0072379

SAF-RC-008
ERDF Groundwater Well Samples
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan H4-21 (2 copies)

COMMENTS:

SDG K0557 **SAF-RC-008**

X Rad only Chem only Rad & Chem

X Complete Partial

CALENDAR 2006 ERDF GROUNDWATER

RECEIVED
MAR 14 2007
EDMC

Date: 26 February 2007
To: Washington Closure Hanford (technical representative)
From: ELR Consulting
Project: Data Validation Calendar 2006 ERDF Groundwater
Subject: Radiochemistry - Data Package No. K0557-EB

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. K0557 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
B1KJR0	9/12/06	Water	C	See note 1
B1KJR1	9/12/06	Water	C	See note 1
B1KJT1	9/12/06	Water	C	See note 1
B1KJT6	9/12/06	Water	C	See note 1

1 - Gross alpha and beta; carbon-14; technetium-99; iodine-129; total radium and total uranium.

Data validation was conducted in accordance with the WCH validation statement of work and the Description of Work for Routine Groundwater Sampling at the Environmental Restoration Disposal Facility (BHI-00873, Rev. 1, August 2005). 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**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Laboratory (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the required detection limit (RDL), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the minimum detectable activity (MDA) are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

Field Blanks

One field (equipment) blank (B1KJT6) was submitted for analysis. Gross beta was detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is 75-125%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to an LCS recovery outside QC limits (72%), all total radium results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection limit (CRDL) and the RPD is less than 20 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (B1KJR0/B1KJR1) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the BHI-00873 PQLs to ensure that laboratory detection levels meet the required criteria. The technetium-99 result in sample B1KJT6 exceeded the PQL. Under the WCH statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

Data package SDG No. K0557 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an LCS recovery outside QC limits (72%), all total radium results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The technetium-99 result in sample B1KJT6 exceeded the PQL. Under the WCH statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford, July 7, 2003.

BHI-00873, Rev. 1, *Description of Work for Routine Groundwater Sampling at the Environmental Restoration Disposal Facility,* August 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

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

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0557	REVIEWER: ELR	Project: ERDF	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Total radium	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0557

7526-001 B1KJR0

DATA SHEET

SDG	7526	Client/Case no	Hanford	SDG K0557	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R609095-01	Client sample id	B1KJR0		
Dept sample id	7526-001	Location/Matrix	Hanford Site	WATER	
Received	09/13/06	Collected/Volume	09/12/06 13:10	9.4 L	
		Custody/SAF No	RC-008A-4	RC-008A	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.34	1.5	2.0	3.0	U	93A
Gross Beta	12587-47-2	27.6	2.6	2.7	4.0		93B
Carbon 14	14762-75-5	1.42	36	60	200	U	C
Technetium 99	14133-76-7	47.1	3.7	4.1	15		TC
Total Radium	ALPHA-RA	-0.117	0.18	0.70	1.0	U J	RAT
Total Uranium (ug/L)	7440-61-1	1.94	0.22	0.026	0.10		U_T
Iodine 129	15046-84-1	12.7	2.6	5.8	5.0		I

ERDF, SEPTEMBER 2006

JR
2/23/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/31/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0557

7526-002 B1KJR1

DATA SHEET

SDG	7526	Client/Case no	Hanford		SDG_K0557
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R609095-02	Client sample id	B1KJR1		
ept sample id	7526-002	Location/Matrix	Hanford Site		WATER
Received	09/13/06	Collected/Volume	09/12/06 13:10	9.4 L	
		Custody/SAF No	RC-008A-5	RC-008A	

NALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
ross Alpha	12587-46-1	3.05	2.0	2.4	3.0		93A
ross Beta	12587-47-2	33.2	2.6	2.0	4.0		93B
arbon 14	14762-75-5	-5.16	35	60	200	U	C
echnetium 99	14133-76-7	48.3	3.6	3.7	15		TC
otal Radium	ALPHA-RA	0.073	0.18	0.58	1.0	U J	RAT
otal Uranium (ug/L)	7440-61-1	1.95	0.22	0.026	0.10		U_T
odine 129	15046-84-1	15.4	1.2	2.3	5.0		I

RDF, SEPTEMBER 2006

2/25/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/31/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0557

7526-003 B1KJT1

DATA SHEET

SDG	7526	Client/Case no	Hanford	SDG K0557	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R609095-03	Client sample id	B1KJT1		
ept sample id	7526-003	Location/Matrix	Hanford Site	WATER	
Received	09/13/06	Collected/Volume	09/12/06 11:24	9.4 L	
		Custody/SAF No	RC-008A-16	RC-008A	

NALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
ross Alpha	12587-46-1	-0.156	1.5	2.6	3.0	U	93A
ross Beta	12587-47-2	40.5	3.2	3.4	4.0		93B
arbon 14	14762-75-5	-4.74	36	60	200	U	C
echnetium 99	14133-76-7	64.5	4.6	5.4	15		TC
otal Radium	ALPHA-RA	0.060	0.19	0.56	1.0	U J	RAT
otal Uranium (ug/L)	7440-61-1	2.72	0.31	0.026	0.10		U_T
odine 129	15046-84-1	3.58	2.1	4.7	5.0	U	I

RDF, SEPTEMBER 2006

2/23/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/31/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0557

7526-004 B1KJT6

DATA SHEET

SDG	7526	Client/Case no	Hanford	SDG K0557	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R609095-04	Client sample id	B1KJT6		
Lept sample id	7526-004	Location/Matrix	Hanford Site	WATER	
Received	09/13/06	Collected/Volume	09/12/06 09:20	9.4 L	
		Custody/SAF No	RC-008A-23	RC-008A	

NALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
ross Alpha	12587-46-1	0.138	0.68	1.2	3.0	U	93A
ross Beta	12587-47-2	2.17	1.2	1.7	4.0		93B
arbon 14	14762-75-5	14.8	35	59	200	U	C
echnetium 99	14133-76-7	-2.92	5.2	18	15	U	TC
otal Radium	ALPHA-RA	-0.125	0.091	0.58	1.0	U J	RAT
otal Uranium (ug/L)	7440-61-1	-0.002	0.011	0.026	0.10	U	U_T
odine 129	15046-84-1	0.005	1.0	2.3	5.0	U	I

RDF, SEPTEMBER 2006

2/25/07

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/31/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0557 was composed of four water samples designated under SAF No. RC-008A with a Project Designation of: ERDF, September 2006.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on October 31, 2006.

2.0 ANALYSIS NOTES

2.1 Gross Alpha/Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.3 Technetium-99 Analysis

The MDA for sample B1KTJ6 was 18 pCi/L, greater than the required detection limit of 15 pCi/L; no activity was detected in the sample greater than the MDA. No other problems were encountered during the course of the analyses.

2.4 Iodine-129 Analysis

No problems were encountered during the course of the analysis.

2.5 Total Radium Analysis

The QC LCS activity recovery was 72%, less than the lower control limit of 80%. No other problems were encountered during the course of the analyses

2.6 Total Uranium Analysis

No problems were encountered during the course of the analyses.

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."

Melissa Mannion

Melissa C. Mannion
Senior Program Manager

11/1/6
Date

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: DURATEK L. D. WALL	Contact/Requester: Dot Stewart K0557 (7526)	Telephone No.: 509-376-5056 MSIN FAX
SAF No.: RC-008A	Sampling Origin: Hanford Site	Purchase Order/Charge Code
Project Title: ERDF, SEPTEMBER 2006	DTS-SHWS-H106	Ice Chest No.: 6RP-03-004 Temp.
Shipped To (Lab): Eberline Services	Method of Shipment: Govt. Vehicle	Bill of Lading/Air Bill No.: 792204545011
Protocol: GPP	Priority: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS

** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI

**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and DL Stewart (372-1704).

**Sample Management will send all results to Tom Lazarski (Sigma 1, Rm 58, MSIN: H9-03)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1KJR0		W	9-12-06	1310	1x20-mL P	Activity Scan	None
B1KJR0		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B1KJR0		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B1KJR0		W			1x125-mL G/P	Carbon-14	None
B1KJR0		W			4x1000-mL G/P	Iodine-129	None
B1KJR0		W			1x1000-mL G/P	Total Radium	HNO3 to pH <2
B1KJR0		W			1x250-mL G/P	Technetium-99	HCl to pH <2
B1KJR0		W			1x~~100~~ 125 mL G/P 9-12-06	Total Uranium	HNO3 to pH <2

00017

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
DURATEK L. D. WALL	L. D. Wall		SEP 12 2006 1100	FedEX			
Relinquished By	FED EX		Date/Time	Received By	MFM		09/13/06 10:15
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liquid	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

DURATEK

Collector L. D. WALL	Contact/Requester Dot Stewart K0557 (7526)	Telephone No. 509-376-5056 MSIN FAX
SAF No. RC-008A	Sampling Origin Hanford Site	Purchase Order/Charge Code
Project Title ERDF SEPTEMBER 2006	DIS-SAWS-H106	Ice Chest No. GRP-03-004 Temp.
Shipped To (Lab) Eberline Services	Method of Shipment Govt. Vehicle	Bill of Lading/Air Bill No. 7922 0454 5011
Protocol GPP	Priority: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS

** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐

**Submit invoices and deliverables to JH Kessner, BHI

**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and DL Stewart (372-1704).

**Sample Management will send all results to Tom Lazarski (Sigma 1, Rm 58, MSIN: H9-03)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1KJR1		W	9-12-06	1310	1x20-mL P	Activity Scan	None
B1KJR1		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B1KJR1		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B1KJR1		W			1x125-mL G/P	Carbon-14	None
B1KJR1		W			4x1000-mL G/P	Iodine-129	None
B1KJR1		W			1x1000-mL G/P	Total Radium	HNO3 to pH <2
B1KJR1		W			1x250-mL G/P	Technetium-99	HCl to pH <2
B1KJR1		W			1x~~100~~ 125 mL G/P 9-13-06	Total Uranium	HNO3 to pH <2

C00018

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
DURATEK L. D. WALL	L. D. Wall		SEP 12 2006 1400	FedEX			
Relinquished By	FED EX		Date/Time	Received By			Date/Time 09/13/06 10:15
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liquid
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: DURATEK L. D. WALL	Contact/Requester: Dot Stewart K0557 (7528)	Telephone No.: 509-376-5056 MSIN FAX
SAF No.: RC-008A	Sampling Origin: Hanford Site	Purchase Order/Charge Code
Project Title: ERDF, SEPTEMBER 2006	DTS-SHWS-H106	Ice Chest No.: 6RP2-03-004 Temp.
Shipped To (Lab): Eberline Services	Method of Shipment: Govt. Vehicle	Bill of Lading/Air Bill No.: 7922045450 11
Protocol: GPP	Priority: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL INSTRUCTIONS Hold Time — Total Activity Exemption: Yes ☑ No ☐
**Submit invoices and deliverables to JH Kessner, BHI.
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and DL Stewart (372-1704).
**Sample Management will send all results to Tom Lazarski (Sigma 1, Rm 58, MSIN: H9-03)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1KJT1		W	9-12-06	1124	1x20-mL P	Activity Scan	None
B1KJT1		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B1KJT1		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B1KJT1		W			1x125-mL G/P	Carbon-14	None
B1KJT1		W			4x1000-mL G/P	Iodine-129	None
B1KJT1		W			1x1000-mL G/P	Total Radium	HNO3 to pH <2
B1KJT1		W			1x250-mL G/P	Technetium-99	HCl to pH <2
B1KJT1		W			1x100-mL G/P	Total Uranium	HNO3 to pH <2

0000019

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
DURATEK L. D. WALL		L.D. Wall	SEP 12 2006 1400	FedEx			
FED EX							

Relinquished By	Date/Time	Received By	Date/Time
			09/13/06 10:15

Matrix *

S	= Soil	DS	= Drum Solid
SE	= Sediment	DL	= Drum Liquid
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wine
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: DURATEK L. D. WALL	Contact/Requester: Dot Stewart K0557 (7526)	Telephone No. 509-376-5056 MSIN FAX
SAF No. RC-008A	Sampling Origin: Hanford Site	Purchase Order/Charge Code
Project Title: ERDF, SEPTEMBER 2006	DTS-SHWS-H106	Ice Chest No. ORP-03-004 Temp.
Shipped To (Lab): Eberline Services	Method of Shipment: Govt. Vehicle	Bill of Lading/Air Bill No. 792204545011
Protocol: GPP	Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)	Offsite Property No.

Priority: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes ☑ No ☐
**Submit invoices and deliverables to JH Kessner, BHI
**FAX copies of Eberline/Lionville log-in to JH Kessner (1-425-969-4823) and DL Stewart (372-1704).
**Sample Management will send all results to Tom Lazarski (Sigma 1, Rm 58, MSIN: H9-03)

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1KJT6		W	9-12-06	0920	1x20-mL P	Activity Scan	None
B1KJT6		W			2x1000-mL G/P	Gross Alpha	HNO3 to pH <2
B1KJT6		W			2x1000-mL G/P	Gross Beta	HNO3 to pH <2
B1KJT6		W			1x125-mL G/P	Carbon-14	None
B1KJT6		W			4x1000-mL G/P	Iodine-129	None
B1KJT6		W			1x1000-mL G/P	Total Radium	HNO3 to pH <2
B1KJT6		W			1x250-mL G/P 125 [illegible] 9-12-06	Technetium-99	HCl to pH <2
B1KJT6		W			1x~~100~~-mL G/P	Total Uranium	HNO3 to pH <2

000020

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
DURATEK L. D. WALL	R.D. Wall		SEP 12 2006 1400	Fed EX			
Relinquished By	FED EX		Date/Time	Received By	[illegible]	09/13/06	Date/Time 10:15
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: ERDF			DATA PACKAGE: K0557		
VALIDATOR: ELR		LAB: EB		DATE: 2/23/07	
			SDG: K0557		
ANALYSES PERFORMED					
Gross Alpha/Beta Total Uranium	Strontium-90 Radium-22	Technetium-99 Tritium	Alpha Spectroscopy tot radium	Gamma Spectroscopy C-14	I-129
SAMPLES/MATRIX					
BIKJR0	BIKJR1	BIKJT1			
					Water

1. Completeness ..... ☐ N/A

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

Comments: _____

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: EB - 557 7/2a Tl gr beta in FB

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: total radium - 72% - J all

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: _____

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: _____

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: _____

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: _____

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: RO|R1 no PS or PAs

12. Holding Times (All levels)

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

Comments: _____

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: TC-99 over in T6

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0557

7526-006 Method Blank

METHOD BLANK

SDG	7526	Client/Case no	Hanford SDG K0557
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R609095-06	Client sample id	Method Blank
Dept sample id	7526-006	Material/Matrix	WATER
		SAF No	RC-008A

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALIFIERS	TEST
Gross Alpha	12587-46-1	-0.560	0.56	1.6	3.0	U	93A
Gross Beta	12587-47-2	-0.534	1.0	1.8	4.0	U	93B
Carbon 14	14762-75-5	19.3	36	60	200	U	C
Technetium 99	14133-76-7	-0.972	1.9	6.0	15	U	TC
Total Radium	ALPHA-RA	-0.134	0.21	0.86	1.0	U	RAT
Total Uranium (ug/L)	7440-61-1	0	0.011	0.026	0.10	U	U_T
Iodine 129	15046-84-1	-0.583	0.87	2.0	5.0	U	I

RDF, SEPTEMBER 2006

QC-BLANK 58712

METHOD BLANKS
Page 1
SUMMARY DATA SECTION
Page 8

000029

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/31/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0557

7526-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7526

Contact Melissa C. Mannion

Client/Case no Hanford

SDG K0557

Contract No. 630

Lab sample id R609095-05

Dept sample id 7526-005

Client sample id Lab Control Sample

Material/Matrix WATER

SAF No RC-008A

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
Gross Alpha	31.1	4.2	1.5	3.0		93A	37.3	1.5	83	69-131	70-130
Gross Beta	39.1	2.8	2.1	4.0		93B	38.7	1.5	101	74-126	70-130
Carbon 14	9110	310	140	200		C	9570	380	95	84-116	80-120
Technetium 99	1140	20	3.8	15		TC	1200	48	95	84-116	80-120
Total Radium	44.3	2.5	0.88	1.0		RAT	61.5	2.5	72	90-110	80-120
Total Uranium (ug/L)	85.0	10	0.26	0.10		U_T	90.5	3.6	94	78-122	80-120
Iodine 129	249	4.6	8.3	5.0		I	254	10	98	90-110	80-120

ERDF, SEPTEMBER 2006

QC-LCS 58711

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 10/31/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0557

7526-007 B1KJR0

DUPLICATE

SDG 7526		Client/Case no Hanford	SDG K0557
Contact Melissa C. Mannion		Contract No. 630	
DUPLICATE	ORIGINAL		
sample id R609095-07	Lab sample id R609095-01	Client sample id B1KJR0	
sample id 7526-007	Dept sample id 7526-001	Location/Matrix Hanford Site	WATER
	Received 09/13/06	Collected/Volume 09/12/06 13:10	9.4 L
		Custody/SAF No RC-008A-4	RC-008A

YTE	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
s Alpha	-0.033	1.2	2.1	3.0	U	93A	1.34	1.5	2.0	U	-		1.4
s Beta	28.6	2.4	1.9	4.0		93B	27.6	2.6	2.7		4	37	0.3
on 14	11.3	36	60	200	U	C	1.42	36	60	U	-		0.4
netium 99	50.4	3.6	3.7	15		TC	47.1	3.7	4.1		7	27	0.8
l Radium	-0.200	0.29	0.84	1.0	U	RAT	-0.117	0.18	0.70	U	-		0.5
l Uranium (ug/L)	1.86	0.21	0.026	0.10		U_T	1.94	0.22	0.026		4	31	0.4
ne 129	14.0	2.2	4.9	5.0		I	12.7	2.6	5.8		10	40	0.7

, SEPTEMBER 2006

UP#1 S8713

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	10/31/06

ERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0557

7526-008 B1KJR1

MATRIX SPIKE

SDG	7526	Client/Case no	Hanford SDG K0557
Contact	Melissa C. Mannion	Contract	No. 630
MATRIX SPIKE		ORIGINAL	
sample id	R609095-08	Lab sample id	R609095-02
sample id	7526-008	Dept sample id	7526-002
		Received	09/13/06
Client sample id	B1KJR1		
Location/Matrix	Hanford Site		WATER
Collected/Volume	09/12/06 13:10		9.4 L
Custody/SAF No	RC-008A-5		RC-008A

TE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
1 14	27800	940	310	200	X	C	28700	1100	-5.16	35	97	84-116	60-140

SEPTEMBER 2006

12 58714

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-MS
Version	3.06
Report date	10/31/06