Analytical Data Package

Radiochemical Analysis By

STL Richland

2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.

Assigned Laboratory Code:

Data Package Contains __18__ Pages

Report No.: 28531

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
28207		SOIL #1	J5B150358-1	G4GWL1AC	9G4GWL10	5047394
		SOIL #1	J5B150358-1	G4GWL1AE	9G4GWL10	5047395
		SOIL #1	J5B150358-1	G4GWL1AF	9G4GWL10	5047398
		SOIL #1	J5B150358-1	G4GWL1AA	9G4GWL10	5047399
		SOIL #1	J5B150358-1	G4GWL1AD	9G4GWL10	5047401
		SOIL #2	J5B150358-2	G4GWM1AC	9G4GWM10	5047394
		SOIL #2	J5B150358-2	G4GWM1AE	9G4GWM10	5047395
		SOIL #2	J5B150358-2	G4GWM1AF	9G4GWM10	5047398
		SOIL #2	J5B150358-2	G4GWM1AA	9G4GWM10	5047399
		SOIL #2	J5B150358-2	G4GWM1AD	9G4GWM10	5047401

STL

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CERTIFICATE OF ANALYSIS

April 7, 2005

Santa Monica, CA 904

Attention:

Project	:	
Sample Type	:	Soil (2)
Lot Number	:	J5B150358
SDG Number	:	28207

CASE NARRATIVE

I.   Introduction

On February 14, 2005, two soil samples were received at the STL Richland (STLR) laboratory for radiochemical analysis. Upon receipt, the samples were assigned STLR identification numbers as described on the cover page of the Analytical Data Package. The samples were assigned to Lot Number J5B150358.

II.   Sample Receipt

The samples were received in good condition and no anomalies were noted upon receipt.

III.   Analytical Results/Methodology

The analytical results for this report are presented by client and laboratory sample ID's. Each set of data includes sample identification information; analytical results and the appropriate associated statistical uncertainties.

The analyses requested were:

> **Alpha Spectroscopy**
> Plutonium-238, 239/40 by method RICHRC5010
> **Gamma Spectroscopy**
> Gamma by method RICH-RC-5017
> **Gas Proportional Counting**
> Gross Alpha by method RICH-RC-5020
> Gross Beta by method RICH-RC-5020
> Total Strontium by method RICH-RC-5006

IV.   Quality Control

The analytical result for each analysis performed includes a minimum of one laboratory control sample (LCS), one method blank, one sample duplicate analysis, isotopic tracer in each sample in applicable methods and matrix spike/matrix in applicable methods. Any exceptions have been noted in the "Comments" section.

V.   Comments

Alpha Spectroscopy

Plutonium-238, 239/40 by method STL RICHRC5010
All QC and sample parameters were within established control limits.

Gamma Spectroscopy
Gamma Spectroscopy by method SLT RICHRC5017 (EPA 901.1)
The achieved MDA for sample Soil #1 was slightly elevated (0.26) due to the sample size analyzed. Except as noted, all QC and sample parameters were within established control limits.

Gas Proportional Counting

Gross Alpha by method STL RICHRC5020
All QC and sample parameters were within established control limits.
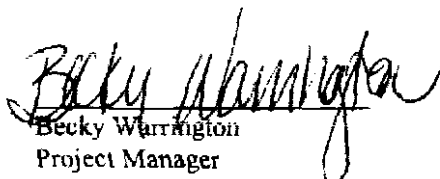
Gross Beta by method STL RICHRC5020
All QC and sample parameters were within established control limits.

Total Strontium by method STL RICHRC5006
All QC and sample parameters were within established control limits.

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

Reviewed and approved:

Becky Warrington
Project Manager

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, $R = constants * f(x,y,z,...)$. The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/√n), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) u_c Combined Uncertainty.	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, u_c the combined uncertainty. The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = $(S-D)/[sqrt(TPUs^2 + TPUd^2)]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

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Ordered by Method, Batch No., Client Sample ID.

Report No. : 28531

SDG No: 28207

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
5047394 RICHRC5010									
SOIL #1									
	G4GWL1AC	PU-238	-4.10E-03 +- 8.2E-03	U	pCi/g	83%	9.80E-02	1.18E+00	
		PU239/40	2.04E-02 +- 4.1E-02	U	pCi/g	83%	5.54E-02	1.07E+00	
SOIL #1 DUP									
	G4GWL1AG	PU-238	-4.79E-03 +- 9.6E-03	U	pCi/g	71%	1.15E-01	1.18E+00	0.1
		PU239/40	-4.79E-03 +- 9.6E-03	U	pCi/g	71%	1.15E-01	1.07E+00	1.2
SOIL #2									
	G4GWM1A	PU-238	0.00E+00 +- 3.2E-02	U	pCi/g	84%	3.54E-02	1.18E+00	
		PU239/40	2.08E-02 +- 3.8E-02	U	pCi/g	84%	7.36E-02	1.07E+00	
5047399 RICHRC5017									
SOIL #1									
	G4GWL1AA	CS-137	-5.01E-02 +- 1.5E-01	U	pCi/g		2.61E-01	3.16E-01	
		K-40	6.49E+00 +- 4.0E+00		pCi/g		2.79E+00		
		RA-226	1.28E+00 +- 4.7E-01	U	pCi/g		8.35E-01		
		TH-232	1.66E+00 +- 8.5E-01	U	pCi/g		1.64E+00		
		U-238DHP	2.93E+00 +- 2.2E+00	U	pCi/g		4.00E+00		
SOIL #2									
	G4GWM1AA	CS-137	7.11E-02 +- 5.8E-02	U	pCi/g		1.13E-01	3.16E-01	
		K-40	2.17E+01 +- 4.0E+00		pCi/g		1.34E+00		
		RA-226	5.28E-01 +- 2.3E-01	U	pCi/g		3.06E-01		
		TH-232	7.52E-01 +- 4.6E-01		pCi/g		4.63E-01		
		U-238DHP	9.33E-01 +- 9.7E-01	U	pCi/g		1.77E+00		
SOIL #2 DUP									
	G4GWM1A	CS-137	1.24E-01 +- 6.8E-02	U	pCi/g		1.33E-01	3.16E-01	
		K-40	2.22E+01 +- 4.2E+00		pCi/g		1.66E+00		
		RA-226	5.75E-01 +- 1.9E-01	U	pCi/g		3.17E-01		
		TH-232	8.53E-01 +- 4.7E-01		pCi/g		4.88E-01		
		U-238DHP	7.58E-01 +- 1.1E+00	U	pCi/g		1.97E+00		
5047395 RICHRC5013									
SOIL #1									
	G4GWL1AE	ALPHA	1.14E+01 +- 5.8E+00		pCi/g	100%	6.20E+00	1.00E+01	
SOIL #2									
	G4GWM1AE	ALPHA	3.60E+00 +- 3.1E+00	U	pCi/g	100%	4.44E+00	1.00E+01	
SOIL #2 DUP									
	G4GWM1A	ALPHA	7.62E+00 +- 4.5E+00	J	pCi/g	100%	5.13E+00	1.00E+01	1.5
5047398 RICHRC5013									
SOIL #1									
	G4GWL1AF	BETA	3.71E+01 +- 8.5E+00		pCi/g	100%	4.19E+00	1.00E+01	
SOIL #1 DUP									

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rptSTLRchSaSummary2 V4.12 A97

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

J Qual - No Uj< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

Sample Results Summary
STL Richland
Ordered by Method, Batch No., Client Sample ID.

Report No. : 28531   SDG No: 28207

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
5047398 RICHRC5013									
SOIL #1 DUP									
	G4GWL1AH	BETA	2.34E+01 +- 5.1E+00		pCi/g	100%	4.08E+00	1.00E+01	2.8
SOIL #2									
	G4GWM1AF	BETA	3.24E+01 +- 8.1E+00		pCi/g	100%	4.16E+00	1.00E+01	
5047401 RICHRC5006									
SOIL #1									
	G4GWL1AD	STRONTIUM	7.17E-02 +- 9.2E-02	U	pCi/g	78%	1.95E-01	1.00E+00	
SOIL #2									
	G4GWM1A	STRONTIUM	5.39E-02 +- 8.4E-02	U	pCi/g	86%	1.82E-01	1.00E+00	
SOIL #2 DUP									
	G4GWM1AK	STRONTIUM	2.62E-02 +- 8.5E-02	U	pCi/g	80%	1.94E-01	1.00E+00	0.5

No. of Results: 30

STL Richland   RER2   - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

rptSTLRchSaSum   U Qual - Analyzed for, but the result is less than the Mdc/Mda;Total Uncert or gamma scan software did not identify the nuclide.
mary2 V4.12 A97

7

Date: 07-Apr-06

Report No. : 28531

SDG No.: 28207

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC|MDA
RICHRC5010								
5047394 BLANK QC								
G4J4H1AA	PU-238	-2.07E-03 +- 2.9E-03	U	pCi/g	68%			2.93E-02
	PU239/40	-3.10E-03 +- 3.6E-03	U	pCi/g	68%			3.26E-02
5047394 LCS								
G4J4H1AC	PU239/40	4.46E-01 +- 1.0E-01	J	pCi/g	87%	97%	0.0	1.06E-02
RICHRC5017								
5047399 BLANK QC								
G4J4P1AA	CS-137	8.75E-03 +- 9.7E-02	U	pCi/g				1.83E-01
	K-40	-2.77E+00 +- 3.0E+00	U	pCi/g				6.48E+00
	RA-226	2.23E-01 +- 2.8E-01	U	pCi/g				5.46E-01
	TH-232	-2.08E-01 +- 5.4E-01	U	pCi/g				9.34E-01
	U-238DHP	3.32E-01 +- 1.5E+00	U	pCi/g				2.62E+00
5047399 LCS								
G4J4P1AC	CS-137	7.98E+00 +- 1.1E+00		pCi/g				2.13E-01
RICHRC5013								
5047395 BLANK QC								
G4J4K1AA	ALPHA	3.51E-01 +- 1.0E+00	U	pCi/g	100%			2.39E+00
5047395 LCS								
G4J4K1AC	ALPHA	8.55E+01 +- 2.0E+01		pCi/g	100%	94%	-0.1	2.68E+00
RICHRC5013								
5047398 BLANK QC								
G4J4M1AA	BETA	1.59E+00 +- 1.7E+00	U	pCi/g	100%			3.65E+00
5047398 LCS								
G4J4M1AC	BETA	6.12E+01 +- 1.0E+01		pCi/g	100%	92%	-0.1	3.51E+00
RICHRC5006								
5047401 BLANK QC								
G4J4W1AA	STRONTIUM	2.72E-02 +- 7.5E-02	U	pCi/g	89%			1.70E-01
5047401 LCS								
G4J4W1AC	STRONTIUM	2.52E+00 +- 7.2E-01		pCi/g	91%	94%	-0.1	1.69E-01

No. of Results: 15

Bias   - (Result/Expected)-1 as defined by ANSI N13.30.

J Qual - No U/< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 07-Apr-05

Lab Name: **STL Richland**	SDG: 28207	Collection Date: 12/30/2004
Lot-Sample No.: J5B150358-1	Report No. : 28531	Received Date: 2/14/2005 12:10:00 PM
Client Sample ID: SOIL #1	COC No. :	Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action-Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5047394	RICHRC5010				**Work Order:** G4GWL1AC		**Report DB ID:** 9G4GWL10					
PU-238	**-4.10E-03**	U	8.2E-03	8.2E-03	9.80E-02	pCi/g	83%	-0.04	3/22/05 10:55 a		0.402	ALP41
						2.13E-02	1.18E+00	-1.			G	
PU239/40	**2.04E-02**	U	4.1E-02	4.1E-02	5.54E-02	pCi/g	83%	0.37	3/22/05 10:55 a		0.402	ALP41
							1.07E+00	1.			G	
Batch: 5047395	RICHRC5013				**Work Order:** G4GWL1AE		**Report DB ID:** 9G4GWL10					
ALPHA	**1.14E+01**		5.3E+00	5.8E+00	6.20E+00	pCi/g	100%	(1.8)	3/17/05 04:34 p		0.05	GPC10A
						2.44E+00	1.00E+01	(4.)			G	
Batch: 5047398	RICHRC5013				**Work Order:** G4GWL1AF		**Report DB ID:** 9G4GWL10					
BETA	**3.71E+01**		4.5E+00	8.5E+00	4.19E+00	pCi/g	100%	(8.8)	3/17/05 06:36 p		0.2002	GPC26D
						1.94E+00	1.00E+01	(8.7)			G	
Batch: 5047399	RICHRC5017				**Work Order:** G4GWL1AA		**Report DB ID:** 9G4GWL10					
CS-137	**-5.01E-02**	U	1.5E-01	1.5E-01	2.61E-01	pCi/g		-0.19	3/3/05 06:35 a		24.0	GER6$1
						1.31E-01	3.16E-01	-0.67			g	
K-40	**8.49E+00**		4.0E+00	4.0E+00	2.79E+00	pCi/g		(2.3)	3/3/05 06:35 a		24.0	GER6$1
						1.41E+00		(3.2)			g	
RA-226	**1.28E+00**	U	4.7E-01	4.7E-01	8.35E-01	pCi/g		(1.5)	3/3/05 06:35 a		24.0	GER6$1
						4.18E-01		(5.4)			g	
TH-232	**1.66E+00**	U	8.5E-01	8.5E-01	1.64E+00	pCi/g		(1.)	3/3/05 06:35 a		24.0	GER6$1
						8.21E-01		(3.9)			g	
U-238DHP	**2.93E+00**	U	2.2E+00	2.2E+00	4.00E+00	pCi/g		0.73	3/3/05 06:35 a		24.0	GER6$1
						2.01E+00		(2.7)			g	

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rptSTLRchSample
V4.12 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

SAMPLE RESULTS

Lab Name:	STL Richland	SDG:	28207	Collection Date: 12/30/2004
Lot-Sample No.:	J5B150358-1	Report No. :	28531	Received Date: 2/14/2005 12:10:00 PM
Client Sample ID: SOIL #1		COC No. :		Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5047401	RICHRC5006			Work Order:	G4GWL1AD		Report DB ID: 9G4GWL10					
STRONTIUM	7.17E-02	U	9.0E-02	9.2E-02	1.95E-01	pCi/g	78%	0.37	3/11/05 07:07 p		5.0	GPC31C
						9.05E-02	1.00E+00	(1.6)			G	

No. of Results: 10   Comments:

10

MDC\|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U\|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda\|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 07-Apr-05

Lab Name: **STL Richland**	SDG: 28207	Collection Date: 12/30/2004
Lot-Sample No.: J5B150358-2	Report No.: 28531	Received Date: 2/14/2005 12:10:00 PM
Client Sample ID: SOIL #2	COC No.:	Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5047394	RICHRC5010				Work Order: G4GWM1AC		Report DB ID: 9G4GWM10					
PU-238	*0.00E+00*	U	0.0E+00	3.2E-02	3.54E-02	pCi/g	84%	0.	3/22/05 10:55 a		0.6009	ALP47
						1.18E+00		0.			G	
PU239/40	*2.08E-02*	U	3.8E-02	3.8E-02	7.36E-02	pCi/g	84%	0.28	3/22/05 10:55 a		0.6009	ALP47
						1.92E-02	1.07E+00	(1.1)			G	
Batch: 5047395	RICHRC5013				Work Order: G4GWM1AE		Report DB ID: 9G4GW/M10					
ALPHA	*3.60E+00*	U	3.0E+00	3.1E+00	4.44E+00	pCi/g	100%	0.81	3/17/05 04:34 p		0.0503	GPC10B
						1.59E+00	1.00E+01	(2.3)			G	
Batch: 5047398	RICHRC5013				Work Order: G4GWM1AF		Report DB ID: 9G4GWM10					
BETA	*3.24E+01*		4.2E+00	6.1E+00	4.16E+00	pCi/g	100%	(7.8)	3/17/05 06:36 p		0.2	GPC27D
						1.93E+00	1.00E+01	(10.5)			G	
Batch: 5047399	RICHRC5017				Work Order: G4GWM1AA		Report DB ID: 9G4GWM10					
CS-137	*7.11E-02*	U	5.8E-02	5.8E-02	1.13E-01	pCi/g		0.63	3/3/05 08:22 a		51.5	GER12$1
						5.82E-02	3.16E-01	(2.4)			g	
K-40	*2.17E+01*		4.0E+00	4.0E+00	1.34E+00	pCi/g		(16.2)	3/3/05 08:22 a		51.5	GER12$1
						6.74E-01		(10.9)			g	
RA-226	*5.28E-01*	U	2.3E-01	2.3E-01	3.06E-01	pCi/g		(1.7)	3/3/05 08:22 a		51.5	GER12$1
						1.53E-01		(4.6)			g	
TH-232	*7.52E-01*		4.6E-01	4.6E-01	4.63E-01	pCi/g		(1.6)	3/3/05 08:22 a		51.5,	GER12$1
						2.32E-01		(3.3)			g	
U-238DHP	*9.33E-01*	U	9.7E-01	9.7E-01	1.77E+00	pCi/g		0.53	3/3/05 08:22 a		51.5	GER12$1
						8.87E-01		(1.9)			g	

STL Richland

rptSTLRchSample
V4.12 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

SAMPLE RESULTS

Lab Name:	STL Richland	SDG:	28207	Collection Date:	12/30/2004
Lot-Sample No.:	J5B150358-2	Report No. :	28531	Received Date:	2/14/2005 12:10:00 PM
Client Sample ID:	SOIL #2	COC No. :		Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5047401	RICHRC5006			Work Order: G4GWM1AD		Report DB ID: 9G4GWM10						
STRONTIUM	5.39E-02	U	8.3E-02	8.4E-02	1.82E-01	pCi/g	86%	0.3	3/11/05 07:07 p		5.0l	GPC31D
						8.44E-02	1.00E+00	(1.3)			G	

No. of Results: 10   Comments:

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MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 07-Apr-05

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	28207	Collection Date:	12/30/2004
Lot-Sample No.:	J5B150358-1	Report No. :	28531	Received Date:	2/14/2005 12:10:00 PM
Client Sample ID:	SOIL #1 DUP	COC No. :		Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5047394	RICHRC5010			Work Order: G4GWL1AG		Report DB ID: G4GWL1GR			Orig Sa DB ID: 9G4GWL10			
PU-238	-4.79E-03	U	9.6E-03	9.6E-03	1.15E-01	pCi/g	71%	-0.04	3/22/05 10:55 a		0.4067	ALP43
	-4.10E-03	U	RER2 0.1			1.18E+00		-1.			G	
PU238/40	-4.79E-03	U	9.6E-03	9.6E-03	1.15E-01	pCi/g	71%	-0.04	3/22/05 10:55 a		0.4067	ALP43
	2.04E-02	U	RER2 1.2			1.07E+00		-1.			G	
Batch: 5047398	RICHRC5013			Work Order: G4GWL1AH		Report DB ID: G4GWL1HR			Orig Sa DB ID: 9G4GWL10			
BETA	2.34E+01		3.6E+00	5.1E+00	4.08E+00	pCi/g	100%	(5.7)	3/17/05 06:36 p		0.2007	GPC27A
3	3.71E+01		RER2 2.8			1.00E+01		(9.2)			G	

No. of Results: 3   Comments:

STL Richland   RER2   - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

rptSTLRchDupV4.1   MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

2 A97   U Qual - Analyzed for, but the result is less than the Mdc/Mda[Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 07-Apr-05

DUPLICATE RESULTS

Lab Name: STL Richland	SDG: 28207	Collection Date: 12/30/2004
Lot-Sample No.: J5B150358-2	Report No. : 28531	Received Date: 2/14/2005 12:10:00 PM
Client Sample ID: SOIL #2 DUP	COC No. :	Matrix: SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5047395	RICHRC5013			Work Order: G4GWM1AG		Report DB ID: G4GWM1GR			Orig Sa DB ID: 9G4GWM10			
ALPHA	7.62E+00	J	4.2E+00	4.5E+00	5.13E+00	pCi/g	100%	(1.5)	3/17/05 04:34 p		0.0505	GPC10C
	3.60E+00	U	RER2 1.5			1.00E+01		(3.4)			G	
Batch: 5047399	RICHRC5017			Work Order: G4GWM1AH		Report DB ID: G4GWM1HR			Orig Sa DB ID: 9G4GWM10			
CS-137	1.24E-01	U	6.8E-02	6.8E-02	1.33E-01	pCi/g		0.93	3/3/05 10:11 a		49.1	GER12$1
	7.11E-02	U	RER2 1.2			3.16E-01		(3.7)			g	
K-40	2.22E+01		4.2E+00	4.2E+00	1.66E+00	pCi/g		(13.4)	3/3/05 10:11 a		49.1	GER12$1
	2.17E+01		RER2 0.2					(10.6)			g	
RA-226	5.75E-01	U	1.9E-01	1.9E-01	3.17E-01	pCi/g		(1.8)	3/3/05 10:11 a		49.1	GER12$1
	5.28E-01	U	RER2 0.3					(6.1)			g	
TH-232	8.53E-01		4.7E-01	4.7E-01	4.88E-01	pCi/g		(1.7)	3/3/05 10:11 a		49.1	GER12$1
	7.52E-01		RER2 0.3					(3.6)			g	
U-238DNP	7.58E-01	U	1.1E+00	1.1E+00	1.97E+00	pCi/g		0.39	3/3/05 10:11 a		49.1	GER12$1
	9.33E-01	U	RER2 0.2					(1.4)			g	
Batch: 5047401	RICHRC5006			Work Order: G4GWM1AK		Report DB ID: G4GWM1KR			Orig Sa DB ID: 9G4GWM10			
STRONTIUM	2.62E-02	U	8.4E-02	8.5E-02	1.94E-01	pCi/g	80%	0.13	3/11/05 07:08 p		5.01	GPC32A
	5.39E-02	U	RER2 0.5			1.00E+00		0.62			G	

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No. of Results: 7   Comments:

STL Richland   RER2   - Replicate Error Ratio = (S-D)/(sqrt(sq(TPUs)+sq(TPUd))) as defined by ICPT BOA.

rptSTLRchDupV4.1   MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

2 A97   J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

BLANK RESULTS

Lab Name: STL Richland

Matrix: SOIL

SDG: 28207

Report No. : 28531

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5047394	RICHRC5010				**Work Order:** G4J4H1AA		**Report DB ID:** G4J4H1AB					
PU-238	-2.07E-03	U	2.9E-03	2.9E-03	2.93E-02	pCi/g	68%	-0.07	3/22/05 10:56 a		2.0	ALP125
					7.62E-03	1.18E+00		-(1.4)			G	
PU239/40	-3.10E-03	U	3.6E-03	3.6E-03	3.26E-02	pCi/g	68%	-0.1	3/22/05 10:56 a		2.0	ALP125
					9.31E-03	1.07E+00		-(1.7)			G	
Batch: 5047399	RICHRC5017				**Work Order:** G4J4P1AA		**Report DB ID:** G4J4P1AB					
CS-137	8.75E-03	U	9.7E-02	9.7E-02	1.83E-01	pCi/g		0.05	3/3/05 08:22 a		25.0	GER6$1
					9.26E-02	3.16E-01		0.18			g	
K-40	-2.77E+00	U	3.0E+00	3.0E+00	6.48E+00	pCi/g		-0.43	3/3/05 08:22 a		25.0	GER6$1
					3.25E+00			-(1.9)			g	
RA-226	2.23E-01	U	2.8E-01	2.8E-01	5.46E-01	pCi/g		0.41	3/3/05 08:22 a		25.0	GER6$1
					2.74E-01			(1.6)			g	
TH-232	-2.08E-01	U	5.4E-01	5.4E-01	9.34E-01	pCi/g		-0.22	3/3/05 08:22 a		25.0	GER6$1
					4.69E-01			-0.78			g	
U-238DHP	3.32E-01	U	1.5E+00	1.5E+00	2.62E+00	pCi/g		0.13	3/3/05 08:22 a		25.0	GER6$1
					1.31E+00			0.45			g	
Batch: 5047395	RICHRC5013				**Work Order:** G4J4K1AA		**Report DB ID:** G4J4K1AB					
ALPHA	3.51E-01	U	1.0E+00	1.0E+00	2.39E+00	pCi/g	100%	0.15	3/17/05 04:34 p		.0.05	GPC10E
					9.30E-01	1.00E+01		0.69			G	
Batch: 5047398	RICHRC5013				**Work Order:** G4J4M1AA		**Report DB ID:** G4J4M1AB					
BETA	1.59E+00	U	1.7E+00	1.7E+00	3.65E+00	pCi/g	100%	0.44	3/17/05 06:36 p		0.2	GPC28A
					1.69E+00	1.00E+01		(1.8)			G	
Batch: 5047401	RICHRC5006				**Work Order:** G4J4W1AA		**Report DB ID:** G4J4W1AB					

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STL Richland

rptSTLRchBlank

V4.12 A97

MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

BLANK RESULTS

Lab Name: STL Richland

Matrix: SOIL

SDG: 28207

Report No. : 28531

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
STRONTIUM	2.72E-02	U	7.5E-02	7.5E-02	1.70E-01	pCi/g	89%	0.16	3/11/05 07:08 p		5.0	GPC32B
					7.91E-02	1.00E+00		0.73			G	

No. of Results: 10   Comments:

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MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/MdaTotal Uncert or gamma scan software did not identify the nuclide.

FORM II

LCS RESULTS

Lab Name: STL Richland

Matrix: SOIL

SDG: 28207

Report No.: 28531

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(1 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 5047394	RICHRC5010				**Work Order:** G4J4H1AC		**Report DB ID:** G4J4H1CS						
PU239/40	4.46E-01		8.3E-02	1.0E-01	1.06E-02	pCi/g	87%	4.60E-01	9.8E-03	97%	3/22/05 10:56 a	2.0	ALP130
							Rec Limits: 70		130	0.0		G	
Batch: 5047399	RICHRC5017				**Work Order:** G4J4P1AC		**Report DB ID:** G4J4P1CS						
CS-137	7.98E+00		1.1E+00	1.1E+00	2.13E-01	pCi/g					3/3/05 10:12 a	25.0	GER6$1
							Rec Limits: 70		130			g	
Batch: 5047395	RICHRC5013				**Work Order:** G4J4K1AC		**Report DB ID:** G4J4K1CS						
ALPHA	8.55E+01		8.4E+00	2.0E+01	2.66E+00	pCi/g	100%	9.14E+01	2.7E+00	94%	3/17/05 04:34 p	0.05	GPC10D
							Rec Limits: 70		130	-0.1		G	
Batch: 5047398	RICHRC5013				**Work Order:** G4J4M1AC		**Report DB ID:** G4J4M1CS						
BETA	6.12E+01		5.1E+00	1.0E+01	3.51E+00	pCi/g	100%	6.65E+01	1.3E+00	92%	3/17/05 06:36 p	0.2	GPC28D
							Rec Limits: 70		130	-0.1		G	
Batch: 5047401	RICHRC5006				**Work Order:** G4J4W1AC		**Report DB ID:** G4J4W1CS						
STRONTIUM	2.52E+00		2.2E-01	7.2E-01	1.69E-01	pCi/g	91%	2.68E+00	3.2E-02	94%	3/11/05 07:08 p	5.0	GPC32C
							Rec Limits: 20		115	-0.1		G	

No. of Results: 5   **Comments:**

STL Richland   Bias   - (Result/Expected)-1 as defined by ANSI N13.30.

rptSTLRchLcs
V4.12 A97