REVIEW COMMENT RECORD (RCR)	1. Date 02/10/2011	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
Data Validation Summary for VSR11-021 associated with the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-16 Operable Units Remedial Investigation/Feasibility Study	S&GRP Sample Data Groups (SDGs); WSCF102975	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)	02/10/2010 (Date); JA Edwards / Reviewer/Point of Contact (print and sign); Author/Originator (print and sign)	02/10/2010 (Date); JA Edwards / Reviewer/Point of Contact (print and sign); J Norman 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	(pages 4, 5, 6 of 58) Detection Limits: (page 7 of 58) References ***DOE/DOE/DOE/RL-2009-43***	Incorrect reference	CHANGE TO: **DOE/RL-2009-43**	Y	Accepted by validator, typographical error corrected	
1	(page 14 of 58) Data Qualification Summary Comments/Analysis Type: ??? Missing, ***'Metals Analysis'***	Missing information	ADD TO: Comments/Analysis Type: ***Metals Analysis***	Y	Accepted by validator, missing information added to page 14 of 58	

Documents: *Portage, Butte, MT*

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
DOE/RL-2009-43, Rev. 0, *Sampling and Analysis Plan for the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-6 Operable Units Remedial Investigation/Feasibility Study*, April 2010
LA-508-481: Gamma Energy Analysis Using Procount Software
LA-505-412: Inductively Coupled Plasma-Mass Spectrometry (ICP/MS) for Trace Elements in Water and Solids
LA-265-403: Hexavalent Chromium Analysis By Spectrophotometer or Discrete Analyzer

REVIEW COMMENT RECORD (RCR)	1. Date 02/10/2011	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
Data Validation Summary for VSR11-021 associated with the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-16 Operable Units Remedial Investigation/Feasibility Study	S&GRP Sample Data Groups (SDGs); WSCF102975	MW Stinnett	Sampling, Management, Reporting Group	MO277/B105/200 East 373-5940

17. Comment Submittal Approval	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
Date / Organization Manager (optional) (print and sign)	MW Stinnett / Reviewer/Point of Contact (print and sign)	MW Stinnett / Reviewer/Point of Contact (print and sign)
	02/10/2010 Date	02/10/2010 Date
	Author/Originator (print and sign)	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	Same errors as noted by JA Edwards in his review. No additional observations					

Documents: *Portage, Butte, MT*

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
DOE/RL-2009-43, Rev. 0, *Sampling and Analysis Plan for the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-6 Operable Units Remedial Investigation/Feasibility Study*, April 2010
LA-508-481: Gamma Energy Analysis Using Procount Software
LA-505-412: Inductively Coupled Plasma-Mass Spectrometry (ICP/MS) for Trace Elements in Water and Solids
LA-265-403: Hexavalent Chromium Analysis By Spectrophotometer or Discrete Analyzer

Portage

103 North Main Street
Butte, Montana 59701
(406) 782-2822

MEMORANDUM

DATE: February 08, 2011
TO: Sherry Lynch, CH2M Hill PRC
FROM: Jennifer Norman, Portage, Inc.
RE: Data Validation Summary for VSR11-021 associated with the *100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-16 Operable Units Remedial Investigation/Feasibility Study*

The following memo presents the results of data validation completed in support of CH2M Hill Plateau Remediation Company (CH2-PRC) VSR11-021. This request included sample delivery group (SDG) WSCF102975. Data Validation was conducted in accordance with the guidance contained in GRP-GD-002 for Radiochemical Analyses and GRP-GD-003 for Chemical Analyses.

Validator: _____ **Date:** 02/07/11

Reviewer: _____ **Date:** 02/07/11

Contents

Introduction

On January 21, 2011, Portage, Inc received VSR11-021 from CH2-PRC. The request contained data acquired in support of the *100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-16 Operable Units Remedial Investigation/Feasibility Study*. VSR11-021 included one (1) SDG containing a total of two (2) soil samples. The soil samples and associated analyses underwent Level C validation in accordance with CH2-PRC guidance documents: a) *GRP-GD-003, "Data Validation for Chemical Analyses,"* and b) *GRP-GD-002, "Data Validation for Radiochemical Analyses"*. The Level C validation effort included assessments of batch quality control (QC) data, field QC data, reporting limits, and data package completeness. Tables 1-2, cross-reference field identifications to the corresponding SDGs and analyses types. They are provided to assist data users when evaluating project data.

Table 1. Sample Delivery Groups and Applicable Analyses

SDG#	Analyses Performed	Laboratory	# of Samples
WSCF102975	ICP-MS metals, Hexavalent Chromium, Gamma Spectroscopy, and Sr-90	WSCF Laboratory	2

Table 2. Sample Identifications for the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-16 Operable Units Remedial Investigation/Feasibility Study Soil Samples

SDG#	Field Sample Id#:	Original Sample Matrix:	Sample Date:
WSCF102975	B273B4	Soil	11/15/10
	B273B3	Soil	11/15/10

Radiochemical Analyses:

Table 3 identifies the project samples that underwent radiochemical analyses and Level C data validation.

Table 3. Radiochemical Sample Identification	
SDG#	**Field Sample Identification #**
WSCF102975	B273B4
	B273B3

Measurement Quality Objectives – Radiochemical Analyses

Precision: All precision criteria were met.

Accuracy: All accuracy criteria were met.

Detection Limits: The Eu-155 results failed to meet the MDA outlined in DOE/RL-2009-43. The remaining detection limit goals were met as specified in DOE/RL-2009-43.

Completeness: Quantitative determinations of completeness are not a required element for Level C validation. As part of validation, a review of required elements was completed and the data packages were complete for all requested radiochemical analyses for Level C deliverables.

Major Deficiencies: No major deficiencies were identified during data validation which resulted in the qualification of any data points as unusable.

Minor Deficiencies: No minor deficiencies were identified during review of hexavalent chromium results which required qualification of any data points.

Wet Chemistry Analyses:

Table 4 identifies the project samples that underwent hexavalent chromium analyses and Level C data validation

Table 4 Cr(VI) Analyses Samples Identification	
SDG#	**Field Sample Identification #**
WSCF102975	B273B4
	B273B3

Measurement Quality Objectives - Hexavalent Chromium

Precision: The hexavalent chromium results exhibited recovery outside relative percent difference (RPD) acceptance criteria. However, no data qualification was warranted as both results were undetected.

Accuracy: The hexavalent chromium results exhibited matrix spike (MS) recovery below the 85-115% acceptance criteria. This has resulted in the "UJ" qualification of the hexavalent chromium results.

Detection Limits: The reported detection limits met the requirements specified in DOE/RL-2009-43.

Completeness: Quantitative determinations of completeness are not a required element for Level C validation. As part of validation, a review of required elements was completed and the data packages were complete for all requested radiochemical analyses for Level C deliverables.

Major Deficiencies: No major deficiencies were identified during review of hexavalent chromium results which required qualification of data as unusable.

Minor Deficiencies: No minor deficiencies were identified during review of hexavalent chromium results which required qualification of any data points.

Metals Analyses

Table 5 identifies the samples that underwent analysis for ICP-AES and ICP-MS metal analytes and Level C data validation.

Table 5. ICP-MS Analyses Samples Identification	
SDG#	**Field Sample Identification #**
WSCF102975	B273B4
	B273B3

Measurement Quality Objectives - ICP-MS Analyses:

Precision: All precision criteria were met.

Accuracy: All accuracy criteria were met.

Detection Limits: The aluminum result for sample B273B4 exceeded the soil detection limit outlined in DOE/RL-2009-43. The remaining detection limits met the requirements specified in DOE/RL-2009-43.

Completeness: Quantitative determinations of completeness are not a required element for Level C validation. As part of validation, a review of required elements was completed and the data packages were complete for all requested radiochemical analyses for Level C deliverables.

Major Deficiencies: No major deficiencies were identified during review of hexavalent chromium results which required qualification of data as unusable.

Minor Deficiencies: The following minor deficiencies were identified during data validation requiring the qualification of data points.

Laboratory Blanks

Selenium was present in the laboratory blank. Selenium results for samples B273B4 and B273B3 were greater that their respective RLs and less than five times the blank concentration. As a result, selenium in these samples has been qualified as undetected (U).

No further minor deficiencies were noted.

Attachment Identification

Attachments 1 through 5 provide the following information, for all analyses included in this data validation report, as indicated below:

Attachment 1. Glossary of Data Reporting Qualifiers
Attachment 2. Summary of Data Qualifications.
Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

References

1. DOE/RL-2009-43, *Sampling and Analysis Plan for the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-6 Operable Units Remedial Investigation/Feasibility Study*. Revision 0. CH2M-Hill Plateau Remediation Company. Richland, Washington.

2. GRP-GD-002, *Data Validation for Radiochemical Analyses,* Rev 0. August 16, 2010. CH2M-Hill Plateau Remediation Company. Richland, Washington.

3. GRP-GD-003, *Data Validation for Chemical Analyses,* Rev 0. August 16, 2010. CH2M-Hill Plateau Remediation Company. Richland, Washington.

Attachment 1

Glossary of Data Reporting Qualifiers

GLOSSARY OF RADIOCHEMICAL DATA REPORTING QUALIFIERS

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 Minimum Detectable Activity (MDA). 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.

GLOSSARY OF CHEMICAL DATA REPORTING QUALIFIERS

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.

C - This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).

X - This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful. The data should be considered unusable 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.

Attachment 2

Summary of Data Qualifications

VSR#: VSR11-021
Date: 02/07/11

Data Qualification Summary

SDG# WSCF102975	Validator: Jennifer Norman	Date: 02/07/11	Page _1_ of _1_
Comments/Analysis Type: Radiochemical Analyses			
Compound	**Qualifier**	**Samples Affected**	**Reason**
No comments to report			

VSR#: VSR11-021
Date: 02/07/11

Data Qualification Summary

SDG# WSCF102975	Validator: Brienne Meyer	Date: 02/07/11	Page _1_ of _1_
Comments/Analysis Type: Hexavalent Chromium			
Compound	**Qualifier**	**Samples Affected**	**Reason**
Cr(VI)	UJ	B273B4, B273B3	Low MS recovery

VSR#: VSR11-021
Date: 02/07/11

Data Qualification Summary

SDG# WSCF102975	Validator: Brienne Meyer	Date: 02/07/11	Page _1_ of _1_
Comments/Analysis Type: ICP Metals Analysis			
Compound	**Qualifier**	**Samples Affected**	**Reason**
Selenium	U	B273B4, B273B3	Compound present in lab blank

Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Radiochemical

WSCF Analytical Results Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102975

Sample # 102975001
SAF# F10-234
Sample ID B273B4

Matrix SOIL
Sampled 11/15/10
Received 11/15/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
GEA Prep										**11/17/10**
GEA										
Antimony-125	14234-35-6	LA-508-481	U	3.8E-3	.035	pCi/g	1	0.075		11/18/10
Cesium-134	13967-70-9	LA-508-481	U	0.039	.017	pCi/g	1	0.049		11/18/10
Cesium-137	10045-97-3	LA-508-481	U	-0.020	.013	pCi/g	1	0.026		11/18/10
Cobalt-60	10198-40-0	LA-508-481	U	-0.0020	.01	pCi/g	1	0.023		11/18/10
Europium-152	14683-23-9	LA-508-481	U	0.019	.042	pCi/g	1	0.081		11/18/10
Europium-154	15585-10-1	LA-508-481	U	0.0020	.039	pCi/g	1	0.085		11/18/10
Europium-155	14391-16-3	LA-508-481	U	0.10	.06	pCi/g	1	0.13		11/18/10
Potassium-40	13966-00-2	LA-508-481		16	1.6	pCi/g	1	0.19		11/18/10
Radium-226	13982-63-3	LA-508-481		0.60	.083	pCi/g	1	0.047		11/18/10
Ruthenium-106	13967-48-1	LA-508-481	U	-0.048	.095	pCi/g	1	0.20		11/18/10
Beryllium-7	13966-02-4	LA-508-481	U	-0.032	.1	pCi/g	1	0.21		11/18/10
SR-89/90										**11/19/10**
SR-89/90										
Strontium-89/90	SR-RAD	LA-220-406	U	-1.0	.71	pCi/g	1	0.47		12/01/10

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.

JAM
2-7-11

WSCF Analytical Results Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102975

Sample # 102975002
SAF# F10-234
Sample ID B273B3

Matrix SOIL
Sampled 11/15/10
Received 11/15/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
GEA Prep										**11/17/10**
GEA										
Antimony-125	14234-35-6	LA-508-481	U	1.8E-3	.044	pCi/g	1	0.10		11/18/10
Cesium-134	13967-70-9	LA-508-481	U	0.048	.027	pCi/g	1	0.051		11/18/10
Cesium-137	10045-97-3	LA-508-481	U	3.6E-4	.016	pCi/g	1	0.036		11/18/10
Cobalt-60	10198-40-0	LA-508-481	U	-3.7E-3	.014	pCi/g	1	0.033		11/18/10
Europium-152	14683-23-9	LA-508-481	U	0.028	.058	pCi/g	1	0.11		11/18/10
Europium-154	15585-10-1	LA-508-481	U	1.6E-3	.044	pCi/g	1	0.095		11/18/10
Europium-155	14391-16-3	LA-508-481	U	-0.020	.086	pCi/g	1	0.18		11/18/10
Potassium-40	13966-00-2	LA-508-481		17	1.7	pCi/g	1	0.27		11/18/10
Radium-226	13982-63-3	LA-508-481		0.62	.092	pCi/g	1	0.066		11/18/10
Ruthenium-106	13967-48-1	LA-508-481	U	-0.038	.14	pCi/g	1	0.32		11/18/10
Beryllium-7	13966-02-4	LA-508-481	U	-0.054	.14	pCi/g	1	0.30		11/18/10
SR-89/90										**11/19/10**
SR-89/90										
Strontium-89/90	SR-RAD	LA-220-406	U	-1.8	.74	pCi/g	1	0.47		12/01/10

JAH
2-7-11

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.

Wet Chemistry

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

Sample # 102975001
SAF# F10-234
Sample ID B273B4

Matrix SOIL
Sampled 11/15/10
Received 11/15/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Cr(VI) Prep										
Cr(VI)										**12/01/10**
Hexavalent chromium	18540-29-9	LA-265-403	UN	<0.12		ug/g	1	0.12	0.62	12/02/10 UJ
ICPMS Prep										
ICP-MS										**11/18/10**
Aluminum	7429-90-5	LA-505-412	U	<6.2		mg/kg	1	6.2	120	11/19/10
Manganese	7439-96-5	LA-505-412		688		mg/kg	1	0.12	1.2	11/19/10
Nickel	7440-02-0	LA-505-412		25.6		mg/kg	1	0.25	2.5	11/19/10
Silver	7440-22-4	LA-505-412	U	<0.12		mg/kg	1	0.12	1.2	11/19/10
Antimony	7440-36-0	LA-505-412	U	<0.37		mg/kg	1	0.37	3.7	11/19/10
Barium	7440-39-3	LA-505-412		84.4		mg/kg	1	0.25	2.5	11/19/10
Beryllium	7440-41-7	LA-505-412	B	0.507		mg/kg	1	0.12	0.62	11/19/10
Cadmium	7440-43-9	LA-505-412	B	0.291		mg/kg	1	0.12	1.2	11/19/10
Chromium	7440-47-3	LA-505-412		23.8		mg/kg	1	0.62	6.2	11/19/10
Cobalt	7440-48-4	LA-505-412		10.6		mg/kg	1	0.12	0.62	11/19/10
Copper	7440-50-8	LA-505-412		36.7		mg/kg	1	0.12	1.2	11/19/10
Vanadium	7440-62-2	LA-505-412		42.6		mg/kg	1	0.25	2.5	11/19/10
Zinc	7440-66-6	LA-505-412		50.3		mg/kg	1	0.99	6.2	11/19/10
Lead	7439-92-1	LA-505-412		8.02		mg/kg	1	0.12	1.2	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)

BJM
2-4-11

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

Sample # 102975002
SAF# F10-234
Sample ID B273B3

Matrix SOIL
Sampled 11/15/10
Received 11/15/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Cr(VI) Prep										
Cr(VI)										**12/01/10**
Hexavalent chromium	18540-29-9	LA-265-403	UN	<0.13		ug/g	1	0.13	0.63	12/02/10 UJ
ICPMS Prep										
ICP-MS										**11/18/10**
Aluminum	7429-90-5	LA-505-412		12800		mg/kg	1	6.4	130	11/19/10
Manganese	7439-96-5	LA-505-412		633		mg/kg	1	0.13	1.3	11/19/10
Nickel	7440-02-0	LA-505-412		19.0		mg/kg	1	0.26	2.6	11/19/10
Silver	7440-22-4	LA-505-412	U	<0.13		mg/kg	1	0.13	1.3	11/19/10
Antimony	7440-36-0	LA-505-412	U	<0.38		mg/kg	1	0.38	3.8	11/19/10
Barium	7440-39-3	LA-505-412		73.9		mg/kg	1	0.26	2.6	11/19/10
Beryllium	7440-41-7	LA-505-412	B	0.325		mg/kg	1	0.13	0.64	11/19/10
Cadmium	7440-43-9	LA-505-412	B	0.210		mg/kg	1	0.13	1.3	11/19/10
Chromium	7440-47-3	LA-505-412		20.8		mg/kg	1	0.64	6.4	11/19/10
Cobalt	7440-48-4	LA-505-412		8.64		mg/kg	1	0.13	0.64	11/19/10
Copper	7440-50-8	LA-505-412		16.8		mg/kg	1	0.13	1.3	11/19/10
Vanadium	7440-62-2	LA-505-412		41.3		mg/kg	1	0.26	2.6	11/19/10
Zinc	7440-66-6	LA-505-412		42.4		mg/kg	1	1.0	6.4	11/19/10
Lead	7439-92-1	LA-505-412		6.06		mg/kg	1	0.13	1.3	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)

BJM
2·4·11

ICP Metals

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

Sample # 102975001
SAF# F10-234
Sample ID B273B4

Matrix SOIL
Sampled 11/15/10
Received 11/15/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Cr(VI) Prep										**12/01/10**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	UN	<0.12		ug/g	1	0.12	0.62	12/02/10
ICPMS Prep										**11/18/10**
ICP-MS										
Aluminum	7429-90-5	LA-505-412	U	<6.2		mg/kg	1	6.2	120	11/19/10
Manganese	7439-96-5	LA-505-412		688		mg/kg	1	0.12	1.2	11/19/10
Nickel	7440-02-0	LA-505-412		25.6		mg/kg	1	0.25	2.5	11/19/10
Silver	7440-22-4	LA-505-412	U	<0.12		mg/kg	1	0.12	1.2	11/19/10
Antimony	7440-36-0	LA-505-412	U	<0.37		mg/kg	1	0.37	3.7	11/19/10
Barium	7440-39-3	LA-505-412		84.4		mg/kg	1	0.25	2.5	11/19/10
Beryllium	7440-41-7	LA-505-412	B	0.507		mg/kg	1	0.12	0.62	11/19/10
Cadmium	7440-43-9	LA-505-412	B	0.291		mg/kg	1	0.12	1.2	11/19/10
Chromium	7440-47-3	LA-505-412		23.8		mg/kg	1	0.62	6.2	11/19/10
Cobalt	7440-48-4	LA-505-412		10.6		mg/kg	1	0.12	0.62	11/19/10
Copper	7440-50-8	LA-505-412		36.7		mg/kg	1	0.12	1.2	11/19/10
Vanadium	7440-62-2	LA-505-412		42.6		mg/kg	1	0.25	2.5	11/19/10
Zinc	7440-66-6	LA-505-412		50.3		mg/kg	1	0.99	6.2	11/19/10
Lead	7439-92-1	LA-505-412		8.02		mg/kg	1	0.12	1.2	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)

BJM
2-4-11

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

Sample # 102975001
SAF# F10-234
Sample ID B273B4

Matrix SOIL
Sampled 11/15/10
Received 11/15/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Thallium	7440-28-0	LA-505-412	U	<0.12		mg/kg	1	0.12	0.62	11/19/10
Arsenic	7440-38-2	LA-505-412		5.67		mg/kg	1	0.49	4.9	11/19/10
Selenium	7782-49-2	LA-505-412	BC	1.91		mg/kg	1	0.37	3.7	11/19/10 U

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)

BJM
2·4·11

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

Sample # 102975002
SAF# F10-234
Sample ID B273B3

Matrix SOIL
Sampled 11/15/10
Received 11/15/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Cr(VI) Prep										
Cr(VI)										**12/01/10**
Hexavalent chromium	18540-29-9	LA-265-403	UN	<0.13		ug/g	1	0.13	0.63	12/02/10
ICPMS Prep										
ICP-MS										**11/18/10**
Aluminum	7429-90-5	LA-505-412		12800		mg/kg	1	6.4	130	11/19/10
Manganese	7439-96-5	LA-505-412		633		mg/kg	1	0.13	1.3	11/19/10
Nickel	7440-02-0	LA-505-412		19.0		mg/kg	1	0.26	2.6	11/19/10
Silver	7440-22-4	LA-505-412	U	<0.13		mg/kg	1	0.13	1.3	11/19/10
Antimony	7440-36-0	LA-505-412	U	<0.38		mg/kg	1	0.38	3.8	11/19/10
Barium	7440-39-3	LA-505-412		73.9		mg/kg	1	0.26	2.6	11/19/10
Beryllium	7440-41-7	LA-505-412	B	0.325		mg/kg	1	0.13	0.64	11/19/10
Cadmium	7440-43-9	LA-505-412	B	0.210		mg/kg	1	0.13	1.3	11/19/10
Chromium	7440-47-3	LA-505-412		20.8		mg/kg	1	0.64	6.4	11/19/10
Cobalt	7440-48-4	LA-505-412		8.64		mg/kg	1	0.13	0.64	11/19/10
Copper	7440-50-8	LA-505-412		16.8		mg/kg	1	0.13	1.3	11/19/10
Vanadium	7440-62-2	LA-505-412		41.3		mg/kg	1	0.26	2.6	11/19/10
Zinc	7440-66-6	LA-505-412		42.4		mg/kg	1	1.0	6.4	11/19/10
Lead	7439-92-1	LA-505-412		6.06		mg/kg	1	0.13	1.3	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)

BJM
2·4·11

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

Sample # 102975002
SAF# F10-234
Sample ID B273B3

Matrix SOIL
Sampled 11/15/10
Received 11/15/10

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Thallium	7440-28-0	LA-505-412	U	<0.13		mg/kg	1	0.13	0.64	11/19/10
Arsenic	7440-38-2	LA-505-412	B	4.77		mg/kg	1	0.51	5.1	11/19/10
Selenium	7782-49-2	LA-505-412	BC	1.41		mg/kg	1	0.38	3.8	11/19/10 U

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)

BJM
2-4-11

Attachment 4

Laboratory Narrative and Chain of Custody Documentation

WSCF Laboratory

PO Box 650 S3-30
Richland, WA 99352

RECEIVED DECEMBER 08, 2010

December 7, 2010

Michael Neely
CH2M-HILL PRC
PO Box 1600
Richland, WA 99352

Dear Michael Neely,

FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF102975

Reference: (1) SOW, Mod 2, #36587, Release 3
(2) HNF-SD-CD-QAPP-017, current version, Waste Sampling & Characterization Facility Quality Assurance Plan

This letter contains the following information for sample delivery group WSCF102975

* Cover Sheet (Attachment 1)
* Narrative (Attachment 2)
* Analytical Results (Attachment 3)
* Sample Receipt Information (Attachment 4)

Very truly yours,

Electronically signed by Carolyn Watkins

For Lab Manager

WSCF Analytical Lab

(509) 373-7495

Attachments 4

CC: w/Attachments

File/LB

WSCF SAF Number Cross Reference

Group # WSCF102975
Data Deliverable Date 12/30/10

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
F10-234	B273B4	102975001	SOIL	11/15/10	11/15/10
F10-234	B273B3	102975002	SOIL	11/15/10	11/15/10

Attachment 2
Narrative
WSCF102975

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on November 15, 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

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

- Batch QC 170517 analyzed on sample# B29B37 (103062001)
  - Matrix Spike and/or Matrix Spike Duplicate recoveries are outside established laboratory limits. Affected sample results in this batch were "N" flagged.

Attachment 2
Narrative
WSCF102975

All other applicable QC controls are within the established limits.

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.

Batch QC 170026 analyzed on sample# B28JR7 (102960001)

- Nickel and Selenium were detected in the Blank and evaluated. Affected sample results in this batch were "C" Flagged.
- Manganese Relative Percent Difference (RPD) for Matrix Spike Duplicate (MSD) was flagged as being outside laboratory control limits, recoveries are within limits. No flags assigned to sample results.

All other applicable QC controls are within the established limits.

Radiochemistry Comments

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

- Gamma Energy Analysis:
  - Batch QC 169949 analyzed on sample# B29D61 (103010010)
    - Radium- 226 was detected in the blank. Radium 226 is Naturally Occurring Radioactive Material (NORM). The laboratory cannot support the Ra-226 results submitted with gamma energy analysis results in this work order due to the following problems: the container is not brought to an equilibrium condition prior to analysis and the Ra-226 results are impacted by environmental factors in the counting room.
    - Cobalt- 60 Duplicate RPD and Percent Recovery Limits are not shown due to the inability of the LIMS system to calculate a value when the results from the Sample and the Duplicate add up to zero.

All other applicable QC controls are within the established limits.

- Strontium-89/90:
  - Batch QC 170060 analyzed on sample# B28JR7 (102960001)

All applicable QC controls are within the established limits.

Attachment 2
Narrative
WSCF102975

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.

Waste Sampling and Characterization Facility
P.O. Box 1970 S3-30, Richland WA 99352
Phone: (509) 373-7004/FAX: (509) 373-7134

ACKNOWLEDGEMENT OF SAMPLES RECEIVED

WSCF Laboratory
PO Box 650 S3-30
Richland, WA 99352

ATTN: Michael Neely

Customer Code: CHPRC
PO #: 401922/ES20
Work Order #: 102975
Profile #: F10-234-040
Proj. Mgr.:
Phone:

The following samples were received from you on 11/15/2010 10:15:00 AM. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Waste Sampling and Characterization Facility.

Sample #	Sample ID	Matrix	Collected	Received
		Tests scheduled		
102975001	B273B4	SOIL	11/15/2010 08:30	11/15/2010 10:15
		2008-S; CR6-S; DRY-WEIGHT; GEA-S; SR89/90-S		
102975002	B273B3	SOIL	11/15/2010 08:30	11/15/2010 10:15
		2008-S; CR6-S; DRY-WEIGHT; GEA-S; SR89/90-S		

Test Acronym Description

Test Acronym	Description
2008-S	ICP-MS (S)
CR6-S	Cr6 (S)
DRY-WEIGHT	Dry Weight as Pct Moisture
GEA-S	Gamma Energy Analysis (S)
SR89/90-S	Strontium 89/90 (GPC) (S)

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-234-040

PAGE 1 **OF** 1

COLLECTOR Crow	**COMPANY CONTACT** DYEKMAN, DL	**TELEPHONE NO.** 373-2530	**PROJECT COORDINATOR** DYEKMAN, DL	**PRICE CODE**	8N	**DATA TURNAROUND** 45 Days / 45 Days
SAMPLING LOCATION C7791 (199-F5-53); Top non-water-bearing RUM DUP	**PROJECT DESIGNATION** 100 Area Remedial Investigation/Feasibility Analysis - 100- FR-3 Soils		**SAF NO.** F10-234	**AIR QUALITY**	☐	
ICE CHEST NO. NA	**FIELD LOGBOOK NO.** HNF-N-585 14	**ACTUAL SAMPLE DEPTH** 55.1' - 57.6'	**COA** 300118ES10	**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
CL=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

102975

PRESERVATION	Cool~4C	Cool~4C	None	None
HOLDING TIME	30 Days	6 Months	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P	Square Bottle - Poly	G/P
NO. OF CONTAINER(S)	1	1	1	1
VOLUME	60mL	250mL	500mL	60mL
SAMPLE ANALYSIS	Chromium Hex - 7196;	ICP/MS - 300.8 (100 Area RI/FS);	Gamma Spectroscopy (100 Area RI/FS);	Strontium-89,90 - Total Sr;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**				
B273B4	SOIL	11-15-10	0830	/	/	/	/

CHAIN OF POSSESSION	**DATE/TIME**	**SIGN/ PRINT NAMES**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM RCrow/R Crow 11-15-10	1015	**RECEIVED BY/STORED IN**	11/15/10 1015
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 401922ES20.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

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** | **F10-234-037** | **PAGE 1 OF 1**

COLLECTOR Crow	**COMPANY CONTACT** DYEKMAN, DL	**TELEPHONE NO.** 373-2530	**PROJECT COORDINATOR** DYEKMAN, DL	**PRICE CODE** BN	**DATA TURNAROUND**
SAMPLING LOCATION C7791 (199-F5-53); Top non-water-bearing RUM	**PROJECT DESIGNATION** 100 Area Remedial Investigation/Feasibility Analysis - 100- FR-3 Soils		**SAF NO.** F10-234	**AIR QUALITY** ☐	45 Days / 45 Days
ICE CHEST NO. NA	**FIELD LOGBOOK NO.** HNF-N-585 14	**ACTUAL SAMPLE DEPTH** 55.1 - 57.6'	**COA** 300118ES10	**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	Cool~4C	Cool~4C	None	None
HOLDING TIME	30 Days	6 Months	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P	Square Bottle - Poly	G/P
NO. OF CONTAINER(S)	1	1	1	1
VOLUME	60mL	250mL	500mL	60mL
SAMPLE ANALYSIS	Chromium Hex - 7196;	ICP/MS - 200.8 (100 Area RI/FS);	Gamma Spectroscopy (100 Area RI/FS);	Strontium-89,90 - Total Sr;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**				
B273B3	SOIL	11/15/10	0830	/	/	/	/

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM RCrow/RCrow 11-15-10	**DATE/TIME** 1015	**RECEIVED BY/STORED IN**	**DATE/TIME** 11/15/10 1015
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 401922ES20.☐** The 100 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 5

Data Validation Supporting Documentation

Radiochemical

Radiochemical Data Validation Checklist

Validation Level:	C	***Data Package:***	VSR11-021
Project:	100 Area RI/FS	***Date:***	02/03/11
Validator:	Jennifer Norman	***SDG:***	WSCF102975
Analyses Performed:	Gamma Isotopes and Strontium -90	***Lab:***	WSCF Analytical Lab

Sample ID#	Matrix
B273B4	Soil
B273B3	Soil

1. Data Package Completeness and Case Narrative

						N/A
Technical verification forms present?	X	Yes		No		N/A

Comments: None.

2. Holding Times *(All Levels)*

						N/A
Are sample holding times acceptable?	X	Yes		No		N/A

Comments: None.

3. Results and Detection Limits *(All Levels)*

						N/A
Results reported for all required sample analyses?	X	Yes		No		N/A
Results supported in raw data? *(Levels D, E)*		Yes		No	X	N/A
Results acceptable? *(Levels D, E)*		Yes		No	X	N/A
Transcription/Calculation errors? *(Levels D, E)*		Yes		No	X	N/A
MDA meet required detection limits?	X	Yes		No		N/A
Transcription/Calculation errors? *(Levels D, E)*		Yes		No	X	N/A

Comments: The Eu-155 MDAs for samples B273B4 (0.13 pCi/g) and B273B3 (0.18 pCi/g) respectively, were above the requested MDAs outlined in RL-2009-43. No data qualification is warranted.

4. Initial Calibration *(Levels D,E)*

					X	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: None.

5. Continuing Calibration *(Levels D,E)*

					X	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: None.

6. Background Counts *(Levels D,E)* [ ] N/A [X] 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: None

7. Blanks *(Levels B, C, D, E)* [ ] N/A

Method blank analyzed within required frequency?	[X]	Yes	[ ]	No	[ ]	N/A
Method blank results acceptable?	[ ]	Yes	[X]	No	[ ]	N/A
Analytes detected in method blank?	[X]	Yes	[ ]	No	[ ]	N/A
Field blank(s) analyzed?	[ ]	Yes	[X]	No	[ ]	N/A
Field blank results acceptable?	[ ]	Yes	[ ]	No	[X]	N/A
Analytes detected in field blank(s)?	[ ]	Yes	[ ]	No	[X]	N/A
Transcription/Calculation Errors? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A

Comments: The Ra-226 blank exhibited positive activity above the MDA. However, both the Ra-226 results warrant no qualification due to sample results greater five times the blank value.

Field blank samples were not included in this SDG.

8. Laboratory Control Samples or Blank Spike Samples *(Levels C, D, E)* [ ] N/A

LCS/BSS analyzed within required frequency?	[X]	Yes	[ ]	No	[ ]	N/A
LCS/BBS recoveries acceptable?	[X]	Yes	[ ]	No	[ ]	N/A
LCS/BSS traceable? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
LCS/BSS expired? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
LCS/BSS levels correct? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
Transcription/Calculation Errors? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A

Comments: None.

9. Chemical Carrier Recovery *(Levels C, D, E)* [X] 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 tracer expired? *(Levels D, E)*	[ ]	Yes	[ ]	No	[ ]	N/A
Transcription/Calculation errors? *(Levels D, E)*	[ ]	Yes	[ ]	No	[ ]	N/A

Comments: None.

10. Tracer Recovery *(Levels C, D, E)* [ ] N/A

Tracer added?	[X]	Yes	[ ]	No	[ ]	N/A
Tracer recovery acceptable?	[X]	Yes	[ ]	No	[ ]	N/A
Tracer traceable? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
Tracer expired? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
Transcription/Calculation errors? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A

Comments: None.

11. Matrix Spikes *(Levels C, D, E)* [X] 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: None.

12. Duplicates *(Levels C, D, E)*

							N/A
Duplicates analyzed at required frequency?	X	Yes		No		N/A
RPD Values acceptable?	X	Yes		No		N/A
Transcription/Calculation errors? *(Levels D, E)*		Yes		No	X	N/A

Comments: None.

13. Field QC Samples *(Levels C, D, E)*

							N/A
Field duplicate sample(s) analyzed?	X	Yes		No		N/A
Field duplicate RPD values acceptable?	X	Yes		No		N/A
Field split sample(s) analyzed?	X	Yes		No		N/A
Field spilt RPD values acceptable?		Yes		No	X	N/A
Performance audit sample(s) analyzed		Yes		No	X	N/A
Performance audit sample results acceptable?		Yes		No	X	N/A

Comments: Field duplicate and field split samples were not analyzed with this SDG.

	Target Analyte and Assigned Qualification: SDG#: WSCF102975											
Field Sample Id#:	Be-7	Co-60	Cs-134	Cs-137	Eu-152	Eu-154	EU-155	K-40	Ru-106	Sb-125	Ra-226	Sr-90
B273B4												
B273B4												

Validator Signature: _____ **Date:** 2/7/11

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102975

QC Batch 169949
Associated Samples 102975001, 102975002

Test Gamma Energy Analysis-general

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
IBLANK			**QC Sample #42008**								
Antimony-125	14234-35-6		-3.2E-3	pCi/g						U	11/18/10
Cesium-134	13967-70-9		0.016	pCi/g						U	11/18/10
Cesium-137	10045-97-3		4.1E-3	pCi/g						U	11/18/10
Cobalt-60	10198-40-0		0.013	pCi/g						U	11/18/10
Europium-152	14683-23-9		-2.4E-3	pCi/g						U	11/18/10
Europium-154	15585-10-1		0.033	pCi/g						U	11/18/10
Europium-155	14391-16-3		-0.024	pCi/g						U	11/18/10
Potassium-40	13966-00-2		0.11	pCi/g						U	11/18/10
Radium-226	13982-63-3		0.098	pCi/g							11/18/10
Ruthenium-106	13967-48-1		-0.022	pCi/g						U	11/18/10
Beryllium-7	13966-02-4		0.041	pCi/g						U	11/18/10
LCS			**QC Sample #42009**								
Cesium-137	10045-97-3		6600	pCi/sample	108.7	80 - 120					11/17/10
Cobalt-60	10198-40-0		11000	pCi/sample	106.3	80 - 120					11/17/10
DUP			**QC Sample #42010**								
			Original 103010010								
Antimony-125	14234-35-6		0.024	pCi/g			-4800.00	-30 - 30	*	U	11/18/10
Cesium-134	13967-70-9		0.034	pCi/g			3.10	-30 - 30		U	11/18/10

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102975

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
Cesium-137	10045-97-3		1.2E-3	pCi/g			-302.30	-30 - 30	*	U	11/18/10
Cobalt-60	10198-40-0		1.6E-3	pCi/g						U	11/18/10
Europium-152	14683-23-9		-0.016	pCi/g			661.50	-30 - 30	*	U	11/18/10
Europium-154	15585-10-1		0.051	pCi/g			1000.00	-30 - 30	*	U	11/18/10
Europium-155	14391-16-3		-0.010	pCi/g			-59.00	-30 - 30	*	U	11/18/10
Potassium-40	13966-00-2		12	pCi/g			9.50	-30 - 30			11/18/10
Radium-226	13982-63-3		0.42	pCi/g			14.00	-30 - 30			11/18/10
Ruthenium-106	13967-48-1		-0.021	pCi/g			272.70	-30 - 30	*	U	11/18/10
Beryllium-7	13966-02-4		-0.056	pCi/g			-14.10	-30 - 30		U	11/18/10

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF102975

QC Batch 170060
Associated Samples 102975001, 102975002

Test Strontium 89/90 (GPC/GEA)

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
BLANK			**QC Sample #42308**								
Strontium-89/90	SR-RAD		-0.57	pCi/g						U	12/01/10
LCS			**QC Sample #42309**								
Strontium-89/90	SR-RAD		27	pCi/g	95.8	80 - 120					12/01/10
DUP			**QC Sample #42310**								
			Original 102960001								
Strontium-89/90	SR-RAD		-0.39	pCi/g			-55.70	-30 - 30	*	U	12/01/10
SAMPLE			**Sample #102975001**								
Strontium-85	13967-73-2				89.3	25 - 105					12/01/10
SAMPLE			**Sample #102975002**								
Strontium-85	13967-73-2				96.3	25 - 105					12/01/10
BLANK			**QC Sample #42308**								
Strontium-85	13967-73-2				88.4	25 - 105					12/01/10
LCS			**QC Sample #42309**								
Strontium-85	13967-73-2				88.9	25 - 105					12/01/10

Attention Michael Neely
Department Radiochemistry

Group # WSCF102975

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
DUP			**QC Sample #42310**							
			Original 102960001							
Strontium-85	13967-73-2				89.3	25 - 105	0.00			12/01/10

Wet Chemistry

Chemical Data Validation Checklist

Validation Level:	*C*	***Data Package:***	*VSR11-021*
Project:	*100 Area RI/FS*	***Date:***	*02/03/11*
Validator:	*Brienne Meyer*	***SDG:***	*WSCF102975*
Analyses Performed:	*Hexavalent Chromium*	***Lab:***	*WSCF Laboratory*

Sample ID#	Matrix
B273B4	Soil
B273B3	Soil

1. Data Package Completeness and Case Narrative

Technical verification forms present?	[X]	Yes	[ ]	No	[ ]	N/A
Comments: None.						

2. Holding Times *(All Levels)*

Samples properly preserved?	[X]	Yes	[ ]	No	[ ]	N/A
Are sample holding times acceptable?	[X]	Yes	[ ]	No	[ ]	N/A
Comments: None.						

3. Result Quantitation and Detection Limits *(All Levels)*

Results reported for all requested analyses?	[X]	Yes	[ ]	No	[ ]	N/A
Results supported in raw data? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
Samples properly prepared? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
Detection limits meet RDL?	[ ]	Yes	[ ]	No	[X]	N/A
Transcription/Calculation errors? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
Comments: None.						

4. Instrument Performance and Calibration *(Levels D and E)*

Initial Calibrations performed on all instruments?	[ ]	Yes	[ ]	No	[X]	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: None.						

5. Blanks *(Levels B, C,D, and E)*

ICB and CCB checks performed for all applicable analyses? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
ICB and CCB results acceptable? *(Levels D, E)*	[ ]	Yes	[ ]	No	[X]	N/A
Laboratory blanks analyzed?	[X]	Yes	[ ]	No	[ ]	N/A
Laboratory blank results acceptable?	[X]	Yes	[ ]	No	[ ]	N/A
Field blanks analyzed? *(Levels C, D,E)*	[ ]	Yes	[ ]	No	[X]	N/A

Field blank results acceptable? *(Levels C, D, E)*		Yes		No	X	N/A
Transcription/calculation errors? *(Levels D, E)*		Yes		No	X	N/A

Comments: Field blank samples were not included in this SDG.

6. Accuracy *(Levels C, D, and E)*

							N/A
MS/MSD samples analyzed?	X	Yes		No		N/A
MS/MSD results acceptable?		Yes	X	No		N/A
MS/MSD standards NIST traceable? *(Levels D, E)*		Yes		No	X	N/A
MS/MSD standards expired? *(Levels D, E)*		Yes		No	X	N/A
LCS/BSS samples analyzed?	X	Yes		No		N/A
LCS/BSS results acceptable?	X	Yes		No		N/A
Standards traceable? *(Levels D, E)*		Yes		No	X	N/A
Standards expired? *(Levels D, E)*		Yes		No	X	N/A
Transcription/calculation errors? *(Levels D, E)*		Yes		No	X	N/A
Performance audit sample(s) analyzed?		Yes		No	X	N/A
Performance audit sample results acceptable?		Yes		No	X	N/A

Comments: The MS result for hexavalent chromium (-1.7%) was outside the 85-115% recovery criteria outlined in SW-846 Method 7196A. The laboratory analyzed a post spike (PS) and an insoluble matrix spike (IMS). These results were within the acceptance criteria. In addition, GRP-GD-003 notes that because Hanford Site soils tend to be reducing in nature, hexavalent chromium results should not be rejected based solely on low MS recoveries. Therefore, both the hexavalent chromium results have been qualified 'UJ' due to low MS recovery and non-detect sample results.

7. Precision *(Levels C,D, and E)*

							N/A
Duplicate RPD values acceptable?		Yes	X	No		N/A
Duplicate results acceptable?	X	Yes		No		N/A
MS/MSD standards NIST traceable? *(Levels D, E)*		Yes		No	X	N/A
MS/MSD standards expired? *(Levels D, E)*		Yes		No	X	N/A
Field duplicate RPD values acceptable?		Yes		No	X	N/A
Field split RPD values acceptable?		Yes		No	X	N/A
Transcription/calculation errors? *(Levels D, E)*		Yes		No	X	N/A

Comments: Duplicate RPD result for hexavalent chromium (71.6%) was outside the ≤35% RPD criteria. Both hexavalent chromium results warrant no qualifications as the samples were non-detect.

Field duplicate and field split samples were not analyzed with this SDG.

Target Analyte and Assigned Qualification: SDG#: WSCF102975	
Field Sample Id#:	**Hexavalent Chromium**
B273B4	UJ
B273B3	UJ

Validator Signature: _____ **Date:** 2/4/11

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

QC Batch 170517
Associated Samples 102975001, 102975002

Test Hexavalent chromium

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
BLANK			**QC Sample #42985**								
Hexavalent chromium	18540-29-9		<0.099	ug/g						U	12/02/10
LCS			**QC Sample #42986**								
Hexavalent chromium	18540-29-9		3.89	ug/g	98.2	80 - 120					12/02/10
DUP			**QC Sample #42987**								
			Original 103062001								
Hexavalent chromium	18540-29-9		<0.11	ug/g			71.60	20	*	UX	12/02/10
MS			**QC Sample #42988**								
			Original 103062001								
Hexavalent chromium	18540-29-9		-0.0665	ug/g	-1.7	75 - 125				UN	12/02/10
PSTSPK			**QC Sample #42989**								
Hexavalent chromium	18540-29-9		0.0542	ug/g	101.9	85 - 115				U	12/02/10
IMS			**QC Sample #42990**								
			Original 103062001								
Hexavalent chromium	18540-29-9		320	ug/g	93.5	75 - 125				D	12/02/10

ICP Metals

Metals Data Validation Checklist

Validation Level:	*C*	***Data Package:***	*VSR11-021*
Project:	*100 Area RI/FS*	***Date:***	*02/03/11*
Validator:	*Brienne Meyer*	***SDG:***	*WSCF102975*
Analyses Performed:	*Total Metals by USEPA 200.8*	***Lab:***	*WSCF Analytical Lab*

Sample ID#	Matrix
B273B4	Soil
B273B3	Soil

1. Data Package Completeness and Case Narrative

Technical verification forms present? [x] Yes [ ] No [ ] N/A [ ] N/A

Comments: This data package also contained the sample results for % solids. These results were not validated as no QC data was provided for % solids analysis.

2. Holding Times *(All Levels)*

Samples properly preserved?	[x]	Yes	[ ]	No	[ ] N/A
Are sample holding times acceptable?	[x]	Yes	[ ]	No	[ ] N/A

Comments: None.

3. Result Quantitation and Detection Limits *(All Levels)*

Results reported for all requested analyses?	[x]	Yes	[ ]	No	[ ] N/A
Results supported in raw data? *(Levels D, E)*	[ ]	Yes	[ ]	No	[x] N/A
Samples properly prepared? *(Levels D, E)*	[ ]	Yes	[ ]	No	[x] N/A
Detection limits meet RDL?	[ ]	Yes	[x]	No	[ ] N/A
Transcription/Calculation errors? *(Levels D, E)*	[ ]	Yes	[ ]	No	[x] N/A

Comments: The reported MDL for aluminum for sample B273B4 exceeded the required soil EQL listed in Table A-2 of the project-specific SAP (DOE/RL-2009-43, Rev. 0). The associated sample result was reported by the laboratory as non-detect. No action is warranted.

4. Instrument Performance and Calibration *(Levels D and E)*

Initial Calibrations performed on all instruments?	[ ]	Yes	[ ]	No	[x] 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: None.

5. Blanks *(Levels B, C,D, and E)*

							N/A
ICB and CCB checks performed for all applicable analyses? *(Levels D, E)*		Yes		No	x		N/A
ICB and CCB results acceptable? *(Levels D, E)*		Yes		No	x		N/A
Laboratory blanks analyzed?	x	Yes		No			N/A
Laboratory blank results acceptable?		Yes	x	No			N/A
Field blanks analyzed? *(Levels C, D,E)*		Yes	x	No			N/A
Field blank results acceptable? *(Levels C, D, E)*		Yes		No	x		N/A
Transcription/calculation errors? *(Levels D, E)*		Yes		No	x		N/A

Comments: Positive detections were noted in the MB for nickel and selenium at concentrations >MDL but <RL. Qualification is as follows:

- Both selenium results have been qualified 'U' due to sample results ≥MDL but <RL.
- Both nickel results warrants no qualification due to sample result >RL.

Field blank samples were not included in this SDG.

6. Accuracy*(Levels C, D, and E)*

							N/A
MS/MSD samples analyzed?	x	Yes		No			N/A
MS/MSD results acceptable?	x	Yes		No			N/A
MS/MSD standards NIST traceable? *(Levels D, E)*		Yes		No	x		N/A
MS/MSD standards expired? *(Levels D, E)*		Yes		No	x		N/A
LCS/BSS samples analyzed?	x	Yes		No			N/A
LCS/BSS results acceptable?	x	Yes		No			N/A
Standards traceable? *(Levels D, E)*		Yes		No	x		N/A
Standards expired? *(Levels D, E)*		Yes		No	x		N/A
Transcription/calculation errors? *(Levels D, E)*		Yes		No	x		N/A
Performance audit sample(s) analyzed?		Yes		No	x		N/A
Performance audit sample results acceptable?		Yes		No	x		N/A

Comments: None.

7. Precision *(Levels C,D, and E)*

							N/A
Duplicate RPD values acceptable?	x	Yes		No			N/A
Duplicate results acceptable?	x	Yes		No			N/A
MS/MSD standards NIST traceable? *(Levels D, E)*		Yes		No	x		N/A
MS/MSD standards expired? *(Levels D, E)*		Yes		No	x		N/A
Field duplicate RPD values acceptable?		Yes		No	x		N/A
Field split RPD values acceptable?		Yes		No	x		N/A
Transcription/calculation errors? *(Levels D, E)*		Yes		No	x		N/A

Comments: Field duplicate and field split samples were not analyzed with this SDG.

8. ICP Quality Control *(Levels D and E)*

						x	N/A
ICP serial dilution samples analyzed?		Yes		No			N/A
ICP serial dilution %D values acceptable?		Yes		No			N/A
ICP interference check sample required?		Yes		No			N/A
ICP interference check sample acceptable?		Yes		No			N/A
Standards traceable?		Yes		No			N/A

Standards expired? ☐ Yes ☐ No ☐ N/A
Transcription/calculation errors? *(Levels D, E)* ☐ Yes ☐ No ☐ N/A
Comments: None.

	Target Analyte and Assigned Qualification: SDG#: WSCF102975 Total Metals by USEPA 200.8																	
Field Sample I d#:	**Al**	**Sb**	**As**	**Ba**	**Be**	**Cd**	**Cr**	**Co**	**Cu**	**Pb**	**Hg**	**Mn**	**Se**	**Ag**	**Ni**	**Tl**	**V**	**Zn**
B273B4													U					
B273B3													U					

Validator Signature: _____ **Date:** 2/4/11

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

QC Batch 170026
Associated Samples 102975001, 102975002

Test ICP-2008 MS All possible metal

Analyte	CAS #	Original Found	QC Found	Units	% Recov Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #42206**						
Aluminum	7429-90-5		<5.0	ug/L				U	11/19/10
Manganese	7439-96-5		<0.10	ug/L				U	11/19/10
Nickel	7440-02-0		0.438	ug/L				B	11/19/10
Silver	7440-22-4		<0.10	ug/L				U	11/19/10
Antimony	7440-36-0		<0.30	ug/L				U	11/19/10
Barium	7440-39-3		<0.20	ug/L				U	11/19/10
Beryllium	7440-41-7		<0.10	ug/L				U	11/19/10
Cadmium	7440-43-9		<0.10	ug/L				U	11/19/10
Chromium	7440-47-3		<0.50	ug/L				U	11/19/10
Cobalt	7440-48-4		<0.050	ug/L				U	11/19/10
Copper	7440-50-8		<0.10	ug/L				U	11/19/10
Vanadium	7440-62-2		<0.20	ug/L				U	11/19/10
Zinc	7440-66-6		<0.80	ug/L				U	11/19/10
Lead	7439-92-1		<0.10	ug/L				U	11/19/10
Thallium	7440-28-0		<0.050	ug/L				U	11/19/10
Arsenic	7440-38-2		<0.40	ug/L				U	11/19/10
Selenium	7782-49-2		0.493	ug/L				B	11/19/10
LCS			**QC Sample #42207**						

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Aluminum	7429-90-5		8010	mg/kg	97	49 - 124				11/19/10
Manganese	7439-96-5		469	mg/kg	103.4	75 - 121				11/19/10
Nickel	7440-02-0		57.1	mg/kg	102.7	74 - 122				11/19/10
Silver	7440-22-4		99.8	mg/kg	98.8	83 - 127				11/19/10
Antimony	7440-36-0		161	mg/kg	178.9	62 - 205				11/19/10
Barium	7440-39-3		321	mg/kg	100.6	78 - 118				11/19/10
Beryllium	7440-41-7		87.3	mg/kg	97.6	77 - 120				11/19/10
Cadmium	7440-43-9		64.7	mg/kg	97.2	76 - 129				11/19/10
Chromium	7440-47-3		72.1	mg/kg	99	68 - 119				11/19/10
Cobalt	7440-48-4		73.5	mg/kg	100.5	77 - 122				11/19/10
Copper	7440-50-8		62.5	mg/kg	91.2	67 - 120				11/19/10
Vanadium	7440-62-2		84.8	mg/kg	102.1	67 - 122				11/19/10
Zinc	7440-66-6		171	mg/kg	96.5	73 - 131				11/19/10
Lead	7439-92-1		120	mg/kg	92.2	79 - 124				11/19/10
Thallium	7440-28-0		122	mg/kg	91.7	52 - 137				11/19/10
Arsenic	7440-38-2		132	mg/kg	100.1	79 - 125				11/19/10
Selenium	7782-49-2		172	mg/kg	107	82 - 133				11/19/10
MS			**QC Sample #42208**							
			Original 102960001							
Aluminum	7429-90-5		994	mg/kg	99.4	70 - 130				11/19/10
Manganese	7439-96-5		106	mg/kg	106.4	70 - 130				11/19/10
Nickel	7440-02-0		96.3	mg/kg	96.3	70 - 130				11/19/10
Silver	7440-22-4		92.0	mg/kg	92	70 - 130				11/19/10
Antimony	7440-36-0		93.9	mg/kg	93.9	70 - 130				11/19/10
Barium	7440-39-3		107	mg/kg	107	70 - 130				11/19/10

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
Beryllium	7440-41-7		94.3	mg/kg	94.3	70 - 130					11/19/10
Cadmium	7440-43-9		94.9	mg/kg	94.9	70 - 130					11/19/10
Chromium	7440-47-3		98.8	mg/kg	98.8	70 - 130					11/19/10
Cobalt	7440-48-4		94.9	mg/kg	94.9	70 - 130					11/19/10
Copper	7440-50-8		89.9	mg/kg	89.9	70 - 130					11/19/10
Vanadium	7440-62-2		103	mg/kg	102.5	70 - 130					11/19/10
Zinc	7440-66-6		94.6	mg/kg	94.6	70 - 130					11/19/10
Lead	7439-92-1		92.4	mg/kg	92.4	70 - 130					11/19/10
Thallium	7440-28-0		90.5	mg/kg	90.5	70 - 130					11/19/10
Arsenic	7440-38-2		98.3	mg/kg	98.3	70 - 130					11/19/10
Selenium	7782-49-2		102	mg/kg	102.1	70 - 130					11/19/10
MSD			**QC Sample #42209**								
			Original 102960001						**Paired**	**42208**	
Aluminum	7429-90-5		1200	mg/kg	119.6	70 - 130	18.40	30			11/19/10
Manganese	7439-96-5		75.6	mg/kg	75.6	70 - 130	33.80	30	*	X	11/19/10
Nickel	7440-02-0		95.4	mg/kg	95.4	70 - 130	0.90	30			11/19/10
Silver	7440-22-4		91.0	mg/kg	91	70 - 130	1.10	30			11/19/10
Antimony	7440-36-0		92.4	mg/kg	92.4	70 - 130	1.60	30			11/19/10
Barium	7440-39-3		106	mg/kg	105.6	70 - 130	1.30	30			11/19/10
Beryllium	7440-41-7		90.0	mg/kg	90	70 - 130	4.70	30			11/19/10
Cadmium	7440-43-9		94.4	mg/kg	94.4	70 - 130	0.50	30			11/19/10
Chromium	7440-47-3		94.7	mg/kg	94.7	70 - 130	4.20	30			11/19/10
Cobalt	7440-48-4		91.4	mg/kg	91.4	70 - 130	3.80	30			11/19/10
Copper	7440-50-8		86.9	mg/kg	86.9	70 - 130	3.40	30			11/19/10
Vanadium	7440-62-2		92.7	mg/kg	92.7	70 - 130	10.00	30			11/19/10

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF102975

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Zinc	7440-66-6		89.7	mg/kg	89.7	70 - 130	5.30	30		11/19/10
Lead	7439-92-1		91.0	mg/kg	91	70 - 130	1.50	30		11/19/10
Thallium	7440-28-0		90.4	mg/kg	90.4	70 - 130	0.10	30		11/19/10
Arsenic	7440-38-2		96.7	mg/kg	96.7	70 - 130	1.60	30		11/19/10
Selenium	7782-49-2		98.7	mg/kg	98.7	70 - 130	3.40	30		11/19/10