TA-21 (21-011(k))

ENVIRONMENTAL RESTORATION PROJECT COMMUNICATION RECORD		
Date: 11/18/02	**Time:** 9:00 a.m.	**Recorded By:** P. Bertino
To: Vickie Maranville VM 11·18·02	**From:** P. Bertino, LANL RRES-R	**Telephone No.:** 665-2198
Affiliation: NMED-HWB		
Other Parties: Mark Thacker (LANL RRES-R), Woody Woodworth (OLASO), and John Crocker (WGII)		

Discussion: This communication record was prepared at the request of Vickie Maranville, of the New Mexico Environment Department Hazardous Waste Bureau (NMED-HWB) to document the submittal of offsite analytical laboratory data to validate the proposed screening method to be used during the implementation of the voluntary corrective measures (VCM) at Solid Waste Management Unit (SWMU) 21-011(k) at TA-21. The provision of this data to NMED-HWB is called for in Sections 4.2.2 and 4.2.3 of the VCM Plan for SWMU 21-011(k), Revision 2, (LA-UR-02-6797).

Action Items: LANL will discuss the radiological screening methodology and provide all screening and offsite analytical results from the VCM at SWMU 21-011(k) in the VCM completion report.

Distribution:
V. Maranville/J. Young, NMED-HWB
M. Thacker, RRES-R
L. Woodworth, OLASO
P. Bertino, RRES-R
J. Crocker, WGII
RPF

DI-4.3, R0	**LOS ALAMOS** **Environmental Restoration** **Project**

VMaranville 11·18·02
reviewed/approved.

10667

Pre-Excavation Offsite Contract Laboratory Analytical Results for Verification of Field Screening Approach to be used During the VCM of SWMU 21-011(k)

In accordance with Section 4.2 of the VCM Plan for SWMU 21-011(k), Revision 2, 14 soil, tuff and/or sediment samples were collected at SWMU 21-011(k) between August 16 and 21, 2002 and screened in the field in accordance with the Washington Group International's (WGII) SOP 10.15, Rev. 0 *(Use of Gamma Scintillation Detectors for Soil Screening).* Following this procedure, count rates from each sample were used to calculate estimated cesium-137 (Cs-137) and americium-241 (Am-241) concentrations (pCi/g). For comparison, aliquots of each of the 14 samples were analyzed at the ARS screening laboratory by gamma spectroscopy. The approximate sample locations are shown in the attached map.

Cs-137 and Am-241 results from the two data sets were compared by linear regression. A correlation coefficient of greater than 99.5% was obtained for the Cs-137 data sets. However, the screening method was found to underestimate Cs-137 activity reported from the ARS screening lab by a factor of 2.4593, (i.e., fixed lab results = 2.4593 x screening results). This empirical correction will be incorporated into the calculation used to estimate Cs-137 concentrations in accordance with WGII SOP 10.15, Rev 0.

A correlation coefficient of 94% was obtained for the Am-241 data sets. The screening method was found to underestimate Am-241 activity from the ARS screening lab results by a factor of 1.5039. This empirical correction will be incorporated into the calculation used to estimate Am-241 concentrations in accordance with WGII SOP 10.15, Rev 0. With the correction factors applied to the screening results, the accuracy and precision of the screening procedure are deemed sufficient to guide excavation of contaminated material in the field during implementation of the VCM at SWMU 21-011(k).

For final confirmation of the SOP 10.15, Rev. 0 procedure, a subset of the 14 soil samples discussed above was submitted to Severn-Trent Laboratories for offsite contract laboratory analysis. Linear regression was performed using the field screening data ***after applying the correction factors, as stated above***. The Severn-Trent gamma spectroscopy results for Cs-137 and Am-241 are presented below in Table 1. Linear regression of the Cs-137 and Am-241 data sets yielded the following results: 1) use of the screening data overestimates Cs-137 activity by approximately 31%, and 2) use of the screening data overestimates Am-241 activity by approximately 34%.

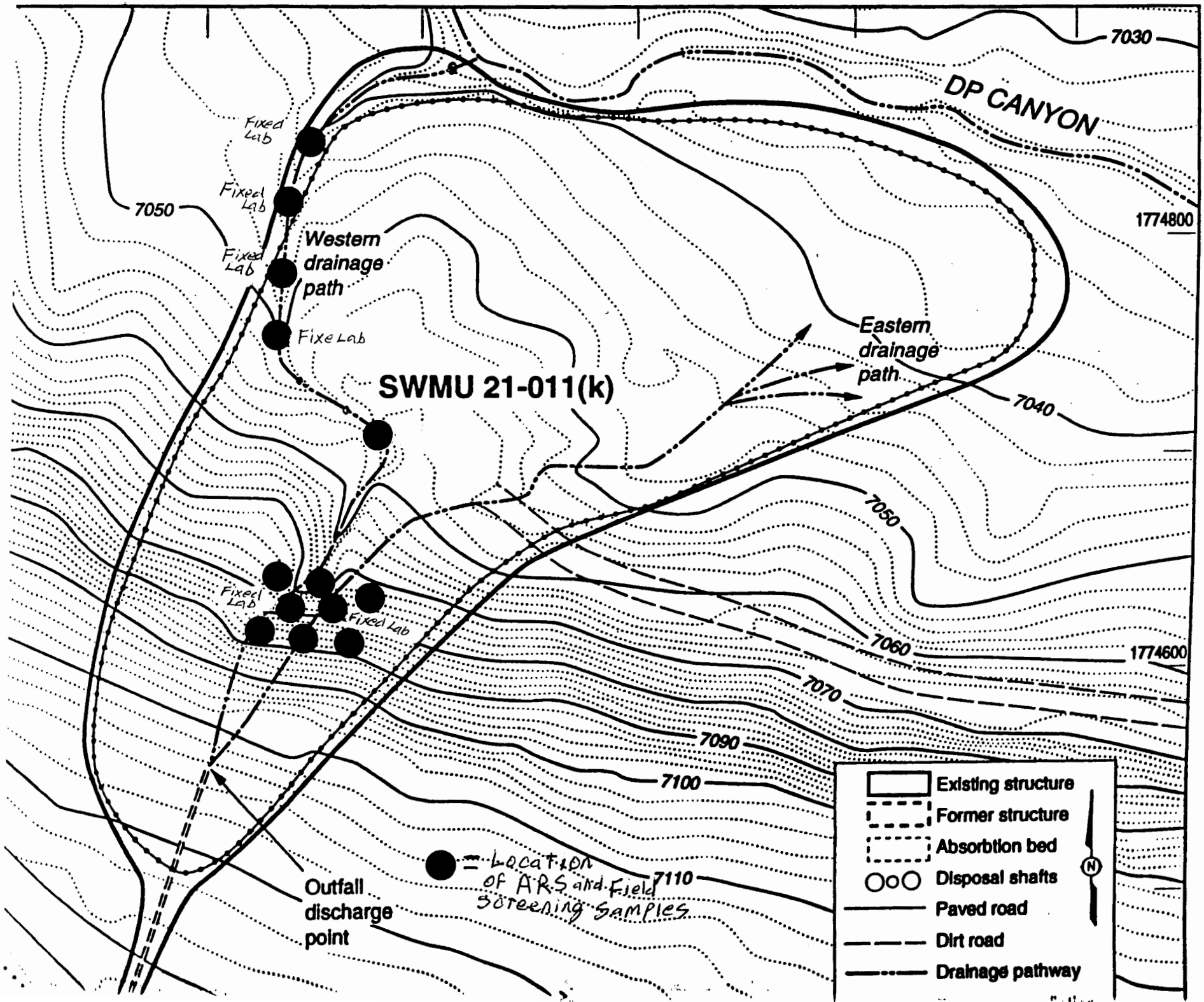
The second comparison indicates that correction factors derived in the first analysis were larger than necessary. However, use of these factors with screening results will result in overestimation of Cs-137 and Am-241 activity in the field and ensure that the cleanup goals (150 pCi/g for Cs-137 and 170 pCi/g for Am-241) will be met. Specifically, when the screening results indicate that a cleanup goal has been achieved, offsite contract laboratory results for post-excavation confirmation samples should indicate that the residual activity level is actually lower than the cleanup goal.

Table 1: Offsite Contract Laboratory Pre-Excavation Gamma Spectroscopy Results for Americium-241 and Cesium-137

		Severn-Trent Results for Cs-137 pCi/g	Severn-Trent Results for Am-241 pCi/g
Location ID	**Sample ID**		
21-02-19961	21-02-49373	10	12
21-02-19962	21-02-49374	2	3
21-02-19963	21-02-49375	24	73
21-02-19964	21-02-49376	13	23
21-02-19967	21-02-49377	72	184
21-02-19967	21-02-49378	82	281
21-02-19969	21-02-49380	384	211
21-02-19970	21-02-49381	166	32

Pre-Excavation Offsite Contract Laboratory Analytical Results for Verification of Field Screening Approach to be used During the VCM of SWMU 21-011(k)

Copies of the Severn-Trent gamma spectroscopy analytical data for Cs-137 and Am-241 are attached. The screening and offsite contract laboratory analytical results discussed herein will be included in the VCM completion report for SWMU 21-011(k) in addition to correlation coefficients from the post excavation screening and confirmation sample analytical results.



VCM Plan for SWMU

Data Validation Cover Sheet

Section I. Data Record Package Identification

Request Number: 1186S Validation Date: 04-Nov-02 Lab Code: _____

Contract Laboratory Name: Severn- Trent- St. Louis

Validator: Keith Greene Organization: RRES

Analytical Suite(s): (check all that apply)

- ☐ Volatile Organics
- ☐ Semivolatile Organics
- ☐ Organochlorine Pesticides/Polychlorinated Biphenyls
- ☐ Other: _____ (describe)
- ☐ High Explosives
- ☐ Inorganics
- ☒ Radiochemistry

Section II. Completeness Check

Yes	No	n/a	(check one)	Yes	No	n/a	(check one)
☒	☐	☐	1. Chain-of-custody form(s)	☒	☐	☐	6. Raw/BSS data
☒	☐	☐	2. Case narrative	☒	☐	☐	7. Quality control forms
☒	☐	☐	3. Sample result forms	☒	☐	☐	8. Quantitation reports
☐	☐	☒	4. Sample chromatograms	☐	☐	☒	9. TICs forms
☐	☐	☒	5. Standard chromatograms	☐	☐	☒	10. TICs mass spectra

Identify any samples in the assigned Request Number that are missing:

_____ _____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____ _____

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed upon date of resolution and contract laboratory point of contact): ISOPU - All Qc within limits.

Sr-90 - All QC within limits.

Gamma spec - results qualified not detected (U, R5) because results were less than the MDC. Several analytes qaulifed as not detected (U, R11) because the results were less than 3 times the total propagated uncertainty.

All other QC within limits.

(Attach additional comment sheets as necessary)

Validator's signature: _____ Date: 11/4/02

LOS ALAMOS NATIONAL LABORATORY

Client Sample ID: MD21-02-49380

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2I110280-001
Work Order: E73P4
Matrix: SOLID

Date Collected: 09/06/02 0000
Date Received: 09/11/02 0900

Parameter	Result	Qual	Total Uncert. (1 σ+/-)	MDC	DLC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by DOE RP-730 MOD				pCi/g		RP-730 MOD			
Americium 241	211		13	1	0.0	09/13/02	09/17/02	2256499	
Antimony 125	0.70 U, R5	U	0.68	2.3	0.0	09/13/02	09/17/02	2256499	
Bismuth 211	2.5	U	1.3	4.3	0.0	09/13/02	09/17/02	2256499	
Bismuth 214	1.11 U, R11		0.40	0.96	0.0	09/13/02	09/17/02	2256499	
Cadmium 109	0.3 U, R5	U	2.1	6.8	0.0	09/13/02	09/17/02	2256499	
Cerium 139	0.11	U	0.11	0.37	0.0	09/13/02	09/17/02	2256499	
Cesium 134	0.13	U	0.14	0.43	0.0	09/13/02	09/17/02	2256499	
Cesium 137	384		21	0.4	0.0	09/13/02	09/17/02	2256499	
Cobalt 60	0.054 U, R5	U	0.044	0.18	0.0	09/13/02	09/17/02	2256499	
Europium 152	0.30	U	0.15	0.72	0.0	09/13/02	09/17/02	2256499	
Europium 154	0.10	U	0.39	1.4	0.0	09/13/02	09/17/02	2256499	
Europium 155	-0.08	U	0.35	1.2	0.0	09/13/02	09/17/02	2256499	
Lead 212	1.33		0.37	0.87	0.0	09/13/02	09/17/02	2256499	
Lead 214	0.82 U, R5	U	0.44	1.4	0.0	09/13/02	09/17/02	2256499	
Mercury 203	0.03	U	0.18	0.62	0.0	09/13/02	09/17/02	2256499	
Potassium 40	31.8		2.4	0.8	0.0	09/13/02	09/17/02	2256499	
Protactinium 233	0.49 U, R5	U	0.34	1.2	0.0	09/13/02	09/17/02	2256499	
Radium (226)	1.11 U, R11		0.39	0.96	0.0	09/13/02	09/17/02	2256499	
Radium 228	1.57 U, R5	U	0.30	1.6	0.0	09/13/02	09/17/02	2256499	
Radium 223	-1.5	U	1.5	4.9	0.0	09/13/02	09/17/02	2256499	
Radium 224	6.0	U	3.9	10	0.0	09/13/02	09/17/02	2256499	
Ruthenium 106	-0.02	U	1.3	4.2	0.0	09/13/02	09/17/02	2256499	
Sodium 22	-0.035	U	0.048	0.17	0.0	09/13/02	09/17/02	2256499	
Strontium 85	-0.30	U	0.19	0.63	0.0	09/13/02	09/17/02	2256499	
Thallium 208	0.41	U	0.17	0.53	0.0	09/13/02	09/17/02	2256499	
Thorium 227	0.8	U	1.2	3.3	0.0	09/13/02	09/17/02	2256499	
Thorium 231	1.1	U	1.1	3.8	0.0	09/13/02	09/17/02	2256499	
Thorium 234	-0.3	U	1.4	4.5	0.0	09/13/02	09/17/02	2256499	
Tin 113	-0.10	U	0.29	0.95	0.0	09/13/02	09/17/02	2256499	
Uranium 235	-0.25	U	0.73	2.5	0.0	09/13/02	09/17/02	2256499	
Yttrium 88	0.012	U	0.021	0.11	0.0	09/13/02	09/17/02	2256499	
--- Other Detected Radionuclides ---									
Thorium 232	1.62		0.40	1.4	0.0	09/13/02	09/17/02	2256499	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		7500-SR MOD			
Strontium 90	141		13	0.8	3	09/16/02	09/27/02	2259564	87
Iso PLUTONIUM (LONG CT) NAS & DOE MOD				pCi/g		3058/RP-725			
Plutonium 238	12.3		1.2	0.02	0.006	10/09/02	10/17/02	2280439	97
Plutonium 239/40	52.3		5.0	0.006	0.0	10/09/02	10/17/02	2280439	97

LOS ALAMOS NATIONAL LABORATORY

Client Sample ID: MD21-02-49381

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2I110280-002
Work Order: E73QQ
Matrix: SOLID

Date Collected: 09/06/02 0000
Date Received: 09/11/02 0900

Parameter	Result	Qual	Total Uncert. (1 σ+/-)	MDC	DLC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by DOE RP-730 MOD				pCi/g		RP-730 MOD			
Americium 241	32.4		2.1	0.7	0.0	09/13/02	09/17/02	2256499	
Antimony 125	-0.34	U, RS U	0.47	1.5	0.0	09/13/02	09/17/02	2256499	
Bismuth 211	2.26	U	0.85	2.9	0.0	09/13/02	09/17/02	2256499	
Bismuth 214	1.01		0.26	0.71	0.0	09/13/02	09/17/02	2256499	
Cadmium 109	1.6	U, RS U	1.5	5.0	0.0	09/13/02	09/17/02	2256499	
Cerium 139	0.047	U	0.076	0.26	0.0	09/13/02	09/17/02	2256499	
Cesium 134	-0.289	U	0.0997	0.25	0.0	09/13/02	09/17/02	2256499	
Cesium 137	166		11	0.3	0.0	09/13/02	09/17/02	2256499	
Cobalt 60	-0.014	U, RS U	0.040	0.16	0.0	09/13/02	09/17/02	2256499	
Europium 152	-0.12	U	0.18	0.64	0.0	09/13/02	09/17/02	2256499	
Europium 154	0.12	U	0.31	1.2	0.0	09/13/02	09/17/02	2256499	
Europium 155	0.06	U	0.24	0.82	0.0	09/13/02	09/17/02	2256499	
Lead 212	1.06		0.21	0.60	0.0	09/13/02	09/17/02	2256499	
Lead 214	0.48	U, RS U	0.28	0.94	0.0	09/13/02	09/17/02	2256499	
Mercury 203	0.11	U	0.13	0.43	0.0	09/13/02	09/17/02	2256499	
Potassium 40	28.4		2.2	0.9	0.0	09/13/02	09/17/02	2256499	
Protactinium 233	-0.20	U, RS U	0.23	0.77	0.0	09/13/02	09/17/02	2256499	
Radium (226)	1.00		0.26	0.71	0.0	09/13/02	09/17/02	2256499	
Radium 228	1.02	U, RS U	0.35	1.2	0.0	09/13/02	09/17/02	2256499	
Radium 223	-0.8	U	1.0	3.3	0.0	09/13/02	09/17/02	2256499	
Radium 224	14.5		4.8	7.4	0.0	09/13/02	09/17/02	2256499	
Ruthenium 106	-0.68	U, RS U	0.79	2.7	0.0	09/13/02	09/17/02	2256499	
Sodium 22	0.028	U	0.036	0.14	0.0	09/13/02	09/17/02	2256499	
Strontium 85	0.17	U	0.13	0.44	0.0	09/13/02	09/17/02	2256499	
Thallium 208	0.69		0.16	0.33	0.0	09/13/02	09/17/02	2256499	
Thorium 227	-0.91	U, RS U	0.82	2.3	0.0	09/13/02	09/17/02	2256499	
Thorium 231	-1.14	U	0.81	2.7	0.0	09/13/02	09/17/02	2256499	
Thorium 234	2.17	U	0.996	3.4	0.0	09/13/02	09/17/02	2256499	
Tin 113	0.12	U	0.19	0.64	0.0	09/13/02	09/17/02	2256499	
Uranium 235	-0.52	U	0.54	1.7	0.0	09/13/02	09/17/02	2256499	
Yttrium 88	0.019	U	0.028	0.13	0.0	09/13/02	09/17/02	2256499	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		7500-SR MOD			
Strontium 90	3.43		0.37	0.63	0.43	09/16/02	09/26/02	2259564	79
Iso PLUTONIUM (LONG CT) NAS & DOE MOD				pCi/g		3058/RP-725			
Plutonium 238	3.39		0.33	0.02	0.009	10/09/02	10/17/02	2280439	95
Plutonium 239/40	16.2		1.5	0.03	0.01	10/09/02	10/17/02	2280439	95

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Result is less than the sample detection limit.

CHAIN OF CUSTODY DOCUMENT NUMBER: 1186SC

Los Alamos
NATIONAL LABORATORY

REQUEST NUMBER: 1186S

ANALYSIS TYPE: RAD

ATTN: Mark Loeb
Severn Trent Laboraties, Inc., St. Louis
13715 Rider Trail N.
Earth City, MO 63045

SAMPLE ID	CONT ID	CONTAINER DESCRIPTION	ORDER TEMPLATE CODE	PRESERVATIVE	MATRIX
MD21-02-49380	2	1 L POLY	GS+ISOPU+SR90	NONE	S
MD21-02-49381	2	1 L POLY	GS+ISOPU+SR90	NONE	S

Final Page of CHAIN OF CUSTODY DOCUMENT FOR REQUEST NUMBER 1186S

linquished By:		Date	Time	Received By:		Date	Time
Padilla	Padilla	9/10/02	1400	CHAS CLIFFORD	[signature]	9/11/02	0900
NTED NAME	SIGNATURE			PRINTED NAME	SIGNATURE		
NTED NAME	SIGNATURE			PRINTED NAME	SIGNATURE		
NTED NAME	SIGNATURE			PRINTED NAME	SIGNATURE		

eived for DISPOSAL By:		Date	Time	Remarks:
TED NAME	SIGNATURE			

T# E2T110280

Data Validation Cover Sheet

Section I. Data Record Package Identification

Request Number: 1182S Validation Date: 04-Nov-02 Lab Code: _____

Contract Laboratory Name: Severn- Trent- St. Louis

Validator: Keith Greene Organization: RRES

Analytical Suite(s): (check all that apply)

- ☐ Volatile Organics
- ☐ Semivolatile Organics
- ☐ Organochlorine Pesticides/Polychlorinated Biphenyls
- ☐ Other: _____ (describe)
- ☐ High Explosives
- ☐ Inorganics
- ☒ Radiochemistry

Section II. Completeness Check

Yes	No	n/a	(check one)	Yes	No	n/a	(check one)
☒	☐	☐	1. Chain-of-custody form(s)	☒	☐	☐	6. Raw/BSS data
☒	☐	☐	2. Case narrative	☒	☐	☐	7. Quality control forms
☒	☐	☐	3. Sample result forms	☒	☐	☐	8. Quantitation reports
☐	☐	☒	4. Sample chromatograms	☐	☐	☒	9. TICs forms
☐	☐	☒	5. Standard chromatograms	☐	☐	☒	10. TICs mass spectra

Identify any samples in the assigned Request Number that are missing:

_____ _____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____ _____

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed upon date of resolution and contract laboratory point of contact): ISOPU - Results qualified as not detected (U, R5) because result was less than the MDC.

Sr-90 - Results qualified as not detected (U, R5) because result was less than the MDC.

Gamma spec - results qualified not detected (U, R5) because results were less than the MDC. Several analytes qaulifed as not detected (U, R11) because the results were less than 3 times the total propagated uncertainty.

All other QC within limits.

(Attach additional comment sheets as necessary)

Validator's signature: _____ Date: 11/4/02

LOS ALAMOS NATIONAL LABORATORY

Client Sample ID: MD21-02-49373

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2I110288-001
Work Order: E73RW
Matrix: SOLID

Date Collected: 08/15/02 0000
Date Received: 09/11/02 0900

Parameter	Result	Qual	Total Uncert. (1 σ+/-)	MDC	DLC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by DOE RP-730 MOD				pCi/g		RP-730 MOD			
Americium 241	11.9		0.73	0.36	0.0	09/13/02	09/17/02	2256499	
Antimony 125	0.06	U, RS U	0.22	0.79	0.0	09/13/02	09/17/02	2256499	
Bismuth 211	4.33		0.55	1.9	0.0	09/13/02	09/17/02	2256499	
Bismuth 214	1.16		0.16	0.59	0.0	09/13/02	09/17/02	2256499	
Cadmium 109	10.2		2.8	7.7	0.0	09/13/02	09/17/02	2256499	
Cerium 139	1.3	U, RS U	1.2	4.3	0.0	09/13/02	09/17/02	2256499	
Cesium 134	0.025	U	0.075	0.26	0.0	09/13/02	09/17/02	2256499	
Cesium 137	9.90		0.61	0.14	0.0	09/13/02	09/17/02	2256499	
Cobalt 60	0.036	U, RS U	0.044	0.19	0.0	09/13/02	09/17/02	2256499	
Europium 152	0.12	U	0.11	0.58	0.0	09/13/02	09/17/02	2256499	
Europium 154	-0.16	U	0.35	1.3	0.0	09/13/02	09/17/02	2256499	
Europium 155	0.006	U	0.13	0.47	0.0	09/13/02	09/17/02	2256499	
Lead 212	3.22		0.28	0.44	0.0	09/13/02	09/17/02	2256499	
Lead 214	1.34		0.17	0.59	0.0	09/13/02	09/17/02	2256499	
Mercury 203	3100	U, R11	3200	0.0	0.0	09/13/02	09/17/02	2256499	
Potassium 40	26.2		2.2	1.3	0.0	09/13/02	09/17/02	2256499	
Protactinium 233	-0.155	U, RS U	0.081	0.26	0.0	09/13/02	09/17/02	2256499	
Radium (226)	1.25		0.10	0.27	0.0	09/13/02	09/17/02	2256499	
Radium 228	1.35	U, RS U	0.40	1.7	0.0	09/13/02	09/17/02	2256499	
Radium 223	-0.04	U	0.40	1.4	0.0	09/13/02	09/17/02	2256499	
Radium 224	3.7	U	1.4	4.9	0.0	09/13/02	09/17/02	2256499	
Ruthenium 106	-1	U	1.4	4.9	0.0	09/13/02	09/17/02	2256499	
Sodium 22	-0.008	U	0.079	0.30	0.0	09/13/02	09/17/02	2256499	
Strontium 85	-470	U	170	0.0	0.0	09/13/02	09/17/02	2256499	
Thallium 208	1.04		0.16	0.60	0.0	09/13/02	09/17/02	2256499	
Thorium 227	-0.11	U, RS U	0.31	0.92	0.0	09/13/02	09/17/02	2256499	
Thorium 231	0.36	U	0.38	1.3	0.0	09/13/02	09/17/02	2256499	
Thorium 234	0.56	U	0.45	1.7	0.0	09/13/02	09/17/02	2256499	
Tin 113	-1	U	5.1	18	0.0	09/13/02	09/17/02	2256499	
Uranium 235	0.09	U	0.21	0.72	0.0	09/13/02	09/17/02	2256499	
Yttrium 88	1.6	U	4.0	19	0.0	09/13/02	09/17/02	2256499	
--- Other Detected Radionuclides ---									
Actinium 228	1.76		0.32	0.64	0.0	09/13/02	09/17/02	2256499	
Thorium 232	1.39		0.21	0.38	0.0	09/13/02	09/17/02	2256499	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		7500-SR MOD			
Strontium 90	4.04		0.58	0.94	0.37	09/16/02	09/26/02	2259564	51
Iso PLUTONIUM (LONG CT) NAS & DOE MOD				pCi/g		3058/RP-725			
Plutonium 238	0.483		0.055	0.020	0.007	10/09/02	10/17/02	2280439	85
Plutonium 239/40	1.59		0.16	0.02	0.006	10/09/02	10/17/02	2280439	85

LOS ALAMOS NATIONAL LABORATORY

Client Sample ID: MD21-02-49374

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2I110288-002
Work Order: E73TG
Matrix: SOLID

Date Collected: 08/15/02 0000
Date Received: 09/11/02 0900

Parameter	Result	Qual	Total Uncert. (1 σ+/-)	MDC	DLC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by DOE RP-730 MOD				pCi/g		RP-730 MOD			
Americium 241	3.27		0.26	0.29	0.0	09/13/02	09/17/02	2256499	
Antimony 125	-0.34 U, RS	U	0.15	0.48	0.0	09/13/02	09/17/02	2256499	
Bismuth 211	4.50		0.49	1.6	0.0	09/13/02	09/17/02	2256499	
Bismuth 214	1.20		0.14	0.29	0.0	09/13/02	09/17/02	2256499	
Cadmium 109	9.9		1.6	5.8	0.0	09/13/02	09/17/02	2256499	
Cerium 139	-1.1 U, RS	U	1.1	3.8	0.0	09/13/02	09/17/02	2256499	
Cesium 134	-0.051	U	0.087	0.25	0.0	09/13/02	09/17/02	2256499	
Cesium 137	1.70		0.17	0.16	0.0	09/13/02	09/17/02	2256499	
Cobalt 60	-0.035 U, RS	U	0.058	0.21	0.0	09/13/02	09/17/02	2256499	
Europium 152	0.12	U	0.19	0.78	0.0	09/13/02	09/17/02	2256499	
Europium 154	-0.49	U	0.31	1.0	0.0	09/13/02	09/17/02	2256499	
Europium 155	0.19	U	0.12	0.42	0.0	09/13/02	09/17/02	2256499	
Lead 212	3.34		0.26	0.35	0.0	09/13/02	09/17/02	2256499	
Lead 214	1.35		0.099	0.21	0.0	09/13/02	09/17/02	2256499	
Mercury 203	1300 U, R11		2500	0.0	0.0	09/13/02	09/17/02	2256499	
Potassium 40	35.7		2.8	1.4	0.0	09/13/02	09/17/02	2256499	
Protactinium 233	-0.011 U, RS	U	0.057	0.20	0.0	09/13/02	09/17/02	2256499	
Radium (226)	1.04		0.15	0.52	0.0	09/13/02	09/17/02	2256499	
Radium 228	1.53 U, RS	U	0.55	1.8	0.0	09/13/02	09/17/02	2256499	
Radium 223	0.23	U	0.35	1.2	0.0	09/13/02	09/17/02	2256499	
Radium 224	6.4	U	2.1	7.9	0.0	09/13/02	09/17/02	2256499	
Ruthenium 106	0.2	U	1.4	5.1	0.0	09/13/02	09/17/02	2256499	
Sodium 22	-0.059	U	0.087	0.30	0.0	09/13/02	09/17/02	2256499	
Strontium 85	-230	U	130	0.0	0.0	09/13/02	09/17/02	2256499	
Thallium 208	1.16		0.18	0.54	0.0	09/13/02	09/17/02	2256499	
Thorium 227	0.38 U, RS	U	0.27	0.83	0.0	09/13/02	09/17/02	2256499	
Thorium 231	0.23	U	0.33	1.2	0.0	09/13/02	09/17/02	2256499	
Thorium 234	2.19		0.36	1.6	0.0	09/13/02	09/17/02	2256499	
Tin 113	7.9 U, RS	U	4.0	15	0.0	09/13/02	09/17/02	2256499	
Uranium 235	0.153	U	0.077	0.56	0.0	09/13/02	09/17/02	2256499	
Yttrium 88	-1.3	U	4.7	19	0.0	09/13/02	09/17/02	2256499	
--- Other Detected Radionuclides ---									
Actinium 228	1.56		0.24	0.55	0.0	09/13/02	09/17/02	2256499	
Thorium 232	1.56		0.23	0.34	0.0	09/13/02	09/17/02	2256499	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		7500-SR MOD			
Strontium 90	11.1		1.1	0.5	0.7	09/16/02	09/26/02	2259564	88
Iso PLUTONIUM (LONG CT) NAS & DOE MOD				pCi/g		3058/RP-725			
Plutonium 238	0.187		0.025	0.011	0.003	10/09/02	10/17/02	2280439	91
Plutonium 239/40	0.934		0.097	0.011	0.003	10/09/02	10/17/02	2280439	91

LOS ALAMOS NATIONAL LABORATORY

Client Sample ID: MD21-02-49375

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2I110288-003
Work Order: E73TN
Matrix: SOLID

Date Collected: 08/14/02 0000
Date Received: 09/11/02 0900

Parameter	Result	Qual	Total Uncert. (1 σ+/-)	MDC	DLC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by DOE RP-730 MOD				pCi/g		RP-730 MOD			
Americium 241	72.7		4.5	0.7	0.0	09/13/02	09/17/02	2256499	
Antimony 125	0.63	U, RS U	0.35	1.2	0.0	09/13/02	09/17/02	2256499	
Bismuth 211	3.31		0.61	1.9	0.0	09/13/02	09/17/02	2256499	
Bismuth 214	0.60	U, R11	0.21	0.56	0.0	09/13/02	09/17/02	2256499	
Cadmium 109	6.9	U, RS U	3.3	8.0	0.0	09/13/02	09/17/02	2256499	
Cerium 139	-0.8	U	1.6	5.4	0.0	09/13/02	09/17/02	2256499	
Cesium 134	-0.04	U	0.11	0.32	0.0	09/13/02	09/17/02	2256499	
Cesium 137	24.2		1.7	0.2	0.0	09/13/02	09/17/02	2256499	
Cobalt 60	0.015	U, RS U	0.060	0.25	0.0	09/13/02	09/17/02	2256499	
Europium 152	0.24	U	0.19	0.85	0.0	09/13/02	09/17/02	2256499	
Europium 154	-0.51	U	0.36	1.2	0.0	09/13/02	09/17/02	2256499	
Europium 155	0.08	U	0.16	0.56	0.0	09/13/02	09/17/02	2256499	
Lead 212	2.35		0.34	0.71	0.0	09/13/02	09/17/02	2256499	
Lead 214	1.02		0.19	0.58	0.0	09/13/02	09/17/02	2256499	
Mercury 203	3000	U, R11	4300	0.0	0.0	09/13/02	09/17/02	2256499	
Potassium 40	26.5		2.1	0.9	0.0	09/13/02	09/17/02	2256499	
Protactinium 233	-0.1	U, RS U	0.11	0.36	0.0	09/13/02	09/17/02	2256499	
Radium (226)	0.90		0.12	0.36	0.0	09/13/02	09/17/02	2256499	
Radium 228	0.78	U, RS U	0.34	1.1	0.0	09/13/02	09/17/02	2256499	
Radium 223	0.59	U	0.53	1.8	0.0	09/13/02	09/17/02	2256499	
Radium 224	29.7		9.0	11	0.0	09/13/02	09/17/02	2256499	
Ruthenium 106	-2.7	U, RS U	1.8	5.8	0.0	09/13/02	09/17/02	2256499	
Sodium 22	0.150	U	0.082	0.34	0.0	09/13/02	09/17/02	2256499	
Strontium 85	-610	U	210	0.0	0.0	09/13/02	09/17/02	2256499	
Thallium 208	1.34		0.21	0.64	0.0	09/13/02	09/17/02	2256499	
Thorium 227	0.52	U, RS U	0.42	1.2	0.0	09/13/02	09/17/02	2256499	
Thorium 231	-0.58	U	0.52	1.5	0.0	09/13/02	09/17/02	2256499	
Thorium 234	1.18	U	0.56	2.0	0.0	09/13/02	09/17/02	2256499	
Tin 113	-3.1	U	7.9	27	0.0	09/13/02	09/17/02	2256499	
Uranium 235	-0.17	U	0.26	0.85	0.0	09/13/02	09/17/02	2256499	
Yttrium 88	4.6	U	4.0	20	0.0	09/13/02	09/17/02	2256499	
--- Other Detected Radionuclides ---									
Actinium 228	1.39		0.30	0.57	0.0	09/13/02	09/17/02	2256499	
Thorium 232	1.79		0.28	0.55	0.0	09/13/02	09/17/02	2256499	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		7500-SR MOD			
Strontium 90	4.21		0.77	0.59	0.41	09/16/02	09/26/02	2259564	76
Iso PLUTONIUM (LONG CT) NAS & DOE MOD				pCi/g		3058/RP-725			
Plutonium 238	3.79		0.36	0.01	0.004	10/09/02	10/17/02	2280439	110
Plutonium 239/40	11.8		1.1	0.004	0.0	10/09/02	10/17/02	2280439	110

LOS ALAMOS NATIONAL LABORATORY

Client Sample ID: MD21-02-49376

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2I110288-004
Work Order: E73TQ
Matrix: SOLID

Date Collected: 08/14/02 0000
Date Received: 09/11/02 0900

Parameter	Result	Qual	Total Uncert. (1 σ+/-)	MDC	DLC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by DOE RP-730 MOD				pCi/g		RP-730 MOD			
Americium 241	23.3		1.5	0.5	0.0	09/13/02	09/17/02	2256499	
Antimony 125	-0.35 U, RS	U	0.25	0.85	0.0	09/13/02	09/17/02	2256499	
Bismuth 211	4.20		0.59	1.8	0.0	09/13/02	09/17/02	2256499	
Bismuth 214	1.15		0.18	0.61	0.0	09/13/02	09/17/02	2256499	
Cadmium 109	5.5 U, RS	U	4.8	7.9	0.0	09/13/02	09/17/02	2256499	
Cerium 139	-1	U	1.3	4.4	0.0	09/13/02	09/17/02	2256499	
Cesium 134	-0.036	U	0.087	0.26	0.0	09/13/02	09/17/02	2256499	
Cesium 137	12.5		0.75	0.17	0.0	09/13/02	09/17/02	2256499	
Cobalt 60	-0.048 U, RS	U	0.053	0.19	0.0	09/13/02	09/17/02	2256499	
Europium 152	-0.004	U	0.19	0.76	0.0	09/13/02	09/17/02	2256499	
Europium 154	-0.09	U	0.35	1.3	0.0	09/13/02	09/17/02	2256499	
Europium 155	0.13	U	0.14	0.48	0.0	09/13/02	09/17/02	2256499	
Lead 212	3.56		0.31	0.53	0.0	09/13/02	09/17/02	2256499	
Lead 214	1.30		0.18	0.57	0.0	09/13/02	09/17/02	2256499	
Mercury 203	3700 U, R 11		3300	0.0	0.0	09/13/02	09/17/02	2256499	
Potassium 40	28.8		2.3	0.9	0.0	09/13/02	09/17/02	2256499	
Protactinium 233	0.106 U, RS	U	0.085	0.31	0.0	09/13/02	09/17/02	2256499	
Radium (226)	1.31		0.11	0.26	0.0	09/13/02	09/17/02	2256499	
Radium 228	0.63 U, RS	U	0.38	1.0	0.0	09/13/02	09/17/02	2256499	
Radium 223	0.33	U	0.43	1.5	0.0	09/13/02	09/17/02	2256499	
Radium 224	3.1	U	1.4	5.3	0.0	09/13/02	09/17/02	2256499	
Ruthenium 106	1.4	U	1.4	5.5	0.0	09/13/02	09/17/02	2256499	
Sodium 22	0.015	U	0.069	0.28	0.0	09/13/02	09/17/02	2256499	
Strontium 85	-410	U	170	0.0	0.0	09/13/02	09/17/02	2256499	
Thallium 208	1.11		0.18	0.65	0.0	09/13/02	09/17/02	2256499	
Thorium 227	-0.03 U, RS	U	0.33	0.96	0.0	09/13/02	09/17/02	2256499	
Thorium 231	-0.006	U	0.43	1.3	0.0	09/13/02	09/17/02	2256499	
Thorium 234	1.70	U	0.58	1.9	0.0	09/13/02	09/17/02	2256499	
Tin 113	-10.6	U	6.2	20	0.0	09/13/02	09/17/02	2256499	
Uranium 235	0.33	U	0.21	0.75	0.0	09/13/02	09/17/02	2256499	
Yttrium 88	1.8	U	4.1	20	0.0	09/13/02	09/17/02	2256499	
--- Other Detected Radionuclides ---									
Actinium 228	1.94		0.32	0.61	0.0	09/13/02	09/17/02	2256499	
Thorium 232	1.48		0.24	0.42	0.0	09/13/02	09/17/02	2256499	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		7500-SR MOD			
Strontium 90	7.44		0.55	0.84	0.51	09/16/02	09/26/02	2259564	59
Iso PLUTONIUM (LONG CT) NAS & DOE MOD				pCi/g		3058/RP-725			
Plutonium 238	1.30		0.13	0.01	0.004	10/09/02	10/17/02	2280439	92
Plutonium 239/40	7.03		0.67	0.01	0.004	10/09/02	10/17/02	2280439	92

LOS ALAMOS NATIONAL LABORATORY

Client Sample ID: MD21-02-49377

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2I110288-005
Work Order: E73TV
Matrix: SOLID

Date Collected: 08/14/02 0000
Date Received: 09/11/02 0900

Parameter	Result	Qual	Total Uncert. (1 σ+/-)	MDC	DLC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by DOE RP-730 MOD				pCi/g		RP-730 MOD			
Americium 241	184		11	1	0.0	09/13/02	09/17/02	2256499	
Antimony 125	0.51 U, RS	U	0.53	1.8	0.0	09/13/02	09/17/02	2256499	
Bismuth 211	3.34		0.70	2.5	0.0	09/13/02	09/17/02	2256499	
Bismuth 214	1.06		0.22	0.67	0.0	09/13/02	09/17/02	2256499	
Cadmium 109	5.0 U, RS	U	4.0	12	0.0	09/13/02	09/17/02	2256499	
Cerium 139	-0.9	U	2.4	8.0	0.0	09/13/02	09/17/02	2256499	
Cesium 134	0.19	U	0.14	0.44	0.0	09/13/02	09/17/02	2256499	
Cesium 137	72.4		4.1	0.3	0.0	09/13/02	09/17/02	2256499	
Cobalt 60	-0.003 U, RS	U	0.046	0.19	0.0	09/13/02	09/17/02	2256499	
Europium 152	0.32	U	0.24	1.0	0.0	09/13/02	09/17/02	2256499	
Europium 154	0.04	U	0.32	1.2	0.0	09/13/02	09/17/02	2256499	
Europium 155	0.03	U	0.23	0.78	0.0	09/13/02	09/17/02	2256499	
Lead 212	2.82		0.43	0.94	0.0	09/13/02	09/17/02	2256499	
Lead 214	1.03		0.22	0.79	0.0	09/13/02	09/17/02	2256499	
Mercury 203	-9500 U, RS	U	6200	0.0	0.0	09/13/02	09/17/02	2256499	
Potassium 40	27.8		2.3	1.4	0.0	09/13/02	09/17/02	2256499	
Protactinium 233	-0.03 U, RS	U	0.16	0.54	0.0	09/13/02	09/17/02	2256499	
Radium (226)	1.05		0.22	0.67	0.0	09/13/02	09/17/02	2256499	
Radium 228	1.00 U, RS	U	0.28	1.0	0.0	09/13/02	09/17/02	2256499	
Radium 223	0.26	U	0.74	2.5	0.0	09/13/02	09/17/02	2256499	
Radium 224	10.7	U	4.8	11	0.0	09/13/02	09/17/02	2256499	
Ruthenium 106	-0.9	U	2.8	9.6	0.0	09/13/02	09/17/02	2256499	
Sodium 22	0.006	U	0.081	0.31	0.0	09/13/02	09/17/02	2256499	
Strontium 85	-760	U	300	0.0	0.0	09/13/02	09/17/02	2256499	
Thallium 208	0.79		0.26	0.75	0.0	09/13/02	09/17/02	2256499	
Thorium 227	-0.43 U, RS	U	0.61	1.7	0.0	09/13/02	09/17/02	2256499	
Thorium 231	-1.10	U	0.63	2.0	0.0	09/13/02	09/17/02	2256499	
Thorium 234	1.40	U	0.79	2.5	0.0	09/13/02	09/17/02	2256499	
Tin 113	-16	U	12	41	0.0	09/13/02	09/17/02	2256499	
Uranium 235	0.36	U	0.14	1.3	0.0	09/13/02	09/17/02	2256499	
Yttrium 88	-1.9	U	3.2	13	0.0	09/13/02	09/17/02	2256499	
--- Other Detected Radionuclides ---									
Actinium 228	1.20		0.39	0.80	0.0	09/13/02	09/17/02	2256499	
Thorium 232	1.36		0.31	0.68	0.0	09/13/02	09/17/02	2256499	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		7500-SR MOD			
Strontium 90	34.5		5.2	0.7	1.0	09/16/02	09/26/02	2259564	71
Iso PLUTONIUM (LONG CT) NAS & DOE MOD				pCi/g		3058/RP-725			
Plutonium 238	8.74		0.82	0.004	0.0	10/09/02	10/17/02	2280439	93
Plutonium 239/40	24.1		2.2	0.004	0.0	10/09/02	10/17/02	2280439	93

LOS ALAMOS NATIONAL LABORATORY

Client Sample ID: MD21-02-49378

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2I110288-006
Work Order: E73TW
Matrix: SOLID

Date Collected: 08/14/02 0000
Date Received: 09/11/02 0900

Parameter	Result	Qual	Total Uncert. (1 σ+/-)	MDC	DLC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by DOE RP-730 MOD				pCi/g		RP-730 MOD			
Americium 241	281		17	1	0.0	09/13/02	09/17/02	2256499	
Antimony 125	0.84	U, RS U	0.58	1.9	0.0	09/13/02	09/17/02	2256499	
Bismuth 211	3.2	U, R11	1.1	2.5	0.0	09/13/02	09/17/02	2256499	
Bismuth 214	0.76		0.20	0.59	0.0	09/13/02	09/17/02	2256499	
Cadmium 109	-4.2	U, RS U	3.6	12	0.0	09/13/02	09/17/02	2256499	
Cerium 139	-0.4	U	2.5	8.5	0.0	09/13/02	09/17/02	2256499	
Cesium 134	0.28	U	0.13	0.41	0.0	09/13/02	09/17/02	2256499	
Cesium 137	81.6		5.5	0.2	0.0	09/13/02	09/17/02	2256499	
Cobalt 60	-0.061	U, RS U	0.057	0.21	0.0	09/13/02	09/17/02	2256499	
Europium 152	0.19	U	0.20	0.83	0.0	09/13/02	09/17/02	2256499	
Europium 154	0.46	U	0.37	1.5	0.0	09/13/02	09/17/02	2256499	
Europium 155	0.07	U	0.25	0.84	0.0	09/13/02	09/17/02	2256499	
Lead 212	2.56		0.48	1.0	0.0	09/13/02	09/17/02	2256499	
Lead 214	0.98	U, R11	0.34	0.76	0.0	09/13/02	09/17/02	2256499	
Mercury 203	7500		6600	0.0	0.0	09/13/02	09/17/02	2256499	
Potassium 40	28.6		2.2	1	0.0	09/13/02	09/17/02	2256499	
Protactinium 233	0.05	U, RS U	0.19	0.56	0.0	09/13/02	09/17/02	2256499	
Radium (226)	0.75		0.20	0.58	0.0	09/13/02	09/17/02	2256499	
Radium 228	1.22	U, RS U	0.44	1.7	0.0	09/13/02	09/17/02	2256499	
Radium 223	-0.71	U	0.81	2.7	0.0	09/13/02	09/17/02	2256499	
Radium 224	34		11	13	0.0	09/13/02	09/17/02	2256499	
Ruthenium 106	-0.03	U, RS U	2.4	8.5	0.0	09/13/02	09/17/02	2256499	
Sodium 22	-0.043	U	0.079	0.28	0.0	09/13/02	09/17/02	2256499	
Strontium 85	-320	U	310	0.0	0.0	09/13/02	09/17/02	2256499	
Thallium 208	0.84		0.22	0.65	0.0	09/13/02	09/17/02	2256499	
Thorium 227	0.46	U, RS U	0.64	1.8	0.0	09/13/02	09/17/02	2256499	
Thorium 231	-0.08	U	0.65	2.2	0.0	09/13/02	09/17/02	2256499	
Thorium 234	1.82	U	0.78	2.7	0.0	09/13/02	09/17/02	2256499	
Tin 113	-23	U	13	43	0.0	09/13/02	09/17/02	2256499	
Uranium 235	0.66	U	0.21	1.3	0.0	09/13/02	09/17/02	2256499	
Yttrium 88	-1.4	U	3.2	13	0.0	09/13/02	09/17/02	2256499	
--- Other Detected Radionuclides ---									
Actinium 228	2.19		0.37	0.55	0.0	09/13/02	09/17/02	2256499	
Thorium 232	1.12		0.29	0.75	0.0	09/13/02	09/17/02	2256499	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		7500-SR MOD			
Strontium 90	54.6		3.4	0.8	1.2	09/16/02	09/26/02	2259564	57
Iso PLUTONIUM (LONG CT) NAS & DOE MOD				pCi/g		3058/RP-725			
Plutonium 238	19.2		1.8	0.01	0.007	10/09/02	10/18/02	2280439	92
Plutonium 239/40	34.9		3.3	0.01	0.005	10/09/02	10/18/02	2280439	92

LOS ALAMOS NATIONAL LABORATORY

Client Sample ID: MD21-02-49379

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2I110288-007
Work Order: E73T0
Matrix: SOLID

Date Collected: 08/15/02 0000
Date Received: 09/11/02 0900

Parameter	Result	Qual	Total Uncert. (1 σ+/-)	MDC	DLC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by DOE RP-730 MOD				pCi/g		RP-730 MOD			
Americium 241	0.094	U, RS U	0.074	0.27	0.0	09/13/02	09/17/02	2256499	
Antimony 125	0.01	U	0.14	0.52	0.0	09/13/02	09/17/02	2256499	
Bismuth 211	**3.71**		**0.47**	**1.6**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
Bismuth 214	**1.06**		**0.15**	**0.56**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
Cadmium 109	0.9	U, RS U	2.0	7.2	0.0	09/13/02	09/17/02	2256499	
Cerium 139	1.3	U	1.0	3.8	0.0	09/13/02	09/17/02	2256499	
Cesium 134	-0.024	U	0.064	0.21	0.0	09/13/02	09/17/02	2256499	
Cesium 137	**0.604**		**0.076**	**0.14**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
Cobalt 60	-0.099	U, RS U	0.046	0.13	0.0	09/13/02	09/17/02	2256499	
Europium 152	-0.003	U	0.11	0.48	0.0	09/13/02	09/17/02	2256499	
Europium 154	0.48	U	0.34	1.4	0.0	09/13/02	09/17/02	2256499	
Europium 155	0.11	U	0.10	0.38	0.0	09/13/02	09/17/02	2256499	
Lead 212	**3.05**		**0.26**	**0.32**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
Lead 214	**1.15**		**0.15**	**0.51**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
Mercury 203	-2300	U, RS U	2400	0.0	0.0	09/13/02	09/17/02	2256499	
Potassium 40	**30.8**		**2.4**	**1.1**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
Protactinium 233	0.033	U, RS U	0.054	0.20	0.0	09/13/02	09/17/02	2256499	
Radium (226)	**1.08**		**0.091**	**0.22**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
Radium 228	1.72	U, RS U	0.42	1.7	0.0	09/13/02	09/17/02	2256499	
Radium 223	0.25	U	0.32	1.2	0.0	09/13/02	09/17/02	2256499	
Radium 224	3.3	U	1.2	3.4	0.0	09/13/02	09/17/02	2256499	
Ruthenium 106	1.1	U	1.2	4.8	0.0	09/13/02	09/17/02	2256499	
Sodium 22	0.070	U	0.070	0.30	0.0	09/13/02	09/17/02	2256499	
Strontium 85	-570	U	130	0.0	0.0	09/13/02	09/17/02	2256499	
Thallium 208	**1.04**		**0.16**	**0.60**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
Thorium 227	-0.11	U, RS U	0.20	0.61	0.0	09/13/02	09/17/02	2256499	
Thorium 231	0.43	U	0.33	1.3	0.0	09/13/02	09/17/02	2256499	
Thorium 234	0.96	U	0.41	1.6	0.0	09/13/02	09/17/02	2256499	
Tin 113	6.6	U	4.1	16	0.0	09/13/02	09/17/02	2256499	
Uranium 235	0.120	U	0.067	0.60	0.0	09/13/02	09/17/02	2256499	
Yttrium 88	3.1	U	4.3	21	0.0	09/13/02	09/17/02	2256499	
--- Other Detected Radionuclides ---									
Actinium 228	**1.61**		**0.29**	**0.49**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
Thorium 232	**1.39**		**0.21**	**0.35**	**0.0**	**09/13/02**	**09/17/02**	**2256499**	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		7500-SR MOD			
Strontium 90	0.42	U, RS U	0.16	0.58	0.28	09/16/02	09/26/02	2259564	94
Iso PLUTONIUM (LONG CT) NAS & DOE MOD				pCi/g		3058/RP-725			
Plutonium 238	0.0082	U, RS U	0.0048	0.015	0.0092	10/09/02	10/18/02	2280439	91
Plutonium 239/40	**0.867**		**0.088**	**0.004**	**0.0**	**10/09/02**	**10/18/02**	**2280439**	**91**

CHAIN OF CUSTODY DOCUMENT NUMBER: 1182SC

Los Alamos
NATIONAL LABORATORY

REQUEST NUMBER: 1182S

ANALYSIS TYPE: RAD

ATTN: Mark Loeb
Severn Trent Laboraties, Inc., St. Louis
13715 Rider Trail N.
Earth City, MO 63045

SAMPLE ID	CONT ID	CONTAINER DESCRIPTION	ORDER TEMPLATE CODE	PRESERVATIVE	MATRIX
MD21-02-49373	2	1 L POLY	GS+ISOPU+SR90	NONE	S
MD21-02-49374	2	1 L POLY	GS+ISOPU+SR90	NONE	S
MD21-02-49375	2	1 L POLY	GS+ISOPU+SR90	NONE	S
MD21-02-49376	2	1 L POLY	GS+ISOPU+SR90	NONE	S
MD21-02-49377	2	1 L POLY	GS+ISOPU+SR90	NONE	S
MD21-02-49378	2	1 L POLY	GS+ISOPU+SR90	NONE	S
MD21-02-49379	2	1 L POLY	GS+ISOPU+SR90	NONE	S

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elinquished By:		Date	Time	Received By:		Date	Time
Padilla	Padilla	9/10/02	1400	CHRIS CLIFFORD		9/11/02	0900
RINTED NAME	SIGNATURE			PRINTED NAME	SIGNATURE		
RINTED NAME	SIGNATURE			PRINTED NAME	SIGNATURE		
INTED NAME	SIGNATURE			PRINTED NAME	SIGNATURE		

eceived for DISPOSAL By:		Date	Time	Remarks:
INTED NAME	SIGNATURE			

T# F2T110288