLID	N/A	<1.2857E-01			0.12857	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Toluene	SOLID	N/A	3.4350E-01			0.093911	ug/Kg			J
3	SAMPLE	S10V000156		0 0			trans-1,3-Dichloroprope ne	SOLID	N/A	<3.1733E-01			0.31733	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Trichloroethene	SOLID	N/A	<1.4169E-01			0.14169	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Vinyl Chloride	SOLID	N/A	<2.0304E-01			0.20304	ug/Kg			U
3	SAMPLE	S10V000156		0 0			cis-Dichloroethylene	SOLID	N/A	<2.1265E-01			0.21265	ug/Kg			U
3	SAMPLE	S10V000156		0 0			trans-Dichloroethylene	SOLID	N/A	<3.5480E-01			0.3548	ug/Kg			U
3	SAMPLE	S10V000156		0 0			112Trichloro-122Triflu oroethan	SOLID	N/A	<1.3606E-01			0.13606	ug/Kg			U

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019881

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
3	SAMPLE	S10V000156		0 0			2-Nitropropane	SOLID	N/A	<6.8852E-01			0.68852	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Ethyl acetate	SOLID	N/A	<6.8759E-01			0.68759	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Diethyl ether	SOLID	N/A	<3.0000E-01			0.3	ug/Kg			U
3	SAMPLE	S10V000156		0 0			Trichlorofluoromethane	SOLID	N/A	<1.1007E-01			0.11007	ug/Kg			U
3	SAMPLE	S10V000156		0 0			o-Xylene	SOLID	N/A	<1.0773E-01			0.10773	ug/Kg			U
3	SAMPLE	S10V000156		0 0			m,p-Xylene	SOLID	N/A	<1.9602E-01			0.19602	ug/Kg			U
3	SAMPLE	S10V000156		0 0			4-Bromofluorobenzene	SOLID	23.4192	2.1609E+01			0.1555	ug/Kg	92.27	% Recovery	
3	SAMPLE	S10V000156		0 0			Dibromofluoromethane	SOLID	23.4192	2.2582E+01			0.21171	ug/Kg	96.425	% Recovery	
3	SAMPLE	S10V000156		0 0			1,2-Dichloroethane-d4	SOLID	23.4192	2.5058E+01			0.22436	ug/Kg	107	% Recovery	
3	SAMPLE	S10V000156		0 0			Toluene-d8	SOLID	23.4192	2.2663E+01			0.2007	ug/Kg	96.771	% Recovery	
3	SAMPLE	S10V000156		0 0			2-Hexanone	SOLID	N/A	2.7700E+00			2.7684	ug/Kg			BJ
3	SAMPLE	S10V000156		0 0			Unknown-1	SOLID		2.7185016				ug/Kg			JT
3	SAMPLE	S10V000156		0 0			Unknown-2	SOLID		3.0299393				ug/Kg			JT
Sample Sequence 4																	
4	MS	S1006040063	S10V000156	0 0			1,1-Dichloroethene	SOLID	19.08396	1.8680E+01			0.40382	ug/Kg	97.883	% Recovery	
4	MS	S1006040063	S10V000156	0 0			1-Butanol	SOLID	190.8396	2.0224E+02			9.8206	ug/Kg	105.97	% Recovery	
4	MS	S1006040063	S10V000156	0 0			4-Methyl-2-pentanone	SOLID	95.41984	1.2268E+02			1.6298	ug/Kg	128.57	% Recovery	
4	MS	S1006040063	S10V000156	0 0			Acetone	SOLID	95.41984	1.1425E+02			2.0989	ug/Kg	119.73	% Recovery	
4	MS	S1006040063	S10V000156	0 0			Benzene	SOLID	19.08396	1.8558E+01			0.14065	ug/Kg	97.244	% Recovery	
4	MS	S1006040063	S10V000156	0 0			Chlorobenzene	SOLID	19.08396	1.8849E+01			0.082442	ug/Kg	98.769	% Recovery	
4	MS	S1006040063	S10V000156	0 0			2-Butanone	SOLID	95.41984	1.1196E+02			1.8744	ug/Kg	117.33	% Recovery	
4	MS	S1006040063	S10V000156	0 0			Toluene	SOLID	19.08396	1.9267E+01			0.076526	ug/Kg	99.159	% Recovery	
4	MS	S1006040063	S10V000156	0 0			Trichloroethene	SOLID	19.08396	1.8186E+01			0.11546	ug/Kg	95.295	% Recovery	
Sample Sequence 5																	
5	MSD	S1006040064	S10V000156	0 0			1,1-Dichloroethene	SOLID	19.23076	1.7291E+01			0.40692	ug/Kg	89.913	% Recovery	
															8.4879	% RPD	
5	MSD	S1006040064	S10V000156	0 0			1-Butanol	SOLID	192.3076	2.1430E+02			9.8962	ug/Kg	111.44	% Recovery	
															5.0320	% RPD	
5	MSD	S1006040064	S10V000156	0 0			4-Methyl-2-pentanone	SOLID	96.15384	1.4371E+02			1.6423	ug/Kg	149.46	% Recovery	
															15.027	% RPD	
5	MSD	S1006040064	S10V000156	0 0			Acetone	SOLID	96.15384	1.2626E+02			2.115	ug/Kg	131.31	% Recovery	
															9.2256	% RPD	
5	MSD	S1006040064	S10V000156	0 0			Benzene	SOLID	19.23076	1.8683E+01			0.14173	ug/Kg	97.152	% Recovery	
															0.094652	% RPD	
5	MSD	S1006040064	S10V000156	0 0			Chlorobenzene	SOLID	19.23076	1.8307E+01			0.083076	ug/Kg	95.196	% Recovery	
															3.6842	% RPD	
5	MSD	S1006040064	S10V000156	0 0			2-Butanone	SOLID	96.15384	1.3001E+02			1.8888	ug/Kg	135.21	% Recovery	
															14.160	% RPD	
5	MSD	S1006040064	S10V000156	0 0			Toluene	SOLID	19.23076	1.8357E+01			0.077115	ug/Kg	93.67	% Recovery	
															5.6931	% RPD	
5	MSD	S1006040064	S10V000156	0 0			Trichloroethene	SOLID	19.23076	1.7052E+01			0.11635	ug/Kg	88.67	% Recovery	
															7.2025	% RPD	

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* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019881

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 6																	
6	SAMPLE	S10V000190		0 0			1,1,1-Trichloroethane	SOLID	N/A	<7.4918E-02			0.074918	ug/Kg			U
6	SAMPLE	S10V000190		0 0			1,1,2-Trichloroethane	SOLID	N/A	<1.3502E-01			0.13502	ug/Kg			U
6	SAMPLE	S10V000190		0 0			1,1,2,2-Tetrachloroetha ne	SOLID	N/A	<1.7231E-01			0.17231	ug/Kg			U
6	SAMPLE	S10V000190		0 0			1,1-Dichloroethene	SOLID	N/A	<3.4462E-01			0.34462	ug/Kg			U
6	SAMPLE	S10V000190		0 0			1,2-Dichloroethane	SOLID	N/A	<4.3811E-02			0.043811	ug/Kg			U
6	SAMPLE	S10V000190		0 0			1-Butanol	SOLID	N/A	<8.3811E+00			8.3811	ug/Kg			U
6	SAMPLE	S10V000190		0 0			4-Methyl-2-pentanone	SOLID	N/A	<1.3909E+00			1.3909	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Acetone	SOLID	N/A	2.5320E+00			1.7912	ug/Kg			J
6	SAMPLE	S10V000190		0 0			Benzene	SOLID	N/A	<1.2003E-01			0.12003	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Carbon Disulfide	SOLID	N/A	<1.3094E-01			0.13094	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Carbon Tetrachloride	SOLID	N/A	<7.6058E-02			0.076058	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Chloroform	SOLID	N/A	<1.0651E-01			0.10651	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Chlorobenzene	SOLID	N/A	<7.0358E-02			0.070358	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Ethylbenzene	SOLID	N/A	<8.7296E-02			0.087296	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Xylenes (total)	SOLID	N/A	<1.6547E-01			0.16547	ug/Kg			U
6	SAMPLE	S10V000190		0 0			2-Butanone	SOLID	N/A	<1.5997E+00			1.5997	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Methylene Chloride	SOLID	N/A	<5.2117E-02			0.052117	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Tetrachloroethene	SOLID	N/A	<8.9413E-02			0.089413	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Toluene	SOLID	N/A	3.1620E-01			0.065309	ug/Kg			J
6	SAMPLE	S10V000190		0 0			trans-1,3-Dichloroprope ne	SOLID	N/A	<2.2068E-01			0.22068	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Trichloroethene	SOLID	N/A	<9.8534E-02			0.098534	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Vinyl Chloride	SOLID	N/A	<1.4120E-01			0.1412	ug/Kg			U
6	SAMPLE	S10V000190		0 0			cis-Dichloroethylene	SOLID	N/A	<1.4788E-01			0.14788	ug/Kg			U
6	SAMPLE	S10V000190		0 0			trans-Dichloroethylene	SOLID	N/A	<2.4674E-01			0.24674	ug/Kg			U
6	SAMPLE	S10V000190		0 0			112Trichloro-122Triflu oroethan	SOLID	N/A	<9.4625E-02			0.094625	ug/Kg			U
6	SAMPLE	S10V000190		0 0			2-Nitropropane	SOLID	N/A	<4.7883E-01			0.47883	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Ethyl acetate	SOLID	N/A	<4.7818E-01			0.47818	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Diethyl ether	SOLID	N/A	<2.0863E-01			0.20863	ug/Kg			U
6	SAMPLE	S10V000190		0 0			Trichlorofluoromethane	SOLID	N/A	<7.6547E-02			0.076547	ug/Kg			U
6	SAMPLE	S10V000190		0 0			o-Xylene	SOLID	N/A	<7.4918E-02			0.074918	ug/Kg			U
6	SAMPLE	S10V000190		0 0			m,p-Xylene	SOLID	N/A	<1.3632E-01			0.13632	ug/Kg			U
6	SAMPLE	S10V000190		0 0			4-Bromofluorobenzene	SOLID	16.28664	1.5600E+01			0.10814	ug/Kg	95.784	% Recovery	
6	SAMPLE	S10V000190		0 0			Dibromofluoromethane	SOLID	16.28664	1.6032E+01			0.14723	ug/Kg	98.437	% Recovery	
6	SAMPLE	S10V000190		0 0			1,2-Dichloroethane-d4	SOLID	16.28664	1.8782E+01			0.15603	ug/Kg	115.32	% Recovery	
6	SAMPLE	S10V000190		0 0			Toluene-d8	SOLID	16.28664	1.5978E+01			0.13958	ug/Kg	98.105	% Recovery	
6	SAMPLE	S10V000190		0 0			2-Hexanone	SOLID	N/A	2.0830E+00			1.9252	ug/Kg			BJ
6	SAMPLE	S10V000190		0 0			1-Hexanol, 2-ethyl-	SOLID		3.6257619				ug/Kg			JNT
Sample Sequence 7																	
7	SAMPLE	S10V000259		0 0			1,1,1-Trichloroethane	SOLID	N/A	<7.1317E-02			0.071317	ug/Kg			U

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LABCORE Completed Batch Report for Batch# 00019881

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
7	SAMPLE	S10V000259		0 0			1,1,2-Trichloroethane	SOLID	N/A	<1.2853E-01			0.12853	ug/Kg			U
7	SAMPLE	S10V000259		0 0			1,1,2,2-Tetrachloroethane	SOLID	N/A	<1.6403E-01			0.16403	ug/Kg			U
7	SAMPLE	S10V000259		0 0			1,1-Dichloroethene	SOLID	N/A	<3.2806E-01			0.32806	ug/Kg			U
7	SAMPLE	S10V000259		0 0			1,2-Dichloroethane	SOLID	N/A	<4.1705E-02			0.041705	ug/Kg			U
7	SAMPLE	S10V000259		0 0			1-Butanol	SOLID	N/A	<7.9783E+00			7.9783	ug/Kg			U
7	SAMPLE	S10V000259		0 0			4-Methyl-2-pentanone	SOLID	N/A	<1.3240E+00			1.324	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Acetone	SOLID	N/A	3.8610E+00			1.7051	ug/Kg			J
7	SAMPLE	S10V000259		0 0			Benzene	SOLID	N/A	<1.1426E-01			0.11426	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Carbon Disulfide	SOLID	N/A	<1.2465E-01			0.12465	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Carbon Tetrachloride	SOLID	N/A	<7.2403E-02			0.072403	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Chloroform	SOLID	N/A	<1.0140E-01			0.1014	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Chlorobenzene	SOLID	N/A	<6.6976E-02			0.066976	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Ethylbenzene	SOLID	N/A	<8.3100E-02			0.0831	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Xylenes (total)	SOLID	N/A	<1.5752E-01			0.15752	ug/Kg			U
7	SAMPLE	S10V000259		0 0			2-Butanone	SOLID	N/A	<1.5228E+00			1.5228	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Methylene Chloride	SOLID	N/A	<4.9612E-02			0.049612	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Tetrachloroethene	SOLID	N/A	<8.5116E-02			0.085116	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Toluene	SOLID	N/A	2.5580E-01			0.06217	ug/Kg			J
7	SAMPLE	S10V000259		0 0			trans-1,3-Dichloropropene	SOLID	N/A	<2.1008E-01			0.21008	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Trichloroethene	SOLID	N/A	<9.3798E-02			0.093798	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Vinyl Chloride	SOLID	N/A	<1.3442E-01			0.13442	ug/Kg			U
7	SAMPLE	S10V000259		0 0			cis-Dichloroethylene	SOLID	N/A	<1.4078E-01			0.14078	ug/Kg			U
7	SAMPLE	S10V000259		0 0			trans-Dichloroethylene	SOLID	N/A	<2.3488E-01			0.23488	ug/Kg			U
7	SAMPLE	S10V000259		0 0			112Trichloro-122Trifluoroethan	SOLID	N/A	<9.0077E-02			0.090077	ug/Kg			U
7	SAMPLE	S10V000259		0 0			2-Nitropropane	SOLID	N/A	<4.5581E-01			0.45581	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Ethyl acetate	SOLID	N/A	<4.5519E-01			0.45519	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Diethyl ether	SOLID	N/A	<1.9860E-01			0.1986	ug/Kg			U
7	SAMPLE	S10V000259		0 0			Trichlorofluoromethane	SOLID	N/A	<7.2868E-02			0.072868	ug/Kg			U
7	SAMPLE	S10V000259		0 0			o-Xylene	SOLID	N/A	<7.1317E-02			0.071317	ug/Kg			U
7	SAMPLE	S10V000259		0 0			m,p-Xylene	SOLID	N/A	<1.2977E-01			0.12977	ug/Kg			U
7	SAMPLE	S10V000259		0 0			4-Bromofluorobenzene	SOLID	15.50387	1.4810E+01			0.10294	ug/Kg	95.525	% Recovery	
7	SAMPLE	S10V000259		0 0			Dibromofluoromethane	SOLID	15.50387	1.4944E+01			0.14016	ug/Kg	96.389	% Recovery	
7	SAMPLE	S10V000259		0 0			1,2-Dichloroethane-d4	SOLID	15.50387	1.6624E+01			0.14853	ug/Kg	107.22	% Recovery	
7	SAMPLE	S10V000259		0 0			Toluene-d8	SOLID	15.50387	1.5454E+01			0.13287	ug/Kg	99.678	% Recovery	
7	SAMPLE	S10V000259		0 0			3-Heptanone	SOLID	N/A	3.33				ug/Kg			JNT
7	SAMPLE	S10V000259		0 0			Unknown-1	SOLID		3.8993369				ug/Kg			JT

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019881

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00019881

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

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LABCORE Completed Batch Report for Batch# 00019881

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1006040060	BLNK				
2	S1006040061	LCS				
3	S10V000156	SAMPLE		20100064	B23TL0	C Farm WMC 2010-1
4	S1006040063	MS	S10V000156			
5	S1006040064	MSD	S10V000156			
6	S10V000190	SAMPLE		20100064	B23TL6	C Farm WMC 2010-1
7	S10V000259	SAMPLE		20100064	B23TM8	C Farm WMC 2010-1

Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

19881

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 100527_CFARM

Level:(low/med) LOW

	CLIENT SAMPLE NO.	SMC1 #	SMC2 (DCE)#	SMC3 (TOL)#	OTHER (BFB)#	TOT OUT
01	CCB	94	100	98	102	0
02	LCS	97	102	100	101	0
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
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19						
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27						
28						
29						
30						

		QC LIMITS
SMC1	= Dibromofluoromethane	(77-129)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(73-140)
SMC3 (TOL)	= Toluene-d8	(70-126)
OTHER(BFB)	= Bromofluorobenzene	(79-125)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 100527_CFARM

Level:(low/med) LOW

	CLIENT SAMPLE NO.	SMC1 #	SMC2 (DCE)#	SMC3 (TOL)#	OTHER (BFB)#	TOT OUT
01	S10V000156	96	107	97	92	0
02	S10V000156MS	102	111	102	100	0
03	S10V000190	98	115	98	96	0
04	S10V000259	96	107	100	96	0
05	S10V000156MS	101	115	98	95	0
06						
07						
08						
09						
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30						

		QC LIMITS
SMC1	= Dibromofluoromethane	(74-126)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(78-133)
SMC3 (TOL)	= Toluene-d8	(74-128)
OTHER(BFB)	= Bromofluorobenzene	(64-144)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

Date: 27 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: WMA C
Subject: Semivolatile Organics - Sample Data Group (SDG) 20100064

INTRODUCTION

This memorandum presents the results of data validation for SDG 20100064 prepared by 222-S Laboratory. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B27130	5/17/2010	Soil	C	8270C
B27131	5/19/2010	Soil	C	8270C

Data validation was conducted in accordance with the CHPRC validation statement of work and the Field Sampling and Analysis Plan for Waste Management Area C, RPP-PLAN-40564, Rev. 2 (SAP). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested By Client

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preservation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirements for semivolatile organics in soil are extraction within 14 days of sample collection and analysis within 40 days of sample extraction. Sample preservation requires chilling to 4 degrees Celsius.

The samples were extracted and analyzed within the prescribed holding times and properly preserved.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable with the following exception. The butylbenzylphthalate laboratory blank result was > the method detection limit (MDL). The butylbenzylphthalate results for samples B27130 and B27131 were detects <5X the laboratory blank result and would be qualified as non-detects at the sample concentrations (109 ug/kg and 102 ug/kg, respectively) and flagged "U," but were further flagged "UJ" due to non-represented MS/MSD and LCS data.

Trip Blanks

No trip blanks were submitted for validation.

Field Blanks

No field blanks were submitted for validation.

Equipment Blanks

No equipment blanks were submitted for validation.

- **Accuracy**

Accuracy is evaluated by reviewing surrogate results, matrix spike sample results, and laboratory control sample results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 70% to 130%.

Surrogates

All surrogate recoveries were acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable with the following exceptions.

Only seven 8270C MS/MSD analytes were reported. Reported analytes not represented in the MS/MSDs were cyclohexanone, isobutanol, n-nitrosomorpholine, pyridine, tributyl phosphate, 2-ethoxyethanol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, di-n-butylphthalate, di-n-octylphthalate, 2-methylphenol, 3&4-methylphenol, total methylphenols, 2-nitrophenol, hexachlorobutadiene, hexachloroethane and 1,2-dichlorobenzene. All associated sample results for these analytes *except* for di-n-octylphthalate for both samples were non-detects (or qualified as non-detects) and should be qualified as estimates and flagged "UJ." The di-n-octylphthalate results for samples B27130 and B27131 were detects and should be qualified as estimates and flagged "J."

The MS and/or MSD recoveries for 1,2,4-trichlorobenzene, 2-chlorophenol and n-nitroso-di-n-dipropylamine were below the lower acceptance limits. The 1,2,4-trichlorobenzene, 2-chlorophenol and n-nitroso-di-n-dipropylamine results for samples B27130 and B27131 were non-detects and should be qualified as estimates and flagged "UJ."

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable with the following exceptions.

Only seven 8270C LCS analytes were reported. Reported analytes not represented in the LCSs were cyclohexanone, isobutanol, n-nitrosomorpholine, pyridine, tributyl phosphate, 2-ethoxyethanol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, di-n-butylphthalate, di-n-octylphthalate, 2-methylphenol, 3&4-methylphenol, total methylphenols, 2-nitrophenol, hexachlorobutadiene, hexachloroethane and 1,2-dichlorobenzene. All associated sample results for these analytes *except* for di-n-octylphthalate for both samples were non-detects (or qualified as non-detects) and should be qualified as estimates and flagged "UJ." The di-n-octylphthalate results for samples B27130 and B27131 were detects and should be qualified as estimates and flagged "J."

- **Precision**

Precision is evaluated by reviewing MS/MSD results, field duplicate sample results, and field split sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference (RPD) limits are ±30%. When duplicate RPDs exceed the limits and have associated results <5X the SAP required detection limits with differences <2X the required detection limits no precision infraction occurred.

MS/MSD Samples

All MS/MSD relative percent difference values were acceptable.

Field Duplicate Samples

No field duplicates were submitted for validation.

Field Split Samples

No field splits were submitted for validation.

- **Detection Limits**

Reported MDLs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs were below the CRDLs.

- **Completeness**

SDG 20100064 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Multiple minor deficiencies leading to qualification of sample results as estimates occurred. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

GRP-GD-003, Rev. 0, Change 0, *Data Validation for Chemical Analyses*, August 2010

RPP-PLAN-40564, Rev. 2, *Field Sampling and Analysis Plan for Waste Management Area C*, December 2009

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers that may be applied by data validators in compliance with the CHPRC statement of work are as follows:

- **U** — The constituent was analyzed for, but was not detected. The data should be considered usable for decision-making purposes.

- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the RL. The data should be considered usable for decision-making purposes.

- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J+** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J-** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **N** — The analysis indicates the presence of an analyte that has been tentatively identified.

- **NJ** — The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

- **NJ+** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation.

- **NJ-** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation.

- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2

Summary of Data Qualification

Semivolatile Organics Data Qualification Summary			
SDG: 20100064	Reviewer: AQA	Project: WMA C	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
cyclohexanone isobutanol n-nitrosomorpholine pyridine tributyl phosphate 2-ethoxyethanol 2,4,5-trichlorophenol 2,4,6-trichlorophenol bis(2-ethylhexyl)phthalate di-n-butylphthalate 2-methylphenol 3&4-methylphenol total methylphenols 2-nitrophenol hexachlorobutadiene hexachloroethane 1,2-dichlorobenzene	UJ	B27130, B27131	Non-represented MS/MSD and LCS data
di-n-octylphthalate	J	B27130, B27131	Non-represented MS/MSD and LCS data
butylbenzylphthalate	109UJ	B27130	Lab blank contamination and non-represented MS/MSD and LCS data
butylbenzylphthalate	102UJ	B27131	Lab blank contamination and non-represented MS/MSD and LCS data
1,2,4-trichlorobenzene 2-chlorophenol n-nitroso-di-n-dipropylamine	UJ	B27130, B27131	Low MS and/or MSD recoveries

Comments: None

Appendix 3

Annotated Laboratory Reports

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte		Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
~~S10V000196~~			~~57-12-5~~	~~Cyanide~~		~~ug/g~~	~~100~~	~~<0.0370~~	~~<2.68~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~2.68~~	~~n/a~~	~~U~~
S10V000196			7439-97-6	Mercury		ug/g	101	<1.00E-04	<7.85E-03	n/a	n/a	n/a	102	7.85E-03	n/a	U
S10V000196			PH	pH		unitless	n/a	n/a	7.21	7.24	7.22	0.415	n/a	0.0100	n/a	
S10V000196			18496-25-8	Sulfide		ug/g	96.7	<0.180	24.4	n/a	n/a	n/a	n/a	6.91	n/a	J
~~S10V000196~~			~~15046-84-1~~	~~Iodine-129~~		~~uCi/g~~	~~109~~	~~<9.68E-07~~	~~<1.59E-07~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~1.59E-07~~	~~n/a~~	~~U~~
S10V000199		O	120-82-1	1,2,4-Trichlorobenzene	UJ	ug/kg	73.2	<77.4	<76.8	n/a	n/a	n/a	n/a	76.8	n/a	U
S10V000199		O	95-50-1	1,2-Dichlorobenzene	UJ	ug/kg	n/a	<101	<99.9	n/a	n/a	n/a	n/a	99.9	n/a	U
S10V000199		O	121-14-2	2,4-Dinitrotoluene		ug/kg	84.1	<38.1	<37.8	n/a	n/a	n/a	n/a	37.8	n/a	U
S10V000199		O	95-95-4	2,4,5-Trichlorophenol	UJ	ug/kg	n/a	<44.0	<43.6	n/a	n/a	n/a	n/a	43.6	n/a	U
S10V000199		O	88-06-2	2,4,6-Trichlorophenol	UJ	ug/kg	n/a	<49.5	<49.1	n/a	n/a	n/a	n/a	49.1	n/a	U
S10V000199		O	95-48-7	2-Methylphenol	UJ	ug/kg	n/a	<57.5	<57.0	n/a	n/a	n/a	n/a	57.0	n/a	U
S10V000199		O	88-75-5	2-Nitrophenol	UJ	ug/kg	n/a	<53.7	<53.3	n/a	n/a	n/a	n/a	53.3	n/a	U
S10V000199		O	65794-96-9	3 &4 Methylphenol	UJ	ug/kg	n/a	<51.4	<51.0	n/a	n/a	n/a	n/a	51.0	n/a	U
S10V000199		O	83-32-9	Acenaphthene		ug/kg	76.9	<17.6	<17.5	n/a	n/a	n/a	n/a	17.5	n/a	U
S10V000199		O	56-55-3	Benzo(a)anthracene		ug/kg	n/a	<37.8	<37.5	n/a	n/a	n/a	n/a	37.5	n/a	U
S10V000199		O	205-99-2	Benzo(b)fluoranthene		ug/kg	n/a	<48.9	<48.5	n/a	n/a	n/a	n/a	48.5	n/a	U
S10V000199		O	50-32-8	Benzo(a)pyrene		ug/kg	n/a	<41.2	<40.9	n/a	n/a	n/a	n/a	40.9	n/a	U
S10V000199		O	117-81-7	Bis(2-ethylhexyl) phthalate	UJ	ug/kg	n/a	<590	<585	n/a	n/a	n/a	n/a	585	n/a	U
S10V000199		O	207-08-9	Benzo(k)fluoranthene		ug/kg	n/a	<39.1	<38.8	n/a	n/a	n/a	n/a	38.8	n/a	U
S10V000199		O	85-68-7	Butylbenzylphthalate	109UJ	ug/kg	n/a	107	109	n/a	n/a	n/a	n/a	49.6	n/a	BJ
S10V000199		O	59-50-7	4-Chloro-3-methylphenol		ug/kg	83.1	<43.2	<42.8	n/a	n/a	n/a	n/a	42.8	n/a	U
S10V000199		O	95-57-8	2-Chlorophenol	UJ	ug/kg	77.0	<66.5	<66.0	n/a	n/a	n/a	n/a	66.0	n/a	U
S10V000199		O	218-01-9	Chrysene		ug/kg	n/a	<81.4	<80.7	n/a	n/a	n/a	n/a	80.7	n/a	U
S10V000199		O	53-70-3	Dibenz[a,h]anthracene		ug/kg	n/a	<51.1	<50.7	n/a	n/a	n/a	n/a	50.7	n/a	U
S10V000199		O	84-74-2	Di-n-butylphthalate	UJ	ug/kg	n/a	<562	<558	n/a	n/a	n/a	n/a	558	n/a	U
S10V000199		O	117-84-0	Di-n-octylphthalate	J	ug/kg	n/a	<47.7	572	n/a	n/a	n/a	n/a	47.3	n/a	
S10V000199		O	621-64-7	N-Nitroso-di-n-dipropylamine	UJ	ug/kg	69.8	<58.1	<57.6	n/a	n/a	n/a	n/a	57.6	n/a	U
S10V000199		O	206-44-0	Fluoranthene		ug/kg	n/a	<35.4	<35.1	n/a	n/a	n/a	n/a	35.1	n/a	U
S10V000199		O	87-68-3	Hexachlorobutadiene	UJ	ug/kg	n/a	<69.7	<69.1	n/a	n/a	n/a	n/a	69.1	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
b - MS/MSD Outside Range
J - Estimated
a - LCS Outside Range
LS 4-27-2011
c - RPD Outside Range
B - Found in Blank

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte		Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000199		O	67-72-1	Hexachloroethane	UJ	ug/kg	n/a	<112	<111	n/a	n/a	n/a	n/a	111	n/a	U
S10V000199		O	193-39-5	Indeno(1,2,3-cd)pyrene		ug/kg	n/a	<51.0	<50.6	n/a	n/a	n/a	n/a	50.6	n/a	U
S10V000199		O	91-20-3	Naphthalene		ug/kg	n/a	<62.6	<62.1	n/a	n/a	n/a	n/a	62.1	n/a	U
S10V000199		O	98-95-3	Nitrobenzene		ug/kg	n/a	<64.6	<64.1	n/a	n/a	n/a	n/a	64.1	n/a	U
S10V000199		O	129-00-0	Pyrene		ug/kg	91.3	<62.9	<62.4	n/a	n/a	n/a	n/a	62.4	n/a	U
S10V000199		O	110-86-1	Pyridine	UJ	ug/kg	n/a	<65.0	<64.5	n/a	n/a	n/a	n/a	64.5	n/a	U
S10V000199		O	126-73-8	Tributyl phosphate	UJ	ug/kg	n/a	<108	<107	n/a	n/a	n/a	n/a	107	n/a	U
S10V000199		O	128-37-0	BHT		ug/kg	n/a	<236	<234	n/a	n/a	n/a	n/a	234	n/a	U
S10V000199		O	110-80-5	2-Ethoxyethanol	UJ	ug/kg	n/a	<182	<181	n/a	n/a	n/a	n/a	181	n/a	U
S10V000199		O	1319-77-3	Total Methylphenols	UJ	ug/kg	n/a	<107	<106	n/a	n/a	n/a	n/a	106	n/a	U
S10V000199		O	108-94-1	Cyclohexanone	UJ	ug/kg	n/a	<558	<554	n/a	n/a	n/a	n/a	554	n/a	U
S10V000199		O	59-89-2	N-Nitrosomorpholine	UJ	ug/kg	n/a	<191	<190	n/a	n/a	n/a	n/a	190	n/a	U
S10V000199		O	78-83-1	Isobutanol	UJ	ug/kg	n/a	<460	<457	n/a	n/a	n/a	n/a	457	n/a	U
S10V000200		W	16984-48-8	Fluoride		ug/g	104	<1.61E-03	3.53	n/a	n/a	n/a	n/a	0.0175	n/a	
S10V000200		W	666-14-8	Glycolate		ug/g	101	<9.37E-03	<0.102	n/a	n/a	n/a	n/a	0.102	n/a	U
S10V000200		W	71-50-1	Acetate		ug/g	98.9	<6.04E-03	0.854	n/a	n/a	n/a	n/a	0.0655	n/a	J
S10V000200		W	12311-97-6	Formate		ug/g	103	<4.67E-03	0.556	n/a	n/a	n/a	n/a	0.0507	n/a	J
S10V000200		W	16887-00-6	Chloride		ug/g	100	<9.98E-03	0.763	n/a	n/a	n/a	n/a	0.108	n/a	
S10V000200		W	14797-65-0	Nitrite		ug/g	102	0.0389	1.90	n/a	n/a	n/a	n/a	0.208	n/a	BJ
S10V000200		W	14808-79-8	Sulfate		ug/g	101	<0.0187	7.83	n/a	n/a	n/a	n/a	0.203	n/a	
S10V000200		W	338-70-5	Oxalate		ug/g	103	<0.0231	1.20	n/a	n/a	n/a	n/a	0.251	n/a	J
S10V000200		W	24959-67-9	Bromide		ug/g	103	<0.0580	<0.629	n/a	n/a	n/a	n/a	0.629	n/a	U
S10V000200		W	14797-55-8	Nitrate		ug/g	103	<0.0208	39.7	n/a	n/a	n/a	n/a	0.226	n/a	
S10V000200		W	14265-44-2	Phosphate		ug/g	101	<0.0167	2.79	n/a	n/a	n/a	n/a	0.181	n/a	Jb
S10V000201		A	7429-90-5	Aluminum		ug/g	83.2	<0.0300	6.77E+03	n/a	n/a	n/a	n/a	3.28	n/a	
S10V000201		A	7440-39-3	Barium		ug/g	84.5	<3.00E-03	66.8	n/a	n/a	n/a	n/a	0.328	n/a	
S10V000201		A	7440-41-7	Beryllium		ug/g	82.5	<1.00E-03	0.166	n/a	n/a	n/a	n/a	0.109	n/a	J
S10V000201		A	7440-69-9	Bismuth		ug/g	82.3	<0.100	36.7	n/a	n/a	n/a	n/a	10.9	n/a	Jb
S10V000201		A	7440-70-2	Calcium		ug/g	78.3	<0.0500	8.06E+03	n/a	n/a	n/a	n/a	5.46	n/a	a

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
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J - Estimated
a - LCS Outside Range

LS
4-27-2011

c - RPD Outside Range
B - Found in Blank

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte		Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000231			%WATERA	%WATER APD		%	n/a	n/a	5.780	n/a	n/a	n/a	n/a	0.01000	n/a	
S10V000231			57-12-5	Cyanide		ug/g	100	<0.0370	<2.61	n/a	n/a	n/a	n/a	2.61	n/a	U
S10V000231			7439-97-6	Mercury		ug/g	101	<1.00E-04	<8.01E-03	n/a	n/a	n/a	n/a	8.01E-03	n/a	U
S10V000231			PH	pH		unitless	n/a	n/a	7.86	n/a	n/a	n/a	n/a	0.0100	n/a	
S10V000231			18496-25-8	Sulfide		ug/g	105	<0.180	24.5	23.9	24.2	2.58	97.7	7.12	n/a	J
S10V000233			13966-00-2	Potassium-40		uCi/g	n/a	n/a	1.04E-05	n/a	n/a	n/a	n/a	5.77E-06	36.50	J
S10V000233			10198-40-0	Cobalt-60		uCi/g	102	<3.08E-07	<2.71E-07	n/a	n/a	n/a	n/a	2.71E-07	n/a	U
S10V000233			14234-35-6	Antimony-125		uCi/g	n/a	<6.68E-07	<7.15E-07	n/a	n/a	n/a	n/a	7.15E-07	n/a	U
S10V000233			10045-97-3	Cesium-137		uCi/g	107	<3.81E-07	<3.55E-07	n/a	n/a	n/a	n/a	3.55E-07	n/a	U
S10V000233			14683-23-9	Europium-152		uCi/g	n/a	<1.37E-06	<1.28E-06	n/a	n/a	n/a	n/a	1.28E-06	n/a	U
S10V000233			15585-10-1	Europium-154		uCi/g	n/a	<9.15E-07	<8.47E-07	n/a	n/a	n/a	n/a	8.47E-07	n/a	U
S10V000233			14391-16-3	Europium-155		uCi/g	n/a	<4.54E-07	<4.44E-07	n/a	n/a	n/a	n/a	4.44E-07	n/a	U
S10V000233			15092-94-1	Lead-212		uCi/g	n/a	n/a	8.16E-07	n/a	n/a	n/a	n/a	5.57E-07	29.49	
S10V000233			14274-82-9	Thorium-228		uCi/g	n/a	<8.10E-06	<8.80E-06	n/a	n/a	n/a	n/a	8.80E-06	n/a	U
S10V000233			15065-10-8	Thorium-234		uCi/g	n/a	<2.56E-06	<3.00E-06	n/a	n/a	n/a	n/a	3.00E-06	n/a	U
S10V000233			15046-84-1	Iodine-129		uCi/g	117	<2.00E-07	<1.76E-07	n/a	n/a	n/a	n/a	1.76E-07	n/a	U
S10V000234		O	120-82-1	1,2,4-Trichlorobenzene	UJ	ug/kg	73.2	<77.4	<77.0	n/a	n/a	n/a	67.1	77.0	n/a	U
S10V000234		O	95-50-1	1,2-Dichlorobenzene	UJ	ug/kg	n/a	<101	<100	n/a	n/a	n/a	n/a	100	n/a	U
S10V000234		O	121-14-2	2,4-Dinitrotoluene		ug/kg	84.1	<38.1	<37.9	n/a	n/a	n/a	86.5	37.9	n/a	U
S10V000234		O	95-95-4	2,4,5-Trichlorophenol	UJ	ug/kg	n/a	<44.0	<43.8	n/a	n/a	n/a	n/a	43.8	n/a	U
S10V000234		O	88-06-2	2,4,6-Trichlorophenol	UJ	ug/kg	n/a	<49.5	<49.2	n/a	n/a	n/a	n/a	49.2	n/a	U
S10V000234		O	95-48-7	2-Methylphenol	UJ	ug/kg	n/a	<57.5	<57.2	n/a	n/a	n/a	n/a	57.2	n/a	U
S10V000234		O	88-75-5	2-Nitrophenol	UJ	ug/kg	n/a	<53.7	<53.4	n/a	n/a	n/a	n/a	53.4	n/a	U
S10V000234		O	65794-96-9	3 &4 Methylphenol	UJ	ug/kg	n/a	<51.4	<51.1	n/a	n/a	n/a	n/a	51.1	n/a	U
S10V000234		O	83-32-9	Acenaphthene		ug/kg	76.9	<17.6	<17.5	n/a	n/a	n/a	71.4	17.5	n/a	U
S10V000234		O	56-55-3	Benzo(a)anthracene		ug/kg	n/a	<37.8	<37.6	n/a	n/a	n/a	n/a	37.6	n/a	U
S10V000234		O	205-99-2	Benzo(b)fluoranthene		ug/kg	n/a	<48.9	<48.6	n/a	n/a	n/a	n/a	48.6	n/a	U
S10V000234		O	50-32-8	Benzo(a)pyrene		ug/kg	n/a	<41.2	<41.0	n/a	n/a	n/a	n/a	41.0	n/a	U
S10V000234		O	117-81-7	Bis(2-ethylhexyl) phthalate	UJ	ug/kg	n/a	<590	<587	n/a	n/a	n/a	n/a	587	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated
c - RPD Outside Range
B - Found in Blank
b - MS/MSD Outside Range
a - LCS Outside Range

LS
4-27-2011

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000234		O	207-08-9	Benzo(k)fluoranthene	ug/kg	n/a	<39.1	<38.9	n/a	n/a	n/a	n/a	38.9	n/a	U
S10V000234		O	85-68-7	Butylbenzylphthalate 102UJ	ug/kg	n/a	107	102	n/a	n/a	n/a	n/a	49.7	n/a	BJ
S10V000234		O	59-50-7	4-Chloro-3-methylphenol	ug/kg	83.1	<43.2	<43.0	n/a	n/a	n/a	83.3	43.0	n/a	U
S10V000234		O	95-57-8	2-Chlorophenol UJ	ug/kg	77.0	<66.5	<66.1	n/a	n/a	n/a	71.9	66.1	n/a	U
S10V000234		O	218-01-9	Chrysene	ug/kg	n/a	<81.4	<80.9	n/a	n/a	n/a	n/a	80.9	n/a	U
S10V000234		O	53-70-3	Dibenz[a,h]anthracene	ug/kg	n/a	<51.1	<50.8	n/a	n/a	n/a	n/a	50.8	n/a	U
S10V000234		O	84-74-2	Di-n-butylphthalate UJ	ug/kg	n/a	<562	<559	n/a	n/a	n/a	n/a	559	n/a	U
S10V000234		O	117-84-0	Di-n-octylphthalate J	ug/kg	n/a	<47.7	320	n/a	n/a	n/a	n/a	47.4	n/a	J
S10V000234		O	621-64-7	N-Nitroso-di-n-dipropylamine UJ	ug/kg	69.8	<58.1	<57.8	n/a	n/a	n/a	66.7	57.8	n/a	U
S10V000234		O	206-44-0	Fluoranthene	ug/kg	n/a	<35.4	<35.2	n/a	n/a	n/a	n/a	35.2	n/a	U
S10V000234		O	87-68-3	Hexachlorobutadiene UJ	ug/kg	n/a	<69.7	<69.3	n/a	n/a	n/a	n/a	69.3	n/a	U
S10V000234		O	67-72-1	Hexachloroethane UJ	ug/kg	n/a	<112	<111	n/a	n/a	n/a	n/a	111	n/a	U
S10V000234		O	193-39-5	Indeno(1,2,3-cd)pyrene	ug/kg	n/a	<51.0	<50.7	n/a	n/a	n/a	n/a	50.7	n/a	U
S10V000234		O	91-20-3	Naphthalene	ug/kg	n/a	<62.6	<62.2	n/a	n/a	n/a	n/a	62.2	n/a	U
S10V000234		O	98-95-3	Nitrobenzene	ug/kg	n/a	<64.6	<64.2	n/a	n/a	n/a	n/a	64.2	n/a	U
S10V000234		O	129-00-0	Pyrene	ug/kg	91.3	<62.9	<62.5	n/a	n/a	n/a	90.6	62.5	n/a	U
S10V000234		O	110-86-1	Pyridine UJ	ug/kg	n/a	<65.0	<64.6	n/a	n/a	n/a	n/a	64.6	n/a	U
S10V000234		O	126-73-8	Tributyl phosphate UJ	ug/kg	n/a	<108	<107	n/a	n/a	n/a	n/a	107	n/a	U
S10V000234		O	128-37-0	BHT	ug/kg	n/a	<236	<234	n/a	n/a	n/a	n/a	234	n/a	U
S10V000234		O	110-80-5	2-Ethoxyethanol UJ	ug/kg	n/a	<182	<181	n/a	n/a	n/a	n/a	181	n/a	U
S10V000234		O	1319-77-3	Total Methylphenols UJ	ug/kg	n/a	<107	<106	n/a	n/a	n/a	n/a	106	n/a	U
S10V000234		O	108-94-1	Cyclohexanone UJ	ug/kg	n/a	<558	<555	n/a	n/a	n/a	n/a	555	n/a	U
S10V000234		O	59-89-2	N-Nitrosomorpholine UJ	ug/kg	n/a	<191	<190	n/a	n/a	n/a	n/a	190	n/a	U
S10V000234		O	78-83-1	Isobutanol UJ	ug/kg	n/a	<460	<458	n/a	n/a	n/a	n/a	458	n/a	U
S10V000235		W	16984-48-8	Fluoride	ug/g	104	<1.61E-03	1.92	n/a	n/a	n/a	n/a	0.0173	n/a	
S10V000235		W	666-14-8	Glycolate	ug/g	101	<9.37E-03	<0.101	n/a	n/a	n/a	n/a	0.101	n/a	U
S10V000235		W	71-50-1	Acetate	ug/g	98.9	<6.04E-03	0.478	n/a	n/a	n/a	n/a	0.0649	n/a	J
S10V000235		W	12311-97-6	Formate	ug/g	103	<4.67E-03	0.318	n/a	n/a	n/a	n/a	0.0501	n/a	J
S10V000235		W	16887-00-6	Chloride	ug/g	100	<9.98E-03	0.573	n/a	n/a	n/a	n/a	0.107	n/a	

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
b - MS/MSD Outside Range
J - Estimated
a - LCS Outside Range
LS 4-27-2011
c - RPD Outside Range
B - Found in Blank

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

222-S LABORATORY

FINAL ANALYTICAL REPORT FOR SAMPLES FROM WASTE MANAGEMENT AREA C FOR CORE HOLE C7668 IN SUPPORT OF RCRA SOIL CHARACTERIZATION

1.0 INTRODUCTION

This final report presents the results for the samples taken from Waste Management Area C between May 15, 2010 and June 8, 2010. The samples were analyzed in accordance with RPP-PLAN-40564, *Field Sampling and Analysis Plan for Sites P and L at Waste Management Area C* (FSAP); RPP-PLAN-38777, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C* (SAP); ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP); SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*; and the additional guidance given by the client's point of contact.

Because the 222-S Laboratory facility was designed to analyze hazardous and complex tank waste samples, most SW-846 test methods performed at the 222-S Laboratory contain deviations that are listed in an appendix in the analytical procedures. All other known deviations or variances from SW-846 are documented in this narrative. The following attachments are included in this report.

Attachment 1	Data Summary Report
Attachment 2	Sample Breakdown Diagrams
Attachment 3	Holding Time Report
Attachment 4	Additional Mercury and Organic Analyses QC Results
Attachment 5	Tentatively Identified Compounds (TIC) for Organic Analyses
Attachment 6	Geological Report
Attachment 7	Characterization Change Notices (CCN), and Correspondence
Attachment 8	Receipt Paperwork
Appendix 1	Analytical Report for Analysis Performed at the Waste Sampling and Characterization Facility (WSCF)

2.0 SAMPLE RECEIPT AND BREAKDOWN

2.1 SAMPLE RECEIPT

A total of nine core intervals and two surface grab samples from core hole C7668 along with seven field blanks, and six trip blanks were received by the 222-S Laboratory between May 15, 2010 and June 8, 2010. Due to an instrumentation issue, the volatile organic analysis samples for client sample numbers B25WN0 (I012), B23VB5 (Field Blank 10), and B23VC4 (Trip Blank 9) were delivered directly to WSCF for analysis. The samples were delivered in a cooler with ice or, in the case of the volatile organic samples, in a freezer. The temperatures of the temperature blanks were measured and recorded on the sample receipt check list and/or the chain of custody form.

2.2 SAMPLE BREAKDOWN

The laboratory received each core interval as a set of volatile organic analysis (VOA) samples and three liner samples when complete core recovery was obtained. The VOA samples were made from the shoe section of each core interval following SW-846 5035. The liner samples from each core interval were extruded, described, and composited by the Washington River Protection Solutions, Inc. (WRPS) geologist. The geologist's report is included in Attachment 6. Provided sufficient samples existed, the composite for each core interval was analyzed as described in the SAP and FSAP. Six core intervals (I001, I003, I004, I005, I006, and I007) had less than full recovery (see Attachment 2 and Attachment 8). There was no I002 for core hole C7668. Intervals I001 and I007 were extruded and composited in the normal manner. Interval I003 was combined with I004 to form a single composite, and Interval I005 was combined with I006 to form a single composite (see Attachment 7, CCN-WMAC-008). The surface samples were received as a single grab in a 500-mL jar and a set of VOA samples.

In addition to the grab and core samples, a water sample from interval I010 was delivered to the lab. This sample was from a small amount of standing water encountered on top of the sampler. CCN-WMAC-009 request that this sample be analyzed for ^{99}Tc.

C7668 CCN-WMAC-008 provided a priority list for the laboratory to follow for the intervals without enough sample to perform all analysis requested in the SAP and FSAP. For interval I001, the laboratory followed this instruction. For the combined interval of I004 and I005, the laboratory analyzed for ^{99}Tc using the Vadose water digest, which consumed the sample that was to be used for the radiochemistry analysis, which had a higher priority. The analyses which were not performed were gamma energy analysis % Water (GEA), ^{63}Ni, $^{89/90}$Sr, $^{238,239/240}$Pu, ^{241}Am, and $^{242,243/244}$Cm.This failure to follow the client's instruction has been addressed, and improvements in communications and better use of the Laboratory Information Management System will be made to avoid this in the future.

WRPS shipped subsamples of the composites to Test America Laboratories, Inc. (TAL) in St Louis, Missouri and Knoxville, Tennessee to be analyzed for dibutyl and monobutyl phosphate, total petroleum hydrocarbons (diesel and gasoline range), ethylene glycol, chlorinated pesticides, and polychlorinated biphenyls (Aroclors and congeners). TAL subsequently subcontracted the monobutyl and dibutyl phosphate analyses to Southwest Research Institute. The results of these analyses will be released in the final WRPS report.

3.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for those analytes requested in the SAP and FSAP. Secondary analytes are only reported if detected. The TIC from gas chromatography-mass spectrometry (GC/MS) analysis of semivolatile organic compounds (SVOC) is presented in Attachment 5. In addition to the required isotopes, all isotopes with positive GEA results were reported.

The "Det Limit" column in Attachment 1 contains the method detection limit (MDL) for non-radionuclide analyses, or the minimum detectable activity for radionuclides.

In Attachment 1, the column labeled “A#” indicates the aliquot class or the method used for sample preparation before analysis. For solid samples, the aliquot classes are defined as follows:

“A” indicates samples that were prepared by SW-846 3050B.

“E” indicates samples that were prepared by a strong acid digest.

“O” indicates samples that were extracted for organic analysis.

“S” indicates samples that were prepared by a distillation.

“W” indicates samples that were prepared by a standard water digest.

“WV” indicates samples that were prepared by a Vadose water digest.

Samples without a letter identifier in the “A#” column were analyzed directly with no separate preparation or with sample preparation performed as a part of the procedure steps.

The “Qual Flags” column in Attachment 1 contains data qualifier flags that are defined as follows:

“B” is used to indicate that the analyte was detected in the method or preparation blank and in the sample, and the result for the blank was greater than 5% of the reported sample result.

“J” indicates that the reported result should be considered an estimate because it is below the quantitation limit. The “J” flag is applied to sample concentrations that are greater than the MDL but less than the quantitation limit or sample activity with a counting uncertainty greater than 30%.

“N” indicates a TIC which has been named.

“T” indicates a TIC.

“U” indicates that the reported result is less than the calculated detection limit.

“a” indicates that the laboratory control sample (LCS) recovery was outside of the specified range in the QAPP or SAP.

“b” indicates that the matrix spike (MS) recovery was outside of the specified range in the QAPP or SAP.

“c” indicates that the relative percent difference (RPD) between the sample and the duplicate is greater than 30%.

Manual calculations using rounded results from the Data Summary Report (Attachment 1) or result calculation forms may differ slightly from the actual results derived from the raw data.

3.1 SAMPLE DIGESTIONS

3.1.1 Radiochemistry Strong Acid Digestion

Strong acid digestions with a hot plate for the heat source were performed using a mixture of concentrated nitric and hydrochloric acids. For each digest, approximately 1 to 10 g of sample

was digested depending on the analysis being performed. The digestate was then filtered and diluted to a final volume. This digestion was used for all radiochemical analyses except ^{3}H, ^{14}C, and ^{129}I. This digestion is a leach of the acid soluble species only.

3.1.2 SW-846 3050B - Acid Digestion-Heating Block

This acid digestion follows SW-846 3050B using a heating block and nitric and hydrochloric acids. An aliquot of approximately 5 g of sample was digested. All heating-block digestions were filtered and diluted to a final volume of 50 mL. In soil, this digestion is a leach of the acid soluble species only. This digestion was used for all inductively coupled plasma/mass spectrometry (ICP/MS) and inductively coupled plasma/atomic emission spectroscopy (ICP/AES) analyses except for ^{99}Tc and isotopic tin (^{117}Sn and ^{126}Sn) analysis. The digestion is modified for the ^{99}Tc analysis by using only nitric acid. This is done to eliminate the possibility of the formation a zinc-chlorine ion pair of mass 99. The laboratory believes this ion, when present, is responsible for low level false positives. A separate digestion for antimony was prepared using additional hydrochloric acid, as recommended in SW-846.

3.1.3 Water Digestion

A water digestion or leach was prepared for the anions by ion chromatography, ^{14}C, and ^{3}H analyses using approximately 0.25 to 4 g of sample diluted to 25 mL. Sonification was used, and the leachate was then filtered. In soil, this digestion is a leach of the water soluble species only.

3.1.4 Vadose Water Digestion

A 70-g sample of soil was leached using a ratio of one part water to one part soil. To maintain a one-to-one ratio, the amount of water added to the sample was adjusted based on the percent moisture of the soil. The slurries were placed on a shaker table for about 1 hour. They were then transferred to a centrifuge tube and centrifuged at 4,000 rpm for 30 minutes. An unfiltered aliquot was set aside for alkalinity analysis. The remainder was filtered using a disposable vacuum filtration system. The filtrates were transferred to a clean bottle and then analyzed for anions using IC nitrate analysis (intervals I005 to I010) and ^{99}Tc by ICP/MS analysis.

3.2 INORGANIC ANALYSES

3.2.1 Cyanide

The cyanide analysis by distillation and spectrophotometry was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 14 days. There was no required reporting limit in the SAP for cyanide. The target detection limit was 0.5 μg/g, which is lower than what the current laboratory method (lachet micro-distillation) can reach. There were no notable quality control (QC) issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.2.2 Sulfide

Sulfide analysis by distillation and ion selective electrode was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 7 days. There was no required reporting limit in the SAP for sulfide. The target detection limit was 5 µg/g. All sample results had adjusted MDLs of approximately 7 µg/g.

Batches 19830, 19631, 19885, 19967, and 20058: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19596: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required.

3.2.3 pH Analysis

The pH analysis was performed on the grab samples and liner composite samples except for sample B23TK8 (I001). This was due to insufficient sample. These analyses met all QC requirements in the FSAP, SAP, and QAPP. The FSAP lists a pH holding time requirement of "as soon as possible." All pH measurements were taken after the water leach was performed. The sampling to analysis time varied from 7 to 35 days (see Attachment 3). There is no correlation between pH results and days to analysis, and the results fall within an expected range for alkaline soils. This indicates that the variation in time has no apparent effect on the results.

3.2.4 Mercury

Analysis for Hg by cold-vapor graphic furnace/atomic absorption was performed on the digested subsamples of the grab samples and liner composite samples. All results met the QC requirements in the FSAP, SAP, and QAPP. All analyses met the holding time of 28 days. This analysis met the required and target detection limits.

3.2.5 Ion Chromatography – Ammonium

Analysis for ammonium was performed using a distillation preparation of the grab samples and the liner composite samples. The SAP lists an administrative holding time of 7 days. The laboratory believes that after distillation and preservation, the holding time is 28 days based on U.S. Environmental Protection Agency drinking water and waste water holding times for preserved samples. There is no regulatory holding time limit promulgated for ammonium in soil. All samples met these holding times. These analyses met the target detection limit listed in the SAP. There was no required reporting limit in the SAP or FSAP for ammonium.

Batch 19420: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19583: Laboratory personnel used an unknown and incorrect spike amount for the MS resulting in a high spike recovery of 247%. Since the project requirement is that one MS be performed per core hole, and five acceptable MSs exist, this MS was not reported (see

Attachment 7). All other QC requirements were met in this batch, including the post digestion spike.

Batches 19668, 19896, and 19938: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required. Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

Batches 19655 and 20024: Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

3.2.6 Ion Chromatography – Anions and Small Organic Acids

Ion chromatography analysis was performed on a standard water digest of subsamples from all grab samples and liner composite samples.

The laboratory met all of the required and target detection limits. For the standard water digest, all analyses were within the applicable holding time. The sample spikes used for the standard water digestions are predigestion spikes.

Batch 19599: The RPD for fluoride exceeded the required 30% at 32%. The laboratory believes this was due to sample inhomogeneity, which is indicated by high RPDs for the other anions in this sample. Additionally, a second duplicate sample from a separate Vadose project was analyzed in this batch, with acceptable duplicate RPDs. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. One sample result for nitrite has been flagged with a “B”.

Batch 19650: The RPD for nitrite exceeded the required 30% in the SAP and FSAP. However, since the result was below the quantitation limit, this criterion does not apply. The MS recovery for phosphate was below the ±25% requirement at 70%. The sample results have been flagged with a “b”. Since the post digestion spike was recovered at 99%, the laboratory believes that the low MS recovery was matrix related. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. All samples results for nitrite were flagged with a “B”.

Batch 20668: The results for nitrite, sulfate, and nitrate in the preparation blank were slightly above the MDL and below the quantitation limit. The blank is therefore acceptable. All but one nitrite and two nitrates were flagged with a “B”. The un-flagged results were more than 20 times the adjusted blank results. The blank result for sulfate was less than 5% of the lowest sulfate results, and therefore no flags were applied.

3.2.7 Inductively Coupled Plasma/Atomic Emission Spectroscopy

The ICP/AES analysis was performed on an acid-digest (SW-846 3050B) of all grab samples and liner composite samples. The ICP/AES analysis was unable to obtain the required detection limit for antimony, arsenic, cadmium, lead, selenium, silver, and thallium. These elements have been reported from separate ICP/MS analyses. Total uranium has not been reported by the ICP/AES analysis since it cannot meet the required detection limits in the SAP. The isotopic uranium analysis by ICP/MS met the required detection limit for ^{238}U, which is essentially total uranium. The overall data usability was not affected. For all other metals reported by ICP/AES, all target and required detection limits were met. SW-846 lists the holding time for ICP/AES metals as 6 months. All analyses met the holding times.

Batch 20821: The interference check standard-AB (ICSAB) had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. A result slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. Low levels of iron, sodium, chromium, and calcium were detected in the preparation blank, but reanalysis was not required since these levels were less than 5% of the lowest sample result. The MS recoveries for aluminum, calcium, iron, magnesium, phosphorous, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for sodium, sulfur, silicon, and zirconium exceeded the ±25 requirement in the SAP and FSAP. The laboratory believes this was due to matrix interference. The RPD for silicon exceeded the ±30% requirement at 40%. All sample results in this batch for silicon have been flagged with “c”. Reanalysis was not required since this is secondary element. It should be noted that silicon is not listed with other elements in SW-846 3050B, section 1.1, under “Scope and Application” for the method and does not perform consistently when using this digest.

Batch 20563: The ICSAB had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. Results slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. The LCS for calcium was recovered outside the ±20% requirement at 78.3%. Since two of the samples in this batch were exhausted and could not be reanalyzed, a decision was reached with the client to accept the data “as is” (see Attachment 7). The MS recoveries for aluminum, calcium, iron, magnesium, sodium, phosphorous, silicon, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for bismuth and zirconium exceeded the ±25 requirement at 56% and 19%, respectively. This could indicate that the results for elements are biased low. All sample results in this batch for bismuth and zirconium have been flagged with “b”. Reanalysis was not required since these are secondary elements. Silicon experienced an LCS failure, and reanalysis was not required for this secondary element.

3.2.8 Inductively Coupled Plasma/Mass Spectroscopy

The ICP/MS actinide and trace metal analyses were performed on the standard SW-846 3050 acid digestion of all grab samples and liner composite samples. The ICP/MS ^{126}Sn and ^{99}Tc analysis was performed on the sample digest without the addition of the hydrochloric acid. Hydrochloric acid is not used for ^{99}Tc analysis because of the potential formation of a ZnCl ion pair with mass 99. ICP/MS trace metal analysis for antimony was perform on the same digest with additional hydrochloric acid, which is required to keep antimony in solution. In addition to these acid digests, ICP/MS ^{99}Tc analysis was performed on a Vadose water digest of all solid samples except B23TK8 (I001) and directly on single water samples from interval I010. The I001 analysis was not performed due to lack of sample.

Direct is the most accurate type of calibration; however, standard material is not commercially available for all the isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument's mass-response curve, which is generated by using the intensity/concentration relationship for the available isotope standards. Results estimated in this manner are designated "semi-quantitative."

Table 1. Inductively Coupled Plasma-Mass Spectroscopy Standards and Spikes

Standard Type	Analytes Analyzed
Initial calibration verification (nondigested)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Acid digest standard (laboratory control standard)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Predigest spike (MS)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Post-digest spike	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
No standard or spike of either type	^{126}Sn, ^{230}Th, ^{233}U, ^{234}U, ^{236}U

3.2.8.1 Technetium-99 and Tin-126

The required detection limit listed in the SAP for ^{99}Tc was met. The target detection limit for ^{99}Tc was not met. There were no required or target detection limits for ^{126}Sn listed in the SAP. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Because there is no available source for ^{126}Sn, ^{117}Sn is used to monitor the chemical recovery for this analysis. Though not specifically requested in the SAP, ^{117}Sn is reported for the laboratory control sample LCS and MS in order to demonstrate method accuracy and presence of possible matrix interference.

Batch 20681: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 21058: The middle and closing continuing calibration blanks (CCB) contained ^{99}Tc just above the MDL. ^{99}Tc was detected in one sample bracketed by these CCBs. The other samples in the batch were non-detect. Since all results were below the quantitation limit, reanalysis was not required. The one positive result has been flagged with "B". The laboratory believes that these results most likely represent some type of interference. The RPD for ^{126}Sn exceeded the ±30 requirement in the SAP and FSAP at 39%. Since the results for ^{126}Sn were below the quantitation

limit, this criterion does not apply. The matrix spike for ^{117}Sn was recovered below the ±25% requirement. Similar results have been observed in other batches, and this appears to be a matrix interference issue. This batch was not reanalyzed, but others have been with no improvement. Tin results should be considered biased low at these levels. All samples in the batch have been flagged with a "b".

3.2.8.2 Technetium-99 (Vadose Water Digest)

The required and target detection limits listed in the SAP for ^{99}Tc were met. The SAP lists a holding time of 6 months for isotopic analytes. All analysis met this holding time.

Batch 21206 and 23804: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 23572: The middle CCB contained ^{99}Tc just above the MDL. ^{99}Tc was detected in two samples bracketed by the CCB. The other samples in the batch were non-detect. Since the blank result was below the quantitation limit, reanalysis was not required. One positive result, which was below the quantitation limit, has been flagged with "B". The other positive sample result was more than 20 times the adjusted blank result and was therefore not flagged. The laboratory believes that the blank result is most likely some type of interference.

3.2.8.3 Actinides

The required and target detection limits were met for all isotopes and in all samples. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Batch 20597: The result for ^{234}Th in the preparation blank was slightly above the MDL. Four of the six samples in the batch demonstrated a similar result and have been flagged with a "B". Since all results were below the quantitation limit, the blank was acceptable and reanalysis was not required.

Batch 21207: The RPD for U^{233} exceed the ±30% requirement in the SAP and FSAP; however, since the result was below the quantitation level, this criterion does not apply.

3.2.8.4 Trace Metals

Antimony, arsenic, cadmium, lead, selenium, silver, and thallium were analyzed by ICP/MS to obtain the required detection limits in the SAP. Except for the required detection limit for selenium, all required detection limits were met or the sample results were above the quantitation limit and the sample detection limit criteria do not apply. All target detection limits were met. The required detection limit for selenium was approximately an order of magnitude below the detection limit obtained by ICP/MS. The laboratory does not anticipate reaching this detection limit for future projects. The adjusted MDL for selenium was approximately 0.25 µg/g. SW-846 lists the holding time for metals as 6 months. All samples were analyzed within the holding time.

Batches 20672, 22361, and 22376: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20590: The first CCB had a result for antimony slightly above the MDL. All affected samples have been flagged with a "B". Since the blank result was below the quantitation limit, reanalysis was not required. The duplicate RPD for antimony was outside the ±30% requirement in the SAP and FSAP at 37%. The laboratory believes this was a result of sample inhomogeneity. Additionally, the sample result was well below the required detection limit. With customer agreement (see Attachment 7), all results were flagged with "c" and reported.

Batch 21747: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 7% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

Batch 22437: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 30% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

3.3 RADIOCHEMICAL ANALYSIS

The holding time listed in the SAP for radioactive isotopes is 6 months. The FSAP list the holding time as "none". SW-846 does not address holding times for radiochemical analytes. All radiochemical analyses met the 6-month holding time listed in the SAP. Holding time tables for these analytes have not been included in Attachment 3. With the exception of the ^{14}C and ^{3}H analyses, tracers and spikes are added prior to the digestion.

3.3.1 Gamma Energy Analysis

Gamma energy analysis was performed directly on approximately 60 mL of soil from the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The SAP requires the reporting of all isotopes with positive results above the minimum detectable activity (MDA); therefore, isotopes additional to those required in the SAP were reported when detected. The GEA analysis met all the required detection limits in the SAP. The laboratory was unable to meet any of the target detection limits. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.2 Strontium-89/90

Strontium-89/90 analysis was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. All of the sample analyses met the required and target detection limits. The FSAP and SAP requested ^{90}Sr, not $^{89/90}Sr$, be reported. The 222-S Laboratory only performs the latter analysis. Since the half-life for ^{89}Sr is approximately 51 days and ^{89}Sr has not been produced at Hanford for years, $^{89/90}Sr$ is essentially ^{90}Sr. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.3 Tritium

The ^{3}H analysis by liquid scintillation counting (LSC) was performed on the equipment blank and a water leach of all grab samples and liner composite samples. This method only measured the ^{3}H in the samples that could be dissolved in water. This analysis achieved the required and target detection limit in the FSAP.

Batch 20359: The laboratory failed to include an MS with this batch and did analyze a MS for C7668 as required. This was discussed with the client.

Batch 20794: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.4 Selenium-79

The ^{79}Se analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the target detection limit in the FSAP. No required detection limit was listed. No standard is currently available for ^{79}Se, and a cold carrier is used to monitor recovery and is measured gravimetrically. The ^{14}C LSC curve is used to determine the ^{79}Se results since their energies are similar. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum tracer/carrier recovery is 50%.

Batch 20850: The preparation blank demonstrated a positive result below the quantitation limit, as did the one sample in this batch. All results had very large counting uncertainties and were below the target detection limit. Because of these factors, reanalysis was not required. The associated results have been flagged with a “B”.

3.3.5 Carbon-14

The ^{14}C analysis by LSC was performed on a water leach of the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required detection limit in the FSAP but exceeded the target detection limit. This analysis will only detect water soluble forms of ^{14}C.

Batches 21604 and 22478: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.6 Nickel-63

The ^{63}Ni analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required and target detection limits in the FSAP. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum trace/carrier recovery is 50%.

Batch 21309: There were no notable issues with the batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20890: This duplicate for this batch was reanalyzed in batch 21309 along with the other sample that had a positive result for ^{63}Ni. All sample results were below the MDA in the reanalysis.

3.3.7 Iodine-129

Analysis for ^{129}I by low energy GEA was performed on an iodine-specific fusion digest of all grab samples and liner composite samples except for sample B23TK8 (I001) as explained in Section 2.2 of this report. The required and target detection limits in the SAP were met. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.8 Americium-241, Curium-243/244, and Curium-242

Analysis for ^{241}Am, $^{243/244}$Cm, and ^{242}Cm by alpha energy analysis (AEA) was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met. The SAP and FSAP requested ^{243}Cm and ^{244}Cm be reported separately. Since it is not possible to resolve these individual isotopes when using AEA, these isotopes have been reported as $^{243/244}$Cm.

3.3.9 Plutonium-238 and Plutonium-239/240

Plutonium isotopic (^{238}Pu and $^{239/240}$Pu) analysis by AEA was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met.

3.4 ORGANIC ANALYSES

3.4.1 Volatile Organic Analysis

The VOA by GC/MS was performed on field samples by purge and trap. Due to the instrumentation problem discussed in Section 2.1, the following samples were shipped from the 222-S Laboratory to WSCF for analysis by WRPS:

- Volatile organic samples: B23TM2, B25WM4, and B25WM7
- Field blanks: B23V99, B23VB3, and B23VB4
- Trip blanks: B23VC2 and B23VC3

These samples were received at the 222-S Laboratory prior to shipment to WSCF and were given 222-S Laboratory sample IDs, which appear in Attachment 2. These numbers are for tracking purposes only and will not be used to report results. The WSCF results for these samples are reported in Appendix I and were provided by WRPS. Sample B23V99 was analyzed by both the 222-S Laboratory and WSCF. Both sets of results have been reported (see Attachment 1 and Appendix 1).

Field sampling methods, sample containers, and preservation methods followed SW-846 5035.The soil samples were delivered in a freezer in pre-weighed VOA vials with magnetic stir bars and approximately 5 g of sample. After receipt, the VOA samples were stored in a freezer. For each sample interval, an additional high level sample preserved in methanol was also received. These were not used because none of the results for the frozen samples were above the calibration range. The exact weight of the sample and the tare weight of the VOA vials were recorded by sampling personnel and delivered with the samples. One equipment blank, eight field blanks, and seven trip blanks were also received and analyzed. The samples were preserved with either HCl or H_2SO_4 to a pH < 2.The holding time for all samples is 14 days. All samples analyzed at 222-S Laboratory met the required holding time.

The VOA met the target and required detection limits in the SAP. The SAP and FSAP requested m-xylene and p-xylene be reported separately. Since it is not possible to resolve these individual compounds when performing VOA by SW-846 8260C, these compounds have been reported as m+p xylene. The SAP and FSAP request that methanol be reported with this analysis; however, this compound is too polar to be purged and cannot be reported (see Attachment 7). Isobutanol, another poor purger, was reported as a semivolatile organic compound.

All but one of the field blanks and all trip blanks contained chloroform above the estimated quantification level. Since chloroform is a common chlorination byproduct, the laboratory believes the source of chloroform was the water used by sampling personnel to make the various blanks.

All laboratory blanks for the liquid sample batches contained acetone at a level slightly below the quantitation level, based on the low calibration. Some blanks were 30 to 50 times the MDL. Fortunately, the samples contained only a trace of acetone; most results were below the MDL and all were below the quantitation level. “B” flags have been applied when appropriate. For this reason, reanalysis was not required. The laboratory believes that this relatively high level of acetone in the method blanks was due to contamination in the hydrochloric acid used in the blanks. For analyses performed after these, acetone was only occasionally found in the blank and generally at a level below the quantitation level.

The LCS, MS, and matrix spike duplicat (MSD) recoveries were compared against the laboratory’s statistical process control (SPC) limits, as required by SW-846. The use of SPC limits is allowed in the FSAP, SAP, and QAPP.

Batch 19566: It is apparent from the following discussion that this batch should have been reanalyzed; however, due to a pending instrument outage and an expiring holding time, these are the only results available. With the exception of acetone, all QC failures indicate a high bias; the impact on the data is minimal. Toluene and 2-hexanone were detected in the sample and method

blanks above the MDL and below the quantitation limit. The sample results have been flagged with a “B”. Since the results were below the quantitation limit, reanalysis was not required. The MS failed high for acetone, 2-butanone, 2-hexanone, and hexone. The 2-hexanone result was slightly above the MDL. All results have been flagged with a “b”. Since the 2-hexanone result was below the quantitation limit and flagged with “J”, this result was not affected. All other results were below the MDL. The LCS for acetone failed high, again indicating a high bias, and the result has been flagged with an “a”. Two continuous calibration veritication standards (CCV) were analyzed with this batch; the closing CCV was normal with only two compounds slightly above the ±20% requirement. However, the first CCV had six primary analytes above this requirement. Since the acetone results were below the MDL, the LCS and CCVs are acceptable.

Batch 19680: The LCS recovery for acetone was above the upper limit of 136% at 172%. Due to the holding time limitation, reanalysis was not performed. Since the results for acetone were below the quantitation limit or below the MDL and flagged with a “J”, the data usability was not affected and reanalysis was unnecessary. The results have been flagged with an “a”. The method blank contained acetone as discussed above.

Batch 19878: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required. The method blank contained acetone as discussed above.

Batch 19881: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required.

3.4.2 Semivolatile Organic Analysis

The semivolatile organic analysis (SVOA) by GC/MS was performed on methylene chloride extractions of all grab samples and liner composite samples. All holding times were met.

The SVOA analysis met the required and target detection limits with two exceptions:

- The adjusted MDLs for cyclohexanone were above the 0.5 mg/kg target detection limit for most samples. This compound obtained detection limits between 0.5 mg/kg and 0.6 mg/kg.
- The adjusted MDLs for di-n-butyl-phthalate were above the target detection limit of 0.33 mg/kg. The analysis achieved a detection limit of between 0.5 mg/kg and 0.6 mg/kg for this compound.

LCS, MS, and MSD recoveries were compared against the laboratory’s SPC limits, as required by SW-846. The use of SPC limits is permitted in the FSAP, SAP, and QAPP.

The SAP and FSAP requested m-cresol and p- cresol be reported separately. Since it is not possible to resolve these individual compounds when performing SVOA by SW-846 8270C, these compounds have been reported as m+p cresol.

Batch 20093: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batches 19989, 19999, and 20019: Butylbenzylphthalate was detected in the method blank and samples at slightly above the MDL and below the quantitation limit. Therefore, the blank is acceptable and reanalysis was unnecessary. Sample results have been flagged with a "B".

3.4.3 Tentatively Identified Compounds

Unassigned peaks or TICs were treated as follows. Standards were obtained and analyzed for each secondary analyte identified in the SAP. This data was accumulated in the Hanford library. Following analysis, the largest TICs with instrument responses greater than 10% of the response of the nearest internal standard were evaluated and compared to the Hanford library. The estimated concentration of these TICs was calculated using measured response factors from the Hanford library compound list.

After comparison to the Hanford library, remaining unknowns were compared to National Institute of Standards and Technology (NIST) 02, *HP Mass Spectral (compound) Libraries*. The estimated concentration of compounds identified in the NIST library was calculated based on an arbitrary response factor of 1.0. If the compounds were not identified as a result of this comparison, they were reported as "unknown." Summaries of the SVOA and VOA TICs from the field samples and method blanks are provided in Attachment 5. TICs that were found in the field samples and were present in the associated batch method blank have been flagged with "B".

4.0 PROCEDURES

Table 2 lists the analytical procedures used for analysis of the Area C samples.

Table 2. Analytical Procedures

Analysis	Preparation Method	Analysis Procedure
Inorganic Analyses		
Cyanide	LA-695-103, Rev. J-0 (SW-846 9010C)	LA-695-103, Rev. J-0 (SW-846 9014)
Sulfide	LA-361-101, Rev. D-0 (SW-846 9030B)	LA-361-101, Rev. D-0 (SW-846 9215)
pH (solid)	LA-212-105, Rev. G-0 (SW-846 9045D)	LA-212-105, Rev. G-0 (SW-846 9045D)
Mercury – Cold Vapor Atomic Absorption	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)
Ammonia – IC	LA-544-112, Rev. E-0	LA-533-101, Rev. Q-0
Anions & Organic Acids – IC	LA-504-101, Rev. L-0	LA-533-115, Rev. J-0
Metals – ICP /AES	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-505-161, Rev. J-0-A (SW-846 6010C)

Analysis	Preparation Method	Analysis Procedure
^{99}Tc, ^{126}Sn – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1
^{99}Tc – ICP/MS	08-ATL-078 Vadose Water Digest	LA-506-102, Rev. F-1
Metals – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1 LA-506-103, Rev. A-0 (SW-846 6020A)
Actinides – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-1-2, Rev. F-1
Radiochemical Analyses		
GEA	Direct	LA-548-121, Rev. I-0
^{90}Sr – Separation/Beta counting (Solid)	LA-544-101, Rev. F-0	LA-220-101, Rev. J-0
^{3}H – LSC	LA-504-101, Rev. L-0	LA-218-111, Rev. G-0
^{14}C – LSC	LA-504-101, Rev. L-0	LA-348-104, Rev. H-0, I-0
^{79}Se – Separation/LSC	LA-544-101, Rev. F-0	LA-365-132, Rev. I-0
^{63}Ni – Separation/LSC	LA-544-101, Rev. F-0	LA-285-102, Rev. E-0
^{129}I – Separation/GEA	LA-378-105, Rev. C-0	LA-378-105, Rev. C-0
^{241}Am, $^{243/244,\ 242}$Cm – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
$^{239/240,\ 238}$Pu – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
Organic Analyses		
VOC – GC/MS	Direct	LA-523-118, Rev. G-O-A (SW-846 8260B)
SVOC – GC/MS	LA-523-138, Rev. F-0 (SW-846 3540C)	LA-523-135, Rev. D-0 (SW-846 8270C)

5.0 REFERENCES

ATL-MP-1011, 2010, *ATL Quality Assurance Project Plan for 222-S Laboratory*, Rev. 9, Advanced Technologies and Laboratories International, Inc., Richland, Washington.

NIST 02, 2002, *HP Mass Spectral Libraries*, July 2002 Release, Hewlett-Packard Company, Palo Alto, California.

SW-846, 1986, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods,* Third Edition, as amended, U.S. Environmental Protection Agency, Washington, D.C.

RPP-PLAN-40564, 2009, *Field Sampling and Analysis Plan for Sites P and L at Waste Management Area C,* Rev. 2, Washington River Protection Solutions, Inc.

RPP-PLAN-38777, 2009, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C*, Rev. 1, Washington River Protection Solutions, Inc.

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-099	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Campbell / Harris	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I003	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	10-12ft.	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations	N/A		N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	~~3~~ 2 RKS 5/17/10
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B23TL4	SOIL	5/17/10	1400	✓	~~1400~~ RKS 5/17/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Campbell Campbell	5.17.10 1450	RA Steele RA Steele	5.17.10 1450

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

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GRP# 20100064
SAM# S10V000193
194

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-102	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I004	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	12-14 ft	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations	N/A		N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C	Cool-6C
TYPE OF CONTAINER	Liner	500mL JAR
NO. OF CONTAINER(S)	1 5/19/10 RRE	1
VOLUME	160g	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B23TL7	SOIL	5/19/10	0855	✓	✓								

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Campbell	5-19-10 1040	[illegible]	5-19-10 1040

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

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Rt

GRPH 20100064
SMH 510V000 210
" 211

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-105	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I005	WMA C Sampling for CMS		V10-003		

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
TFVZ-09-003	TFVZ-09-000001	14-16 ft.	N/A	Govt. Vehicle

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
222-S Lab Operations	N/A	N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
TYPE OF CONTAINER	~~Liner~~ 500mL Jar
NO. OF CONTAINER(S)	~~2~~ 1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B23TM0	SOIL	5/19/10	0945	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Cphill C-pbell	5-19-10 1040	RHSteele	5-19-10 1040
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

SCTB
RK

EXP # 20100064
SAM # S10V000228

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-108	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC		
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**	**AIR QUALITY** ☐	75 Days / 75 Days
C7668 - I006	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFV2-09-003	TFV2-09-000001	16-18 ft	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations					

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C	Cool 6C
TYPE OF CONTAINER	Liner	500 mL Jar
NO. OF CONTAINER(S)	~~3~~ 2	1
VOLUME	160g	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	See item (1) in special Instructions

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B23TM3	SOIL	5/20/10	1000	✓	✓								

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Gabe Campbell	5-20-10 1230	R Abel R Steele	5-20-10 1230
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

QC TB
GA

QRP# 20100064
SAM# S10V000245
246
247 → JAR

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Appendix 5

Data Validation Supporting Documentation

Appendix A - Chemical Data Validation Checklist

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: WMA C			DATA PACKAGE: VSR11-044		
VALIDATOR: Carl Schloesslin		LAB: 222-S Lab		DATE: 4-27-2011	
			SDG: 20100064		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270 X		SW-846 8270 (TCLP)

SAMPLES/MATRIX Soil samples

B27130*, B27131**

*Sample B27130 is a composite of samples B23TL4 & B23TL7

**Sample B27131 is a composite of samples B23TM0 & B23TM3

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present?..... Yes (No) N/A

Comments: None

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

MB Hit: butylbenzylphthalate 107 ug/kg

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments:

7 spiked LCS and MS/MSD analytes, 19 non-represented analytes

1,2,4-trichlorobenzene MS %R = 67%, MSD %R = 66%
2-chlorophenol MSD %R = 69%
n-nitroso-di-n-dipropylamine MS %R = 67%, MSD %R = 61%

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD RPD values acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: None

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Internal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: None

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses?..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E)..... Yes No N/A

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL?..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: None

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A

GPC check performed?..... Yes No N/A

GPC check recoveries acceptable?..... Yes No N/A

GPC calibration performed?..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired?..... Yes No N/A

Analytical batch QC given similar cleanup?..... Yes No N/A

Transcription/Calculation Errors?..... Yes No N/A

Comments:

Comments (attach additional sheets as necessary): None

Appendix 6

Additional Documentation Requested By Client

Holding Time Report: SVOA

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Prep Date	Analysis Date	Missed Holding Time
S10V000134	SOLID	SW846-8270D	SW846-3540C	05/11/10 09:15	05/11/10 11:00	05/16/10 16:19	05/25/10 17:18	N
S10V000148	SOLID	SW846-8270D	SW846-3540C	05/11/10 09:15	05/11/10 11:00	05/16/10 16:19	05/25/10 19:53	N
S10V000165	SOLID	SW846-8270D	SW846-3540C	05/17/10 10:50	05/17/10 14:50	05/26/10 15:55	06/10/10 17:14	N
S10V000199	SOLID	SW846-8270D	SW846-3540C	05/17/10 14:00	05/17/10 14:50	05/26/10 15:55	06/10/10 18:01	N
S10V000234	SOLID	SW846-8270D	SW846-3540C	05/19/10 09:45	05/19/10 10:40	05/26/10 15:55	06/10/10 18:49	N
S10V000268	SOLID	SW846-8270D	SW846-3540C	05/20/10 11:00	05/20/10 12:30	05/26/10 15:55	06/10/10 21:11	N
S10V000285	SOLID	SW846-8270D	SW846-3540C	06/03/10 11:15	06/03/10 15:15	06/08/10 15:40	06/14/10 16:36	N
S10V001008	SOLID	SW846-8270D	SW846-3540C	06/01/10 11:30	06/01/10 13:00	06/08/10 15:40	06/14/10 19:11	N
S10V000302	SOLID	SW846-8270D	SW846-3540C	06/08/10 11:05	06/08/10 12:30	06/14/10 16:03	06/16/10 16:45	N

LABCORE Completed Batch Report for Batch# 00019989

Analyst: Getz, Andrew

Book#:

Instrument: GCMSD5 (TUVOK) for SVOA

Method: SVOA 222S #2, LA-523-135 Rev/Mod D-0

Specification: C Farm WMC 2010-1

Prep Batch: 00019638

Batch Comment: C Farm WMC 2010-1 SVOA SOL

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	BLNK	S1005260020		0 0	O		1,2,4-Trichlorobenzene	SOLID		<7.7400E+01			77.4	ug/Kg			U
1	BLNK	S1005260020		0 0	O		1,2-Dichlorobenzene	SOLID		<1.0070E+02			100.7	ug/Kg			U
1	BLNK	S1005260020		0 0	O		2,4-Dinitrotoluene	SOLID		<3.8100E+01			38.1	ug/Kg			U
1	BLNK	S1005260020		0 0	O		2,4,5-Trichlorophenol	SOLID		<4.4000E+01			44	ug/Kg			U
1	BLNK	S1005260020		0 0	O		2,4,6-Trichlorophenol	SOLID		<4.9500E+01			49.5	ug/Kg			U
1	BLNK	S1005260020		0 0	O		2-Methylphenol	SOLID		<5.7500E+01			57.5	ug/Kg			U
1	BLNK	S1005260020		0 0	O		2-Nitrophenol	SOLID		<5.3700E+01			53.7	ug/Kg			U
1	BLNK	S1005260020		0 0	O		3 & 4 Methylphenol Total	SOLID		<5.1400E+01			51.4	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Acenaphthene	SOLID		<1.7600E+01			17.6	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Benzo(a)anthracene	SOLID		<3.7800E+01			37.8	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Benzo(b)fluoranthene	SOLID		<4.8900E+01			48.9	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Benzo(a)pyrene	SOLID		<4.1200E+01			41.2	ug/Kg			U
1	BLNK	S1005260020		0 0	O		bis(2-Ethylhexyl)phthalate	SOLID		<5.9020E+02			590.2	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Benzo(k)fluoranthene	SOLID		<3.9100E+01			39.1	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Butylbenzylphthalate	SOLID		1.0706E+02			50	ug/Kg			J
1	BLNK	S1005260020		0 0	O		4-Chloro-3-methylphenol	SOLID		<4.3200E+01			43.2	ug/Kg			U
1	BLNK	S1005260020		0 0	O		2-Chlorophenol	SOLID		<6.6500E+01			66.5	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Chrysene	SOLID		<8.1400E+01			81.4	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Dibenz(a,h)anthracene	SOLID		<5.1100E+01			51.1	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Di-n-butylphthalate	SOLID		<5.6230E+02			562.3	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Di-n-octylphthalate	SOLID		<4.7700E+01			47.7	ug/Kg			U
1	BLNK	S1005260020		0 0	O		N-Nitrosodipropylamine	SOLID		<5.8100E+01			58.1	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Fluoranthene	SOLID		<3.5400E+01			35.4	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Hexachlorobutadiene	SOLID		<6.9700E+01			69.7	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Hexachloroethane	SOLID		<1.1180E+02			111.8	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Indeno(1,2,3-cd)pyrene	SOLID		<5.1000E+01			51	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Naphthalene	SOLID		<6.2600E+01			62.6	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Nitrobenzene	SOLID		<6.4600E+01			64.6	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Pyrene	SOLID		<6.2900E+01			62.9	ug/Kg			U

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019989

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
1	BLNK	S1005260020		0 0	O		Pyridine	SOLID		<6.5000E+01			65	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Tri-n-butylphosphate	SOLID		<1.0780E+02			107.8	ug/Kg			U
1	BLNK	S1005260020		0 0	O		2,6 bis-4Methylphenol	SOLID		<2.3560E+02			235.6	ug/Kg			U
1	BLNK	S1005260020		0 0	O		2-Ethoxyethanol	SOLID		<1.8240E+02			182.4	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Methylphenols, Total	SOLID		<1.0660E+02			106.6	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Cyclohexanone	SOLID		<5.5810E+02			558.1	ug/Kg			U
1	BLNK	S1005260020		0 0	O		N-Nitrosomorpholine	SOLID		<1.9130E+02			191.3	ug/Kg			U
1	BLNK	S1005260020		0 0	O		Isobutanol	SOLID		<4.6030E+02			460.3	ug/Kg			U
1	BLNK	S1005260020		0 0	O		1,2-Benzenedicarboxyli	SOLID		1331.2907				ug/Kg			JNT
1	BLNK	S1005260020		0 0	O		Ethanol, 2-(2-butoxyet	SOLID		268.25415				ug/Kg			JNT
1	BLNK	S1005260020		0 0	O		Unknown-1	SOLID		303.00115				ug/Kg			JT
1	BLNK	S1005260020		0 0	O		Unknown-2	SOLID		457.04935				ug/Kg			JT
1	BLNK	S1005260020		0 0	O		Unknown-3	SOLID		323.7669				ug/Kg			JT
Sample Sequence 2																	
2	LCS	S1005260021		0 0	O		1,2,4-Trichlorobenzene	SOLID	2000	1.4640E+03			77.4	ug/Kg	73.2	% Recovery	
2	LCS	S1005260021		0 0	O		2,4-Dinitrotoluene	SOLID	2000	1.6820E+03			38.1	ug/Kg	84.1	% Recovery	
2	LCS	S1005260021		0 0	O		Acenaphthene	SOLID	2000	1.5376E+03			17.6	ug/Kg	76.88	% Recovery	
2	LCS	S1005260021		0 0	O		4-Chloro-3-methylphenol	SOLID	4000	3.3236E+03			43.2	ug/Kg	83.09	% Recovery	
2	LCS	S1005260021		0 0	O		2-Chlorophenol	SOLID	4000	3.0812E+03			66.5	ug/Kg	77.03	% Recovery	
2	LCS	S1005260021		0 0	O		N-Nitrosodipropylamine	SOLID	2000	1.3968E+03			58.1	ug/Kg	69.84	% Recovery	
2	LCS	S1005260021		0 0	O		Pyrene	SOLID	2000	1.8254E+03			62.9	ug/Kg	91.27	% Recovery	
Sample Sequence 3																	
3	SAMPLE	S10V000165		0 0	O		1,2,4-Trichlorobenzene	SOLID	N/A	<7.6592E+01			76.592	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		1,2-Dichlorobenzene	SOLID	N/A	<9.9649E+01			99.649	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		2,4-Dinitrotoluene	SOLID	N/A	<3.7702E+01			37.702	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		2,4,5-Trichlorophenol	SOLID	N/A	<4.3541E+01			43.541	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		2,4,6-Trichlorophenol	SOLID	N/A	<4.8983E+01			48.983	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		2-Methylphenol	SOLID	N/A	<5.6900E+01			56.9	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		2-Nitrophenol	SOLID	N/A	<5.3139E+01			53.139	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		3 & 4 Methylphenol Total	SOLID	N/A	<5.0863E+01			50.863	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Acenaphthene	SOLID	N/A	<1.7416E+01			17.416	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Benzo(a)anthracene	SOLID	N/A	<3.7405E+01			37.405	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Benzo(b)fluoranthene	SOLID	N/A	<4.8389E+01			48.389	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Benzo(a)pyrene	SOLID	N/A	<4.0770E+01			40.77	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		bis(2-Ethylhexyl)phthalate	SOLID	N/A	<5.8404E+02			584.04	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Benzo(k)fluoranthene	SOLID	N/A	<3.8692E+01			38.692	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Butylbenzylphthalate	SOLID	N/A	1.0660E+02			49.478	ug/Kg			BJ
3	SAMPLE	S10V000165		0 0	O		4-Chloro-3-methylphenol	SOLID	N/A	<4.2749E+01			42.749	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		2-Chlorophenol	SOLID	N/A	<6.5806E+01			65.806	ug/Kg			U

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019989

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
3	SAMPLE	S10V000165		0 0	O		Chrysene	SOLID	N/A	<8.0550E+01			80.55	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Dibenz(a,h)anthracene	SOLID	N/A	<5.0567E+01			50.567	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Di-n-butylphthalate	SOLID	N/A	<5.5643E+02			556.43	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Di-n-octylphthalate	SOLID	N/A	4.2247E+02			47.202	ug/Kg			J
3	SAMPLE	S10V000165		0 0	O		N-Nitrosodipropylamine	SOLID	N/A	<5.7493E+01			57.493	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Fluoranthene	SOLID	N/A	<3.5030E+01			35.03	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Hexachlorobutadiene	SOLID	N/A	<6.8972E+01			68.972	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Hexachloroethane	SOLID	N/A	<1.1063E+02			110.63	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Indeno(1,2,3-cd)pyrene	SOLID	N/A	<5.0468E+01			50.468	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Naphthalene	SOLID	N/A	<6.1946E+01			61.946	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Nitrobenzene	SOLID	N/A	<6.3926E+01			63.926	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Pyrene	SOLID	N/A	<6.2243E+01			62.243	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Pyridine	SOLID	N/A	<6.4321E+01			64.321	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Tri-n-butylphosphate	SOLID	N/A	<1.0667E+02			106.67	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		2,6 bis-4Methylphenol	SOLID	N/A	<2.3314E+02			233.14	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		2-Ethoxyethanol	SOLID	N/A	<1.8050E+02			180.5	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Methylphenols, Total	SOLID	N/A	<1.0549E+02			105.49	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Cyclohexanone	SOLID	N/A	<5.5227E+02			552.27	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		N-Nitrosomorpholine	SOLID	N/A	<1.8930E+02			189.3	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		Isobutanol	SOLID	N/A	<4.5549E+02			455.49	ug/Kg			U
3	SAMPLE	S10V000165		0 0	O		2-Fluorobiphenyl	SOLID	1979.12	1.5624E+03				ug/Kg	78.944	% Recovery	
3	SAMPLE	S10V000165		0 0	O		2-Fluorophenol	SOLID	3958.24	2.9732E+03				ug/Kg	75.114	% Recovery	
3	SAMPLE	S10V000165		0 0	O		Nitrobenzene-d5	SOLID	1979.12	1.4634E+03				ug/Kg	73.942	% Recovery	
3	SAMPLE	S10V000165		0 0	O		2,4,6-Tribromophenol	SOLID	3958.24	3.8066E+03				ug/Kg	96.169	% Recovery	
3	SAMPLE	S10V000165		0 0	O		Terphenyl-d14	SOLID	1979.12	2.0518E+03				ug/Kg	103.67	% Recovery	
3	SAMPLE	S10V000165		0 0	O		Phenol-d6	SOLID	3958.24	3.2102E+03				ug/Kg	81.1	% Recovery	
3	SAMPLE	S10V000165		0 0	O		1,2-Benzenedicarboxyli	SOLID		854.06479				ug/Kg			JNT
3	SAMPLE	S10V000165		0 0	O		Bromacil	SOLID		203.67495				ug/Kg			JNT
3	SAMPLE	S10V000165		0 0	O		Unknown-1	SOLID		266.35927				ug/Kg			BJT
3	SAMPLE	S10V000165		0 0	O		Unknown-10	SOLID		541.25067				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-11	SOLID		578.41473				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-12	SOLID		479.75664				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-13	SOLID		235.6615				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-2	SOLID		347.00558				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-3	SOLID		496.50371				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-4	SOLID		606.166				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-5	SOLID		337.28707				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-6	SOLID		1116.1135				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-7	SOLID		654.18884				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-8	SOLID		414.63592				ug/Kg			JT
3	SAMPLE	S10V000165		0 0	O		Unknown-9	SOLID		729.47341				ug/Kg			JT

Sample Sequence 4

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019989

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
4	SAMPLE	S10V000199		0 0	O		1,2,4-Trichlorobenzene	SOLID	N/A	<7.6767E+01			76.767	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		1,2-Dichlorobenzene	SOLID	N/A	<9.9876E+01			99.876	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		2,4-Dinitrotoluene	SOLID	N/A	<3.7788E+01			37.788	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		2,4,5-Trichlorophenol	SOLID	N/A	<4.3640E+01			43.64	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		2,4,6-Trichlorophenol	SOLID	N/A	<4.9095E+01			49.095	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		2-Methylphenol	SOLID	N/A	<5.7030E+01			57.03	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		2-Nitrophenol	SOLID	N/A	<5.3261E+01			53.261	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		3 & 4 Methylphenol Total	SOLID	N/A	<5.0979E+01			50.979	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Acenaphthene	SOLID	N/A	<1.7456E+01			17.456	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Benzo(a)anthracene	SOLID	N/A	<3.7491E+01			37.491	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Benzo(b)fluoranthene	SOLID	N/A	<4.8500E+01			48.5	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Benzo(a)pyrene	SOLID	N/A	<4.0863E+01			40.863	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		bis(2-Ethylhexyl)phthalate	SOLID	N/A	<5.8537E+02			585.37	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Benzo(k)fluoranthene	SOLID	N/A	<3.8780E+01			38.78	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Butylbenzylphthalate	SOLID	N/A	1.0911E+02			49.591	ug/Kg			BJ
4	SAMPLE	S10V000199		0 0	O		4-Chloro-3-methylphenol	SOLID	N/A	<4.2847E+01			42.847	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		2-Chlorophenol	SOLID	N/A	<6.5956E+01			65.956	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Chrysene	SOLID	N/A	<8.0734E+01			80.734	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Dibenz(a,h)anthracene	SOLID	N/A	<5.0682E+01			50.682	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Di-n-butylphthalate	SOLID	N/A	<5.5770E+02			557.7	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Di-n-octylphthalate	SOLID	N/A	5.7172E+02			47.31	ug/Kg			
4	SAMPLE	S10V000199		0 0	O		N-Nitrosodipropylamine	SOLID	N/A	<5.7625E+01			57.625	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Fluoranthene	SOLID	N/A	<3.5110E+01			35.11	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Hexachlorobutadiene	SOLID	N/A	<6.9130E+01			69.13	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Hexachloroethane	SOLID	N/A	<1.1089E+02			110.89	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Indeno(1,2,3-cd)pyrene	SOLID	N/A	<5.0583E+01			50.583	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Naphthalene	SOLID	N/A	<6.2088E+01			62.088	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Nitrobenzene	SOLID	N/A	<6.4071E+01			64.071	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Pyrene	SOLID	N/A	<6.2385E+01			62.385	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Pyridine	SOLID	N/A	<6.4468E+01			64.468	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Tri-n-butylphosphate	SOLID	N/A	<1.0692E+02			106.92	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		2,6 bis-4Methylphenol	SOLID	N/A	<2.3367E+02			233.67	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		2-Ethoxyethanol	SOLID	N/A	<1.8091E+02			180.91	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Methylphenols, Total	SOLID	N/A	<1.0573E+02			105.73	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Cyclohexanone	SOLID	N/A	<5.5353E+02			553.53	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		N-Nitrosomorpholine	SOLID	N/A	<1.8973E+02			189.73	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		Isobutanol	SOLID	N/A	<4.5653E+02			456.53	ug/Kg			U
4	SAMPLE	S10V000199		0 0	O		2-Fluorobiphenyl	SOLID	1983.635	1.6062E+03				ug/Kg	80.973	% Recovery	
4	SAMPLE	S10V000199		0 0	O		2-Fluorophenol	SOLID	3967.27	3.0448E+03				ug/Kg	76.748	% Recovery	
4	SAMPLE	S10V000199		0 0	O		Nitrobenzene-d5	SOLID	1983.635	1.4223E+03				ug/Kg	71.702	% Recovery	

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LABCORE Completed Batch Report for Batch# 00019989

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
4	SAMPLE	S10V000199		0 0	O		2,4,6-Tribromophenol	SOLID	3967.27	4.1479E+03				ug/Kg	104.55	% Recovery	
4	SAMPLE	S10V000199		0 0	O		Terphenyl-d14	SOLID	1983.635	2.1573E+03				ug/Kg	108.75	% Recovery	
4	SAMPLE	S10V000199		0 0	O		Phenol-d6	SOLID	3967.27	3.2433E+03				ug/Kg	81.8	% Recovery	
4	SAMPLE	S10V000199		0 0	O		Unknown-1	SOLID		857.80014				ug/Kg			BJT
4	SAMPLE	S10V000199		0 0	O		Unknown-10	SOLID		1524.5625				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-11	SOLID		543.05628				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-12	SOLID		1301.684				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-13	SOLID		442.41475				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-14	SOLID		739.4838				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-15	SOLID		1211.7379				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-16	SOLID		824.94721				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-17	SOLID		878.86737				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-18	SOLID		852.6907				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-19	SOLID		375.70445				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-2	SOLID		619.11774				ug/Kg			BJT
4	SAMPLE	S10V000199		0 0	O		Unknown-20	SOLID		232.01007				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-3	SOLID		292.91353				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-4	SOLID		562.16519				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-5	SOLID		212.45598				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-6	SOLID		990.8437				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-7	SOLID		630.45895				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-8	SOLID		299.5899				ug/Kg			JT
4	SAMPLE	S10V000199		0 0	O		Unknown-9	SOLID		1171.4221				ug/Kg			JT
Sample Sequence 5																	
5	SAMPLE	S10V000234		0 0	O		1,2,4-Trichlorobenzene	SOLID	N/A	<7.6961E+01			76.961	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		1,2-Dichlorobenzene	SOLID	N/A	<1.0013E+02			100.13	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		2,4-Dinitrotoluene	SOLID	N/A	<3.7884E+01			37.884	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		2,4,5-Trichlorophenol	SOLID	N/A	<4.3751E+01			43.751	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		2,4,6-Trichlorophenol	SOLID	N/A	<4.9219E+01			49.219	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		2-Methylphenol	SOLID	N/A	<5.7174E+01			57.174	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		2-Nitrophenol	SOLID	N/A	<5.3396E+01			53.396	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		3 & 4 Methylphenol Total	SOLID	N/A	<5.1109E+01			51.109	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Acenaphthene	SOLID	N/A	<1.7500E+01			17.5	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Benzo(a)anthracene	SOLID	N/A	<3.7586E+01			37.586	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Benzo(b)fluoranthene	SOLID	N/A	<4.8623E+01			48.623	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Benzo(a)pyrene	SOLID	N/A	<4.0966E+01			40.966	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		bis(2-Ethylhexyl)phthalate	SOLID	N/A	<5.8685E+02			586.85	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Benzo(k)fluoranthene	SOLID	N/A	<3.8878E+01			38.878	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Butylbenzylphthalate	SOLID	N/A	1.0249E+02			49.717	ug/Kg			BJ
5	SAMPLE	S10V000234		0 0	O		4-Chloro-3-methylphenol	SOLID	N/A	<4.2955E+01			42.955	ug/Kg			U

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LABCORE Completed Batch Report for Batch# 00019989

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
5	SAMPLE	S10V000234		0 0	O		2-Chlorophenol	SOLID	N/A	<6.6123E+01			66.123	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Chrysene	SOLID	N/A	<8.0939E+01			80.939	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Dibenz(a,h)anthracene	SOLID	N/A	<5.0810E+01			50.81	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Di-n-butylphthalate	SOLID	N/A	<5.5911E+02			559.11	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Di-n-octylphthalate	SOLID	N/A	3.2017E+02			47.43	ug/Kg			J
5	SAMPLE	S10V000234		0 0	O		N-Nitrosodipropylamine	SOLID	N/A	<5.7771E+01			57.771	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Fluoranthene	SOLID	N/A	<3.5199E+01			35.199	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Hexachlorobutadiene	SOLID	N/A	<6.9305E+01			69.305	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Hexachloroethane	SOLID	N/A	<1.1117E+02			111.17	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Indeno(1,2,3-cd)pyrene	SOLID	N/A	<5.0711E+01			50.711	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Naphthalene	SOLID	N/A	<6.2245E+01			62.245	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Nitrobenzene	SOLID	N/A	<6.4234E+01			64.234	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Pyrene	SOLID	N/A	<6.2544E+01			62.544	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Pyridine	SOLID	N/A	<6.4632E+01			64.632	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Tri-n-butylphosphate	SOLID	N/A	<1.0719E+02			107.19	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		2,6 bis-4Methylphenol	SOLID	N/A	<2.3426E+02			234.26	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		2-Ethoxyethanol	SOLID	N/A	<1.8137E+02			181.37	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Methylphenols, Total	SOLID	N/A	<1.0600E+02			106	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Cyclohexanone	SOLID	N/A	<5.5494E+02			554.94	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		N-Nitrosomorpholine	SOLID	N/A	<1.9022E+02			190.22	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		Isobutanol	SOLID	N/A	<4.5769E+02			457.69	ug/Kg			U
5	SAMPLE	S10V000234		0 0	O		2-Fluorobiphenyl	SOLID	1988.664	1.6874E+03				ug/Kg	84.851	% Recovery	
5	SAMPLE	S10V000234		0 0	O		2-Fluorophenol	SOLID	3977.329	3.2978E+03				ug/Kg	82.915	% Recovery	
5	SAMPLE	S10V000234		0 0	O		Nitrobenzene-d5	SOLID	1988.664	1.6019E+03				ug/Kg	80.552	% Recovery	
5	SAMPLE	S10V000234		0 0	O		2,4,6-Tribromophenol	SOLID	3977.329	3.8510E+03				ug/Kg	96.824	% Recovery	
5	SAMPLE	S10V000234		0 0	O		Terphenyl-d14	SOLID	1988.664	2.1040E+03				ug/Kg	105.8	% Recovery	
5	SAMPLE	S10V000234		0 0	O		Phenol-d6	SOLID	3977.329	3.4334E+03				ug/Kg	86.3	% Recovery	
5	SAMPLE	S10V000234		0 0	O		1,2-Benzenedicarboxyli	SOLID		230.57416				ug/Kg			BJNT
5	SAMPLE	S10V000234		0 0	O		Unknown-1	SOLID		267.35617				ug/Kg			BJT
5	SAMPLE	S10V000234		0 0	O		Unknown-10	SOLID		374.41699				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-11	SOLID		352.85511				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-12	SOLID		362.38861				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-2	SOLID		255.83362				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-3	SOLID		407.92655				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-4	SOLID		650.52341				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-5	SOLID		276.74997				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-6	SOLID		857.90626				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-7	SOLID		236.33142				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-8	SOLID		320.25817				ug/Kg			JT
5	SAMPLE	S10V000234		0 0	O		Unknown-9	SOLID		607.65731				ug/Kg			JT
Sample Sequence 6																	
6	MS	S1005260023	S10V000234	0 0	O		1,2,4-Trichlorobenzene	SOLID	1993.719	1.3384E+03			77.157	ug/Kg	67.131	% Recovery	

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LABCORE Completed Batch Report for Batch# 00019989

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
6	MS	S1005260023	S10V000234	0 0	O		2,4-Dinitrotoluene	SOLID	1993.719	1.7248E+03			37.98	ug/Kg	86.512	% Recovery	
6	MS	S1005260023	S10V000234	0 0	O		Acenaphthene	SOLID	1993.719	1.4236E+03			17.545	ug/Kg	71.404	% Recovery	
6	MS	S1005260023	S10V000234	0 0	O		4-Chloro-3-methylphenol	SOLID	3987.439	3.3232E+03			43.064	ug/Kg	83.342	% Recovery	
6	MS	S1005260023	S10V000234	0 0	O		2-Chlorophenol	SOLID	3987.439	2.8674E+03			66.291	ug/Kg	71.911	% Recovery	
6	MS	S1005260023	S10V000234	0 0	O		N-Nitrosodipropylamine	SOLID	1993.719	1.3290E+03			57.918	ug/Kg	66.659	% Recovery	
6	MS	S1005260023	S10V000234	0 0	O		Pyrene	SOLID	1993.719	1.8058E+03			62.702	ug/Kg	90.574	% Recovery	
Sample Sequence 7																	
7	MSD	S1005260025	S10V000234	0 0	O		1,2,4-Trichlorobenzene	SOLID	1993.819	1.3090E+03			77.161	ug/Kg	65.653	% Recovery	
															2.2262	% RPD	
7	MSD	S1005260025	S10V000234	0 0	O		2,4-Dinitrotoluene	SOLID	1993.819	1.6172E+03			37.982	ug/Kg	81.111	% Recovery	
															6.4442	% RPD	
7	MSD	S1005260025	S10V000234	0 0	O		Acenaphthene	SOLID	1993.819	1.4277E+03			17.546	ug/Kg	71.606	% Recovery	
															0.28250	% RPD	
7	MSD	S1005260025	S10V000234	0 0	O		4-Chloro-3-methylphenol	SOLID	3987.638	3.1292E+03			43.066	ug/Kg	78.473	% Recovery	
															6.0180	% RPD	
7	MSD	S1005260025	S10V000234	0 0	O		2-Chlorophenol	SOLID	3987.638	2.7532E+03			66.294	ug/Kg	69.043	% Recovery	
															4.0694	% RPD	
7	MSD	S1005260025	S10V000234	0 0	O		N-Nitrosodipropylamine	SOLID	1993.819	1.2154E+03			57.92	ug/Kg	60.958	% Recovery	
															8.9345	% RPD	
7	MSD	S1005260025	S10V000234	0 0	O		Pyrene	SOLID	1993.819	1.6958E+03			62.706	ug/Kg	85.053	% Recovery	
															6.2872	% RPD	
Sample Sequence 8																	
8	SAMPLE	S10V000268		0 0	O		1,2,4-Trichlorobenzene	SOLID	N/A	<7.6645E+01			76.645	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		1,2-Dichlorobenzene	SOLID	N/A	<9.9718E+01			99.718	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		2,4-Dinitrotoluene	SOLID	N/A	<3.7728E+01			37.728	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		2,4,5-Trichlorophenol	SOLID	N/A	<4.3571E+01			43.571	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		2,4,6-Trichlorophenol	SOLID	N/A	<4.9017E+01			49.017	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		2-Methylphenol	SOLID	N/A	<5.6939E+01			56.939	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		2-Nitrophenol	SOLID	N/A	<5.3176E+01			53.176	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		3 & 4 Methylphenol Total	SOLID	N/A	<5.0899E+01			50.899	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Acenaphthene	SOLID	N/A	<1.7428E+01			17.428	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Benzo(a)anthracene	SOLID	N/A	<3.7431E+01			37.431	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Benzo(b)fluoranthene	SOLID	N/A	<4.8423E+01			48.423	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Benzo(a)pyrene	SOLID	N/A	<4.0798E+01			40.798	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		bis(2-Ethylhexyl)phthalate	SOLID	N/A	<5.8444E+02			584.44	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Benzo(k)fluoranthene	SOLID	N/A	<3.8719E+01			38.719	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Butylbenzylphthalate	SOLID	N/A	1.0722E+02			49.512	ug/Kg			BJ
8	SAMPLE	S10V000268		0 0	O		4-Chloro-3-methylphenol	SOLID	N/A	<4.2779E+01			42.779	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		2-Chlorophenol	SOLID	N/A	<6.5851E+01			65.851	ug/Kg			U

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019989

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
8	SAMPLE	S10V000268		0 0	O		Chrysene	SOLID	N/A	<8.0606E+01			80.606	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Dibenz(a,h)anthracene	SOLID	N/A	<5.0602E+01			50.602	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Di-n-butylphthalate	SOLID	N/A	<5.5682E+02			556.82	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Di-n-octylphthalate	SOLID	N/A	3.1723E+02			47.235	ug/Kg			J
8	SAMPLE	S10V000268		0 0	O		N-Nitrosodipropylamine	SOLID	N/A	<5.7533E+01			57.533	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Fluoranthene	SOLID	N/A	<3.5055E+01			35.055	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Hexachlorobutadiene	SOLID	N/A	<6.9020E+01			69.02	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Hexachloroethane	SOLID	N/A	<1.1071E+02			110.71	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Indeno(1,2,3-cd)pyrene	SOLID	N/A	<5.0503E+01			50.503	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Naphthalene	SOLID	N/A	<6.1989E+01			61.989	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Nitrobenzene	SOLID	N/A	<6.3970E+01			63.97	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Pyrene	SOLID	N/A	<6.2286E+01			62.286	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Pyridine	SOLID	N/A	<6.4366E+01			64.366	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Tri-n-butylphosphate	SOLID	N/A	<1.0675E+02			106.75	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		2,6 bis-4Methylphenol	SOLID	N/A	<2.3330E+02			233.3	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		2-Ethoxyethanol	SOLID	N/A	<1.8062E+02			180.62	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Methylphenols, Total	SOLID	N/A	<1.0556E+02			105.56	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Cyclohexanone	SOLID	N/A	<5.5266E+02			552.66	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		N-Nitrosomorpholine	SOLID	N/A	<1.8943E+02			189.43	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		Isobutanol	SOLID	N/A	<4.5581E+02			455.81	ug/Kg			U
8	SAMPLE	S10V000268		0 0	O		2-Fluorobiphenyl	SOLID	1980.492	1.4741E+03				ug/Kg	74.43	% Recovery	
8	SAMPLE	S10V000268		0 0	O		2-Fluorophenol	SOLID	3960.984	2.8383E+03				ug/Kg	71.656	% Recovery	
8	SAMPLE	S10V000268		0 0	O		Nitrobenzene-d5	SOLID	1980.492	1.3532E+03				ug/Kg	68.326	% Recovery	
8	SAMPLE	S10V000268		0 0	O		2,4,6-Tribromophenol	SOLID	3960.984	3.7275E+03				ug/Kg	94.105	% Recovery	
8	SAMPLE	S10V000268		0 0	O		Terphenyl-d14	SOLID	1980.492	2.1207E+03				ug/Kg	107.08	% Recovery	
8	SAMPLE	S10V000268		0 0	O		Phenol-d6	SOLID	3960.984	3.1758E+03				ug/Kg	80.2	% Recovery	
8	SAMPLE	S10V000268		0 0	O		1,2-Benzenedicarboxyli	SOLID		231.42342				ug/Kg			BJNT
8	SAMPLE	S10V000268		0 0	O		Unknown-1	SOLID		959.87269				ug/Kg			BJT
8	SAMPLE	S10V000268		0 0	O		Unknown-10	SOLID		513.56657				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-11	SOLID		351.20021				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-12	SOLID		343.46672				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-13	SOLID		345.89948				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-2	SOLID		889.23028				ug/Kg			BJT
8	SAMPLE	S10V000268		0 0	O		Unknown-3	SOLID		233.32057				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-4	SOLID		373.75945				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-5	SOLID		570.12589				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-6	SOLID		266.30021				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-7	SOLID		802.42601				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-8	SOLID		206.10079				ug/Kg			JT
8	SAMPLE	S10V000268		0 0	O		Unknown-9	SOLID		318.72181				ug/Kg			JT

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019989

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00019989

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019989

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1005260020	BLNK				
2	S1005260021	LCS				
3	S10V000165	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
4	S10V000199	SAMPLE		20100064	B27130	C Farm WMC 2010-1
5	S10V000234	SAMPLE		20100064	B27131	C Farm WMC 2010-1
6	S1005260023	MS	S10V000234			
7	S1005260025	MSD	S10V000234			
8	S10V000268	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

19989

FORM 2
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: CFARM_C

Level: (low/med) LOW

	CHG SAMPLE NO.	S1 (FBP) #	S2 (2FP) #	S3 (NBZ) #	S4 #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	BLANK	98	91	89	92	102	121			0
02	LCS	86	85	78	87	92	106			0
03	S10V000165	79	75	74	81	96	104			0
04	S10V000199	81	77	72	82	104	109			0
05	S10V000234	85	83	80	86	97	106			0
06	S10V000234MS	77	77	74	83	96	103			0
07	S10V000234MS	78	75	72	81	90	101			0
08	S10V000268SA	74	72	68	80	94	107			0
09										
10										
11										
12										
13										
14										
15										
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29										
30										

		QC LIMITS
S1 (FBP)	= 2-Fluorobiphenyl	(10-147)
S2 (2FP)	= 2-Fluorophenol	(0-127)
S3 (NBZ)	= Nitrobenzene-d5	(0-125)
S4	= Phenol-d6	(37-125)
S5 (TBP)	= 2,4,6-Tribromophenol	(40-176)
S6 (TPH)	= Terphenyl-d14	(71-175)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate diluted out

Date: 27 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: WMA C
Subject: Inorganics - Sample Data Group (SDG) 20100064

INTRODUCTION

This memorandum presents the results of data validation for SDG 20100064 prepared by 222-S Laboratory. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B27130	5/17/2010	Soil	C	See note 1
B27131	5/19/2010	Soil	C	See note 1

1 – 6010C (ICP-AES), 6020A (ICP-MS), ICP-MS actinides, ICP-MS fission products, ICP-MS Tc-99 Vadose Water Digest, 7470A (CVAA Hg)

Data validation was conducted in accordance with the CHPRC validation statement of work and the Field Sampling and Analysis Plan for Waste Management Area C, RPP-PLAN-40564, Rev. 2 (SAP). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested By Client

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preservation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirement for ICP metals are analysis within 180 days of sample collection, and the holding time requirement for mercury is analysis within 28 days of sample collection. Radionuclides in soil have no holding time. Sample preservation for soil samples requires chilling to <6 degrees Celsius.

The samples were analyzed within the prescribed holding times and properly preserved.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable with the following exception. The U-234 laboratory blank result was > the MDL. The U-234 result for sample B27131 was a detect <5X the laboratory blank result and should be qualified as a non-detect at the sample concentration (4.26E-05 ug/g) and flagged "U." The U-234 result for sample B27130 was a non-detect and should not be qualified.

Trip Blanks

No trip blanks were submitted for validation.

Field Blanks

No field blanks were submitted for validation.

Equipment Blanks

No equipment blanks were submitted for validation.

- **Accuracy**

Accuracy is evaluated by reviewing matrix spike sample results and laboratory control sample results. According to the SAP, the matrix spike sample accuracy limits are 75% to 125% and the laboratory control sample accuracy limits are 80% to 120%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable with the following exceptions.

The MS recoveries for Bi and Zr were < the lower acceptance limit, and the associated post spike recoveries were acceptable. The Bi and Zr results for samples B27130 and B27131 were detects and should be qualified as estimates and flagged "J."

The MS recovery for Sn-117 was < the lower acceptance limit and the associated post spike recovery was acceptable. The Sn-117 and Sn-126 results for samples B27130 and B27131 were non-detects and should be qualified as estimates and flagged "UJ."

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable with the following exceptions. The LCS recoveries for Ca and Si were < the lower acceptance limit. The Ca and Si results for samples B27130 and B27131 were detects and should be qualified as estimates and flagged "J-."

- **Precision**

Precision is evaluated by reviewing MS/MSD results, laboratory duplicate sample results, field duplicate sample results and field split sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference (RPD) limits are ±30%. The limits for reported analytes not listed in the SAP are specified by the DV procedure. When soil duplicate RPDs exceed the limits and have associated results <5X the SAP required detection limits with differences <2X the required detection limits no precision infraction occurred.

MS/MSD Samples

All MS/MSD RPD values were acceptable.

Laboratory Duplicate Samples

All laboratory duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for validation.

Field Split Samples

No field splits were submitted for validation.

- **Detection Limits**

Reported MDLs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs with associated non-detected sample results were below the CRDLs with the following exceptions.

The Se MDLs for samples B27130 and B27131 were significantly greater than the CRDL.

- **Completeness**

SDG 20100064 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Multiple minor deficiencies leading to qualification of sample results as estimates occurred. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

GRP-GD-003, Rev. 0, Change 0, *Data Validation for Chemical Analyses*, August 2010.

RPP-PLAN-40564, Rev. 2, *Field Sampling and Analysis Plan for Waste Management Area C*, December 2009

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers that may be applied by data validators in compliance with the CHPRC statement of work are as follows:

- **U** — The constituent was analyzed for, but was not detected. The data should be considered usable for decision-making purposes.

- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the RL. The data should be considered usable for decision-making purposes.

- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J+** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J-** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **N** — The analysis indicates the presence of an analyte that has been tentatively identified.

- **NJ** — The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

- **NJ+** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation.

- **NJ-** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation.

- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2

Summary of Data Qualification

Inorganic Data Qualification Summary			
SDG: 20100064	Reviewer: AQA	Project: WMA C	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
Ca, Si	J-	B27130, B7131	Low LCS recovery
Bi, Zr	J	B27130, B27131	Low MS recovery
Sn-117, Sn-126	UJ	B27130, B27131	Low MS recovery
U-234	4.26E-05U	B27131	Lab blank contamination

Comments: None

Appendix 3

Annotated Laboratory Reports

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000196			57-12-5	Cyanide	ug/g	100	<0.0370	<2.68	n/a	n/a	n/a	n/a	2.68	n/a	U
S10V000196			7439-97-6	Mercury	ug/g	101	<1.00E-04	<7.85E-03	n/a	n/a	n/a	102	7.85E-03	n/a	U
S10V000196			PH	pH	unitless	n/a	n/a	7.21	7.24	7.22	0.415	n/a	0.0100	n/a	
S10V000196			18496-25-8	Sulfide	ug/g	96.7	<0.180	24.4	n/a	n/a	n/a	n/a	6.91	n/a	J
S10V000198			15046-84-1	Iodine-129	uCi/g	109	<9.68E-07	<1.59E-07	n/a	n/a	n/a	n/a	1.59E-07	n/a	U
S10V000199		O	120-82-1	1,2,4-Trichlorobenzene	ug/kg	73.2	<77.4	<76.8	n/a	n/a	n/a	n/a	76.8	n/a	U
S10V000199		O	95-50-1	1,2-Dichlorobenzene	ug/kg	n/a	<101	<99.9	n/a	n/a	n/a	n/a	99.9	n/a	U
S10V000199		O	121-14-2	2,4-Dinitrotoluene	ug/kg	84.1	<38.1	<37.8	n/a	n/a	n/a	n/a	37.8	n/a	U
S10V000199		O	95-95-4	2,4,5-Trichlorophenol	ug/kg	n/a	<44.0	<43.6	n/a	n/a	n/a	n/a	43.6	n/a	U
S10V000199		O	88-06-2	2,4,6-Trichlorophenol	ug/kg	n/a	<49.5	<49.1	n/a	n/a	n/a	n/a	49.1	n/a	U
S10V000199		O	95-48-7	2-Methylphenol	ug/kg	n/a	<57.5	<57.0	n/a	n/a	n/a	n/a	57.0	n/a	U
S10V000199		O	88-75-5	2-Nitrophenol	ug/kg	n/a	<53.7	<53.3	n/a	n/a	n/a	n/a	53.3	n/a	U
S10V000199		O	65794-96-9	3 &4 Methylphenol	ug/kg	n/a	<51.4	<51.0	n/a	n/a	n/a	n/a	51.0	n/a	U
S10V000199		O	83-32-9	Acenaphthene	ug/kg	76.9	<17.6	<17.5	n/a	n/a	n/a	n/a	17.5	n/a	U
S10V000199		O	56-55-3	Benzo(a)anthracene	ug/kg	n/a	<37.8	<37.5	n/a	n/a	n/a	n/a	37.5	n/a	U
S10V000199		O	205-99-2	Benzo(b)fluoranthene	ug/kg	n/a	<48.9	<48.5	n/a	n/a	n/a	n/a	48.5	n/a	U
S10V000199		O	50-32-8	Benzo(a)pyrene	ug/kg	n/a	<41.2	<40.9	n/a	n/a	n/a	n/a	40.9	n/a	U
S10V000199		O	117-81-7	Bis(2-ethylhexyl) phthalate	ug/kg	n/a	<590	<585	n/a	n/a	n/a	n/a	585	n/a	U
S10V000199		O	207-08-9	Benzo(k)fluoranthene	ug/kg	n/a	<39.1	<38.8	n/a	n/a	n/a	n/a	38.8	n/a	U
S10V000199		O	85-68-7	Butylbenzylphthalate	ug/kg	n/a	107	109	n/a	n/a	n/a	n/a	49.6	n/a	BJ
S10V000199		O	59-50-7	4-Chloro-3-methylphenol	ug/kg	83.1	<43.2	<42.8	n/a	n/a	n/a	n/a	42.8	n/a	U
S10V000199		O	95-57-8	2-Chlorophenol	ug/kg	77.0	<66.5	<66.0	n/a	n/a	n/a	n/a	66.0	n/a	U
S10V000199		O	218-01-9	Chrysene	ug/kg	n/a	<81.4	<80.7	n/a	n/a	n/a	n/a	80.7	n/a	U
S10V000199		O	53-70-3	Dibenz[a,h]anthracene	ug/kg	n/a	<51.1	<50.7	n/a	n/a	n/a	n/a	50.7	n/a	U
S10V000199		O	84-74-2	Di-n-butylphthalate	ug/kg	n/a	<562	<558	n/a	n/a	n/a	n/a	558	n/a	U
S10V000199		O	117-84-0	Di-n-octylphthalate	ug/kg	n/a	<47.7	572	n/a	n/a	n/a	n/a	47.3	n/a	
S10V000199		O	621-64-7	N-Nitroso-di-n-dipropylamine	ug/kg	69.8	<58.1	<57.6	n/a	n/a	n/a	n/a	57.6	n/a	U
S10V000199		O	206-44-0	Fluoranthene	ug/kg	n/a	<35.4	<35.1	n/a	n/a	n/a	n/a	35.1	n/a	U
S10V000199		O	87-68-3	Hexachlorobutadiene	ug/kg	n/a	<69.7	<69.1	n/a	n/a	n/a	n/a	69.1	n/a	U

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4-27-2011
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Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000199		O	67-72-1	Hexachloroethane	ug/kg	n/a	<112	<111	n/a	n/a	n/a	n/a	111	n/a	U
S10V000199		O	193-39-5	Indeno(1,2,3-cd)pyrene	ug/kg	n/a	<51.0	<50.6	n/a	n/a	n/a	n/a	50.6	n/a	U
S10V000199		O	91-20-3	Naphthalene	ug/kg	n/a	<62.6	<62.1	n/a	n/a	n/a	n/a	62.1	n/a	U
S10V000199		O	98-95-3	Nitrobenzene	ug/kg	n/a	<64.6	<64.1	n/a	n/a	n/a	n/a	64.1	n/a	U
S10V000199		O	129-00-0	Pyrene	ug/kg	91.3	<62.9	<62.4	n/a	n/a	n/a	n/a	62.4	n/a	U
S10V000199		O	110-86-1	Pyridine	ug/kg	n/a	<65.0	<64.5	n/a	n/a	n/a	n/a	64.5	n/a	U
S10V000199		O	126-73-8	Tributyl phosphate	ug/kg	n/a	<108	<107	n/a	n/a	n/a	n/a	107	n/a	U
S10V000199		O	128-37-0	BHT	ug/kg	n/a	<236	<234	n/a	n/a	n/a	n/a	234	n/a	U
S10V000199		O	110-80-5	2-Ethoxyethanol	ug/kg	n/a	<182	<181	n/a	n/a	n/a	n/a	181	n/a	U
S10V000199		O	1319-77-3	Total Methylphenols	ug/kg	n/a	<107	<106	n/a	n/a	n/a	n/a	106	n/a	U
S10V000199		O	108-94-1	Cyclohexanone	ug/kg	n/a	<558	<554	n/a	n/a	n/a	n/a	554	n/a	U
S10V000199		O	59-89-2	N-Nitrosomorpholine	ug/kg	n/a	<191	<190	n/a	n/a	n/a	n/a	190	n/a	U
S10V000199		O	78-83-1	Isobutanol	ug/kg	n/a	<460	<457	n/a	n/a	n/a	n/a	457	n/a	U
S10V000200		W	16984-48-8	Fluoride	ug/g	104	<1.61E-03	3.53	n/a	n/a	n/a	n/a	0.0175	n/a	
S10V000200		W	666-14-8	Glycolate	ug/g	101	<9.37E-03	<0.102	n/a	n/a	n/a	n/a	0.102	n/a	U
S10V000200		W	71-50-1	Acetate	ug/g	98.9	<6.04E-03	0.854	n/a	n/a	n/a	n/a	0.0655	n/a	J
S10V000200		W	12311-97-6	Formate	ug/g	103	<4.67E-03	0.556	n/a	n/a	n/a	n/a	0.0507	n/a	J
S10V000200		W	16887-00-6	Chloride	ug/g	100	<9.98E-03	0.763	n/a	n/a	n/a	n/a	0.108	n/a	
S10V000200		W	14797-65-0	Nitrite	ug/g	102	0.0389	1.90	n/a	n/a	n/a	n/a	0.208	n/a	BJ
S10V000200		W	14808-79-8	Sulfate	ug/g	101	<0.0187	7.83	n/a	n/a	n/a	n/a	0.203	n/a	
S10V000200		W	338-70-5	Oxalate	ug/g	103	<0.0231	1.20	n/a	n/a	n/a	n/a	0.251	n/a	J
S10V000200		W	24959-67-9	Bromide	ug/g	103	<0.0580	<0.629	n/a	n/a	n/a	n/a	0.629	n/a	U
S10V000200		W	14797-55-8	Nitrate	ug/g	103	<0.0208	39.7	n/a	n/a	n/a	n/a	0.226	n/a	
S10V000200		W	14265-44-2	Phosphate	ug/g	101	<0.0167	2.79	n/a	n/a	n/a	n/a	0.181	n/a	Jb
S10V000201		A	7429-90-5	Aluminum	ug/g	83.2	<0.0300	6.77E+03	n/a	n/a	n/a	n/a	3.28	n/a	
S10V000201		A	7440-39-3	Barium	ug/g	84.5	<3.00E-03	66.8	n/a	n/a	n/a	n/a	0.328	n/a	
S10V000201		A	7440-41-7	Beryllium	ug/g	82.5	<1.00E-03	0.166	n/a	n/a	n/a	n/a	0.109	n/a	J
S10V000201		A	7440-69-9	Bismuth J	ug/g	82.3	<0.100	36.7	n/a	n/a	n/a	n/a	10.9	n/a	Jb
S10V000201		A	7440-70-2	Calcium J-	ug/g	78.3	<0.0500	8.06E+03	n/a	n/a	n/a	n/a	5.46	n/a	a

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Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte		Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000201		A	7440-43-9	Cadmium		ug/g	83.0	<5.00E-03	2.99	n/a	n/a	n/a	n/a	0.546	n/a	J
S10V000201		A	7440-45-1	Cerium		ug/g	89.7	<0.0300	23.7	n/a	n/a	n/a	n/a	3.28	n/a	J
S10V000201		A	7440-48-4	Cobalt		ug/g	82.2	<0.0100	8.37	n/a	n/a	n/a	n/a	1.09	n/a	J
S10V000201		A	7440-47-3	Chromium		ug/g	82.1	<5.00E-03	10.0	n/a	n/a	n/a	n/a	0.546	n/a	
S10V000201		A	7440-50-8	Copper		ug/g	86.4	<5.00E-03	11.0	n/a	n/a	n/a	n/a	0.546	n/a	
S10V000201		A	7439-89-6	Iron		ug/g	82.8	<5.00E-03	2.21E+04	n/a	n/a	n/a	n/a	0.546	n/a	
S10V000201		A	7440-09-7	Potassium		ug/g	82.0	<0.500	1.06E+03	n/a	n/a	n/a	n/a	54.6	n/a	
S10V000201		A	7439-91-0	Lanthanum		ug/g	85.3	<3.00E-03	9.86	n/a	n/a	n/a	n/a	0.328	n/a	
S10V000201		A	7439-93-2	Lithium		ug/g	86.1	<3.00E-03	7.29	n/a	n/a	n/a	n/a	0.328	n/a	
S10V000201		A	7439-95-4	Magnesium		ug/g	80.0	<0.0500	4.55E+03	n/a	n/a	n/a	n/a	5.46	n/a	
S10V000201		A	7439-96-5	Manganese		ug/g	81.4	<3.00E-03	331	n/a	n/a	n/a	n/a	0.328	n/a	
S10V000201		A	7439-98-7	Molybdenum		ug/g	94.9	<0.0200	<2.18	n/a	n/a	n/a	n/a	2.18	n/a	U
S10V000201		A	7440-23-5	Sodium		ug/g	87.0	<0.100	300	n/a	n/a	n/a	n/a	10.9	n/a	
S10V000201		A	7440-02-0	Nickel		ug/g	81.1	<0.0200	8.69	n/a	n/a	n/a	n/a	2.18	n/a	J
S10V000201		A	7723-14-0	Phosphorus		ug/g	91.7	<0.0500	772	n/a	n/a	n/a	n/a	5.46	n/a	
S10V000201		A	7704-34-9	Sulfur		ug/g	93.0	<0.100	66.0	n/a	n/a	n/a	n/a	10.9	n/a	J
S10V000201		A	7440-21-3	Silicon	J-	ug/g	77.7	<0.0300	32.9	n/a	n/a	n/a	n/a	3.28	n/a	a
S10V000201		A	7440-24-6	Strontium		ug/g	84.6	<3.00E-03	29.9	n/a	n/a	n/a	n/a	0.328	n/a	
S10V000201		A	7440-32-6	Titanium		ug/g	92.6	<5.00E-03	1.58E+03	n/a	n/a	n/a	n/a	0.546	n/a	
S10V000201		A	7440-62-2	Vanadium		ug/g	84.2	<5.00E-03	55.6	n/a	n/a	n/a	n/a	0.546	n/a	
S10V000201		A	7440-65-5	Yttrium		ug/g	85.5	<2.00E-03	8.82	n/a	n/a	n/a	n/a	0.218	n/a	
S10V000201		A	7440-66-6	Zinc		ug/g	83.9	<5.00E-03	45.3	n/a	n/a	n/a	n/a	0.546	n/a	
S10V000201		A	7440-67-7	Zirconium	J	ug/g	88.7	<5.00E-03	13.9	n/a	n/a	n/a	n/a	0.546	n/a	b
S10V000201		A	14269-63-7	Thorium-230		ug/g	n/a	<2.80E-06	<3.06E-05	n/a	n/a	n/a	n/a	3.06E-05	n/a	U
S10V000201		A	TH-232	Thorium-232		ug/g	106	<6.80E-05	3.08	n/a	n/a	n/a	n/a	7.42E-04	n/a	
S10V000201		A	13968-55-3	Uranium-233		ug/g	n/a	<4.00E-06	1.91E-04	n/a	n/a	n/a	n/a	4.37E-05	n/a	J
S10V000201		A	13966-29-5	Uranium-234		ug/g	n/a	2.15E-06	<2.18E-05	n/a	n/a	n/a	n/a	2.18E-05	n/a	U
S10V000201		A	15117-96-1	Uranium-235		ug/g	104	<4.40E-06	3.11E-03	n/a	n/a	n/a	n/a	4.80E-05	n/a	
S10V000201		A	13982-70-2	Uranium-236		ug/g	n/a	<1.60E-06	<1.75E-05	n/a	n/a	n/a	n/a	1.75E-05	n/a	U

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Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000201		A	13994-20-2	Neptunium-237	ug/g	106	<2.12E-05	<2.31E-04	n/a	n/a	n/a	n/a	2.31E-04	n/a	U
S10V000201		A	U-238	Uranium-238	ug/g	110	<2.20E-04	0.468	n/a	n/a	n/a	n/a	2.40E-03	n/a	
S10V000201		A	7440-22-4	Silver	ug/g	82.2	<3.20E-03	0.0694	n/a	n/a	n/a	n/a	0.0349	n/a	J
S10V000201		A	7440-38-2	Arsenic	ug/g	108	<0.0168	4.90	n/a	n/a	n/a	n/a	0.183	n/a	b
S10V000201		A	7439-92-1	Lead	ug/g	84.0	<0.0124	4.31	n/a	n/a	n/a	n/a	0.135	n/a	
S10V000201		A	7782-49-2	Selenium	ug/g	86.4	<0.0244	0.685	n/a	n/a	n/a	n/a	0.266	n/a	J
S10V000201		A	7440-28-0	Thallium	ug/g	103	<1.20E-03	0.703	n/a	n/a	n/a	n/a	0.0131	n/a	B
~~S10V000202~~		~~S~~	~~14798-03-9~~	~~Ammonium~~	~~ug/g~~	~~101~~	~~<0.0120~~	~~1.73~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~0.469~~	~~n/a~~	~~J~~
S10V000203		A	14133-76-7	Technetium-99	ug/g	93.6	<1.50E-04	<1.76E-03	n/a	n/a	n/a	n/a	1.76E-03	n/a	U
S10V000203		A	SN-117	Tin-117 UJ	ug/g	104	<5.50E-03	<0.0646	n/a	n/a	n/a	n/a	0.0646	n/a	U
S10V000203		A	15832-50-5	Tin-126 UJ	ug/g	n/a	<1.00E-04	<1.17E-03	n/a	n/a	n/a	n/a	1.17E-03	n/a	U
~~S10V001168~~		~~W~~	~~10028-17-8~~	~~Tritium~~	~~uCi/g~~	~~87.9~~	~~<3.83E-06~~	~~2.50E-06~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~2.45E-06~~	~~136.6~~	~~J~~
S10V001207		A	7440-36-0	Antimony	ug/g	99.4	<0.0100	0.161	n/a	n/a	n/a	n/a	9.24E-03	n/a	
S10V002144		WV	14133-76-7	Technetium-99	ug/g	109	<3.00E-06	<3.01E-06	n/a	n/a	n/a	n/a	3.01E-06	n/a	U
~~S10V002235~~		~~W~~	~~14762-75-5~~	~~Carbon-14~~	~~uCi/g~~	~~94.0~~	~~<3.49E-07~~	~~<2.81E-06~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~2.81E-06~~	~~n/a~~	~~U~~

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Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000231			%WATERA	%WATER-APD	%	n/a	n/a	5.780	n/a	n/a	n/a	n/a	0.01000	n/a	
S10V000231			57-12-5	Cyanide	ug/g	100	<0.0370	<2.61	n/a	n/a	n/a	n/a	2.61	n/a	U
S10V000231			7439-97-6	Mercury	ug/g	101	<1.00E-04	<8.01E-03	n/a	n/a	n/a	n/a	8.01E-03	n/a	U
S10V000231			PH	pH	unitless	n/a	n/a	7.86	n/a	n/a	n/a	n/a	0.0100	n/a	
S10V000231			18496-25-8	Sulfide	ug/g	105	<0.180	24.5	23.9	24.2	2.58	97.7	7.12	n/a	J
S10V000233			13966-00-2	Potassium-40	uCi/g	n/a	n/a	1.04E-05	n/a	n/a	n/a	n/a	5.77E-06	36.50	J
S10V000233			10198-40-0	Cobalt-60	uCi/g	102	<3.08E-07	<2.71E-07	n/a	n/a	n/a	n/a	2.71E-07	n/a	U
S10V000233			14234-35-6	Antimony-125	uCi/g	n/a	<6.68E-07	<7.15E-07	n/a	n/a	n/a	n/a	7.15E-07	n/a	U
S10V000233			10045-97-3	Cesium-137	uCi/g	107	<3.81E-07	<3.55E-07	n/a	n/a	n/a	n/a	3.55E-07	n/a	U
S10V000233			14683-23-9	Europium-152	uCi/g	n/a	<1.37E-06	<1.28E-06	n/a	n/a	n/a	n/a	1.28E-06	n/a	U
S10V000233			15585-10-1	Europium-154	uCi/g	n/a	<9.15E-07	<8.47E-07	n/a	n/a	n/a	n/a	8.47E-07	n/a	U
S10V000233			14391-16-3	Europium-155	uCi/g	n/a	<4.54E-07	<4.44E-07	n/a	n/a	n/a	n/a	4.44E-07	n/a	U
S10V000233			15092-94-1	Lead-212	uCi/g	n/a	n/a	8.16E-07	n/a	n/a	n/a	n/a	5.57E-07	29.49	
S10V000233			14274-82-9	Thorium-228	uCi/g	n/a	<8.10E-06	<8.80E-06	n/a	n/a	n/a	n/a	8.80E-06	n/a	U
S10V000233			15065-10-8	Thorium-234	uCi/g	n/a	<2.56E-06	<3.00E-06	n/a	n/a	n/a	n/a	3.00E-06	n/a	U
S10V000233			15046-84-1	Iodine-129	uCi/g	117	<2.00E-07	<1.76E-07	n/a	n/a	n/a	n/a	1.76E-07	n/a	U
S10V000234		O	120-82-1	1,2,4-Trichlorobenzene	ug/kg	73.2	<77.4	<77.0	n/a	n/a	n/a	67.1	77.0	n/a	U
S10V000234		O	95-50-1	1,2-Dichlorobenzene	ug/kg	n/a	<101	<100	n/a	n/a	n/a	n/a	100	n/a	U
S10V000234		O	121-14-2	2,4-Dinitrotoluene	ug/kg	84.1	<38.1	<37.9	n/a	n/a	n/a	86.5	37.9	n/a	U
S10V000234		O	95-95-4	2,4,5-Trichlorophenol	ug/kg	n/a	<44.0	<43.8	n/a	n/a	n/a	n/a	43.8	n/a	U
S10V000234		O	88-06-2	2,4,6-Trichlorophenol	ug/kg	n/a	<49.5	<49.2	n/a	n/a	n/a	n/a	49.2	n/a	U
S10V000234		O	95-48-7	2-Methylphenol	ug/kg	n/a	<57.5	<57.2	n/a	n/a	n/a	n/a	57.2	n/a	U
S10V000234		O	88-75-5	2-Nitrophenol	ug/kg	n/a	<53.7	<53.4	n/a	n/a	n/a	n/a	53.4	n/a	U
S10V000234		O	65794-96-9	3 &4 Methylphenol	ug/kg	n/a	<51.4	<51.1	n/a	n/a	n/a	n/a	51.1	n/a	U
S10V000234		O	83-32-9	Acenaphthene	ug/kg	76.9	<17.6	<17.5	n/a	n/a	n/a	71.4	17.5	n/a	U
S10V000234		O	56-55-3	Benzo(a)anthracene	ug/kg	n/a	<37.8	<37.6	n/a	n/a	n/a	n/a	37.6	n/a	U
S10V000234		O	205-99-2	Benzo(b)fluoranthene	ug/kg	n/a	<48.9	<48.6	n/a	n/a	n/a	n/a	48.6	n/a	U
S10V000234		O	50-32-8	Benzo(a)pyrene	ug/kg	n/a	<41.2	<41.0	n/a	n/a	n/a	n/a	41.0	n/a	U
S10V000234		O	117-81-7	Bis(2-ethylhexyl) phthalate	ug/kg	n/a	<590	<587	n/a	n/a	n/a	n/a	587	n/a	U

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LS
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c - RPD Outside Range
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Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000235		W	14797-65-0	Nitrite	ug/g	102	0.0389	4.75	n/a	n/a	n/a	n/a	0.206	n/a	B
S10V000235		W	14808-79-8	Sulfate	ug/g	101	<0.0187	9.10	n/a	n/a	n/a	n/a	0.201	n/a	
S10V000235		W	338-70-5	Oxalate	ug/g	103	<0.0231	1.25	n/a	n/a	n/a	n/a	0.248	n/a	J
S10V000235		W	24959-67-9	Bromide	ug/g	103	<0.0580	<0.623	n/a	n/a	n/a	n/a	0.623	n/a	U
S10V000235		W	14797-55-8	Nitrate	ug/g	103	<0.0208	12.2	n/a	n/a	n/a	n/a	0.223	n/a	
S10V000235		W	14265-44-2	Phosphate	ug/g	101	<0.0167	2.32	n/a	n/a	n/a	n/a	0.179	n/a	Jb
S10V000236		A	7429-90-5	Aluminum	ug/g	83.2	<0.0300	7.11E+03	n/a	n/a	n/a	n/a	3.05	n/a	
S10V000236		A	7440-39-3	Barium	ug/g	84.5	<3.00E-03	75.5	n/a	n/a	n/a	n/a	0.305	n/a	
S10V000236		A	7440-41-7	Beryllium	ug/g	82.5	<1.00E-03	0.135	n/a	n/a	n/a	n/a	0.102	n/a	J
S10V000236		A	7440-69-9	Bismuth J	ug/g	82.3	<0.100	19.4	n/a	n/a	n/a	n/a	10.2	n/a	Jb
S10V000236		A	7440-70-2	Calcium J-	ug/g	78.3	<0.0500	8.77E+03	n/a	n/a	n/a	n/a	5.09	n/a	a
S10V000236		A	7440-43-9	Cadmium	ug/g	83.0	<5.00E-03	2.97	n/a	n/a	n/a	n/a	0.509	n/a	J
S10V000236		A	7440-45-1	Cerium	ug/g	89.7	<0.0300	23.7	n/a	n/a	n/a	n/a	3.05	n/a	J
S10V000236		A	7440-48-4	Cobalt	ug/g	82.2	<0.0100	9.35	n/a	n/a	n/a	n/a	1.02	n/a	J
S10V000236		A	7440-47-3	Chromium	ug/g	82.1	<5.00E-03	11.0	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-50-8	Copper	ug/g	86.4	<5.00E-03	12.2	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7439-89-6	Iron	ug/g	82.8	<5.00E-03	2.40E+04	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-09-7	Potassium	ug/g	82.0	<0.500	1.07E+03	n/a	n/a	n/a	n/a	50.9	n/a	
S10V000236		A	7439-91-0	Lanthanum	ug/g	85.3	<3.00E-03	9.99	n/a	n/a	n/a	n/a	0.305	n/a	
S10V000236		A	7439-93-2	Lithium	ug/g	86.1	<3.00E-03	7.62	n/a	n/a	n/a	n/a	0.305	n/a	
S10V000236		A	7439-95-4	Magnesium	ug/g	80.0	<0.0500	4.58E+03	n/a	n/a	n/a	n/a	5.09	n/a	
S10V000236		A	7439-96-5	Manganese	ug/g	81.4	<3.00E-03	359	n/a	n/a	n/a	n/a	0.305	n/a	
S10V000236		A	7439-98-7	Molybdenum	ug/g	94.9	<0.0200	<2.04	n/a	n/a	n/a	n/a	2.04	n/a	U
S10V000236		A	7440-23-5	Sodium	ug/g	87.0	<0.100	315	n/a	n/a	n/a	n/a	10.2	n/a	
S10V000236		A	7440-02-0	Nickel	ug/g	81.1	<0.0200	9.19	n/a	n/a	n/a	n/a	2.04	n/a	J
S10V000236		A	7723-14-0	Phosphorus	ug/g	91.7	<0.0500	839	n/a	n/a	n/a	n/a	5.09	n/a	
S10V000236		A	7704-34-9	Sulfur	ug/g	93.0	<0.100	70.3	n/a	n/a	n/a	n/a	10.2	n/a	J
S10V000236		A	7440-21-3	Silicon J-	ug/g	77.7	<0.0300	27.5	n/a	n/a	n/a	n/a	3.05	n/a	Ja
S10V000236		A	7440-24-6	Strontium	ug/g	84.6	<3.00E-03	31.5	n/a	n/a	n/a	n/a	0.305	n/a	

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LS
4-27-2011

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000236		A	7440-32-6	Titanium	ug/g	92.6	<5.00E-03	1.63E+03	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-62-2	Vanadium	ug/g	84.2	<5.00E-03	60.0	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-65-5	Yttrium	ug/g	85.5	<2.00E-03	9.15	n/a	n/a	n/a	n/a	0.204	n/a	
S10V000236		A	7440-66-6	Zinc	ug/g	83.9	<5.00E-03	42.3	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-67-7	Zirconium J	ug/g	88.7	<5.00E-03	7.28	n/a	n/a	n/a	n/a	0.509	n/a	b
S10V000236		A	14269-63-7	Thorium-230	ug/g	n/a	<2.80E-06	<2.85E-05	n/a	n/a	n/a	n/a	2.85E-05	n/a	U
S10V000236		A	TH-232	Thorium-232	ug/g	106	<6.80E-05	2.73	n/a	n/a	n/a	n/a	6.92E-04	n/a	
S10V000236		A	13968-55-3	Uranium-233	ug/g	n/a	<4.00E-06	1.72E-04	n/a	n/a	n/a	n/a	4.07E-05	n/a	J
S10V000236		A	13966-29-5	Uranium-234 4.26E-05U	ug/g	n/a	2.15E-06	4.26E-05	n/a	n/a	n/a	n/a	2.04E-05	n/a	BJ
S10V000236		A	15117-96-1	Uranium-235	ug/g	104	<4.40E-06	3.37E-03	n/a	n/a	n/a	n/a	4.48E-05	n/a	
S10V000236		A	13982-70-2	Uranium-236	ug/g	n/a	<1.60E-06	<1.63E-05	n/a	n/a	n/a	n/a	1.63E-05	n/a	U
S10V000236		A	13994-20-2	Neptunium-237	ug/g	106	<2.12E-05	<2.16E-04	n/a	n/a	n/a	n/a	2.16E-04	n/a	U
S10V000236		A	U-238	Uranium-238	ug/g	110	<2.20E-04	0.477	n/a	n/a	n/a	n/a	2.24E-03	n/a	
S10V000236		A	7440-22-4	Silver	ug/g	82.2	<3.20E-03	0.0419	n/a	n/a	n/a	n/a	0.0326	n/a	J
S10V000236		A	7440-38-2	Arsenic	ug/g	108	<0.0168	3.77	n/a	n/a	n/a	n/a	0.171	n/a	b
S10V000236		A	7439-92-1	Lead	ug/g	84.0	<0.0124	4.30	n/a	n/a	n/a	n/a	0.126	n/a	
S10V000236		A	7782-49-2	Selenium	ug/g	86.4	<0.0244	0.438	n/a	n/a	n/a	n/a	0.248	n/a	J
S10V000236		A	7440-28-0	Thallium	ug/g	103	<1.20E-03	0.661	n/a	n/a	n/a	n/a	0.0122	n/a	B
S10V000237		S	14798-03-9	Ammonium	ug/g	97.6	0.0298	3.63	1.80	2.71	67.4	96.6	0.464	n/a	BJ
S10V000238		A	14133-76-7	Technetium-99	ug/g	93.6	<1.50E-04	<1.64E-03	n/a	n/a	n/a	n/a	1.64E-03	n/a	U
S10V000238		A	SN-117	Tin-117 UJ	ug/g	104	<5.50E-03	<0.0601	n/a	n/a	n/a	n/a	0.0601	n/a	U
S10V000238		A	15832-50-5	Tin-126 UJ	ug/g	n/a	<1.00E-04	<1.09E-03	n/a	n/a	n/a	n/a	1.09E-03	n/a	U
~~S10V000239~~		~~E~~	~~CM-243/244~~	~~Curium-243/244~~	~~uCi/g~~	~~n/a~~	~~<2.56E-07~~	~~<2.12E-07~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~2.12E-07~~	~~n/a~~	~~U~~
S10V000239		E	14596-10-2	Americium-241	uCi/g	104	<6.41E-07	<5.31E-07	n/a	n/a	n/a	n/a	5.31E-07	n/a	U
S10V000239		E	15510-73-3	Curium-242	uCi/g	n/a	<2.56E-07	<2.12E-07	n/a	n/a	n/a	n/a	2.12E-07	n/a	U
S10V000239		E	PU-239/240	Plutonium-239/240	uCi/g	99.8	<3.55E-07	<3.13E-07	n/a	n/a	n/a	n/a	3.13E-07	n/a	U
S10V000239		E	13981-16-3	Plutonium-238	uCi/g	n/a	<3.55E-07	<3.13E-07	n/a	n/a	n/a	n/a	3.13E-07	n/a	U
S10V000240		E	SR-89/90	Strontium-89/90	uCi/g	99.4	<6.99E-07	<2.62E-07	n/a	n/a	n/a	n/a	2.62E-07	n/a	U
~~S10V000241~~		~~E~~	~~13981-37-8~~	~~Nickel-63~~	~~uCi/g~~	~~103~~	~~<5.87E-06~~	~~<8.76E-06~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~8.76E-06~~	~~n/a~~	~~U~~

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LS
4-27-2011

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
~~S10V000241~~		~~E~~	~~15758-45-9~~	~~Selenium-79~~	~~uCi/g~~	~~n/a~~	~~4.38E-06~~	~~<3.81E-06~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~3.81E-06~~	~~n/a~~	~~U~~
~~S10V001168~~		~~W~~	~~10028-17-8~~	~~Tritium~~	~~uCi/g~~	~~94.2~~	~~<4.07E-06~~	~~4.21E-06~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~2.48E-06~~	~~74.703~~	~~J~~
S10V001208		A	7440-36-0	Antimony	ug/g	99.9	<2.00E-04	0.114	n/a	n/a	n/a	n/a	9.41E-03	n/a	
S10V002145		WV	14133-76-7	Technetium-99	ug/g	109	<3.00E-06	<3.06E-06	n/a	n/a	n/a	n/a	3.06E-06	n/a	U
~~S10V002236~~		~~W~~	~~14762-75-5~~	~~Carbon-14~~	~~uCi/g~~	~~95.1~~	~~<1.33E-07~~	~~<2.56E-06~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~2.56E-06~~	~~n/a~~	~~U~~

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4-27-2011

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b - MS/MSD Outside Range
a - LCS Outside Range

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

222-S LABORATORY

FINAL ANALYTICAL REPORT FOR SAMPLES FROM WASTE MANAGEMENT AREA C FOR CORE HOLE C7668 IN SUPPORT OF RCRA SOIL CHARACTERIZATION

1.0 INTRODUCTION

This final report presents the results for the samples taken from Waste Management Area C between May 15, 2010 and June 8, 2010. The samples were analyzed in accordance with RPP-PLAN-40564, *Field Sampling and Analysis Plan for Sites P and L at Waste Management Area C* (FSAP); RPP-PLAN-38777, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C* (SAP); ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP); SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*; and the additional guidance given by the client's point of contact.

Because the 222-S Laboratory facility was designed to analyze hazardous and complex tank waste samples, most SW-846 test methods performed at the 222-S Laboratory contain deviations that are listed in an appendix in the analytical procedures. All other known deviations or variances from SW-846 are documented in this narrative. The following attachments are included in this report.

Attachment 1	Data Summary Report
Attachment 2	Sample Breakdown Diagrams
Attachment 3	Holding Time Report
Attachment 4	Additional Mercury and Organic Analyses QC Results
Attachment 5	Tentatively Identified Compounds (TIC) for Organic Analyses
Attachment 6	Geological Report
Attachment 7	Characterization Change Notices (CCN), and Correspondence
Attachment 8	Receipt Paperwork
Appendix 1	Analytical Report for Analysis Performed at the Waste Sampling and Characterization Facility (WSCF)

2.0 SAMPLE RECEIPT AND BREAKDOWN

2.1 SAMPLE RECEIPT

A total of nine core intervals and two surface grab samples from core hole C7668 along with seven field blanks, and six trip blanks were received by the 222-S Laboratory between May 15, 2010 and June 8, 2010. Due to an instrumentation issue, the volatile organic analysis samples for client sample numbers B25WN0 (I012), B23VB5 (Field Blank 10), and B23VC4 (Trip Blank 9) were delivered directly to WSCF for analysis. The samples were delivered in a cooler with ice or, in the case of the volatile organic samples, in a freezer. The temperatures of the temperature blanks were measured and recorded on the sample receipt check list and/or the chain of custody form.

2.2 SAMPLE BREAKDOWN

The laboratory received each core interval as a set of volatile organic analysis (VOA) samples and three liner samples when complete core recovery was obtained. The VOA samples were made from the shoe section of each core interval following SW-846 5035. The liner samples from each core interval were extruded, described, and composited by the Washington River Protection Solutions, Inc. (WRPS) geologist. The geologist's report is included in Attachment 6. Provided sufficient samples existed, the composite for each core interval was analyzed as described in the SAP and FSAP. Six core intervals (I001, I003, I004, I005, I006, and I007) had less than full recovery (see Attachment 2 and Attachment 8). There was no I002 for core hole C7668. Intervals I001 and I007 were extruded and composited in the normal manner. Interval I003 was combined with I004 to form a single composite, and Interval I005 was combined with I006 to form a single composite (see Attachment 7, CCN-WMAC-008). The surface samples were received as a single grab in a 500-mL jar and a set of VOA samples.

In addition to the grab and core samples, a water sample from interval I010 was delivered to the lab. This sample was from a small amount of standing water encountered on top of the sampler. CCN-WMAC-009 request that this sample be analyzed for ^{99}Tc.

C7668 CCN-WMAC-008 provided a priority list for the laboratory to follow for the intervals without enough sample to perform all analysis requested in the SAP and FSAP. For interval I001, the laboratory followed this instruction. For the combined interval of I004 and I005, the laboratory analyzed for ^{99}Tc using the Vadose water digest, which consumed the sample that was to be used for the radiochemistry analysis, which had a higher priority. The analyses which were not performed were gamma energy analysis % Water (GEA), ^{63}Ni, $^{89/90}$Sr, $^{238,239/240}$Pu, ^{241}Am, and $^{242,243/244}$Cm.This failure to follow the client's instruction has been addressed, and improvements in communications and better use of the Laboratory Information Management System will be made to avoid this in the future.

WRPS shipped subsamples of the composites to Test America Laboratories, Inc. (TAL) in St Louis, Missouri and Knoxville, Tennessee to be analyzed for dibutyl and monobutyl phosphate, total petroleum hydrocarbons (diesel and gasoline range), ethylene glycol, chlorinated pesticides, and polychlorinated biphenyls (Aroclors and congeners). TAL subsequently subcontracted the monobutyl and dibutyl phosphate analyses to Southwest Research Institute. The results of these analyses will be released in the final WRPS report.

3.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for those analytes requested in the SAP and FSAP. Secondary analytes are only reported if detected. The TIC from gas chromatography-mass spectrometry (GC/MS) analysis of semivolatile organic compounds (SVOC) is presented in Attachment 5. In addition to the required isotopes, all isotopes with positive GEA results were reported.

The "Det Limit" column in Attachment 1 contains the method detection limit (MDL) for non-radionuclide analyses, or the minimum detectable activity for radionuclides.

In Attachment 1, the column labeled "A#" indicates the aliquot class or the method used for sample preparation before analysis. For solid samples, the aliquot classes are defined as follows:

"A" indicates samples that were prepared by SW-846 3050B.

"E" indicates samples that were prepared by a strong acid digest.

"O" indicates samples that were extracted for organic analysis.

"S" indicates samples that were prepared by a distillation.

"W" indicates samples that were prepared by a standard water digest.

"WV" indicates samples that were prepared by a Vadose water digest.

Samples without a letter identifier in the "A#" column were analyzed directly with no separate preparation or with sample preparation performed as a part of the procedure steps.

The "Qual Flags" column in Attachment 1 contains data qualifier flags that are defined as follows:

"B" is used to indicate that the analyte was detected in the method or preparation blank and in the sample, and the result for the blank was greater than 5% of the reported sample result.

"J" indicates that the reported result should be considered an estimate because it is below the quantitation limit. The "J" flag is applied to sample concentrations that are greater than the MDL but less than the quantitation limit or sample activity with a counting uncertainty greater than 30%.

"N" indicates a TIC which has been named.

"T" indicates a TIC.

"U" indicates that the reported result is less than the calculated detection limit.

"a" indicates that the laboratory control sample (LCS) recovery was outside of the specified range in the QAPP or SAP.

"b" indicates that the matrix spike (MS) recovery was outside of the specified range in the QAPP or SAP.

"c" indicates that the relative percent difference (RPD) between the sample and the duplicate is greater than 30%.

Manual calculations using rounded results from the Data Summary Report (Attachment 1) or result calculation forms may differ slightly from the actual results derived from the raw data.

3.1 SAMPLE DIGESTIONS

3.1.1 Radiochemistry Strong Acid Digestion

Strong acid digestions with a hot plate for the heat source were performed using a mixture of concentrated nitric and hydrochloric acids. For each digest, approximately 1 to 10 g of sample

was digested depending on the analysis being performed. The digestate was then filtered and diluted to a final volume. This digestion was used for all radiochemical analyses except ^{3}H, ^{14}C, and ^{129}I. This digestion is a leach of the acid soluble species only.

3.1.2 SW-846 3050B - Acid Digestion-Heating Block

This acid digestion follows SW-846 3050B using a heating block and nitric and hydrochloric acids. An aliquot of approximately 5 g of sample was digested. All heating-block digestions were filtered and diluted to a final volume of 50 mL. In soil, this digestion is a leach of the acid soluble species only. This digestion was used for all inductively coupled plasma/mass spectrometry (ICP/MS) and inductively coupled plasma/atomic emission spectroscopy (ICP/AES) analyses except for ^{99}Tc and isotopic tin (^{117}Sn and ^{126}Sn) analysis. The digestion is modified for the ^{99}Tc analysis by using only nitric acid. This is done to eliminate the possibility of the formation a zinc-chlorine ion pair of mass 99. The laboratory believes this ion, when present, is responsible for low level false positives. A separate digestion for antimony was prepared using additional hydrochloric acid, as recommended in SW-846.

3.1.3 Water Digestion

A water digestion or leach was prepared for the anions by ion chromatography, ^{14}C, and ^{3}H analyses using approximately 0.25 to 4 g of sample diluted to 25 mL. Sonification was used, and the leachate was then filtered. In soil, this digestion is a leach of the water soluble species only.

3.1.4 Vadose Water Digestion

A 70-g sample of soil was leached using a ratio of one part water to one part soil. To maintain a one-to-one ratio, the amount of water added to the sample was adjusted based on the percent moisture of the soil. The slurries were placed on a shaker table for about 1 hour. They were then transferred to a centrifuge tube and centrifuged at 4,000 rpm for 30 minutes. An unfiltered aliquot was set aside for alkalinity analysis. The remainder was filtered using a disposable vacuum filtration system. The filtrates were transferred to a clean bottle and then analyzed for anions using IC nitrate analysis (intervals I005 to I010) and ^{99}Tc by ICP/MS analysis.

3.2 INORGANIC ANALYSES

3.2.1 Cyanide

The cyanide analysis by distillation and spectrophotometry was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 14 days. There was no required reporting limit in the SAP for cyanide. The target detection limit was 0.5 μg/g, which is lower than what the current laboratory method (lachet micro-distillation) can reach. There were no notable quality control (QC) issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.2.2 Sulfide

Sulfide analysis by distillation and ion selective electrode was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 7 days. There was no required reporting limit in the SAP for sulfide. The target detection limit was 5 µg/g. All sample results had adjusted MDLs of approximately 7 µg/g.

Batches 19830, 19631, 19885, 19967, and 20058: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19596: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required.

3.2.3 pH Analysis

The pH analysis was performed on the grab samples and liner composite samples except for sample B23TK8 (I001). This was due to insufficient sample. These analyses met all QC requirements in the FSAP, SAP, and QAPP. The FSAP lists a pH holding time requirement of "as soon as possible." All pH measurements were taken after the water leach was performed. The sampling to analysis time varied from 7 to 35 days (see Attachment 3). There is no correlation between pH results and days to analysis, and the results fall within an expected range for alkaline soils. This indicates that the variation in time has no apparent effect on the results.

3.2.4 Mercury

Analysis for Hg by cold-vapor graphic furnace/atomic absorption was performed on the digested subsamples of the grab samples and liner composite samples. All results met the QC requirements in the FSAP, SAP, and QAPP. All analyses met the holding time of 28 days. This analysis met the required and target detection limits.

3.2.5 Ion Chromatography – Ammonium

Analysis for ammonium was performed using a distillation preparation of the grab samples and the liner composite samples. The SAP lists an administrative holding time of 7 days. The laboratory believes that after distillation and preservation, the holding time is 28 days based on U.S. Environmental Protection Agency drinking water and waste water holding times for preserved samples. There is no regulatory holding time limit promulgated for ammonium in soil. All samples met these holding times. These analyses met the target detection limit listed in the SAP. There was no required reporting limit in the SAP or FSAP for ammonium.

Batch 19420: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19583: Laboratory personnel used an unknown and incorrect spike amount for the MS resulting in a high spike recovery of 247%. Since the project requirement is that one MS be performed per core hole, and five acceptable MSs exist, this MS was not reported (see

Attachment 7). All other QC requirements were met in this batch, including the post digestion spike.

Batches 19668, 19896, and 19938: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required. Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

Batches 19655 and 20024: Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

3.2.6 Ion Chromatography – Anions and Small Organic Acids

Ion chromatography analysis was performed on a standard water digest of subsamples from all grab samples and liner composite samples.

The laboratory met all of the required and target detection limits. For the standard water digest, all analyses were within the applicable holding time. The sample spikes used for the standard water digestions are predigestion spikes.

Batch 19599: The RPD for fluoride exceeded the required 30% at 32%. The laboratory believes this was due to sample inhomogeneity, which is indicated by high RPDs for the other anions in this sample. Additionally, a second duplicate sample from a separate Vadose project was analyzed in this batch, with acceptable duplicate RPDs. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. One sample result for nitrite has been flagged with a “B”.

Batch 19650: The RPD for nitrite exceeded the required 30% in the SAP and FSAP. However, since the result was below the quantitation limit, this criterion does not apply. The MS recovery for phosphate was below the ±25% requirement at 70%. The sample results have been flagged with a “b”. Since the post digestion spike was recovered at 99%, the laboratory believes that the low MS recovery was matrix related. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. All samples results for nitrite were flagged with a “B”.

Batch 20668: The results for nitrite, sulfate, and nitrate in the preparation blank were slightly above the MDL and below the quantitation limit. The blank is therefore acceptable. All but one nitrite and two nitrates were flagged with a “B”. The un-flagged results were more than 20 times the adjusted blank results. The blank result for sulfate was less than 5% of the lowest sulfate results, and therefore no flags were applied.

3.2.7 Inductively Coupled Plasma/Atomic Emission Spectroscopy

The ICP/AES analysis was performed on an acid-digest (SW-846 3050B) of all grab samples and liner composite samples. The ICP/AES analysis was unable to obtain the required detection limit for antimony, arsenic, cadmium, lead, selenium, silver, and thallium. These elements have been reported from separate ICP/MS analyses. Total uranium has not been reported by the ICP/AES analysis since it cannot meet the required detection limits in the SAP. The isotopic uranium analysis by ICP/MS met the required detection limit for ^{238}U, which is essentially total uranium. The overall data usability was not affected. For all other metals reported by ICP/AES, all target and required detection limits were met. SW-846 lists the holding time for ICP/AES metals as 6 months. All analyses met the holding times.

Batch 20821: The interference check standard-AB (ICSAB) had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. A result slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. Low levels of iron, sodium, chromium, and calcium were detected in the preparation blank, but reanalysis was not required since these levels were less than 5% of the lowest sample result. The MS recoveries for aluminum, calcium, iron, magnesium, phosphorous, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for sodium, sulfur, silicon, and zirconium exceeded the ±25 requirement in the SAP and FSAP. The laboratory believes this was due to matrix interference. The RPD for silicon exceeded the ±30% requirement at 40%. All sample results in this batch for silicon have been flagged with “c”. Reanalysis was not required since this is secondary element. It should be noted that silicon is not listed with other elements in SW-846 3050B, section 1.1, under “Scope and Application” for the method and does not perform consistently when using this digest.

Batch 20563: The ICSAB had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. Results slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. The LCS for calcium was recovered outside the ±20% requirement at 78.3%. Since two of the samples in this batch were exhausted and could not be reanalyzed, a decision was reached with the client to accept the data “as is” (see Attachment 7). The MS recoveries for aluminum, calcium, iron, magnesium, sodium, phosphorous, silicon, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for bismuth and zirconium exceeded the ±25 requirement at 56% and 19%, respectively. This could indicate that the results for elements are biased low. All sample results in this batch for bismuth and zirconium have been flagged with “b”. Reanalysis was not required since these are secondary elements. Silicon experienced an LCS failure, and reanalysis was not required for this secondary element.

3.2.8 Inductively Coupled Plasma/Mass Spectroscopy

The ICP/MS actinide and trace metal analyses were performed on the standard SW-846 3050 acid digestion of all grab samples and liner composite samples. The ICP/MS ^{126}Sn and ^{99}Tc analysis was performed on the sample digest without the addition of the hydrochloric acid. Hydrochloric acid is not used for ^{99}Tc analysis because of the potential formation of a ZnCl ion pair with mass 99. ICP/MS trace metal analysis for antimony was perform on the same digest with additional hydrochloric acid, which is required to keep antimony in solution. In addition to these acid digests, ICP/MS ^{99}Tc analysis was performed on a Vadose water digest of all solid samples except B23TK8 (I001) and directly on single water samples from interval I010. The I001 analysis was not performed due to lack of sample.

Direct is the most accurate type of calibration; however, standard material is not commercially available for all the isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument's mass-response curve, which is generated by using the intensity/concentration relationship for the available isotope standards. Results estimated in this manner are designated "semi-quantitative."

Table 1. Inductively Coupled Plasma-Mass Spectroscopy Standards and Spikes

Standard Type	Analytes Analyzed
Initial calibration verification (nondigested)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Acid digest standard (laboratory control standard)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Predigest spike (MS)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Post-digest spike	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
No standard or spike of either type	^{126}Sn, ^{230}Th, ^{233}U, ^{234}U, ^{236}U

3.2.8.1 Technetium-99 and Tin-126

The required detection limit listed in the SAP for ^{99}Tc was met. The target detection limit for ^{99}Tc was not met. There were no required or target detection limits for ^{126}Sn listed in the SAP. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Because there is no available source for ^{126}Sn, ^{117}Sn is used to monitor the chemical recovery for this analysis. Though not specifically requested in the SAP, ^{117}Sn is reported for the laboratory control sample LCS and MS in order to demonstrate method accuracy and presence of possible matrix interference.

Batch 20681: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 21058: The middle and closing continuing calibration blanks (CCB) contained ^{99}Tc just above the MDL. ^{99}Tc was detected in one sample bracketed by these CCBs. The other samples in the batch were non-detect. Since all results were below the quantitation limit, reanalysis was not required. The one positive result has been flagged with "B". The laboratory believes that these results most likely represent some type of interference. The RPD for ^{126}Sn exceeded the ±30 requirement in the SAP and FSAP at 39%. Since the results for ^{126}Sn were below the quantitation

limit, this criterion does not apply. The matrix spike for ^{117}Sn was recovered below the ±25% requirement. Similar results have been observed in other batches, and this appears to be a matrix interference issue. This batch was not reanalyzed, but others have been with no improvement. Tin results should be considered biased low at these levels. All samples in the batch have been flagged with a "b".

3.2.8.2 Technetium-99 (Vadose Water Digest)

The required and target detection limits listed in the SAP for ^{99}Tc were met. The SAP lists a holding time of 6 months for isotopic analytes. All analysis met this holding time.

Batch 21206 and 23804: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 23572: The middle CCB contained ^{99}Tc just above the MDL. ^{99}Tc was detected in two samples bracketed by the CCB. The other samples in the batch were non-detect. Since the blank result was below the quantitation limit, reanalysis was not required. One positive result, which was below the quantitation limit, has been flagged with "B". The other positive sample result was more than 20 times the adjusted blank result and was therefore not flagged. The laboratory believes that the blank result is most likely some type of interference.

3.2.8.3 Actinides

The required and target detection limits were met for all isotopes and in all samples. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Batch 20597: The result for ^{234}Th in the preparation blank was slightly above the MDL. Four of the six samples in the batch demonstrated a similar result and have been flagged with a "B". Since all results were below the quantitation limit, the blank was acceptable and reanalysis was not required.

Batch 21207: The RPD for U^{233} exceed the ±30% requirement in the SAP and FSAP; however, since the result was below the quantitation level, this criterion does not apply.

3.2.8.4 Trace Metals

Antimony, arsenic, cadmium, lead, selenium, silver, and thallium were analyzed by ICP/MS to obtain the required detection limits in the SAP. Except for the required detection limit for selenium, all required detection limits were met or the sample results were above the quantitation limit and the sample detection limit criteria do not apply. All target detection limits were met. The required detection limit for selenium was approximately an order of magnitude below the detection limit obtained by ICP/MS. The laboratory does not anticipate reaching this detection limit for future projects. The adjusted MDL for selenium was approximately 0.25 µg/g. SW-846 lists the holding time for metals as 6 months. All samples were analyzed within the holding time.

Batches 20672, 22361, and 22376: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20590: The first CCB had a result for antimony slightly above the MDL. All affected samples have been flagged with a "B". Since the blank result was below the quantitation limit, reanalysis was not required. The duplicate RPD for antimony was outside the ±30% requirement in the SAP and FSAP at 37%. The laboratory believes this was a result of sample inhomogeneity. Additionally, the sample result was well below the required detection limit. With customer agreement (see Attachment 7), all results were flagged with "c" and reported.

Batch 21747: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 7% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

Batch 22437: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 30% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

3.3 RADIOCHEMICAL ANALYSIS

The holding time listed in the SAP for radioactive isotopes is 6 months. The FSAP list the holding time as "none". SW-846 does not address holding times for radiochemical analytes. All radiochemical analyses met the 6-month holding time listed in the SAP. Holding time tables for these analytes have not been included in Attachment 3. With the exception of the ^{14}C and ^{3}H analyses, tracers and spikes are added prior to the digestion.

3.3.1 Gamma Energy Analysis

Gamma energy analysis was performed directly on approximately 60 mL of soil from the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The SAP requires the reporting of all isotopes with positive results above the minimum detectable activity (MDA); therefore, isotopes additional to those required in the SAP were reported when detected. The GEA analysis met all the required detection limits in the SAP. The laboratory was unable to meet any of the target detection limits. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.2 Strontium-89/90

Strontium-89/90 analysis was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. All of the sample analyses met the required and target detection limits. The FSAP and SAP requested ^{90}Sr, not $^{89/90}Sr$, be reported. The 222-S Laboratory only performs the latter analysis. Since the half-life for ^{89}Sr is approximately 51 days and ^{89}Sr has not been produced at Hanford for years, $^{89/90}Sr$ is essentially ^{90}Sr. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.3 Tritium

The ^{3}H analysis by liquid scintillation counting (LSC) was performed on the equipment blank and a water leach of all grab samples and liner composite samples. This method only measured the ^{3}H in the samples that could be dissolved in water. This analysis achieved the required and target detection limit in the FSAP.

Batch 20359: The laboratory failed to include an MS with this batch and did analyze a MS for C7668 as required. This was discussed with the client.

Batch 20794: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.4 Selenium-79

The ^{79}Se analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the target detection limit in the FSAP. No required detection limit was listed. No standard is currently available for ^{79}Se, and a cold carrier is used to monitor recovery and is measured gravimetrically. The ^{14}C LSC curve is used to determine the ^{79}Se results since their energies are similar. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum tracer/carrier recovery is 50%.

Batch 20850: The preparation blank demonstrated a positive result below the quantitation limit, as did the one sample in this batch. All results had very large counting uncertainties and were below the target detection limit. Because of these factors, reanalysis was not required. The associated results have been flagged with a “B”.

3.3.5 Carbon-14

The ^{14}C analysis by LSC was performed on a water leach of the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required detection limit in the FSAP but exceeded the target detection limit. This analysis will only detect water soluble forms of ^{14}C.

Batches 21604 and 22478: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.6 Nickel-63

The ^{63}Ni analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required and target detection limits in the FSAP. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum trace/carrier recovery is 50%.

Batch 21309: There were no notable issues with the batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20890: This duplicate for this batch was reanalyzed in batch 21309 along with the other sample that had a positive result for ^{63}Ni. All sample results were below the MDA in the reanalysis.

3.3.7 Iodine-129

Analysis for ^{129}I by low energy GEA was performed on an iodine-specific fusion digest of all grab samples and liner composite samples except for sample B23TK8 (I001) as explained in Section 2.2 of this report. The required and target detection limits in the SAP were met. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.8 Americium-241, Curium-243/244, and Curium-242

Analysis for ^{241}Am, $^{243/244}$Cm, and ^{242}Cm by alpha energy analysis (AEA) was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met. The SAP and FSAP requested ^{243}Cm and ^{244}Cm be reported separately. Since it is not possible to resolve these individual isotopes when using AEA, these isotopes have been reported as $^{243/244}$Cm.

3.3.9 Plutonium-238 and Plutonium-239/240

Plutonium isotopic (^{238}Pu and $^{239/240}$Pu) analysis by AEA was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met.

3.4 ORGANIC ANALYSES

3.4.1 Volatile Organic Analysis

The VOA by GC/MS was performed on field samples by purge and trap. Due to the instrumentation problem discussed in Section 2.1, the following samples were shipped from the 222-S Laboratory to WSCF for analysis by WRPS:

- Volatile organic samples: B23TM2, B25WM4, and B25WM7
- Field blanks: B23V99, B23VB3, and B23VB4
- Trip blanks: B23VC2 and B23VC3

These samples were received at the 222-S Laboratory prior to shipment to WSCF and were given 222-S Laboratory sample IDs, which appear in Attachment 2. These numbers are for tracking purposes only and will not be used to report results. The WSCF results for these samples are reported in Appendix I and were provided by WRPS. Sample B23V99 was analyzed by both the 222-S Laboratory and WSCF. Both sets of results have been reported (see Attachment 1 and Appendix 1).

Field sampling methods, sample containers, and preservation methods followed SW-846 5035.The soil samples were delivered in a freezer in pre-weighed VOA vials with magnetic stir bars and approximately 5 g of sample. After receipt, the VOA samples were stored in a freezer. For each sample interval, an additional high level sample preserved in methanol was also received. These were not used because none of the results for the frozen samples were above the calibration range. The exact weight of the sample and the tare weight of the VOA vials were recorded by sampling personnel and delivered with the samples. One equipment blank, eight field blanks, and seven trip blanks were also received and analyzed. The samples were preserved with either HCl or H_2SO_4 to a pH < 2.The holding time for all samples is 14 days. All samples analyzed at 222-S Laboratory met the required holding time.

The VOA met the target and required detection limits in the SAP. The SAP and FSAP requested m-xylene and p-xylene be reported separately. Since it is not possible to resolve these individual compounds when performing VOA by SW-846 8260C, these compounds have been reported as m+p xylene. The SAP and FSAP request that methanol be reported with this analysis; however, this compound is too polar to be purged and cannot be reported (see Attachment 7). Isobutanol, another poor purger, was reported as a semivolatile organic compound.

All but one of the field blanks and all trip blanks contained chloroform above the estimated quantification level. Since chloroform is a common chlorination byproduct, the laboratory believes the source of chloroform was the water used by sampling personnel to make the various blanks.

All laboratory blanks for the liquid sample batches contained acetone at a level slightly below the quantitation level, based on the low calibration. Some blanks were 30 to 50 times the MDL. Fortunately, the samples contained only a trace of acetone; most results were below the MDL and all were below the quantitation level. “B” flags have been applied when appropriate. For this reason, reanalysis was not required. The laboratory believes that this relatively high level of acetone in the method blanks was due to contamination in the hydrochloric acid used in the blanks. For analyses performed after these, acetone was only occasionally found in the blank and generally at a level below the quantitation level.

The LCS, MS, and matrix spike duplicat (MSD) recoveries were compared against the laboratory’s statistical process control (SPC) limits, as required by SW-846. The use of SPC limits is allowed in the FSAP, SAP, and QAPP.

Batch 19566: It is apparent from the following discussion that this batch should have been reanalyzed; however, due to a pending instrument outage and an expiring holding time, these are the only results available. With the exception of acetone, all QC failures indicate a high bias; the impact on the data is minimal. Toluene and 2-hexanone were detected in the sample and method

blanks above the MDL and below the quantitation limit. The sample results have been flagged with a “B”. Since the results were below the quantitation limit, reanalysis was not required. The MS failed high for acetone, 2-butanone, 2-hexanone, and hexone. The 2-hexanone result was slightly above the MDL. All results have been flagged with a “b”. Since the 2-hexanone result was below the quantitation limit and flagged with “J”, this result was not affected. All other results were below the MDL. The LCS for acetone failed high, again indicating a high bias, and the result has been flagged with an “a”. Two continuous calibration veritication standards (CCV) were analyzed with this batch; the closing CCV was normal with only two compounds slightly above the ±20% requirement. However, the first CCV had six primary analytes above this requirement. Since the acetone results were below the MDL, the LCS and CCVs are acceptable.

Batch 19680: The LCS recovery for acetone was above the upper limit of 136% at 172%. Due to the holding time limitation, reanalysis was not performed. Since the results for acetone were below the quantitation limit or below the MDL and flagged with a “J”, the data usability was not affected and reanalysis was unnecessary. The results have been flagged with an “a”. The method blank contained acetone as discussed above.

Batch 19878: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required. The method blank contained acetone as discussed above.

Batch 19881: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required.

3.4.2 Semivolatile Organic Analysis

The semivolatile organic analysis (SVOA) by GC/MS was performed on methylene chloride extractions of all grab samples and liner composite samples. All holding times were met.

The SVOA analysis met the required and target detection limits with two exceptions:

- The adjusted MDLs for cyclohexanone were above the 0.5 mg/kg target detection limit for most samples. This compound obtained detection limits between 0.5 mg/kg and 0.6 mg/kg.
- The adjusted MDLs for di-n-butyl-phthalate were above the target detection limit of 0.33 mg/kg. The analysis achieved a detection limit of between 0.5 mg/kg and 0.6 mg/kg for this compound.

LCS, MS, and MSD recoveries were compared against the laboratory’s SPC limits, as required by SW-846. The use of SPC limits is permitted in the FSAP, SAP, and QAPP.

The SAP and FSAP requested m-cresol and p- cresol be reported separately. Since it is not possible to resolve these individual compounds when performing SVOA by SW-846 8270C, these compounds have been reported as m+p cresol.

Batch 20093: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batches 19989, 19999, and 20019: Butylbenzylphthalate was detected in the method blank and samples at slightly above the MDL and below the quantitation limit. Therefore, the blank is acceptable and reanalysis was unnecessary. Sample results have been flagged with a "B".

3.4.3 Tentatively Identified Compounds

Unassigned peaks or TICs were treated as follows. Standards were obtained and analyzed for each secondary analyte identified in the SAP. This data was accumulated in the Hanford library. Following analysis, the largest TICs with instrument responses greater than 10% of the response of the nearest internal standard were evaluated and compared to the Hanford library. The estimated concentration of these TICs was calculated using measured response factors from the Hanford library compound list.

After comparison to the Hanford library, remaining unknowns were compared to National Institute of Standards and Technology (NIST) 02, *HP Mass Spectral (compound) Libraries*. The estimated concentration of compounds identified in the NIST library was calculated based on an arbitrary response factor of 1.0. If the compounds were not identified as a result of this comparison, they were reported as "unknown." Summaries of the SVOA and VOA TICs from the field samples and method blanks are provided in Attachment 5. TICs that were found in the field samples and were present in the associated batch method blank have been flagged with "B".

4.0 PROCEDURES

Table 2 lists the analytical procedures used for analysis of the Area C samples.

Table 2. Analytical Procedures

Analysis	Preparation Method	Analysis Procedure
Inorganic Analyses		
Cyanide	LA-695-103, Rev. J-0 (SW-846 9010C)	LA-695-103, Rev. J-0 (SW-846 9014)
Sulfide	LA-361-101, Rev. D-0 (SW-846 9030B)	LA-361-101, Rev. D-0 (SW-846 9215)
pH (solid)	LA-212-105, Rev. G-0 (SW-846 9045D)	LA-212-105, Rev. G-0 (SW-846 9045D)
Mercury – Cold Vapor Atomic Absorption	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)
Ammonia – IC	LA-544-112, Rev. E-0	LA-533-101, Rev. Q-0
Anions & Organic Acids – IC	LA-504-101, Rev. L-0	LA-533-115, Rev. J-0
Metals – ICP /AES	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-505-161, Rev. J-0-A (SW-846 6010C)

Analysis	Preparation Method	Analysis Procedure
^{99}Tc, ^{126}Sn – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1
^{99}Tc – ICP/MS	08-ATL-078 Vadose Water Digest	LA-506-102, Rev. F-1
Metals – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1 LA-506-103, Rev. A-0 (SW-846 6020A)
Actinides – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-1-2, Rev. F-1
Radiochemical Analyses		
GEA	Direct	LA-548-121, Rev. I-0
^{90}Sr – Separation/Beta counting (Solid)	LA-544-101, Rev. F-0	LA-220-101, Rev. J-0
^{3}H – LSC	LA-504-101, Rev. L-0	LA-218-111, Rev. G-0
^{14}C – LSC	LA-504-101, Rev. L-0	LA-348-104, Rev. H-0, I-0
^{79}Se – Separation/LSC	LA-544-101, Rev. F-0	LA-365-132, Rev. I-0
^{63}Ni – Separation/LSC	LA-544-101, Rev. F-0	LA-285-102, Rev. E-0
^{129}I – Separation/GEA	LA-378-105, Rev. C-0	LA-378-105, Rev. C-0
^{241}Am, $^{243/244,\ 242}$Cm – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
$^{239/240,\ 238}$Pu – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
Organic Analyses		
VOC – GC/MS	Direct	LA-523-118, Rev. G-O-A (SW-846 8260B)
SVOC – GC/MS	LA-523-138, Rev. F-0 (SW-846 3540C)	LA-523-135, Rev. D-0 (SW-846 8270C)

5.0 REFERENCES

ATL-MP-1011, 2010, *ATL Quality Assurance Project Plan for 222-S Laboratory*, Rev. 9, Advanced Technologies and Laboratories International, Inc., Richland, Washington.

NIST 02, 2002, *HP Mass Spectral Libraries*, July 2002 Release, Hewlett-Packard Company, Palo Alto, California.

SW-846, 1986, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods,* Third Edition, as amended, U.S. Environmental Protection Agency, Washington, D.C.

RPP-PLAN-40564, 2009, *Field Sampling and Analysis Plan for Sites P and L at Waste Management Area C,* Rev. 2, Washington River Protection Solutions, Inc.

RPP-PLAN-38777, 2009, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C*, Rev. 1, Washington River Protection Solutions, Inc.

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-099	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Campbell / Harris	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I003	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	10-12ft.	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations	N/A		N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	~~3~~ 2 RKS 5/17/10
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B23TL4	SOIL	5/17/10	1400	✓	1400 RKS 5/17/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Campbell Campbell	5.17.10 1450	RA Steele RA Steele	5.17.10 1450

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

oC TB
O MS

GRP# 20100064
SAM# S10V000193
194

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-102	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I004	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	12-14 ft	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations	N/A		N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C	Cool-6C
TYPE OF CONTAINER	Liner	500mL JAR
NO. OF CONTAINER(S)	1 5/19/10 RRE	1
VOLUME	160g	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B23TL7	SOIL	5/19/10	0855	✓	✓

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Campbell	5-19-10 1040	[signature]	5-19-10 1040

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

TB
Rt

GRPH 20100064
SMH 510V000 210
" 211

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-105	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I005	WMA C Sampling for CMS		V10-003		

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
TFVZ-09-003	TFVZ-09-000001	14-16 ft.	N/A	Govt. Vehicle

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
222-S Lab Operations	N/A	N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
TYPE OF CONTAINER	~~Liner~~ 500mL Jar
NO. OF CONTAINER(S)	~~2~~ 1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B23TM0	SOIL	5/19/10	0945	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Cphil C-pbell	5-19-10 1040	RHSteele	5-19-10 1040
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

SCTB
RK

EXP # 20100064
SAM # S10V000228

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-108	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC		
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**	**AIR QUALITY** ☐	75 Days / 75 Days
C7668 - I006	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	16-18 ft	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations					

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C	Cool 6C
TYPE OF CONTAINER	Liner	500 mL Jar
NO. OF CONTAINER(S)	~~3~~ 2	1
VOLUME	160g	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	See item (1) in special Instructions

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B23TM3	SOIL	5/20/10	1000	✓	✓								

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Gabe Campbell	5-20-10 1230	R Abel R Steele	5-20-10 1230
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

QC TB
QA

QRP# 20100064
SAM# S10V000245
246
247 → JAR

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Appendix 5

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: WMA C			DATA PACKAGE: VSR11-044		
VALIDATOR: Carl Schloesslin		LAB: 222-S Lab		DATE: 4-27-2011	
			SDG: 20100064		
ANALYSES PERFORMED					
SW-846/ICP X	SW-846/GFAA	SW-846/Hg X		EPA 200.8	

SAMPLES/MATRIX Soil samples

B27130*, B27131**

*Sample B27130 is a composite of samples B23TL4 & B23TL7

**Sample B27131 is a composite of samples B23TM0 & B23TM3

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present?..... Yes (No) N/A

Comments: None

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

ICP-MS Actinides Batch 20597 MB Hit: U-234 2.15E-5 ug/g

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments:

6010C Batch 20563: Ca LCS %R = 78%, Si LCS %R = 78%, Bi MS/PS %Rs = 56%/OK, Zr MS/PS %Rs = 19%/OK

ICP-MS Fission Batch 20681: Sn-117 MS/PS %Rs = 70%/OK

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?..... Yes No N/A

Duplicate results acceptable?..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E)..... Yes No N/A

MS/MSD standards expired? (Levels D, E)..... Yes No N/A

Field duplicate RPD values acceptable?..... Yes No N/A

Field split RPD values acceptable?..... Yes No N/A

Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments:

None

C,

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No (N/A)

ICP serial dilution %D values acceptable? ..... Yes No (N/A)

ICP post digestion spike required? ..... Yes No (N/A)

ICP post digestion spike values acceptable?..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Transcription/calculation errors?..... Yes No (N/A)

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? .....(Yes) No N/A

Sample holding times acceptable? .....(Yes) No N/A

Comments:

None

8. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?.....Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E)..... Yes No N/A

Detection limits meet RDL?..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

The MDL for Se significantly > the CRDL of 0.03 ug/g.

Appendix 6

Additional Documentation Requested By Client

Holding Time Report: Mercury

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Analysis Date	Missed Holding Time
S10V000131	SOLID	SW846-7471A	SW846-7471A	05/11/10 09:15	05/11/10 11:00	05/17/10 15:20	N
S10V000145	SOLID	SW846-7471A	SW846-7471A	05/11/10 09:15	05/11/10 11:00	05/17/10 15:20	N
S10V000162	SOLID	SW846-7471A	SW846-7471A	05/17/10 10:50	05/17/10 14:50	06/01/10 15:25	N
S10V000196	SOLID	SW846-7471A	SW846-7471A	05/17/10 14:00	05/17/10 14:50	06/01/10 15:25	N
S10V000231	SOLID	SW846-7471A	SW846-7471A	05/19/10 09:45	05/19/10 10:40	06/01/10 15:25	N
S10V000265	SOLID	SW846-7471A	SW846-7471A	05/20/10 11:00	05/20/10 12:30	06/01/10 15:25	N
S10V001005	SOLID	SW846-7471A	SW846-7471A	06/01/10 11:30	06/01/10 13:00	06/18/10 15:20	N
S10V000282	SOLID	SW846-7471A	SW846-7471A	06/03/10 11:15	06/03/10 15:15	06/18/10 15:20	N
S10V000299	SOLID	SW846-7471A	SW846-7471A	06/08/10 11:05	06/08/10 12:30	06/18/10 15:20	N

Holding Time Report: Metals ICP/AES, ICP/MS

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Prep Date	Analysis Date	Missed Holding Time
S10V000136	SOLID	SW846-6010C	SW846-3050B	05/11/10 09:15	05/11/10 11:00	05/27/10 21:29	07/06/10 11:27	N
S10V000150	SOLID	SW846-6010C	SW846-3050B	05/11/10 09:15	05/11/10 11:00	05/27/10 21:29	07/06/10 13:43	N
S10V000167	SOLID	SW846-6010C	SW846-3050B	05/17/10 10:50	05/17/10 14:50	05/27/10 21:29	07/06/10 13:46	N
S10V000201	SOLID	SW846-6010C	SW846-3050B	05/17/10 14:00	05/17/10 14:50	05/27/10 21:29	07/06/10 13:50	N
S10V000236	SOLID	SW846-6010C	SW846-3050B	05/19/10 09:45	05/19/10 10:40	05/27/10 21:29	07/06/10 13:53	N
S10V000270	SOLID	SW846-6010C	SW846-3050B	05/20/10 11:00	05/20/10 12:30	05/27/10 21:29	07/06/10 13:56	N
S10V000287	SOLID	SW846-6010C	SW846-3050B	06/03/10 11:15	06/03/10 15:15	06/30/10 12:32	07/19/10 10:48	N
S10V000304	SOLID	SW846-6010C	SW846-3050B	06/08/10 11:05	06/08/10 12:30	06/30/10 12:32	07/19/10 13:29	N
S10V001010	SOLID	SW846-6010C	SW846-3050B	06/01/10 11:30	06/01/10 13:00	06/30/10 12:32	07/19/10 13:32	N
S10V000136	SOLID	SW846-6020A	SW846-3050B	05/11/10 09:15	05/11/10 11:00	05/27/10 21:29	08/03/10 20:31	N
S10V000136	SOLID	SW846-6020A	SW846-3050B	05/11/10 09:15	05/11/10 11:00	05/27/10 21:29	08/04/10 12:24	N
S10V000150	SOLID	SW846-6020A	SW846-3050B	05/11/10 09:15	05/11/10 11:00	05/27/10 21:29	08/03/10 20:44	N
S10V000150	SOLID	SW846-6020A	SW846-3050B	05/11/10 09:15	05/11/10 11:00	05/27/10 21:29	08/04/10 12:40	N
S10V000167	SOLID	SW846-6020A	SW846-3050B	05/17/10 10:50	05/17/10 14:50	05/27/10 21:29	08/03/10 20:51	N
S10V000167	SOLID	SW846-6020A	SW846-3050B	05/17/10 10:50	05/17/10 14:50	05/27/10 21:29	08/04/10 12:48	N
S10V000201	SOLID	SW846-6020A	SW846-3050B	05/17/10 14:00	05/17/10 14:50	05/27/10 21:29	08/03/10 20:58	N
S10V000201	SOLID	SW846-6020A	SW846-3050B	05/17/10 14:00	05/17/10 14:50	05/27/10 21:29	08/04/10 12:56	N
S10V000236	SOLID	SW846-6020A	SW846-3050B	05/19/10 09:45	05/19/10 10:40	05/27/10 21:29	08/03/10 21:04	N
S10V000236	SOLID	SW846-6020A	SW846-3050B	05/19/10 09:45	05/19/10 10:40	05/27/10 21:29	08/04/10 13:04	N
S10V000270	SOLID	SW846-6020A	SW846-3050B	05/20/10 11:00	05/20/10 12:30	05/27/10 21:29	08/03/10 21:11	N
S10V000270	SOLID	SW846-6020A	SW846-3050B	05/20/10 11:00	05/20/10 12:30	05/27/10 21:29	08/04/10 13:12	N
S10V001210	SOLID	SW846-6020A	SW846-3050B	06/01/10 11:30	06/01/10 13:00	06/29/10 12:24	07/13/10 12:06	N
S10V001211	SOLID	SW846-6020A	SW846-3050B	06/03/10 11:15	06/03/10 15:15	06/29/10 12:24	07/13/10 11:51	N
S10V001212	SOLID	SW846-6020A	SW846-3050B	06/08/10 11:05	06/08/10 12:30	06/29/10 12:24	07/13/10 12:14	N
S10V000287	SOLID	SW846-6020A	SW846-3050B	06/03/10 11:15	06/03/10 15:15	06/30/10 12:32	08/04/10 12:20	N
S10V000287	SOLID	SW846-6020A	SW846-3050B	06/03/10 11:15	06/03/10 15:15	06/30/10 12:32	09/22/10 19:21	N
S10V000304	SOLID	SW846-6020A	SW846-3050B	06/08/10 11:05	06/08/10 12:30	06/30/10 12:32	08/04/10 12:33	N
S10V000304	SOLID	SW846-6020A	SW846-3050B	06/08/10 11:05	06/08/10 12:30	06/30/10 12:32	09/22/10 19:35	N
S10V001010	SOLID	SW846-6020A	SW846-3050B	06/01/10 11:30	06/01/10 13:00	06/30/10 12:32	08/04/10 12:40	N

Holding Time Report: Metals ICP/AES, ICP/MS

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Prep Date	Analysis Date	Missed Holding Time
S10V001010	SOLID	SW846-6020A	SW846-3050B	06/01/10 11:30	06/01/10 13:00	06/30/10 12:32	09/22/10 19:43	N
S10V001204	SOLID	SW846-6020A	SW846-3050B	05/11/10 09:15	05/11/10 11:00	07/09/10 14:33	07/12/10 22:52	N
S10V001205	SOLID	SW846-6020A	SW846-3050B	05/11/10 09:15	05/11/10 11:00	07/09/10 14:33	07/12/10 23:07	N
S10V001207	SOLID	SW846-6020A	SW846-3050B	05/17/10 14:00	05/17/10 14:50	07/09/10 14:33	07/12/10 23:15	N
S10V001209	SOLID	SW846-6020A	SW846-3050B	05/20/10 11:00	05/20/10 12:30	07/09/10 14:33	07/12/10 23:22	N
S10V001208	SOLID	SW846-6020A	SW846-3050B	05/19/10 09:45	05/19/10 10:40	09/01/10 10:00	09/16/10 14:39	N

Hold Time Report: ICP/MS Actinides

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Prep Date	Analysis Date	Missed Holding Time
S10V000420	SOLID	LA-506-102	SW846-3050B	04/15/10 10:10	04/15/10 14:10	04/27/10 09:48	05/26/10 18:35	N
S10V000578	SOLID	LA-506-102	SW846-3050B	04/15/10 10:10	04/15/10 14:10	04/27/10 09:48	05/26/10 18:49	N
S10V000630	SOLID	LA-506-102	SW846-3050B	04/20/10 12:45	04/20/10 13:50	04/27/10 09:48	05/26/10 18:56	N
S10V000639	SOLID	LA-506-102	SW846-3050B	04/22/10 09:15	04/22/10 12:00	04/27/10 09:48	05/26/10 19:03	N
S10V000657	SOLID	LA-506-102	SW846-3050B	04/22/10 10:55	04/23/10 12:00	04/27/10 09:48	05/26/10 19:10	N
S10V000666	SOLID	LA-506-102	SW846-3050B	04/23/10 09:43	04/23/10 11:50	05/25/10 22:40	06/22/10 18:17	N
S10V000675	SOLID	LA-506-102	SW846-3050B	05/04/10 10:02	05/04/10 12:15	05/25/10 22:40	06/22/10 18:31	N
S10V000684	SOLID	LA-506-102	SW846-3050B	05/05/10 10:30	05/06/10 11:30	05/25/10 22:40	06/22/10 18:38	N
S10V000693	SOLID	LA-506-102	SW846-3050B	05/07/10 12:15	05/07/10 13:00	05/25/10 22:40	06/22/10 18:44	N

Hold Time Report: ICP/MS Tc-99, Tn-126

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Prep Date	Analysis Date	Missed Holding Time
S10V000422	SOLID	LA-506-102	SW846-3050B	04/15/10 10:10	04/20/10 09:08	04/27/10 16:55	06/04/10 19:20	N
S10V000624	SOLID	LA-506-102	SW846-3050B	04/15/10 10:10	04/15/10 14:10	04/27/10 16:55	06/04/10 20:08	N
S10V000632	SOLID	LA-506-102	SW846-3050B	04/20/10 12:45	04/20/10 13:50	04/27/10 16:55	06/04/10 20:49	N
S10V000641	SOLID	LA-506-102	SW846-3050B	04/22/10 09:15	04/22/10 12:00	04/27/10 16:55	06/04/10 20:57	N
S10V000659	SOLID	LA-506-102	SW846-3050B	04/22/10 10:55	04/23/10 12:00	04/27/10 16:55	06/04/10 21:06	N
S10V000668	SOLID	LA-506-102	SW846-3050B	04/23/10 09:43	04/23/10 11:50	05/25/10 22:33	07/02/10 14:06	N
S10V000677	SOLID	LA-506-102	SW846-3050B	05/04/10 10:02	05/04/10 12:15	05/25/10 22:33	07/02/10 14:23	N
S10V000686	SOLID	LA-506-102	SW846-3050B	05/05/10 10:30	05/06/10 11:30	05/25/10 22:33	07/02/10 14:55	N
S10V000695	SOLID	LA-506-102	SW846-3050B	05/07/10 12:15	05/07/10 13:00	05/25/10 22:33	07/02/10 15:03	N
S10V000422	SOLID	LA-506-102	SW846-3050B	04/15/10 10:10	04/20/10 09:08	06/11/10 14:00	06/14/10 13:03	N
S10V000624	SOLID	LA-506-102	SW846-3050B	04/15/10 10:10	04/15/10 14:10	06/11/10 14:00	06/14/10 13:19	N
S10V000632	SOLID	LA-506-102	SW846-3050B	04/20/10 12:45	04/20/10 13:50	06/11/10 14:00	06/14/10 13:49	N
S10V000641	SOLID	LA-506-102	SW846-3050B	04/22/10 09:15	04/22/10 12:00	06/11/10 14:00	06/14/10 13:57	N
S10V000659	SOLID	LA-506-102	SW846-3050B	04/22/10 10:55	04/23/10 12:00	06/11/10 14:00	06/14/10 14:28	N

Hold Time Report: ICP/MS Tc-99

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Prep Date	Analysis Date	Missed Holding Time
S10V001729	SOLID	LA-506-102	WATER DIGEST	04/15/10 10:10	04/15/10 14:10	08/18/10 11:17	08/19/10 20:15	N
S10V001730	SOLID	LA-506-102	WATER DIGEST	04/15/10 10:10	04/15/10 14:10	08/18/10 11:17	08/19/10 20:27	N
S10V001731	SOLID	LA-506-102	WATER DIGEST	04/20/10 12:45	04/20/10 13:50	08/18/10 11:17	08/19/10 20:33	N
S10V001732	SOLID	LA-506-102	WATER DIGEST	04/22/10 09:15	04/22/10 12:00	08/18/10 11:17	08/19/10 20:39	N
S10V001733	SOLID	LA-506-102	WATER DIGEST	04/22/10 10:55	04/23/10 12:00	08/18/10 11:17	08/19/10 20:45	N
S10V001734	SOLID	LA-506-102	WATER DIGEST	04/23/10 09:43	04/23/10 11:50	08/18/10 11:17	08/19/10 20:51	N
S10V001735	SOLID	LA-506-102	WATER DIGEST	05/04/10 10:02	05/04/10 12:15	08/18/10 11:17	08/19/10 21:14	N
S10V001736	SOLID	LA-506-102	WATER DIGEST	05/05/10 10:30	05/06/10 11:30	08/18/10 11:17	08/19/10 21:20	N
S10V001737	SOLID	LA-506-102	WATER DIGEST	05/07/10 12:15	05/07/10 13:00	08/18/10 11:17	08/19/10 21:26	N

Holding Time Report: Metals ICP/AES, ICP/MS

Sample	Method	Sample Date Time	Received Date	Analysis Date	Missed Holding Time
S10V000139	AMERICIUM	05/11/2010 09:15	05/11/2010 14:39	08/17/2010 14:20	N
S10V000153	AMERICIUM	05/11/2010 09:15	05/11/2010 14:41	08/17/2010 14:20	N
S10V000239	AMERICIUM	05/19/2010 09:45	05/19/2010 10:40	08/17/2010 14:20	N
S10V000273	AMERICIUM	05/20/2010 11:00	05/20/2010 12:30	09/16/2010 11:30	N
S10V000290	AMERICIUM	06/03/2010 11:15	06/03/2010 15:15	08/17/2010 14:20	N
S10V000307	AMERICIUM	06/08/2010 11:05	06/08/2010 12:30	08/17/2010 14:20	N
S10V001013	AMERICIUM	06/01/2010 11:30	06/01/2010 13:00	08/17/2010 14:20	N
S10V002232	CARBON-14	05/11/2010 09:15	05/11/2010 11:00	08/31/2010 13:55	N
S10V002233	CARBON-14	05/11/2010 09:15	05/11/2010 11:00	08/31/2010 13:55	N
S10V002235	CARBON-14	05/17/2010 14:00	05/17/2010 14:50	08/31/2010 13:55	N
S10V002236	CARBON-14	05/19/2010 09:45	05/19/2010 10:40	09/24/2010 14:10	N
S10V002237	CARBON-14	05/20/2010 11:00	05/20/2010 12:30	08/31/2010 13:55	N
S10V002238	CARBON-14	06/01/2010 11:30	06/01/2010 13:00	08/31/2010 13:55	N
S10V002239	CARBON-14	06/03/2010 11:15	06/03/2010 15:15	08/31/2010 13:55	N
S10V002240	CARBON-14	06/08/2010 11:05	06/08/2010 12:30	08/31/2010 13:55	N
S10V000133	GEA	05/11/2010 09:15	05/11/2010 14:39	06/16/2010 00:53	N
S10V000147	GEA	05/11/2010 09:15	05/11/2010 14:41	06/16/2010 03:46	N
S10V000233	GEA	05/19/2010 09:45	05/19/2010 10:40	06/16/2010 08:01	N
S10V000267	GEA	05/20/2010 11:00	05/20/2010 12:30	06/16/2010 11:21	N
S10V000284	GEA	06/03/2010 11:15	06/03/2010 15:15	06/16/2010 14:25	N
S10V000301	GEA	06/08/2010 11:05	06/08/2010 12:30	06/16/2010 17:13	N
S10V001007	GEA	06/01/2010 11:30	06/01/2010 13:00	06/16/2010 22:28	N
S10V000133	IODINE-129 in SOIL	05/11/2010 09:15	05/11/2010 14:39	07/20/2010 10:00	N
S10V000147	IODINE-129 in SOIL	05/11/2010 09:15	05/11/2010 14:41	07/20/2010 10:00	N
S10V000198	IODINE-129 in SOIL	05/17/2010 14:00	05/17/2010 14:50	09/09/2010 22:30	N
S10V000233	IODINE-129 in SOIL	05/19/2010 09:45	05/19/2010 10:40	07/20/2010 10:00	N
S10V000267	IODINE-129 in SOIL	05/20/2010 11:00	05/20/2010 12:30	07/20/2010 10:00	N
S10V000284	IODINE-129 in SOIL	06/03/2010 11:15	06/03/2010 15:15	07/20/2010 10:00	N
S10V000301	IODINE-129 in SOIL	06/08/2010 11:05	06/08/2010 12:30	07/20/2010 10:00	N
S10V001007	IODINE-129 in SOIL	06/01/2010 11:30	06/01/2010 13:00	07/20/2010 10:00	N

Holding Time Report: Metals ICP/AES, ICP/MS

Sample	Method	Sample Date Time	Received Date	Analysis Date	Missed Holding Time
S10V000141	NICKEL-63	05/11/2010 09:15	05/11/2010 14:39	08/18/2010 09:45	N
S10V000155	NICKEL-63	05/11/2010 09:15	05/11/2010 14:41	07/22/2010 18:45	N
S10V000241	NICKEL-63	05/19/2010 09:45	05/19/2010 10:40	08/18/2010 09:45	N
S10V000275	NICKEL-63	05/20/2010 11:00	05/20/2010 12:30	08/18/2010 09:45	N
S10V000292	NICKEL-63	06/03/2010 11:15	06/03/2010 15:15	07/22/2010 18:45	N
S10V000309	NICKEL-63	06/08/2010 11:05	06/08/2010 12:30	07/22/2010 18:45	N
S10V001015	NICKEL-63	06/01/2010 11:30	06/01/2010 13:00	08/18/2010 09:45	N
S10V000139	PLUTONIUM	05/11/2010 09:15	05/11/2010 14:39	08/17/2010 14:00	N
S10V000153	PLUTONIUM	05/11/2010 09:15	05/11/2010 14:41	08/17/2010 14:00	N
S10V000239	PLUTONIUM	05/19/2010 09:45	05/19/2010 10:40	08/17/2010 14:00	N
S10V000273	PLUTONIUM	05/20/2010 11:00	05/20/2010 12:30	08/17/2010 14:00	N
S10V000290	PLUTONIUM	06/03/2010 11:15	06/03/2010 15:15	08/17/2010 14:00	N
S10V000307	PLUTONIUM	06/08/2010 11:05	06/08/2010 12:30	08/17/2010 14:00	N
S10V001013	PLUTONIUM	06/01/2010 11:30	06/01/2010 13:00	08/17/2010 14:00	N
S10V000141	SELENIUM-79	05/11/2010 09:15	05/11/2010 14:39	07/20/2010 22:05	N
S10V000155	SELENIUM-79	05/11/2010 09:15	05/11/2010 14:41	07/20/2010 22:05	N
S10V000241	SELENIUM-79	05/19/2010 09:45	05/19/2010 10:40	07/20/2010 22:05	N
S10V000275	SELENIUM-79	05/20/2010 11:00	05/20/2010 12:30	07/20/2010 22:05	N
S10V000292	SELENIUM-79	06/03/2010 11:15	06/03/2010 15:15	07/20/2010 22:05	N
S10V000309	SELENIUM-79	06/08/2010 11:05	06/08/2010 12:30	07/20/2010 22:05	N
S10V001015	SELENIUM-79	06/01/2010 11:30	06/01/2010 13:00	07/20/2010 22:05	N
S10V000140	STRONTIUM-90	05/11/2010 09:15	05/11/2010 14:39	09/08/2010 16:00	N
S10V000154	STRONTIUM-90	05/11/2010 09:15	05/11/2010 14:41	09/08/2010 16:00	N
S10V000240	STRONTIUM-90	05/19/2010 09:45	05/19/2010 10:40	09/08/2010 16:00	N
S10V000274	STRONTIUM-90	05/20/2010 11:00	05/20/2010 12:30	09/21/2010 15:15	N
S10V000291	STRONTIUM-90	06/03/2010 11:15	06/03/2010 15:15	09/21/2010 15:15	N
S10V000308	STRONTIUM-90	06/08/2010 11:05	06/08/2010 12:30	09/08/2010 16:00	N
S10V001014	STRONTIUM-90	06/01/2010 11:30	06/01/2010 13:00	09/08/2010 16:00	N
S10V001165	TRITIUM	05/11/2010 09:15	05/11/2010 11:00	07/27/2010 13:30	N
S10V001166	TRITIUM	05/11/2010 09:15	05/11/2010 11:00	07/27/2010 13:30	N

Holding Time Report: Metals ICP/AES, ICP/MS

Sample	Method	Sample Date Time	Received Date	Analysis Date	Missed Holding Time
S10V001168	TRITIUM	05/17/2010 14:00	05/17/2010 14:50	07/27/2010 13:30	N
S10V001169	TRITIUM	05/19/2010 09:45	05/19/2010 10:40	07/08/2010 11:05	N
S10V001171	TRITIUM	05/20/2010 11:00	05/20/2010 12:30	07/27/2010 13:30	N
S10V001172	TRITIUM	06/03/2010 11:15	06/03/2010 15:15	07/27/2010 13:30	N
S10V001173	TRITIUM	06/08/2010 11:05	06/08/2010 12:30	07/27/2010 13:30	N
S10V001174	TRITIUM	05/11/2010 09:15	06/01/2010 13:00	07/27/2010 13:30	N

LABCORE Completed Batch Report for Batch# 00020563

Analyst: Thorndike, Kathy

Book#: A-123-100615-2, A-123-100615-3, A-123-100623-6

Instrument: ICP-TJA

Method: ICP-TOTAL METALS, LA-505-161 Rev/Mod J-0-A

Specification: C Farm WMC 2010-1

Prep Batch: 00019741

Batch Comment: C-Farm WMC 2010-1 ICP TJA Total Metals trm

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICV	S1007120062		0 0			Silver	LIQUID	1	9.5462E-01			5.00E-03	ug/mL	95.462	% Recovery	
1	ICV	S1007120062		0 0			Aluminum	LIQUID	5	5.2071E+00			0.03	ug/mL	104.14	% Recovery	
1	ICV	S1007120062		0 0			Arsenic	LIQUID	5	5.0804E+00			0.05	ug/mL	101.61	% Recovery	
1	ICV	S1007120062		0 0			Boron	LIQUID	5	5.1190E+00			0.03	ug/mL	102.38	% Recovery	
1	ICV	S1007120062		0 0			Barium	LIQUID	5	5.0175E+00			3.00E-03	ug/mL	100.35	% Recovery	
1	ICV	S1007120062		0 0			Beryllium	LIQUID	5	5.0377E+00			1.00E-03	ug/mL	100.75	% Recovery	
1	ICV	S1007120062		0 0			Bismuth	LIQUID	5	5.0728E+00			0.1	ug/mL	101.46	% Recovery	
1	ICV	S1007120062		0 0			Calcium	LIQUID	5	5.0636E+00			0.05	ug/mL	101.27	% Recovery	
1	ICV	S1007120062		0 0			Cadmium	LIQUID	5	5.0935E+00			5.00E-03	ug/mL	101.87	% Recovery	
2	ICV	S1007120062		0 1			Cerium	LIQUID	5	5.3606E+00			0.03	ug/mL	107.21	% Recovery	
1	ICV	S1007120062		0 0			Cobalt	LIQUID	5	5.1156E+00			0.01	ug/mL	102.31	% Recovery	
1	ICV	S1007120062		0 0			Chromium	LIQUID	5	5.1274E+00			5.00E-03	ug/mL	102.55	% Recovery	
1	ICV	S1007120062		0 0			Copper	LIQUID	5	4.9761E+00			5.00E-03	ug/mL	99.522	% Recovery	
2	ICV	S1007120062		0 1			Europium	LIQUID	5	5.0726E+00			5.00E-03	ug/mL	101.45	% Recovery	
1	ICV	S1007120062		0 0			Iron	LIQUID	5	5.0628E+00			5.00E-03	ug/mL	101.26	% Recovery	
1	ICV	S1007120062		0 0			Potassium	LIQUID	5	4.9296E+00			0.5	ug/mL	98.591	% Recovery	
1	ICV	S1007120062		0 0			Lanthanum	LIQUID	5	4.9867E+00			3.00E-03	ug/mL	99.734	% Recovery	
1	ICV	S1007120062		0 0			Lithium	LIQUID	5	5.0738E+00			3.00E-03	ug/mL	101.48	% Recovery	
1	ICV	S1007120062		0 0			Magnesium	LIQUID	5	5.0491E+00			0.05	ug/mL	100.98	% Recovery	
1	ICV	S1007120062		0 0			Manganese	LIQUID	5	5.0684E+00			3.00E-03	ug/mL	101.37	% Recovery	
1	ICV	S1007120062		0 0			Molybdenum	LIQUID	5	5.2264E+00			0.02	ug/mL	104.53	% Recovery	
1	ICV	S1007120062		0 0			Sodium	LIQUID	5	5.1208E+00			0.1	ug/mL	102.42	% Recovery	
2	ICV	S1007120062		0 1			Neodymium	LIQUID	5	5.2220E+00			0.01	ug/mL	104.44	% Recovery	
1	ICV	S1007120062		0 0			Nickel	LIQUID	5	5.0814E+00			0.02	ug/mL	101.63	% Recovery	
3	ICV	S1007120062		0 2			Niobium	LIQUID	5	5.2392E+00			0.03	ug/mL	104.78	% Recovery	
1	ICV	S1007120062		0 0			Phosphorus	LIQUID	5	5.0718E+00			0.05	ug/mL	101.44	% Recovery	
1	ICV	S1007120062		0 0			Lead	LIQUID	5	5.1636E+00			0.05	ug/mL	103.27	% Recovery	
2	ICV	S1007120062		0 1			Palladium	LIQUID	5	5.0646E+00			0.1	ug/mL	101.29	% Recovery	
2	ICV	S1007120062		0 1			Praseodymium	LIQUID	5	5.1629E+00			0.01	ug/mL	103.26	% Recovery	
2	ICV	S1007120062		0 1			Rubidium	LIQUID	5	4.6865E+00			1	ug/mL	93.731	% Recovery	
2	ICV	S1007120062		0 1			Rhodium	LIQUID	5	5.0833E+00			0.05	ug/mL	101.67	% Recovery	

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
2	ICV	S1007120062		0 1			Ruthenium	LIQUID	5	5.1814E+00			0.03	ug/mL	103.63	% Recovery	
1	ICV	S1007120062		0 0			Sulfur	LIQUID	5	5.1597E+00			0.1	ug/mL	103.19	% Recovery	
1	ICV	S1007120062		0 0			Antimony	LIQUID	5	5.0967E+00			0.05	ug/mL	101.93	% Recovery	
1	ICV	S1007120062		0 0			Selenium	LIQUID	5	5.1709E+00			0.1	ug/mL	103.42	% Recovery	
1	ICV	S1007120062		0 0			Silicon	LIQUID	5	4.8982E+00			0.03	ug/mL	97.964	% Recovery	
2	ICV	S1007120062		0 1			Samarium	LIQUID	5	5.2099E+00			0.02	ug/mL	104.2	% Recovery	
3	ICV	S1007120062		0 2			Tin	LIQUID	5	5.2882E+00			0.03	ug/mL	105.76	% Recovery	
1	ICV	S1007120062		0 0			Strontium	LIQUID	5	4.9992E+00			3.00E-03	ug/mL	99.984	% Recovery	
3	ICV	S1007120062		0 2			Tantalum	LIQUID	5	5.3817E+00			0.05	ug/mL	107.63	% Recovery	
3	ICV	S1007120062		0 2			Tellurium	LIQUID	5	5.3177E+00			0.1	ug/mL	106.35	% Recovery	
2	ICV	S1007120062		0 1			Thorium	LIQUID	5	5.1994E+00			0.05	ug/mL	103.99	% Recovery	
1	ICV	S1007120062		0 0			Titanium	LIQUID	5	5.0927E+00			5.00E-03	ug/mL	101.85	% Recovery	
2	ICV	S1007120062		0 1			Thallium	LIQUID	5	5.2994E+00			0.1	ug/mL	105.99	% Recovery	
2	ICV	S1007120062		0 1			Uranium	LIQUID	5	5.4881E+00			0.1	ug/mL	109.76	% Recovery	
1	ICV	S1007120062		0 0			Vanadium	LIQUID	5	5.1693E+00			5.00E-03	ug/mL	103.39	% Recovery	
3	ICV	S1007120062		0 2			Tungsten	LIQUID	5	5.2965E+00			0.2	ug/mL	105.93	% Recovery	
2	ICV	S1007120062		0 1			Yttrium	LIQUID	5	5.1637E+00			2.00E-03	ug/mL	103.27	% Recovery	
1	ICV	S1007120062		0 0			Zinc	LIQUID	5	5.0392E+00			5.00E-03	ug/mL	100.78	% Recovery	
1	ICV	S1007120062		0 0			Zirconium	LIQUID	5	4.8623E+00			5.00E-03	ug/mL	97.247	% Recovery	
Sample Sequence 4																	
4	LLS	S1007120064		0 0			Silver	LIQUID	.02	2.0230E-02			5.00E-03	ug/mL	101.15	% Recovery	
4	LLS	S1007120064		0 0			Aluminum	LIQUID	.1	1.0927E-01			0.03	ug/mL	109.27	% Recovery	
4	LLS	S1007120064		0 0			Arsenic	LIQUID	.2	1.7994E-01			0.05	ug/mL	89.97	% Recovery	
5	LLS	S1007120064		0 1			Boron	LIQUID	.1	1.1289E-01			0.03	ug/mL	112.89	% Recovery	
4	LLS	S1007120064		0 0			Barium	LIQUID	.01	9.7900E-03			3.00E-03	ug/mL	97.9	% Recovery	
4	LLS	S1007120064		0 0			Beryllium	LIQUID	.001	7.5000E-04			1.00E-04	ug/mL	75	% Recovery	
4	LLS	S1007120064		0 0			Bismuth	LIQUID	.2	2.1862E-01			0.1	ug/mL	109.31	% Recovery	
4	LLS	S1007120064		0 0			Calcium	LIQUID	.2	2.1262E-01			0.05	ug/mL	106.31	% Recovery	
4	LLS	S1007120064		0 0			Cadmium	LIQUID	.01	1.1160E-02			5.00E-03	ug/mL	111.6	% Recovery	
4	LLS	S1007120064		0 0			Cerium	LIQUID	.2	2.0925E-01			0.03	ug/mL	104.62	% Recovery	
5	LLS	S1007120064		0 1			Cobalt	LIQUID	.04	4.4590E-02			0.01	ug/mL	111.48	% Recovery	
4	LLS	S1007120064		0 0			Chromium	LIQUID	.02	2.1310E-02			5.00E-03	ug/mL	106.55	% Recovery	
5	LLS	S1007120064		0 1			Copper	LIQUID	.02	2.2080E-02			5.00E-03	ug/mL	110.4	% Recovery	
6	LLS	S1007120064		0 2			Europium	LIQUID	.1	9.6230E-02			5.00E-03	ug/mL	96.23	% Recovery	
4	LLS	S1007120064		0 0			Iron	LIQUID	.05	5.1390E-02			5.00E-03	ug/mL	102.78	% Recovery	
4	LLS	S1007120064		0 0			Potassium	LIQUID	.5	4.9764E-01			0.1	ug/mL	99.528	% Recovery	
4	LLS	S1007120064		0 0			Lanthanum	LIQUID	.01	1.0830E-02			3.00E-03	ug/mL	108.3	% Recovery	
4	LLS	S1007120064		0 0			Lithium	LIQUID	.02	1.8520E-02			3.00E-03	ug/mL	92.6	% Recovery	
4	LLS	S1007120064		0 0			Magnesium	LIQUID	.2	2.0843E-01			0.05	ug/mL	104.22	% Recovery	
4	LLS	S1007120064		0 0			Manganese	LIQUID	.02	2.1050E-02			3.00E-03	ug/mL	105.25	% Recovery	
5	LLS	S1007120064		0 1			Molybdenum	LIQUID	.1	1.2531E-01			0.02	ug/mL	125.31	% Recovery	
4	LLS	S1007120064		0 0			Sodium	LIQUID	.2	1.9617E-01			0.1	ug/mL	98.085	% Recovery	

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
4	LLS	S1007120064		0 0			Neodymium	LIQUID	.1	1.0150E-01			0.01	ug/mL	101.5	% Recovery	
4	LLS	S1007120064		0 0			Nickel	LIQUID	.04	4.3350E-02			0.02	ug/mL	108.38	% Recovery	
8	LLS	S1007120064		0 4			Niobium	LIQUID	.1	9.2190E-02			0.03	ug/mL	92.19	% Recovery	
5	LLS	S1007120064		0 1			Phosphorus	LIQUID	.4	4.8343E-01			0.05	ug/mL	120.86	% Recovery	
4	LLS	S1007120064		0 0			Lead	LIQUID	.2	1.8543E-01			0.05	ug/mL	92.715	% Recovery	
7	LLS	S1007120064		0 3			Palladium	LIQUID	1	1.0460E+00			0.1	ug/mL	104.6	% Recovery	
6	LLS	S1007120064		0 2			Praseodymium	LIQUID	.1	1.0138E-01			0.01	ug/mL	101.38	% Recovery	
6	LLS	S1007120064		0 2			Rubidium	LIQUID	1	1.2367E+00			1	ug/mL	123.67	% Recovery	
7	LLS	S1007120064		0 3			Rhodium	LIQUID	.1	8.4730E-02			0.05	ug/mL	84.73	% Recovery	
7	LLS	S1007120064		0 3			Ruthenium	LIQUID	.1	9.4290E-02			0.03	ug/mL	94.29	% Recovery	
5	LLS	S1007120064		0 1			Sulfur	LIQUID	.2	2.3002E-01			0.1	ug/mL	115.01	% Recovery	
5	LLS	S1007120064		0 1			Antimony	LIQUID	.1	1.1315E-01			0.05	ug/mL	113.15	% Recovery	
4	LLS	S1007120064		0 0			Selenium	LIQUID	.2	2.4034E-01			0.1	ug/mL	120.17	% Recovery	
5	LLS	S1007120064		0 1			Silicon	LIQUID	.1	1.0540E-01			0.03	ug/mL	105.4	% Recovery	
4	LLS	S1007120064		0 0			Samarium	LIQUID	.1	1.0014E-01			0.02	ug/mL	100.14	% Recovery	
9	LLS	S1007120064		0 5			Tin	LIQUID	.1	1.1069E-01			0.03	ug/mL	110.69	% Recovery	
4	LLS	S1007120064		0 0			Strontium	LIQUID	.02	2.0370E-02			3.00E-03	ug/mL	101.85	% Recovery	
9	LLS	S1007120064		0 5			Tantalum	LIQUID	1	1.0135E+00			0.05	ug/mL	101.35	% Recovery	
8	LLS	S1007120064		0 4			Tellurium	LIQUID	1	1.0633E+00			0.1	ug/mL	106.33	% Recovery	
6	LLS	S1007120064		0 2			Thorium	LIQUID	.1	8.5630E-02			0.05	ug/mL	85.63	% Recovery	
5	LLS	S1007120064		0 1			Titanium	LIQUID	.02	2.1060E-02			5.00E-03	ug/mL	105.3	% Recovery	
4	LLS	S1007120064		0 0			Thallium	LIQUID	.4	4.0961E-01			0.1	ug/mL	102.4	% Recovery	
5	LLS	S1007120064		0 1			Uranium	LIQUID	.5	5.7337E-01			0.1	ug/mL	114.67	% Recovery	
5	LLS	S1007120064		0 1			Vanadium	LIQUID	.05	5.8960E-02			5.00E-03	ug/mL	117.92	% Recovery	
9	LLS	S1007120064		0 5			Tungsten	LIQUID	1	1.0026E+00			0.2	ug/mL	100.26	% Recovery	
6	LLS	S1007120064		0 2			Yttrium	LIQUID	.1	9.9820E-02			2.00E-03	ug/mL	99.82	% Recovery	
5	LLS	S1007120064		0 1			Zinc	LIQUID	.02	1.9750E-02			5.00E-03	ug/mL	98.75	% Recovery	
5	LLS	S1007120064		0 1			Zirconium	LIQUID	.02	2.5030E-02			5.00E-03	ug/mL	125.15	% Recovery	
Sample Sequence 10																	
10	ICB	S1007120063		0 0			Silver	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Aluminum	LIQUID		<3.0000E-02			0.03	ug/mL			
10	ICB	S1007120063		0 0			Arsenic	LIQUID		<5.0000E-02			0.05	ug/mL			
10	ICB	S1007120063		0 0			Boron	LIQUID		<3.0000E-02			0.03	ug/mL			
10	ICB	S1007120063		0 0			Barium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Beryllium	LIQUID		<1.0000E-03			1.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Bismuth	LIQUID		<1.0000E-01			0.1	ug/mL			
10	ICB	S1007120063		0 0			Calcium	LIQUID		<5.0000E-02			0.05	ug/mL			
10	ICB	S1007120063		0 0			Cadmium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Cerium	LIQUID		<3.0000E-02			0.03	ug/mL			
10	ICB	S1007120063		0 0			Cobalt	LIQUID		<1.0000E-02			0.01	ug/mL			
10	ICB	S1007120063		0 0			Chromium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Copper	LIQUID		<5.0000E-03			5.00E-03	ug/mL			

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
10	ICB	S1007120063		0 0			Europium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Iron	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Potassium	LIQUID		<5.0000E-01			0.5	ug/mL			
10	ICB	S1007120063		0 0			Lanthanum	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Lithium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Magnesium	LIQUID		<5.0000E-02			0.05	ug/mL			
10	ICB	S1007120063		0 0			Manganese	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Molybdenum	LIQUID		<2.0000E-02			0.02	ug/mL			
10	ICB	S1007120063		0 0			Sodium	LIQUID		<1.0000E-01			0.1	ug/mL			
10	ICB	S1007120063		0 0			Neodymium	LIQUID		<1.0000E-02			0.01	ug/mL			
10	ICB	S1007120063		0 0			Nickel	LIQUID		<2.0000E-02			0.02	ug/mL			
10	ICB	S1007120063		0 0			Niobium	LIQUID		<3.0000E-02			0.03	ug/mL			
10	ICB	S1007120063		0 0			Phosphorus	LIQUID		<5.0000E-02			0.05	ug/mL			
10	ICB	S1007120063		0 0			Lead	LIQUID		<5.0000E-02			0.05	ug/mL			
10	ICB	S1007120063		0 0			Palladium	LIQUID		<1.0000E-01			0.1	ug/mL			
10	ICB	S1007120063		0 0			Praseodymium	LIQUID		<1.0000E-02			0.01	ug/mL			
10	ICB	S1007120063		0 0			Rubidium	LIQUID		<1.0000E+00			1	ug/mL			
10	ICB	S1007120063		0 0			Rhodium	LIQUID		<5.0000E-02			0.05	ug/mL			
10	ICB	S1007120063		0 0			Ruthenium	LIQUID		<3.0000E-02			0.03	ug/mL			
10	ICB	S1007120063		0 0			Sulfur	LIQUID		<1.0000E-01			0.1	ug/mL			
10	ICB	S1007120063		0 0			Antimony	LIQUID		<5.0000E-02			0.05	ug/mL			
10	ICB	S1007120063		0 0			Selenium	LIQUID		<1.0000E-01			0.1	ug/mL			
10	ICB	S1007120063		0 0			Silicon	LIQUID		<3.0000E-02			0.03	ug/mL			
10	ICB	S1007120063		0 0			Samarium	LIQUID		<2.0000E-02			0.02	ug/mL			
10	ICB	S1007120063		0 0			Tin	LIQUID		<3.0000E-02			0.03	ug/mL			
10	ICB	S1007120063		0 0			Strontium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Tantalum	LIQUID		<5.0000E-02			0.05	ug/mL			
10	ICB	S1007120063		0 0			Tellurium	LIQUID		<1.0000E-01			0.1	ug/mL			
10	ICB	S1007120063		0 0			Thorium	LIQUID		<5.0000E-02			0.05	ug/mL			
10	ICB	S1007120063		0 0			Titanium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Thallium	LIQUID		<1.0000E-01			0.1	ug/mL			
10	ICB	S1007120063		0 0			Uranium	LIQUID		<1.0000E-01			0.1	ug/mL			
10	ICB	S1007120063		0 0			Vanadium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Tungsten	LIQUID		<2.0000E-01			0.2	ug/mL			
10	ICB	S1007120063		0 0			Yttrium	LIQUID		<2.0000E-03			2.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Zinc	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
10	ICB	S1007120063		0 0			Zirconium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
Sample Sequence 11																	
11	ICSA	S1007120065		0 0			Silver	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Aluminum	LIQUID	200	2.1011E+02			0.03	ug/mL	105.06	% Recovery	
11	ICSA	S1007120065		0 0			Arsenic	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Boron	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
11	ICSA	S1007120065		0 0			Barium	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Beryllium	LIQUID		<1.0000E-03			1.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Bismuth	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Calcium	LIQUID	200	2.1715E+02			0.05	ug/mL	108.57	% Recovery	
11	ICSA	S1007120065		0 0			Cadmium	LIQUID		1.1390E-02			5.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Cerium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Cobalt	LIQUID		<1.0000E-02			0.01	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Chromium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Copper	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Europium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Iron	LIQUID	200	1.9465E+02			5.00E-03	ug/mL	97.326	% Recovery	
11	ICSA	S1007120065		0 0			Potassium	LIQUID		<5.0000E-01			0.5	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Lanthanum	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Lithium	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Magnesium	LIQUID	200	1.9378E+02			0.05	ug/mL	96.889	% Recovery	
11	ICSA	S1007120065		0 0			Manganese	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Molybdenum	LIQUID		<2.0000E-02			0.02	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Sodium	LIQUID	200	1.7588E+02			0.1	ug/mL	87.941	% Recovery	
11	ICSA	S1007120065		0 0			Neodymium	LIQUID		<1.0000E-02			0.01	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Nickel	LIQUID		<2.0000E-02			0.02	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Niobium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Phosphorus	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Lead	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Palladium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Praseodymium	LIQUID		<1.0000E-02			0.01	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Rubidium	LIQUID		<1.0000E+00			1	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Rhodium	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Ruthenium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Sulfur	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Antimony	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Selenium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Silicon	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Samarium	LIQUID		<2.0000E-02			0.02	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Tin	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Strontium	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Tantalum	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Tellurium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Thorium	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Titanium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Thallium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Vanadium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Yttrium	LIQUID		<2.0000E-03			2.00E-03	ug/mL	N/A		

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
11	ICSA	S1007120065		0 0			Zinc	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
11	ICSA	S1007120065		0 0			Zirconium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
Sample Sequence 12																	
12	ICSAB	S1007120066		0 0			Silver	LIQUID	1	1.0171E+00			5.00E-03	ug/mL	101.71	% Recovery	
12	ICSAB	S1007120066		0 0			Aluminum	LIQUID	200	2.0922E+02			0.03	ug/mL	104.61	% Recovery	
12	ICSAB	S1007120066		0 0			Arsenic	LIQUID	5	5.1137E+00			0.05	ug/mL	102.27	% Recovery	
12	ICSAB	S1007120066		0 0			Boron	LIQUID	1	1.0210E+00			0.03	ug/mL	102.1	% Recovery	
12	ICSAB	S1007120066		0 0			Barium	LIQUID	1	9.4932E-01			3.00E-03	ug/mL	94.932	% Recovery	
12	ICSAB	S1007120066		0 0			Beryllium	LIQUID	.1	9.0960E-02			1.00E-03	ug/mL	90.96	% Recovery	
12	ICSAB	S1007120066		0 0			Bismuth	LIQUID	5	6.4715E+00			0.1	ug/mL	129.43	% Recovery	
12	ICSAB	S1007120066		0 0			Calcium	LIQUID	200	2.0996E+02			0.05	ug/mL	104.98	% Recovery	
12	ICSAB	S1007120066		0 0			Cadmium	LIQUID	.2	2.1226E-01			5.00E-03	ug/mL	106.13	% Recovery	
12	ICSAB	S1007120066		0 0			Cerium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Cobalt	LIQUID	5	5.0170E+00			0.01	ug/mL	100.34	% Recovery	
12	ICSAB	S1007120066		0 0			Chromium	LIQUID	5	4.9310E+00			5.00E-03	ug/mL	98.62	% Recovery	
12	ICSAB	S1007120066		0 0			Copper	LIQUID	5	5.1080E+00			5.00E-03	ug/mL	102.16	% Recovery	
12	ICSAB	S1007120066		0 0			Europium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Iron	LIQUID	200	1.9105E+02			5.00E-03	ug/mL	95.524	% Recovery	
12	ICSAB	S1007120066		0 0			Potassium	LIQUID		<5.0000E-01			0.5	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Lanthanum	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Lithium	LIQUID	1	9.1905E-01			3.00E-03	ug/mL	91.905	% Recovery	
12	ICSAB	S1007120066		0 0			Magnesium	LIQUID	200	1.9044E+02			0.05	ug/mL	95.221	% Recovery	
12	ICSAB	S1007120066		0 0			Manganese	LIQUID	5	4.9037E+00			3.00E-03	ug/mL	98.074	% Recovery	
12	ICSAB	S1007120066		0 0			Molybdenum	LIQUID	5	4.9553E+00			0.02	ug/mL	99.106	% Recovery	
12	ICSAB	S1007120066		0 0			Sodium	LIQUID	200	1.7620E+02			0.1	ug/mL	88.098	% Recovery	
12	ICSAB	S1007120066		0 0			Neodymium	LIQUID		1.2954E-01			0.01	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Nickel	LIQUID	5	4.9742E+00			0.02	ug/mL	99.485	% Recovery	
12	ICSAB	S1007120066		0 0			Niobium	LIQUID	5	4.5387E+00			0.03	ug/mL	90.774	% Recovery	
12	ICSAB	S1007120066		0 0			Phosphorus	LIQUID	1	9.8825E-01			0.05	ug/mL	98.825	% Recovery	
12	ICSAB	S1007120066		0 0			Lead	LIQUID	1	9.5787E-01			0.05	ug/mL	95.787	% Recovery	
12	ICSAB	S1007120066		0 0			Palladium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Praseodymium	LIQUID		<1.0000E-02			0.01	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Rubidium	LIQUID		<1.0000E+00			1	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Rhodium	LIQUID	1	1.0091E+00			0.05	ug/mL	100.91	% Recovery	
12	ICSAB	S1007120066		0 0			Ruthenium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Sulfur	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Antimony	LIQUID	5	5.1498E+00			0.05	ug/mL	103	% Recovery	
12	ICSAB	S1007120066		0 0			Selenium	LIQUID	5	5.0173E+00			0.1	ug/mL	100.35	% Recovery	
12	ICSAB	S1007120066		0 0			Silicon	LIQUID	5	4.9227E+00			0.03	ug/mL	98.454	% Recovery	
12	ICSAB	S1007120066		0 0			Samarium	LIQUID		<2.0000E-02			0.02	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Tin	LIQUID	1	8.8562E-01			0.03	ug/mL	88.562	% Recovery	
12	ICSAB	S1007120066		0 0			Strontium	LIQUID	1	9.5952E-01			3.00E-03	ug/mL	95.952	% Recovery	

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
12	ICSAB	S1007120066		0 0			Tantalum	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Thorium	LIQUID	5	4.6450E+00			0.05	ug/mL	92.901	% Recovery	
12	ICSAB	S1007120066		0 0			Titanium	LIQUID	50	4.9374E+01			5.00E-03	ug/mL	98.748	% Recovery	
12	ICSAB	S1007120066		0 0			Thallium	LIQUID	5	4.3333E+00			0.1	ug/mL	86.666	% Recovery	
12	ICSAB	S1007120066		0 0			Uranium	LIQUID	5	5.0066E+00			0.1	ug/mL	100.13	% Recovery	
12	ICSAB	S1007120066		0 0			Vanadium	LIQUID	1	9.9595E-01			5.00E-03	ug/mL	99.595	% Recovery	
12	ICSAB	S1007120066		0 0			Tungsten	LIQUID	5	5.2599E+00			0.2	ug/mL	105.2	% Recovery	
12	ICSAB	S1007120066		0 0			Yttrium	LIQUID		<2.0000E-03			2.00E-03	ug/mL	N/A		
12	ICSAB	S1007120066		0 0			Zinc	LIQUID	5	4.9101E+00			5.00E-03	ug/mL	98.202	% Recovery	
12	ICSAB	S1007120066		0 0			Zirconium	LIQUID	5	4.2637E+00			5.00E-03	ug/mL	85.274	% Recovery	
Sample Sequence 13																	
13	BLNK-PREP	S1005270089		0 0	A		Silver	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Aluminum	LIQUID		<3.0000E-02			0.03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Arsenic	LIQUID		<5.0000E-02			0.05	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Boron	LIQUID		<3.0000E-02			0.03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Barium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Beryllium	LIQUID		<1.0000E-03			1.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Bismuth	LIQUID		<1.0000E-01			0.1	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Calcium	LIQUID		<5.0000E-02			0.05	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Cadmium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Cerium	LIQUID		<3.0000E-02			0.03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Cobalt	LIQUID		<1.0000E-02			0.01	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Chromium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Copper	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Europium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Iron	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Potassium	LIQUID		<5.0000E-01			0.5	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Lanthanum	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Lithium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Magnesium	LIQUID		<5.0000E-02			0.05	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Manganese	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Molybdenum	LIQUID		<2.0000E-02			0.02	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Sodium	LIQUID		<1.0000E-01			0.1	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Neodymium	LIQUID		<1.0000E-02			0.01	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Nickel	LIQUID		<2.0000E-02			0.02	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Niobium	LIQUID		<3.0000E-02			0.03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Phosphorus	LIQUID		<5.0000E-02			0.05	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Lead	LIQUID		<5.0000E-02			0.05	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Palladium	LIQUID		<1.0000E-01			0.1	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Praseodymium	LIQUID		<1.0000E-02			0.01	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Rubidium	LIQUID		<1.0000E+00			1	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Rhodium	LIQUID		<5.0000E-02			0.05	ug/mL			

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
13	BLNK-PREP	S1005270089		0 0	A		Ruthenium	LIQUID		<3.0000E-02			0.03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Sulfur	LIQUID		<1.0000E-01			0.1	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Antimony	LIQUID		<5.0000E-02			0.05	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Selenium	LIQUID		<1.0000E-01			0.1	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Silicon	LIQUID		<3.0000E-02			0.03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Samarium	LIQUID		<2.0000E-02			0.02	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Tin	LIQUID		<3.0000E-02			0.03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Strontium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Tantalum	LIQUID		<5.0000E-02			0.05	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Tellurium	LIQUID		<1.0000E-01			0.1	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Thorium	LIQUID		<5.0000E-02			0.05	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Titanium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Thallium	LIQUID		<1.0000E-01			0.1	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Uranium	LIQUID		<1.0000E-01			0.1	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Vanadium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Tungsten	LIQUID		<2.0000E-01			0.2	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Yttrium	LIQUID		<2.0000E-03			2.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Zinc	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
13	BLNK-PREP	S1005270089		0 0	A		Zirconium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
Sample Sequence 14																	
14	STD-PREP	S1005270090		0 0	A		Aluminum	LIQUID	5	4.1585E+00			0.03	ug/mL	83.169	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Arsenic	LIQUID	5	4.2640E+00			0.05	ug/mL	85.281	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Boron	LIQUID	5	4.7640E+00			0.03	ug/mL	95.28	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Barium	LIQUID	5	4.2253E+00			3.00E-03	ug/mL	84.506	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Beryllium	LIQUID	5	4.1248E+00			1.00E-03	ug/mL	82.495	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Bismuth	LIQUID	5	4.1155E+00			0.1	ug/mL	82.31	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Calcium	LIQUID	5	3.9168E+00			0.05	ug/mL	78.337	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Cadmium	LIQUID	5	4.1476E+00			5.00E-03	ug/mL	82.952	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Cobalt	LIQUID	5	4.1085E+00			0.01	ug/mL	82.17	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Chromium	LIQUID	5	4.1057E+00			5.00E-03	ug/mL	82.114	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Copper	LIQUID	5	4.3215E+00			5.00E-03	ug/mL	86.43	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Iron	LIQUID	5	4.1384E+00			5.00E-03	ug/mL	82.769	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Potassium	LIQUID	5	4.0992E+00			0.5	ug/mL	81.984	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Lanthanum	LIQUID	5	4.2654E+00			3.00E-03	ug/mL	85.307	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Lithium	LIQUID	5	4.3060E+00			3.00E-03	ug/mL	86.12	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Magnesium	LIQUID	5	4.0002E+00			0.05	ug/mL	80.005	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Manganese	LIQUID	5	4.0683E+00			3.00E-03	ug/mL	81.366	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Molybdenum	LIQUID	5	4.7435E+00			0.02	ug/mL	94.871	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Sodium	LIQUID	5	4.3487E+00			0.1	ug/mL	86.974	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Nickel	LIQUID	5	4.0544E+00			0.02	ug/mL	81.087	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Phosphorus	LIQUID	5	4.5845E+00			0.05	ug/mL	91.691	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Sulfur	LIQUID	5	4.6513E+00			0.1	ug/mL	93.026	% Recovery	

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
14	STD-PREP	S1005270090		0 0	A		Antimony	LIQUID	5	4.6380E+00			0.05	ug/mL	92.759	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Selenium	LIQUID	5	4.2957E+00			0.1	ug/mL	85.914	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Silicon	LIQUID	5	3.8859E+00			0.03	ug/mL	77.718	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Strontium	LIQUID	5	4.2297E+00			3.00E-03	ug/mL	84.594	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Titanium	LIQUID	5	4.6296E+00			5.00E-03	ug/mL	92.592	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Vanadium	LIQUID	5	4.2085E+00			5.00E-03	ug/mL	84.169	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Zinc	LIQUID	5	4.1950E+00			5.00E-03	ug/mL	83.899	% Recovery	
14	STD-PREP	S1005270090		0 0	A		Zirconium	LIQUID	5	4.4328E+00			5.00E-03	ug/mL	88.655	% Recovery	
Sample Sequence 15																	
15	STD-PREP	S1005270094		0 0	A		Cerium	LIQUID	5	4.4826E+00			0.03	ug/mL	89.652	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Neodymium	LIQUID	5	4.5439E+00			0.01	ug/mL	90.877	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Niobium	LIQUID	5	4.4708E+00			0.03	ug/mL	89.416	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Palladium	LIQUID	5	4.3354E+00			0.1	ug/mL	86.708	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Praseodymium	LIQUID	5	4.4928E+00			0.01	ug/mL	89.855	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Rhodium	LIQUID	5	4.4623E+00			0.05	ug/mL	89.246	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Ruthenium	LIQUID	5	4.3251E+00			0.03	ug/mL	86.501	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Samarium	LIQUID	5	4.5331E+00			0.02	ug/mL	90.663	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Tin	LIQUID	5	4.2631E+00			0.03	ug/mL	85.262	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Tantalum	LIQUID	5	4.3711E+00			0.05	ug/mL	87.422	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Tellurium	LIQUID	5	4.6276E+00			0.1	ug/mL	92.553	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Thorium	LIQUID	5	4.2352E+00			0.05	ug/mL	84.704	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Thallium	LIQUID	5	4.2496E+00			0.1	ug/mL	84.992	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Uranium	LIQUID	5	4.8770E+00			0.1	ug/mL	97.539	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Tungsten	LIQUID	5	4.5506E+00			0.2	ug/mL	91.013	% Recovery	
15	STD-PREP	S1005270094		0 0	A		Yttrium	LIQUID	5	4.2756E+00			2.00E-03	ug/mL	85.512	% Recovery	
Sample Sequence 16																	
16	SERDIL	S1007120067	S10V000136	0 0			Aluminum	SOLID		6.4771E+03			16.031	ug/g	.53667	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Barium	SOLID		6.9734E+01			1.6031	ug/g	2.1845	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Beryllium	SOLID		<5.3437E-01			0.53437	ug/g	N/A		
16	SERDIL	S1007120067	S10V000136	0 0			Bismuth	SOLID		<5.3437E+01			53.437	ug/g	N/A		
16	SERDIL	S1007120067	S10V000136	0 0			Calcium	SOLID		9.4370E+03			26.719	ug/g	.54075	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Cadmium	SOLID		<2.6719E+00			2.6719	ug/g	N/A		
16	SERDIL	S1007120067	S10V000136	0 0			Cerium	SOLID		2.5599E+01			16.031	ug/g	25.991	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Cobalt	SOLID		1.3555E+01			5.3437	ug/g	69.414	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Chromium	SOLID		7.0947E+00			2.6719	ug/g	5.1443	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Copper	SOLID		1.1237E+01			2.6719	ug/g	1.8177	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Iron	SOLID		2.3554E+04			2.6719	ug/g	2.9247	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Potassium	SOLID		1.1694E+03			267.19	ug/g	6.7837	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Lanthanum	SOLID		9.6240E+00			1.6031	ug/g	6.744	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Lithium	SOLID		7.5297E+00			1.6031	ug/g	7.2517	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Magnesium	SOLID		5.0609E+03			26.719	ug/g	3.0087	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Manganese	SOLID		3.3533E+02			1.6031	ug/g	1.5077	% Diff	

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
16	SERDIL	S1007120067	S10V000136	0 0			Molybdenum	SOLID		<1.0687E+01			10.687	ug/g	N/A		
16	SERDIL	S1007120067	S10V000136	0 0			Sodium	SOLID		1.9037E+02			53.437	ug/g	6.6723	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Neodymium	SOLID		1.7867E+01			5.3437	ug/g	2.4942	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Nickel	SOLID		1.6620E+01			10.687	ug/g	79.463	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Phosphorus	SOLID		9.1044E+02			26.719	ug/g	2.668	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Sulfur	SOLID		6.9392E+01			53.437	ug/g	7.4185	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Silicon	SOLID		1.0261E+02			16.031	ug/g	1.6351	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Strontium	SOLID		3.0575E+01			1.6031	ug/g	2.3625	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Titanium	SOLID		1.8158E+03			2.6719	ug/g	2.2348	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Vanadium	SOLID		5.8144E+01			2.6719	ug/g	1.9781	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Yttrium	SOLID		1.0165E+01			1.0687	ug/g	.68569	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Zinc	SOLID		4.1809E+01			2.6719	ug/g	1.6692	% Diff	
16	SERDIL	S1007120067	S10V000136	0 0			Zirconium	SOLID		3.3325E+00			2.6719	ug/g	7.966	% Diff	
Sample Sequence 17																	
17	SAMPLE	S10V000136		0 0	A		Aluminum	SOLID	N/A	6.4425E+03			3.2062	ug/g			
17	SAMPLE	S10V000136		0 0	A		Barium	SOLID	N/A	6.8243E+01			0.32062	ug/g			
17	SAMPLE	S10V000136		0 0	A		Beryllium	SOLID	N/A	1.2419E-01			0.10687	ug/g			J
17	SAMPLE	S10V000136		0 0	A		Bismuth	SOLID	N/A	3.8965E+01			10.687	ug/g			Jb
17	SAMPLE	S10V000136		0 0	A		Calcium	SOLID	N/A	9.4883E+03			5.3437	ug/g			a
17	SAMPLE	S10V000136		0 0	A		Cadmium	SOLID	N/A	2.4830E+00			0.53437	ug/g			J
17	SAMPLE	S10V000136		0 0	A		Cerium	SOLID	N/A	2.0318E+01			3.2062	ug/g			J
17	SAMPLE	S10V000136		0 0	A		Cobalt	SOLID	N/A	8.0009E+00			1.0687	ug/g			J
17	SAMPLE	S10V000136		0 0	A		Chromium	SOLID	N/A	7.4795E+00			0.53437	ug/g			
17	SAMPLE	S10V000136		0 0	A		Copper	SOLID	N/A	1.1445E+01			0.53437	ug/g			
17	SAMPLE	S10V000136		0 0	A		Iron	SOLID	N/A	2.2885E+04			0.53437	ug/g			
17	SAMPLE	S10V000136		0 0	A		Potassium	SOLID	N/A	1.0951E+03			53.437	ug/g			
17	SAMPLE	S10V000136		0 0	A		Lanthanum	SOLID	N/A	1.0320E+01			0.32062	ug/g			
17	SAMPLE	S10V000136		0 0	A		Lithium	SOLID	N/A	7.0206E+00			0.32062	ug/g			
17	SAMPLE	S10V000136		0 0	A		Magnesium	SOLID	N/A	4.9131E+03			5.3437	ug/g			
17	SAMPLE	S10V000136		0 0	A		Manganese	SOLID	N/A	3.3035E+02			0.32062	ug/g			
17	SAMPLE	S10V000136		0 0	A		Molybdenum	SOLID	N/A	<2.1375E+00			2.1375	ug/g			U
17	SAMPLE	S10V000136		0 0	A		Sodium	SOLID	N/A	1.7846E+02			10.687	ug/g			
17	SAMPLE	S10V000136		0 0	A		Nickel	SOLID	N/A	9.2610E+00			2.1375	ug/g			J
17	SAMPLE	S10V000136		0 0	A		Phosphorus	SOLID	N/A	8.8678E+02			5.3437	ug/g			
17	SAMPLE	S10V000136		0 0	A		Sulfur	SOLID	N/A	7.4952E+01			10.687	ug/g			J
17	SAMPLE	S10V000136		0 0	A		Silicon	SOLID	N/A	1.0096E+02			3.2062	ug/g			a
17	SAMPLE	S10V000136		0 0	A		Strontium	SOLID	N/A	2.9869E+01			0.32062	ug/g			
17	SAMPLE	S10V000136		0 0	A		Titanium	SOLID	N/A	1.7761E+03			0.53437	ug/g			
17	SAMPLE	S10V000136		0 0	A		Vanadium	SOLID	N/A	5.7016E+01			0.53437	ug/g			
17	SAMPLE	S10V000136		0 0	A		Yttrium	SOLID	N/A	1.0096E+01			0.21375	ug/g			
17	SAMPLE	S10V000136		0 0	A		Zinc	SOLID	N/A	4.2519E+01			0.53437	ug/g			
17	SAMPLE	S10V000136		0 0	A		Zirconium	SOLID	N/A	3.6210E+00			0.53437	ug/g			Jb

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 18																	
18	DUP	S1005270091	S10V000136	0 0	A		Aluminum	SOLID	6.4425E+03	7.1104E+03			3.1161	ug/g	9.8566	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Barium	SOLID	6.8243E+01	8.2521E+01			0.29461	ug/g	18.941	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Beryllium	SOLID	1.2419E-01	1.7473E-01			0.13597	ug/g	33.817	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Bismuth	SOLID	3.8965E+01	4.1921E+01			11.331	ug/g	7.3087	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Calcium	SOLID	9.4883E+03	1.1779E+04			1.1444	ug/g	21.542	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Cadmium	SOLID	2.4830E+00	3.1098E+00			0.31727	ug/g	22.414	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Cerium	SOLID	2.0318E+01	2.6632E+01			3.3994	ug/g	26.896	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Cobalt	SOLID	8.0009E+00	1.0633E+01			0.53257	ug/g	28.250	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Chromium	SOLID	7.4795E+00	8.4790E+00			0.31727	ug/g	12.527	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Copper	SOLID	1.1445E+01	1.3439E+01			0.16997	ug/g	16.023	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Iron	SOLID	2.2885E+04	2.7296E+04			0.26062	ug/g	17.582	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Potassium	SOLID	1.0951E+03	1.2765E+03			49.075	ug/g	15.296	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Lanthanum	SOLID	1.0320E+01	1.2549E+01			0.33994	ug/g	19.492	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Lithium	SOLID	7.0206E+00	8.0973E+00			0.47591	ug/g	14.245	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Magnesium	SOLID	4.9131E+03	5.7821E+03			2.5042	ug/g	16.250	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Manganese	SOLID	3.3035E+02	4.0468E+02			0.12464	ug/g	20.225	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Molybdenum	SOLID	<2.1375E+00	6.9381E-01			0.52123	ug/g	101.98	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Sodium	SOLID	1.7846E+02	2.2317E+02			1.3597	ug/g	22.265	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Neodymium	SOLID		2.0946E+01			1.1331	ug/g			
18	DUP	S1005270091	S10V000136	0 0	A		Nickel	SOLID	9.2610E+00	9.8846E+00			1.2918	ug/g	6.5147	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Phosphorus	SOLID	8.8678E+02	1.0844E+03			2.6402	ug/g	20.051	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Sulfur	SOLID	7.4952E+01	9.6936E+01			11.331	ug/g	25.580	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Silicon	SOLID	1.0096E+02	8.4830E+01			3.3994	ug/g	17.360	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Strontium	SOLID	2.9869E+01	3.6104E+01			0.12464	ug/g	18.901	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Titanium	SOLID	1.7761E+03	2.0151E+03			0.56656	ug/g	12.608	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Vanadium	SOLID	5.7016E+01	6.7865E+01			0.49857	ug/g	17.376	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Yttrium	SOLID	1.0096E+01	1.2328E+01			0.22662	ug/g	19.904	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Zinc	SOLID	4.2519E+01	5.1243E+01			0.27195	ug/g	18.610	% RPD	
18	DUP	S1005270091	S10V000136	0 0	A		Zirconium	SOLID	3.6210E+00	3.8985E+00			0.56656	ug/g	7.3807	% RPD	
Sample Sequence 19																	
19	SPK-POST	S1007120068	S10V000136	0 0			Aluminum	SOLID	100	7.0416E+02			0.03	ug/g	101.35	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Barium	SOLID	100	1.0679E+02			3.00E-03	ug/g	100.41	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Beryllium	SOLID	100	9.5377E+01			1.00E-03	ug/g	95.365	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Bismuth	SOLID	100	1.0691E+02			0.1	ug/g	103.26	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Calcium	SOLID	100	9.7634E+02			0.05	ug/g	88.538	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Cadmium	SOLID	100	9.8554E+01			5.00E-03	ug/g	98.322	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Cerium	SOLID	100	1.0090E+02			0.03	ug/g	98.994	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Cobalt	SOLID	100	1.0057E+02			0.01	ug/g	99.822	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Chromium	SOLID	100	9.9998E+01			5.00E-03	ug/g	99.299	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Copper	SOLID	100	1.0200E+02			5.00E-03	ug/g	100.93	% Recovery	
22	SPK-POST	S1007120068	S10V000136	0 3			Iron	SOLID	2000	3.9997E+03			5.00E-03	ug/g	92.922	% Recovery	

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
19	SPK-POST	S1007120068	S10V000136	0 0			Potassium	SOLID	100	2.0477E+02			0.5	ug/g	102.3	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Lanthanum	SOLID	100	9.7712E+01			3.00E-03	ug/g	96.746	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Lithium	SOLID	100	9.4695E+01			3.00E-03	ug/g	94.038	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Magnesium	SOLID	100	5.4112E+02			0.05	ug/g	81.414	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Manganese	SOLID	100	1.3139E+02			3.00E-03	ug/g	100.48	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Molybdenum	SOLID	100	1.0056E+02			0.02	ug/g	100.56	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Sodium	SOLID	100	1.1494E+02			0.1	ug/g	98.242	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Neodymium	SOLID	100	9.9941E+01			0.01	ug/g	98.31	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Nickel	SOLID	100	9.8913E+01			0.02	ug/g	98.046	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Phosphorus	SOLID	100	1.8362E+02			0.05	ug/g	100.64	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Sulfur	SOLID	100	1.0713E+02			0.1	ug/g	100.12	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Silicon	SOLID	100	1.0286E+02			0.03	ug/g	93.415	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Strontium	SOLID	100	1.0061E+02			3.00E-03	ug/g	97.816	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Titanium	SOLID	100	2.6319E+02			5.00E-03	ug/g	97.007	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Vanadium	SOLID	100	1.0416E+02			5.00E-03	ug/g	98.826	% Recovery	
20	SPK-POST	S1007120068	S10V000136	0 1			Yttrium	SOLID	100	9.6256E+01			2.00E-03	ug/g	95.312	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Zinc	SOLID	100	9.9928E+01			5.00E-03	ug/g	95.949	% Recovery	
19	SPK-POST	S1007120068	S10V000136	0 0			Zirconium	SOLID	100	9.0977E+01			5.00E-03	ug/g	90.638	% Recovery	
Sample Sequence 23																	
23	CCV	S1007120069		0 0			Silver	LIQUID	1	9.5084E-01			5.00E-03	ug/mL	95.084	% Recovery	
23	CCV	S1007120069		0 0			Aluminum	LIQUID	5	5.1924E+00			0.03	ug/mL	103.85	% Recovery	
23	CCV	S1007120069		0 0			Arsenic	LIQUID	5	5.1210E+00			0.05	ug/mL	102.42	% Recovery	
23	CCV	S1007120069		0 0			Boron	LIQUID	5	5.1069E+00			0.03	ug/mL	102.14	% Recovery	
23	CCV	S1007120069		0 0			Barium	LIQUID	5	5.0424E+00			3.00E-03	ug/mL	100.85	% Recovery	
23	CCV	S1007120069		0 0			Beryllium	LIQUID	5	5.0505E+00			1.00E-03	ug/mL	101.01	% Recovery	
23	CCV	S1007120069		0 0			Bismuth	LIQUID	5	5.1425E+00			0.1	ug/mL	102.85	% Recovery	
23	CCV	S1007120069		0 0			Calcium	LIQUID	5	5.0540E+00			0.05	ug/mL	101.08	% Recovery	
23	CCV	S1007120069		0 0			Cadmium	LIQUID	5	5.0944E+00			5.00E-03	ug/mL	101.89	% Recovery	
24	CCV	S1007120069		0 1			Cerium	LIQUID	5	5.2831E+00			0.03	ug/mL	105.66	% Recovery	
23	CCV	S1007120069		0 0			Cobalt	LIQUID	5	5.1548E+00			0.01	ug/mL	103.1	% Recovery	
23	CCV	S1007120069		0 0			Chromium	LIQUID	5	5.1587E+00			5.00E-03	ug/mL	103.17	% Recovery	
23	CCV	S1007120069		0 0			Copper	LIQUID	5	4.9638E+00			5.00E-03	ug/mL	99.276	% Recovery	
24	CCV	S1007120069		0 1			Europium	LIQUID	5	4.9739E+00			5.00E-03	ug/mL	99.478	% Recovery	
23	CCV	S1007120069		0 0			Iron	LIQUID	5	5.0621E+00			5.00E-03	ug/mL	101.24	% Recovery	
23	CCV	S1007120069		0 0			Potassium	LIQUID	5	4.9085E+00			0.5	ug/mL	98.171	% Recovery	
23	CCV	S1007120069		0 0			Lanthanum	LIQUID	5	5.0298E+00			3.00E-03	ug/mL	100.6	% Recovery	
23	CCV	S1007120069		0 0			Lithium	LIQUID	5	4.9612E+00			3.00E-03	ug/mL	99.223	% Recovery	
23	CCV	S1007120069		0 0			Magnesium	LIQUID	5	5.0137E+00			0.05	ug/mL	100.27	% Recovery	
23	CCV	S1007120069		0 0			Manganese	LIQUID	5	5.0828E+00			3.00E-03	ug/mL	101.66	% Recovery	
23	CCV	S1007120069		0 0			Molybdenum	LIQUID	5	5.2570E+00			0.02	ug/mL	105.14	% Recovery	
23	CCV	S1007120069		0 0			Sodium	LIQUID	5	5.1052E+00			0.1	ug/mL	102.1	% Recovery	
24	CCV	S1007120069		0 1			Neodymium	LIQUID	5	5.1013E+00			0.01	ug/mL	102.03	% Recovery	

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
23	CCV	S1007120069		0 0			Nickel	LIQUID	5	5.0483E+00			0.02	ug/mL	100.97	% Recovery	
25	CCV	S1007120069		0 2			Niobium	LIQUID	5	5.1882E+00			0.03	ug/mL	103.76	% Recovery	
23	CCV	S1007120069		0 0			Phosphorus	LIQUID	5	5.1185E+00			0.05	ug/mL	102.37	% Recovery	
23	CCV	S1007120069		0 0			Lead	LIQUID	5	5.1538E+00			0.05	ug/mL	103.08	% Recovery	
24	CCV	S1007120069		0 1			Palladium	LIQUID	5	4.9872E+00			0.1	ug/mL	99.745	% Recovery	
24	CCV	S1007120069		0 1			Praseodymium	LIQUID	5	5.1013E+00			0.01	ug/mL	102.03	% Recovery	
24	CCV	S1007120069		0 1			Rubidium	LIQUID	5	4.6707E+00			1	ug/mL	93.413	% Recovery	
24	CCV	S1007120069		0 1			Rhodium	LIQUID	5	4.9761E+00			0.05	ug/mL	99.522	% Recovery	
24	CCV	S1007120069		0 1			Ruthenium	LIQUID	5	5.1358E+00			0.03	ug/mL	102.72	% Recovery	
23	CCV	S1007120069		0 0			Sulfur	LIQUID	5	5.2201E+00			0.1	ug/mL	104.4	% Recovery	
23	CCV	S1007120069		0 0			Antimony	LIQUID	5	5.0887E+00			0.05	ug/mL	101.77	% Recovery	
23	CCV	S1007120069		0 0			Selenium	LIQUID	5	5.0901E+00			0.1	ug/mL	101.8	% Recovery	
23	CCV	S1007120069		0 0			Silicon	LIQUID	5	4.8781E+00			0.03	ug/mL	97.563	% Recovery	
24	CCV	S1007120069		0 1			Samarium	LIQUID	5	5.1400E+00			0.02	ug/mL	102.8	% Recovery	
25	CCV	S1007120069		0 2			Tin	LIQUID	5	5.1960E+00			0.03	ug/mL	103.92	% Recovery	
23	CCV	S1007120069		0 0			Strontium	LIQUID	5	5.0253E+00			3.00E-03	ug/mL	100.51	% Recovery	
25	CCV	S1007120069		0 2			Tantalum	LIQUID	5	5.2350E+00			0.05	ug/mL	104.7	% Recovery	
25	CCV	S1007120069		0 2			Tellurium	LIQUID	5	5.1728E+00			0.1	ug/mL	103.46	% Recovery	
24	CCV	S1007120069		0 1			Thorium	LIQUID	5	5.1331E+00			0.05	ug/mL	102.66	% Recovery	
23	CCV	S1007120069		0 0			Titanium	LIQUID	5	5.1040E+00			5.00E-03	ug/mL	102.08	% Recovery	
24	CCV	S1007120069		0 1			Thallium	LIQUID	5	5.1473E+00			0.1	ug/mL	102.95	% Recovery	
24	CCV	S1007120069		0 1			Uranium	LIQUID	5	5.4382E+00			0.1	ug/mL	108.76	% Recovery	
23	CCV	S1007120069		0 0			Vanadium	LIQUID	5	5.2014E+00			5.00E-03	ug/mL	104.03	% Recovery	
25	CCV	S1007120069		0 2			Tungsten	LIQUID	5	5.1816E+00			0.2	ug/mL	103.63	% Recovery	
24	CCV	S1007120069		0 1			Yttrium	LIQUID	5	5.0871E+00			2.00E-03	ug/mL	101.74	% Recovery	
23	CCV	S1007120069		0 0			Zinc	LIQUID	5	5.0164E+00			5.00E-03	ug/mL	100.33	% Recovery	
23	CCV	S1007120069		0 0			Zirconium	LIQUID	5	4.8830E+00			5.00E-03	ug/mL	97.659	% Recovery	
Sample Sequence 26																	
26	CCB	S1007120070		0 0			Silver	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Aluminum	LIQUID		<3.0000E-02			0.03	ug/mL			
26	CCB	S1007120070		0 0			Arsenic	LIQUID		<5.0000E-02			0.05	ug/mL			
26	CCB	S1007120070		0 0			Boron	LIQUID		<3.0000E-02			0.03	ug/mL			
26	CCB	S1007120070		0 0			Barium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Beryllium	LIQUID		<1.0000E-03			1.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Bismuth	LIQUID		<1.0000E-01			0.1	ug/mL			
26	CCB	S1007120070		0 0			Calcium	LIQUID		<5.0000E-02			0.05	ug/mL			
26	CCB	S1007120070		0 0			Cadmium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Cerium	LIQUID		<3.0000E-02			0.03	ug/mL			
26	CCB	S1007120070		0 0			Cobalt	LIQUID		<1.0000E-02			0.01	ug/mL			
26	CCB	S1007120070		0 0			Chromium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Copper	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Europium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			

Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
26	CCB	S1007120070		0 0			Iron	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Potassium	LIQUID		<5.0000E-01			0.5	ug/mL			
26	CCB	S1007120070		0 0			Lanthanum	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Lithium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Magnesium	LIQUID		<5.0000E-02			0.05	ug/mL			
26	CCB	S1007120070		0 0			Manganese	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Molybdenum	LIQUID		<2.0000E-02			0.02	ug/mL			
26	CCB	S1007120070		0 0			Sodium	LIQUID		<1.0000E-01			0.1	ug/mL			
26	CCB	S1007120070		0 0			Neodymium	LIQUID		<1.0000E-02			0.01	ug/mL			
26	CCB	S1007120070		0 0			Nickel	LIQUID		<2.0000E-02			0.02	ug/mL			
26	CCB	S1007120070		0 0			Niobium	LIQUID		<3.0000E-02			0.03	ug/mL			
26	CCB	S1007120070		0 0			Phosphorus	LIQUID		<5.0000E-02			0.05	ug/mL			
26	CCB	S1007120070		0 0			Lead	LIQUID		<5.0000E-02			0.05	ug/mL			
26	CCB	S1007120070		0 0			Palladium	LIQUID		<1.0000E-01			0.1	ug/mL			
26	CCB	S1007120070		0 0			Praseodymium	LIQUID		<1.0000E-02			0.01	ug/mL			
26	CCB	S1007120070		0 0			Rubidium	LIQUID		<1.0000E+00			1	ug/mL			
26	CCB	S1007120070		0 0			Rhodium	LIQUID		<5.0000E-02			0.05	ug/mL			
26	CCB	S1007120070		0 0			Ruthenium	LIQUID		<3.0000E-02			0.03	ug/mL			
26	CCB	S1007120070		0 0			Sulfur	LIQUID		<1.0000E-01			0.1	ug/mL			
26	CCB	S1007120070		0 0			Antimony	LIQUID		<5.0000E-02			0.05	ug/mL			
26	CCB	S1007120070		0 0			Selenium	LIQUID		<1.0000E-01			0.1	ug/mL			
26	CCB	S1007120070		0 0			Silicon	LIQUID		<3.0000E-02			0.03	ug/mL			
26	CCB	S1007120070		0 0			Samarium	LIQUID		<2.0000E-02			0.02	ug/mL			
26	CCB	S1007120070		0 0			Tin	LIQUID		<3.0000E-02			0.03	ug/mL			
26	CCB	S1007120070		0 0			Strontium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Tantalum	LIQUID		<5.0000E-02			0.05	ug/mL			
26	CCB	S1007120070		0 0			Tellurium	LIQUID		<1.0000E-01			0.1	ug/mL			
26	CCB	S1007120070		0 0			Thorium	LIQUID		<5.0000E-02			0.05	ug/mL			
26	CCB	S1007120070		0 0			Titanium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Thallium	LIQUID		<1.0000E-01			0.1	ug/mL			
26	CCB	S1007120070		0 0			Uranium	LIQUID		<1.0000E-01			0.1	ug/mL			
26	CCB	S1007120070		0 0			Vanadium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Tungsten	LIQUID		<2.0000E-01			0.2	ug/mL			
26	CCB	S1007120070		0 0			Yttrium	LIQUID		<2.0000E-03			2.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Zinc	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
26	CCB	S1007120070		0 0			Zirconium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
Sample Sequence 28																	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Aluminum	SOLID	54.0412	7.6352E+03			3.2425	ug/g	2207.1	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Barium	SOLID	54.0412	1.1217E+02			0.32425	ug/g	81.276	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Beryllium	SOLID	54.0412	4.3563E+01			0.10808	ug/g	80.381	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Bismuth	SOLID	54.0412	6.9076E+01			10.808	ug/g	55.719	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Calcium	SOLID	54.0412	1.0162E+04			5.4041	ug/g	1245.9	% Recovery	

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Cadmium	SOLID	54.0412	4.6970E+01			0.54041	ug/g	82.32	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Cobalt	SOLID	54.0412	5.3361E+01			1.0808	ug/g	83.937	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Chromium	SOLID	54.0412	5.2573E+01			0.54041	ug/g	83.443	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Copper	SOLID	54.0412	5.5744E+01			0.54041	ug/g	81.972	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Iron	SOLID	54.0412	2.2921E+04			0.54041	ug/g	67.01	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Potassium	SOLID	54.0412	1.1555E+03			54.041	ug/g	111.78	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Lanthanum	SOLID	54.0412	5.4755E+01			0.32425	ug/g	82.225	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Lithium	SOLID	54.0412	4.9315E+01			0.32425	ug/g	78.263	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Magnesium	SOLID	54.0412	5.0358E+03			5.4041	ug/g	227.11	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Manganese	SOLID	54.0412	3.8395E+02			0.32425	ug/g	99.192	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Molybdenum	SOLID	54.0412	4.2535E+01			2.1616	ug/g	78.709	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Sodium	SOLID	54.0412	4.2677E+02			10.808	ug/g	459.48	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Neodymium	SOLID	54.0412	1.9184E+01			1.0808	ug/g	3.2421	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Nickel	SOLID	54.0412	5.1684E+01			2.1616	ug/g	78.501	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Phosphorus	SOLID	54.0412	9.1909E+02			5.4041	ug/g	59.796	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Sulfur	SOLID	54.0412	1.1605E+02			10.808	ug/g	76.058	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Silicon	SOLID	54.0412	1.2208E+02			3.2425	ug/g	39.074	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Strontium	SOLID	54.0412	7.3106E+01			0.32425	ug/g	80.007	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Titanium	SOLID	54.0412	1.8860E+03			0.54041	ug/g	203.36	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Vanadium	SOLID	54.0412	1.0288E+02			0.54041	ug/g	84.863	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Zinc	SOLID	54.0412	8.5733E+01			0.54041	ug/g	79.964	% Recovery	
28	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Zirconium	SOLID	54.0412	1.4034E+01			0.54041	ug/g	19.268	% Recovery	
Sample Sequence 29																	
29	SPK-PREDIG	S1005270093	S10V000136	0 0	A		Cerium	SOLID	53.6883925	7.6759E+01			3.2213	ug/g	105.13	% Recovery	
29	SPK-PREDIG	S1005270093	S10V000136	0 0	A		Yttrium	SOLID	53.6883925	5.5647E+01			0.21475	ug/g	84.843	% Recovery	
Sample Sequence 30																	
30	SAMPLE	S10V000150		0 0	A		Aluminum	SOLID	N/A	7.7029E+03			3.1696	ug/g			
30	SAMPLE	S10V000150		0 0	A		Barium	SOLID	N/A	7.3241E+01			0.31696	ug/g			
30	SAMPLE	S10V000150		0 0	A		Beryllium	SOLID	N/A	1.5637E-01			0.10565	ug/g			J
30	SAMPLE	S10V000150		0 0	A		Bismuth	SOLID	N/A	4.0463E+01			10.565	ug/g			Jb
30	SAMPLE	S10V000150		0 0	A		Calcium	SOLID	N/A	1.0685E+04			5.2826	ug/g			a
30	SAMPLE	S10V000150		0 0	A		Cadmium	SOLID	N/A	3.0150E+00			0.52826	ug/g			J
30	SAMPLE	S10V000150		0 0	A		Cerium	SOLID	N/A	2.4371E+01			3.1696	ug/g			J
30	SAMPLE	S10V000150		0 0	A		Cobalt	SOLID	N/A	1.0495E+01			1.0565	ug/g			J
30	SAMPLE	S10V000150		0 0	A		Chromium	SOLID	N/A	9.2509E+00			0.52826	ug/g			
30	SAMPLE	S10V000150		0 0	A		Copper	SOLID	N/A	1.3491E+01			0.52826	ug/g			
30	SAMPLE	S10V000150		0 0	A		Iron	SOLID	N/A	2.5770E+04			0.52826	ug/g			
30	SAMPLE	S10V000150		0 0	A		Potassium	SOLID	N/A	1.2697E+03			52.826	ug/g			
30	SAMPLE	S10V000150		0 0	A		Lanthanum	SOLID	N/A	1.1036E+01			0.31696	ug/g			
30	SAMPLE	S10V000150		0 0	A		Lithium	SOLID	N/A	7.9965E+00			0.31696	ug/g			
30	SAMPLE	S10V000150		0 0	A		Magnesium	SOLID	N/A	5.7256E+03			5.2826	ug/g			
30	SAMPLE	S10V000150		0 0	A		Manganese	SOLID	N/A	3.8594E+02			0.31696	ug/g			

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
30	SAMPLE	S10V000150		0 0	A		Molybdenum	SOLID	N/A	<2.1130E+00			2.113	ug/g			U
30	SAMPLE	S10V000150		0 0	A		Sodium	SOLID	N/A	2.3611E+02			10.565	ug/g			
30	SAMPLE	S10V000150		0 0	A		Nickel	SOLID	N/A	1.1009E+01			2.113	ug/g			J
30	SAMPLE	S10V000150		0 0	A		Phosphorus	SOLID	N/A	9.5323E+02			5.2826	ug/g			
30	SAMPLE	S10V000150		0 0	A		Sulfur	SOLID	N/A	8.3401E+01			10.565	ug/g			J
30	SAMPLE	S10V000150		0 0	A		Silicon	SOLID	N/A	4.9740E+01			3.1696	ug/g			a
30	SAMPLE	S10V000150		0 0	A		Strontium	SOLID	N/A	3.1017E+01			0.31696	ug/g			
30	SAMPLE	S10V000150		0 0	A		Titanium	SOLID	N/A	1.9595E+03			0.52826	ug/g			
30	SAMPLE	S10V000150		0 0	A		Vanadium	SOLID	N/A	6.4238E+01			0.52826	ug/g			
30	SAMPLE	S10V000150		0 0	A		Yttrium	SOLID	N/A	1.0938E+01			0.2113	ug/g			
30	SAMPLE	S10V000150		0 0	A		Zinc	SOLID	N/A	4.7819E+01			0.52826	ug/g			
30	SAMPLE	S10V000150		0 0	A		Zirconium	SOLID	N/A	1.7513E+00			0.52826	ug/g			Jb
Sample Sequence 31																	
31	SAMPLE	S10V000167		0 0	A		Aluminum	SOLID	N/A	8.3883E+03			3.1342	ug/g			
31	SAMPLE	S10V000167		0 0	A		Barium	SOLID	N/A	7.9167E+01			0.31342	ug/g			
31	SAMPLE	S10V000167		0 0	A		Beryllium	SOLID	N/A	1.7468E-01			0.10447	ug/g			J
31	SAMPLE	S10V000167		0 0	A		Bismuth	SOLID	N/A	3.6629E+01			10.447	ug/g			Jb
31	SAMPLE	S10V000167		0 0	A		Calcium	SOLID	N/A	1.1492E+04			5.2237	ug/g			a
31	SAMPLE	S10V000167		0 0	A		Cadmium	SOLID	N/A	3.4749E+00			0.52237	ug/g			J
31	SAMPLE	S10V000167		0 0	A		Cerium	SOLID	N/A	2.7338E+01			3.1342	ug/g			J
31	SAMPLE	S10V000167		0 0	A		Cobalt	SOLID	N/A	1.0547E+01			1.0447	ug/g			
31	SAMPLE	S10V000167		0 0	A		Chromium	SOLID	N/A	1.1163E+01			0.52237	ug/g			
31	SAMPLE	S10V000167		0 0	A		Copper	SOLID	N/A	1.4806E+01			0.52237	ug/g			
31	SAMPLE	S10V000167		0 0	A		Iron	SOLID	N/A	2.5934E+04			0.52237	ug/g			
31	SAMPLE	S10V000167		0 0	A		Potassium	SOLID	N/A	1.1841E+03			52.237	ug/g			
31	SAMPLE	S10V000167		0 0	A		Lanthanum	SOLID	N/A	1.1964E+01			0.31342	ug/g			
31	SAMPLE	S10V000167		0 0	A		Lithium	SOLID	N/A	9.0500E+00			0.31342	ug/g			
31	SAMPLE	S10V000167		0 0	A		Magnesium	SOLID	N/A	6.0973E+03			5.2237	ug/g			
31	SAMPLE	S10V000167		0 0	A		Manganese	SOLID	N/A	4.0946E+02			0.31342	ug/g			
31	SAMPLE	S10V000167		0 0	A		Molybdenum	SOLID	N/A	<2.0895E+00			2.0895	ug/g			U
31	SAMPLE	S10V000167		0 0	A		Sodium	SOLID	N/A	2.8725E+02			10.447	ug/g			
31	SAMPLE	S10V000167		0 0	A		Nickel	SOLID	N/A	1.0879E+01			2.0895	ug/g			J
31	SAMPLE	S10V000167		0 0	A		Phosphorus	SOLID	N/A	9.9041E+02			5.2237	ug/g			
31	SAMPLE	S10V000167		0 0	A		Sulfur	SOLID	N/A	8.8015E+01			10.447	ug/g			J
31	SAMPLE	S10V000167		0 0	A		Silicon	SOLID	N/A	7.0171E+01			3.1342	ug/g			a
31	SAMPLE	S10V000167		0 0	A		Strontium	SOLID	N/A	3.7343E+01			0.31342	ug/g			
31	SAMPLE	S10V000167		0 0	A		Titanium	SOLID	N/A	1.9071E+03			0.52237	ug/g			
31	SAMPLE	S10V000167		0 0	A		Vanadium	SOLID	N/A	6.4106E+01			0.52237	ug/g			
31	SAMPLE	S10V000167		0 0	A		Yttrium	SOLID	N/A	1.0893E+01			0.20895	ug/g			
31	SAMPLE	S10V000167		0 0	A		Zinc	SOLID	N/A	4.8554E+01			0.52237	ug/g			
31	SAMPLE	S10V000167		0 0	A		Zirconium	SOLID	N/A	3.6757E+00			0.52237	ug/g			Jb
Sample Sequence 32																	

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
32	SAMPLE	S10V000201		0 0	A		Aluminum	SOLID	N/A	6.7684E+03			3.275	ug/g			
32	SAMPLE	S10V000201		0 0	A		Barium	SOLID	N/A	6.6809E+01			0.3275	ug/g			
32	SAMPLE	S10V000201		0 0	A		Beryllium	SOLID	N/A	1.6583E-01			0.10917	ug/g			J
32	SAMPLE	S10V000201		0 0	A		Bismuth	SOLID	N/A	3.6692E+01			10.917	ug/g			Jb
32	SAMPLE	S10V000201		0 0	A		Calcium	SOLID	N/A	8.0615E+03			5.4584	ug/g			a
32	SAMPLE	S10V000201		0 0	A		Cadmium	SOLID	N/A	2.9925E+00			0.54584	ug/g			J
32	SAMPLE	S10V000201		0 0	A		Cerium	SOLID	N/A	2.3676E+01			3.275	ug/g			J
32	SAMPLE	S10V000201		0 0	A		Cobalt	SOLID	N/A	8.3680E+00			1.0917	ug/g			J
32	SAMPLE	S10V000201		0 0	A		Chromium	SOLID	N/A	1.0043E+01			0.54584	ug/g			
32	SAMPLE	S10V000201		0 0	A		Copper	SOLID	N/A	1.0958E+01			0.54584	ug/g			
32	SAMPLE	S10V000201		0 0	A		Iron	SOLID	N/A	2.2066E+04			0.54584	ug/g			
32	SAMPLE	S10V000201		0 0	A		Potassium	SOLID	N/A	1.0599E+03			54.584	ug/g			
32	SAMPLE	S10V000201		0 0	A		Lanthanum	SOLID	N/A	9.8580E+00			0.3275	ug/g			
32	SAMPLE	S10V000201		0 0	A		Lithium	SOLID	N/A	7.2884E+00			0.3275	ug/g			
32	SAMPLE	S10V000201		0 0	A		Magnesium	SOLID	N/A	4.5456E+03			5.4584	ug/g			
32	SAMPLE	S10V000201		0 0	A		Manganese	SOLID	N/A	3.3090E+02			0.3275	ug/g			
32	SAMPLE	S10V000201		0 0	A		Molybdenum	SOLID	N/A	<2.1834E+00			2.1834	ug/g			U
32	SAMPLE	S10V000201		0 0	A		Sodium	SOLID	N/A	2.9965E+02			10.917	ug/g			
32	SAMPLE	S10V000201		0 0	A		Nickel	SOLID	N/A	8.6873E+00			2.1834	ug/g			J
32	SAMPLE	S10V000201		0 0	A		Phosphorus	SOLID	N/A	7.7153E+02			5.4584	ug/g			
32	SAMPLE	S10V000201		0 0	A		Sulfur	SOLID	N/A	6.6002E+01			10.917	ug/g			J
32	SAMPLE	S10V000201		0 0	A		Silicon	SOLID	N/A	3.2938E+01			3.275	ug/g			a
32	SAMPLE	S10V000201		0 0	A		Strontium	SOLID	N/A	2.9917E+01			0.3275	ug/g			
32	SAMPLE	S10V000201		0 0	A		Titanium	SOLID	N/A	1.5792E+03			0.54584	ug/g			
32	SAMPLE	S10V000201		0 0	A		Vanadium	SOLID	N/A	5.5640E+01			0.54584	ug/g			
32	SAMPLE	S10V000201		0 0	A		Yttrium	SOLID	N/A	8.8208E+00			0.21834	ug/g			
32	SAMPLE	S10V000201		0 0	A		Zinc	SOLID	N/A	4.5347E+01			0.54584	ug/g			
32	SAMPLE	S10V000201		0 0	A		Zirconium	SOLID	N/A	1.3919E+01			0.54584	ug/g			b
Sample Sequence 33																	
33	SAMPLE	S10V000236		0 0	A		Aluminum	SOLID	N/A	7.1097E+03			3.0549	ug/g			
33	SAMPLE	S10V000236		0 0	A		Barium	SOLID	N/A	7.5462E+01			0.30549	ug/g			
33	SAMPLE	S10V000236		0 0	A		Beryllium	SOLID	N/A	1.3533E-01			0.10183	ug/g			J
33	SAMPLE	S10V000236		0 0	A		Bismuth	SOLID	N/A	1.9426E+01			10.183	ug/g			Jb
33	SAMPLE	S10V000236		0 0	A		Calcium	SOLID	N/A	8.7700E+03			5.0914	ug/g			a
33	SAMPLE	S10V000236		0 0	A		Cadmium	SOLID	N/A	2.9661E+00			0.50914	ug/g			J
33	SAMPLE	S10V000236		0 0	A		Cerium	SOLID	N/A	2.3709E+01			3.0549	ug/g			J
33	SAMPLE	S10V000236		0 0	A		Cobalt	SOLID	N/A	9.3464E+00			1.0183	ug/g			J
33	SAMPLE	S10V000236		0 0	A		Chromium	SOLID	N/A	1.1039E+01			0.50914	ug/g			
33	SAMPLE	S10V000236		0 0	A		Copper	SOLID	N/A	1.2235E+01			0.50914	ug/g			
33	SAMPLE	S10V000236		0 0	A		Iron	SOLID	N/A	2.3983E+04			0.50914	ug/g			
33	SAMPLE	S10V000236		0 0	A		Potassium	SOLID	N/A	1.0663E+03			50.914	ug/g			
33	SAMPLE	S10V000236		0 0	A		Lanthanum	SOLID	N/A	9.9943E+00			0.30549	ug/g			

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
33	SAMPLE	S10V000236		0 0	A		Lithium	SOLID	N/A	7.6183E+00			0.30549	ug/g			
33	SAMPLE	S10V000236		0 0	A		Magnesium	SOLID	N/A	4.5768E+03			5.0914	ug/g			
33	SAMPLE	S10V000236		0 0	A		Manganese	SOLID	N/A	3.5930E+02			0.30549	ug/g			
33	SAMPLE	S10V000236		0 0	A		Molybdenum	SOLID	N/A	<2.0366E+00			2.0366	ug/g			U
33	SAMPLE	S10V000236		0 0	A		Sodium	SOLID	N/A	3.1530E+02			10.183	ug/g			
33	SAMPLE	S10V000236		0 0	A		Nickel	SOLID	N/A	9.1874E+00			2.0366	ug/g			J
33	SAMPLE	S10V000236		0 0	A		Phosphorus	SOLID	N/A	8.3856E+02			5.0914	ug/g			
33	SAMPLE	S10V000236		0 0	A		Sulfur	SOLID	N/A	7.0341E+01			10.183	ug/g			J
33	SAMPLE	S10V000236		0 0	A		Silicon	SOLID	N/A	2.7506E+01			3.0549	ug/g			Ja
33	SAMPLE	S10V000236		0 0	A		Strontium	SOLID	N/A	3.1467E+01			0.30549	ug/g			
33	SAMPLE	S10V000236		0 0	A		Titanium	SOLID	N/A	1.6306E+03			0.50914	ug/g			
33	SAMPLE	S10V000236		0 0	A		Vanadium	SOLID	N/A	5.9977E+01			0.50914	ug/g			
33	SAMPLE	S10V000236		0 0	A		Yttrium	SOLID	N/A	9.1487E+00			0.20366	ug/g			
33	SAMPLE	S10V000236		0 0	A		Zinc	SOLID	N/A	4.2309E+01			0.50914	ug/g			
33	SAMPLE	S10V000236		0 0	A		Zirconium	SOLID	N/A	7.2785E+00			0.50914	ug/g			b
Sample Sequence 34																	
34	SAMPLE	S10V000270		0 0	A		Aluminum	SOLID	N/A	7.1863E+03			3.3503	ug/g			
34	SAMPLE	S10V000270		0 0	A		Barium	SOLID	N/A	7.3160E+01			0.33503	ug/g			
34	SAMPLE	S10V000270		0 0	A		Beryllium	SOLID	N/A	1.5947E-01			0.11168	ug/g			J
34	SAMPLE	S10V000270		0 0	A		Bismuth	SOLID	N/A	3.4142E+01			11.168	ug/g			Jb
34	SAMPLE	S10V000270		0 0	A		Calcium	SOLID	N/A	6.7322E+03			5.5838	ug/g			a
34	SAMPLE	S10V000270		0 0	A		Cadmium	SOLID	N/A	3.0844E+00			0.55838	ug/g			J
34	SAMPLE	S10V000270		0 0	A		Cerium	SOLID	N/A	2.3269E+01			3.3503	ug/g			J
34	SAMPLE	S10V000270		0 0	A		Cobalt	SOLID	N/A	9.7181E+00			1.1168	ug/g			J
34	SAMPLE	S10V000270		0 0	A		Chromium	SOLID	N/A	1.0899E+01			0.55838	ug/g			
34	SAMPLE	S10V000270		0 0	A		Copper	SOLID	N/A	1.1295E+01			0.55838	ug/g			
34	SAMPLE	S10V000270		0 0	A		Iron	SOLID	N/A	2.1858E+04			0.55838	ug/g			
34	SAMPLE	S10V000270		0 0	A		Potassium	SOLID	N/A	1.1420E+03			55.838	ug/g			
34	SAMPLE	S10V000270		0 0	A		Lanthanum	SOLID	N/A	1.0506E+01			0.33503	ug/g			
34	SAMPLE	S10V000270		0 0	A		Lithium	SOLID	N/A	7.0063E+00			0.33503	ug/g			
34	SAMPLE	S10V000270		0 0	A		Magnesium	SOLID	N/A	4.5789E+03			5.5838	ug/g			
34	SAMPLE	S10V000270		0 0	A		Manganese	SOLID	N/A	3.2265E+02			0.33503	ug/g			
34	SAMPLE	S10V000270		0 0	A		Molybdenum	SOLID	N/A	<2.2335E+00			2.2335	ug/g			U
34	SAMPLE	S10V000270		0 0	A		Sodium	SOLID	N/A	3.1179E+02			11.168	ug/g			
34	SAMPLE	S10V000270		0 0	A		Nickel	SOLID	N/A	1.4589E+01			2.2335	ug/g			J
34	SAMPLE	S10V000270		0 0	A		Phosphorus	SOLID	N/A	8.1226E+02			5.5838	ug/g			
34	SAMPLE	S10V000270		0 0	A		Sulfur	SOLID	N/A	7.1878E+01			11.168	ug/g			J
34	SAMPLE	S10V000270		0 0	A		Silicon	SOLID	N/A	8.0017E+01			3.3503	ug/g			a
34	SAMPLE	S10V000270		0 0	A		Strontium	SOLID	N/A	2.8388E+01			0.33503	ug/g			
34	SAMPLE	S10V000270		0 0	A		Titanium	SOLID	N/A	1.5506E+03			0.55838	ug/g			
34	SAMPLE	S10V000270		0 0	A		Vanadium	SOLID	N/A	5.3222E+01			0.55838	ug/g			
34	SAMPLE	S10V000270		0 0	A		Yttrium	SOLID	N/A	8.8242E+00			0.22335	ug/g			

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
34	SAMPLE	S10V000270		0 0	A		Zinc	SOLID	N/A	3.9217E+01			0.55838	ug/g			
34	SAMPLE	S10V000270		0 0	A		Zirconium	SOLID	N/A	5.1724E+00			0.55838	ug/g			Jb
Sample Sequence 35																	
35	ICSA	S1007120071		0 0			Silver	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Aluminum	LIQUID	200	2.0670E+02			0.03	ug/mL	103.35	% Recovery	
35	ICSA	S1007120071		0 0			Arsenic	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Boron	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Barium	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Beryllium	LIQUID		<1.0000E-03			1.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Bismuth	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Calcium	LIQUID	200	2.1477E+02			0.05	ug/mL	107.39	% Recovery	
35	ICSA	S1007120071		0 0			Cadmium	LIQUID		1.0610E-02			5.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Cerium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Cobalt	LIQUID		<1.0000E-02			0.01	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Chromium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Copper	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Europium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Iron	LIQUID	200	1.9006E+02			5.00E-03	ug/mL	95.03	% Recovery	
35	ICSA	S1007120071		0 0			Potassium	LIQUID		<5.0000E-01			0.5	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Lanthanum	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Lithium	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Magnesium	LIQUID	200	1.9039E+02			0.05	ug/mL	95.194	% Recovery	
35	ICSA	S1007120071		0 0			Manganese	LIQUID		3.7200E-03			3.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Molybdenum	LIQUID		<2.0000E-02			0.02	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Sodium	LIQUID	200	1.7438E+02			0.1	ug/mL	87.192	% Recovery	
35	ICSA	S1007120071		0 0			Neodymium	LIQUID		1.1890E-02			0.01	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Nickel	LIQUID		<2.0000E-02			0.02	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Niobium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Phosphorus	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Lead	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Praseodymium	LIQUID		<1.0000E-02			0.01	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Rubidium	LIQUID		<1.0000E+00			1	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Rhodium	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Ruthenium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Sulfur	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Antimony	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Selenium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Silicon	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Samarium	LIQUID		<2.0000E-02			0.02	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Tin	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Strontium	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Tantalum	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
35	ICSA	S1007120071		0 0			Tellurium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Thorium	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Titanium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Thallium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Vanadium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Yttrium	LIQUID		<2.0000E-03			2.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Zinc	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
35	ICSA	S1007120071		0 0			Zirconium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
Sample Sequence 36																	
36	ICSAB	S1007120072		0 0			Silver	LIQUID	1	1.0158E+00			5.00E-03	ug/mL	101.58	% Recovery	
36	ICSAB	S1007120072		0 0			Aluminum	LIQUID	200	2.0762E+02			0.03	ug/mL	103.81	% Recovery	
36	ICSAB	S1007120072		0 0			Arsenic	LIQUID	5	5.1461E+00			0.05	ug/mL	102.92	% Recovery	
36	ICSAB	S1007120072		0 0			Boron	LIQUID	1	1.0099E+00			0.03	ug/mL	100.99	% Recovery	
36	ICSAB	S1007120072		0 0			Barium	LIQUID	1	9.4294E-01			3.00E-03	ug/mL	94.294	% Recovery	
36	ICSAB	S1007120072		0 0			Beryllium	LIQUID	.1	9.0190E-02			1.00E-03	ug/mL	90.19	% Recovery	
36	ICSAB	S1007120072		0 0			Bismuth	LIQUID	5	6.2002E+00			0.1	ug/mL	124	% Recovery	
36	ICSAB	S1007120072		0 0			Calcium	LIQUID	200	2.0814E+02			0.05	ug/mL	104.07	% Recovery	
36	ICSAB	S1007120072		0 0			Cadmium	LIQUID	.2	2.1196E-01			5.00E-03	ug/mL	105.98	% Recovery	
36	ICSAB	S1007120072		0 0			Cerium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Cobalt	LIQUID	5	4.9774E+00			0.01	ug/mL	99.547	% Recovery	
36	ICSAB	S1007120072		0 0			Chromium	LIQUID	5	4.9410E+00			5.00E-03	ug/mL	98.819	% Recovery	
36	ICSAB	S1007120072		0 0			Copper	LIQUID	5	5.0558E+00			5.00E-03	ug/mL	101.12	% Recovery	
36	ICSAB	S1007120072		0 0			Europium	LIQUID		<5.0000E-03			5.00E-03	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Iron	LIQUID	200	1.8828E+02			5.00E-03	ug/mL	94.141	% Recovery	
36	ICSAB	S1007120072		0 0			Potassium	LIQUID		<5.0000E-01			0.5	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Lanthanum	LIQUID		<3.0000E-03			3.00E-03	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Lithium	LIQUID	1	9.0483E-01			3.00E-03	ug/mL	90.483	% Recovery	
36	ICSAB	S1007120072		0 0			Magnesium	LIQUID	200	1.8908E+02			0.05	ug/mL	94.538	% Recovery	
36	ICSAB	S1007120072		0 0			Manganese	LIQUID	5	4.8788E+00			3.00E-03	ug/mL	97.576	% Recovery	
36	ICSAB	S1007120072		0 0			Molybdenum	LIQUID	5	4.9210E+00			0.02	ug/mL	98.42	% Recovery	
36	ICSAB	S1007120072		0 0			Sodium	LIQUID	200	1.7506E+02			0.1	ug/mL	87.532	% Recovery	
36	ICSAB	S1007120072		0 0			Neodymium	LIQUID		1.2458E-01			0.01	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Nickel	LIQUID	5	4.8896E+00			0.02	ug/mL	97.792	% Recovery	
36	ICSAB	S1007120072		0 0			Niobium	LIQUID	5	4.5850E+00			0.03	ug/mL	91.699	% Recovery	
36	ICSAB	S1007120072		0 0			Phosphorus	LIQUID	1	9.9598E-01			0.05	ug/mL	99.598	% Recovery	
36	ICSAB	S1007120072		0 0			Lead	LIQUID	1	9.2155E-01			0.05	ug/mL	92.155	% Recovery	
36	ICSAB	S1007120072		0 0			Palladium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Praseodymium	LIQUID		<1.0000E-02			0.01	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Rubidium	LIQUID		<1.0000E+00			1	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Rhodium	LIQUID	1	1.0144E+00			0.05	ug/mL	101.44	% Recovery	
36	ICSAB	S1007120072		0 0			Ruthenium	LIQUID		<3.0000E-02			0.03	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Sulfur	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
36	ICSAB	S1007120072		0 0			Antimony	LIQUID	5	5.1448E+00			0.05	ug/mL	102.9	% Recovery	
36	ICSAB	S1007120072		0 0			Selenium	LIQUID	5	5.0389E+00			0.1	ug/mL	100.78	% Recovery	
36	ICSAB	S1007120072		0 0			Silicon	LIQUID	5	4.8847E+00			0.03	ug/mL	97.695	% Recovery	
36	ICSAB	S1007120072		0 0			Samarium	LIQUID		<2.0000E-02			0.02	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Tin	LIQUID	1	9.5899E-01			0.03	ug/mL	95.899	% Recovery	
36	ICSAB	S1007120072		0 0			Strontium	LIQUID	1	9.5184E-01			3.00E-03	ug/mL	95.184	% Recovery	
36	ICSAB	S1007120072		0 0			Tantalum	LIQUID		<5.0000E-02			0.05	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Tellurium	LIQUID		<1.0000E-01			0.1	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Thorium	LIQUID	5	4.6589E+00			0.05	ug/mL	93.178	% Recovery	
36	ICSAB	S1007120072		0 0			Titanium	LIQUID	50	4.8979E+01			5.00E-03	ug/mL	97.958	% Recovery	
36	ICSAB	S1007120072		0 0			Thallium	LIQUID	5	4.4595E+00			0.1	ug/mL	89.189	% Recovery	
36	ICSAB	S1007120072		0 0			Uranium	LIQUID	5	4.9617E+00			0.1	ug/mL	99.235	% Recovery	
36	ICSAB	S1007120072		0 0			Vanadium	LIQUID	1	9.8914E-01			5.00E-03	ug/mL	98.914	% Recovery	
36	ICSAB	S1007120072		0 0			Tungsten	LIQUID	5	5.1354E+00			0.2	ug/mL	102.71	% Recovery	
36	ICSAB	S1007120072		0 0			Yttrium	LIQUID		<2.0000E-03			2.00E-03	ug/mL	N/A		
36	ICSAB	S1007120072		0 0			Zinc	LIQUID	5	4.8931E+00			5.00E-03	ug/mL	97.863	% Recovery	
36	ICSAB	S1007120072		0 0			Zirconium	LIQUID	5	4.2451E+00			5.00E-03	ug/mL	84.903	% Recovery	
Sample Sequence 37																	
37	CCV	S1007120073		0 0			Silver	LIQUID	1	9.5512E-01			5.00E-03	ug/mL	95.512	% Recovery	
37	CCV	S1007120073		0 0			Aluminum	LIQUID	5	5.2335E+00			0.03	ug/mL	104.67	% Recovery	
37	CCV	S1007120073		0 0			Arsenic	LIQUID	5	5.1191E+00			0.05	ug/mL	102.38	% Recovery	
37	CCV	S1007120073		0 0			Boron	LIQUID	5	5.1056E+00			0.03	ug/mL	102.11	% Recovery	
37	CCV	S1007120073		0 0			Barium	LIQUID	5	5.1442E+00			3.00E-03	ug/mL	102.88	% Recovery	
37	CCV	S1007120073		0 0			Beryllium	LIQUID	5	5.0688E+00			1.00E-03	ug/mL	101.38	% Recovery	
37	CCV	S1007120073		0 0			Bismuth	LIQUID	5	5.1985E+00			0.1	ug/mL	103.97	% Recovery	
37	CCV	S1007120073		0 0			Calcium	LIQUID		5.1351E+00			0.05	ug/mL	N/A		
37	CCV	S1007120073		0 0			Cadmium	LIQUID	5	5.1485E+00			5.00E-03	ug/mL	102.97	% Recovery	
38	CCV	S1007120073		0 1			Cerium	LIQUID	5	5.3051E+00			0.03	ug/mL	106.1	% Recovery	
37	CCV	S1007120073		0 0			Cobalt	LIQUID	5	5.2211E+00			0.01	ug/mL	104.42	% Recovery	
37	CCV	S1007120073		0 0			Chromium	LIQUID	5	5.2374E+00			5.00E-03	ug/mL	104.75	% Recovery	
37	CCV	S1007120073		0 0			Copper	LIQUID	5	4.9857E+00			5.00E-03	ug/mL	99.714	% Recovery	
38	CCV	S1007120073		0 1			Europium	LIQUID	5	5.0324E+00			5.00E-03	ug/mL	100.65	% Recovery	
37	CCV	S1007120073		0 0			Iron	LIQUID	5	5.0760E+00			5.00E-03	ug/mL	101.52	% Recovery	
37	CCV	S1007120073		0 0			Potassium	LIQUID	5	4.9033E+00			0.5	ug/mL	98.066	% Recovery	
37	CCV	S1007120073		0 0			Lanthanum	LIQUID	5	5.1271E+00			3.00E-03	ug/mL	102.54	% Recovery	
37	CCV	S1007120073		0 0			Lithium	LIQUID	5	5.0115E+00			3.00E-03	ug/mL	100.23	% Recovery	
37	CCV	S1007120073		0 0			Magnesium	LIQUID	5	5.0070E+00			0.05	ug/mL	100.14	% Recovery	
37	CCV	S1007120073		0 0			Manganese	LIQUID	5	5.1538E+00			3.00E-03	ug/mL	103.08	% Recovery	
37	CCV	S1007120073		0 0			Molybdenum	LIQUID	5	5.3410E+00			0.02	ug/mL	106.82	% Recovery	
37	CCV	S1007120073		0 0			Sodium	LIQUID	5	5.2087E+00			0.1	ug/mL	104.17	% Recovery	
38	CCV	S1007120073		0 1			Neodymium	LIQUID	5	5.1567E+00			0.01	ug/mL	103.13	% Recovery	
37	CCV	S1007120073		0 0			Nickel	LIQUID	5	5.1364E+00			0.02	ug/mL	102.73	% Recovery	

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
39	CCV	S1007120073		0 2			Niobium	LIQUID	5	5.0604E+00			0.03	ug/mL	101.21	% Recovery	
37	CCV	S1007120073		0 0			Phosphorus	LIQUID	5	5.0628E+00			0.05	ug/mL	101.26	% Recovery	
37	CCV	S1007120073		0 0			Lead	LIQUID	5	5.2104E+00			0.05	ug/mL	104.21	% Recovery	
38	CCV	S1007120073		0 1			Palladium	LIQUID	5	5.0918E+00			0.1	ug/mL	101.84	% Recovery	
38	CCV	S1007120073		0 1			Praseodymium	LIQUID	5	5.1635E+00			0.01	ug/mL	103.27	% Recovery	
38	CCV	S1007120073		0 1			Rubidium	LIQUID	5	5.4142E+00			1	ug/mL	108.28	% Recovery	
38	CCV	S1007120073		0 1			Rhodium	LIQUID	5	5.1447E+00			0.05	ug/mL	102.89	% Recovery	
38	CCV	S1007120073		0 1			Ruthenium	LIQUID	5	5.1582E+00			0.03	ug/mL	103.16	% Recovery	
37	CCV	S1007120073		0 0			Sulfur	LIQUID	5	5.1664E+00			0.1	ug/mL	103.33	% Recovery	
37	CCV	S1007120073		0 0			Antimony	LIQUID	5	5.1556E+00			0.05	ug/mL	103.11	% Recovery	
37	CCV	S1007120073		0 0			Selenium	LIQUID	5	5.1376E+00			0.1	ug/mL	102.75	% Recovery	
37	CCV	S1007120073		0 0			Silicon	LIQUID	5	4.8967E+00			0.03	ug/mL	97.934	% Recovery	
38	CCV	S1007120073		0 1			Samarium	LIQUID	5	5.2144E+00			0.02	ug/mL	104.29	% Recovery	
39	CCV	S1007120073		0 2			Tin	LIQUID	5	5.1560E+00			0.03	ug/mL	103.12	% Recovery	
37	CCV	S1007120073		0 0			Strontium	LIQUID	5	5.0991E+00			3.00E-03	ug/mL	101.98	% Recovery	
39	CCV	S1007120073		0 2			Tantalum	LIQUID	5	5.1205E+00			0.05	ug/mL	102.41	% Recovery	
39	CCV	S1007120073		0 2			Tellurium	LIQUID	5	5.2001E+00			0.1	ug/mL	104	% Recovery	
38	CCV	S1007120073		0 1			Thorium	LIQUID	5	5.1061E+00			0.05	ug/mL	102.12	% Recovery	
37	CCV	S1007120073		0 0			Titanium	LIQUID	5	5.1471E+00			5.00E-03	ug/mL	102.94	% Recovery	
38	CCV	S1007120073		0 1			Thallium	LIQUID	5	5.2774E+00			0.1	ug/mL	105.55	% Recovery	
38	CCV	S1007120073		0 1			Uranium	LIQUID	5	5.4495E+00			0.1	ug/mL	108.99	% Recovery	
37	CCV	S1007120073		0 0			Vanadium	LIQUID	5	5.2798E+00			5.00E-03	ug/mL	105.6	% Recovery	
39	CCV	S1007120073		0 2			Tungsten	LIQUID	5	5.1233E+00			0.2	ug/mL	102.47	% Recovery	
38	CCV	S1007120073		0 1			Yttrium	LIQUID	5	5.0902E+00			2.00E-03	ug/mL	101.8	% Recovery	
37	CCV	S1007120073		0 0			Zinc	LIQUID	5	5.0284E+00			5.00E-03	ug/mL	100.57	% Recovery	
37	CCV	S1007120073		0 0			Zirconium	LIQUID	5	4.9764E+00			5.00E-03	ug/mL	99.529	% Recovery	
Sample Sequence 40																	
41	LLS	S1007120075		0 1			Silver	LIQUID	.02	1.6650E-02			5.00E-03	ug/mL	83.25	% Recovery	
40	LLS	S1007120075		0 0			Aluminum	LIQUID	.1	1.0756E-01			0.03	ug/mL	107.56	% Recovery	
40	LLS	S1007120075		0 0			Arsenic	LIQUID	.2	1.9280E-01			0.05	ug/mL	96.4	% Recovery	
42	LLS	S1007120075		0 2			Boron	LIQUID	.1	1.0603E-01			0.03	ug/mL	106.03	% Recovery	
40	LLS	S1007120075		0 0			Barium	LIQUID	.01	9.3300E-03			3.00E-03	ug/mL	93.3	% Recovery	
40	LLS	S1007120075		0 0			Beryllium	LIQUID	.001	9.2000E-04			1.00E-04	ug/mL	92	% Recovery	
40	LLS	S1007120075		0 0			Bismuth	LIQUID	.2	2.4512E-01			0.1	ug/mL	122.56	% Recovery	
40	LLS	S1007120075		0 0			Calcium	LIQUID	.2	1.9049E-01			0.05	ug/mL	95.245	% Recovery	
40	LLS	S1007120075		0 0			Cadmium	LIQUID	.01	9.8400E-03			5.00E-03	ug/mL	98.4	% Recovery	
41	LLS	S1007120075		0 1			Cerium	LIQUID	.2	1.9187E-01			0.03	ug/mL	95.935	% Recovery	
42	LLS	S1007120075		0 2			Cobalt	LIQUID	.04	4.8260E-02			0.01	ug/mL	120.65	% Recovery	
41	LLS	S1007120075		0 1			Chromium	LIQUID	.02	1.7860E-02			5.00E-03	ug/mL	89.3	% Recovery	
42	LLS	S1007120075		0 2			Copper	LIQUID	.02	2.2340E-02			5.00E-03	ug/mL	111.7	% Recovery	
43	LLS	S1007120075		0 3			Europium	LIQUID	.1	9.5790E-02			5.00E-03	ug/mL	95.79	% Recovery	
40	LLS	S1007120075		0 0			Iron	LIQUID	.05	4.5390E-02			5.00E-03	ug/mL	90.78	% Recovery	

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
40	LLS	S1007120075		0 0			Potassium	LIQUID	.5	4.8183E-01			0.1	ug/mL	96.366	% Recovery	
41	LLS	S1007120075		0 1			Lanthanum	LIQUID	.01	8.2100E-03			3.00E-03	ug/mL	82.1	% Recovery	
41	LLS	S1007120075		0 1			Lithium	LIQUID	.02	2.3220E-02			3.00E-03	ug/mL	116.1	% Recovery	
40	LLS	S1007120075		0 0			Magnesium	LIQUID	.2	1.9413E-01			0.05	ug/mL	97.065	% Recovery	
40	LLS	S1007120075		0 0			Manganese	LIQUID	.02	1.9170E-02			3.00E-03	ug/mL	95.85	% Recovery	
42	LLS	S1007120075		0 2			Molybdenum	LIQUID	.1	1.1556E-01			0.02	ug/mL	115.56	% Recovery	
41	LLS	S1007120075		0 1			Sodium	LIQUID	.2	2.2913E-01			0.1	ug/mL	114.56	% Recovery	
41	LLS	S1007120075		0 1			Neodymium	LIQUID	.1	9.8770E-02			0.01	ug/mL	98.77	% Recovery	
41	LLS	S1007120075		0 1			Nickel	LIQUID	.04	4.4630E-02			0.02	ug/mL	111.58	% Recovery	
45	LLS	S1007120075		0 5			Niobium	LIQUID	.1	1.0926E-01			0.03	ug/mL	109.26	% Recovery	
42	LLS	S1007120075		0 2			Phosphorus	LIQUID	.4	4.4544E-01			0.05	ug/mL	111.36	% Recovery	
41	LLS	S1007120075		0 1			Lead	LIQUID	.2	2.1891E-01			0.05	ug/mL	109.46	% Recovery	
44	LLS	S1007120075		0 4			Palladium	LIQUID	1	1.0605E+00			0.1	ug/mL	106.05	% Recovery	
43	LLS	S1007120075		0 3			Praseodymium	LIQUID	.1	1.0151E-01			0.01	ug/mL	101.51	% Recovery	
43	LLS	S1007120075		0 3			Rubidium	LIQUID	1	1.0748E+00			1	ug/mL	107.48	% Recovery	
44	LLS	S1007120075		0 4			Rhodium	LIQUID	.1	9.5560E-02			0.05	ug/mL	95.56	% Recovery	
44	LLS	S1007120075		0 4			Ruthenium	LIQUID	.1	9.3290E-02			0.03	ug/mL	93.29	% Recovery	
42	LLS	S1007120075		0 2			Sulfur	LIQUID	.2	2.1810E-01			0.1	ug/mL	109.05	% Recovery	
42	LLS	S1007120075		0 2			Antimony	LIQUID	.1	9.3340E-02			0.05	ug/mL	93.34	% Recovery	
41	LLS	S1007120075		0 1			Selenium	LIQUID	.2	1.9862E-01			0.1	ug/mL	99.31	% Recovery	
42	LLS	S1007120075		0 2			Silicon	LIQUID	.1	9.5960E-02			0.03	ug/mL	95.96	% Recovery	
40	LLS	S1007120075		0 0			Samarium	LIQUID	.1	8.9260E-02			0.02	ug/mL	89.26	% Recovery	
45	LLS	S1007120075		0 5			Tin	LIQUID	.1	1.0712E-01			0.03	ug/mL	107.12	% Recovery	
41	LLS	S1007120075		0 1			Strontium	LIQUID	.02	1.9710E-02			3.00E-03	ug/mL	98.55	% Recovery	
45	LLS	S1007120075		0 5			Tantalum	LIQUID	1	1.0303E+00			0.05	ug/mL	103.03	% Recovery	
45	LLS	S1007120075		0 5			Tellurium	LIQUID	1	1.0796E+00			0.1	ug/mL	107.96	% Recovery	
43	LLS	S1007120075		0 3			Thorium	LIQUID	.1	9.2760E-02			0.05	ug/mL	92.76	% Recovery	
42	LLS	S1007120075		0 2			Titanium	LIQUID	.02	1.9770E-02			5.00E-03	ug/mL	98.85	% Recovery	
41	LLS	S1007120075		0 1			Thallium	LIQUID	.4	3.9293E-01			0.1	ug/mL	98.232	% Recovery	
42	LLS	S1007120075		0 2			Uranium	LIQUID	.5	5.5932E-01			0.1	ug/mL	111.86	% Recovery	
42	LLS	S1007120075		0 2			Vanadium	LIQUID	.05	5.5360E-02			5.00E-03	ug/mL	110.72	% Recovery	
45	LLS	S1007120075		0 5			Tungsten	LIQUID	1	1.0729E+00			0.2	ug/mL	107.29	% Recovery	
43	LLS	S1007120075		0 3			Yttrium	LIQUID	.1	9.9090E-02			2.00E-03	ug/mL	99.09	% Recovery	
42	LLS	S1007120075		0 2			Zinc	LIQUID	.02	2.0400E-02			5.00E-03	ug/mL	102	% Recovery	
42	LLS	S1007120075		0 2			Zirconium	LIQUID	.02	2.3780E-02			5.00E-03	ug/mL	118.9	% Recovery	
Sample Sequence 46																	
46	CCB	S1007120074		0 0			Silver	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Aluminum	LIQUID		<3.0000E-02			0.03	ug/mL			
46	CCB	S1007120074		0 0			Arsenic	LIQUID		<5.0000E-02			0.05	ug/mL			
46	CCB	S1007120074		0 0			Boron	LIQUID		<3.0000E-02			0.03	ug/mL			
46	CCB	S1007120074		0 0			Barium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Beryllium	LIQUID		<1.0000E-03			1.00E-03	ug/mL			

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
46	CCB	S1007120074		0 0			Bismuth	LIQUID		<1.0000E-01			0.1	ug/mL			
46	CCB	S1007120074		0 0			Calcium	LIQUID		<5.0000E-02			0.05	ug/mL			
46	CCB	S1007120074		0 0			Cadmium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Cerium	LIQUID		<3.0000E-02			0.03	ug/mL			
46	CCB	S1007120074		0 0			Cobalt	LIQUID		<1.0000E-02			0.01	ug/mL			
46	CCB	S1007120074		0 0			Chromium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Copper	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Europium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Iron	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Potassium	LIQUID		<5.0000E-01			0.5	ug/mL			
46	CCB	S1007120074		0 0			Lanthanum	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Lithium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Magnesium	LIQUID		<5.0000E-02			0.05	ug/mL			
46	CCB	S1007120074		0 0			Manganese	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Molybdenum	LIQUID		<2.0000E-02			0.02	ug/mL			
46	CCB	S1007120074		0 0			Sodium	LIQUID		<1.0000E-01			0.1	ug/mL			
46	CCB	S1007120074		0 0			Neodymium	LIQUID		<1.0000E-02			0.01	ug/mL			
46	CCB	S1007120074		0 0			Nickel	LIQUID		<2.0000E-02			0.02	ug/mL			
46	CCB	S1007120074		0 0			Niobium	LIQUID		<3.0000E-02			0.03	ug/mL			
46	CCB	S1007120074		0 0			Phosphorus	LIQUID		<5.0000E-02			0.05	ug/mL			
46	CCB	S1007120074		0 0			Lead	LIQUID		<5.0000E-02			0.05	ug/mL			
47	CCB	S1007120074		0 1			Palladium	LIQUID		<1.0000E-01			0.1	ug/mL			
46	CCB	S1007120074		0 0			Praseodymium	LIQUID		<1.0000E-02			0.01	ug/mL			
46	CCB	S1007120074		0 0			Rubidium	LIQUID		<1.0000E+00			1	ug/mL			
46	CCB	S1007120074		0 0			Rhodium	LIQUID		<5.0000E-02			0.05	ug/mL			
46	CCB	S1007120074		0 0			Ruthenium	LIQUID		<3.0000E-02			0.03	ug/mL			
46	CCB	S1007120074		0 0			Sulfur	LIQUID		<1.0000E-01			0.1	ug/mL			
46	CCB	S1007120074		0 0			Antimony	LIQUID		<5.0000E-02			0.05	ug/mL			
46	CCB	S1007120074		0 0			Selenium	LIQUID		<1.0000E-01			0.1	ug/mL			
46	CCB	S1007120074		0 0			Silicon	LIQUID		<3.0000E-02			0.03	ug/mL			
46	CCB	S1007120074		0 0			Samarium	LIQUID		<2.0000E-02			0.02	ug/mL			
46	CCB	S1007120074		0 0			Tin	LIQUID		<3.0000E-02			0.03	ug/mL			
46	CCB	S1007120074		0 0			Strontium	LIQUID		<3.0000E-03			3.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Tantalum	LIQUID		<5.0000E-02			0.05	ug/mL			
46	CCB	S1007120074		0 0			Tellurium	LIQUID		<1.0000E-01			0.1	ug/mL			
46	CCB	S1007120074		0 0			Thorium	LIQUID		<5.0000E-02			0.05	ug/mL			
46	CCB	S1007120074		0 0			Titanium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Thallium	LIQUID		<1.0000E-01			0.1	ug/mL			
46	CCB	S1007120074		0 0			Uranium	LIQUID		<1.0000E-01			0.1	ug/mL			
46	CCB	S1007120074		0 0			Vanadium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Tungsten	LIQUID		<2.0000E-01			0.2	ug/mL			
46	CCB	S1007120074		0 0			Yttrium	LIQUID		<2.0000E-03			2.00E-03	ug/mL			

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
46	CCB	S1007120074		0 0			Zinc	LIQUID		<5.0000E-03			5.00E-03	ug/mL			
46	CCB	S1007120074		0 0			Zirconium	LIQUID		<5.0000E-03			5.00E-03	ug/mL			

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00020563

Reviewer Signature **Date**

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LABCORE Completed Batch Report for Batch# 00020563

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1007120062	ICV				
2	S1007120062	ICV				
3	S1007120062	ICV				
4	S1007120064	LLS				
5	S1007120064	LLS				
6	S1007120064	LLS				
7	S1007120064	LLS				
8	S1007120064	LLS				
9	S1007120064	LLS				
10	S1007120063	ICB				
11	S1007120065	ICSA				
12	S1007120066	ICSAB				
13	S1005270089	BLNK-PREP				
14	S1005270090	STD-PREP				
15	S1005270094	STD-PREP				
16	S1007120067	SERDIL	S10V000136			
17	S10V000136	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
18	S1005270091	DUP	S10V000136			
19	S1007120068	SPK-POST	S10V000136			
20	S1007120068	SPK-POST	S10V000136			
21	S1007120068	SPK-POST	S10V000136			
22	S1007120068	SPK-POST	S10V000136			
23	S1007120069	CCV				
24	S1007120069	CCV				
25	S1007120069	CCV				
26	S1007120070	CCB				
27	S1007120070	CCB				
28	S1005270092	SPK-PREDIG	S10V000136			
29	S1005270093	SPK-PREDIG	S10V000136			
30	S10V000150	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
31	S10V000167	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
32	S10V000201	SAMPLE		20100064	B27130	C Farm WMC 2010-1
33	S10V000236	SAMPLE		20100064	B27131	C Farm WMC 2010-1
34	S10V000270	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
35	S1007120071	ICSA				

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LABCORE Completed Batch Report for Batch# 00020563

36	S1007120072	ICSAB
37	S1007120073	CCV
38	S1007120073	CCV
39	S1007120073	CCV
40	S1007120075	LLS
41	S1007120075	LLS
42	S1007120075	LLS
43	S1007120075	LLS
44	S1007120075	LLS
45	S1007120075	LLS
46	S1007120074	CCB
47	S1007120074	CCB

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LABCORE Completed Batch Report for Batch# 00021747

Analyst: Thorndike, Kathy

Book#:

Instrument: ICP/MS AGILENT

Method: MS PERIODIC TABLE, LA-506-103 Rev/Mod A-0

Specification: C Farm WMC 2010-1

Prep Batch: 00019741

Batch Comment:

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICV	S1008300158		0 0			Silver	LIQUID	.0004	4.1520E-04			8.00E-06	ug/mL	103.8	% Recovery	
1	ICV	S1008300158		0 0			Arsenic	LIQUID	.002	2.1310E-03			4.20E-05	ug/mL	106.55	% Recovery	
1	ICV	S1008300158		0 0			Selenium	LIQUID	.002	2.1400E-03			6.10E-05	ug/mL	107	% Recovery	
2	ICV	S1008300158		0 1			Thallium	LIQUID	.002	2.0330E-03			3.00E-06	ug/mL	101.65	% Recovery	
Sample Sequence 3																	
4	LLS	S1008300160		0 1			Silver	LIQUID	.00001	1.0450E-05			8.00E-06	ug/mL	104.5	% Recovery	
4	LLS	S1008300160		0 1			Arsenic	LIQUID	.00005	4.9780E-05			4.20E-05	ug/mL	99.56	% Recovery	
5	LLS	S1008300160		0 2			Selenium	LIQUID	.0002	1.9120E-04			6.10E-05	ug/mL	95.6	% Recovery	
7	LLS	S1008300160		0 4			Thallium	LIQUID	.00001	9.5030E-06			3.00E-06	ug/mL	95.03	% Recovery	
Sample Sequence 8																	
8	ICB	S1008300159		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
8	ICB	S1008300159		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
8	ICB	S1008300159		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
8	ICB	S1008300159		0 0			Thallium	LIQUID		<3.0000E-06			3.00E-06	ug/mL			
Sample Sequence 9																	
9	BLNK-PREP	S1005270089		0 0	A		Silver	LIQUID		<3.2000E-03			3.20E-03	ug/mL			
9	BLNK-PREP	S1005270089		0 0	A		Arsenic	LIQUID		<1.6800E-02			0.0168	ug/mL			
9	BLNK-PREP	S1005270089		0 0	A		Selenium	LIQUID		<2.4400E-02			0.0244	ug/mL			
9	BLNK-PREP	S1005270089		0 0	A		Thallium	LIQUID		<1.2000E-03			1.20E-03	ug/mL			
Sample Sequence 10																	
10	SERDIL	S1008300161	S10V000136	0 0			Silver	SOLID		<1.7100E-01			0.171	ug/g	N/A		
10	SERDIL	S1008300161	S10V000136	0 0			Arsenic	SOLID		4.2840E+00			0.89774	ug/g	7.8441	% Diff	
10	SERDIL	S1008300161	S10V000136	0 0			Selenium	SOLID		<1.3039E+00			1.3039	ug/g	N/A		
Sample Sequence 11																	
11	SAMPLE	S10V000136		0 0	A		Silver	SOLID	N/A	5.3010E-02			0.0342	ug/g			J
11	SAMPLE	S10V000136		0 0	A		Arsenic	SOLID	N/A	4.6487E+00			0.17955	ug/g			b
11	SAMPLE	S10V000136		0 0	A		Selenium	SOLID	N/A	7.0135E-01			0.26077	ug/g			J
Sample Sequence 12																	
12	DUP	S1005270091	S10V000136	0 0	A		Silver	SOLID	5.3010E-02	6.1596E-02			0.03626	ug/g	14.984	% RPD	
12	DUP	S1005270091	S10V000136	0 0	A		Arsenic	SOLID	4.6487E+00	5.2944E+00			0.19036	ug/g	12.988	% RPD	
12	DUP	S1005270091	S10V000136	0 0	A		Selenium	SOLID	7.0135E-01	8.1528E-01			0.27648	ug/g	15.024	% RPD	
Sample Sequence 13																	

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LABCORE Completed Batch Report for Batch# 00021747

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
13	SAMPLE	S10V000150		0 0	A		Silver	SOLID	N/A	4.5261E-02			0.033809	ug/g			J
13	SAMPLE	S10V000150		0 0	A		Arsenic	SOLID	N/A	5.2549E+00			0.1775	ug/g			
13	SAMPLE	S10V000150		0 0	A		Selenium	SOLID	N/A	3.2062E-01			0.25779	ug/g			J
13	SAMPLE	S10V000150		0 0	A		Thallium	SOLID	N/A	7.6873E-01			0.012678	ug/g			B
Sample Sequence 14																	
14	SAMPLE	S10V000167		0 0	A		Silver	SOLID	N/A	5.1861E-02			0.033432	ug/g			J
14	SAMPLE	S10V000167		0 0	A		Arsenic	SOLID	N/A	5.8279E+00			0.17552	ug/g			b
14	SAMPLE	S10V000167		0 0	A		Selenium	SOLID	N/A	5.9397E-01			0.25492	ug/g			J
14	SAMPLE	S10V000167		0 0	A		Thallium	SOLID	N/A	7.1418E-01			0.012537	ug/g			B
Sample Sequence 15																	
15	SAMPLE	S10V000201		0 0	A		Silver	SOLID	N/A	6.9431E-02			0.034934	ug/g			J
15	SAMPLE	S10V000201		0 0	A		Arsenic	SOLID	N/A	4.8971E+00			0.1834	ug/g			b
15	SAMPLE	S10V000201		0 0	A		Selenium	SOLID	N/A	6.8451E-01			0.26637	ug/g			J
15	SAMPLE	S10V000201		0 0	A		Thallium	SOLID	N/A	7.0348E-01			0.0131	ug/g			B
Sample Sequence 16																	
16	SAMPLE	S10V000236		0 0	A		Silver	SOLID	N/A	4.1872E-02			0.032585	ug/g			J
16	SAMPLE	S10V000236		0 0	A		Arsenic	SOLID	N/A	3.7694E+00			0.17107	ug/g			b
16	SAMPLE	S10V000236		0 0	A		Selenium	SOLID	N/A	4.3818E-01			0.24846	ug/g			J
16	SAMPLE	S10V000236		0 0	A		Thallium	SOLID	N/A	6.6067E-01			0.012219	ug/g			B
Sample Sequence 17																	
17	SAMPLE	S10V000270		0 0	A		Silver	SOLID	N/A	5.8385E-02			0.035737	ug/g			J
17	SAMPLE	S10V000270		0 0	A		Arsenic	SOLID	N/A	4.4832E+00			0.18762	ug/g			b
17	SAMPLE	S10V000270		0 0	A		Selenium	SOLID	N/A	5.2407E-01			0.27249	ug/g			J
17	SAMPLE	S10V000270		0 0	A		Thallium	SOLID	N/A	6.6693E-01			0.013401	ug/g			B
Sample Sequence 18																	
18	CCV	S1008300163		0 0			Silver	LIQUID	.0004	4.0140E-04			8.00E-06	ug/mL	100.35	% Recovery	
18	CCV	S1008300163		0 0			Arsenic	LIQUID	.002	1.9310E-03			4.20E-05	ug/mL	96.55	% Recovery	
18	CCV	S1008300163		0 0			Selenium	LIQUID	.002	1.9260E-03			6.10E-05	ug/mL	96.3	% Recovery	
19	CCV	S1008300163		0 1			Thallium	LIQUID	.002	2.1110E-03			3.00E-06	ug/mL	105.55	% Recovery	
Sample Sequence 20																	
20	CCB	S1008300164		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
20	CCB	S1008300164		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
20	CCB	S1008300164		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
20	CCB	S1008300164		0 0			Thallium	LIQUID		1.1630E-05			3.00E-06	ug/mL			
Sample Sequence 21																	
21	ICV	S1009200005		0 0			Silver	LIQUID	.0004	3.9150E-04			8.00E-06	ug/mL	97.875	% Recovery	
21	ICV	S1009200005		0 0			Arsenic	LIQUID	.002	2.1340E-03			4.20E-05	ug/mL	106.7	% Recovery	
21	ICV	S1009200005		0 0			Selenium	LIQUID	.002	1.9700E-03			6.10E-05	ug/mL	98.5	% Recovery	
Sample Sequence 23																	
24	LLS	S1009200003		0 1			Silver	LIQUID	.00005	5.2080E-05			8.00E-06	ug/mL	104.16	% Recovery	
24	LLS	S1009200003		0 1			Arsenic	LIQUID	.00005	6.2100E-05			4.20E-05	ug/mL	124.2	% Recovery	
25	LLS	S1009200003		0 2			Selenium	LIQUID	.0002	2.5810E-04			6.10E-05	ug/mL	129.05	% Recovery	
Sample Sequence 28																	

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LABCORE Completed Batch Report for Batch# 00021747

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
28	ICB	S1009200004		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
28	ICB	S1009200004		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
28	ICB	S1009200004		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
Sample Sequence 29																	
29	CCV	S1008300168		0 0			Silver	LIQUID	.0004	3.9000E-04			8.00E-06	ug/mL	97.5	% Recovery	
29	CCV	S1008300168		0 0			Arsenic	LIQUID	.002	2.0810E-03			4.20E-05	ug/mL	104.05	% Recovery	
29	CCV	S1008300168		0 0			Selenium	LIQUID	.002	1.9430E-03			6.10E-05	ug/mL	97.15	% Recovery	
Sample Sequence 31																	
31	CCB	S1008300170		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
31	CCB	S1008300170		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
31	CCB	S1008300170		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
Sample Sequence 32																	
32	STD-PREP	S1005270090		0 0	A		Silver	LIQUID	1	8.2150E-01			0.04	ug/mL	82.15	% Recovery	
32	STD-PREP	S1005270090		0 0	A		Arsenic	LIQUID	5	5.4150E+00			0.21	ug/mL	108.3	% Recovery	
32	STD-PREP	S1005270090		0 0	A		Selenium	LIQUID	5	4.3195E+00			0.305	ug/mL	86.39	% Recovery	
Sample Sequence 34																	
34	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Silver	SOLID	10.80824	8.9114E+00			0.43233	ug/g	81.96	% Recovery	
34	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Arsenic	SOLID	54.0412	4.4724E+01			2.2697	ug/g	74.158	% Recovery	
34	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Selenium	SOLID	54.0412	4.4481E+01			3.2965	ug/g	81.012	% Recovery	
Sample Sequence 36																	
36	SPK-POST	S1008300162	S10V000136	0 0			Silver	SOLID	.4	3.7968E-01			8.00E-06	ug/mL	93.68	% Recovery	
36	SPK-POST	S1008300162	S10V000136	0 0			Arsenic	SOLID	.4	8.5920E-01			4.20E-05	ug/mL	106.06	% Recovery	
37	SPK-POST	S1008300162	S10V000136	0 1			Antimony	SOLID	.4	4.5080E-01			4.40E-05	ug/mL	112.7	% Recovery	
36	SPK-POST	S1008300162	S10V000136	0 0			Selenium	SOLID	.4	4.1640E-01			6.10E-05	ug/mL	87.694	% Recovery	
Sample Sequence 38																	
38	CCV	S1008300165		0 0			Silver	LIQUID	.0004	3.9320E-04			8.00E-06	ug/mL	98.3	% Recovery	
38	CCV	S1008300165		0 0			Arsenic	LIQUID	.002	2.0490E-03			4.20E-05	ug/mL	102.45	% Recovery	
38	CCV	S1008300165		0 0			Selenium	LIQUID	.002	1.8840E-03			6.10E-05	ug/mL	94.2	% Recovery	
Sample Sequence 40																	
40	CCB	S1008300166		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
40	CCB	S1008300166		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
40	CCB	S1008300166		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
Sample Sequence 41																	
41	CCV	S1008300169		0 0			Silver	LIQUID	.0004	3.9350E-04			8.00E-06	ug/mL	98.375	% Recovery	
41	CCV	S1008300169		0 0			Arsenic	LIQUID	.002	2.2180E-03			4.20E-05	ug/mL	110.9	% Recovery	
41	CCV	S1008300169		0 0			Selenium	LIQUID	.002	2.0070E-03			6.10E-05	ug/mL	100.35	% Recovery	
Sample Sequence 43																	
44	LLS	S1008300167		0 1			Silver	LIQUID	.00001	9.4800E-06			8.00E-06	ug/mL	94.8	% Recovery	
44	LLS	S1008300167		0 1			Arsenic	LIQUID	.00005	5.2230E-05			4.20E-05	ug/mL	104.46	% Recovery	
45	LLS	S1008300167		0 2			Selenium	LIQUID	.0002	3.1100E-04			6.10E-05	ug/mL	155.5	% Recovery	
Sample Sequence 48																	
48	CCB	S1008300171		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
48	CCB	S1008300171		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			

Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00021747

48	CCB	S1008300171	0 0	Selenium	LIQUID	<6.1000E-05		6.10E-05	ug/mL

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00021747

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

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LABCORE Completed Batch Report for Batch# 00021747

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1008300158	ICV				
2	S1008300158	ICV				
3	S1008300160	LLS				
4	S1008300160	LLS				
5	S1008300160	LLS				
6	S1008300160	LLS				
7	S1008300160	LLS				
8	S1008300159	ICB				
9	S1005270089	BLNK-PREP				
10	S1008300161	SERDIL	S10V000136			
11	S10V000136	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
12	S1005270091	DUP	S10V000136			
13	S10V000150	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
14	S10V000167	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
15	S10V000201	SAMPLE		20100064	B27130	C Farm WMC 2010-1
16	S10V000236	SAMPLE		20100064	B27131	C Farm WMC 2010-1
17	S10V000270	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
18	S1008300163	CCV				
19	S1008300163	CCV				
20	S1008300164	CCB				
21	S1009200005	ICV				
22	S1009200005	ICV				
23	S1009200003	LLS				
24	S1009200003	LLS				
25	S1009200003	LLS				
26	S1009200003	LLS				
27	S1009200003	LLS				
28	S1009200004	ICB				
29	S1008300168	CCV				
30	S1008300168	CCV				
31	S1008300170	CCB				
32	S1005270090	STD-PREP				
33	S1005270090	STD-PREP				
34	S1005270092	SPK-PREDIG	S10V000136			
35	S1005270093	SPK-PREDIG	S10V000136			

Units shown for QC (BLK/BKG) may not reflect the actual units.

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LABCORE Completed Batch Report for Batch# 00021747

36	S1008300162	SPK-POST	S10V000136
37	S1008300162	SPK-POST	S10V000136
38	S1008300165	CCV	
39	S1008300165	CCV	
40	S1008300166	CCB	
41	S1008300169	CCV	
42	S1008300169	CCV	
43	S1008300167	LLS	
44	S1008300167	LLS	
45	S1008300167	LLS	
46	S1008300167	LLS	
47	S1008300167	LLS	
48	S1008300171	CCB	

Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00023195

Analyst: Shaw, Levi **Book#:**

Instrument: ICP/MS AGILENT

Method: MS PERIODIC TABLE, LA-506-102 Rev/Mod F-1, LA-506-103 Rev/Mod A-0

Specification: C Farm WMC 2010-1

Prep Batch: 00019741

Batch Comment: ICP-MS analysis of C Farm WMC 2010-1 acid digestates for periodic table analytes. bsm

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
2	ICV	S1010140071		0 1			Lead	LIQUID	.002	2.0640E-03			3.10E-05	ug/mL	103.2	% Recovery	
1	ICV	S1010140071		0 0			Thallium	LIQUID	.002	2.0330E-03			3.00E-06	ug/mL	101.65	% Recovery	
Sample Sequence 3																	
4	LLS	S1010140073		0 1			Lead	LIQUID	.00005	5.3080E-05			3.10E-05	ug/mL	106.16	% Recovery	
3	LLS	S1010140073		0 0			Thallium	LIQUID	.00001	9.5030E-06			3.00E-06	ug/mL	95.03	% Recovery	
Sample Sequence 5																	
6	ICB	S1010140072		0 1			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
5	ICB	S1010140072		0 0			Thallium	LIQUID		<3.0000E-06			3.00E-06	ug/mL			
Sample Sequence 7																	
8	SERDIL	S1010140074	S10V000136	0 1			Lead	SOLID		5.3437E+00			0.66262	ug/g	.55629	% Diff	
7	SERDIL	S1010140074	S10V000136	0 0			Thallium	SOLID		4.2664E+00			0.064124	ug/g	249.94	% Diff	
Sample Sequence 9																	
10	SAMPLE	S10V000136		0 2	A		Lead	SOLID	N/A	5.3736E+00			0.13252	ug/g			
9	SAMPLE	S10V000136		0 1	A		Thallium	SOLID	N/A	1.2192E+00			0.012825	ug/g			B
Sample Sequence 11																	
12	DUP	S1005270091	S10V000136	0 2	A		Lead	SOLID	5.3736E+00	5.9919E+00			0.14051	ug/g	10.881	% RPD	
11	DUP	S1005270091	S10V000136	0 1	A		Thallium	SOLID	1.2192E+00	1.0030E+00			0.013597	ug/g	19.460	% RPD	
Sample Sequence 13																	
13	BLNK-PREP	S1005270089		0 1	A		Lead	LIQUID		<1.2400E-02			0.0124	ug/mL			
Sample Sequence 14																	
14	SAMPLE	S10V000150		0 1	A		Lead	SOLID	N/A	8.4490E+00			0.13101	ug/g			
Sample Sequence 15																	
15	SAMPLE	S10V000167		0 1	A		Lead	SOLID	N/A	6.2966E+00			0.12955	ug/g			
Sample Sequence 16																	
16	SAMPLE	S10V000201		0 1	A		Lead	SOLID	N/A	4.3121E+00			0.13537	ug/g			
Sample Sequence 17																	
17	SAMPLE	S10V000236		0 1	A		Lead	SOLID	N/A	4.3002E+00			0.12627	ug/g			
Sample Sequence 18																	
18	SAMPLE	S10V000270		0 1	A		Lead	SOLID	N/A	4.4604E+00			0.13848	ug/g			
Sample Sequence 19																	
20	CCV	S1010140076		0 1			Lead	LIQUID	.002	1.9630E-03			3.10E-05	ug/mL	98.15	% Recovery	
19	CCV	S1010140076		0 0			Thallium	LIQUID	.002	2.1110E-03			3.00E-06	ug/mL	105.55	% Recovery	
Sample Sequence 21																	

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00023195

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
22	CCB	S1010140077		0 1			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
21	CCB	S1010140077		0 0			Thallium	LIQUID		1.1630E-05			3.00E-06	ug/mL			
Sample Sequence 23																	
24	SPK-POST	S1010140075	S10V000136	0 1			Lead	SOLID	.4	8.8110E-01			3.10E-05	ug/mL	94.575	% Recovery	
23	SPK-POST	S1010140075	S10V000136	0 0			Thallium	SOLID	.4	4.2620E-01			3.00E-06	ug/mL	78.03	% Recovery	
Sample Sequence 25																	
25	SPK-PREDIG	S1005270092	S10V000136	0 1	A		Lead	SOLID	54.0412	4.7740E+01			1.6753	ug/g	78.396	% Recovery	
Sample Sequence 26																	
27	STD-PREP	S1005270090		0 3	A		Lead	LIQUID	5	4.2010E+00			0.155	ug/mL	84.02	% Recovery	
26	STD-PREP	S1005270090		0 2	A		Thallium	LIQUID	5	5.1520E+00			0.015	ug/mL	103.04	% Recovery	
Sample Sequence 28																	
29	CCV	S1010140078		0 1			Lead	LIQUID	.002	1.9570E-03			3.10E-05	ug/mL	97.85	% Recovery	
28	CCV	S1010140078		0 0			Thallium	LIQUID	.002	2.1040E-03			3.00E-06	ug/mL	105.2	% Recovery	
Sample Sequence 30																	
31	LLS	S1010140086		0 1			Lead	LIQUID	.00005	4.7540E-05			3.10E-05	ug/mL	95.08	% Recovery	
30	LLS	S1010140086		0 0			Thallium	LIQUID	.00001	1.2540E-05			3.00E-06	ug/mL	125.4	% Recovery	
Sample Sequence 32																	
33	CCB	S1010140079		0 1			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
32	CCB	S1010140079		0 0			Thallium	LIQUID		1.1120E-03			3.00E-06	ug/mL			
Sample Sequence 34																	
34	ICV	S1010140085		0 0			Lead	LIQUID	.002	2.0900E-03			3.10E-05	ug/mL	104.5	% Recovery	
35	ICV	S1010140085		0 1			Thallium	LIQUID	.002	2.0340E-03			3.00E-06	ug/mL	101.7	% Recovery	
Sample Sequence 36																	
36	LLS	S1010140087		0 0			Lead	LIQUID	.00005	4.8770E-05			3.10E-05	ug/mL	97.54	% Recovery	
37	LLS	S1010140087		0 1			Thallium	LIQUID	.00001	1.0350E-05			3.00E-06	ug/mL	103.5	% Recovery	
Sample Sequence 38																	
38	ICB	S1010140084		0 0			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
38	ICB	S1010140084		0 0			Thallium	LIQUID		<3.0000E-06			3.00E-06	ug/mL			
Sample Sequence 39																	
39	SPK-PREDIG	S1005270093	S10V000136	0 1	A		Thallium	SOLID	53.68839	5.4462E+01			0.16107	ug/g	99.169	% Recovery	
Sample Sequence 40																	
40	CCV	S1010140090		0 0			Lead	LIQUID	.002	2.1130E-03			3.10E-05	ug/mL	105.65	% Recovery	
41	CCV	S1010140090		0 1			Thallium	LIQUID	.002	2.0340E-03			3.00E-06	ug/mL	101.7	% Recovery	
Sample Sequence 42																	
42	CCB	S1010140089		0 0			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
42	CCB	S1010140089		0 0			Thallium	LIQUID		<3.0000E-06			3.00E-06	ug/mL			
Sample Sequence 43																	
43	CCV	S1010140092		0 0			Lead	LIQUID	.002	2.1520E-03			3.10E-05	ug/mL	107.6	% Recovery	
44	CCV	S1010140092		0 1			Thallium	LIQUID	.002	2.0990E-03			3.00E-06	ug/mL	104.95	% Recovery	
Sample Sequence 45																	
45	LLS	S1010140093		0 0			Lead	LIQUID	.00005	5.2470E-05			3.10E-05	ug/mL	104.94	% Recovery	
46	LLS	S1010140093		0 1			Thallium	LIQUID	.00001	1.0670E-05			3.00E-06	ug/mL	106.7	% Recovery	
Sample Sequence 47																	
47	CCB	S1010140091		0 0			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00023195

47	CCB	S1010140091	0 0	Thallium	LIQUID	<3.0000E-06		3.00E-06	ug/mL

Comments Section:

Data Flagger Status:
Flagging Completed

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Reviewer Signature **Date**

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LABCORE Completed Batch Report for Batch# 00023195

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1010140071	ICV				
2	S1010140071	ICV				
3	S1010140073	LLS				
4	S1010140073	LLS				
5	S1010140072	ICB				
6	S1010140072	ICB				
7	S1010140074	SERDIL	S10V000136			
8	S1010140074	SERDIL	S10V000136			
9	S10V000136	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
10	S10V000136	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
11	S1005270091	DUP	S10V000136			
12	S1005270091	DUP	S10V000136			
13	S1005270089	BLNK-PREP				
14	S10V000150	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
15	S10V000167	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
16	S10V000201	SAMPLE		20100064	B27130	C Farm WMC 2010-1
17	S10V000236	SAMPLE		20100064	B27131	C Farm WMC 2010-1
18	S10V000270	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
19	S1010140076	CCV				
20	S1010140076	CCV				
21	S1010140077	CCB				
22	S1010140077	CCB				
23	S1010140075	SPK-POST	S10V000136			
24	S1010140075	SPK-POST	S10V000136			
25	S1005270092	SPK-PREDIG	S10V000136			
26	S1005270090	STD-PREP				
27	S1005270090	STD-PREP				
28	S1010140078	CCV				
29	S1010140078	CCV				
30	S1010140086	LLS				
31	S1010140086	LLS				
32	S1010140079	CCB				
33	S1010140079	CCB				
34	S1010140085	ICV				
35	S1010140085	ICV				

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LABCORE Completed Batch Report for Batch# 00023195

36	S1010140087	LLS	
37	S1010140087	LLS	
38	S1010140084	ICB	
39	S1005270093	SPK-PREDIG	S10V000136
40	S1010140090	CCV	
41	S1010140090	CCV	
42	S1010140089	CCB	
43	S1010140092	CCV	
44	S1010140092	CCV	
45	S1010140093	LLS	
46	S1010140093	LLS	
47	S1010140091	CCB	

Units shown for QC (BLK/BKG) may not reflect the actual units.

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LABCORE Completed Batch Report for Batch# 00019801

Analyst: Dinh, Liem

Book#: 118N11D, 119N11D

Instrument: Hg by FIMS

Method: HG, LA-325-110 Rev/Mod A-0

Specification: C Farm WMC 2010-1

Prep Batch:

Batch Comment: Total Mercury for C-Farm WMC 2010-1. lnd

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICV	S1006010120		0 0			Mercury	LIQUID	.01	1.0070E-02			1.00E-04	ug/mL	100.7	% Recovery	
Sample Sequence 2																	
2	ICB	S1006010121		0 0			Mercury	LIQUID		<1.0000E-04			1.00E-04	ug/mL			
Sample Sequence 3																	
3	LLS	S1006010122		0 0			Mercury	LIQUID	.001	1.0090E-03			1.00E-04	ug/mL	100.9	% Recovery	
Sample Sequence 4																	
4	SAMPLE	S10V000162		0 0			Mercury	SOLID	N/A	<7.7790E-03			7.78E-03	ug/g			U
Sample Sequence 5																	
5	SAMPLE	S10V000196		0 0			Mercury	SOLID	N/A	<7.8462E-03			7.85E-03	ug/g			U
Sample Sequence 6																	
6	SPK-PREDIG	S1006010138	S10V000196	0 0			Mercury	SOLID	.39032	3.9657E-01			7.81E-03	ug/g	101.6	% Recovery	
Sample Sequence 7																	
7	SPKPRE-DUP	S1006010139	S10V000196	0 0			Mercury	SOLID	.388955	3.9907E-01			7.78E-03	ug/g	102.6	% Recovery	
															0.97943	% RPD	
Sample Sequence 8																	
8	SAMPLE	S10V000231		0 0			Mercury	SOLID	N/A	<8.0064E-03			8.01E-03	ug/g			U
Sample Sequence 9																	
9	SAMPLE	S10V000265		0 0			Mercury	SOLID	N/A	<8.0354E-03			8.04E-03	ug/g			U
Sample Sequence 10																	
10	CCV	S1006010126		0 0			Mercury	LIQUID	.01	1.0070E-02			1.00E-04	ug/mL	100.7	% Recovery	
Sample Sequence 11																	
11	CCB	S1006010127		0 0			Mercury	LIQUID		<1.0000E-04			1.00E-04	ug/mL			

Comments Section:

Data Flagger Status:
Flagging Completed

Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019801

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Reviewer Signature **Date**

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LABCORE Completed Batch Report for Batch# 00019801

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1006010120	ICV				
2	S1006010121	ICB				
3	S1006010122	LLS				
4	S10V000162	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
5	S10V000196	SAMPLE		20100064	B27130	C Farm WMC 2010-1
6	S1006010138	SPK-PREDIG	S10V000196			
7	S1006010139	SPKPRE-DUP	S10V000196			
8	S10V000231	SAMPLE		20100064	B27131	C Farm WMC 2010-1
9	S10V000265	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
10	S1006010126	CCV				
11	S1006010127	CCB				

Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020597

Analyst: Shaw, Levi **Book#:**

Instrument: ICP/MS PQ-EXCELL

Method: MS ACTINIDES, LA-506-102 Rev/Mod F-1

Specification: C Farm WMC 2010-1

Prep Batch: 00019741

Batch Comment: ICP-MS analysis of actinides for C Farm WMC 2010-1 acid digestates. bsm

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICV	S1007130092		0 0			Thorium-232	LIQUID	.001	9.9630E-04			1.70E-07	ug/mL	99.63	% Recovery	
1	ICV	S1007130092		0 0			Uranium-235	LIQUID	.0000072	7.0890E-06			1.10E-08	ug/mL	98.458	% Recovery	
1	ICV	S1007130092		0 0			Neptunium-237	LIQUID	.0011	1.0830E-03			5.30E-08	ug/mL	98.455	% Recovery	
1	ICV	S1007130092		0 0			Uranium-238	LIQUID	.0009928	9.6890E-04			5.50E-07	ug/mL	97.593	% Recovery	
Sample Sequence 2																	
2	LLS	S1007130094		0 0			Thorium-232	LIQUID	.000005	5.4180E-06			1.70E-07	ug/mL	108.36	% Recovery	
2	LLS	S1007130094		0 0			Uranium-235	LIQUID	.000000036	3.8000E-08			1.10E-08	ug/mL	105.56	% Recovery	
2	LLS	S1007130094		0 0			Neptunium-237	LIQUID	.0000049175	5.0280E-06			5.30E-08	ug/mL	102.25	% Recovery	
2	LLS	S1007130094		0 0			Uranium-238	LIQUID	.000004964	5.0240E-06			5.50E-07	ug/mL	101.21	% Recovery	
Sample Sequence 3																	
3	ICB	S1007130093		0 0			Thorium-230	LIQUID		<7.0000E-09			7.00E-09	ug/mL			
3	ICB	S1007130093		0 0			Thorium-232	LIQUID		<1.7000E-07			1.70E-07	ug/mL			
3	ICB	S1007130093		0 0			Uranium-233	LIQUID		<1.0000E-08			1.00E-08	ug/mL			
3	ICB	S1007130093		0 0			Uranium-234	LIQUID		<5.0000E-09			5.00E-09	ug/mL			
3	ICB	S1007130093		0 0			Uranium-235	LIQUID		<1.1000E-08			1.10E-08	ug/mL			
3	ICB	S1007130093		0 0			Uranium-236	LIQUID		<4.0000E-09			4.00E-09	ug/mL			
3	ICB	S1007130093		0 0			Neptunium-237	LIQUID		<5.3000E-08			5.30E-08	ug/mL			
3	ICB	S1007130093		0 0			Uranium-238	LIQUID		<5.5000E-07			5.50E-07	ug/mL			
Sample Sequence 4																	
4	BLNK-PREP	S1005270089		0 0	A		Thorium-230	LIQUID		<2.8000E-06			2.80E-06	ug/mL			
4	BLNK-PREP	S1005270089		0 0	A		Thorium-232	LIQUID		<6.8000E-05			6.80E-05	ug/mL			
4	BLNK-PREP	S1005270089		0 0	A		Uranium-233	LIQUID		<4.0000E-06			4.00E-06	ug/mL			
4	BLNK-PREP	S1005270089		0 0	A		Uranium-234	LIQUID		2.1470E-06			2.00E-06	ug/mL			
4	BLNK-PREP	S1005270089		0 0	A		Uranium-235	LIQUID		<4.4000E-06			4.40E-06	ug/mL			
4	BLNK-PREP	S1005270089		0 0	A		Uranium-236	LIQUID		<1.6000E-06			1.60E-06	ug/mL			
4	BLNK-PREP	S1005270089		0 0	A		Neptunium-237	LIQUID		<2.1200E-05			2.12E-05	ug/mL			
4	BLNK-PREP	S1005270089		0 0	A		Uranium-238	LIQUID		<2.2000E-04			2.20E-04	ug/mL			
Sample Sequence 5																	
5	SERDIL	S1007130095	S10V000136	0 0			Thorium-230	SOLID		<1.4962E-04			1.50E-04	ug/g	N/A		
5	SERDIL	S1007130095	S10V000136	0 0			Thorium-232	SOLID		3.1378E+00			3.63E-03	ug/g	.71981	% Diff	
5	SERDIL	S1007130095	S10V000136	0 0			Uranium-233	SOLID		<2.1375E-04			2.14E-04	ug/g	N/A		
5	SERDIL	S1007130095	S10V000136	0 0			Uranium-234	SOLID		<1.0687E-04			1.07E-04	ug/g	N/A		

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LABCORE Completed Batch Report for Batch# 00020597

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
5	SERDIL	S1007130095	S10V000136	0 0			Uranium-235	SOLID		3.8571E-03			2.35E-04	ug/g	1.4742	% Diff	
5	SERDIL	S1007130095	S10V000136	0 0			Uranium-236	SOLID		<8.5499E-05			8.55E-05	ug/g	N/A		
5	SERDIL	S1007130095	S10V000136	0 0			Neptunium-237	SOLID		<1.1329E-03			1.13E-03	ug/g	N/A		
5	SERDIL	S1007130095	S10V000136	0 0			Uranium-238	SOLID		5.7648E-01			0.011756	ug/g	1.0675	% Diff	
Sample Sequence 6																	
6	SAMPLE	S10V000136		0 0	A		Thorium-230	SOLID	N/A	<2.9925E-05			2.99E-05	ug/g			U
6	SAMPLE	S10V000136		0 0	A		Thorium-232	SOLID	N/A	3.1154E+00			7.27E-04	ug/g			
6	SAMPLE	S10V000136		0 0	A		Uranium-233	SOLID	N/A	1.8992E-04			4.28E-05	ug/g			J
6	SAMPLE	S10V000136		0 0	A		Uranium-234	SOLID	N/A	3.5835E-05			2.14E-05	ug/g			BJ
6	SAMPLE	S10V000136		0 0	A		Uranium-235	SOLID	N/A	3.9148E-03			4.70E-05	ug/g			
6	SAMPLE	S10V000136		0 0	A		Uranium-236	SOLID	N/A	<1.7100E-05			1.71E-05	ug/g			U
6	SAMPLE	S10V000136		0 0	A		Neptunium-237	SOLID	N/A	<2.2657E-04			2.27E-04	ug/g			U
6	SAMPLE	S10V000136		0 0	A		Uranium-238	SOLID	N/A	5.7039E-01			2.35E-03	ug/g			
Sample Sequence 7																	
7	DUP	S1005270091	S10V000136	0 0	A		Thorium-230	SOLID	<2.9925E-05	3.4458E-05			3.17E-05	ug/g			
7	DUP	S1005270091	S10V000136	0 0	A		Thorium-232	SOLID	3.1154E+00	3.2849E+00			7.71E-04	ug/g	5.2970	% RPD	
7	DUP	S1005270091	S10V000136	0 0	A		Uranium-233	SOLID	1.8992E-04	1.8912E-04			4.53E-05	ug/g	0.42343	% RPD	
7	DUP	S1005270091	S10V000136	0 0	A		Uranium-234	SOLID	3.5835E-05	3.2147E-05			2.27E-05	ug/g	10.851	% RPD	
7	DUP	S1005270091	S10V000136	0 0	A		Uranium-235	SOLID	3.9148E-03	3.4923E-03			4.99E-05	ug/g	11.409	% RPD	
7	DUP	S1005270091	S10V000136	0 0	A		Uranium-236	SOLID	<1.7100E-05	<1.8130E-05			1.81E-05	ug/g			
7	DUP	S1005270091	S10V000136	0 0	A		Neptunium-237	SOLID	<2.2657E-04	<2.4022E-04			2.40E-04	ug/g			
7	DUP	S1005270091	S10V000136	0 0	A		Uranium-238	SOLID	5.7039E-01	5.0220E-01			2.49E-03	ug/g	12.715	% RPD	
Sample Sequence 8																	
8	SAMPLE	S10V000150		0 0	A		Thorium-230	SOLID	N/A	<2.9583E-05			2.96E-05	ug/g			U
8	SAMPLE	S10V000150		0 0	A		Thorium-232	SOLID	N/A	3.3883E+00			7.18E-04	ug/g			
8	SAMPLE	S10V000150		0 0	A		Uranium-233	SOLID	N/A	2.2229E-04			4.23E-05	ug/g			J
8	SAMPLE	S10V000150		0 0	A		Uranium-234	SOLID	N/A	<2.1130E-05			2.11E-05	ug/g			U
8	SAMPLE	S10V000150		0 0	A		Uranium-235	SOLID	N/A	3.4506E-03			4.65E-05	ug/g			
8	SAMPLE	S10V000150		0 0	A		Uranium-236	SOLID	N/A	<1.6904E-05			1.69E-05	ug/g			U
8	SAMPLE	S10V000150		0 0	A		Neptunium-237	SOLID	N/A	<2.2398E-04			2.24E-04	ug/g			U
8	SAMPLE	S10V000150		0 0	A		Uranium-238	SOLID	N/A	5.4052E-01			2.32E-03	ug/g			
Sample Sequence 9																	
9	SAMPLE	S10V000167		0 0	A		Thorium-230	SOLID	N/A	<2.9253E-05			2.93E-05	ug/g			U
9	SAMPLE	S10V000167		0 0	A		Thorium-232	SOLID	N/A	3.5479E+00			7.10E-04	ug/g			
9	SAMPLE	S10V000167		0 0	A		Uranium-233	SOLID	N/A	2.4499E-04			4.18E-05	ug/g			J
9	SAMPLE	S10V000167		0 0	A		Uranium-234	SOLID	N/A	3.4121E-05			2.09E-05	ug/g			BJ
9	SAMPLE	S10V000167		0 0	A		Uranium-235	SOLID	N/A	4.7180E-03			4.60E-05	ug/g			
9	SAMPLE	S10V000167		0 0	A		Uranium-236	SOLID	N/A	<1.6716E-05			1.67E-05	ug/g			U
9	SAMPLE	S10V000167		0 0	A		Neptunium-237	SOLID	N/A	<2.2148E-04			2.21E-04	ug/g			U
9	SAMPLE	S10V000167		0 0	A		Uranium-238	SOLID	N/A	6.5421E-01			2.30E-03	ug/g			
Sample Sequence 10																	
10	SAMPLE	S10V000201		0 0	A		Thorium-230	SOLID	N/A	<3.0567E-05			3.06E-05	ug/g			U

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LABCORE Completed Batch Report for Batch# 00020597

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
10	SAMPLE	S10V000201		0 0	A		Thorium-232	SOLID	N/A	3.0764E+00			7.42E-04	ug/g			
10	SAMPLE	S10V000201		0 0	A		Uranium-233	SOLID	N/A	1.9126E-04			4.37E-05	ug/g			J
10	SAMPLE	S10V000201		0 0	A		Uranium-234	SOLID	N/A	<2.1834E-05			2.18E-05	ug/g			U
10	SAMPLE	S10V000201		0 0	A		Uranium-235	SOLID	N/A	3.1080E-03			4.80E-05	ug/g			
10	SAMPLE	S10V000201		0 0	A		Uranium-236	SOLID	N/A	<1.7467E-05			1.75E-05	ug/g			U
10	SAMPLE	S10V000201		0 0	A		Neptunium-237	SOLID	N/A	<2.3144E-04			2.31E-04	ug/g			U
10	SAMPLE	S10V000201		0 0	A		Uranium-238	SOLID	N/A	4.6811E-01			2.40E-03	ug/g			
Sample Sequence 11																	
11	SAMPLE	S10V000236		0 0	A		Thorium-230	SOLID	N/A	<2.8512E-05			2.85E-05	ug/g			U
11	SAMPLE	S10V000236		0 0	A		Thorium-232	SOLID	N/A	2.7300E+00			6.92E-04	ug/g			
11	SAMPLE	S10V000236		0 0	A		Uranium-233	SOLID	N/A	1.7240E-04			4.07E-05	ug/g			J
11	SAMPLE	S10V000236		0 0	A		Uranium-234	SOLID	N/A	4.2636E-05			2.04E-05	ug/g			BJ
11	SAMPLE	S10V000236		0 0	A		Uranium-235	SOLID	N/A	3.3675E-03			4.48E-05	ug/g			
11	SAMPLE	S10V000236		0 0	A		Uranium-236	SOLID	N/A	<1.6293E-05			1.63E-05	ug/g			U
11	SAMPLE	S10V000236		0 0	A		Neptunium-237	SOLID	N/A	<2.1588E-04			2.16E-04	ug/g			U
11	SAMPLE	S10V000236		0 0	A		Uranium-238	SOLID	N/A	4.7737E-01			2.24E-03	ug/g			
Sample Sequence 12																	
12	SAMPLE	S10V000270		0 0	A		Thorium-230	SOLID	N/A	<3.1270E-05			3.13E-05	ug/g			U
12	SAMPLE	S10V000270		0 0	A		Thorium-232	SOLID	N/A	3.0086E+00			7.59E-04	ug/g			
12	SAMPLE	S10V000270		0 0	A		Uranium-233	SOLID	N/A	1.7265E-04			4.47E-05	ug/g			J
12	SAMPLE	S10V000270		0 0	A		Uranium-234	SOLID	N/A	4.6960E-05			2.23E-05	ug/g			BJ
12	SAMPLE	S10V000270		0 0	A		Uranium-235	SOLID	N/A	3.3726E-03			4.91E-05	ug/g			
12	SAMPLE	S10V000270		0 0	A		Uranium-236	SOLID	N/A	<1.7868E-05			1.79E-05	ug/g			U
12	SAMPLE	S10V000270		0 0	A		Neptunium-237	SOLID	N/A	<2.3676E-04			2.37E-04	ug/g			U
12	SAMPLE	S10V000270		0 0	A		Uranium-238	SOLID	N/A	5.1840E-01			2.46E-03	ug/g			
Sample Sequence 13																	
13	CCV	S1007130097		0 0			Thorium-232	LIQUID	.001	9.8410E-04			1.70E-07	ug/mL	98.41	% Recovery	
13	CCV	S1007130097		0 0			Uranium-235	LIQUID	.0000072	7.1020E-06			1.10E-08	ug/mL	98.639	% Recovery	
13	CCV	S1007130097		0 0			Neptunium-237	LIQUID	.0011	1.0760E-03			5.30E-08	ug/mL	97.818	% Recovery	
13	CCV	S1007130097		0 0			Uranium-238	LIQUID	.0009928	9.6070E-04			5.50E-07	ug/mL	96.767	% Recovery	
Sample Sequence 14																	
14	CCB	S1007130098		0 0			Thorium-230	LIQUID		<7.0000E-09			7.00E-09	ug/mL			
14	CCB	S1007130098		0 0			Thorium-232	LIQUID		<1.7000E-07			1.70E-07	ug/mL			
14	CCB	S1007130098		0 0			Uranium-233	LIQUID		<1.0000E-08			1.00E-08	ug/mL			
14	CCB	S1007130098		0 0			Uranium-234	LIQUID		<5.0000E-09			5.00E-09	ug/mL			
14	CCB	S1007130098		0 0			Uranium-235	LIQUID		<1.1000E-08			1.10E-08	ug/mL			
14	CCB	S1007130098		0 0			Uranium-236	LIQUID		<4.0000E-09			4.00E-09	ug/mL			
14	CCB	S1007130098		0 0			Neptunium-237	LIQUID		<5.3000E-08			5.30E-08	ug/mL			
14	CCB	S1007130098		0 0			Uranium-238	LIQUID		<5.5000E-07			5.50E-07	ug/mL			
Sample Sequence 15																	
16	STD-PREP	S1005270090		0 1	A		Thorium-232	LIQUID	.02	2.1240E-02			3.40E-06	ug/mL	106.2	% Recovery	
16	STD-PREP	S1005270090		0 1	A		Uranium-235	LIQUID	.000144	1.4960E-04			2.20E-07	ug/mL	103.89	% Recovery	

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LABCORE Completed Batch Report for Batch# 00020597

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
15	STD-PREP	S1005270090		0 0	A		Neptunium-237	LIQUID	.017514	1.8610E-02			1.06E-06	ug/mL	106.26	% Recovery	
16	STD-PREP	S1005270090		0 1	A		Uranium-238	LIQUID	.019856	2.1860E-02			1.10E-05	ug/mL	110.09	% Recovery	
Sample Sequence 17																	
17	SPK-PREDIG	S1005270093	S10V000136	0 0	A		Thorium-232	SOLID	53.68839	5.2110E+01			9.13E-03	ug/g	91.257	% Recovery	
Sample Sequence 18																	
18	SPK-PREDIG	S1005270095	S10V000136	0 0	A		Neptunium-237	SOLID	.51500552508	4.9864E-01			2.18E-04	ug/g	96.823	% Recovery	
Sample Sequence 19																	
19	SPK-PREDIG	S1005270097	S10V000136	0 0	A		Uranium-235	SOLID	.0073188576	1.0623E-02			4.47E-05	ug/g	91.65	% Recovery	
19	SPK-PREDIG	S1005270097	S10V000136	0 0	A		Uranium-238	SOLID	1.0091891424	1.5563E+00			2.24E-03	ug/g	97.691	% Recovery	
Sample Sequence 20																	
20	SPK-POST	S1007130096	S10V000136	0 0			Thorium-232	SOLID	.4	6.9650E-01			1.70E-07	ug/mL	101.25	% Recovery	
20	SPK-POST	S1007130096	S10V000136	0 0			Uranium-235	SOLID	.00288	3.1870E-03			1.10E-08	ug/mL	97.941	% Recovery	
20	SPK-POST	S1007130096	S10V000136	0 0			Neptunium-237	SOLID	.3934	3.9620E-01			5.30E-08	ug/mL	100.71	% Recovery	
20	SPK-POST	S1007130096	S10V000136	0 0			Uranium-238	SOLID	.39712	4.5090E-01			5.50E-07	ug/mL	100.1	% Recovery	
Sample Sequence 21																	
21	CCV	S1007130099		0 0			Thorium-232	LIQUID	.001	9.9240E-04			1.70E-07	ug/mL	99.24	% Recovery	
21	CCV	S1007130099		0 0			Uranium-235	LIQUID	.0000072	7.1850E-06			1.10E-08	ug/mL	99.792	% Recovery	
21	CCV	S1007130099		0 0			Neptunium-237	LIQUID	.0011	1.0770E-03			5.30E-08	ug/mL	97.909	% Recovery	
21	CCV	S1007130099		0 0			Uranium-238	LIQUID	.0009928	9.6480E-04			5.50E-07	ug/mL	97.18	% Recovery	
Sample Sequence 22																	
22	LLS	S1007130101		0 0			Thorium-232	LIQUID	.000005	5.8050E-06			1.70E-07	ug/mL	116.1	% Recovery	
22	LLS	S1007130101		0 0			Uranium-235	LIQUID	.000000036	4.2000E-08			1.10E-08	ug/mL	116.67	% Recovery	
22	LLS	S1007130101		0 0			Neptunium-237	LIQUID	.0000049175	5.2400E-06			5.30E-08	ug/mL	106.56	% Recovery	
22	LLS	S1007130101		0 0			Uranium-238	LIQUID	.000004964	5.3670E-06			5.50E-07	ug/mL	108.12	% Recovery	
Sample Sequence 23																	
23	CCB	S1007130100		0 0			Thorium-230	LIQUID		<7.0000E-09			7.00E-09	ug/mL			
23	CCB	S1007130100		0 0			Thorium-232	LIQUID		<1.7000E-07			1.70E-07	ug/mL			
23	CCB	S1007130100		0 0			Uranium-233	LIQUID		<1.0000E-08			1.00E-08	ug/mL			
23	CCB	S1007130100		0 0			Uranium-234	LIQUID		<5.0000E-09			5.00E-09	ug/mL			
23	CCB	S1007130100		0 0			Uranium-235	LIQUID		<1.1000E-08			1.10E-08	ug/mL			
23	CCB	S1007130100		0 0			Uranium-236	LIQUID		<4.0000E-09			4.00E-09	ug/mL			
23	CCB	S1007130100		0 0			Neptunium-237	LIQUID		<5.3000E-08			5.30E-08	ug/mL			
23	CCB	S1007130100		0 0			Uranium-238	LIQUID		<5.5000E-07			5.50E-07	ug/mL			

Comments Section:

Data Flagger Status:
Flagging Completed

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LABCORE Completed Batch Report for Batch# 00020597

Final Page for Batch# 00020597

Reviewer Signature **Date**

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LABCORE Completed Batch Report for Batch# 00020597

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1007130092	ICV				
2	S1007130094	LLS				
3	S1007130093	ICB				
4	S1005270089	BLNK-PREP				
5	S1007130095	SERDIL	S10V000136			
6	S10V000136	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
7	S1005270091	DUP	S10V000136			
8	S10V000150	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
9	S10V000167	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
10	S10V000201	SAMPLE		20100064	B27130	C Farm WMC 2010-1
11	S10V000236	SAMPLE		20100064	B27131	C Farm WMC 2010-1
12	S10V000270	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
13	S1007130097	CCV				
14	S1007130098	CCB				
15	S1005270090	STD-PREP				
16	S1005270090	STD-PREP				
17	S1005270093	SPK-PREDIG	S10V000136			
18	S1005270095	SPK-PREDIG	S10V000136			
19	S1005270097	SPK-PREDIG	S10V000136			
20	S1007130096	SPK-POST	S10V000136			
21	S1007130099	CCV				
22	S1007130101	LLS				
23	S1007130100	CCB				

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LABCORE Completed Batch Report for Batch# 00020681

Analyst: Mull, Bryanna **Book#:**

Instrument: ICP/MS PQ-EXCELL

Method: MS FISSION PRODUCTS, LA-506-102 Rev/Mod F-1

Specification: C Farm WMC 2010-1

Prep Batch: 00019744

Batch Comment: ICPMS Fission Products for C-Farm WMC 2010-1. lnd

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
2	ICV	S1007150032		0 1			Technetium-99	LIQUID	.001	9.4860E-04			3.00E-07	ug/mL	94.86	% Recovery	
1	ICV	S1007150032		0 0			Tin-117	LIQUID	.001	1.0030E-03			1.10E-05	ug/mL	100.3	% Recovery	
Sample Sequence 3																	
4	LLS	S1007150034		0 1			Technetium-99	LIQUID	.000002	2.0960E-06			3.00E-07	ug/mL	104.8	% Recovery	
3	LLS	S1007150034		0 0			Tin-117	LIQUID	.000016	1.7830E-05			1.10E-05	ug/mL	111.44	% Recovery	
Sample Sequence 5																	
5	ICB	S1007150033		0 0			Technetium-99	LIQUID		<3.0000E-07			3.00E-07	ug/mL			
5	ICB	S1007150033		0 0			Tin-117	LIQUID		<1.1000E-05			1.10E-05	ug/mL			
5	ICB	S1007150033		0 0			Tin-126	LIQUID		<2.0000E-07			2.00E-07	ug/mL			
Sample Sequence 6																	
6	BLNK-PREP	S1005270099		0 0	A		Technetium-99	LIQUID		<1.5000E-04			1.50E-04	ug/mL			
6	BLNK-PREP	S1005270099		0 0	A		Tin-117	LIQUID		<5.5000E-03			5.50E-03	ug/mL			
6	BLNK-PREP	S1005270099		0 0	A		Tin-126	LIQUID		<1.0000E-04			1.00E-04	ug/mL			
Sample Sequence 7																	
7	SERDIL	S1007150035	S10V000138	0 0			Technetium-99	SOLID		<8.6587E-03			8.66E-03	ug/g	N/A		
7	SERDIL	S1007150035	S10V000138	0 0			Tin-117	SOLID		<3.1749E-01			0.31749	ug/g	N/A		
7	SERDIL	S1007150035	S10V000138	0 0			Tin-126	SOLID		<5.7725E-03			5.77E-03	ug/g	N/A		
Sample Sequence 8																	
8	SAMPLE	S10V000138		0 0	A		Technetium-99	SOLID	N/A	<1.7317E-03			1.73E-03	ug/g			U
8	SAMPLE	S10V000138		0 0	A		Tin-117	SOLID	N/A	<6.3497E-02			0.063497	ug/g			U
8	SAMPLE	S10V000138		0 0	A		Tin-126	SOLID	N/A	<1.1545E-03			1.15E-03	ug/g			U
Sample Sequence 9																	
9	DUP	S1005270101	S10V000138	0 0	A		Technetium-99	SOLID	<1.7317E-03	<1.7133E-03			1.71E-03	ug/g			
9	DUP	S1005270101	S10V000138	0 0	A		Tin-117	SOLID	<6.3497E-02	<6.2820E-02			0.06282	ug/g			
9	DUP	S1005270101	S10V000138	0 0	A		Tin-126	SOLID	<1.1545E-03	<1.1422E-03			1.14E-03	ug/g			
Sample Sequence 10																	
10	SAMPLE	S10V000152		0 0	A		Technetium-99	SOLID	N/A	<1.6493E-03			1.65E-03	ug/g			U
10	SAMPLE	S10V000152		0 0	A		Tin-117	SOLID	N/A	<6.0473E-02			0.060473	ug/g			U
10	SAMPLE	S10V000152		0 0	A		Tin-126	SOLID	N/A	<1.0995E-03			1.10E-03	ug/g			U
Sample Sequence 11																	
12	CCV	S1007150037		0 1			Technetium-99	LIQUID	.001	9.4970E-04			3.00E-07	ug/mL	94.97	% Recovery	
11	CCV	S1007150037		0 0			Tin-117	LIQUID	.001	1.0030E-03			1.10E-05	ug/mL	100.3	% Recovery	

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* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020681

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 13																	
13	CCB	S1007150038		0 0			Technetium-99	LIQUID		<3.0000E-07			3.00E-07	ug/mL			
13	CCB	S1007150038		0 0			Tin-117	LIQUID		<1.1000E-05			1.10E-05	ug/mL			
13	CCB	S1007150038		0 0			Tin-126	LIQUID		<2.0000E-07			2.00E-07	ug/mL			
Sample Sequence 14																	
14	SAMPLE	S10V000169		0 0	A		Technetium-99	SOLID	N/A	<1.6930E-03			1.69E-03	ug/g			U
14	SAMPLE	S10V000169		0 0	A		Tin-117	SOLID	N/A	<6.2075E-02			0.062075	ug/g			U
14	SAMPLE	S10V000169		0 0	A		Tin-126	SOLID	N/A	<1.1286E-03			1.13E-03	ug/g			U
Sample Sequence 15																	
15	SAMPLE	S10V000203		0 0	A		Technetium-99	SOLID	N/A	<1.7609E-03			1.76E-03	ug/g			U
15	SAMPLE	S10V000203		0 0	A		Tin-117	SOLID	N/A	<6.4568E-02			0.064568	ug/g			U
15	SAMPLE	S10V000203		0 0	A		Tin-126	SOLID	N/A	<1.1740E-03			1.17E-03	ug/g			U
Sample Sequence 16																	
16	SAMPLE	S10V000238		0 0	A		Technetium-99	SOLID	N/A	<1.6397E-03			1.64E-03	ug/g			U
16	SAMPLE	S10V000238		0 0	A		Tin-117	SOLID	N/A	<6.0121E-02			0.060121	ug/g			U
16	SAMPLE	S10V000238		0 0	A		Tin-126	SOLID	N/A	<1.0931E-03			1.09E-03	ug/g			U
Sample Sequence 17																	
17	SAMPLE	S10V000272		0 0	A		Technetium-99	SOLID	N/A	<1.6676E-03			1.67E-03	ug/g			U
17	SAMPLE	S10V000272		0 0	A		Tin-117	SOLID	N/A	<6.1144E-02			0.061144	ug/g			U
17	SAMPLE	S10V000272		0 0	A		Tin-126	SOLID	N/A	<1.1117E-03			1.11E-03	ug/g			U
Sample Sequence 18																	
18	SPK-PREDIG	S1005270103	S10V000138	0 0	A		Technetium-99	SOLID	.0063320262	6.7253E-03			3.62E-04	ug/g	106.21	% Recovery	
Sample Sequence 19																	
19	SPK-PREDIG	S1005270102	S10V000138	0 0	A		Tin-117	SOLID	.369428444	2.5764E-01			0.026388	ug/g	69.74	% Recovery	
Sample Sequence 20																	
20	SPK-POST	S1007150036	S10V000138	0 0			Technetium-99	SOLID	.5	4.7370E-01			3.00E-07	ug/g	94.74	% Recovery	
21	SPK-POST	S1007150036	S10V000138	0 1			Tin-117	SOLID	.5	5.0850E-01			1.10E-05	ug/g	101.7	% Recovery	
Sample Sequence 22																	
22	STD-PREP	S1005270104		0 0	A		Technetium-99	LIQUID	.0005249	4.9140E-04			6.00E-07	ug/mL	93.618	% Recovery	
Sample Sequence 23																	
23	STD-PREP	S1005270100		0 0	A		Tin-117	LIQUID	.00616	6.4150E-03			5.50E-05	ug/mL	104.14	% Recovery	
Sample Sequence 24																	
25	CCV	S1007150039		0 1			Technetium-99	LIQUID	.001	9.4260E-04			3.00E-07	ug/mL	94.26	% Recovery	
24	CCV	S1007150039		0 0			Tin-117	LIQUID	.001	1.0040E-03			1.10E-05	ug/mL	100.4	% Recovery	
Sample Sequence 26																	
27	LLS	S1007150041		0 1			Technetium-99	LIQUID	.000002	1.9180E-06			3.00E-07	ug/mL	95.9	% Recovery	
26	LLS	S1007150041		0 0			Tin-117	LIQUID	.000016	1.1610E-05			1.10E-05	ug/mL	72.562	% Recovery	
Sample Sequence 28																	
28	CCB	S1007150040		0 0			Technetium-99	LIQUID		<3.0000E-07			3.00E-07	ug/mL			
28	CCB	S1007150040		0 0			Tin-117	LIQUID		<1.1000E-05			1.10E-05	ug/mL			
28	CCB	S1007150040		0 0			Tin-126	LIQUID		<2.0000E-07			2.00E-07	ug/mL			

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020681

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00020681

Reviewer Signature **Date**

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LABCORE Completed Batch Report for Batch# 00020681

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1007150032	ICV				
2	S1007150032	ICV				
3	S1007150034	LLS				
4	S1007150034	LLS				
5	S1007150033	ICB				
6	S1005270099	BLNK-PREP				
7	S1007150035	SERDIL	S10V000138			
8	S10V000138	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
9	S1005270101	DUP	S10V000138			
10	S10V000152	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
11	S1007150037	CCV				
12	S1007150037	CCV				
13	S1007150038	CCB				
14	S10V000169	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
15	S10V000203	SAMPLE		20100064	B27130	C Farm WMC 2010-1
16	S10V000238	SAMPLE		20100064	B27131	C Farm WMC 2010-1
17	S10V000272	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
18	S1005270103	SPK-PREDIG	S10V000138			
19	S1005270102	SPK-PREDIG	S10V000138			
20	S1007150036	SPK-POST	S10V000138			
21	S1007150036	SPK-POST	S10V000138			
22	S1005270104	STD-PREP				
23	S1005270100	STD-PREP				
24	S1007150039	CCV				
25	S1007150039	CCV				
26	S1007150041	LLS				
27	S1007150041	LLS				
28	S1007150040	CCB				

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LABCORE Completed Batch Report for Batch# 00021747

Analyst: Thorndike, Kathy

Book#:

Instrument: ICP/MS AGILENT

Method: MS PERIODIC TABLE, LA-506-103 Rev/Mod A-0

Specification: C Farm WMC 2010-1

Prep Batch: 00019741

Batch Comment:

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICV	S1008300158		0 0			Silver	LIQUID	.0004	4.1520E-04			8.00E-06	ug/mL	103.8	% Recovery	
1	ICV	S1008300158		0 0			Arsenic	LIQUID	.002	2.1310E-03			4.20E-05	ug/mL	106.55	% Recovery	
1	ICV	S1008300158		0 0			Selenium	LIQUID	.002	2.1400E-03			6.10E-05	ug/mL	107	% Recovery	
2	ICV	S1008300158		0 1			Thallium	LIQUID	.002	2.0330E-03			3.00E-06	ug/mL	101.65	% Recovery	
Sample Sequence 3																	
4	LLS	S1008300160		0 1			Silver	LIQUID	.00001	1.0450E-05			8.00E-06	ug/mL	104.5	% Recovery	
4	LLS	S1008300160		0 1			Arsenic	LIQUID	.00005	4.9780E-05			4.20E-05	ug/mL	99.56	% Recovery	
5	LLS	S1008300160		0 2			Selenium	LIQUID	.0002	1.9120E-04			6.10E-05	ug/mL	95.6	% Recovery	
7	LLS	S1008300160		0 4			Thallium	LIQUID	.00001	9.5030E-06			3.00E-06	ug/mL	95.03	% Recovery	
Sample Sequence 8																	
8	ICB	S1008300159		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
8	ICB	S1008300159		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
8	ICB	S1008300159		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
8	ICB	S1008300159		0 0			Thallium	LIQUID		<3.0000E-06			3.00E-06	ug/mL			
Sample Sequence 9																	
9	BLNK-PREP	S1005270089		0 0	A		Silver	LIQUID		<3.2000E-03			3.20E-03	ug/mL			
9	BLNK-PREP	S1005270089		0 0	A		Arsenic	LIQUID		<1.6800E-02			0.0168	ug/mL			
9	BLNK-PREP	S1005270089		0 0	A		Selenium	LIQUID		<2.4400E-02			0.0244	ug/mL			
9	BLNK-PREP	S1005270089		0 0	A		Thallium	LIQUID		<1.2000E-03			1.20E-03	ug/mL			
Sample Sequence 10																	
10	SERDIL	S1008300161	S10V000136	0 0			Silver	SOLID		<1.7100E-01			0.171	ug/g	N/A		
10	SERDIL	S1008300161	S10V000136	0 0			Arsenic	SOLID		4.2840E+00			0.89774	ug/g	7.8441	% Diff	
10	SERDIL	S1008300161	S10V000136	0 0			Selenium	SOLID		<1.3039E+00			1.3039	ug/g	N/A		
Sample Sequence 11																	
11	SAMPLE	S10V000136		0 0	A		Silver	SOLID	N/A	5.3010E-02			0.0342	ug/g			J
11	SAMPLE	S10V000136		0 0	A		Arsenic	SOLID	N/A	4.6487E+00			0.17955	ug/g			b
11	SAMPLE	S10V000136		0 0	A		Selenium	SOLID	N/A	7.0135E-01			0.26077	ug/g			J
Sample Sequence 12																	
12	DUP	S1005270091	S10V000136	0 0	A		Silver	SOLID	5.3010E-02	6.1596E-02			0.03626	ug/g	14.984	% RPD	
12	DUP	S1005270091	S10V000136	0 0	A		Arsenic	SOLID	4.6487E+00	5.2944E+00			0.19036	ug/g	12.988	% RPD	
12	DUP	S1005270091	S10V000136	0 0	A		Selenium	SOLID	7.0135E-01	8.1528E-01			0.27648	ug/g	15.024	% RPD	
Sample Sequence 13																	

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LABCORE Completed Batch Report for Batch# 00021747

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
13	SAMPLE	S10V000150		0 0	A		Silver	SOLID	N/A	4.5261E-02			0.033809	ug/g			J
13	SAMPLE	S10V000150		0 0	A		Arsenic	SOLID	N/A	5.2549E+00			0.1775	ug/g			
13	SAMPLE	S10V000150		0 0	A		Selenium	SOLID	N/A	3.2062E-01			0.25779	ug/g			J
13	SAMPLE	S10V000150		0 0	A		Thallium	SOLID	N/A	7.6873E-01			0.012678	ug/g			B
Sample Sequence 14																	
14	SAMPLE	S10V000167		0 0	A		Silver	SOLID	N/A	5.1861E-02			0.033432	ug/g			J
14	SAMPLE	S10V000167		0 0	A		Arsenic	SOLID	N/A	5.8279E+00			0.17552	ug/g			b
14	SAMPLE	S10V000167		0 0	A		Selenium	SOLID	N/A	5.9397E-01			0.25492	ug/g			J
14	SAMPLE	S10V000167		0 0	A		Thallium	SOLID	N/A	7.1418E-01			0.012537	ug/g			B
Sample Sequence 15																	
15	SAMPLE	S10V000201		0 0	A		Silver	SOLID	N/A	6.9431E-02			0.034934	ug/g			J
15	SAMPLE	S10V000201		0 0	A		Arsenic	SOLID	N/A	4.8971E+00			0.1834	ug/g			b
15	SAMPLE	S10V000201		0 0	A		Selenium	SOLID	N/A	6.8451E-01			0.26637	ug/g			J
15	SAMPLE	S10V000201		0 0	A		Thallium	SOLID	N/A	7.0348E-01			0.0131	ug/g			B
Sample Sequence 16																	
16	SAMPLE	S10V000236		0 0	A		Silver	SOLID	N/A	4.1872E-02			0.032585	ug/g			J
16	SAMPLE	S10V000236		0 0	A		Arsenic	SOLID	N/A	3.7694E+00			0.17107	ug/g			b
16	SAMPLE	S10V000236		0 0	A		Selenium	SOLID	N/A	4.3818E-01			0.24846	ug/g			J
16	SAMPLE	S10V000236		0 0	A		Thallium	SOLID	N/A	6.6067E-01			0.012219	ug/g			B
Sample Sequence 17																	
17	SAMPLE	S10V000270		0 0	A		Silver	SOLID	N/A	5.8385E-02			0.035737	ug/g			J
17	SAMPLE	S10V000270		0 0	A		Arsenic	SOLID	N/A	4.4832E+00			0.18762	ug/g			b
17	SAMPLE	S10V000270		0 0	A		Selenium	SOLID	N/A	5.2407E-01			0.27249	ug/g			J
17	SAMPLE	S10V000270		0 0	A		Thallium	SOLID	N/A	6.6693E-01			0.013401	ug/g			B
Sample Sequence 18																	
18	CCV	S1008300163		0 0			Silver	LIQUID	.0004	4.0140E-04			8.00E-06	ug/mL	100.35	% Recovery	
18	CCV	S1008300163		0 0			Arsenic	LIQUID	.002	1.9310E-03			4.20E-05	ug/mL	96.55	% Recovery	
18	CCV	S1008300163		0 0			Selenium	LIQUID	.002	1.9260E-03			6.10E-05	ug/mL	96.3	% Recovery	
19	CCV	S1008300163		0 1			Thallium	LIQUID	.002	2.1110E-03			3.00E-06	ug/mL	105.55	% Recovery	
Sample Sequence 20																	
20	CCB	S1008300164		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
20	CCB	S1008300164		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
20	CCB	S1008300164		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
20	CCB	S1008300164		0 0			Thallium	LIQUID		1.1630E-05			3.00E-06	ug/mL			
Sample Sequence 21																	
21	ICV	S1009200005		0 0			Silver	LIQUID	.0004	3.9150E-04			8.00E-06	ug/mL	97.875	% Recovery	
21	ICV	S1009200005		0 0			Arsenic	LIQUID	.002	2.1340E-03			4.20E-05	ug/mL	106.7	% Recovery	
21	ICV	S1009200005		0 0			Selenium	LIQUID	.002	1.9700E-03			6.10E-05	ug/mL	98.5	% Recovery	
Sample Sequence 23																	
24	LLS	S1009200003		0 1			Silver	LIQUID	.00005	5.2080E-05			8.00E-06	ug/mL	104.16	% Recovery	
24	LLS	S1009200003		0 1			Arsenic	LIQUID	.00005	6.2100E-05			4.20E-05	ug/mL	124.2	% Recovery	
25	LLS	S1009200003		0 2			Selenium	LIQUID	.0002	2.5810E-04			6.10E-05	ug/mL	129.05	% Recovery	
Sample Sequence 28																	

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LABCORE Completed Batch Report for Batch# 00021747

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
28	ICB	S1009200004		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
28	ICB	S1009200004		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
28	ICB	S1009200004		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
Sample Sequence 29																	
29	CCV	S1008300168		0 0			Silver	LIQUID	.0004	3.9000E-04			8.00E-06	ug/mL	97.5	% Recovery	
29	CCV	S1008300168		0 0			Arsenic	LIQUID	.002	2.0810E-03			4.20E-05	ug/mL	104.05	% Recovery	
29	CCV	S1008300168		0 0			Selenium	LIQUID	.002	1.9430E-03			6.10E-05	ug/mL	97.15	% Recovery	
Sample Sequence 31																	
31	CCB	S1008300170		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
31	CCB	S1008300170		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
31	CCB	S1008300170		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
Sample Sequence 32																	
32	STD-PREP	S1005270090		0 0	A		Silver	LIQUID	1	8.2150E-01			0.04	ug/mL	82.15	% Recovery	
32	STD-PREP	S1005270090		0 0	A		Arsenic	LIQUID	5	5.4150E+00			0.21	ug/mL	108.3	% Recovery	
32	STD-PREP	S1005270090		0 0	A		Selenium	LIQUID	5	4.3195E+00			0.305	ug/mL	86.39	% Recovery	
Sample Sequence 34																	
34	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Silver	SOLID	10.80824	8.9114E+00			0.43233	ug/g	81.96	% Recovery	
34	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Arsenic	SOLID	54.0412	4.4724E+01			2.2697	ug/g	74.158	% Recovery	
34	SPK-PREDIG	S1005270092	S10V000136	0 0	A		Selenium	SOLID	54.0412	4.4481E+01			3.2965	ug/g	81.012	% Recovery	
Sample Sequence 36																	
36	SPK-POST	S1008300162	S10V000136	0 0			Silver	SOLID	.4	3.7968E-01			8.00E-06	ug/mL	93.68	% Recovery	
36	SPK-POST	S1008300162	S10V000136	0 0			Arsenic	SOLID	.4	8.5920E-01			4.20E-05	ug/mL	106.06	% Recovery	
37	SPK-POST	S1008300162	S10V000136	0 1			Antimony	SOLID	.4	4.5080E-01			4.40E-05	ug/mL	112.7	% Recovery	
36	SPK-POST	S1008300162	S10V000136	0 0			Selenium	SOLID	.4	4.1640E-01			6.10E-05	ug/mL	87.694	% Recovery	
Sample Sequence 38																	
38	CCV	S1008300165		0 0			Silver	LIQUID	.0004	3.9320E-04			8.00E-06	ug/mL	98.3	% Recovery	
38	CCV	S1008300165		0 0			Arsenic	LIQUID	.002	2.0490E-03			4.20E-05	ug/mL	102.45	% Recovery	
38	CCV	S1008300165		0 0			Selenium	LIQUID	.002	1.8840E-03			6.10E-05	ug/mL	94.2	% Recovery	
Sample Sequence 40																	
40	CCB	S1008300166		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
40	CCB	S1008300166		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			
40	CCB	S1008300166		0 0			Selenium	LIQUID		<6.1000E-05			6.10E-05	ug/mL			
Sample Sequence 41																	
41	CCV	S1008300169		0 0			Silver	LIQUID	.0004	3.9350E-04			8.00E-06	ug/mL	98.375	% Recovery	
41	CCV	S1008300169		0 0			Arsenic	LIQUID	.002	2.2180E-03			4.20E-05	ug/mL	110.9	% Recovery	
41	CCV	S1008300169		0 0			Selenium	LIQUID	.002	2.0070E-03			6.10E-05	ug/mL	100.35	% Recovery	
Sample Sequence 43																	
44	LLS	S1008300167		0 1			Silver	LIQUID	.00001	9.4800E-06			8.00E-06	ug/mL	94.8	% Recovery	
44	LLS	S1008300167		0 1			Arsenic	LIQUID	.00005	5.2230E-05			4.20E-05	ug/mL	104.46	% Recovery	
45	LLS	S1008300167		0 2			Selenium	LIQUID	.0002	3.1100E-04			6.10E-05	ug/mL	155.5	% Recovery	
Sample Sequence 48																	
48	CCB	S1008300171		0 0			Silver	LIQUID		<8.0000E-06			8.00E-06	ug/mL			
48	CCB	S1008300171		0 0			Arsenic	LIQUID		<4.2000E-05			4.20E-05	ug/mL			

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LABCORE Completed Batch Report for Batch# 00021747

48	CCB	S1008300171	0 0	Selenium	LIQUID	<6.1000E-05		6.10E-05	ug/mL

Comments Section:

Data Flagger Status:
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Final Page for Batch# 00021747

Reviewer Signature **Date**

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LABCORE Completed Batch Report for Batch# 00021747

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1008300158	ICV				
2	S1008300158	ICV				
3	S1008300160	LLS				
4	S1008300160	LLS				
5	S1008300160	LLS				
6	S1008300160	LLS				
7	S1008300160	LLS				
8	S1008300159	ICB				
9	S1005270089	BLNK-PREP				
10	S1008300161	SERDIL	S10V000136			
11	S10V000136	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
12	S1005270091	DUP	S10V000136			
13	S10V000150	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
14	S10V000167	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
15	S10V000201	SAMPLE		20100064	B27130	C Farm WMC 2010-1
16	S10V000236	SAMPLE		20100064	B27131	C Farm WMC 2010-1
17	S10V000270	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
18	S1008300163	CCV				
19	S1008300163	CCV				
20	S1008300164	CCB				
21	S1009200005	ICV				
22	S1009200005	ICV				
23	S1009200003	LLS				
24	S1009200003	LLS				
25	S1009200003	LLS				
26	S1009200003	LLS				
27	S1009200003	LLS				
28	S1009200004	ICB				
29	S1008300168	CCV				
30	S1008300168	CCV				
31	S1008300170	CCB				
32	S1005270090	STD-PREP				
33	S1005270090	STD-PREP				
34	S1005270092	SPK-PREDIG	S10V000136			
35	S1005270093	SPK-PREDIG	S10V000136			

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LABCORE Completed Batch Report for Batch# 00021747

36	S1008300162	SPK-POST	S10V000136
37	S1008300162	SPK-POST	S10V000136
38	S1008300165	CCV	
39	S1008300165	CCV	
40	S1008300166	CCB	
41	S1008300169	CCV	
42	S1008300169	CCV	
43	S1008300167	LLS	
44	S1008300167	LLS	
45	S1008300167	LLS	
46	S1008300167	LLS	
47	S1008300167	LLS	
48	S1008300171	CCB	

Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00023195

Analyst: Shaw, Levi **Book#:**

Instrument: ICP/MS AGILENT

Method: MS PERIODIC TABLE, LA-506-102 Rev/Mod F-1, LA-506-103 Rev/Mod A-0

Specification: C Farm WMC 2010-1

Prep Batch: 00019741

Batch Comment: ICP-MS analysis of C Farm WMC 2010-1 acid digestates for periodic table analytes. bsm

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
2	ICV	S1010140071		0 1			Lead	LIQUID	.002	2.0640E-03			3.10E-05	ug/mL	103.2	% Recovery	
1	ICV	S1010140071		0 0			Thallium	LIQUID	.002	2.0330E-03			3.00E-06	ug/mL	101.65	% Recovery	
Sample Sequence 3																	
4	LLS	S1010140073		0 1			Lead	LIQUID	.00005	5.3080E-05			3.10E-05	ug/mL	106.16	% Recovery	
3	LLS	S1010140073		0 0			Thallium	LIQUID	.00001	9.5030E-06			3.00E-06	ug/mL	95.03	% Recovery	
Sample Sequence 5																	
6	ICB	S1010140072		0 1			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
5	ICB	S1010140072		0 0			Thallium	LIQUID		<3.0000E-06			3.00E-06	ug/mL			
Sample Sequence 7																	
8	SERDIL	S1010140074	S10V000136	0 1			Lead	SOLID		5.3437E+00			0.66262	ug/g	.55629	% Diff	
7	SERDIL	S1010140074	S10V000136	0 0			Thallium	SOLID		4.2664E+00			0.064124	ug/g	249.94	% Diff	
Sample Sequence 9																	
10	SAMPLE	S10V000136		0 2	A		Lead	SOLID	N/A	5.3736E+00			0.13252	ug/g			
9	SAMPLE	S10V000136		0 1	A		Thallium	SOLID	N/A	1.2192E+00			0.012825	ug/g			B
Sample Sequence 11																	
12	DUP	S1005270091	S10V000136	0 2	A		Lead	SOLID	5.3736E+00	5.9919E+00			0.14051	ug/g	10.881	% RPD	
11	DUP	S1005270091	S10V000136	0 1	A		Thallium	SOLID	1.2192E+00	1.0030E+00			0.013597	ug/g	19.460	% RPD	
Sample Sequence 13																	
13	BLNK-PREP	S1005270089		0 1	A		Lead	LIQUID		<1.2400E-02			0.0124	ug/mL			
Sample Sequence 14																	
14	SAMPLE	S10V000150		0 1	A		Lead	SOLID	N/A	8.4490E+00			0.13101	ug/g			
Sample Sequence 15																	
15	SAMPLE	S10V000167		0 1	A		Lead	SOLID	N/A	6.2966E+00			0.12955	ug/g			
Sample Sequence 16																	
16	SAMPLE	S10V000201		0 1	A		Lead	SOLID	N/A	4.3121E+00			0.13537	ug/g			
Sample Sequence 17																	
17	SAMPLE	S10V000236		0 1	A		Lead	SOLID	N/A	4.3002E+00			0.12627	ug/g			
Sample Sequence 18																	
18	SAMPLE	S10V000270		0 1	A		Lead	SOLID	N/A	4.4604E+00			0.13848	ug/g			
Sample Sequence 19																	
20	CCV	S1010140076		0 1			Lead	LIQUID	.002	1.9630E-03			3.10E-05	ug/mL	98.15	% Recovery	
19	CCV	S1010140076		0 0			Thallium	LIQUID	.002	2.1110E-03			3.00E-06	ug/mL	105.55	% Recovery	
Sample Sequence 21																	

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LABCORE Completed Batch Report for Batch# 00023195

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
22	CCB	S1010140077		0 1			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
21	CCB	S1010140077		0 0			Thallium	LIQUID		1.1630E-05			3.00E-06	ug/mL			
Sample Sequence 23																	
24	SPK-POST	S1010140075	S10V000136	0 1			Lead	SOLID	.4	8.8110E-01			3.10E-05	ug/mL	94.575	% Recovery	
23	SPK-POST	S1010140075	S10V000136	0 0			Thallium	SOLID	.4	4.2620E-01			3.00E-06	ug/mL	78.03	% Recovery	
Sample Sequence 25																	
25	SPK-PREDIG	S1005270092	S10V000136	0 1	A		Lead	SOLID	54.0412	4.7740E+01			1.6753	ug/g	78.396	% Recovery	
Sample Sequence 26																	
27	STD-PREP	S1005270090		0 3	A		Lead	LIQUID	5	4.2010E+00			0.155	ug/mL	84.02	% Recovery	
26	STD-PREP	S1005270090		0 2	A		Thallium	LIQUID	5	5.1520E+00			0.015	ug/mL	103.04	% Recovery	
Sample Sequence 28																	
29	CCV	S1010140078		0 1			Lead	LIQUID	.002	1.9570E-03			3.10E-05	ug/mL	97.85	% Recovery	
28	CCV	S1010140078		0 0			Thallium	LIQUID	.002	2.1040E-03			3.00E-06	ug/mL	105.2	% Recovery	
Sample Sequence 30																	
31	LLS	S1010140086		0 1			Lead	LIQUID	.00005	4.7540E-05			3.10E-05	ug/mL	95.08	% Recovery	
30	LLS	S1010140086		0 0			Thallium	LIQUID	.00001	1.2540E-05			3.00E-06	ug/mL	125.4	% Recovery	
Sample Sequence 32																	
33	CCB	S1010140079		0 1			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
32	CCB	S1010140079		0 0			Thallium	LIQUID		1.1120E-03			3.00E-06	ug/mL			
Sample Sequence 34																	
34	ICV	S1010140085		0 0			Lead	LIQUID	.002	2.0900E-03			3.10E-05	ug/mL	104.5	% Recovery	
35	ICV	S1010140085		0 1			Thallium	LIQUID	.002	2.0340E-03			3.00E-06	ug/mL	101.7	% Recovery	
Sample Sequence 36																	
36	LLS	S1010140087		0 0			Lead	LIQUID	.00005	4.8770E-05			3.10E-05	ug/mL	97.54	% Recovery	
37	LLS	S1010140087		0 1			Thallium	LIQUID	.00001	1.0350E-05			3.00E-06	ug/mL	103.5	% Recovery	
Sample Sequence 38																	
38	ICB	S1010140084		0 0			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
38	ICB	S1010140084		0 0			Thallium	LIQUID		<3.0000E-06			3.00E-06	ug/mL			
Sample Sequence 39																	
39	SPK-PREDIG	S1005270093	S10V000136	0 1	A		Thallium	SOLID	53.68839	5.4462E+01			0.16107	ug/g	99.169	% Recovery	
Sample Sequence 40																	
40	CCV	S1010140090		0 0			Lead	LIQUID	.002	2.1130E-03			3.10E-05	ug/mL	105.65	% Recovery	
41	CCV	S1010140090		0 1			Thallium	LIQUID	.002	2.0340E-03			3.00E-06	ug/mL	101.7	% Recovery	
Sample Sequence 42																	
42	CCB	S1010140089		0 0			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			
42	CCB	S1010140089		0 0			Thallium	LIQUID		<3.0000E-06			3.00E-06	ug/mL			
Sample Sequence 43																	
43	CCV	S1010140092		0 0			Lead	LIQUID	.002	2.1520E-03			3.10E-05	ug/mL	107.6	% Recovery	
44	CCV	S1010140092		0 1			Thallium	LIQUID	.002	2.0990E-03			3.00E-06	ug/mL	104.95	% Recovery	
Sample Sequence 45																	
45	LLS	S1010140093		0 0			Lead	LIQUID	.00005	5.2470E-05			3.10E-05	ug/mL	104.94	% Recovery	
46	LLS	S1010140093		0 1			Thallium	LIQUID	.00001	1.0670E-05			3.00E-06	ug/mL	106.7	% Recovery	
Sample Sequence 47																	
47	CCB	S1010140091		0 0			Lead	LIQUID		<3.1000E-05			3.10E-05	ug/mL			

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00023195

47	CCB	S1010140091	0 0	Thallium	LIQUID	<3.0000E-06		3.00E-06	ug/mL

Comments Section:

Data Flagger Status:
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LABCORE Completed Batch Report for Batch# 00023195

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1010140071	ICV				
2	S1010140071	ICV				
3	S1010140073	LLS				
4	S1010140073	LLS				
5	S1010140072	ICB				
6	S1010140072	ICB				
7	S1010140074	SERDIL	S10V000136			
8	S1010140074	SERDIL	S10V000136			
9	S10V000136	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
10	S10V000136	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
11	S1005270091	DUP	S10V000136			
12	S1005270091	DUP	S10V000136			
13	S1005270089	BLNK-PREP				
14	S10V000150	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
15	S10V000167	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
16	S10V000201	SAMPLE		20100064	B27130	C Farm WMC 2010-1
17	S10V000236	SAMPLE		20100064	B27131	C Farm WMC 2010-1
18	S10V000270	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
19	S1010140076	CCV				
20	S1010140076	CCV				
21	S1010140077	CCB				
22	S1010140077	CCB				
23	S1010140075	SPK-POST	S10V000136			
24	S1010140075	SPK-POST	S10V000136			
25	S1005270092	SPK-PREDIG	S10V000136			
26	S1005270090	STD-PREP				
27	S1005270090	STD-PREP				
28	S1010140078	CCV				
29	S1010140078	CCV				
30	S1010140086	LLS				
31	S1010140086	LLS				
32	S1010140079	CCB				
33	S1010140079	CCB				
34	S1010140085	ICV				
35	S1010140085	ICV				

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LABCORE Completed Batch Report for Batch# 00023195

36	S1010140087	LLS	
37	S1010140087	LLS	
38	S1010140084	ICB	
39	S1005270093	SPK-PREDIG	S10V000136
40	S1010140090	CCV	
41	S1010140090	CCV	
42	S1010140089	CCB	
43	S1010140092	CCV	
44	S1010140092	CCV	
45	S1010140093	LLS	
46	S1010140093	LLS	
47	S1010140091	CCB	

Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00023572

Analyst: Thorndike, Kathy

Book#:

Instrument: ICP/MS PQ-EXCELL

Method: MS TC-99, LA-506-102 Rev/Mod F-1

Specification: C Farm WMC 2010-1

Prep Batch: 00022479

Batch Comment: ICPMS Tc-99 for C-Farm Solids. LND

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICV	S1010260219		0 0			Technetium-99	LIQUID	.001	1.0060E-03			3.00E-07	ug/mL	100.6	% Recovery	
Sample Sequence 2																	
2	LLS	S1010260221		0 0			Technetium-99	LIQUID	.000002	2.1040E-06			3.00E-07	ug/mL	105.2	% Recovery	
Sample Sequence 3																	
3	ICB	S1010260220		0 0			Technetium-99	LIQUID		<3.0000E-07			3.00E-07	ug/mL			
Sample Sequence 4																	
4	BLNK-PREP	S1009230104		0 0	WV		Technetium-99	LIQUID		<3.0000E-06			3.00E-06	ug/mL			
Sample Sequence 5																	
5	SERDIL	S1010260222	S10V002142	0 0			Technetium-99	SOLID		<1.4755E-05			1.48E-05	ug/g	N/A		
Sample Sequence 6																	
6	SAMPLE	S10V002142		0 0	WV		Technetium-99	SOLID	N/A	<2.9510E-06			2.95E-06	ug/g			U
Sample Sequence 7																	
7	DUP	S1009230105	S10V002142	0 0	WV		Technetium-99	SOLID	<2.9510E-06	<2.9507E-06			2.95E-06	ug/g			
Sample Sequence 8																	
8	SAMPLE	S10V002141		0 0	WV		Technetium-99	SOLID	N/A	<2.9410E-06			2.94E-06	ug/g			U
Sample Sequence 9																	
9	SAMPLE	S10V002144		0 0	WV		Technetium-99	SOLID	N/A	<3.0098E-06			3.01E-06	ug/g			U
Sample Sequence 10																	
10	SAMPLE	S10V002145		0 0	WV		Technetium-99	SOLID	N/A	<3.0563E-06			3.06E-06	ug/g			U
Sample Sequence 11																	
11	SAMPLE	S10V002146		0 0	WV		Technetium-99	SOLID	N/A	<3.6307E-06			3.63E-06	ug/g			U
Sample Sequence 12																	
12	CCV	S1010260227		0 0			Technetium-99	LIQUID	.001	1.0010E-03			3.00E-07	ug/mL	100.1	% Recovery	
Sample Sequence 13																	
13	CCB	S1010260226		0 0			Technetium-99	LIQUID		3.0600E-07			3.00E-07	ug/mL			
Sample Sequence 14																	
14	SAMPLE	S10V002148		0 0	WV		Technetium-99	SOLID	N/A	<3.0278E-06			3.03E-06	ug/g			U
Sample Sequence 15																	
15	SAMPLE	S10V002149		0 0	WV		Technetium-99	SOLID	N/A	4.6062E-06			3.22E-06	ug/g			BJ
Sample Sequence 16																	
16	STD-PREP	S1009230103		0 0	WV		Technetium-99	LIQUID	.0010245149	1.1170E-03			6.00E-07	ug/mL	109.03	% Recovery	
Sample Sequence 17																	
17	SPK-POST	S1010260224	S10V002142	0 0			Technetium-99	SOLID	.00464	4.7070E-03			3.00E-07	ug/mL	101.44	% Recovery	

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00023572

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 18																	
18	CCV	S1010260225		0 0			Technetium-99	LIQUID	.001	1.0110E-03			3.00E-07	ug/mL	101.1	% Recovery	
Sample Sequence 19																	
19	LLS	S1010260232		0 0			Technetium-99	LIQUID	.000002	2.3090E-06			3.00E-07	ug/mL	115.45	% Recovery	
Sample Sequence 20																	
20	CCB	S1010260228		0 0			Technetium-99	LIQUID		<3.0000E-07			3.00E-07	ug/mL			

Comments Section:

Data Flagger Status:
Flagging Completed

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Units shown for QC (BLK/BKG) may not reflect the actual units.

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N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00023572

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1010260219	ICV				
2	S1010260221	LLS				
3	S1010260220	ICB				
4	S1009230104	BLNK-PREP				
5	S1010260222	SERDIL	S10V002142			
6	S10V002142	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
7	S1009230105	DUP	S10V002142			
8	S10V002141	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
9	S10V002144	SAMPLE		20100064	B27130	C Farm WMC 2010-1
10	S10V002145	SAMPLE		20100064	B27131	C Farm WMC 2010-1
11	S10V002146	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
12	S1010260227	CCV				
13	S1010260226	CCB				
14	S10V002148	SAMPLE		20100064	B25WM8	C Farm WMC 2010-1
15	S10V002149	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1
16	S1009230103	STD-PREP				
17	S1010260224	SPK-POST	S10V002142			
18	S1010260225	CCV				
19	S1010260232	LLS				
20	S1010260228	CCB				

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

Date: 27 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: WMA C
Subject: General Chemistry - Sample Data Group (SDG) 20100064

INTRODUCTION

This memorandum presents the results of data validation for SDG 20100064 prepared by 222-S Laboratory. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B27130	5/17/2010	Soil	C	See note 1
B27131	5/19/2010	Soil	C	See note 1

1 – 300.7 (ammonium), 9014 (cyanide), 9045D (pH), 9056 (anions) and 9215 (sulfide)

Data validation was conducted in accordance with the CHPRC validation statement of work and the Field Sampling and Analysis Plan for Waste Management Area C, RPP-PLAN-40564, Rev. 2 (SAP). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested By Client

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preservation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results.

The holding time requirements for soil samples are as follows:

- All anions – analysis within 48 hours of sample preparation
- Ammonium – analysis within 7 days of sample collection
- pH – analysis as soon as possible after sample collection (24 hours is a reasonable limit)
- Sulfide – analysis within 7 days of sample collection
- Cyanide – analysis within 14 days of sample collection

Sample preservation for soil requires chilling to approximately 4 degrees Celsius.

The samples were analyzed within the prescribed holding times and properly preserved with the following exceptions. Samples B27130 and B27131were analyzed for pH 11 and 9 days, respectively, after sample collection. Based on professional judgment, these results should be qualified as estimates and flagged "J."

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable with the following exceptions.

For batch 19688, the ammonium laboratory blank result was > the method detection limit (MDL). The ammonium result for sample B27131 was a detect <5X the laboratory blank result and should be qualified as a non-detect at the sample concentration (3.63 ug/g) and flagged "U."

The nitrite laboratory blank result was > the MDL. The nitrite result for sample B27130 was a detect <5X the laboratory blank result and should be qualified as a non-detect at the sample concentration (1.90 ug/g) and flagged "U." The nitrite result for sample B27131 was a detect >5X the laboratory blank result and should not be qualified.

Trip Blanks

No trip blanks were submitted for validation.

Field Blanks

No field blanks were submitted for validation.

Equipment Blanks

No equipment blanks were submitted for validation.

- **Accuracy**

Accuracy is evaluated by reviewing matrix spike sample results and laboratory control sample results. According to the SAP, the matrix spike sample accuracy limits are 75% to 125% and the laboratory control sample accuracy limits are 80% to 120%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

Matrix Spike (MS) Samples

All MS recoveries were acceptable with the following exception. The MS recovery for phosphate was below the lower acceptance limit. The phosphate results for samples B27130 and B27131 were detects and should be qualified as estimates and flagged "J."

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable.

- **Precision**

Precision is evaluated by reviewing laboratory duplicate sample results, field duplicate sample results, and field split sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference (RPD) limits are ±30%. The limits for reported analytes not listed in the SAP are specified by the DV procedure. When soil duplicate RPDs exceed the limits and have associated results <5X the SAP required detection limits with differences <2X the required detection limits no precision infraction occurred.

Laboratory Duplicate Samples

All laboratory duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for validation.

Field Split Samples

No field splits were submitted for validation.

- **Detection Limits**

Reported MDLs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs with associated non-detected sample results were below the CRDLs.

- **Completeness**

SDG 20100064 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Multiple minor deficiencies leading to qualification of sample results as estimates occurred. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

GRP-GD-003, Rev. 0, Change 0, *Data Validation for Chemical Analyses*, August 2010.

RPP-PLAN-40564, Rev. 2, *Field Sampling and Analysis Plan for Waste Management Area C*, December 2009

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers that may be applied by data validators in compliance with the CHPRC statement of work are as follows:

- **U** — The constituent was analyzed for, but was not detected. The data should be considered usable for decision-making purposes.

- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the RL. The data should be considered usable for decision-making purposes.

- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J+** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J-** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **N** — The analysis indicates the presence of an analyte that has been tentatively identified.

- **NJ** — The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

- **NJ+** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation.

- **NJ-** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation.

- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2

Summary of Data Qualification

General Chemistry Data Qualification Summary			
SDG: 20100064	Reviewer: AQA	Project: WMA C	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
pH	J	B27130, B27131	Analysis beyond the holding time
Ammonium	3.63U	B27131	Lab blank contamination
Nitrite	1.90U	B27130	Lab blank contamination
Phosphate	J	B27130, B27131	Low MS recovery

Comments: None

Appendix 3

Annotated Laboratory Reports

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000196			57-12-5	Cyanide	ug/g	100	<0.0370	<2.68	n/a	n/a	n/a	n/a	2.68	n/a	U
S10V000196			7439-97-6	Mercury	ug/g	101	<1.00E-04	<7.85E-03	n/a	n/a	n/a	102	7.85E-03	n/a	U
S10V000196			PH	pH J	unitless	n/a	n/a	7.21	7.24	7.22	0.415	n/a	0.0100	n/a	
S10V000196			18496-25-8	Sulfide	ug/g	96.7	<0.180	24.4	n/a	n/a	n/a	n/a	6.91	n/a	J
S10V000198			15046-84-1	Iodine-129	uCi/g	109	<9.68E-07	<1.59E-07	n/a	n/a	n/a	n/a	1.59E-07	n/a	U
S10V000199		O	120-82-1	1,2,4-Trichlorobenzene	ug/kg	73.2	<77.4	<76.8	n/a	n/a	n/a	n/a	76.8	n/a	U
S10V000199		O	95-50-1	1,2-Dichlorobenzene	ug/kg	n/a	<101	<99.9	n/a	n/a	n/a	n/a	99.9	n/a	U
S10V000199		O	121-14-2	2,4-Dinitrotoluene	ug/kg	84.1	<38.1	<37.8	n/a	n/a	n/a	n/a	37.8	n/a	U
S10V000199		O	95-95-4	2,4,5-Trichlorophenol	ug/kg	n/a	<44.0	<43.6	n/a	n/a	n/a	n/a	43.6	n/a	U
S10V000199		O	88-06-2	2,4,6-Trichlorophenol	ug/kg	n/a	<49.5	<49.1	n/a	n/a	n/a	n/a	49.1	n/a	U
S10V000199		O	95-48-7	2-Methylphenol	ug/kg	n/a	<57.5	<57.0	n/a	n/a	n/a	n/a	57.0	n/a	U
S10V000199		O	88-75-5	2-Nitrophenol	ug/kg	n/a	<53.7	<53.3	n/a	n/a	n/a	n/a	53.3	n/a	U
S10V000199		O	65794-96-9	3 &4 Methylphenol	ug/kg	n/a	<51.4	<51.0	n/a	n/a	n/a	n/a	51.0	n/a	U
S10V000199		O	83-32-9	Acenaphthene	ug/kg	76.9	<17.6	<17.5	n/a	n/a	n/a	n/a	17.5	n/a	U
S10V000199		O	56-55-3	Benzo(a)anthracene	ug/kg	n/a	<37.8	<37.5	n/a	n/a	n/a	n/a	37.5	n/a	U
S10V000199		O	205-99-2	Benzo(b)fluoranthene	ug/kg	n/a	<48.9	<48.5	n/a	n/a	n/a	n/a	48.5	n/a	U
S10V000199		O	50-32-8	Benzo(a)pyrene	ug/kg	n/a	<41.2	<40.9	n/a	n/a	n/a	n/a	40.9	n/a	U
S10V000199		O	117-81-7	Bis(2-ethylhexyl) phthalate	ug/kg	n/a	<590	<585	n/a	n/a	n/a	n/a	585	n/a	U
S10V000199		O	207-08-9	Benzo(k)fluoranthene	ug/kg	n/a	<39.1	<38.8	n/a	n/a	n/a	n/a	38.8	n/a	U
S10V000199		O	85-68-7	Butylbenzylphthalate	ug/kg	n/a	107	109	n/a	n/a	n/a	n/a	49.6	n/a	BJ
S10V000199		O	59-50-7	4-Chloro-3-methylphenol	ug/kg	83.1	<43.2	<42.8	n/a	n/a	n/a	n/a	42.8	n/a	U
S10V000199		O	95-57-8	2-Chlorophenol	ug/kg	77.0	<66.5	<66.0	n/a	n/a	n/a	n/a	66.0	n/a	U
S10V000199		O	218-01-9	Chrysene	ug/kg	n/a	<81.4	<80.7	n/a	n/a	n/a	n/a	80.7	n/a	U
S10V000199		O	53-70-3	Dibenz[a,h]anthracene	ug/kg	n/a	<51.1	<50.7	n/a	n/a	n/a	n/a	50.7	n/a	U
S10V000199		O	84-74-2	Di-n-butylphthalate	ug/kg	n/a	<562	<558	n/a	n/a	n/a	n/a	558	n/a	U
S10V000199		O	117-84-0	Di-n-octylphthalate	ug/kg	n/a	<47.7	572	n/a	n/a	n/a	n/a	47.3	n/a	
S10V000199		O	621-64-7	N-Nitroso-di-n-dipropylamine	ug/kg	69.8	<58.1	<57.6	n/a	n/a	n/a	n/a	57.6	n/a	U
S10V000199		O	206-44-0	Fluoranthene	ug/kg	n/a	<35.4	<35.1	n/a	n/a	n/a	n/a	35.1	n/a	U
S10V000199		O	87-68-3	Hexachlorobutadiene	ug/kg	n/a	<69.7	<69.1	n/a	n/a	n/a	n/a	69.1	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated
c - RPD Outside Range
B - Found in Blank
b - MS/MSD Outside Range
a - LCS Outside Range

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000199		O	67-72-1	Hexachloroethane	ug/kg	n/a	<112	<111	n/a	n/a	n/a	n/a	111	n/a	U
S10V000199		O	193-39-5	Indeno(1,2,3-cd)pyrene	ug/kg	n/a	<51.0	<50.6	n/a	n/a	n/a	n/a	50.6	n/a	U
S10V000199		O	91-20-3	Naphthalene	ug/kg	n/a	<62.6	<62.1	n/a	n/a	n/a	n/a	62.1	n/a	U
S10V000199		O	98-95-3	Nitrobenzene	ug/kg	n/a	<64.6	<64.1	n/a	n/a	n/a	n/a	64.1	n/a	U
S10V000199		O	129-00-0	Pyrene	ug/kg	91.3	<62.9	<62.4	n/a	n/a	n/a	n/a	62.4	n/a	U
S10V000199		O	110-86-1	Pyridine	ug/kg	n/a	<65.0	<64.5	n/a	n/a	n/a	n/a	64.5	n/a	U
S10V000199		O	126-73-8	Tributyl phosphate	ug/kg	n/a	<108	<107	n/a	n/a	n/a	n/a	107	n/a	U
S10V000199		O	128-37-0	BHT	ug/kg	n/a	<236	<234	n/a	n/a	n/a	n/a	234	n/a	U
S10V000199		O	110-80-5	2-Ethoxyethanol	ug/kg	n/a	<182	<181	n/a	n/a	n/a	n/a	181	n/a	U
S10V000199		O	1319-77-3	Total Methylphenols	ug/kg	n/a	<107	<106	n/a	n/a	n/a	n/a	106	n/a	U
S10V000199		O	108-94-1	Cyclohexanone	ug/kg	n/a	<558	<554	n/a	n/a	n/a	n/a	554	n/a	U
S10V000199		O	59-89-2	N-Nitrosomorpholine	ug/kg	n/a	<191	<190	n/a	n/a	n/a	n/a	190	n/a	U
S10V000199		O	78-83-1	Isobutanol	ug/kg	n/a	<460	<457	n/a	n/a	n/a	n/a	457	n/a	U
S10V000200		W	16984-48-8	Fluoride	ug/g	104	<1.61E-03	3.53	n/a	n/a	n/a	n/a	0.0175	n/a	
S10V000200		W	666-14-8	Glycolate	ug/g	101	<9.37E-03	<0.102	n/a	n/a	n/a	n/a	0.102	n/a	U
S10V000200		W	71-50-1	Acetate	ug/g	98.9	<6.04E-03	0.854	n/a	n/a	n/a	n/a	0.0655	n/a	J
S10V000200		W	12311-97-6	Formate	ug/g	103	<4.67E-03	0.556	n/a	n/a	n/a	n/a	0.0507	n/a	J
S10V000200		W	16887-00-6	Chloride	ug/g	100	<9.98E-03	0.763	n/a	n/a	n/a	n/a	0.108	n/a	
S10V000200		W	14797-65-0	Nitrite 1.90U	ug/g	102	0.0389	1.90	n/a	n/a	n/a	n/a	0.208	n/a	BJ
S10V000200		W	14808-79-8	Sulfate	ug/g	101	<0.0187	7.83	n/a	n/a	n/a	n/a	0.203	n/a	
S10V000200		W	338-70-5	Oxalate	ug/g	103	<0.0231	1.20	n/a	n/a	n/a	n/a	0.251	n/a	J
S10V000200		W	24959-67-9	Bromide	ug/g	103	<0.0580	<0.629	n/a	n/a	n/a	n/a	0.629	n/a	U
S10V000200		W	14797-55-8	Nitrate	ug/g	103	<0.0208	39.7	n/a	n/a	n/a	n/a	0.226	n/a	
S10V000200		W	14265-44-2	Phosphate J	ug/g	101	<0.0167	2.79	n/a	n/a	n/a	n/a	0.181	n/a	Jb
S10V000201		A	7429-90-5	Aluminum	ug/g	83.2	<0.0300	6.77E+03	n/a	n/a	n/a	n/a	3.28	n/a	
S10V000201		A	7440-39-3	Barium	ug/g	84.5	<3.00E-03	66.8	n/a	n/a	n/a	n/a	0.328	n/a	
S10V000201		A	7440-41-7	Beryllium	ug/g	82.5	<1.00E-03	0.166	n/a	n/a	n/a	n/a	0.109	n/a	J
S10V000201		A	7440-69-9	Bismuth	ug/g	82.3	<0.100	36.7	n/a	n/a	n/a	n/a	10.9	n/a	Jb
S10V000201		A	7440-70-2	Calcium	ug/g	78.3	<0.0500	8.06E+03	n/a	n/a	n/a	n/a	5.46	n/a	a

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated
c - RPD Outside Range
B - Found in Blank
b - MS/MSD Outside Range
a - LCS Outside Range

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000201		A	13994-20-2	Neptunium-237	ug/g	106	<2.12E-05	<2.31E-04	n/a	n/a	n/a	n/a	2.31E-04	n/a	U
S10V000201		A	U-238	Uranium-238	ug/g	110	<2.20E-04	0.468	n/a	n/a	n/a	n/a	2.40E-03	n/a	
S10V000201		A	7440-22-4	Silver	ug/g	82.2	<3.20E-03	0.0694	n/a	n/a	n/a	n/a	0.0349	n/a	J
S10V000201		A	7440-38-2	Arsenic	ug/g	108	<0.0168	4.90	n/a	n/a	n/a	n/a	0.183	n/a	b
S10V000201		A	7439-92-1	Lead	ug/g	84.0	<0.0124	4.31	n/a	n/a	n/a	n/a	0.135	n/a	
S10V000201		A	7782-49-2	Selenium	ug/g	86.4	<0.0244	0.685	n/a	n/a	n/a	n/a	0.266	n/a	J
S10V000201		A	7440-28-0	Thallium	ug/g	103	<1.20E-03	0.703	n/a	n/a	n/a	n/a	0.0131	n/a	B
S10V000202		S	14798-03-9	Ammonium	ug/g	101	<0.0120	1.73	n/a	n/a	n/a	n/a	0.469	n/a	J
S10V000203		A	14133-76-7	Technetium-99	ug/g	93.6	<1.50E-04	<1.76E-03	n/a	n/a	n/a	n/a	1.76E-03	n/a	U
S10V000203		A	SN-117	Tin-117	ug/g	104	<5.50E-03	<0.0646	n/a	n/a	n/a	n/a	0.0646	n/a	U
S10V000203		A	15832-50-5	Tin-126	ug/g	n/a	<1.00E-04	<1.17E-03	n/a	n/a	n/a	n/a	1.17E-03	n/a	U
S10V001168		W	10028-17-8	Tritium	uCi/g	87.9	<3.83E-06	2.50E-06	n/a	n/a	n/a	n/a	2.45E-06	136.6	J
S10V001207		A	7440-36-0	Antimony	ug/g	99.4	<0.0100	0.161	n/a	n/a	n/a	n/a	9.24E-03	n/a	
S10V002144		WV	14133-76-7	Technetium-99	ug/g	109	<3.00E-06	<3.01E-06	n/a	n/a	n/a	n/a	3.01E-06	n/a	U
S10V002235		W	14762-75-5	Carbon-14	uCi/g	94.0	<3.49E-07	<2.81E-06	n/a	n/a	n/a	n/a	2.81E-06	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated
c - RPD Outside Range
B - Found in Blank
b - MS/MSD Outside Range
a - LCS Outside Range

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000231			%WATERA	%WATER-APD	%	n/a	n/a	5.780	n/a	n/a	n/a	n/a	0.01000	n/a	
S10V000231			57-12-5	Cyanide	ug/g	100	<0.0370	<2.61	n/a	n/a	n/a	n/a	2.61	n/a	U
S10V000231			7439-97-6	Mercury	ug/g	101	<1.00E-04	<8.01E-03	n/a	n/a	n/a	n/a	8.01E-03	n/a	U
S10V000231			PH	pH	unitless	n/a	n/a	7.86	n/a	n/a	n/a	n/a	0.0100	n/a	
S10V000231			18496-25-8	Sulfide	ug/g	105	<0.180	24.5	23.9	24.2	2.58	97.7	7.12	n/a	J
S10V000233			13966-00-2	Potassium-40	uCi/g	n/a	n/a	1.04E-05	n/a	n/a	n/a	n/a	5.77E-06	36.50	J
S10V000233			10198-40-0	Cobalt-60	uCi/g	102	<3.08E-07	<2.71E-07	n/a	n/a	n/a	n/a	2.71E-07	n/a	U
S10V000233			14234-35-6	Antimony-125	uCi/g	n/a	<6.68E-07	<7.15E-07	n/a	n/a	n/a	n/a	7.15E-07	n/a	U
S10V000233			10045-97-3	Cesium-137	uCi/g	107	<3.81E-07	<3.55E-07	n/a	n/a	n/a	n/a	3.55E-07	n/a	U
S10V000233			14683-23-9	Europium-152	uCi/g	n/a	<1.37E-06	<1.28E-06	n/a	n/a	n/a	n/a	1.28E-06	n/a	U
S10V000233			15585-10-1	Europium-154	uCi/g	n/a	<9.15E-07	<8.47E-07	n/a	n/a	n/a	n/a	8.47E-07	n/a	U
S10V000233			14391-16-3	Europium-155	uCi/g	n/a	<4.54E-07	<4.44E-07	n/a	n/a	n/a	n/a	4.44E-07	n/a	U
S10V000233			15092-94-1	Lead-212	uCi/g	n/a	n/a	8.16E-07	n/a	n/a	n/a	n/a	5.57E-07	29.49	
S10V000233			14274-82-9	Thorium-228	uCi/g	n/a	<8.10E-06	<8.80E-06	n/a	n/a	n/a	n/a	8.80E-06	n/a	U
S10V000233			15065-10-8	Thorium-234	uCi/g	n/a	<2.56E-06	<3.00E-06	n/a	n/a	n/a	n/a	3.00E-06	n/a	U
S10V000233			15046-84-1	Iodine-129	uCi/g	117	<2.00E-07	<1.76E-07	n/a	n/a	n/a	n/a	1.76E-07	n/a	U
S10V000234		O	120-82-1	1,2,4-Trichlorobenzene	ug/kg	73.2	<77.4	<77.0	n/a	n/a	n/a	67.1	77.0	n/a	U
S10V000234		O	95-50-1	1,2-Dichlorobenzene	ug/kg	n/a	<101	<100	n/a	n/a	n/a	n/a	100	n/a	U
S10V000234		O	121-14-2	2,4-Dinitrotoluene	ug/kg	84.1	<38.1	<37.9	n/a	n/a	n/a	86.5	37.9	n/a	U
S10V000234		O	95-95-4	2,4,5-Trichlorophenol	ug/kg	n/a	<44.0	<43.8	n/a	n/a	n/a	n/a	43.8	n/a	U
S10V000234		O	88-06-2	2,4,6-Trichlorophenol	ug/kg	n/a	<49.5	<49.2	n/a	n/a	n/a	n/a	49.2	n/a	U
S10V000234		O	95-48-7	2-Methylphenol	ug/kg	n/a	<57.5	<57.2	n/a	n/a	n/a	n/a	57.2	n/a	U
S10V000234		O	88-75-5	2-Nitrophenol	ug/kg	n/a	<53.7	<53.4	n/a	n/a	n/a	n/a	53.4	n/a	U
S10V000234		O	65794-96-9	3 &4 Methylphenol	ug/kg	n/a	<51.4	<51.1	n/a	n/a	n/a	n/a	51.1	n/a	U
S10V000234		O	83-32-9	Acenaphthene	ug/kg	76.9	<17.6	<17.5	n/a	n/a	n/a	71.4	17.5	n/a	U
S10V000234		O	56-55-3	Benzo(a)anthracene	ug/kg	n/a	<37.8	<37.6	n/a	n/a	n/a	n/a	37.6	n/a	U
S10V000234		O	205-99-2	Benzo(b)fluoranthene	ug/kg	n/a	<48.9	<48.6	n/a	n/a	n/a	n/a	48.6	n/a	U
S10V000234		O	50-32-8	Benzo(a)pyrene	ug/kg	n/a	<41.2	<41.0	n/a	n/a	n/a	n/a	41.0	n/a	U
S10V000234		O	117-81-7	Bis(2-ethylhexyl) phthalate	ug/kg	n/a	<590	<587	n/a	n/a	n/a	n/a	587	n/a	U

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Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000234		O	207-08-9	Benzo(k)fluoranthene	ug/kg	n/a	<39.1	<38.9	n/a	n/a	n/a	n/a	38.9	n/a	U
S10V000234		O	85-68-7	Butylbenzylphthalate	ug/kg	n/a	107	102	n/a	n/a	n/a	n/a	49.7	n/a	BJ
S10V000234		O	59-50-7	4-Chloro-3-methylphenol	ug/kg	83.1	<43.2	<43.0	n/a	n/a	n/a	83.3	43.0	n/a	U
S10V000234		O	95-57-8	2-Chlorophenol	ug/kg	77.0	<66.5	<66.1	n/a	n/a	n/a	71.9	66.1	n/a	U
S10V000234		O	218-01-9	Chrysene	ug/kg	n/a	<81.4	<80.9	n/a	n/a	n/a	n/a	80.9	n/a	U
S10V000234		O	53-70-3	Dibenz[a,h]anthracene	ug/kg	n/a	<51.1	<50.8	n/a	n/a	n/a	n/a	50.8	n/a	U
S10V000234		O	84-74-2	Di-n-butylphthalate	ug/kg	n/a	<562	<559	n/a	n/a	n/a	n/a	559	n/a	U
S10V000234		O	117-84-0	Di-n-octylphthalate	ug/kg	n/a	<47.7	320	n/a	n/a	n/a	n/a	47.4	n/a	J
S10V000234		O	621-64-7	N-Nitroso-di-n-dipropylamine	ug/kg	69.8	<58.1	<57.8	n/a	n/a	n/a	66.7	57.8	n/a	U
S10V000234		O	206-44-0	Fluoranthene	ug/kg	n/a	<35.4	<35.2	n/a	n/a	n/a	n/a	35.2	n/a	U
S10V000234		O	87-68-3	Hexachlorobutadiene	ug/kg	n/a	<69.7	<69.3	n/a	n/a	n/a	n/a	69.3	n/a	U
S10V000234		O	67-72-1	Hexachloroethane	ug/kg	n/a	<112	<111	n/a	n/a	n/a	n/a	111	n/a	U
S10V000234		O	193-39-5	Indeno(1,2,3-cd)pyrene	ug/kg	n/a	<51.0	<50.7	n/a	n/a	n/a	n/a	50.7	n/a	U
S10V000234		O	91-20-3	Naphthalene	ug/kg	n/a	<62.6	<62.2	n/a	n/a	n/a	n/a	62.2	n/a	U
S10V000234		O	98-95-3	Nitrobenzene	ug/kg	n/a	<64.6	<64.2	n/a	n/a	n/a	n/a	64.2	n/a	U
S10V000234		O	129-00-0	Pyrene	ug/kg	91.3	<62.9	<62.5	n/a	n/a	n/a	90.6	62.5	n/a	U
S10V000234		O	110-86-1	Pyridine	ug/kg	n/a	<65.0	<64.6	n/a	n/a	n/a	n/a	64.6	n/a	U
S10V000234		O	126-73-8	Tributyl phosphate	ug/kg	n/a	<108	<107	n/a	n/a	n/a	n/a	107	n/a	U
S10V000234		O	128-37-0	BHT	ug/kg	n/a	<236	<234	n/a	n/a	n/a	n/a	234	n/a	U
S10V000234		O	110-80-5	2-Ethoxyethanol	ug/kg	n/a	<182	<181	n/a	n/a	n/a	n/a	181	n/a	U
S10V000234		O	1319-77-3	Total Methylphenols	ug/kg	n/a	<107	<106	n/a	n/a	n/a	n/a	106	n/a	U
S10V000234		O	108-94-1	Cyclohexanone	ug/kg	n/a	<558	<555	n/a	n/a	n/a	n/a	555	n/a	U
S10V000234		O	59-89-2	N-Nitrosomorpholine	ug/kg	n/a	<191	<190	n/a	n/a	n/a	n/a	190	n/a	U
S10V000234		O	78-83-1	Isobutanol	ug/kg	n/a	<460	<458	n/a	n/a	n/a	n/a	458	n/a	U
S10V000235		W	16984-48-8	Fluoride	ug/g	104	<1.61E-03	1.92	n/a	n/a	n/a	n/a	0.0173	n/a	
S10V000235		W	666-14-8	Glycolate	ug/g	101	<9.37E-03	<0.101	n/a	n/a	n/a	n/a	0.101	n/a	U
S10V000235		W	71-50-1	Acetate	ug/g	98.9	<6.04E-03	0.478	n/a	n/a	n/a	n/a	0.0649	n/a	J
S10V000235		W	12311-97-6	Formate	ug/g	103	<4.67E-03	0.318	n/a	n/a	n/a	n/a	0.0501	n/a	J
S10V000235		W	16887-00-6	Chloride	ug/g	100	<9.98E-03	0.573	n/a	n/a	n/a	n/a	0.107	n/a	

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Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000235	W	14797-65-0	Nitrite	ug/g	102	0.0389	4.75	n/a	n/a	n/a	n/a	0.206	n/a	B
S10V000235	W	14808-79-8	Sulfate	ug/g	101	<0.0187	9.10	n/a	n/a	n/a	n/a	0.201	n/a	
S10V000235	W	338-70-5	Oxalate	ug/g	103	<0.0231	1.25	n/a	n/a	n/a	n/a	0.248	n/a	J
S10V000235	W	24959-67-9	Bromide	ug/g	103	<0.0580	<0.623	n/a	n/a	n/a	n/a	0.623	n/a	U
S10V000235	W	14797-55-8	Nitrate	ug/g	103	<0.0208	12.2	n/a	n/a	n/a	n/a	0.223	n/a	
S10V000235	W	14265-44-2	Phosphate J	ug/g	101	<0.0167	2.32	n/a	n/a	n/a	n/a	0.179	n/a	Jb
S10V000236	A	7429-90-5	Aluminum	ug/g	83.2	<0.0300	7.11E+03	n/a	n/a	n/a	n/a	3.05	n/a	
S10V000236	A	7440-39-3	Barium	ug/g	84.5	<3.00E-03	75.5	n/a	n/a	n/a	n/a	0.305	n/a	
S10V000236	A	7440-41-7	Beryllium	ug/g	82.5	<1.00E-03	0.135	n/a	n/a	n/a	n/a	0.102	n/a	J
S10V000236	A	7440-69-9	Bismuth	ug/g	82.3	<0.100	19.4	n/a	n/a	n/a	n/a	10.2	n/a	Jb
S10V000236	A	7440-70-2	Calcium	ug/g	78.3	<0.0500	8.77E+03	n/a	n/a	n/a	n/a	5.09	n/a	a
S10V000236	A	7440-43-9	Cadmium	ug/g	83.0	<5.00E-03	2.97	n/a	n/a	n/a	n/a	0.509	n/a	J
S10V000236	A	7440-45-1	Cerium	ug/g	89.7	<0.0300	23.7	n/a	n/a	n/a	n/a	3.05	n/a	J
S10V000236	A	7440-48-4	Cobalt	ug/g	82.2	<0.0100	9.35	n/a	n/a	n/a	n/a	1.02	n/a	J
S10V000236	A	7440-47-3	Chromium	ug/g	82.1	<5.00E-03	11.0	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236	A	7440-50-8	Copper	ug/g	86.4	<5.00E-03	12.2	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236	A	7439-89-6	Iron	ug/g	82.8	<5.00E-03	2.40E+04	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236	A	7440-09-7	Potassium	ug/g	82.0	<0.500	1.07E+03	n/a	n/a	n/a	n/a	50.9	n/a	
S10V000236	A	7439-91-0	Lanthanum	ug/g	85.3	<3.00E-03	9.99	n/a	n/a	n/a	n/a	0.305	n/a	
S10V000236	A	7439-93-2	Lithium	ug/g	86.1	<3.00E-03	7.62	n/a	n/a	n/a	n/a	0.305	n/a	
S10V000236	A	7439-95-4	Magnesium	ug/g	80.0	<0.0500	4.58E+03	n/a	n/a	n/a	n/a	5.09	n/a	
S10V000236	A	7439-96-5	Manganese	ug/g	81.4	<3.00E-03	359	n/a	n/a	n/a	n/a	0.305	n/a	
S10V000236	A	7439-98-7	Molybdenum	ug/g	94.9	<0.0200	<2.04	n/a	n/a	n/a	n/a	2.04	n/a	U
S10V000236	A	7440-23-5	Sodium	ug/g	87.0	<0.100	315	n/a	n/a	n/a	n/a	10.2	n/a	
S10V000236	A	7440-02-0	Nickel	ug/g	81.1	<0.0200	9.19	n/a	n/a	n/a	n/a	2.04	n/a	J
S10V000236	A	7723-14-0	Phosphorus	ug/g	91.7	<0.0500	839	n/a	n/a	n/a	n/a	5.09	n/a	
S10V000236	A	7704-34-9	Sulfur	ug/g	93.0	<0.100	70.3	n/a	n/a	n/a	n/a	10.2	n/a	J
S10V000236	A	7440-21-3	Silicon	ug/g	77.7	<0.0300	27.5	n/a	n/a	n/a	n/a	3.05	n/a	Ja
S10V000236	A	7440-24-6	Strontium	ug/g	84.6	<3.00E-03	31.5	n/a	n/a	n/a	n/a	0.305	n/a	

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Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000236		A	7440-32-6	Titanium	ug/g	92.6	<5.00E-03	1.63E+03	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-62-2	Vanadium	ug/g	84.2	<5.00E-03	60.0	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-65-5	Yttrium	ug/g	85.5	<2.00E-03	9.15	n/a	n/a	n/a	n/a	0.204	n/a	
S10V000236		A	7440-66-6	Zinc	ug/g	83.9	<5.00E-03	42.3	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-67-7	Zirconium	ug/g	88.7	<5.00E-03	7.28	n/a	n/a	n/a	n/a	0.509	n/a	b
S10V000236		A	14269-63-7	Thorium-230	ug/g	n/a	<2.80E-06	<2.85E-05	n/a	n/a	n/a	n/a	2.85E-05	n/a	U
S10V000236		A	TH-232	Thorium-232	ug/g	106	<6.80E-05	2.73	n/a	n/a	n/a	n/a	6.92E-04	n/a	
S10V000236		A	13968-55-3	Uranium-233	ug/g	n/a	<4.00E-06	1.72E-04	n/a	n/a	n/a	n/a	4.07E-05	n/a	J
S10V000236		A	13966-29-5	Uranium-234	ug/g	n/a	2.15E-06	4.26E-05	n/a	n/a	n/a	n/a	2.04E-05	n/a	BJ
S10V000236		A	15117-96-1	Uranium-235	ug/g	104	<4.40E-06	3.37E-03	n/a	n/a	n/a	n/a	4.48E-05	n/a	
S10V000236		A	13982-70-2	Uranium-236	ug/g	n/a	<1.60E-06	<1.63E-05	n/a	n/a	n/a	n/a	1.63E-05	n/a	U
S10V000236		A	13994-20-2	Neptunium-237	ug/g	106	<2.12E-05	<2.16E-04	n/a	n/a	n/a	n/a	2.16E-04	n/a	U
S10V000236		A	U-238	Uranium-238	ug/g	110	<2.20E-04	0.477	n/a	n/a	n/a	n/a	2.24E-03	n/a	
S10V000236		A	7440-22-4	Silver	ug/g	82.2	<3.20E-03	0.0419	n/a	n/a	n/a	n/a	0.0326	n/a	J
S10V000236		A	7440-38-2	Arsenic	ug/g	108	<0.0168	3.77	n/a	n/a	n/a	n/a	0.171	n/a	b
S10V000236		A	7439-92-1	Lead	ug/g	84.0	<0.0124	4.30	n/a	n/a	n/a	n/a	0.126	n/a	
S10V000236		A	7782-49-2	Selenium	ug/g	86.4	<0.0244	0.438	n/a	n/a	n/a	n/a	0.248	n/a	J
S10V000236		A	7440-28-0	Thallium	ug/g	103	<1.20E-03	0.661	n/a	n/a	n/a	n/a	0.0122	n/a	B
S10V000237		S	14798-03-9	Ammonium 3.63U	ug/g	97.6	0.0298	3.63	1.80	2.71	67.4	96.6	0.464	n/a	BJ
S10V000238		A	14133-76-7	Technetium-99	ug/g	93.6	<1.50E-04	<1.64E-03	n/a	n/a	n/a	n/a	1.64E-03	n/a	U
S10V000238		A	SN-117	Tin-117	ug/g	104	<5.50E-03	<0.0601	n/a	n/a	n/a	n/a	0.0601	n/a	U
S10V000238		A	15832-50-5	Tin-126	ug/g	n/a	<1.00E-04	<1.09E-03	n/a	n/a	n/a	n/a	1.09E-03	n/a	U
S10V000239		E	CM-243/244	Curium-243/244	uCi/g	n/a	<2.56E-07	<2.12E-07	n/a	n/a	n/a	n/a	2.12E-07	n/a	U
S10V000239		E	14596-10-2	Americium-241	uCi/g	104	<6.41E-07	<5.31E-07	n/a	n/a	n/a	n/a	5.31E-07	n/a	U
S10V000239		E	15510-73-3	Curium-242	uCi/g	n/a	<2.56E-07	<2.12E-07	n/a	n/a	n/a	n/a	2.12E-07	n/a	U
S10V000239		E	PU-239/240	Plutonium-239/240	uCi/g	99.8	<3.55E-07	<3.13E-07	n/a	n/a	n/a	n/a	3.13E-07	n/a	U
S10V000239		E	13981-16-3	Plutonium-238	uCi/g	n/a	<3.55E-07	<3.13E-07	n/a	n/a	n/a	n/a	3.13E-07	n/a	U
S10V000240		E	SR-89/90	Strontium-89/90	uCi/g	99.4	<6.99E-07	<2.62E-07	n/a	n/a	n/a	n/a	2.62E-07	n/a	U
S10V000241		E	13981-37-8	Nickel-63	uCi/g	103	<5.87E-06	<8.76E-06	n/a	n/a	n/a	n/a	8.76E-06	n/a	U

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

222-S LABORATORY

FINAL ANALYTICAL REPORT FOR SAMPLES FROM WASTE MANAGEMENT AREA C FOR CORE HOLE C7668 IN SUPPORT OF RCRA SOIL CHARACTERIZATION

1.0 INTRODUCTION

This final report presents the results for the samples taken from Waste Management Area C between May 15, 2010 and June 8, 2010. The samples were analyzed in accordance with RPP-PLAN-40564, *Field Sampling and Analysis Plan for Sites P and L at Waste Management Area C* (FSAP); RPP-PLAN-38777, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C* (SAP); ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP); SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*; and the additional guidance given by the client's point of contact.

Because the 222-S Laboratory facility was designed to analyze hazardous and complex tank waste samples, most SW-846 test methods performed at the 222-S Laboratory contain deviations that are listed in an appendix in the analytical procedures. All other known deviations or variances from SW-846 are documented in this narrative. The following attachments are included in this report.

Attachment 1	Data Summary Report
Attachment 2	Sample Breakdown Diagrams
Attachment 3	Holding Time Report
Attachment 4	Additional Mercury and Organic Analyses QC Results
Attachment 5	Tentatively Identified Compounds (TIC) for Organic Analyses
Attachment 6	Geological Report
Attachment 7	Characterization Change Notices (CCN), and Correspondence
Attachment 8	Receipt Paperwork
Appendix 1	Analytical Report for Analysis Performed at the Waste Sampling and Characterization Facility (WSCF)

2.0 SAMPLE RECEIPT AND BREAKDOWN

2.1 SAMPLE RECEIPT

A total of nine core intervals and two surface grab samples from core hole C7668 along with seven field blanks, and six trip blanks were received by the 222-S Laboratory between May 15, 2010 and June 8, 2010. Due to an instrumentation issue, the volatile organic analysis samples for client sample numbers B25WN0 (I012), B23VB5 (Field Blank 10), and B23VC4 (Trip Blank 9) were delivered directly to WSCF for analysis. The samples were delivered in a cooler with ice or, in the case of the volatile organic samples, in a freezer. The temperatures of the temperature blanks were measured and recorded on the sample receipt check list and/or the chain of custody form.

2.2 SAMPLE BREAKDOWN

The laboratory received each core interval as a set of volatile organic analysis (VOA) samples and three liner samples when complete core recovery was obtained. The VOA samples were made from the shoe section of each core interval following SW-846 5035. The liner samples from each core interval were extruded, described, and composited by the Washington River Protection Solutions, Inc. (WRPS) geologist. The geologist's report is included in Attachment 6. Provided sufficient samples existed, the composite for each core interval was analyzed as described in the SAP and FSAP. Six core intervals (I001, I003, I004, I005, I006, and I007) had less than full recovery (see Attachment 2 and Attachment 8). There was no I002 for core hole C7668. Intervals I001 and I007 were extruded and composited in the normal manner. Interval I003 was combined with I004 to form a single composite, and Interval I005 was combined with I006 to form a single composite (see Attachment 7, CCN-WMAC-008). The surface samples were received as a single grab in a 500-mL jar and a set of VOA samples.

In addition to the grab and core samples, a water sample from interval I010 was delivered to the lab. This sample was from a small amount of standing water encountered on top of the sampler. CCN-WMAC-009 request that this sample be analyzed for ^{99}Tc.

C7668 CCN-WMAC-008 provided a priority list for the laboratory to follow for the intervals without enough sample to perform all analysis requested in the SAP and FSAP. For interval I001, the laboratory followed this instruction. For the combined interval of I004 and I005, the laboratory analyzed for ^{99}Tc using the Vadose water digest, which consumed the sample that was to be used for the radiochemistry analysis, which had a higher priority. The analyses which were not performed were gamma energy analysis % Water (GEA), ^{63}Ni, $^{89/90}$Sr, $^{238,239/240}$Pu, ^{241}Am, and $^{242,243/244}$Cm.This failure to follow the client's instruction has been addressed, and improvements in communications and better use of the Laboratory Information Management System will be made to avoid this in the future.

WRPS shipped subsamples of the composites to Test America Laboratories, Inc. (TAL) in St Louis, Missouri and Knoxville, Tennessee to be analyzed for dibutyl and monobutyl phosphate, total petroleum hydrocarbons (diesel and gasoline range), ethylene glycol, chlorinated pesticides, and polychlorinated biphenyls (Aroclors and congeners). TAL subsequently subcontracted the monobutyl and dibutyl phosphate analyses to Southwest Research Institute. The results of these analyses will be released in the final WRPS report.

3.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for those analytes requested in the SAP and FSAP. Secondary analytes are only reported if detected. The TIC from gas chromatography-mass spectrometry (GC/MS) analysis of semivolatile organic compounds (SVOC) is presented in Attachment 5. In addition to the required isotopes, all isotopes with positive GEA results were reported.

The "Det Limit" column in Attachment 1 contains the method detection limit (MDL) for non-radionuclide analyses, or the minimum detectable activity for radionuclides.

In Attachment 1, the column labeled "A#" indicates the aliquot class or the method used for sample preparation before analysis. For solid samples, the aliquot classes are defined as follows:

"A" indicates samples that were prepared by SW-846 3050B.

"E" indicates samples that were prepared by a strong acid digest.

"O" indicates samples that were extracted for organic analysis.

"S" indicates samples that were prepared by a distillation.

"W" indicates samples that were prepared by a standard water digest.

"WV" indicates samples that were prepared by a Vadose water digest.

Samples without a letter identifier in the "A#" column were analyzed directly with no separate preparation or with sample preparation performed as a part of the procedure steps.

The "Qual Flags" column in Attachment 1 contains data qualifier flags that are defined as follows:

"B" is used to indicate that the analyte was detected in the method or preparation blank and in the sample, and the result for the blank was greater than 5% of the reported sample result.

"J" indicates that the reported result should be considered an estimate because it is below the quantitation limit. The "J" flag is applied to sample concentrations that are greater than the MDL but less than the quantitation limit or sample activity with a counting uncertainty greater than 30%.

"N" indicates a TIC which has been named.

"T" indicates a TIC.

"U" indicates that the reported result is less than the calculated detection limit.

"a" indicates that the laboratory control sample (LCS) recovery was outside of the specified range in the QAPP or SAP.

"b" indicates that the matrix spike (MS) recovery was outside of the specified range in the QAPP or SAP.

"c" indicates that the relative percent difference (RPD) between the sample and the duplicate is greater than 30%.

Manual calculations using rounded results from the Data Summary Report (Attachment 1) or result calculation forms may differ slightly from the actual results derived from the raw data.

3.1 SAMPLE DIGESTIONS

3.1.1 Radiochemistry Strong Acid Digestion

Strong acid digestions with a hot plate for the heat source were performed using a mixture of concentrated nitric and hydrochloric acids. For each digest, approximately 1 to 10 g of sample

was digested depending on the analysis being performed. The digestate was then filtered and diluted to a final volume. This digestion was used for all radiochemical analyses except ^{3}H, ^{14}C, and ^{129}I. This digestion is a leach of the acid soluble species only.

3.1.2 SW-846 3050B - Acid Digestion-Heating Block

This acid digestion follows SW-846 3050B using a heating block and nitric and hydrochloric acids. An aliquot of approximately 5 g of sample was digested. All heating-block digestions were filtered and diluted to a final volume of 50 mL. In soil, this digestion is a leach of the acid soluble species only. This digestion was used for all inductively coupled plasma/mass spectrometry (ICP/MS) and inductively coupled plasma/atomic emission spectroscopy (ICP/AES) analyses except for ^{99}Tc and isotopic tin (^{117}Sn and ^{126}Sn) analysis. The digestion is modified for the ^{99}Tc analysis by using only nitric acid. This is done to eliminate the possibility of the formation a zinc-chlorine ion pair of mass 99. The laboratory believes this ion, when present, is responsible for low level false positives. A separate digestion for antimony was prepared using additional hydrochloric acid, as recommended in SW-846.

3.1.3 Water Digestion

A water digestion or leach was prepared for the anions by ion chromatography, ^{14}C, and ^{3}H analyses using approximately 0.25 to 4 g of sample diluted to 25 mL. Sonification was used, and the leachate was then filtered. In soil, this digestion is a leach of the water soluble species only.

3.1.4 Vadose Water Digestion

A 70-g sample of soil was leached using a ratio of one part water to one part soil. To maintain a one-to-one ratio, the amount of water added to the sample was adjusted based on the percent moisture of the soil. The slurries were placed on a shaker table for about 1 hour. They were then transferred to a centrifuge tube and centrifuged at 4,000 rpm for 30 minutes. An unfiltered aliquot was set aside for alkalinity analysis. The remainder was filtered using a disposable vacuum filtration system. The filtrates were transferred to a clean bottle and then analyzed for anions using IC nitrate analysis (intervals I005 to I010) and ^{99}Tc by ICP/MS analysis.

3.2 INORGANIC ANALYSES

3.2.1 Cyanide

The cyanide analysis by distillation and spectrophotometry was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 14 days. There was no required reporting limit in the SAP for cyanide. The target detection limit was 0.5 μg/g, which is lower than what the current laboratory method (lachet micro-distillation) can reach. There were no notable quality control (QC) issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.2.2 Sulfide

Sulfide analysis by distillation and ion selective electrode was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 7 days. There was no required reporting limit in the SAP for sulfide. The target detection limit was 5 µg/g. All sample results had adjusted MDLs of approximately 7 µg/g.

Batches 19830, 19631, 19885, 19967, and 20058: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19596: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required.

3.2.3 pH Analysis

The pH analysis was performed on the grab samples and liner composite samples except for sample B23TK8 (I001). This was due to insufficient sample. These analyses met all QC requirements in the FSAP, SAP, and QAPP. The FSAP lists a pH holding time requirement of "as soon as possible." All pH measurements were taken after the water leach was performed. The sampling to analysis time varied from 7 to 35 days (see Attachment 3). There is no correlation between pH results and days to analysis, and the results fall within an expected range for alkaline soils. This indicates that the variation in time has no apparent effect on the results.

3.2.4 Mercury

Analysis for Hg by cold-vapor graphic furnace/atomic absorption was performed on the digested subsamples of the grab samples and liner composite samples. All results met the QC requirements in the FSAP, SAP, and QAPP. All analyses met the holding time of 28 days. This analysis met the required and target detection limits.

3.2.5 Ion Chromatography – Ammonium

Analysis for ammonium was performed using a distillation preparation of the grab samples and the liner composite samples. The SAP lists an administrative holding time of 7 days. The laboratory believes that after distillation and preservation, the holding time is 28 days based on U.S. Environmental Protection Agency drinking water and waste water holding times for preserved samples. There is no regulatory holding time limit promulgated for ammonium in soil. All samples met these holding times. These analyses met the target detection limit listed in the SAP. There was no required reporting limit in the SAP or FSAP for ammonium.

Batch 19420: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19583: Laboratory personnel used an unknown and incorrect spike amount for the MS resulting in a high spike recovery of 247%. Since the project requirement is that one MS be performed per core hole, and five acceptable MSs exist, this MS was not reported (see

Attachment 7). All other QC requirements were met in this batch, including the post digestion spike.

Batches 19668, 19896, and 19938: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required. Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

Batches 19655 and 20024: Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

3.2.6 Ion Chromatography – Anions and Small Organic Acids

Ion chromatography analysis was performed on a standard water digest of subsamples from all grab samples and liner composite samples.

The laboratory met all of the required and target detection limits. For the standard water digest, all analyses were within the applicable holding time. The sample spikes used for the standard water digestions are predigestion spikes.

Batch 19599: The RPD for fluoride exceeded the required 30% at 32%. The laboratory believes this was due to sample inhomogeneity, which is indicated by high RPDs for the other anions in this sample. Additionally, a second duplicate sample from a separate Vadose project was analyzed in this batch, with acceptable duplicate RPDs. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. One sample result for nitrite has been flagged with a “B”.

Batch 19650: The RPD for nitrite exceeded the required 30% in the SAP and FSAP. However, since the result was below the quantitation limit, this criterion does not apply. The MS recovery for phosphate was below the ±25% requirement at 70%. The sample results have been flagged with a “b”. Since the post digestion spike was recovered at 99%, the laboratory believes that the low MS recovery was matrix related. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. All samples results for nitrite were flagged with a “B”.

Batch 20668: The results for nitrite, sulfate, and nitrate in the preparation blank were slightly above the MDL and below the quantitation limit. The blank is therefore acceptable. All but one nitrite and two nitrates were flagged with a “B”. The un-flagged results were more than 20 times the adjusted blank results. The blank result for sulfate was less than 5% of the lowest sulfate results, and therefore no flags were applied.

3.2.7 Inductively Coupled Plasma/Atomic Emission Spectroscopy

The ICP/AES analysis was performed on an acid-digest (SW-846 3050B) of all grab samples and liner composite samples. The ICP/AES analysis was unable to obtain the required detection limit for antimony, arsenic, cadmium, lead, selenium, silver, and thallium. These elements have been reported from separate ICP/MS analyses. Total uranium has not been reported by the ICP/AES analysis since it cannot meet the required detection limits in the SAP. The isotopic uranium analysis by ICP/MS met the required detection limit for ^{238}U, which is essentially total uranium. The overall data usability was not affected. For all other metals reported by ICP/AES, all target and required detection limits were met. SW-846 lists the holding time for ICP/AES metals as 6 months. All analyses met the holding times.

Batch 20821: The interference check standard-AB (ICSAB) had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. A result slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. Low levels of iron, sodium, chromium, and calcium were detected in the preparation blank, but reanalysis was not required since these levels were less than 5% of the lowest sample result. The MS recoveries for aluminum, calcium, iron, magnesium, phosphorous, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for sodium, sulfur, silicon, and zirconium exceeded the ±25 requirement in the SAP and FSAP. The laboratory believes this was due to matrix interference. The RPD for silicon exceeded the ±30% requirement at 40%. All sample results in this batch for silicon have been flagged with “c”. Reanalysis was not required since this is secondary element. It should be noted that silicon is not listed with other elements in SW-846 3050B, section 1.1, under “Scope and Application” for the method and does not perform consistently when using this digest.

Batch 20563: The ICSAB had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. Results slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. The LCS for calcium was recovered outside the ±20% requirement at 78.3%. Since two of the samples in this batch were exhausted and could not be reanalyzed, a decision was reached with the client to accept the data “as is” (see Attachment 7). The MS recoveries for aluminum, calcium, iron, magnesium, sodium, phosphorous, silicon, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for bismuth and zirconium exceeded the ±25 requirement at 56% and 19%, respectively. This could indicate that the results for elements are biased low. All sample results in this batch for bismuth and zirconium have been flagged with “b”. Reanalysis was not required since these are secondary elements. Silicon experienced an LCS failure, and reanalysis was not required for this secondary element.

3.2.8 Inductively Coupled Plasma/Mass Spectroscopy

The ICP/MS actinide and trace metal analyses were performed on the standard SW-846 3050 acid digestion of all grab samples and liner composite samples. The ICP/MS ^{126}Sn and ^{99}Tc analysis was performed on the sample digest without the addition of the hydrochloric acid. Hydrochloric acid is not used for ^{99}Tc analysis because of the potential formation of a ZnCl ion pair with mass 99. ICP/MS trace metal analysis for antimony was perform on the same digest with additional hydrochloric acid, which is required to keep antimony in solution. In addition to these acid digests, ICP/MS ^{99}Tc analysis was performed on a Vadose water digest of all solid samples except B23TK8 (I001) and directly on single water samples from interval I010. The I001 analysis was not performed due to lack of sample.

Direct is the most accurate type of calibration; however, standard material is not commercially available for all the isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument's mass-response curve, which is generated by using the intensity/concentration relationship for the available isotope standards. Results estimated in this manner are designated "semi-quantitative."

Table 1. Inductively Coupled Plasma-Mass Spectroscopy Standards and Spikes

Standard Type	Analytes Analyzed
Initial calibration verification (nondigested)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Acid digest standard (laboratory control standard)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Predigest spike (MS)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Post-digest spike	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
No standard or spike of either type	^{126}Sn, ^{230}Th, ^{233}U, ^{234}U, ^{236}U

3.2.8.1 Technetium-99 and Tin-126

The required detection limit listed in the SAP for ^{99}Tc was met. The target detection limit for ^{99}Tc was not met. There were no required or target detection limits for ^{126}Sn listed in the SAP. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Because there is no available source for ^{126}Sn, ^{117}Sn is used to monitor the chemical recovery for this analysis. Though not specifically requested in the SAP, ^{117}Sn is reported for the laboratory control sample LCS and MS in order to demonstrate method accuracy and presence of possible matrix interference.

Batch 20681: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 21058: The middle and closing continuing calibration blanks (CCB) contained ^{99}Tc just above the MDL. ^{99}Tc was detected in one sample bracketed by these CCBs. The other samples in the batch were non-detect. Since all results were below the quantitation limit, reanalysis was not required. The one positive result has been flagged with "B". The laboratory believes that these results most likely represent some type of interference. The RPD for ^{126}Sn exceeded the ±30 requirement in the SAP and FSAP at 39%. Since the results for ^{126}Sn were below the quantitation

limit, this criterion does not apply. The matrix spike for ^{117}Sn was recovered below the ±25% requirement. Similar results have been observed in other batches, and this appears to be a matrix interference issue. This batch was not reanalyzed, but others have been with no improvement. Tin results should be considered biased low at these levels. All samples in the batch have been flagged with a "b".

3.2.8.2 Technetium-99 (Vadose Water Digest)

The required and target detection limits listed in the SAP for ^{99}Tc were met. The SAP lists a holding time of 6 months for isotopic analytes. All analysis met this holding time.

Batch 21206 and 23804: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 23572: The middle CCB contained ^{99}Tc just above the MDL. ^{99}Tc was detected in two samples bracketed by the CCB. The other samples in the batch were non-detect. Since the blank result was below the quantitation limit, reanalysis was not required. One positive result, which was below the quantitation limit, has been flagged with "B". The other positive sample result was more than 20 times the adjusted blank result and was therefore not flagged. The laboratory believes that the blank result is most likely some type of interference.

3.2.8.3 Actinides

The required and target detection limits were met for all isotopes and in all samples. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Batch 20597: The result for ^{234}Th in the preparation blank was slightly above the MDL. Four of the six samples in the batch demonstrated a similar result and have been flagged with a "B". Since all results were below the quantitation limit, the blank was acceptable and reanalysis was not required.

Batch 21207: The RPD for U^{233} exceed the ±30% requirement in the SAP and FSAP; however, since the result was below the quantitation level, this criterion does not apply.

3.2.8.4 Trace Metals

Antimony, arsenic, cadmium, lead, selenium, silver, and thallium were analyzed by ICP/MS to obtain the required detection limits in the SAP. Except for the required detection limit for selenium, all required detection limits were met or the sample results were above the quantitation limit and the sample detection limit criteria do not apply. All target detection limits were met. The required detection limit for selenium was approximately an order of magnitude below the detection limit obtained by ICP/MS. The laboratory does not anticipate reaching this detection limit for future projects. The adjusted MDL for selenium was approximately 0.25 µg/g. SW-846 lists the holding time for metals as 6 months. All samples were analyzed within the holding time.

Batches 20672, 22361, and 22376: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20590: The first CCB had a result for antimony slightly above the MDL. All affected samples have been flagged with a "B". Since the blank result was below the quantitation limit, reanalysis was not required. The duplicate RPD for antimony was outside the ±30% requirement in the SAP and FSAP at 37%. The laboratory believes this was a result of sample inhomogeneity. Additionally, the sample result was well below the required detection limit. With customer agreement (see Attachment 7), all results were flagged with "c" and reported.

Batch 21747: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 7% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

Batch 22437: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 30% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

3.3 RADIOCHEMICAL ANALYSIS

The holding time listed in the SAP for radioactive isotopes is 6 months. The FSAP list the holding time as "none". SW-846 does not address holding times for radiochemical analytes. All radiochemical analyses met the 6-month holding time listed in the SAP. Holding time tables for these analytes have not been included in Attachment 3. With the exception of the ^{14}C and ^{3}H analyses, tracers and spikes are added prior to the digestion.

3.3.1 Gamma Energy Analysis

Gamma energy analysis was performed directly on approximately 60 mL of soil from the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The SAP requires the reporting of all isotopes with positive results above the minimum detectable activity (MDA); therefore, isotopes additional to those required in the SAP were reported when detected. The GEA analysis met all the required detection limits in the SAP. The laboratory was unable to meet any of the target detection limits. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.2 Strontium-89/90

Strontium-89/90 analysis was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. All of the sample analyses met the required and target detection limits. The FSAP and SAP requested ^{90}Sr, not $^{89/90}Sr$, be reported. The 222-S Laboratory only performs the latter analysis. Since the half-life for ^{89}Sr is approximately 51 days and ^{89}Sr has not been produced at Hanford for years, $^{89/90}Sr$ is essentially ^{90}Sr. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.3 Tritium

The ^{3}H analysis by liquid scintillation counting (LSC) was performed on the equipment blank and a water leach of all grab samples and liner composite samples. This method only measured the ^{3}H in the samples that could be dissolved in water. This analysis achieved the required and target detection limit in the FSAP.

Batch 20359: The laboratory failed to include an MS with this batch and did analyze a MS for C7668 as required. This was discussed with the client.

Batch 20794: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.4 Selenium-79

The ^{79}Se analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the target detection limit in the FSAP. No required detection limit was listed. No standard is currently available for ^{79}Se, and a cold carrier is used to monitor recovery and is measured gravimetrically. The ^{14}C LSC curve is used to determine the ^{79}Se results since their energies are similar. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum tracer/carrier recovery is 50%.

Batch 20850: The preparation blank demonstrated a positive result below the quantitation limit, as did the one sample in this batch. All results had very large counting uncertainties and were below the target detection limit. Because of these factors, reanalysis was not required. The associated results have been flagged with a “B”.

3.3.5 Carbon-14

The ^{14}C analysis by LSC was performed on a water leach of the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required detection limit in the FSAP but exceeded the target detection limit. This analysis will only detect water soluble forms of ^{14}C.

Batches 21604 and 22478: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.6 Nickel-63

The ^{63}Ni analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required and target detection limits in the FSAP. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum trace/carrier recovery is 50%.

Batch 21309: There were no notable issues with the batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20890: This duplicate for this batch was reanalyzed in batch 21309 along with the other sample that had a positive result for ^{63}Ni. All sample results were below the MDA in the reanalysis.

3.3.7 Iodine-129

Analysis for ^{129}I by low energy GEA was performed on an iodine-specific fusion digest of all grab samples and liner composite samples except for sample B23TK8 (I001) as explained in Section 2.2 of this report. The required and target detection limits in the SAP were met. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.8 Americium-241, Curium-243/244, and Curium-242

Analysis for ^{241}Am, $^{243/244}$Cm, and ^{242}Cm by alpha energy analysis (AEA) was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met. The SAP and FSAP requested ^{243}Cm and ^{244}Cm be reported separately. Since it is not possible to resolve these individual isotopes when using AEA, these isotopes have been reported as $^{243/244}$Cm.

3.3.9 Plutonium-238 and Plutonium-239/240

Plutonium isotopic (^{238}Pu and $^{239/240}$Pu) analysis by AEA was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met.

3.4 ORGANIC ANALYSES

3.4.1 Volatile Organic Analysis

The VOA by GC/MS was performed on field samples by purge and trap. Due to the instrumentation problem discussed in Section 2.1, the following samples were shipped from the 222-S Laboratory to WSCF for analysis by WRPS:

- Volatile organic samples: B23TM2, B25WM4, and B25WM7
- Field blanks: B23V99, B23VB3, and B23VB4
- Trip blanks: B23VC2 and B23VC3

These samples were received at the 222-S Laboratory prior to shipment to WSCF and were given 222-S Laboratory sample IDs, which appear in Attachment 2. These numbers are for tracking purposes only and will not be used to report results. The WSCF results for these samples are reported in Appendix I and were provided by WRPS. Sample B23V99 was analyzed by both the 222-S Laboratory and WSCF. Both sets of results have been reported (see Attachment 1 and Appendix 1).

Field sampling methods, sample containers, and preservation methods followed SW-846 5035.The soil samples were delivered in a freezer in pre-weighed VOA vials with magnetic stir bars and approximately 5 g of sample. After receipt, the VOA samples were stored in a freezer. For each sample interval, an additional high level sample preserved in methanol was also received. These were not used because none of the results for the frozen samples were above the calibration range. The exact weight of the sample and the tare weight of the VOA vials were recorded by sampling personnel and delivered with the samples. One equipment blank, eight field blanks, and seven trip blanks were also received and analyzed. The samples were preserved with either HCl or H_2SO_4 to a pH < 2.The holding time for all samples is 14 days. All samples analyzed at 222-S Laboratory met the required holding time.

The VOA met the target and required detection limits in the SAP. The SAP and FSAP requested m-xylene and p-xylene be reported separately. Since it is not possible to resolve these individual compounds when performing VOA by SW-846 8260C, these compounds have been reported as m+p xylene. The SAP and FSAP request that methanol be reported with this analysis; however, this compound is too polar to be purged and cannot be reported (see Attachment 7). Isobutanol, another poor purger, was reported as a semivolatile organic compound.

All but one of the field blanks and all trip blanks contained chloroform above the estimated quantification level. Since chloroform is a common chlorination byproduct, the laboratory believes the source of chloroform was the water used by sampling personnel to make the various blanks.

All laboratory blanks for the liquid sample batches contained acetone at a level slightly below the quantitation level, based on the low calibration. Some blanks were 30 to 50 times the MDL. Fortunately, the samples contained only a trace of acetone; most results were below the MDL and all were below the quantitation level. “B” flags have been applied when appropriate. For this reason, reanalysis was not required. The laboratory believes that this relatively high level of acetone in the method blanks was due to contamination in the hydrochloric acid used in the blanks. For analyses performed after these, acetone was only occasionally found in the blank and generally at a level below the quantitation level.

The LCS, MS, and matrix spike duplicat (MSD) recoveries were compared against the laboratory’s statistical process control (SPC) limits, as required by SW-846. The use of SPC limits is allowed in the FSAP, SAP, and QAPP.

Batch 19566: It is apparent from the following discussion that this batch should have been reanalyzed; however, due to a pending instrument outage and an expiring holding time, these are the only results available. With the exception of acetone, all QC failures indicate a high bias; the impact on the data is minimal. Toluene and 2-hexanone were detected in the sample and method

blanks above the MDL and below the quantitation limit. The sample results have been flagged with a “B”. Since the results were below the quantitation limit, reanalysis was not required. The MS failed high for acetone, 2-butanone, 2-hexanone, and hexone. The 2-hexanone result was slightly above the MDL. All results have been flagged with a “b”. Since the 2-hexanone result was below the quantitation limit and flagged with “J”, this result was not affected. All other results were below the MDL. The LCS for acetone failed high, again indicating a high bias, and the result has been flagged with an “a”. Two continuous calibration veritication standards (CCV) were analyzed with this batch; the closing CCV was normal with only two compounds slightly above the ±20% requirement. However, the first CCV had six primary analytes above this requirement. Since the acetone results were below the MDL, the LCS and CCVs are acceptable.

Batch 19680: The LCS recovery for acetone was above the upper limit of 136% at 172%. Due to the holding time limitation, reanalysis was not performed. Since the results for acetone were below the quantitation limit or below the MDL and flagged with a “J”, the data usability was not affected and reanalysis was unnecessary. The results have been flagged with an “a”. The method blank contained acetone as discussed above.

Batch 19878: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required. The method blank contained acetone as discussed above.

Batch 19881: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required.

3.4.2 Semivolatile Organic Analysis

The semivolatile organic analysis (SVOA) by GC/MS was performed on methylene chloride extractions of all grab samples and liner composite samples. All holding times were met.

The SVOA analysis met the required and target detection limits with two exceptions:

- The adjusted MDLs for cyclohexanone were above the 0.5 mg/kg target detection limit for most samples. This compound obtained detection limits between 0.5 mg/kg and 0.6 mg/kg.
- The adjusted MDLs for di-n-butyl-phthalate were above the target detection limit of 0.33 mg/kg. The analysis achieved a detection limit of between 0.5 mg/kg and 0.6 mg/kg for this compound.

LCS, MS, and MSD recoveries were compared against the laboratory’s SPC limits, as required by SW-846. The use of SPC limits is permitted in the FSAP, SAP, and QAPP.

The SAP and FSAP requested m-cresol and p- cresol be reported separately. Since it is not possible to resolve these individual compounds when performing SVOA by SW-846 8270C, these compounds have been reported as m+p cresol.

Batch 20093: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batches 19989, 19999, and 20019: Butylbenzylphthalate was detected in the method blank and samples at slightly above the MDL and below the quantitation limit. Therefore, the blank is acceptable and reanalysis was unnecessary. Sample results have been flagged with a "B".

3.4.3 Tentatively Identified Compounds

Unassigned peaks or TICs were treated as follows. Standards were obtained and analyzed for each secondary analyte identified in the SAP. This data was accumulated in the Hanford library. Following analysis, the largest TICs with instrument responses greater than 10% of the response of the nearest internal standard were evaluated and compared to the Hanford library. The estimated concentration of these TICs was calculated using measured response factors from the Hanford library compound list.

After comparison to the Hanford library, remaining unknowns were compared to National Institute of Standards and Technology (NIST) 02, *HP Mass Spectral (compound) Libraries*. The estimated concentration of compounds identified in the NIST library was calculated based on an arbitrary response factor of 1.0. If the compounds were not identified as a result of this comparison, they were reported as "unknown." Summaries of the SVOA and VOA TICs from the field samples and method blanks are provided in Attachment 5. TICs that were found in the field samples and were present in the associated batch method blank have been flagged with "B".

4.0 PROCEDURES

Table 2 lists the analytical procedures used for analysis of the Area C samples.

Table 2. Analytical Procedures

Analysis	Preparation Method	Analysis Procedure
Inorganic Analyses		
Cyanide	LA-695-103, Rev. J-0 (SW-846 9010C)	LA-695-103, Rev. J-0 (SW-846 9014)
Sulfide	LA-361-101, Rev. D-0 (SW-846 9030B)	LA-361-101, Rev. D-0 (SW-846 9215)
pH (solid)	LA-212-105, Rev. G-0 (SW-846 9045D)	LA-212-105, Rev. G-0 (SW-846 9045D)
Mercury – Cold Vapor Atomic Absorption	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)
Ammonia – IC	LA-544-112, Rev. E-0	LA-533-101, Rev. Q-0
Anions & Organic Acids – IC	LA-504-101, Rev. L-0	LA-533-115, Rev. J-0
Metals – ICP /AES	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-505-161, Rev. J-0-A (SW-846 6010C)

Analysis	Preparation Method	Analysis Procedure
^{99}Tc, ^{126}Sn – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1
^{99}Tc – ICP/MS	08-ATL-078 Vadose Water Digest	LA-506-102, Rev. F-1
Metals – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1 LA-506-103, Rev. A-0 (SW-846 6020A)
Actinides – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-1-2, Rev. F-1
Radiochemical Analyses		
GEA	Direct	LA-548-121, Rev. I-0
^{90}Sr – Separation/Beta counting (Solid)	LA-544-101, Rev. F-0	LA-220-101, Rev. J-0
^{3}H – LSC	LA-504-101, Rev. L-0	LA-218-111, Rev. G-0
^{14}C – LSC	LA-504-101, Rev. L-0	LA-348-104, Rev. H-0, I-0
^{79}Se – Separation/LSC	LA-544-101, Rev. F-0	LA-365-132, Rev. I-0
^{63}Ni – Separation/LSC	LA-544-101, Rev. F-0	LA-285-102, Rev. E-0
^{129}I – Separation/GEA	LA-378-105, Rev. C-0	LA-378-105, Rev. C-0
^{241}Am, $^{243/244, 242}$Cm – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
$^{239/240, 238}$Pu – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
Organic Analyses		
VOC – GC/MS	Direct	LA-523-118, Rev. G-O-A (SW-846 8260B)
SVOC – GC/MS	LA-523-138, Rev. F-0 (SW-846 3540C)	LA-523-135, Rev. D-0 (SW-846 8270C)

5.0 REFERENCES

ATL-MP-1011, 2010, *ATL Quality Assurance Project Plan for 222-S Laboratory*, Rev. 9, Advanced Technologies and Laboratories International, Inc., Richland, Washington.

NIST 02, 2002, *HP Mass Spectral Libraries*, July 2002 Release, Hewlett-Packard Company, Palo Alto, California.

SW-846, 1986, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods,* Third Edition, as amended, U.S. Environmental Protection Agency, Washington, D.C.

RPP-PLAN-40564, 2009, *Field Sampling and Analysis Plan for Sites P and L at Waste Management Area C,* Rev. 2, Washington River Protection Solutions, Inc.

RPP-PLAN-38777, 2009, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C*, Rev. 1, Washington River Protection Solutions, Inc.

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-099	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Campbell / Harris	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I003	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	10-12ft.	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations	N/A		N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	~~3~~ 2 RKS 5/17/10
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B23TL4	SOIL	5/17/10	1400	✓	~~1400~~ RKS 5/17/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Campbell Campbell	5.17.10 1450	RA Steele RA Steele	5.17.10 1450

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

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CRP# 20100064
SAM# S10V000193
194

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-102	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I004	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	12-14 ft	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations	N/A		N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C	Cool-6C
TYPE OF CONTAINER	Liner	500mL JAR
NO. OF CONTAINER(S)	~~1~~ 1 5/19/10 RRE	1
VOLUME	160g	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B23TL7	SOIL	5/19/10	0855	✓	✓

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Campbell C-pbell	5-19-10 1040	Rtbert Rtbert	5-19-10 1040

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

ic TB Rt

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SMH 510V000 210
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LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-105	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I005	WMA C Sampling for CMS		V10-003		

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
TFVZ-09-003	TFVZ-09-000001	14-16 ft.	N/A	Govt. Vehicle

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
222-S Lab Operations	N/A	N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
TYPE OF CONTAINER	~~Liner~~ 500mL Jar
NO. OF CONTAINER(S)	~~2~~ 1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B23TM0	SOIL	5/19/10	0945	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Cphill C-pbell	5-19-10 1040	RHSteele	5-19-10 1040
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

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EXP # 20100064
SAM # S10V000228

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-108	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC		
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**	**AIR QUALITY** ☐	75 Days / 75 Days
C7668 - I006	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFV2-09-003	TFV2-09-000001	16-18 ft	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations					

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C	Cool 6C
TYPE OF CONTAINER	Liner	500 mL Jar
NO. OF CONTAINER(S)	~~3~~ 2	1
VOLUME	160g	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	See item (1) in special Instructions

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B23TM3	SOIL	5/20/10	1000	✓	✓								

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Gabe Campbell	5-20-10 1230	RA Abel RASteele	5-20-10 1230

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

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QRP# 20100064
SAM# S10V000245
246
247 → JAR

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Appendix 5

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: WMA C			DATA PACKAGE: VSR11-044		
VALIDATOR: Carl Schloesslin		LAB: 222-S Lab		DATE: 4-27-2011	
			SDG: 20100064		
ANALYSES PERFORMED					
Anions/IC X	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia X	BOD/COD	Chloride	Chromium-VI	pH X	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate	Cyanide X	Sulfide X

SAMPLES/MATRIX Soil samples

B27130*, B27131**

*Sample B27130 is a composite of samples B23TL4 & B23TL7

**Sample B27131 is a composite of samples B23TM0 & B23TM3

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present?..... Yes (No) N/A

Comments: None

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

MB Hits: Nitrite 0.40 ug/g, Ammonium (batch 19688) 1.15 ug/g

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... (Yes) No N/A

Spike recoveries acceptable? ..... Yes (No) N/A

Spike standards NIST traceable? (Levels D, E) ..... Yes No (N/A)

Spike standards expired? (Levels D, E) ..... Yes No (N/A)

LCS/BSS samples analyzed? ..... (Yes) No N/A

LCS/BSS results acceptable? ..... (Yes) No N/A

Standards traceable? (Levels D, E) ..... Yes No (N/A)

Standards expired? (Levels D, E) ..... Yes No (N/A)

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Performance audit sample(s) analyzed? ..... Yes No (N/A)

Performance audit sample results acceptable? ..... Yes No (N/A)

Comments:

Phosphate MS %R = 70%

No MS data available for ammonium batch 19583 due to analyst error. According to the laboratory case narrative, project MS frequency was still met. Therefore, the ammonium result for sample B27130 has not been qualified for lack of MS data.

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?..... Yes No N/A

Duplicate results acceptable?..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E)..... Yes No N/A

MS/MSD standards expired? (Levels D, E)..... Yes No N/A

Field duplicate RPD values acceptable?..... Yes No N/A

Field split RPD values acceptable?..... Yes No N/A

Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments:

None

6. HOLDING TIMES (all levels)

Samples properly preserved?..... Yes No N/A

Sample holding times acceptable?..... Yes No N/A

Comments:

Samples B27130 and B27131 analyzed for pH 11 and 9 days, respectively, after sample collection (HT = ASAP).

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?.....(Yes) No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E)..... Yes No (N/A)

Detection limits meet RDL?.....(Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: None

Appendix 6

Additional Documentation Requested By Client

Holding Time Report: Cyanide

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Analysis Date	Missed Holding Time
S10V000131	SOLID	SW846-9014	SW846-9010C	05/11/10 09:15	05/11/10 11:00	05/13/10 15:40	N
S10V000145	SOLID	SW846-9014	SW846-9010C	05/11/10 09:15	05/11/10 11:00	05/13/10 15:40	N
S10V000162	SOLID	SW846-9014	SW846-9010C	05/17/10 10:50	05/17/10 14:50	05/24/10 15:25	N
S10V000196	SOLID	SW846-9014	SW846-9010C	05/17/10 14:00	05/17/10 14:50	05/24/10 15:25	N
S10V000231	SOLID	SW846-9014	SW846-9010C	05/19/10 09:45	05/19/10 10:40	05/24/10 15:25	N
S10V000265	SOLID	SW846-9014	SW846-9010C	05/20/10 11:00	05/20/10 12:30	06/03/10 14:30	N
S10V001005	SOLID	SW846-9014	SW846-9010C	06/01/10 11:30	06/01/10 13:00	06/09/10 22:00	N
S10V000282	SOLID	SW846-9014	SW846-9010C	06/03/10 11:15	06/03/10 15:15	06/09/10 22:00	N
S10V000299	SOLID	SW846-9014	SW846-9010C	06/08/10 11:05	06/08/10 12:30	06/10/10 18:00	N

Holding Time Report: Sulfide

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Analysis Date	Missed Holding Time
S10V000131	SOLID	SW846-9215	SW846-9030B	05/11/10 09:15	05/11/10 11:00	05/12/10 14:45	N
S10V000145	SOLID	SW846-9215	SW846-9030B	05/11/10 09:15	05/11/10 11:00	05/12/10 14:45	N
S10V000162	SOLID	SW846-9215	SW846-9030B	05/17/10 10:50	05/17/10 14:50	05/21/10 15:00	N
S10V000196	SOLID	SW846-9215	SW846-9030B	05/17/10 14:00	05/17/10 14:50	05/21/10 15:00	N
S10V000231	SOLID	SW846-9215	SW846-9030B	05/19/10 09:45	05/19/10 10:40	05/25/10 20:10	N
S10V000265	SOLID	SW846-9215	SW846-9030B	05/20/10 11:00	05/20/10 12:30	05/25/10 20:10	N
S10V001005	SOLID	SW846-9215	SW846-9030B	06/01/10 11:30	06/01/10 13:00	06/04/10 14:25	N
S10V000282	SOLID	SW846-9215	SW846-9030B	06/03/10 11:15	06/03/10 15:15	06/08/10 21:45	N
S10V000299	SOLID	SW846-9215	SW846-9030B	06/08/10 11:05	06/08/10 12:30	06/11/10 16:50	N

Holding Time Report: pH

Sample	Matrix	Method	Sample Date	Received Date	Analysis Date	Days Lapsed
S10V000131	SOLID	SW846-9045D	05/11/10 09:15	05/11/10 11:00	05/17/10 23:23	6.6
S10V000145	SOLID	SW846-9045D	05/11/10 09:15	05/11/10 11:00	05/17/10 23:23	6.6
S10V000196	SOLID	SW846-9045D	05/17/10 14:00	05/17/10 14:50	05/28/10 19:50	11.2
S10V000231	SOLID	SW846-9045D	05/19/10 09:45	05/19/10 10:40	05/28/10 19:50	9.4
S10V000265	SOLID	SW846-9045D	05/20/10 11:00	05/20/10 12:30	05/28/10 19:50	8.4
S10V001005	SOLID	SW846-9045D	06/01/10 11:30	06/01/10 13:00	07/06/10 15:30	35.2
S10V000282	SOLID	SW846-9045D	06/03/10 11:15	06/03/10 15:15	07/06/10 15:30	33.2
S10V000299	SOLID	SW846-9045D	06/08/10 11:05	06/08/10 12:30	07/06/10 15:30	28.2

Holding Time Report: Ammonium

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Prep Date	Analysis Date	Missed Holding Time
S10V000137	SOLID	EPA-300.7	NH4 DIST	05/11/10 09:15	05/12/10 13:40	05/12/10 14:45	05/12/10 17:09	N
S10V000151	SOLID	EPA-300.7	NH4 DIST	05/11/10 09:15	05/12/10 13:42	05/12/10 14:45	05/12/10 19:47	N
S10V000168	SOLID	EPA-300.7	NH4 DIST	05/17/10 10:50	05/17/10 14:50	05/21/10 15:10	05/21/10 14:56	N
S10V000202	SOLID	EPA-300.7	NH4 DIST	05/17/10 14:00	05/17/10 14:50	05/21/10 15:10	05/21/10 16:04	N
S10V000237	SOLID	EPA-300.7	NH4 DIST	05/19/10 09:45	05/19/10 10:40	05/25/10 10:30	05/25/10 15:28	N
S10V000271	SOLID	EPA-300.7	NH4 DIST	05/20/10 11:00	05/20/10 12:30	05/26/10 09:59	05/26/10 15:39	N
S10V001011	SOLID	EPA-300.7	NH4 DIST	06/01/10 11:30	06/01/10 13:00	06/04/10 09:30	06/04/10 15:53	N
S10V000288	SOLID	EPA-300.7	NH4 DIST	06/03/10 11:15	06/03/10 15:15	06/08/10 11:44	06/09/10 11:03	N
S10V000305	SOLID	EPA-300.7	NH4 DIST	06/08/10 11:05	06/08/10 12:30	06/10/10 11:02	06/10/10 16:00	N

Holding Time Report: IC-Anions

Sample	Matrix	Method	Prep Method	Sample Date	Received Date	Prep Date	Analysis Date	Missed Holding Time
S10V000135	SOLID	SW846-9056A	WATER DIGEST	05/11/10 09:15	05/11/10 11:00	05/21/10 10:32	05/21/10 23:01	N
S10V000149	SOLID	SW846-9056A	WATER DIGEST	05/11/10 09:15	05/11/10 11:00	05/21/10 10:32	05/22/10 00:37	N
S10V000166	SOLID	SW846-9056A	WATER DIGEST	05/17/10 10:50	05/17/10 14:50	05/25/10 15:45	05/25/10 21:12	N
S10V000200	SOLID	SW846-9056A	WATER DIGEST	05/17/10 14:00	05/17/10 14:50	05/25/10 15:45	05/25/10 23:20	N
S10V000235	SOLID	SW846-9056A	WATER DIGEST	05/19/10 09:45	05/19/10 10:40	05/25/10 15:45	05/25/10 23:52	N
S10V000269	SOLID	SW846-9056A	WATER DIGEST	05/20/10 11:00	05/20/10 12:30	07/13/10 01:00	07/13/10 23:57	N
S10V000286	SOLID	SW846-9056A	WATER DIGEST	06/03/10 11:15	06/03/10 15:15	07/13/10 01:00	07/14/10 02:05	N
S10V000303	SOLID	SW846-9056A	WATER DIGEST	06/08/10 11:05	06/08/10 12:30	07/13/10 01:00	07/14/10 02:37	N
S10V001009	SOLID	SW846-9056A	WATER DIGEST	06/01/10 11:30	06/01/10 13:00	07/13/10 01:00	07/14/10 03:09	N

LABCORE Completed Batch Report for Batch# 00019637

Analyst: Mull, Bryanna

Book#:

Instrument: CARY 50-2

Method: CN - EDTA, LA-695-103 Rev/Mod J-0

Specification: C Farm WMC 2010-1

Prep Batch:

Batch Comment: Cyanide determination for C Farm WMC 2010-1 soils. bsm

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICV	S1005260019		0 0			Cyanide	LIQUID	.2008	2.0153E-01			0.037	ug/mL	100.36	% Recovery	
Sample Sequence 2																	
2	ICB	S1005260013		0 0			Cyanide	LIQUID		<3.7000E-02			0.037	ug/mL			
Sample Sequence 3																	
3	LLS	S1005260014		0 0			Cyanide	LIQUID	.04028	4.0504E-02			0.037	ug/mL	100.56	% Recovery	
Sample Sequence 4																	
4	SAMPLE	S10V000162		0 0			Cyanide	SOLID	N/A	<2.6350E+00			2.635	ug/g			U
Sample Sequence 5																	
5	DUP	S1005260015	S10V000162	0 0			Cyanide	SOLID	<2.6350E+00	<2.5150E+00			2.515	ug/g			
Sample Sequence 6																	
6	SPK	S1005260016	S10V000162	0 0			Cyanide	SOLID	7.04588	6.5155E+00			2.589	ug/g	92.473	% Recovery	
Sample Sequence 7																	
7	SAMPLE	S10V000196		0 0			Cyanide	SOLID	N/A	<2.6820E+00			2.682	ug/g			U
Sample Sequence 8																	
8	SAMPLE	S10V000231		0 0			Cyanide	SOLID	N/A	<2.6070E+00			2.607	ug/g			U
Sample Sequence 9																	
9	CCV	S1005260017		0 0			Cyanide	LIQUID	.2008	1.9600E-01			0.037	ug/mL	97.61	% Recovery	
Sample Sequence 10																	
10	CCB	S1005260018		0 0			Cyanide	LIQUID		<3.7000E-02			0.037	ug/mL			

Comments Section:

Data Flagger Status:
Flagging Completed

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019637

Final Page for Batch# 00019637

Reviewer Signature **Date**

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LABCORE Completed Batch Report for Batch# 00019637

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1005260019	ICV				
2	S1005260013	ICB				
3	S1005260014	LLS				
4	S10V000162	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
5	S1005260015	DUP	S10V000162			
6	S1005260016	SPK	S10V000162			
7	S10V000196	SAMPLE		20100064	B27130	C Farm WMC 2010-1
8	S10V000231	SAMPLE		20100064	B27131	C Farm WMC 2010-1
9	S1005260017	CCV				
10	S1005260018	CCB				

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019596

Analyst: Boisoneau, Ryan

Book#:

Instrument: ISE-Meter #1

Method: SULFIDE, LA-361-101 Rev/Mod D-0

Specification: C Farm WMC 2010-1

Prep Batch:

Batch Comment: C-Farm Sulfides trm

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICV	S1005240046		0 0			Sulfide	LIQUID	5.4195	5.5200E+00			0.18	ug/mL	101.85	% Recovery	
Sample Sequence 2																	
2	ICB	S1005240047		0 0			Sulfide	LIQUID		<1.8000E-01			0.18	ug/mL			
Sample Sequence 3																	
3	LLS	S1005240048		0 0			Sulfide	LIQUID	1.08	1.2300E+00			0.18	ug/mL	113.89	% Recovery	
Sample Sequence 4																	
4	BLNK-PREP	S1005240049		0 0			Sulfide	LIQUID		<1.8000E-01			0.18	ug/mL			
Sample Sequence 5																	
5	LCS	S1005240050		0 0			Sulfide	LIQUID	2.709	2.6200E+00			0.18	ug/mL	96.715	% Recovery	
Sample Sequence 6																	
6	SAMPLE	S10V000162		0 0			Sulfide	SOLID	N/A	3.0791E+01			7.1885	ug/g			J
Sample Sequence 7																	
7	DUP	S1005240051	S10V000162	0 0			Sulfide	SOLID	3.0791E+01	2.2628E+01			6.9984	ug/g	30.561	% RPD	
Sample Sequence 8																	
8	SPK-PREDIG	S1005240052	S10V000162	0 0			Sulfide	SOLID	105	1.2171E+02			6.9767	ug/g	86.585	% Recovery	
Sample Sequence 9																	
9	SAMPLE	S10V000196		0 0			Sulfide	SOLID	N/A	2.4367E+01			6.9071	ug/g			J
Sample Sequence 10																	
10	CCV	S1005240053		0 0			Sulfide	LIQUID	5.4195	5.7200E+00			0.18	ug/mL	105.54	% Recovery	
Sample Sequence 11																	
11	CCB	S1005240054		0 0			Sulfide	LIQUID		<1.8000E-01			0.18	ug/mL			

Comments Section:

Data Flagger Status:
Flagging Completed

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019596

Final Page for Batch# 00019596

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019596

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1005240046	ICV				
2	S1005240047	ICB				
3	S1005240048	LLS				
4	S1005240049	BLNK-PREP				
5	S1005240050	LCS				
6	S10V000162	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
7	S1005240051	DUP	S10V000162			
8	S1005240052	SPK-PREDIG	S10V000162			
9	S10V000196	SAMPLE		20100064	B27130	C Farm WMC 2010-1
10	S1005240053	CCV				
11	S1005240054	CCB				

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019631

Analyst: Dinh, Liem

Book#:

Instrument: ISE-Meter #1

Method: SULFIDE, LA-361-101 Rev/Mod D-0

Specification: C Farm WMC 2010-1

Prep Batch:

Batch Comment: Sulfide for C-Farm WMC 2010-1. lnd

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICV	S1005250060		0 0			Sulfide	LIQUID	5.42	5.5400E+00			0.18	ug/mL	102.21	% Recovery	
Sample Sequence 2																	
2	ICB	S1005250061		0 0			Sulfide	LIQUID		<1.8000E-01			0.18	ug/mL			
Sample Sequence 3																	
3	LLS	S1005250062		0 0			Sulfide	LIQUID	1.08	1.2500E+00			0.18	ug/mL	115.74	% Recovery	
Sample Sequence 4																	
4	BLNK-PREP	S1005250063		0 0			Sulfide	LIQUID		<1.8000E-01			0.18	ug/mL			
Sample Sequence 5																	
5	LCS	S1005250064		0 0			Sulfide	LIQUID	2.71	2.8500E+00			0.18	ug/mL	105.17	% Recovery	
Sample Sequence 6																	
6	SAMPLE	S10V000231		0 0			Sulfide	SOLID	N/A	2.4516E+01			7.1174	ug/g			J
Sample Sequence 7																	
7	DUP	S1005250065	S10V000231	0 0			Sulfide	SOLID	2.4516E+01	2.3891E+01			7.1315	ug/g	2.5837	% RPD	
Sample Sequence 8																	
8	SPK-PREDIG	S1005250066	S10V000231	0 0			Sulfide	SOLID	106.95	1.2904E+02			7.1034	ug/g	97.736	% Recovery	
Sample Sequence 9																	
9	SAMPLE	S10V000265		0 0			Sulfide	SOLID	N/A	2.0212E+01			7.0505	ug/g			J
Sample Sequence 10																	
10	CCV	S1005250067		0 0			Sulfide	LIQUID	5.42	5.5000E+00			0.18	ug/mL	101.48	% Recovery	
Sample Sequence 11																	
11	CCB	S1005250068		0 0			Sulfide	LIQUID		<1.8000E-01			0.18	ug/mL			

Comments Section:

Data Flagger Status:
Flagging Completed

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019631

Final Page for Batch# 00019631

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019631

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1005250060	ICV				
2	S1005250061	ICB				
3	S1005250062	LLS				
4	S1005250063	BLNK-PREP				
5	S1005250064	LCS				
6	S10V000231	SAMPLE		20100064	B27131	C Farm WMC 2010-1
7	S1005250065	DUP	S10V000231			
8	S1005250066	SPK-PREDIG	S10V000231			
9	S10V000265	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
10	S1005250067	CCV				
11	S1005250068	CCB				

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019761

Analyst: Hexum, Troy

Book#:

Instrument: PH02

Method: PH SOLID, LA-212-105 Rev/Mod G-0

Specification: C Farm WMC 2010-1

Prep Batch:

Batch Comment: ph solids for c-farm wmc 2010-1 TJH

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	ICVPH	S1005280009		0 0			pH	LIQUID	8	8.01			0.01	pH			
Sample Sequence 2																	
2	SAMPLE	S10V000196		0 0			pH	SOLID	N/A	7.21			0.01	pH			
Sample Sequence 3																	
3	DUP	S1005280011	S10V000196	0 0			pH	SOLID	7.21	7.24			0.01	pH	0.41522	% RPD	
Sample Sequence 4																	
4	SAMPLE	S10V000231		0 0			pH	SOLID	N/A	7.86			0.01	pH			
Sample Sequence 5																	
5	SAMPLE	S10V000265		0 0			pH	SOLID	N/A	8.71			0.01	pH			
Sample Sequence 6																	
6	CCVPH	S1005280012		0 0			pH	LIQUID	8	8.03			0.01	pH			

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00019761

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019761

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1005280009	ICVPH				
2	S10V000196	SAMPLE		20100064	B27130	C Farm WMC 2010-1
3	S1005280011	DUP	S10V000196			
4	S10V000231	SAMPLE		20100064	B27131	C Farm WMC 2010-1
5	S10V000265	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
6	S1005280012	CCVPH				

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019650

Analyst: Thorndike, Kathy **Book#:** 17N29B

Instrument: IC-6 (SMALL ORG ACIDS)

Method: IC - ANIONS/SMALL ORG. ACIDS, LA-533-115 Rev/Mod J-0

Specification: C Farm WMC 2010-1

Prep Batch: 00019614

Batch Comment: C Farm WMC 2010 Small Org Acids.KJT/KJL.

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	CCV	S1005260064		0 0			Fluoride	LIQUID	.47619	4.7472E-01			1.61E-03	ug/mL	99.691	% Recovery	
1	CCV	S1005260064		0 0			Glycolate	LIQUID	2.9603145	2.8155E+00			9.37E-03	ug/mL	95.109	% Recovery	
1	CCV	S1005260064		0 0			Acetate	LIQUID	3.5952345	3.4029E+00			6.04E-03	ug/mL	94.65	% Recovery	
1	CCV	S1005260064		0 0			Formate	LIQUID	3.4841235	3.3913E+00			4.67E-03	ug/mL	97.336	% Recovery	
1	CCV	S1005260064		0 0			Chloride	LIQUID	.67380885	6.6317E-01			9.98E-03	ug/mL	98.421	% Recovery	
1	CCV	S1005260064		0 0			Nitrite	LIQUID	4.4047575	4.4335E+00			0.0192	ug/mL	100.65	% Recovery	
1	CCV	S1005260064		0 0			Sulfate	LIQUID	5.190471	5.2094E+00			0.0187	ug/mL	100.36	% Recovery	
1	CCV	S1005260064		0 0			Oxalate	LIQUID	4.1825355	4.1910E+00			0.0231	ug/mL	100.2	% Recovery	
1	CCV	S1005260064		0 0			Bromide	LIQUID	4.841265	4.8366E+00			0.058	ug/mL	99.903	% Recovery	
1	CCV	S1005260064		0 0			Nitrate	LIQUID	4.396821	4.3486E+00			0.0208	ug/mL	98.903	% Recovery	
1	CCV	S1005260064		0 0			Phosphate	LIQUID	4.380948	4.3157E+00			0.0167	ug/mL	98.51	% Recovery	
Sample Sequence 2																	
2	CCB	S1005260065		0 0			Fluoride	LIQUID		<1.6100E-03			1.61E-03	ug/mL			
2	CCB	S1005260065		0 0			Glycolate	LIQUID		<9.3700E-03			9.37E-03	ug/mL			
2	CCB	S1005260065		0 0			Acetate	LIQUID		<6.0400E-03			6.04E-03	ug/mL			
2	CCB	S1005260065		0 0			Formate	LIQUID		<4.6700E-03			4.67E-03	ug/mL			
2	CCB	S1005260065		0 0			Chloride	LIQUID		<9.9800E-03			9.98E-03	ug/mL			
2	CCB	S1005260065		0 0			Nitrite	LIQUID		<1.9200E-02			0.0192	ug/mL			
2	CCB	S1005260065		0 0			Sulfate	LIQUID		<1.8700E-02			0.0187	ug/mL			
2	CCB	S1005260065		0 0			Oxalate	LIQUID		<2.3100E-02			0.0231	ug/mL			
2	CCB	S1005260065		0 0			Bromide	LIQUID		<5.8000E-02			0.058	ug/mL			
2	CCB	S1005260065		0 0			Nitrate	LIQUID		<2.0800E-02			0.0208	ug/mL			
2	CCB	S1005260065		0 0			Phosphate	LIQUID		<1.6700E-02			0.0167	ug/mL			
Sample Sequence 3																	
3	LLS	S1005260066		0 0			Fluoride	LIQUID	.02985	2.3040E-02			1.61E-03	ug/mL	77.186	% Recovery	
3	LLS	S1005260066		0 0			Glycolate	LIQUID	.1855675	1.2846E-01			9.37E-03	ug/mL	69.225	% Recovery	
3	LLS	S1005260066		0 0			Acetate	LIQUID	.2253675	1.5216E-01			6.04E-03	ug/mL	67.516	% Recovery	
3	LLS	S1005260066		0 0			Formate	LIQUID	.2184025	1.7452E-01			4.67E-03	ug/mL	79.908	% Recovery	
3	LLS	S1005260066		0 0			Chloride	LIQUID	.04223775	3.4810E-02			9.98E-03	ug/mL	82.414	% Recovery	
3	LLS	S1005260066		0 0			Nitrite	LIQUID	.2761125	2.4083E-01			0.0192	ug/mL	87.222	% Recovery	
3	LLS	S1005260066		0 0			Sulfate	LIQUID	.325365	2.9383E-01			0.0187	ug/mL	90.308	% Recovery	

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LABCORE Completed Batch Report for Batch# 00019650

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
3	LLS	S1005260066		0 0			Oxalate	LIQUID	.2621825	2.3168E-01			0.0231	ug/mL	88.366	% Recovery	
3	LLS	S1005260066		0 0			Bromide	LIQUID	.303475	2.2344E-01			0.058	ug/mL	73.627	% Recovery	
3	LLS	S1005260066		0 0			Nitrate	LIQUID	.275615	2.3073E-01			0.0208	ug/mL	83.715	% Recovery	
3	LLS	S1005260066		0 0			Phosphate	LIQUID	.27462	2.3763E-01			0.0167	ug/mL	86.53	% Recovery	
Sample Sequence 4																	
4	BLNK-PREP	S1005250010		0 0	W		Fluoride	LIQUID		<1.6100E-03			1.61E-03	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Glycolate	LIQUID		<9.3700E-03			9.37E-03	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Acetate	LIQUID		<6.0400E-03			6.04E-03	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Formate	LIQUID		<4.6700E-03			4.67E-03	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Chloride	LIQUID		<9.9800E-03			9.98E-03	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Nitrite	LIQUID		3.8920E-02			0.0192	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Sulfate	LIQUID		<1.8700E-02			0.0187	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Oxalate	LIQUID		<2.3100E-02			0.0231	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Bromide	LIQUID		<5.8000E-02			0.058	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Nitrate	LIQUID		<2.0800E-02			0.0208	ug/mL			
4	BLNK-PREP	S1005250010		0 0	W		Phosphate	LIQUID		<1.6700E-02			0.0167	ug/mL			
Sample Sequence 5																	
5	STD-PREP	S1005250009		0 0	W		Fluoride	LIQUID	.6	6.2381E-01			1.61E-03	ug/mL	103.97	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Glycolate	LIQUID	3.73	3.7490E+00			9.37E-03	ug/mL	100.51	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Acetate	LIQUID	4.53	4.4811E+00			6.04E-03	ug/mL	98.92	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Formate	LIQUID	4.39	4.5034E+00			4.67E-03	ug/mL	102.58	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Chloride	LIQUID	.849	8.5177E-01			9.98E-03	ug/mL	100.33	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Nitrite	LIQUID	5.55	5.6640E+00			0.0192	ug/mL	102.05	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Sulfate	LIQUID	6.54	6.6148E+00			0.0187	ug/mL	101.14	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Oxalate	LIQUID	5.27	5.4440E+00			0.0231	ug/mL	103.3	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Bromide	LIQUID	6.1	6.2700E+00			0.058	ug/mL	102.79	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Nitrate	LIQUID	5.54	5.7189E+00			0.0208	ug/mL	103.23	% Recovery	
5	STD-PREP	S1005250009		0 0	W		Phosphate	LIQUID	5.52	5.5722E+00			0.0167	ug/mL	100.95	% Recovery	
Sample Sequence 6																	
6	SAMPLE	S10V000166		0 0	W		Fluoride	SOLID	N/A	2.6869E+00			0.01683	ug/g			
6	SAMPLE	S10V000166		0 0	W		Glycolate	SOLID	N/A	<9.7951E-02			0.097951	ug/g			U
6	SAMPLE	S10V000166		0 0	W		Acetate	SOLID	N/A	2.5925E-01			0.06314	ug/g			J
6	SAMPLE	S10V000166		0 0	W		Formate	SOLID	N/A	2.5277E-01			0.048819	ug/g			J
6	SAMPLE	S10V000166		0 0	W		Chloride	SOLID	N/A	1.2992E+00			0.10433	ug/g			
6	SAMPLE	S10V000166		0 0	W		Nitrite	SOLID	N/A	3.8679E-01			0.20071	ug/g			BJ
6	SAMPLE	S10V000166		0 0	W		Sulfate	SOLID	N/A	5.6617E+00			0.19548	ug/g			
6	SAMPLE	S10V000166		0 0	W		Oxalate	SOLID	N/A	9.5076E-01			0.24148	ug/g			J
6	SAMPLE	S10V000166		0 0	W		Bromide	SOLID	N/A	<6.0631E-01			0.60631	ug/g			U
6	SAMPLE	S10V000166		0 0	W		Nitrate	SOLID	N/A	9.2101E+00			0.21744	ug/g			
6	SAMPLE	S10V000166		0 0	W		Phosphate	SOLID	N/A	6.6088E-01			0.17458	ug/g			Jb
Sample Sequence 7																	
7	DUP	S1005250011	S10V000166	0 0	W		Fluoride	SOLID	2.6869E+00	3.0405E+00			0.01709	ug/g	12.347	% RPD	

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LABCORE Completed Batch Report for Batch# 00019650

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
7	DUP	S1005250011	S10V000166	0 0	W		Glycolate	SOLID	<9.7951E-02	<9.9461E-02			0.099461	ug/g			
7	DUP	S1005250011	S10V000166	0 0	W		Acetate	SOLID	2.5925E-01	2.9594E-01			0.064113	ug/g	13.217	% RPD	
7	DUP	S1005250011	S10V000166	0 0	W		Formate	SOLID	2.5277E-01	2.8883E-01			0.049571	ug/g	13.316	% RPD	
7	DUP	S1005250011	S10V000166	0 0	W		Chloride	SOLID	1.2992E+00	1.3754E+00			0.10594	ug/g	5.6992	% RPD	
7	DUP	S1005250011	S10V000166	0 0	W		Nitrite	SOLID	3.8679E-01	3.0144E+00			0.2038	ug/g	154.51	% RPD	
7	DUP	S1005250011	S10V000166	0 0	W		Sulfate	SOLID	5.6617E+00	6.3336E+00			0.1985	ug/g	11.202	% RPD	
7	DUP	S1005250011	S10V000166	0 0	W		Oxalate	SOLID	9.5076E-01	1.0560E+00			0.2452	ug/g	10.488	% RPD	
7	DUP	S1005250011	S10V000166	0 0	W		Bromide	SOLID	<6.0631E-01	<6.1566E-01			0.61566	ug/g			
7	DUP	S1005250011	S10V000166	0 0	W		Nitrate	SOLID	9.2101E+00	1.0839E+01			0.22079	ug/g	16.249	% RPD	
7	DUP	S1005250011	S10V000166	0 0	W		Phosphate	SOLID	6.6088E-01	6.5440E-01			0.17727	ug/g	0.98569	% RPD	
Sample Sequence 8																	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Fluoride	SOLID	6.272214	9.3231E+00			0.017467	ug/g	105.8	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Glycolate	SOLID	38.9922637	4.1517E+01			0.10165	ug/g	106.48	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Acetate	SOLID	47.3552157	5.0331E+01			0.065527	ug/g	105.74	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Formate	SOLID	45.8916991	5.0093E+01			0.050664	ug/g	108.6	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Chloride	SOLID	8.87518281	1.1098E+01			0.10827	ug/g	110.4	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Nitrite	SOLID	58.0179795	6.3505E+01			0.2083	ug/g	108.79	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Sulfate	SOLID	68.3671326	7.9857E+01			0.20287	ug/g	108.53	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Oxalate	SOLID	55.0909463	6.0137E+01			0.25061	ug/g	107.43	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Bromide	SOLID	63.767509	6.9642E+01			0.62923	ug/g	109.21	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Nitrate	SOLID	57.9134426	7.5639E+01			0.22566	ug/g	114.7	% Recovery	
8	SPK-PREDIG	S1005250012	S10V000166	0 0	W		Phosphate	SOLID	57.7043688	4.0770E+01			0.18118	ug/g	69.508	% Recovery	
Sample Sequence 9																	
9	SPK-IC	S1005260067	S10V000166	0 0			Fluoride	SOLID	60	8.6062E-01			1.61E-03	ug/g	100.6	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Glycolate	SOLID	373	3.6117E+00			9.37E-03	ug/g	96.829	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Acetate	SOLID	453	4.3119E+00			6.04E-03	ug/g	94.638	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Formate	SOLID	439	4.3880E+00			4.67E-03	ug/g	99.404	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Chloride	SOLID	84.9	9.6992E-01			9.98E-03	ug/g	99.604	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Nitrite	SOLID	555	5.2647E+00			0.0192	ug/g	94.193	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Sulfate	SOLID	654	7.0206E+00			0.0187	ug/g	99.067	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Oxalate	SOLID	527	5.3125E+00			0.0231	ug/g	99.08	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Bromide	SOLID	610	5.9651E+00			0.058	ug/g	97.789	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Nitrate	SOLID	554	6.3389E+00			0.0208	ug/g	98.517	% Recovery	
9	SPK-IC	S1005260067	S10V000166	0 0			Phosphate	SOLID	552	5.5219E+00			0.0167	ug/g	98.889	% Recovery	
Sample Sequence 10																	
10	SAMPLE	S10V000200		0 0	W		Fluoride	SOLID	N/A	3.5332E+00			0.017467	ug/g			
10	SAMPLE	S10V000200		0 0	W		Glycolate	SOLID	N/A	<1.0165E-01			0.10165	ug/g			U
10	SAMPLE	S10V000200		0 0	W		Acetate	SOLID	N/A	8.5380E-01			0.065527	ug/g			J
10	SAMPLE	S10V000200		0 0	W		Formate	SOLID	N/A	5.5633E-01			0.050664	ug/g			J
10	SAMPLE	S10V000200		0 0	W		Chloride	SOLID	N/A	7.6311E-01			0.10827	ug/g			
10	SAMPLE	S10V000200		0 0	W		Nitrite	SOLID	N/A	1.9022E+00			0.2083	ug/g			BJ
10	SAMPLE	S10V000200		0 0	W		Sulfate	SOLID	N/A	7.8335E+00			0.20287	ug/g			

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LABCORE Completed Batch Report for Batch# 00019650

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
10	SAMPLE	S10V000200		0 0	W		Oxalate	SOLID	N/A	1.1951E+00			0.25061	ug/g			J
10	SAMPLE	S10V000200		0 0	W		Bromide	SOLID	N/A	<6.2923E-01			0.62923	ug/g			U
10	SAMPLE	S10V000200		0 0	W		Nitrate	SOLID	N/A	3.9723E+01			0.22566	ug/g			
10	SAMPLE	S10V000200		0 0	W		Phosphate	SOLID	N/A	2.7906E+00			0.18118	ug/g			Jb
Sample Sequence 11																	
11	SAMPLE	S10V000235		0 0	W		Fluoride	SOLID	N/A	1.9205E+00			0.017289	ug/g			
11	SAMPLE	S10V000235		0 0	W		Glycolate	SOLID	N/A	<1.0062E-01			0.10062	ug/g			U
11	SAMPLE	S10V000235		0 0	W		Acetate	SOLID	N/A	4.7786E-01			0.06486	ug/g			J
11	SAMPLE	S10V000235		0 0	W		Formate	SOLID	N/A	3.1839E-01			0.050148	ug/g			J
11	SAMPLE	S10V000235		0 0	W		Chloride	SOLID	N/A	5.7257E-01			0.10717	ug/g			
11	SAMPLE	S10V000235		0 0	W		Nitrite	SOLID	N/A	4.7529E+00			0.20618	ug/g			
11	SAMPLE	S10V000235		0 0	W		Sulfate	SOLID	N/A	9.1036E+00			0.20081	ug/g			
11	SAMPLE	S10V000235		0 0	W		Oxalate	SOLID	N/A	1.2480E+00			0.24806	ug/g			J
11	SAMPLE	S10V000235		0 0	W		Bromide	SOLID	N/A	<6.2283E-01			0.62283	ug/g			U
11	SAMPLE	S10V000235		0 0	W		Nitrate	SOLID	N/A	1.2200E+01			0.22336	ug/g			
11	SAMPLE	S10V000235		0 0	W		Phosphate	SOLID	N/A	2.3213E+00			0.17933	ug/g			Jb
Sample Sequence 12																	
12	CCV	S1005260068		0 0			Fluoride	LIQUID	.47619	4.8023E-01			1.61E-03	ug/mL	100.85	% Recovery	
12	CCV	S1005260068		0 0			Glycolate	LIQUID	2.9603145	2.8463E+00			9.37E-03	ug/mL	96.148	% Recovery	
12	CCV	S1005260068		0 0			Acetate	LIQUID	3.5952345	3.4338E+00			6.04E-03	ug/mL	95.51	% Recovery	
12	CCV	S1005260068		0 0			Formate	LIQUID	3.4841235	3.4276E+00			4.67E-03	ug/mL	98.378	% Recovery	
12	CCV	S1005260068		0 0			Chloride	LIQUID	.67380885	6.6830E-01			9.98E-03	ug/mL	99.182	% Recovery	
12	CCV	S1005260068		0 0			Nitrite	LIQUID	4.4047575	4.2968E+00			0.0192	ug/mL	97.548	% Recovery	
12	CCV	S1005260068		0 0			Sulfate	LIQUID	5.190471	5.2468E+00			0.0187	ug/mL	101.08	% Recovery	
12	CCV	S1005260068		0 0			Oxalate	LIQUID	4.1825355	4.2167E+00			0.0231	ug/mL	100.82	% Recovery	
12	CCV	S1005260068		0 0			Bromide	LIQUID	4.841265	4.8642E+00			0.058	ug/mL	100.47	% Recovery	
12	CCV	S1005260068		0 0			Nitrate	LIQUID	4.396821	4.3854E+00			0.0208	ug/mL	99.74	% Recovery	
12	CCV	S1005260068		0 0			Phosphate	LIQUID	4.380948	4.3383E+00			0.0167	ug/mL	99.027	% Recovery	
Sample Sequence 13																	
13	CCB	S1005260069		0 0			Fluoride	LIQUID		<1.6100E-03			1.61E-03	ug/mL			
13	CCB	S1005260069		0 0			Glycolate	LIQUID		<9.3700E-03			9.37E-03	ug/mL			
13	CCB	S1005260069		0 0			Acetate	LIQUID		<6.0400E-03			6.04E-03	ug/mL			
13	CCB	S1005260069		0 0			Formate	LIQUID		<4.6700E-03			4.67E-03	ug/mL			
13	CCB	S1005260069		0 0			Chloride	LIQUID		<9.9800E-03			9.98E-03	ug/mL			
13	CCB	S1005260069		0 0			Nitrite	LIQUID		<1.9200E-02			0.0192	ug/mL			
13	CCB	S1005260069		0 0			Sulfate	LIQUID		<1.8700E-02			0.0187	ug/mL			
13	CCB	S1005260069		0 0			Oxalate	LIQUID		<2.3100E-02			0.0231	ug/mL			
13	CCB	S1005260069		0 0			Bromide	LIQUID		<5.8000E-02			0.058	ug/mL			
13	CCB	S1005260069		0 0			Nitrate	LIQUID		<2.0800E-02			0.0208	ug/mL			
13	CCB	S1005260069		0 0			Phosphate	LIQUID		<1.6700E-02			0.0167	ug/mL			

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LABCORE Completed Batch Report for Batch# 00019650

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00019650

Reviewer Signature **Date**

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LABCORE Completed Batch Report for Batch# 00019650

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1005260064	CCV				
2	S1005260065	CCB				
3	S1005260066	LLS				
4	S1005250010	BLNK-PREP				
5	S1005250009	STD-PREP				
6	S10V000166	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
7	S1005250011	DUP	S10V000166			
8	S1005250012	SPK-PREDIG	S10V000166			
9	S1005260067	SPK-IC	S10V000166			
10	S10V000200	SAMPLE		20100064	B27130	C Farm WMC 2010-1
11	S10V000235	SAMPLE		20100064	B27131	C Farm WMC 2010-1
12	S1005260068	CCV				
13	S1005260069	CCB				

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LABCORE Completed Batch Report for Batch# 00019583

Analyst: Purinton, Tony **Book#:** 13N29E

Instrument: IC-5 (IC-NH4)

Method: IC - NH4, LA-533-101 Rev/Mod Q-0

Specification: C Farm WMC 2010-1

Prep Batch: 00019561

Batch Comment: NH4 Dist C Farm 2010. ADP/KJL

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	CCV	S1005240020		0 0			Ammonium	LIQUID	3.13861383	3.1430E+00			0.012	ug/mL	100.14	% Recovery	
Sample Sequence 2																	
2	CCB	S1005240021		0 0			Ammonium	LIQUID		<1.2000E-02			0.012	ug/mL			
Sample Sequence 3																	
3	LLS	S1005240022		0 0			Ammonium	LIQUID	.124264	1.1996E-01			0.012	ug/mL	96.536	% Recovery	
Sample Sequence 4																	
4	BLNK-PREP	S1005210077		0 0	S		Ammonium	LIQUID		<1.2000E-02			0.012	ug/mL			
Sample Sequence 5																	
5	LCS	S1005210076		0 0	S		Ammonium	LIQUID	317	3.1893E+02			0.6	ug/mL	100.61	% Recovery	
Sample Sequence 6																	
6	SAMPLE	S10V000168		0 0	S		Ammonium	SOLID	N/A	4.1251E+00			0.47375	ug/g			J
Sample Sequence 7																	
7	DUP	S1005210078	S10V000168	0 0	S		Ammonium	SOLID	4.1251E+00	3.4314E+00			0.47752	ug/g	18.362	% RPD	
Sample Sequence 9																	
9	SPK-IC	S1005250087	S10V000168	0 0			Ammonium	SOLID	320.17	3.3061E+00			0.012	ug/g	99.997	% Recovery	
Sample Sequence 10																	
10	SAMPLE	S10V000202		0 0	S		Ammonium	SOLID	N/A	1.7289E+00			0.46875	ug/g			J
Sample Sequence 11																	
11	CCV	S1005240026		0 0			Ammonium	LIQUID	3.13861383	3.1614E+00			0.012	ug/mL	100.73	% Recovery	
Sample Sequence 12																	
12	CCB	S1005240027		0 0			Ammonium	LIQUID		<1.2000E-02			0.012	ug/mL			

Comments Section:

Data Flagger Status:
Flagging Completed

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019583

Final Page for Batch# 00019583

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019583

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1005240020	CCV				
2	S1005240021	CCB				
3	S1005240022	LLS				
4	S1005210077	BLNK-PREP				
5	S1005210076	LCS				
6	S10V000168	SAMPLE		20100064	B23TK8	C Farm WMC 2010-1
7	S1005210078	DUP	S10V000168			
8	S1005210079	SPK-PREDIG	S10V000168			
9	S1005250087	SPK-IC	S10V000168			
10	S10V000202	SAMPLE		20100064	B27130	C Farm WMC 2010-1
11	S1005240026	CCV				
12	S1005240027	CCB				

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019668

Analyst: Thorndike, Kathy

Book#: 13N29E

Instrument: IC-5 (IC-NH4)

Method: IC - NH4, LA-533-101 Rev/Mod Q-0

Specification: C Farm WMC 2010-1

Prep Batch: 00019621

Batch Comment: NH4 DIST for C Farm WMC 2010. KJT/KJL

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	CCV	S1005260118		0 0			Ammonium	LIQUID	3.13861383	3.1322E+00			0.012	ug/mL	99.796	% Recovery	
Sample Sequence 2																	
2	CCB	S1005260119		0 0			Ammonium	LIQUID		<1.2000E-02			0.012	ug/mL			
Sample Sequence 3																	
3	LLS	S1005260120		0 0			Ammonium	LIQUID	.124313769	1.1854E-01			0.012	ug/mL	95.355	% Recovery	
Sample Sequence 4																	
4	BLNK-PREP	S1005250044		0 0	S		Ammonium	LIQUID		2.9850E-02			0.012	ug/mL			
Sample Sequence 5																	
5	LCS	S1005250043		0 0	S		Ammonium	LIQUID	6.34	6.1890E+00			0.012	ug/mL	97.619	% Recovery	
Sample Sequence 6																	
6	SAMPLE	S10V000237		0 0	S		Ammonium	SOLID	N/A	3.6253E+00			0.46404	ug/g			BJ
Sample Sequence 7																	
7	DUP	S1005250045	S10V000237	0 0	S		Ammonium	SOLID	3.6253E+00	1.7985E+00			0.46422	ug/g	67.362	% RPD	
Sample Sequence 8																	
8	SPK-PREDIG	S1005250046	S10V000237	0 0	S		Ammonium	SOLID	126.5464	1.2589E+02			0.47923	ug/g	96.613	% Recovery	
Sample Sequence 9																	
9	SPK-IC	S1005260126	S10V000237	0 0			Ammonium	SOLID	320.17	3.2406E+00			0.012	ug/g	98.287	% Recovery	
Sample Sequence 10																	
10	CCV	S1005260124		0 0			Ammonium	LIQUID	3.13861383	3.1343E+00			0.012	ug/mL	99.862	% Recovery	
Sample Sequence 11																	
11	CCB	S1005260125		0 0			Ammonium	LIQUID		<1.2000E-02			0.012	ug/mL			

Comments Section:

Data Flagger Status:
Flagging Completed

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019668

Final Page for Batch# 00019668

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00019668

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1005260118	CCV				
2	S1005260119	CCB				
3	S1005260120	LLS				
4	S1005250044	BLNK-PREP				
5	S1005250043	LCS				
6	S10V000237	SAMPLE		20100064	B27131	C Farm WMC 2010-1
7	S1005250045	DUP	S10V000237			
8	S1005250046	SPK-PREDIG	S10V000237			
9	S1005260126	SPK-IC	S10V000237			
10	S1005260124	CCV				
11	S1005260125	CCB				

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

Date: 27 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: WMA C
Subject: Radiochemical - Sample Data Group (SDG) 20100064

INTRODUCTION

This memorandum presents the results of data validation for SDG 20100064 prepared by 222-S Laboratory. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B27130	5/17/2010	Soil	C	See note 1
B27131	5/19/2010	Soil	C	See note 2

1 –Tritium, C-14, I-129
2 – Gamma spectrometry, Sr-89/90, Tritium, Se-79, C-14, Ni-63, I-129, Isotopic-Am/Cm, Isotopic-Pu

Data validation was conducted in accordance with the CHPRC validation statement of work and the Field Sampling and Analysis Plan for Waste Management Area C, RPP-PLAN-40564, Rev. 2 (SAP). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested By Client

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preservation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. There are no specific holding time and preservation requirements for radiochemical soil analysis.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable with the following exception. The Se-79

laboratory blank result was > the minimum detectable concentration. The Se-79 result for sample B27131 was a non-detect and should not be qualified for the blank infraction.

Trip Blanks

No trip blanks were submitted for validation.

Field Blanks

No field blanks were submitted for validation.

Equipment Blanks

No equipment blanks were submitted for validation.

- **Accuracy**

Accuracy is evaluated by reviewing matrix spike sample results, laboratory control sample results, and chemical recovery factors. Chemical recovery factors are determined through use of a carrier or tracer and provide assessment of the chemical separation process that is affected by the laboratory procedure, sample matrix, and/or interference. Chemical recovery factors are used to correct sample concentration, uncertainty, and MDC results. According to the SAP, the matrix spike sample accuracy limits are 75% to 125% and the laboratory control sample accuracy limits are 80% to 120%.

Matrix Spike (MS) Samples

All MS recoveries were acceptable with the following exception. MS analysis was not performed for C-14 batch 22478. The C-14 result for sample B27131 was a non-detect and should be qualified as an estimate and flagged "UJ."

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable with the following exception. LCS analysis was not performed for Se-79. The Se-79 result for sample for sample B27131 was a non-detect and should be qualified as an estimate and flagged "UJ."

Carrier/Tracer Recovery Factors

All carrier/tracer recovery factors were acceptable.

- **Precision**

Precision is evaluated by reviewing laboratory duplicate, field duplicate, and field split sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the

relative percent difference (RPD) limits are ±30%. The RPD limits for reported analytes not listed in the SAP are specified by the DV procedure. When duplicate RPDs exceed the limits and have associated results <5X the MDCs the precision limits are ones specified by the DV procedure.

Laboratory Duplicate Samples

All laboratory duplicate results were acceptable with the following exceptions.

Laboratory duplicate analysis was not performed for C-14 batch 22478. The C-14 result for sample B27131 was a non-detect and should be qualified as an estimate and flagged "UJ."

Laboratory duplicate analysis was not performed for I-129 batch 22059. The I-129 result for sample B27130 was a non-detect and should be qualified as an estimate and flagged "UJ."

Field Duplicate Samples

No field duplicates were submitted for validation.

Field Split Samples

No field splits were submitted for validation.

- **Detection Limits**

Reported MDCs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDCs were below the CRDLs.

- **Completeness**

SDG 20100064 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Minor deficiencies leading to qualification of sample results as estimates were due to lack of MS analysis for C-14, lack of LCS analyses for Se-79, and lack of laboratory duplicate analyses for C-14 and I-129. See the table in Appendix 2 for a listing of all affected sample results.

It should be noted that there was insufficient sample to perform gamma, Sr-89/90, Se-79, Ni-63, Am-241/Iso-Cm, and Iso-Pu analyses for sample B27130.

REFERENCES

GRP-GD-002, Rev. 0, Change 0, *Data Validation for Radiochemical Analyses*, August 2010.

RPP-PLAN-40564, Rev. 2, *Field Sampling and Analysis Plan for Waste Management Area C*, December 2009

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers that may be applied by data validators in compliance with the CHPRC statement of work are as follows:

- **U** — The constituent was analyzed for and was not detected. The data should be considered usable for decision-making purposes.

- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDC. The data should be considered usable for decision-making purposes.

- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J+** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J-** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2

Summary of Data Qualification

Radiochemical Data Qualification Summary			
SDG: 20100064	Reviewer: AQA	Project: WMA C	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
Se-79	UJ	B27131	Lack of LCS data
C-14	UJ	B27131	Lack of MS and lab duplicate data
I-129	UJ	B27130	Lack of lab duplicate data

Comments: None

Appendix 3

Annotated Laboratory Reports

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27130
Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000196			57-12-5	Cyanide	ug/g	100	<0.0370	<2.68	n/a	n/a	n/a	n/a	2.68	n/a	U
S10V000196			7439-97-6	Mercury	ug/g	101	<1.00E-04	<7.85E-03	n/a	n/a	n/a	102	7.85E-03	n/a	U
S10V000196			PH	pH	unitless	n/a	n/a	7.21	7.24	7.22	0.415	n/a	0.0100	n/a	
S10V000196			18496-25-8	Sulfide	ug/g	96.7	<0.180	24.4	n/a	n/a	n/a	n/a	6.91	n/a	J
S10V000198			15046-84-1	Iodine-129 UJ	uCi/g	109	<9.68E-07	<1.59E-07	n/a	n/a	n/a	n/a	1.59E-07	n/a	U
S10V000199		O	120-82-1	1,2,4-Trichlorobenzene	ug/kg	73.2	<77.4	<76.8	n/a	n/a	n/a	n/a	76.8	n/a	U
S10V000199		O	95-50-1	1,2-Dichlorobenzene	ug/kg	n/a	<101	<99.9	n/a	n/a	n/a	n/a	99.9	n/a	U
S10V000199		O	121-14-2	2,4-Dinitrotoluene	ug/kg	84.1	<38.1	<37.8	n/a	n/a	n/a	n/a	37.8	n/a	U
S10V000199		O	95-95-4	2,4,5-Trichlorophenol	ug/kg	n/a	<44.0	<43.6	n/a	n/a	n/a	n/a	43.6	n/a	U
S10V000199		O	88-06-2	2,4,6-Trichlorophenol	ug/kg	n/a	<49.5	<49.1	n/a	n/a	n/a	n/a	49.1	n/a	U
S10V000199		O	95-48-7	2-Methylphenol	ug/kg	n/a	<57.5	<57.0	n/a	n/a	n/a	n/a	57.0	n/a	U
S10V000199		O	88-75-5	2-Nitrophenol	ug/kg	n/a	<53.7	<53.3	n/a	n/a	n/a	n/a	53.3	n/a	U
S10V000199		O	65794-96-9	3 &4 Methylphenol	ug/kg	n/a	<51.4	<51.0	n/a	n/a	n/a	n/a	51.0	n/a	U
S10V000199		O	83-32-9	Acenaphthene	ug/kg	76.9	<17.6	<17.5	n/a	n/a	n/a	n/a	17.5	n/a	U
S10V000199		O	56-55-3	Benzo(a)anthracene	ug/kg	n/a	<37.8	<37.5	n/a	n/a	n/a	n/a	37.5	n/a	U
S10V000199		O	205-99-2	Benzo(b)fluoranthene	ug/kg	n/a	<48.9	<48.5	n/a	n/a	n/a	n/a	48.5	n/a	U
S10V000199		O	50-32-8	Benzo(a)pyrene	ug/kg	n/a	<41.2	<40.9	n/a	n/a	n/a	n/a	40.9	n/a	U
S10V000199		O	117-81-7	Bis(2-ethylhexyl) phthalate	ug/kg	n/a	<590	<585	n/a	n/a	n/a	n/a	585	n/a	U
S10V000199		O	207-08-9	Benzo(k)fluoranthene	ug/kg	n/a	<39.1	<38.8	n/a	n/a	n/a	n/a	38.8	n/a	U
S10V000199		O	85-68-7	Butylbenzylphthalate	ug/kg	n/a	107	109	n/a	n/a	n/a	n/a	49.6	n/a	BJ
S10V000199		O	59-50-7	4-Chloro-3-methylphenol	ug/kg	83.1	<43.2	<42.8	n/a	n/a	n/a	n/a	42.8	n/a	U
S10V000199		O	95-57-8	2-Chlorophenol	ug/kg	77.0	<66.5	<66.0	n/a	n/a	n/a	n/a	66.0	n/a	U
S10V000199		O	218-01-9	Chrysene	ug/kg	n/a	<81.4	<80.7	n/a	n/a	n/a	n/a	80.7	n/a	U
S10V000199		O	53-70-3	Dibenz[a,h]anthracene	ug/kg	n/a	<51.1	<50.7	n/a	n/a	n/a	n/a	50.7	n/a	U
S10V000199		O	84-74-2	Di-n-butylphthalate	ug/kg	n/a	<562	<558	n/a	n/a	n/a	n/a	558	n/a	U
S10V000199		O	117-84-0	Di-n-octylphthalate	ug/kg	n/a	<47.7	572	n/a	n/a	n/a	n/a	47.3	n/a	
S10V000199		O	621-64-7	N-Nitroso-di-n-dipropylamine	ug/kg	69.8	<58.1	<57.6	n/a	n/a	n/a	n/a	57.6	n/a	U
S10V000199		O	206-44-0	Fluoranthene	ug/kg	n/a	<35.4	<35.1	n/a	n/a	n/a	n/a	35.1	n/a	U
S10V000199		O	87-68-3	Hexachlorobutadiene	ug/kg	n/a	<69.7	<69.1	n/a	n/a	n/a	n/a	69.1	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
b - MS/MSD Outside Range
J - Estimated
a - LCS Outside Range
LS 4-27-2011
c - RPD Outside Range
B - Found in Blank

Data Summary Report

Sample Group: 20100064

Core Number: C7668

Customer Sample ID: B27130

Sample Depth: 10-14

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000201		A	13994-20-2	Neptunium-237	ug/g	106	<2.12E-05	<2.31E-04	n/a	n/a	n/a	n/a	2.31E-04	n/a	U
S10V000201		A	U-238	Uranium-238	ug/g	110	<2.20E-04	0.468	n/a	n/a	n/a	n/a	2.40E-03	n/a	
S10V000201		A	7440-22-4	Silver	ug/g	82.2	<3.20E-03	0.0694	n/a	n/a	n/a	n/a	0.0349	n/a	J
S10V000201		A	7440-38-2	Arsenic	ug/g	108	<0.0168	4.90	n/a	n/a	n/a	n/a	0.183	n/a	b
S10V000201		A	7439-92-1	Lead	ug/g	84.0	<0.0124	4.31	n/a	n/a	n/a	n/a	0.135	n/a	
S10V000201		A	7782-49-2	Selenium	ug/g	86.4	<0.0244	0.685	n/a	n/a	n/a	n/a	0.266	n/a	J
S10V000201		A	7440-28-0	Thallium	ug/g	103	<1.20E-03	0.703	n/a	n/a	n/a	n/a	0.0131	n/a	B
S10V000202		S	14798-03-9	Ammonium	ug/g	101	<0.0120	1.73	n/a	n/a	n/a	n/a	0.469	n/a	J
S10V000203		A	14133-76-7	Technetium-99	ug/g	93.6	<1.50E-04	<1.76E-03	n/a	n/a	n/a	n/a	1.76E-03	n/a	U
S10V000203		A	SN-117	Tin-117	ug/g	104	<5.50E-03	<0.0646	n/a	n/a	n/a	n/a	0.0646	n/a	U
S10V000203		A	15832-50-5	Tin-126	ug/g	n/a	<1.00E-04	<1.17E-03	n/a	n/a	n/a	n/a	1.17E-03	n/a	U
S10V001168		W	10028-17-8	Tritium	uCi/g	87.9	<3.83E-06	2.50E-06	n/a	n/a	n/a	n/a	2.45E-06	136.6	J
S10V001207		A	7440-36-0	Antimony	ug/g	99.4	<0.0100	0.161	n/a	n/a	n/a	n/a	9.24E-03	n/a	
S10V002144		WV	14133-76-7	Technetium-99	ug/g	109	<3.00E-06	<3.01E-06	n/a	n/a	n/a	n/a	3.01E-06	n/a	U
S10V002235		W	14762-75-5	Carbon-14	uCi/g	94.0	<3.49E-07	<2.81E-06	n/a	n/a	n/a	n/a	2.81E-06	n/a	U

LS
4-27-2011

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated
c - RPD Outside Range
B - Found in Blank
b - MS/MSD Outside Range
a - LCS Outside Range

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000231			%WATERA	%WATER-APD	%	n/a	n/a	5.780	n/a	n/a	n/a	n/a	0.01000	n/a	
S10V000231			57-12-5	Cyanide	ug/g	100	<0.0370	<2.61	n/a	n/a	n/a	n/a	2.61	n/a	U
S10V000231			7439-97-6	Mercury	ug/g	101	<1.00E-04	<8.01E-03	n/a	n/a	n/a	n/a	8.01E-03	n/a	U
S10V000231			PH	pH	unitless	n/a	n/a	7.86	n/a	n/a	n/a	n/a	0.0100	n/a	
S10V000231			18496-25-8	Sulfide	ug/g	105	<0.180	24.5	23.9	24.2	2.58	97.7	7.12	n/a	J
S10V000233			13966-00-2	Potassium-40	uCi/g	n/a	n/a	1.04E-05	n/a	n/a	n/a	n/a	5.77E-06	36.50	J
S10V000233			10198-40-0	Cobalt-60	uCi/g	102	<3.08E-07	<2.71E-07	n/a	n/a	n/a	n/a	2.71E-07	n/a	U
S10V000233			14234-35-6	Antimony-125	uCi/g	n/a	<6.68E-07	<7.15E-07	n/a	n/a	n/a	n/a	7.15E-07	n/a	U
S10V000233			10045-97-3	Cesium-137	uCi/g	107	<3.81E-07	<3.55E-07	n/a	n/a	n/a	n/a	3.55E-07	n/a	U
S10V000233			14683-23-9	Europium-152	uCi/g	n/a	<1.37E-06	<1.28E-06	n/a	n/a	n/a	n/a	1.28E-06	n/a	U
S10V000233			15585-10-1	Europium-154	uCi/g	n/a	<9.15E-07	<8.47E-07	n/a	n/a	n/a	n/a	8.47E-07	n/a	U
S10V000233			14391-16-3	Europium-155	uCi/g	n/a	<4.54E-07	<4.44E-07	n/a	n/a	n/a	n/a	4.44E-07	n/a	U
S10V000233			15092-94-1	Lead-212	uCi/g	n/a	n/a	8.16E-07	n/a	n/a	n/a	n/a	5.57E-07	29.49	
S10V000233			14274-82-9	Thorium-228	uCi/g	n/a	<8.10E-06	<8.80E-06	n/a	n/a	n/a	n/a	8.80E-06	n/a	U
S10V000233			15065-10-8	Thorium-234	uCi/g	n/a	<2.56E-06	<3.00E-06	n/a	n/a	n/a	n/a	3.00E-06	n/a	U
S10V000233			15046-84-1	Iodine-129	uCi/g	117	<2.00E-07	<1.76E-07	n/a	n/a	n/a	n/a	1.76E-07	n/a	U
S10V000234		O	120-82-1	1,2,4 Trichlorobenzene	ug/kg	73.2	<77.4	<77.0	n/a	n/a	n/a	67.1	77.0	n/a	U
S10V000234		O	95-50-1	1,2-Dichlorobenzene	ug/kg	n/a	<101	<100	n/a	n/a	n/a	n/a	100	n/a	U
S10V000234		O	121-14-2	2,4-Dinitrotoluene	ug/kg	84.1	<38.1	<37.9	n/a	n/a	n/a	86.5	37.9	n/a	U
S10V000234		O	95-95-4	2,4,5-Trichlorophenol	ug/kg	n/a	<44.0	<43.8	n/a	n/a	n/a	n/a	43.8	n/a	U
S10V000234		O	88-06-2	2,4,6-Trichlorophenol	ug/kg	n/a	<49.5	<49.2	n/a	n/a	n/a	n/a	49.2	n/a	U
S10V000234		O	95-48-7	2-Methylphenol	ug/kg	n/a	<57.5	<57.2	n/a	n/a	n/a	n/a	57.2	n/a	U
S10V000234		O	88-75-5	2-Nitrophenol	ug/kg	n/a	<53.7	<53.4	n/a	n/a	n/a	n/a	53.4	n/a	U
S10V000234		O	65794-96-9	3 &4 Methylphenol	ug/kg	n/a	<51.4	<51.1	n/a	n/a	n/a	n/a	51.1	n/a	U
S10V000234		O	83-32-9	Acenaphthene	ug/kg	76.9	<17.6	<17.5	n/a	n/a	n/a	71.4	17.5	n/a	U
S10V000234		O	56-55-3	Benzo(a)anthracene	ug/kg	n/a	<37.8	<37.6	n/a	n/a	n/a	n/a	37.6	n/a	U
S10V000234		O	205-99-2	Benzo(b)fluoranthene	ug/kg	n/a	<48.9	<48.6	n/a	n/a	n/a	n/a	48.6	n/a	U
S10V000234		O	50-32-8	Benzo(a)pyrene	ug/kg	n/a	<41.2	<41.0	n/a	n/a	n/a	n/a	41.0	n/a	U
S10V000234		O	117-81-7	Bis(2-ethylhexyl) phthalate	ug/kg	n/a	<590	<587	n/a	n/a	n/a	n/a	587	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
b - MS/MSD Outside Range
J - Estimated
a - LCS Outside Range
LS 4-27-2011
c - RPD Outside Range
B - Found in Blank

Data Summary Report

Sample Group: 20100064
Core Number: C7668
Customer Sample ID: B27131
Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000236		A	7440-32-6	Titanium	ug/g	92.6	<5.00E-03	1.63E+03	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-62-2	Vanadium	ug/g	84.2	<5.00E-03	60.0	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-65-5	Yttrium	ug/g	85.5	<2.00E-03	9.15	n/a	n/a	n/a	n/a	0.204	n/a	
S10V000236		A	7440-66-6	Zinc	ug/g	83.9	<5.00E-03	42.3	n/a	n/a	n/a	n/a	0.509	n/a	
S10V000236		A	7440-67-7	Zirconium	ug/g	88.7	<5.00E-03	7.28	n/a	n/a	n/a	n/a	0.509	n/a	b
S10V000236		A	14269-63-7	Thorium-230	ug/g	n/a	<2.80E-06	<2.85E-05	n/a	n/a	n/a	n/a	2.85E-05	n/a	U
S10V000236		A	TH-232	Thorium-232	ug/g	106	<6.80E-05	2.73	n/a	n/a	n/a	n/a	6.92E-04	n/a	
S10V000236		A	13968-55-3	Uranium-233	ug/g	n/a	<4.00E-06	1.72E-04	n/a	n/a	n/a	n/a	4.07E-05	n/a	J
S10V000236		A	13966-29-5	Uranium-234	ug/g	n/a	2.15E-06	4.26E-05	n/a	n/a	n/a	n/a	2.04E-05	n/a	BJ
S10V000236		A	15117-96-1	Uranium-235	ug/g	104	<4.40E-06	3.37E-03	n/a	n/a	n/a	n/a	4.48E-05	n/a	
S10V000236		A	13982-70-2	Uranium-236	ug/g	n/a	<1.60E-06	<1.63E-05	n/a	n/a	n/a	n/a	1.63E-05	n/a	U
S10V000236		A	13994-20-2	Neptunium-237	ug/g	106	<2.12E-05	<2.16E-04	n/a	n/a	n/a	n/a	2.16E-04	n/a	U
S10V000236		A	U-238	Uranium-238	ug/g	110	<2.20E-04	0.477	n/a	n/a	n/a	n/a	2.24E-03	n/a	
S10V000236		A	7440-22-4	Silver	ug/g	82.2	<3.20E-03	0.0419	n/a	n/a	n/a	n/a	0.0326	n/a	J
S10V000236		A	7440-38-2	Arsenic	ug/g	108	<0.0168	3.77	n/a	n/a	n/a	n/a	0.171	n/a	b
S10V000236		A	7439-92-1	Lead	ug/g	84.0	<0.0124	4.30	n/a	n/a	n/a	n/a	0.126	n/a	
S10V000236		A	7782-49-2	Selenium	ug/g	86.4	<0.0244	0.438	n/a	n/a	n/a	n/a	0.248	n/a	J
S10V000236		A	7440-28-0	Thallium	ug/g	103	<1.20E-03	0.661	n/a	n/a	n/a	n/a	0.0122	n/a	B
S10V000237		S	14798-03-9	Ammonium	ug/g	97.6	0.0298	3.63	1.80	2.71	67.4	96.6	0.464	n/a	BJ
S10V000238		A	14133-76-7	Technetium-99	ug/g	93.6	<1.50E-04	<1.64E-03	n/a	n/a	n/a	n/a	1.64E-03	n/a	U
S10V000238		A	SN-117	Tin-117	ug/g	104	<5.50E-03	<0.0601	n/a	n/a	n/a	n/a	0.0601	n/a	U
S10V000238		A	15832-50-5	Tin-126	ug/g	n/a	<1.00E-04	<1.09E-03	n/a	n/a	n/a	n/a	1.09E-03	n/a	U
S10V000239		E	CM-243/244	Curium-243/244	uCi/g	n/a	<2.56E-07	<2.12E-07	n/a	n/a	n/a	n/a	2.12E-07	n/a	U
S10V000239		E	14596-10-2	Americium-241	uCi/g	104	<6.41E-07	<5.31E-07	n/a	n/a	n/a	n/a	5.31E-07	n/a	U
S10V000239		E	15510-73-3	Curium-242	uCi/g	n/a	<2.56E-07	<2.12E-07	n/a	n/a	n/a	n/a	2.12E-07	n/a	U
S10V000239		E	PU-239/240	Plutonium-239/240	uCi/g	99.8	<3.55E-07	<3.13E-07	n/a	n/a	n/a	n/a	3.13E-07	n/a	U
S10V000239		E	13981-16-3	Plutonium-238	uCi/g	n/a	<3.55E-07	<3.13E-07	n/a	n/a	n/a	n/a	3.13E-07	n/a	U
S10V000240		E	SR-89/90	Strontium-89/90	uCi/g	99.4	<6.99E-07	<2.62E-07	n/a	n/a	n/a	n/a	2.62E-07	n/a	U
S10V000241		E	13981-37-8	Nickel-63	uCi/g	103	<5.87E-06	<8.76E-06	n/a	n/a	n/a	n/a	8.76E-06	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
b - MS/MSD Outside Range
J - Estimated
a - LCS Outside Range
LS
4-27-2011
c - RPD Outside Range
B - Found in Blank

Data Summary Report

Sample Group: 20100064

Core Number: C7668

Customer Sample ID: B27131

Sample Depth: 14-18

Sample#	R	A#	CAS #	Analyte		Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10V000241		E	15758-45-9	Selenium-79	UJ	uCi/g	n/a	4.38E-06	<3.81E-06	n/a	n/a	n/a	n/a	3.81E-06	n/a	U
S10V001169		W	10028-17-8	Tritium		uCi/g	94.2	<4.07E-06	4.21E-06	n/a	n/a	n/a	n/a	2.48E-06	74.703	J
~~S10V001208~~		~~A~~	~~7440-36-0~~	~~Antimony~~		~~ug/g~~	~~99.9~~	~~<2.00E-04~~	~~0.114~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~9.41E-03~~	~~n/a~~	
~~S10V002145~~		~~WV~~	~~14133-76-7~~	~~Technetium-99~~		~~ug/g~~	~~109~~	~~<3.00E-06~~	~~<3.06E-06~~	~~n/a~~	~~n/a~~	~~n/a~~	~~n/a~~	~~3.06E-06~~	~~n/a~~	~~U~~
S10V002236		W	14762-75-5	Carbon-14	UJ	uCi/g	95.1	<1.33E-07	<2.56E-06	n/a	n/a	n/a	n/a	2.56E-06	n/a	U

LS
4-27-2011

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated
c - RPD Outside Range
B - Found in Blank
b - MS/MSD Outside Range
a - LCS Outside Range

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

222-S LABORATORY

FINAL ANALYTICAL REPORT FOR SAMPLES FROM WASTE MANAGEMENT AREA C FOR CORE HOLE C7668 IN SUPPORT OF RCRA SOIL CHARACTERIZATION

1.0 INTRODUCTION

This final report presents the results for the samples taken from Waste Management Area C between May 15, 2010 and June 8, 2010. The samples were analyzed in accordance with RPP-PLAN-40564, *Field Sampling and Analysis Plan for Sites P and L at Waste Management Area C* (FSAP); RPP-PLAN-38777, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C* (SAP); ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP); SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*; and the additional guidance given by the client's point of contact.

Because the 222-S Laboratory facility was designed to analyze hazardous and complex tank waste samples, most SW-846 test methods performed at the 222-S Laboratory contain deviations that are listed in an appendix in the analytical procedures. All other known deviations or variances from SW-846 are documented in this narrative. The following attachments are included in this report.

Attachment 1	Data Summary Report
Attachment 2	Sample Breakdown Diagrams
Attachment 3	Holding Time Report
Attachment 4	Additional Mercury and Organic Analyses QC Results
Attachment 5	Tentatively Identified Compounds (TIC) for Organic Analyses
Attachment 6	Geological Report
Attachment 7	Characterization Change Notices (CCN), and Correspondence
Attachment 8	Receipt Paperwork
Appendix 1	Analytical Report for Analysis Performed at the Waste Sampling and Characterization Facility (WSCF)

2.0 SAMPLE RECEIPT AND BREAKDOWN

2.1 SAMPLE RECEIPT

A total of nine core intervals and two surface grab samples from core hole C7668 along with seven field blanks, and six trip blanks were received by the 222-S Laboratory between May 15, 2010 and June 8, 2010. Due to an instrumentation issue, the volatile organic analysis samples for client sample numbers B25WN0 (I012), B23VB5 (Field Blank 10), and B23VC4 (Trip Blank 9) were delivered directly to WSCF for analysis. The samples were delivered in a cooler with ice or, in the case of the volatile organic samples, in a freezer. The temperatures of the temperature blanks were measured and recorded on the sample receipt check list and/or the chain of custody form.

2.2 SAMPLE BREAKDOWN

The laboratory received each core interval as a set of volatile organic analysis (VOA) samples and three liner samples when complete core recovery was obtained. The VOA samples were made from the shoe section of each core interval following SW-846 5035. The liner samples from each core interval were extruded, described, and composited by the Washington River Protection Solutions, Inc. (WRPS) geologist. The geologist's report is included in Attachment 6. Provided sufficient samples existed, the composite for each core interval was analyzed as described in the SAP and FSAP. Six core intervals (I001, I003, I004, I005, I006, and I007) had less than full recovery (see Attachment 2 and Attachment 8). There was no I002 for core hole C7668. Intervals I001 and I007 were extruded and composited in the normal manner. Interval I003 was combined with I004 to form a single composite, and Interval I005 was combined with I006 to form a single composite (see Attachment 7, CCN-WMAC-008). The surface samples were received as a single grab in a 500-mL jar and a set of VOA samples.

In addition to the grab and core samples, a water sample from interval I010 was delivered to the lab. This sample was from a small amount of standing water encountered on top of the sampler. CCN-WMAC-009 request that this sample be analyzed for ^{99}Tc.

C7668 CCN-WMAC-008 provided a priority list for the laboratory to follow for the intervals without enough sample to perform all analysis requested in the SAP and FSAP. For interval I001, the laboratory followed this instruction. For the combined interval of I004 and I005, the laboratory analyzed for ^{99}Tc using the Vadose water digest, which consumed the sample that was to be used for the radiochemistry analysis, which had a higher priority. The analyses which were not performed were gamma energy analysis % Water (GEA), ^{63}Ni, $^{89/90}$Sr, $^{238,239/240}$Pu, ^{241}Am, and $^{242,243/244}$Cm.This failure to follow the client's instruction has been addressed, and improvements in communications and better use of the Laboratory Information Management System will be made to avoid this in the future.

WRPS shipped subsamples of the composites to Test America Laboratories, Inc. (TAL) in St Louis, Missouri and Knoxville, Tennessee to be analyzed for dibutyl and monobutyl phosphate, total petroleum hydrocarbons (diesel and gasoline range), ethylene glycol, chlorinated pesticides, and polychlorinated biphenyls (Aroclors and congeners). TAL subsequently subcontracted the monobutyl and dibutyl phosphate analyses to Southwest Research Institute. The results of these analyses will be released in the final WRPS report.

3.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for those analytes requested in the SAP and FSAP. Secondary analytes are only reported if detected. The TIC from gas chromatography-mass spectrometry (GC/MS) analysis of semivolatile organic compounds (SVOC) is presented in Attachment 5. In addition to the required isotopes, all isotopes with positive GEA results were reported.

The "Det Limit" column in Attachment 1 contains the method detection limit (MDL) for non-radionuclide analyses, or the minimum detectable activity for radionuclides.

In Attachment 1, the column labeled "A#" indicates the aliquot class or the method used for sample preparation before analysis. For solid samples, the aliquot classes are defined as follows:

"A" indicates samples that were prepared by SW-846 3050B.

"E" indicates samples that were prepared by a strong acid digest.

"O" indicates samples that were extracted for organic analysis.

"S" indicates samples that were prepared by a distillation.

"W" indicates samples that were prepared by a standard water digest.

"WV" indicates samples that were prepared by a Vadose water digest.

Samples without a letter identifier in the "A#" column were analyzed directly with no separate preparation or with sample preparation performed as a part of the procedure steps.

The "Qual Flags" column in Attachment 1 contains data qualifier flags that are defined as follows:

"B" is used to indicate that the analyte was detected in the method or preparation blank and in the sample, and the result for the blank was greater than 5% of the reported sample result.

"J" indicates that the reported result should be considered an estimate because it is below the quantitation limit. The "J" flag is applied to sample concentrations that are greater than the MDL but less than the quantitation limit or sample activity with a counting uncertainty greater than 30%.

"N" indicates a TIC which has been named.

"T" indicates a TIC.

"U" indicates that the reported result is less than the calculated detection limit.

"a" indicates that the laboratory control sample (LCS) recovery was outside of the specified range in the QAPP or SAP.

"b" indicates that the matrix spike (MS) recovery was outside of the specified range in the QAPP or SAP.

"c" indicates that the relative percent difference (RPD) between the sample and the duplicate is greater than 30%.

Manual calculations using rounded results from the Data Summary Report (Attachment 1) or result calculation forms may differ slightly from the actual results derived from the raw data.

3.1 SAMPLE DIGESTIONS

3.1.1 Radiochemistry Strong Acid Digestion

Strong acid digestions with a hot plate for the heat source were performed using a mixture of concentrated nitric and hydrochloric acids. For each digest, approximately 1 to 10 g of sample

was digested depending on the analysis being performed. The digestate was then filtered and diluted to a final volume. This digestion was used for all radiochemical analyses except ^{3}H, ^{14}C, and ^{129}I. This digestion is a leach of the acid soluble species only.

3.1.2 SW-846 3050B - Acid Digestion-Heating Block

This acid digestion follows SW-846 3050B using a heating block and nitric and hydrochloric acids. An aliquot of approximately 5 g of sample was digested. All heating-block digestions were filtered and diluted to a final volume of 50 mL. In soil, this digestion is a leach of the acid soluble species only. This digestion was used for all inductively coupled plasma/mass spectrometry (ICP/MS) and inductively coupled plasma/atomic emission spectroscopy (ICP/AES) analyses except for ^{99}Tc and isotopic tin (^{117}Sn and ^{126}Sn) analysis. The digestion is modified for the ^{99}Tc analysis by using only nitric acid. This is done to eliminate the possibility of the formation a zinc-chlorine ion pair of mass 99. The laboratory believes this ion, when present, is responsible for low level false positives. A separate digestion for antimony was prepared using additional hydrochloric acid, as recommended in SW-846.

3.1.3 Water Digestion

A water digestion or leach was prepared for the anions by ion chromatography, ^{14}C, and ^{3}H analyses using approximately 0.25 to 4 g of sample diluted to 25 mL. Sonification was used, and the leachate was then filtered. In soil, this digestion is a leach of the water soluble species only.

3.1.4 Vadose Water Digestion

A 70-g sample of soil was leached using a ratio of one part water to one part soil. To maintain a one-to-one ratio, the amount of water added to the sample was adjusted based on the percent moisture of the soil. The slurries were placed on a shaker table for about 1 hour. They were then transferred to a centrifuge tube and centrifuged at 4,000 rpm for 30 minutes. An unfiltered aliquot was set aside for alkalinity analysis. The remainder was filtered using a disposable vacuum filtration system. The filtrates were transferred to a clean bottle and then analyzed for anions using IC nitrate analysis (intervals I005 to I010) and ^{99}Tc by ICP/MS analysis.

3.2 INORGANIC ANALYSES

3.2.1 Cyanide

The cyanide analysis by distillation and spectrophotometry was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 14 days. There was no required reporting limit in the SAP for cyanide. The target detection limit was 0.5 μg/g, which is lower than what the current laboratory method (lachet micro-distillation) can reach. There were no notable quality control (QC) issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.2.2 Sulfide

Sulfide analysis by distillation and ion selective electrode was performed on direct subsamples of the grab samples and liner composite samples. All analyses met the SW-846 holding time of 7 days. There was no required reporting limit in the SAP for sulfide. The target detection limit was 5 µg/g. All sample results had adjusted MDLs of approximately 7 µg/g.

Batches 19830, 19631, 19885, 19967, and 20058: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19596: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required.

3.2.3 pH Analysis

The pH analysis was performed on the grab samples and liner composite samples except for sample B23TK8 (I001). This was due to insufficient sample. These analyses met all QC requirements in the FSAP, SAP, and QAPP. The FSAP lists a pH holding time requirement of "as soon as possible." All pH measurements were taken after the water leach was performed. The sampling to analysis time varied from 7 to 35 days (see Attachment 3). There is no correlation between pH results and days to analysis, and the results fall within an expected range for alkaline soils. This indicates that the variation in time has no apparent effect on the results.

3.2.4 Mercury

Analysis for Hg by cold-vapor graphic furnace/atomic absorption was performed on the digested subsamples of the grab samples and liner composite samples. All results met the QC requirements in the FSAP, SAP, and QAPP. All analyses met the holding time of 28 days. This analysis met the required and target detection limits.

3.2.5 Ion Chromatography – Ammonium

Analysis for ammonium was performed using a distillation preparation of the grab samples and the liner composite samples. The SAP lists an administrative holding time of 7 days. The laboratory believes that after distillation and preservation, the holding time is 28 days based on U.S. Environmental Protection Agency drinking water and waste water holding times for preserved samples. There is no regulatory holding time limit promulgated for ammonium in soil. All samples met these holding times. These analyses met the target detection limit listed in the SAP. There was no required reporting limit in the SAP or FSAP for ammonium.

Batch 19420: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 19583: Laboratory personnel used an unknown and incorrect spike amount for the MS resulting in a high spike recovery of 247%. Since the project requirement is that one MS be performed per core hole, and five acceptable MSs exist, this MS was not reported (see

Attachment 7). All other QC requirements were met in this batch, including the post digestion spike.

Batches 19668, 19896, and 19938: The RPD exceeded the required 30%. Since the result for this analyte was below the quantitation limit, the criterion does not apply and reanalysis is not required. Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

Batches 19655 and 20024: Ammonium was detected in the preparation blanks at a level below the quantitation limit and above the MDL. Ammonium was also detected in the samples at a similar level; these results have been flagged with a “B”. Since all results were below the quantitation limit, reanalysis was not required.

3.2.6 Ion Chromatography – Anions and Small Organic Acids

Ion chromatography analysis was performed on a standard water digest of subsamples from all grab samples and liner composite samples.

The laboratory met all of the required and target detection limits. For the standard water digest, all analyses were within the applicable holding time. The sample spikes used for the standard water digestions are predigestion spikes.

Batch 19599: The RPD for fluoride exceeded the required 30% at 32%. The laboratory believes this was due to sample inhomogeneity, which is indicated by high RPDs for the other anions in this sample. Additionally, a second duplicate sample from a separate Vadose project was analyzed in this batch, with acceptable duplicate RPDs. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. One sample result for nitrite has been flagged with a “B”.

Batch 19650: The RPD for nitrite exceeded the required 30% in the SAP and FSAP. However, since the result was below the quantitation limit, this criterion does not apply. The MS recovery for phosphate was below the ±25% requirement at 70%. The sample results have been flagged with a “b”. Since the post digestion spike was recovered at 99%, the laboratory believes that the low MS recovery was matrix related. The result for nitrite in the preparation blank was above the MDL but below the quantitation limit, and the blank is therefore acceptable. All samples results for nitrite were flagged with a “B”.

Batch 20668: The results for nitrite, sulfate, and nitrate in the preparation blank were slightly above the MDL and below the quantitation limit. The blank is therefore acceptable. All but one nitrite and two nitrates were flagged with a “B”. The un-flagged results were more than 20 times the adjusted blank results. The blank result for sulfate was less than 5% of the lowest sulfate results, and therefore no flags were applied.

3.2.7 Inductively Coupled Plasma/Atomic Emission Spectroscopy

The ICP/AES analysis was performed on an acid-digest (SW-846 3050B) of all grab samples and liner composite samples. The ICP/AES analysis was unable to obtain the required detection limit for antimony, arsenic, cadmium, lead, selenium, silver, and thallium. These elements have been reported from separate ICP/MS analyses. Total uranium has not been reported by the ICP/AES analysis since it cannot meet the required detection limits in the SAP. The isotopic uranium analysis by ICP/MS met the required detection limit for ^{238}U, which is essentially total uranium. The overall data usability was not affected. For all other metals reported by ICP/AES, all target and required detection limits were met. SW-846 lists the holding time for ICP/AES metals as 6 months. All analyses met the holding times.

Batch 20821: The interference check standard-AB (ICSAB) had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. A result slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. Low levels of iron, sodium, chromium, and calcium were detected in the preparation blank, but reanalysis was not required since these levels were less than 5% of the lowest sample result. The MS recoveries for aluminum, calcium, iron, magnesium, phosphorous, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for sodium, sulfur, silicon, and zirconium exceeded the ±25 requirement in the SAP and FSAP. The laboratory believes this was due to matrix interference. The RPD for silicon exceeded the ±30% requirement at 40%. All sample results in this batch for silicon have been flagged with “c”. Reanalysis was not required since this is secondary element. It should be noted that silicon is not listed with other elements in SW-846 3050B, section 1.1, under “Scope and Application” for the method and does not perform consistently when using this digest.

Batch 20563: The ICSAB had a result above the quantitation limits for neodymium. This indicates that spectral interference was occurring. Neodymium results were not reported due to the high probability that they were the result of this interference. Results slightly above the MDL for cadmium in the ICSA indicate a possible high bias for this element. However, the recovery of cadmium in the ICSAB was within the ±20% requirement; this indicates no significant bias was present. The LCS for calcium was recovered outside the ±20% requirement at 78.3%. Since two of the samples in this batch were exhausted and could not be reanalyzed, a decision was reached with the client to accept the data “as is” (see Attachment 7). The MS recoveries for aluminum, calcium, iron, magnesium, sodium, phosphorous, silicon, and titanium exceeded the ±25% requirement in the FSAP and SAP. Since the sample results for these elements exceeded the matrix spike level by more than four times, this criterion does not apply. The MS recoveries for bismuth and zirconium exceeded the ±25 requirement at 56% and 19%, respectively. This could indicate that the results for elements are biased low. All sample results in this batch for bismuth and zirconium have been flagged with “b”. Reanalysis was not required since these are secondary elements. Silicon experienced an LCS failure, and reanalysis was not required for this secondary element.

3.2.8 Inductively Coupled Plasma/Mass Spectroscopy

The ICP/MS actinide and trace metal analyses were performed on the standard SW-846 3050 acid digestion of all grab samples and liner composite samples. The ICP/MS ^{126}Sn and ^{99}Tc analysis was performed on the sample digest without the addition of the hydrochloric acid. Hydrochloric acid is not used for ^{99}Tc analysis because of the potential formation of a ZnCl ion pair with mass 99. ICP/MS trace metal analysis for antimony was perform on the same digest with additional hydrochloric acid, which is required to keep antimony in solution. In addition to these acid digests, ICP/MS ^{99}Tc analysis was performed on a Vadose water digest of all solid samples except B23TK8 (I001) and directly on single water samples from interval I010. The I001 analysis was not performed due to lack of sample.

Direct is the most accurate type of calibration; however, standard material is not commercially available for all the isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument's mass-response curve, which is generated by using the intensity/concentration relationship for the available isotope standards. Results estimated in this manner are designated "semi-quantitative."

Table 1. Inductively Coupled Plasma-Mass Spectroscopy Standards and Spikes

Standard Type	Analytes Analyzed
Initial calibration verification (nondigested)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Acid digest standard (laboratory control standard)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Predigest spike (MS)	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
Post-digest spike	^{232}Th, ^{235}U, ^{238}U, ^{237}Np, ^{99}Tc, ^{117}Sn
No standard or spike of either type	^{126}Sn, ^{230}Th, ^{233}U, ^{234}U, ^{236}U

3.2.8.1 Technetium-99 and Tin-126

The required detection limit listed in the SAP for ^{99}Tc was met. The target detection limit for ^{99}Tc was not met. There were no required or target detection limits for ^{126}Sn listed in the SAP. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Because there is no available source for ^{126}Sn, ^{117}Sn is used to monitor the chemical recovery for this analysis. Though not specifically requested in the SAP, ^{117}Sn is reported for the laboratory control sample LCS and MS in order to demonstrate method accuracy and presence of possible matrix interference.

Batch 20681: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 21058: The middle and closing continuing calibration blanks (CCB) contained ^{99}Tc just above the MDL. ^{99}Tc was detected in one sample bracketed by these CCBs. The other samples in the batch were non-detect. Since all results were below the quantitation limit, reanalysis was not required. The one positive result has been flagged with "B". The laboratory believes that these results most likely represent some type of interference. The RPD for ^{126}Sn exceeded the ±30 requirement in the SAP and FSAP at 39%. Since the results for ^{126}Sn were below the quantitation

limit, this criterion does not apply. The matrix spike for ^{117}Sn was recovered below the ±25% requirement. Similar results have been observed in other batches, and this appears to be a matrix interference issue. This batch was not reanalyzed, but others have been with no improvement. Tin results should be considered biased low at these levels. All samples in the batch have been flagged with a "b".

3.2.8.2 Technetium-99 (Vadose Water Digest)

The required and target detection limits listed in the SAP for ^{99}Tc were met. The SAP lists a holding time of 6 months for isotopic analytes. All analysis met this holding time.

Batch 21206 and 23804: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 23572: The middle CCB contained ^{99}Tc just above the MDL. ^{99}Tc was detected in two samples bracketed by the CCB. The other samples in the batch were non-detect. Since the blank result was below the quantitation limit, reanalysis was not required. One positive result, which was below the quantitation limit, has been flagged with "B". The other positive sample result was more than 20 times the adjusted blank result and was therefore not flagged. The laboratory believes that the blank result is most likely some type of interference.

3.2.8.3 Actinides

The required and target detection limits were met for all isotopes and in all samples. The SAP lists the holding time for isotopic analytes as 6 months. All samples were analyzed within the holding time.

Batch 20597: The result for ^{234}Th in the preparation blank was slightly above the MDL. Four of the six samples in the batch demonstrated a similar result and have been flagged with a "B". Since all results were below the quantitation limit, the blank was acceptable and reanalysis was not required.

Batch 21207: The RPD for U^{233} exceed the ±30% requirement in the SAP and FSAP; however, since the result was below the quantitation level, this criterion does not apply.

3.2.8.4 Trace Metals

Antimony, arsenic, cadmium, lead, selenium, silver, and thallium were analyzed by ICP/MS to obtain the required detection limits in the SAP. Except for the required detection limit for selenium, all required detection limits were met or the sample results were above the quantitation limit and the sample detection limit criteria do not apply. All target detection limits were met. The required detection limit for selenium was approximately an order of magnitude below the detection limit obtained by ICP/MS. The laboratory does not anticipate reaching this detection limit for future projects. The adjusted MDL for selenium was approximately 0.25 µg/g. SW-846 lists the holding time for metals as 6 months. All samples were analyzed within the holding time.

Batches 20672, 22361, and 22376: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20590: The first CCB had a result for antimony slightly above the MDL. All affected samples have been flagged with a "B". Since the blank result was below the quantitation limit, reanalysis was not required. The duplicate RPD for antimony was outside the ±30% requirement in the SAP and FSAP at 37%. The laboratory believes this was a result of sample inhomogeneity. Additionally, the sample result was well below the required detection limit. With customer agreement (see Attachment 7), all results were flagged with "c" and reported.

Batch 21747: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 7% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

Batch 22437: Thallium was detected in the preparation blank below the quantitation limit. The blank result was approximately 30% of the sample results, and a "B" flag was applied. Since the blank result was below the quantitation limit and the all sample results were below the required detection limit, reanalysis was not required.

3.3 RADIOCHEMICAL ANALYSIS

The holding time listed in the SAP for radioactive isotopes is 6 months. The FSAP list the holding time as "none". SW-846 does not address holding times for radiochemical analytes. All radiochemical analyses met the 6-month holding time listed in the SAP. Holding time tables for these analytes have not been included in Attachment 3. With the exception of the ^{14}C and ^{3}H analyses, tracers and spikes are added prior to the digestion.

3.3.1 Gamma Energy Analysis

Gamma energy analysis was performed directly on approximately 60 mL of soil from the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The SAP requires the reporting of all isotopes with positive results above the minimum detectable activity (MDA); therefore, isotopes additional to those required in the SAP were reported when detected. The GEA analysis met all the required detection limits in the SAP. The laboratory was unable to meet any of the target detection limits. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.2 Strontium-89/90

Strontium-89/90 analysis was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. All of the sample analyses met the required and target detection limits. The FSAP and SAP requested ^{90}Sr, not $^{89/90}Sr$, be reported. The 222-S Laboratory only performs the latter analysis. Since the half-life for ^{89}Sr is approximately 51 days and ^{89}Sr has not been produced at Hanford for years, $^{89/90}Sr$ is essentially ^{90}Sr. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.3 Tritium

The ^{3}H analysis by liquid scintillation counting (LSC) was performed on the equipment blank and a water leach of all grab samples and liner composite samples. This method only measured the ^{3}H in the samples that could be dissolved in water. This analysis achieved the required and target detection limit in the FSAP.

Batch 20359: The laboratory failed to include an MS with this batch and did analyze a MS for C7668 as required. This was discussed with the client.

Batch 20794: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.4 Selenium-79

The ^{79}Se analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the target detection limit in the FSAP. No required detection limit was listed. No standard is currently available for ^{79}Se, and a cold carrier is used to monitor recovery and is measured gravimetrically. The ^{14}C LSC curve is used to determine the ^{79}Se results since their energies are similar. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum tracer/carrier recovery is 50%.

Batch 20850: The preparation blank demonstrated a positive result below the quantitation limit, as did the one sample in this batch. All results had very large counting uncertainties and were below the target detection limit. Because of these factors, reanalysis was not required. The associated results have been flagged with a “B”.

3.3.5 Carbon-14

The ^{14}C analysis by LSC was performed on a water leach of the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required detection limit in the FSAP but exceeded the target detection limit. This analysis will only detect water soluble forms of ^{14}C.

Batches 21604 and 22478: There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.6 Nickel-63

The ^{63}Ni analysis by LSC was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. The analysis achieved the required and target detection limits in the FSAP. Since both ^{63}Ni and ^{79}Se use a single digestion batch that is equally split prior to the separation step, the maximum trace/carrier recovery is 50%.

Batch 21309: There were no notable issues with the batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batch 20890: This duplicate for this batch was reanalyzed in batch 21309 along with the other sample that had a positive result for ^{63}Ni. All sample results were below the MDA in the reanalysis.

3.3.7 Iodine-129

Analysis for ^{129}I by low energy GEA was performed on an iodine-specific fusion digest of all grab samples and liner composite samples except for sample B23TK8 (I001) as explained in Section 2.2 of this report. The required and target detection limits in the SAP were met. There were no notable issues with these batches, and all QC requirements in the FSAP, SAP, and the QAPP were met.

3.3.8 Americium-241, Curium-243/244, and Curium-242

Analysis for ^{241}Am, $^{243/244}$Cm, and ^{242}Cm by alpha energy analysis (AEA) was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met. The SAP and FSAP requested ^{243}Cm and ^{244}Cm be reported separately. Since it is not possible to resolve these individual isotopes when using AEA, these isotopes have been reported as $^{243/244}$Cm.

3.3.9 Plutonium-238 and Plutonium-239/240

Plutonium isotopic (^{238}Pu and $^{239/240}$Pu) analysis by AEA was performed on the grab samples and liner composite samples except for samples B23TK8 (I001) and B27130 (I003+4) as explained in Section 2.2 of this report. For this analysis, there were no notable issues with any batches and all QC requirements in the FSAP, SAP, and the QAPP were met. The required and target detection limits in the SAP were met.

3.4 ORGANIC ANALYSES

3.4.1 Volatile Organic Analysis

The VOA by GC/MS was performed on field samples by purge and trap. Due to the instrumentation problem discussed in Section 2.1, the following samples were shipped from the 222-S Laboratory to WSCF for analysis by WRPS:

- Volatile organic samples: B23TM2, B25WM4, and B25WM7
- Field blanks: B23V99, B23VB3, and B23VB4
- Trip blanks: B23VC2 and B23VC3

These samples were received at the 222-S Laboratory prior to shipment to WSCF and were given 222-S Laboratory sample IDs, which appear in Attachment 2. These numbers are for tracking purposes only and will not be used to report results. The WSCF results for these samples are reported in Appendix I and were provided by WRPS. Sample B23V99 was analyzed by both the 222-S Laboratory and WSCF. Both sets of results have been reported (see Attachment 1 and Appendix 1).

Field sampling methods, sample containers, and preservation methods followed SW-846 5035.The soil samples were delivered in a freezer in pre-weighed VOA vials with magnetic stir bars and approximately 5 g of sample. After receipt, the VOA samples were stored in a freezer. For each sample interval, an additional high level sample preserved in methanol was also received. These were not used because none of the results for the frozen samples were above the calibration range. The exact weight of the sample and the tare weight of the VOA vials were recorded by sampling personnel and delivered with the samples. One equipment blank, eight field blanks, and seven trip blanks were also received and analyzed. The samples were preserved with either HCl or H_2SO_4 to a pH < 2.The holding time for all samples is 14 days. All samples analyzed at 222-S Laboratory met the required holding time.

The VOA met the target and required detection limits in the SAP. The SAP and FSAP requested m-xylene and p-xylene be reported separately. Since it is not possible to resolve these individual compounds when performing VOA by SW-846 8260C, these compounds have been reported as m+p xylene. The SAP and FSAP request that methanol be reported with this analysis; however, this compound is too polar to be purged and cannot be reported (see Attachment 7). Isobutanol, another poor purger, was reported as a semivolatile organic compound.

All but one of the field blanks and all trip blanks contained chloroform above the estimated quantification level. Since chloroform is a common chlorination byproduct, the laboratory believes the source of chloroform was the water used by sampling personnel to make the various blanks.

All laboratory blanks for the liquid sample batches contained acetone at a level slightly below the quantitation level, based on the low calibration. Some blanks were 30 to 50 times the MDL. Fortunately, the samples contained only a trace of acetone; most results were below the MDL and all were below the quantitation level. “B” flags have been applied when appropriate. For this reason, reanalysis was not required. The laboratory believes that this relatively high level of acetone in the method blanks was due to contamination in the hydrochloric acid used in the blanks. For analyses performed after these, acetone was only occasionally found in the blank and generally at a level below the quantitation level.

The LCS, MS, and matrix spike duplicat (MSD) recoveries were compared against the laboratory’s statistical process control (SPC) limits, as required by SW-846. The use of SPC limits is allowed in the FSAP, SAP, and QAPP.

Batch 19566: It is apparent from the following discussion that this batch should have been reanalyzed; however, due to a pending instrument outage and an expiring holding time, these are the only results available. With the exception of acetone, all QC failures indicate a high bias; the impact on the data is minimal. Toluene and 2-hexanone were detected in the sample and method

blanks above the MDL and below the quantitation limit. The sample results have been flagged with a “B”. Since the results were below the quantitation limit, reanalysis was not required. The MS failed high for acetone, 2-butanone, 2-hexanone, and hexone. The 2-hexanone result was slightly above the MDL. All results have been flagged with a “b”. Since the 2-hexanone result was below the quantitation limit and flagged with “J”, this result was not affected. All other results were below the MDL. The LCS for acetone failed high, again indicating a high bias, and the result has been flagged with an “a”. Two continuous calibration veritication standards (CCV) were analyzed with this batch; the closing CCV was normal with only two compounds slightly above the ±20% requirement. However, the first CCV had six primary analytes above this requirement. Since the acetone results were below the MDL, the LCS and CCVs are acceptable.

Batch 19680: The LCS recovery for acetone was above the upper limit of 136% at 172%. Due to the holding time limitation, reanalysis was not performed. Since the results for acetone were below the quantitation limit or below the MDL and flagged with a “J”, the data usability was not affected and reanalysis was unnecessary. The results have been flagged with an “a”. The method blank contained acetone as discussed above.

Batch 19878: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required. The method blank contained acetone as discussed above.

Batch 19881: The method blank result for 2-hexanone was above the MDL but below the quantitation limit. The sample result is similar and has been flagged with “B”. Since all results were below the quantitation limit and 2-hexanone is not a primary analyte, reanalysis was not required.

3.4.2 Semivolatile Organic Analysis

The semivolatile organic analysis (SVOA) by GC/MS was performed on methylene chloride extractions of all grab samples and liner composite samples. All holding times were met.

The SVOA analysis met the required and target detection limits with two exceptions:

- The adjusted MDLs for cyclohexanone were above the 0.5 mg/kg target detection limit for most samples. This compound obtained detection limits between 0.5 mg/kg and 0.6 mg/kg.
- The adjusted MDLs for di-n-butyl-phthalate were above the target detection limit of 0.33 mg/kg. The analysis achieved a detection limit of between 0.5 mg/kg and 0.6 mg/kg for this compound.

LCS, MS, and MSD recoveries were compared against the laboratory’s SPC limits, as required by SW-846. The use of SPC limits is permitted in the FSAP, SAP, and QAPP.

The SAP and FSAP requested m-cresol and p- cresol be reported separately. Since it is not possible to resolve these individual compounds when performing SVOA by SW-846 8270C, these compounds have been reported as m+p cresol.

Batch 20093: There were no notable issues with this batch, and all QC requirements in the FSAP, SAP, and the QAPP were met.

Batches 19989, 19999, and 20019: Butylbenzylphthalate was detected in the method blank and samples at slightly above the MDL and below the quantitation limit. Therefore, the blank is acceptable and reanalysis was unnecessary. Sample results have been flagged with a "B".

3.4.3 Tentatively Identified Compounds

Unassigned peaks or TICs were treated as follows. Standards were obtained and analyzed for each secondary analyte identified in the SAP. This data was accumulated in the Hanford library. Following analysis, the largest TICs with instrument responses greater than 10% of the response of the nearest internal standard were evaluated and compared to the Hanford library. The estimated concentration of these TICs was calculated using measured response factors from the Hanford library compound list.

After comparison to the Hanford library, remaining unknowns were compared to National Institute of Standards and Technology (NIST) 02, *HP Mass Spectral (compound) Libraries*. The estimated concentration of compounds identified in the NIST library was calculated based on an arbitrary response factor of 1.0. If the compounds were not identified as a result of this comparison, they were reported as "unknown." Summaries of the SVOA and VOA TICs from the field samples and method blanks are provided in Attachment 5. TICs that were found in the field samples and were present in the associated batch method blank have been flagged with "B".

4.0 PROCEDURES

Table 2 lists the analytical procedures used for analysis of the Area C samples.

Table 2. Analytical Procedures

Analysis	Preparation Method	Analysis Procedure
Inorganic Analyses		
Cyanide	LA-695-103, Rev. J-0 (SW-846 9010C)	LA-695-103, Rev. J-0 (SW-846 9014)
Sulfide	LA-361-101, Rev. D-0 (SW-846 9030B)	LA-361-101, Rev. D-0 (SW-846 9215)
pH (solid)	LA-212-105, Rev. G-0 (SW-846 9045D)	LA-212-105, Rev. G-0 (SW-846 9045D)
Mercury – Cold Vapor Atomic Absorption	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)	LA-325-110, Rev. A-0 (SW-846 7470A, 7471A)
Ammonia – IC	LA-544-112, Rev. E-0	LA-533-101, Rev. Q-0
Anions & Organic Acids – IC	LA-504-101, Rev. L-0	LA-533-115, Rev. J-0
Metals – ICP /AES	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-505-161, Rev. J-0-A (SW-846 6010C)

Analysis	Preparation Method	Analysis Procedure
^{99}Tc, ^{126}Sn – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1
^{99}Tc – ICP/MS	08-ATL-078 Vadose Water Digest	LA-506-102, Rev. F-1
Metals – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-102, Rev. F-1 LA-506-103, Rev. A-0 (SW-846 6020A)
Actinides – ICP/MS	LA-505-163, Rev. G-0 (SW-846 3050B)	LA-506-1-2, Rev. F-1
Radiochemical Analyses		
GEA	Direct	LA-548-121, Rev. I-0
^{90}Sr – Separation/Beta counting (Solid)	LA-544-101, Rev. F-0	LA-220-101, Rev. J-0
^{3}H – LSC	LA-504-101, Rev. L-0	LA-218-111, Rev. G-0
^{14}C – LSC	LA-504-101, Rev. L-0	LA-348-104, Rev. H-0, I-0
^{79}Se – Separation/LSC	LA-544-101, Rev. F-0	LA-365-132, Rev. I-0
^{63}Ni – Separation/LSC	LA-544-101, Rev. F-0	LA-285-102, Rev. E-0
^{129}I – Separation/GEA	LA-378-105, Rev. C-0	LA-378-105, Rev. C-0
^{241}Am, $^{243/244,\ 242}$Cm – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
$^{239/240,\ 238}$Pu – Separation/AEA	LA-544-101, Rev. F-0	LA-953-104, Rev. H-1
Organic Analyses		
VOC – GC/MS	Direct	LA-523-118, Rev. G-O-A (SW-846 8260B)
SVOC – GC/MS	LA-523-138, Rev. F-0 (SW-846 3540C)	LA-523-135, Rev. D-0 (SW-846 8270C)

5.0 REFERENCES

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Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-099	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Campbell / Harris	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I003	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	10-12ft.	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations	N/A		N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	~~3~~ 2 RKS 5/17/10
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B23TL4	SOIL	5/17/10	1400	✓	~~1400~~ RKS 5/17/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Campbell Campbell	5.17.10 1450	RA Steele RA Steele	5.17.10 1450

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

oC TB
O MK

GRP# 20100064
SAM# S10V000193
194

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-102	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I004	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	12-14 ft	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations	N/A		N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C	Cool-6C
TYPE OF CONTAINER	Liner	500mL JAR
NO. OF CONTAINER(S)	1 5/19/10 RRE	1
VOLUME	160g	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B23TL7	SOIL	5/19/10	0855	✓	✓

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Campbell	5-19-10 1040	[signature]	5-19-10 1040

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

TB
Rt

GRPH 20100064
SMH 510V000 210
" 211

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-105	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC	AIR QUALITY ☐	75 Days / 75 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7668 - I005	WMA C Sampling for CMS		V10-003		

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
TFVZ-09-003	TFVZ-09-000001	14-16 ft.	N/A	Govt. Vehicle

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
222-S Lab Operations	N/A	N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
TYPE OF CONTAINER	~~Liner~~ 500mL Jar
NO. OF CONTAINER(S)	~~2~~ 1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B23TM0	SOIL	5/19/10	0945	✓

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Cphill C-pbell	5-19-10 1040	RHSteele	5-19-10 1040

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

SCTB
RK

EXP # 20100064
SAM # S10V000228

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	V10-003-108	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8P	DATA TURNAROUND
Ekstrom / Campbell	SYDNOR, HA	373-3967	BERLIN, PC		
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**	**AIR QUALITY** ☐	75 Days / 75 Days
C7668 - I006	WMA C Sampling for CMS		V10-003		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
TFVZ-09-003	TFVZ-09-000001	16-18 ft	N/A	Govt. Vehicle	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
222-S Lab Operations					

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C	Cool 6C
TYPE OF CONTAINER	Liner	500 mL Jar
NO. OF CONTAINER(S)	~~3~~ 2	1
VOLUME	160g	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	See item (1) in special Instructions

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B23TM3	SOIL	5/20/10	1000	✓	✓								

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Gabe Campbell	5-20-10 1230	R Abel R Steele	5-20-10 1230
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** After VOA bottles for the direct pushes are filled, the sampler will cap remaining liners for shipment to 222-S. Where capping is not possible, the sample shall be put into 500 mL or 250 mL glass bottles with Teflon-lined lids.
(1)Semi-VOA - 8270 Complete (TF); TPH-Gasoline Range - WTPH-G; TPH-Diesel Range - WTPH-D; PCBs - 8082; Pesticides - 8081 (TF); ICP Metals - 6010 (SW-846) (TF); Mercury - 7471 - (CV) (TF); 300.7_AMMONIUM (TF); IC Anions - 9056; Sulfide - 9215; Total Cyanide - 9014 (TF); pH (Soil) - 9045; Americium-241 (TF); C-14; CURIUM; GAMMA ENERGY ANALYSIS (TF); H3 - TRITIUM; I129_SEP_GEA (TF); Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Nickel-63 (TF); RADISO_ICPMS (TF); Selenium-79 (TF); Strontium-89,90 -- Sr-90;

QC TB
QA

QRP# 20100064
SAM# S10V000245
246
247 → JAR

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

Appendix 5

Data Validation Supporting Documentation

Appendix B - Radiochemical Data Validation Checklist

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: WMA C			DATA PACKAGE: VSR11-044		
VALIDATOR: Carl Schloesslin		LAB: 222-S Lab		DATE: 4-27-2011	
			SDG: 20100064		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90 X	Technetium-99	Alpha Spectroscopy X	Gamma Spectroscopy X	Se-79 X
Total Uranium	Radium-22	Tritium X	C-14 X	I-129 X	Ni-63 X

SAMPLES/MATRIX Soil samples

B27130*, B27131**

*Sample B27130 is a composite of samples B23TL4 & B23TL7

**Sample B27131 is a composite of samples B23TM0 & B23TM3

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... Yes (No) N/A

Comments:

For sample B27130, there was insufficient sample to perform gamma, Sr-89/90, Se-79, Ni-63, Am-241/Iso-Cm, and Iso-Pu analyses.

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

3. Continuing Calibration (Levels D, E)..... ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable?..... Yes No N/A

Comments:

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable?..... Yes No N/A

Comments:

5. Blanks (Levels B, C, D, E) ☐ N/A

Method blank analyzed within required frequency? (Yes) No N/A

Method blank results acceptable? (Yes) No N/A

Analytes detected in method blank? (Yes) No N/A

Field blank(s) analyzed? Yes No (N/A)

Field blank results acceptable? Yes No (N/A)

Analytes detected in field blank(s)? Yes No (N/A)

Transcription/Calculation Errors? (Levels D, E) Yes No (N/A)

Comments:

MB Hit: Se-79 4.38E-06 uCi/g

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ☐ N/A

LCS /BSS analyzed within required frequency? Yes (No) N/A

LCS/BSS recoveries acceptable? (Yes) No N/A

LCS/BSS traceable? (Levels D,E) Yes No (N/A)

LCS/BSS expired? (Levels D,E) Yes No (N/A)

LCS/BSS levels correct? (Levels D,E) Yes No (N/A)

Transcription/Calculation Errors? (Levels D, E) Yes No (N/A)

Comments:

No LCS performed for Se-79.

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☐ N/A

Chemical carrier added? ..... (Yes) No N/A

Chemical recovery acceptable? ..... (Yes) No N/A

Chemical carrier traceable? (Levels D, E) ..... Yes No (N/A)

Chemical carrier expired? (Levels D, E) ..... Yes No (N/A)

Transcription/Calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments:

Note - For the Se-79 and Ni-63 soil batches a single dissolved sample was split for the two analyses. This means that the maximum chemical yield for these analyses is 50%.

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... (Yes) No N/A

Tracer recovery acceptable? ..... (Yes) No N/A

Tracer traceable? (Levels D, E) ..... Yes No (N/A)

Tracer expired? (Levels D, E) ..... Yes No (N/A)

Transcription/Calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: None

9. Matrix Spikes (Levels C, D, E)..... ☐ N/A

Matrix spike analyzed?..... Yes (No) N/A

Spike recoveries acceptable? ..... (Yes) No N/A

Spike source traceable? (Levels D, E) ..... Yes No (N/A)

Spike source expired? Levels D, E) ..... Yes No (N/A)

Transcription/Calculation Errors? (Levels D, E)..... Yes No (N/A)

Comments:

C-14 Batch 22478: No MS performed.

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes (No) N/A

RPD Values Acceptable?..... (Yes) No N/A

Transcription/Calculation Errors? (Levels D, E)..... Yes No (N/A)

Comments:

C-14 Batch 22478: No laboratory duplicate performed.
I-129 Batch 22059: No laboratory duplicate performed.

11. Field QC Samples (Levels C, D E) ..... ☐ N/A

Field duplicate sample(s) analyzed? ..... Yes No (N/A)

Field duplicate RPD values acceptable? ..... Yes No (N/A)

Field split sample(s) analyzed? ..... Yes No (N/A)

Field split RPD values acceptable? ..... Yes No (N/A)

Performance audit sample(s) analyzed? ..... Yes No (N/A)

Performance audit sample results acceptable? ..... Yes No (N/A)

Comments:

None

12. Holding Times (All levels)

Are sample holding times acceptable? ..... (Yes) No N/A

Comments: None

13. Results and Detection Limits (All Levels) ..... ☐ N/A

Results reported for all required sample analyses? ..... (Yes) No N/A

Results supported in raw data?(Levels D, E) ..... Yes No (N/A)

Results Acceptable? (Levels D, E) ..... Yes No (N/A)

Transcription/Calculation errors? (Levels D, E) ..... Yes No (N/A)

MDA's meet required detection limits? ..... (Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: None

Appendix 6

Additional Documentation Requested By Client

LABCORE Completed Batch Report for Batch# 00020081

Analyst: Casey, Adam

Book#: 120B64

Instrument: GEA03 B-1A

Method: GEA, LA-548-121 Rev/Mod I-0

Specification: C Farm WMC 2010-1

Prep Batch:

Batch Comment:

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1006150009		0 0			Cobalt-60	LIQUID	.00444	4.5320E-03		4.23	1.03E-04	uCi/mL	102.07	% Recovery	
1	STD	S1006150009		0 0			Cesium-137	LIQUID	.00483	5.1610E-03		5.32	9.57E-05	uCi/mL	106.85	% Recovery	
Sample Sequence 2																	
2	BLNK	S1006150010		0 0			Cobalt-60	LIQUID		<3.0800E-07			3.08E-07	uCi/g			
2	BLNK	S1006150010		0 0			Antimony-125	LIQUID		<6.6800E-07			6.68E-07	uCi/g			
2	BLNK	S1006150010		0 0			Cesium-137	LIQUID		<3.8100E-07			3.81E-07	uCi/g			
2	BLNK	S1006150010		0 0			Europium-152	LIQUID		<1.3700E-06			1.37E-06	uCi/g			
2	BLNK	S1006150010		0 0			Europium-154	LIQUID		<9.1500E-07			9.15E-07	uCi/g			
2	BLNK	S1006150010		0 0			Europium-155	LIQUID		<4.5400E-07			4.54E-07	uCi/g			
2	BLNK	S1006150010		0 0			Thorium-228	LIQUID		<8.1000E-06			8.10E-06	uCi/g			
2	BLNK	S1006150010		0 0			Thorium-234	LIQUID		<2.5600E-06			2.56E-06	uCi/g			
Sample Sequence 3																	
3	SAMPLE	S10V000133		0 0			Cobalt-60	SOLID	N/A	<3.3700E-07			3.37E-07	uCi/g			U
3	SAMPLE	S10V000133		0 0			Antimony-125	SOLID	N/A	<8.2300E-07			8.23E-07	uCi/g			U
3	SAMPLE	S10V000133		0 0			Cesium-137	SOLID	N/A	<4.4200E-07			4.42E-07	uCi/g			U
3	SAMPLE	S10V000133		0 0			Europium-152	SOLID	N/A	<1.4900E-06			1.49E-06	uCi/g			U
3	SAMPLE	S10V000133		0 0			Europium-154	SOLID	N/A	<9.9200E-07			9.92E-07	uCi/g			U
3	SAMPLE	S10V000133		0 0			Europium-155	SOLID	N/A	<5.5400E-07			5.54E-07	uCi/g			U
3	SAMPLE	S10V000133		0 0			Thorium-228	SOLID	N/A	<1.1200E-05			1.12E-05	uCi/g			U
3	SAMPLE	S10V000133		0 0			Thorium-234	SOLID	N/A	<3.4700E-06			3.47E-06	uCi/g			U
3	SAMPLE	S10V000133		0 0			Lead-212	SOLID	N/A	4.8240E-07		43.56	4.48E-07	uCi/g			J
3	SAMPLE	S10V000133		0 0			Lead-214	SOLID	N/A	8.0070E-07		36.12	6.31E-07	uCi/g			J
3	SAMPLE	S10V000133		0 0			Potassium-40	SOLID	N/A	1.1320E-05		37.14	6.39E-06	uCi/g			J
Sample Sequence 4																	
4	SAMPLE	S10V000147		0 0			Cobalt-60	SOLID	N/A	<3.2900E-07			3.29E-07	uCi/g			U
4	SAMPLE	S10V000147		0 0			Antimony-125	SOLID	N/A	<7.5700E-07			7.57E-07	uCi/g			U
4	SAMPLE	S10V000147		0 0			Cesium-137	SOLID	N/A	<3.3000E-07			3.30E-07	uCi/g			U
4	SAMPLE	S10V000147		0 0			Europium-152	SOLID	N/A	<1.4100E-06			1.41E-06	uCi/g			U
4	SAMPLE	S10V000147		0 0			Europium-154	SOLID	N/A	<8.9300E-07			8.93E-07	uCi/g			U
4	SAMPLE	S10V000147		0 0			Europium-155	SOLID	N/A	<4.9400E-07			4.94E-07	uCi/g			U
4	SAMPLE	S10V000147		0 0			Thorium-228	SOLID	N/A	<9.2400E-06			9.24E-06	uCi/g			U

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020081

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
4	SAMPLE	S10V000147		0 0			Thorium-234	SOLID	N/A	<3.2500E-06			3.25E-06	uCi/g			U
4	SAMPLE	S10V000147		0 0			Lead-212	SOLID	N/A	7.2020E-07		30.75	5.47E-07	uCi/g			J
4	SAMPLE	S10V000147		0 0			Potassium-40	SOLID	N/A	1.1420E-05		34.87	6.00E-06	uCi/g			J
Sample Sequence 5																	
5	SAMPLE	S10V000233		0 0			Cobalt-60	SOLID	N/A	<2.7100E-07			2.71E-07	uCi/g			U
5	SAMPLE	S10V000233		0 0			Antimony-125	SOLID	N/A	<7.1500E-07			7.15E-07	uCi/g			U
5	SAMPLE	S10V000233		0 0			Cesium-137	SOLID	N/A	<3.5500E-07			3.55E-07	uCi/g			U
5	SAMPLE	S10V000233		0 0			Europium-152	SOLID	N/A	<1.2800E-06			1.28E-06	uCi/g			U
5	SAMPLE	S10V000233		0 0			Europium-154	SOLID	N/A	<8.4700E-07			8.47E-07	uCi/g			U
5	SAMPLE	S10V000233		0 0			Europium-155	SOLID	N/A	<4.4400E-07			4.44E-07	uCi/g			U
5	SAMPLE	S10V000233		0 0			Thorium-228	SOLID	N/A	<8.8000E-06			8.80E-06	uCi/g			U
5	SAMPLE	S10V000233		0 0			Thorium-234	SOLID	N/A	<3.0000E-06			3.00E-06	uCi/g			U
5	SAMPLE	S10V000233		0 0			Lead-212	SOLID	N/A	8.1570E-07		29.49	5.57E-07	uCi/g			
5	SAMPLE	S10V000233		0 0			Potassium-40	SOLID	N/A	1.0390E-05		36.50	5.77E-06	uCi/g			J
Sample Sequence 6																	
6	SAMPLE	S10V000267		0 0			Cobalt-60	SOLID	N/A	<2.9300E-07			2.93E-07	uCi/g			U
6	SAMPLE	S10V000267		0 0			Antimony-125	SOLID	N/A	<7.0800E-07			7.08E-07	uCi/g			U
6	SAMPLE	S10V000267		0 0			Cesium-137	SOLID	N/A	<3.5200E-07			3.52E-07	uCi/g			U
6	SAMPLE	S10V000267		0 0			Europium-152	SOLID	N/A	<1.2500E-06			1.25E-06	uCi/g			U
6	SAMPLE	S10V000267		0 0			Europium-154	SOLID	N/A	<8.6500E-07			8.65E-07	uCi/g			U
6	SAMPLE	S10V000267		0 0			Europium-155	SOLID	N/A	<4.3000E-07			4.30E-07	uCi/g			U
6	SAMPLE	S10V000267		0 0			Thorium-228	SOLID	N/A	<8.3800E-06			8.38E-06	uCi/g			U
6	SAMPLE	S10V000267		0 0			Thorium-234	SOLID	N/A	<2.8900E-06			2.89E-06	uCi/g			U
6	SAMPLE	S10V000267		0 0			Bismuth-214	SOLID	N/A	7.5930E-07		45.09	5.69E-07	uCi/g			J
6	SAMPLE	S10V000267		0 0			Lead-212	SOLID	N/A	5.2020E-07		39.98	4.60E-07	uCi/g			J
6	SAMPLE	S10V000267		0 0			Lead-214	SOLID	N/A	9.7650E-07		29.51	6.09E-07	uCi/g			
6	SAMPLE	S10V000267		0 0			Potassium-40	SOLID	N/A	8.9320E-06		39.46	5.40E-06	uCi/g			J
Sample Sequence 7																	
7	SAMPLE	S10V000284		0 0			Cobalt-60	SOLID	N/A	<2.7000E-07			2.70E-07	uCi/g			U
7	SAMPLE	S10V000284		0 0			Antimony-125	SOLID	N/A	<7.1800E-07			7.18E-07	uCi/g			U
7	SAMPLE	S10V000284		0 0			Cesium-137	SOLID	N/A	<3.4900E-07			3.49E-07	uCi/g			U
7	SAMPLE	S10V000284		0 0			Europium-152	SOLID	N/A	<1.3400E-06			1.34E-06	uCi/g			U
7	SAMPLE	S10V000284		0 0			Europium-154	SOLID	N/A	<9.2900E-07			9.29E-07	uCi/g			U
7	SAMPLE	S10V000284		0 0			Europium-155	SOLID	N/A	<4.7400E-07			4.74E-07	uCi/g			U
7	SAMPLE	S10V000284		0 0			Thorium-228	SOLID	N/A	<8.8700E-06			8.87E-06	uCi/g			U
7	SAMPLE	S10V000284		0 0			Thorium-234	SOLID	N/A	<3.0200E-06			3.02E-06	uCi/g			U
7	SAMPLE	S10V000284		0 0			Lead-212	SOLID	N/A	5.0060E-07		38.35	4.17E-07	uCi/g			J
7	SAMPLE	S10V000284		0 0			Lead-214	SOLID	N/A	5.8220E-07		44.12	5.57E-07	uCi/g			J
7	SAMPLE	S10V000284		0 0			Potassium-40	SOLID	N/A	1.8070E-05		22.41	5.69E-06	uCi/g			
Sample Sequence 8																	
8	SAMPLE	S10V000301		0 0			Cobalt-60	SOLID	N/A	<2.9700E-07			2.97E-07	uCi/g			U
8	SAMPLE	S10V000301		0 0			Antimony-125	SOLID	N/A	<8.5000E-07			8.50E-07	uCi/g			U

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LABCORE Completed Batch Report for Batch# 00020081

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
8	SAMPLE	S10V000301		0 0			Cesium-137	SOLID	N/A	<4.0700E-07			4.07E-07	uCi/g			U
8	SAMPLE	S10V000301		0 0			Europium-152	SOLID	N/A	<1.5600E-06			1.56E-06	uCi/g			U
8	SAMPLE	S10V000301		0 0			Europium-154	SOLID	N/A	<9.3900E-07			9.39E-07	uCi/g			U
8	SAMPLE	S10V000301		0 0			Europium-155	SOLID	N/A	<5.4900E-07			5.49E-07	uCi/g			U
8	SAMPLE	S10V000301		0 0			Thorium-228	SOLID	N/A	<1.0100E-05			1.01E-05	uCi/g			U
8	SAMPLE	S10V000301		0 0			Thorium-234	SOLID	N/A	<3.4600E-06			3.46E-06	uCi/g			U
8	SAMPLE	S10V000301		0 0			Lead-212	SOLID	N/A	7.6380E-07		49.49	5.92E-07	uCi/g			J
8	SAMPLE	S10V000301		0 0			Potassium-40	SOLID	N/A	1.3960E-05		31.40	6.51E-06	uCi/g			J
Sample Sequence 9																	
9	SAMPLE	S10V001007		0 0			Cobalt-60	SOLID	N/A	<2.9600E-07			2.96E-07	uCi/g			U
9	SAMPLE	S10V001007		0 0			Antimony-125	SOLID	N/A	<7.7700E-07			7.77E-07	uCi/g			U
9	SAMPLE	S10V001007		0 0			Cesium-137	SOLID	N/A	<3.9400E-07			3.94E-07	uCi/g			U
9	SAMPLE	S10V001007		0 0			Europium-152	SOLID	N/A	<1.5000E-06			1.50E-06	uCi/g			U
9	SAMPLE	S10V001007		0 0			Europium-154	SOLID	N/A	<1.0300E-06			1.03E-06	uCi/g			U
9	SAMPLE	S10V001007		0 0			Europium-155	SOLID	N/A	<4.8800E-07			4.88E-07	uCi/g			U
9	SAMPLE	S10V001007		0 0			Thorium-228	SOLID	N/A	<9.4400E-06			9.44E-06	uCi/g			U
9	SAMPLE	S10V001007		0 0			Thorium-234	SOLID	N/A	<3.3000E-06			3.30E-06	uCi/g			U
9	SAMPLE	S10V001007		0 0			Lead-212	SOLID	N/A	4.5590E-07		40.06	3.51E-07	uCi/g			J
9	SAMPLE	S10V001007		0 0			Lead-214	SOLID	N/A	5.7930E-07		49.73	7.05E-07	uCi/g			J
9	SAMPLE	S10V001007		0 0			Potassium-40	SOLID	N/A	1.0680E-05		37.94	6.17E-06	uCi/g			J
Sample Sequence 10																	
10	DUP	S1006150011	S10V001007	0 0			Cobalt-60	SOLID	<2.9600E-07	<3.7500E-07			3.75E-07	uCi/g			
10	DUP	S1006150011	S10V001007	0 0			Antimony-125	SOLID	<7.7700E-07	<8.1900E-07			8.19E-07	uCi/g			
10	DUP	S1006150011	S10V001007	0 0			Cesium-137	SOLID	<3.9400E-07	<4.2000E-07			4.20E-07	uCi/g			
10	DUP	S1006150011	S10V001007	0 0			Europium-152	SOLID	<1.5000E-06	<1.5600E-06			1.56E-06	uCi/g			
10	DUP	S1006150011	S10V001007	0 0			Europium-154	SOLID	<1.0300E-06	<1.0400E-06			1.04E-06	uCi/g			
10	DUP	S1006150011	S10V001007	0 0			Europium-155	SOLID	<4.8800E-07	<5.4100E-07			5.41E-07	uCi/g			
10	DUP	S1006150011	S10V001007	0 0			Thorium-228	SOLID	<9.4400E-06	<1.0000E-05			1.00E-05	uCi/g			
10	DUP	S1006150011	S10V001007	0 0			Thorium-234	SOLID	<3.3000E-06	<3.5000E-06			3.50E-06	uCi/g			
10	DUP	S1006150011	S10V001007	0 0			Lead-212	SOLID	4.5590E-07	6.1260E-07		26.77	4.03E-07	uCi/g	29.331	% RPD	
10	DUP	S1006150011	S10V001007	0 0			Potassium-40	SOLID	1.0680E-05	9.1850E-06		46.73	6.68E-06	uCi/g	15.052	% RPD	

Comments Section:

Data Flagger Status:
Flagging Completed

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LABCORE Completed Batch Report for Batch# 00020081

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Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1006150009	STD				
2	S1006150010	BLNK				
3	S10V000133	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
4	S10V000147	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
5	S10V000233	SAMPLE		20100064	B27131	C Farm WMC 2010-1
6	S10V000267	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
7	S10V000284	SAMPLE		20100064	B25WM5	C Farm WMC 2010-1
8	S10V000301	SAMPLE		20100064	B25WM8	C Farm WMC 2010-1
9	S10V001007	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1
10	S1006150011	DUP	S10V001007			

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LABCORE Completed Batch Report for Batch# 00021908

Analyst: Fabre, Martha **Book#:** 120B64

Instrument: A/B Detector 18 B-1A

Method: STRONTIUM-90, LA-220-101 Rev/Mod I-0

Specification: C Farm WMC 2010-1

Prep Batch: 00021475

Batch Comment: C Farm WMC 2010-2 Gp # 20100064 for Sr-90 Solid. MOF

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1009020056		0 0			Strontium-89/90	LIQUID	.000694820902906604	6.9034E-04		5.857	8.80E-06	uCi/mL	99.356	% Recovery	
1	STD	S1009020056		0 0			Strontium-C	LIQUID		73.926				% Recovery	N/A		
Sample Sequence 2																	
2	BLNK-PREP	S1008230006		0 0	E		Strontium-89/90	SOLID		<6.9928E-07			6.99E-07	uCi/g			
2	BLNK-PREP	S1008230006		0 0	E		Strontium-C	SOLID		71.628				% Recovery			
Sample Sequence 3																	
3	SAMPLE	S10V000140		0 0	E		Strontium-89/90	SOLID	N/A	<1.1895E-06			1.19E-06	uCi/g			U
3	SAMPLE	S10V000140		0 0	E		Strontium-C	SOLID		53.147				% Recovery			
Sample Sequence 4																	
4	SAMPLE	S10V000154		0 0	E		Strontium-89/90	SOLID	N/A	3.7123E-07		114.357	2.71E-07	uCi/g			J
4	SAMPLE	S10V000154		0 0	E		Strontium-C	SOLID		58.042				% Recovery			
Sample Sequence 5																	
5	SAMPLE	S10V000240		0 0	E		Strontium-89/90	SOLID	N/A	<2.6155E-07			2.62E-07	uCi/g			U
5	SAMPLE	S10V000240		0 0	E		Strontium-C	SOLID		61.738				% Recovery			
Sample Sequence 6																	
6	SAMPLE	S10V000274		0 0	E	*	Strontium-89/90	SOLID	N/A	<3.9661E-07			3.97E-07	uCi/g			U
6	SAMPLE	S10V000274		0 0	E	*	Strontium-C	SOLID		39.361				% Recovery			
Sample Sequence 7																	
7	SAMPLE	S10V000291		0 0	E	*	Strontium-89/90	SOLID	N/A	9.4717E-07		74.358	4.33E-07	uCi/g			J
7	SAMPLE	S10V000291		0 0	E	*	Strontium-C	SOLID		37.163				% Recovery			
Sample Sequence 8																	
8	SAMPLE	S10V000308		0 0	E		Strontium-89/90	SOLID	N/A	<2.5968E-07			2.60E-07	uCi/g			U
8	SAMPLE	S10V000308		0 0	E		Strontium-C	SOLID		61.439				% Recovery			
Sample Sequence 9																	
9	SAMPLE	S10V001014		0 0	E		Strontium-89/90	SOLID	N/A	<1.1210E-06			1.12E-06	uCi/g			U
9	SAMPLE	S10V001014		0 0	E		Strontium-C	SOLID		54.545				% Recovery			
Sample Sequence 10																	
10	DUP	S1008230007	S10V001014	0 0	E		Strontium-89/90	SOLID	<1.1210E-06	<7.3520E-07			7.35E-07	uCi/g			
10	DUP	S1008230007	S10V001014	0 0	E		Strontium-C	SOLID	54.545	69.73				% Recovery			

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LABCORE Completed Batch Report for Batch# 00021908

Comments Section:

Data Flagger Status:
Flagging Completed

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LABCORE Completed Batch Report for Batch# 00021908

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1009020056	STD				
2	S1008230006	BLNK-PREP				
3	S10V000140	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
4	S10V000154	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
5	S10V000240	SAMPLE		20100064	B27131	C Farm WMC 2010-1
6	S10V000274	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
7	S10V000291	SAMPLE		20100064	B25WM5	C Farm WMC 2010-1
8	S10V000308	SAMPLE		20100064	B25WM8	C Farm WMC 2010-1
9	S10V001014	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1
10	S1008230007	DUP	S10V001014			

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LABCORE Completed Batch Report for Batch# 00020794

Analyst: Casey, Adam

Book#: 111B64

Instrument: LSC3 LS6500 B-1A

Method: TRITIUM-LARGE VOLUME, LA-218-111 Rev/Mod G-0

Specification: C Farm WMC 2010-1

Prep Batch: 00020195

Batch Comment: C Farm WMC 2010-1. ACC

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1007190120		0 0			Tritium	LIQUID	.00002625831 2621157	2.3089E-05		2.598	2.43E-07	uCi/mL	87.932	% Recovery	
Sample Sequence 2																	
2	BLNK-PREP	S1006210125		0 0	W		Tritium	LIQUID		<3.8300E-06			3.83E-06	uCi/g			
Sample Sequence 3																	
3	SAMPLE	S10V001165		0 0	W		Tritium	SOLID	N/A	<3.8800E-06			3.88E-06	uCi/g			U
Sample Sequence 4																	
4	DUP	S1006210126	S10V001165	0 0	W		Tritium	SOLID	<3.8800E-06	<4.8100E-06			4.81E-06	uCi/g			
Sample Sequence 5																	
5	SAMPLE	S10V001166		0 0	W		Tritium	SOLID	N/A	<4.8200E-06			4.82E-06	uCi/g			U
Sample Sequence 6																	
6	SAMPLE	S10V001168		0 0	W		Tritium	SOLID	N/A	2.5000E-06		136.6	2.45E-06	uCi/g			J
Sample Sequence 7																	
7	SAMPLE	S10V001171		0 0	W		Tritium	SOLID	N/A	<2.9000E-06			2.90E-06	uCi/g			U
Sample Sequence 8																	
8	SAMPLE	S10V001172		0 0	W		Tritium	SOLID	N/A	<3.3000E-06			3.30E-06	uCi/g			U
Sample Sequence 9																	
9	SAMPLE	S10V001173		0 0	W		Tritium	SOLID	N/A	3.4600E-06		124.044	2.48E-06	uCi/g			J
Sample Sequence 10																	
10	SAMPLE	S10V001174		0 0	W		Tritium	SOLID	N/A	2.8700E-06		104.856	2.35E-06	uCi/g			J

Comments Section:

Data Flagger Status:
Flagging Completed

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LABCORE Completed Batch Report for Batch# 00020794

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LABCORE Completed Batch Report for Batch# 00020794

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1007190120	STD				
2	S1006210125	BLNK-PREP				
3	S10V001165	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
4	S1006210126	DUP	S10V001165			
5	S10V001166	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
6	S10V001168	SAMPLE		20100064	B27130	C Farm WMC 2010-1
7	S10V001171	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
8	S10V001172	SAMPLE		20100064	B25WM5	C Farm WMC 2010-1
9	S10V001173	SAMPLE		20100064	B25WM8	C Farm WMC 2010-1
10	S10V001174	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1

Units shown for QC (BLK/BKG) may not reflect the actual units.

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LABCORE Completed Batch Report for Batch# 00020359

Analyst: Casey, Adam

Book#: 111B64

Instrument: LSC3 LS6500 B-1A

Method: TRITIUM-LARGE VOLUME, LA-218-111 Rev/Mod G-0

Specification: C Farm WMC 2010-1

Prep Batch: 00020208

Batch Comment: C Farm 2010-1 H3. ACC

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1006300018		0 0			Tritium	LIQUID	.0000263352	2.4800E-05		2.51	1.48E-07	uCi/mL	94.17	% Recovery	
Sample Sequence 2																	
2	BLNK-PREP	S1006220014		0 0	W		Tritium	LIQUID		<4.0700E-06		194.291	4.07E-06	uCi/g			
Sample Sequence 3																	
3	SAMPLE	S10V001169		0 0	W		Tritium	SOLID	N/A	4.2100E-06		74.703	2.48E-06	uCi/g			J
Sample Sequence 4																	
4	SAMPLE	S10V001175		0 0	W		Tritium	SOLID	N/A	<3.8900E-06			3.89E-06	uCi/g			U
Sample Sequence 5																	
5	SAMPLE	S10V001176		0 0	W		Tritium	SOLID	N/A	<4.8500E-06			4.85E-06	uCi/g			U
Sample Sequence 6																	
6	DUP	S1006220015	S10V001176	0 0	W		Tritium	SOLID	<4.8500E-06	4.2600E-06		86.704	2.50E-06	uCi/g			
Sample Sequence 7																	
7	SPK	S1006300019	S10V001176	0 0			Tritium	SOLID	.0000263352	2.4893E-05		4.012181479	2.51E-07	uCi/g	94.523	% Recovery	
Sample Sequence 8																	
8	SAMPLE	S10V001177		0 0	W		Tritium	SOLID	N/A	4.6500E-06		81.595	2.51E-06	uCi/g			J
Sample Sequence 9																	
9	SAMPLE	S10V001178		0 0	W		Tritium	SOLID	N/A	<4.9400E-06			1.48E-06	uCi/g			U
Sample Sequence 10																	
10	SAMPLE	S10V001179		0 0	W		Tritium	SOLID	N/A	<3.8500E-06			3.85E-06	uCi/g			U
Sample Sequence 11																	
11	SAMPLE	S10V001180		0 0	W		Tritium	SOLID	N/A	3.1500E-06		115.972	2.47E-06	uCi/g			J
Sample Sequence 12																	
12	SAMPLE	S10V001181		0 0	W		Tritium	SOLID	N/A	3.3000E-06		121.89	1.49E-06	uCi/g			J
Sample Sequence 13																	
13	SAMPLE	S10V001182		0 0	W		Tritium	SOLID	N/A	4.3700E-06		85.179	2.50E-06	uCi/g			J
Sample Sequence 14																	
14	SAMPLE	S10V001183		0 0	W		Tritium	SOLID	N/A	<4.0600E-06			4.06E-06	uCi/g			U

Comments Section:

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LABCORE Completed Batch Report for Batch# 00020359

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00020359

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LABCORE Completed Batch Report for Batch# 00020359

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1006300018	STD				
2	S1006220014	BLNK-PREP				
3	S10V001169	SAMPLE		20100064	B27131	C Farm WMC 2010-1
4	S10V001175	SAMPLE		20100213	B23R25	C Farm WMC 2010-1
5	S10V001176	SAMPLE		20100213	B23KN7	C Farm WMC 2010-1
6	S1006220015	DUP	S10V001176			
7	S1006300019	SPK	S10V001176			
8	S10V001177	SAMPLE		20100213	B238J9	C Farm WMC 2010-1
9	S10V001178	SAMPLE		20100213	B25CN2	C Farm WMC 2010-1
10	S10V001179	SAMPLE		20100213	B23KP6	C Farm WMC 2010-1
11	S10V001180	SAMPLE		20100213	B23KP9	C Farm WMC 2010-1
12	S10V001181	SAMPLE		20100213	B23KR2	C Farm WMC 2010-1
13	S10V001182	SAMPLE		20100213	B23KR5	C Farm WMC 2010-1
14	S10V001183	SAMPLE		20100213	B25ND7	C Farm WMC 2010-1

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020850

Analyst: Shaw, Levi

Book#:

Instrument: LSC3 LS6500 B-1A

Method: SELENIUM-79, LA-365-132 Rev/Mod I-0

Specification: C Farm WMC 2010-1

Prep Batch: 00020574, 00021045

Batch Comment: Se-79. LS

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	BLNK-PREP	S1007130006		0 0	E		Selenium-79	LIQUID		4.3800E-06		50.715	1.78E-06	uCi/mL			
1	BLNK-PREP	S1007130006		0 0	E		Selenium-C	LIQUID		28.133				% Recovery			
Sample Sequence 2																	
2	SAMPLE	S10V000141		0 0	E	*	Selenium-79	SOLID	N/A	<1.6100E-06			1.61E-06	uCi/g			U
2	SAMPLE	S10V000141		0 0	E	*	Selenium-C	SOLID		31.37				% Recovery			
Sample Sequence 3																	
3	SAMPLE	S10V000155		0 0	E		Selenium-79	SOLID	N/A	<1.3600E-06			1.36E-06	uCi/g			U
3	SAMPLE	S10V000155		0 0	E		Selenium-C	SOLID		34.357				% Recovery			
Sample Sequence 4																	
4	SAMPLE	S10V000241		0 0	E		Selenium-79	SOLID	N/A	<3.8100E-06			3.81E-06	uCi/g			U
4	SAMPLE	S10V000241		0 0	E		Selenium-C	SOLID		27.386				% Recovery			
Sample Sequence 5																	
5	SAMPLE	S10V000275		0 0	E		Selenium-79	SOLID	N/A	<1.7700E-06			1.77E-06	uCi/g			U
5	SAMPLE	S10V000275		0 0	E		Selenium-C	SOLID		29.129				% Recovery			
Sample Sequence 6																	
6	SAMPLE	S10V000292		0 0	E		Selenium-79	SOLID	N/A	3.9700E-06		82.431	2.22E-06	uCi/g			BJ
6	SAMPLE	S10V000292		0 0	E		Selenium-C	SOLID		25.395				% Recovery			
Sample Sequence 7																	
7	SAMPLE	S10V000309		0 0	E		Selenium-79	SOLID	N/A	<1.6700E-06			1.67E-06	uCi/g			U
7	SAMPLE	S10V000309		0 0	E		Selenium-C	SOLID		33.859				% Recovery			
Sample Sequence 8																	
8	SAMPLE	S10V001015		0 0	E		Selenium-79	SOLID	N/A	<1.4400E-06			1.44E-06	uCi/g			U
8	SAMPLE	S10V001015		0 0	E		Selenium-C	SOLID		36.598				% Recovery			
Sample Sequence 9																	
9	DUP	S1007130007	S10V001015	0 0	E		Selenium-79	SOLID	<1.4400E-06	<3.3200E-06			3.32E-06	uCi/g			
9	DUP	S1007130007	S10V001015	0 0	E		Selenium-C	SOLID	36.598	15.187				% Recovery			

Comments Section:

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020850

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00020850

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020850

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1007130006	BLNK-PREP				
2	S10V000141	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
3	S10V000155	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
4	S10V000241	SAMPLE		20100064	B27131	C Farm WMC 2010-1
5	S10V000275	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
6	S10V000292	SAMPLE		20100064	B25WM5	C Farm WMC 2010-1
7	S10V000309	SAMPLE		20100064	B25WM8	C Farm WMC 2010-1
8	S10V001015	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1
9	S1007130007	DUP	S10V001015			

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00021604

Analyst: Lai, Sue **Book#:** 40B64B

Instrument: LSC2 LS6000 B-1A

Method: CARBON-14, LA-348-104 Rev/Mod H-0

Specification: C Farm WMC 2010-1

Prep Batch: 00021372

Batch Comment: C Farm WMC 2010-1 Gp 20100064 for C-14 scl

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1008260050		0 0			Carbon-14	SOLID	.00120819888763342	1.1353E-03		0.633	1.26E-06	uCi/g	93.968	% Recovery	
Sample Sequence 2																	
2	BLNK-PREP	S1008170104		0 0	W		Carbon-14	LIQUID		<3.4900E-07			3.49E-07	uCi/mL			
Sample Sequence 3																	
3	SAMPLE	S10V002232		0 0	W		Carbon-14	SOLID	N/A	<2.4800E-06			2.48E-06	uCi/g			U
Sample Sequence 4																	
4	DUP	S1008170105	S10V002232	0 0	W		Carbon-14	SOLID	<2.4800E-06	<2.4200E-06			2.42E-06	uCi/g			
Sample Sequence 5																	
5	SPK	S1008260051	S10V002232	0 0			Carbon-14	SOLID	.00120819888763342	1.1508E-03		0.622	1.25E-06	uCi/g	95.252	% Recovery	
Sample Sequence 6																	
6	SAMPLE	S10V002233		0 0	W		Carbon-14	SOLID	N/A	<2.9700E-06			2.97E-06	uCi/g			U
Sample Sequence 7																	
7	SAMPLE	S10V002235		0 0	W		Carbon-14	SOLID	N/A	<2.8100E-06			2.81E-06	uCi/g			U
Sample Sequence 8																	
8	SAMPLE	S10V002237		0 0	W		Carbon-14	SOLID	N/A	<2.4800E-06			2.48E-06	uCi/g			U
Sample Sequence 9																	
9	SAMPLE	S10V002238		0 0	W		Carbon-14	SOLID	N/A	<2.4300E-06			2.43E-06	uCi/g			U
Sample Sequence 10																	
10	SAMPLE	S10V002239		0 0	W		Carbon-14	SOLID	N/A	<4.1700E-06			4.17E-06	uCi/g			U
Sample Sequence 11																	
11	SAMPLE	S10V002240		0 0	W		Carbon-14	SOLID	N/A	<4.7600E-06			4.76E-06	uCi/g			U

Comments Section:

Data Flagger Status:
Flagging Completed

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00021604

Final Page for Batch# 00021604

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00021604

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1008260050	STD				
2	S1008170104	BLNK-PREP				
3	S10V002232	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
4	S1008170105	DUP	S10V002232			
5	S1008260051	SPK	S10V002232			
6	S10V002233	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
7	S10V002235	SAMPLE		20100064	B27130	C Farm WMC 2010-1
8	S10V002237	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
9	S10V002238	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1
10	S10V002239	SAMPLE		20100064	B25WM5	C Farm WMC 2010-1
11	S10V002240	SAMPLE		20100064	B25WM8	C Farm WMC 2010-1

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00022478

Analyst: Lai, Sue

Book#: 40B64B

Instrument: LSC3 LS6500 B-1A

Method: CARBON-14, LA-348-104 Rev/Mod I-0

Specification: C Farm WMC 2010-1

Prep Batch: 00021906

Batch Comment: C Farm WMC 2010-1 for C-14 scl

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1009230099		0 0			Carbon-14	LIQUID	.00120818923361064	1.1486E-03		0.635	1.28E-06	uCi/mL	95.066	% Recovery	
Sample Sequence 2																	
2	BLNK-PREP	S1009230100		0 0			Carbon-14	SOLID		<2.7800E-06			2.78E-06	uCi/g			
Sample Sequence 3																	
3	SAMPLE	S10V002236		0 0	W		Carbon-14	SOLID	N/A	<2.5600E-06			2.56E-06	uCi/g			U

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00022478

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00022478

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1009230099	STD				
2	S1009230100	BLNK-PREP				
3	S10V002236	SAMPLE		20100064	B27131	C Farm WMC 2010-1

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00021309

Analyst: Fabre, Martha **Book#:** 40B54B

Instrument: LSC2 LS6000 B-1A

Method: NICKEL-63, LA-285-102 Rev/Mod E-0

Specification: C Farm WMC 2010-1

Prep Batch: 00021045

Batch Comment: C-Farm 2010 for NI-63 Solid, Group # 20100064. MOF

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1008160009		0 0			Nickel-63	LIQUID	.00436832885 951603	4.4913E-03		0.884	5.58E-06	uCi/mL	102.82	% Recovery	
1	STD	S1008160009		0 0			Nickel-C	LIQUID		83.331				% Recovery	N/A		
Sample Sequence 2																	
2	BLNK-PREP	S1007290005		0 0	E		Nickel-63	SOLID		<5.8700E-06			5.87E-06	uCi/g			
2	BLNK-PREP	S1007290005		0 0	E		Nickel-C	SOLID		39.2				% Recovery			
Sample Sequence 3																	
3	SAMPLE	S10V000141		0 0	E		Nickel-63	SOLID	N/A	<5.4200E-06			5.42E-06	uCi/g			U
3	SAMPLE	S10V000141		0 0	E		Nickel-C	SOLID		50.9				% Recovery			
Sample Sequence 4																	
4	SAMPLE	S10V000241		0 1	E		Nickel-63	SOLID	N/A	<8.7600E-06			8.76E-06	uCi/g			U
4	SAMPLE	S10V000241		0 1	E		Nickel-C	SOLID		50.2				% Recovery			
Sample Sequence 5																	
5	SAMPLE	S10V000275		0 1	E		Nickel-63	SOLID	N/A	<6.8400E-06			6.84E-06	uCi/g			U
5	SAMPLE	S10V000275		0 1	E		Nickel-C	SOLID		41.5				% Recovery			
Sample Sequence 6																	
6	SAMPLE	S10V001015		0 1	E		Nickel-63	SOLID	N/A	<4.8400E-06			4.84E-06	uCi/g			U
6	SAMPLE	S10V001015		0 1	E		Nickel-C	SOLID		46				% Recovery			
Sample Sequence 7																	
7	DUP	S1007290006	S10V001015	0 0	E		Nickel-63	SOLID	<4.8400E-06	<7.1500E-06			7.15E-06	uCi/g			
7	DUP	S1007290006	S10V001015	0 0	E		Nickel-C	SOLID	46	43.3				% Recovery			

Comments Section:

Data Flagger Status:
Flagging Completed

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00021309

Final Page for Batch# 00021309

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00021309

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1008160009	STD				
2	S1007290005	BLNK-PREP				
3	S10V000141	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
4	S10V000241	SAMPLE		20100064	B27131	C Farm WMC 2010-1
5	S10V000275	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
6	S10V001015	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1
7	S1007290006	DUP	S10V001015			

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00022059

Analyst: Painter, JimaLee **Book#:** 82B64

Instrument: GEA06 B-1F

Method: IODINE-129 in SOIL, LA-378-105 Rev/Mod C-0

Specification: C Farm WMC 2010-1

Prep Batch:

Batch Comment: i-129 for C Farm WMC 2010-2 jp

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1009090063		0 0			Iodine-129	LIQUID	.003197	3.4846E-03		4.54	7.59E-06	uCi/mL	109	% Recovery	
1	STD	S1009090063		0 0			Iodine-C	LIQUID		83.052				% Recovery	N/A		
Sample Sequence 2																	
2	BLNK	S1009090064		0 0			Iodine-129	LIQUID		<9.6783E-07			9.68E-07	uCi/mL			
2	BLNK	S1009090064		0 0			Iodine-C	LIQUID		80.426				% Recovery			
Sample Sequence 3																	
3	SAMPLE	S10V000198		0 0			Iodine-129	SOLID	N/A	<1.5890E-07			1.59E-07	uCi/g			U
3	SAMPLE	S10V000198		0 0			Iodine-C	SOLID		86.006				% Recovery			

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00022059

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00022059

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1009090063	STD				
2	S1009090064	BLNK				
3	S10V000198	SAMPLE		20100064	B27130	C Farm WMC 2010-1

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020598

Analyst: Painter, JimaLee **Book#:** 82B64

Instrument: GEA06 B-1F

Method: IODINE-129 in SOIL, LA-378-105 Rev/Mod C-0

Specification: C Farm WMC 2010-1

Prep Batch:

Batch Comment: I-129 for C-Farm group 201000064. jp

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1007130102		0 0			Iodine-129	LIQUID	.00319699982 687642	3.7317E-03		4.55	8.37E-06	uCi/mL	116.73	% Recovery	
1	STD	S1007130102		0 0			Iodine-C	LIQUID		79.427				% Recovery	N/A		
Sample Sequence 2																	
2	BLNK	S1007130103		0 0			Iodine-129	LIQUID		<1.9969E-07			2.00E-07	uCi/mL			
2	BLNK	S1007130103		0 0			Iodine-C	LIQUID		82.052				% Recovery			
Sample Sequence 3																	
3	SAMPLE	S10V000133		0 0			Iodine-129	SOLID	N/A	<1.6749E-07			1.67E-07	uCi/g			U
3	SAMPLE	S10V000133		0 0			Iodine-C	SOLID		83.693				% Recovery			
Sample Sequence 4																	
4	SAMPLE	S10V000147		0 0			Iodine-129	SOLID	N/A	<1.6007E-07			1.60E-07	uCi/g			U
4	SAMPLE	S10V000147		0 0			Iodine-C	SOLID		84.022				% Recovery			
Sample Sequence 5																	
5	SAMPLE	S10V000233		0 0			Iodine-129	SOLID	N/A	<1.7558E-07			1.76E-07	uCi/g			U
5	SAMPLE	S10V000233		0 0			Iodine-C	SOLID		84.35				% Recovery			
Sample Sequence 6																	
6	SAMPLE	S10V000267		0 0			Iodine-129	SOLID	N/A	<1.6480E-07			1.65E-07	uCi/g			U
6	SAMPLE	S10V000267		0 0			Iodine-C	SOLID		78.114				% Recovery			
Sample Sequence 7																	
7	SAMPLE	S10V000284		0 0			Iodine-129	SOLID	N/A	<1.6348E-07			1.63E-07	uCi/g			U
7	SAMPLE	S10V000284		0 0			Iodine-C	SOLID		80.74				% Recovery			
Sample Sequence 8																	
8	SAMPLE	S10V000301		0 0			Iodine-129	SOLID	N/A	<1.8003E-07			1.80E-07	uCi/g			U
8	SAMPLE	S10V000301		0 0			Iodine-C	SOLID		77.786				% Recovery			
Sample Sequence 9																	
9	SAMPLE	S10V001007		0 0			Iodine-129	SOLID	N/A	<1.7944E-07			1.79E-07	uCi/g			U
9	SAMPLE	S10V001007		0 0			Iodine-C	SOLID		76.801				% Recovery			
Sample Sequence 10																	
10	DUP	S1007130104	S10V001007	0 0			Iodine-129	SOLID	<1.7944E-07	<1.9390E-07			1.94E-07	uCi/g			
10	DUP	S1007130104	S10V001007	0 0			Iodine-C	SOLID	76.801	71.878				% Recovery			

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020598

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00020598

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00020598

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1007130102	STD				
2	S1007130103	BLNK				
3	S10V000133	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
4	S10V000147	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
5	S10V000233	SAMPLE		20100064	B27131	C Farm WMC 2010-1
6	S10V000267	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
7	S10V000284	SAMPLE		20100064	B25WM5	C Farm WMC 2010-1
8	S10V000301	SAMPLE		20100064	B25WM8	C Farm WMC 2010-1
9	S10V001007	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1
10	S1007130104	DUP	S10V001007			

Units shown for QC (BLK/BKG) may not reflect the actual units.

* = Rejected Analyte
N, A = Non-reported Analyte

LABCORE Completed Batch Report for Batch# 00021338

Analyst: LaPlant, Gary **Book#:** 31B64

Instrument: A/B Detector 13 B-1A

Method: AMERICIUM, LA-953-104 Rev/Mod H-1

Specification: C Farm WMC 2010-1

Prep Batch: 00021336

Batch Comment: C-Farm WMC 2010-1 for AM-241. gll

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1008160045		0 0			Americium-241	LIQUID	.00007508152 80673125	7.8113E-05		6.29	8.73E-06	uCi/mL	104.04	% Recovery	
1	STD	S1008160045		0 0			Americium-243T	LIQUID		97.857				% Recovery	N/A		
Sample Sequence 2																	
2	BLNK-PREP	S1008160043		0 0	E		Curium-243/244	SOLID		<2.5640E-07			2.56E-07	uCi/g			
2	BLNK-PREP	S1008160043		0 0	E		Americium-241	SOLID		<6.4100E-07			6.41E-07	uCi/g			
2	BLNK-PREP	S1008160043		0 0	E		Americium-243T	SOLID		71.321				% Recovery			
2	BLNK-PREP	S1008160043		0 0	E		Curium-242	SOLID		<2.5640E-07			2.56E-07	uCi/g			
Sample Sequence 3																	
3	SAMPLE	S10V000139		0 1	E		Curium-243/244	SOLID	N/A	<2.0268E-07			2.03E-07	uCi/g			U
3	SAMPLE	S10V000139		0 1	E		Americium-241	SOLID	N/A	<5.0670E-07			5.07E-07	uCi/g			U
3	SAMPLE	S10V000139		0 1	E		Americium-243T	SOLID		87.086				% Recovery			
3	SAMPLE	S10V000139		0 1	E		Curium-242	SOLID	N/A	<2.0268E-07			2.03E-07	uCi/g			U
Sample Sequence 4																	
4	SAMPLE	S10V000153		0 1	E		Curium-243/244	SOLID	N/A	<2.0283E-07			2.03E-07	uCi/g			U
4	SAMPLE	S10V000153		0 1	E		Americium-241	SOLID	N/A	<5.0707E-07			5.07E-07	uCi/g			U
4	SAMPLE	S10V000153		0 1	E		Americium-243T	SOLID		81.699				% Recovery			
4	SAMPLE	S10V000153		0 1	E		Curium-242	SOLID	N/A	<2.0283E-07			2.03E-07	uCi/g			U
Sample Sequence 5																	
5	SAMPLE	S10V000239		0 1	E		Curium-243/244	SOLID	N/A	<2.1236E-07			2.12E-07	uCi/g			U
5	SAMPLE	S10V000239		0 1	E		Americium-241	SOLID	N/A	<5.3089E-07			5.31E-07	uCi/g			U
5	SAMPLE	S10V000239		0 1	E		Americium-243T	SOLID		79.611				% Recovery			
5	SAMPLE	S10V000239		0 1	E		Curium-242	SOLID	N/A	<2.1236E-07			2.12E-07	uCi/g			U
Sample Sequence 6																	
6	SAMPLE	S10V000273		0 1	E	*	Curium-243/244	SOLID	N/A	<1.6227E-07			1.62E-07	uCi/g			U
6	SAMPLE	S10V000273		0 1	E	*	Americium-241	SOLID	N/A	<4.0568E-07			4.06E-07	uCi/g			U
6	SAMPLE	S10V000273		0 1	E	*	Americium-243T	SOLID		136.3				% Recovery			
6	SAMPLE	S10V000273		0 1	E	*	Curium-242	SOLID	N/A	<1.6227E-07			1.62E-07	uCi/g			U
Sample Sequence 7																	
7	SAMPLE	S10V000290		0 1	E		Curium-243/244	SOLID	N/A	<2.1656E-07			2.17E-07	uCi/g			U
7	SAMPLE	S10V000290		0 1	E		Americium-241	SOLID	N/A	<5.4141E-07			5.41E-07	uCi/g			U
7	SAMPLE	S10V000290		0 1	E		Americium-243T	SOLID		77.922				% Recovery			

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LABCORE Completed Batch Report for Batch# 00021338

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
7	SAMPLE	S10V000290		0 1	E		Curium-242	SOLID	N/A	<2.1656E-07			2.17E-07	uCi/g			U
Sample Sequence 8																	
8	SAMPLE	S10V000307		0 1	E		Curium-243/244	SOLID	N/A	<1.8743E-07			1.87E-07	uCi/g			U
8	SAMPLE	S10V000307		0 1	E		Americium-241	SOLID	N/A	<4.6858E-07			4.69E-07	uCi/g			U
8	SAMPLE	S10V000307		0 1	E		Americium-243T	SOLID		86.139				% Recovery			
8	SAMPLE	S10V000307		0 1	E		Curium-242	SOLID	N/A	<1.8743E-07			1.87E-07	uCi/g			U
Sample Sequence 9																	
9	SAMPLE	S10V001013		0 1	E		Curium-243/244	SOLID	N/A	<1.8433E-07			1.84E-07	uCi/g			U
9	SAMPLE	S10V001013		0 1	E		Americium-241	SOLID	N/A	<4.6083E-07			4.61E-07	uCi/g			U
9	SAMPLE	S10V001013		0 1	E		Americium-243T	SOLID		93.621				% Recovery			
9	SAMPLE	S10V001013		0 1	E		Curium-242	SOLID	N/A	<1.8433E-07			1.84E-07	uCi/g			U
Sample Sequence 10																	
10	DUP	S1008160044	S10V001013	0 0	E		Curium-243/244	SOLID	<1.8433E-07	<1.7311E-07			1.73E-07	uCi/g			
10	DUP	S1008160044	S10V001013	0 0	E		Americium-241	SOLID	<4.6083E-07	<4.3279E-07			4.33E-07	uCi/g			
10	DUP	S1008160044	S10V001013	0 0	E		Americium-243T	SOLID	93.621	90.265				% Recovery			
10	DUP	S1008160044	S10V001013	0 0	E		Curium-242	SOLID	<1.8433E-07	<1.7311E-07			1.73E-07	uCi/g			

Comments Section:

Data Flagger Status:
Flagging Completed

Final Page for Batch# 00021338

Reviewer Signature **Date**

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LABCORE Completed Batch Report for Batch# 00021338

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1008160045	STD				
2	S1008160043	BLNK-PREP				
3	S10V000139	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
4	S10V000153	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
5	S10V000239	SAMPLE		20100064	B27131	C Farm WMC 2010-1
6	S10V000273	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
7	S10V000290	SAMPLE		20100064	B25WM5	C Farm WMC 2010-1
8	S10V000307	SAMPLE		20100064	B25WM8	C Farm WMC 2010-1
9	S10V001013	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1
10	S1008160044	DUP	S10V001013			

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LABCORE Completed Batch Report for Batch# 00021333

Analyst: LaPlant, Gary **Book#:** 31B64

Instrument: A/B Detector 23 B-1A

Method: PLUTONIUM, LA-953-104 Rev/Mod H-1

Specification: C Farm WMC 2010-1

Prep Batch: 00021044

Batch Comment: C-Farm WMC 2010-1 for PU-239. gll

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
Sample Sequence 1																	
1	STD	S1008160041		0 0			Pu-239/240	LIQUID	.0000971903106323761	9.7034E-05		6.92	6.77E-06	uCi/mL	99.839	% Recovery	
1	STD	S1008160041		0 0			Plutonium-236T	LIQUID		79.035				% Recovery	N/A		
Sample Sequence 2																	
2	BLNK-PREP	S1007290003		0 0	E		Pu-239/240	SOLID		<3.5484E-07			3.55E-07	uCi/g			
2	BLNK-PREP	S1007290003		0 0	E		Plutonium-236T	SOLID		65.136				% Recovery			
2	BLNK-PREP	S1007290003		0 0	E		Plutonium-238	SOLID		<3.5484E-07			3.55E-07	uCi/g			
Sample Sequence 3																	
3	SAMPLE	S10V000139		0 1	E		Pu-239/240	SOLID	N/A	<3.7221E-07			3.72E-07	uCi/g			U
3	SAMPLE	S10V000139		0 1	E		Plutonium-236T	SOLID		63.335				% Recovery			
3	SAMPLE	S10V000139		0 1	E		Plutonium-238	SOLID	N/A	<3.7221E-07			3.72E-07	uCi/g			U
Sample Sequence 4																	
4	SAMPLE	S10V000153		0 1	E		Pu-239/240	SOLID	N/A	<2.8565E-07			2.86E-07	uCi/g			U
4	SAMPLE	S10V000153		0 1	E		Plutonium-236T	SOLID		77.066				% Recovery			
4	SAMPLE	S10V000153		0 1	E		Plutonium-238	SOLID	N/A	<2.8565E-07			2.86E-07	uCi/g			U
Sample Sequence 5																	
5	SAMPLE	S10V000239		0 1	E		Pu-239/240	SOLID	N/A	<3.1337E-07			3.13E-07	uCi/g			U
5	SAMPLE	S10V000239		0 1	E		Plutonium-236T	SOLID		71.54				% Recovery			
5	SAMPLE	S10V000239		0 1	E		Plutonium-238	SOLID	N/A	<3.1337E-07			3.13E-07	uCi/g			U
Sample Sequence 6																	
6	SAMPLE	S10V000273		0 1	E		Pu-239/240	SOLID	N/A	<2.1413E-07			2.14E-07	uCi/g			U
6	SAMPLE	S10V000273		0 1	E		Plutonium-236T	SOLID		100.33				% Recovery			
6	SAMPLE	S10V000273		0 1	E		Plutonium-238	SOLID	N/A	<2.1413E-07			2.14E-07	uCi/g			U
Sample Sequence 7																	
7	SAMPLE	S10V000290		0 1	E		Pu-239/240	SOLID	N/A	<3.1325E-07			3.13E-07	uCi/g			U
7	SAMPLE	S10V000290		0 1	E		Plutonium-236T	SOLID		73.799				% Recovery			
7	SAMPLE	S10V000290		0 1	E		Plutonium-238	SOLID	N/A	<3.1325E-07			3.13E-07	uCi/g			U
Sample Sequence 8																	
8	SAMPLE	S10V000307		0 1	E		Pu-239/240	SOLID	N/A	<2.6978E-07			2.70E-07	uCi/g			U
8	SAMPLE	S10V000307		0 1	E		Plutonium-236T	SOLID		81.453				% Recovery			
8	SAMPLE	S10V000307		0 1	E		Plutonium-238	SOLID	N/A	<2.6978E-07			2.70E-07	uCi/g			U
Sample Sequence 9																	

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LABCORE Completed Batch Report for Batch# 00021333

Seq	Type	Sample#	Assoc. Sample	RepR	A	*	Test	Matrix	Actual	Found	Blank	CTR	Limit (DL/RL/UL)	Unit	Yield	Yield Unit	Flags
9	SAMPLE	S10V001013		0 1	E		Pu-239/240	SOLID	N/A	<3.2130E-07			3.21E-07	uCi/g			U
9	SAMPLE	S10V001013		0 1	E		Plutonium-236T	SOLID		74.227				% Recovery			
9	SAMPLE	S10V001013		0 1	E		Plutonium-238	SOLID	N/A	<3.2130E-07			3.21E-07	uCi/g			U
Sample Sequence 10																	
10	DUP	S1007290004	S10V001013	0 0	E		Pu-239/240	SOLID	<3.2130E-07	<2.5540E-07			2.55E-07	uCi/g			
10	DUP	S1007290004	S10V001013	0 0	E		Plutonium-236T	SOLID	74.227	85.921				% Recovery			
10	DUP	S1007290004	S10V001013	0 0	E		Plutonium-238	SOLID	<3.2130E-07	<2.5540E-07			2.55E-07	uCi/g			

Comments Section:

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Flagging Completed

Final Page for Batch# 00021333

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LABCORE Completed Batch Report for Batch# 00021333

Seq	Sample#	QC Type	Assoc. Sample	Sample Group	Customer Id	Specification
1	S1008160041	STD				
2	S1007290003	BLNK-PREP				
3	S10V000139	SAMPLE		20100064	B23TK2	C Farm WMC 2010-1
4	S10V000153	SAMPLE		20100064	B23TK5	C Farm WMC 2010-1
5	S10V000239	SAMPLE		20100064	B27131	C Farm WMC 2010-1
6	S10V000273	SAMPLE		20100064	B23TM6	C Farm WMC 2010-1
7	S10V000290	SAMPLE		20100064	B25WM5	C Farm WMC 2010-1
8	S10V000307	SAMPLE		20100064	B25WM8	C Farm WMC 2010-1
9	S10V001013	SAMPLE		20100064	B25WM2	C Farm WMC 2010-1
10	S1007290004	DUP	S10V001013			

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