REVIEW COMMENT RECORD (RCR)	1. Date 04/26/2011	2. Review No.
	3. Project No.	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
VSR11-041, Data Validation Report for CHPRC - Project 200 Area SGRP, Chemical and Radiochemical Validation - Level C	S&GRP Sample Data Groups (SDGs); H4424, SL876, W05803, W05804 W06058, WSCF100307, WSCF102360, WSCF103048, WSCF103087, and 222S20100241	JA Edwards	Environmental Quality Assurance (EQA)	2420 Stevens Rm. 345 376-4324

17. Comment Submittal Approval	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
Date / Organization Manager (optional) (print and sign)	JA Edwards / JA Edwards Reviewer/Point of Contact (print and sign) 04/27/2011 Date Author/Originator (print and sign)	JA Edwards / JA Edwards Reviewer/Point of Contact (print and sign) 04/27/2011 Date Author/Originator (print and sign)

12. Item	13a. Comments	13b. Basis	13c. Recommendation	14. Reviewer Concurrence Required (Y or N)	15. Disposition (provide justification if **NOT** accepted)	16. Status
1	(Page 11 of 243) Volatile Organics Data Qualification Summary Analyte(s); Toluene, Qualifier; 'J' (Pages 14, and 17 of 243) Client Sample ID: B23CT3 & B23CX3	Incorrect Client Sample ID on the *Volatile Organics Data Qualification Summary*	REMOVE: B23CX3 ADD: B23CT3 On page 11 of 243	Y	Change made	CLOSED

Documents:

HNF-20433, Rev.0, *Data Validation Procedure for Chemical Analyses*, June 2004
HNF-20434, Rev.0, *Data Validation Procedure for Radiochemical Analyses*, June 2004
DOE/RL-2009-95, Rev. 0, *Sampling and Analysis Plan for Eleven ARRA Wells to Support the 200 West Groundwater Treatment System in FY 2010*, October 2009
GRP-GD-002, Rev. 0, Change 0, *Data Validation for Radiochemical Analyses*, August 2010
GRP-GD-003, Rev. 0, Change 0, *Data Validation for Chemical Analyses*, August 2010
LA-265-403: Hexavalent Chromium Anaysis By Spectrophotometer or Discrete Analyzer, D-4, 03/30/10
LA-505-412: Inductively Coupled Plasma-Mass Spectrometry (ICP/MS) for Trace Elements in Water and Solids, H-2, 04/11/2011
LA-523-455, *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry*
LA-533-410: Anion Analysis By Ion Chromatography, E-5, 06/15/10
LA-508-421: Operation of the Tri-Carb Model 2500TR Liquid Scintillation Analyzer, D-3, 05/12/10

CHPRC - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
04/26/2011	
3. Project No.	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
VSR11-041		Scot Fitzgerald	Analytical Support Group	2753/373-7495

17. Comment Submittal Approval	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
Date / Organization Manager (optional) (print and sign)	Scot Fitzgerald — Reviewer/Point of Contact (print and sign) 04/26/2011 — Date Author/Originator (print and sign)	Scot Fitzgerald — Reviewer/Point of Contact (print and sign) 4/27/2011 — Date Author/Originator (print and sign)

12. Item	13a. Comments	13b. Basis	13c. Recommendation	14. Reviewer Concurrence Required (Y or N)	15. Disposition (provide justification if NOT accepted)	16. Status
1	On page 4 of 243 - first paragraph, the toluene J flag references sample number from B23CX3.	Incorrect sample number referenced	Change the toluene J flag sample number from B23CX3 to B23CT3.	Y	Change made	closed
2	On page 11 of 243 Toluene J flag references sample B23CX3	"	Change the toluene J flag sample number from B23CX3 to B23CT3	Y	Change made	closed

ANALYTICAL QUALITY ASSOCIATES, INC.
616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Data Validation Report for CH2M Hill Plateau Remediation Company

VSR11-041
Project 200 Area SGRP

Chemical & Radiochemical Validation - Level C

Validation Performed By: Eyda Hergenreder **Date:** 4-21-2011
Eyda Hergenreder

Validation Reviewed By: Carl Schlosser **Date:** 4-21-2011

TABLE OF CONTENTS

Volatile Organics

Memorandum 3
Appendix 1 – Glossary of Data Reporting Qualifiers 8
Appendix 2 – Summary of Data Qualification 10
Appendix 3 – Annotated Laboratory Reports 13
Appendix 4 – Laboratory Narrative and Chain-of-Custody Documentation 29
Appendix 5 – Data Validation Supporting Documentation 51
Appendix 6 – Additional Documentation Requested By Client 58

Inorganics

Memorandum 80
Appendix 1 – Glossary of Data Reporting Qualifiers 84
Appendix 2 – Summary of Data Qualification 86
Appendix 3 – Annotated Laboratory Reports 88
Appendix 4 – Laboratory Narrative and Chain-of-Custody Documentation 94
Appendix 5 – Data Validation Supporting Documentation 106
Appendix 6 – Additional Documentation Requested By Client 113

General Chemistry

Memorandum 123
Appendix 1 – Glossary of Data Reporting Qualifiers 127
Appendix 2 – Summary of Data Qualification 129
Appendix 3 – Annotated Laboratory Reports 131
Appendix 4 – Laboratory Narrative and Chain-of-Custody Documentation 138
Appendix 5 – Data Validation Supporting Documentation 166
Appendix 6 – Additional Documentation Requested By Client 172

Radiochemical

Memorandum 185
Appendix 1 – Glossary of Data Reporting Qualifiers 189
Appendix 2 – Summary of Data Qualification 191
Appendix 3 – Annotated Laboratory Reports 193
Appendix 4 – Laboratory Narrative and Chain-of-Custody Documentation 203
Appendix 5 – Data Validation Supporting Documentation 222
Appendix 6 – Additional Documentation Requested By Client 229

Date: 21 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: 200 Area SGRP
Subject: Volatile Organics - Sample Data Groups (SDGs) SL876, WSCF102360, WSCF103048 and 222S20100241

INTRODUCTION

This memorandum presents the results of data validation for SDG SL876 prepared by TestAmerica, SDGs WSCF102360 and WSCF103048 prepared by WSCF Analytical Laboratories and SDG 222S20100241 prepared by 222-S Lab Operations. 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
B23CT3	02/05/10	Water	C	8260B
B23CX3	02/05/10	Water	C	8260B
B23WW1	09/01/10	Water	C	8260B
B24116	09/01/10	Water	C	8260B
B24J97	11/17/10	Water	C	8260B
B24JJ5	11/17/10	Water	C	8260B
B23C74	03/08/10	Water	C	8260B

Data validation was conducted in accordance with the CHPRC validation statement of work and the Sampling and Analysis Plan for Eleven ARRA Wells to Support the 200 West Groundwater Treatment System in FY 2010, DOE/RL-2009-95, Rev. 0 (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 requires chilling to 4 degrees Celsius and acid preservation with hydrochloric or sulfuric acid to pH <2.

The samples were analyzed within the prescribed holding time and properly preserved with the following exception.

For SDG SL876, samples B23CT3 and B23CX3 were received at 12 degree Celsius. Based on professional judgment, the acetone, chloroform and carbon tetrachloride results for both samples and the toluene result for sample B23CT3 were detects and should be qualified as estimates and flagged "J." The bromomethane result for sample B23CT3 was a detect and would be flagged as "J," but was further qualified as a non-detect estimate at the reporting limit (RL) due to laboratory blank contamination. The remaining sample results were non-detects and should be qualified as estimates and flagged "UJ."

- **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 SDG SL876, the bromomethane laboratory blank result was > the method detection limit (MDL) but < the RL. The bromomethane result for sample B23CT3 was a detect < the RL and would be qualified as a non-detect at the RL (2.0 µg/L) and flagged "U," but was further flagged "UJ" due to temperature infraction. The bromomethane result for sample B23CX3 was a non-detect and should not be qualified for the blank infraction.

For SDG 222S20100241, the acetone laboratory blank result was > the MDL. The acetone result for sample B23C74 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 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 80% to 120%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

Surrogates

All surrogate recoveries were acceptable.

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

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

For SDG SL876, the MS and/or MSD recoveries for chloromethane, vinyl chloride, chloroethane, acetone, 1,1-dichloroethane, carbon tetrachloride, 1,2-dichloroethane, 4-methyl-2-pentanone, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,1,2-trichloroethane, 2-hexanone, chlorobenzene and 1,1,2,2-tetrachloroethane were below the lower acceptance limit. The acetone and carbon tetrachloride results for samples B23CT3 and B23CX3 were detects and should be qualified as estimates and flagged "J." All other results for samples B23CT3 and B23CX3 were non-detects and should be qualified as estimates and flagged "UJ."

For the two WSCF SDGs, the only 8260B MS/MSD analytes reported were 1,1-dichloroethene, benzene, chlorobenzene, toluene and trichloroethene. Reported analytes not represented in the MS/MSDs were cis-1,3-dichloropropene, trans-1,3-dichloropropene, methyl isobutyl ketone, 2-hexanone, acetone, carbon disulfide, bromodichloromethane and methyl ethyl ketone. All sample results for these non-represented analytes were non-detects and should be qualified as estimates and flagged “UJ.”

For SDG WSCF102360, the MS and MSD recoveries for 1,1-dichloroethene were below the lower acceptance limit. The chloroform results for samples B23WW1 and B24116 were detects and should be qualified as estimates and flagged "J." All other reported analytes represented by 1,1-dichloroethene were non-detects and should be qualified as estimates and flagged "UJ." See the table in Appendix 2 for a listing of all affected sample results

For SDG WSCF103048, the MS and MSD recoveries for 1,1-dichloroethene were above the upper acceptance limit. The chloroform results for samples B24J97 and B24JJ5 were detects and should be qualified as estimates and flagged "J." All other reported analytes represented by 1,1-dichloroethene were non-detects and should be not be qualified.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable with the following exceptions.

For SDG SL876, the LCS recovery for chloromethane was below the lower acceptance limit. The chloromethane results for samples B23CT3 and B23CX3 were non-detects and should be qualified as estimates and flagged "UJ."

For the two WSCF SDGs, the only 8260B LCS analytes reported were 1,1-dichloroethene, benzene, chlorobenzene, toluene and trichloroethene. Reported analytes not represented in the LCSs were cis-1,3-dichloropropene, trans-1,3-dichloropropene, methyl isobutyl ketone, 2-hexanone, acetone, carbon disulfide, bromodichloromethane and methyl ethyl ketone. All

sample results for these non-represented analytes were non-detects and should be qualified as estimates and flagged “UJ.”

For SDG WSCF102360, the LCS recovery for 1,1-dichloroethene was below the lower acceptance limit. The chloroform results for samples B23WW1 and B24116 were detects and should be qualified as estimates and flagged "J." All other reported analytes represented by 1,1-dichloroethene were non-detects and should be qualified as estimates and flagged "UJ." See the table in Appendix 2 for listing of all affected sample results.

For SDG WSCF103048, the LCS recovery for 1,1-dichloroethene was above the upper acceptance limit. The chloroform results for samples B24J97 and B24JJ5 were detects and should be qualified as estimates and flagged "J." All other reported analytes represented by 1,1-dichloroethene were non-detects and should not be qualified.

- **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 ±20%. The 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 reported limits with differences <1X the required detection limits no precision infraction occurred.

MS/MSD Samples

All MS/MSD RPD values were acceptable.

Field Duplicate Samples

All field duplicate results were acceptable with the following exception.

For SDG WSCF103048, sample B24J97 and its duplicate B24JJ5 had a carbon tetrachloride RPD above the upper acceptance limit.

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**

SDGs SL876, WSCF102360, WSCF103048 and 222S20100241 were 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.

DOE/RL-2009-95, Rev. 0, *Sampling and Analysis Plan for Eleven ARRA Wells to Support the 200 West Groundwater Treatment System in FY 2010*, October 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: SL876, WSCF102360, WSCF103048, 222S20100241	Reviewer: AQA	Project: 200 Area SGRP	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
bromomethane	2.0UJ	B23CT3	Sample temperature >6°C and laboratory blank contamination
acetone carbon tetrachloride	J	B23CT3, B23CX3	Sample temperature >6°C and low MS or MSD recoveries
chloromethane	UJ	B23CT3, B23CX3	Sample temperature >6°C and low MS/MSD and LCS recoveries
vinyl chloride chloroethane 1,1-dichloroethane 1,2-dichloroethane 4-methyl-2-pentanone cis-1,3-dichloropropene trans-1,3-dichloropropene 1,1,2-trichloroethane 2-hexanone chlorobenzene 1,1,2,2-tetrachloroethane	UJ	B23CT3, B23CX3	Sample temperature >6°C and low MS and/or MSD recoveries
chloroform	J	B23CT3, B23CX3	Sample temperature >6°C
toluene	J	B23CT3	Sample temperature >6°C
bromomethane toluene	UJ	B23CX3	Sample temperature >6°C
1,1-dichloroethene methylene chloride carbon disulfide 2-butanone total 1,2-dichloroethene 1,1,1-trichloroethane benzene trichloroethene 1,2-dichloropropane bromodichloromethane tetrachloroethene dibromochloromethane ethylbenzene total xylenes	UJ	B23CT3, B23CX3	Sample temperature >6°C

styrene bromoform			
cis-1,3-dichloropropene trans-1,3-dichloropropene methyl isobutyl ketone 2-hexanone acetone carbon disulfide bromodichloromethane methyl ethyl ketone	UJ	B23WW1, B24116, B24J97, B24JJ5	Non-represented MS/MSD and LCS data
1,1-dichloroethene 1,1-dichloroethane 1,2-dichloroethane total 1,2-dichloroethene bromomethane chloromethane chloroethane vinyl chloride methylene chloride bromoform 1,2-dichloropropane	UJ	B23WW1, B24116	Low MS/MSD and LCS recoveries
chloroform	J	B23WW1, B24116	Low MS/MSD and LCS recoveries
chloroform	J	B24J97, B24JJ5	High MS/MSD recoveries

Comments: None

Appendix 3

Annotated Laboratory Reports

CH2M Hill Plateau Remediation (ARRA)

Client Sample ID: B23CT3

GC/MS Volatiles

Lot-Sample #...: F0B080466-001 Work Order #...: LVEML1AA Matrix.....: WATER
Date Sampled...: 02/05/10 Date Received..: 02/08/10
Prep Date.....: 02/16/10 Analysis Date..: 02/16/10
Prep Batch #...: 0048151
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER		RESULT	REPORTING LIMIT	UNITS	MDL
Chloromethane	UJ	ND	2.0	ug/L	0.086
Vinyl chloride	UJ	ND	2.0	ug/L	0.091
Bromomethane	2.0UJ	**0.12 J,B**	**2.0**	**ug/L**	**0.096**
Chloroethane	UJ	ND	2.0	ug/L	0.085
Acetone	J	**1.1 J**	**2.0**	**ug/L**	**0.42**
1,1-Dichloroethene	UJ	ND	1.0	ug/L	0.11
Methylene chloride	UJ	ND	1.0	ug/L	0.10
Carbon disulfide	UJ	ND	1.0	ug/L	0.52
1,1-Dichloroethane	UJ	ND	1.0	ug/L	0.083
2-Butanone	UJ	ND	5.0	ug/L	0.83
1,2-Dichloroethene (total)	UJ	ND	2.0	ug/L	0.21
Chloroform	J	**1.1**	**1.0**	**ug/L**	**0.067**
1,1,1-Trichloroethane	UJ	ND	1.0	ug/L	0.088
Carbon tetrachloride	J	**6.6**	**1.0**	**ug/L**	**0.073**
1,2-Dichloroethane	UJ	ND	1.0	ug/L	0.050
Benzene	UJ	ND	1.0	ug/L	0.060
Trichloroethene	UJ	ND	1.0	ug/L	0.091
1,2-Dichloropropane	UJ	ND	1.0	ug/L	0.054
Bromodichloromethane	UJ	ND	1.0	ug/L	0.098
4-Methyl-2-pentanone	UJ	ND	5.0	ug/L	0.32
cis-1,3-Dichloropropene	UJ	ND	1.0	ug/L	0.099
Toluene	J	**0.076 J**	**1.0**	**ug/L**	**0.070**
trans-1,3-Dichloropropene	UJ	ND	1.0	ug/L	0.23
1,1,2-Trichloroethane	UJ	ND	1.0	ug/L	0.071
2-Hexanone	UJ	ND	5.0	ug/L	1.3
Tetrachloroethene	UJ	ND	1.0	ug/L	0.065
Dibromochloromethane	UJ	ND	1.0	ug/L	0.21
Chlorobenzene	UJ	ND	1.0	ug/L	0.060
Ethylbenzene	UJ	ND	1.0	ug/L	0.11
Xylenes (total)	UJ	ND	3.0	ug/L	0.22
Styrene	UJ	ND	1.0	ug/L	0.042
Bromoform	UJ	ND	1.0	ug/L	0.15
1,1,2,2-Tetrachloroethane	UJ	ND	1.0	ug/L	0.11

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	95	(68 - 118)
Dibromofluoromethane	96	(75 - 121)
1,2-Dichloroethane-d4	89	(67 - 132)
4-Bromofluorobenzene	98	(77 - 113)

(Continued on next page)

EH
04/21/11

CH2M Hill Plateau Remediation (ARRA)

Client Sample ID: B23CT3

GC/MS Volatiles

Lot-Sample #...: F0B080466-001 Work Order #...: LVEML1AA Matrix.....: WATER

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

CH2M Hill Plateau Remediation (ARRA)

B23CT3

GC/MS Volatiles

Lot-Sample #: F0B080466-001 **Work Order #:** LVEML1AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/L

CH2M Hill Plateau Remediation (ARRA)

Client Sample ID: B23CX3

GC/MS Volatiles

Lot-Sample #...: F0B080466-002 Work Order #...: LVEMX1AA Matrix.....: WATER
Date Sampled...: 02/05/10 Date Received..: 02/08/10
Prep Date.....: 02/16/10 Analysis Date..: 02/16/10
Prep Batch #...: 0048151
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER		RESULT	REPORTING LIMIT	UNITS	MDL
Chloromethane	UJ	ND	2.0	ug/L	0.086
Vinyl chloride	UJ	ND	2.0	ug/L	0.091
Bromomethane	UJ	ND	2.0	ug/L	0.096
Chloroethane	UJ	ND	2.0	ug/L	0.085
Acetone	J	**0.98 J**	**2.0**	**ug/L**	**0.42**
1,1-Dichloroethene	UJ	ND	1.0	ug/L	0.11
Methylene chloride	UJ	ND	1.0	ug/L	0.10
Carbon disulfide	UJ	ND	1.0	ug/L	0.52
1,1-Dichloroethane	UJ	ND	1.0	ug/L	0.083
2-Butanone	UJ	ND	5.0	ug/L	0.83
1,2-Dichloroethene (total)	UJ	ND	2.0	ug/L	0.21
Chloroform	J	**1.1**	**1.0**	**ug/L**	**0.067**
1,1,1-Trichloroethane	UJ	ND	1.0	ug/L	0.088
Carbon tetrachloride	J	**7.1**	**1.0**	**ug/L**	**0.073**
1,2-Dichloroethane	UJ	ND	1.0	ug/L	0.050
Benzene	UJ	ND	1.0	ug/L	0.060
Trichloroethene	UJ	ND	1.0	ug/L	0.091
1,2-Dichloropropane	UJ	ND	1.0	ug/L	0.054
Bromodichloromethane	UJ	ND	1.0	ug/L	0.098
4-Methyl-2-pentanone	UJ	ND	5.0	ug/L	0.32
cis-1,3-Dichloropropene	UJ	ND	1.0	ug/L	0.099
Toluene	UJ	ND	1.0	ug/L	0.070
trans-1,3-Dichloropropene	UJ	ND	1.0	ug/L	0.23
1,1,2-Trichloroethane	UJ	ND	1.0	ug/L	0.071
2-Hexanone	UJ	ND	5.0	ug/L	1.3
Tetrachloroethene	UJ	ND	1.0	ug/L	0.065
Dibromochloromethane	UJ	ND	1.0	ug/L	0.21
Chlorobenzene	UJ	ND	1.0	ug/L	0.060
Ethylbenzene	UJ	ND	1.0	ug/L	0.11
Xylenes (total)	UJ	ND	3.0	ug/L	0.22
Styrene	UJ	ND	1.0	ug/L	0.042
Bromoform	UJ	ND	1.0	ug/L	0.15
1,1,2,2-Tetrachloroethane	UJ	ND	1.0	ug/L	0.11

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	95	(68 - 118)
Dibromofluoromethane	96	(75 - 121)
1,2-Dichloroethane-d4	87	(67 - 132)
4-Bromofluorobenzene	98	(77 - 113)

(Continued on next page)

EH
04/21/11

CH2M Hill Plateau Remediation (ARRA)

Client Sample ID: B23CX3

GC/MS Volatiles

Lot-Sample #...: F0B080466-002 Work Order #...: LVEMX1AA Matrix.....: WATER

NOTE(S):

J Estimated result. Result is less than RL.

CH2M Hill Plateau Remediation (ARRA)

B23CX3

GC/MS Volatiles

Lot-Sample #: F0B080466-002 **Work Order #:** LVEMX1AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/L

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF102360

Sample # 102360001
SAF# F10-065
Sample ID B23WW1

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
8260 Prep											**09/02/10**
SW-846 8260B											
1,1-Dichloroethene	75-35-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Trichloroethene	79-01-6		LA-523-455	J	3.9		ug/L	1	1	5	09/03/10
Benzene	71-43-2		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Toluene	108-88-3		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Chlorobenzene	108-90-7		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,1-Dichloroethane	75-34-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Ethylbenzene	100-41-4		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Styrene	100-42-5		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
cis-1,3-Dichloropropene	10061-01-5	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
trans-1,3-Dichloropropene	10061-02-6	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,2-Dichloroethane	107-06-2	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Methyl isobutyl ketone	108-10-1	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Dibromochloromethane	124-48-1		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Tetrachloroethene	127-18-4		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Total Xylenes	1330-20-7		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Total 1,2-Dichloroethene	540-59-0	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
N - MS and/or MSD recovery outside control limits.

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF102360

Sample # 102360001
SAF# F10-065
Sample ID B23WW1

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Carbon tetrachloride	56-23-5		LA-523-455		630		ug/L	1	10	50	09/07/10
2-Hexanone	591-78-6	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Acetone	67-64-1	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Chloroform	67-66-3	J	LA-523-455		88		ug/L	1	1	5	09/03/10
1,1,1-Trichloroethane	71-55-6		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Bromomethane	74-83-9	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Chloromethane	74-87-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Chloroethane	75-00-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Vinyl chloride	75-01-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Methylene chloride	75-09-2	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Carbon disulfide	75-15-0	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Bromoform	75-25-2	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Bromodichloromethane	75-27-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,2-Dichloropropane	78-87-5	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Methyl ethyl ketone	78-93-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,1,2-Trichloroethane	79-00-5		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,1,2,2-Tetrachloroethane	79-34-5		LA-523-455	U	<1		ug/L	1	1	5	09/03/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
N - MS and/or MSD recovery outside control limits.

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF102360

Sample # 102360002
SAF# F10-065
Sample ID B24116

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
8260 Prep											**09/02/10**
SW-846 8260B											
1,1-Dichloroethene	75-35-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Trichloroethene	79-01-6		LA-523-455	J	4.6		ug/L	1	1	5	09/03/10
Benzene	71-43-2		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Toluene	108-88-3		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Chlorobenzene	108-90-7		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,1-Dichloroethane	75-34-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Ethylbenzene	100-41-4		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Styrene	100-42-5		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
cis-1,3-Dichloropropene	10061-01-5	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
trans-1,3-Dichloropropene	10061-02-6	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,2-Dichloroethane	107-06-2	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Methyl isobutyl ketone	108-10-1	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Dibromochloromethane	124-48-1		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Tetrachloroethene	127-18-4		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Total Xylenes	1330-20-7		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Total 1,2-Dichloroethene	540-59-0	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
N - MS and/or MSD recovery outside control limits.

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF102360

Sample # 102360002
SAF# F10-065
Sample ID B24116

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Carbon tetrachloride	56-23-5		LA-523-455		690		ug/L	1	10	50	09/07/10
2-Hexanone	591-78-6	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Acetone	67-64-1	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Chloroform	67-66-3	J	LA-523-455		87		ug/L	1	1	5	09/03/10
1,1,1-Trichloroethane	71-55-6		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Bromomethane	74-83-9	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Chloromethane	74-87-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Chloroethane	75-00-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Vinyl chloride	75-01-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Methylene chloride	75-09-2	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Carbon disulfide	75-15-0	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Bromoform	75-25-2	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Bromodichloromethane	75-27-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,2-Dichloropropane	78-87-5	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
Methyl ethyl ketone	78-93-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,1,2-Trichloroethane	79-00-5		LA-523-455	U	<1		ug/L	1	1	5	09/03/10
1,1,2,2-Tetrachloroethane	79-34-5		LA-523-455	U	<1		ug/L	1	1	5	09/03/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
N - MS and/or MSD recovery outside control limits.

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF103048

Sample # 103048001
SAF# F10-065
Sample ID B24J97

Matrix WATER
Sampled 11/17/10
Received 11/17/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
8260 Prep										**11/18/10**
SW-846 8260B										
1,1-Dichloroethene	75-35-4	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Trichloroethene	79-01-6	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Benzene	71-43-2	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Toluene	108-88-3	LA-523-455		6.8		ug/L	1	1	5	11/18/10
Chlorobenzene	108-90-7	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,1-Dichloroethane	75-34-3	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Ethylbenzene	100-41-4	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Styrene	100-42-5	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
cis-1,3-Dichloropropene	10061-01-5 UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
trans-1,3-Dichloropropene	10061-02-6 UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,2-Dichloroethane	107-06-2	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Methyl isobutyl ketone	108-10-1 UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Dibromochloromethane	124-48-1	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Tetrachloroethene	127-18-4	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Total Xylenes	1330-20-7	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Total 1,2-Dichloroethene	540-59-0	LA-523-455	U	<1		ug/L	1	1	5	11/18/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < PQL (or EQL) >= MDL.
N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
N - MS and/or MSD recovery outside control limits.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF103048

Sample # 103048001
SAF# F10-065
Sample ID B24J97

Matrix WATER
Sampled 11/17/10
Received 11/17/10

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Carbon tetrachloride	56-23-5		LA-523-455		33		ug/L	1	1	5	11/18/10
2-Hexanone	591-78-6	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Acetone	67-64-1	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Chloroform	67-66-3	J	LA-523-455	J	1.6		ug/L	1	1	5	11/18/10
1,1,1-Trichloroethane	71-55-6		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Bromomethane	74-83-9		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Chloromethane	74-87-3		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Chloroethane	75-00-3		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Vinyl chloride	75-01-4		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Methylene chloride	75-09-2		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Carbon disulfide	75-15-0	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Bromoform	75-25-2		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Bromodichloromethane	75-27-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,2-Dichloropropane	78-87-5		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Methyl ethyl ketone	78-93-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,1,2-Trichloroethane	79-00-5		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,1,2,2-Tetrachloroethane	79-34-5		LA-523-455	U	<1		ug/L	1	1	5	11/18/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < PQL (or EQL) >= MDL.
N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
N - MS and/or MSD recovery outside control limits.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF103048

Sample # 103048002
SAF# F10-065
Sample ID B24JJ5

Matrix WATER
Sampled 11/17/10
Received 11/17/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
8260 Prep										**11/18/10**
SW-846 8260B										
1,1-Dichloroethene	75-35-4	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Trichloroethene	79-01-6	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Benzene	71-43-2	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Toluene	108-88-3	LA-523-455		8.0		ug/L	1	1	5	11/18/10
Chlorobenzene	108-90-7	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,1-Dichloroethane	75-34-3	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Ethylbenzene	100-41-4	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Styrene	100-42-5	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
cis-1,3-Dichloropropene	10061-01-5 UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
trans-1,3-Dichloropropene	10061-02-6 UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,2-Dichloroethane	107-06-2	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Methyl isobutyl ketone	108-10-1 UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Dibromochloromethane	124-48-1	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Tetrachloroethene	127-18-4	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Total Xylenes	1330-20-7	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Total 1,2-Dichloroethene	540-59-0	LA-523-455	U	<1		ug/L	1	1	5	11/18/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < PQL (or EQL) >= MDL.
N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
N - MS and/or MSD recovery outside control limits.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF103048

Sample # 103048002
SAF# F10-065
Sample ID B24JJ5

Matrix WATER
Sampled 11/17/10
Received 11/17/10

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Carbon tetrachloride	56-23-5		LA-523-455		51		ug/L	1	1	5	11/18/10
2-Hexanone	591-78-6	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Acetone	67-64-1	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Chloroform	67-66-3	J	LA-523-455	J	1.7		ug/L	1	1	5	11/18/10
1,1,1-Trichloroethane	71-55-6		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Bromomethane	74-83-9		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Chloromethane	74-87-3		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Chloroethane	75-00-3		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Vinyl chloride	75-01-4		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Methylene chloride	75-09-2		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Carbon disulfide	75-15-0	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Bromoform	75-25-2		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Bromodichloromethane	75-27-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,2-Dichloropropane	78-87-5		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
Methyl ethyl ketone	78-93-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,1,2-Trichloroethane	79-00-5		LA-523-455	U	<1		ug/L	1	1	5	11/18/10
1,1,2,2-Tetrachloroethane	79-34-5		LA-523-455	U	<1		ug/L	1	1	5	11/18/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < PQL (or EQL) >= MDL.
N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
N - MS and/or MSD recovery outside control limits.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF - Anions & HexCr
Data Summary of All Results

Sample Group: 20100241

Customer Group or SDG Number: 222S20100241

Customer Sample ID: B23C74

Customer Sample ID: B23C74

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000127			16984-48-8	Fluoride	ug/mL	94.6	<6.16E-03	0.361	n/a	n/a	n/a	92.4	6.16E-03	n/a	
S10M000127			16887-00-6	Chloride	ug/mL	99.6	<3.10E-03	21.5	21.0	21.2	2.40	90.2	0.0341	n/a	
S10M000127			14797-65-0	Nitrite	ug/mL	91.2	<0.0400	<0.0400	n/a	n/a	n/a	92.8	0.0400	n/a	U
S10M000127			24959-67-9	Bromide	ug/mL	93.3	<0.0237	0.243	n/a	n/a	n/a	91.8	0.0237	n/a	
S10M000127			14797-55-8	Nitrate	ug/mL	91.9	<0.0162	128	133	130	4.27	94.8	1.64	n/a	
S10M000127			14265-44-2	Phosphate	ug/mL	95.1	<0.0381	<0.0381	n/a	n/a	n/a	101	0.0381	n/a	U
S10M000127			14808-79-8	Sulfate	ug/mL	91.7	<0.0219	32.2	32.0	32.1	0.673	96.5	0.241	n/a	
S10M000162			75-35-4	1,1-Dichloroethene	ug/L	96.3	<0.172	<0.191	n/a	n/a	n/a	91.2	0.191	n/a	U
S10M000162			67-64-1	Acetone	ug/L	110	6.18	<0.637	n/a	n/a	n/a	92.0	0.637	n/a	U
S10M000162			78-93-3	2-Butanone	ug/L	95.2	<0.458	<0.509	n/a	n/a	n/a	95.4	0.509	n/a	U
S10M000162			67-66-3	Chloroform	ug/L	n/a	<0.0414	41.2	n/a	n/a	n/a	n/a	0.0460	n/a	
S10M000162			56-23-5	Carbon tetrachloride	ug/L	n/a	<0.0479	1.63E+03	n/a	n/a	n/a	n/a	1.92	n/a	
S10M000162			71-36-3	1-Butanol	ug/L	88.8	<1.15	<1.28	n/a	n/a	n/a	85.0	1.28	n/a	U
S10M000162			71-43-2	Benzene	ug/L	92.8	<0.0163	<0.0181	n/a	n/a	n/a	89.6	0.0181	n/a	U
S10M000162			79-01-6	Trichloroethene	ug/L	90.1	<0.0378	16.5	n/a	n/a	n/a	90.0	0.0420	n/a	
S10M000162			108-10-1	Hexone	ug/L	109	<0.453	<0.503	n/a	n/a	n/a	103	0.503	n/a	U
S10M000162			108-88-3	Toluene	ug/L	95.8	<0.0522	<0.0580	n/a	n/a	n/a	89.5	0.0580	n/a	U
S10M000162			591-78-6	2-Hexanone	ug/L	104	<0.454	<0.505	n/a	n/a	n/a	101	0.505	n/a	U
S10M000162			108-90-7	Chlorobenzene	ug/L	96.6	<0.0320	<0.0356	n/a	n/a	n/a	91.3	0.0356	n/a	U
S10M000162			1868-53-7	Dibromofluoromethane	ug/L	91.6	10.2	14.1	n/a	n/a	n/a	117	0.0592	n/a	
S10M000162			17060-07-0	1,2-Dichloroethane-d4	ug/L	96.5	10.2	11.5	n/a	n/a	n/a	90.7	0.166	n/a	
S10M000162			2037-26-5	Toluene-d8	ug/L	102	11.1	11.8	n/a	n/a	n/a	94.8	0.0774	n/a	
S10M000162			460-00-4	4-Bromofluorobenzene	ug/L	94.8	10.8	11.2	n/a	n/a	n/a	96.2	0.0906	n/a	

NA = Not Analyzed, ND = Not Detected

U - < Det Limit

EH
04/21/11

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
MS B3-60
Richland, Washington 99352
March 8, 2010
Attention: Mike Neely

TestAmerica Laboratories, Inc.

SDG	: SL876
Number of Samples	: two samples
Sample Matrix	: Water
Data Deliverable	: Summary
Date SDG Closed	: February 8, 2010

II. Introduction

On February 8, 2010, two water samples were received by TestAmerica - St. Louis for chemical analysis. The samples were received outside temperature criteria at 12 Degrees Celsius. The FedEx shipment was not marked for Saturday delivery; therefore, the cooler was received the next business day. Issue Resolution Form 10-036 accepted the proposed resolution to proceed with all analysis. This IRF is included with this case narrative and report. See the COC and CUR forms for further documentation of any variations on receipt conditions and temperature. Upon receipt, the samples were given laboratory Ids to correspond with specific client Ids. Please refer to the Sample Summary sheets attached to this case narrative. This report is incomplete without the narrative.

The following SAFs are associated with this SDG: F10-065

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits. All results are based upon samples as they were received, i.e. wet weight, unless otherwise noted on the data sheets. See the attached Methods Summary Form for the methods used in this SDG.

MS/MSD/Dup analysis was done per the client requirements. Analytical batches that did not contain matrix QC were analyzed with a LCS/LCS duplicate.

Deviation from Request: None

IV. Definitions

QCBLK-	Quality Control Blank, Method Blank
QCLCS-	Quality Control Laboratory Control Sample, Blank Spike
DUP-	Laboratory Duplicate
MS-	Matrix Spike
MSD-	Matrix Spike Duplicate

The term "Detection Limit" used in the analytical data report refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

CH2M Hill Plateau Remediation Company
March 8, 2010
SDG: SL876

TestAmerica Laboratories, Inc.

The following data qualifiers may be applicable to the results in this report, as appropriate.

- **B** – For inorganic analyses, the sample result is greater than the MDL but less than the RL.
- **B** – For organic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **J** – For organic analyses, the sample is estimated and less than the RL.
- **C** – For inorganic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **D** – For all analyses, the sample result was obtained from the analysis of a dilution.
- **N** – For inorganics and GC analyses, the spike/spike duplicate recoveries are outside QC limits.
- **T** – For GCMS analyses, the spike/spike duplicate recoveries are outside QC limits.

Volatiles

Batch: 0048151

The D% CCV is (higher recovered) outside the Method criteria (greater than 20% D) for the Bromomethane (31.6%), indicating a potential high bias for this analyte in the samples associated with this CCV. This analyte was not detected above the reporting limits in the associated samples.
Affected Samples:
F0B080466 (1): B23CT3
F0B080466 (2): B23CX3

Bromomethane was detected in the method blank at a concentration above the method detection limit but below the reporting limit. This analyte was not detected above the reporting limits in the associated samples. The analyte is qualified with a "B" flag accordingly.
Affected Samples:
F0B080466 (1): B23CT3
F0B080466 (2): B23CX3

Ion Chromatography

Batches: 0040446-0040452

The sample was received outside hold time for Nitrite in batch 0040448, Nitrate in batch 0040449, and Ortho Phosphate in batch 0040450. Issue Resolution Form 10-037 accepted the proposed resolution to proceed with the analysis. The sample was received on 02/08/10 and analyzed on 02/09/10.
Affected Samples:
F0B080466 (1): B23CT3

The sample was analyzed at a dilution for Chloride, Nitrate, and Sulfate due to high concentrations of target analytes. These analytes are qualified with a "D" flag in the associated samples.
Affected Samples:
F0B080466 (1): B23CT3

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

CH2M Hill Plateau Remediation Company

March 8, 2010

SDG: SL876

TestAmerica Laboratories, Inc.

The anion matrix spike solution contains all routine anions. Spiking technique, sample preparation and method compliance is demonstrated by the remaining acceptable MS recoveries. Poor matrix spike recovery for Ortho Phosphate in batch 0040450 is attributed to matrix interference. This analyte is qualified with an "N" accordingly.

Affected Samples:

F0B080466 (1): B23CT3

There were no observations or nonconformances for the following methods:

ICP Metals

I certify that this Summary Package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Michael Franks

St. Louis Project Manager

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-037

Date: February 9, 2010 SAF Nos. F10-065

SDG: SL876 LOGIN No.: **F0B080466** TEST: Anions

Sample No.(s) : **B23CT3**

Submitted By: Mike Franks
Phone No. 314-298-8566
Fax No. 314-298-8757

Submitted To: Heidi Hampt
Phone No. 509-376-4319
Fax No. 509-373-1788

ISSUE	PROPOSED RESOLUTION
The FedEx shipment was not marked for Saturday delivery; therefore the cooler was delivered on the next business day. The hold time for Anions 300.0 analysis expired in transit. The samples were collected 02/05/10 and received on 02/08/10.	1) Proceed with analysis ASAP. 2) Cancel Analysis.

CHPRC/BHI/WMH/PNNL COMMENTS

Proceed with analysis.

Heidi Hampt 2/10/10
Signature and Date

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-036

Date: February 9, 2010 SAF Nos. F10-065

SDG: SL876 LOGIN No.: **F0B080466** TEST: Volatiles, Anions

Sample No.(s) : **B23CT3, B23CX3**

Submitted By: Mike Franks
Phone No. 314-298-8566
Fax No. 314-298-8757

Submitted To: Heidi Hampt
Phone No. 509-376-4319
Fax No. 509-373-1788

ISSUE	PROPOSED RESOLUTION
The cooler was received on 02/08/10 outside the required 2-6 Degrees Celsius acceptance limits. The cooler was received at 12 Degrees Celsius. The FedEx shipment was not marked for Saturday delivery; therefore the cooler was delivered on the next business day.	1) Proceed with analysis. 2) Cancel Analysis.

CHPRC/BHI/WMH/PNNL COMMENTS

Proceed with analysis and note temperature in case narrative.

Heidi Hampt 2/10/10
Signature and Date

SDG# SL876

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-125	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 1A	DATA TURNAROUND
Bates/Crow	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	24 Hours / 15 Days

SAMPLING LOCATION	PROJECT DESIGNATION	SAF NO.
EW-12 (C7019, 299-W11-49); I-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	F10-065

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
LUNCH 3584	HNF-N-5858 p9.74	287'	300194ES10	GOVERNMENT VEHICLE

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
Waste Sampling & Characterization	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	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)
TYPE OF CONTAINER	aGs*	P	Nalgene
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	500mL
SAMPLE ANALYSIS	* SEE ITEM (1) IN SPECIAL INSTRUCTIONS	* SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS (Technetium-99)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23CT3	WATER	2-5-10	1150

*SDG-WO5803
Ship TO STL

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
R. Crow/R. Crow	2-5-10 1330	M0413 SSU-R2	2-5-10 1330
M0413 SSU-R2 R Crow/R Crow	2-5-10 1345	L.D. Wall R. Crow/R Crow	2/5/10 1345
R.Crow/R Crow	FEB 05 2010 1350	L.D. Wall	FEB 05 2010 1350
L.D. Wall	FEB 05 2010 1430		FEB 05 2010 1430
	2-5-10 350	Brunson Sample Room	2-8-10 9:30

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}
(2)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Fluoride, Phosphate, Nitrogen in Nitrate}

ORIGINAL

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

A-6003-618(01/06)

TestAmerica St. Louis

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-155	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
Bates/Crow	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days

SAMPLING LOCATION	PROJECT DESIGNATION	SAF NO.
EW-12 (C7019, 299-W11-49); I-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	F10-065

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
LUNCH 3584	HNF-N-5858 pg. 74	287'	300194ES10	GOVERNMENT VEHICLE

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
Waste Sampling & Characterization	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	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	* VOA - 8260B (TCL);	* SEE ITEM (1) IN SPECIAL INSTRUCTIONS	~~Lithium Ion Ex (Tritium)~~

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23CX3	WATER	2-5-10	1150

*SDG WO580 Ship to STL

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
R. Crow/R Crow	2-5-10 1330	M0413 SSU-R2	2-5-10 1330
2-5- R M0413 SSU-R2	2-5-10 1345	L.D. Wall L.D. Wall CHPRC	FEB 05 2010 1345
L.D. Wall L.D. Wall CHPRC	FEB 05 2010 1430	TAN	FEB 05 2010 1430
TAN	2-5-10 3:50pm	Brunson A Ang Brunson	2-8-10 9:30

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Attachment 2
Narrative
WSCF102360

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on September 1, 2010. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, U and J) may be applicable to this report, as appropriate

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 156047 analyzed on sample# B27JX0 (102354001)

All QC controls are within the established limits.

Attachment 2
Narrative
WSCF102360

ICP-MS Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Technetium-99 is analyzed without prep therefore there is no Matrix Spike or Matrix Spike Duplicate with analysis. Analytical Note(s):

- Batch QC 163534 analyzed on sample# B27567 (102335003)
    - Vanadium contamination was detected in the Blank. Affected sample results in this batch were "C" Flagged.
    - Chromium – exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.

All QC controls are within the established limits.

- Technetium-99:
    - Batch QC 162850

All QC controls are within the established limits.

Organic Comments

VOA – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 156061 analyzed on sample# B27JW9 (102352001)

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Applies only to T Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Tritium:
    - Batch QC 155935 analyzed on sample# B26JD6 (102345001)

All QC controls are within the established limits.

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-065-207	PAGE 1 OF 1
COLLECTOR: Hecus, Morgan	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 7N; AIR QUALITY: ☐	DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: EW-6; C7020(299-W11-50); I-004	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F10-065	
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-50711 (Pg 16)	ACTUAL SAMPLE DEPTH: 2705'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: 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: 102360

PRESERVATION	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	VOA - 8260B (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B23WW1 001	WATER	9/1/10	0815	✓	✓	✓

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
J Muller	9/1/10 0955	Victor Bingham	9/1/10 0955
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-065-236	PAGE 1 OF 1
COLLECTOR: Helmz Morton	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 7N; AIR QUALITY: ☐	DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: EW-6; C7020(299-W11-50); I-004 DUP	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F10-065	
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-567-11 (Pg 16)	ACTUAL SAMPLE DEPTH: 270.5'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: 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	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2 (ULTREX)
TYPE OF CONTAINER	aGs*	G/P	G	aGs*	P	Nalgene
NO. OF CONTAINER(S)	3	1	1	3	1	1
VOLUME	40mL	500mL	250mL	40mL	500mL	500mL
SAMPLE ANALYSIS	VOA - 8260B (TCL);	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS (Technetium-99)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B24116 002	WATER	9/1/10	0815	✓	✓	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	9/1/10 0955	Victor Bins	9/1/10 0955
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

(2)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}

(3)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Phosphate, Fluoride, Nitrogen in Nitrate}

ORIGINAL

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

A-6003-618(01/06)

Attachment 2
Narrative
WSCF103048

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on November 17, 2010. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, U and J) may be applicable to this report, as appropriate

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 170085 analyzed on sample# B25YN4 (103043001)

All applicable QC controls are within the established limits.

Attachment 2
Narrative
WSCF103048

ICP-MS Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Technetium-99 is analyzed without prep therefore there is no Matrix Spike or Matrix Spike Duplicate with analysis. Analytical Note(s):

- Batch QC 170564 analyzed on sample# B240Y5 (103021001)
  - Barium – exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.
- Batch QC 170050

All other applicable QC controls are within the established limits.

Organic Comments

VOA – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 170054 analyzed on sample# B28315 (103033001)

All applicable QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Matrix Spikes apply only to Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Tritium:
  - Batch QC 170191 analyzed on sample# B24J97 (103048001)

All applicable QC controls are within the established limits.

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

Chemnitt Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-065-336 PAGE 1 OF 1

COLLECTOR Bates, M.T.	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT COORDINATOR DYEKMAN, DL
PRICE CODE 7N	DATA TURNAROUND 45 Days / 45 Days		
SAMPLING LOCATION C7573; 299-W10-35; IW-4; I-003	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO. F10-065	AIR QUALITY ☐
ICE CHEST NO.	FIELD LOGBOOK NO. HAF-N-507-11 pages 27	ACTUAL SAMPLE DEPTH 306.6	COA 300194ES10
METHOD OF SHIPMENT GOVERNMENT VEHICLE			
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. 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 Meterial 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: 103048

PRESERVATION	HCl or H2SO4 to pH <2/Cool=4C	HNO3 to pH <2/Cool=4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	VOA - 8260B (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium Ion Ex (Tritium)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B24J97 001	WATER	11-17-10	1322

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Nate Bates	11-17-10 1510	V.L. Tate	11-17-10 1510
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20. ** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time. ** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-065-394

PAGE 1 OF 1

COLLECTOR Mh. Te, Bates

COMPANY CONTACT: DYEKMAN, DL

TELEPHONE NO.: 373-2530

PROJECT COORDINATOR: DYEKMAN, DL

PRICE CODE: 7N

DATA TURNAROUND: 45 Days / 45 Days

SAMPLING LOCATION: C7573; 299-W10-35; IW-4; I-003 DUP

PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

SAF NO.: F10-065

AIR QUALITY: ☐

ICE CHEST NO.

FIELD LOGBOOK NO.: HnF-N-507-11 page 27

ACTUAL SAMPLE DEPTH: 306.6

COA: 300194ES10

METHOD OF SHIPMENT: GOVERNMENT VEHICLE

SHIPPED TO: Waste Sampling & Characterization

OFFSITE PROPERTY NO.: N/A

BILL OF LADING/AIR BILL NO.: 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	HCl or H2SO4 to pH <2/Cool-4C	HNO3 to pH <2/Cool-4C	Cool-4C	None	HNO3 to pH <2 (ULTREX)
TYPE OF CONTAINER	aGs*	G/P	P	G	Nalgene
NO. OF CONTAINER(S)	3	1	1	1	1
VOLUME	40mL	500mL	500mL	250mL	500mL
SAMPLE ANALYSIS	VOA 8260B (TCL);	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	IC Anions - 300.0 (Nitrogen in Nitrate)	Tritium, Sr-90 (Tritium)	Tc-99 by ICP/MS (Technetium-99)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B24JJ5 602	WATER	11-17-10	1322	—	—	—	—	—				

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dale Bates Mh Te Bates	11-17-10 1510	Victor Bjorg	11-17-10 1510
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20. ** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time. ** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Wednesday, November 17, 2010 8:21:52 PM
Page 3 of 3

ChemWare

222-S LABORATORY

FINAL REPORT FOR THE SAMPLES RECEIVED IN MARCH, 2010 FOR SAF F10-065-012

1.0 INTRODUCTION

This report has been reissued in order to update the Data Summary Report to include matrix spike recoveries and RPD information as described in Section 3.1.1.

This final report presents the results for one ground water sample taken on March 8, 2010. The sample was analyzed in accordance with Sampling Authorization Form F10-065-012; *ARRA 200 ZP-1 Remedial Action Wells Sampling and Analysis - Water* (SAF) and ATL-MP-1011; *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP). The following attachments are included in this report.

Attachment 1	Data Summary Report
Attachment 2	Holding Time Report
Attachment 3	Receipt Paperwork
Attachment 4	Project Correspondence
Attachment 5	VOA Surrogates. MS-MSD Recoveries, and RPDs
Attachment 6	Additional Sample Duplicate Results

2.0 SAMPLE RECEIPT AND HANDLING

The sample (B23C74) was received on March 9, 2010, with adequate paperwork and instructions to be analyzed for anions. The measured temperature of the outside of the sample container was 8 ^{o}C. On March 10, 2010, another portion of sample (B23C74) was received with instructions to be analyzed for VOA. The measured temperature of the outside of the sample was 2 ^{o}C. The temperatures of the samples were reported to the client on the laboratory's sample receipt check list (see Attachment 3).

3.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for those analytes requested in the SAF. The "Det Limit" column in Attachment 1 contains the method detection limit (MDL).

In Attachment 1, the column labeled "A#" indicates the aliquot class or the method used for sample preparation before analysis. For analysis without a preparation step, this column is left blank.

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

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

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

3.1 ANALYSES

3.1.1 Anions by Ion Chromatography

The ion chromatography analysis for anions was performed on direct aliquots of the sample. All requirements in the SAF and QAPP were met, except the holding time requirement of 48 hours for Nitrate, Nitrite, and Phosphate. This was due to the following reasons:

- Partially expired holding time upon receipt of samples by the laboratory
- Two dilutions of the sample were prepared on 03/10/2010; Only NO3 was reported from this run. Another run was performed on 03/12/2010 to reach detection limits for NO2 (see Attachment 2).

The Data Summary Report (Attachment 1) has been updated to include all matrix spike recoveries and duplicate RPDs from a sample in this SDG. Only RPDs for chloride, nitrate, and sulfate were available; no RPD data is available for fluoride, nitrite, bromide, and phosphate for this sample. A second sample duplicate from a separate SDG was run as part of this analytical batch, this duplicate contained all analytes, but only chloride was detected in this sample (see Attachment 6).

Table 1 lists the analytical procedures used for analysis of these samples.

3.1.2 Volatile Organic Analysis

The VOA analysis was performed on direct aliquots of the sample. All requirements in the SAF and QAPP were met.

At the time this analysis was performed, the laboratory was transitioning to a new set of Statistical Process Control (SPC) limits (see Attachment 5). On the original report, it was mentioned that one of the surrogate compounds, dibromofluoromethane, had a high recovery (127 %). However, after processing the analytical results with the new SPC limits, recoveries of all surrogate compounds are within control limits.

Acetone was detected in the blank at a concentration above the quantitation limits. However, the laboratory considered that reanalysis was not necessary due to two reasons:

1- Acetone was not detected in the sample and

2- Acetone was not an analyte of interest (not requested by customer).

The SAF only requested chloroform, trichloroethene, and carbon tetrachloride. Additional compounds have been reported to provide analytical QC parameters.

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-091

Date : **3/14/10** SAF No.: **See table**

SDG: **See table**
LOGIN No.**: See attached table**
TEST: **IC Anion: Nitrate, Nitrite,Phosphate**
Sample No.(s**) See table**

Submitted By: G. P. Ritenour
Phone No: 372-2742
Fax No.: 373-4884

Submitted To: Heidi Hampt
Phone No. 376-4319
Fax No. 373-1788

ISSUE	PROPOSED RESOLUTION
The table below displays the samples for which the holding time for NO3, NO2, and PO4 were missed. This was due to an instrument failure, limited capacity, and partially expired holding times upon receipt. The instrument column was replaced and calibrated and the analysis was completed	Analyze and note in narrative.

CHPRC/BHI/WMH/PNNL COMMENTS
Accept proposed resolution.

Heidi Hampt 4/8/10
Signature and Date

SDG	SAF	Lab ID	Client ID	Analysis	Sample Date/Time	Analysis Time Lapse	Anion
20100241	F10-065	S10M000127	B23C74	IC - ANIONS	3/8/2010 9:16	56	NO3
20100241	F10-065	S10M000127	B23C74	IC - ANIONS	3/8/2010 9:16	92	NO2, PO4
20100242	F10-119	S10M000128	B243V3	IC - ANIONS	3/8/2010 10:15	91	**NO3,NO2,PO4**
20100243	W10-002	S10M000129	B23X10	IC - ANIONS	3/8/2010 11:34	61	NO3,NO2,PO4
20100244	X10-033	S10M000130	B24CJ1	IC - ANIONS	3/8/2010 8:59	63	NO3,NO2,PO4
20100244	X10-033	S10M000131	B24CJ5	IC - ANIONS	3/8/2010 11:19	91	**NO3,NO2,PO4**
20100244	X10-033	S10M000132	B24CJ7	IC - ANIONS	3/8/2010 11:59	91	**NO3,NO2,PO4**
20100245	S10-002	S10M000133	B23WJ8	IC - ANIONS	3/8/2010 13:00	90	**NO3,NO2,PO4**
20100246	L10-008	S10M000134	B24942	IC - ANIONS	3/7/2010 23:41	74	**NO3,NO2,PO4**
20100247	X10-034	S10M000135	B248T7	IC - ANIONS	3/8/2010 13:56	60	NO3,NO2,PO4
20100247	X10-034	S10M000136	B248R8	IC - ANIONS	3/8/2010 13:56	60	NO3,NO2,PO4
20100247	X10-034	S10M000137	B249H9	IC - ANIONS	3/8/2010 10:37	64	NO3,NO2,PO4
20100247	X10-034	S10M000138	B24B04	IC - ANIONS	3/8/2010 9:28	65	NO3,NO2,PO4
20100247	X10-034	S10M000139	B24B14	IC - ANIONS	3/8/2010 13:52	61	NO3,NO2,PO4
20100247	X10-034	S10M000140	B24B17	IC - ANIONS	3/8/2010 12:14	63	NO3,NO2,PO4
20100247	X10-034	S10M000141	B24B20	IC - ANIONS	3/8/2010 10:23	65	NO3,NO2,PO4
20100247	X10-034	S10M000142	B24B23	IC - ANIONS	3/8/2010 7:55	95	**NO3,NO2,PO4**
20100247	X10-034	S10M000143	B24B47	IC - ANIONS	3/8/2010 12:23	64	NO3,NO2,PO4
20100244	X10-033	S10M000144	B24CJ9	IC - ANIONS	3/8/2010 10:55	66	NO3,NO2,PO4

1. The data package has the following issues:

a) Please discuss blank contamination in the narrative even though the sample result was a non-detect.

Resolution: *Provide correction to narrative.*

Lab Response:

Please correct the issues and resubmit the hard copy data package.

CH2MHill Plateau Remediation Company

COLLECTOR Helms, Bates	**COMPANY CONTACT** DYEKMAN, DL	**TELEPHONE NO.** 373-2530	**PROJECT CODE** DYEKMAN, DL
SAMPLING LOCATION EW-7 (C7022, 299-W11-90); I-011	**PROJECT DESIGNATION** ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		**SAF NO.** F10-065
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-N-585-8 Page 59	**ACTUAL SAMPLE DEPTH** 508'	**COA** 300194ES10
SHIPPED TO ~~Waste Sampling & Characterization~~ 222-S 3-9-10	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A

PRICE CODE — **AIR QUALITY** ☐ — **TAT** 24 Hours / 15 Days

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)

100480

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)
TYPE OF CONTAINER	aGs*	P	Nalgene
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS (Technetium-99)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B23C74	WATER	3-8-10	0916	—	—	—
S10M000127						
GRP# 20100241						

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dale Bates / Dale Bates	3-8-10 1010	MD Kessler MD Kessler	3-8-10 1010
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Beebe KB Beebe	3/9/10 0830	L.D. WALL L.D. Wall	3/9/10 0830
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
L.D. Wall CHPRC L.D. Wall	MAR 09 2010 930	RJ Steele RJ Steele	MAR 09 2010 930
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}
(2)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Phosphate, Fluoride, Nitrogen in Nitrate}

ORIGINAL

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

A-6003-618(01/06)

CHAIN OF CUSTODY/SAF — **PROJECT COORDINATOR** — **PRICE CODE** 1A — **TURNAROUND**

ISPOSITION

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				
ECTOR Helms, Bates	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT COORDINATOR DYEKMAN, DL	PRICE CODE 1A	DATA TURNAROUND
LING LOCATION (C7022, 299-W11-90); I-011	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F10-065	AIR QUALITY ☐	24 Hours / 15 Days
HEST NO.	FIELD LOGBOOK NO. HNF-N-585-8 Page 84	ACTUAL SAMPLE DEPTH 508'	COA 300194ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
PED TO e Sampling & Characterization	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

TRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)
um um uid sdiment sue etation ater ipe er	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) 100480	TYPE OF CONTAINER	aGs*	P	Nalgene
		NO. OF CONTAINER(S)	3	1	1
		VOLUME	40mL	500mL	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS {Technetium-99}

Shipped to 2225 3/10/10 ✓ Shipped to 2225 3/9/10 ✓

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
74	WATER	3-8-10	0916	—	—	—

Group # 20100241
Sample # S10M000162

IN OF POSSESSION		SIGN/ PRINT NAMES	
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Bates/Dak Bates 3-8-10	1010	MD Kessler MD Kessler	3-8-10 1010
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
D Kessler MD Kessler	3/10/10 1040	KS Hulse KS Hulse	3/10/10 1040
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
S Hulse KS Hulse	3-10-10 1100	[illegible]	3/10/10 1100
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}
(2)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Phosphate, Fluoride, Nitrogen in Nitrate}

☐ ORIGINAL COPY

ABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
NAL SAMPLE	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: 200 Area SGRP			DATA PACKAGE: VSR11-041		
VALIDATOR: Eyda Hergenreder		LAB: TestAmerica, WSCF, 222-S		DATE: 04-21-2011	
			SDG: SL876, WSCF102360, WSCF103048, 222S20100241		
ANALYSES PERFORMED					
SW-846 8260 X		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)

SAMPLES/MATRIX Water samples

SDG SL876: B23CT3, B23CX3

SDG WSCF102360: B23WW1, B24116

SDG WSCF103048: B24J97, B24JJ5

SDG 222S20100241: B23C74

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:
SDG SL876: bromomethane 0.26 ug/L
SDG 222S20100241: acetone 6.18 ug/L

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:

SDG SL876: chloromethane MS/MSD %R = 69%/65%; LCS = 74%; vinyl chloride MS/MSD %R = 77%/75%; chloroethane MS %R = 79%; acetone MSD %R = 72%; 1,1-dichloroethane MSD %R = 78%; carbon tetrachloride MS %R = 75%; 1,2-dichloroethane MS/MSD %R = 76%/77%; 4-methyl-2-pentanone MS/MSD %R = 76%/75%; cis-1,3-dichloropropene MS/MSD %R = 75%/79%; trans-1,3-dichloropropene MS/MSD %R = 69%/73%; 1,1,2-trichloroethane MSD %R = 79%; 2-hexanone MS %R = 78%; chlorobenzene MS/MSD %R = 79%/79%; 1,1,2,2-tetrachloroethane MS/MSD %R = 72%/75%

SDG WSCF102360: 1,1-dichloroethene MS/MSD %R = 77%/78%; LCS %R = 76%

SDG WSCF103048: 1,1-dichloroethene MS/MSD %R = 124%/121%; LCS %R = 122%

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:
SDG WSCF103048: carbon tetrachloride field duplicate RPD=43%

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:

SDG SL876: the temperature of the samples were 12 degrees C when received at laboratory.

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

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F0B080466 **Work Order #...:** LVQ811AA **Matrix.....:** WATER
MB Lot-Sample #: F0B170000-151

Prep Date.....: 02/16/10
Analysis Date..: 02/16/10 **Prep Batch #...:** 0048151
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Chloromethane	ND	2.0	ug/L	SW846 8260B
Vinyl chloride	ND	2.0	ug/L	SW846 8260B
Bromomethane	**0.26 J**	**2.0**	**ug/L**	**SW846 8260B**
Chloroethane	ND	2.0	ug/L	SW846 8260B
Acetone	ND	2.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	1.0	ug/L	SW846 8260B
Carbon disulfide	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
2-Butanone	ND	5.0	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	2.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
Benzene	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
2-Hexanone	ND	5.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Xylenes (total)	ND	3.0	ug/L	SW846 8260B
Styrene	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	95	(68 - 118)
Dibromofluoromethane	94	(75 - 121)
1,2-Dichloroethane-d4	83	(67 - 132)
4-Bromofluorobenzene	94	(77 - 113)

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F0B080466 Work Order #...: LVQ811AA Matrix.....: WATER

NOTE(S):

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

J Estimated result. Result is less than RL.

CH2M Hill Plateau Remediation (ARRA)

Method Blank Report

GC/MS Volatiles

Lot-Sample #: F0B170000-151 B **Work Order #:** LVQ811AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/L

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F0B080466 Work Order #...: LVQ811AC Matrix.....: WATER
LCS Lot-Sample#: F0B170000-151
Prep Date.....: 02/16/10 Analysis Date..: 02/16/10
Prep Batch #...: 0048151
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Chloromethane	10.0	7.44	ug/L	74	SW846 8260B
Vinyl chloride	10.0	8.96	ug/L	90	SW846 8260B
Bromomethane	10.0	11.9	ug/L	119	SW846 8260B
Chloroethane	10.0	9.43	ug/L	94	SW846 8260B
Acetone	10.0	8.46	ug/L	85	SW846 8260B
1,1-Dichloroethene	10.0	10.1	ug/L	101	SW846 8260B
Methylene chloride	10.0	10.4	ug/L	104	SW846 8260B
Carbon disulfide	10.0	9.76	ug/L	98	SW846 8260B
1,1-Dichloroethane	10.0	9.10	ug/L	91	SW846 8260B
2-Butanone	10.0	9.37	ug/L	94	SW846 8260B
1,2-Dichloroethene (total)	20.0	20.7	ug/L	104	SW846 8260B
Chloroform	10.0	10.2	ug/L	102	SW846 8260B
1,1,1-Trichloroethane	10.0	9.69	ug/L	97	SW846 8260B
Carbon tetrachloride	10.0	9.76	ug/L	98	SW846 8260B
1,2-Dichloroethane	10.0	9.16	ug/L	92	SW846 8260B
Benzene	10.0	9.78	ug/L	98	SW846 8260B
Trichloroethene	10.0	10.6	ug/L	106	SW846 8260B
1,2-Dichloropropane	10.0	9.29	ug/L	93	SW846 8260B
Bromodichloromethane	10.0	9.49	ug/L	95	SW846 8260B
4-Methyl-2-pentanone	10.0	10.4	ug/L	104	SW846 8260B
cis-1,3-Dichloropropene	10.0	9.67	ug/L	97	SW846 8260B
Toluene	10.0	9.93	ug/L	99	SW846 8260B
trans-1,3-Dichloropropene	10.0	9.84	ug/L	98	SW846 8260B
1,1,2-Trichloroethane	10.0	9.82	ug/L	98	SW846 8260B
2-Hexanone	10.0	9.49	ug/L	95	SW846 8260B
Tetrachloroethene	10.0	10.5	ug/L	105	SW846 8260B
Dibromochloromethane	10.0	10.5	ug/L	105	SW846 8260B
Chlorobenzene	10.0	9.74	ug/L	97	SW846 8260B
Ethylbenzene	10.0	10.7	ug/L	107	SW846 8260B
Styrene	10.0	11.4	ug/L	114	SW846 8260B
Bromoform	10.0	11.3	ug/L	113	SW846 8260B
1,1,2,2-Tetrachloroethane	10.0	9.18	ug/L	92	SW846 8260B

(Continued on next page)

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F0B080466 **Work Order #...:** LVQ811AC **Matrix.....:** WATER
LCS Lot-Sample#: F0B170000-151

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	94	(83 - 115)
Dibromofluoromethane	97	(81 - 115)
1,2-Dichloroethane-d4	86	(66 - 125)
4-Bromofluorobenzene	92	(84 - 115)

NOTE(S):

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

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F0B080466 Work Order #...: LVEML1AJ-MS Matrix.....: WATER
MS Lot-Sample #: F0B080466-001 LVEML1AK-MSD
Date Sampled...: 02/05/10 Date Received..: 02/08/10
Prep Date.....: 02/16/10 Analysis Date..: 02/16/10
Prep Batch #...: 0048151
Dilution Factor: 1

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Chloromethane	ND	10.0	6.88	ug/L	69		SW846 8260B
	ND	10.0	6.46	ug/L	65	6.2	SW846 8260B
Vinyl chloride	ND	10.0	7.72	ug/L	77		SW846 8260B
	ND	10.0	7.51	ug/L	75	2.8	SW846 8260B
Bromomethane	0.12	10.0	10.3	ug/L	102		SW846 8260B
	0.12	10.0	10.9	ug/L	108	6.1	SW846 8260B
Chloroethane	ND	10.0	7.95	ug/L	79		SW846 8260B
	ND	10.0	8.07	ug/L	81	1.5	SW846 8260B
Acetone	1.1	10.0	9.65	ug/L	85		SW846 8260B
	1.1	10.0	8.38	ug/L	72	14	SW846 8260B
1,1-Dichloroethene	ND	10.0	8.42	ug/L	84		SW846 8260B
	ND	10.0	8.33	ug/L	83	1.1	SW846 8260B
Methylene chloride	ND	10.0	8.05	ug/L	81		SW846 8260B
	ND	10.0	8.19	ug/L	82	1.7	SW846 8260B
Carbon disulfide	ND	10.0	8.30	ug/L	83		SW846 8260B
	ND	10.0	8.29	ug/L	83	0.13	SW846 8260B
1,1-Dichloroethane	ND	10.0	7.98	ug/L	80		SW846 8260B
	ND	10.0	7.83	ug/L	78	1.8	SW846 8260B
2-Butanone	ND	10.0	8.21	ug/L	82		SW846 8260B
	ND	10.0	8.25	ug/L	82	0.43	SW846 8260B
1,2-Dichloroethene (total)	ND	20.0	17.7	ug/L	89		SW846 8260B
	ND	20.0	17.8	ug/L	89	0.28	SW846 8260B
Chloroform	1.1	10.0	10.0	ug/L	90		SW846 8260B
	1.1	10.0	10.2	ug/L	92	2.0	SW846 8260B
1,1,1-Trichloroethane	ND	10.0	8.53	ug/L	85		SW846 8260B
	ND	10.0	8.55	ug/L	85	0.21	SW846 8260B
Carbon tetrachloride	6.6	10.0	14.1	ug/L	75		SW846 8260B
	6.6	10.0	16.1	ug/L	95	13	SW846 8260B
1,2-Dichloroethane	ND	10.0	7.59	ug/L	76		SW846 8260B
	ND	10.0	7.73	ug/L	77	1.8	SW846 8260B
Benzene	ND	10.0	8.59	ug/L	86		SW846 8260B
	ND	10.0	8.51	ug/L	85	0.93	SW846 8260B
Trichloroethene	ND	10.0	8.91	ug/L	89		SW846 8260B
	ND	10.0	8.78	ug/L	88	1.4	SW846 8260B
1,2-Dichloropropane	ND	10.0	8.24	ug/L	82		SW846 8260B
	ND	10.0	8.24	ug/L	82	0.03	SW846 8260B
Bromodichloromethane	ND	10.0	7.98	ug/L	80		SW846 8260B
	ND	10.0	7.99	ug/L	80	0.07	SW846 8260B

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: F0B080466 Work Order #...: LVEML1AJ-MS Matrix.....: WATER
MS Lot-Sample #: F0B080466-001 LVEML1AK-MSD

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
4-Methyl-2-pentanone	ND	10.0	7.61	ug/L	76		SW846 8260B
	ND	10.0	7.53	ug/L	75	1.1	SW846 8260B
cis-1,3-Dichloropropene	ND	10.0	7.50	ug/L	75		SW846 8260B
	ND	10.0	7.88	ug/L	79	5.0	SW846 8260B
Toluene	0.076	10.0	8.62	ug/L	85		SW846 8260B
	0.076	10.0	8.27	ug/L	82	4.2	SW846 8260B
trans-1,3-Dichloropropene	ND	10.0	6.91	ug/L	69		SW846 8260B
	ND	10.0	7.30	ug/L	73	5.4	SW846 8260B
1,1,2-Trichloroethane	ND	10.0	8.01	ug/L	80		SW846 8260B
	ND	10.0	7.90	ug/L	79	1.4	SW846 8260B
2-Hexanone	ND	10.0	7.78	ug/L	78		SW846 8260B
	ND	10.0	8.29	ug/L	83	6.4	SW846 8260B
Tetrachloroethene	ND	10.0	8.35	ug/L	84		SW846 8260B
	ND	10.0	8.29	ug/L	83	0.74	SW846 8260B
Dibromochloromethane	ND	10.0	7.97	ug/L	80		SW846 8260B
	ND	10.0	8.32	ug/L	83	4.3	SW846 8260B
Chlorobenzene	ND	10.0	7.94	ug/L	79		SW846 8260B
	ND	10.0	7.90	ug/L	79	0.55	SW846 8260B
Ethylbenzene	ND	10.0	8.88	ug/L	89		SW846 8260B
	ND	10.0	8.67	ug/L	87	2.4	SW846 8260B
Styrene	ND	10.0	9.01	ug/L	90		SW846 8260B
	ND	10.0	9.08	ug/L	91	0.81	SW846 8260B
Bromoform	ND	10.0	8.24	ug/L	82		SW846 8260B
	ND	10.0	8.50	ug/L	85	3.2	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	10.0	7.18	ug/L	72		SW846 8260B
	ND	10.0	7.47	ug/L	75	4.0	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	92	(68 - 118)
	91	(68 - 118)
Dibromofluoromethane	92	(75 - 121)
	93	(75 - 121)
1,2-Dichloroethane-d4	83	(67 - 132)
	83	(67 - 132)
4-Bromofluorobenzene	91	(77 - 113)
	92	(77 - 113)

NOTE(S):

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

Bold print denotes control parameters

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF102360

QC Batch 156061
Associated Samples 102360001, 102360002

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #37394**							
1,1-Dichloroethene	75-35-4		<1	ug/L					U	09/02/10
Trichloroethene	79-01-6		<1	ug/L					U	09/02/10
Benzene	71-43-2		<1	ug/L					U	09/02/10
Toluene	108-88-3		<1	ug/L					U	09/02/10
Chlorobenzene	108-90-7		<1	ug/L					U	09/02/10
1,1-Dichloroethane	75-34-3		<1	ug/L					U	09/02/10
Ethylbenzene	100-41-4		<1	ug/L					U	09/02/10
Styrene	100-42-5		<1	ug/L					U	09/02/10
cis-1,3-Dichloropropene	10061-01-5		<1	ug/L					U	09/02/10
trans-1,3-Dichloropropene	10061-02-6		<1	ug/L					U	09/02/10
1,2-Dichloroethane	107-06-2		<1	ug/L					U	09/02/10
Methyl isobutyl ketone	108-10-1		<1	ug/L					U	09/02/10
Dibromochloromethane	124-48-1		<1	ug/L					U	09/02/10
Tetrachloroethene	127-18-4		<1	ug/L					U	09/02/10
Total Xylenes	1330-20-7		<1	ug/L					U	09/02/10
Total 1,2-Dichloroethene	540-59-0		<1	ug/L					U	09/02/10
Carbon tetrachloride	56-23-5		<1	ug/L					U	09/02/10

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF102360

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
2-Hexanone	591-78-6		<1	ug/L					U	09/02/10
Acetone	67-64-1		<1	ug/L					U	09/02/10
Chloroform	67-66-3		<1	ug/L					U	09/02/10
1,1,1-Trichloroethane	71-55-6		<1	ug/L					U	09/02/10
Bromomethane	74-83-9		<1	ug/L					U	09/02/10
Chloromethane	74-87-3		<1	ug/L					U	09/02/10
Chloroethane	75-00-3		<1	ug/L					U	09/02/10
Vinyl chloride	75-01-4		<1	ug/L					U	09/02/10
Methylene chloride	75-09-2		<1	ug/L					U	09/02/10
Carbon disulfide	75-15-0		<1	ug/L					U	09/02/10
Bromoform	75-25-2		<1	ug/L					U	09/02/10
Bromodichloromethane	75-27-4		<1	ug/L					U	09/02/10
1,2-Dichloropropane	78-87-5		<1	ug/L					U	09/02/10
Methyl ethyl ketone	78-93-3		<1	ug/L					U	09/02/10
1,1,2-Trichloroethane	79-00-5		<1	ug/L					U	09/02/10
1,1,2,2-Tetrachloroethane	79-34-5		<1	ug/L					U	09/02/10
LCS			**QC Sample #37395**							
1,1-Dichloroethene	75-35-4		19	ug/L	76.3	75 - 125				09/02/10
Trichloroethene	79-01-6		20	ug/L	80.9	75 - 125				09/02/10
Benzene	71-43-2		22	ug/L	87.2	75 - 125				09/02/10
Toluene	108-88-3		22	ug/L	87.1	75 - 125				09/02/10
Chlorobenzene	108-90-7		22	ug/L	87.4	75 - 125				09/02/10

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF102360

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MS			**QC Sample #37396**							
			Original 102352001							
1,1-Dichloroethene	75-35-4		19	ug/L	76.6	75 - 125				09/02/10
Trichloroethene	79-01-6		22	ug/L	87.4	75 - 125				09/02/10
Benzene	71-43-2		23	ug/L	92.6	75 - 125				09/02/10
Toluene	108-88-3		24	ug/L	96.6	75 - 125				09/02/10
Chlorobenzene	108-90-7		23	ug/L	92.6	75 - 125				09/02/10
MSD			**QC Sample #37397**							
			Original 102352001					**Paired**	**37396**	
1,1-Dichloroethene	75-35-4		19	ug/L	77.6	75 - 125	1.30	20		09/02/10
Trichloroethene	79-01-6		22	ug/L	86.6	75 - 125	0.90	20		09/02/10
Benzene	71-43-2		23	ug/L	91.6	75 - 125	1.10	20		09/02/10
Toluene	108-88-3		24	ug/L	95.9	75 - 125	0.70	20		09/02/10
Chlorobenzene	108-90-7		23	ug/L	93.9	75 - 125	1.40	20		09/02/10

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF102360

QC Batch 156061
Associated Samples 102360001, 102360002

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
SAMPLE			**Sample #102360001**							
1,2-Dichloroethane-d4	17060-07-0				105.7	75 - 125				09/03/10
Toluene-d8	2037-26-5				104.2	75 - 125				09/03/10
4-Bromofluorobenzene	460-00-4				104.8	75 - 125				09/03/10
SAMPLE			**Sample #102360002**							
1,2-Dichloroethane-d4	17060-07-0				104.5	75 - 125				09/03/10
Toluene-d8	2037-26-5				105.1	75 - 125				09/03/10
4-Bromofluorobenzene	460-00-4				104.8	75 - 125				09/03/10
BLANK			**QC Sample #37394**							
1,2-Dichloroethane-d4	17060-07-0				102.7	75 - 125				09/02/10
Toluene-d8	2037-26-5				104.1	75 - 125				09/02/10
4-Bromofluorobenzene	460-00-4				107	75 - 125				09/02/10
LCS			**QC Sample #37395**							
1,2-Dichloroethane-d4	17060-07-0				102.9	75 - 125				09/02/10
Toluene-d8	2037-26-5				104.7	75 - 125				09/02/10

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF102360

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
4-Bromofluorobenzene	460-00-4				104.3	75 - 125				09/02/10
MS			**QC Sample #37396**							
			Original	**102352001**						
1,2-Dichloroethane-d4	17060-07-0				104	75 - 125				09/02/10
Toluene-d8	2037-26-5				105.8	75 - 125				09/02/10
4-Bromofluorobenzene	460-00-4				103.5	75 - 125				09/02/10
MSD			**QC Sample #37397**							
			Original	**102352001**					**Paired**	**37396**
1,2-Dichloroethane-d4	17060-07-0				105.4	75 - 125	1.30	20		09/02/10
Toluene-d8	2037-26-5				103.6	75 - 125	2.10	20		09/02/10
4-Bromofluorobenzene	460-00-4				104.6	75 - 125	1.10	20		09/02/10

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF103048

QC Batch 170054
Associated Samples 103048001, 103048002

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #42300**							
1,1-Dichloroethene	75-35-4		<1	ug/L					U	11/18/10
Trichloroethene	79-01-6		<1	ug/L					U	11/18/10
Benzene	71-43-2		<1	ug/L					U	11/18/10
Toluene	108-88-3		<1	ug/L					U	11/18/10
Chlorobenzene	108-90-7		<1	ug/L					U	11/18/10
1,1-Dichloroethane	75-34-3		<1	ug/L					U	11/18/10
Ethylbenzene	100-41-4		<1	ug/L					U	11/18/10
Styrene	100-42-5		<1	ug/L					U	11/18/10
cis-1,3-Dichloropropene	10061-01-5		<1	ug/L					U	11/18/10
trans-1,3-Dichloropropene	10061-02-6		<1	ug/L					U	11/18/10
1,2-Dichloroethane	107-06-2		<1	ug/L					U	11/18/10
Methyl isobutyl ketone	108-10-1		<1	ug/L					U	11/18/10
Dibromochloromethane	124-48-1		<1	ug/L					U	11/18/10
Tetrachloroethene	127-18-4		<1	ug/L					U	11/18/10
Total Xylenes	1330-20-7		<1	ug/L					U	11/18/10
Total 1,2-Dichloroethene	540-59-0		<1	ug/L					U	11/18/10
Carbon tetrachloride	56-23-5		<1	ug/L					U	11/18/10

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF103048

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
2-Hexanone	591-78-6		<1	ug/L					U	11/18/10
Acetone	67-64-1		<1	ug/L					U	11/18/10
Chloroform	67-66-3		<1	ug/L					U	11/18/10
1,1,1-Trichloroethane	71-55-6		<1	ug/L					U	11/18/10
Bromomethane	74-83-9		<1	ug/L					U	11/18/10
Chloromethane	74-87-3		<1	ug/L					U	11/18/10
Chloroethane	75-00-3		<1	ug/L					U	11/18/10
Vinyl chloride	75-01-4		<1	ug/L					U	11/18/10
Methylene chloride	75-09-2		<1	ug/L					U	11/18/10
Carbon disulfide	75-15-0		<1	ug/L					U	11/18/10
Bromoform	75-25-2		<1	ug/L					U	11/18/10
Bromodichloromethane	75-27-4		<1	ug/L					U	11/18/10
1,2-Dichloropropane	78-87-5		<1	ug/L					U	11/18/10
Methyl ethyl ketone	78-93-3		<1	ug/L					U	11/18/10
1,1,2-Trichloroethane	79-00-5		<1	ug/L					U	11/18/10
1,1,2,2-Tetrachloroethane	79-34-5		<1	ug/L					U	11/18/10
LCS			**QC Sample #42301**							
1,1-Dichloroethene	75-35-4		31	ug/L	122.2	75 - 125				11/18/10
Trichloroethene	79-01-6		21	ug/L	84.4	75 - 125				11/18/10
Benzene	71-43-2		23	ug/L	91.4	75 - 125				11/18/10
Toluene	108-88-3		24	ug/L	96.3	75 - 125				11/18/10
Chlorobenzene	108-90-7		24	ug/L	94.8	75 - 125				11/18/10

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF103048

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MS			**QC Sample #42302**							
			Original	**103033001**						
1,1-Dichloroethene	75-35-4		31	ug/L	123.6	75 - 125				11/18/10
Trichloroethene	79-01-6		24	ug/L	95.2	75 - 125				11/18/10
Benzene	71-43-2		27	ug/L	106.6	75 - 125				11/18/10
Toluene	108-88-3		24	ug/L	97.9	75 - 125				11/18/10
Chlorobenzene	108-90-7		27	ug/L	107.7	75 - 125				11/18/10
MSD			**QC Sample #42303**							
			Original	**103033001**					**Paired**	**42302**
1,1-Dichloroethene	75-35-4		30	ug/L	121	75 - 125	2.10	20		11/18/10
Trichloroethene	79-01-6		24	ug/L	94	75 - 125	1.30	20		11/18/10
Benzene	71-43-2		26	ug/L	102.5	75 - 125	3.90	20		11/18/10
Toluene	108-88-3		24	ug/L	96.9	75 - 125	1.00	20		11/18/10
Chlorobenzene	108-90-7		27	ug/L	108.5	75 - 125	0.70	20		11/18/10

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF103048

QC Batch 170054
Associated Samples 103048001, 103048002

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
SAMPLE			**Sample #103048001**							
1,2-Dichloroethane-d4	17060-07-0				102.6	75 - 125				11/18/10
Toluene-d8	2037-26-5				103.8	75 - 125				11/18/10
4-Bromofluorobenzene	460-00-4				92.5	75 - 125				11/18/10
SAMPLE			**Sample #103048002**							
1,2-Dichloroethane-d4	17060-07-0				101.4	75 - 125				11/18/10
Toluene-d8	2037-26-5				101	75 - 125				11/18/10
4-Bromofluorobenzene	460-00-4				90.6	75 - 125				11/18/10
BLANK			**QC Sample #42300**							
1,2-Dichloroethane-d4	17060-07-0				99.6	75 - 125				11/18/10
Toluene-d8	2037-26-5				100.6	75 - 125				11/18/10
4-Bromofluorobenzene	460-00-4				94.8	75 - 125				11/18/10
LCS			**QC Sample #42301**							
1,2-Dichloroethane-d4	17060-07-0				100.3	75 - 125				11/18/10
Toluene-d8	2037-26-5				101.3	75 - 125				11/18/10

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF103048

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
4-Bromofluorobenzene	460-00-4				95.7	75 - 125				11/18/10
MS			**QC Sample #42302**							
			Original	**103033001**						
1,2-Dichloroethane-d4	17060-07-0				105.5	75 - 125				11/18/10
Toluene-d8	2037-26-5				103.1	75 - 125				11/18/10
4-Bromofluorobenzene	460-00-4				95.1	75 - 125				11/18/10
MSD			**QC Sample #42303**							
			Original	**103033001**					**Paired**	**42302**
1,2-Dichloroethane-d4	17060-07-0				101.9	75 - 125	3.50	20		11/18/10
Toluene-d8	2037-26-5				103.2	75 - 125	0.10	20		11/18/10
4-Bromofluorobenzene	460-00-4				97.1	75 - 125	2.10	20		11/18/10

Hold Time Report SDG 222S20100241

Client Sample ID	Sample Group	Laboratory Sample ID	Method	Sample Date	Received Date	Analysis Date	Analysis Time lapse	Missed Holding Time
~~B23C74~~	~~20100241~~	~~S10M000127~~	~~SW846-9056A~~	~~03/08/10 09:16~~	~~03/09/10 09:30~~	~~03/10/10 17:05~~	~~56 hours~~	~~**Yes,** for NO3~~
~~B23C74~~	~~20100241~~	~~S10M000127~~	~~SW846-9056A~~	~~03/08/10 09:16~~	~~03/09/10 09:30~~	~~03/12/10 05:30~~	~~92 hours~~	~~**Yes,** for NO2, PO4~~
B23C74	20100241	S10M000162	SW846-8260B	03/08/10 09:16	03/10/10 11:00	03/10/10 14:43	2 days	**N**
B23C74	20100241	S10M000162	SW846-8260B	03/08/10 09:16	03/10/10 11:00	03/10/10 16:12	2 days	**N**

EH
04/21/11

WSCF - Anions & HexCr
Data Summary of All Results

Sample Group: 20100241

Customer Group or SDG Number: 222S20100241

Customer Sample ID: B23C74

Customer Sample ID: B23C74

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000127			16984-48-8	Fluoride	ug/mL	94.6	<6.16E-03	0.361	n/a	n/a	n/a	92.4	6.16E-03	n/a	
S10M000127			16887-00-6	Chloride	ug/mL	99.6	<3.10E-03	21.5	21.0	21.2	2.40	90.2	0.0341	n/a	
S10M000127			14797-65-0	Nitrite	ug/mL	91.2	<0.0400	<0.0400	n/a	n/a	n/a	92.8	0.0400	n/a	U
S10M000127			24959-67-9	Bromide	ug/mL	93.3	<0.0237	0.243	n/a	n/a	n/a	91.8	0.0237	n/a	
S10M000127			14797-55-8	Nitrate	ug/mL	91.9	<0.0162	128	133	130	4.27	94.8	1.64	n/a	
S10M000127			14265-44-2	Phosphate	ug/mL	95.1	<0.0381	<0.0381	n/a	n/a	n/a	101	0.0381	n/a	U
S10M000127			14808-79-8	Sulfate	ug/mL	91.7	<0.0219	32.2	32.0	32.1	0.673	96.5	0.241	n/a	
S10M000162			75-35-4	1,1-Dichloroethene	ug/L	96.3	<0.172	<0.191	n/a	n/a	n/a	91.2	0.191	n/a	U
S10M000162			67-64-1	Acetone	ug/L	110	6.18	<0.637	n/a	n/a	n/a	92.0	0.637	n/a	U
S10M000162			78-93-3	2-Butanone	ug/L	95.2	<0.458	<0.509	n/a	n/a	n/a	95.4	0.509	n/a	U
S10M000162			67-66-3	Chloroform	ug/L	n/a	<0.0414	41.2	n/a	n/a	n/a	n/a	0.0460	n/a	
S10M000162			56-23-5	Carbon tetrachloride	ug/L	n/a	<0.0479	1.63E+03	n/a	n/a	n/a	n/a	1.92	n/a	
S10M000162			71-36-3	1-Butanol	ug/L	88.8	<1.15	<1.28	n/a	n/a	n/a	85.0	1.28	n/a	U
S10M000162			71-43-2	Benzene	ug/L	92.8	<0.0163	<0.0181	n/a	n/a	n/a	89.6	0.0181	n/a	U
S10M000162			79-01-6	Trichloroethene	ug/L	90.1	<0.0378	16.5	n/a	n/a	n/a	90.0	0.0420	n/a	
S10M000162			108-10-1	Hexone	ug/L	109	<0.453	<0.503	n/a	n/a	n/a	103	0.503	n/a	U
S10M000162			108-88-3	Toluene	ug/L	95.8	<0.0522	<0.0580	n/a	n/a	n/a	89.5	0.0580	n/a	U
S10M000162			591-78-6	2-Hexanone	ug/L	104	<0.454	<0.505	n/a	n/a	n/a	101	0.505	n/a	U
S10M000162			108-90-7	Chlorobenzene	ug/L	96.6	<0.0320	<0.0356	n/a	n/a	n/a	91.3	0.0356	n/a	U
S10M000162			1868-53-7	Dibromofluoromethane	ug/L	91.6	10.2	14.1	n/a	n/a	n/a	117	0.0592	n/a	
S10M000162			17060-07-0	1,2-Dichloroethane-d4	ug/L	96.5	10.2	11.5	n/a	n/a	n/a	90.7	0.166	n/a	
S10M000162			2037-26-5	Toluene-d8	ug/L	102	11.1	11.8	n/a	n/a	n/a	94.8	0.0774	n/a	
S10M000162			460-00-4	4-Bromofluorobenzene	ug/L	94.8	10.8	11.2	n/a	n/a	n/a	96.2	0.0906	n/a	

EH
04/21/11

NA = Not Analyzed, ND = Not Detected

U - < Det Limit

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 100310_WSCF

Matrix Spike - EPA Sample No.: S10M000162

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	11.111	0.0000	10.137	91	62-151
Acetone	55.556	0.0000	51.085	92	55-139
2-Butanone	55.556	0.0000	52.996	95	60-146
n-Butanol	111.11	0.0000	94.489	85	73-140
Benzene	11.111	0.0000	9.956	90	86-120
Trichloroethene	11.111	16.518	26.520	90	71-128
Methyl Isobutyl Ketone	55.556	0.0000	57.125	103	75-137
Toluene	11.111	0.0000	9.944	89	83-118
2-Hexanone	55.556	0.0000	56.071	101	71-141
Chlorobenzene	11.111	0.0000	10.142	91	88-113

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	11.111	11.024	99	8	20	62-151
Acetone	55.556	59.004	106	14	20	55-139
2-Butanone	55.556	59.500	107	12	20	60-146
n-Butanol	111.11	109.57	99	15	20	73-140
Benzene	11.111	10.681	96	6	20	86-120
Trichloroethene	11.111	26.582	90	0	20	71-128
Methyl Isobutyl Ketone	55.556	64.877	117	13	20	75-137
Toluene	11.111	10.740	97	9	20	83-118
2-Hexanone	55.556	64.606	116	14	20	71-141
Chlorobenzene	11.111	10.770	97	6	20	88-113

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 10 outside limits
Spike Recovery: 0 out of 20 outside limits

COMMENTS: _____

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 100310_WSCF

	CLIENT SAMPLE NO.	SMC1 #	SMC2 (DCE) #	SMC3 (TOL) #	OTHER (BFB) #	TOT OUT
01	CCB	102	102	110	108	0
02	LCS	92	96	102	95	0
+ 03	S10M000162SA	127*	104	106	101	1
04	S10M000162MS	117	91	95	96	0
05	S10M000162MS	126*	103	103	99	1
DI 06	S10M000162	107	107	112	110	0
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		QC LIMITS (LCS, CCB)	(SAMPLE, MS, MSD) NEW LIMITS
SMC1	= Dibromofluoromethane	(85-123)	(73 - 136)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(83-123)	(77 - 132)
SMC3 (TOL)	= Toluene-d8	(82-121)	(86 - 119)
OTHER (BFB)	= Bromofluorobenzene	(82-126)	(82 - 128)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

+ - none diluted sample requires rerun

DI - sample was diluted, surr were not diluted.

Date: 21 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: 200 Area SGRP
Subject: Inorganics - Sample Data Groups (SDGs) SL876 and WSCF102360

INTRODUCTION

This memorandum presents the results of data validation for SDG SL876 prepared by TestAmerica and SDG WSCF102360 prepared by WSCF Analytical Laboratories. 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
B23CX3	02/05/10	Water	C	6010B & 7470A
B23WW1	09/01/10	Water	C	200.8
B24116	09/01/10	Water	C	200.8

Data validation was conducted in accordance with the CHPRC validation statement of work and the Sampling and Analysis Plan for Eleven ARRA Wells to Support the 200 West Groundwater Treatment System in FY 2010, DOE/RL-2009-95, Rev. 0 (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. Sample preservation for all samples requires chilling to 4 degrees Celsius and acid preservation with nitric acid to pH <2.

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

For SDG SL876, the temperature for sample B23CX3 was 12 degrees Celsius when received at the laboratory. No data should be qualified based on professional judgment.

- **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.

For SDG WSCF102360, the V laboratory blank result was > the method detection limit (MDL) but < the reporting limit (RL). The V results for samples B23WW1 and B24116 were detects > the RL and >10X the blank value 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 and laboratory control sample accuracy limits are 80% to 120% for all ICP analytes. 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 exception.

For SDG WSCF102360, the MS and MSD recoveries for Sr were < the lower acceptance limit. The Sr results for samples B23WW1 and B24116 were detects and should be qualified as estimates and flagged “J-.” In addition, an MS/MSD pair was not performed for Tc-99. The Tc-99 result for sample B24116 was a detect and should be qualified as estimate and flagged "J" due to lack of MS/MSD data.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable.

- **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 ±20%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

MS/MSD Samples

All MS/MSD RPD values were acceptable. For SDG WSCF102360, an MS/MSD pair was not performed for Tc-99. The Tc-99 result for sample B24116 was a detect and should be qualified as an estimate and flagged "J" due to lack of MS/MSD data.

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 Al and U MDLs for sample B23CX3 were greater than the CRDLs.

- **Completeness**

SDGs SL876 and WSCF102360 were 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 Sr results for samples B23WW1 and B24116 as estimates were due to low MS/MSD recoveries and for the Tc-99 result for sample B24116 due to lack of MS/MSD data.

It should be noted that COC requested analyte chromium was not reported for sample B23CX3.

REFERENCES

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

DOE/RL-2009-95, Rev. 0, *Sampling and Analysis Plan for Eleven ARRA Wells to Support the 200 West Groundwater Treatment System in FY 2010*, October 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			
SDGs: SL876 WSCF102360	Reviewer: AQA	Project: 200 Area SGRP	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
Sr	J-	B23WW1, B24116	Low MS/MSD recoveries
Tc-99	J	B24116	Lack of MS/MSD data

Comments: None

Appendix 3

Annotated Laboratory Reports

CH2M Hill Plateau Remediation (ARRA)

Client Sample ID: B23CX3

TOTAL Metals

Lot-Sample #...: F0B080466-002 Matrix.....: WATER
Date Sampled...: 02/05/10 Date Received..: 02/08/10

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0056128						
Mercury	**0.078 B**	**0.20**	**ug/L**	**SW846 7470A**	**03/03/10**	**LVEMX1AQ**
		Dilution Factor: 1		MDL.....: 0.044		
Prep Batch #...: 0057128						
Aluminum	ND	200	ug/L	SW846 6010B	02/26-03/03/10	LVEMX1AC
		Dilution Factor: 1		MDL.....: 79.9		
Arsenic	ND	10.0	ug/L	SW846 6010B	02/26-03/03/10	LVEMX1AD
		Dilution Factor: 1		MDL.....: 2.0		
Barium	**58.5**	**50.0**	**ug/L**	**SW846 6010B**	**02/26-03/03/10**	**LVEMX1AE**
		Dilution Factor: 1		MDL.....: 4.0		
Cadmium	ND	5.0	ug/L	SW846 6010B	02/26-03/03/10	LVEMX1AF
		Dilution Factor: 1		MDL.....: 0.91		
Cobalt	ND	50.0	ug/L	SW846 6010B	02/26-03/03/10	LVEMX1AP
		Dilution Factor: 1		MDL.....: 4.0		
Copper	ND	25.0	ug/L	SW846 6010B	02/26-03/03/10	LVEMX1AG
		Dilution Factor: 1		MDL.....: 4.6		
Manganese	**208**	**15.0**	**ug/L**	**SW846 6010B**	**02/26-03/03/10**	**LVEMX1AL**
		Dilution Factor: 1		MDL.....: 3.3		
Nickel	ND	40.0	ug/L	SW846 6010B	02/26-03/03/10	LVEMX1AH
		Dilution Factor: 1		MDL.....: 13.3		
Lead	ND	10.0	ug/L	SW846 6010B	02/26-03/03/10	LVEMX1AJ
		Dilution Factor: 1		MDL.....: 1.3		
Strontium	**149**	**5.0**	**ug/L**	**SW846 6010B**	**02/26-03/03/10**	**LVEMX1AM**
		Dilution Factor: 1		MDL.....: 0.54		
Uranium	ND	500	ug/L	SW846 6010B	02/26-03/03/10	LVEMX1AN
		Dilution Factor: 1		MDL.....: 23.5		
Vanadium	ND	50.0	ug/L	SW846 6010B	02/26-03/03/10	LVEMX1AK
		Dilution Factor: 1		MDL.....: 4.1		

NOTE(S):

B Estimated result. Result is less than RL.

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102360

Sample # 102360001
SAF# F10-065
Sample ID B23WW1

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed		CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPMS Prep											**09/16/10**
ICP-MS											
Aluminum		7429-90-5	LA-505-412	UD	<10		ug/L	2	10	200	09/16/10
Manganese		7439-96-5	LA-505-412	D	211		ug/L	2	0.20	2.0	09/16/10
Nickel		7440-02-0	LA-505-412	BD	3.99		ug/L	2	0.40	4.0	09/16/10
Barium		7440-39-3	LA-505-412	D	140		ug/L	2	0.40	4.0	09/16/10
Cadmium		7440-43-9	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	09/16/10
Chromium		7440-47-3	LA-505-412	D	14.8		ug/L	2	1.0	10	09/16/10
Cobalt		7440-48-4	LA-505-412	D	0.878		ug/L	2	0.10	0.50	09/16/10
Copper		7440-50-8	LA-505-412	BD	1.74		ug/L	2	0.20	2.0	09/16/10
Vanadium		7440-62-2	LA-505-412	DC	5.44		ug/L	2	0.40	4.0	09/16/10
Lead		7439-92-1	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	09/16/10
Strontium	J-	7440-24-6	LA-505-412	D	582		ug/L	2	0.20	2.0	09/16/10
Uranium		7440-61-1	LA-505-412	D	2.38		ug/L	2	0.10	0.40	09/16/10
Arsenic		7440-38-2	LA-505-412	BD	0.870		ug/L	2	0.80	8.0	09/16/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL. (Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102360

Sample # 102360002
SAF# F10-065
Sample ID B24116

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**09/01/10**
Anions by IC										
Fluoride	16984-48-8	LA-533-410	BD	0.306		ug/mL	2	0.088	0.40	09/01/10
Chloride	16887-00-6	LA-533-410	D	32.7		ug/mL	2	0.084	0.80	09/01/10
Nitrite-N	NO2-N	LA-533-410	D	0.626		ug/mL	2	0.036	0.20	09/01/10
Bromide	24959-67-9	LA-533-410	BD	0.324		ug/mL	2	0.11	1.0	09/01/10
Nitrate-N	NO3-N	LA-533-410	D	125		ug/mL	51	0.49	5.1	09/01/10
Phosphate-P	PO4-P	LA-533-410	UD	<0.14		ug/mL	2	0.14	0.80	09/01/10
ICPMS Prep										**09/16/10**
ICP-MS										
Aluminum	7429-90-5	LA-505-412	BD	13.2		ug/L	2	10	200	09/16/10
Manganese	7439-96-5	LA-505-412	D	210		ug/L	2	0.20	2.0	09/16/10
Nickel	7440-02-0	LA-505-412	D	4.51		ug/L	2	0.40	4.0	09/16/10
Barium	7440-39-3	LA-505-412	D	149		ug/L	2	0.40	4.0	09/16/10
Cadmium	7440-43-9	LA-505-412	BD	0.697		ug/L	2	0.20	2.0	09/16/10
Chromium	7440-47-3	LA-505-412	D	15.0		ug/L	2	1.0	10	09/16/10
Cobalt	7440-48-4	LA-505-412	D	1.61		ug/L	2	0.10	0.50	09/16/10
Copper	7440-50-8	LA-505-412	D	2.20		ug/L	2	0.20	2.0	09/16/10
Vanadium	7440-62-2	LA-505-412	DC	6.21		ug/L	2	0.40	4.0	09/16/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL. (Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102360

Sample # 102360002
SAF# F10-065
Sample ID B24116

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed		CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Lead		7439-92-1	LA-505-412	BD	0.714		ug/L	2	0.20	2.0	09/16/10
Strontium	J-	7440-24-6	LA-505-412	D	606		ug/L	2	0.20	2.0	09/16/10
Uranium		7440-61-1	LA-505-412	D	3.34		ug/L	2	0.10	0.40	09/16/10
Arsenic		7440-38-2	LA-505-412	BD	1.47		ug/L	2	0.80	8.0	09/16/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL. (Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102360

Sample # 102360002
SAF# F10-065
Sample ID B24116

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed		CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
H3 EICHROM											**09/01/10**
TRI-CARB LSC											
~~Tritium~~		~~10028-17-8~~	~~LA-508-421~~		~~1.2E4~~	~~2400~~	~~pCi/L~~	~~1~~	~~200~~		~~09/03/10~~
ICPMS Prep											**09/02/10**
TC-99 ICP/MS											
Technetium-99	J	14133-76-7	LA-505-412		0.057		ug/L	1	0.0010		09/02/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
U - Analyzed for but not detected above limiting criteria.
N - Spike Recovery is Outside Control Limits.
X,Y or Z - See comment detail and/or narrative.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
MS B3-60
Richland, Washington 99352
March 8, 2010
Attention: Mike Neely

TestAmerica Laboratories, Inc.

SDG	: SL876
Number of Samples	: two samples
Sample Matrix	: Water
Data Deliverable	: Summary
Date SDG Closed	: February 8, 2010

II. Introduction

On February 8, 2010, two water samples were received by TestAmerica - St. Louis for chemical analysis. The samples were received outside temperature criteria at 12 Degrees Celsius. The FedEx shipment was not marked for Saturday delivery; therefore, the cooler was received the next business day. Issue Resolution Form 10-036 accepted the proposed resolution to proceed with all analysis. This IRF is included with this case narrative and report. See the COC and CUR forms for further documentation of any variations on receipt conditions and temperature. Upon receipt, the samples were given laboratory Ids to correspond with specific client Ids. Please refer to the Sample Summary sheets attached to this case narrative. This report is incomplete without the narrative.

The following SAFs are associated with this SDG: F10-065

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits. All results are based upon samples as they were received, i.e. wet weight, unless otherwise noted on the data sheets. See the attached Methods Summary Form for the methods used in this SDG.

MS/MSD/Dup analysis was done per the client requirements. Analytical batches that did not contain matrix QC were analyzed with a LCS/LCS duplicate.

Deviation from Request: None

IV. Definitions

QCBLK-	Quality Control Blank, Method Blank
QCLCS-	Quality Control Laboratory Control Sample, Blank Spike
DUP-	Laboratory Duplicate
MS-	Matrix Spike
MSD-	Matrix Spike Duplicate

The term "Detection Limit" used in the analytical data report refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

CH2M Hill Plateau Remediation Company
March 8, 2010
SDG: SL876

TestAmerica Laboratories, Inc.

The following data qualifiers may be applicable to the results in this report, as appropriate.

- **B** – For inorganic analyses, the sample result is greater than the MDL but less than the RL.
- **B** – For organic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **J** – For organic analyses, the sample is estimated and less than the RL.
- **C** – For inorganic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **D** – For all analyses, the sample result was obtained from the analysis of a dilution.
- **N** – For inorganics and GC analyses, the spike/spike duplicate recoveries are outside QC limits.
- **T** – For GCMS analyses, the spike/spike duplicate recoveries are outside QC limits.

Volatiles

Batch: 0048151

The D% CCV is (higher recovered) outside the Method criteria (greater than 20% D) for the Bromomethane (31.6%), indicating a potential high bias for this analyte in the samples associated with this CCV. This analyte was not detected above the reporting limits in the associated samples.
Affected Samples:
F0B080466 (1): B23CT3
F0B080466 (2): B23CX3

Bromomethane was detected in the method blank at a concentration above the method detection limit but below the reporting limit. This analyte was not detected above the reporting limits in the associated samples. The analyte is qualified with a "B" flag accordingly.
Affected Samples:
F0B080466 (1): B23CT3
F0B080466 (2): B23CX3

Ion Chromatography

Batches: 0040446-0040452

The sample was received outside hold time for Nitrite in batch 0040448, Nitrate in batch 0040449, and Ortho Phosphate in batch 0040450. Issue Resolution Form 10-037 accepted the proposed resolution to proceed with the analysis. The sample was received on 02/08/10 and analyzed on 02/09/10.
Affected Samples:
F0B080466 (1): B23CT3

The sample was analyzed at a dilution for Chloride, Nitrate, and Sulfate due to high concentrations of target analytes. These analytes are qualified with a "D" flag in the associated samples.
Affected Samples:
F0B080466 (1): B23CT3

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

CH2M Hill Plateau Remediation Company
March 8, 2010
SDG: SL876

TestAmerica Laboratories, Inc.

The anion matrix spike solution contains all routine anions. Spiking technique, sample preparation and method compliance is demonstrated by the remaining acceptable MS recoveries. Poor matrix spike recovery for Ortho Phosphate in batch 0040450 is attributed to matrix interference. This analyte is qualified with an "N" accordingly.
Affected Samples:
F0B080466 (1): B23CT3

There were no observations or nonconformances for the following methods:

ICP Metals

I certify that this Summary Package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Michael Franks
St. Louis Project Manager

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-037

Date: February 9, 2010 SAF Nos. F10-065

SDG: SL876 LOGIN No.: **F0B080466** TEST: Anions

Sample No.(s) : **B23CT3**

Submitted By: Mike Franks
Phone No. 314-298-8566
Fax No. 314-298-8757

Submitted To: Heidi Hampt
Phone No. 509-376-4319
Fax No. 509-373-1788

ISSUE	PROPOSED RESOLUTION
The FedEx shipment was not marked for Saturday delivery; therefore the cooler was delivered on the next business day. The hold time for Anions 300.0 analysis expired in transit. The samples were collected 02/05/10 and received on 02/08/10.	1) Proceed with analysis ASAP. 2) Cancel Analysis.

CHPRC/BHI/WMH/PNNL COMMENTS

Proceed with analysis.

Heidi Hampt 2/10/10
Signature and Date

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-036

Date: February 9, 2010 SAF Nos. F10-065

SDG: SL876 LOGIN No.: **F0B080466** TEST: Volatiles, Anions

Sample No.(s) : **B23CT3, B23CX3**

Submitted By: Mike Franks
Phone No. 314-298-8566
Fax No. 314-298-8757

Submitted To: Heidi Hampt
Phone No. 509-376-4319
Fax No. 509-373-1788

ISSUE	PROPOSED RESOLUTION
The cooler was received on 02/08/10 outside the required 2-6 Degrees Celsius acceptance limits. The cooler was received at 12 Degrees Celsius. The FedEx shipment was not marked for Saturday delivery; therefore the cooler was delivered on the next business day.	1) Proceed with analysis. 2) Cancel Analysis.

CHPRC/BHI/WMH/PNNL COMMENTS

Proceed with analysis and note temperature in case narrative.

Heidi Hampt 2/10/10
Signature and Date

SDG# SL876 9 of 39

S876

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-125	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 1A	DATA TURNAROUND
Bates/Crow	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	24 Hours / 15 Days

SAMPLING LOCATION	PROJECT DESIGNATION	SAF NO.
EW-12 (C7019, 299-W11-49); I-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	F10-065

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
LUNCH 3584	HNF-N-5858 p9.74	287'	300194ES10	GOVERNMENT VEHICLE

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
Waste Sampling & Characterization	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	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)
TYPE OF CONTAINER	aGs*	P	Nalgene
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	500mL
SAMPLE ANALYSIS	* SEE ITEM (1) IN SPECIAL INSTRUCTIONS	* SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS (Technetium-99)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23CT3	WATER	2-5-10	1150

*SDG-WO5803
Ship TO STL

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
R. Crow/R. Crow	2-5-10 1330	M0413 SSU-R2	2-5-10 1330
M0413 SSU-R2 R Crow/R Crow	2-5-10 1345	L.D. Wall R. Crow/R Crow	2-5-10 1345
R.Crow/R Crow	FEB 05 2010 1350	L.D. Wall CHPRC	FEB 05 2010 1350
L.D. Wall CHPRC	FEB 05 2010 1430	TAN	FEB 05 2010 1430
TAN	2-5-10 350	Brunson Cooler Room	2-8-10 9:30

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}
(2)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Fluoride, Phosphate, Nitrogen in Nitrate}

ORIGINAL

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

A-6003-618(01/06)

TestAmerica St. Louis

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-155	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
Bates/Crow	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days

SAMPLING LOCATION	PROJECT DESIGNATION	SAF NO.
EW-12 (C7019, 299-W11-49); I-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	F10-065

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
LUNCH 3584	HNF-N-5858 pg. 74	287'	300194ES10	GOVERNMENT VEHICLE

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
Waste Sampling & Characterization	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	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	* VOA - 8260B (TCL);	* SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Lithium Ion Ex (Tritium)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23CX3	WATER	2-5-10	1150

*SDG WO580 Ship to STL

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
R. Crow/R Crow	2-5-10 1330	MO413 SSU-R2	2-5-10 1330
MO413 SSU-R2	2-5-10 1345	L.D. Wall CHPRC	FEB 05 2010 1345
L.D. Wall CHPRC	FEB 05 2010 1430	TAIR	FEB 05 2010 1430
TAIR	2-5-10 3:50pm	Brunson A	2-8-10 9:30

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Attachment 2
Narrative
WSCF102360

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on September 1, 2010. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, U and J) may be applicable to this report, as appropriate

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 156047 analyzed on sample# B27JX0 (102354001)

All QC controls are within the established limits.

Attachment 2
Narrative
WSCF102360

ICP-MS Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Technetium-99 is analyzed without prep therefore there is no Matrix Spike or Matrix Spike Duplicate with analysis. Analytical Note(s):

- Batch QC 163534 analyzed on sample# B27567 (102335003)
    - Vanadium contamination was detected in the Blank. Affected sample results in this batch were "C" Flagged.
    - Chromium – exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.

All QC controls are within the established limits.

- Technetium-99:
    - Batch QC 162850

All QC controls are within the established limits.

Organic Comments

VOA – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 156061 analyzed on sample# B27JW9 (102352001)

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Applies only to T Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Tritium:
    - Batch QC 155935 analyzed on sample# B26JD6 (102345001)

All QC controls are within the established limits.

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-065-207	PAGE 1 OF 1
COLLECTOR: Hecus, Morgan	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 7N; AIR QUALITY: ☐	DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: EW-6; C7020(299-W11-50); I-004	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F10-065	
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-50711 (Pg 16)	ACTUAL SAMPLE DEPTH: 2705'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: 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: 102360

PRESERVATION	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	VOA - 8260B (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B23WW1 001	WATER	9/1/10	0815	✓	✓	✓

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	9/1/10 0955	Victor Bingham	9/1/10 0955
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-236	PAGE 1 OF 1
COLLECTOR: Helmz Morton	COMPANY CONTACT: DYEKMAN, DL TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 7N AIR QUALITY: ☐	DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: EW-6; C7020(299-W11-50); I-004 DUP	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO.: F10-065	
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-567-11 (Pg 16) ACTUAL SAMPLE DEPTH: 270.5'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: 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	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2 (ULTREX)				
TYPE OF CONTAINER	aGs*	G/P	G	aGs*	P	Nalgene				
NO. OF CONTAINER(S)	3	1	1	3	1	1				
VOLUME	40mL	500mL	250mL	40mL	500mL	500mL				
SAMPLE ANALYSIS	VOA - 8260B (TCL);	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS (Technetium-99)				

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B24116 002	WATER	9/1/10	0815	✓	✓	✓	✓	✓	✓				

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	9/1/10 0955	Victor Bins	9/1/10 0955
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

(2)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}

(3)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Phosphate, Fluoride, Nitrogen in Nitrate}

ORIGINAL

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: 200 Area SGRP			DATA PACKAGE: VSR11-041		
VALIDATOR: Eyda Hergenreder		LAB: TestAmerica, WSCF		DATE: 4-21-2011	
			SDG: SL876, WSCF102360		
ANALYSES PERFORMED					
SW-846/ICP X	SW-846/GFAA	SW-846/Hg X		EPA 200.8 X	

SAMPLES/MATRIX Water samples

SDG SL876: B23CX3

SDG WSCF102360: B23WW1, B24116

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

SDG SL876: COC requested analyte chromium was not reported for B23CX3.

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:

SDG WSCF102360: laboratory blank V = 0.220 ug/L

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:

SDG WSCF102360: Sr MS/MSD %R = 72%/79%
No MS performed for Tc-99

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:

SDG WSCF102360: No method of precision was included with Tc-99

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:

SDG SL876: Lab sample receipt temperature was 12 degree C.

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:

SDG SL876: Al RDL = 50 ug/L, MDL = 79.9 ug/L
U RDL = 1 ug/L, MDL = 23.5 ug/L

Appendix 6

Additional Documentation Requested By Client

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F0B080466 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F0B250000-128 **Prep Batch #...:** 0056128						
Mercury	ND	0.20	ug/L	SW846 7470A	03/03/10	LV3CW1AA
		Dilution Factor: 1				
MB Lot-Sample #: F0B260000-128 **Prep Batch #...:** 0057128						
Aluminum	ND	200	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AA
		Dilution Factor: 1				
Arsenic	ND	10.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AC
		Dilution Factor: 1				
Barium	ND	50.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AD
		Dilution Factor: 1				
Cadmium	ND	5.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AE
		Dilution Factor: 1				
Cobalt	ND	50.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AN
		Dilution Factor: 1				
Copper	ND	25.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AF
		Dilution Factor: 1				
Lead	ND	10.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AH
		Dilution Factor: 1				
Manganese	ND	15.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AK
		Dilution Factor: 1				
Nickel	ND	40.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AG
		Dilution Factor: 1				
Strontium	ND	5.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AL
		Dilution Factor: 1				
Uranium	ND	500	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AM
		Dilution Factor: 1				
Vanadium	ND	50.0	ug/L	SW846 6010B	02/26-03/03/10	LV40W1AJ
		Dilution Factor: 1				

NOTE(S):

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

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F0B080466 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F0B250000-128 **Prep Batch #...:** 0056128							
Mercury	1.00	0.961	ug/L	96	SW846 7470A	03/03/10	LV3CW1AC
			Dilution Factor: 1				
LCS Lot-Sample#: F0B260000-128 **Prep Batch #...:** 0057128							
Aluminum	10000	10000	ug/L	100	SW846 6010B	02/26-03/03/10	LV40W1CE
			Dilution Factor: 1				
Arsenic	1000	1040	ug/L	104	SW846 6010B	02/26-03/03/10	LV40W1CF
			Dilution Factor: 1				
Barium	1000	1040	ug/L	104	SW846 6010B	02/26-03/03/10	LV40W1CG
			Dilution Factor: 1				
Cadmium	1000	1040	ug/L	104	SW846 6010B	02/26-03/03/10	LV40W1CH
			Dilution Factor: 1				
Copper	1000	996	ug/L	100	SW846 6010B	02/26-03/03/10	LV40W1CJ
			Dilution Factor: 1				
Nickel	1000	1030	ug/L	103	SW846 6010B	02/26-03/03/10	LV40W1CK
			Dilution Factor: 1				
Lead	1000	1030	ug/L	103	SW846 6010B	02/26-03/03/10	LV40W1CL
			Dilution Factor: 1				
Vanadium	1000	1040	ug/L	104	SW846 6010B	02/26-03/03/10	LV40W1CM
			Dilution Factor: 1				
Manganese	1000	1050	ug/L	105	SW846 6010B	02/26-03/03/10	LV40W1CN
			Dilution Factor: 1				
Strontium	1000	1040	ug/L	104	SW846 6010B	02/26-03/03/10	LV40W1CP
			Dilution Factor: 1				
Uranium	1000	1070	ug/L	107	SW846 6010B	02/26-03/03/10	LV40W1CQ
			Dilution Factor: 1				
Cobalt	1000	1040	ug/L	104	SW846 6010B	02/26-03/03/10	LV40W1CR
			Dilution Factor: 1				

(Continued on next page)

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F0B080466 Matrix.....: WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #

NOTE(S):

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

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F0B080466 **Matrix.....:** WATER
Date Sampled...: 02/05/10 **Date Received..:** 02/08/10

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F0B080466-002 **Prep Batch #...:** 0056128									
Mercury									
	0.078	1.00	0.878	ug/L	80		SW846 7470A	03/03/10	LVEMX1CK
	0.078	1.00	0.901	ug/L	82	2.6	SW846 7470A	03/03/10	LVEMX1CL
			Dilution Factor: 1						
MS Lot-Sample #: F0B080466-002 **Prep Batch #...:** 0057128									
Aluminum									
	ND	10000	10100	ug/L	101		SW846 6010B	02/26-03/03/10	LVEMX1AR
	ND	10000	10100	ug/L	101	0.37	SW846 6010B	02/26-03/03/10	LVEMX1AT
			Dilution Factor: 1						
Arsenic									
	ND	1000	1030	ug/L	103		SW846 6010B	02/26-03/03/10	LVEMX1AU
	ND	1000	1030	ug/L	103	0.11	SW846 6010B	02/26-03/03/10	LVEMX1AV
			Dilution Factor: 1						
Barium									
	58.5	1000	1110	ug/L	105		SW846 6010B	02/26-03/03/10	LVEMX1AW
	58.5	1000	1100	ug/L	104	0.75	SW846 6010B	02/26-03/03/10	LVEMX1AX
			Dilution Factor: 1						
Cadmium									
	ND	1000	1020	ug/L	102		SW846 6010B	02/26-03/03/10	LVEMX1A0
	ND	1000	1020	ug/L	102	0.06	SW846 6010B	02/26-03/03/10	LVEMX1A1
			Dilution Factor: 1						
Cobalt									
	ND	1000	1000	ug/L	100		SW846 6010B	02/26-03/03/10	LVEMX1CH
	ND	1000	1000	ug/L	100	0.23	SW846 6010B	02/26-03/03/10	LVEMX1CJ
			Dilution Factor: 1						
Copper									
	ND	1000	1000	ug/L	100		SW846 6010B	02/26-03/03/10	LVEMX1A2
	ND	1000	995	ug/L	100	0.65	SW846 6010B	02/26-03/03/10	LVEMX1A3
			Dilution Factor: 1						
Lead									
	ND	1000	1010	ug/L	101		SW846 6010B	02/26-03/03/10	LVEMX1A6
	ND	1000	1010	ug/L	101	0.30	SW846 6010B	02/26-03/03/10	LVEMX1A7
			Dilution Factor: 1						

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F0B080466 **Matrix.....:** WATER
Date Sampled...: 02/05/10 **Date Received..:** 02/08/10

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Manganese									
	208	1000	1240	ug/L	103		SW846 6010B	02/26-03/03/10	LVEMX1CA
	208	1000	1240	ug/L	103	0.47	SW846 6010B	02/26-03/03/10	LVEMX1CC
			Dilution Factor: 1						
Nickel									
	ND	1000	994	ug/L	99		SW846 6010B	02/26-03/03/10	LVEMX1A4
	ND	1000	991	ug/L	99	0.27	SW846 6010B	02/26-03/03/10	LVEMX1A5
			Dilution Factor: 1						
Strontium									
	149	1000	1200	ug/L	105		SW846 6010B	02/26-03/03/10	LVEMX1CD
	149	1000	1190	ug/L	104	0.31	SW846 6010B	02/26-03/03/10	LVEMX1CE
			Dilution Factor: 1						
Uranium									
	ND	1000	1060	ug/L	106		SW846 6010B	02/26-03/03/10	LVEMX1CF
	ND	1000	1000	ug/L	100	6.1	SW846 6010B	02/26-03/03/10	LVEMX1CG
			Dilution Factor: 1						
Vanadium									
	ND	1000	1030	ug/L	103		SW846 6010B	02/26-03/03/10	LVEMX1A8
	ND	1000	1030	ug/L	103	0.27	SW846 6010B	02/26-03/03/10	LVEMX1A9
			Dilution Factor: 1						

NOTE(S):

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

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102360

QC Batch 163534
Associated Samples 102360001, 102360002

Test ICP-2008 MS All possible metal

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #38685**							
Aluminum	7429-90-5		<5.0	ug/L					U	09/16/10
Manganese	7439-96-5		<0.10	ug/L					U	09/16/10
Nickel	7440-02-0		<0.20	ug/L					U	09/16/10
Barium	7440-39-3		<0.20	ug/L					U	09/16/10
Cadmium	7440-43-9		<0.10	ug/L					U	09/16/10
Chromium	7440-47-3		<0.50	ug/L					U	09/16/10
Cobalt	7440-48-4		<0.050	ug/L					U	09/16/10
Copper	7440-50-8		<0.10	ug/L					U	09/16/10
Vanadium	7440-62-2		0.220	ug/L					B	09/16/10
Lead	7439-92-1		<0.10	ug/L					U	09/16/10
Strontium	7440-24-6		<0.10	ug/L					U	09/16/10
Uranium	7440-61-1		<0.050	ug/L					U	09/16/10
Arsenic	7440-38-2		<0.40	ug/L					U	09/16/10
LCS			**QC Sample #38686**							
Aluminum	7429-90-5		410	ug/L	102.6	85 - 115				09/16/10
Manganese	7439-96-5		41.1	ug/L	102.8	85 - 115				09/16/10
Nickel	7440-02-0		40.6	ug/L	101.4	85 - 115				09/16/10
Barium	7440-39-3		42.0	ug/L	105	85 - 115				09/16/10

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102360

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Cadmium	7440-43-9		40.5	ug/L	101.2	85 - 115				09/16/10
Chromium	7440-47-3		40.6	ug/L	101.6	85 - 115				09/16/10
Cobalt	7440-48-4		41.2	ug/L	103.1	85 - 115				09/16/10
Copper	7440-50-8		41.3	ug/L	103.2	85 - 115				09/16/10
Vanadium	7440-62-2		41.0	ug/L	102.5	85 - 115				09/16/10
Lead	7439-92-1		42.2	ug/L	105.4	85 - 115				09/16/10
Strontium	7440-24-6		41.3	ug/L	103.2	85 - 115				09/16/10
Uranium	7440-61-1		41.5	ug/L	103.8	85 - 115				09/16/10
Arsenic	7440-38-2		40.1	ug/L	100.3	85 - 115				09/16/10
MS			**QC Sample #38687**							
			Original 102335003							
Aluminum	7429-90-5		377	ug/L	94.3	70 - 130				09/16/10
Manganese	7439-96-5		37.0	ug/L	92.5	70 - 130				09/16/10
Nickel	7440-02-0		36.0	ug/L	90	70 - 130				09/16/10
Barium	7440-39-3		35.7	ug/L	89.2	70 - 130				09/16/10
Cadmium	7440-43-9		37.9	ug/L	94.8	70 - 130				09/16/10
Chromium	7440-47-3		27.1	ug/L	67.8	70 - 130			X	09/16/10
Cobalt	7440-48-4		36.9	ug/L	92.1	70 - 130				09/16/10
Copper	7440-50-8		36.0	ug/L	90	70 - 130				09/16/10
Vanadium	7440-62-2		37.5	ug/L	93.8	70 - 130				09/16/10
Lead	7439-92-1		40.3	ug/L	100.8	70 - 130				09/16/10
Strontium	7440-24-6		28.7	ug/L	71.8	70 - 130				09/16/10
Uranium	7440-61-1		41.5	ug/L	103.9	70 - 130				09/16/10
Arsenic	7440-38-2		39.5	ug/L	98.6	70 - 130				09/16/10

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102360

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MSD			**QC Sample #38688**							
			Original	**102335003**				**Paired**	**38687**	
Aluminum	7429-90-5		390	ug/L	97.5	70 - 130	3.30	20		09/16/10
Manganese	7439-96-5		38.7	ug/L	96.8	70 - 130	4.50	20		09/16/10
Nickel	7440-02-0		36.3	ug/L	90.8	70 - 130	0.90	20		09/16/10
Barium	7440-39-3		37.8	ug/L	94.6	70 - 130	5.90	20		09/16/10
Cadmium	7440-43-9		38.4	ug/L	96.1	70 - 130	1.40	20		09/16/10
Chromium	7440-47-3		32.0	ug/L	80	70 - 130	16.50	20	X	09/16/10
Cobalt	7440-48-4		38.4	ug/L	95.9	70 - 130	4.00	20		09/16/10
Copper	7440-50-8		36.9	ug/L	92.2	70 - 130	2.40	20		09/16/10
Vanadium	7440-62-2		39.6	ug/L	99	70 - 130	5.40	20		09/16/10
Lead	7439-92-1		41.4	ug/L	103.4	70 - 130	2.50	20		09/16/10
Strontium	7440-24-6		31.7	ug/L	79.2	70 - 130	9.80	20		09/16/10
Uranium	7440-61-1		42.7	ug/L	106.7	70 - 130	2.70	20		09/16/10
Arsenic	7440-38-2		39.8	ug/L	99.5	70 - 130	0.90	20		09/16/10

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102360

QC Batch 162850
Associated Samples 102360002

Test Technicium-99 by ICP MS

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #38551**							
Technetium-99	14133-76-7		<0.0010	ug/L					U	09/02/10
LCS			**QC Sample #38552**							
Technetium-99	14133-76-7		0.043	ug/L	98.1	49 - 125				09/02/10

Date: 21 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: 200 Area SGRP
Subject: General Chemistry - Sample Data Groups (SDGs) SL876, WSCF100307, WSCF102360, WSCF103048, WSCF103087 and 222S20100241

INTRODUCTION

This memorandum presents the results of data validation for SDG SL876 prepared by TestAmerica, SDGs WSCF100307, WSCF102360, WSCF103048 and WSCF103087 prepared by WSCF Analytical Laboratories and SDG 222S20100241 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
B23CT3	02/05/10	Water	C	300.0
B23C81	02/12/10	Water	C	7196A
B24116	09/01/10	Water	C	300.0
B24JJ5	11/17/10	Water	C	300.0
B24JT4	11/19/10	Water	C	7196A
B23C74	03/08/10	Water	C	300.0

Data validation was conducted in accordance with the CHPRC validation statement of work and the Sampling and Analysis Plan for Eleven ARRA Wells to Support the 200 West Groundwater Treatment System in FY 2010, DOE/RL-2009-95, Rev. 0 (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 are as follows:

- All anions except nitrate, nitrite, and phosphate – analysis within 28 days of sample collection
- Nitrate, nitrite, and phosphate – analysis within 48 hours of sample collection
- Hexavalent chromium – analysis within 24 hours of sample collection

Sample preservation for the above analyses requires chilling to 4 degrees Celsius.

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

For SDG SL876, the temperature for sample B23CT3 was 12 degrees Celsius when received by the laboratory. In addition the analysis for nitrate, nitrite and phosphate were performed beyond but ≤ 2X the holding time. The nitrate, nitrite and phosphate results were detects and should be qualified as unusable and flagged “R” due to missed holding time and the temperature infraction. Based on professional judgment, the chloride, fluoride and sulfate results were detects and should be qualified as estimates and flagged "J" and the bromide result was a non-detect and should be qualified as an estimate and flagged "UJ" due to the temperature infraction.

For SDG 222S20100241, the temperature for sample B23C74 was 8 degree Celsius when received by the laboratory. In addition the analyses for nitrate, nitrite and phosphate were performed beyond but ≤ 2X the holding time. The nitrite and phosphate results were non-detects and should be qualified as unusable and flagged “UR” and the nitrate result was a detect and should be qualified as unusable and flagged "R" due to missed holding time and the temperature infraction. Based on professional judgment, the fluoride, chloride, bromide and sulfate results were detects and should be qualified as estimates and flagged "J" due to the temperature infraction.

- **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.

For SDG SL876, the sulfate laboratory blank result was > the method detection limit (MDL) but < the reporting limit (RL). The sulfate result for sample B23CT3 was a detect > the RL and >10X the blank value 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 and laboratory control sample for anions and the laboratory control sample for hexavalent chromium accuracy limits are 80% to 120% and the matrix spike sample accuracy limit for hexavalent chromium are ones specified by the DV procedure. 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.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable.

- **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 ±20%. 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 reporting limits with difference <1X the reporting 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

For SDG WSCF103048, the primary sample associated with field duplicate sample B24JJ5 was not selected for validation; therefore field duplicate precision could not be assessed.

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**

SDGs SL876, WSCF100307, WSCF102360, WSCF103048. WSCF103087 and 222S20100241 were 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 for method 300.0 was 71%. The completion for all remaining analyses was 100%.

MAJOR DEFICIENCIES

Major deficiencies leading to qualification of nitrate, nitrite and phosphate results for samples B23CT3 and B23C74 as unusable were due to holding time and preservation infractions.

MINOR DEFICIENCIES

Minor deficiencies leading to qualification of bromide, chloride, sulfate and fluoride results for samples B23CT3 and B23C74 as estimates were due to preservation infractions.

REFERENCES

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

DOE/RL-2009-95, Rev. 0, *Sampling and Analysis Plan for Eleven ARRA Wells to Support the 200 West Groundwater Treatment System in FY 2010*, October 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			
SDGs: SL876, WSCF100307, WSCF102360, WSCF103048, WSCF103087, 222S20100241	Reviewer: AQA	Project: 200 Area SGRP	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
nitrate nitrite phosphate	**R**	B23CT3	Sample temperature >4°C and analysis beyond but within 2X the holding time
bromide	UJ	B23CT3	Sample temperature >4°C
chloride fluoride sulfate	J	B23CT3	Sample temperature >4°C
nitrate	**R**	B23C74	Sample temperature >4°C and analysis beyond but within 2X the holding time
nitrite phosphate	**UR**	B23C74	Sample temperature >4°C and analysis beyond but within 2X the holding time
fluoride chloride bromide sulfate	J	B23C74	Sample temperature >4°C

Comments: None

Appendix 3

Annotated Laboratory Reports

CH2M Hill Plateau Remediation (ARRA)

Client Sample ID: B23CT3

General Chemistry

Lot-Sample #...: F0B080466-001 Work Order #...: LVEML Matrix.....: WATER
Date Sampled...: 02/05/10 Date Received..: 02/08/10

PARAMETER		RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bromide	UJ	ND	0.25	mg/L	MCAWW 300.0A	02/09/10	0040451
			Dilution Factor: 1		MDL.....: 0.026		
Chloride	J	36.6 D	4.0	mg/L	MCAWW 300.0A	02/09/10	0040446
			Dilution Factor: 20		MDL.....: 0.40		
Fluoride	J	0.44	0.10	mg/L	MCAWW 300.0A	02/09/10	0040447
			Dilution Factor: 1		MDL.....: 0.010		
Nitrogen, Nitrate	R	5.6 D	0.40	mg/L	MCAWW 300.0A	02/09/10	0040449
			Dilution Factor: 20		MDL.....: 0.17		
Nitrogen, Nitrite	R	0.011 B	0.020	mg/L	MCAWW 300.0A	02/09/10	0040448
			Dilution Factor: 1		MDL.....: 0.0030		
Phosphate as P, Ortho	R	0.20 B,N	0.50	mg/L	MCAWW 300.0A	02/09/10	0040450
			Dilution Factor: 1		MDL.....: 0.050		
Sulfate	J	29.2 C,D	10.0	mg/L	MCAWW 300.0A	02/09/10	0040452
			Dilution Factor: 20		MDL.....: 1.0		

NOTE(S):

RL Reporting Limit

D Result was obtained from the analysis of a dilution.

B Estimated result. Result is less than RL.

N Spiked analyte recovery is outside stated control limits.

C Analyte detected in method blank above the MDL/IDL.

EH
04/21/11

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF100307

Sample # 100307001
SAF# F10-065
Sample ID B23C81

Matrix WATER
Sampled 02/12/10
Received 02/12/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Cr(VI)										**02/12/10**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	U	<0.0020		mg/L	1	0.0020	0.0050	02/12/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL. (Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD sample recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102360

Sample # 102360002
SAF# F10-065
Sample ID B24116

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**09/01/10**
Anions by IC										
Fluoride	16984-48-8	LA-533-410	BD	0.306		ug/mL	2	0.088	0.40	09/01/10
Chloride	16887-00-6	LA-533-410	D	32.7		ug/mL	2	0.084	0.80	09/01/10
Nitrite-N	NO2-N	LA-533-410	D	0.626		ug/mL	2	0.036	0.20	09/01/10
Bromide	24959-67-9	LA-533-410	BD	0.324		ug/mL	2	0.11	1.0	09/01/10
Nitrate-N	NO3-N	LA-533-410	D	125		ug/mL	51	0.49	5.1	09/01/10
Phosphate-P	PO4-P	LA-533-410	UD	<0.14		ug/mL	2	0.14	0.80	09/01/10
ICPMS Prep										**09/16/10**
ICP-MS										
Aluminum	7429-90-5	LA-505-412	BD	13.2		ug/L	2	10	200	09/16/10
Manganese	7439-96-5	LA-505-412	D	210		ug/L	2	0.20	2.0	09/16/10
Nickel	7440-02-0	LA-505-412	D	4.51		ug/L	2	0.40	4.0	09/16/10
Barium	7440-39-3	LA-505-412	D	149		ug/L	2	0.40	4.0	09/16/10
Cadmium	7440-43-9	LA-505-412	BD	0.697		ug/L	2	0.20	2.0	09/16/10
Chromium	7440-47-3	LA-505-412	D	15.0		ug/L	2	1.0	10	09/16/10
Cobalt	7440-48-4	LA-505-412	D	1.61		ug/L	2	0.10	0.50	09/16/10
Copper	7440-50-8	LA-505-412	D	2.20		ug/L	2	0.20	2.0	09/16/10
Vanadium	7440-62-2	LA-505-412	DC	6.21		ug/L	2	0.40	4.0	09/16/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL. (Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF103048

Sample # 103048002
SAF# F10-065
Sample ID B24JJ5

Matrix WATER
Sampled 11/17/10
Received 11/17/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**11/18/10**
Anions by IC										
Nitrate-N	NO3-N	LA-533-410	D	4.20		ug/mL	2	0.019	0.20	11/18/10
ICPMS Prep										**12/02/10**
ICP-MS										
Aluminum	7429-90-5	LA-505-412	UD	<10		ug/L	2	10	200	12/07/10
Manganese	7439-96-5	LA-505-412	D	65.3		ug/L	2	0.20	2.0	12/07/10
Nickel	7440-02-0	LA-505-412	BD	0.722		ug/L	2	0.40	4.0	12/07/10
Barium	7440-39-3	LA-505-412	D	25.2		ug/L	2	0.40	4.0	12/07/10
Cadmium	7440-43-9	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	12/07/10
Chromium	7440-47-3	LA-505-412	UD	<1.0		ug/L	2	1.0	10	12/07/10
Cobalt	7440-48-4	LA-505-412	BD	0.199		ug/L	2	0.10	0.50	12/07/10
Copper	7440-50-8	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	12/07/10
Vanadium	7440-62-2	LA-505-412	BD	2.80		ug/L	2	0.40	4.0	12/07/10
Lead	7439-92-1	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	12/07/10
Strontium	7440-24-6	LA-505-412	D	133		ug/L	2	0.20	2.0	12/07/10
Uranium	7440-61-1	LA-505-412	BD	0.345		ug/L	2	0.10	0.40	12/07/10
Arsenic	7440-38-2	LA-505-412	UD	<0.80		ug/L	2	0.80	8.0	12/07/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF103087

Sample # 103087001
SAF# F10-065
Sample ID B24JT4

Matrix WATER
Sampled 11/19/10
Received 11/19/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Cr(VI)										**11/19/10**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	U	<0.0020		mg/L	1	0.0020	0.0050	11/19/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF - Anions & HexCr
Data Summary of All Results

Sample Group: 20100241

Customer Group or SDG Number: 222S20100241

Customer Sample ID: B23C74

Customer Sample ID: B23C74

Sample#	R	A#	CAS #	Analyte		Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000127			16984-48-8	Fluoride	J	ug/mL	94.6	<6.16E-03	0.361	n/a	n/a	n/a	92.4	6.16E-03	n/a	
S10M000127			16887-00-6	Chloride	J	ug/mL	99.6	<3.10E-03	21.5	21.0	21.2	2.40	90.2	0.0341	n/a	
S10M000127			14797-65-0	Nitrite	UR	ug/mL	91.2	<0.0400	<0.0400	n/a	n/a	n/a	92.8	0.0400	n/a	U
S10M000127			24959-67-9	Bromide	J	ug/mL	93.3	<0.0237	0.243	n/a	n/a	n/a	91.8	0.0237	n/a	
S10M000127			14797-55-8	Nitrate	R	ug/mL	91.9	<0.0162	128	133	130	4.27	94.8	1.64	n/a	
S10M000127			14265-44-2	Phosphate	UR	ug/mL	95.1	<0.0381	<0.0381	n/a	n/a	n/a	101	0.0381	n/a	U
S10M000127			14808-79-8	Sulfate	J	ug/mL	91.7	<0.0219	32.2	32.0	32.1	0.673	96.5	0.241	n/a	
S10M000162			75-35-4	1,1-Dichloroethene		ug/L	96.3	<0.172	<0.191	n/a	n/a	n/a	91.2	0.191	n/a	U
S10M000162			67-64-1	Acetone		ug/L	110	6.18	<0.637	n/a	n/a	n/a	92.0	0.637	n/a	U
S10M000162			78-93-3	2-Butanone		ug/L	95.2	<0.458	<0.509	n/a	n/a	n/a	95.4	0.509	n/a	U
S10M000162			67-66-3	Chloroform		ug/L	n/a	<0.0414	41.2	n/a	n/a	n/a	n/a	0.0460	n/a	
S10M000162			56-23-5	Carbon tetrachloride		ug/L	n/a	<0.0479	1.63E+03	n/a	n/a	n/a	n/a	1.92	n/a	
S10M000162			71-36-3	1-Butanol		ug/L	88.8	<1.15	<1.28	n/a	n/a	n/a	85.0	1.28	n/a	U
S10M000162			71-43-2	Benzene		ug/L	92.8	<0.0163	<0.0181	n/a	n/a	n/a	89.6	0.0181	n/a	U
S10M000162			79-01-6	Trichloroethene		ug/L	90.1	<0.0378	16.5	n/a	n/a	n/a	90.0	0.0420	n/a	
S10M000162			108-10-1	Hexone		ug/L	109	<0.453	<0.503	n/a	n/a	n/a	103	0.503	n/a	U
S10M000162			108-88-3	Toluene		ug/L	95.8	<0.0522	<0.0580	n/a	n/a	n/a	89.5	0.0580	n/a	U
S10M000162			591-78-6	2-Hexanone		ug/L	104	<0.454	<0.505	n/a	n/a	n/a	101	0.505	n/a	U
S10M000162			108-90-7	Chlorobenzene		ug/L	96.6	<0.0320	<0.0356	n/a	n/a	n/a	91.3	0.0356	n/a	U
S10M000162			1868-53-7	Dibromofluoromethane		ug/L	91.6	10.2	14.1	n/a	n/a	n/a	117	0.0592	n/a	
S10M000162			17060-07-0	1,2-Dichloroethane-d4		ug/L	96.5	10.2	11.5	n/a	n/a	n/a	90.7	0.166	n/a	
S10M000162			2037-26-5	Toluene-d8		ug/L	102	11.1	11.8	n/a	n/a	n/a	94.8	0.0774	n/a	
S10M000162			460-00-4	4-Bromofluorobenzene		ug/L	94.8	10.8	11.2	n/a	n/a	n/a	96.2	0.0906	n/a	

NA = Not Analyzed, ND = Not Detected

U - < Det Limit

EH
04/21/11

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
MS B3-60
Richland, Washington 99352
March 8, 2010
Attention: Mike Neely

TestAmerica Laboratories, Inc.

SDG	: SL876
Number of Samples	: two samples
Sample Matrix	: Water
Data Deliverable	: Summary
Date SDG Closed	: February 8, 2010

II. Introduction

On February 8, 2010, two water samples were received by TestAmerica - St. Louis for chemical analysis. The samples were received outside temperature criteria at 12 Degrees Celsius. The FedEx shipment was not marked for Saturday delivery; therefore, the cooler was received the next business day. Issue Resolution Form 10-036 accepted the proposed resolution to proceed with all analysis. This IRF is included with this case narrative and report. See the COC and CUR forms for further documentation of any variations on receipt conditions and temperature. Upon receipt, the samples were given laboratory Ids to correspond with specific client Ids. Please refer to the Sample Summary sheets attached to this case narrative. This report is incomplete without the narrative.

The following SAFs are associated with this SDG: F10-065

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits. All results are based upon samples as they were received, i.e. wet weight, unless otherwise noted on the data sheets. See the attached Methods Summary Form for the methods used in this SDG.

MS/MSD/Dup analysis was done per the client requirements. Analytical batches that did not contain matrix QC were analyzed with a LCS/LCS duplicate.

Deviation from Request: None

IV. Definitions

QCBLK-	Quality Control Blank, Method Blank
QCLCS-	Quality Control Laboratory Control Sample, Blank Spike
DUP-	Laboratory Duplicate
MS-	Matrix Spike
MSD-	Matrix Spike Duplicate

The term "Detection Limit" used in the analytical data report refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

CH2M Hill Plateau Remediation Company
March 8, 2010
SDG: SL876

TestAmerica Laboratories, Inc.

The following data qualifiers may be applicable to the results in this report, as appropriate.

- **B** – For inorganic analyses, the sample result is greater than the MDL but less than the RL.
- **B** – For organic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **J** – For organic analyses, the sample is estimated and less than the RL.
- **C** – For inorganic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **D** – For all analyses, the sample result was obtained from the analysis of a dilution.
- **N** – For inorganics and GC analyses, the spike/spike duplicate recoveries are outside QC limits.
- **T** – For GCMS analyses, the spike/spike duplicate recoveries are outside QC limits.

Volatiles

Batch: 0048151

The D% CCV is (higher recovered) outside the Method criteria (greater than 20% D) for the Bromomethane (31.6%), indicating a potential high bias for this analyte in the samples associated with this CCV. This analyte was not detected above the reporting limits in the associated samples.
Affected Samples:
F0B080466 (1): B23CT3
F0B080466 (2): B23CX3

Bromomethane was detected in the method blank at a concentration above the method detection limit but below the reporting limit. This analyte was not detected above the reporting limits in the associated samples. The analyte is qualified with a "B" flag accordingly.
Affected Samples:
F0B080466 (1): B23CT3
F0B080466 (2): B23CX3

Ion Chromatography

Batches: 0040446-0040452

The sample was received outside hold time for Nitrite in batch 0040448, Nitrate in batch 0040449, and Ortho Phosphate in batch 0040450. Issue Resolution Form 10-037 accepted the proposed resolution to proceed with the analysis. The sample was received on 02/08/10 and analyzed on 02/09/10.
Affected Samples:
F0B080466 (1): B23CT3

The sample was analyzed at a dilution for Chloride, Nitrate, and Sulfate due to high concentrations of target analytes. These analytes are qualified with a "D" flag in the associated samples.
Affected Samples:
F0B080466 (1): B23CT3

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

CH2M Hill Plateau Remediation Company

March 8, 2010

SDG: SL876

TestAmerica Laboratories, Inc.

The anion matrix spike solution contains all routine anions. Spiking technique, sample preparation and method compliance is demonstrated by the remaining acceptable MS recoveries. Poor matrix spike recovery for Ortho Phosphate in batch 0040450 is attributed to matrix interference. This analyte is qualified with an "N" accordingly.

Affected Samples:

F0B080466 (1): B23CT3

There were no observations or nonconformances for the following methods:

ICP Metals

I certify that this Summary Package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Michael Franks

St. Louis Project Manager

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-037

Date: February 9, 2010 SAF Nos. F10-065

SDG: SL876 LOGIN No.: **F0B080466** TEST: Anions

Sample No.(s) : **B23CT3**

Submitted By: Mike Franks
Phone No. 314-298-8566
Fax No. 314-298-8757

Submitted To: Heidi Hampt
Phone No. 509-376-4319
Fax No. 509-373-1788

ISSUE	PROPOSED RESOLUTION
The FedEx shipment was not marked for Saturday delivery; therefore the cooler was delivered on the next business day. The hold time for Anions 300.0 analysis expired in transit. The samples were collected 02/05/10 and received on 02/08/10.	1) Proceed with analysis ASAP. 2) Cancel Analysis.

CHPRC/BHI/WMH/PNNL COMMENTS

Proceed with analysis.

Heidi Hampt 2/10/10
Signature and Date

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-036

Date: February 9, 2010 SAF Nos. F10-065

SDG: SL876 LOGIN No.: **F0B080466** TEST: Volatiles, Anions

Sample No.(s) : **B23CT3, B23CX3**

Submitted By: Mike Franks
Phone No. 314-298-8566
Fax No. 314-298-8757

Submitted To: Heidi Hampt
Phone No. 509-376-4319
Fax No. 509-373-1788

ISSUE	PROPOSED RESOLUTION
The cooler was received on 02/08/10 outside the required 2-6 Degrees Celsius acceptance limits. The cooler was received at 12 Degrees Celsius. The FedEx shipment was not marked for Saturday delivery; therefore the cooler was delivered on the next business day.	1) Proceed with analysis. 2) Cancel Analysis.

CHPRC/BHI/WMH/PNNL COMMENTS

Proceed with analysis and note temperature in case narrative.

Heidi Hampt 2/10/10
Signature and Date

SDG# SL876 9 of 39

S876

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-125	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 1A	DATA TURNAROUND
Bates/Crow	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	24 Hours / 15 Days

SAMPLING LOCATION	PROJECT DESIGNATION	SAF NO.
EW-12 (C7019, 299-W11-49); I-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	F10-065

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
LUNCH 3584	HNF-N-5858 p9.74	287'	300194ES10	GOVERNMENT VEHICLE

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
Waste Sampling & Characterization	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	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)
TYPE OF CONTAINER	aGs*	P	Nalgene
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	500mL
SAMPLE ANALYSIS	* SEE ITEM (1) IN SPECIAL INSTRUCTIONS	* SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS (Technetium-99)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23CT3	WATER	2-5-10	1150

*SDG-WO5803
Ship TO STL

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
R. Crow/R. Crow	2-5-10 1330	M0413 SSU-R2	2-5-10 1330
M0413 SSU-R2 R Crow/R Crow	2-5-10 1345	L.D. Wall R. Crow/R Crow	2/5/10 1345
R.Crow/R Crow	FEB 05 2010 1350	L.D. Wall CHPRC	FEB 05 2010 1350
L.D. Wall CHPRC	FEB 05 2010 1430	TAN	FEB 05 2010 1430
TAN	2-5-10 350	Brunson Sample Room	2-8-10 9:30

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}
(2)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Fluoride, Phosphate, Nitrogen in Nitrate}

ORIGINAL

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

A-6003-618(01/06)

TestAmerica St. Louis

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-155	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
Bates/Crow	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
EW-12 (C7019, 299-W11-49); I-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F10-065		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
LUNCH 3584	HNF-N-5858 pg. 74	287'	300194ES10	GOVERNMENT VEHICLE	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Waste Sampling & Characterization	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	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	* VOA - 8260B (TCL);	* SEE ITEM (1) IN SPECIAL INSTRUCTIONS	~~Lithium Ion Ex (Tritium)~~

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23CX3	WATER	2-5-10	1150

*SDG W0580 Ship to STL

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
R. Crow/R Crow	2-5-10 1330	M0413 SSU-R2	2-5-10 1330
2-5- R M0413 SSU-R2	2-5-10 1345	L.D. Wall L.D. Wall CHPRC	FEB 05 2010 1345
L.D. Wall L.D. Wall CHPRC	FEB 05 2010 1430	TAN	FEB 05 2010 1430
TAN	2-5-10 3:50pm	Brunson A Ang Brunson	2-8-10 9:30

SPECIAL INSTRUCTIONS
** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Attachment 2
Narrative
WSCF100307

Introduction

One (1) S&GRP sample was received at the WSCF Laboratory on February 12, 2010. The sample was analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, and J) may be applicable to this report, as appropriate

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report,* pages for a complete listing of approved analytical methods.

Inorganic Comments

Hexavalent Chromium – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

All QC controls are within the established limits.

Narrative

Attachment 2
Narrative
WSCF100307

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-065-019

PAGE 1 OF 1

COLLECTOR: Mokler / White	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL
PRICE CODE: 1A	DATA TURNAROUND: 24 Hours / 15 Days	SAMPLING LOCATION: EW-7 (C7022, 299-W11-90); 1-004	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water
SAF NO.: F10-065	AIR QUALITY: ☐	ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-585-8
ACTUAL SAMPLE DEPTH: 366'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	SHIPPED TO: Waste Sampling & Characterization
OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: 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)

100307

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool-4C
TYPE OF CONTAINER	HG
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Chromium Hex - 7196;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B23C81	WATER	2-12-10	1200	✓

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MA White Mokler	2-12-10 1240	Victor Bins	2-12-10 1240
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem.☐☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

ORIGINAL

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

A-6003-618(01/06)

Attachment 2
Narrative
WSCF102360

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on September 1, 2010. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, U and J) may be applicable to this report, as appropriate

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 156047 analyzed on sample# B27JX0 (102354001)

All QC controls are within the established limits.

Attachment 2
Narrative
WSCF102360

ICP-MS Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Technetium-99 is analyzed without prep therefore there is no Matrix Spike or Matrix Spike Duplicate with analysis. Analytical Note(s):

- Batch QC 163534 analyzed on sample# B27567 (102335003)
    - Vanadium contamination was detected in the Blank. Affected sample results in this batch were "C" Flagged.
    - Chromium – exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.

All QC controls are within the established limits.

- Technetium-99:
    - Batch QC 162850

All QC controls are within the established limits.

Organic Comments

VOA – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 156061 analyzed on sample# B27JW9 (102352001)

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Applies only to T Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Tritium:
    - Batch QC 155935 analyzed on sample# B26JD6 (102345001)

All QC controls are within the established limits.

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-065-207	PAGE 1 OF 1
COLLECTOR: Hecus, Morgan	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 7N; AIR QUALITY: ☐; DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: EW-6; C7020(299-W11-50); I-004	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F10-065	
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-50711 (Pg 16)	ACTUAL SAMPLE DEPTH: 2705'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: 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: 102360

PRESERVATION	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	VOA - 8260B (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B23WW1 001	WATER	9/1/10	0815	✓	✓	✓

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	9/1/10 0955	Victor Bingham	9/1/10 0955
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-065-236	PAGE 1 OF 1
COLLECTOR: Helmz Morton	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 7N; AIR QUALITY: ☐	DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: EW-6; C7020(299-W1:1-50); I-004 DUP	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F10-065	
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-567-11 (Pg 16)	ACTUAL SAMPLE DEPTH: 270.5'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: 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	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2 (ULTREX)				
TYPE OF CONTAINER	aGs*	G/P	G	aGs*	P	Nalgene				
NO. OF CONTAINER(S)	3	1	1	3	1	1				
VOLUME	40mL	500mL	250mL	40mL	500mL	500mL				
SAMPLE ANALYSIS	VOA - 8260B (TCL);	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS (Technetium-99)				

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B24116 002	WATER	9/1/10	0815	✓	✓	✓	✓	✓	✓				

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	9/1/10 0955	Victor Bins	9/1/10 0955
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

(2)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}

(3)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Phosphate, Fluoride, Nitrogen in Nitrate}

ORIGINAL

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

A-6003-618(01/06)

Attachment 2
Narrative
WSCF103048

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on November 17, 2010. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, U and J) may be applicable to this report, as appropriate

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 170085 analyzed on sample# B25YN4 (103043001)

All applicable QC controls are within the established limits.

Attachment 2
Narrative
WSCF103048

ICP-MS Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Technetium-99 is analyzed without prep therefore there is no Matrix Spike or Matrix Spike Duplicate with analysis. Analytical Note(s):

- Batch QC 170564 analyzed on sample# B240Y5 (103021001)
  - Barium – exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.
- Batch QC 170050

All other applicable QC controls are within the established limits.

Organic Comments

VOA – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 170054 analyzed on sample# B28315 (103033001)

All applicable QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Matrix Spikes apply only to Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Tritium:
  - Batch QC 170191 analyzed on sample# B24J97 (103048001)

All applicable QC controls are within the established limits.

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

Chemnitt Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-065-336 PAGE 1 OF 1

COLLECTOR Bates, M.T.	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT COORDINATOR DYEKMAN, DL
PRICE CODE 7N	DATA TURNAROUND 45 Days / 45 Days		
SAMPLING LOCATION C7573; 299-W10-35; IW-4; I-003	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO. F10-065	AIR QUALITY ☐
ICE CHEST NO.	FIELD LOGBOOK NO. HAF-w-507-11 page 27	ACTUAL SAMPLE DEPTH 306.6	COA 300194ES10
METHOD OF SHIPMENT GOVERNMENT VEHICLE			
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. 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 Meterial 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: 103048

PRESERVATION	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	VOA - 8260B (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium Ion Ex (Tritium)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B24J97 001	WATER	11-17-10	1322

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Nate Bates	11-17-10 1510	V.L. Tal	11-17-10 1510
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20. ** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time. ** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Wednesday, November 17, 2010 8:21:52 PM
Page 2 of 3

ChemWare

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-065-394

PAGE 1 OF 1

COLLECTOR Wh. Te, Bates

COMPANY CONTACT: DYEKMAN, DL

TELEPHONE NO.: 373-2530

PROJECT COORDINATOR: DYEKMAN, DL

PRICE CODE: 7N

DATA TURNAROUND: 45 Days / 45 Days

SAMPLING LOCATION: C7573; 299-W10-35; IW-4; I-003 DUP

PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

SAF NO.: F10-065

AIR QUALITY: ☐

ICE CHEST NO.

FIELD LOGBOOK NO.: HnF-N-507-11 page 27

ACTUAL SAMPLE DEPTH: 306.6

COA: 300194ES10

METHOD OF SHIPMENT: GOVERNMENT VEHICLE

SHIPPED TO: Waste Sampling & Characterization

OFFSITE PROPERTY NO.: N/A

BILL OF LADING/AIR BILL NO.: 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	HCl or H2SO4 to pH <2/Cool-4C	HNO3 to pH <2/Cool-4C	Cool-4C	None	HNO3 to pH <2 (ULTREX)
TYPE OF CONTAINER	aGs*	G/P	P	G	Nalgene
NO. OF CONTAINER(S)	3	1	1	1	1
VOLUME	40mL	500mL	500mL	250mL	500mL
SAMPLE ANALYSIS	VOA 8260B (TCL);	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	IC Anions - 300.0 (Nitrogen in Nitrate)	Tritium, Sr-90 (Tritium)	Tc-99 by ICP/MS (Technetium-99)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B24JJ5 602	WATER	11-17-10	1322	—	—	—	—	—				

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dale Bates Dale Bates	11-17-10 1510	Victor Bjorg	11-17-10 1510
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20. ** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time. ** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Wednesday, November 17, 2010 8:21:52 PM
Page 3 of 3

ChemWare

Attachment 2
Narrative
WSCF103087

Introduction

One (1) S&GRP sample was received at the WSCF Laboratory on November 19, 2010. The sample was analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, U and J) may be applicable to this report, as appropriate

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Inorganic Comments

Hexavalent Chromium – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 170133 analyzed on sample# B27C56 (103086001)

All QC controls are within the established limits.

Narrative

Attachment 2
Narrative
WSCF103087

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-065-528

PAGE 1 OF 1

COLLECTOR: Turner	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL
PRICE CODE: 1A	DATA TURNAROUND: 24 Hours / 15 Days		
SAMPLING LOCATION: C7573; 299-W10-35; IW-4; T-005	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO.: F10-065	AIR QUALITY: ☐
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-307-11	ACTUAL SAMPLE DEPTH: 347 ft	COA: 300194ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: 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)

PRESERVATION	COO=4C
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	500m.
SPECIAL HANDLING AND/OR STORAGE	
SAMPLE ANALYSIS	Chromium Free - Cr6

183087

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24JT4	WATER	11-19-10	1218	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
A. Turner	11-19-10 1310		11/19/10 1310
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

** The CACN for all analytical work at WSCF laboratory is 401548ES20. ** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time. ** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

☐ ORIGINAL

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

A-6003-618(01/06)

222-S LABORATORY

FINAL REPORT FOR THE SAMPLES RECEIVED IN MARCH, 2010 FOR SAF F10-065-012

1.0 INTRODUCTION

This report has been reissued in order to update the Data Summary Report to include matrix spike recoveries and RPD information as described in Section 3.1.1.

This final report presents the results for one ground water sample taken on March 8, 2010. The sample was analyzed in accordance with Sampling Authorization Form F10-065-012; *ARRA 200 ZP-1 Remedial Action Wells Sampling and Analysis - Water* (SAF) and ATL-MP-1011; *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP). The following attachments are included in this report.

Attachment 1	Data Summary Report
Attachment 2	Holding Time Report
Attachment 3	Receipt Paperwork
Attachment 4	Project Correspondence
Attachment 5	VOA Surrogates. MS-MSD Recoveries, and RPDs
Attachment 6	Additional Sample Duplicate Results

2.0 SAMPLE RECEIPT AND HANDLING

The sample (B23C74) was received on March 9, 2010, with adequate paperwork and instructions to be analyzed for anions. The measured temperature of the outside of the sample container was 8 ^{o}C. On March 10, 2010, another portion of sample (B23C74) was received with instructions to be analyzed for VOA. The measured temperature of the outside of the sample was 2 ^{o}C. The temperatures of the samples were reported to the client on the laboratory's sample receipt check list (see Attachment 3).

3.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for those analytes requested in the SAF. The "Det Limit" column in Attachment 1 contains the method detection limit (MDL).

In Attachment 1, the column labeled "A#" indicates the aliquot class or the method used for sample preparation before analysis. For analysis without a preparation step, this column is left blank.

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

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

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

3.1 ANALYSES

3.1.1 Anions by Ion Chromatography

The ion chromatography analysis for anions was performed on direct aliquots of the sample. All requirements in the SAF and QAPP were met, except the holding time requirement of 48 hours for Nitrate, Nitrite, and Phosphate. This was due to the following reasons:

- Partially expired holding time upon receipt of samples by the laboratory
- Two dilutions of the sample were prepared on 03/10/2010; Only NO3 was reported from this run. Another run was performed on 03/12/2010 to reach detection limits for NO2 (see Attachment 2).

The Data Summary Report (Attachment 1) has been updated to include all matrix spike recoveries and duplicate RPDs from a sample in this SDG. Only RPDs for chloride, nitrate, and sulfate were available; no RPD data is available for fluoride, nitrite, bromide, and phosphate for this sample. A second sample duplicate from a separate SDG was run as part of this analytical batch, this duplicate contained all analytes, but only chloride was detected in this sample (see Attachment 6).

Table 1 lists the analytical procedures used for analysis of these samples.

3.1.2 Volatile Organic Analysis

The VOA analysis was performed on direct aliquots of the sample. All requirements in the SAF and QAPP were met.

At the time this analysis was performed, the laboratory was transitioning to a new set of Statistical Process Control (SPC) limits (see Attachment 5). On the original report, it was mentioned that one of the surrogate compounds, dibromofluoromethane, had a high recovery (127 %). However, after processing the analytical results with the new SPC limits, recoveries of all surrogate compounds are within control limits.

Acetone was detected in the blank at a concentration above the quantitation limits. However, the laboratory considered that reanalysis was not necessary due to two reasons:

1- Acetone was not detected in the sample and

2- Acetone was not an analyte of interest (not requested by customer).

The SAF only requested chloroform, trichloroethene, and carbon tetrachloride. Additional compounds have been reported to provide analytical QC parameters.

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-091

Date : **3/14/10** SAF No.: **See table**

SDG: **See table**
LOGIN No.**: See attached table**
TEST: **IC Anion: Nitrate, Nitrite,Phosphate**
Sample No.(s**) See table**

Submitted By: G. P. Ritenour
Phone No: 372-2742
Fax No.: 373-4884

Submitted To: Heidi Hampt
Phone No. 376-4319
Fax No. 373-1788

ISSUE	PROPOSED RESOLUTION
The table below displays the samples for which the holding time for NO3, NO2, and PO4 were missed. This was due to an instrument failure, limited capacity, and partially expired holding times upon receipt. The instrument column was replaced and calibrated and the analysis was completed	Analyze and note in narrative.

CHPRC/BHI/WMH/PNNL COMMENTS
Accept proposed resolution.

Heidi Hampt 4/8/10
Signature and Date

SDG	SAF	Lab ID	Client ID	Analysis	Sample Date/Time	Analysis Time Lapse	Anion
20100241	F10-065	S10M000127	B23C74	IC - ANIONS	3/8/2010 9:16	56	NO3
20100241	F10-065	S10M000127	B23C74	IC - ANIONS	3/8/2010 9:16	92	NO2, PO4
20100242	F10-119	S10M000128	B243V3	IC - ANIONS	3/8/2010 10:15	91	**NO3,NO2,PO4**
20100243	W10-002	S10M000129	B23X10	IC - ANIONS	3/8/2010 11:34	61	NO3,NO2,PO4
20100244	X10-033	S10M000130	B24CJ1	IC - ANIONS	3/8/2010 8:59	63	NO3,NO2,PO4
20100244	X10-033	S10M000131	B24CJ5	IC - ANIONS	3/8/2010 11:19	91	**NO3,NO2,PO4**
20100244	X10-033	S10M000132	B24CJ7	IC - ANIONS	3/8/2010 11:59	91	**NO3,NO2,PO4**
20100245	S10-002	S10M000133	B23WJ8	IC - ANIONS	3/8/2010 13:00	90	**NO3,NO2,PO4**
20100246	L10-008	S10M000134	B24942	IC - ANIONS	3/7/2010 23:41	74	**NO3,NO2,PO4**
20100247	X10-034	S10M000135	B248T7	IC - ANIONS	3/8/2010 13:56	60	NO3,NO2,PO4
20100247	X10-034	S10M000136	B248R8	IC - ANIONS	3/8/2010 13:56	60	NO3,NO2,PO4
20100247	X10-034	S10M000137	B249H9	IC - ANIONS	3/8/2010 10:37	64	NO3,NO2,PO4
20100247	X10-034	S10M000138	B24B04	IC - ANIONS	3/8/2010 9:28	65	NO3,NO2,PO4
20100247	X10-034	S10M000139	B24B14	IC - ANIONS	3/8/2010 13:52	61	NO3,NO2,PO4
20100247	X10-034	S10M000140	B24B17	IC - ANIONS	3/8/2010 12:14	63	NO3,NO2,PO4
20100247	X10-034	S10M000141	B24B20	IC - ANIONS	3/8/2010 10:23	65	NO3,NO2,PO4
20100247	X10-034	S10M000142	B24B23	IC - ANIONS	3/8/2010 7:55	95	**NO3,NO2,PO4**
20100247	X10-034	S10M000143	B24B47	IC - ANIONS	3/8/2010 12:23	64	NO3,NO2,PO4
20100244	X10-033	S10M000144	B24CJ9	IC - ANIONS	3/8/2010 10:55	66	NO3,NO2,PO4

1. The data package has the following issues:

a) Please discuss blank contamination in the narrative even though the sample result was a non-detect.

Resolution: *Provide correction to narrative.*

Lab Response:

Please correct the issues and resubmit the hard copy data package.

CH2MHill Plateau Remediation Company

COLLECTOR Helms, Bates	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT CODE DYEKMAN, DL	PRICE CODE
SAMPLING LOCATION EW-7 (C7022, 299-W11-90); I-011	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F10-065	AIR QUALITY ☐ 24 Hours / 15 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-585-8 Page 55	ACTUAL SAMPLE DEPTH 508'	COA 300194ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE
SHIPPED TO ~~Waste Sampling & Characterization~~ 222-S 3-9-10	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. 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)

100480

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)
TYPE OF CONTAINER	aGs*	P	Nalgene
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS (Technetium-99)

3/9/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B23C74	WATER	3-8-10	0916	—	—	—
S10M000127						
GRP# 20100241						

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dale Bates / Dale Bates	3-8-10 1010	MD Kessler MD Kessler	3-8-10 1010
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Beebe KB Beebe	3/9/10 0830	L.D. WALL L.D. Wall	3/9/10 0830
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
L.D. Wall CHPRC L.D. Wall	MAR 09 2010 930	RJ Steele RJ Steele	MAR 09 2010 930
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}
(2)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Phosphate, Fluoride, Nitrogen in Nitrate}

ORIGINAL

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

A-6003-618(01/06)

CHAIN OF CUSTODY/SAF

PROJECT COORDINATOR | PRICE CODE 1A | TURNAROUND

ISPOSITION

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				
ECTOR Helms, Bates	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT COORDINATOR DYEKMAN, DL	PRICE CODE 1A	DATA TURNAROUND
LING LOCATION (C7022, 299-W11-90); I-011	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F10-065	AIR QUALITY ☐	24 Hours / 15 Days
HEST NO.	FIELD LOGBOOK NO. HNF-N-585-8 Page 84	ACTUAL SAMPLE DEPTH 508'	COA 300194ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
PED TO e Sampling & Characterization	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

TRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)
um um uid sdiment sue etation ater ipe er	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) 100480	TYPE OF CONTAINER	aGs*	P	Nalgene
		NO. OF CONTAINER(S)	3	1	1
		VOLUME	40mL	500mL	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS {Technetium-99}

Shipped Z to 2225 3/10/10 Shipped to 2225 3/9/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
74	WATER	3-8-10	0916	—	—	—

Group # 20100241
Sample # S10M000162

IN OF POSSESSION		SIGN/ PRINT NAMES	
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Bates/Dak Bates 3-8-10	1010	MD Kessler MD Kessler 3-8-10	1010
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
D Kessler MD Kessler 3/10/10	1040	KS Hulse KS Hulse 3/10/10	1040
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
S Hulse KS Hulse 3-10-10	1100	C Williams 3/10/10	1100
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
NQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}
(2)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Phosphate, Fluoride, Nitrogen in Nitrate}

☐ ORIGINAL COPY

ABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
NAL SAMPLE	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: 200 Area SGRP			DATA PACKAGE: VSR11-041		
VALIDATOR: Eyda Hergenreder		LAB:TestAmerica, WSCF, 222-S		DATE: 04-21-2011	
			SDG: SL876, WSCF100307, WSCF102360, WSCF103048, WSCF103087, 222S20100241		
ANALYSES PERFORMED					
Anions/IC X	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI X	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate	Cyanide	

SAMPLES/MATRIX Water samples

SDG SL876: B23CT3
SDG WSCF100307: B23C81
SDG WSCF102360: B24116
SDG WSCF103048: B24JJ5
SDG WSCF103087: B24JT4
SDG 222S20100241: B23C74

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:

SDG SL876: laboratory blank sulfate 0.13 mg/L

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: None

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:

SDG SL876: Samples were received at 12 degrees C and nitrate, nitrite and phosphate were analyzed 96 hours after collection.

SDG 222S20100241: The anion sample was received at 8 degrees C and nitrate was analyzed 56 hours after collection and nitrite and phosphate were analyzed 92 hours after collection.

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

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F0B080466 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bromide		Work Order #: LVG541AA		MB Lot-Sample #:	F0B090000-451	
	ND	0.25	mg/L	MCAWW 300.0A	02/09/10	0040451
		Dilution Factor: 1				
Chloride		Work Order #: LVG5W1AA		MB Lot-Sample #:	F0B090000-446	
	ND	0.20	mg/L	MCAWW 300.0A	02/09/10	0040446
		Dilution Factor: 1				
Fluoride		Work Order #: LVG5X1AA		MB Lot-Sample #:	F0B090000-447	
	ND	0.10	mg/L	MCAWW 300.0A	02/09/10	0040447
		Dilution Factor: 1				
Nitrogen, Nitrate		Work Order #: LVG521AA		MB Lot-Sample #:	F0B090000-449	
	ND	0.020	mg/L	MCAWW 300.0A	02/09/10	0040449
		Dilution Factor: 1				
Nitrogen, Nitrite		Work Order #: LVG511AA		MB Lot-Sample #:	F0B090000-448	
	ND	0.020	mg/L	MCAWW 300.0A	02/09/10	0040448
		Dilution Factor: 1				
Phosphate as P, Ortho		Work Order #: LVG531AA		MB Lot-Sample #:	F0B090000-450	
	ND	0.50	mg/L	MCAWW 300.0A	02/09/10	0040450
		Dilution Factor: 1				
Sulfate		Work Order #: LVG561AA		MB Lot-Sample #:	F0B090000-452	
	0.13 B	**0.50**	**mg/L**	**MCAWW 300.0A**	**02/09/10**	**0040452**
		Dilution Factor: 1				

NOTE(S):

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

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F0B080466 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bromide			Work Order #: LVG541AC LCS Lot-Sample#: F0B090000-451				
	2.00	1.99	mg/L	100	MCAWW 300.0A	02/09/10	0040451
			Dilution Factor: 1				
Chloride			Work Order #: LVG5W1AC LCS Lot-Sample#: F0B090000-446				
	2.00	1.99	mg/L	100	MCAWW 300.0A	02/09/10	0040446
			Dilution Factor: 1				
Fluoride			Work Order #: LVG5X1AC LCS Lot-Sample#: F0B090000-447				
	1.00	0.976	mg/L	98	MCAWW 300.0A	02/09/10	0040447
			Dilution Factor: 1				
Nitrogen, Nitrate			Work Order #: LVG521AC LCS Lot-Sample#: F0B090000-449				
	0.400	0.407	mg/L	102	MCAWW 300.0A	02/09/10	0040449
			Dilution Factor: 1				
Nitrogen, Nitrite			Work Order #: LVG511AC LCS Lot-Sample#: F0B090000-448				
	0.160	0.169	mg/L	106	MCAWW 300.0A	02/09/10	0040448
			Dilution Factor: 1				
Phosphate as P, Ortho			Work Order #: LVG531AC LCS Lot-Sample#: F0B090000-450				
	8.00	8.24	mg/L	103	MCAWW 300.0A	02/09/10	0040450
			Dilution Factor: 1				
Sulfate			Work Order #: LVG561AC LCS Lot-Sample#: F0B090000-452				
	8.00	7.96	mg/L	100	MCAWW 300.0A	02/09/10	0040452
			Dilution Factor: 1				

NOTE(S):

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

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F0B080466 **Matrix.....:** WATER
Date Sampled...: 02/05/10 **Date Received..:** 02/08/10

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bromide			Work Order #...:		LVEML1AR	MS Lot-Sample #: F0B080466-001		
	ND	2.00	2.01	mg/L	100	MCAWW 300.0A	02/09/10	0040451
			Dilution Factor: 1					
Chloride			Work Order #...:		LVEML1AL	MS Lot-Sample #: F0B080466-001		
	36.6	40.0	78.4 D	mg/L	104	MCAWW 300.0A	02/09/10	0040446
			Dilution Factor: 20					
Fluoride			Work Order #...:		LVEML1AM	MS Lot-Sample #: F0B080466-001		
	0.44	2.00	2.48	mg/L	102	MCAWW 300.0A	02/09/10	0040447
			Dilution Factor: 1					
Nitrogen, Nitrate			Work Order #...:		LVEML1AP	MS Lot-Sample #: F0B080466-001		
	5.6	8.00	13.7 D	mg/L	101	MCAWW 300.0A	02/09/10	0040449
			Dilution Factor: 20					
Nitrogen, Nitrite			Work Order #...:		LVEML1AN	MS Lot-Sample #: F0B080466-001		
	0.011	0.100	0.106	mg/L	96	MCAWW 300.0A	02/09/10	0040448
			Dilution Factor: 1					
Phosphate as P, Ortho			Work Order #...:		LVEML1AQ	MS Lot-Sample #: F0B080466-001		
	0.20	4.00	4.78 N	mg/L	114	MCAWW 300.0A	02/09/10	0040450
			Dilution Factor: 1					
Sulfate			Work Order #...:		LVEML1A2	MS Lot-Sample #: F0B080466-001		
	29.2	80.0	108 D	mg/L	98	MCAWW 300.0A	02/09/10	0040452
			Dilution Factor: 20					

NOTE(S):

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

D Result was obtained from the analysis of a dilution.

N Spiked analyte recovery is outside stated control limits.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F0B080466 **Work Order #...:** LVEML-SMP LVEML-DUP **Matrix.....:** WATER

Date Sampled...: 02/05/10 **Date Received..:** 02/08/10

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride						SD Lot-Sample #:	F0B080466-001	
	36.6 D	37.2 D	mg/L	1.5	(0-20)	MCAWW 300.0A	02/09/10	0040446
			Dilution Factor: 20					
Fluoride						SD Lot-Sample #:	F0B080466-001	
	0.44	0.45	mg/L	1.7	(0-20)	MCAWW 300.0A	02/09/10	0040447
			Dilution Factor: 1					
Sulfate						SD Lot-Sample #:	F0B080466-001	
	29.2 C,D	28.1 D	mg/L	3.8	(0-20)	MCAWW 300.0A	02/09/10	0040452
			Dilution Factor: 20					
Nitrogen, Nitrite						SD Lot-Sample #:	F0B080466-001	
	0.011 B	0.0098 B	mg/L	8.8	(0-20)	MCAWW 300.0A	02/09/10	0040448
			Dilution Factor: 1					
Nitrogen, Nitrate						SD Lot-Sample #:	F0B080466-001	
	5.6 D	5.7 D	mg/L	1.7	(0-20)	MCAWW 300.0A	02/09/10	0040449
			Dilution Factor: 20					
Phosphate as P, Ortho						SD Lot-Sample #:	F0B080466-001	
	0.20 B,N	0.11 B,N	mg/L	57	(0-20)	MCAWW 300.0A	02/09/10	0040450
			Dilution Factor: 1					
Bromide						SD Lot-Sample #:	F0B080466-001	
	ND	ND	mg/L	0	(0-20)	MCAWW 300.0A	02/09/10	0040451
			Dilution Factor: 1					

NOTE(S):

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

D Result was obtained from the analysis of a dilution.

C Analyte detected in method blank above the MDL/IDL.

B Estimated result. Result is less than RL.

N Spiked analyte recovery is outside stated control limits.

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF100307

QC Batch 89775
Associated Samples 100307001

Test Hexavalent chromium Discrete Analyzer

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #23515**							
Hexavalent chromium	18540-29-9		<0.0020	mg/L					U	02/12/10
LCS			**QC Sample #23517**							
Hexavalent chromium	18540-29-9		0.0492	mg/L	98.4	90 - 110				02/12/10
DUP			**QC Sample #23518**							
			Original 100298001							
Hexavalent chromium	18540-29-9		<0.0020	mg/L			-7.10	20	U	02/12/10
MS			**QC Sample #23519**							
			Original 100298001							
Hexavalent chromium	18540-29-9		0.0412	mg/L	103	85 - 115				02/12/10

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102360

QC Batch 156047
Associated Samples 102360002

Test Anions by Ion Chromatography (Water)

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #37326**							
Fluoride	16984-48-8		<0.044	ug/mL					U	09/01/10
Chloride	16887-00-6		<0.042	ug/mL					U	09/01/10
Nitrite-N	NO2-N		<0.018	ug/mL					U	09/01/10
Bromide	24959-67-9		<0.054	ug/mL					U	09/01/10
Nitrate-N	NO3-N		<9.7E-3	ug/mL					U	09/01/10
Phosphate-P	PO4-P		<0.072	ug/mL					U	09/01/10
LCS			**QC Sample #37327**							
Fluoride	16984-48-8		0.908	ug/mL	91.7	90 - 110				09/01/10
Chloride	16887-00-6		1.96	ug/mL	99.2	90 - 110				09/01/10
Nitrite-N	NO2-N		0.990	ug/mL	101.2	90 - 110				09/01/10
Bromide	24959-67-9		3.90	ug/mL	99.5	90 - 110				09/01/10
Nitrate-N	NO3-N		0.885	ug/mL	100	90 - 110				09/01/10
Phosphate-P	PO4-P		1.86	ug/mL	97.1	90 - 110				09/01/10
DUP			**QC Sample #37328**							
			Original 102354001							
Fluoride	16984-48-8		0.451	ug/mL			1.60	20	D	09/01/10
Chloride	16887-00-6		4.51	ug/mL			0.70	20	D	09/01/10
Nitrite-N	NO2-N		<0.036	ug/mL			0.00	20	UD	09/01/10

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102360

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Bromide	24959-67-9		<0.11	ug/mL			0.00	20	UD	09/01/10
Nitrate-N	NO3-N		<0.019	ug/mL			0.00	20	UD	09/01/10
Phosphate-P	PO4-P		<0.14	ug/mL			0.00	20	UD	09/01/10
MS			**QC Sample #37329**							
			Original 102354001							
Fluoride	16984-48-8		0.942	ug/mL	94.2	80 - 120			D	09/01/10
Chloride	16887-00-6		1.96	ug/mL	97.8	80 - 120			D	09/01/10
Nitrite-N	NO2-N		1.04	ug/mL	105	80 - 120			D	09/01/10
Bromide	24959-67-9		3.95	ug/mL	99.8	80 - 120			D	09/01/10
Nitrate-N	NO3-N		0.877	ug/mL	98.1	80 - 120			D	09/01/10
Phosphate-P	PO4-P		1.87	ug/mL	96.6	80 - 120			D	09/01/10
MSD			**QC Sample #37330**							
			Original 102354001					**Paired**	**37329**	
Fluoride	16984-48-8		0.922	ug/mL	92.2	80 - 120	2.10	20	D	09/01/10
Chloride	16887-00-6		1.89	ug/mL	94.6	80 - 120	3.30	20	D	09/01/10
Nitrite-N	NO2-N		1.01	ug/mL	101.9	80 - 120	3.00	20	D	09/01/10
Bromide	24959-67-9		3.98	ug/mL	100.5	80 - 120	0.70	20	D	09/01/10
Nitrate-N	NO3-N		0.898	ug/mL	100.4	80 - 120	2.30	20	D	09/01/10
Phosphate-P	PO4-P		1.86	ug/mL	96.4	80 - 120	0.20	20	D	09/01/10

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF103048

QC Batch 170085
Associated Samples 103048002

Test Anions by Ion Chromatography (Water)

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #42379**							
Nitrate-N	NO3-N		<9.7E-3	ug/mL					U	11/18/10
LCS			**QC Sample #42380**							
Nitrate-N	NO3-N		0.922	ug/mL	104.1	90 - 110				11/18/10
DUP			**QC Sample #42381**							
			Original 103043001							
Nitrate-N	NO3-N		0.761	ug/mL			1.20	20	D	11/18/10
MS			**QC Sample #42382**							
			Original 103043001							
Nitrate-N	NO3-N		0.910	ug/mL	101.8	80 - 120			D	11/18/10
MSD			**QC Sample #42383**							
			Original 103043001					**Paired**	**42382**	
Nitrate-N	NO3-N		0.913	ug/mL	102.1	80 - 120	0.30	20	D	11/18/10

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF103087

QC Batch 170133
Associated Samples 103087001

Test Hexavalent chromium Discrete Analyzer

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #42507**							
Hexavalent chromium	18540-29-9		<0.0020	mg/L					U	11/19/10
LCS			**QC Sample #42509**							
Hexavalent chromium	18540-29-9		0.0511	mg/L	102.2	90 - 110				11/19/10
DUP			**QC Sample #42510**							
			Original 103086001							
Hexavalent chromium	18540-29-9		0.0733	mg/L			0.30	20		11/19/10
MS			**QC Sample #42511**							
			Original 103086001							
Hexavalent chromium	18540-29-9		0.0429	mg/L	107.2	85 - 115				11/19/10

Hold Time Report SDG 222S20100241

Client Sample ID	Sample Group	Laboratory Sample ID	Method	Sample Date	Received Date	Analysis Date	Analysis Time lapse	Missed Holding Time
B23C74	20100241	S10M000127	SW846-9056A	03/08/10 09:16	03/09/10 09:30	03/10/10 17:05	56 hours	**Yes,** for NO3
B23C74	20100241	S10M000127	SW846-9056A	03/08/10 09:16	03/09/10 09:30	03/12/10 05:30	92 hours	**Yes,** for NO2, PO4
~~B23C74~~	~~20100241~~	~~S10M000162~~	~~SW846-8260B~~	~~03/08/10 09:16~~	~~03/10/10 11:00~~	~~03/10/10 14:43~~	~~2 days~~	~~N~~
~~B23C74~~	~~20100241~~	~~S10M000162~~	~~SW846-8260B~~	~~03/08/10 09:16~~	~~03/10/10 11:00~~	~~03/10/10 16:12~~	~~2 days~~	~~N~~

EH
04/21/11

WSCF - Anions & HexCr
Data Summary of All Results

Sample Group: 20100241

Customer Group or SDG Number: 222S20100241

Customer Sample ID: B23C74

Customer Sample ID: B23C74

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000127			16984-48-8	Fluoride	ug/mL	94.6	<6.16E-03	0.361	n/a	n/a	n/a	92.4	6.16E-03	n/a	
S10M000127			16887-00-6	Chloride	ug/mL	99.6	<3.10E-03	21.5	21.0	21.2	2.40	90.2	0.0341	n/a	
S10M000127			14797-65-0	Nitrite	ug/mL	91.2	<0.0400	<0.0400	n/a	n/a	n/a	92.8	0.0400	n/a	U
S10M000127			24959-67-9	Bromide	ug/mL	93.3	<0.0237	0.243	n/a	n/a	n/a	91.8	0.0237	n/a	
S10M000127			14797-55-8	Nitrate	ug/mL	91.9	<0.0162	128	133	130	4.27	94.8	1.64	n/a	
S10M000127			14265-44-2	Phosphate	ug/mL	95.1	<0.0381	<0.0381	n/a	n/a	n/a	101	0.0381	n/a	U
S10M000127			14808-79-8	Sulfate	ug/mL	91.7	<0.0219	32.2	32.0	32.1	0.673	96.5	0.241	n/a	
S10M000162			75-35-4	1,1-Dichloroethene	ug/L	96.3	<0.172	<0.191	n/a	n/a	n/a	91.2	0.191	n/a	U
S10M000162			67-64-1	Acetone	ug/L	110	6.18	<0.637	n/a	n/a	n/a	92.0	0.637	n/a	U
S10M000162			78-93-3	2-Butanone	ug/L	95.2	<0.458	<0.509	n/a	n/a	n/a	95.4	0.509	n/a	U
S10M000162			67-66-3	Chloroform	ug/L	n/a	<0.0414	41.2	n/a	n/a	n/a	n/a	0.0460	n/a	
S10M000162			56-23-5	Carbon tetrachloride	ug/L	n/a	<0.0479	1.63E+03	n/a	n/a	n/a	n/a	1.92	n/a	
S10M000162			71-36-3	1-Butanol	ug/L	88.8	<1.15	<1.28	n/a	n/a	n/a	85.0	1.28	n/a	U
S10M000162			71-43-2	Benzene	ug/L	92.8	<0.0163	<0.0181	n/a	n/a	n/a	89.6	0.0181	n/a	U
S10M000162			79-01-6	Trichloroethene	ug/L	90.1	<0.0378	16.5	n/a	n/a	n/a	90.0	0.0420	n/a	
S10M000162			108-10-1	Hexone	ug/L	109	<0.453	<0.503	n/a	n/a	n/a	103	0.503	n/a	U
S10M000162			108-88-3	Toluene	ug/L	95.8	<0.0522	<0.0580	n/a	n/a	n/a	89.5	0.0580	n/a	U
S10M000162			591-78-6	2-Hexanone	ug/L	104	<0.454	<0.505	n/a	n/a	n/a	101	0.505	n/a	U
S10M000162			108-90-7	Chlorobenzene	ug/L	96.6	<0.0320	<0.0356	n/a	n/a	n/a	91.3	0.0356	n/a	U
S10M000162			1868-53-7	Dibromofluoromethane	ug/L	91.6	10.2	14.1	n/a	n/a	n/a	117	0.0592	n/a	
S10M000162			17060-07-0	1,2-Dichloroethane-d4	ug/L	96.5	10.2	11.5	n/a	n/a	n/a	90.7	0.166	n/a	
S10M000162			2037-26-5	Toluene-d8	ug/L	102	11.1	11.8	n/a	n/a	n/a	94.8	0.0774	n/a	
S10M000162			460-00-4	4-Bromofluorobenzene	ug/L	94.8	10.8	11.2	n/a	n/a	n/a	96.2	0.0906	n/a	

EH
04/21/11

NA = Not Analyzed, ND = Not Detected

U - < Det Limit

WSCF - Anions & HexCr
Data Summary of All Results

Sample Group: 20100269

Customer Group or SDG Number: 222S20100269

Customer Sample ID: B23PW8

Customer Sample ID: B23PW8

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000160			16984-48-8	Fluoride	ug/mL	94.6	<6.16E-03	<6.16E-03	<6.16E-03	n/a	n/a	97.2	6.16E-03	n/a	U
S10M000160			16887-00-6	Chloride	ug/mL	99.6	<3.10E-03	0.0183	0.0196	0.0189	6.81	95.7	3.10E-03	n/a	B
S10M000160			14797-65-0	Nitrite	ug/mL	91.2	<0.0400	<0.0400	<0.0400	n/a	n/a	89.1	0.0400	n/a	U
S10M000160			24959-67-9	Bromide	ug/mL	93.3	<0.0237	<0.0237	<0.0237	n/a	n/a	83.6	0.0237	n/a	U
S10M000160			14797-55-8	Nitrate	ug/mL	91.9	<0.0162	<0.0162	<0.0162	n/a	n/a	105	0.0162	n/a	U
S10M000160			14265-44-2	Phosphate	ug/mL	95.1	<0.0381	<0.0381	<0.0381	n/a	n/a	91.3	0.0381	n/a	U
S10M000160			14808-79-8	Sulfate	ug/mL	91.7	<0.0219	<0.0219	<0.0219	n/a	n/a	89.7	0.0219	n/a	U

NA = Not Analyzed, ND = Not Detected

U - < Det Limit

B - Estimated

Date: 21 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: 200 Area SGRP
Subject: Radiochemical - Sample Data Groups (SDGs) W05803, W05804 W06058, WSCF102360 and H4424

INTRODUCTION

This memorandum presents the results of data validation for SDGs W05803, W05804 and W06058 prepared by TestAmerica, SDG WSCF102360 prepared by WSCF Analytical Laboratories and SDG H4424 prepared by Eberline Services. 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
B23CT3	02/05/10	Water	C	Tc-99
B23CX3	02/05/10	Water	C	I-129 and Tritium
B24J96	11/16/10	Water	C	I-129
B24J97	11/17/10	Water	C	I-129
B24JJ5	11/17/10	Water	C	I-129
B23WW1	09/01/10	Water	C	Tritium
B24116	09/01/10	Water	C	Tritium
B23WV4	11/10/10	Water	C	I-129

Data validation was conducted in accordance with the CHPRC validation statement of work and the Sampling and Analysis Plan for Eleven ARRA Wells to Support the 200 West Groundwater Treatment System in FY 2010, DOE/RL-2009-95, Rev. 0 (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 maximum holding time for radiochemical analysis is 180 days. Sample preservation for water samples for all analyses except tritium and I-129 requires acid preservation with nitric acid to pH <2.

The samples were 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 with the following exception.

For SDG W05804, the tritium laboratory blank result was > the minimum detectable concentration (MDC). The tritium result for sample B23CX3 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, 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 laboratory control sample accuracy limits are 80% to 120%. The matrix spike sample accuracy limits are ones specified by the DV procedure.

Matrix Spike (MS) Samples

All MS recoveries were acceptable with the following exception.

For SDG W05804, MS analysis was not performed for tritium. The tritium result for sample B23CX3 was a non-detect and should be qualified as an estimate and flagged “UJ” due to lack of MS data.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable with the following exception.

For SDG W05803, the LCS recovery for Tc-99 was below the lower acceptance limit. The Tc-99 result for sample B23CT3 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 ±20%. 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 exception.

For SDG W05803, a duplicate sample was not included with the Tc-99 analysis. The Tc-99 result for sample B23CT3 was a non-detect and should be qualified as an estimate and flagged "UJ" due to lack of laboratory duplicate data.

Field Duplicate Samples

All field duplicate results were acceptable.

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 with associated non-detected sample results were below the CRDLs.

- **Completeness**

SDGs W05803, W05804, W06058, WSCF102360 and H4424 were 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 data for tritium and low LCS recovery and lack of laboratory duplicate data for Tc-99. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

GRP-GD-002, Rev. 0, Change 0, *Data Validation for Radiochemical Analyses*, August 2010.

DOE/RL-2009-95, Rev. 0, *Sampling and Analysis Plan for Eleven ARRA Wells to Support the 200 West Groundwater Treatment System in FY 2010*, October 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			
SDGs: W05803, W05804, W06058, WSCF102360 and H4424	Reviewer: AQA	Project: 200 Area SGRP	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
Tritium	UJ	B23CX3	Lack of MS data
Tc-99	UJ	B23CT3	Low LCS recovery and lack of lab duplicate data

Comments: None

Appendix 3

Annotated Laboratory Reports

2/16/2010 1:51:57 PM

TestAmerica Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **Version:** 05 **Rpt Nbr:** 43264 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05803.Edd, h:\Reportdb\edd\FeadIV\Rad\43264.Edd

Lab Sample Id:	Client Id:	Test User	Contract Nbr	SAF Nbr	Sdg Nbr:	QC Type:	Moisture/ Solids%*:	Distilled Volume	Sample On Date:	Collection Date:
9LVD2620	B23CT3	F10-065	MW6-SBB-A1	F10-065	W05803					02/05/2010 11:50

Batch	Analyte		CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
0046365	TC-99	UJ	14133-76-7	1.88E+00	pCi/L	4.1E+00	5.7E+00	U	9.78E+00	100.0	TC99_SEP_LSC	1.253E-01	L	02/16/2010 01:21	I

EH
04/21/11

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

FORM I

SAMPLE RESULTS

Date: 22-Mar-10

Lab Name:	TestAmerica	**SDG:**	W05804	**Collection Date:**	2/5/2010 11:50:00 AM
Lot-Sample No.:	J0B050613-1	**Report No. :**	43488	**Received Date:**	2/5/2010 2:30:00 PM
Client Sample ID:	B23CX3	**COC No. :**	F10-065-170	**Matrix:**	WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0043395	I129_SEP_LEPS_GS			**Work Order:** LVA461AA			**Report DB ID:** 9LVA4610					
I129	***2.81E-02***	U	1.2E-01	1.2E-01	2.13E-01	pCi/L	97%	*0.13*	3/5/10 02:00 p		3.8249	LEP4$1
						1.04E-01	1.00E+00	*0.46*			L	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM I

SAMPLE RESULTS

Date: 22-Mar-10

Lab Name:	TestAmerica	**SDG:**	W05804	**Collection Date:**	2/5/2010 11:50:00 AM
Lot-Sample No.:	J0B080410-1	**Report No. :**	43488	**Received Date:**	2/5/2010 2:30:00 PM
Client Sample ID:	B23CX3	**COC No. :**	F10-065-155	**Matrix:**	WATER

Ordered by Client Sample ID, Batch No.

Parameter		Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0062283		906.0_H3_LSC			Work Order:	LVD4E2AA		Report DB ID:	9LVD4E20				
H-3	UJ	***-9.85E+01***	U	1.2E+02	1.3E+02	3.14E+02	pCi/L	100%	*-0.31*	3/5/10 03:04 a		0.005	LSC8
							1.50E+02	4.00E+02	*-(1.5)*			L	

No. of Results: 1 **Comments:**

EH
04/21/11

TestAmerica
rptSTLRchSample
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM I

SAMPLE RESULTS

Date: 28-Dec-10

Lab Name:	TestAmerica	**SDG:**	W06058	**Collection Date:**	11/16/2010 1:59:00 PM
Lot-Sample No.:	J0K230529-3	**Report No. :**	45394	**Received Date:**	11/18/2010 2:45:00 PM
Client Sample ID:	B24J96	**COC No. :**	F10-065-400	**Matrix:**	WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0336379	I129_SEP_LEPS_GS			**Work Order:**	MAGXP1AA		**Report DB ID:**	9MAGXP10				
I129	***-3.05E-02***	U	1.3E-01	1.3E-01	2.18E-01	pCi/L	95%	*-0.14*	12/20/10 09:45 p		3.6758	LEP4$1
						1.04E-01	1.00E+00	*-0.48*			L	

No. of Results: 1 **Comments:**

TestAmerica
rptSTLRchSample
V5.2.9 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda, Total Uncert,CRDL, or not identified by gamma scan software.

FORM I

SAMPLE RESULTS

Date: 28-Dec-10

Lab Name:	TestAmerica	**SDG:**	W06058	**Collection Date:**	11/17/2010 1:22:00 PM
Lot-Sample No.:	J0K230529-2	**Report No. :**	45394	**Received Date:**	11/18/2010 2:45:00 PM
Client Sample ID:	B24J97	**COC No. :**	F10-065-401	**Matrix:**	WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0336379	I129_SEP_LEPS_GS			Work Order:	MAGW41AA		Report DB ID:	9MAGW410				
I129	***2.57E-02***	U	9.7E-02	9.7E-02	1.79E-01	pCi/L	94%	*0.14*	12/20/10 06:10 p		3.635	LEP5$1
						8.49E-02	1.00E+00	*0.53*			L	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda, Total Uncert,CRDL, or not identified by gamma scan software.

FORM I

SAMPLE RESULTS

Date: 28-Dec-10

Lab Name:	TestAmerica	**SDG:**	W06058	**Collection Date:**	11/17/2010 1:22:00 PM
Lot-Sample No.:	J0K230529-1	**Report No. :**	45394	**Received Date:**	11/18/2010 2:45:00 PM
Client Sample ID:	B24JJ5	**COC No. :**	F10-065-459	**Matrix:**	WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0336379	I129_SEP_LEPS_GS			**Work Order:**	MAGWJ1AA		**Report DB ID:**	9MAGWJ10				
I129	***-5.73E-02***	U	9.0E-02	9.0E-02	1.52E-01	pCi/L	96%	*-0.38*	12/20/10 02:31 p		3.5826	LEP5$1
						7.36E-02	1.00E+00	*-(1.3)*			L	

No. of Results: 1 **Comments:**

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda, Total Uncert,CRDL, or not identified by gamma scan software.

WSCF Analytical Results Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102360

Sample # 102360001
SAF# F10-065
Sample ID B23WW1

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
H3 EICHROM										**09/01/10**
TRI-CARB LSC										
Tritium	10028-17-8	LA-508-421		1.2E4	2400	pCi/L	1	200		09/03/10

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
U - Analyzed for but not detected above limiting criteria.
N - Spike Recovery is Outside Control Limits.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102360

Sample # 102360002
SAF# F10-065
Sample ID B24116

Matrix WATER
Sampled 09/01/10
Received 09/01/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
H3 EICHROM										**09/01/10**
TRI-CARB LSC										
Tritium	10028-17-8	LA-508-421		1.2E4	2400	pCi/L	1	200		09/03/10
ICPMS Prep										**09/02/10**
TC-99 ICP/MS										
Technetium-99	14133-76-7	LA-505-412		0.057		ug/L	1	0.0010		09/02/10

EH
04/21/11

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
U - Analyzed for but not detected above limiting criteria.
N - Spike Recovery is Outside Control Limits.
X,Y or Z - See comment detail and/or narrative.

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4424

7257-001 B23WV4

DATA SHEET

SDG	7257	Client/Case no	CHPRC	SDG H4424	
Contact	N. Joseph Verville	Contract	No. 33677		
Lab sample id	S011131-01	Client sample id	B23WV4		
Dept sample id	7257-001	Location/Matrix	EW6;C7020(299W115)I-013	WATER	
Received	11/13/10	Collected/Volume	11/10/10 13:25	4 L	
		Custody/SAF No	F10-065-231	F10-065	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.164	0.60	0.827	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/15/10

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

TestAmerica Laboratories, Inc.

CH2M Hill Plateau Remediation Company
P.O. Box 1600
Mail Stop – R3-60
Richland, WA 99352

February 16, 2010

Attention: Mike Neely

SAF Number	:	F10-065
Date SDG Closed	:	February 5, 2010
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W05803
Data Deliverable	:	7/15 Day

CASE NARRATIVE

I. Introduction

On February 5, 2010 one sample was received at TestAmerica for radiochemical analysis. Upon receipt, the sample was assigned to lot J0B080408 and assigned the following laboratory ID number to correspond with the CH2M specific ID:

CH2M ID#	TARL ID#	MATRIX	DATE OF RECEIPT
B23CT3	LVD26	WATER	02/05/10

II. Sample Receipt

The sample was received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

CH2M Hill Plateau Remediation Company
February 16, 2010

The requested analyses were:

Liquid Scintillation Counting
Technetium-99 by method RL-LSC-013 (RICH-RC-5078)*

*SOP ID's changed effective 7-01-2008. Attached is a cross reference until SOP ID's are changed in all systems.

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Liquid Scintillation Counting
Technetium-99 by method RL-LSC-013 (RICH-RC-5078):
The TSIE was above acceptance limits on sample B23CT3. The entire batch was recounted. The recounted results confirm the original results. The raw counts for sample B23CT3 are consistent with the raw counts of the duplicate, B23CT3 DUP. The duplicate, B23CT3 DUP, is being reported as the sample, B23CT3. There will be no duplicate reported.

The LCS, batch blank, sample, and sample matrix spike (B23CT3) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Sandra Seger
Project Manager

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-065-125	PAGE 1 OF 1
COLLECTOR: Bates/Crow	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 1A	DATA TURNAROUND
SAMPLING LOCATION: EW-12 (C7019, 299-W11-49); I-001	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F10-065	AIR QUALITY ☐	24 Hours / 15 Days
ICE CHEST NO.: LUNCH 3584	FIELD LOGBOOK NO.: HNF-N-5858 pg.74	ACTUAL SAMPLE DEPTH: 287'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

JOB080408

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	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)			
TYPE OF CONTAINER	aGs*	P	Nalgene			
NO. OF CONTAINER(S)	3	1	1			
VOLUME	40mL	500mL	500mL			
SAMPLE ANALYSIS	* SEE ITEM (1) IN SPECIAL INSTRUCTIONS	* SEE ITEM (2) IN SPECIAL INSTRUCTIONS	TC99 [redacted]			

LVD26
DUE 2/16/10
SDG WO 5803
JOB080408

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23CT3	WATER	2-5-10	1150

*SDG WO 5803
Ship TO SR

CHAIN OF POSSESSION — SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
R. Crow/R. Crow	2-5-10 1330	M0413 SSU-R2	2-5-10 1330
M0413 SSU-R2 R. Crow/R. Crow	2-5-10 1345	L.D. Wall CHPRC R. Crow/R. Crow	2/5/10 1345
R. Crow/R. Crow	FEB 05 2010 1350	L.D. Wall CHPRC	FEB 05 2010 1350
L.D. Wall CHPRC	FEB 05 2010 1430		FEB 05 2010 1430

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}
(2)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Fluoride, Phosphate, Nitrogen in Nitrate}

☐ ORIGINAL

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

A-6003-618(01/06)

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

TestAmerica Laboratories, Inc.

CH2M Hill Plateau Remediation Company
P.O. Box 1600
Mail Stop – R3-60
Richland, WA 99352

March 22, 2010

Attention: Mike Neely

SAF Number	:	F10-065
Date SDG Closed	:	February 5, 2010
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W05804
Data Deliverable	:	45/45 Day

CASE NARRATIVE

I. Introduction

On February 5, 2010 one sample was received at TestAmerica for radiochemical analysis. Upon receipt, the sample was assigned to lots J0B050613 and J0B080410 and assigned the following laboratory ID number to correspond with the CH2M specific ID:

CH2M ID#	TARL ID#	MATRIX	DATE OF RECEIPT
B23CX3	LVA46	WATER	02/05/10
B23CX3	LVD4E	WATER	02/05/10

II. Sample Receipt

The sample was received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

CH2M Hill Plateau Remediation Company
March 22, 2010

The requested analyses were:

Gamma Spectroscopy
Iodine-129 (LL) by method RL-GAM-002 (RICH-RC-5025)*
Liquid Scintillation Counting
Tritium by method RL-LSC-005 (RICH-RC-5007)*

*SOP ID's changed effective 7-01-2008. Attached is a cross reference until SOP ID's are changed in all systems.

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gamma Spectroscopy
Iodine-129 (LL) by method RL-GAM-002 (RICH-RC-5025):
Samples B23CX3 and B23CX3 DUP were analyzed with a reduced aliquot due to insufficient sample volume. Except as noted, the LCS, batch blank, sample and sample duplicate (B23CX3) results are within contractual requirements.

Liquid Scintillation Counting
Tritium by method RL-LSC-005 (RICH-RC-5007):
The matrix blank was high. The entire batch was re-analyzed. Except as noted, the LCS, batch blank, sample and sample duplicate (B23CX3) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Sandra Seger
Project Manager

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-170	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
Bates/Crow	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days

SAMPLING LOCATION	PROJECT DESIGNATION	SAF NO.
EW-12 (C7019, 299-W11-49); I-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	F10-065

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
LUNCH 3584	HNF-N-585 8 pg.74	287'	300194ES10	GOVERNMENT VEHICLE

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
TestAmerica Incorporated, Richland	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	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	2
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 Low Level {Iodine-129}

J0B050613

LV446

J0B050613 4
SDG-W05807 SKS 2/10/10
DUE- 3-26-10
22
PW 2/9/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23CX3	WATER	2-5-10	1150

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
R. Crow/R Crow	2-5-10 1330	M0413 SSU-R2	2-5-10 1330
M0413 SSU-R2	2-5-10 1345	L.D. Wall CHPRC L.D. Wall	FEB 05 2010 1345
L.D. Wall CHPRC L.D. Wall	FEB 05 2010 1430	TAHR	FEB 05 2010 1430

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

☐ ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-155	PAGE 1 OF 1

COLLECTOR: Bates/Crow	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL
PRICE CODE: 7N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: EW-12 (C7019, 299-W11-49); I-001	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO.: F10-065	
ICE CHEST NO.: Lunch 3584	FIELD LOGBOOK NO.: HNF-N-5858 pg. 74	ACTUAL SAMPLE DEPTH: 287'	COA: 300194ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE	SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A

JOB080410

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	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	VOA - 8260B (TCL);	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	[redacted]

H3

Due - 3/26/10 RW 2/10/10
SDGW05804
JOB080410
462/8/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23CX3	WATER	2-5-10	1150

LVD4C

~~STG-W05803~~
SHIP TO STL
SDGW05804

CHAIN OF POSSESSION	SIGN/ PRINT NAMES		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
R. Crow/R Crow	2-5-10 1330	M0413 SSU-R2	2-5-10 1330
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
M0413 SSU-R2	2-5-10 1345	L.D. Wall L.D. Wall	FEB 05 2010 1345
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
L.D. Wall L.D. Wall	FEB 05 2010 1430	CHPRC TAM	FEB 05 2010 1430
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

☐ ORIGINAL

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

A-6003-618(01/06)

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

TestAmerica Laboratories, Inc.

CH2M Hill Plateau Remediation Company
P.O. Box 1600
Mail Stop – R3-60
Richland, WA 99352

December 28, 2010

Attention: Mike Neely

SAF Number	:	F10-065
Date SDG Closed	:	November 18, 2010
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W06058
Data Deliverable	:	45/45 Day

CASE NARRATIVE

I. Introduction

On November 18, 2010 three samples were received at TestAmerica for radiochemical analysis. Upon receipt, the samples were assigned to lot J0K230529 and assigned the following laboratory ID number to correspond with the CH2M specific ID:

CH2M ID#	TARL ID#	MATRIX	DATE OF RECEIPT
B24JJ5	MAGWJ	WATER	11/18/10
B24J97	MAGW4	WATER	11/18/10
B24J96	MAGXP	WATER	11/18/10

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

CH2M Hill Plateau Remediation Company
December 28, 2010

The requested analyses were:

Gamma Spectroscopy
Iodine-129 (LL) by method RL-GAM-002 (RICH-RC-5025)*

*SOP ID's changed effective 7-01-2008. Attached is a cross reference until SOP ID's are changed in all systems.

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gamma Spectroscopy

Iodine-129 (LL) by method RL-GAM-002 (RICH-RC-5025):
The LCS, batch blank, samples and sample duplicate (B24JJ5) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Sandra Seger
Project Manager

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-065-459	PAGE 1 OF 1
COLLECTOR Bates, White	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT COORDINATOR DYEKMAN, DL	PRICE CODE 7N	DATA TURNAROUND
SAMPLING LOCATION C7573; 299-W10-35; IW-4; I-003 DUP	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F10-065	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-11 page 27	ACTUAL SAMPLE DEPTH 306.6	COA 300194ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO TestAmerica Incorporated, Richland	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. 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	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	2
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 Low Level (Iodine-129)

No DOT more info 11-17-10

Quote# 29754
SDG# W06058
LOT# JOK230529
Report: ~~12/24/10~~ 1/3/10
FLH
SKS 12/2/10

JOK230529

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B24JJ5	WATER MAGWJ	11-17-10	1322

No DOT more info 11-18-10

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dale Bates / Dale Bates	11-17-10 1545	M0413 SSU-R1	NOV 17 2010 1545
M0413 SSU-R1	11-18-10 / 1400	[illegible] / [illegible]	11-18-10 / 1400
[illegible] / [illegible]	11-18-10 / 1445	[illegible] / [illegible]	11-18-10 / 1445

SPECIAL INSTRUCTIONS
** The CACN for all analytical work at WSCF laboratory is 401648ES20. ** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time. ** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-065-401	PAGE 1 OF 1
COLLECTOR Bates, White	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT COORDINATOR DYEKMAN, DL	PRICE CODE 7N	DATA TURNAROUND
SAMPLING LOCATION C7573; 299-W10-35; IW-4; I-003	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F10-065	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-11 page 29	ACTUAL SAMPLE DEPTH 306.6'	COA 300194ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO TestAmerica Incorporated, Richland	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. 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	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	2
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 Low Level (Iodine-129)

SDG# W06056
LOT# JOK230529

No DOS more info 11-17-10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B24J97	WATER MAGW4	11-17-10	1322

No DOS more info 11-17-10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dale Bates	11-17-10 1545	Mo413 SSH-R1	NOV 17 2010 1945
Mo413 SSH-R1	11-18-10 / 1400	[illegible]	11-18-10 / 1400
[illegible]	11-18-10 / 1445	[illegible]	11-18-10 / 1445

SPECIAL INSTRUCTIONS
** The CACN for all analytical work at WSCF laboratory is 401648ES20. ** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time. ** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-065-400	PAGE 1 OF 1
COLLECTOR Bates, White	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT COORDINATOR DYEKMAN, DL	PRICE CODE 7N	DATA TURNAROUND
SAMPLING LOCATION C7573; 299-W10-35; IW-4; I-002	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F10-065	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-11 page 26	ACTUAL SAMPLE DEPTH 287	COA 300194ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO TestAmerica Incorporated, Richland	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. 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	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	2
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 Low Level (Iodine-129)

SDG: W06058
LOT: JOK230529

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24J96	WATER MAGXP	11-16-10	1359	—

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dale Bates	11-16-10 1515	MO 413 SSU-R1	11-16-10 1515
[illegible]		[illegible]	11-18-10
MO 413 SSU-R1	11-18-10 1400	[illegible]	11-18-10 1400
[illegible]	11-18-10 1445	[illegible] TAM	11-18-10 1445

SPECIAL INSTRUCTIONS
** The CACN for all analytical work at WSCF laboratory is 401648ES20. ** All requests for Tc-99, Nitrate, TCE, CHCl3, Cr+6, and CCL4 by Field GC will require a 24 hour turnaround time. ** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

ORIGINAL

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

A-6003-618(01/06)

Attachment 2
Narrative
WSCF102360

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on September 1, 2010. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, U and J) may be applicable to this report, as appropriate

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 156047 analyzed on sample# B27JX0 (102354001)

All QC controls are within the established limits.

Attachment 2
Narrative
WSCF102360

ICP-MS Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Technetium-99 is analyzed without prep therefore there is no Matrix Spike or Matrix Spike Duplicate with analysis. Analytical Note(s):

- Batch QC 163534 analyzed on sample# B27567 (102335003)
    - Vanadium contamination was detected in the Blank. Affected sample results in this batch were "C" Flagged.
    - Chromium – exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.

All QC controls are within the established limits.

- Technetium-99:
    - Batch QC 162850

All QC controls are within the established limits.

Organic Comments

VOA – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC 156061 analyzed on sample# B27JW9 (102352001)

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Applies only to T Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Tritium:
    - Batch QC 155935 analyzed on sample# B26JD6 (102345001)

All QC controls are within the established limits.

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-065-207	PAGE 1 OF 1
COLLECTOR: Hecus, Morgan	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 7N; AIR QUALITY: ☐	DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: EW-6; C7020(299-W11-50); I-004	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F10-065	
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-50711 (Pg 16)	ACTUAL SAMPLE DEPTH: 270.5'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: 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: 102360

PRESERVATION	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None
TYPE OF CONTAINER	aGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	VOA - 8260B (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B23WW1 001	WATER	9/1/10	0815	✓	✓	✓

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	9/1/10 0955	Victor Bingham	9/1/10 0955
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

ORIGINAL

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

A-6003-618(01/06)

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-065-236	PAGE 1 OF 1
COLLECTOR: Helmz Morton	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 7N; AIR QUALITY: ☐	DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: EW-6; C7020(299-W11-50); I-004 DUP	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F10-065	
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-567-11 (Pg 16)	ACTUAL SAMPLE DEPTH: 270.5'	COA: 300194ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: 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	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2/Cool~4C	None	HCl to pH <2/Cool~4C	Cool~4C	HNO3 to pH <2 (ULTREX)
TYPE OF CONTAINER	aGs*	G/P	G	aGs*	P	Nalgene
NO. OF CONTAINER(S)	3	1	1	3	1	1
VOLUME	40mL	500mL	250mL	40mL	500mL	500mL
SAMPLE ANALYSIS	VOA - 8260B (TCL);	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	Tc-99 by ICPMS (Technetium-99)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B24116 002	WATER	9/1/10	0815	✓	✓	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	9/1/10 0955	Victor Bins	9/1/10 0955
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

** The CACN for all analytical work at WSCF laboratory is 401648ES20.** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

(1)ICP/MS - 200.8 (TAL) {Aluminum, Barium, Chromium, Cobalt, Cadmium, Copper, Manganese, Nickel, Vanadium} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Strontium, Uranium}

(2)VOLATILE ORGANICS BY FIELD GC {Chloroform, Trichloroethene, Carbon tetrachloride}

(3)IC Anions - 300.0 {Nitrate, Chloride, Bromide, Phosphate, Fluoride, Nitrogen in Nitrate}

ORIGINAL

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

A-6003-618(01/06)

1.0 GENERAL

CH2M Hill Plateau Remediation Company (CHPRC) Sample Delivery Group H4424 was composed of one water sample designated under SAF No. F10-065 with a Project Designation of: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis – Water.

The sample was received as stated on the chain-of-custody document. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Iodine-129, Low Level, MDA Analysis

No problems were encountered during the course of the analyses. The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD, or statistical control limit is calculated.

3.0 Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

N. Joseph Verville
Client Services Manager

12/16/10
Date

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-065-231	PAGE 1 OF 1

COLLECTOR Fulton	**COMPANY CONTACT** DYEKMAN, DL H4424	**TELEPHONE NO.** 373-2530 (7257)	**PROJECT COORDINATOR** DYEKMAN, DL
PRICE CODE 7N	**DATA TURNAROUND**		
AIR QUALITY ☐	**45 Days / 45 Days**		
SAMPLING LOCATION EW-6; C7020(299-W11-50); I-013	**PROJECT DESIGNATION** ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		**SAF NO.** F10-065
ICE CHEST NO. GWS-107	**FIELD LOGBOOK NO.** HNF-N-501-11 ps24	**ACTUAL SAMPLE DEPTH** 447'	**COA** 300194ES10
METHOD OF SHIPMENT FEDERAL EXPRESS			
SHIPPED TO Eberline Services	**OFFSITE PROPERTY NO.** SEE PTR 02358		**BILL OF LADING/AIR BILL NO.** SEE PTR 7941122911 13

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	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	4
VOLUME	1000mL
SAMPLE ANALYSIS	I-129 Low Level {Iodine-129}

N/A 11/12/10 DD

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B23WV4	WATER	11-10-10	1325

N/A 11/12/10 DD

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
CFulton	11-10-10 1440	SSU-R4	11-10-10 1440
SSU-R4	1000 NOV 12 2010	SE Hamaker CHPRC	1000 NOV 12 2010
SE Hamaker CHPRC	1400 NOV 12 2010	FED EX	
FED EX		F NATARAJAN	11/16/10 0915

SPECIAL INSTRUCTIONS
** The CACN for all analytical work at WSCF laboratory is 401648ES20.☐☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

ORIGINAL

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: 200 Area SGRP			DATA PACKAGE: VSR11-041		
VALIDATOR: Eyda Hergenreder		LAB: TestAmerica, WSCF, Eberline		DATE: 04-21-2011	
			SDG: W05803, W05804, W06058, WSCF102360, H4424		

ANALYSES PERFORMED

Gross Alpha/Beta	Strontium-90	Technetium-99 X	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium X	C-14	I-129 X	

SAMPLES/MATRIX Water samples

SDG W05803: B23CT3

SDG W05804: B23CX3

SDG W06058: B24J96, B24J97, B24JJ5

SDG WSCF102360: B23WW1, B24116

SDG H4424: B23WV4

1. Completeness ..... ☐ N/A

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

Comments: None

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:

SDG W05804: H-3 method blank 333 pCi/L

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:

SDG W05803: Tc-99 LCS %R = 71%

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: None

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:

SDG W05804: A matrix spike was not included for H-3

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:

SDG W05803: A duplicate sample was not included for Tc-99

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

Tuesday, February 16, 2010

TestAmerica QC Blank Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05803.Edd, h:\Reportdb\edd\FeadIV\Rad\43264.Edd

Lab Sample Id: LVGH02AB **Sdg/Rept Nbr:** W05803 43264 **Collection Date:** 02/05/2010 11:50
Client Id: NA **Matrix:** WATER WATER **Sample On Date:**
Moisture/Solids%*: **QC Type:** BLK **Received Date:** 02/05/2010

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
	MW6-SBB-A19981								AC	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
0046365	TC-99	-2.09E-01	pCi/L	5.6E+00	U	9.71E+00	100.0		TC99_SEP_LS	1.25E-01	02/16/2010				D
BLK	14133-76-7			4.0E+00						L	01:21				

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Tuesday, February 16, 2010

TestAmerica QC Control Sample Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05803.Edd, h:\Reportdb\edd\FeadIV\Rad\43264.Edd

Lab Sample Id: LVGH02CS **Sdg/Rept Nbr:** W05803 43264 **Collection Date:** 02/05/2010 11:50

Client Id: NA **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** BS **Received Date:** 02/05/2010

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
	MW6-SBB-A19981								AD	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
0046365	TC-99	3.91E+02	pCi/L	2.9E+01		9.80E+00	100.0	5.48E+02	TC99_SEP_LS	1.249E-01	02/16/2010			70	D
BS	14133-76-7			1.1E+01				71.3		L	01:21			130	

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

Tuesday, February 16, 2010

TestAmerica Qc Matrix Spike Report

Lab Code: TARL

FormNbr: R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05803.Edd, h:\Reportdb\edd\FeadIV\Rad\43264.Edd

Lab Sample Id: LVD262CW **Sdg/Rept Nbr:** W05803 43264 **Collection Date:** 02/05/2010 11:50

Client Id: B23CT3 **Matrix:** WATER WATER **Sample On Date:**

Moisture/Solids%*: **QC Type:** MS **Received Date:** 02/05/2010

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp
F10-065	MW6-SBB-A19981								AB	H

Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu-al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
0046365	TC-99	2.71E+03	pCi/L	1.7E+02		9.71E+00	100.0	3.61E+03	TC99_SEP_LS	1.256E-01	02/16/2010			70	D
MS	14133-76-7			2.8E+01				75.1		L	01:21			130	

U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

FORM II

Date: 22-Mar-10

DUPLICATE RESULTS

Lab Name:	**TestAmerica**	**SDG:**	W05804	**Collection Date:**	2/5/2010 11:50:00 AM
Lot-Sample No.:	**J0B050613-1**	**Report No. :**	43488	**Received Date:**	2/5/2010 2:30:00 PM
Client Sample ID:	**B23CX3 DUP**	**COC No. :**	F10-065-170	**Matrix:**	WATER

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0043395	I129_SEP_LEPS_GS			**Work Order:** LVA461AC		**Report DB ID:** LVA461CR			**Orig Sa DB ID:** 9LVA4610			
I129	2.56E-02	U	8.2E-02	8.2E-02	1.55E-01	pCi/L	99%	0.16	3/5/10 02:00 p		3.8529	LEP5$1
	2.81E-02	U	**RPD**	**9.3**		1.00E+00		0.62			L	
Batch: 0062283	906.0_H3_LSC			**Work Order:** LVD4E1AD		**Report DB ID:** LVD4E1DR			**Orig Sa DB ID:** 9LVD4E20			
H-3	2.24E+01	U	1.3E+02	1.4E+02	3.15E+02	pCi/L	100%	0.07	3/5/10 04:26 a		0.005	LSC8
	-9.85E+01	U	**RPD**	**-317.7**		4.00E+02		0.32			L	

No. of Results: 2 **Comments:**

RPD - Relative Percent Difference.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II
BLANK RESULTS

Date: 22-Mar-10

Lab Name: TestAmerica
Matrix: WATER

SDG: W05804
Report No. : 43488

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0062283	906.0_H3_LSC			**Work Order:**	LV9HT1AA		**Report DB ID:**	LV9HT1AB				
H-3	-2.34E+01	U	1.3E+02	1.4E+02	3.12E+02	pCi/L	100%	-0.08	3/4/10 09:35 p		0.005	LSC8
					1.49E+02	4.00E+02		-0.34			L	
Batch: 0062283	906.0_H3_LSC			**Work Order:**	LV9HT1AD		**Report DB ID:**	LV9HT1DX				
H-3	3.33E+02		1.5E+02	1.5E+02	3.31E+02	pCi/L	100%	(1.)	3/5/10 12:19 a		0.005	LSC8
					1.58E+02	4.00E+02		(4.3)			L	
Batch: 0043395	I129_SEP_LEPS_GS			**Work Order:**	LVMLT1AA		**Report DB ID:**	LVMLT1AB				
I129	-5.39E-03	U	1.2E-01	1.2E-01	2.03E-01	pCi/L	95%	-0.03	3/5/10 05:26 p		4.0001	LEP4$1
					9.66E-02	1.00E+00		-0.09			L	

No. of Results: 3 **Comments:**

TestAmerica
rptSTLRchBlank
V5.2.5 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II

LCS RESULTS

Date: 22-Mar-10

Lab Name: TestAmerica

Matrix: WATER

SDG: W05804

Report No. : 43488

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 0062283	906.0_H3_LSC			**Work Order:**	LV9HT1AC		**Report DB ID:**	LV9HT1CS					
H-3	2.32E+03		2.0E+02	2.2E+02	3.13E+02	pCi/L	100%	2.71E+03	8.14E+01	86%	3/4/10 10:57 p	0.005	LSC8
							Rec Limits:	70	130	-0.1		L	
Batch: 0062283	906.0_H3_LSC			**Work Order:**	LV9HT1AE		**Report DB ID:**	LV9HT1EM					
H-3	2.67E+03		2.2E+02	2.3E+02	3.26E+02	pCi/L	100%	2.71E+03	8.14E+01	98%	3/5/10 01:42 a	0.005	LSC8
							Rec Limits:	70	130	0.0		L	
Batch: 0043395	I129_SEP_LEPS_GS			**Work Order:**	LVMLT1AC		**Report DB ID:**	LVMLT1CS					
I129	1.02E+01		1.2E+00	1.2E+00	2.08E-01	pCi/L	96%	9.76E+00	3.16E-01	104%	3/5/10 05:27 p	3.9816	LEP5$1
							Rec Limits:	70	130	0.0		L	

No. of Results: 3 **Comments:**

FORM II

Date: 28-Dec-10

DUPLICATE RESULTS

Lab Name:	**TestAmerica**	**SDG:**	W06058	**Collection Date:**	11/17/2010 1:22:00 PM
Lot-Sample No.:	**J0K230529-1**	**Report No. :**	45394	**Received Date:**	11/18/2010 2:45:00 PM
Client Sample ID:	**B24JJ5 DUP**	**COC No. :**	F10-065-459	**Matrix:**	WATER

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0336379	I129_SEP_LEPS_GS			**Work Order:** MAGWJ1AC		**Report DB ID:** MAGWJ1CR			**Orig Sa DB ID:** 9MAGWJ10			
I129	-4.34E-02	U	1.3E-01	1.3E-01	2.22E-01	pCi/L	94%	-0.2	12/20/10 06:08 p		3.7046	LEP4$1
	-5.73E-02	U	**RPD**	**-27.6**		1.00E+00		-0.67			L	

No. of Results: 1 **Comments:**

RPD - Relative Percent Difference.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda, Total Uncert,CRDL, or not identified by gamma scan software.

FORM II

BLANK RESULTS

Date: 28-Dec-10

Lab Name: TestAmerica

Matrix: WATER

SDG: W06058

Report No. : 45394

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 0336379	I129_SEP_LEPS_GS			**Work Order:**	MARRV1AA		**Report DB ID:**	MARRV1AB				
I129	-3.70E-02	U	1.0E-01	1.0E-01	1.74E-01	pCi/L	93%	-0.21	12/20/10 09:46 p		3.7875	LEP5$1
					8.15E-02	1.00E+00		-0.74			L	

No. of Results: 1 **Comments:**

TestAmerica
rptSTLRchBlank
V5.2.9 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda, Total Uncert,CRDL, or not identified by gamma scan software.

FORM II

LCS RESULTS

Date: 28-Dec-10

Lab Name: TestAmerica

Matrix: WATER

SDG: W06058

Report No. : 45394

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 0336379	I129_SEP_LEPS_GS			Work Order:	MARRV1AC		Report DB ID:	MARRV1CS					
I129	1.22E+01		1.4E+00	1.4E+00	3.16E-01	pCi/L	94%	1.03E+01		119%	12/21/10 03:35 a	3.7498	LEP4$1
							Rec Limits:	70	130	0.2		L	

No. of Results: 1 Comments:

TestAmerica Bias - (Result/Expected)-1 as defined by ANSI N13.30.

rptSTLRchLcs
V5.2.9 A2002

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102360

QC Batch 155935
Associated Samples 102360001, 102360002

Test Tritium by LSC

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
BLANK			**QC Sample #37293**								
Tritium	10028-17-8		21	pCi/L						U	09/03/10
LCS			**QC Sample #37294**								
Tritium	10028-17-8		2800	pCi/L	93.1	80 - 120					09/03/10
DUP			**QC Sample #37295**								
			Original 102345001								
Tritium	10028-17-8		50	pCi/L			107.70	-20 - 20	*	U	09/03/10
MS			**QC Sample #37296**								
			Original 102345001								
Tritium	10028-17-8		18000	pCi/L	87	75 - 125					09/03/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4424

7257-003 Method Blank

METHOD BLANK

SDG	7257	Client/Case no	CHPRC	SDG H4424	
Contact	N. Joseph Verville	Contract	No. 33677		
Lab sample id	S011131-03	Client sample id	Method Blank		
Dept sample id	7257-003	Material/Matrix		WATER	
		SAF No	F10-065		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.132	0.54	0.766	1.00	U	I

QC-BLANK #76123

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/15/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4424

7257-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7257
Contact N. Joseph Verville

Client/Case no CHPRC SDG H4424
Contract No. 33677

Lab sample id S011131-02
Dept sample id 7257-002

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No F10-065

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Iodine 129	66.3	2.0	0.792	1.00		I	58.0	2.3	114	66-134	80-120

QC-LCS #76122

LAB CONTROL SAMPLES
Page 1
SUMMARY DATA SECTION
Page 8

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 12/15/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4424

7257-004 B23WV4

DUPLICATE

SDG 7257
Contact N. Joseph Verville

DUPLICATE
Lab sample id S011131-04
Dept sample id 7257-004

ORIGINAL
Lab sample id S011131-01
Dept sample id 7257-001
Received 11/13/10

Client/Case no CHPRC SDG H4424
Contract No. 33677

Client sample id B23WV4
Location/Matrix EW6;C7020(299W115)I-013 WATER
Collected/Volume 11/10/10 13:25 4 L
Custody/SAF No F10-065-231 F10-065

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	DER σ
Iodine 129	-0.458	0.58	0.801	1.00	U	I	-0.164	0.60	0.827	U	-		0.7

QC-DUP#1 76124

ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 12/15/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4424

Test I Matrix WATER
SDG 7257
Contact N. Joseph Verville

LAB METHOD SUMMARY

IODINE 129 IN WATER

GAMMA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4424

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Iodine 129	
Preparation batch 7274-057						
S011131-01			7257-001	B23WV4	U	
S011131-02			7257-002	Lab Control Sample	ok	
S011131-03			7257-003	Method Blank	U	
S011131-04			7257-004	Duplicate (S011131-01)	-	U
Nominal values and limits from method				RDLs (pCi/L)	1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7274-057			2σ prep error 19.4 % Reference Lab Notebook No. 7270 pg.057													
S011131-01			B23WV4	0.827	2.00			85		400			33	12/12/10	12/13	GRB-201
S011131-02			Lab Control Sample	0.792	2.00			81		400				12/12/10	12/13	GRB-202
S011131-03			Method Blank	0.766	2.00			82		400				12/12/10	12/13	GRB-203
S011131-04			Duplicate (S011131-01)	0.801	2.00			86		400			33	12/12/10	12/13	GRB-204
Nominal values and limits from method				1.00	2.00			40-110		200	100		180			

PROCEDURES	REFERENCE	I129_SEP_LEPS_GS
	SPP-007	Aqueous Sample Receipt by Chemistry Laboratory, rev 1
	SPP-062	Sample Aliquoting, rev 1
	CP-530	Iodine-129 Purification, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.796 ± 0.050
YIELD 84 ± 5

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/15/10