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SEVERN TRENT STL

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
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ANALYTICAL REPORT

PROJECT NO. 5601

Li-Tungsten

Lot #: F7C280211

Ted Johnson

Environmental Chemical Corpora
1746 Cole Blvd
Bldg 21, Suite 350
Golden, CO 80401

SEVERN TRENT LABORATORIES, INC.

Terry Romanko
Project Manager

May 9, 2007

Case Narrative
LOT NUMBER: F7C280211

This report contains the analytical results for the 15 samples received under chain of custody by STL St. Louis on March 28, 2007. These samples are associated with your Li-Tungsten project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted on the following page.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Radium-226 by GFPC

In the initial analysis, the LCS recovery for Radium 226 was outside the upper QC limit, indicating a potential positive bias for that analyte. The RER/RPD for the sample/duplicate was outside of criteria. It appears the sample may be heterogeneous. Only sample -001 had a result above the RL of 1 pCi/g (after rounding the sample results). Sample -001 was reprepared and reanalyzed yielding acceptable LCS results. The reanalysis result for -001 is reported. The initial result for all samples is reported (including -001, as it was the batch SMP/DUP for the initial analysis).

Affected Samples:

F7C280211 (1): 5601-BKGD-1001
F7C280211 (2): 5601-BKGD-1002
F7C280211 (3): 5601-BKGD-1003
F7C280211 (4): 5601-BKGD-1004
F7C280211 (5): 5601-BKGD-1005
F7C280211 (6): 5601-BKGD-1006
F7C280211 (7): 5601-BKGD-1007
F7C280211 (8): 5601-BKGD-1008
F7C280211 (9): 5601-BKGD-1009
F7C280211 (10): 5601-BKGD-1010
F7C280211 (11): 5601-BKGD-1011
F7C280211 (12): 5601-BKGD-1012
F7C280211 (13): 5601-BKGD-1013
F7C280211 (14): 5601-BKGD-1014
F7C280211 (15): 5601-BKGD-1015

There were no nonconformances or observations noted with any other analysis on this lot.

Environmental Chemical Corporation
1746 Cole Blvd.
Bldg. 21, Suite 350
Lakewood, CO 80401
Phone: (303) 298-7607
Fax: (303) 298-7837

COC Number:

Customer Name: ECC – Li Tungsten
Address: 63 Herb Hill Road, Glen Cove, NY 11542

Contact: Theodore Johnson
Phone: (303) 472 - 8834
Fax: (516) 665- 8531

ECC Project Manager: Phil O'Dwyer
Address: 63 Herb Hill Road, Glen Cove, NY 11542

Phone: (614) 402 - 2020
Customer Project Name: Li Tungsten

SAMPLE NUMBER	DATE	TIME	TYPE	CLIENT SAMPLE IDENTIFIER	TESTS	CONTAINER(S)	MATRIX
5601 -BKGD-1001	3/26/2007	9:05	Rad Background	Off-Site	Ra-226/Ra-228, Iso-Th, Iso-U	1 Gallon Pl Bag	Soil
5601 -BKGD-1002	3/26/2007	9:10	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1003	3/26/2007	9:15	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1004	3/26/2007	9:15	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1005	3/26/2007	9:30	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1006	3/26/2007	9:45	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1007	3/26/2007	9:35	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1008	3/26/2007	9:35	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1009	3/26/2007	10:05	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1010	3/26/2007	10:15	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1011	3/26/2007	10:15	Rad Background	Off-Site		1 Gallon Pl Bag	Soil

Notes:
Ship to: Severn Trent Laboratory, St Louis
13715 Rider Trail N., Earth City, Mo 63045
Phone: 314-298-8566
Request Turnaround Time: 7 Day

Samples cooled below 4 C

Laboratory Receipt Information
Cooler/Container Intact? Yes ✓ No ___
Samples Received At Below 4 C? Yes ___ No ✓ Ambient
Samples Containers Intact? Yes ✓ No ___
Cooler/Container Custody Seal? Yes ✓ No ___

CUSTODY TRANSFER RECORD

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Print: Ted Johnson Sign: TJ	ECC	3/27/2007	16:15	Print: Angela Brunson	STL	3-28-07	9:20
Print:				Print:			
Print:				Print:			

Environmental Chemical Corporation
1746 Cole Blvd.
Bldg. 21, Suite 350
Lakewood, CO 80401
Phone: (303) 298-7607
Fax: (303) 298-7837

COC Number:

Customer Name: ECC – Li Tungsten
Address: 63 Herb Hill Road, Glen Cove, NY 11542

Contact: Theodore Johnson
Phone: (303) 472 - 8834
Fax: (516) 665- 8531

ECC Project Manager: Phil O'Dwyer
Address: 63 Herb Hill Road, Glen Cove, NY 11542

Phone: (614) 402 - 2020
Customer Project Name: Li Tungsten

SAMPLE NUMBER	DATE	TIME	TYPE	CLIENT SAMPLE IDENTIFIER	TESTS	CONTAINER(S)	MATRIX
5601 -BKGD-1012	3/26/2007	9:05	Rad Background	Off-Site	Ra-226/Ra-228, Iso-Th, Iso-U	1 Gallon Pl Bag	Soil
5601 -BKGD-1013	3/26/2007	9:05	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1014	3/26/2007	10:15	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
5601 -BKGD-1015	3/26/2007	10:15	Rad Background	Off-Site		1 Gallon Pl Bag	Soil
N/A							
N/A							
N/A							
N/A							
N/A							
N/A							
N/A							

Notes:
Ship to: Severn Trent Laboratory, St Louis
13715 Rider Trail N., Earth City, Mo 63045
Phone: 314-298-8566
Request Turnaround Time: 7 Day

Samples cooled below 4 C

Laboratory Receipt Information
Cooler/Container Intact? Yes ✓ No___
Samples Received At Below 4 C? Yes___ No ✓ Ambient
Samples Containers Intact? Yes ✓ No___
Cooler/Container Custody Seal? Yes ✓ No___

CUSTODY TRANSFER RECORD

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Print:Ted Johnson Sign: [signature]	ECC	3/27/2007	16:15	Angela Brunson Print: A. Brunson	STL	3-28-07	9:20
Print:				Print:			
Print:				Print:			

STL St. Louis

Lot #(s): F7C280211

- 6408 -

Condition Upon Receipt Form

Client: ECC
Quote No:
COC/RFA No:
Initiated By: AB
Date 3-28-07
Time: 9:20

Shipping Information

Shipper Name: FedEx
Shipping # (s):*
1. 7986 3828 6490
2.
3.
4.
5.
6.
7.
8.
9.
10.

Multiple Packages Y (N) N/A
Sample Temperature (s):**
1. Ambient
2.
3.
4.
5.
6.
7.
8.
9.
10.

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests- Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1.	Y (N)	Was sample received broken?	8.	(Y) N	Sample received with Chain of Custody?
2.	Y N (N/A)	Was sample received with proper pH[1] ? (If not, make note below)	9.	Y (N)	Chain of Custody matches sample ID's on container(s)?
3.	Y N	If N/A-Was pH taken by original STL Lab?	10.	(Y) N	Are there custody seals present on cooler?
4.	(Y) N	Sample received in proper containers?	11.	Y (N) N/A	Do custody seals on cooler appear to be tampered with?
5.	(Y) N	Sample volume sufficient for analysis?	12.	Y (N)	Are there custody seals present on bottles?
6.	Y N (N/A)	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)	13.	Y N (N/A)	Do custody seals on bottles appear to be tampered with?
7.	Y (N)	Were contents of the cooler frisked after opening	14.	Y N	Was Internal COC/Workshare received?

[1] For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes:

Sample id & COC id do not match the following AB 3-28-07

COC Id	Sample ID
5601-BKGD-1006	5600-BKGD-1006

Corrective Action:

☐ Client Contact Name: Informed by:

☐ Sample(s) processed "as is"

☐ Sample(s) on hold until: If released, notify:

Project Management Review: T. Lang Date: 3/30/07

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

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METHODS SUMMARY

F7C280211

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Isotopic Thorium by Alpha Spectroscopy	EML A-01-R MOD	
Isotopic Uranium by Alpha Spectroscopy	EML A-01-R MOD	
Radium-226 by GFPC	EPA 903.0 MOD	
Radium-228 by GFPC	EPA 904 MOD	

References:

EML "ENVIRONMENTAL MEASUREMENTS LABORATORY PROCEDURES MANUAL" HASL-300 28TH EDITION, VOLUME I and II DEPARTMENT OF ENERGY

EPA "EASTERN ENVIRONMENTAL RADIATION FACILITY RADIOCHEMISTRY PROCEDURES MANUAL" US EPA EPA 520/5-84-006 AUGUST 1984

SAMPLE SUMMARY

F7C280211

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
JRWHL	001	5601-BKGD-1001	03/26/07	09:05
JRWHT	002	5601-BKGD-1002	03/26/07	09:10
JRWHW	003	5601-BKGD-1003	03/26/07	09:15
JRWHX	004	5601-BKGD-1004	03/26/07	09:15
JRWH0	005	5601-BKGD-1005	03/26/07	09:30
JRWH3	006	5601-BKGD-1006	03/26/07	09:45
JRWH5	007	5601-BKGD-1007	03/26/07	09:35
JRWH8	008	5601-BKGD-1008	03/26/07	09:35
JRWJA	009	5601-BKGD-1009	03/26/07	10:05
JRWJC	010	5601-BKGD-1010	03/26/07	10:15
JRWJE	011	5601-BKGD-1011	03/26/07	10:15
JRWJG	012	5601-BKGD-1012	03/26/07	09:05
JRWJH	013	5601-BKGD-1013	03/26/07	09:05
JRWJJ	014	5601-BKGD-1014	03/26/07	10:15
JRWJK	015	5601-BKGD-1015	03/26/07	10:15

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1001

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-001
Work Order: JRWHL
Matrix: SOLID

Date Collected: 03/26/07 0905
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 99
Radium (226)	1.89		0.36	1.00	0.19	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 89
Radium 228	1.32		0.38	1.00	0.47	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 74
Uranium 234	1.06		0.21	0.10	0.02	03/30/07	04/12/07
Uranium 235/236	0.095	J	0.049	0.100	0.026	03/30/07	04/12/07
Uranium 238	0.97		0.19	0.10	0.01	03/30/07	04/12/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 74
Thorium 228	0.84		0.18	0.10	0.05	03/30/07	04/12/07
Thorium 230	0.79		0.17	0.10	0.03	03/30/07	04/12/07
Thorium 232	0.73		0.16	0.10	0.01	03/30/07	04/12/07
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7110210	Yld % 110
Radium (226)	0.68	J	0.20	1.00	0.16	04/20/07	05/08/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1001 DUP

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-001X
Work Order: JRWHL
Matrix: SOLID

Date Collected: 03/26/07 0905
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 97
Radium (226)	1.18		0.28	1.00	0.20	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 99
Radium 228	0.80	J	0.32	1.00	0.45	03/28/07	04/17/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 72
Thorium 228	1.06		0.22	0.10	0.06	03/30/07	04/12/07
Thorium 230	0.83		0.18	0.10	0.03	03/30/07	04/12/07
Thorium 232	0.95		0.20	0.10	0.04	03/30/07	04/12/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 76
Uranium 234	0.72		0.16	0.10	0.03	03/30/07	04/12/07
Uranium 235/236	0.032	J	0.030	0.100	0.031	03/30/07	04/12/07
Uranium 238	0.70		0.15	0.10	0.01	03/30/07	04/12/07
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7110210	Yld % 107
Radium (226)	0.76	J	0.22	1.00	0.17	04/20/07	05/08/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1002

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-002
Work Order: JRWHT
Matrix: SOLID

Date Collected: 03/26/07 0910
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 98
Radium (226)	1.10		0.28	1.00	0.22	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 96
Radium 228	0.99	J	0.33	1.00	0.43	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 84
Uranium 234	0.78		0.16	0.10	0.03	03/30/07	04/07/07
Uranium 235/236	0.033	J	0.029	0.100	0.015	03/30/07	04/07/07
Uranium 238	0.74		0.16	0.10	0.02	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 85
Thorium 228	0.74		0.15	0.10	0.05	03/30/07	04/05/07
Thorium 230	0.65		0.14	0.10	0.02	03/30/07	04/05/07
Thorium 232	0.72		0.15	0.10	0.02	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1003

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-003
Work Order: JRWHW
Matrix: SOLID

Date Collected: 03/26/07 0915
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 94
Radium (226)	0.80	J	0.24	1.00	0.23	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 95
Radium 228	1.07		0.32	1.00	0.39	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 79
Uranium 234	0.64		0.14	0.10	0.03	03/30/07	04/07/07
Uranium 235/236	0.038	J	0.031	0.100	0.026	03/30/07	04/07/07
Uranium 238	0.58		0.13	0.10	0.03	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 90
Thorium 228	0.74		0.15	0.10	0.05	03/30/07	04/05/07
Thorium 230	0.59		0.13	0.10	0.02	03/30/07	04/05/07
Thorium 232	0.62		0.13	0.10	0.02	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1004

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-004
Work Order: JRWHX
Matrix: SOLID

Date Collected: 03/26/07 0915
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 96
Radium (226)	1.16		0.29	1.00	0.22	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 100
Radium 228	0.95	J	0.31	1.00	0.40	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 91
Uranium 234	0.50		0.11	0.10	0.03	03/30/07	04/07/07
Uranium 235/236	0.037	J	0.028	0.100	0.022	03/30/07	04/07/07
Uranium 238	0.53		0.12	0.10	0.03	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 70
Thorium 228	0.99		0.21	0.10	0.05	03/30/07	04/05/07
Thorium 230	0.64		0.15	0.10	0.03	03/30/07	04/05/07
Thorium 232	0.84		0.18	0.10	0.02	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1005

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-005
Work Order: JRWH0
Matrix: SOLID

Date Collected: 03/26/07 0930
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 98
Radium (226)	0.94	J	0.25	1.00	0.21	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 90
Radium 228	0.77	J	0.34	1.00	0.48	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 85
Uranium 234	0.47		0.11	0.10	0.02	03/30/07	04/07/07
Uranium 235/236	0.025	J	0.025	0.100	0.014	03/30/07	04/07/07
Uranium 238	0.44		0.11	0.10	0.02	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 86
Thorium 228	0.54		0.12	0.10	0.04	03/30/07	04/05/07
Thorium 230	0.55		0.12	0.10	0.02	03/30/07	04/05/07
Thorium 232	0.68		0.14	0.10	0.02	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1006

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-006
Work Order: JRWH3
Matrix: SOLID

Date Collected: 03/26/07 0945
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 97
Radium (226)	0.97	J	0.26	1.00	0.20	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 98
Radium 228	0.73	J	0.30	1.00	0.42	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 81
Uranium 234	0.47		0.11	0.10	0.03	03/30/07	04/07/07
Uranium 235/236	0.027	J	0.026	0.100	0.014	03/30/07	04/07/07
Uranium 238	0.47		0.11	0.10	0.03	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 68
Thorium 228	0.60		0.14	0.10	0.05	03/30/07	04/05/07
Thorium 230	0.52		0.13	0.10	0.03	03/30/07	04/05/07
Thorium 232	0.60		0.14	0.10	0.03	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1007

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-007
Work Order: JRWH5
Matrix: SOLID

Date Collected: 03/26/07 0935
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 95
Radium (226)	0.93	J	0.25	1.00	0.19	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 87
Radium 228	0.68	J	0.33	1.00	0.48	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 83
Uranium 234	0.51		0.12	0.10	0.02	03/30/07	04/07/07
Uranium 235/236	0.026	J	0.025	0.100	0.014	03/30/07	04/07/07
Uranium 238	0.49		0.11	0.10	0.02	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 86
Thorium 228	0.76		0.16	0.10	0.03	03/30/07	04/05/07
Thorium 230	0.47		0.11	0.10	0.03	03/30/07	04/05/07
Thorium 232	0.70		0.15	0.10	0.02	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1008

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-008
Work Order: JRWH8
Matrix: SOLID

Date Collected: 03/26/07 0935
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 96
Radium (226)	1.18		0.30	1.00	0.24	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 92
Radium 228	0.80	J	0.33	1.00	0.46	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 80
Uranium 234	0.73		0.15	0.10	0.03	03/30/07	04/07/07
Uranium 235/236	0.031	J	0.028	0.100	0.025	03/30/07	04/07/07
Uranium 238	0.64		0.14	0.10	0.02	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 77
Thorium 228	0.88		0.18	0.10	0.04	03/30/07	04/05/07
Thorium 230	0.83		0.17	0.10	0.02	03/30/07	04/05/07
Thorium 232	0.72		0.16	0.10	0.01	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1009

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-009
Work Order: JRWJA
Matrix: SOLID

Date Collected: 03/26/07 1005
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 90
Radium (226)	0.94	J	0.26	1.00	0.21	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 82
Radium 228	0.86	J	0.36	1.00	0.50	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 89
Uranium 234	0.51		0.11	0.10	0.02	03/30/07	04/07/07
Uranium 235/236	0.042	J	0.031	0.100	0.026	03/30/07	04/07/07
Uranium 238	0.46		0.11	0.10	0.02	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 88
Thorium 228	0.62		0.14	0.10	0.05	03/30/07	04/05/07
Thorium 230	0.50		0.11	0.10	0.03	03/30/07	04/05/07
Thorium 232	0.75		0.15	0.10	0.03	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1010

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-010
Work Order: JRWJC
Matrix: SOLID

Date Collected: 03/26/07 1015
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				**pCi/g**		**Batch # 7087259**	**Yld % 94**
Radium (226)	**1.09**		**0.30**	1.00	**0.29**	**03/28/07**	**04/17/07**
Radium 228 by GFPC EPA 904 MOD				**pCi/g**		**Batch # 7087261**	**Yld % 70**
Radium 228	**0.73**	**J**	**0.37**	1.00	**0.53**	**03/28/07**	**04/17/07**
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 7089193**	**Yld % 83**
Uranium 234	**0.54**		**0.12**	0.10	**0.02**	**03/30/07**	**04/07/07**
Uranium 235/236	0.013	U	0.020	0.100	0.028	03/30/07	04/07/07
Uranium 238	**0.40**		**0.10**	0.10	**0.01**	**03/30/07**	**04/07/07**
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 7089189**	**Yld % 78**
Thorium 228	**0.65**		**0.15**	0.10	**0.04**	**03/30/07**	**04/05/07**
Thorium 230	**0.42**		**0.11**	0.10	**0.02**	**03/30/07**	**04/05/07**
Thorium 232	**0.72**		**0.15**	0.10	**0.03**	**03/30/07**	**04/05/07**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1011

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-011
Work Order: JRWJE
Matrix: SOLID

Date Collected: 03/26/07 1015
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 95
Radium (226)	**1.01**		**0.27**	1.00	**0.23**	**03/28/07**	**04/17/07**
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 102
Radium 228	**0.58**	**J**	**0.28**	1.00	**0.41**	**03/28/07**	**04/17/07**
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 87
Uranium 234	**0.47**		**0.11**	0.10	**0.03**	**03/30/07**	**04/07/07**
Uranium 235/236	0.022	U	0.023	0.100	0.026	03/30/07	04/07/07
Uranium 238	**0.394**		**0.097**	0.100	**0.025**	**03/30/07**	**04/07/07**
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 79
Thorium 228	**0.56**		**0.13**	0.10	**0.05**	**03/30/07**	**04/05/07**
Thorium 230	**0.43**		**0.11**	0.10	**0.02**	**03/30/07**	**04/05/07**
Thorium 232	**0.54**		**0.13**	0.10	**0.03**	**03/30/07**	**04/05/07**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1012

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-012
Work Order: JRWJG
Matrix: SOLID

Date Collected: 03/26/07 0905
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 92
Radium (226)	1.19		0.26	1.00	0.14	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 85
Radium 228	0.66	J	0.33	1.00	0.49	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 96
Uranium 234	0.60		0.13	0.10	0.02	03/30/07	04/07/07
Uranium 235/236	0.018	U	0.019	0.100	0.021	03/30/07	04/07/07
Uranium 238	0.60		0.13	0.10	0.02	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 79
Thorium 228	0.64		0.14	0.10	0.03	03/30/07	04/05/07
Thorium 230	0.68		0.15	0.10	0.03	03/30/07	04/05/07
Thorium 232	0.61		0.14	0.10	0.03	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1013

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-013
Work Order: JRWJH
Matrix: SOLID

Date Collected: 03/26/07 0905
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 94
Radium (226)	1.26		0.28	1.00	0.14	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 85
Radium 228	1.31		0.50	1.00	0.73	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 84
Uranium 234	0.58		0.13	0.10	0.02	03/30/07	04/07/07
Uranium 235/236	0.045	J	0.032	0.100	0.024	03/30/07	04/07/07
Uranium 238	0.65		0.14	0.10	0.01	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 84
Thorium 228	0.85		0.17	0.10	0.05	03/30/07	04/05/07
Thorium 230	0.79		0.16	0.10	0.02	03/30/07	04/05/07
Thorium 232	0.76		0.16	0.10	0.03	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1014

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-014
Work Order: JRWJJ
Matrix: SOLID

Date Collected: 03/26/07 1015
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				**pCi/g**		**Batch # 7087259**	**Yld % 97**
Radium (226)	**1.00**		**0.24**	1.00	**0.15**	**03/28/07**	**04/17/07**
Radium 228 by GFPC EPA 904 MOD				**pCi/g**		**Batch # 7087261**	**Yld % 79**
Radium 228	**1.14**		**0.53**	1.00	**0.79**	**03/28/07**	**04/17/07**
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 7089193**	**Yld % 77**
Uranium 234	**0.44**		**0.11**	0.10	**0.02**	**03/30/07**	**04/07/07**
Uranium 235/236	**0.059**	**J**	**0.039**	0.100	**0.030**	**03/30/07**	**04/07/07**
Uranium 238	**0.55**		**0.13**	0.10	**0.02**	**03/30/07**	**04/07/07**
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**		**Batch # 7089189**	**Yld % 84**
Thorium 228	**0.76**		**0.16**	0.10	**0.03**	**03/30/07**	**04/05/07**
Thorium 230	**0.58**		**0.13**	0.10	**0.02**	**03/30/07**	**04/05/07**
Thorium 232	**0.52**		**0.12**	0.10	**0.01**	**03/30/07**	**04/05/07**

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Environmental Chemical Corporation

Client Sample ID: 5601-BKGD-1015

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F7C280211-015
Work Order: JRWJK
Matrix: SOLID

Date Collected: 03/26/07 1015
Date Received: 03/28/07 0920

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date
Radium 226 by EPA 903.0 MOD				pCi/g		Batch # 7087259	Yld % 98
Radium (226)	0.96	J	0.23	1.00	0.14	03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD				pCi/g		Batch # 7087261	Yld % 66
Radium 228	1.45		0.62	1.00	0.92	03/28/07	04/17/07
Iso URANIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089193	Yld % 83
Uranium 234	0.43		0.10	0.10	0.02	03/30/07	04/07/07
Uranium 235/236	0.020	J	0.022	0.100	0.013	03/30/07	04/07/07
Uranium 238	0.45		0.11	0.10	0.03	03/30/07	04/07/07
Iso THORIUM (LONG CT) DOE A-01-R MOD				pCi/g		Batch # 7089189	Yld % 79
Thorium 228	0.55		0.13	0.10	0.04	03/30/07	04/05/07
Thorium 230	0.56		0.13	0.10	0.03	03/30/07	04/05/07
Thorium 232	0.61		0.14	0.10	0.02	03/30/07	04/05/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

METHOD BLANK REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F7C280211
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	MDC	Prep Date	Analysis Date	Lab Sample ID
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch # 7089189**		**Yld % 92**		**F7C300000-189B**
Thorium 228	0.0	U	0.0	0.1	0.04		03/30/07	04/05/07
Thorium 230	**0.036**	**J**	**0.026**	0.100	**0.023**		**03/30/07**	**04/05/07**
Thorium 232	0.0	U	0.0	0.1	0.02		03/30/07	04/05/07
Iso URANIUM (LONG CT) DOE A-01-R MOD			**pCi/g**	**Batch # 7089193**		**Yld % 95**		**F7C300000-193B**
Uranium 234	0.005	U	0.013	0.100	0.023		03/30/07	04/07/07
Uranium 235/236	-0.001	U	0.011	0.100	0.022		03/30/07	04/07/07
Uranium 238	0.005	U	0.013	0.100	0.023		03/30/07	04/07/07
Radium 226 by EPA 903.0 MOD			**pCi/g**	**Batch # 7087259**		**Yld % 92**		**F7C280000-259B**
Radium (226)	0.09	U	0.12	1.00	0.19		03/28/07	04/17/07
Radium 228 by GFPC EPA 904 MOD			**pCi/g**	**Batch # 7087261**		**Yld % 98**		**F7C280000-261B**
Radium 228	0.26	U	0.31	1.00	0.50		03/28/07	04/17/07
Radium 226 by EPA 903.0 MOD			**pCi/g**	**Batch # 7110210**		**Yld % 107**		**F7D200000-210B**
Radium (226)	0.007	U	0.098	1.00	0.19		04/20/07	05/08/07

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined using instrument performance only
Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.

Laboratory Control Sample Report

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F7C280211
Matrix: SOLID

Parameter	Spike Amount	Result		Total Uncert. (2 σ+/-)	MDC	% Yld	% Rec		Lab Sample ID / QC Control Limits
Radium 226 by EPA 903.0 MOD			**pCi/g**		**903.0 MOD**				**F7C280000-259C**
Radium (226)	11.2	13.1	a	1.5	0.2	95	117	a	(53 - 113)
	Batch #:	7087259			**Analysis Date:**	04/17/07			
Radium 228 by GFPC EPA 904 MOD			**pCi/g**		**904 MOD**				**F7C280000-261C**
Radium 228	9.06	8.6		1.1	0.5	96	95		(54 - 130)
	Batch #:	7087261			**Analysis Date:**	04/17/07			
Iso THORIUM (LONG CT) DOE A-01-R MOD			**pCi/g**		**A-01-R MOD**				**F7C300000-189C**
Thorium 230	57.9	60.0		9.3	0.5	90	104		(81 - 124)
	Batch #:	7089189			**Analysis Date:**	04/05/07			
Iso URANIUM (LONG CT) DOE A-01-R MOD			**pCi/g**		**A-01-R MOD**				**F7C300000-193C**
Uranium 234	19.2	19.7		3.6	0.4	83	102		(78 - 125)
Uranium 238	19.2	17.9		3.3	0.2	83	93		(76 - 122)
	Batch #:	7089193			**Analysis Date:**	04/07/07			
Radium 226 by EPA 903.0 MOD			**pCi/g**		**903.0 MOD**				**F7D200000-210C**
Radium (226)	11.2	8.7		1.1	0.2	110	78		(53 - 113)
	Batch #:	7110210			**Analysis Date:**	05/08/07			

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

a **Spiked analyte outside of stated QC limits.**

DUPLICATE EVALUATION REPORT

Severn Trent Laboratories - Radiochemistry

Client Lot ID: F7C280211
Matrix: SOLID

Date Sampled: 03/26/07
Date Received: 03/28/07

Parameter	SAMPLE Result		Total Uncert. (2σ+/-)	% Yld	DUPLICATE Result		Total Uncert. (2 σ+/-)	% Yld	QC Sample ID Precision	
Radium 226 by EPA 903.0 MOD				**pCi/g**	**903.0 MOD**				**F7C280211-001**	
Radium (226)	**1.89**		**0.36**	99	**1.18**		**0.28**	97	46	%RPD
	Batch #:		7087259	(Sample)	7087259	(Duplicate)				
Radium 228 by GFPC EPA 904 MOD				**pCi/g**	**904 MOD**				**F7C280211-001**	
Radium 228	**1.32**		**0.38**	89	**0.80**	J	**0.32**	99	49	%RPD
	Batch #:		7087261	(Sample)	7087261	(Duplicate)				
Iso THORIUM (LONG CT) DOE A-01-R MOD				**pCi/g**	**A-01-R MOD**				**F7C280211-001**	
Thorium 228	**0.84**		**0.18**	74	**1.06**		**0.22**	72	23	%RPD
Thorium 230	**0.79**		**0.17**	74	**0.83**		**0.18**	72	6	%RPD
Thorium 232	**0.73**		**0.16**	74	**0.95**		**0.20**	72	26	%RPD
	Batch #:		7089189	(Sample)	7089189	(Duplicate)				
Iso URANIUM (LONG CT) DOE A-01-R MOD				**pCi/g**	**A-01-R MOD**				**F7C280211-001**	
Uranium 234	**1.06**		**0.21**	74	**0.72**		**0.16**	76	39	%RPD
Uranium 235/236	**0.095**	J	**0.049**	74	**0.032**	J	**0.030**	76	99	%RPD
Uranium 238	**0.97**		**0.19**	74	**0.70**		**0.15**	76	32	%RPD
	Batch #:		7089193	(Sample)	7089193	(Duplicate)				
Radium 226 by EPA 903.0 MOD				**pCi/g**	**903.0 MOD**				**F7C280211-001**	
Radium (226)	**0.68**	J	**0.20**	110	**0.76**	J	**0.22**	107	11	%RPD
	Batch #:		7110210	(Sample)	7110210	(Duplicate)				

NOTE(S)

Data are incomplete without the case narrative.
Calculations are performed before rounding to avoid round-off error in calculated results

J Result is greater than sample detection limit but less than stated reporting limit.

ALPHA SPECTROSCOPY

SEVERN TRENT STL

Alpha Spectroscopy Thorium

SEVERN TRENT STL

Analysis Report for Alpha Spectroscopy

Batch: 7089189 **Operator:** 403293

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7C280211-001	JRWHL1AE	2.0005	1.00	2.00	AV11	4/12/07 16:55	240.00	Rad05-0088	Th-229	3.659E+000	73.56%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	8.354E-001	pCi/g	1.288E-001	1.793E-001	4.740E-002	1.717E-002
Th-229	1.212E+000	pCi/g	1.784E-001	1.792E-001	3.269E-002	9.859E-003
Th-230	7.883E-001	pCi/g	1.233E-001	1.698E-001	2.543E-002	6.232E-003
Th-232	7.343E-001	pCi/g	1.183E-001	1.611E-001	1.290E-002	0.000E+000

F7C280211-001X	JRWHL1AH	2.0000	1.00	2.00	AV12	4/12/07 16:55	240.00	Rad05-0088	Th-229	3.660E+000	71.78%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	1.055E+000	pCi/g	1.492E-001	2.182E-001	5.840E-002	2.234E-002
Th-229	1.183E+000	pCi/g	1.827E-001	1.771E-001	2.968E-002	8.024E-003
Th-230	8.333E-001	pCi/g	1.299E-001	1.803E-001	2.672E-002	6.548E-003
Th-232	9.532E-001	pCi/g	1.395E-001	1.997E-001	3.794E-002	1.219E-002

F7C280211-002	JRWHT1AE	2.0077	1.00	2.00	AV3	4/5/07 20:06	240.00	Rad05-0088	Th-229	3.646E+000	84.94%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	7.425E-001	pCi/g	1.134E-001	1.550E-001	4.696E-002	1.797E-002
Th-229	1.395E+000	pCi/g	1.643E-001	1.979E-001	3.084E-002	9.909E-003
Th-230	6.492E-001	pCi/g	1.034E-001	1.386E-001	2.402E-002	6.493E-003
Th-232	7.190E-001	pCi/g	1.085E-001	1.491E-001	2.390E-002	6.461E-003

F7C280211-003	JRWHW1AE	2.0062	1.00	2.00	AV4	4/5/07 20:06	240.00	Rad05-0088	Th-229	3.649E+000	90.23%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	7.378E-001	pCi/g	1.121E-001	1.530E-001	4.806E-002	1.865E-002
Th-229	1.483E+000	pCi/g	1.619E-001	2.087E-001	1.810E-002	3.662E-003
Th-230	5.950E-001	pCi/g	9.765E-002	1.288E-001	2.112E-002	5.176E-003
Th-232	6.168E-001	pCi/g	9.900E-002	1.318E-001	1.800E-002	3.642E-003

F7C280211-004	JRWHX1AE	2.0161	1.00	2.00	AV6	4/5/07 20:06	240.00	Rad05-0088	Th-229	3.631E+000	70.15%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	9.894E-001	pCi/g	1.428E-001	2.058E-001	4.881E-002	1.768E-002
Th-229	1.147E+000	pCi/g	1.809E-001	1.715E-001	3.174E-002	9.143E-003
Th-230	6.384E-001	pCi/g	1.131E-001	1.481E-001	2.637E-002	6.461E-003
Th-232	8.441E-001	pCi/g	1.294E-001	1.809E-001	2.247E-002	4.546E-003

F7C280211-005	JRWH01AE	2.0028	1.00	2.00	AV7	4/5/07 20:06	240.00	Rad05-0088	Th-229	3.655E+000	85.51%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
Th-228	5.423E-001	pCi/g	9.696E-002	1.239E-001	4.031E-002	1.461E-002
Th-229	1.408E+000	pCi/g	1.648E-001	1.998E-001	2.621E-002	7.551E-003
Th-230	5.509E-001	pCi/g	9.562E-002	1.237E-001	2.418E-002	6.536E-003
Th-232	6.788E-001	pCi/g	1.058E-001	1.432E-001	2.405E-002	6.503E-003

F7C280211-006	JRWH31AE	2.0057	1.00	2.00	AV8	4/5/07 20:06	240.00	Rad05-0088	Th-229	3.650E+000	68.01%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte		TracerAdded	TracerYield
						Th-228	6.040E-001	pCi/g	1.113E-001	1.429E-001	4.651E-002	1.669E-002
						Th-229	1.118E+000	pCi/g	1.790E-001	1.656E-001	2.577E-002	6.316E-003
						Th-230	5.206E-001	pCi/g	1.012E-001	1.274E-001	2.860E-002	7.731E-003
						Th-232	6.001E-001	pCi/g	1.083E-001	1.403E-001	2.846E-002	7.693E-003
F7C280211-007	JRWH51AE	2.0089	1.00	2.00	AV9	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.644E+000	85.72%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	7.580E-001	pCi/g	1.124E-001	1.558E-001	2.630E-002	7.576E-003
						Th-229	1.407E+000	pCi/g	1.650E-001	2.000E-001	2.633E-002	7.585E-003
						Th-230	4.730E-001	pCi/g	8.926E-002	1.118E-001	2.810E-002	8.475E-003
						Th-232	7.003E-001	pCi/g	1.073E-001	1.465E-001	1.864E-002	3.771E-003
F7C280211-008	JRWH81AE	2.0056	1.00	2.00	AV11	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.650E+000	76.77%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	8.754E-001	pCi/g	1.291E-001	1.820E-001	4.499E-002	1.630E-002
						Th-229	1.262E+000	pCi/g	1.742E-001	1.844E-001	3.125E-002	9.423E-003
						Th-230	8.267E-001	pCi/g	1.234E-001	1.729E-001	2.431E-002	5.957E-003
						Th-232	7.246E-001	pCi/g	1.149E-001	1.567E-001	1.233E-002	0.000E+000
F7C280211-009	JRWJA1AE	2.0161	1.00	2.00	AV12	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.631E+000	87.57%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	6.189E-001	pCi/g	1.044E-001	1.366E-001	4.716E-002	1.805E-002
						Th-229	1.432E+000	pCi/g	1.640E-001	2.034E-001	2.413E-002	6.525E-003
						Th-230	4.954E-001	pCi/g	9.081E-002	1.150E-001	2.614E-002	7.530E-003
						Th-232	7.506E-001	pCi/g	1.116E-001	1.545E-001	3.085E-002	9.911E-003
F7C280211-010	JRWJC1AE	2.0009	1.00	2.00	AV13	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.658E+000	78.03%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	6.511E-001	pCi/g	1.104E-001	1.454E-001	4.376E-002	1.586E-002
						Th-229	1.286E+000	pCi/g	1.724E-001	1.866E-001	3.665E-002	1.230E-002
						Th-230	4.221E-001	pCi/g	8.695E-002	1.064E-001	2.025E-002	4.096E-003
						Th-232	7.236E-001	pCi/g	1.138E-001	1.550E-001	2.611E-002	7.059E-003
F7C280211-011	JRWJE1AE	2.0019	1.00	2.00	AV15	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.657E+000	79.36%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	5.602E-001	pCi/g	1.033E-001	1.314E-001	4.821E-002	1.814E-002
						Th-229	1.307E+000	pCi/g	1.710E-001	1.890E-001	2.819E-002	8.121E-003
						Th-230	4.303E-001	pCi/g	8.760E-002	1.075E-001	2.342E-002	5.740E-003
						Th-232	5.412E-001	pCi/g	9.810E-002	1.256E-001	2.587E-002	6.994E-003
F7C280211-012	JRWJG1AE	2.0098	1.00	2.00	AV19	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.642E+000	79.47%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	6.363E-001	pCi/g	1.082E-001	1.426E-001	3.082E-002	9.296E-003
						Th-229	1.304E+000	pCi/g	1.726E-001	1.898E-001	2.402E-002	5.886E-003
						Th-230	6.808E-001	pCi/g	1.121E-001	1.498E-001	3.262E-002	1.019E-002
						Th-232	6.110E-001	pCi/g	1.058E-001	1.384E-001	3.069E-002	9.255E-003
F7C280211-013	JRWJH1AE	2.0191	1.00	2.00	AV20	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.625E+000	83.64%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte		TracerAdded	TracerYield
						Th-228	8.491E-001	pCi/g	1.217E-001	1.718E-001	4.829E-002	1.857E-002
						Th-229	1.366E+000	pCi/g	1.647E-001	1.945E-001	2.814E-002	8.485E-003
						Th-230	7.929E-001	pCi/g	1.148E-001	1.612E-001	2.430E-002	6.569E-003
						Th-232	7.551E-001	pCi/g	1.119E-001	1.554E-001	2.620E-002	7.547E-003
F7C280211-014	JRWJJ1AE	2.0049	1.00	2.00	AV22	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.651E+000	83.79%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	7.635E-001	pCi/g	1.163E-001	1.605E-001	2.979E-002	8.984E-003
						Th-229	1.378E+000	pCi/g	1.705E-001	1.990E-001	3.459E-002	1.138E-002
						Th-230	5.836E-001	pCi/g	1.014E-001	1.320E-001	2.320E-002	5.685E-003
						Th-232	5.176E-001	pCi/g	9.490E-002	1.213E-001	1.177E-002	0.000E+000
F7C280211-015	JRWJK1AE	2.0010	1.00	2.00	AV23	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.658E+000	79.33%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	5.546E-001	pCi/g	1.013E-001	1.294E-001	3.899E-002	1.350E-002
						Th-229	1.307E+000	pCi/g	1.715E-001	1.892E-001	3.022E-002	9.115E-003
						Th-230	5.649E-001	pCi/g	1.012E-001	1.303E-001	3.195E-002	9.979E-003
						Th-232	6.116E-001	pCi/g	1.040E-001	1.368E-001	2.004E-002	4.054E-003
F7C300000-189B	JR3GA1AA	2.0000	1.00	2.00	AV24	4/5/07 20:06	240.00	Rad05-0088	Th-229		3.660E+000	92.20%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	0.000E+000	pCi/g	2.218E-002	0.000E+000	3.945E-002	1.442E-002
						Th-229	1.520E+000	pCi/g	1.613E-001	2.132E-001	2.506E-002	7.219E-003
						Th-230	3.629E-002	pCi/g	2.573E-002	2.623E-002	2.311E-002	6.249E-003
						Th-232	0.000E+000	pCi/g	1.104E-002	0.000E+000	2.492E-002	7.180E-003
F7C300000-189C	JR3GA1AC	0.1314	1.00	2.00	AV17	4/5/07 20:06	240.00	Rad05-0088	Th-229		5.571E+001	90.13%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						Th-228	1.088E+000	pCi/g	9.524E-001	9.647E-001	1.208E+000	5.232E-001
						Th-229	2.262E+001	pCi/g	2.458E+000	3.174E+000	4.521E-001	1.453E-001
						Th-230	6.004E+001	pCi/g	3.793E+000	9.259E+000	4.719E-001	1.552E-001
						Th-232	8.313E-001	pCi/g	4.751E-001	4.892E-001	3.791E-001	1.092E-001

Laboratory Control Sample Information

Sample ID	WRKNO	RegionName	Activity	StdAdded	Recovery	LCL	UCL
F7C300000-189C	JR3GA1AC	Th-230	6.004E+001	5.788E+001	103.73%	81.00	124.00

Sample Duplicate Information

Sample ID	Analyte	Sample Activity	Dup Sample ID	Dup Activity	RPD	RER	DER	Qualifier
F7C280211-001	Th-228	8.354E-001	F7C280211-001X	1.055E+000	23.24%	5.527E-001	7.779E-001	
	Th-230	7.883E-001	F7C280211-001X	8.333E-001	5.55%	1.285E-001	1.816E-001	
	Th-232	7.343E-001	F7C280211-001X	9.532E-001	25.94%	6.066E-001	8.529E-001	

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield

Matrix Spike Information

SampID	SampMSID	RegionName	Sample Activity	MS Activity	StdAdded	MSRecovery

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 8:55:22PM 4/12/2007

Sample

Sample Name: F7C280211-001
SampleType: Sample
: JRWHL1AE
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #3 Analysis #1
Sample Weight : 2.0005g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

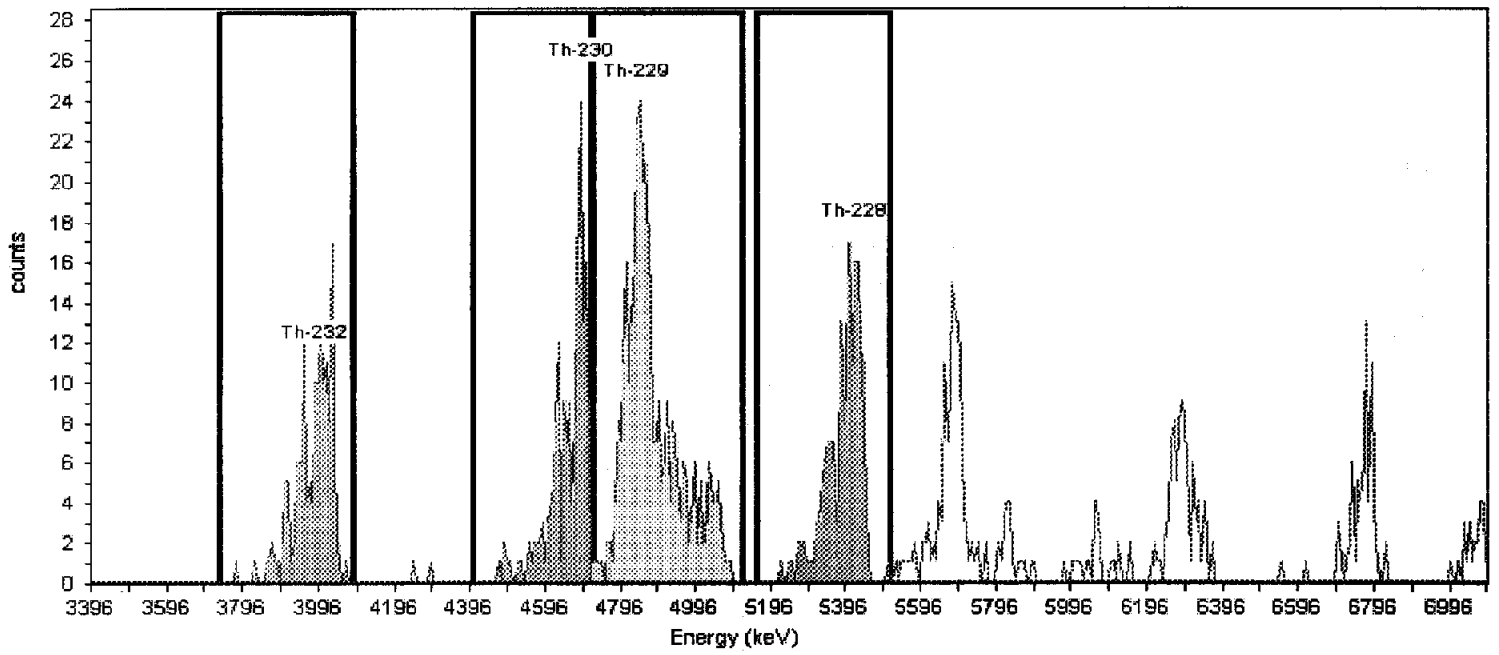
Tracer Nuclide: Th-229
Tracer Recovery: 73.56%

Acquisition

Detector: AV11
Serial Number: 41-172Q3
Acquisition Start Date: 4/12/2007 4:55:06PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:09AM

Calibration Name: Mar2007_AV11
Calibration Date: 3/26/2007 4:58:21PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.69% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV11; Det: AV11; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	84.955	100.2	154.00	0.0000	154	7.343E-001	1.611E-001	0.000E+000	1.290E-002
Th-230	4688.465	4405.333	4717.504	30.076	99.7	165.00	0.5000	165	7.883E-001	1.698E-001	6.232E-003	2.543E-002
Th-229	4840.921	4724.764	5124.053	73.573	99.6	345.00	1.2500	344	1.212E+000	1.792E-001	9.859E-003	3.269E-002
Th-228	5421.705	5160.352	5516.082	67.234	99.8	177.00	3.7500	173	8.354E-001	1.793E-001	1.717E-002	4.740E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 3:14:15PM 4/13/2007

Sample

Sample Name: F7C280211-001X
SampleType: Sample
: JRWHL1AH
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #3 Analysis #1
Sample Weight : 2.0000g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

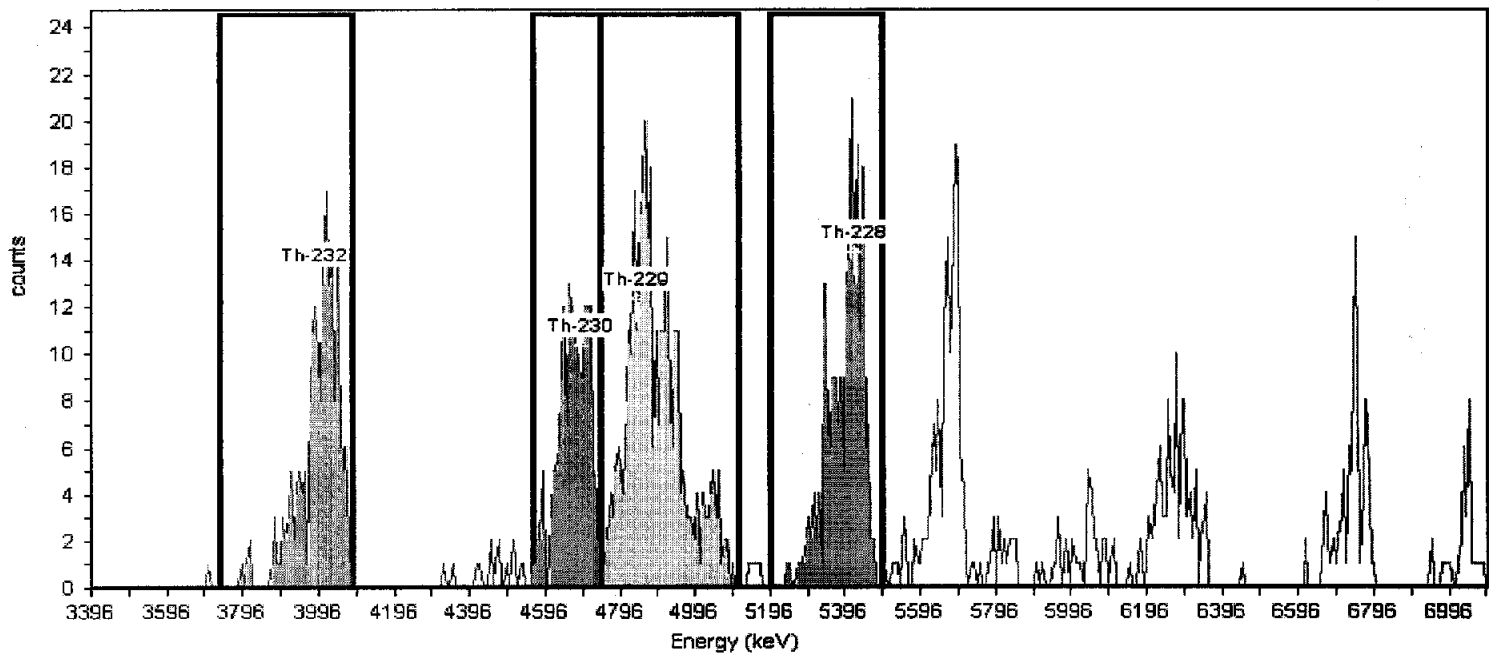
Tracer Nuclide: Th-229
Tracer Recovery: 71.78%

Acquisition

Detector: AV12
Serial Number: 41-172Q2
Acquisition Start Date: 4/12/2007 4:55:08PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:10AM

Calibration Name: Mar2007_AV12
Calibration Date: 3/26/2007 4:58:58PM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.04% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV12; Det: AV12; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	92.739	100.2	192.00	1.7500	190	9.532E-001	1.997E-001	1.219E-002	3.794E-002
Th-230	4688.465	4565.048	4746.543	101.579	99.7	166.00	0.5000	166	8.333E-001	1.803E-001	6.548E-003	2.672E-002
Th-229	4840.921	4746.543	5109.533	129.815	99.6	328.00	0.7500	327	1.183E+000	1.771E-001	8.024E-003	2.968E-002
Th-228	5421.705	5196.651	5494.303	79.042	99.8	214.00	5.7500	208	1.055E+000	2.182E-001	2.234E-002	5.840E-002

Manual integration
Shiftong KW 4/13/07

ST

SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:00:55AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C280211-002
SampleType: Sample
: JRWHT1AE
Sample Collection Date: 3/26/2007 9:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0077g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

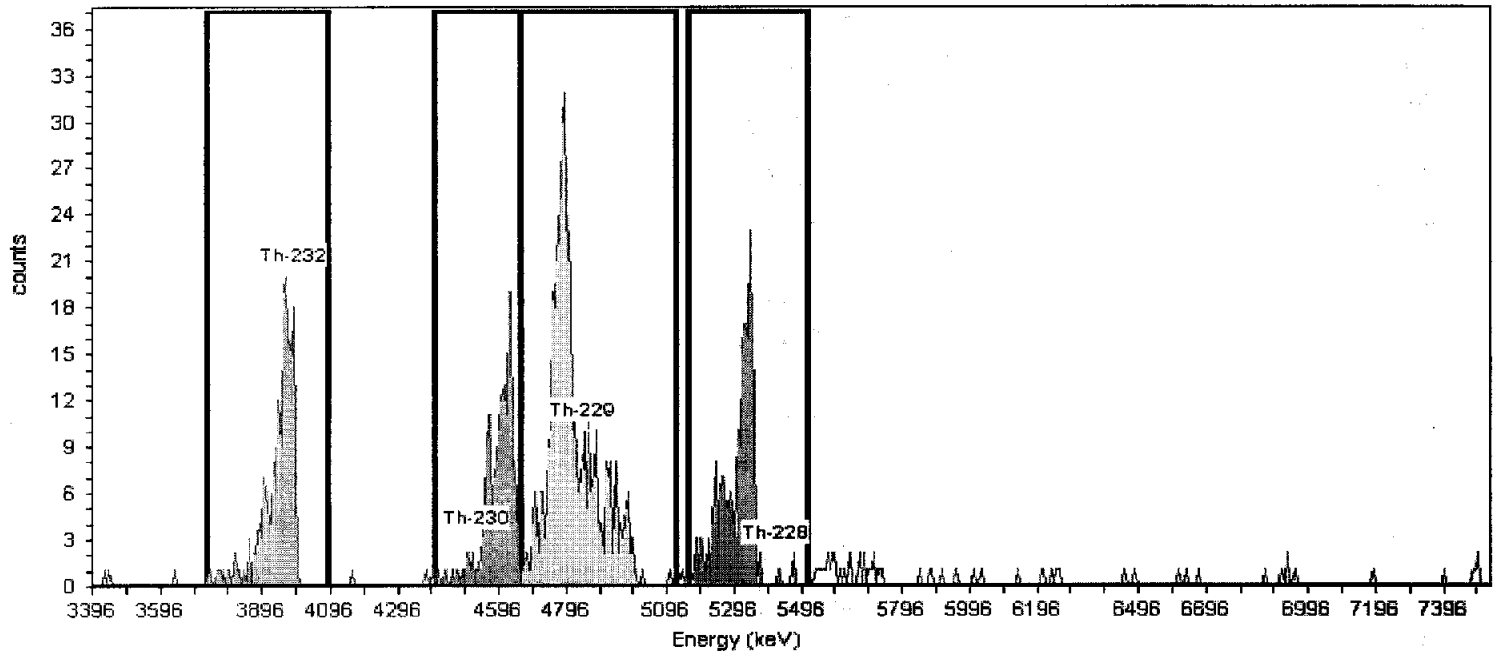
Tracer Nuclide: Th-229
Tracer Recovery: 84.94%

Acquisition

Detector: AV3
Serial Number: 41-158X5
Acquisition Start Date: 4/5/2007 8:06:55PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:46:58AM

Calibration Name: Mar2007_AV3
Calibration Date: 3/26/2007 11:28:43AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.08% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV3; Det: AV3; Spectrum #1; Mar-24-2007 09:46



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	55.064	100.2	178.00	0.7500	177	7.190E-001	1.491E-001	6.461E-003	2.390E-002
Th-230	4532.379	4405.333	4659.426	21.013	99.7	160.00	0.7500	159	6.492E-001	1.386E-001	6.493E-003	2.402E-002
Th-229	4840.921	4659.426	5124.053	62.497	99.8	405.00	1.7500	403	1.395E+000	1.979E-001	9.909E-003	3.084E-002
Th-228	5421.705	5160.352	5516.082	50.735	99.8	188.00	5.7500	182	7.425E-001	1.550E-001	1.797E-002	4.696E-002

manual integration
shifting KW 4/9/07

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 12:07:39AM 4/6/2007

Sample

Sample Name: F7C280211-003
SampleType: Sample
: JRWHW1AE
Sample Collection Date: 3/26/2007 9:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0062g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

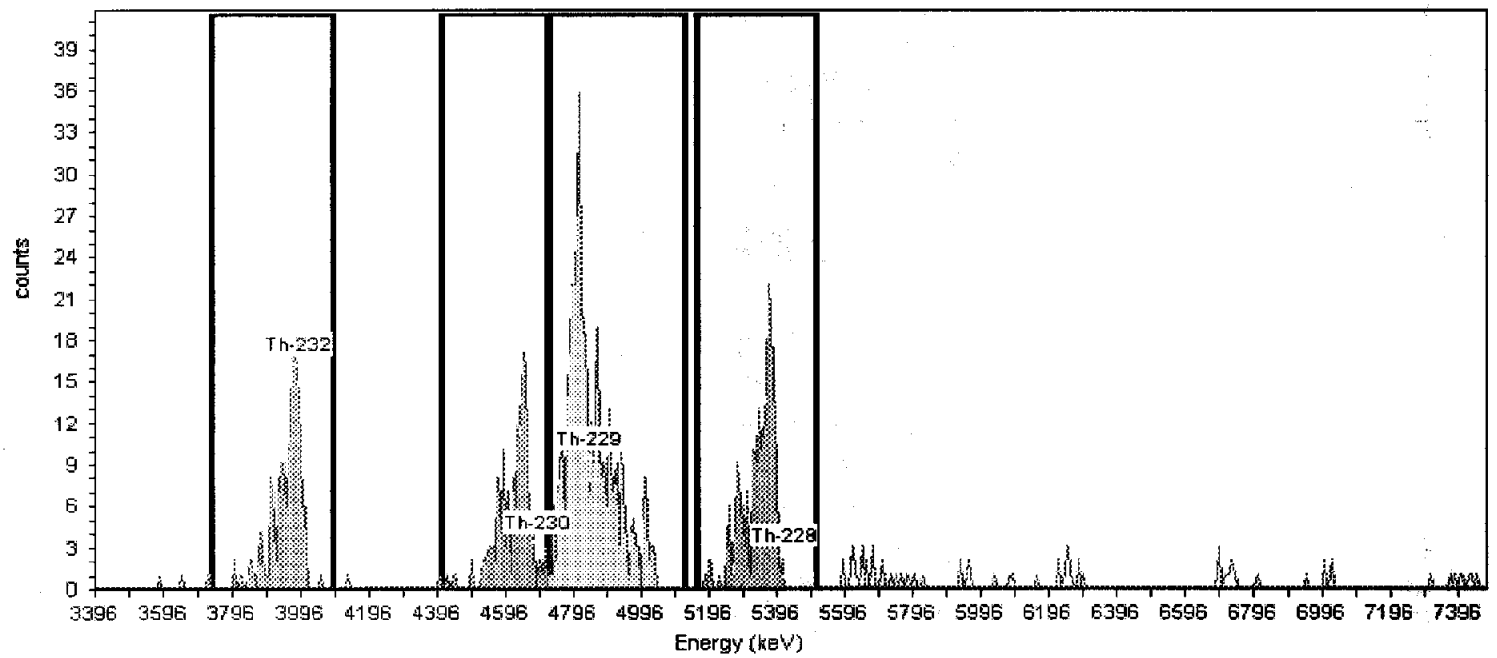
Tracer Nuclide: Th-229
Tracer Recovery: 90.23%

Acquisition

Detector: AV4
Serial Number: 41-172B5
Acquisition Start Date: 4/5/2007 8:06:56PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:46:59AM

Calibration Name: Mar2007_AV4
Calibration Date: 3/26/2007 11:28:51AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.13% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV4; Det: AV4; Spectrum #1; Mar-24-2007 09:46



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	62.042	100.2	156.00	0.2500	156	6.168E-001	1.318E-001	3.642E-003	1.800E-002
Th-230	4688.465	4405.333	4717.504	49.729	99.7	150.00	0.5000	150	5.950E-001	1.288E-001	5.176E-003	2.112E-002
Th-229	4840.921	4724.764	5124.053	63.522	99.6	413.00	0.2500	413	1.483E+000	2.087E-001	3.662E-003	1.810E-002
Th-228	5421.705	5160.352	5516.082	58.439	99.8	192.00	6.5000	186	7.378E-001	1.530E-001	1.865E-002	4.806E-002

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 12:07:42AM 4/6/2007

Sample

Sample Name: F7C280211-004
SampleType: Sample
: JRWHX1AE
Sample Collection Date: 3/26/2007 9:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0161g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

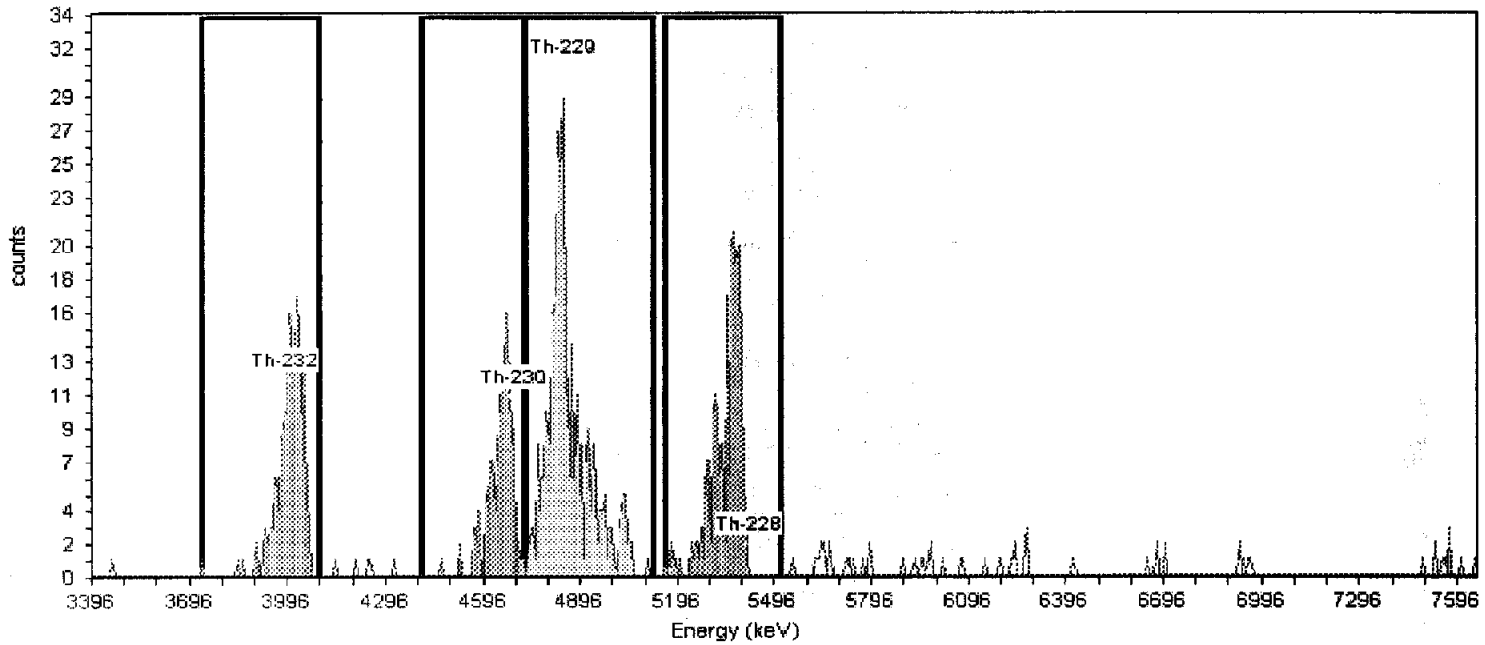
Tracer Nuclide: Th-229
Tracer Recovery: 70.15%

Acquisition

Detector: AV6
Serial Number:
Acquisition Start Date: 4/5/2007 8:06:37PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:01AM

Calibration Name: Mar2007_AV6
Calibration Date: 3/26/2007 2:20:47PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.79% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV6; Det: AV6; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	84.708	100.2	171.00	0.2500	171	8.441E-001	1.809E-001	4.546E-003	2.247E-002
Th-230	4688.465	4405.333	4717.504	51.322	99.7	129.00	0.5000	129	6.384E-001	1.481E-001	6.461E-003	2.637E-002
Th-229	4840.921	4724.764	5124.053	62.037	99.6	330.00	1.0000	329	1.147E+000	1.715E-001	9.143E-003	3.174E-002
Th-228	5421.705	5160.352	5516.082	52.666	99.8	203.00	3.7500	199	9.894E-001	2.058E-001	1.768E-002	4.881E-002

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:03:05AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C280211-005
SampleType: Sample
: JRWH01AE
Sample Collection Date: 3/26/2007 9:30:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0028g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

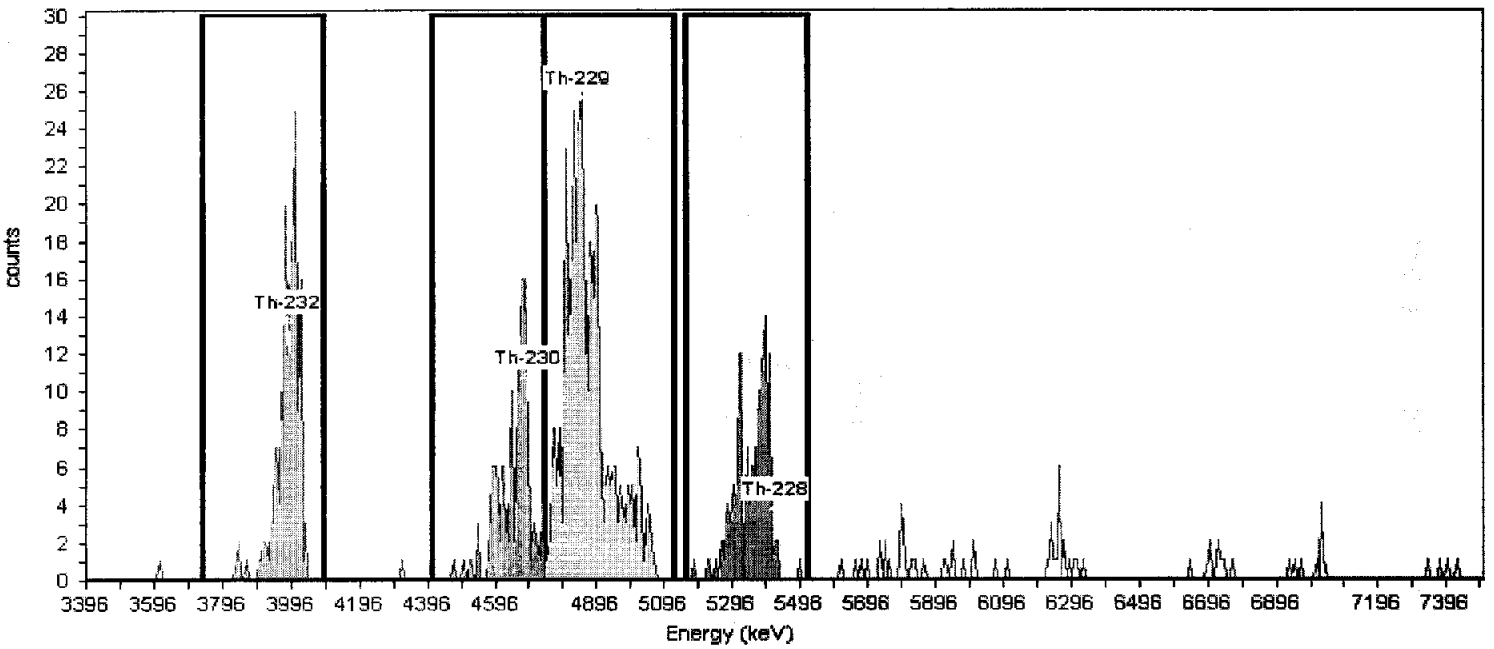
Tracer Nuclide: Th-229
Tracer Recovery: 85.51%

Acquisition

Detector: AV7
Serial Number: 41-158X6
Acquisition Start Date: 4/5/2007 8:06:38PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:03AM

Calibration Name: Mar2007_AV7
Calibration Date: 3/26/2007 1:58:05PM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.79% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV7; Det: AV7; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	58.039	100.2	167.00	0.7500	166	6.788E-001	1.432E-001	6.503E-003	2.405E-002
Th-230	4688.465	4405.333	4739.284	51.473	99.7	135.00	0.7500	134	5.509E-001	1.237E-001	6.536E-003	2.418E-002
Th-229	4840.921	4739.284	5124.053	109.651	99.6	402.00	1.0000	401	1.408E+000	1.998E-001	7.551E-003	2.621E-002
Th-228	5421.705	5160.352	5516.082	91.569	99.8	136.00	3.7500	132	5.423E-001	1.239E-001	1.461E-002	4.031E-002

Manual integration
Shifting JW 4/9/07

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:07:49AM 4/6/2007

Analyst: 60040

Sample

Sample Name: F7C280211-006
SampleType: Sample
: JRWH31AE
Sample Collection Date: 3/26/2007 9:45:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0057g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

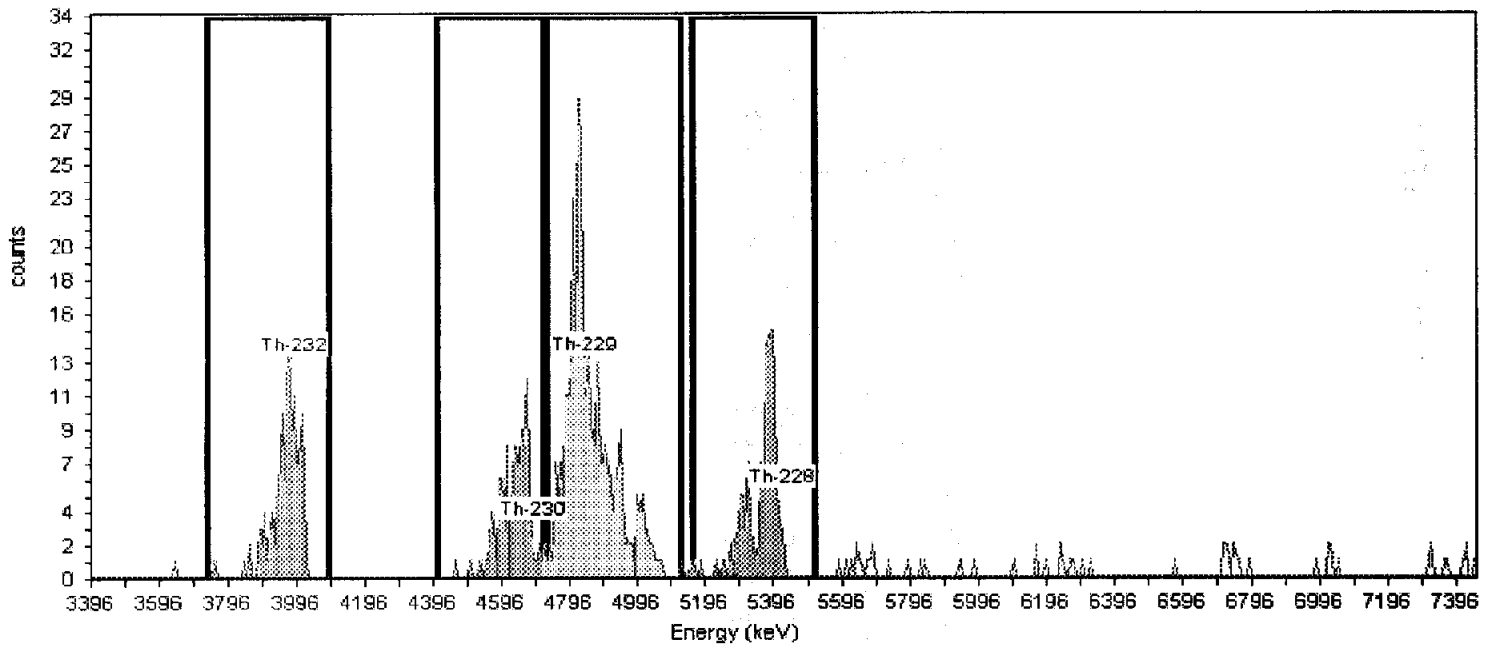
Tracer Nuclide: Th-229
Tracer Recovery: 68.01%

Acquisition

Detector: AV8
Serial Number: 41-158X1
Acquisition Start Date: 4/5/2007 8:06:40PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:05AM

Calibration Name: Mar2007_AV8
Calibration Date: 3/26/2007 1:58:11PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 28.43% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV8; Det: AV8; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	73.635	100.2	125.00	0.7500	124	6.001E-001	1.403E-001	7.693E-003	2.846E-002
Th-230	4688.465	4405.333	4717.504	78.216	99.7	108.00	0.7500	107	5.206E-001	1.274E-001	7.731E-003	2.860E-002
Th-229	4840.921	4724.764	5124.053	65.725	99.6	339.00	0.5000	339	1.118E+000	1.656E-001	6.316E-003	2.577E-002
Th-228	5421.705	5160.352	5516.082	49.614	99.8	128.00	3.5000	125	6.040E-001	1.429E-001	1.669E-002	4.651E-002

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:04:31AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C280211-007
SampleType: Sample
: JRWH51AE
Sample Collection Date: 3/26/2007 9:35:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0089g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

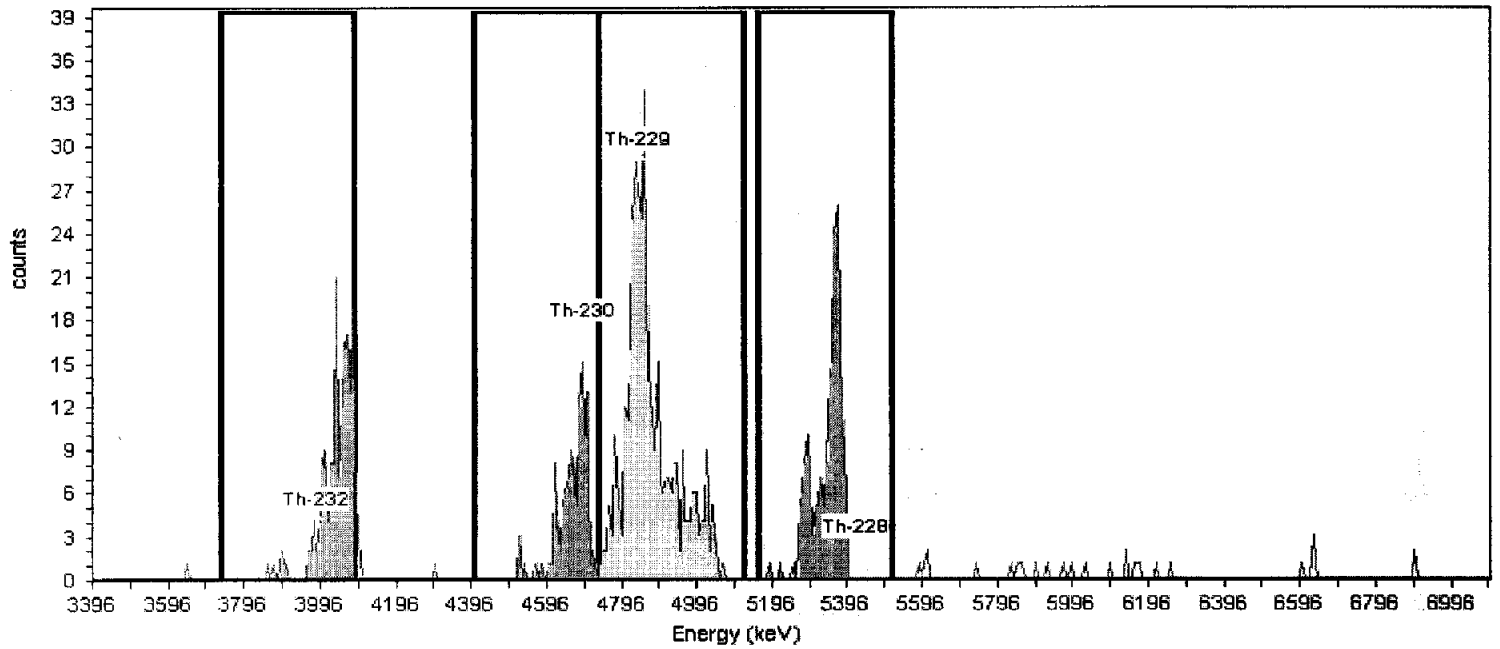
Tracer Nuclide: Th-229
Tracer Recovery: 85.72%

Acquisition

Detector: AV9
Serial Number: 41-172R1
Acquisition Start Date: 4/5/2007 8:06:42PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:07AM

Calibration Name: Mar2007_AV9
Calibration Date: 3/26/2007 2:20:54PM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.52% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV9; Det: AV9; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	42.143	100.2	171.00	0.2500	171	7.003E-001	1.465E-001	3.771E-003	1.864E-002
Th-230	4688.465	4405.333	4732.024	18.307	99.7	116.00	1.2500	115	4.730E-001	1.118E-001	8.475E-003	2.810E-002
Th-229	4840.921	4732.024	5124.053	64.454	99.6	399.00	1.0000	398	1.407E+000	2.000E-001	7.585E-003	2.633E-002
Th-228	5421.705	5160.352	5516.082	49.621	99.8	185.00	1.0000	184	7.580E-001	1.558E-001	7.576E-003	2.630E-002

manual integration
shifting KW 4/9/07

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:05:11AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C280211-008
SampleType: Sample
: JRWH81AE
Sample Collection Date: 3/26/2007 9:35:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0056g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

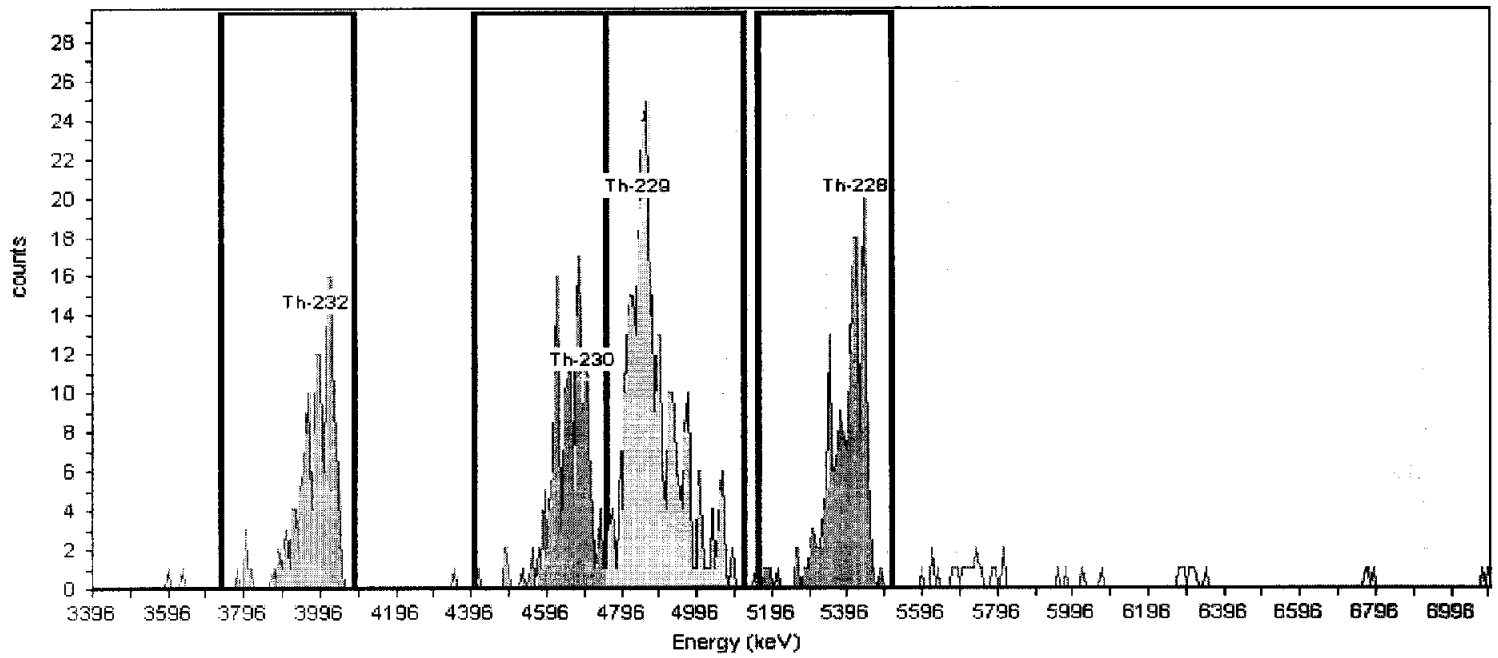
Tracer Nuclide: Th-229
Tracer Recovery: 76.77%

Acquisition

Detector: AV11
Serial Number: 41-172Q3
Acquisition Start Date: 4/5/2007 8:06:43PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:09AM

Calibration Name: Mar2007_AV11
Calibration Date: 3/26/2007 4:58:21PM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.69% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV11; Det: AV11; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	88.044	100.2	159.00	0.0000	159	7.246E-001	1.567E-001	0.000E+000	1.233E-002
Th-230	4688.465	4405.333	4753.803	121.244	99.7	181.00	0.5000	181	8.267E-001	1.729E-001	5.957E-003	2.431E-002
Th-229	4840.921	4753.803	5124.053	80.178	99.6	360.00	1.2500	359	1.262E+000	1.844E-001	9.423E-003	3.125E-002
Th-228	5421.705	5160.352	5516.082	93.003	99.8	195.00	3.7500	191	8.754E-001	1.820E-001	1.630E-002	4.499E-002

manual integration
shifting KW 4/9/07

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:05:45AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C280211-009
SampleType: Sample
: JRWJA1AE
Sample Collection Date: 3/26/2007 10:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0161g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

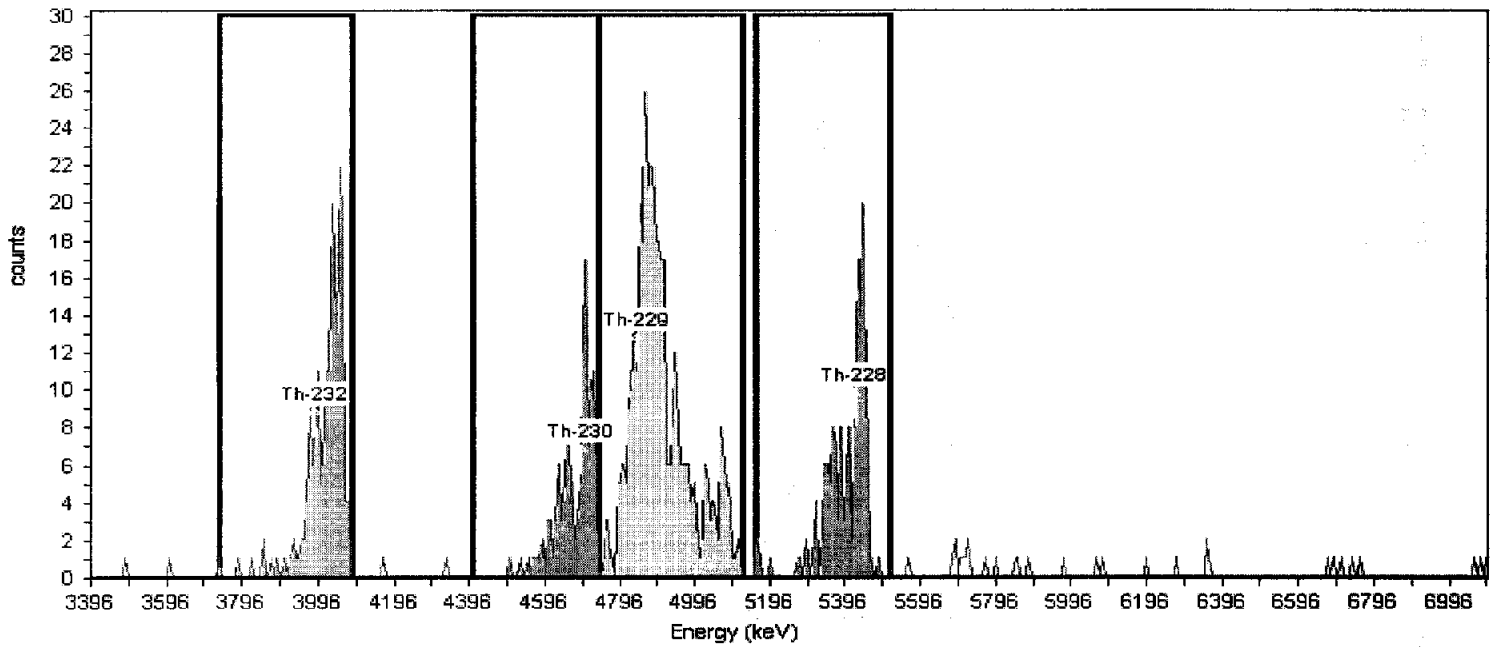
Tracer Nuclide: Th-229
Tracer Recovery: 87.57%

Acquisition

Detector: AV12
Serial Number: 41-172Q2
Acquisition Start Date: 4/5/2007 8:06:44PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:10AM

Calibration Name: Mar2007_AV12
Calibration Date: 3/26/2007 4:58:58PM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.04% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV12; Det: AV12; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	18.032	100.2	186.00	1.7500	184	7.506E-001	1.545E-001	9.911E-003	3.085E-002
Th-230	4688.465	4405.333	4739.284	31.918	99.7	122.00	1.0000	121	4.954E-001	1.150E-001	7.530E-003	2.614E-002
Th-229	4840.921	4739.284	5124.053	90.078	99.6	400.00	0.7500	399	1.432E+000	2.034E-001	6.525E-003	2.413E-002
Th-228	5421.705	5160.352	5516.082	48.628	99.8	157.00	5.7500	151	6.189E-001	1.366E-001	1.805E-002	4.716E-002

manual integration
Shirley KW 4/9/07

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:07:59AM 4/6/2007

Analyst: 60040

Sample

Sample Name: F7C280211-010
SampleType: Sample
: JRWJC1AE
Sample Collection Date: 3/26/2007 10:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0009g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

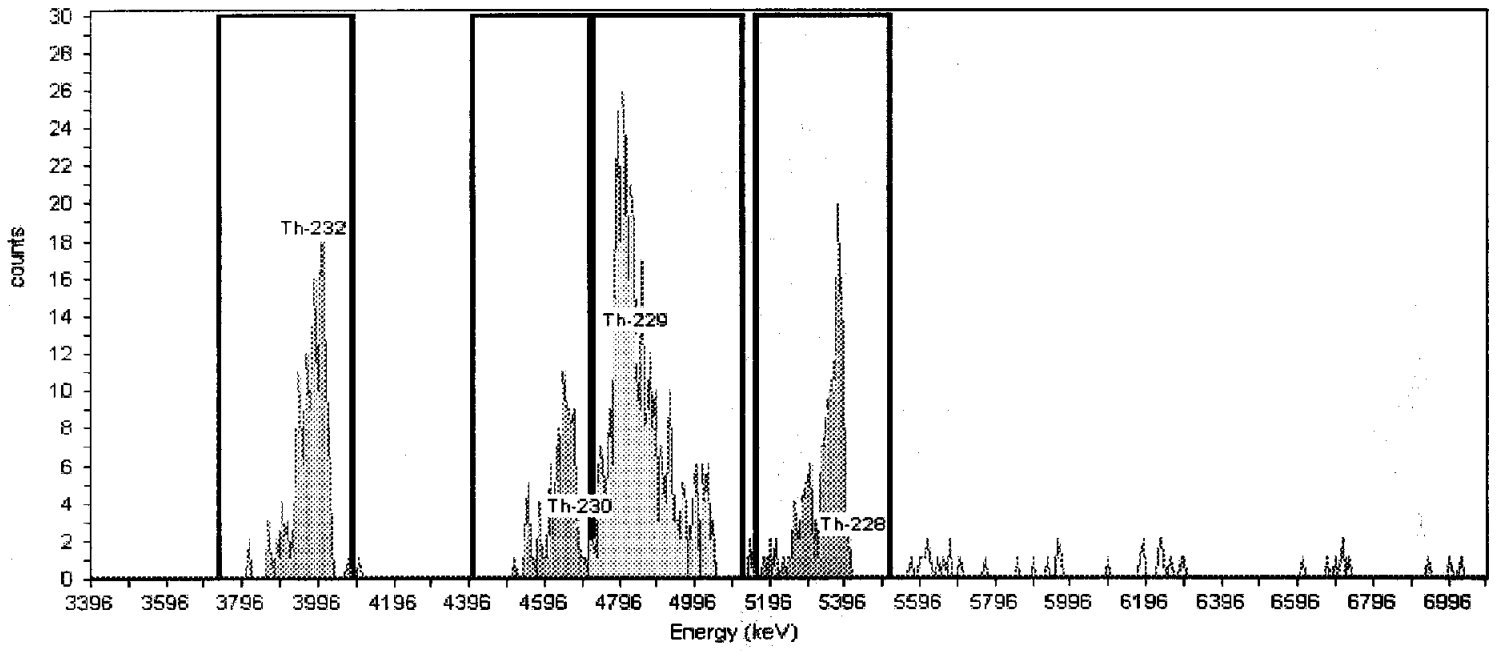
Tracer Nuclide: Th-229
Tracer Recovery: 78.03%

Acquisition

Detector: AV13
Serial Number: 41-172Q1
Acquisition Start Date: 4/5/2007 8:06:45PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:12AM

Calibration Name: Mar2007_AV13
Calibration Date: 3/26/2007 4:58:01PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.07% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV13; Det: AV13; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	73.816	100.2	164.00	0.7500	163	7.236E-001	1.550E-001	7.059E-003	2.611E-002
Th-230	4688.465	4405.333	4717.504	64.423	99.7	95.00	0.2500	95	4.221E-001	1.064E-001	4.096E-003	2.025E-002
Th-229	4840.921	4724.764	5124.053	79.571	99.6	372.00	2.2500	370	1.286E+000	1.866E-001	1.230E-002	3.665E-002
Th-228	5421.705	5160.352	5516.082	54.675	99.8	150.00	3.7500	146	6.511E-001	1.454E-001	1.586E-002	4.376E-002

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:08:22AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C280211-011
SampleType: Sample
: JRWJE1AE
Sample Collection Date: 3/26/2007 10:15:00AM
Comment:.

Spectrum #1 Analysis #1
Sample Weight : 2.0019g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

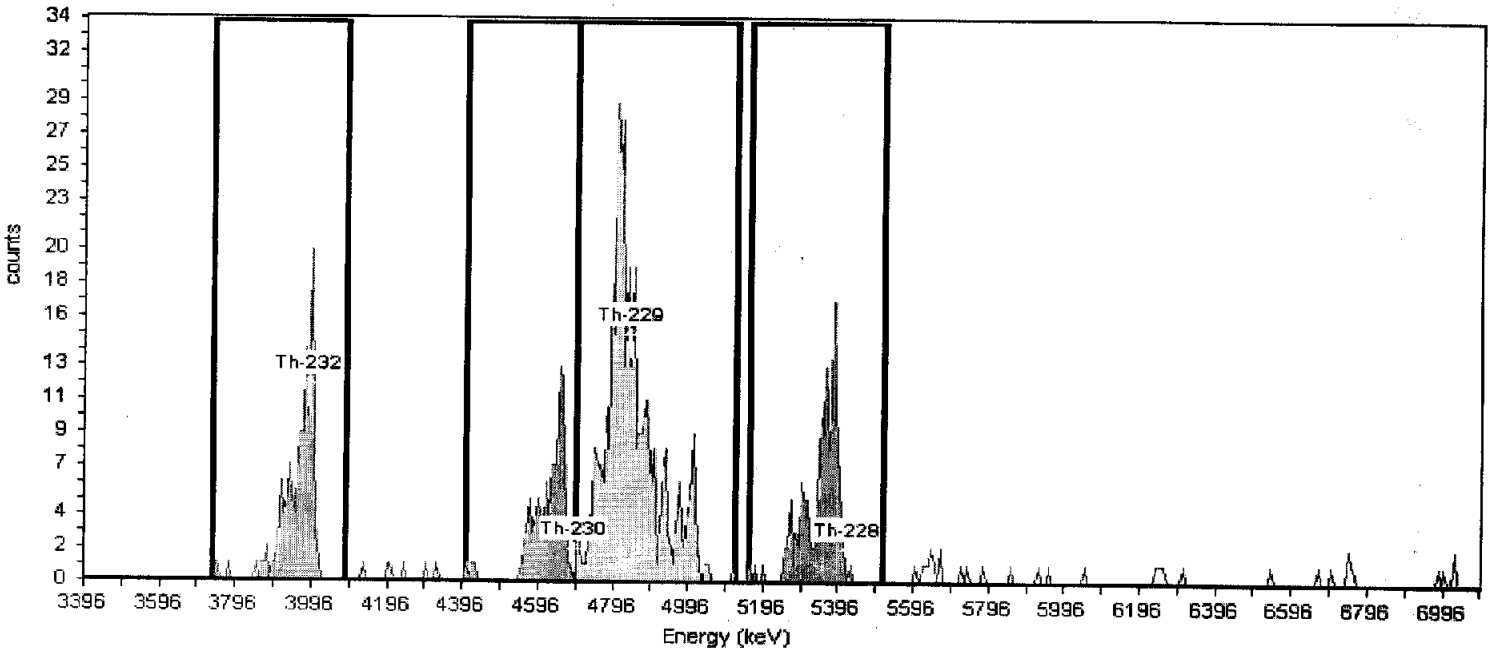
Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

Tracer Nuclide: Th-229
Tracer Recovery: 79.36%

Acquisition

Detector: AV15
Serial Number: 41-172C5
Acquisition Start Date: 4/5/2007 8:06:46PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:15AM
Background Info: Sample: AV15; Det: AV15; Spectrum #1; Mar-24-2007 09:47

Calibration Name: Mar2007_AV15
Calibration Date: 3/27/2007 6:50:49AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.85% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	53.604	100.2	124.00	0.7500	123	5.412E-001	1.256E-001	6.994E-003	2.587E-002
Th-230	4688.465	4405.333	4695.725	15.972	99.7	98.00	0.5000	98	4.303E-001	1.075E-001	5.740E-003	2.342E-002
Th-229	4840.921	4695.725	5124.053	69.899	99.6	374.00	1.0000	373	1.307E+000	1.890E-001	8.121E-003	2.819E-002
Th-228	5421.705	5160.352	5516.082	58.014	99.8	132.00	5.0000	127	5.602E-001	1.314E-001	1.814E-002	4.821E-002

manual integration
NW 4/9/07 Shilong

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:08:09AM 4/6/2007

Analyst: 60040

Sample

Sample Name: F7C280211-012
SampleType: Sample
: JRWJG1AE
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0098g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

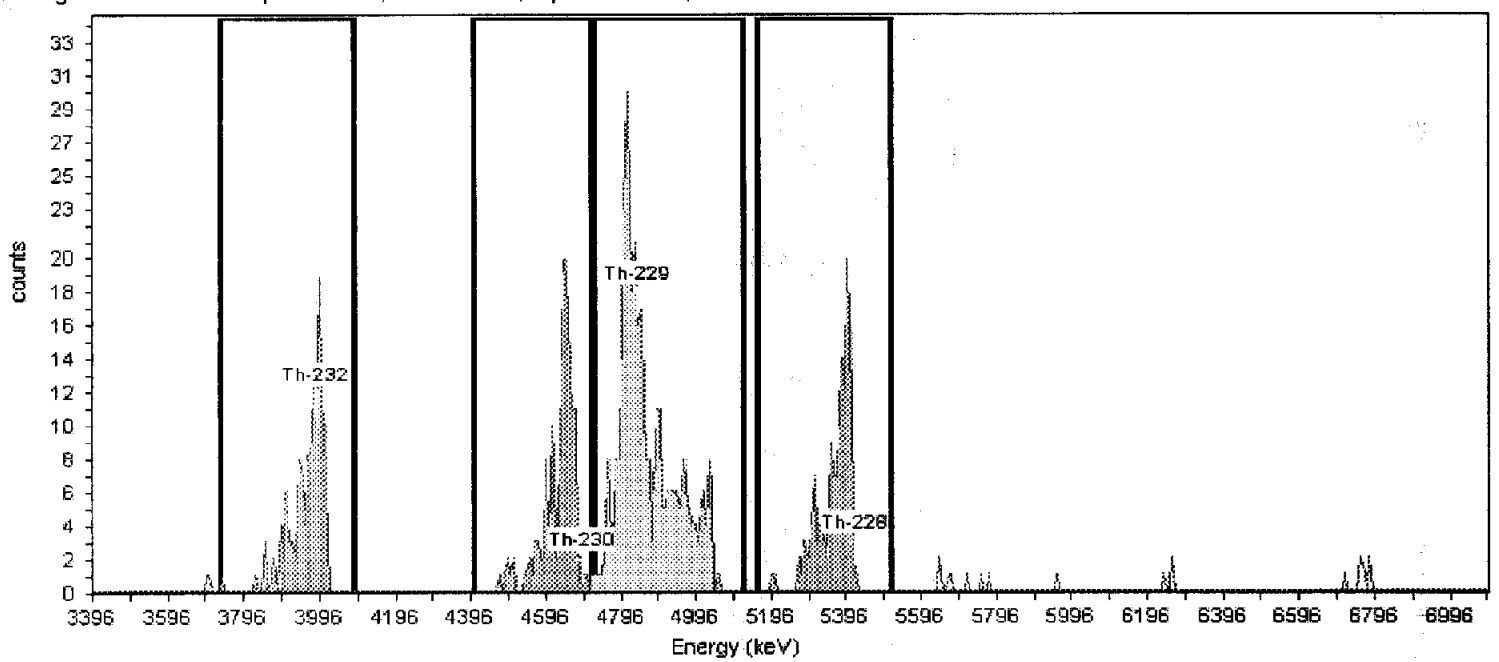
Tracer Nuclide: Th-229
Tracer Recovery: 79.47%

Acquisition

Detector: AV19
Serial Number: 41-172Q6
Acquisition Start Date: 4/5/2007 8:06:48PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:22AM

Calibration Name: Mar2007_AV19
Calibration Date: 3/27/2007 5:22:57PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.06% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV19; Det: AV19; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	56.539	100.2	137.00	1.2500	136	6.110E-001	1.384E-001	9.255E-003	3.069E-002
Th-230	4688.465	4405.333	4717.504	56.932	99.7	152.00	1.5000	151	6.808E-001	1.498E-001	1.019E-002	3.262E-002
Th-229	4840.921	4724.764	5124.053	65.240	99.6	363.00	0.5000	363	1.304E+000	1.898E-001	5.886E-003	2.402E-002
Th-228	5421.705	5160.352	5516.082	53.304	99.8	142.00	1.2500	141	6.363E-001	1.426E-001	9.296E-003	3.082E-002

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:10:47AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C280211-014
SampleType: Sample
: JRWJJ1AE
Sample Collection Date: 3/26/2007 10:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0049g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

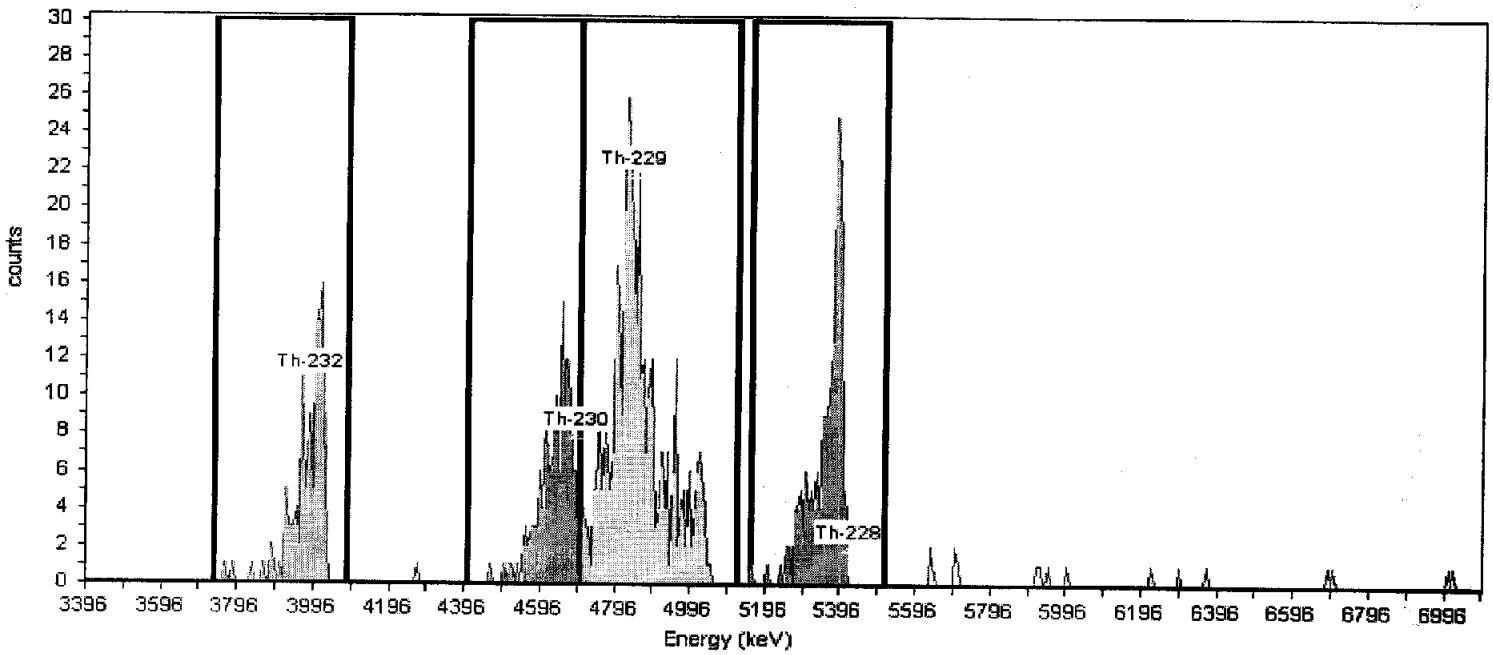
Tracer Nuclide: Th-229
Tracer Recovery: 83.79%

Acquisition

Detector: AV22
Serial Number: 41-172Q5
Acquisition Start Date: 4/5/2007 8:06:37PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:26AM

Calibration Name: Mar2007_AV22
Calibration Date: 3/27/2007 5:23:12PM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 25.63% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV22; Det: AV22; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	58.826	100.2	119.00	0.0000	119	5.176E-001	1.213E-001	0.000E+000	1.177E-002
Th-230	4688.465	4405.333	4702.985	27.557	99.7	134.00	0.5000	134	5.836E-001	1.320E-001	5.685E-003	2.320E-002
Th-229	4840.921	4702.985	5124.053	84.929	99.6	378.00	2.0000	376	1.378E+000	1.990E-001	1.138E-002	3.459E-002
Th-228	5421.705	5160.352	5516.082	52.204	99.8	176.00	1.2500	175	7.635E-001	1.605E-001	8.984E-003	2.979E-002

manual integration
checking KW 4/9/07

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:10:12AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C280211-013
SampleType: Sample
: JRWJH1AE
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0191g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

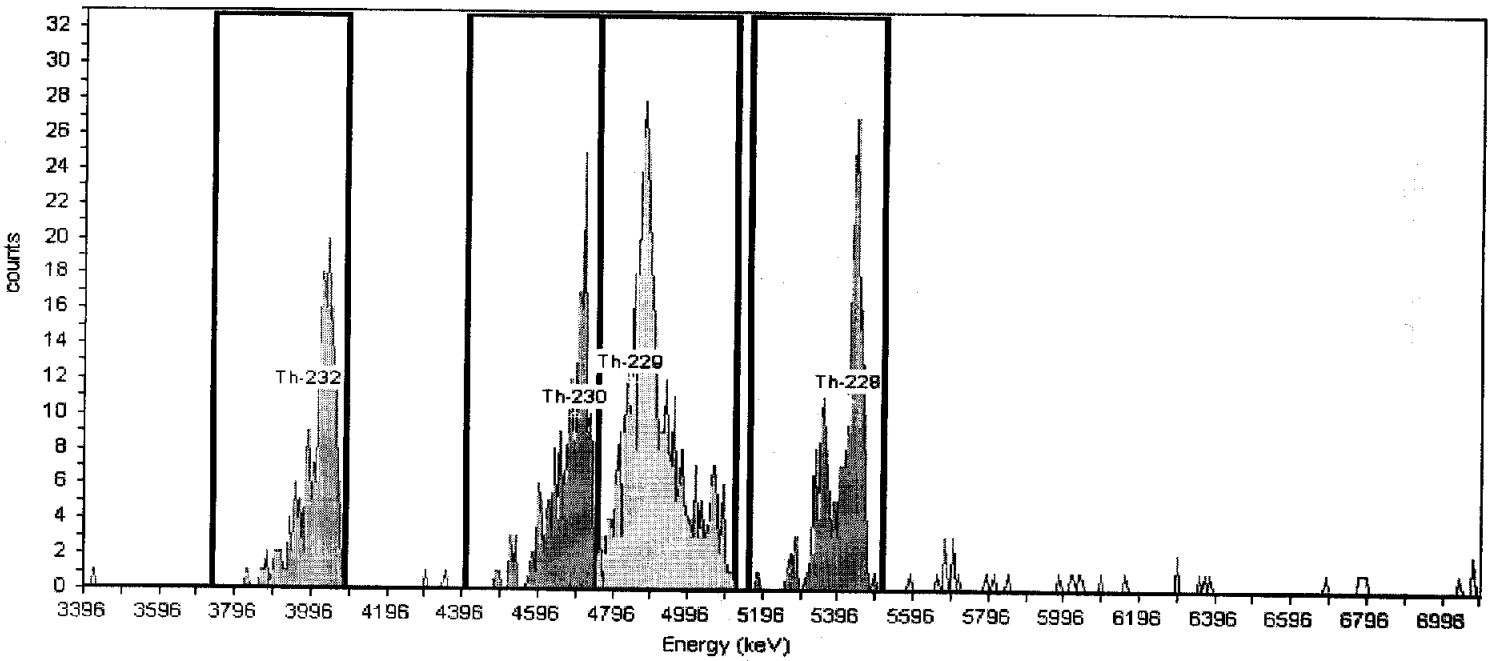
Tracer Nuclide: Th-229
Tracer Recovery: 83.64%

Acquisition

Detector: AV20
Serial Number: 41-172R2
Acquisition Start Date: 4/5/2007 8:06:49PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:23AM

Calibration Name: Mar2007_AV20
Calibration Date: 3/27/2007 6:50:56AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.03% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV20; Det: AV20; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	48.413	100.2	185.00	1.0000	184	7.551E-001	1.554E-001	7.547E-003	2.620E-002
Th-230	4688.465	4405.333	4753.803	15.076	99.7	193.00	0.7500	192	7.929E-001	1.612E-001	6.569E-003	2.430E-002
Th-229	4840.921	4753.803	5124.053	69.008	99.6	397.00	1.2500	396	1.366E+000	1.945E-001	8.485E-003	2.814E-002
Th-228	5421.705	5160.352	5516.082	51.004	99.8	212.00	6.0000	206	8.491E-001	1.718E-001	1.857E-002	4.829E-002

manual integration
sheting MW 4/9/07

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:11:28AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C280211-015
SampleType: Sample
: JRWJK1AE
Sample Collection Date: 3/26/2007 10:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0010g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

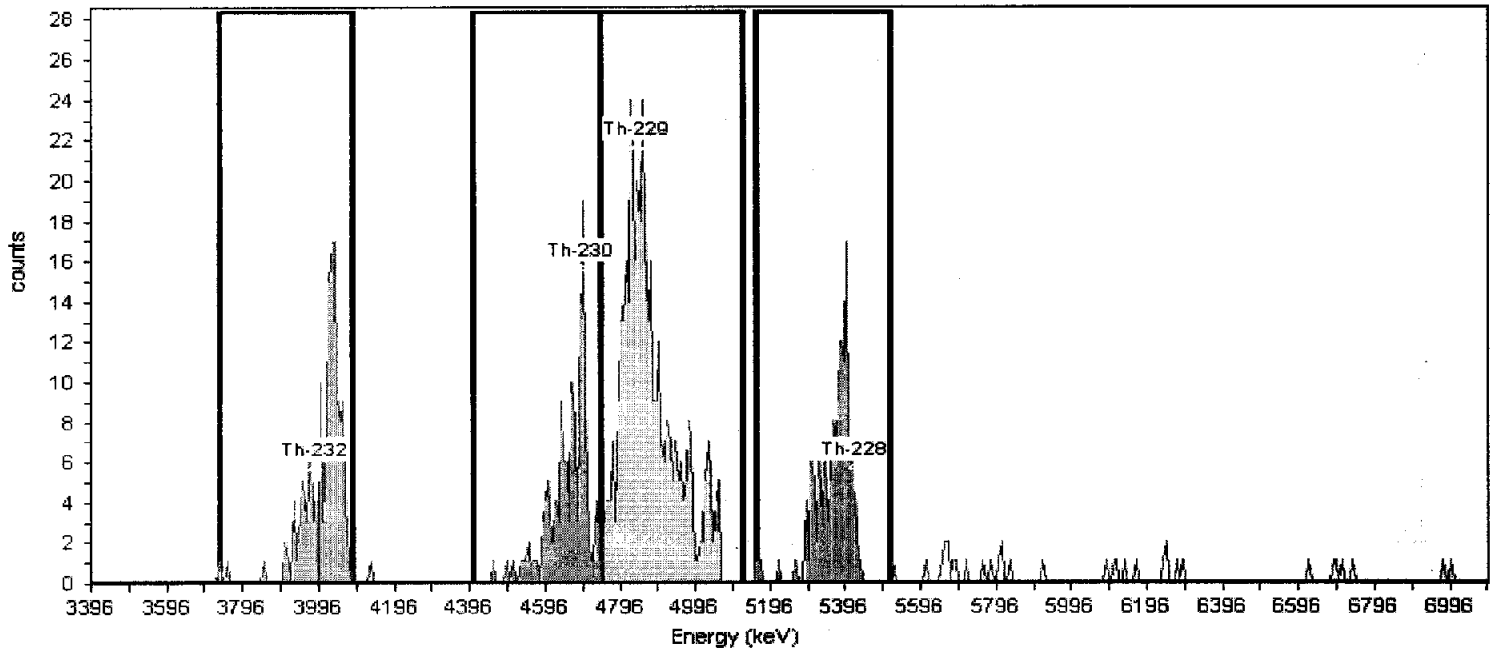
Tracer Nuclide: Th-229
Tracer Recovery: 79.33%

Acquisition

Detector: AV23
Serial Number: 41-172R4
Acquisition Start Date: 4/5/2007 8:06:39PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:28AM

Calibration Name: Mar2007_AV23
Calibration Date: 3/28/2007 7:11:04AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.77% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV23; Det: AV23; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	52.778	100.2	139.00	0.2500	139	6.116E-001	1.368E-001	4.054E-003	2.004E-002
Th-230	4688.465	4405.333	4746.543	77.773	99.7	129.00	1.5000	128	5.649E-001	1.303E-001	9.979E-003	3.195E-002
Th-229	4840.921	4746.543	5124.053	95.207	99.6	373.00	1.2500	372	1.307E+000	1.892E-001	9.115E-003	3.022E-002
Th-228	5421.705	5160.352	5516.082	60.493	99.8	128.00	2.7500	125	5.546E-001	1.294E-001	1.350E-002	3.899E-002

manual integration shifting MW 4/11/07

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:12:10AM 4/9/2007

Analyst: 60040

Sample

Sample Name: F7C300000-189B
SampleType: Blank
: JR3GA1AA
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0000g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

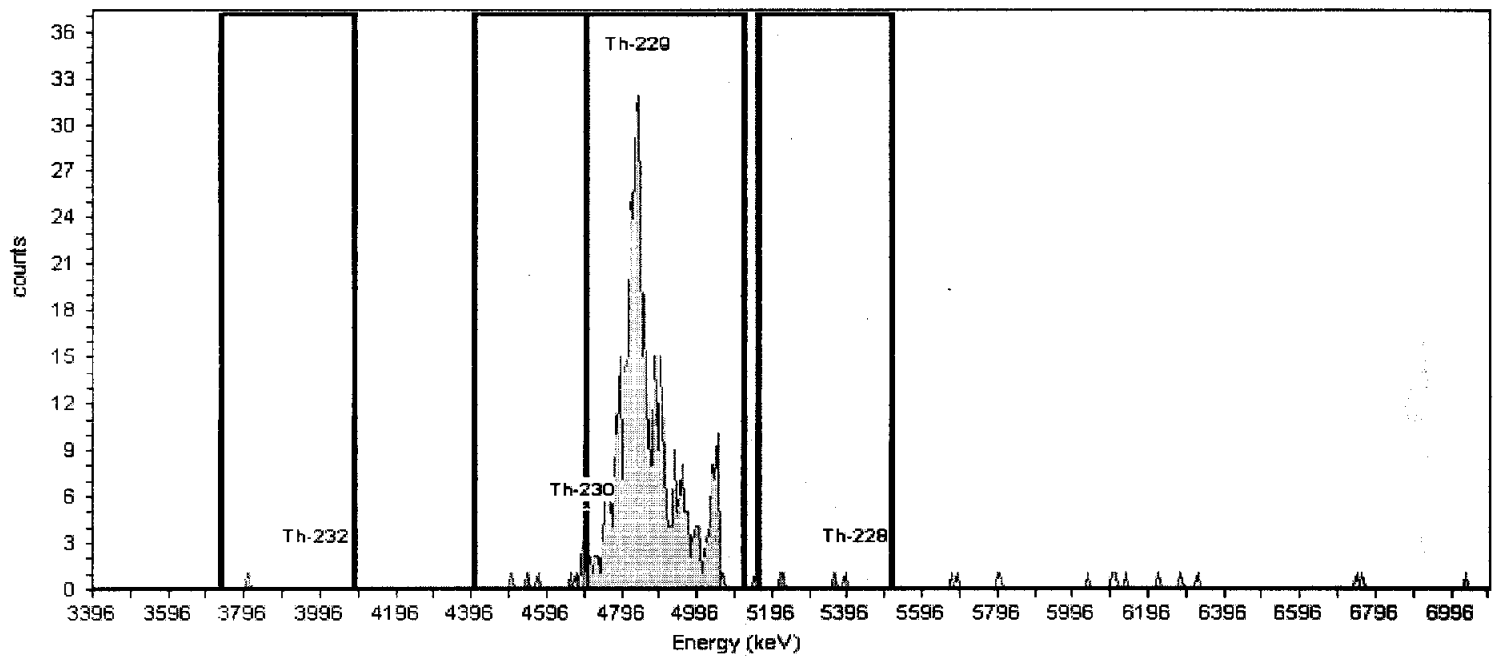
Tracer Nuclide: Th-229
Tracer Recovery: 92.20%

Acquisition

Detector: AV24
Serial Number: 41-172R5
Acquisition Start Date: 4/5/2007 8:06:41PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:30AM

Calibration Name: Mar2007_AV24
Calibration Date: 3/28/2007 7:11:08AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.02% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV24; Det: AV24; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	43.286	100.2	1.00	1.0000	0	0.000E+000	0.000E+000	7.180E-003	2.492E-002
Th-230	4688.465	4405.333	4702.985	14.724	99.7	10.00	0.7500	9	3.629E-002	2.623E-002	6.249E-003	2.311E-002
Th-229	4840.921	4702.985	5124.053	62.504	99.6	421.00	1.0000	420	1.520E+000	2.132E-001	7.219E-003	2.506E-002
Th-228	5421.705	5160.352	5516.082	43.459	99.8	4.00	4.0000	0	0.000E+000	0.000E+000	1.442E-002	3.945E-002

manual integration
shifting MW 4/9/07

ST SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 10:12:50AM 4/9/2007

Sample

Sample Name: F7C300000-189C
SampleType: Control
: JR3GA1AC
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 0.1314g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089189
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad05-0088_Th229
Tracer Activity: 73.20 DPM/mL x (Vol.)0.10 mL = 7.32 DPM
Tracer Ref. Date: 3/19/2007 8:41:39AM

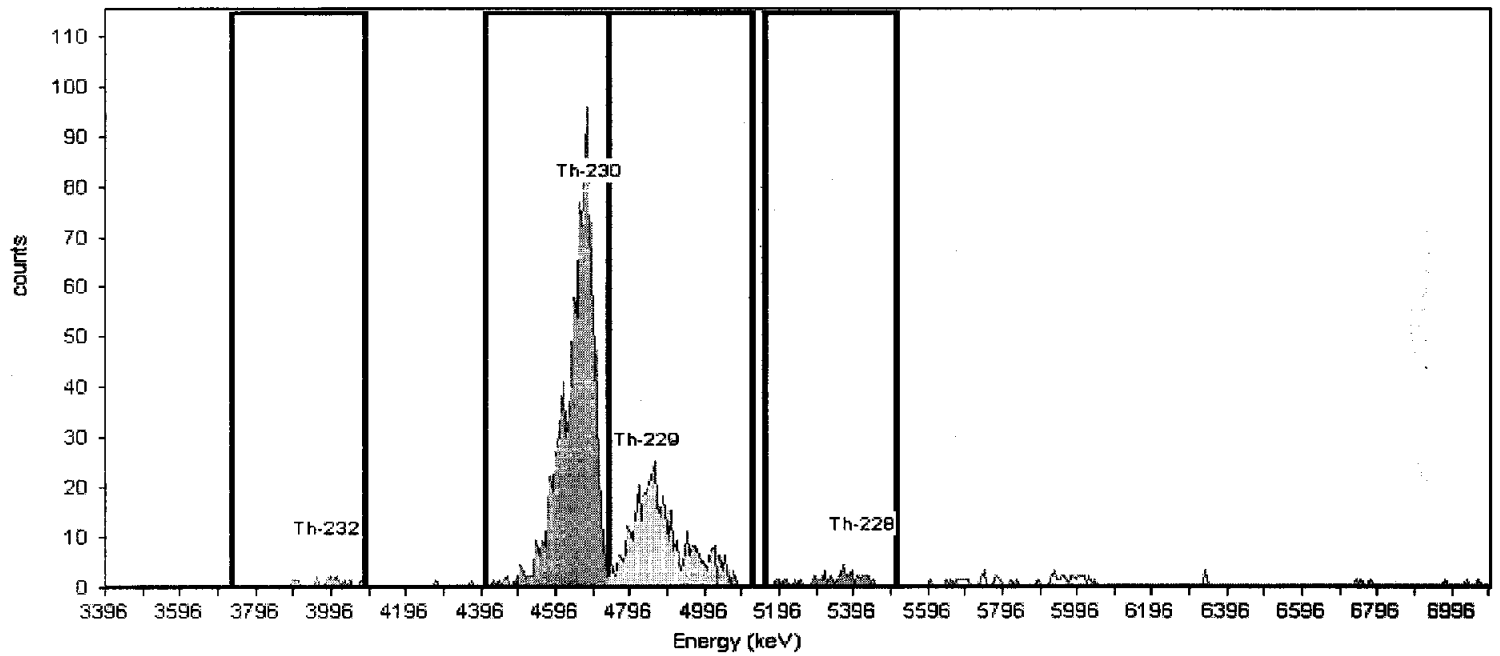
Tracer Nuclide: Th-229
Tracer Recovery: 90.13%

Acquisition

Detector: AV17
Serial Number: 41-172Q4
Acquisition Start Date: 4/5/2007 8:06:46PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:19AM

Calibration Name: Mar2007_AV17
Calibration Date: 3/27/2007 6:49:17AM
Energy Cal: Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.63% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV17; Det: AV17; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = ThROI
Decay Correction: 4/5/2007 8:03:49PM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Thorium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
Th-232	3984.265	3730.172	4085.902	50.941	100.2	15.00	1.0000	14	8.313E-001	4.892E-001	1.092E-001	3.791E-001
Th-230	4688.465	4405.333	4739.284	71.525	99.7	1,008.00	2.0000	1,006	6.004E+001	9.259E+000	1.552E-001	4.719E-001
Th-229	4840.921	4739.284	5124.053	110.462	99.6	422.00	1.7500	420	2.262E+001	3.174E+000	1.453E-001	4.521E-001
Th-228	5421.705	5160.352	5516.082	132.218	99.8	41.00	22.7500	18	1.088E+000	9.647E-001	5.232E-001	1.208E+000

Manual Integration
Ohlberg 4/9/07

TestAmerica STL

Daily Pulsers

4/5/07

Daily Pulser Check - Severn Trent Lab

Pulser Date: 4/5/2007

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria	P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria	P/F	Energy (keV) Result	Energy (keV) Criteria	P/F
AV1	04/05/2007 6:16	7446	7218.7 +/- 5%	Pass	14.5	5 - 50	Pass	221.9	229.0 +/- 5%	Pass	5000	5051.1 +/- 25%	Pass
AV2	04/05/2007 6:16	7441	7468.7 +/- 5%	Pass	15.1	5 - 50	Pass	228.0	222.9 +/- 5%	Pass	5044	5007.5 +/- 25%	Pass
AV3	04/05/2007 6:16	7443	7484.9 +/- 5%	Pass	13.8	5 - 50	Pass	222.0	225.9 +/- 5%	Pass	5001	5028.8 +/- 25%	Pass
AV4	04/05/2007 6:16	7429	7413.7 +/- 5%	Pass	14.8	5 - 50	Pass	227.0	224.9 +/- 5%	Pass	5037	5021.6 +/- 25%	Pass
AV6	04/05/2007 8:08	7307	7476.7 +/- 5%	Pass	11.5	5 - 50	Pass	220.0	224.0 +/- 5%	Pass	4986	5015.3 +/- 25%	Pass
AV7	04/05/2007 8:08	7377	7477.0 +/- 5%	Pass	14.0	5 - 50	Pass	226.9	224.9 +/- 5%	Pass	5036	5021.9 +/- 25%	Pass
AV8	04/05/2007 8:08	7332	7327.4 +/- 5%	Pass	16.0	5 - 50	Pass	223.9	228.0 +/- 5%	Pass	5015	5044.6 +/- 25%	Pass
AV9	04/05/2007 8:08	7658	7519.3 +/- 5%	Pass	13.7	5 - 50	Pass	225.0	227.9 +/- 5%	Pass	5022	5043.3 +/- 25%	Pass
AV11	04/05/2007 8:08	7642	7666.2 +/- 5%	Pass	20.4	5 - 50	Pass	223.9	225.0 +/- 5%	Pass	5015	5022.1 +/- 25%	Pass
AV12	04/05/2007 8:08	7645	7588.7 +/- 5%	Pass	15.1	5 - 50	Pass	223.9	230.0 +/- 5%	Pass	5015	5058.4 +/- 25%	Pass
AV13	04/05/2007 6:15	7707	7584.6 +/- 5%	Pass	14.0	5 - 50	Pass	225.9	228.0 +/- 5%	Pass	5029	5044.1 +/- 25%	Pass
AV14	04/05/2007 6:15	7706	7638.3 +/- 5%	Pass	13.1	5 - 50	Pass	221.9	227.0 +/- 5%	Pass	5000	5037.2 +/- 25%	Pass
AV15	04/05/2007 6:15	7533	7770.5 +/- 5%	Pass	17.8	5 - 50	Pass	220.8	226.9 +/- 5%	Pass	4992	5036.6 +/- 25%	Pass
AV17	04/05/2007 6:15	7747	7619.1 +/- 5%	Pass	40.5	5 - 50	Pass	226.9	229.9 +/- 5%	Pass	5036	5058.3 +/- 25%	Pass
AV18	04/05/2007 6:15	7733	7714.5 +/- 5%	Pass	14.8	5 - 50	Pass	223.1	226.9 +/- 5%	Pass	5009	5036.4 +/- 25%	Pass
AV19	04/05/2007 6:15	7741	7269.8 +/- 5%	FAIL	13.8	5 - 50	Pass	219.9	227.7 +/- 5%	Pass	4985	5041.9 +/- 25%	Pass
AV19	04/05/2007 8:08	7614	7269.8 +/- 5%	Pass	14.2	5 - 50	Pass	219.9	227.7 +/- 5%	Pass	4985	5041.9 +/- 25%	Pass
AV20	04/05/2007 6:15	7736	7503.6 +/- 5%	Pass	13.9	5 - 50	Pass	227.0	226.0 +/- 5%	Pass	5037	5029.9 +/- 25%	Pass
AV21	04/05/2007 6:15	7738	7550.9 +/- 5%	Pass	13.7	5 - 50	Pass	223.0	226.0 +/- 5%	Pass	5008	5029.6 +/- 25%	Pass
AV22	04/05/2007 6:15	7724	7691.4 +/- 5%	Pass	15.1	5 - 50	Pass	224.2	225.0 +/- 5%	Pass	5016	5022.4 +/- 25%	Pass
AV23	04/05/2007 6:15	7717	7665.3 +/- 5%	Pass	20.1	5 - 50	Pass	229.9	229.8 +/- 5%	Pass	5058	5057.0 +/- 25%	Pass
AV24	04/05/2007 6:15	7700	7354.0 +/- 5%	Pass	15.8	5 - 50	Pass	224.1	226.9 +/- 5%	Pass	5016	5036.4 +/- 25%	Pass
AV45	04/05/2007 6:16	7649	7593.5 +/- 5%	Pass	18.2	5 - 50	Pass	226.9	225.6 +/- 5%	Pass	5036	5026.9 +/- 25%	Pass
AV46	04/05/2007 6:16	7458	7722.7 +/- 5%	Pass	12.9	5 - 50	Pass	224.0	225.8 +/- 5%	Pass	5015	5028.0 +/- 25%	Pass
AV47	04/05/2007 6:16	7646	7532.5 +/- 5%	Pass	14.1	5 - 50	Pass	223.0	226.0 +/- 5%	Pass	5008	5029.6 +/- 25%	Pass
AV48	04/05/2007 6:16	7631	7717.5 +/- 5%	Pass	15.5	5 - 50	Pass	224.9	224.0 +/- 5%	Pass	5022	5015.2 +/- 25%	Pass
AV49	04/05/2007 6:16	7637	7703.4 +/- 5%	Pass	14.2	5 - 50	Pass	231.8	226.0 +/- 5%	Pass	5072	5029.5 +/- 25%	Pass
AV50	04/05/2007 6:16	7589	7660.9 +/- 5%	Pass	21.7	5 - 50	Pass	224.8	227.0 +/- 5%	Pass	5021	5037.2 +/- 25%	Pass
AV51	04/05/2007 6:16	7361	7070.5 +/- 5%	Pass	13.8	5 - 50	Pass	226.9	223.0 +/- 5%	Pass	5036	5007.6 +/- 25%	Pass
AV52	04/05/2007 6:16	7313	7156.4 +/- 5%	Pass	15.9	5 - 50	Pass	222.9	225.0 +/- 5%	Pass	5007	5022.4 +/- 25%	Pass
AV53	04/05/2007 6:16	7358	7144.1 +/- 5%	Pass	13.3	5 - 50	Pass	224.0	223.0 +/- 5%	Pass	5016	5007.8 +/- 25%	Pass
AV54	04/05/2007 6:16	7354	7313.1 +/- 5%	Pass	13.5	5 - 50	Pass	228.0	226.0 +/- 5%	Pass	5044	5029.5 +/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria		P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria		P/F	Energy (keV) Result	Energy (keV) Criteria		P/F
AV55	04/05/2007 6:16	7352	7132.9	+/- 5%	Pass	13.5	5 - 50	Pass	225.1	226.0	+/- 5%	Pass	5023	5029.7	+/- 25%	Pass
AV56	04/05/2007 6:16	7346	7163.7	+/- 5%	Pass	14.5	5 - 50	Pass	220.9	222.0	+/- 5%	Pass	4992	5000.7	+/- 25%	Pass
AV57	04/05/2007 6:16	7348	7309.5	+/- 5%	Pass	22.2	5 - 50	Pass	226.0	222.0	+/- 5%	Pass	5030	5000.6	+/- 25%	Pass
AV58	04/05/2007 6:16	7343	7249.2	+/- 5%	Pass	13.9	5 - 50	Pass	220.9	223.0	+/- 5%	Pass	4993	5008.0	+/- 25%	Pass
AV59	04/05/2007 6:16	7304	7141.4	+/- 5%	Pass	15.4	5 - 50	Pass	288.1	284.0	+/- 5%	Pass	5480	5450.6	+/- 25%	Pass
AV60	04/05/2007 6:16	7325	7019.7	+/- 5%	Pass	41.3	5 - 50	Pass	221.2	223.0	+/- 5%	Pass	4995	5007.5	+/- 25%	Pass
AV63	04/05/2007 6:16	7311	7120.8	+/- 5%	Pass	28.2	5 - 50	Pass	225.2	223.0	+/- 5%	Pass	5024	5007.9	+/- 25%	Pass
AV64	04/05/2007 6:16	7320	7153.7	+/- 5%	Pass	31.8	5 - 50	Pass	221.4	224.0	+/- 5%	Pass	4996	5015.3	+/- 25%	Pass
AV65	04/05/2007 6:16	7284	7233.4	+/- 5%	Pass	23.4	5 - 50	Pass	221.1	224.0	+/- 5%	Pass	4994	5015.3	+/- 25%	Pass
AV66	04/05/2007 6:16	7307	7165.5	+/- 5%	Pass	14.6	5 - 50	Pass	218.9	222.0	+/- 5%	Pass	4978	5000.5	+/- 25%	Pass
AV67	04/05/2007 6:16	7441	7128.1	+/- 5%	Pass	18.8	5 - 50	Pass	225.0	224.1	+/- 5%	Pass	5022	5015.6	+/- 25%	Pass
AV68	04/05/2007 6:16	7439	7259.5	+/- 5%	Pass	14.3	5 - 50	Pass	222.0	222.0	+/- 5%	Pass	5000	5000.8	+/- 25%	Pass
AV69	04/05/2007 6:15	7400	7305.4	+/- 5%	Pass	16.4	5 - 50	Pass	221.0	222.0	+/- 5%	Pass	4994	5000.6	+/- 25%	Pass
AV70	04/05/2007 6:15	7440	7406.5	+/- 5%	Pass	13.3	5 - 50	Pass	219.0	222.6	+/- 5%	Pass	4979	5004.7	+/- 25%	Pass
AV71	04/05/2007 6:15	7267	7187.3	+/- 5%	Pass	12.9	5 - 50	Pass	220.0	225.0	+/- 5%	Pass	4986	5022.7	+/- 25%	Pass
AV72	04/05/2007 6:15	7189	7090.0	+/- 5%	Pass	12.7	5 - 50	Pass	220.0	223.9	+/- 5%	Pass	4986	5014.6	+/- 25%	Pass
AV73	04/05/2007 6:15	7430	7251.3	+/- 5%	Pass	22.8	5 - 50	Pass	221.0	225.0	+/- 5%	Pass	4993	5022.4	+/- 25%	Pass
AV75	04/05/2007 6:15	7379	7267.9	+/- 5%	Pass	12.5	5 - 50	Pass	223.0	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV76	04/05/2007 6:15	7556	7374.3	+/- 5%	Pass	13.4	5 - 50	Pass	222.9	224.0	+/- 5%	Pass	5007	5015.2	+/- 25%	Pass
AV77	04/05/2007 6:15	7555	7497.1	+/- 5%	Pass	13.1	5 - 50	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV78	04/05/2007 6:15	7250	7183.8	+/- 5%	Pass	12.8	5 - 50	Pass	223.0	223.3	+/- 5%	Pass	5008	5009.8	+/- 25%	Pass
AV79	04/05/2007 6:15	7414	7349.7	+/- 5%	Pass	12.8	5 - 50	Pass	221.0	222.0	+/- 5%	Pass	4993	5000.4	+/- 25%	Pass
AV80	04/05/2007 6:16	7339	7226.4	+/- 5%	Pass	12.7	5 - 50	Pass	223.0	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV81	04/05/2007 6:16	7545	7453.4	+/- 5%	Pass	13.1	5 - 50	Pass	222.0	223.0	+/- 5%	Pass	5000	5008.1	+/- 25%	Pass
AV82	04/05/2007 6:16	7542	7529.2	+/- 5%	Pass	13.8	5 - 50	Pass	223.9	224.0	+/- 5%	Pass	5015	5015.2	+/- 25%	Pass
AV83	04/05/2007 6:16	7554	7523.7	+/- 5%	Pass	12.4	5 - 50	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.4	+/- 25%	Pass
AV84	04/05/2007 6:16	7468	7637.7	+/- 5%	Pass	12.5	5 - 50	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.7	+/- 25%	Pass
AV85	04/05/2007 6:16	7553	7549.7	+/- 5%	Pass	12.4	5 - 50	Pass	223.0	223.0	+/- 5%	Pass	5008	5008.0	+/- 25%	Pass
AV86	04/05/2007 6:16	7688	7679.0	+/- 5%	Pass	16.9	5 - 50	Pass	224.0	223.9	+/- 5%	Pass	5016	5014.3	+/- 25%	Pass
AV87	04/05/2007 6:16	7720	7512.4	+/- 5%	Pass	13.1	5 - 50	Pass	223.1	223.0	+/- 5%	Pass	5008	5007.7	+/- 25%	Pass
AV88	04/05/2007 6:16	7717	7716.1	+/- 5%	Pass	13.7	5 - 50	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV89	04/05/2007 6:16	7714	7553.8	+/- 5%	Pass	13.7	5 - 50	Pass	221.1	222.6	+/- 5%	Pass	4994	5004.7	+/- 25%	Pass
AV90	04/05/2007 6:16	7713	7474.4	+/- 5%	Pass	13.1	5 - 50	Pass	224.1	224.1	+/- 5%	Pass	5016	5015.6	+/- 25%	Pass
AV92	04/05/2007 6:16	7252	7358.9	+/- 5%	Pass	12.8	5 - 50	Pass	222.9	223.9	+/- 5%	Pass	5007	5014.6	+/- 25%	Pass
AV93	04/05/2007 6:16	7463	7393.5	+/- 5%	Pass	12.5	5 - 50	Pass	223.0	223.0	+/- 5%	Pass	5008	5008.3	+/- 25%	Pass
AV94	04/05/2007 6:16	7642	7477.9	+/- 5%	Pass	14.6	5 - 50	Pass	222.1	222.0	+/- 5%	Pass	5001	5000.5	+/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria		Gross Counts P/F	FWHM (keV) Result	FWHM (keV) Criteria	FWHM (keV) P/F	Pulser Center Result	Pulser Center Criteria		Pulser Center P/F	Energy (keV) Result	Energy (keV) Criteria		Energy (keV) P/F
AV95	04/05/2007 6:16	7646	7432.4	+/- 5%	Pass	13.0	5 - 50	Pass	221.0	222.2	+/- 5%	Pass	4994	5001.9	+/- 25%	Pass
AV96	04/05/2007 6:16	7644	7654.3	+/- 5%	Pass	13.4	5 - 50	Pass	222.0	222.6	+/- 5%	Pass	5001	5005.3	+/- 25%	Pass
AV97	04/05/2007 6:16	7640	7649.9	+/- 5%	Pass	13.8	5 - 50	Pass	223.0	223.8	+/- 5%	Pass	5008	5014.0	+/- 25%	Pass
AV98	04/05/2007 6:16	7635	7582.0	+/- 5%	Pass	13.2	5 - 50	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.6	+/- 25%	Pass

TestAmerica STL

Daily Pulsers

4/12/07

Daily Pulser Check - Severn Trent Lab

Pulser Date: 4/12/2007

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria	P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria	P/F	Energy (keV) Result	Energy (keV) Criteria	P/F
AV1	04/12/2007 7:10	7448	7218.7 +/- 5%	Pass	14.4	10 - 20	Pass	222.0	229.0 +/- 5%	Pass	5001	5051.1 +/- 25%	Pass
AV2	04/12/2007 7:10	7436	7468.7 +/- 5%	Pass	15.4	10 - 20	Pass	225.9	222.9 +/- 5%	Pass	5029	5007.5 +/- 25%	Pass
AV3	04/12/2007 7:10	7373	7484.9 +/- 5%	Pass	14.0	10 - 20	Pass	222.0	225.9 +/- 5%	Pass	5001	5028.8 +/- 25%	Pass
AV4	04/12/2007 7:10	7358	7413.7 +/- 5%	Pass	15.1	10 - 20	Pass	227.1	224.9 +/- 5%	Pass	5037	5021.6 +/- 25%	Pass
AV6	04/12/2007 7:10	7316	7476.7 +/- 5%	Pass	11.3	10 - 20	Pass	222.0	224.0 +/- 5%	Pass	5001	5015.3 +/- 25%	Pass
AV7	04/12/2007 7:10	6862	7477.0 +/- 5%	FAIL	12.7	10 - 20	Pass	228.2	224.9 +/- 5%	Pass	5045	5021.9 +/- 25%	Pass
AV7	04/12/2007 8:14	7343	7477.0 +/- 5%	Pass	14.4	10 - 20	Pass	228.1	224.9 +/- 5%	Pass	5045	5021.9 +/- 25%	Pass
AV8	04/12/2007 7:10	7320	7327.4 +/- 5%	Pass	15.8	10 - 20	Pass	223.8	228.0 +/- 5%	Pass	5014	5044.6 +/- 25%	Pass
AV9	04/12/2007 7:10	7726	7519.3 +/- 5%	Pass	13.7	10 - 20	Pass	225.0	227.9 +/- 5%	Pass	5022	5043.3 +/- 25%	Pass
AV11	04/12/2007 7:10	7717	7666.2 +/- 5%	Pass	18.9	10 - 20	Pass	227.2	225.0 +/- 5%	Pass	5038	5022.1 +/- 25%	Pass
AV12	04/12/2007 7:10	7709	7588.7 +/- 5%	Pass	15.0	10 - 20	Pass	225.0	230.0 +/- 5%	Pass	5023	5058.4 +/- 25%	Pass
AV13	04/12/2007 7:10	7713	7584.6 +/- 5%	Pass	14.2	10 - 20	Pass	226.0	228.0 +/- 5%	Pass	5029	5044.1 +/- 25%	Pass
AV14	04/12/2007 7:10	7715	7638.3 +/- 5%	Pass	13.3	10 - 20	Pass	221.9	227.0 +/- 5%	Pass	5000	5037.2 +/- 25%	Pass
AV15	04/12/2007 7:10	7679	7770.5 +/- 5%	Pass	15.7	10 - 20	Pass	222.0	226.9 +/- 5%	Pass	5000	5036.6 +/- 25%	Pass
AV17	04/12/2007 7:10	7754	7619.1 +/- 5%	Pass	13.6	10 - 20	Pass	225.1	229.9 +/- 5%	Pass	5023	5058.3 +/- 25%	Pass
AV18	04/12/2007 7:10	7737	7714.5 +/- 5%	Pass	15.5	10 - 20	Pass	221.8	226.9 +/- 5%	Pass	4999	5036.4 +/- 25%	Pass
AV19	04/12/2007 7:10	7748	7269.8 +/- 5%	FAIL	13.8	10 - 20	Pass	220.9	227.7 +/- 5%	Pass	4993	5041.9 +/- 25%	Pass
AV19	04/12/2007 8:14	7627	7269.8 +/- 5%	Pass	13.6	10 - 20	Pass	220.9	227.7 +/- 5%	Pass	4993	5041.9 +/- 25%	Pass
AV20	04/12/2007 7:10	7742	7503.6 +/- 5%	Pass	14.0	10 - 20	Pass	227.0	226.0 +/- 5%	Pass	5037	5029.9 +/- 25%	Pass
AV21	04/12/2007 7:10	7744	7550.9 +/- 5%	Pass	13.5	10 - 20	Pass	223.0	226.0 +/- 5%	Pass	5008	5029.6 +/- 25%	Pass
AV22	04/12/2007 7:10	7738	7691.4 +/- 5%	Pass	13.8	10 - 20	Pass	224.2	225.0 +/- 5%	Pass	5016	5022.4 +/- 25%	Pass
AV23	04/12/2007 7:11	7737	7665.3 +/- 5%	Pass	13.6	10 - 20	Pass	222.0	229.8 +/- 5%	Pass	5001	5057.0 +/- 25%	Pass
AV24	04/12/2007 7:11	7714	7354.0 +/- 5%	Pass	15.4	10 - 20	Pass	224.0	226.9 +/- 5%	Pass	5015	5036.4 +/- 25%	Pass
AV45	04/12/2007 7:11	7636	7593.5 +/- 5%	Pass	17.7	10 - 20	Pass	227.0	225.6 +/- 5%	Pass	5037	5026.9 +/- 25%	Pass
AV46	04/12/2007 7:11	7210	7722.7 +/- 5%	FAIL	13.1	10 - 20	Pass	224.1	225.8 +/- 5%	Pass	5016	5028.0 +/- 25%	Pass
AV46	04/12/2007 8:14	7171	7722.7 +/- 5%	FAIL	12.8	10 - 20	Pass	224.1	225.8 +/- 5%	Pass	5016	5028.0 +/- 25%	Pass
AV47	04/12/2007 7:11	7625	7532.5 +/- 5%	Pass	14.5	10 - 20	Pass	220.9	226.0 +/- 5%	Pass	4993	5029.6 +/- 25%	Pass
AV48	04/12/2007 7:11	7612	7717.5 +/- 5%	Pass	15.7	10 - 20	Pass	223.1	224.0 +/- 5%	Pass	5009	5015.2 +/- 25%	Pass
AV49	04/12/2007 7:11	7617	7703.4 +/- 5%	Pass	14.9	10 - 20	Pass	232.0	226.0 +/- 5%	Pass	5073	5029.5 +/- 25%	Pass
AV50	04/12/2007 7:11	7598	7660.9 +/- 5%	Pass	15.4	10 - 20	Pass	225.1	227.0 +/- 5%	Pass	5023	5037.2 +/- 25%	Pass
AV51	04/12/2007 7:11	7358	7070.5 +/- 5%	Pass	13.1	10 - 20	Pass	227.0	223.0 +/- 5%	Pass	5037	5007.6 +/- 25%	Pass
AV52	04/12/2007 7:11	7354	7156.4 +/- 5%	Pass	18.0	10 - 20	Pass	223.0	225.0 +/- 5%	Pass	5008	5022.4 +/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria		P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria		P/F	Energy (keV) Result	Energy (keV) Criteria		P/F
AV53	04/12/2007 7:11	7352	7144.1	+/- 5%	Pass	13.5	10 - 20	Pass	222.9	223.0	+/- 5%	Pass	5007	5007.8	+/- 25%	Pass
AV54	04/12/2007 7:11	7349	7313.1	+/- 5%	Pass	13.4	10 - 20	Pass	228.0	226.0	+/- 5%	Pass	5044	5029.5	+/- 25%	Pass
AV55	04/12/2007 7:11	7348	7132.9	+/- 5%	Pass	13.3	10 - 20	Pass	223.9	226.0	+/- 5%	Pass	5015	5029.7	+/- 25%	Pass
AV56	04/12/2007 7:11	7344	7163.7	+/- 5%	Pass	13.8	10 - 20	Pass	220.9	222.0	+/- 5%	Pass	4993	5000.7	+/- 25%	Pass
AV57	04/12/2007 7:11	7343	7309.5	+/- 5%	Pass	13.4	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.6	+/- 25%	Pass
AV58	04/12/2007 7:11	7339	7249.2	+/- 5%	Pass	13.7	10 - 20	Pass	221.0	223.0	+/- 5%	Pass	4993	5008.0	+/- 25%	Pass
AV59	04/12/2007 7:11	7320	7141.4	+/- 5%	Pass	13.5	10 - 20	Pass	287.0	284.0	+/- 5%	Pass	5473	5450.6	+/- 25%	Pass
AV60	04/12/2007 7:11	7324	7019.7	+/- 5%	Pass	42.6	10 - 20	FAIL	222.3	223.0	+/- 5%	Pass	5003	5007.5	+/- 25%	Pass
AV63	04/12/2007 7:11	7308	7120.8	+/- 5%	Pass	30.7	10 - 20	FAIL	223.8	223.0	+/- 5%	Pass	5013	5007.9	+/- 25%	Pass
AV64	04/12/2007 7:11	7224	7153.7	+/- 5%	Pass	34.2	10 - 20	FAIL	215.9	224.0	+/- 5%	Pass	4956	5015.3	+/- 25%	Pass
AV65	04/12/2007 7:11	7313	7233.4	+/- 5%	Pass	26.3	10 - 20	FAIL	219.5	224.0	+/- 5%	Pass	4983	5015.3	+/- 25%	Pass
AV66	04/12/2007 7:11	7304	7165.5	+/- 5%	Pass	14.1	10 - 20	Pass	220.1	222.0	+/- 5%	Pass	4987	5000.5	+/- 25%	Pass
AV67	04/12/2007 7:11	7434	7128.1	+/- 5%	Pass	18.7	10 - 20	Pass	225.1	224.1	+/- 5%	Pass	5023	5015.6	+/- 25%	Pass
AV68	04/12/2007 7:11	7430	7259.5	+/- 5%	Pass	14.0	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.8	+/- 25%	Pass
AV69	04/12/2007 7:11	7373	7305.4	+/- 5%	Pass	16.1	10 - 20	Pass	219.8	222.0	+/- 5%	Pass	4985	5000.6	+/- 25%	Pass
AV70	04/12/2007 7:11	7429	7406.5	+/- 5%	Pass	13.3	10 - 20	Pass	219.0	222.6	+/- 5%	Pass	4979	5004.7	+/- 25%	Pass
AV71	04/12/2007 7:58	7052	7187.3	+/- 5%	Pass	12.9	10 - 20	Pass	221.0	225.0	+/- 5%	Pass	4994	5022.7	+/- 25%	Pass
AV72	04/12/2007 7:58	7363	7090.0	+/- 5%	Pass	13.2	10 - 20	Pass	226.0	223.9	+/- 5%	Pass	5030	5014.6	+/- 25%	Pass
AV73	04/12/2007 7:58	6974	7251.3	+/- 5%	Pass	12.9	10 - 20	Pass	222.9	225.0	+/- 5%	Pass	5007	5022.4	+/- 25%	Pass
AV75	04/12/2007 7:58	7251	7267.9	+/- 5%	Pass	12.7	10 - 20	Pass	223.1	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV75	04/12/2007 7:58	7251	7267.9	+/- 5%	Pass	12.7	10 - 20	Pass	223.1	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV76	04/12/2007 7:58	7557	7374.3	+/- 5%	Pass	13.2	10 - 20	Pass	223.0	224.0	+/- 5%	Pass	5008	5015.2	+/- 25%	Pass
AV76	04/12/2007 7:58	7557	7374.3	+/- 5%	Pass	13.2	10 - 20	Pass	223.0	224.0	+/- 5%	Pass	5008	5015.2	+/- 25%	Pass
AV77	04/12/2007 7:58	7554	7497.1	+/- 5%	Pass	13.1	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV77	04/12/2007 7:58	7554	7497.1	+/- 5%	Pass	13.1	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV78	04/12/2007 7:58	7366	7183.8	+/- 5%	Pass	12.5	10 - 20	Pass	223.0	223.3	+/- 5%	Pass	5008	5009.8	+/- 25%	Pass
AV78	04/12/2007 7:58	7366	7183.8	+/- 5%	Pass	12.5	10 - 20	Pass	223.0	223.3	+/- 5%	Pass	5008	5009.8	+/- 25%	Pass
AV79	04/12/2007 7:58	7549	7349.7	+/- 5%	Pass	13.3	10 - 20	Pass	221.0	222.0	+/- 5%	Pass	4993	5000.4	+/- 25%	Pass
AV79	04/12/2007 7:58	7549	7349.7	+/- 5%	Pass	13.3	10 - 20	Pass	221.0	222.0	+/- 5%	Pass	4993	5000.4	+/- 25%	Pass
AV80	04/12/2007 7:58	7327	7226.4	+/- 5%	Pass	12.7	10 - 20	Pass	223.0	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV81	04/12/2007 7:58	7544	7453.4	+/- 5%	Pass	13.0	10 - 20	Pass	222.0	223.0	+/- 5%	Pass	5001	5008.1	+/- 25%	Pass
AV81	04/12/2007 7:58	7544	7453.4	+/- 5%	Pass	13.0	10 - 20	Pass	222.0	223.0	+/- 5%	Pass	5001	5008.1	+/- 25%	Pass
AV82	04/12/2007 7:58	7540	7529.2	+/- 5%	Pass	13.4	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.2	+/- 25%	Pass
AV83	04/12/2007 7:58	7525	7523.7	+/- 5%	Pass	12.6	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.4	+/- 25%	Pass
AV84	04/12/2007 7:58	7573	7637.7	+/- 5%	Pass	12.3	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.7	+/- 25%	Pass
AV84	04/12/2007 7:58	7573	7637.7	+/- 5%	Pass	12.3	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.7	+/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria	P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria	P/F	Energy (keV) Result	Energy (keV) Criteria	P/F
AV85	04/12/2007 7:58	7497	7549.7 +/- 5%	Pass	12.5	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5008.0 +/- 25%	Pass
AV85	04/12/2007 7:58	7497	7549.7 +/- 5%	Pass	12.5	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5008.0 +/- 25%	Pass
AV86	04/12/2007 7:58	7671	7679.0 +/- 5%	Pass	17.2	10 - 20	Pass	224.1	223.9 +/- 5%	Pass	5016	5014.3 +/- 25%	Pass
AV86	04/12/2007 7:58	7671	7679.0 +/- 5%	Pass	17.2	10 - 20	Pass	224.1	223.9 +/- 5%	Pass	5016	5014.3 +/- 25%	Pass
AV87	04/12/2007 7:58	7440	7512.4 +/- 5%	Pass	12.4	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5007.7 +/- 25%	Pass
AV87	04/12/2007 7:58	7440	7512.4 +/- 5%	Pass	12.4	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5007.7 +/- 25%	Pass
AV88	04/12/2007 7:58	7712	7716.1 +/- 5%	Pass	14.4	10 - 20	Pass	224.1	224.0 +/- 5%	Pass	5016	5015.4 +/- 25%	Pass
AV89	04/12/2007 7:58	7713	7553.8 +/- 5%	Pass	13.5	10 - 20	Pass	219.9	222.6 +/- 5%	Pass	4985	5004.7 +/- 25%	Pass
AV90	04/12/2007 7:58	7708	7474.4 +/- 5%	Pass	13.6	10 - 20	Pass	222.9	224.1 +/- 5%	Pass	5007	5015.6 +/- 25%	Pass
AV92	04/12/2007 7:58	7317	7358.9 +/- 5%	Pass	12.4	10 - 20	Pass	222.9	223.9 +/- 5%	Pass	5008	5014.6 +/- 25%	Pass
AV93	04/12/2007 7:58	7384	7393.5 +/- 5%	Pass	12.7	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5008.3 +/- 25%	Pass
AV94	04/12/2007 7:58	7569	7477.9 +/- 5%	Pass	13.4	10 - 20	Pass	220.9	222.0 +/- 5%	Pass	4993	5000.5 +/- 25%	Pass
AV95	04/12/2007 7:10	7215	7432.4 +/- 5%	Pass	13.0	10 - 20	Pass	221.1	222.2 +/- 5%	Pass	4994	5001.9 +/- 25%	Pass
AV96	04/12/2007 7:10	7640	7654.3 +/- 5%	Pass	13.6	10 - 20	Pass	222.0	222.6 +/- 5%	Pass	5001	5005.3 +/- 25%	Pass
AV96	04/12/2007 7:10	7640	7654.3 +/- 5%	Pass	13.6	10 - 20	Pass	222.0	222.6 +/- 5%	Pass	5001	5005.3 +/- 25%	Pass
AV97	04/12/2007 7:10	7636	7649.9 +/- 5%	Pass	13.9	10 - 20	Pass	223.0	223.8 +/- 5%	Pass	5008	5014.0 +/- 25%	Pass
AV97	04/12/2007 7:10	7636	7649.9 +/- 5%	Pass	13.9	10 - 20	Pass	223.0	223.8 +/- 5%	Pass	5008	5014.0 +/- 25%	Pass
AV98	04/12/2007 7:10	7632	7582.0 +/- 5%	Pass	13.1	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5007.6 +/- 25%	Pass
AV98	04/12/2007 7:10	7632	7582.0 +/- 5%	Pass	13.1	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5007.6 +/- 25%	Pass

TestAmerica STL

Run Log

Logbook No.: 2925

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	4/4/07	7090036	F7C300326-006	54	180min	U	WW	WW
2			-007	57				
3			-008	66				
4			-009	72				
5			-010	73				
6			F7C310000-036B	46				
7			-036C	41				
8		7094124	F7C210159-007	9		Np		WW
9			-007X	11				
10			F7D010000-124B	12				
11			-124C	13				
12	4/5/7	Daily	Pulser	1-98	1min	QA	SC	—
13		7089130	F7C280185-003	1	240min	U	WW/GS	WW
14			-003X	2				
15			-006 WW 4/5/07	3				
16			-009	4				
17			-013	6				
18			-016	7				
19			-019	8				
20			-022	9				
21			-025	11				
22			-028	12				
23			-031	13				
24			F7C300000-131B	15				
25			-131C	17				
26	4-5-07	7089189	F7C280211-001	1	240min	Th	GS	
27			-001X	2				
28			-002	3				
29			-003	4				

Reviewed By: GS

Date: 4-5-07

SOP References: STL-RD-0210 Rev 5 01/16/06. Form: SL-RAD-0030, Revised 7/07/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2925

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	4-5-07	7094189	F7C280211-004	6	240min	Th	GI	JW
2			-005	7				
3			-006	8				
4			-007	9				
5			-008	11				
6			-009	12				
7			-010	13				
8			-011	15				
9			-012	19				
10			-013	20				
11			-014	22				
12			-015	23				
13			F7C300000-189D	24				
14			-189C	17				
15	4/6/7	Daily	Pulsers	1-98	1min	QA	SE	—
16		7094289	F7C310184-001	9	240min	U		JW
17			-001x	11				
18			-002	12				
19			-004	13				
20			-005	15				
21			-006	20				
22			-007	~~23~~ 22				
23			-008	~~24~~ 23				
24			-011	SE ~~48~~ 24				
25			-012	4/6 ~~50~~ 48				
26			-013	7 ~~54~~ 50				
27			-014	66 54				
28			-015	72 66				
29			-016	72				

Reviewed By: SE

Date: 4/6/7

SOP References: STL-RD-0210 Rev 5 01/16/06. Form: SL-RAD-0030, Revised 7/07/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2925

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	4/12/07	7089189	F7C280221-001	11	240min	Th	KW	KW
2			-001X	12				
3		7089134	F7B280104-001	1	180min	Pu		KW
4			-001X	2				
5			F7C300000-134B	14				
6			-134C	18				
7		7089133	F7B280104-001	3		Am		KW
8			-001X	4				
9			F7C300000-133B	21				
10			-133C	49				
11	4-12-07	7896188	F7D040283-001	13	180min	U	GS	KW
12			-008X	15				
13			-002	19				
14			-003	20				
15			-004	22				
16			-005	24				
17			-006	48				
18			-007	80				
19			-008	84				
20			-009	57				
21			F7D061000-188B	66				
22			-188C	72				
23	4-12-07	7102250	F7D050135-001	1	180min	Pu	GS	
24			F7D120000-250B	2				
25			-250C	3				
26			-250L	4				
27	4-12-07	7102251	F7D050135-001	73	180min	Th	GS	
28			F7D120000-251B	6				
29			-251C	7				

Reviewed By: GS Date: 4-12-07

SOP References: STL-RD-0210 Rev 5 01/16/06. Form: SL-RAD-0030, Revised 7/07/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

4/18

SEVERN TRENT **STL**

Prep Report for:

Thorium, Isotopic by Alpha Spectroscopy

Batch: 7089189 **Prep Analyst:** 403301

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot	Dilution	Adj Aliquot	TracerID	TracerAnalyte	TracerAliquot	Low Level
F7C280211-001	JRWHL1AE	2.0005E+000 g 1	1.00	2.0005E+000 g	Rad05-0088 RC=	Th-229 11	0.10	N
F7C280211-001X	JRWHL1AH	2.0000E+000 g 2	1.00	2.0000E+000 g	Rad05-0088 RC=	Th-229 12	0.10	N
F7C280211-002	JRWHT1AE	2.0077E+000 g 3	1.00	2.0077E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-003	JRWHW1AE	2.0062E+000 g 4	1.00	2.0062E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-004	JRWHX1AE	2.0161E+000 g 6	1.00	2.0161E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-005	JRWH01AE	2.0028E+000 g 7	1.00	2.0028E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-006	JRWH31AE	2.0057E+000 g 8	1.00	2.0057E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-007	JRWH51AE	2.0089E+000 g 9	1.00	2.0089E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-008	JRWH81AE	2.0056E+000 g 11	1.00	2.0056E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-009	JRWJA1AE	2.0161E+000 g 12	1.00	2.0161E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-010	JRWJC1AE	2.0009E+000 g 13	1.00	2.0009E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-011	JRWJE1AE	2.0019E+000 g 15	1.00	2.0019E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-012	JRWJG1AE	2.0098E+000 g 19	1.00	2.0098E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-013	JRWJH1AE	2.0191E+000 g 20	1.00	2.0191E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-014	JRWJJ1AE	2.0049E+000 g 22	1.00	2.0049E+000 g	Rad05-0088	Th-229	0.10	N
F7C280211-015	JRWJK1AE	2.0010E+000 g 23	1.00	2.0010E+000 g	Rad05-0088	Th-229	0.10	N
F7C300000-189B	JR3GA1AA	2.0000E+000 g 24	1.00	2.0000E+000 g	Rad05-0088	Th-229	0.10	N

SampID	WRKNO	Aliquot	Dilution	Adj Aliquot	TracerID	TracerAnalyte	TracerAliquot	Low Level
F7C300000-189C	JR3GA1AC	1.3140E-001 g	1.00	1.3140E-001 g	Rad05-0088	Th-229	0.10	N

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Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7C300000-189C	TRM-3_IsoTh	TH-230	1.299E+002 dpm/g	0.13 g	5/29/2003 12:00:00AM	5.788E+001 pCi/g

KN per MJ — Spiked By

Flip per MJ — Spike Verified By

3/30/07 — Spike Date

Standard Operating Procedures

	SOPNumber	Title	Revision
☐	STL-RC-0002	Planchet Preparation For Radiochemistry And Radiological Screening Analysis	4.00
☐	STL-RC-0003	Drying And Grinding Of Soil And Solid Samples	6.00
☐	STL-RC-0004	Preparation Of Soil, Sludge, And Filter Paper Samples For Radiochemical Analysis	10.00
☐	STL-RC-0090	Preparation Of Samples For Sequential Determination Of Isotopic Americium, Currium, Neptunium, Plutonium, Tho	4.00
☑	STL-RC-0100	Actinide Coprecipitation	9.00
☐	STL-RC-0232	Isotopic Thorium And/oR Neptunium in Water, Soil, Sludge, and Filters by Eichrom TEVA Separation Resins	7.00
☐	STL-RC-0238	Isotopic Uranium By Eichrom UTEVA Resin for Water, Soil, Sludge and Filters	7.00
☐	STL-RC-0240	Isotopic Americium, Curium, Plutonium, Thorium, and Uranium in Water, Soil, Sludge and Filters by Eichrome Sepa	5.00
☐	STL-RC-0241	Isotopic Americium, Plutonium, Curium, and Uranium in Water, Soil, Sludge and Filters by Eichrome Uteva and Tr	3.00
☑	STL-RC-0242	Isotopic Thorium, Plutonium and Uranium in Water, Soil, Sludge and Filters by Eichrome Separation Resin	6.00
☐	STL-RD-0201	Daily Operations Of An Alpha Spectroscopy System	2.00
☐	STL-RD-0203	Calibration And Maintenance Of A Alpha Spectroscopy System	1.00

Column Analyst — 4/5/07 Date — KW Coprecipitated By — 4/5/7 Precip Date

KW Reviewed By — 4/13/07 Review Date

KW Analyst/Relenquished By — 4/5/7 Release Date — GS Received By — 4-5-07 Receipt Date

SEVERN TRENT STL

Alpha Spectroscopy Uranium

SEVERN TRENT STL

Analysis Report for Alpha Spectroscopy

Batch: 7089193 **Operator:** 403293

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7C280211-001	JRWHL1AD	2.0093	1.00	2.00	AV73	4 / 12 / 07 14:37	240.00	rad06-0047	U-232	3.856E+000	74.08%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	1.292E+000	pCi/g	1.774E-001	1.854E-001	2.419E-002	5.928E-003
U-234	1.061E+000	pCi/g	1.390E-001	2.065E-001	2.064E-002	4.176E-003
U-235	9.465E-002	pCi/g	4.694E-002	4.888E-002	2.568E-002	5.196E-003
U-238	9.698E-001	pCi/g	1.326E-001	1.927E-001	1.226E-002	0.000E+000

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7C280211-001X	JRWHL1AJ	2.0053	1.00	2.00	AV9	4 / 12 / 07 16:54	240.00	rad06-0047	U-232	3.864E+000	76.09%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	1.329E+000	pCi/g	1.801E-001	1.920E-001	3.364E-002	1.051E-002
U-234	7.168E-001	pCi/g	1.160E-001	1.556E-001	2.738E-002	7.402E-003
U-235	3.181E-002	pCi/g	2.949E-002	2.984E-002	3.069E-002	7.521E-003
U-238	7.003E-001	pCi/g	1.140E-001	1.528E-001	1.255E-002	0.000E+000

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7C280211-002	JRWHT1AD	2.0025	1.00	2.00	AV22	4 / 7 / 07 10:50	240.00	rad06-0047	U-232	3.869E+000	83.81%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	1.466E+000	pCi/g	1.746E-001	2.084E-001	2.992E-002	9.022E-003
U-234	7.792E-001	pCi/g	1.179E-001	1.620E-001	3.310E-002	1.064E-002
U-235	3.264E-002	pCi/g	2.665E-002	2.916E-002	1.472E-002	0.000E+000
U-238	7.449E-001	pCi/g	1.142E-001	1.559E-001	1.983E-002	4.012E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7C280211-003	JRWHW1AD	2.0057	1.00	2.00	AV24	4 / 7 / 07 10:50	240.00	rad06-0047	U-232	3.863E+000	78.73%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	1.375E+000	pCi/g	1.783E-001	1.977E-001	2.706E-002	7.317E-003
U-234	6.419E-001	pCi/g	1.090E-001	1.430E-001	2.696E-002	7.290E-003
U-235	3.844E-002	pCi/g	3.067E-002	3.117E-002	2.589E-002	5.237E-003
U-238	5.766E-001	pCi/g	1.032E-001	1.325E-001	2.691E-002	7.275E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7C280211-004	JRWHX1AD	2.0139	1.00	2.00	AV48	4 / 7 / 07 10:50	240.00	rad06-0047	U-232	3.847E+000	90.68%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	1.578E+000	pCi/g	1.639E-001	2.180E-001	2.485E-002	7.158E-003
U-234	4.973E-001	pCi/g	8.901E-002	1.126E-001	2.936E-002	9.434E-003
U-235	3.739E-002	pCi/g	2.772E-002	2.820E-002	2.193E-002	4.437E-003
U-238	5.272E-001	pCi/g	9.149E-002	1.171E-001	2.930E-002	9.415E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7C280211-005	JRWH01AD	2.0027	1.00	2.00	AV50	4 / 7 / 07 10:50	240.00	rad06-0047	U-232	3.869E+000	85.30%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
U-232	1.492E+000	pCi/g	1.693E-001	2.088E-001	4.270E-002	1.585E-002
U-234	4.717E-001	pCi/g	8.777E-002	1.099E-001	2.149E-002	5.265E-003
U-235	2.519E-002	pCi/g	2.253E-002	2.493E-002	1.363E-002	0.000E+000
U-238	4.424E-001	pCi/g	8.494E-002	1.052E-001	2.144E-002	5.254E-003

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
F7C280211-006	JRWH31AD	2.0157	1.00	2.00	AV54	4 / 7 / 07 10:50	240.00	rad06-0047	U-232	3.844E+000	81.06%
		g									

Analyte	Activity		CountUnc	TotalUnc	MDA	DLC

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte		TracerAdded	TracerYield
						U-232	1.409E+000	pCi/g	1.722E-001	1.995E-001	2.928E-002	8.830E-003
						U-234	4.695E-001	pCi/g	9.066E-002	1.125E-001	2.917E-002	8.797E-003
						U-235	2.662E-002	pCi/g	2.381E-002	2.635E-002	1.441E-002	0.000E+000
						U-238	4.707E-001	pCi/g	9.027E-002	1.123E-001	2.516E-002	6.801E-003
F7C280211-007	JRWH51AD	2.0032	1.00	2.00	AV66	4/7/07 10:50	240.00	rad06-0047	U-232		3.868E+000	83.19%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.455E+000	pCi/g	1.700E-001	2.041E-001	3.277E-002	1.078E-002
						U-234	5.089E-001	pCi/g	9.224E-002	1.167E-001	2.433E-002	6.577E-003
						U-235	2.569E-002	pCi/g	2.298E-002	2.543E-002	1.390E-002	0.000E+000
						U-238	4.935E-001	pCi/g	9.038E-002	1.139E-001	1.873E-002	3.789E-003
F7C280211-008	JRWH81AD	2.0064	1.00	2.00	AV72	4/7/07 10:50	240.00	rad06-0047	U-232		3.861E+000	80.18%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.400E+000	pCi/g	1.742E-001	1.990E-001	2.331E-002	5.713E-003
						U-234	7.265E-001	pCi/g	1.135E-001	1.536E-001	2.794E-002	8.049E-003
						U-235	3.132E-002	pCi/g	2.723E-002	2.759E-002	2.475E-002	5.008E-003
						U-238	6.355E-001	pCi/g	1.057E-001	1.392E-001	2.318E-002	5.680E-003
F7C280211-009	JRWJA1AD	2.0026	1.00	2.00	AV1	4/7/07 14:10	240.00	rad06-0047	U-232		3.869E+000	89.48%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.565E+000	pCi/g	1.660E-001	2.170E-001	2.857E-002	8.926E-003
						U-234	5.073E-001	pCi/g	8.985E-002	1.142E-001	2.095E-002	5.134E-003
						U-235	4.176E-002	pCi/g	3.028E-002	3.083E-002	2.607E-002	6.389E-003
						U-238	4.551E-001	pCi/g	8.505E-002	1.060E-001	2.091E-002	5.124E-003
F7C280211-010	JRWJC1AD	2.0067	1.00	2.00	AV2	4/7/07 14:10	240.00	rad06-0047	U-232		3.861E+000	83.32%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.455E+000	pCi/g	1.739E-001	2.065E-001	4.327E-002	1.582E-002
						U-234	5.420E-001	pCi/g	9.675E-002	1.238E-001	2.274E-002	5.572E-003
						U-235	1.333E-002	pCi/g	1.995E-002	2.004E-002	2.829E-002	6.933E-003
						U-238	3.976E-001	pCi/g	8.247E-002	1.004E-001	1.157E-002	0.000E+000
F7C280211-011	JRWJE1AD	2.0075	1.00	2.00	AV73	4/7/07 14:10	240.00	rad06-0047	U-232		3.859E+000	86.85%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.516E+000	pCi/g	1.677E-001	2.115E-001	4.202E-002	1.560E-002
						U-234	4.740E-001	pCi/g	8.763E-002	1.099E-001	2.543E-002	7.326E-003
						U-235	2.231E-002	pCi/g	2.325E-002	2.346E-002	2.631E-002	6.446E-003
						U-238	3.936E-001	pCi/g	7.990E-002	9.705E-002	2.538E-002	7.311E-003
F7C280211-012	JRWJG1AD	2.0015	1.00	2.00	AV4	4/7/07 14:10	240.00	rad06-0047	U-232		3.871E+000	95.67%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.675E+000	pCi/g	1.622E-001	2.296E-001	2.983E-002	9.812E-003
						U-234	5.957E-001	pCi/g	9.493E-002	1.254E-001	1.995E-002	4.888E-003
						U-235	1.754E-002	pCi/g	1.928E-002	1.943E-002	2.126E-002	4.301E-003
						U-238	5.955E-001	pCi/g	9.467E-002	1.252E-001	1.705E-002	3.449E-003
F7C280211-013	JRWJH1AD	2.0088	1.00	2.00	AV6	4/7/07 14:10	240.00	rad06-0047	U-232		3.857E+000	83.76%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield
						U-232	1.461E+000 pCi/g		1.708E-001	2.057E-001	3.568E-002	1.218E-002
						U-234	5.820E-001 pCi/g		9.890E-002	1.286E-001	2.214E-002	5.425E-003
						U-235	4.542E-002 pCi/g		3.158E-002	3.222E-002	2.360E-002	4.774E-003
						U-238	6.537E-001 pCi/g		1.043E-001	1.396E-001	1.127E-002	0.000E+000
F7C280211-014	JRWJJ1AD	2.0019	1.00	2.00	AV7	4/7/07 14:10	240.00	rad06-0047	U-232		3.870E+000	77.39%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.354E+000 pCi/g		1.783E-001	1.946E-001	3.741E-002	1.255E-002
						U-234	4.418E-001 pCi/g		8.995E-002	1.102E-001	2.405E-002	5.893E-003
						U-235	5.921E-002 pCi/g		3.825E-002	3.919E-002	2.993E-002	7.334E-003
						U-238	5.495E-001 pCi/g		1.001E-001	1.276E-001	2.400E-002	5.882E-003
F7C280211-015	JRWJK1AD	2.0074	1.00	2.00	AV8	4/7/07 14:10	240.00	rad06-0047	U-232		3.860E+000	83.10%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.450E+000 pCi/g		1.665E-001	2.016E-001	3.392E-002	1.157E-002
						U-234	4.342E-001 pCi/g		8.337E-002	1.030E-001	2.104E-002	5.157E-003
						U-235	1.974E-002 pCi/g		1.974E-002	2.224E-002	1.335E-002	0.000E+000
						U-238	4.472E-001 pCi/g		8.488E-002	1.053E-001	2.527E-002	7.278E-003
F7C300000-193B	JR3GH1AA	2.0000	1.00	2.00	AV18	4/7/07 10:50	240.00	rad06-0047	U-232		3.874E+000	94.95%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	1.663E+000 pCi/g		1.662E-001	2.307E-001	3.472E-002	1.203E-002
						U-234	4.911E-003 pCi/g		1.303E-002	1.305E-002	2.314E-002	6.257E-003
						U-235	-1.222E-003 pCi/g		4.889E-003	1.093E-002	2.222E-002	4.495E-003
						U-238	4.901E-003 pCi/g		1.300E-002	1.302E-002	2.310E-002	6.245E-003
F7C300000-193C	JR3GH1AC	0.1325	1.00	2.00	AV21	4/7/07 10:50	240.00	rad06-0047	U-232		5.847E+001	83.43%
		g				Analyte	Activity		CountUnc	TotalUnc	MDA	DLC
						U-232	2.206E+001 pCi/g		2.600E+000	3.112E+000	2.940E-001	5.949E-002
						U-234	1.966E+001 pCi/g		2.258E+000	3.581E+000	4.115E-001	1.185E-001
						U-235	8.822E-001 pCi/g		5.320E-001	5.695E-001	2.170E-001	0.000E+000
						U-238	1.795E+001 pCi/g		2.149E+000	3.328E+000	1.740E-001	0.000E+000

Laboratory Control Sample Information

Sample ID	WRKNO	RegionName	Activity	StdAdded	Recovery	LCL	UCL
F7C300000-193C	JR3GH1AC	U-234	1.966E+001	1.923E+001	102.22%	78.00	125.00
	JR3GH1AC	U-238	1.795E+001	1.923E+001	93.32%	76.00	122.00

Sample Duplicate Information

Sample ID	Analyte	Sample Activity	Dup Sample ID	Dup Activity	RPD	RER	DER	Qualifier
F7C280211-001	U-234	1.061E+000	F7C280211-001X	7.168E-001	38.76%	9.515E-001	1.333E+000	
	U-235	9.465E-002	F7C280211-001X	3.181E-002	99.39%	7.983E-001	1.097E+000	
	U-238	9.698E-001	F7C280211-001X	7.003E-001	32.27%	7.799E-001	1.096E+000	

Sample ID	Work Order #	Aliquot	Dilution	Sigma	Instrument	RunDateTime	RunDuration	TracerID	TracerAnalyte	TracerAdded	TracerYield

Matrix Spike Information

SampID	SampMSID	RegionName	Sample Activity	MS Activity	StdAdded	MSRecovery

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:37:48PM 4/12/2007

Sample

Sample Name: F7C280211-001
SampleType: Sample
: JRWHL1AD
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #2 Analysis #1
Sample Weight : 2.0093g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

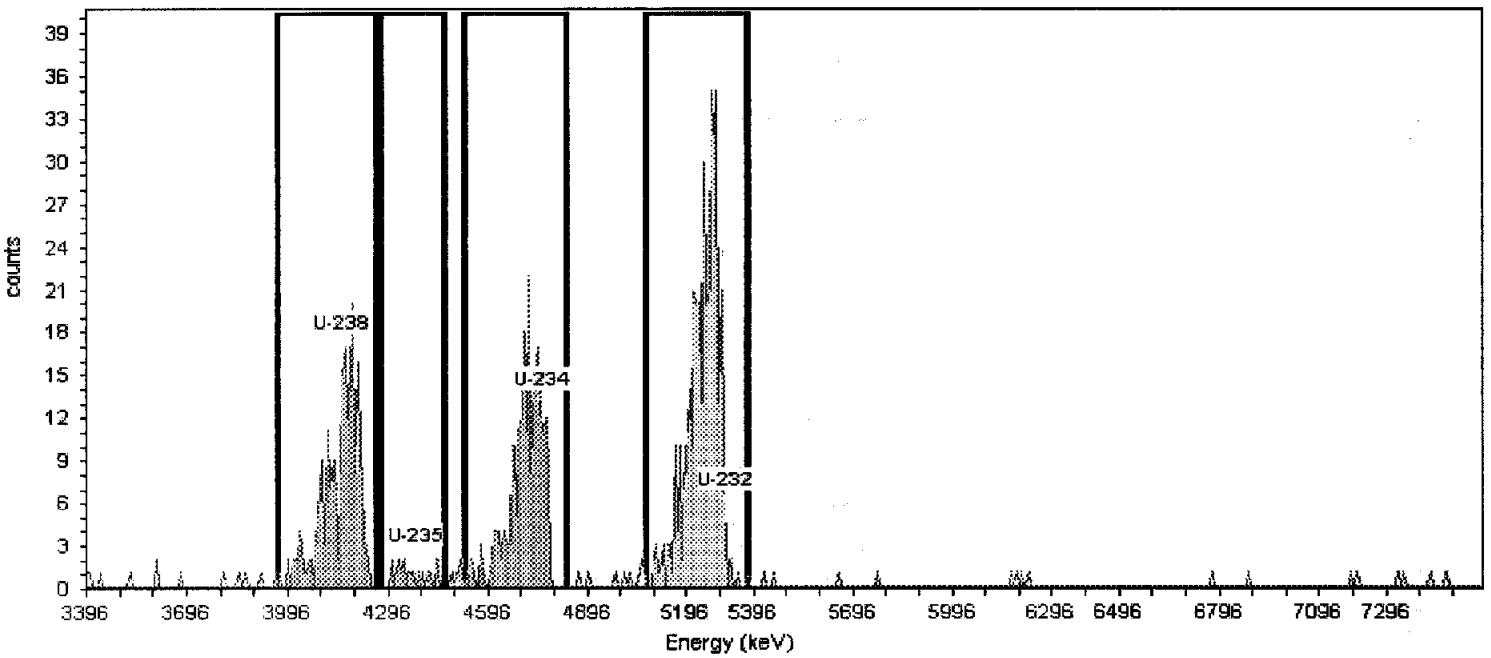
Tracer Nuclide: U-232
Tracer Recovery: 74.08%

Acquisition

Detector: AV73
Serial Number:
Acquisition Start Date: 4/12/2007 2:37:38PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:03AM

Calibration Name: Apr2007_AV73a
Calibration Date: 4/10/2007 2:25:57PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.82% +/- 0.30% TPU(2 sigma)

Background Info: Sample: AV73; Det: AV73; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-235	4376.294	4267.397	4463.412	27.698	80.2	17.00	0.2500	17	9.465E-002	4.888E-002	5.196E-003	2.568E-002
U-234	4761.063	4521.490	4833.661	98.840	99.8	234.00	0.2500	234	1.061E+000	2.065E-001	4.176E-003	2.064E-002
U-232	5312.808	5073.234	5378.146	86.567	100.1	383.00	0.5000	383	1.292E+000	1.854E-001	5.928E-003	2.419E-002
U-238	4158.500	3962.485	4260.137	106.553	100.0	214.00	0.0000	214	9.698E-001	1.927E-001	0.000E+000	1.226E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 8:54:52PM 4/12/2007

Sample

Sample Name: F7C280211-001X
SampleType: Sample
: JRWHL1AJ
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #3 Analysis #1
Sample Weight : 2.0053g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

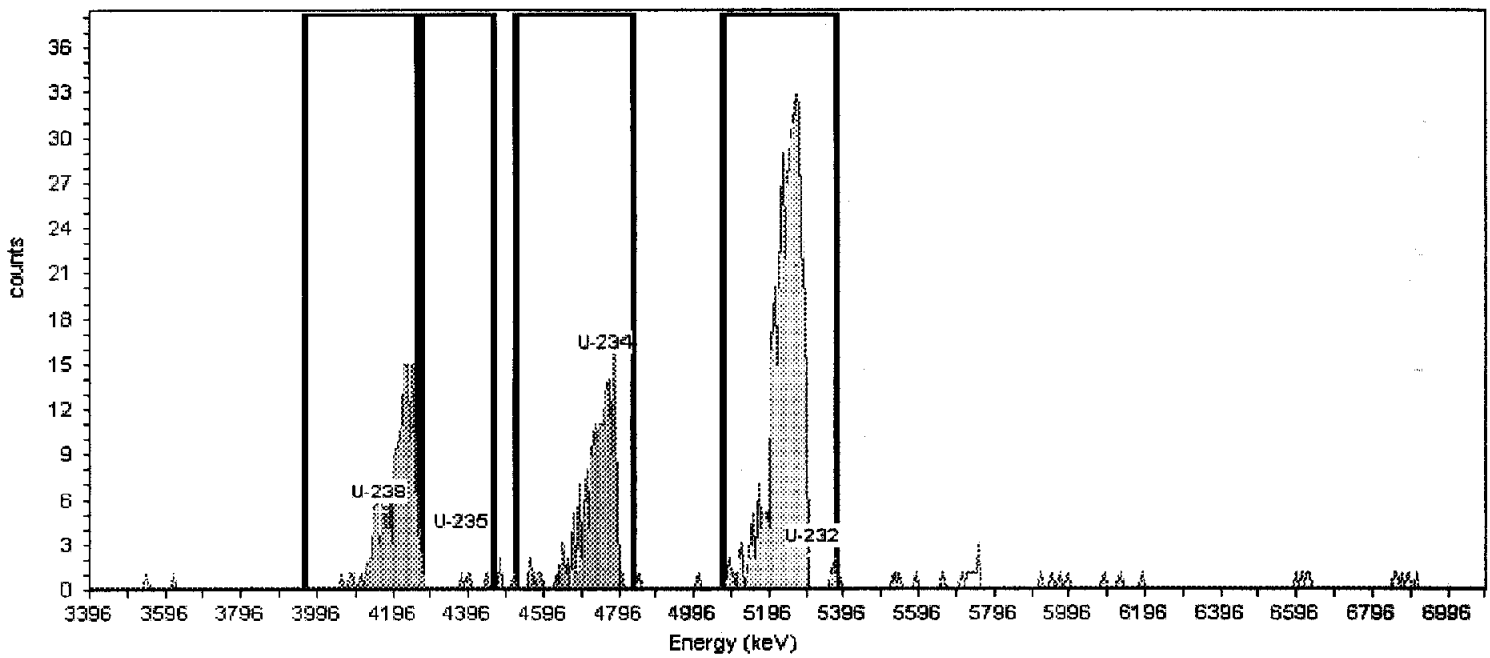
Tracer Nuclide: U-232
Tracer Recovery: 76.09%

Acquisition

Detector: AV9
Serial Number: 41-172R1
Acquisition Start Date: 4/12/2007 4:54:35PM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:07AM

Calibration Name: Mar2007_AV9
Calibration Date: 3/26/2007 2:20:54PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.52% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV9; Det: AV9; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	36.151	100.0	151.00	0.0000	151	7.003E-001	1.528E-001	0.000E+000	1.255E-002
U-235	4376.294	4267.397	4463.412	.000	80.2	6.00	0.5000	6	3.181E-002	2.984E-002	7.521E-003	3.069E-002
U-234	4761.063	4521.490	4833.661	77.197	99.8	155.00	0.7500	154	7.168E-001	1.556E-001	7.402E-003	2.738E-002
U-232	5312.808	5073.234	5378.146	81.855	100.1	376.00	1.5000	375	1.329E+000	1.920E-001	1.051E-002	3.364E-002

STL SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:51:08PM 4/7/2007

Sample

Sample Name: F7C280211-002
SampleType: Sample
: JRWHT1AD
Sample Collection Date: 3/26/2007 9:10:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0025g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

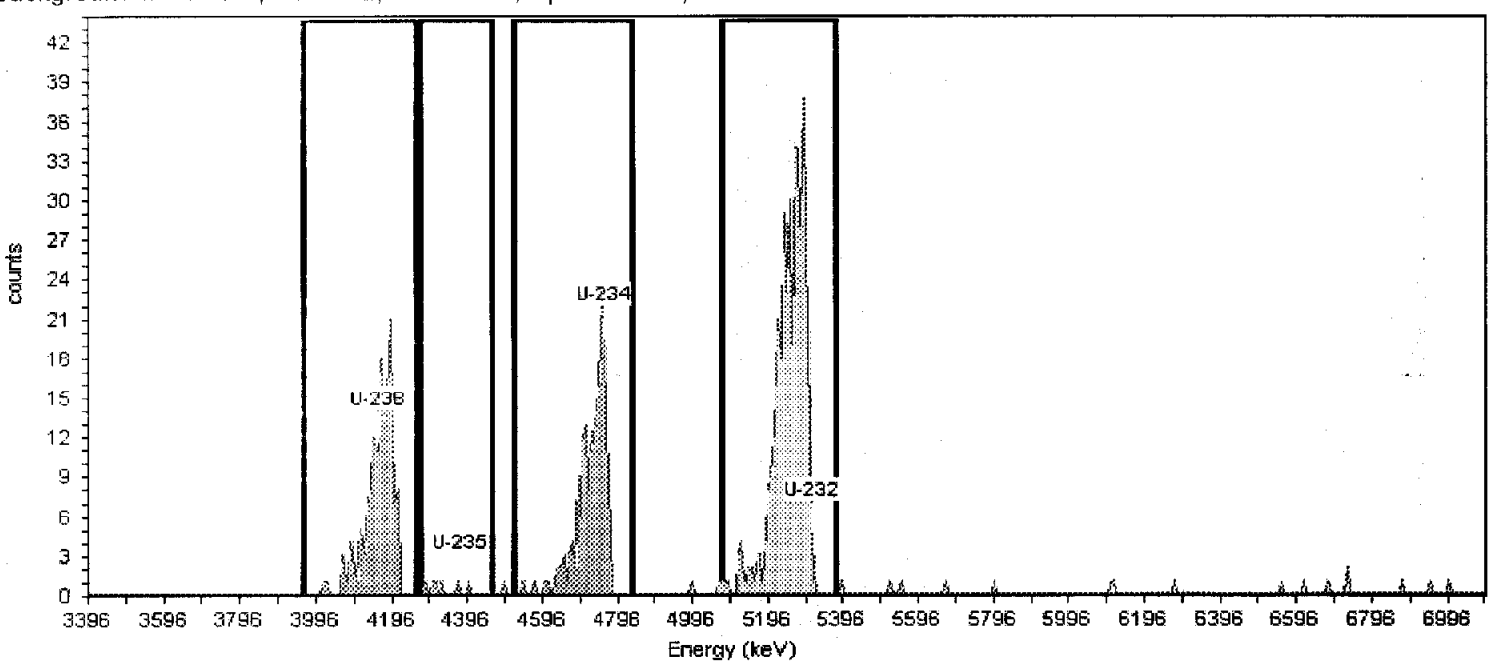
Tracer Nuclide: U-232
Tracer Recovery: 83.81%

Acquisition

Detector: AV22
Serial Number: 41-172Q5
Acquisition Start Date: 4/7/2007 10:50:23AM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:26AM

Calibration Name: Mar2007_AV22
Calibration Date: 3/27/2007 5:23:12PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 25.63% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV22; Det: AV22; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	69.165	100.0	171.00	0.2500	171	7.449E-001	1.559E-001	4.012E-003	1.983E-002
U-235	4376.294	4267.397	4463.412	49.001	80.2	6.00	0.0000	6	3.264E-002	2.916E-002	0.000E+000	1.472E-002
U-234	4761.063	4521.490	4833.661	75.139	99.8	180.00	1.7500	178	7.792E-001	1.620E-001	1.064E-002	3.310E-002
U-232	5312.808	5073.234	5378.146	87.367	100.1	400.00	1.2500	399	1.466E+000	2.084E-001	9.022E-003	2.992E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:51:11PM 4/7/2007

Sample

Sample Name: F7C280211-003
SampleType: Sample
: JRWHW1AD
Sample Collection Date: 3/26/2007 9:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0057g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

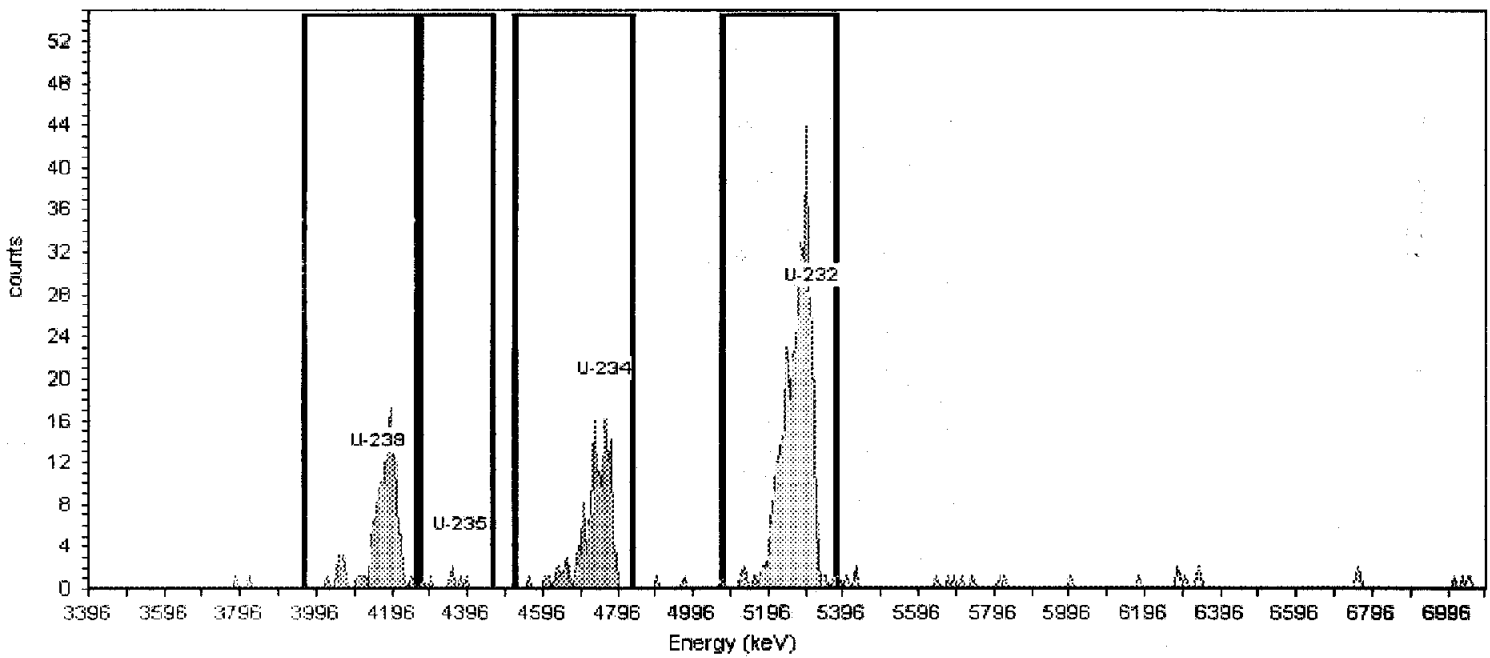
Tracer Nuclide: U-232
Tracer Recovery: 78.73%

Acquisition

Detector: AV24
Serial Number: 41-172R5
Acquisition Start Date: 4/7/2007 10:50:25AM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:30AM

Calibration Name: Mar2007_AV24
Calibration Date: 3/28/2007 7:11:08AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.02% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV24; Det: AV24; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	59.081	100.0	127.00	0.7500	126	5.766E-001	1.325E-001	7.275E-003	2.691E-002
U-235	4376.294	4267.397	4463.412	16.220	80.2	7.00	0.2500	7	3.844E-002	3.117E-002	5.237E-003	2.589E-002
U-234	4761.063	4521.490	4833.661	72.236	99.8	141.00	0.7500	140	6.419E-001	1.430E-001	7.290E-003	2.696E-002
U-232	5312.808	5073.234	5378.146	76.246	100.1	381.00	0.7500	380	1.375E+000	1.977E-001	7.317E-003	2.706E-002

STL SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:50:23PM 4/7/2007

Sample

Sample Name: F7C280211-004
SampleType: Sample
: JRWHX1AD
Sample Collection Date: 3/26/2007 9:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0139g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

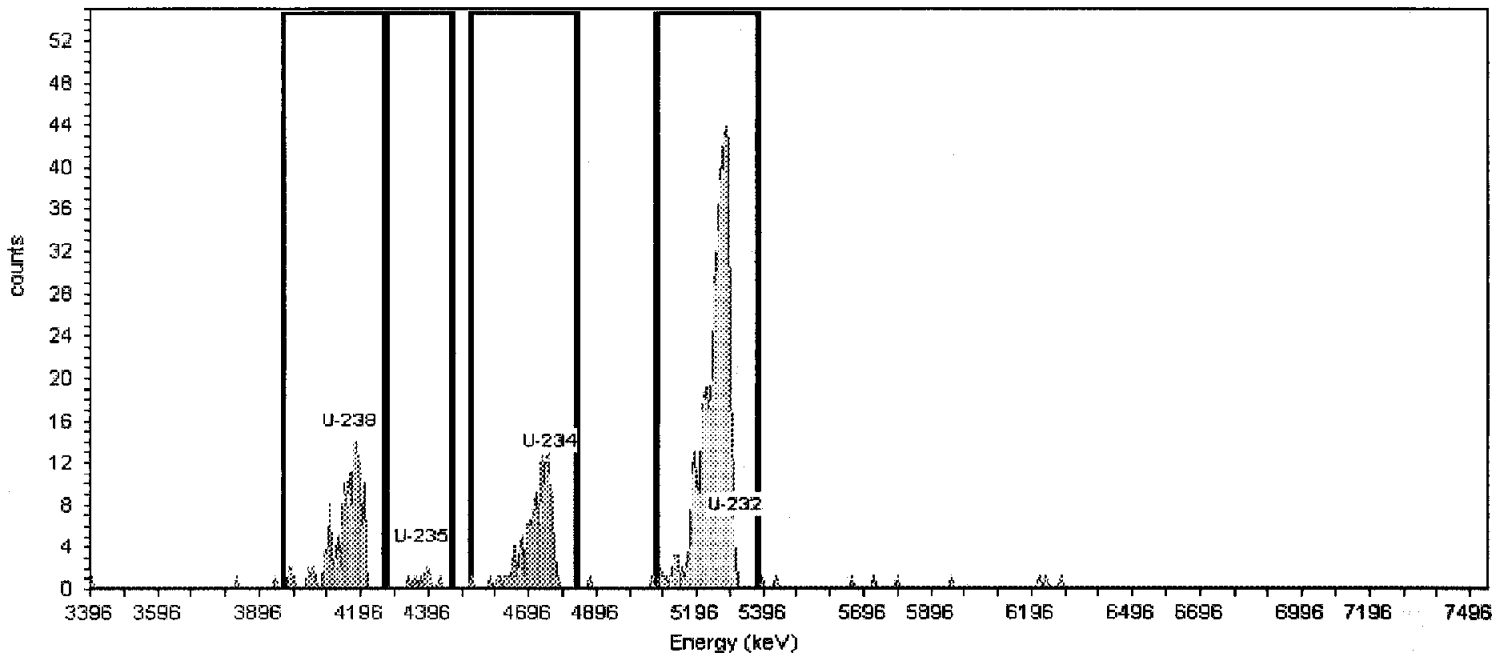
Tracer Nuclide: U-232
Tracer Recovery: 90.68%

Acquisition

Detector: AV48
Serial Number: AV48
Acquisition Start Date: 4/7/2007 10:50:27AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:35AM

Calibration Name: Mar2007_AV48
Calibration Date: 3/28/2007 4:08:22PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.56% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV48; Det: AV48; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	64.441	100.0	138.00	1.7500	136	5.272E-001	1.171E-001	9.415E-003	2.930E-002
U-235	4376.294	4267.397	4463.412	18.417	80.2	8.00	0.2500	8	3.739E-002	2.820E-002	4.437E-003	2.193E-002
U-234	4761.063	4521.490	4833.661	69.272	99.8	130.00	1.7500	128	4.973E-001	1.126E-001	9.434E-003	2.936E-002
U-232	5312.808	5073.234	5378.146	66.837	100.1	448.00	1.0000	447	1.578E+000	2.180E-001	7.158E-003	2.485E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:50:40PM 4/7/2007

Sample

Sample Name: F7C280211-005
SampleType: Sample
: JRWH01AD
Sample Collection Date: 3/26/2007 9:30:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0027g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

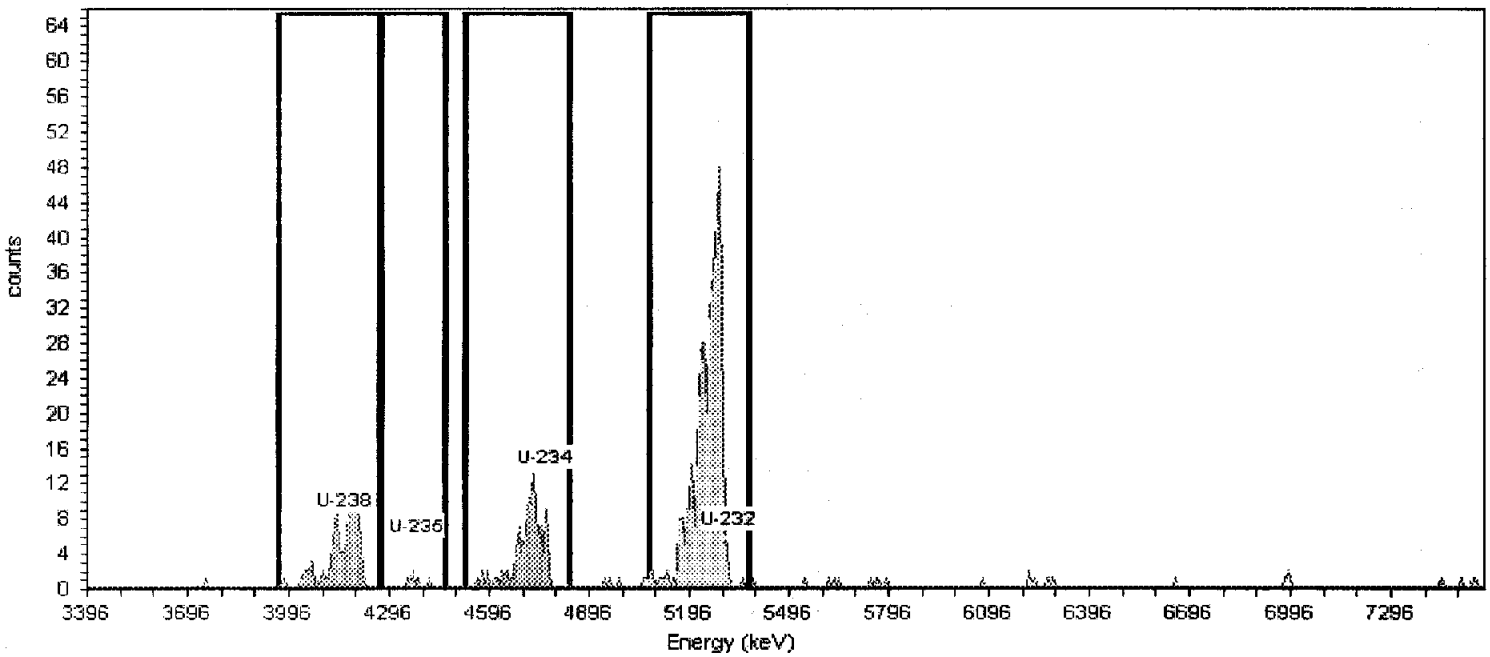
Tracer Nuclide: U-232
Tracer Recovery: 85.30%

Acquisition

Detector: AV50
Serial Number: AV50
Acquisition Start Date: 4/7/2007 10:50:27AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:38AM

Calibration Name: Mar2007_AV50
Calibration Date: 3/28/2007 4:09:16PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.19% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV50; Det: AV50; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	84.160	100.0	110.00	0.5000	110	4.424E-001	1.052E-001	5.254E-003	2.144E-002
U-235	4376.294	4267.397	4463.412	24.715	80.2	5.00	0.0000	5	2.519E-002	2.493E-002	0.000E+000	1.363E-002
U-234	4761.063	4521.490	4833.661	75.358	99.8	117.00	0.5000	117	4.717E-001	1.099E-001	5.265E-003	2.149E-002
U-232	5312.808	5073.234	5378.146	73.008	100.1	435.00	4.5000	431	1.492E+000	2.088E-001	1.585E-002	4.270E-002

SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:50:44PM 4/7/2007

Sample

Sample Name: F7C280211-006
SampleType: Sample
: JRWH31AD
Sample Collection Date: 3/26/2007 9:45:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0157g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

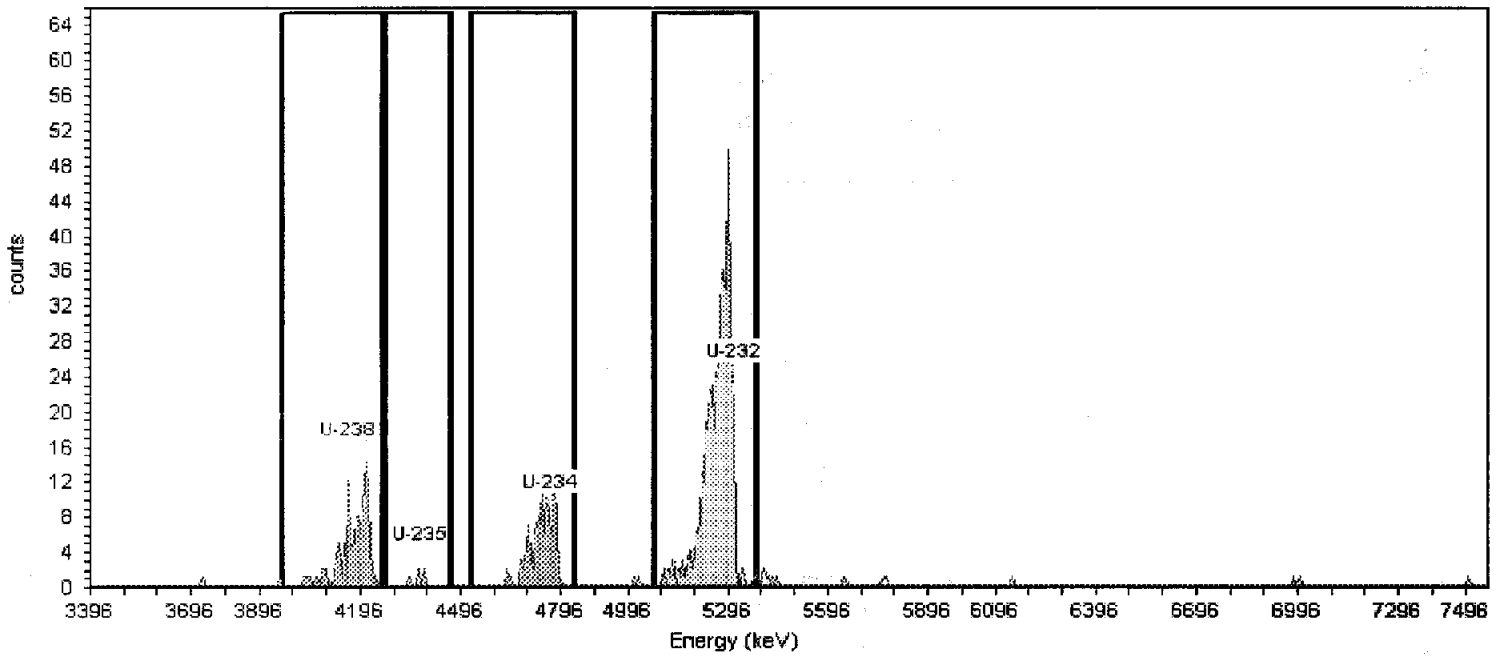
Tracer Nuclide: U-232
Tracer Recovery: 81.06%

Acquisition

Detector: AV54
Serial Number:
Acquisition Start Date: 4/7/2007 10:50:29AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:44AM

Calibration Name: Mar2007_AV54
Calibration Date: 3/29/2007 7:57:55AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.90% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV54; Det: AV54; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	80.341	100.0	111.00	0.7500	110	4.707E-001	1.123E-001	6.801E-003	2.516E-002
U-235	4376.294	4267.397	4463.412	29.039	80.2	5.00	0.0000	5	2.662E-002	2.635E-002	0.000E+000	1.441E-002
U-234	4761.063	4521.490	4833.661	78.873	99.8	111.00	1.2500	110	4.695E-001	1.125E-001	8.797E-003	2.917E-002
U-232	5312.808	5073.234	5378.146	71.175	100.1	406.00	1.2500	405	1.409E+000	1.995E-001	8.830E-003	2.928E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:50:47PM 4/7/2007

Sample

Sample Name: F7C280211-007
SampleType: Sample
: JRWH51AD
Sample Collection Date: 3/26/2007 9:35:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0032g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

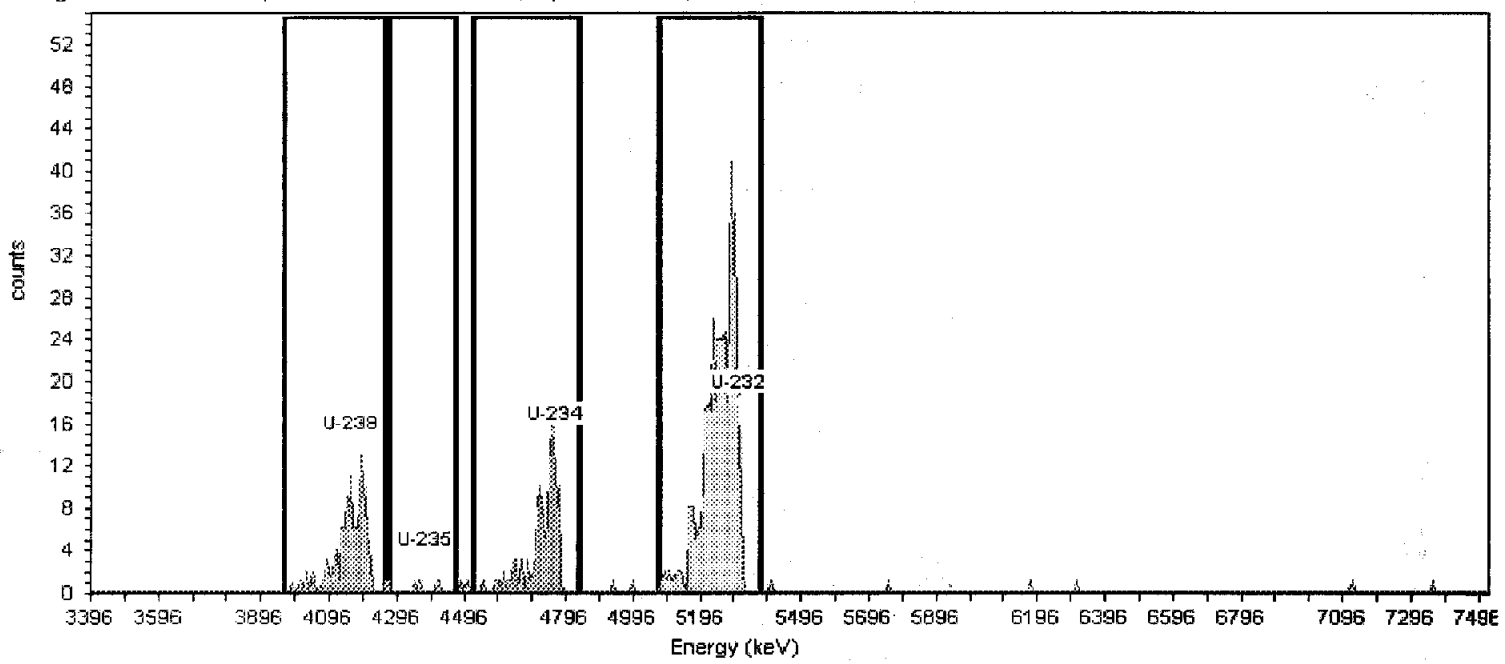
Tracer Nuclide: U-232
Tracer Recovery: 83.19%

Acquisition

Detector: AV66
Serial Number:
Acquisition Start Date: 4/7/2007 10:50:31AM
Live Time: 240.00 min.
Real Time: 240.04 min.
Background Date: 3/24/2007 9:48:00AM

Calibration Name: Mar2007_AV66
Calibration Date: 3/29/2007 2:15:00PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.33% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV66; Det: AV66; Spectrum #1; Mar-24-2007 09:48



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	85.215	100.0	120.00	0.2500	120	4.935E-001	1.139E-001	3.789E-003	1.873E-002
U-235	4376.294	4267.397	4463.412	.000	80.2	5.00	0.0000	5	2.569E-002	2.543E-002	0.000E+000	1.390E-002
U-234	4761.063	4521.490	4833.661	70.130	99.8	124.00	0.7500	123	5.089E-001	1.167E-001	6.577E-003	2.433E-002
U-232	5312.808	5073.234	5378.146	97.357	100.1	424.00	2.0000	422	1.455E+000	2.041E-001	1.078E-002	3.277E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:50:51PM 4/7/2007

Sample

Sample Name: F7C280211-008
SampleType: Sample
: JRWH81AD
Sample Collection Date: 3/26/2007 9:35:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0064g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

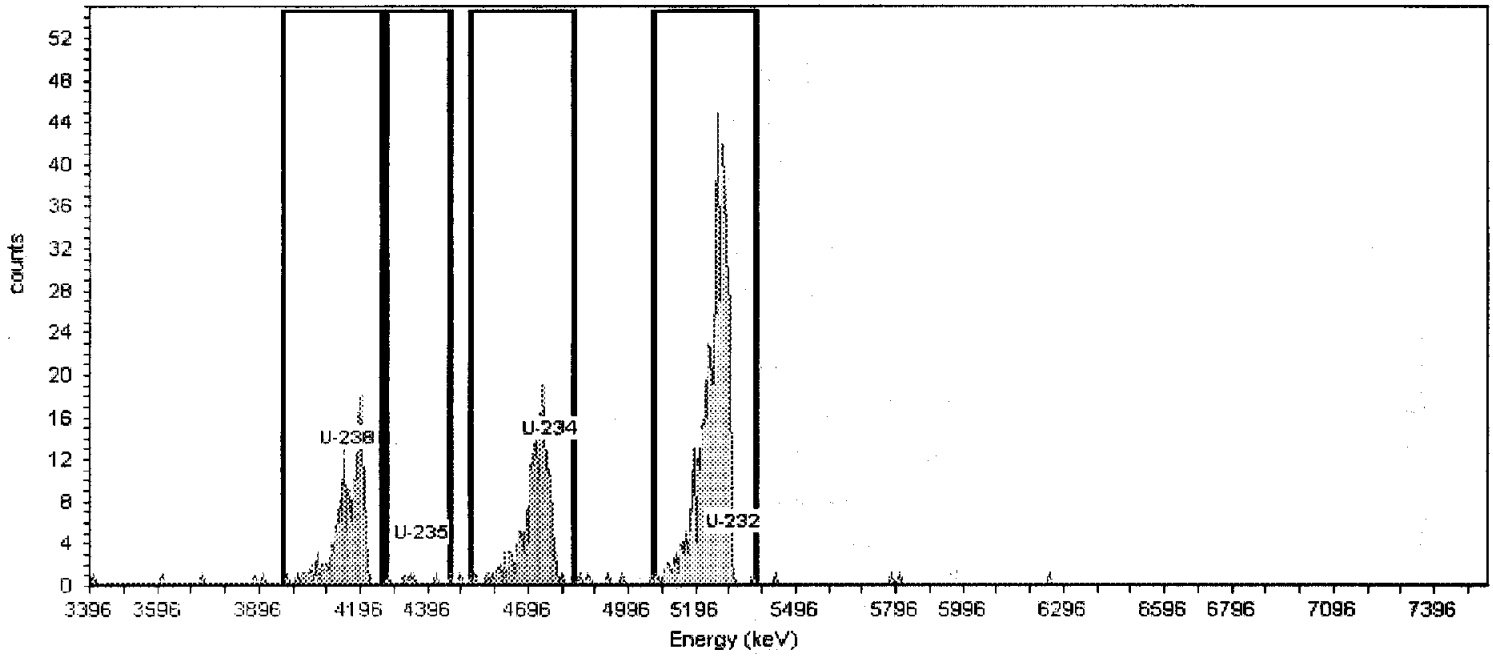
Tracer Nuclide: U-232
Tracer Recovery: 80.18%

Acquisition

Detector: AV72
Serial Number:
Acquisition Start Date: 4/7/2007 10:50:32AM
Live Time: 240.00 min.
Real Time: 240.00 min.
Background Date: 3/24/2007 9:47:01AM

Calibration Name: Mar2007_AV72
Calibration Date: 3/29/2007 4:42:00PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²
Efficiency: 26.71% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV72; Det: AV72; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	85.536	100.0	146.00	0.5000	146	6.355E-001	1.392E-001	5.680E-003	2.318E-002
U-235	4376.294	4267.397	4463.412	.292	80.2	6.00	0.2500	6	3.132E-002	2.759E-002	5.008E-003	2.475E-002
U-234	4761.063	4521.490	4833.661	73.108	99.8	167.00	1.0000	166	7.265E-001	1.536E-001	8.049E-003	2.794E-002
U-232	5312.808	5073.234	5378.146	67.780	100.1	398.00	0.5000	398	1.400E+000	1.990E-001	5.713E-003	2.331E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:10:43PM 4/7/2007

Sample

Sample Name: F7C280211-009
SampleType: Sample
: JRWJA1AD
Sample Collection Date: 3/26/2007 10:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0026g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

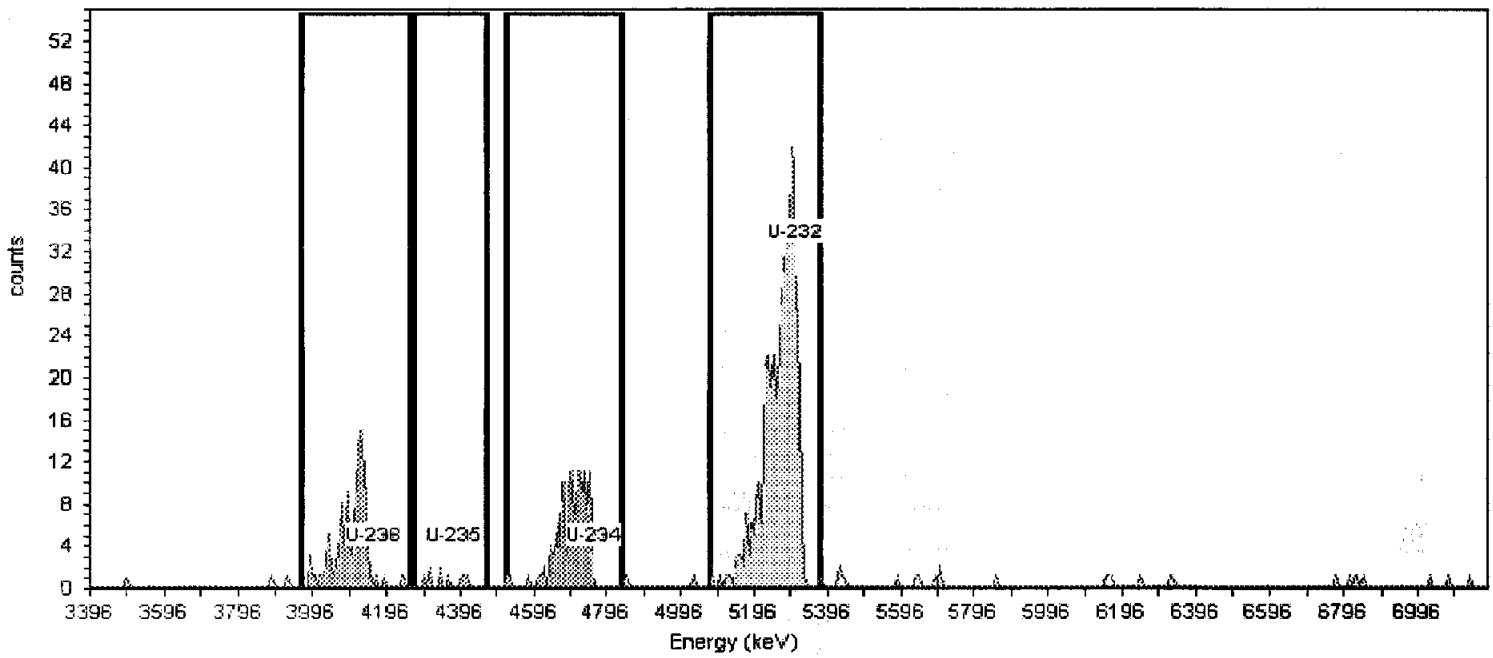
Tracer Nuclide: U-232
Tracer Recovery: 89.48%

Acquisition

Detector: AV1
Serial Number: 41-158W6
Acquisition Start Date: 4/7/2007 2:10:20PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:45AM

Calibration Name: Mar2007_AV1a
Calibration Date: 3/26/2007 11:53:54AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.58% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV1; Det: AV1; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	60.497	100.0	116.00	0.5000	116	4.551E-001	1.060E-001	5.124E-003	2.091E-002
U-235	4376.294	4267.397	4463.412	115.432	80.2	9.00	0.5000	9	4.176E-002	3.083E-002	6.389E-003	2.607E-002
U-234	4761.063	4521.490	4833.661	91.445	99.8	129.00	0.5000	129	5.073E-001	1.142E-001	5.134E-003	2.095E-002
U-232	5312.808	5073.234	5378.146	80.443	100.1	443.00	1.5000	442	1.565E+000	2.170E-001	8.926E-003	2.857E-002

STL SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:10:47PM 4/7/2007

Sample

Sample Name: F7C280211-010
SampleType: Sample
: JRWJC1AD
Sample Collection Date: 3/26/2007 10:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0067g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

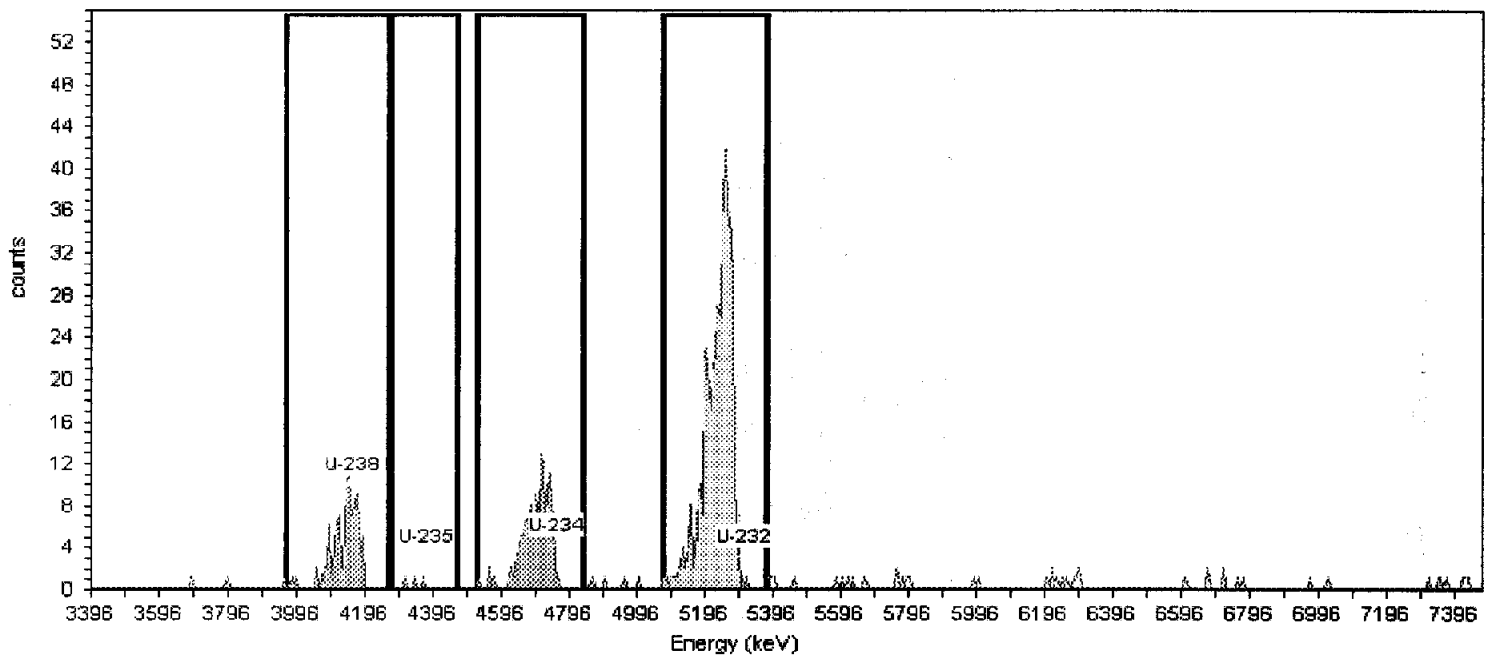
Tracer Nuclide: U-232
Tracer Recovery: 83.32%

Acquisition

Detector: AV2
Serial Number: 41-158W7
Acquisition Start Date: 4/7/2007 2:10:21PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:46:56AM

Calibration Name: Mar2007_AV2a
Calibration Date: 3/26/2007 11:54:01AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.26% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV2; Det: AV2; Spectrum #1; Mar-24-2007 09:46



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	63.159	100.0	93.00	0.0000	93	3.976E-001	1.004E-001	0.000E+000	1.157E-002
U-235	4376.294	4267.397	4463.412	45.126	80.2	3.00	0.5000	3	1.333E-002	2.004E-002	6.933E-003	2.829E-002
U-234	4761.063	4521.490	4833.661	87.487	99.8	127.00	0.5000	127	5.420E-001	1.238E-001	5.572E-003	2.274E-002
U-232	5312.808	5073.234	5378.146	76.196	100.1	410.00	4.0000	406	1.455E+000	2.065E-001	1.582E-002	4.327E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:10:51PM 4/7/2007

Sample

Sample Name: F7C280211-011
SampleType: Sample
: JRWJE1AD
Sample Collection Date: 3/26/2007 10:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0075g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

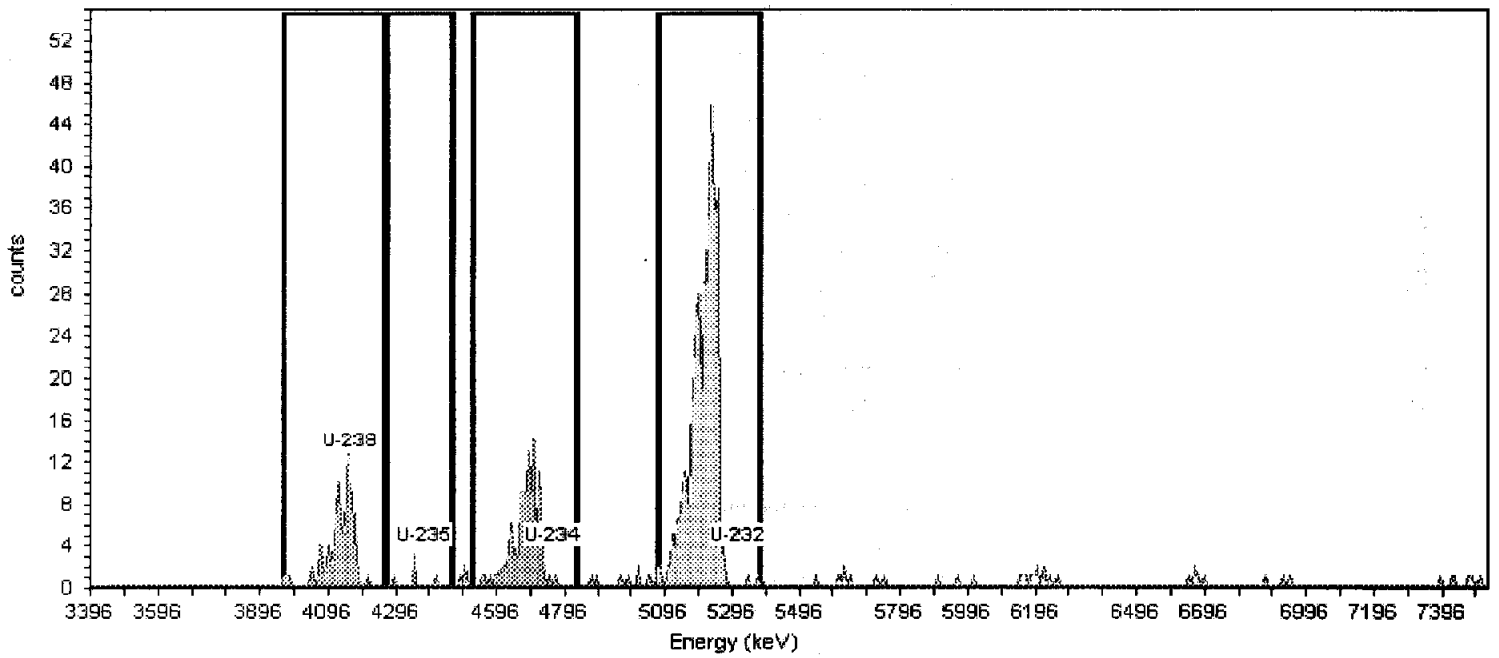
Tracer Nuclide: U-232
Tracer Recovery: 86.85%

Acquisition

Detector: AV3
Serial Number: 41-158X5
Acquisition Start Date: 4/7/2007 2:10:23PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:46:58AM

Calibration Name: Mar2007_AV3
Calibration Date: 3/26/2007 11:28:43AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 27.08% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV3; Det: AV3; Spectrum #1; Mar-24-2007 09:46



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	65.370	100.0	100.00	1.0000	99	3.936E-001	9.705E-002	7.311E-003	2.538E-002
U-235	4376.294	4267.397	4463.412	17.775	80.2	5.00	0.5000	5	2.231E-002	2.346E-002	6.446E-003	2.631E-002
U-234	4761.063	4521.490	4833.661	66.223	99.8	120.00	1.0000	119	4.740E-001	1.099E-001	7.326E-003	2.543E-002
U-232	5312.808	5073.234	5378.146	78.090	100.1	441.00	4.5000	437	1.516E+000	2.115E-001	1.560E-002	4.202E-002

STL SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:10:54PM 4/7/2007

Sample

Sample Name: F7C280211-012
SampleType: Sample
: JRWJG1AD
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0015g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

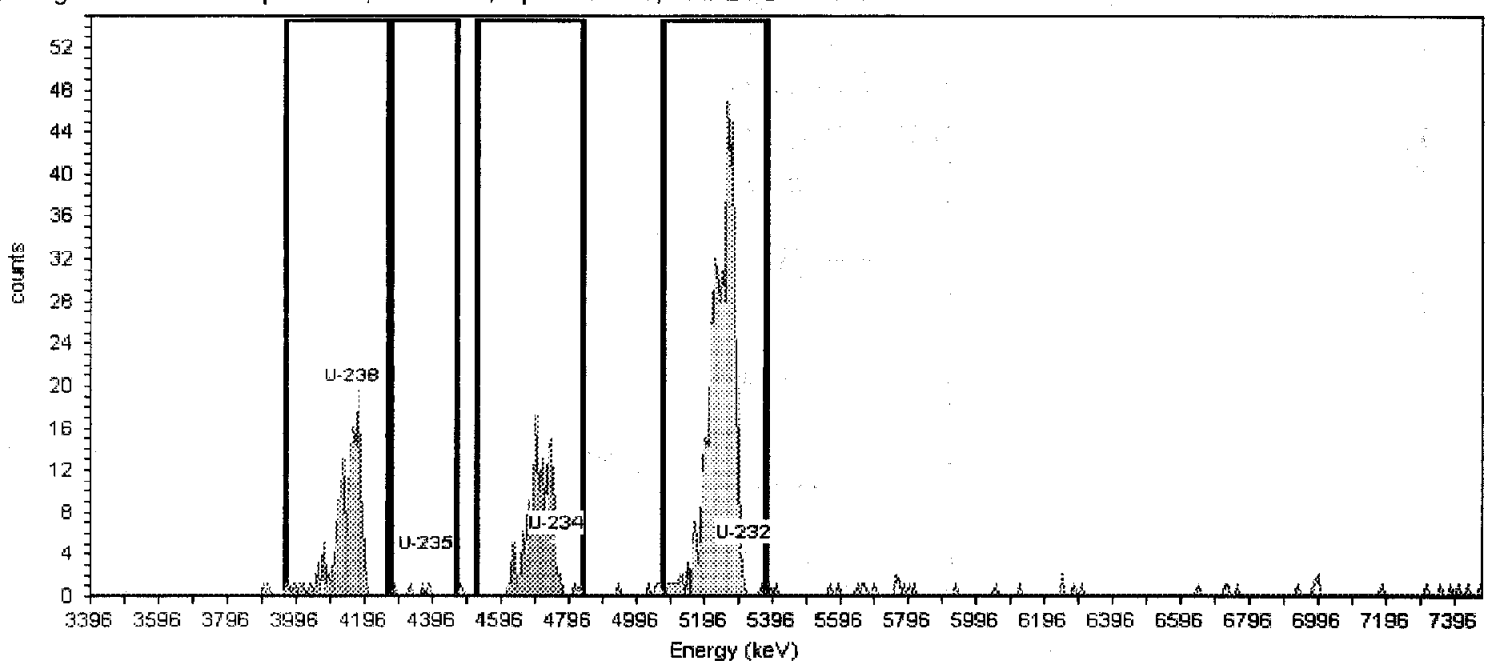
Tracer Nuclide: U-232
Tracer Recovery: 95.67%

Acquisition

Detector: AV4
Serial Number: 41-172B5
Acquisition Start Date: 4/7/2007 2:10:24PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:46:59AM

Calibration Name: Mar2007_AV4
Calibration Date: 3/26/2007 11:28:51AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.13% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV4; Det: AV4; Spectrum #1; Mar-24-2007 09:46



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	70.445	100.0	159.00	0.2500	159	5.955E-001	1.252E-001	3.449E-003	1.705E-002
U-235	4376.294	4267.397	4463.412	19.818	80.2	4.00	0.2500	4	1.754E-002	1.943E-002	4.301E-003	2.126E-002
U-234	4761.063	4521.490	4833.661	87.083	99.8	159.00	0.5000	159	5.957E-001	1.254E-001	4.888E-003	1.995E-002
U-232	5312.808	5073.234	5378.146	86.568	100.1	466.00	2.0000	464	1.675E+000	2.296E-001	9.812E-003	2.983E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:10:57PM 4/7/2007

Sample

Sample Name: F7C280211-013
SampleType: Sample
: JRWJH1AD
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0088g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

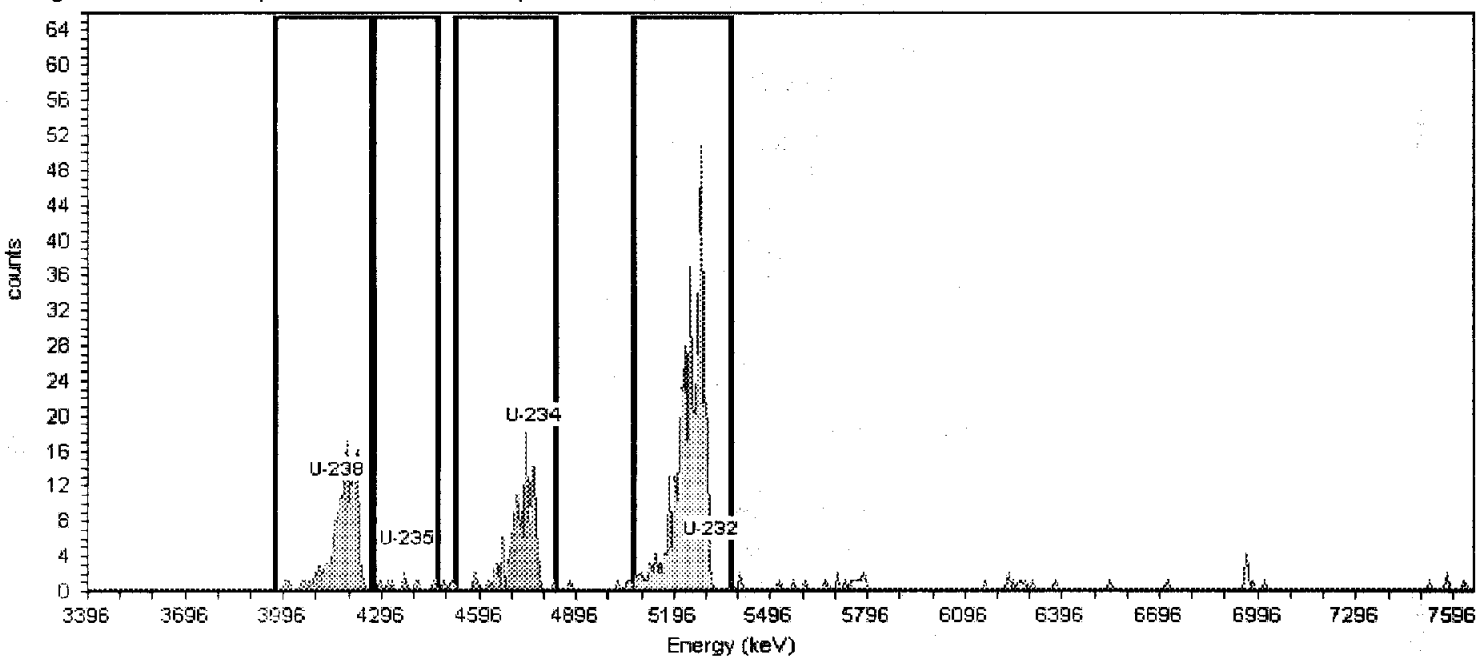
Tracer Nuclide: U-232
Tracer Recovery: 83.76%

Acquisition

Detector: AV6
Serial Number:
Acquisition Start Date: 4/7/2007 2:10:25PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:01AM

Calibration Name: Mar2007_AV6
Calibration Date: 3/26/2007 2:20:47PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.79% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV6; Det: AV6; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-234	4761.063	4521.490	4833.661	78.708	99.8	140.00	0.5000	140	5.820E-001	1.286E-001	5.425E-003	2.214E-002
U-232	5312.808	5073.234	5378.146	85.463	100.1	419.00	2.5000	417	1.461E+000	2.057E-001	1.218E-002	3.568E-002
U-238	4158.500	3962.485	4260.137	75.584	100.0	157.00	0.0000	157	6.537E-001	1.396E-001	0.000E+000	1.127E-002
U-235	4376.294	4267.397	4463.412	104.916	80.2	9.00	0.2500	9	4.542E-002	3.222E-002	4.774E-003	2.360E-002

SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:11:01PM 4/7/2007

Sample

Sample Name: F7C280211-014
SampleType: Sample
: JRWJJ1AD
Sample Collection Date: 3/26/2007 10:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0019g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

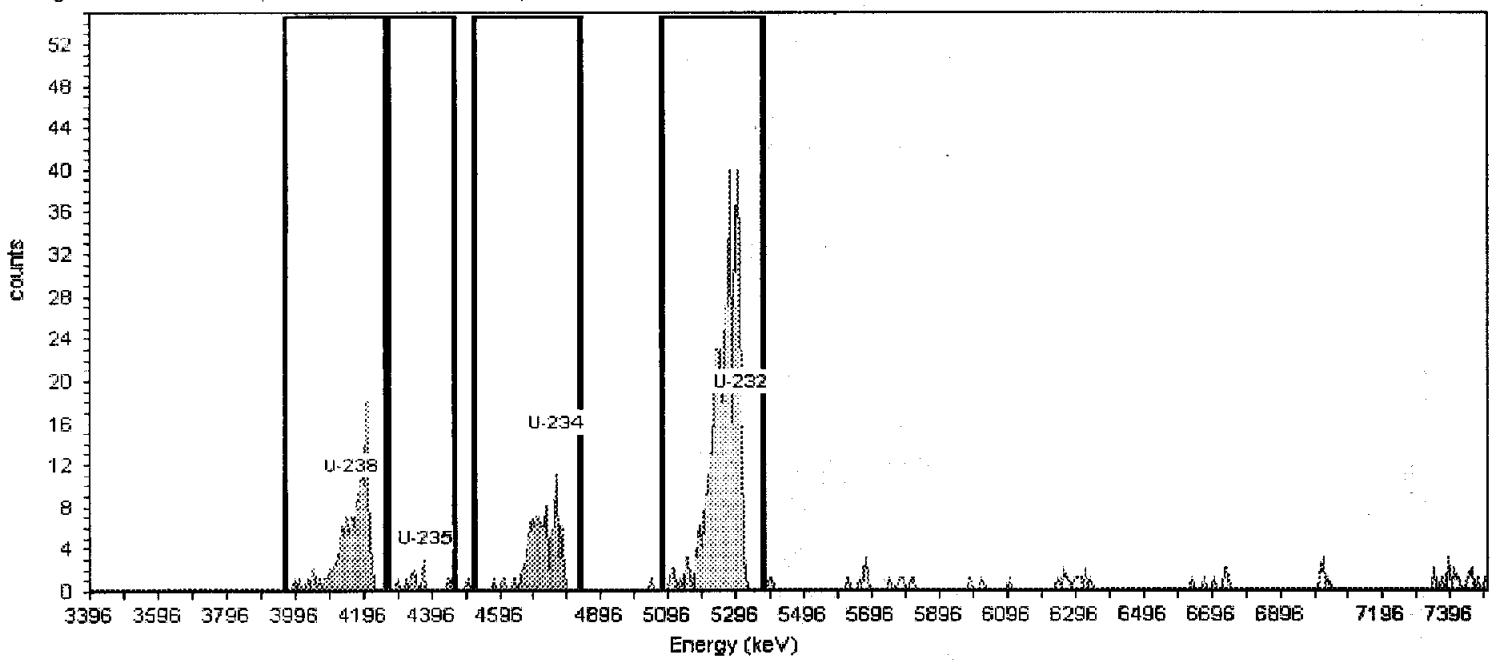
Tracer Nuclide: U-232
Tracer Recovery: 77.39%

Acquisition

Detector: AV7
Serial Number: 41-158X6
Acquisition Start Date: 4/7/2007 2:10:27PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:03AM

Calibration Name: Mar2007_AV7
Calibration Date: 3/26/2007 1:58:05PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.79% +/- 0.29% TPU(2 sigma)

Background Info: Sample: AV7; Det: AV7; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	73.454	100.0	122.00	0.5000	122	5.495E-001	1.276E-001	5.882E-003	2.400E-002
U-235	4376.294	4267.397	4463.412	121.743	80.2	11.00	0.5000	11	5.921E-002	3.919E-002	7.334E-003	2.993E-002
U-234	4761.063	4521.490	4833.661	105.803	99.8	98.00	0.5000	98	4.418E-001	1.102E-001	5.893E-003	2.405E-002
U-232	5312.808	5073.234	5378.146	86.695	100.1	387.00	2.2500	385	1.354E+000	1.946E-001	1.255E-002	3.741E-002

SEVERN TRENT **STL**

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:11:04PM 4/7/2007

Sample

Sample Name: F7C280211-015
SampleType: Sample
: JRWJK1AD
Sample Collection Date: 3/26/2007 10:15:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0074g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

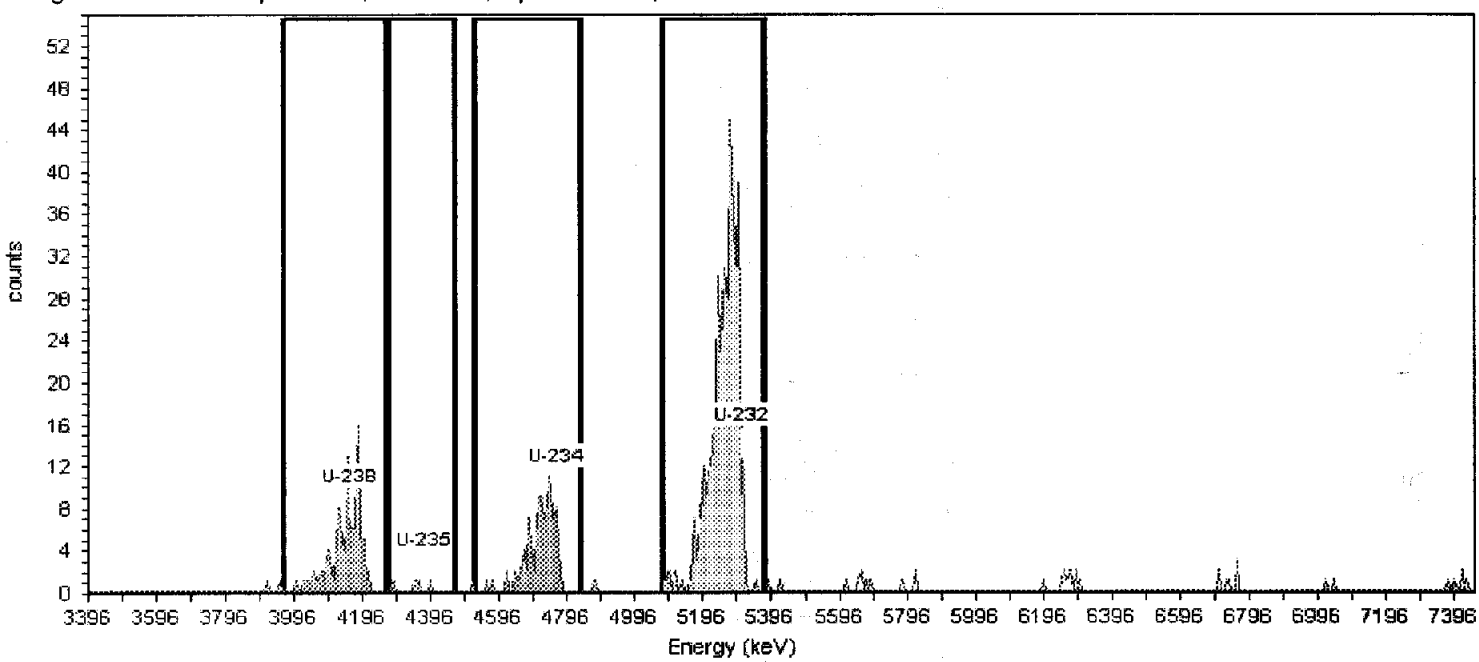
Tracer Nuclide: U-232
Tracer Recovery: 83.10%

Acquisition

Detector: AV8
Serial Number: 41-158X1
Acquisition Start Date: 4/7/2007 2:10:29PM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:05AM

Calibration Name: Mar2007_AV8
Calibration Date: 3/26/2007 1:58:11PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 28.43% +/- 0.28% TPU(2 sigma)

Background Info: Sample: AV8; Det: AV8; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	71.485	100.0	114.00	1.0000	113	4.472E-001	1.053E-001	7.278E-003	2.527E-002
U-235	4376.294	4267.397	4463.412	84.077	80.2	4.00	0.0000	4	1.974E-002	2.224E-002	0.000E+000	1.335E-002
U-234	4761.063	4521.490	4833.661	78.022	99.8	110.00	0.5000	110	4.342E-001	1.030E-001	5.157E-003	2.104E-002
U-232	5312.808	5073.234	5378.146	77.953	100.1	441.00	2.5000	439	1.450E+000	2.016E-001	1.157E-002	3.392E-002

STL SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:50:57PM 4/7/2007

Sample

Sample Name: F7C300000-193B
SampleType: Blank
: JR3GH1AA
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 2.0000g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

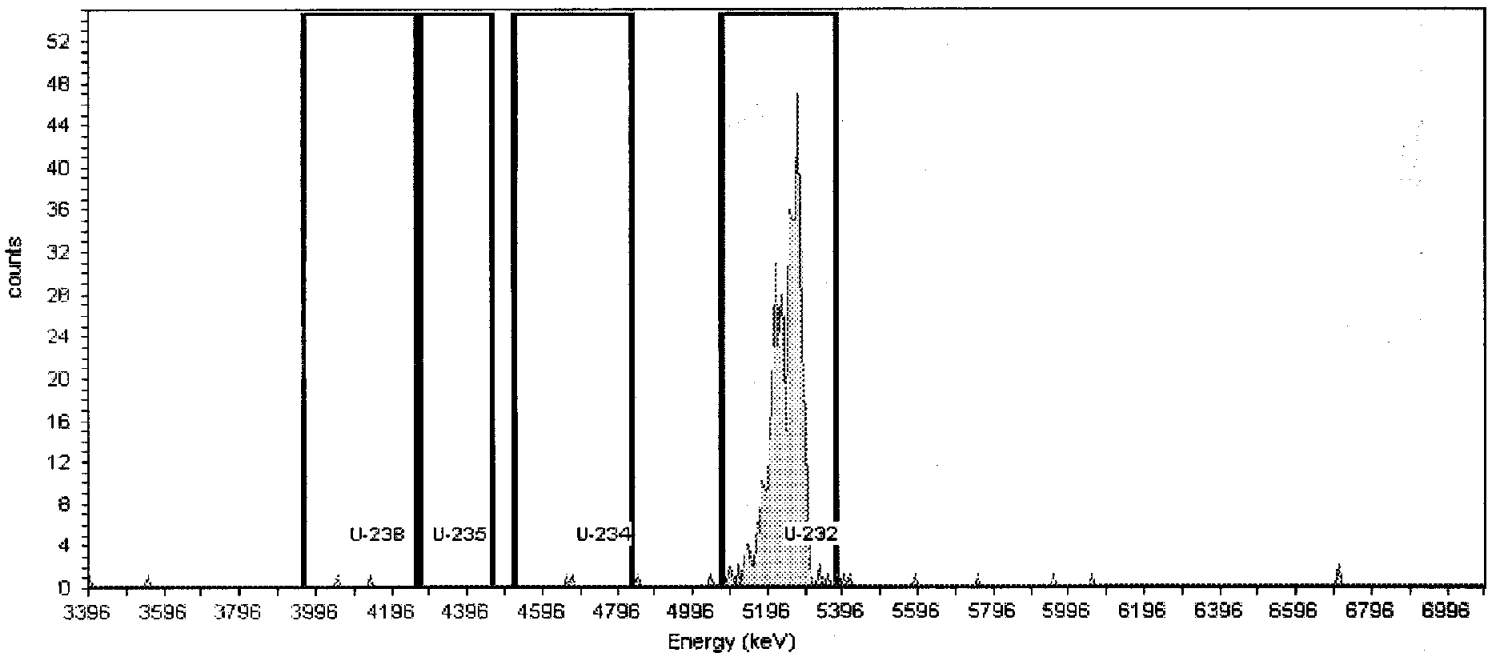
Tracer Nuclide: U-232
Tracer Recovery: 94.95%

Acquisition

Detector: AV18
Serial Number: 41-172C6
Acquisition Start Date: 4/7/2007 10:50:18AM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:20AM

Calibration Name: Mar2007_AV18
Calibration Date: 3/27/2007 6:50:43AM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 25.21% +/- 0.27% TPU(2 sigma)

Background Info: Sample: AV18; Det: AV18; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	43.284	100.0	2.00	0.7500	1	4.901E-003	1.302E-002	6.245E-003	2.310E-002
U-235	4376.294	4267.397	4463.412	.000	80.2	0.00	0.2500	0	-1.222E-003	1.093E-002	4.495E-003	2.222E-002
U-234	4761.063	4521.490	4833.661	42.242	99.8	2.00	0.7500	1	4.911E-003	1.305E-002	6.257E-003	2.314E-002
U-232	5312.808	5073.234	5378.146	91.205	100.1	447.00	2.7500	444	1.663E+000	2.307E-001	1.203E-002	3.472E-002

SEVERN TRENT STL

Alpha-Spectroscopy Analysis Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 2:51:04PM 4/7/2007

Sample

Sample Name: F7C300000-193C
SampleType: Control
: JR3GH1AC
Sample Collection Date: 3/26/2007 9:05:00AM
Comment:

Spectrum #1 Analysis #1
Sample Weight : 0.1325g
Aliquot: N/A Aliquot Fraction: N/A
Lab Preparation:

Batch

Batch Name: 7089193
:
Description:

Client Name: Undefined
Client Contact:

Tracer

Tracer Name: Rad06-0047_U232
Tracer Activity: 77.78 DPM/mL x (Vol.)0.10 mL = 7.78 DPM
Tracer Ref. Date: 8/3/2006 12:00:26PM

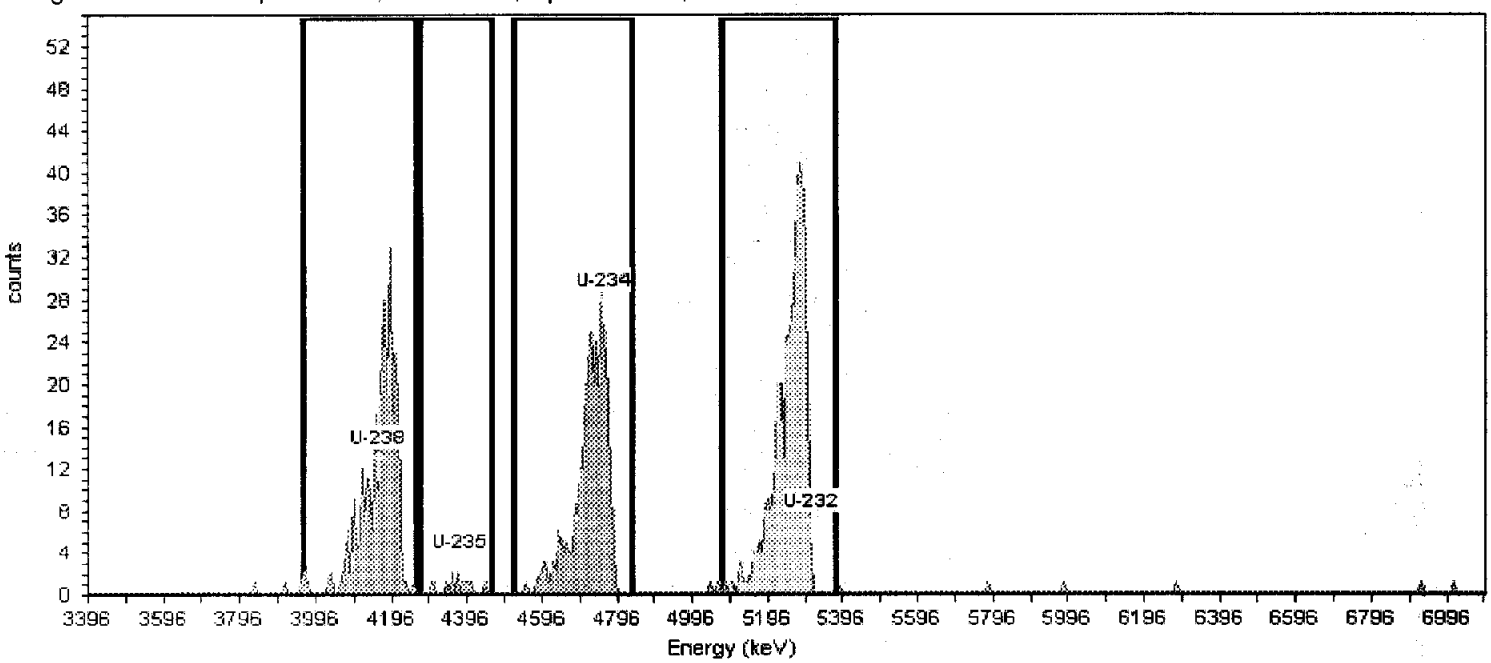
Tracer Nuclide: U-232
Tracer Recovery: 83.43%

Acquisition

Detector: AV21
Serial Number: 41-172C7
Acquisition Start Date: 4/7/2007 10:50:22AM
Live Time: 240.00 min.
Real Time: 240.01 min.
Background Date: 3/24/2007 9:47:25AM

Calibration Name: Mar2007_AV21
Calibration Date: 3/27/2007 5:23:05PM
Energy Cal Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2
Efficiency: 26.40% +/- 0.26% TPU(2 sigma)

Background Info: Sample: AV21; Det: AV21; Spectrum #1; Mar-24-2007 09:47



General Analysis

Analysis Method: ROI Analysis, Set Name = UROI
Decay Correction: 4/7/2007 10:46:55AM
MDA Constants: Kα = 1.65 , Kβ = 1.65

Nuclide Library: Uranium
MDA Source: Background

Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4158.500	3962.485	4260.137	59.778	100.0	279.00	0.0000	279	1.795E+001	3.328E+000	0.000E+000	1.740E-001
U-235	4376.294	4267.397	4463.412	37.493	80.2	11.00	0.0000	11	8.822E-001	5.695E-001	0.000E+000	2.170E-001
U-234	4761.063	4521.490	4833.661	78.032	99.8	306.00	1.0000	305	1.966E+001	3.581E+000	1.185E-001	4.115E-001
U-232	5312.808	5073.234	5378.146	66.864	100.1	409.00	0.2500	409	2.206E+001	3.112E+000	5.949E-002	2.940E-001

TestAmerica STL

Daily Pulsers

4/7/07

Daily Pulser Check - Severn Trent Lab

Pulser Date: 4/7/2007

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria	P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria	P/F	Energy (keV) Result	Energy (keV) Criteria	P/F
AV1	04/07/2007 7:57	7452	7218.7 +/- 5%	Pass	14.8	10 - 20	Pass	221.9	229.0 +/- 5%	Pass	5000	5051.1 +/- 25%	Pass
AV2	04/07/2007 7:57	7452	7468.7 +/- 5%	Pass	14.0	10 - 20	Pass	227.0	222.9 +/- 5%	Pass	5037	5007.5 +/- 25%	Pass
AV3	04/07/2007 7:57	7447	7484.9 +/- 5%	Pass	14.1	10 - 20	Pass	222.0	225.9 +/- 5%	Pass	5001	5028.8 +/- 25%	Pass
AV4	04/07/2007 7:57	7430	7413.7 +/- 5%	Pass	15.1	10 - 20	Pass	227.1	224.9 +/- 5%	Pass	5037	5021.6 +/- 25%	Pass
AV6	04/07/2007 7:57	7277	7476.7 +/- 5%	Pass	11.7	10 - 20	Pass	219.0	224.0 +/- 5%	Pass	4979	5015.3 +/- 25%	Pass
AV7	04/07/2007 7:57	7438	7477.0 +/- 5%	Pass	13.1	10 - 20	Pass	226.9	224.9 +/- 5%	Pass	5036	5021.9 +/- 25%	Pass
AV8	04/07/2007 7:57	7426	7327.4 +/- 5%	Pass	14.5	10 - 20	Pass	223.9	228.0 +/- 5%	Pass	5014	5044.6 +/- 25%	Pass
AV9	04/07/2007 7:57	7718	7519.3 +/- 5%	Pass	14.0	10 - 20	Pass	224.9	227.9 +/- 5%	Pass	5022	5043.3 +/- 25%	Pass
AV11	04/07/2007 7:57	7715	7666.2 +/- 5%	Pass	18.7	10 - 20	Pass	228.2	225.0 +/- 5%	Pass	5046	5022.1 +/- 25%	Pass
AV12	04/07/2007 7:57	7707	7588.7 +/- 5%	Pass	14.6	10 - 20	Pass	225.0	230.0 +/- 5%	Pass	5023	5058.4 +/- 25%	Pass
AV13	04/07/2007 7:57	7707	7584.6 +/- 5%	Pass	14.0	10 - 20	Pass	225.9	228.0 +/- 5%	Pass	5029	5044.1 +/- 25%	Pass
AV14	04/07/2007 7:57	7709	7638.3 +/- 5%	Pass	13.1	10 - 20	Pass	221.9	227.0 +/- 5%	Pass	5000	5037.2 +/- 25%	Pass
AV15	04/07/2007 7:57	7704	7770.5 +/- 5%	Pass	18.3	10 - 20	Pass	222.1	226.9 +/- 5%	Pass	5001	5036.6 +/- 25%	Pass
AV17	04/07/2007 7:57	7747	7619.1 +/- 5%	Pass	41.7	10 - 20	FAIL	227.0	229.9 +/- 5%	Pass	5037	5058.3 +/- 25%	Pass
AV17	04/07/2007 9:13	7655	7619.1 +/- 5%	Pass	41.2	10 - 20	FAIL	227.0	229.9 +/- 5%	Pass	5037	5058.3 +/- 25%	Pass
AV18	04/07/2007 7:57	7731	7714.5 +/- 5%	Pass	15.3	10 - 20	Pass	223.1	226.9 +/- 5%	Pass	5008	5036.4 +/- 25%	Pass
AV19	04/07/2007 7:57	7743	7269.8 +/- 5%	FAIL	13.3	10 - 20	Pass	221.0	227.7 +/- 5%	Pass	4994	5041.9 +/- 25%	Pass
AV19	04/07/2007 9:13	7652	7269.8 +/- 5%	FAIL	13.3	10 - 20	Pass	221.0	227.7 +/- 5%	Pass	4994	5041.9 +/- 25%	Pass
AV20	04/07/2007 7:57	7740	7503.6 +/- 5%	Pass	13.8	10 - 20	Pass	226.0	226.0 +/- 5%	Pass	5030	5029.9 +/- 25%	Pass
AV21	04/07/2007 7:57	7734	7550.9 +/- 5%	Pass	13.4	10 - 20	Pass	223.0	226.0 +/- 5%	Pass	5008	5029.6 +/- 25%	Pass
AV22	04/07/2007 7:57	7730	7691.4 +/- 5%	Pass	14.3	10 - 20	Pass	223.0	225.0 +/- 5%	Pass	5008	5022.4 +/- 25%	Pass
AV23	04/07/2007 9:13	7633	7665.3 +/- 5%	Pass	20.2	10 - 20	FAIL	229.9	229.8 +/- 5%	Pass	5058	5057.0 +/- 25%	Pass
AV23	04/07/2007 7:57	7717	7665.3 +/- 5%	Pass	20.0	10 - 20	FAIL	229.9	229.8 +/- 5%	Pass	5058	5057.0 +/- 25%	Pass
AV24	04/07/2007 7:57	7713	7354.0 +/- 5%	Pass	15.3	10 - 20	Pass	224.0	226.9 +/- 5%	Pass	5015	5036.4 +/- 25%	Pass
AV45	04/07/2007 7:57	7682	7593.5 +/- 5%	Pass	61.0	10 - 20	FAIL	231.5	225.6 +/- 5%	Pass	5070	5026.9 +/- 25%	Pass
AV45	04/07/2007 9:13	7655	7593.5 +/- 5%	Pass	17.7	10 - 20	Pass	226.9	225.6 +/- 5%	Pass	5037	5026.9 +/- 25%	Pass
AV46	04/07/2007 7:57	7676	7722.7 +/- 5%	Pass	62.2	10 - 20	FAIL	226.8	225.8 +/- 5%	Pass	5035	5028.0 +/- 25%	Pass
AV46	04/07/2007 9:13	7653	7722.7 +/- 5%	Pass	12.9	10 - 20	Pass	224.0	225.8 +/- 5%	Pass	5015	5028.0 +/- 25%	Pass
AV47	04/07/2007 7:57	7662	7532.5 +/- 5%	Pass	61.7	10 - 20	FAIL	224.8	226.0 +/- 5%	Pass	5021	5029.6 +/- 25%	Pass
AV47	04/07/2007 9:13	7648	7532.5 +/- 5%	Pass	14.0	10 - 20	Pass	222.0	226.0 +/- 5%	Pass	5001	5029.6 +/- 25%	Pass
AV48	04/07/2007 9:13	7640	7717.5 +/- 5%	Pass	14.7	10 - 20	Pass	225.0	224.0 +/- 5%	Pass	5022	5015.2 +/- 25%	Pass
AV48	04/07/2007 7:58	0	7717.5 +/- 5%	FAIL	5704.8	10 - 20	FAIL	552.4	224.0 +/- 5%	FAIL	7399	5015.2 +/- 25%	FAIL

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria		P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria		P/F	Energy (keV) Result	Energy (keV) Criteria		P/F
AV49	04/07/2007 7:58	7673	7703.4	+/- 5%	Pass	51.2	10 - 20	FAIL	236.9	226.0	+/- 5%	Pass	5109	5029.5	+/- 25%	Pass
AV49	04/07/2007 9:13	7634	7703.4	+/- 5%	Pass	15.4	10 - 20	Pass	231.9	226.0	+/- 5%	Pass	5073	5029.5	+/- 25%	Pass
AV50	04/07/2007 7:58	7668	7660.9	+/- 5%	Pass	57.7	10 - 20	FAIL	229.8	227.0	+/- 5%	Pass	5057	5037.2	+/- 25%	Pass
AV50	04/07/2007 9:13	7582	7660.9	+/- 5%	Pass	17.1	10 - 20	Pass	225.0	227.0	+/- 5%	Pass	5022	5037.2	+/- 25%	Pass
AV51	04/07/2007 9:13	7326	7070.5	+/- 5%	Pass	13.8	10 - 20	Pass	226.9	223.0	+/- 5%	Pass	5037	5007.6	+/- 25%	Pass
AV52	04/07/2007 9:13	7314	7156.4	+/- 5%	Pass	15.0	10 - 20	Pass	222.9	225.0	+/- 5%	Pass	5007	5022.4	+/- 25%	Pass
AV53	04/07/2007 9:13	7321	7144.1	+/- 5%	Pass	13.7	10 - 20	Pass	224.1	223.0	+/- 5%	Pass	5016	5007.8	+/- 25%	Pass
AV54	04/07/2007 9:13	7318	7313.1	+/- 5%	Pass	13.7	10 - 20	Pass	228.0	226.0	+/- 5%	Pass	5044	5029.5	+/- 25%	Pass
AV54	04/07/2007 9:13	7318	7313.1	+/- 5%	Pass	13.7	10 - 20	Pass	228.0	226.0	+/- 5%	Pass	5044	5029.5	+/- 25%	Pass
AV55	04/07/2007 9:13	7316	7132.9	+/- 5%	Pass	13.5	10 - 20	Pass	225.1	226.0	+/- 5%	Pass	5023	5029.7	+/- 25%	Pass
AV56	04/07/2007 7:56	7354	7163.7	+/- 5%	Pass	13.1	10 - 20	Pass	221.0	222.0	+/- 5%	Pass	4993	5000.7	+/- 25%	Pass
AV57	04/07/2007 7:56	7350	7309.5	+/- 5%	Pass	22.1	10 - 20	FAIL	226.1	222.0	+/- 5%	Pass	5030	5000.6	+/- 25%	Pass
AV57	04/07/2007 9:13	7314	7309.5	+/- 5%	Pass	21.6	10 - 20	FAIL	226.0	222.0	+/- 5%	Pass	5030	5000.6	+/- 25%	Pass
AV58	04/07/2007 7:56	7347	7249.2	+/- 5%	Pass	13.8	10 - 20	Pass	220.9	223.0	+/- 5%	Pass	4993	5008.0	+/- 25%	Pass
AV59	04/07/2007 7:57	7324	7141.4	+/- 5%	Pass	13.9	10 - 20	Pass	288.1	284.0	+/- 5%	Pass	5480	5450.6	+/- 25%	Pass
AV60	04/07/2007 7:57	7318	7019.7	+/- 5%	Pass	40.9	10 - 20	FAIL	221.1	223.0	+/- 5%	Pass	4994	5007.5	+/- 25%	Pass
AV60	04/07/2007 9:13	7214	7019.7	+/- 5%	Pass	40.5	10 - 20	FAIL	221.4	223.0	+/- 5%	Pass	4996	5007.5	+/- 25%	Pass
AV63	04/07/2007 7:57	7315	7120.8	+/- 5%	Pass	28.8	10 - 20	FAIL	225.1	223.0	+/- 5%	Pass	5023	5007.9	+/- 25%	Pass
AV63	04/07/2007 9:13	7211	7120.8	+/- 5%	Pass	27.4	10 - 20	FAIL	225.0	223.0	+/- 5%	Pass	5022	5007.9	+/- 25%	Pass
AV64	04/07/2007 7:57	7315	7153.7	+/- 5%	Pass	33.4	10 - 20	FAIL	221.6	224.0	+/- 5%	Pass	4998	5015.3	+/- 25%	Pass
AV64	04/07/2007 9:13	7211	7153.7	+/- 5%	Pass	32.2	10 - 20	FAIL	221.5	224.0	+/- 5%	Pass	4997	5015.3	+/- 25%	Pass
AV65	04/07/2007 7:57	7288	7233.4	+/- 5%	Pass	22.9	10 - 20	FAIL	221.1	224.0	+/- 5%	Pass	4994	5015.3	+/- 25%	Pass
AV65	04/07/2007 9:13	7205	7233.4	+/- 5%	Pass	22.3	10 - 20	FAIL	221.2	224.0	+/- 5%	Pass	4995	5015.3	+/- 25%	Pass
AV66	04/07/2007 7:57	7306	7165.5	+/- 5%	Pass	14.6	10 - 20	Pass	218.9	222.0	+/- 5%	Pass	4978	5000.5	+/- 25%	Pass
AV67	04/07/2007 7:56	7438	7128.1	+/- 5%	Pass	18.7	10 - 20	Pass	225.0	224.1	+/- 5%	Pass	5023	5015.6	+/- 25%	Pass
AV68	04/07/2007 7:56	7436	7259.5	+/- 5%	Pass	13.9	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.8	+/- 25%	Pass
AV69	04/07/2007 7:57	7375	7305.4	+/- 5%	Pass	16.3	10 - 20	Pass	221.1	222.0	+/- 5%	Pass	4994	5000.6	+/- 25%	Pass
AV70	04/07/2007 7:57	7435	7406.5	+/- 5%	Pass	13.2	10 - 20	Pass	219.0	222.6	+/- 5%	Pass	4979	5004.7	+/- 25%	Pass
AV71	04/07/2007 7:57	7433	7187.3	+/- 5%	Pass	13.1	10 - 20	Pass	220.0	225.0	+/- 5%	Pass	4986	5022.7	+/- 25%	Pass
AV72	04/07/2007 7:57	7431	7090.0	+/- 5%	Pass	13.2	10 - 20	Pass	220.9	223.9	+/- 5%	Pass	4993	5014.6	+/- 25%	Pass
AV73	04/07/2007 7:57	7424	7251.3	+/- 5%	Pass	22.1	10 - 20	FAIL	221.0	225.0	+/- 5%	Pass	4993	5022.4	+/- 25%	Pass
AV73	04/07/2007 9:13	7334	7251.3	+/- 5%	Pass	22.3	10 - 20	FAIL	221.0	225.0	+/- 5%	Pass	4993	5022.4	+/- 25%	Pass
AV75	04/07/2007 8:17	7560	7267.9	+/- 5%	Pass	13.1	10 - 20	Pass	223.0	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV76	04/07/2007 8:17	7363	7374.3	+/- 5%	Pass	12.7	10 - 20	Pass	223.0	224.0	+/- 5%	Pass	5008	5015.2	+/- 25%	Pass
AV77	04/07/2007 8:17	7551	7497.1	+/- 5%	Pass	12.9	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV78	04/07/2007 8:17	7378	7183.8	+/- 5%	Pass	12.8	10 - 20	Pass	223.0	223.3	+/- 5%	Pass	5008	5009.8	+/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria		P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria		P/F	Energy (keV) Result	Energy (keV) Criteria		P/F
AV79	04/07/2007 8:17	7546	7349.7	+/- 5%	Pass	13.2	10 - 20	Pass	221.0	222.0	+/- 5%	Pass	4993	5000.4	+/- 25%	Pass
AV80	04/07/2007 8:17	7351	7226.4	+/- 5%	Pass	12.7	10 - 20	Pass	223.0	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV81	04/07/2007 8:17	7541	7453.4	+/- 5%	Pass	13.1	10 - 20	Pass	222.0	223.0	+/- 5%	Pass	5000	5008.1	+/- 25%	Pass
AV82	04/07/2007 8:17	7538	7529.2	+/- 5%	Pass	13.4	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.2	+/- 25%	Pass
AV83	04/07/2007 8:17	7599	7523.7	+/- 5%	Pass	12.1	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.4	+/- 25%	Pass
AV84	04/07/2007 8:17	7521	7637.7	+/- 5%	Pass	12.6	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.7	+/- 25%	Pass
AV85	04/07/2007 8:17	7503	7549.7	+/- 5%	Pass	12.2	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5008.0	+/- 25%	Pass
AV86	04/07/2007 8:17	7674	7679.0	+/- 5%	Pass	16.9	10 - 20	Pass	224.1	223.9	+/- 5%	Pass	5016	5014.3	+/- 25%	Pass
AV87	04/07/2007 8:17	7422	7512.4	+/- 5%	Pass	12.4	10 - 20	Pass	223.1	223.0	+/- 5%	Pass	5008	5007.7	+/- 25%	Pass
AV88	04/07/2007 8:17	7717	7716.1	+/- 5%	Pass	13.6	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV89	04/07/2007 8:17	7370	7553.8	+/- 5%	Pass	12.8	10 - 20	Pass	221.0	222.6	+/- 5%	Pass	4994	5004.7	+/- 25%	Pass
AV90	04/07/2007 8:17	7710	7474.4	+/- 5%	Pass	13.8	10 - 20	Pass	224.1	224.1	+/- 5%	Pass	5016	5015.6	+/- 25%	Pass
AV92	04/07/2007 8:17	7374	7358.9	+/- 5%	Pass	12.4	10 - 20	Pass	222.9	223.9	+/- 5%	Pass	5008	5014.6	+/- 25%	Pass
AV93	04/07/2007 8:17	7430	7393.5	+/- 5%	Pass	12.6	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5008.3	+/- 25%	Pass
AV94	04/07/2007 8:17	7644	7477.9	+/- 5%	Pass	14.6	10 - 20	Pass	222.2	222.0	+/- 5%	Pass	5002	5000.5	+/- 25%	Pass
AV95	04/07/2007 8:17	7644	7432.4	+/- 5%	Pass	13.1	10 - 20	Pass	221.0	222.2	+/- 5%	Pass	4994	5001.9	+/- 25%	Pass
AV96	04/07/2007 8:17	7644	7654.3	+/- 5%	Pass	13.4	10 - 20	Pass	222.0	222.6	+/- 5%	Pass	5001	5005.3	+/- 25%	Pass
AV97	04/07/2007 8:17	7639	7649.9	+/- 5%	Pass	13.8	10 - 20	Pass	223.0	223.8	+/- 5%	Pass	5008	5014.0	+/- 25%	Pass
AV98	04/07/2007 8:17	7635	7582.0	+/- 5%	Pass	13.3	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.6	+/- 25%	Pass

TestAmerica STL

Daily Pulsers

4/12/07

Daily Pulser Check - Severn Trent Lab

Pulser Date: 4/12/2007

		Gross Counts				FWHM (keV)			Pulser Center				Energy (keV)			
Detector	Date/Time	Result	Criteria		P/F	Result	Criteria	P/F	Result	Criteria		P/F	Result	Criteria		P/F
AV1	04/12/2007 7:10	7448	7218.7	+/- 5%	Pass	14.4	10 - 20	Pass	222.0	229.0	+/- 5%	Pass	5001	5051.1	+/- 25%	Pass
AV2	04/12/2007 7:10	7436	7468.7	+/- 5%	Pass	15.4	10 - 20	Pass	225.9	222.9	+/- 5%	Pass	5029	5007.5	+/- 25%	Pass
AV3	04/12/2007 7:10	7373	7484.9	+/- 5%	Pass	14.0	10 - 20	Pass	222.0	225.9	+/- 5%	Pass	5001	5028.8	+/- 25%	Pass
AV4	04/12/2007 7:10	7358	7413.7	+/- 5%	Pass	15.1	10 - 20	Pass	227.1	224.9	+/- 5%	Pass	5037	5021.6	+/- 25%	Pass
AV6	04/12/2007 7:10	7316	7476.7	+/- 5%	Pass	11.3	10 - 20	Pass	222.0	224.0	+/- 5%	Pass	5001	5015.3	+/- 25%	Pass
AV7	04/12/2007 7:10	6862	7477.0	+/- 5%	FAIL	12.7	10 - 20	Pass	228.2	224.9	+/- 5%	Pass	5045	5021.9	+/- 25%	Pass
AV7	04/12/2007 8:14	7343	7477.0	+/- 5%	Pass	14.4	10 - 20	Pass	228.1	224.9	+/- 5%	Pass	5045	5021.9	+/- 25%	Pass
AV8	04/12/2007 7:10	7320	7327.4	+/- 5%	Pass	15.8	10 - 20	Pass	223.8	228.0	+/- 5%	Pass	5014	5044.6	+/- 25%	Pass
AV9	04/12/2007 7:10	7726	7519.3	+/- 5%	Pass	13.7	10 - 20	Pass	225.0	227.9	+/- 5%	Pass	5022	5043.3	+/- 25%	Pass
AV11	04/12/2007 7:10	7717	7666.2	+/- 5%	Pass	18.9	10 - 20	Pass	227.2	225.0	+/- 5%	Pass	5038	5022.1	+/- 25%	Pass
AV12	04/12/2007 7:10	7709	7588.7	+/- 5%	Pass	15.0	10 - 20	Pass	225.0	230.0	+/- 5%	Pass	5023	5058.4	+/- 25%	Pass
AV13	04/12/2007 7:10	7713	7584.6	+/- 5%	Pass	14.2	10 - 20	Pass	226.0	228.0	+/- 5%	Pass	5029	5044.1	+/- 25%	Pass
AV14	04/12/2007 7:10	7715	7638.3	+/- 5%	Pass	13.3	10 - 20	Pass	221.9	227.0	+/- 5%	Pass	5000	5037.2	+/- 25%	Pass
AV15	04/12/2007 7:10	7679	7770.5	+/- 5%	Pass	15.7	10 - 20	Pass	222.0	226.9	+/- 5%	Pass	5000	5036.6	+/- 25%	Pass
AV17	04/12/2007 7:10	7754	7619.1	+/- 5%	Pass	13.6	10 - 20	Pass	225.1	229.9	+/- 5%	Pass	5023	5058.3	+/- 25%	Pass
AV18	04/12/2007 7:10	7737	7714.5	+/- 5%	Pass	15.5	10 - 20	Pass	221.8	226.9	+/- 5%	Pass	4999	5036.4	+/- 25%	Pass
AV19	04/12/2007 7:10	7748	7269.8	+/- 5%	FAIL	13.8	10 - 20	Pass	220.9	227.7	+/- 5%	Pass	4993	5041.9	+/- 25%	Pass
AV19	04/12/2007 8:14	7627	7269.8	+/- 5%	Pass	13.6	10 - 20	Pass	220.9	227.7	+/- 5%	Pass	4993	5041.9	+/- 25%	Pass
AV20	04/12/2007 7:10	7742	7503.6	+/- 5%	Pass	14.0	10 - 20	Pass	227.0	226.0	+/- 5%	Pass	5037	5029.9	+/- 25%	Pass
AV21	04/12/2007 7:10	7744	7550.9	+/- 5%	Pass	13.5	10 - 20	Pass	223.0	226.0	+/- 5%	Pass	5008	5029.6	+/- 25%	Pass
AV22	04/12/2007 7:10	7738	7691.4	+/- 5%	Pass	13.8	10 - 20	Pass	224.2	225.0	+/- 5%	Pass	5016	5022.4	+/- 25%	Pass
AV23	04/12/2007 7:11	7737	7665.3	+/- 5%	Pass	13.6	10 - 20	Pass	222.0	229.8	+/- 5%	Pass	5001	5057.0	+/- 25%	Pass
AV24	04/12/2007 7:11	7714	7354.0	+/- 5%	Pass	15.4	10 - 20	Pass	224.0	226.9	+/- 5%	Pass	5015	5036.4	+/- 25%	Pass
AV45	04/12/2007 7:11	7636	7593.5	+/- 5%	Pass	17.7	10 - 20	Pass	227.0	225.6	+/- 5%	Pass	5037	5026.9	+/- 25%	Pass
AV46	04/12/2007 7:11	7210	7722.7	+/- 5%	FAIL	13.1	10 - 20	Pass	224.1	225.8	+/- 5%	Pass	5016	5028.0	+/- 25%	Pass
AV46	04/12/2007 8:14	7171	7722.7	+/- 5%	FAIL	12.8	10 - 20	Pass	224.1	225.8	+/- 5%	Pass	5016	5028.0	+/- 25%	Pass
AV47	04/12/2007 7:11	7625	7532.5	+/- 5%	Pass	14.5	10 - 20	Pass	220.9	226.0	+/- 5%	Pass	4993	5029.6	+/- 25%	Pass
AV48	04/12/2007 7:11	7612	7717.5	+/- 5%	Pass	15.7	10 - 20	Pass	223.1	224.0	+/- 5%	Pass	5009	5015.2	+/- 25%	Pass
AV49	04/12/2007 7:11	7617	7703.4	+/- 5%	Pass	14.9	10 - 20	Pass	232.0	226.0	+/- 5%	Pass	5073	5029.5	+/- 25%	Pass
AV50	04/12/2007 7:11	7598	7660.9	+/- 5%	Pass	15.4	10 - 20	Pass	225.1	227.0	+/- 5%	Pass	5023	5037.2	+/- 25%	Pass
AV51	04/12/2007 7:11	7358	7070.5	+/- 5%	Pass	13.1	10 - 20	Pass	227.0	223.0	+/- 5%	Pass	5037	5007.6	+/- 25%	Pass
AV52	04/12/2007 7:11	7354	7156.4	+/- 5%	Pass	18.0	10 - 20	Pass	223.0	225.0	+/- 5%	Pass	5008	5022.4	+/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria		P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria		P/F	Energy (keV) Result	Energy (keV) Criteria		P/F
AV53	04/12/2007 7:11	7352	7144.1	+/- 5%	Pass	13.5	10 - 20	Pass	222.9	223.0	+/- 5%	Pass	5007	5007.8	+/- 25%	Pass
AV54	04/12/2007 7:11	7349	7313.1	+/- 5%	Pass	13.4	10 - 20	Pass	228.0	226.0	+/- 5%	Pass	5044	5029.5	+/- 25%	Pass
AV55	04/12/2007 7:11	7348	7132.9	+/- 5%	Pass	13.3	10 - 20	Pass	223.9	226.0	+/- 5%	Pass	5015	5029.7	+/- 25%	Pass
AV56	04/12/2007 7:11	7344	7163.7	+/- 5%	Pass	13.8	10 - 20	Pass	220.9	222.0	+/- 5%	Pass	4993	5000.7	+/- 25%	Pass
AV57	04/12/2007 7:11	7343	7309.5	+/- 5%	Pass	13.4	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.6	+/- 25%	Pass
AV58	04/12/2007 7:11	7339	7249.2	+/- 5%	Pass	13.7	10 - 20	Pass	221.0	223.0	+/- 5%	Pass	4993	5008.0	+/- 25%	Pass
AV59	04/12/2007 7:11	7320	7141.4	+/- 5%	Pass	13.5	10 - 20	Pass	287.0	284.0	+/- 5%	Pass	5473	5450.6	+/- 25%	Pass
AV60	04/12/2007 7:11	7324	7019.7	+/- 5%	Pass	42.6	10 - 20	FAIL	222.3	223.0	+/- 5%	Pass	5003	5007.5	+/- 25%	Pass
AV63	04/12/2007 7:11	7308	7120.8	+/- 5%	Pass	30.7	10 - 20	FAIL	223.8	223.0	+/- 5%	Pass	5013	5007.9	+/- 25%	Pass
AV64	04/12/2007 7:11	7224	7153.7	+/- 5%	Pass	34.2	10 - 20	FAIL	215.9	224.0	+/- 5%	Pass	4956	5015.3	+/- 25%	Pass
AV65	04/12/2007 7:11	7313	7233.4	+/- 5%	Pass	26.3	10 - 20	FAIL	219.5	224.0	+/- 5%	Pass	4983	5015.3	+/- 25%	Pass
AV66	04/12/2007 7:11	7304	7165.5	+/- 5%	Pass	14.1	10 - 20	Pass	220.1	222.0	+/- 5%	Pass	4987	5000.5	+/- 25%	Pass
AV67	04/12/2007 7:11	7434	7128.1	+/- 5%	Pass	18.7	10 - 20	Pass	225.1	224.1	+/- 5%	Pass	5023	5015.6	+/- 25%	Pass
AV68	04/12/2007 7:11	7430	7259.5	+/- 5%	Pass	14.0	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.8	+/- 25%	Pass
AV69	04/12/2007 7:11	7373	7305.4	+/- 5%	Pass	16.1	10 - 20	Pass	219.8	222.0	+/- 5%	Pass	4985	5000.6	+/- 25%	Pass
AV70	04/12/2007 7:11	7429	7406.5	+/- 5%	Pass	13.3	10 - 20	Pass	219.0	222.6	+/- 5%	Pass	4979	5004.7	+/- 25%	Pass
AV71	04/12/2007 7:58	7052	7187.3	+/- 5%	Pass	12.9	10 - 20	Pass	221.0	225.0	+/- 5%	Pass	4994	5022.7	+/- 25%	Pass
AV72	04/12/2007 7:58	7363	7090.0	+/- 5%	Pass	13.2	10 - 20	Pass	226.0	223.9	+/- 5%	Pass	5030	5014.6	+/- 25%	Pass
AV73	04/12/2007 7:58	6974	7251.3	+/- 5%	Pass	12.9	10 - 20	Pass	222.9	225.0	+/- 5%	Pass	5007	5022.4	+/- 25%	Pass
AV75	04/12/2007 7:58	7251	7267.9	+/- 5%	Pass	12.7	10 - 20	Pass	223.1	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV75	04/12/2007 7:58	7251	7267.9	+/- 5%	Pass	12.7	10 - 20	Pass	223.1	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV76	04/12/2007 7:58	7557	7374.3	+/- 5%	Pass	13.2	10 - 20	Pass	223.0	224.0	+/- 5%	Pass	5008	5015.2	+/- 25%	Pass
AV76	04/12/2007 7:58	7557	7374.3	+/- 5%	Pass	13.2	10 - 20	Pass	223.0	224.0	+/- 5%	Pass	5008	5015.2	+/- 25%	Pass
AV77	04/12/2007 7:58	7554	7497.1	+/- 5%	Pass	13.1	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV77	04/12/2007 7:58	7554	7497.1	+/- 5%	Pass	13.1	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.4	+/- 25%	Pass
AV78	04/12/2007 7:58	7366	7183.8	+/- 5%	Pass	12.5	10 - 20	Pass	223.0	223.3	+/- 5%	Pass	5008	5009.8	+/- 25%	Pass
AV78	04/12/2007 7:58	7366	7183.8	+/- 5%	Pass	12.5	10 - 20	Pass	223.0	223.3	+/- 5%	Pass	5008	5009.8	+/- 25%	Pass
AV79	04/12/2007 7:58	7549	7349.7	+/- 5%	Pass	13.3	10 - 20	Pass	221.0	222.0	+/- 5%	Pass	4993	5000.4	+/- 25%	Pass
AV79	04/12/2007 7:58	7549	7349.7	+/- 5%	Pass	13.3	10 - 20	Pass	221.0	222.0	+/- 5%	Pass	4993	5000.4	+/- 25%	Pass
AV80	04/12/2007 7:58	7327	7226.4	+/- 5%	Pass	12.7	10 - 20	Pass	223.0	224.1	+/- 5%	Pass	5008	5015.5	+/- 25%	Pass
AV81	04/12/2007 7:58	7544	7453.4	+/- 5%	Pass	13.0	10 - 20	Pass	222.0	223.0	+/- 5%	Pass	5001	5008.1	+/- 25%	Pass
AV81	04/12/2007 7:58	7544	7453.4	+/- 5%	Pass	13.0	10 - 20	Pass	222.0	223.0	+/- 5%	Pass	5001	5008.1	+/- 25%	Pass
AV82	04/12/2007 7:58	7540	7529.2	+/- 5%	Pass	13.4	10 - 20	Pass	224.0	224.0	+/- 5%	Pass	5015	5015.2	+/- 25%	Pass
AV83	04/12/2007 7:58	7525	7523.7	+/- 5%	Pass	12.6	10 - 20	Pass	222.0	222.0	+/- 5%	Pass	5001	5000.4	+/- 25%	Pass
AV84	04/12/2007 7:58	7573	7637.7	+/- 5%	Pass	12.3	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.7	+/- 25%	Pass
AV84	04/12/2007 7:58	7573	7637.7	+/- 5%	Pass	12.3	10 - 20	Pass	223.0	223.0	+/- 5%	Pass	5008	5007.7	+/- 25%	Pass

Detector	Date/Time	Gross Counts Result	Gross Counts Criteria	P/F	FWHM (keV) Result	FWHM (keV) Criteria	P/F	Pulser Center Result	Pulser Center Criteria	P/F	Energy (keV) Result	Energy (keV) Criteria	P/F
AV85	04/12/2007 7:58	7497	7549.7 +/- 5%	Pass	12.5	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5008.0 +/- 25%	Pass
AV85	04/12/2007 7:58	7497	7549.7 +/- 5%	Pass	12.5	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5008.0 +/- 25%	Pass
AV86	04/12/2007 7:58	7671	7679.0 +/- 5%	Pass	17.2	10 - 20	Pass	224.1	223.9 +/- 5%	Pass	5016	5014.3 +/- 25%	Pass
AV86	04/12/2007 7:58	7671	7679.0 +/- 5%	Pass	17.2	10 - 20	Pass	224.1	223.9 +/- 5%	Pass	5016	5014.3 +/- 25%	Pass
AV87	04/12/2007 7:58	7440	7512.4 +/- 5%	Pass	12.4	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5007.7 +/- 25%	Pass
AV87	04/12/2007 7:58	7440	7512.4 +/- 5%	Pass	12.4	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5007.7 +/- 25%	Pass
AV88	04/12/2007 7:58	7712	7716.1 +/- 5%	Pass	14.4	10 - 20	Pass	224.1	224.0 +/- 5%	Pass	5016	5015.4 +/- 25%	Pass
AV89	04/12/2007 7:58	7713	7553.8 +/- 5%	Pass	13.5	10 - 20	Pass	219.9	222.6 +/- 5%	Pass	4985	5004.7 +/- 25%	Pass
AV90	04/12/2007 7:58	7708	7474.4 +/- 5%	Pass	13.6	10 - 20	Pass	222.9	224.1 +/- 5%	Pass	5007	5015.6 +/- 25%	Pass
AV92	04/12/2007 7:58	7317	7358.9 +/- 5%	Pass	12.4	10 - 20	Pass	222.9	223.9 +/- 5%	Pass	5008	5014.6 +/- 25%	Pass
AV93	04/12/2007 7:58	7384	7393.5 +/- 5%	Pass	12.7	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5008.3 +/- 25%	Pass
AV94	04/12/2007 7:58	7569	7477.9 +/- 5%	Pass	13.4	10 - 20	Pass	220.9	222.0 +/- 5%	Pass	4993	5000.5 +/- 25%	Pass
AV95	04/12/2007 7:10	7215	7432.4 +/- 5%	Pass	13.0	10 - 20	Pass	221.1	222.2 +/- 5%	Pass	4994	5001.9 +/- 25%	Pass
AV96	04/12/2007 7:10	7640	7654.3 +/- 5%	Pass	13.6	10 - 20	Pass	222.0	222.6 +/- 5%	Pass	5001	5005.3 +/- 25%	Pass
AV96	04/12/2007 7:10	7640	7654.3 +/- 5%	Pass	13.6	10 - 20	Pass	222.0	222.6 +/- 5%	Pass	5001	5005.3 +/- 25%	Pass
AV97	04/12/2007 7:10	7636	7649.9 +/- 5%	Pass	13.9	10 - 20	Pass	223.0	223.8 +/- 5%	Pass	5008	5014.0 +/- 25%	Pass
AV97	04/12/2007 7:10	7636	7649.9 +/- 5%	Pass	13.9	10 - 20	Pass	223.0	223.8 +/- 5%	Pass	5008	5014.0 +/- 25%	Pass
AV98	04/12/2007 7:10	7632	7582.0 +/- 5%	Pass	13.1	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5007.6 +/- 25%	Pass
AV98	04/12/2007 7:10	7632	7582.0 +/- 5%	Pass	13.1	10 - 20	Pass	223.0	223.0 +/- 5%	Pass	5008	5007.6 +/- 25%	Pass

TestAmerica

STL

Run Log

Logbook No.: 2925

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	4-7-07	Daily	Pulses	1-98	1 min.	QA	GS	—
2	4-7-07	7090063	F7C290240-001	1	180 min.	Th	GS	WW
3			-001X	2				
4			F7C310900-063B	3				
5			-063C	4				
6	4-7-07	7094164	A7C170133-002	6	180 min.	Th	GS	
7			-002X	7				
8			F7D040000-164B	8				
9			-164C	9				
10	4-7-07	7094289	F7C310124-017	11	240 min.	U	GS	
11			F7D040000-289B	12				
12			-289C	13				
13	4-7-07	7089193	F7C280211-001	15	240 min.	U	GS	WW
14			-001X	20				
15			-002	22				
16			-003	24				
17			-004	48				
18			-005	50				
19			-006	54				
20			-007	66				
21			-008	72				
22			F7C300000-193B	18				
23			-193C	21				
24	4-7-07	7089193	F7C280211-009	1	240 min.	U	GS	
25			-010	2				
26			-011	3				
27			-012	4				
28			-013	6				
29			-014	7				

Reviewed By: GS Date: 4-7-07

SOP References: STL-RD-0210 Rev 5 01/16/06. Form: SL-RAD-0030, Revised 7/07/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2925

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	4-7-07	7094193	F7C280211-015	8	240 min.	U	GS	WW
2	4-7-07	7095098	F7D040265-001	11	180 min.	U	GS	
3			-002	12				
4			-003	13				
5			-005	15				
6			-006	20				
7			-006S	22				
8			-006X	24				
9			F7D050000-098B	19				
10			-098C	21				
11 *	4-7-07	7094164	F7D040000-164C	9	180 min.	Th	GS	WW
12	4-7-07	7095102	F7D040249-001	48	180 min.	Th	GS	
13			-001X	50				
14			-002	54				
15			-003	66				
16			-004	72				
17			F7D050000-102B	45				
18			-102C	46				
19	4-8-07	Daily	Pulser	1-98	1 min.	QA	GS	—
20	4-8-07	7095102	F7D040249-005	66	180 min.	Th	GS	WW
21			-006	72				
22	4-8-07	7095103	F7D040249-001	12	180 min.	U	GS	WW
23			-001X	13				
24			-002	15				
25			-003	20				
26			-004	22				
27			-005	24				
28			-006	48				
29			F7D050000-103B	18				

Reviewed By: GS Date: 4-8-07

* Sample initiated before 7095098. GS 4-7-07

SOP References: STL-RD-0210 Rev 5 01/16/06. Form: SL-RAD-0030, Revised 7/07/06

QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2925

STL
St. Louis

Alpha Spectrometry Runlog

	Date	Batch #	Sample #	Detector	Count Time	Analyte	Setup Initials	Process Initials
1	4-11-07	7099195 (KW 4/11/07)	F7D060163-003	9	180min	U	KW	KW
2			-004	11				
3			-005	12				
4			-006	13				
5			-007	15				
6			-008	17				
7			-009	20				
8			-010	22				
9			-011	23				
10			-012	24				
11			-013	48				
12			-014	50				
13			-015	54				
14			-016	57				
15			-017	66				
16			F7D090000-195B	14				
17			-195C	18				
18	4-12-07	Daily	Pulsers	1-98	1 Min	QA	JW	—
19		7099195	F7D060163-011	1	180min	U	KW	KW
20		7099186	F7D050164-001	48				
21			-001X	50				
22			-002	54				
23			-003	57				
24			-004	66				
25			-005	72				
26			F7D090000-186B	45				
27			-186C	47				
28		7089193	F7C280211-001	73	240min	U		KW
29			F7C280211-001X	9				

Reviewed By: KW Date: 4/12/07

SOP References: STL-RD-0210 Rev 5 01/16/06. Form: SL-RAD-0030, Revised 7/07/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

240 min.

4/18

SEVERN TRENT **STL**

Prep Report for:

Uranium, Isotopic by Alpha Spectroscopy

Batch: 7089193 **Prep Analyst:** 403301

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot	Dilution	Adj Aliquot	TracerID	TracerAnalyte	TracerAliquot	Low Level
F7C280211-001	JRWHL1AD	2.0093E+000 g	1.00	2.0093E+000 g	rad06-0047	U-232	0.10	N
		15			RC= 73			
F7C280211-001X	JRWHL1AJ	2.0053E+000 g	1.00	2.0053E+000 g	rad06-0047	U-232	0.10	N
		20			RC= 9			
F7C280211-002	JRWHT1AD	2.0025E+000 g	1.00	2.0025E+000 g	rad06-0047	U-232	0.10	N
		22						
F7C280211-003	JRWHW1AD	2.0057E+000 g	1.00	2.0057E+000 g	rad06-0047	U-232	0.10	N
		24						
F7C280211-004	JRWHX1AD	2.0139E+000 g	1.00	2.0139E+000 g	rad06-0047	U-232	0.10	N
		48						
F7C280211-005	JRWH01AD	2.0027E+000 g	1.00	2.0027E+000 g	rad06-0047	U-232	0.10	N
		50						
F7C280211-006	JRWH31AD	2.0157E+000 g	1.00	2.0157E+000 g	rad06-0047	U-232	0.10	N
		54						
F7C280211-007	JRWH51AD	2.0032E+000 g	1.00	2.0032E+000 g	rad06-0047	U-232	0.10	N
		66						
F7C280211-008	JRWH81AD	2.0064E+000 g	1.00	2.0064E+000 g	rad06-0047	U-232	0.10	N
		72						
F7C280211-009	JRWJA1AD	2.0026E+000 g	1.00	2.0026E+000 g	rad06-0047	U-232	0.10	N
		1						
F7C280211-010	JRWJC1AD	2.0067E+000 g	1.00	2.0067E+000 g	rad06-0047	U-232	0.10	N
		2						
F7C280211-011	JRWJE1AD	2.0075E+000 g	1.00	2.0075E+000 g	rad06-0047	U-232	0.10	N
		3						
F7C280211-012	JRWJG1AD	2.0015E+000 g	1.00	2.0015E+000 g	rad06-0047	U-232	0.10	N
		4						
F7C280211-013	JRWJH1AD	2.0088E+000 g	1.00	2.0088E+000 g	rad06-0047	U-232	0.10	N
		6						
F7C280211-014	JRWJJ1AD	2.0019E+000 g	1.00	2.0019E+000 g	rad06-0047	U-232	0.10	N
		7						
F7C280211-015	JRWJK1AD	2.0074E+000 g	1.00	2.0074E+000 g	rad06-0047	U-232	0.10	N
		8						
F7C300000-193B	JR3GH1AA	2.0000E+000 g	1.00	2.0000E+000 g	rad06-0047	U-232	0.10	N
		18						

SampID	WRKNO	Aliquot	Dilution	Adj Aliquot	TracerID	TracerAnalyte	TracerAliquot	Low Level
F7C300000-193C	JR3GH1AC	1.3250E-001 g	1.00	1.3250E-001 g	rad06-0047	U-232	0.10	N

21

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7C300000-193C	TRM-3_IsoU	U-234	4.351E+001 dpm/g	0.13 g	5/29/2003 12:00:00AM	1.923E+001 pCi/g
F7C300000-193C	TRM-3_IsoU	U-238	4.351E+001 dpm/g	0.13 g	5/29/2003 12:00:00AM	1.923E+001 pCi/g

BS per MS — Spiked By
Flip per MS — Spike Verified By
3/30/07 — Spike Date

Standard Operating Procedures

	SOPNumber	Title	Revision
☐	STL-RC-0002	Planchet Preparation For Radiochemistry And Radiological Screening Analysis	4.00
☑	STL-RC-0003	Drying And Grinding Of Soil And Solid Samples	6.00
☑	STL-RC-0004	Preparation Of Soil, Sludge, And Filter Paper Samples For Radiochemical Analysis	10.00
☐	STL-RC-0090	Preparation Of Samples For Sequential Determination Of Isotopic Americium, Currium, Neptunium, Plutonium, Tho	4.00
☑	STL-RC-0100	Actinide Coprecipitation	9.00
☐	STL-RC-0232	Isotopic Thorium And/oR Neptunium in Water, Soil, Sludge, and Filters by Eichrom TEVA Separation Resins	7.00
☑	STL-RC-0238	Isotopic Uranium By Eichrom UTEVA Resin for Water, Soil, Sludge and Filters	7.00
☐	STL-RC-0240	Isotopic Americium, Curium, Plutonium, Thorium, and Uranium in Water, Soil, Sludge and Filters by Eichrome Sepa	5.00
☐	STL-RC-0241	Isotopic Americium, Plutonium, Curium, and Uranium in Water, Soil, Sludge and Filters by Eichrome Uteva and Tr	3.00
☐	STL-RC-0242	Isotopic Thorium, Plutonium and Uranium in Water, Soil, Sludge and Filters by Eichrome Separation Resin	6.00
☐	STL-RD-0201	Daily Operations Of An Alpha Spectroscopy System	2.00
☐	STL-RD-0203	Calibration And Maintenance Of A Alpha Spectroscopy System	1.00

RA — Column Analyst
04/05/07 — Date
BS — Coprecipitated By
4/6/07 — Precip Date

LW — Reviewed By
4/12/07 — Review Date

BS — Analyst/Relenquished By
4/6/07 — Release Date
[signature] — Received By
4-6-7 — Receipt Date

SEVERN TRENT STL

Monthly Background
Alpha vision
March 2007

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:17AM 3/25/2007

Sample

Sample Name: AV1 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

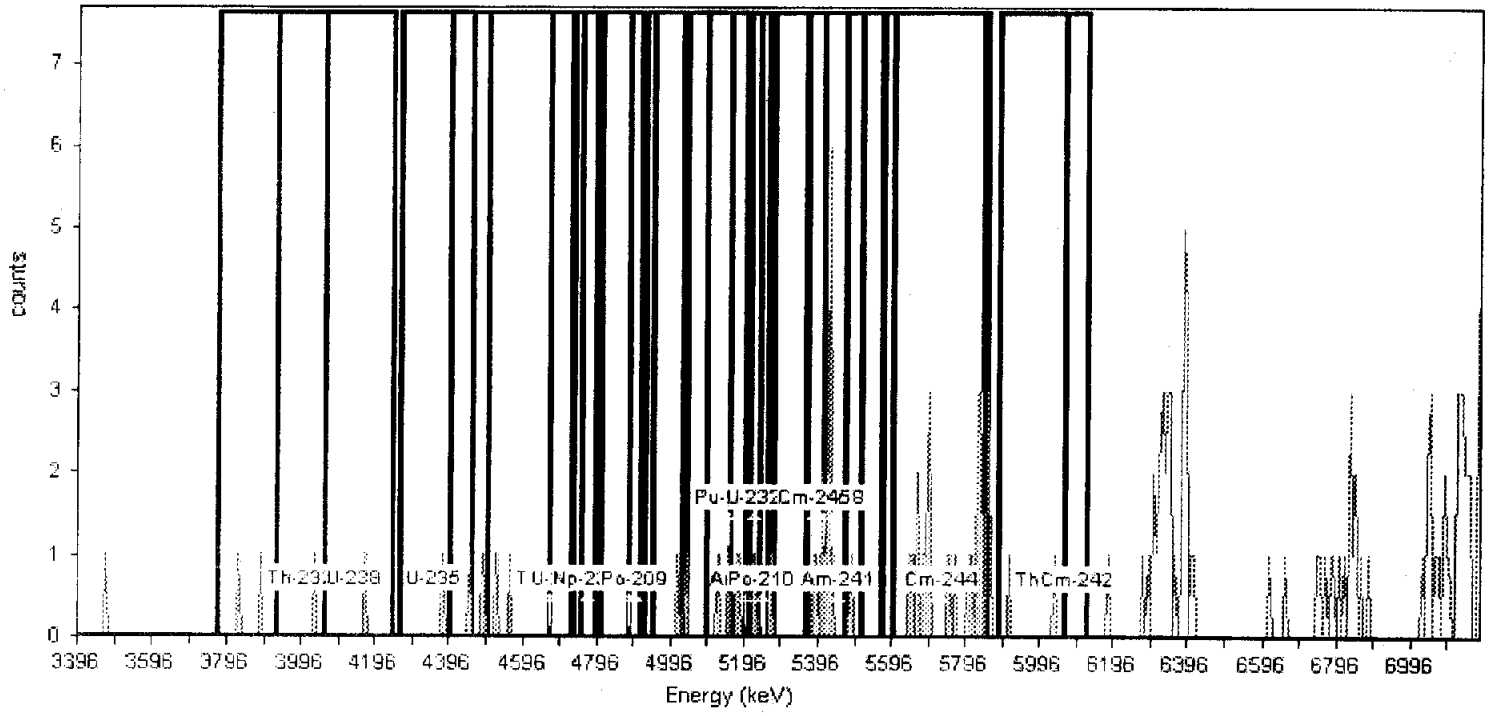
Acquisition

Detector: AV1 , SN: 41-158W6
Acquisition Start Date: 3/24/2007 9:47:45AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi Nuclide Library: Background ROI Library

Total Background Counts: 141.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	3.00	3.125E-003	2.083E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	6.00	6.250E-003	2.756E-003
Am-243	5.20	5.03	5.28	7.00	7.292E-003	2.946E-003
U-232	5.23	5.04	5.37	7.00	7.292E-003	2.946E-003
Th-228	5.41	5.16	5.47	18.00	1.875E-002	4.541E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	16.00	1.667E-002	4.295E-003
Am-241	5.45	5.27	5.57	16.00	1.667E-002	4.295E-003
Cm-245	5.39	5.36	5.41	5.00	5.208E-003	2.552E-003
Pu-236	5.72	5.57	5.84	22.00	2.292E-002	4.996E-003
Cm-244	5.73	5.60	5.86	25.00	2.604E-002	5.311E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:20AM 3/25/2007

Sample

Sample Name: AV2 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

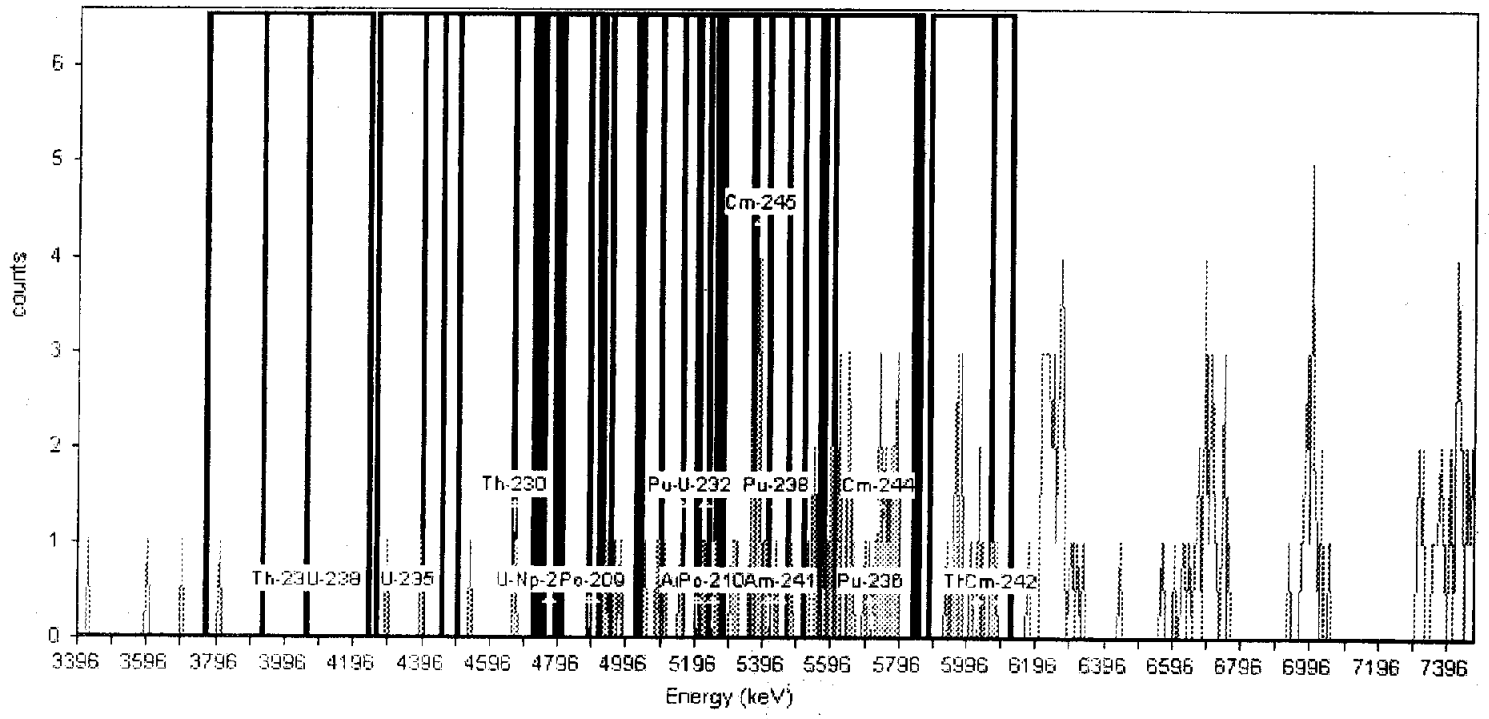
Acquisition

Detector: AV2 , SN: 41-158W7
Acquisition Start Date: 3/24/2007 9:46:56AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 193.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	6.00	6.250E-003	2.756E-003
Am-243	5.20	5.03	5.28	8.00	8.333E-003	3.125E-003
U-232	5.23	5.04	5.37	14.00	1.458E-002	4.034E-003
Th-228	5.41	5.16	5.47	20.00	2.083E-002	4.774E-003
Po-210	5.25	5.20	5.26	4.00	4.167E-003	2.329E-003
Pu-238	5.44	5.24	5.52	19.00	1.979E-002	4.658E-003
Am-241	5.45	5.27	5.57	21.00	2.187E-002	4.886E-003
Cm-245	5.39	5.36	5.41	12.00	1.250E-002	3.756E-003
Pu-236	5.72	5.57	5.84	32.00	3.333E-002	5.984E-003
Cm-244	5.73	5.60	5.86	29.00	3.021E-002	5.705E-003
Th-227	6.02	5.89	6.13	15.00	1.563E-002	4.167E-003
Cm-242	6.10	6.07	6.13	3.00	3.125E-003	2.083E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:23AM 3/25/2007

Sample

Sample Name: AV3 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

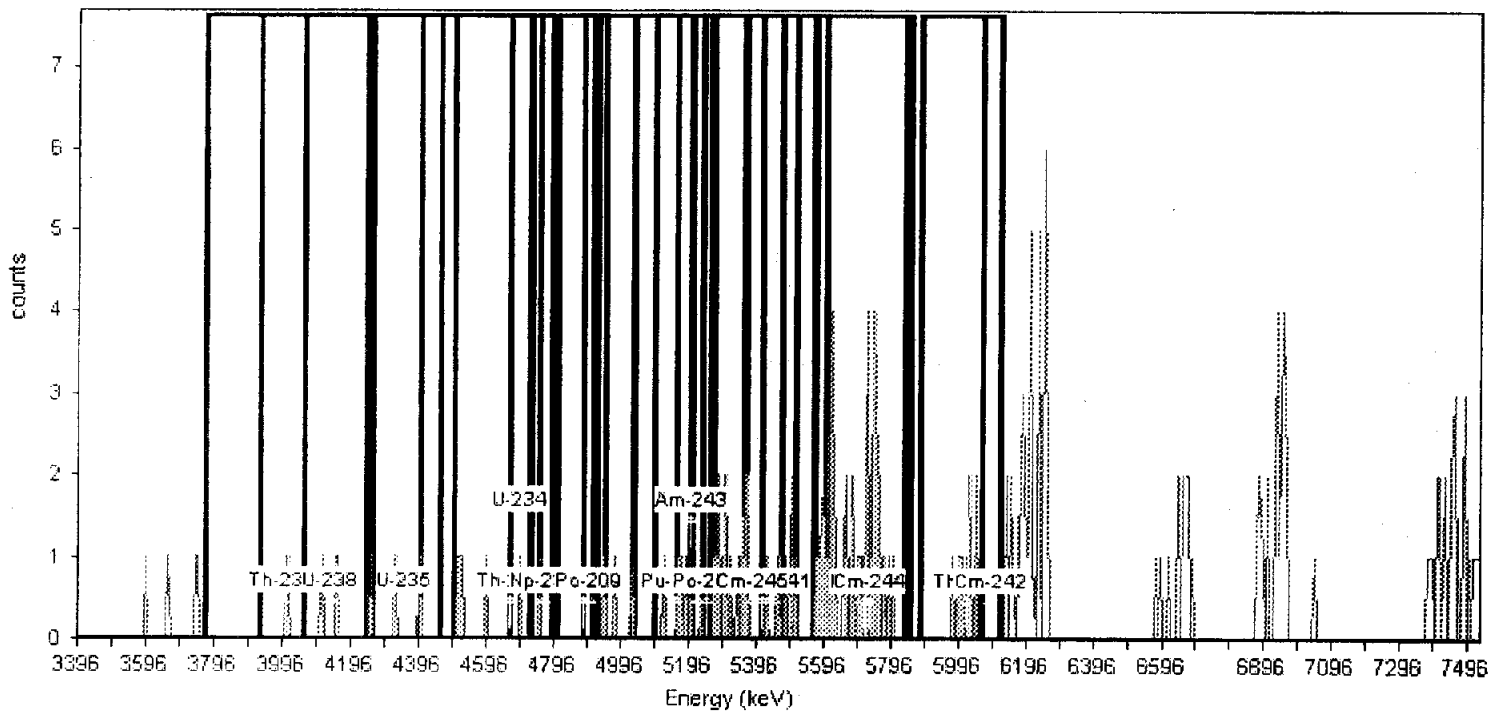
Acquisition

Detector: AV3 , SN: 41-158X5
Acquisition Start Date: 3/24/2007 9:46:58AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Radiide Library: Background ROI Library

Total Background Counts: 176.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	5.00	5.208E-003	2.552E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	8.00	8.333E-003	3.125E-003
Am-243	5.20	5.03	5.28	8.00	8.333E-003	3.125E-003
U-232	5.23	5.04	5.37	18.00	1.875E-002	4.541E-003
Th-228	5.41	5.16	5.47	19.00	1.979E-002	4.658E-003
Po-210	5.25	5.20	5.26	2.00	2.083E-003	1.804E-003
Pu-238	5.44	5.24	5.52	18.00	1.875E-002	4.541E-003
Am-241	5.45	5.27	5.57	18.00	1.875E-002	4.541E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	37.00	3.854E-002	6.421E-003
Cm-244	5.73	5.60	5.86	32.00	3.333E-002	5.984E-003
Th-227	6.02	5.89	6.13	7.00	7.292E-003	2.946E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:26AM 3/25/2007

Sample

Sample Name: AV4 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

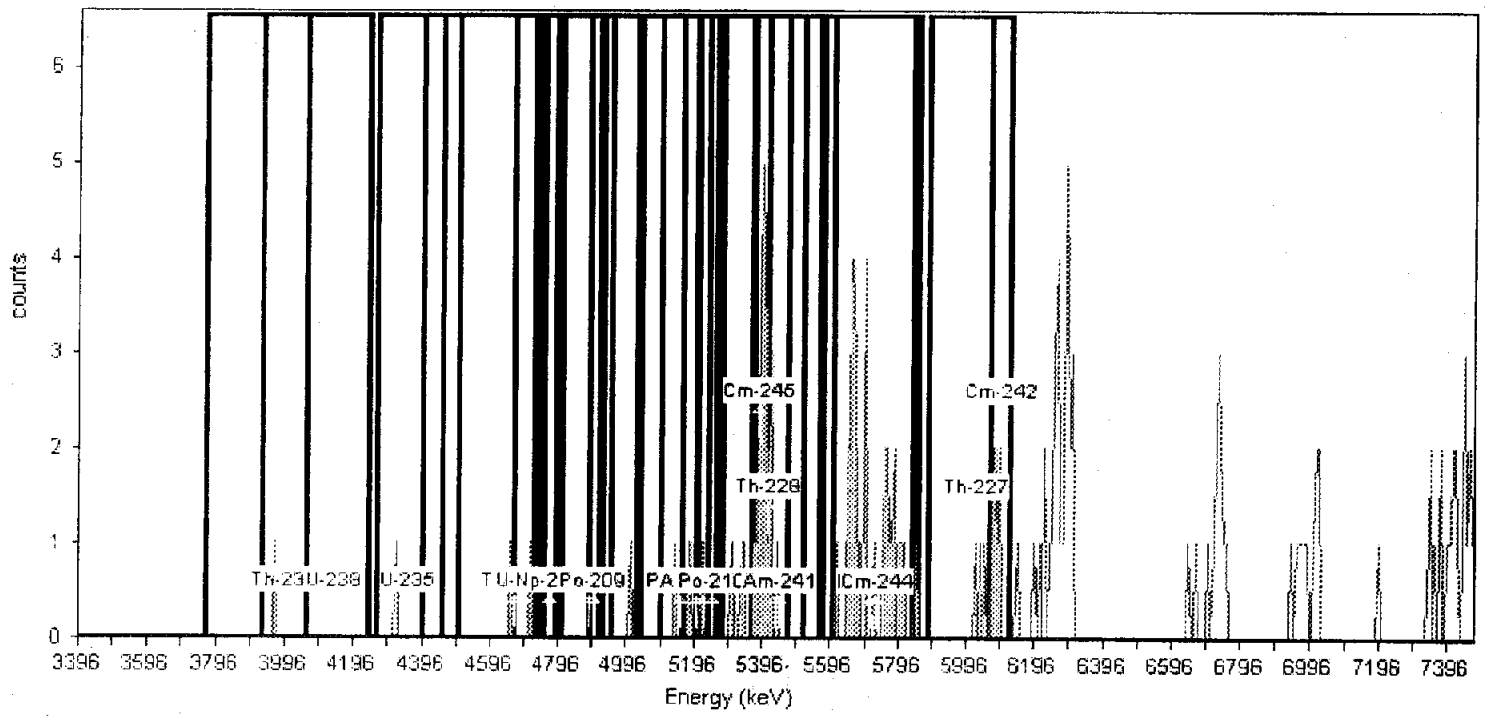
Acquisition

Detector: AV4 , SN: 41-172B5
Acquisition Start Date: 3/24/2007 9:46:59AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 146.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	7.00	7.292E-003	2.946E-003
Th-228	5.41	5.16	5.47	26.00	2.708E-002	5.413E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	24.00	2.500E-002	5.208E-003
Am-241	5.45	5.27	5.57	24.00	2.500E-002	5.208E-003
Cm-245	5.39	5.36	5.41	17.00	1.771E-002	4.419E-003
Pu-236	5.72	5.57	5.84	30.00	3.125E-002	5.800E-003
Cm-244	5.73	5.60	5.86	31.00	3.229E-002	5.893E-003
Th-227	6.02	5.89	6.13	9.00	9.375E-003	3.294E-003
Cm-242	6.10	6.07	6.13	6.00	6.250E-003	2.756E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:31:33AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV6
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

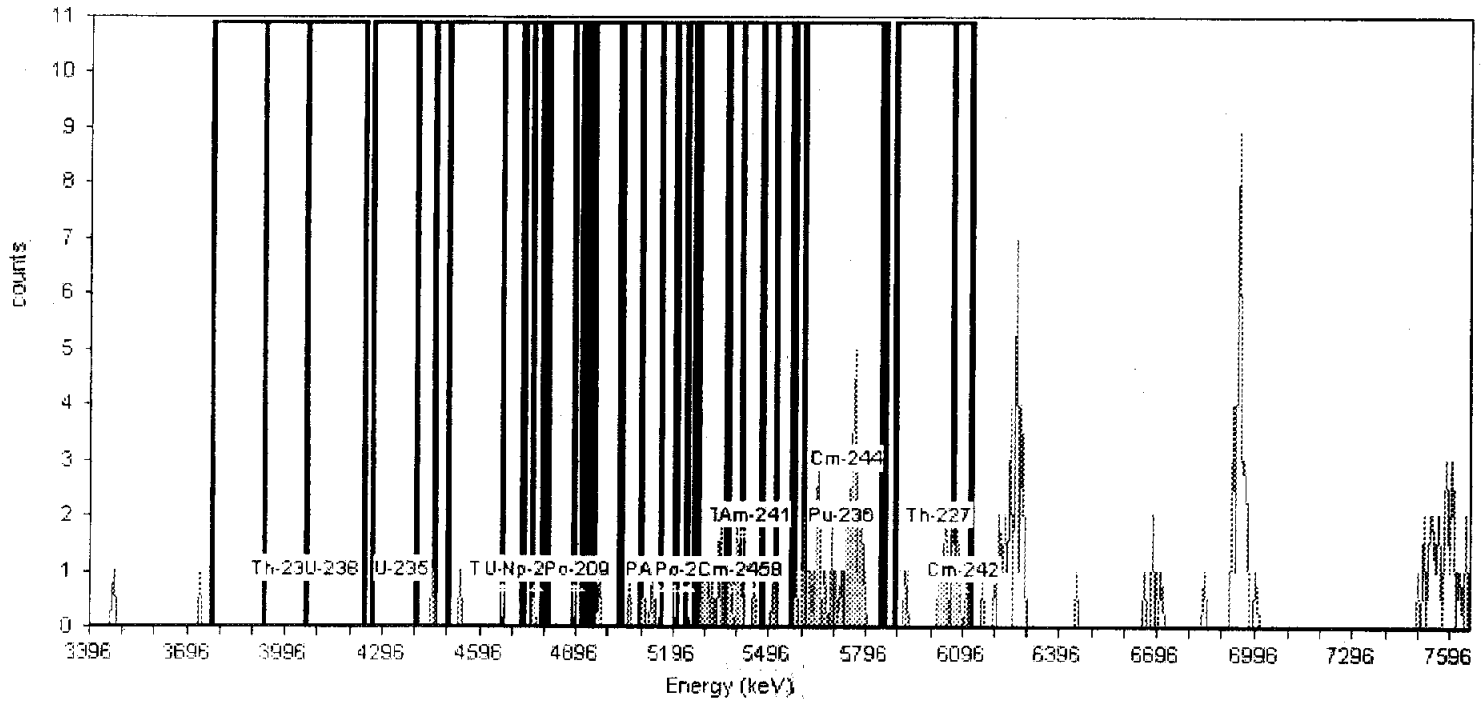
Acquisition

Detector: AV6 , SN:
Acquisition Start Date: 3/24/2007 9:47:01AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background
Nuclide Library: Background ROI Library
Total Background Counts: 167.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	4.00	4.167E-003	2.329E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	10.00	1.042E-002	3.455E-003
Th-228	5.41	5.16	5.47	14.00	1.458E-002	4.034E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	15.00	1.563E-002	4.167E-003
Am-241	5.45	5.27	5.57	15.00	1.563E-002	4.167E-003
Cm-245	5.39	5.36	5.41	7.00	7.292E-003	2.946E-003
Pu-236	5.72	5.57	5.84	36.00	3.750E-002	6.336E-003
Cm-244	5.73	5.60	5.86	35.00	3.646E-002	6.250E-003
Th-227	6.02	5.89	6.13	13.00	1.354E-002	3.898E-003
Cm-242	6.10	6.07	6.13	7.00	7.292E-003	2.946E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:31:30AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV7
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

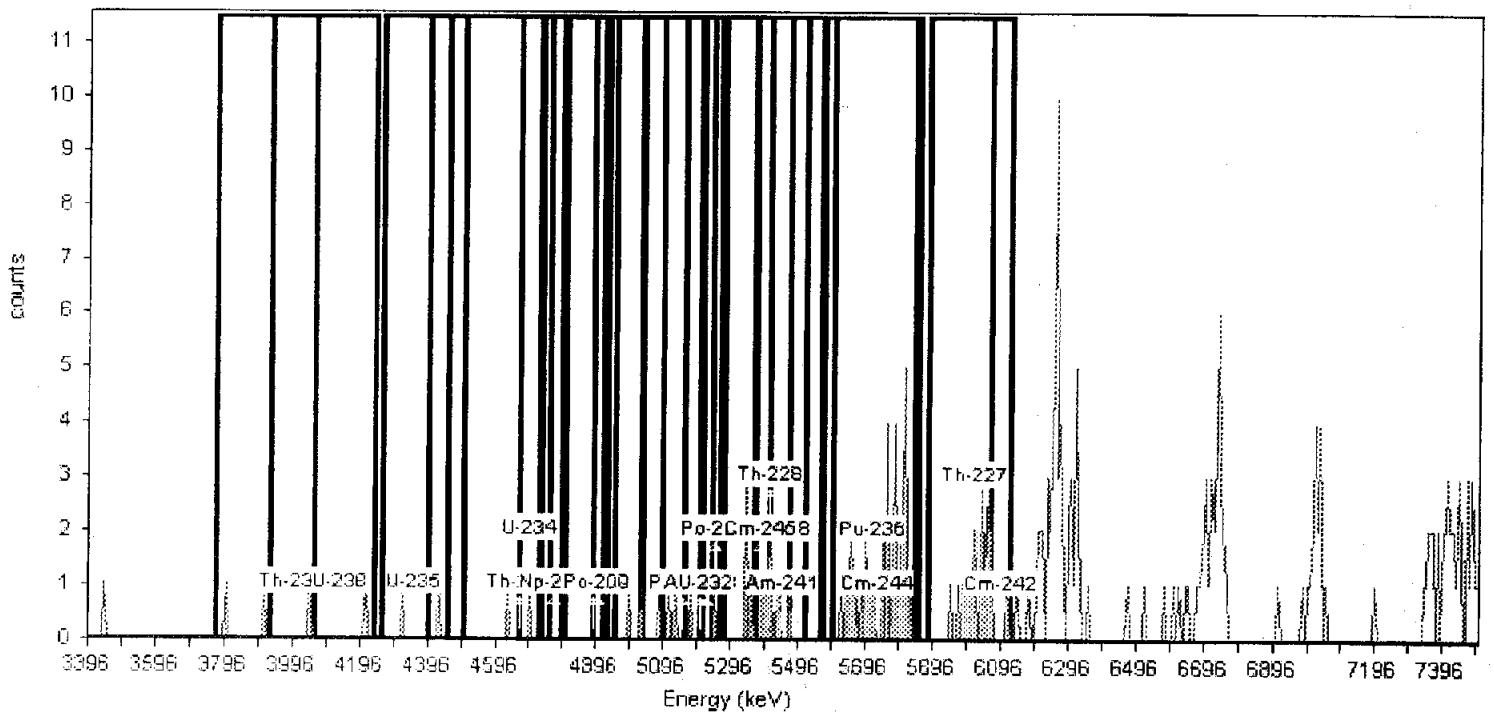
Acquisition

Detector: AV7 , SN: 41-158X6
Acquisition Start Date: 3/24/2007 9:47:03AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi
Nuclide Library: Background ROI Library
Total Background Counts: 227.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	3.00	3.125E-003	2.083E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	6.00	6.250E-003	2.756E-003
Am-243	5.20	5.03	5.28	6.00	6.250E-003	2.756E-003
U-232	5.23	5.04	5.37	9.00	9.375E-003	3.294E-003
Th-228	5.41	5.16	5.47	15.00	1.563E-002	4.167E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	14.00	1.458E-002	4.034E-003
Am-241	5.45	5.27	5.57	13.00	1.354E-002	3.898E-003
Cm-245	5.39	5.36	5.41	6.00	6.250E-003	2.756E-003
Pu-236	5.72	5.57	5.84	36.00	3.750E-002	6.336E-003
Cm-244	5.73	5.60	5.86	36.00	3.750E-002	6.336E-003
Th-227	6.02	5.89	6.13	20.00	2.083E-002	4.774E-003
Cm-242	6.10	6.07	6.13	3.00	3.125E-003	2.083E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:36AM 3/25/2007

Sample

Sample Name: AV8 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

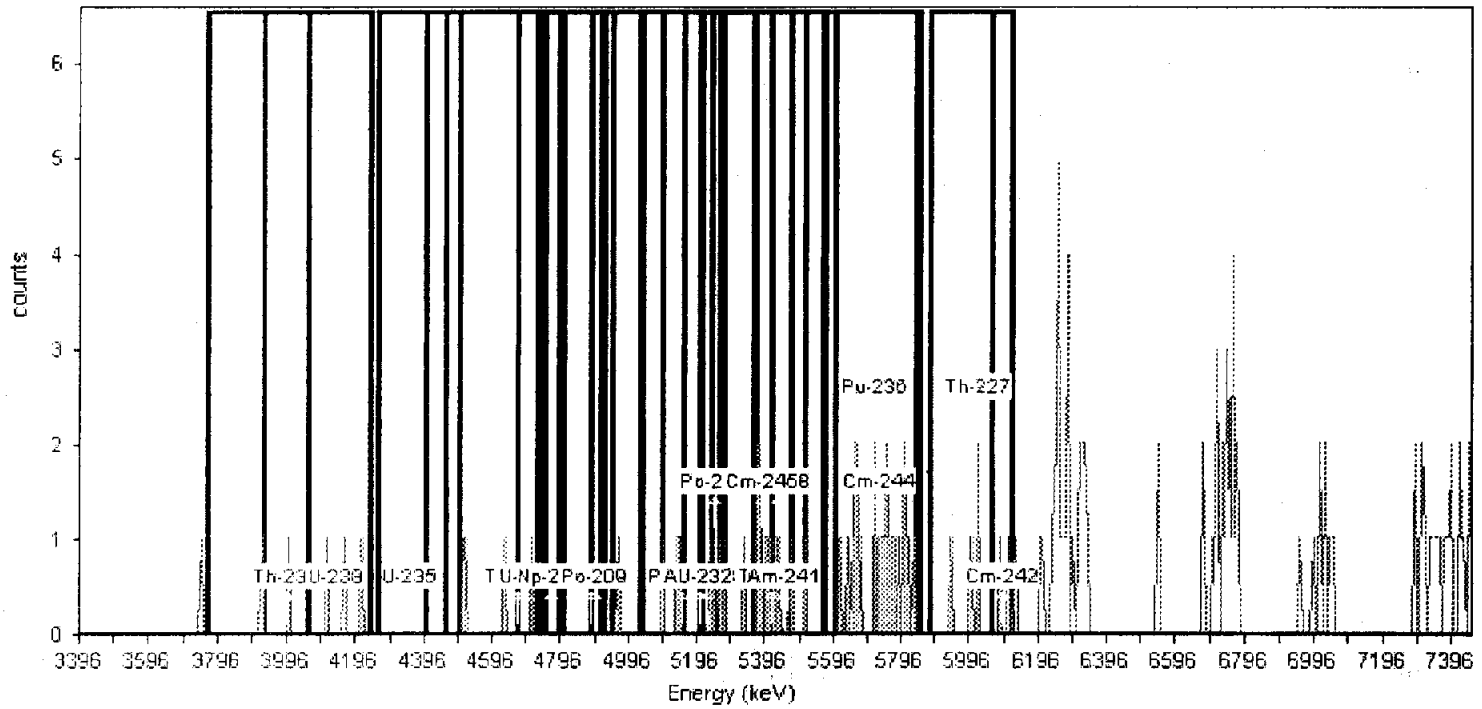
Acquisition

Detector: AV8 , SN: 41-158X1
Acquisition Start Date: 3/24/2007 9:47:05AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 137.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	4.00	4.167E-003	2.329E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	4.00	4.167E-003	2.329E-003
Am-243	5.20	5.03	5.28	7.00	7.292E-003	2.946E-003
U-232	5.23	5.04	5.37	8.00	8.333E-003	3.125E-003
Th-228	5.41	5.16	5.47	13.00	1.354E-002	3.898E-003
Po-210	5.25	5.20	5.26	3.00	3.125E-003	2.083E-003
Pu-238	5.44	5.24	5.52	13.00	1.354E-002	3.898E-003
Am-241	5.45	5.27	5.57	11.00	1.146E-002	3.608E-003
Cm-245	5.39	5.36	5.41	5.00	5.208E-003	2.552E-003
Pu-236	5.72	5.57	5.84	24.00	2.500E-002	5.208E-003
Cm-244	5.73	5.60	5.86	24.00	2.500E-002	5.208E-003
Th-227	6.02	5.89	6.13	6.00	6.250E-003	2.756E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:39AM 3/25/2007

Sample

Sample Name: AV9 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

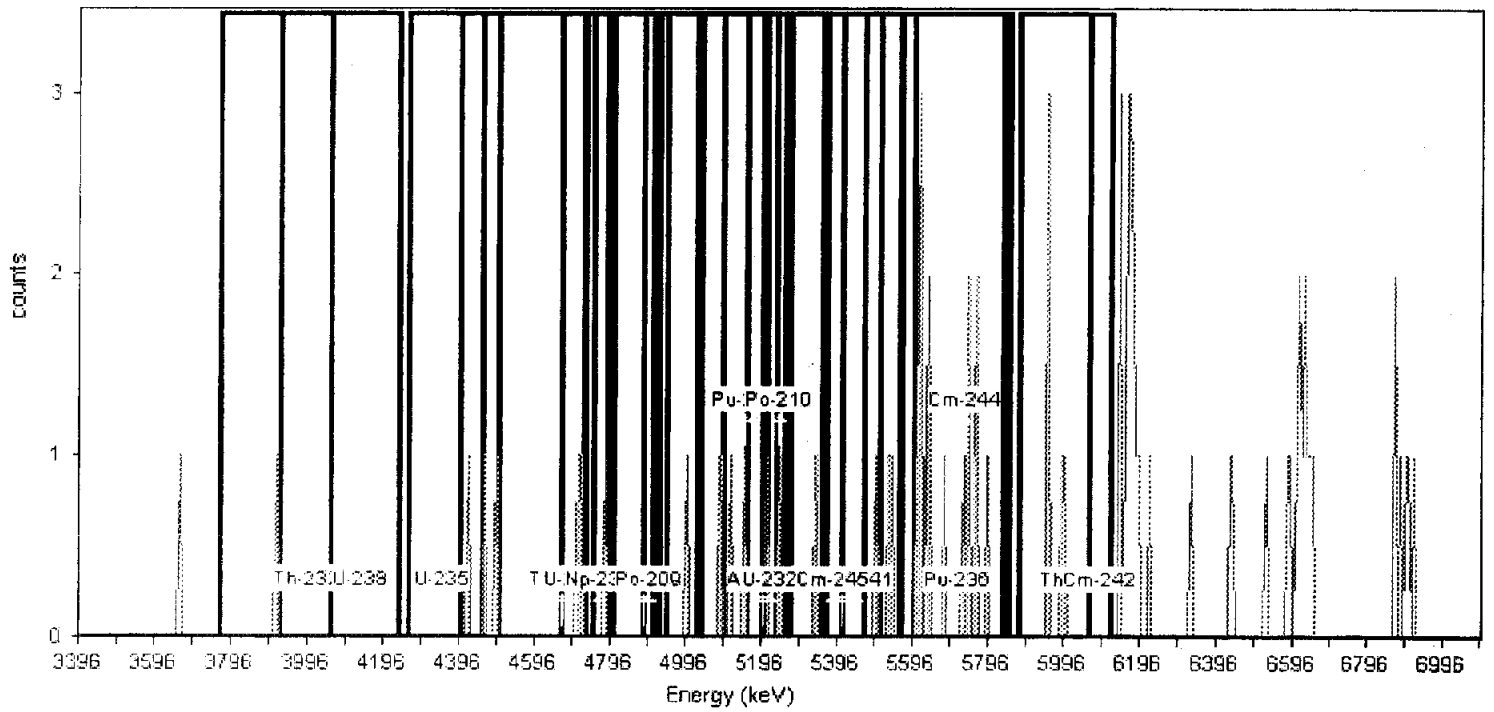
Acquisition

Detector: AV9 , SN: 41-172R1
Acquisition Start Date: 3/24/2007 9:47:07AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 76.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	5.00	5.208E-003	2.552E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	5.00	5.208E-003	2.552E-003
Am-243	5.20	5.03	5.28	5.00	5.208E-003	2.552E-003
U-232	5.23	5.04	5.37	6.00	6.250E-003	2.756E-003
Th-228	5.41	5.16	5.47	3.00	3.125E-003	2.083E-003
Po-210	5.25	5.20	5.26	2.00	2.083E-003	1.804E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	17.00	1.771E-002	4.419E-003
Cm-244	5.73	5.60	5.86	17.00	1.771E-002	4.419E-003
Th-227	6.02	5.89	6.13	5.00	5.208E-003	2.552E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:42AM 3/25/2007

Sample

Sample Name: AV11 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

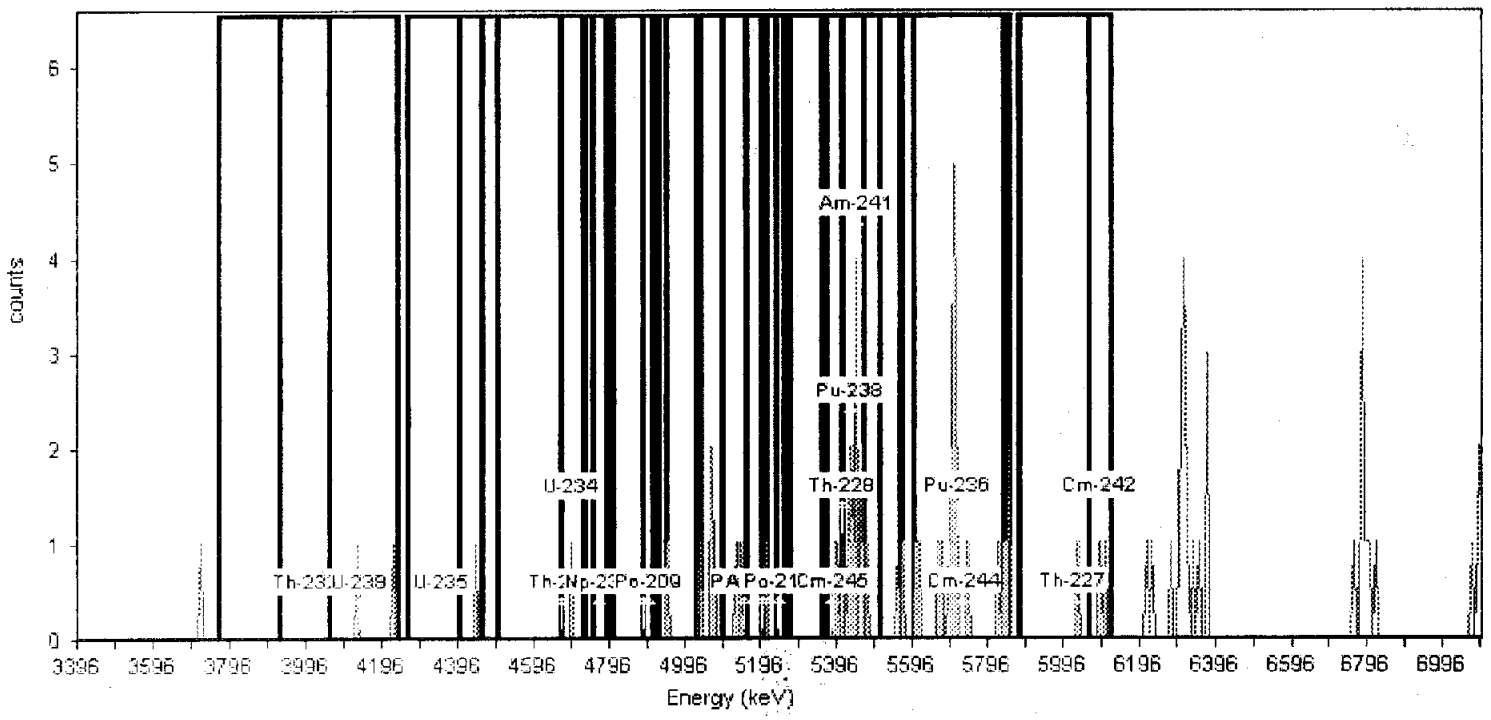
Acquisition

Detector: AV11 , SN: 41-172Q3
Acquisition Start Date: 3/24/2007 9:47:09AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 81.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	8.00	8.333E-003	3.125E-003
Am-243	5.20	5.03	5.28	7.00	7.292E-003	2.946E-003
U-232	5.23	5.04	5.37	7.00	7.292E-003	2.946E-003
Th-228	5.41	5.16	5.47	14.00	1.458E-002	4.034E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	14.00	1.458E-002	4.034E-003
Am-241	5.45	5.27	5.57	15.00	1.563E-002	4.167E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	17.00	1.771E-002	4.419E-003
Cm-244	5.73	5.60	5.86	19.00	1.979E-002	4.658E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

ST SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:46AM 3/25/2007

Sample

Sample Name: AV12 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

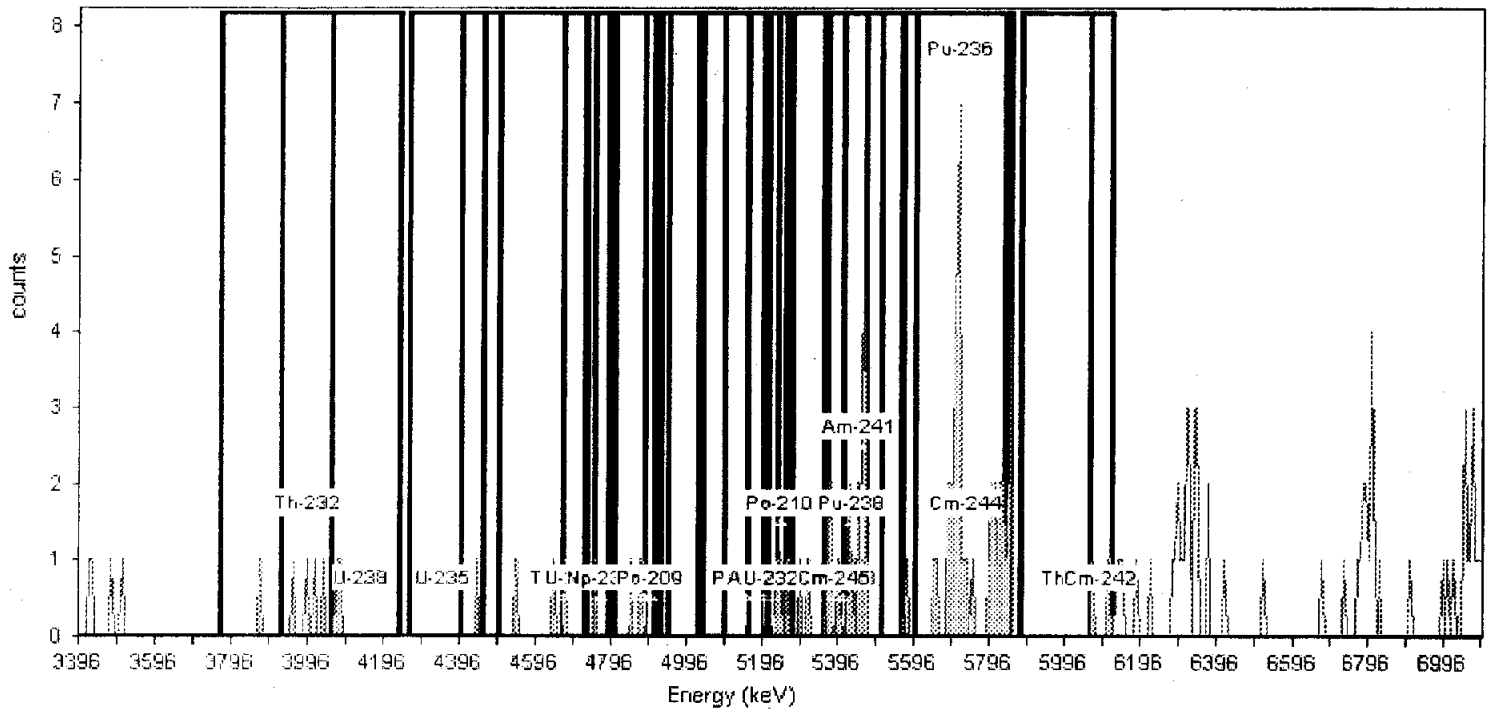
Acquisition

Detector: AV12 , SN: 41-172Q2
Acquisition Start Date: 3/24/2007 9:47:10AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 142.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	5.00	5.208E-003	2.552E-003
U-238	4.14	3.93	4.24	6.00	6.250E-003	2.756E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	4.00	4.167E-003	2.329E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	7.00	7.292E-003	2.946E-003
Th-228	5.41	5.16	5.47	23.00	2.396E-002	5.103E-003
Po-210	5.25	5.20	5.26	4.00	4.167E-003	2.329E-003
Pu-238	5.44	5.24	5.52	22.00	2.292E-002	4.996E-003
Am-241	5.45	5.27	5.57	19.00	1.979E-002	4.658E-003
Cm-245	5.39	5.36	5.41	4.00	4.167E-003	2.329E-003
Pu-236	5.72	5.57	5.84	35.00	3.646E-002	6.250E-003
Cm-244	5.73	5.60	5.86	40.00	4.167E-002	6.670E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:31:49AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV13
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

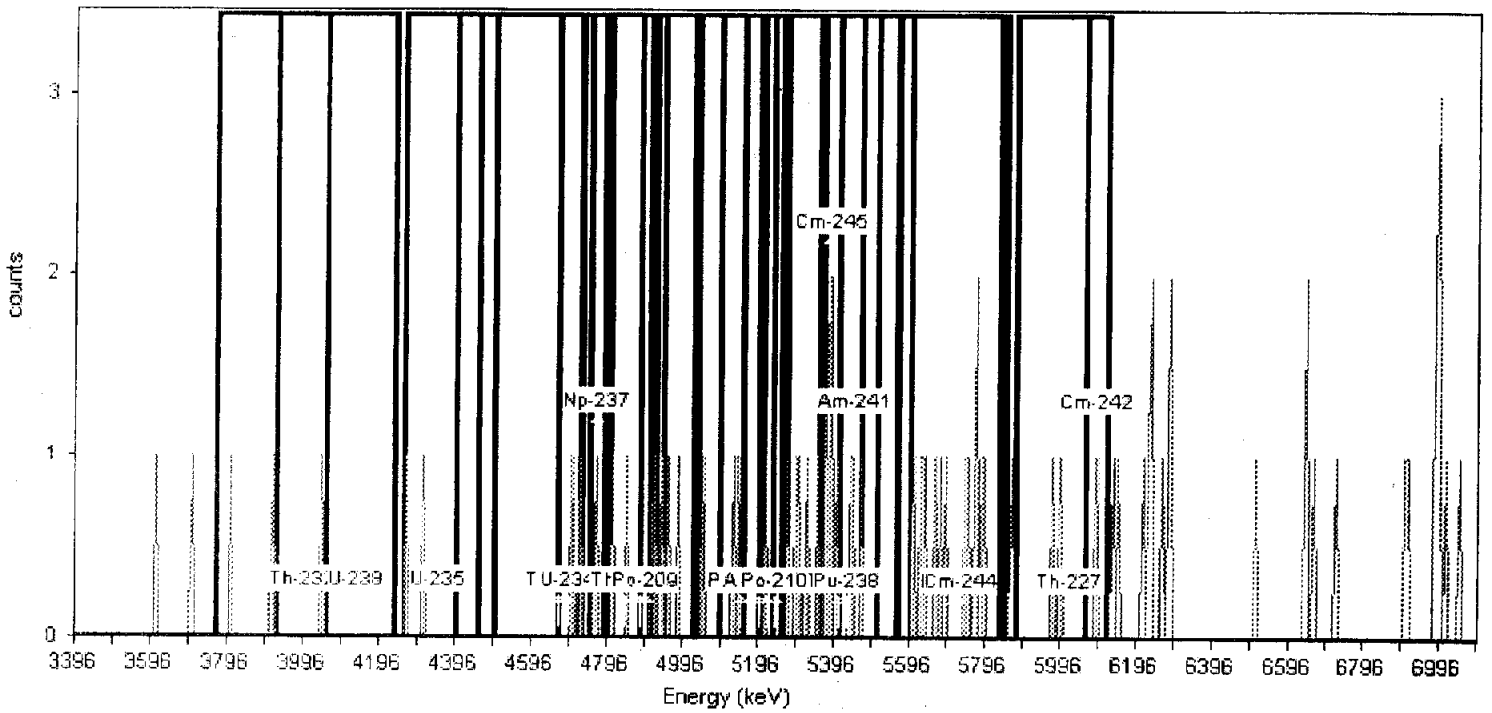
Acquisition

Detector: AV13 , SN: 41-172Q1
Acquisition Start Date: 3/24/2007 9:47:12AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 75.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	3.00	3.125E-003	2.083E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	6.00	6.250E-003	2.756E-003
Th-229	4.84	4.72	5.10	9.00	9.375E-003	3.294E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	5.00	5.208E-003	2.552E-003
Am-243	5.20	5.03	5.28	5.00	5.208E-003	2.552E-003
U-232	5.23	5.04	5.37	9.00	9.375E-003	3.294E-003
Th-228	5.41	5.16	5.47	15.00	1.563E-002	4.167E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	14.00	1.458E-002	4.034E-003
Am-241	5.45	5.27	5.57	14.00	1.458E-002	4.034E-003
Cm-245	5.39	5.36	5.41	6.00	6.250E-003	2.756E-003
Pu-236	5.72	5.57	5.84	12.00	1.250E-002	3.756E-003
Cm-244	5.73	5.60	5.86	12.00	1.250E-002	3.756E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:52AM 3/25/2007

Sample

Sample Name: AV14 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

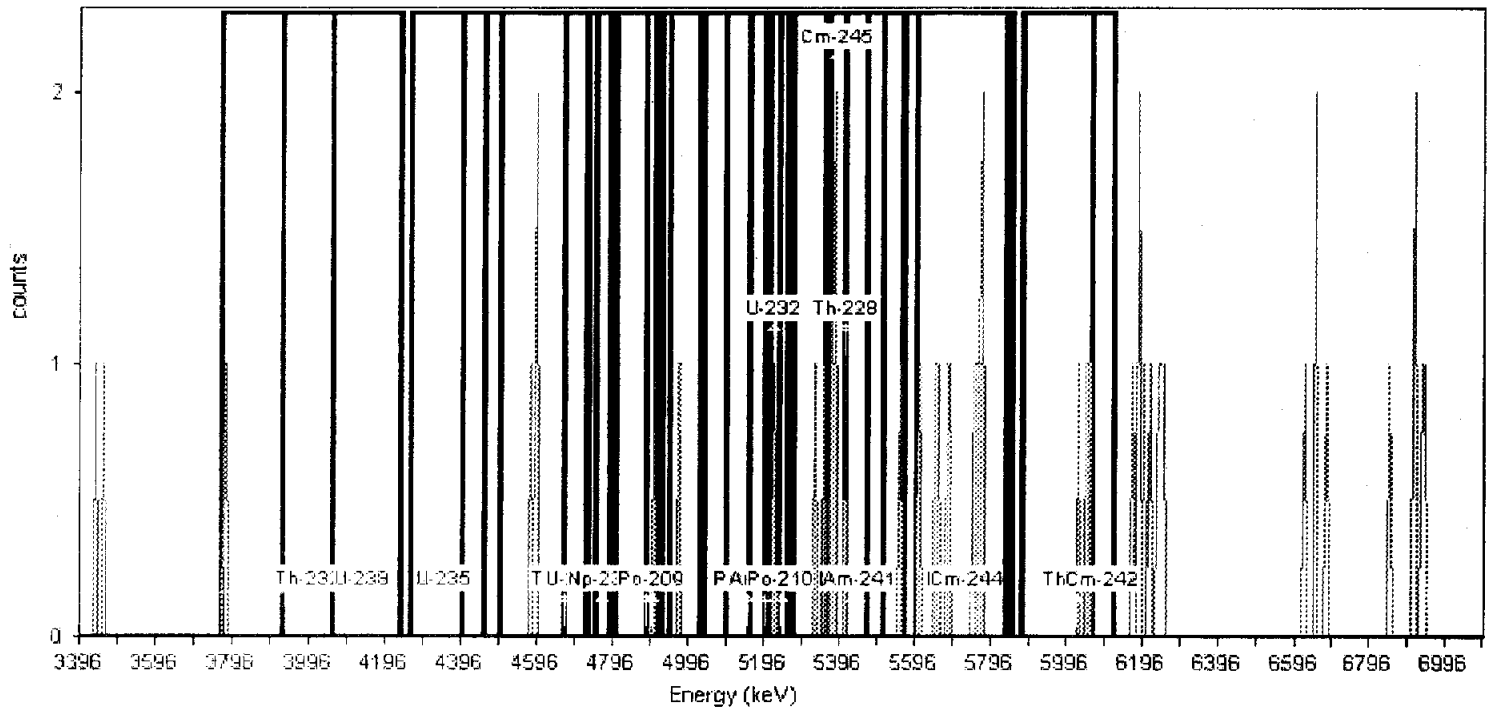
Acquisition

Detector: AV14 , SN: 41-172C4
Acquisition Start Date: 3/24/2007 9:47:13AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 46.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	7.00	7.292E-003	2.946E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	7.00	7.292E-003	2.946E-003
Cm-245	5.39	5.36	5.41	4.00	4.167E-003	2.329E-003
Pu-236	5.72	5.57	5.84	10.00	1.042E-002	3.455E-003
Cm-244	5.73	5.60	5.86	10.00	1.042E-002	3.455E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:55AM 3/25/2007

Sample

Sample Name: AV15 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

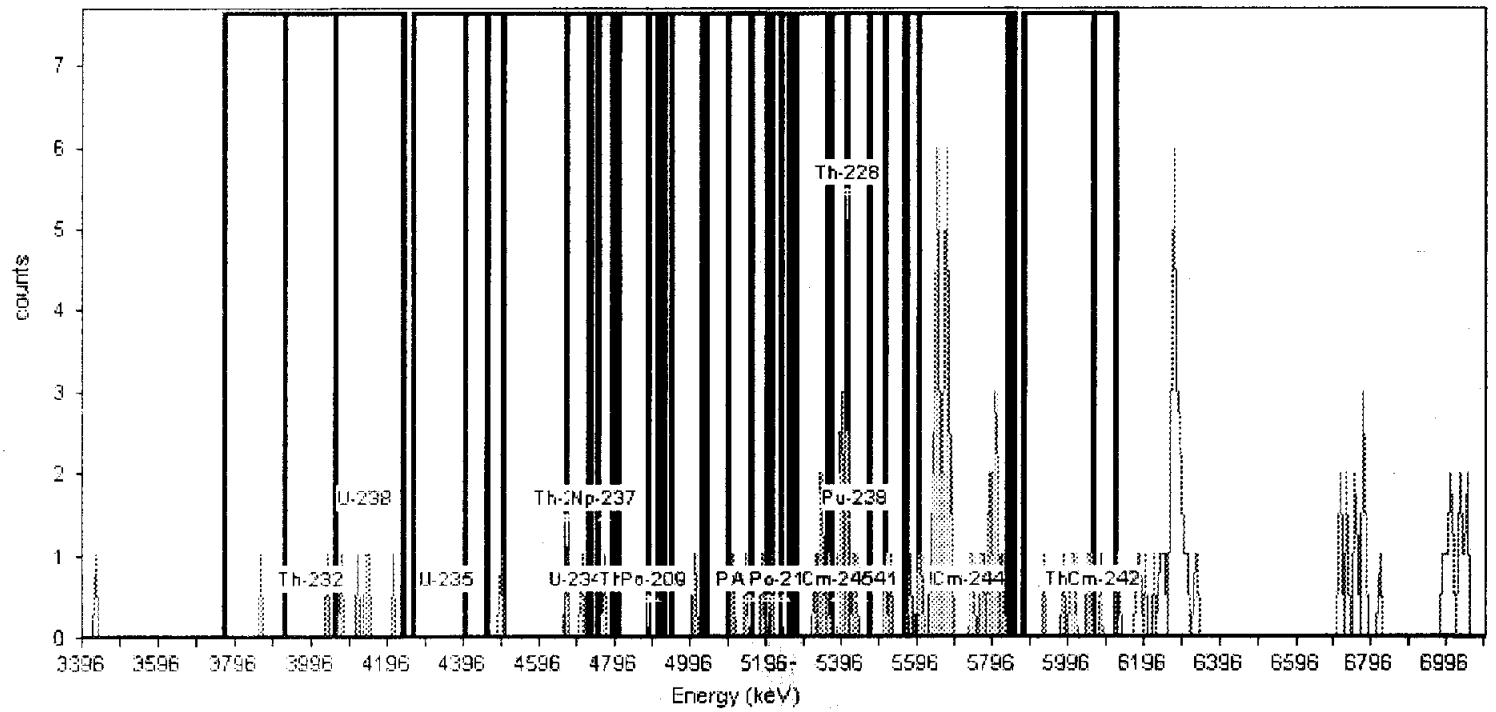
Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 3/24/2007 9:47:15AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 138.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	6.00	6.250E-003	2.756E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	5.00	5.208E-003	2.552E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	9.00	9.375E-003	3.294E-003
Th-228	5.41	5.16	5.47	19.00	1.979E-002	4.658E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	18.00	1.875E-002	4.541E-003
Am-241	5.45	5.27	5.57	19.00	1.979E-002	4.658E-003
Cm-245	5.39	5.36	5.41	11.00	1.146E-002	3.608E-003
Pu-236	5.72	5.57	5.84	42.00	4.375E-002	6.831E-003
Cm-244	5.73	5.60	5.86	41.00	4.271E-002	6.751E-003
Th-227	6.02	5.89	6.13	7.00	7.292E-003	2.946E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:32:02AM 3/25/2007

Sample

Sample Name: AV17 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

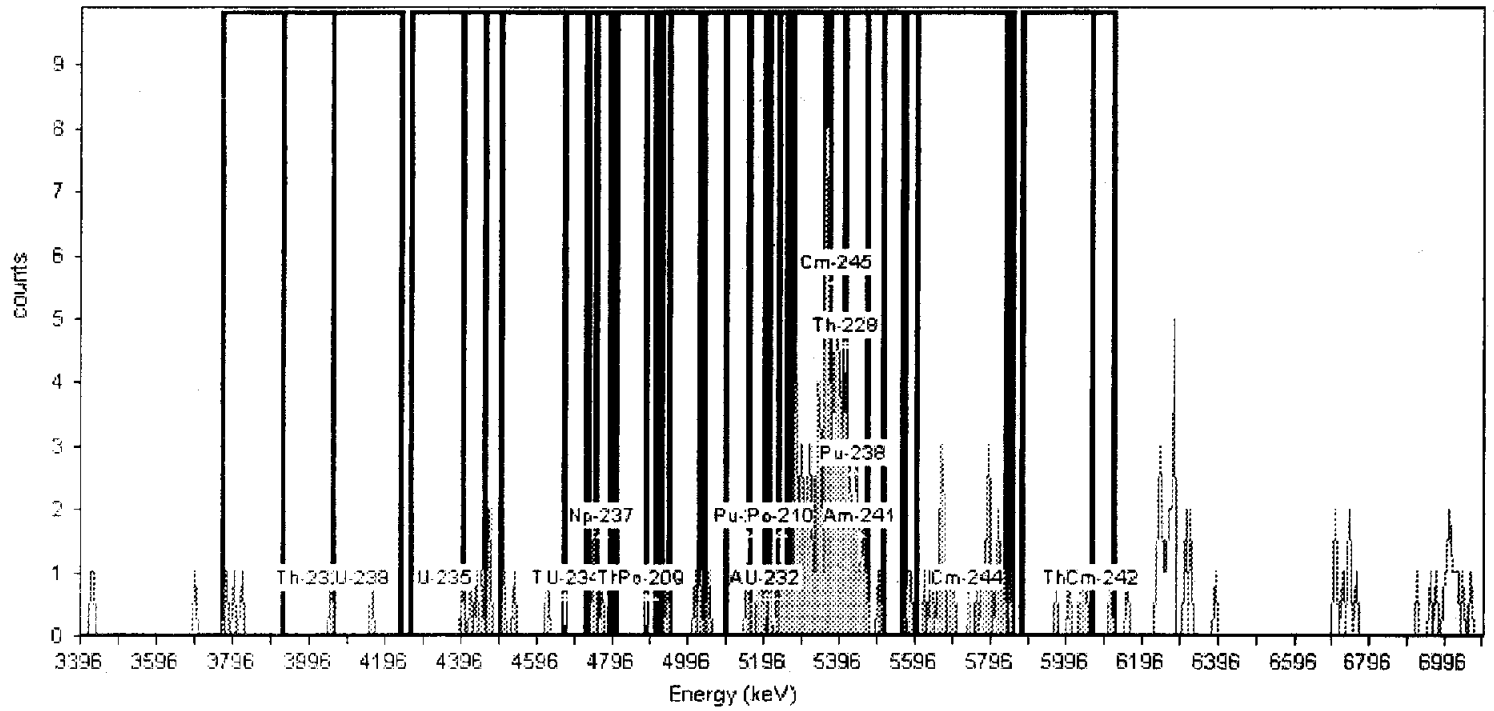
Acquisition

Detector: AV17 , SN: 41-172Q4
Acquisition Start Date: 3/24/2007 9:47:19AM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis. Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 193.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	4.00	4.167E-003	2.329E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	4.00	4.167E-003	2.329E-003
Th-230	4.67	4.40	4.73	9.00	9.375E-003	3.294E-003
U-234	4.70	4.50	4.80	6.00	6.250E-003	2.756E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	7.00	7.292E-003	2.946E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	9.00	9.375E-003	3.294E-003
Am-243	5.20	5.03	5.28	15.00	1.563E-002	4.167E-003
U-232	5.23	5.04	5.37	53.00	5.521E-002	7.655E-003
Th-228	5.41	5.16	5.47	90.00	9.375E-002	9.937E-003
Po-210	5.25	5.20	5.26	6.00	6.250E-003	2.756E-003
Pu-238	5.44	5.24	5.52	84.00	8.750E-002	9.604E-003
Am-241	5.45	5.27	5.57	81.00	8.438E-002	9.433E-003
Cm-245	5.39	5.36	5.41	37.00	3.854E-002	6.421E-003
Pu-236	5.72	5.57	5.84	28.00	2.917E-002	5.610E-003
Cm-244	5.73	5.60	5.86	27.00	2.813E-002	5.512E-003
Th-227	6.02	5.89	6.13	6.00	6.250E-003	2.756E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

STL SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:32:05AM 3/25/2007

Sample

Sample Name: AV18 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

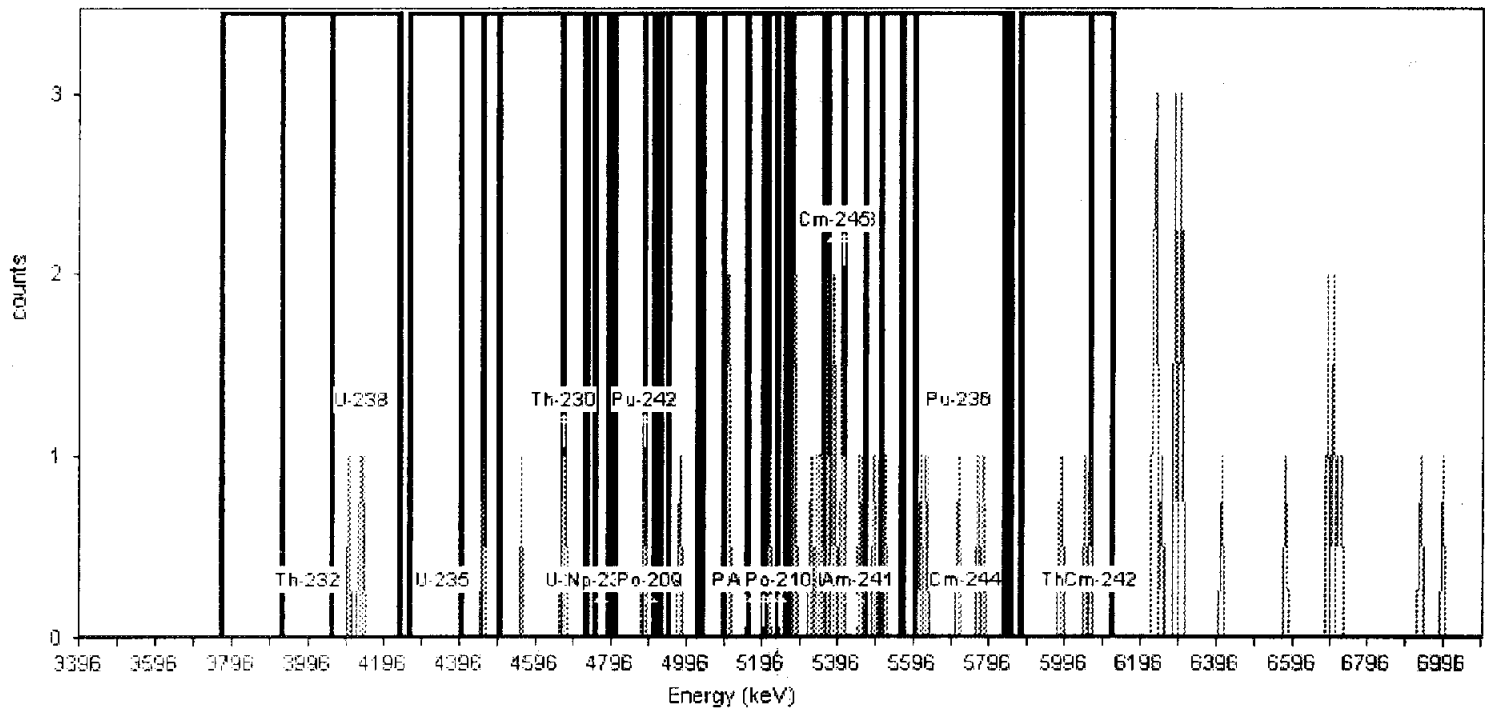
Acquisition

Detector: AV18 , SN: 41-172C6
Acquisition Start Date: 3/24/2007 9:47:20AM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 60.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	11.00	1.146E-002	3.608E-003
Th-228	5.41	5.16	5.47	16.00	1.667E-002	4.295E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	16.00	1.667E-002	4.295E-003
Am-241	5.45	5.27	5.57	17.00	1.771E-002	4.419E-003
Cm-245	5.39	5.36	5.41	8.00	8.333E-003	3.125E-003
Pu-236	5.72	5.57	5.84	5.00	5.208E-003	2.552E-003
Cm-244	5.73	5.60	5.86	5.00	5.208E-003	2.552E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:32:08AM 3/25/2007

Sample

Sample Name: AV19 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

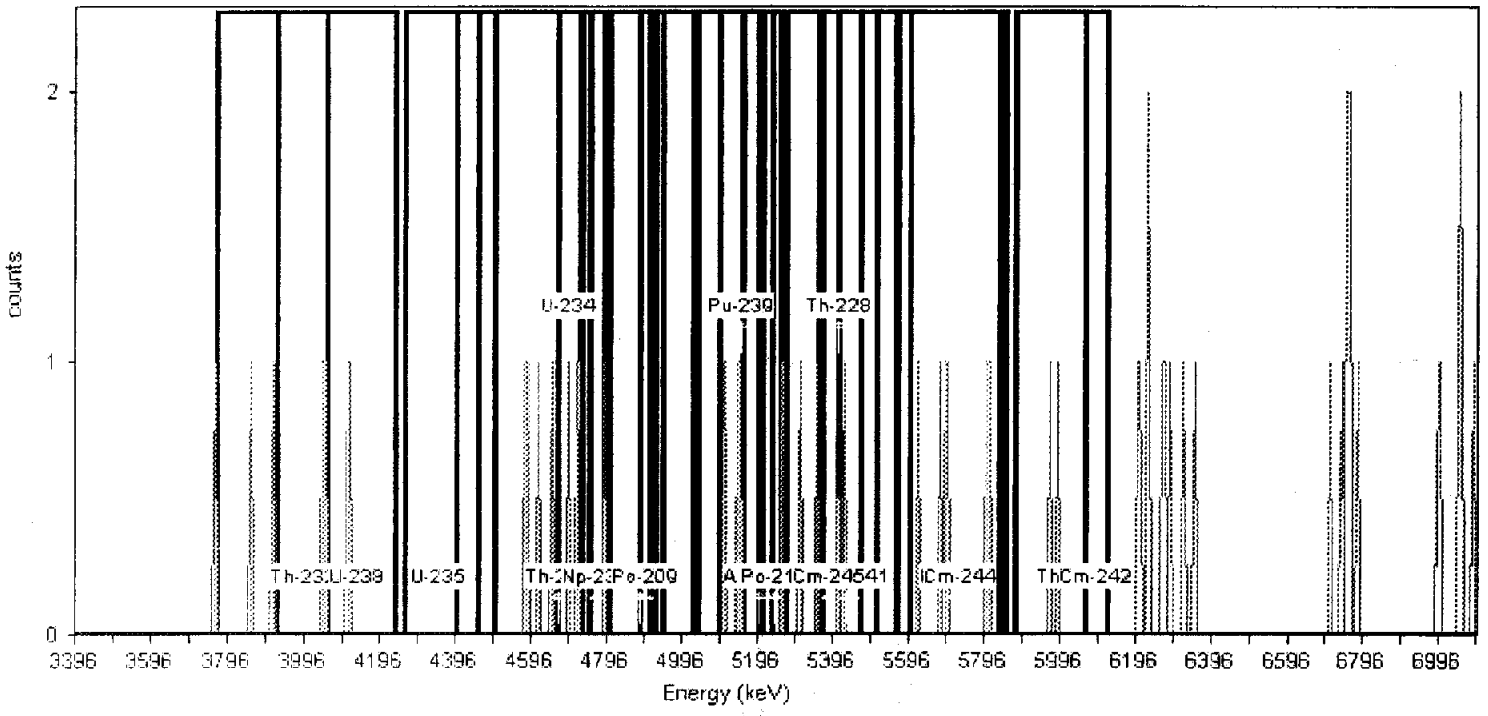
Acquisition

Detector: AV19 , SN: 41-172Q6
Acquisition Start Date: 3/24/2007 9:47:22AM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background01 Nuclide Library: Background ROI Library

Total Background Counts: 52.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	4.00	4.167E-003	2.329E-003
U-238	4.14	3.93	4.24	4.00	4.167E-003	2.329E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	6.00	6.250E-003	2.756E-003
U-234	4.70	4.50	4.80	7.00	7.292E-003	2.946E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	6.00	6.250E-003	2.756E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	5.00	5.208E-003	2.552E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	6.00	6.250E-003	2.756E-003
Cm-244	5.73	5.60	5.86	6.00	6.250E-003	2.756E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:32:11AM 3/25/2007

Sample

Sample Name: AV20 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

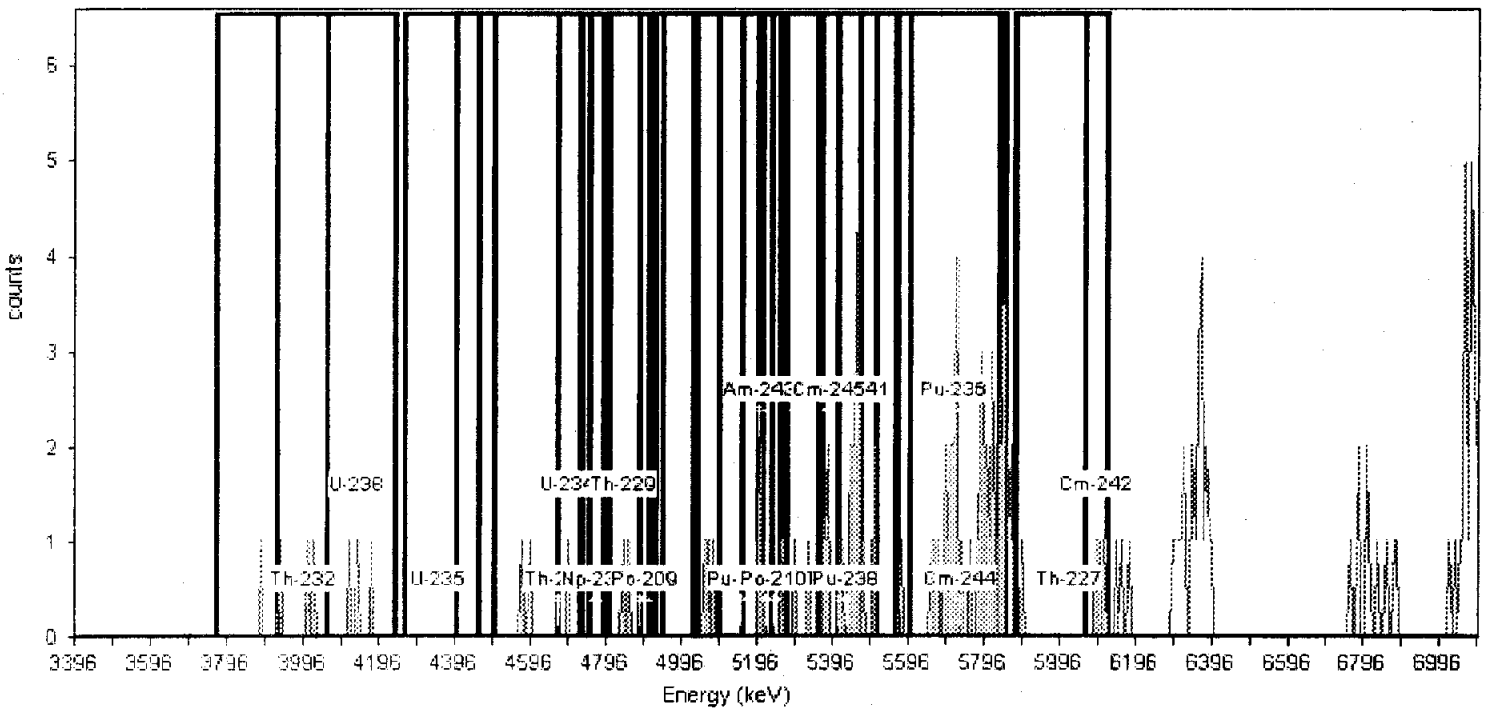
Acquisition

Detector: AV20 , SN: 41-172R2
Acquisition Start Date: 3/24/2007 9:47:23AM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 140.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	4.00	4.167E-003	2.329E-003
U-238	4.14	3.93	4.24	6.00	6.250E-003	2.756E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	5.00	5.208E-003	2.552E-003
Am-243	5.20	5.03	5.28	7.00	7.292E-003	2.946E-003
U-232	5.23	5.04	5.37	9.00	9.375E-003	3.294E-003
Th-228	5.41	5.16	5.47	21.00	2.187E-002	4.886E-003
Po-210	5.25	5.20	5.26	4.00	4.167E-003	2.329E-003
Pu-238	5.44	5.24	5.52	21.00	2.187E-002	4.886E-003
Am-241	5.45	5.27	5.57	20.00	2.083E-002	4.774E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	33.00	3.437E-002	6.074E-003
Cm-244	5.73	5.60	5.86	39.00	4.062E-002	6.588E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	3.00	3.125E-003	2.083E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:32:15AM 3/25/2007

Sample

Sample Name: AV21 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

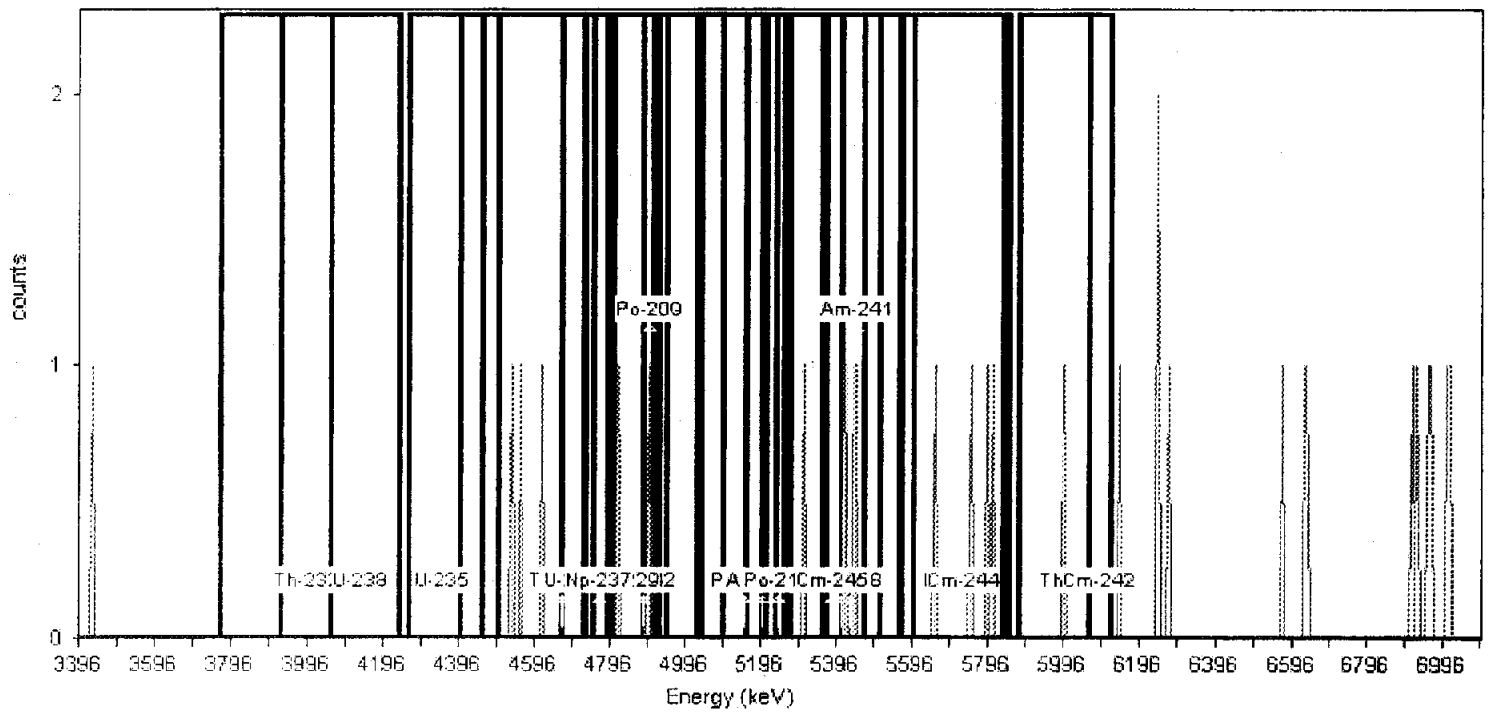
Acquisition

Detector: AV21 , SN: 41-172C7
Acquisition Start Date: 3/24/2007 9:47:25AM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 28.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	4.00	4.167E-003	2.329E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:32:18AM 3/25/2007

Sample

Sample Name: AV22 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

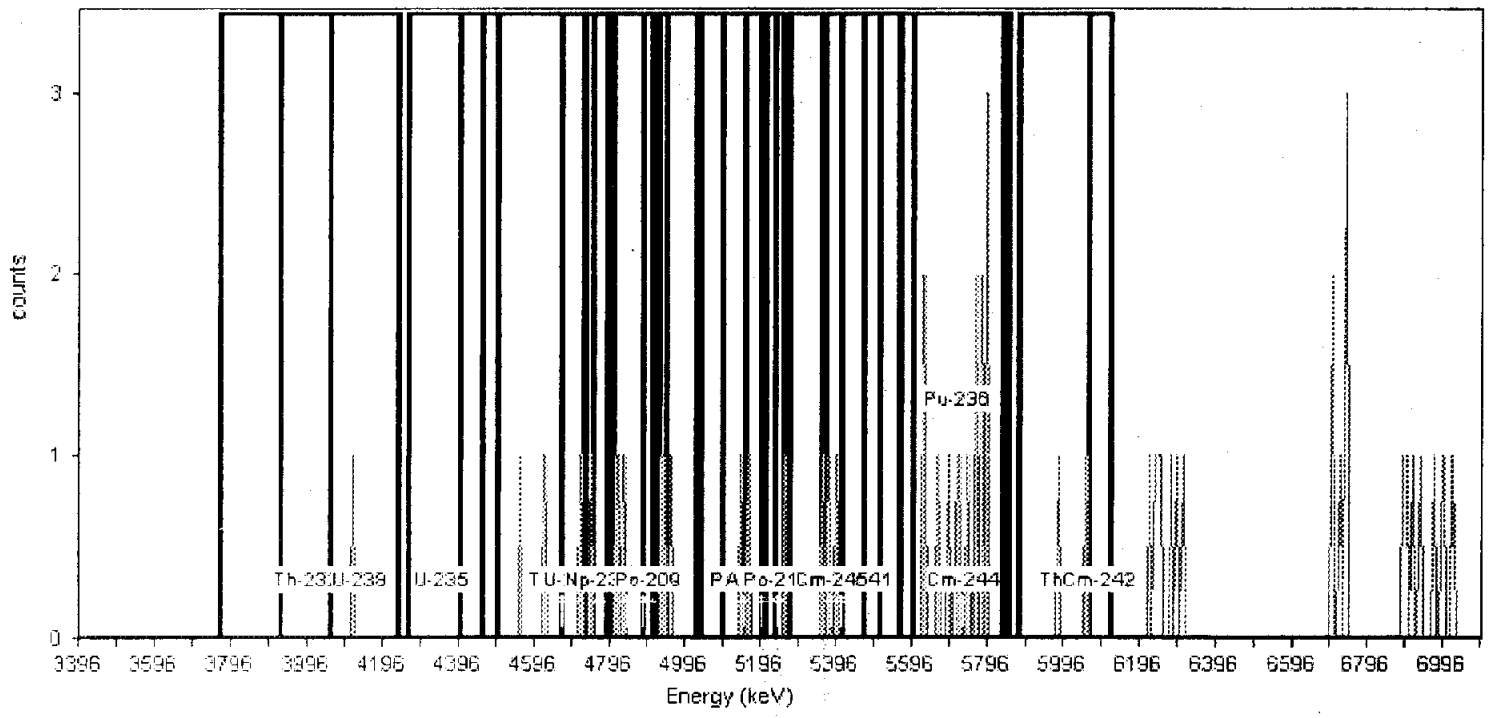
Acquisition

Detector: AV22 , SN: 41-172Q5
Acquisition Start Date: 3/24/2007 9:47:26AM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 54.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	4.00	4.167E-003	2.329E-003
Pu-242	4.88	4.67	4.93	5.00	5.208E-003	2.552E-003
Th-229	4.84	4.72	5.10	7.00	7.292E-003	2.946E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	14.00	1.458E-002	4.034E-003
Cm-244	5.73	5.60	5.86	14.00	1.458E-002	4.034E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:32:21AM 3/25/2007

Sample

Sample Name: AV23 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

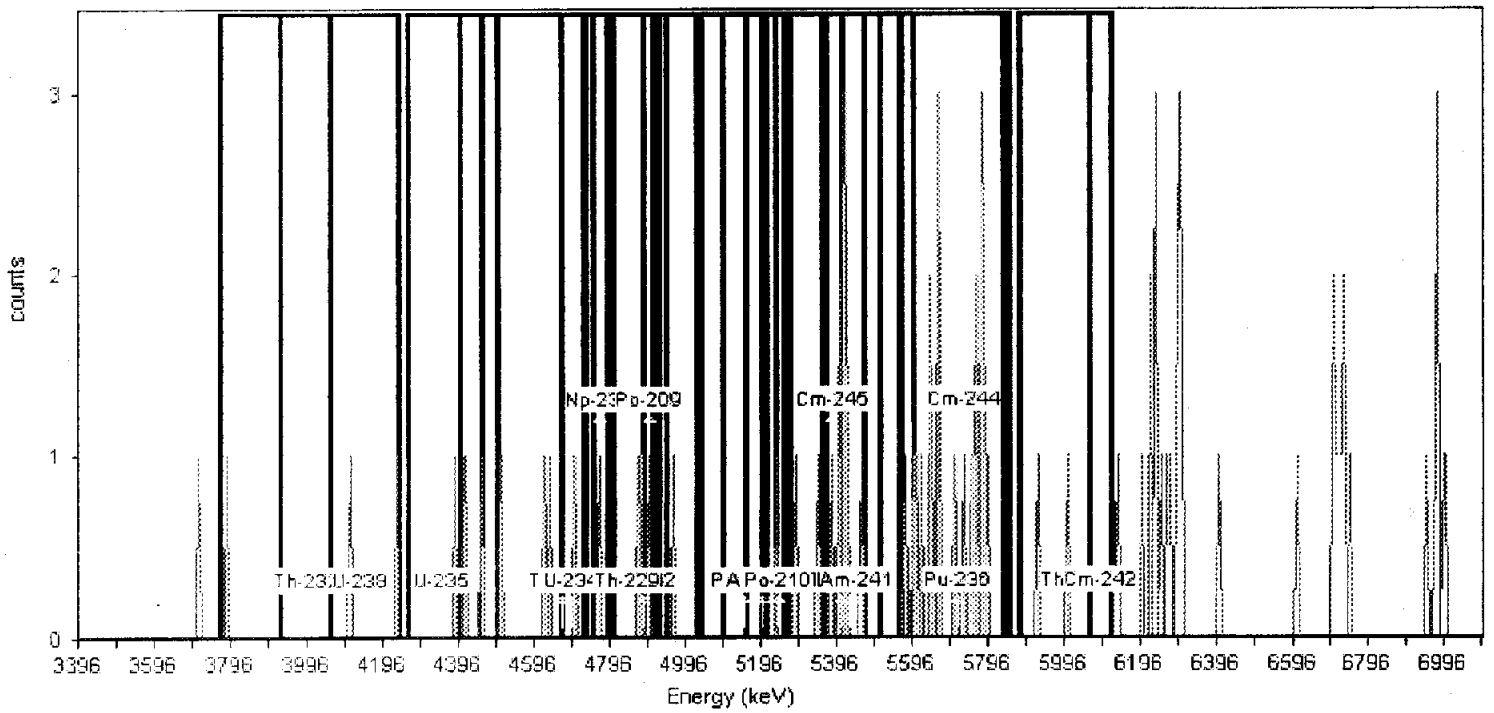
Acquisition

Detector: AV23 , SN: 41-172R4
Acquisition Start Date: 3/24/2007 9:47:28AM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 82.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	3.00	3.125E-003	2.083E-003
Th-230	4.67	4.40	4.73	6.00	6.250E-003	2.756E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	5.00	5.208E-003	2.552E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	11.00	1.146E-002	3.608E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	11.00	1.146E-002	3.608E-003
Am-241	5.45	5.27	5.57	10.00	1.042E-002	3.455E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	21.00	2.187E-002	4.886E-003
Cm-244	5.73	5.60	5.86	20.00	2.083E-002	4.774E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:32:24AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV24
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

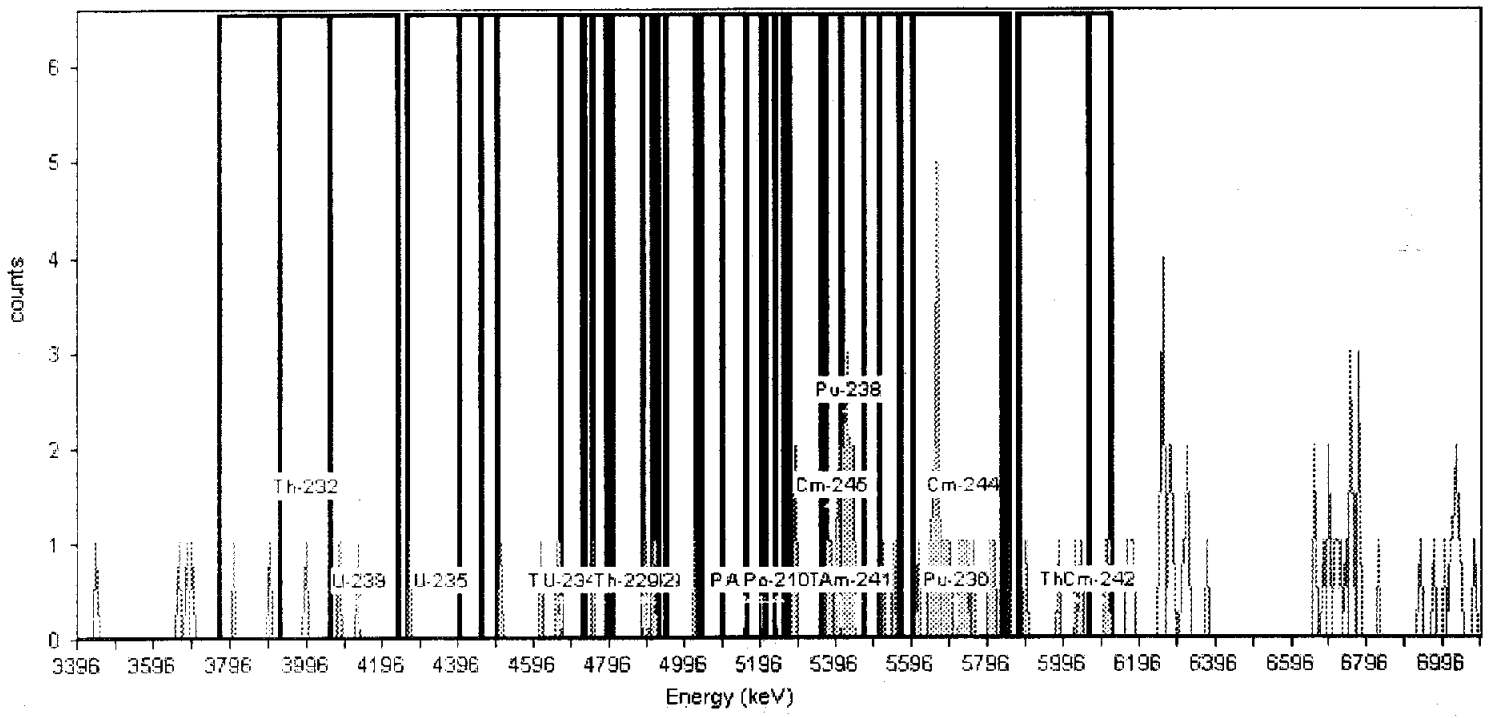
Acquisition

Detector: AV24 , SN: 41-172R5
Acquisition Start Date: 3/24/2007 9:47:30AM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 110.00

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	2.00	2.083E-003	1.804E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	16.00	1.667E-002	4.295E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	16.00	1.667E-002	4.295E-003
Am-241	5.45	5.27	5.57	18.00	1.875E-002	4.541E-003
Cm-245	5.39	5.36	5.41	5.00	5.208E-003	2.552E-003
Pu-236	5.72	5.57	5.84	22.00	2.292E-002	4.996E-003
Cm-244	5.73	5.60	5.86	23.00	2.396E-002	5.103E-003
Th-227	6.02	5.89	6.13	6.00	6.250E-003	2.756E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003
Th-232	3.99	3.77	4.06	3.00	3.125E-003	2.083E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	4.00	4.167E-003	2.329E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003

STL SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:32:27AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV45
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

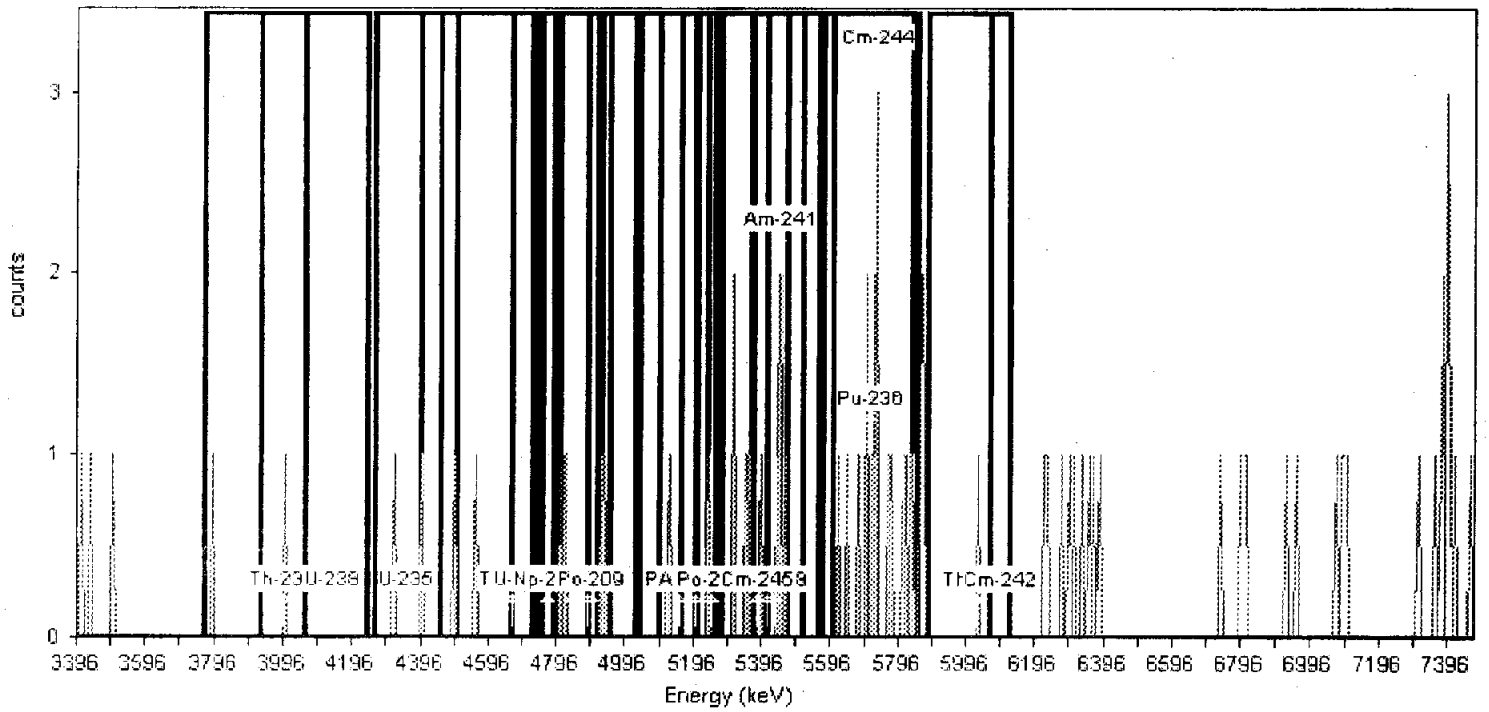
Acquisition

Detector: AV45 , SN: AV45
Acquisition Start Date: 3/24/2007 9:47:31AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 74.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	4.00	4.167E-003	2.329E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	6.00	6.250E-003	2.756E-003
Th-228	5.41	5.16	5.47	10.00	1.042E-002	3.455E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	10.00	1.042E-002	3.455E-003
Am-241	5.45	5.27	5.57	9.00	9.375E-003	3.294E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	16.00	1.667E-002	4.295E-003
Cm-244	5.73	5.60	5.86	16.00	1.667E-002	4.295E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:32:31AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV46 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

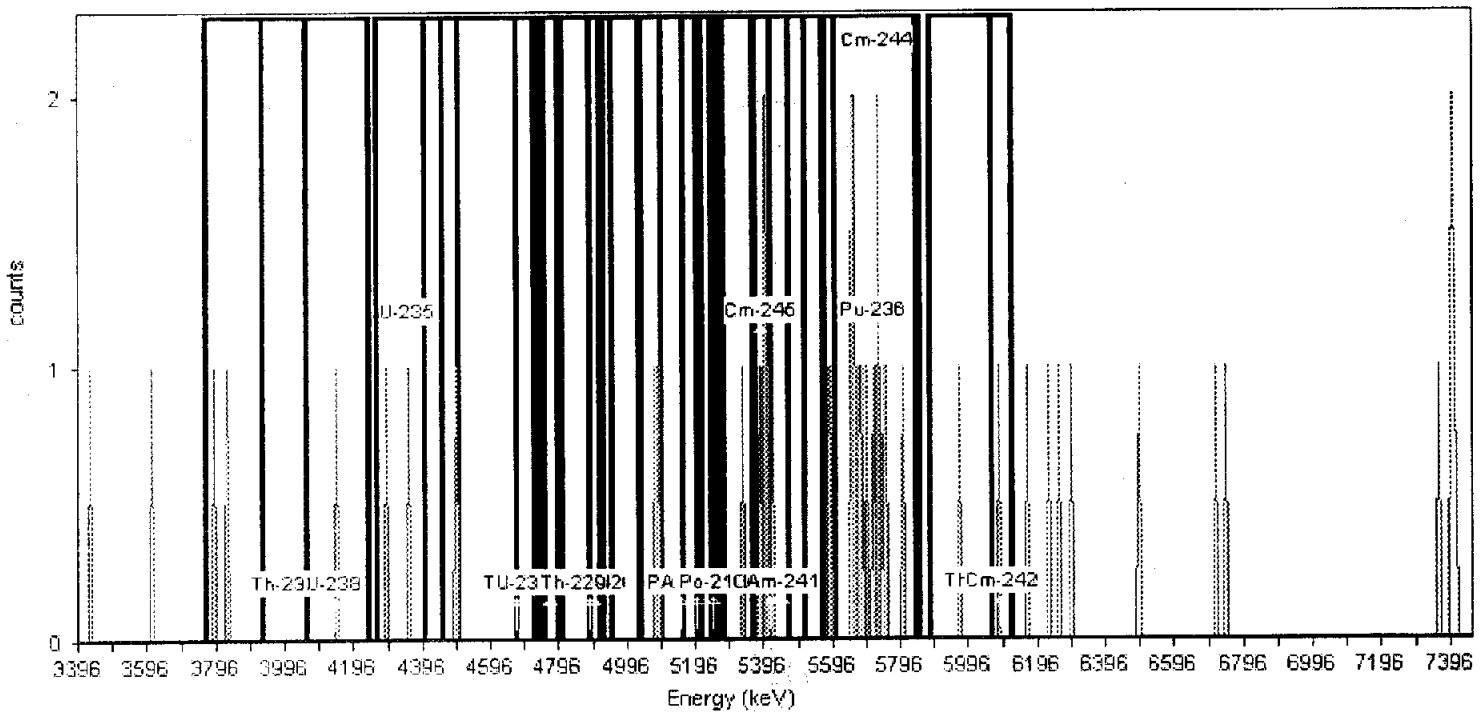
Acquisition

Detector: AV46 , SN: AV46
Acquisition Start Date: 3/24/2007 9:47:32AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi Nuclide Library: Background ROI Library

Total Background Counts: 44.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	6.00	6.250E-003	2.756E-003
Cm-245	5.39	5.36	5.41	4.00	4.167E-003	2.329E-003
Pu-236	5.72	5.57	5.84	14.00	1.458E-002	4.034E-003
Cm-244	5.73	5.60	5.86	13.00	1.354E-002	3.898E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:32:34AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV47
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

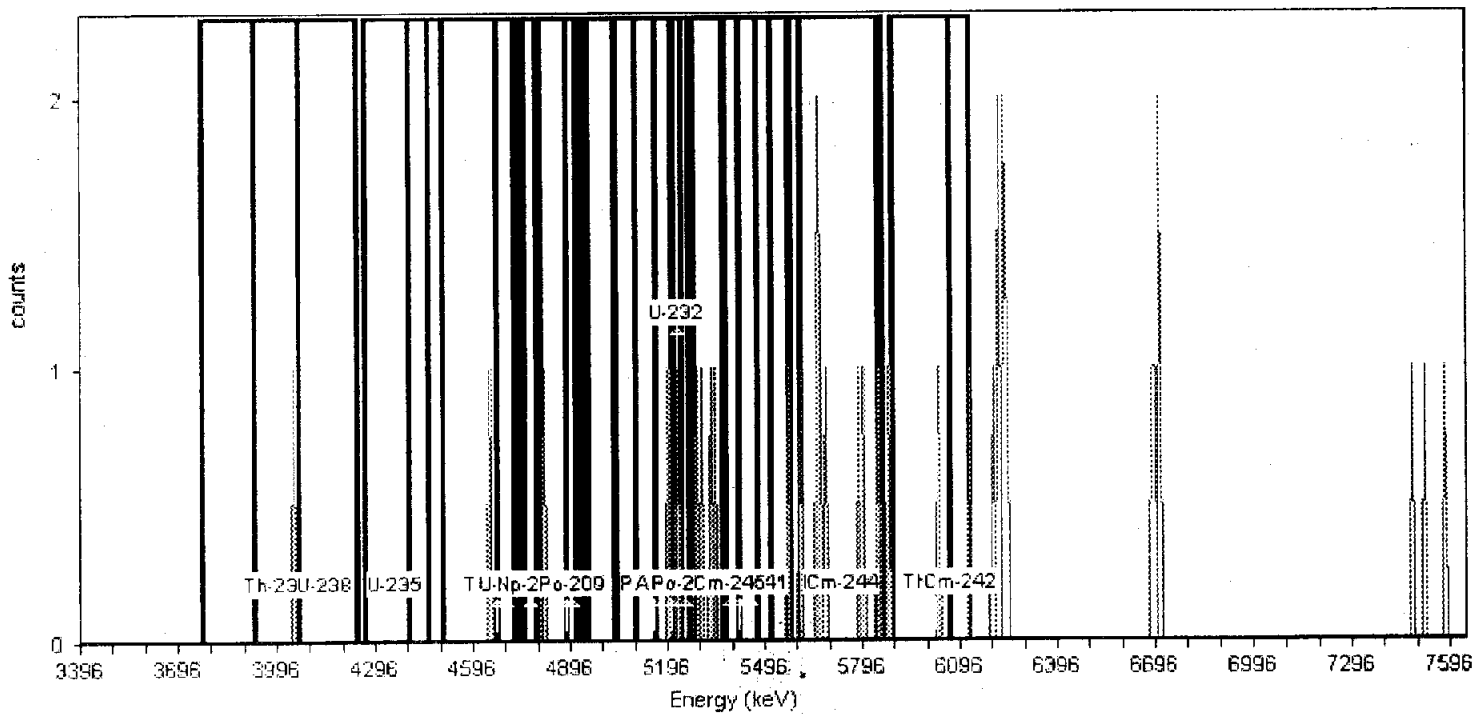
Acquisition

Detector: AV47 , SN: AV47
Acquisition Start Date: 3/24/2007 9:47:34AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background
Nuclide Library: Background ROI Library
Total Background Counts: 37.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	6.00	6.250E-003	2.756E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	5.00	5.208E-003	2.552E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	9.00	9.375E-003	3.294E-003
Cm-244	5.73	5.60	5.86	9.00	9.375E-003	3.294E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:32:37AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV48
Comment:

Spectrum #1 Analysis #1

Batch

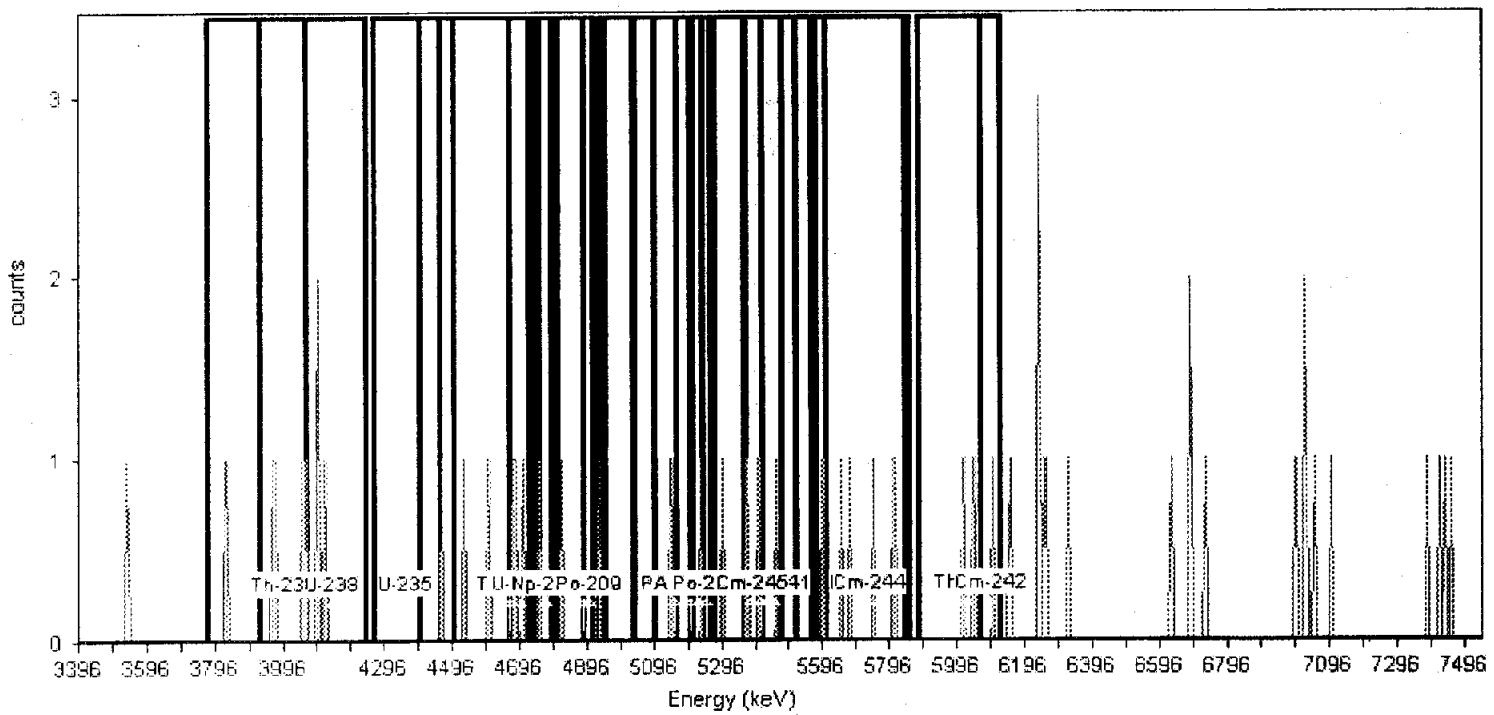
Batch Name: Mar2007
Description:

Acquisition

Detector: AV48 , SN: AV48
Acquisition Start Date: 3/24/2007 9:47:35AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 55.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	5.00	5.208E-003	2.552E-003
U-238	4.14	3.93	4.24	7.00	7.292E-003	2.946E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	6.00	6.250E-003	2.756E-003
U-234	4.70	4.50	4.80	6.00	6.250E-003	2.756E-003
Pu-242	4.88	4.67	4.93	6.00	6.250E-003	2.756E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	6.00	6.250E-003	2.756E-003
Cm-244	5.73	5.60	5.86	5.00	5.208E-003	2.552E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:32:40AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV49 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

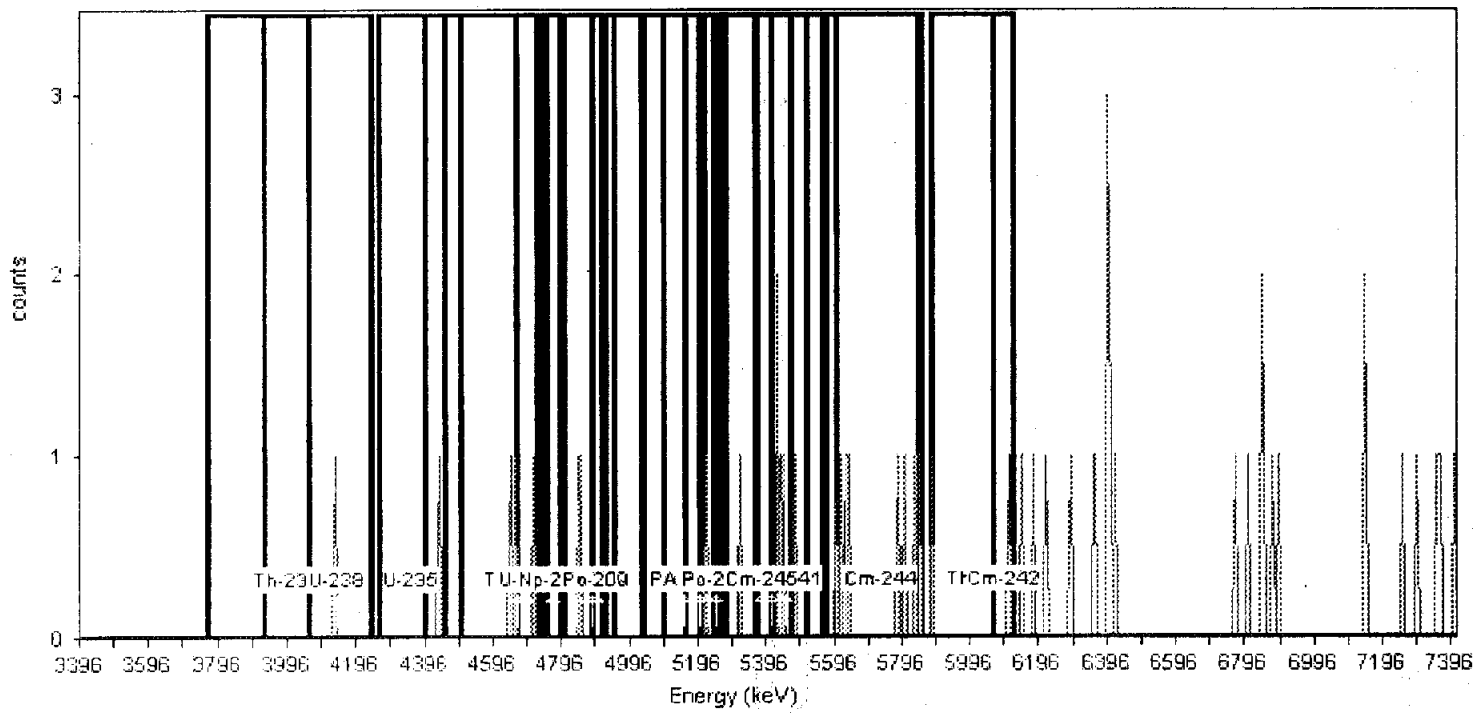
Acquisition

Detector: AV49 , SN: AV49
Acquisition Start Date: 3/24/2007 9:47:37AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 46.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	5.00	5.208E-003	2.552E-003
Am-241	5.45	5.27	5.57	5.00	5.208E-003	2.552E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	7.00	7.292E-003	2.946E-003
Cm-244	5.73	5.60	5.86	8.00	8.333E-003	3.125E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:32:43AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV50
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

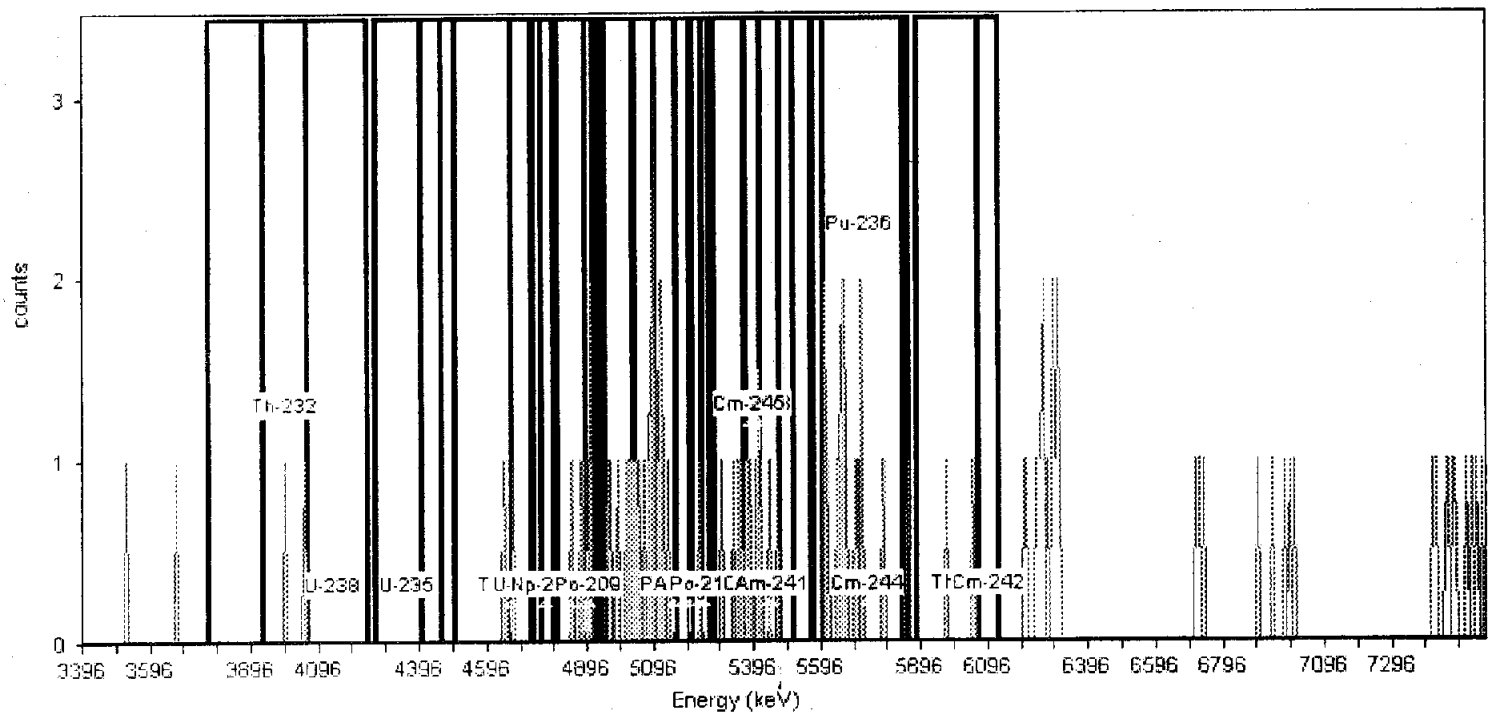
Acquisition

Detector: AV50 , SN: AV50
Acquisition Start Date: 3/24/2007 9:47:38AM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 95.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	6.00	6.250E-003	2.756E-003
Th-229	4.84	4.72	5.10	21.00	2.187E-002	4.886E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	3.00	3.125E-003	2.083E-003
Pu-239	5.15	4.95	5.21	21.00	2.187E-002	4.886E-003
Am-243	5.20	5.03	5.28	17.00	1.771E-002	4.419E-003
U-232	5.23	5.04	5.37	21.00	2.187E-002	4.886E-003
Th-228	5.41	5.16	5.47	13.00	1.354E-002	3.898E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	12.00	1.250E-002	3.756E-003
Am-241	5.45	5.27	5.57	12.00	1.250E-002	3.756E-003
Cm-245	5.39	5.36	5.41	6.00	6.250E-003	2.756E-003
Pu-236	5.72	5.57	5.84	15.00	1.563E-002	4.167E-003
Cm-244	5.73	5.60	5.86	16.00	1.667E-002	4.295E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:32:47AM 3/25/2007

Sample

Sample Name: AV51 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

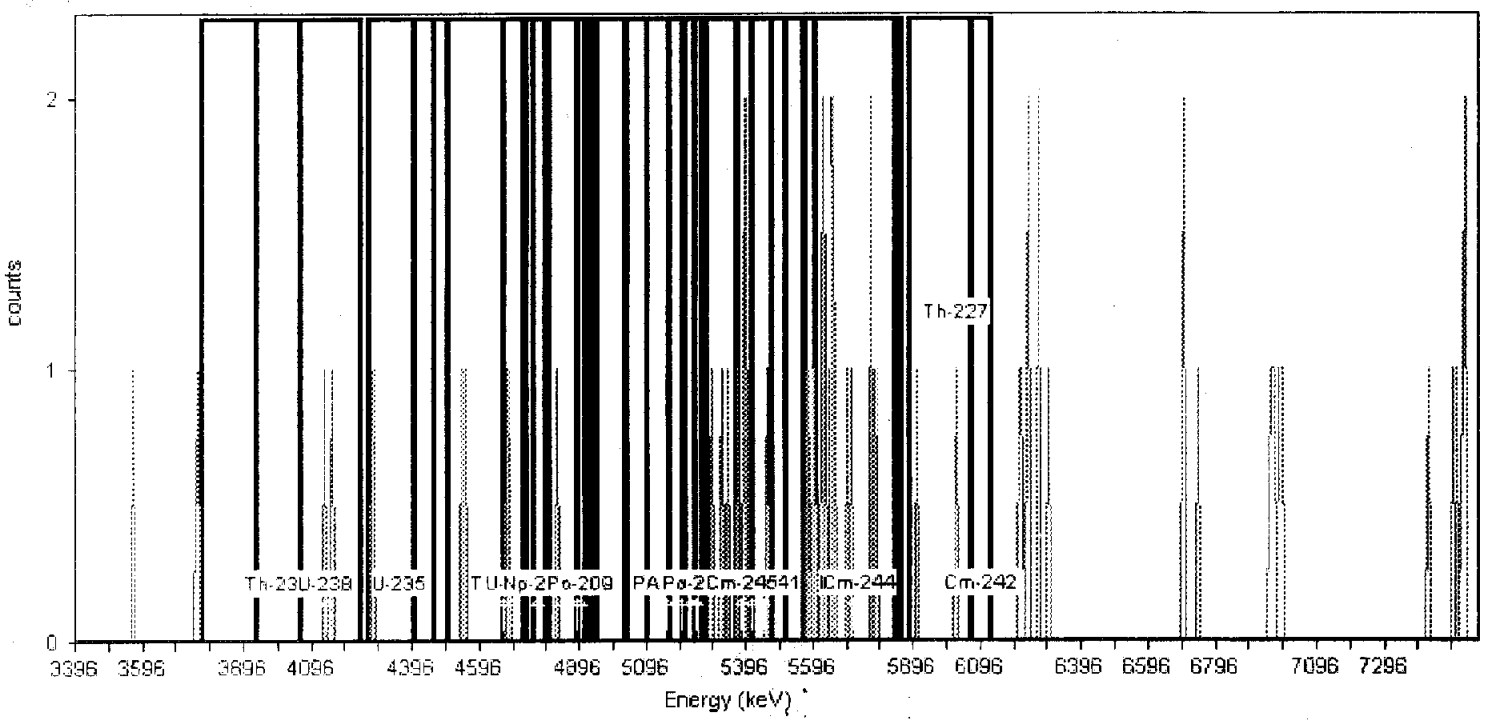
Acquisition

Detector: AV51 , SN:
Acquisition Start Date: 3/24/2007 9:47:40AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 55.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	7.00	7.292E-003	2.946E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	7.00	7.292E-003	2.946E-003
Am-241	5.45	5.27	5.57	7.00	7.292E-003	2.946E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	14.00	1.458E-002	4.034E-003
Cm-244	5.73	5.60	5.86	12.00	1.250E-002	3.756E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:32:50AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV52
Comment:

Spectrum #1 Analysis #1

Batch

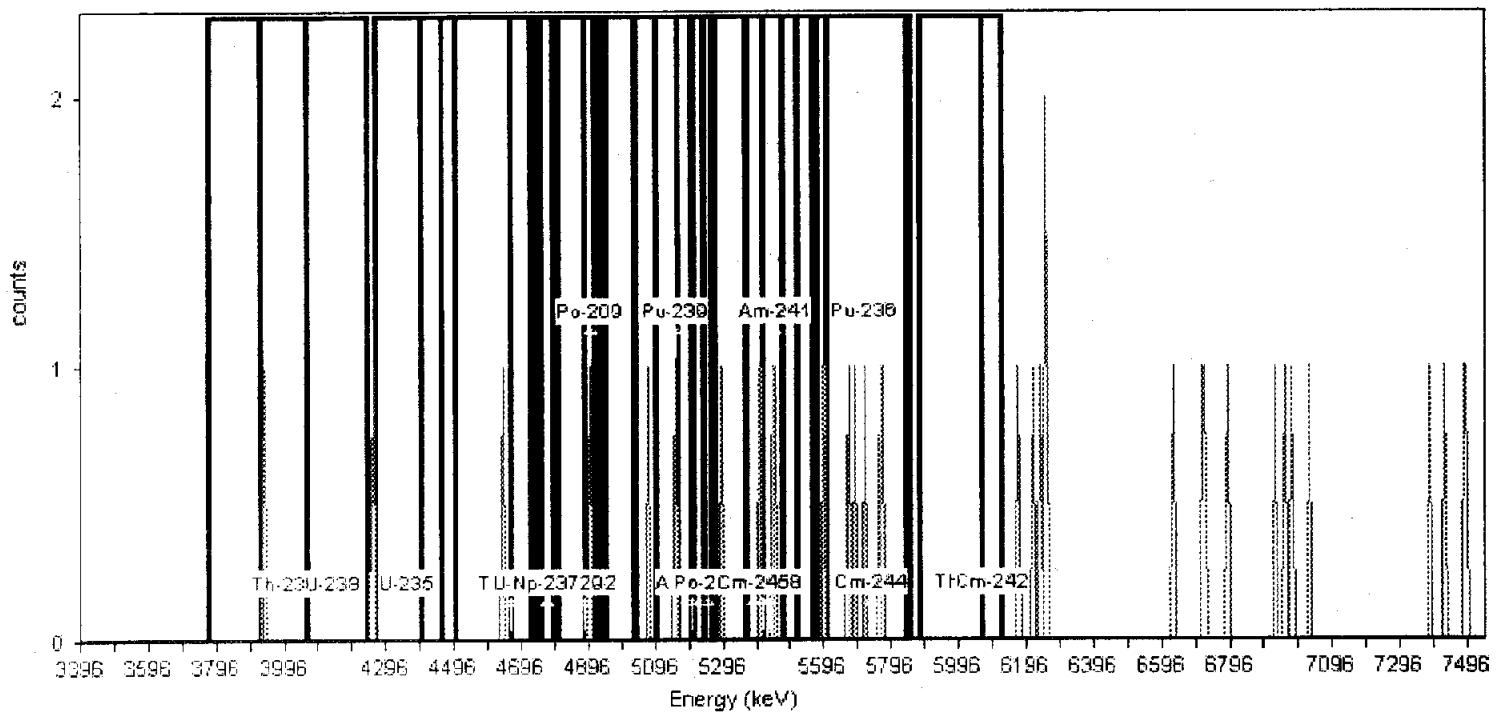
Batch Name: Mar2007
Description:

Acquisition

Detector: AV52 , SN:
Acquisition Start Date: 3/24/2007 9:47:41AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 34.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	4.00	4.167E-003	2.329E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	6.00	6.250E-003	2.756E-003
Cm-244	5.73	5.60	5.86	5.00	5.208E-003	2.552E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:15AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV53
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

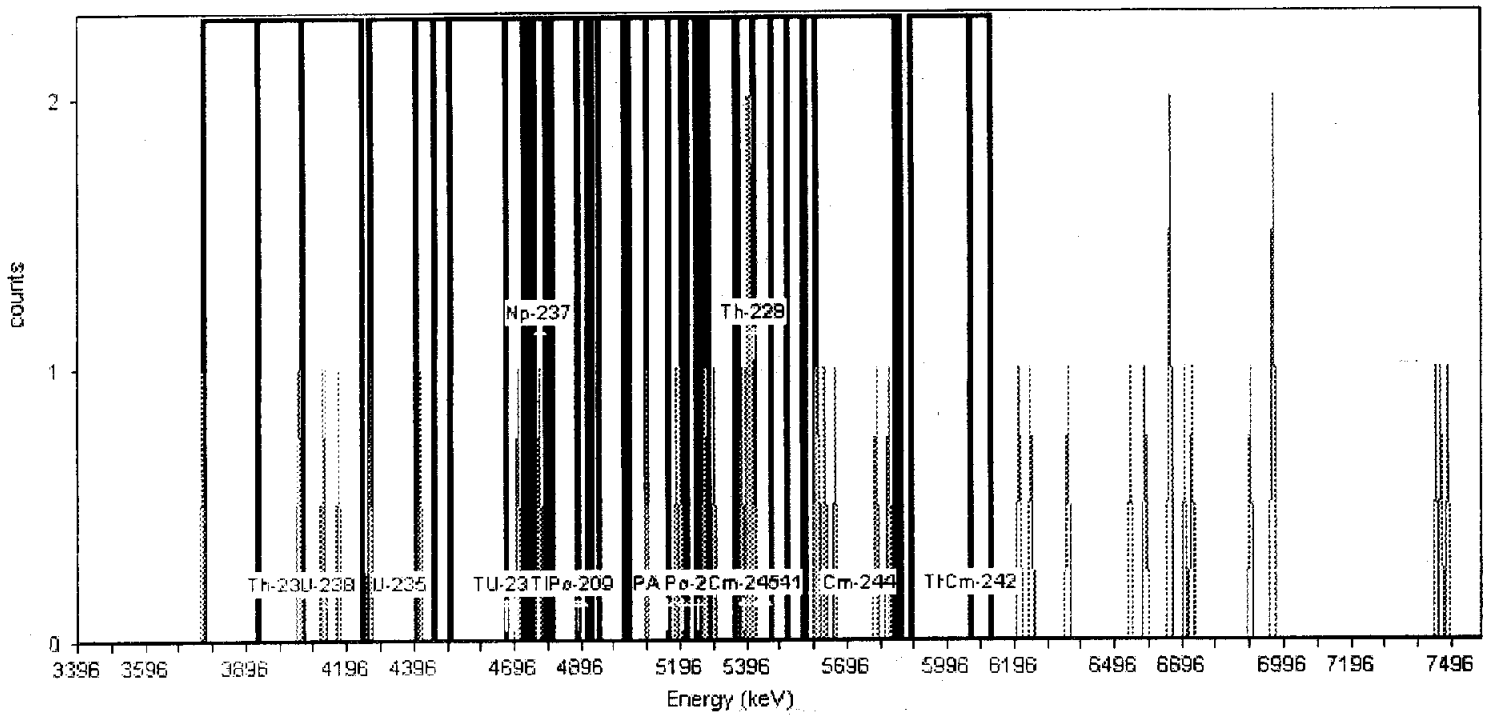
Acquisition

Detector: AV53 , SN:
Acquisition Start Date: 3/24/2007 9:47:43AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV53
Calibration Date: 2/27/2007 7:37:38PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.71% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background
Nuclide Library: Background ROI Library
Total Background Counts: 41.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	4.00	4.167E-003	2.329E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	10.00	1.042E-002	3.455E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	8.00	8.333E-003	3.125E-003
Am-241	5.45	5.27	5.57	8.00	8.333E-003	3.125E-003
Cm-245	5.39	5.36	5.41	6.00	6.250E-003	2.756E-003
Pu-236	5.72	5.57	5.84	7.00	7.292E-003	2.946E-003
Cm-244	5.73	5.60	5.86	7.00	7.292E-003	2.946E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:30:22AM 3/25/2007

Sample

Sample Name: AV54 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

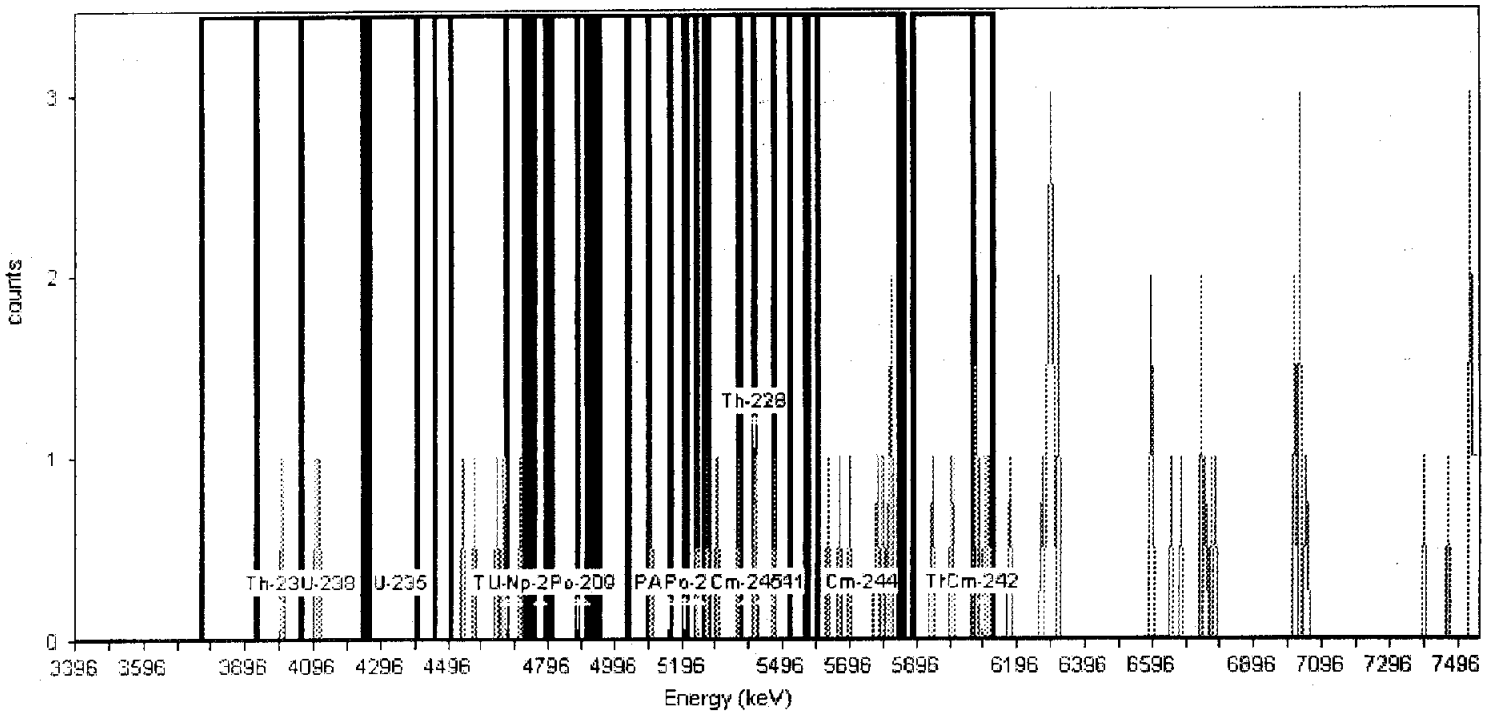
Acquisition

Detector: AV54 , SN:
Acquisition Start Date: 3/24/2007 9:47:44AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV54
Calibration Date: 2/27/2007 7:37:44PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.93% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi Nuclide Library: Background ROI Library

Total Background Counts: 64.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	5.00	5.208E-003	2.552E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	5.00	5.208E-003	2.552E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	9.00	9.375E-003	3.294E-003
Cm-244	5.73	5.60	5.86	9.00	9.375E-003	3.294E-003
Th-227	6.02	5.89	6.13	6.00	6.250E-003	2.756E-003
Cm-242	6.10	6.07	6.13	4.00	4.167E-003	2.329E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:25AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV55
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

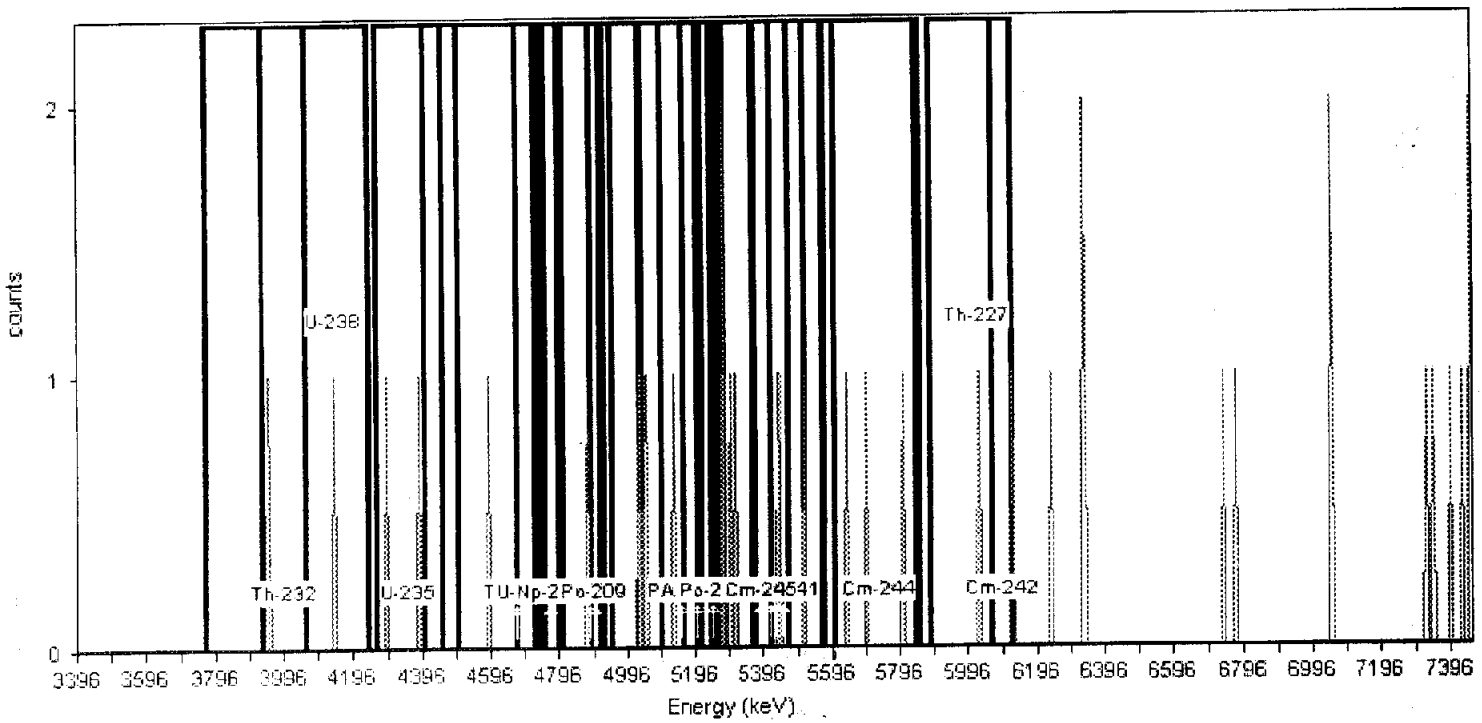
Acquisition

Detector: AV55 , SN:
Acquisition Start Date: 3/24/2007 9:47:45AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: FEB2007_AV55
Calibration Date: 2/23/2007 6:26:07AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.98% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library
Total Background Counts: 34.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	5.00	5.208E-003	2.552E-003
U-232	5.23	5.04	5.37	6.00	6.250E-003	2.756E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	6.00	6.250E-003	2.756E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	3.00	3.125E-003	2.083E-003
Cm-244	5.73	5.60	5.86	3.00	3.125E-003	2.083E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:28AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV56
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

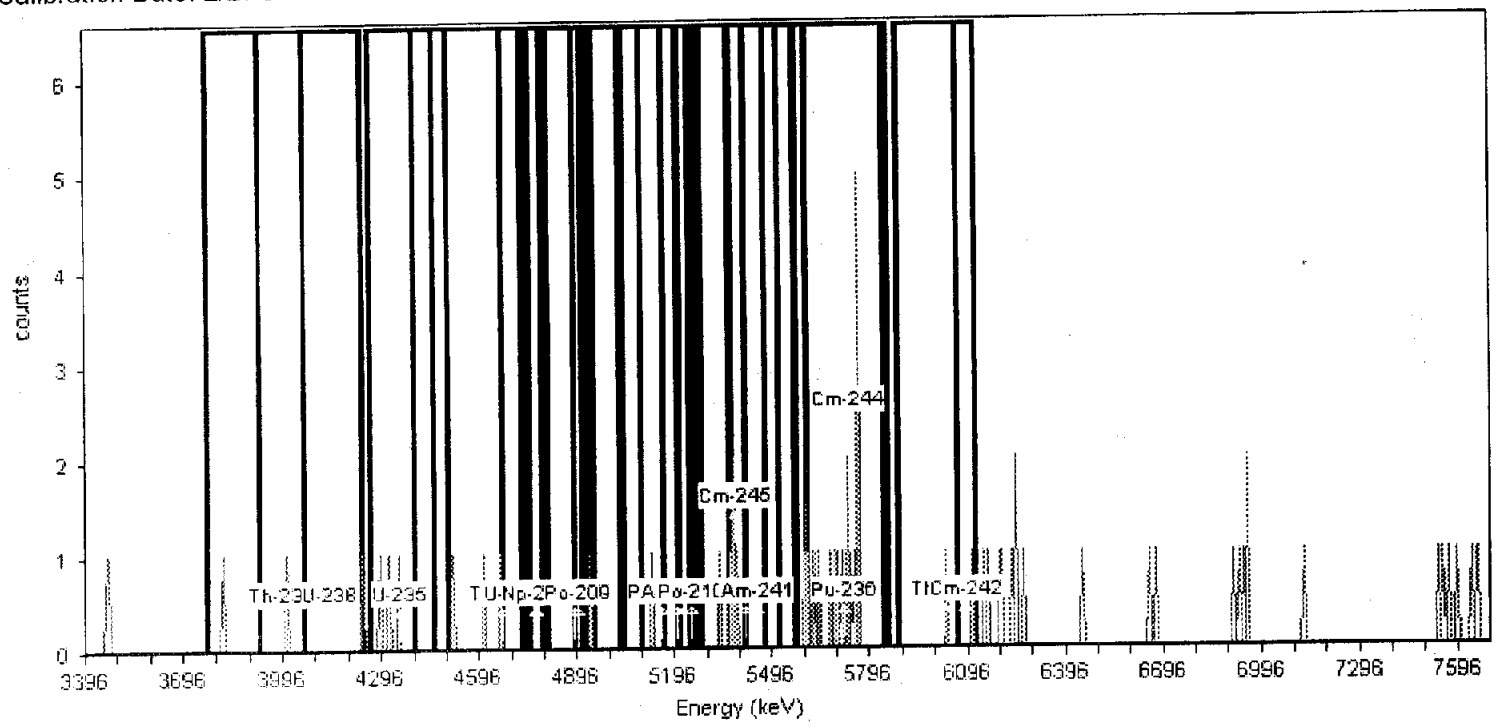
Acquisition

Detector: AV56 , SN:
Acquisition Start Date: 3/24/2007 9:47:47AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV56
Calibration Date: 2/27/2007 4:28:15PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.77% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 62.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	3.00	3.125E-003	2.083E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	6.00	6.250E-003	2.756E-003
Cm-245	5.39	5.36	5.41	5.00	5.208E-003	2.552E-003
Pu-236	5.72	5.57	5.84	17.00	1.771E-002	4.419E-003
Cm-244	5.73	5.60	5.86	16.00	1.667E-002	4.295E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:31AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV57
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

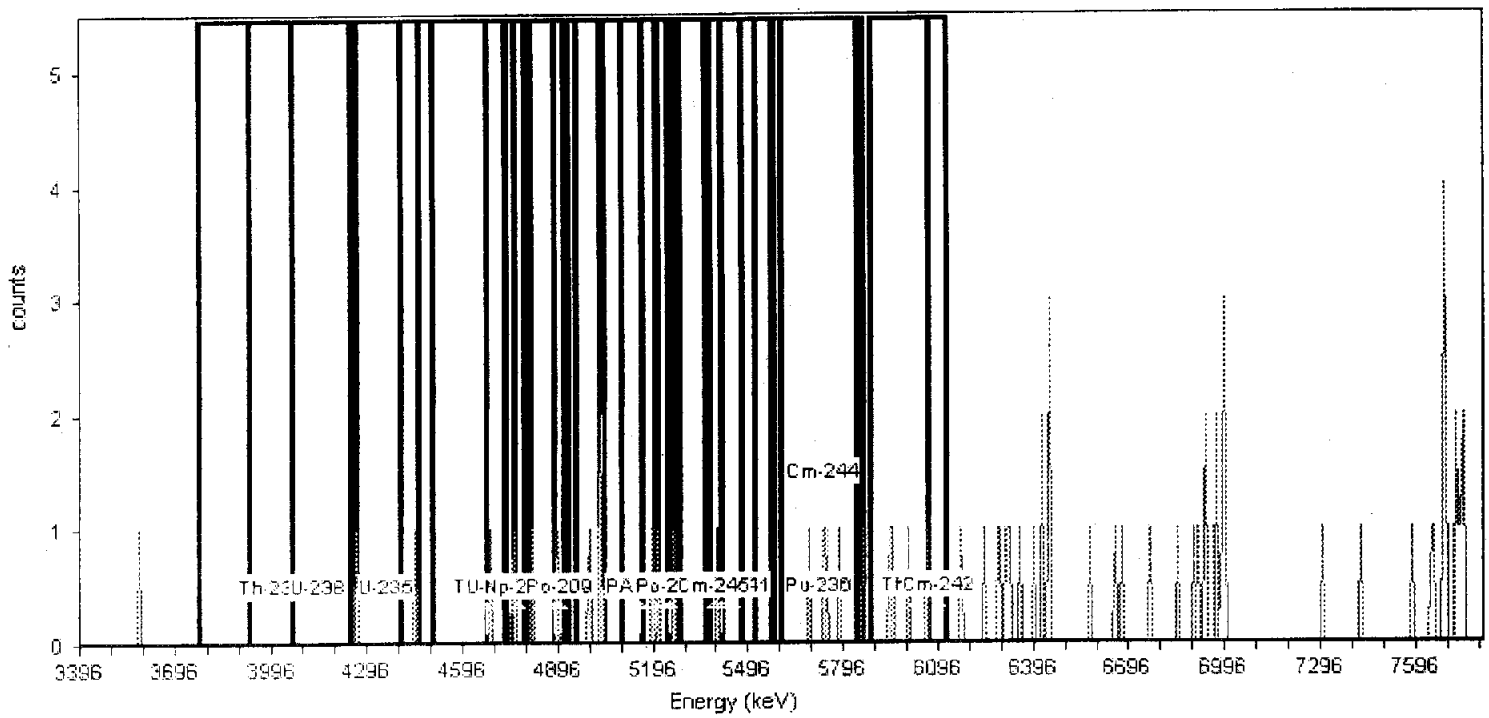
Acquisition

Detector: AV57 , SN:
Acquisition Start Date: 3/24/2007 9:47:49AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV57
Calibration Date: 2/23/2007 11:03:00AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.03% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background
Nuclide Library: Background ROI Library
Total Background Counts: 70.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	6.00	6.250E-003	2.756E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	6.00	6.250E-003	2.756E-003
Am-243	5.20	5.03	5.28	6.00	6.250E-003	2.756E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	5.00	5.208E-003	2.552E-003
Po-210	5.25	5.20	5.26	2.00	2.083E-003	1.804E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	5.00	5.208E-003	2.552E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:18AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV58
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

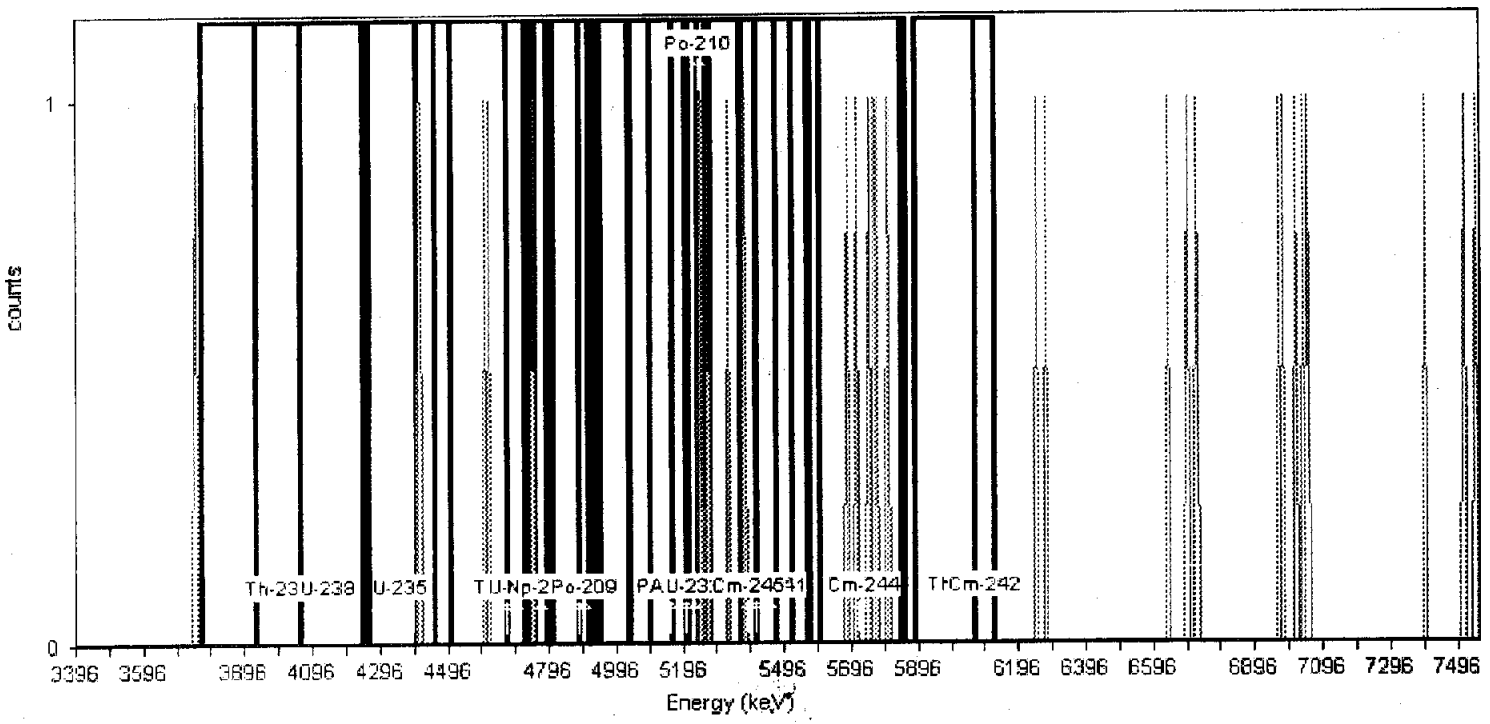
Acquisition

Detector: AV58 , SN:
Acquisition Start Date: 3/24/2007 9:47:51AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: FEB2007_AV58
Calibration Date: 2/28/2007 7:03:13AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.46% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library
Total Background Counts: 29.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	4.00	4.167E-003	2.329E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	4.00	4.167E-003	2.329E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	6.00	6.250E-003	2.756E-003
Cm-244	5.73	5.60	5.86	6.00	6.250E-003	2.756E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:32:53AM 3/25/2007

Sample

Sample Name: AV59 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

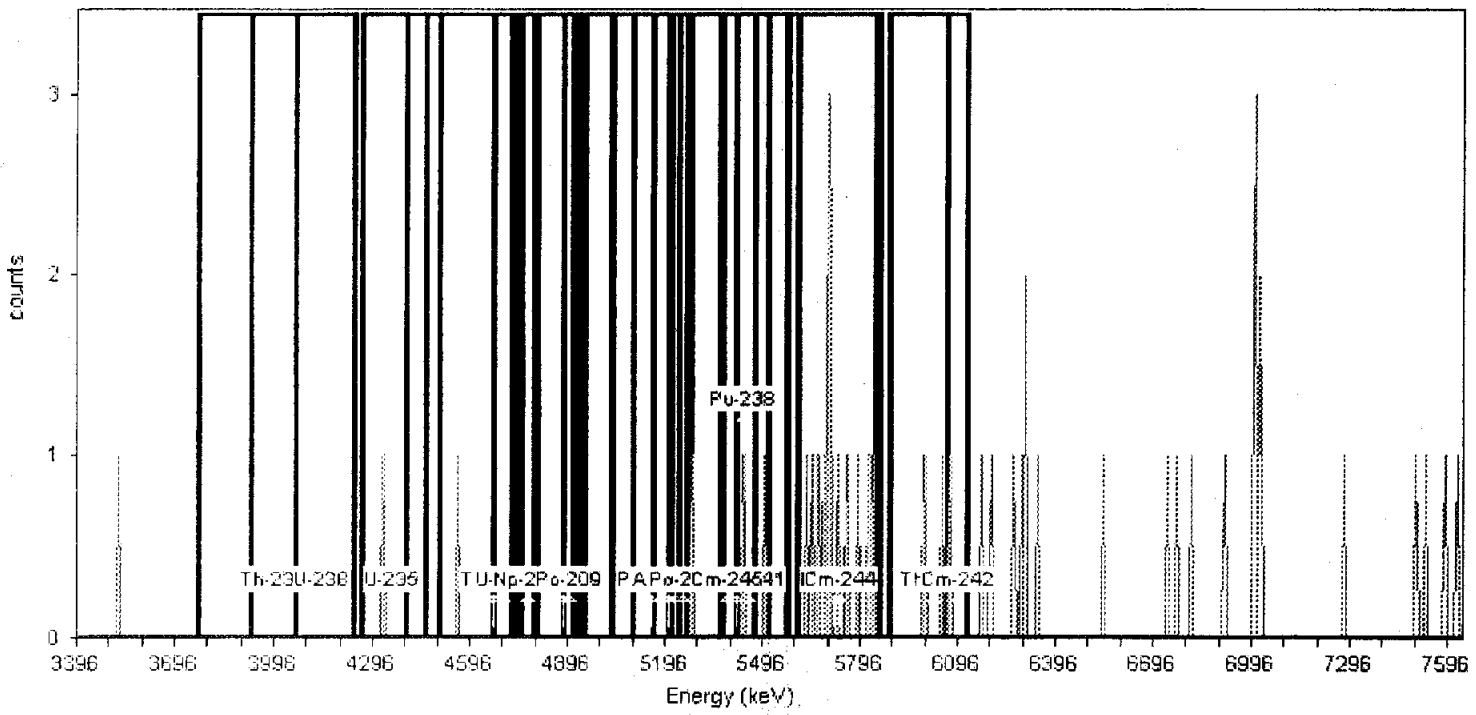
Acquisition

Detector: AV59 , SN:
Acquisition Start Date: 3/24/2007 9:47:52AM
Live Time: 960.00 min.
Real Time: 960.24 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 50.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	17.00	1.771E-002	4.419E-003
Cm-244	5.73	5.60	5.86	17.00	1.771E-002	4.419E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:35AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV60
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

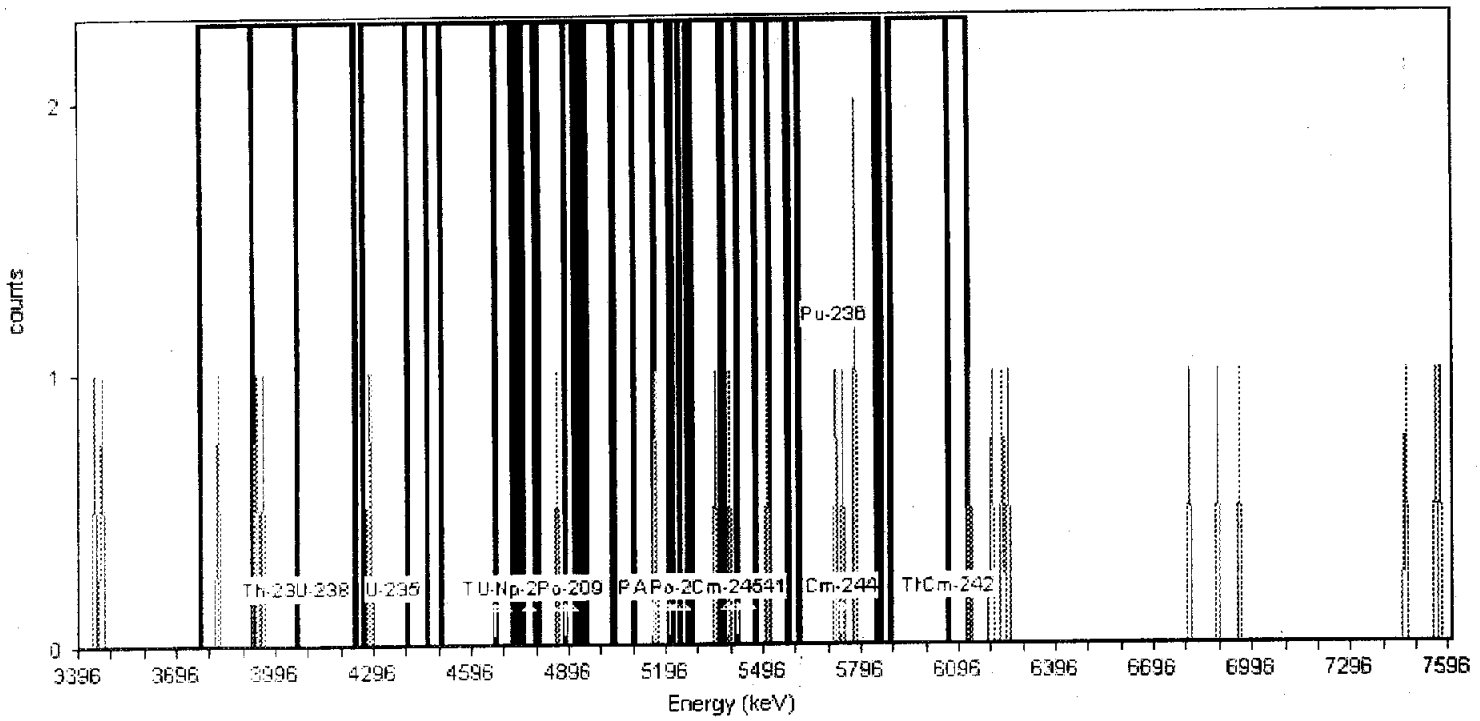
Acquisition

Detector: AV60 , SN:
Acquisition Start Date: 3/24/2007 9:47:53AM
Live Time: 960.00 min.
Real Time: 960.24 min.
Calibration Name: Feb2007_AV60
Calibration Date: 2/22/2007 6:30:34PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.51% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRoi
Nuclide Library: Background ROI Library
Total Background Counts: 25.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	3.00	3.125E-003	2.083E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	3.00	3.125E-003	2.083E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:30:48AM 3/25/2007

Sample

Sample Name: AV63 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

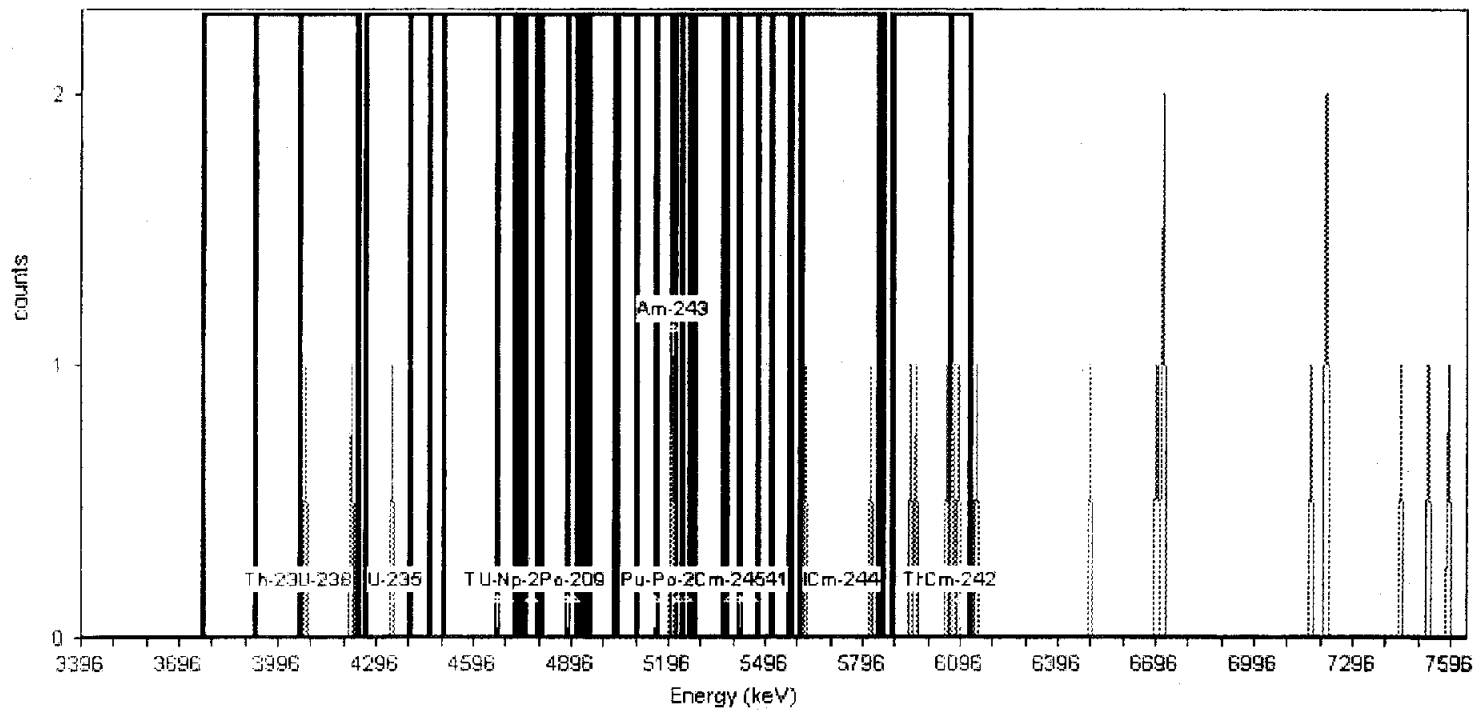
Acquisition

Detector: AV63 , SN:
Acquisition Start Date: 3/24/2007 9:47:55AM
Live Time: 960.00 min.
Real Time: 960.24 min.
Calibration Name: Feb2007_AV69
Calibration Date: 2/28/2007 2:41:51PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.90% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 26.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	2.00	2.083E-003	1.804E-003
Cm-244	5.73	5.60	5.86	2.00	2.083E-003	1.804E-003
Th-227	6.02	5.89	6.13	5.00	5.208E-003	2.552E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:30:54AM 3/25/2007

Sample

Sample Name: AV64 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

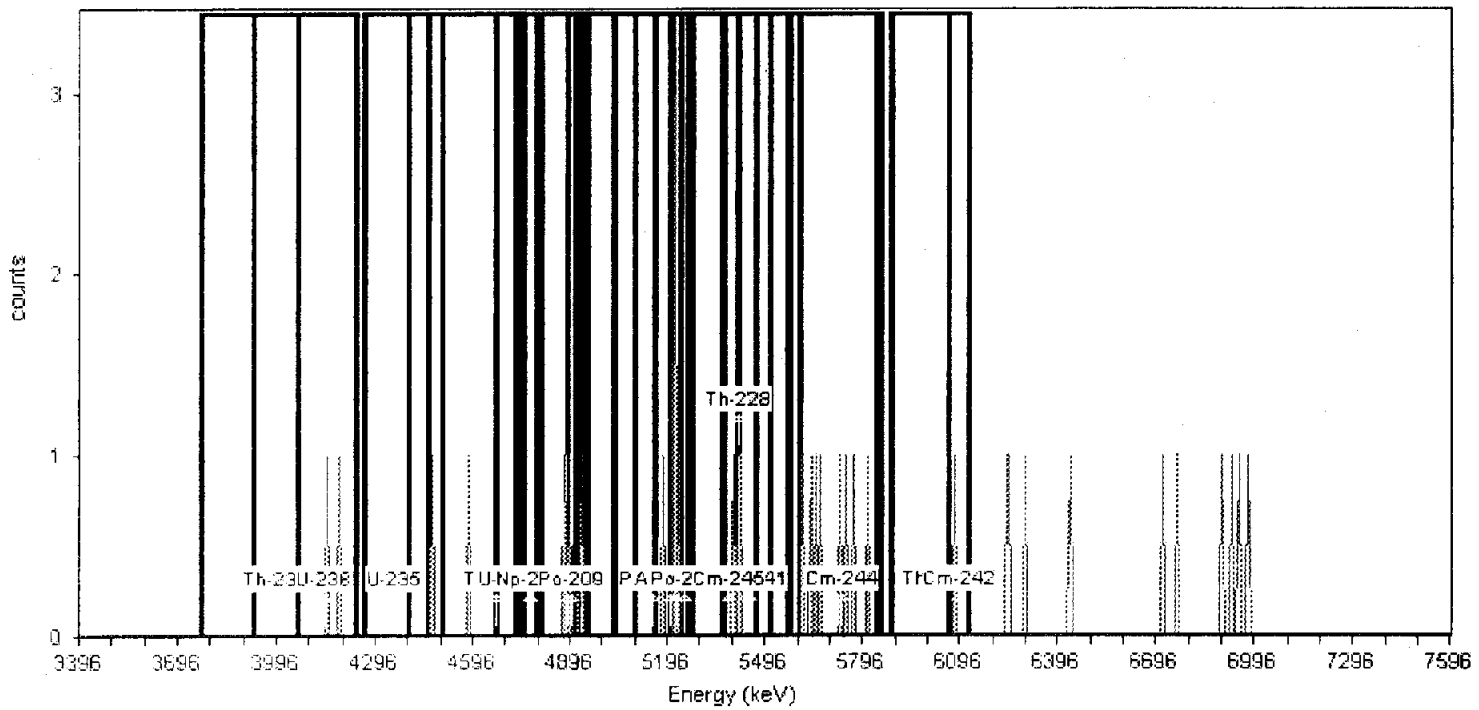
Acquisition

Detector: AV64 , SN:
Acquisition Start Date: 3/24/2007 9:47:57AM
Live Time: 960.00 min.
Real Time: 960.24 min.
Calibration Name: Feb2007_AV70
Calibration Date: 2/28/2007 2:41:57PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.16% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 34.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	3.00	3.125E-003	2.083E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	5.00	5.208E-003	2.552E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	8.00	8.333E-003	3.125E-003
Po-210	5.25	5.20	5.26	4.00	4.167E-003	2.329E-003
Pu-238	5.44	5.24	5.52	3.00	3.125E-003	2.083E-003
Am-241	5.45	5.27	5.57	3.00	3.125E-003	2.083E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	8.00	8.333E-003	3.125E-003
Cm-244	5.73	5.60	5.86	8.00	8.333E-003	3.125E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:01AM 3/25/2007

Sample

Sample Name: AV65 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

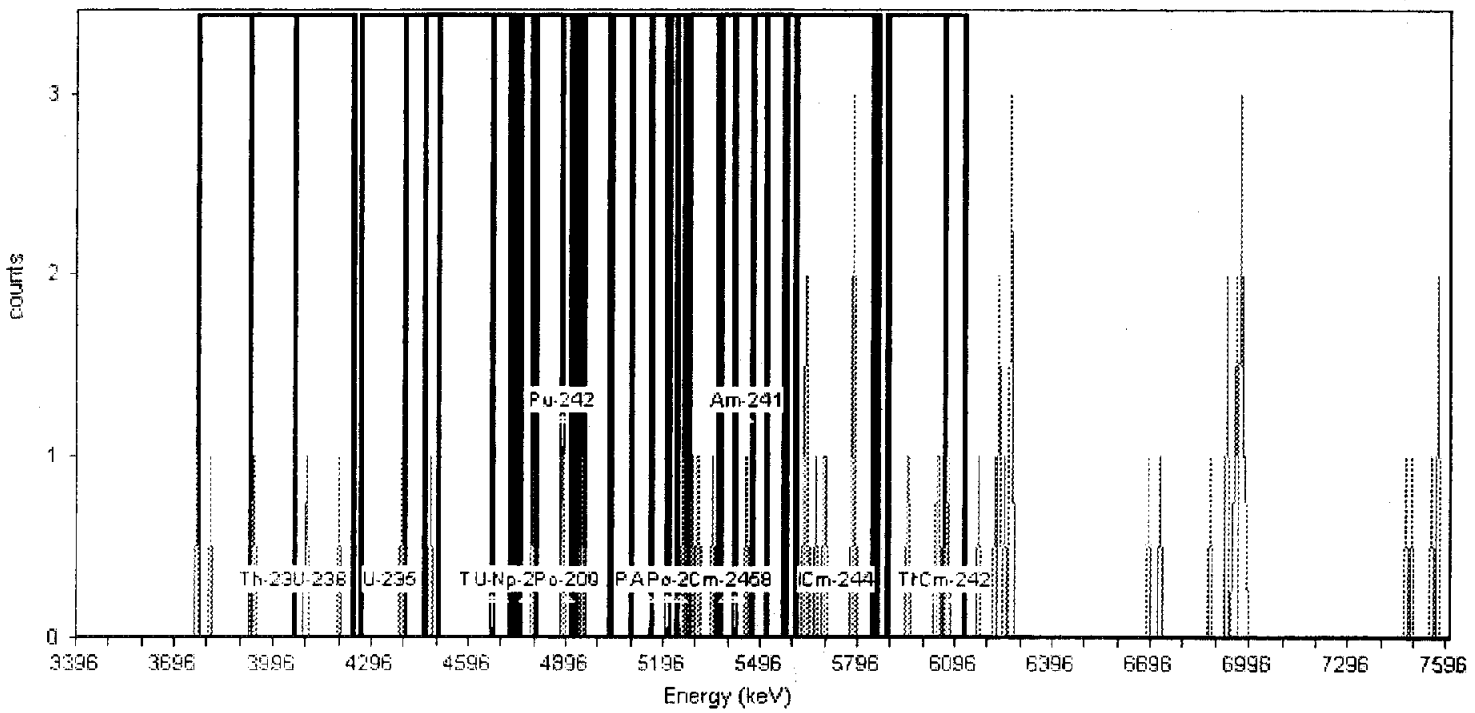
Acquisition

Detector: AV65 , SN:
Acquisition Start Date: 3/24/2007 9:47:59AM
Live Time: 960.00 min.
Real Time: 960.24 min.
Calibration Name: Feb2007_AV71
Calibration Date: 2/28/2007 11:56:51AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.28% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 57.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	3.00	3.125E-003	2.083E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	5.00	5.208E-003	2.552E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	11.00	1.146E-002	3.608E-003
Cm-244	5.73	5.60	5.86	11.00	1.146E-002	3.608E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:07AM 3/25/2007

Sample

Sample Name: AV66 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

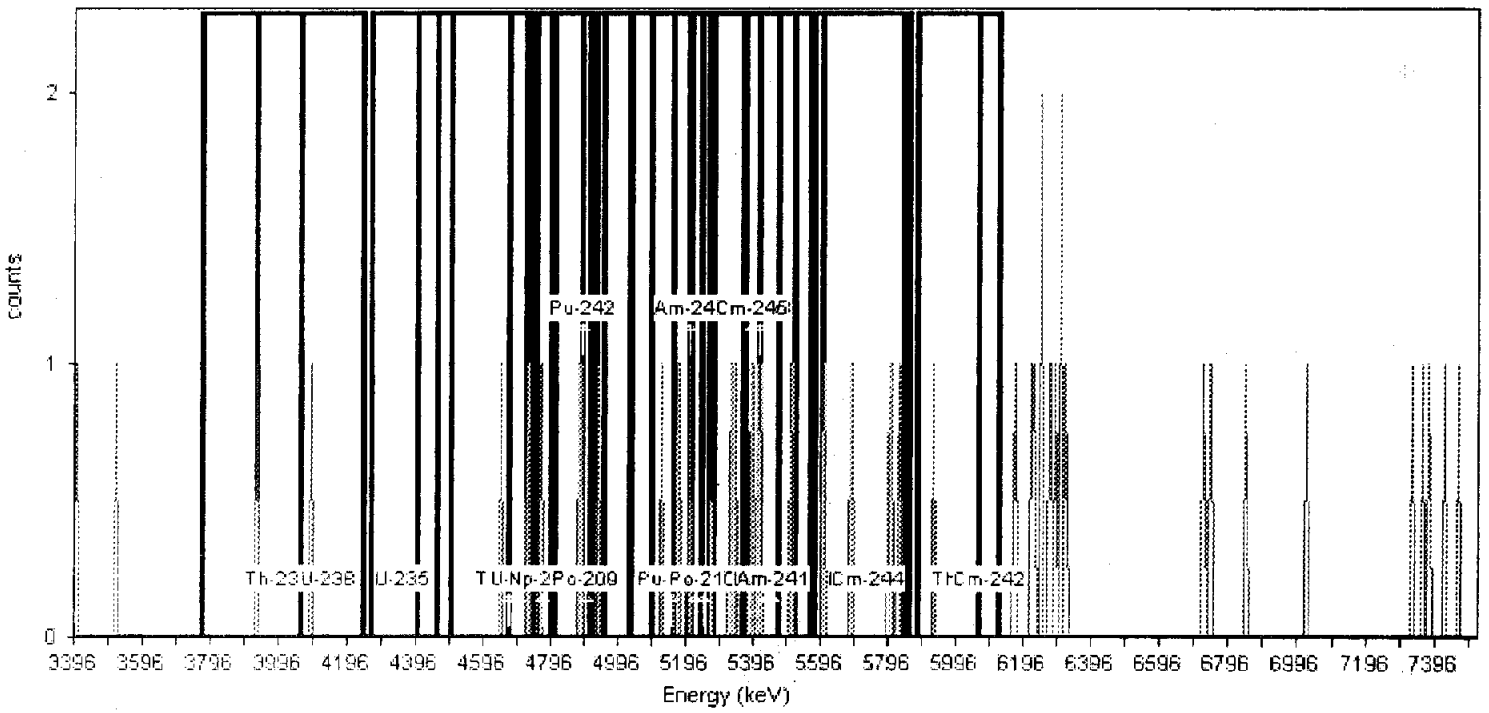
Acquisition

Detector: AV66 , SN:
Acquisition Start Date: 3/24/2007 9:48:00AM
Live Time: 960.00 min.
Real Time: 960.24 min.
Calibration Name: Feb2007_AV72
Calibration Date: 2/28/2007 11:57:00AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 26.71% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 51.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	4.00	4.167E-003	2.329E-003
Th-229	4.84	4.72	5.10	5.00	5.208E-003	2.552E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	1.00	1.042E-003	1.473E-003
Pu-239	5.15	4.95	5.21	4.00	4.167E-003	2.329E-003
Am-243	5.20	5.03	5.28	5.00	5.208E-003	2.552E-003
U-232	5.23	5.04	5.37	8.00	8.333E-003	3.125E-003
Th-228	5.41	5.16	5.47	11.00	1.146E-002	3.608E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	9.00	9.375E-003	3.294E-003
Am-241	5.45	5.27	5.57	9.00	9.375E-003	3.294E-003
Cm-245	5.39	5.36	5.41	4.00	4.167E-003	2.329E-003
Pu-236	5.72	5.57	5.84	6.00	6.250E-003	2.756E-003
Cm-244	5.73	5.60	5.86	6.00	6.250E-003	2.756E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:38AM 3/25/2007

Analyst: 60040

Sample

Spectrum #1 Analysis #1

Sample Name: AV67
Comment:

Batch

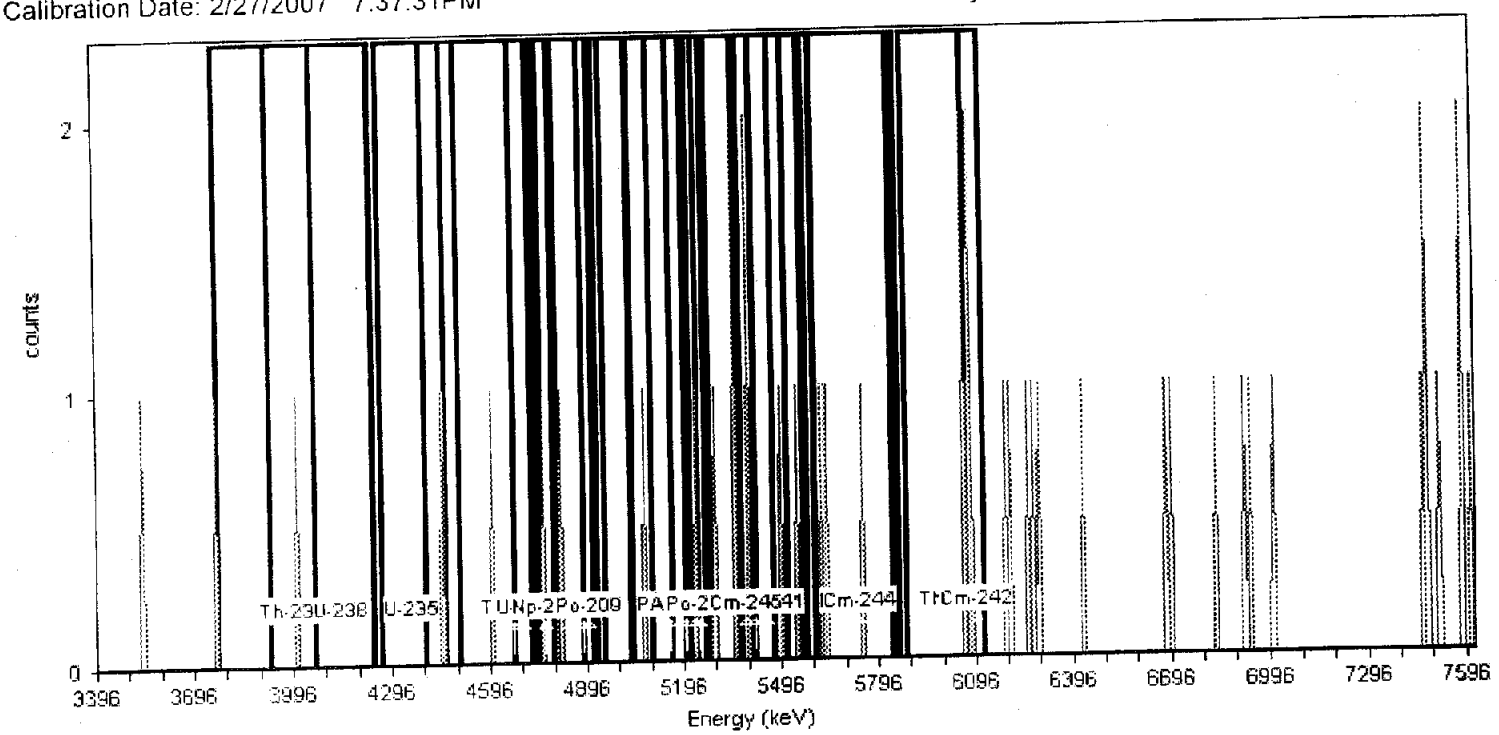
Batch Name: Mar2007
Description:

Acquisition

Detector: AV67 , SN:
Acquisition Start Date: 3/24/2007 9:48:02AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV67
Calibration Date: 2/27/2007 7:37:31PM

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.71% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background
Nuclide Library: Background ROI Library
Total Background Counts: 44.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	5.00	5.208E-003	2.552E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	7.00	7.292E-003	2.946E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	4.00	4.167E-003	2.329E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	4.00	4.167E-003	2.329E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

ST SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:41AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV68

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

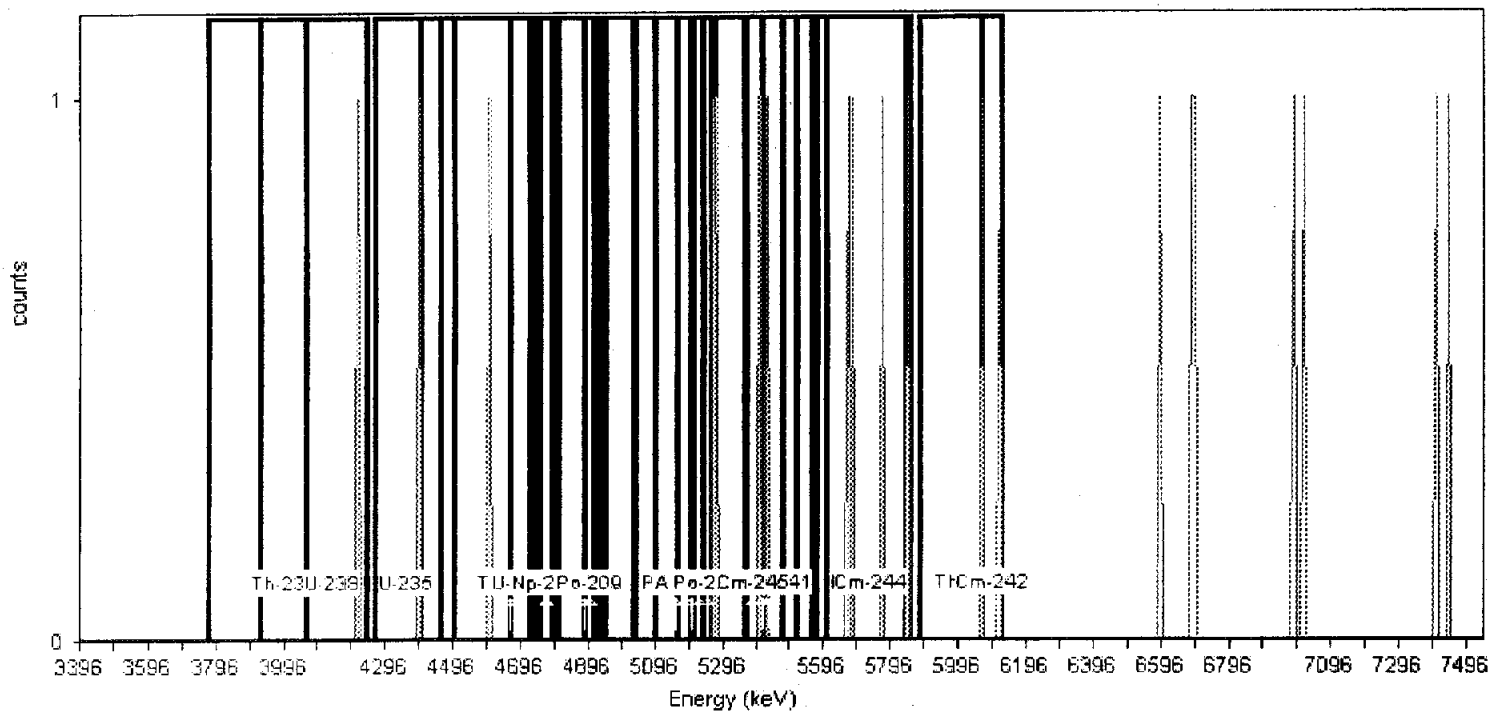
Acquisition

Detector: AV68 , SN:
Acquisition Start Date: 3/24/2007 9:48:03AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: FEB2007_AV68
Calibration Date: 2/28/2007 7:02:56AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.85% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 20.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	4.00	4.167E-003	2.329E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	3.00	3.125E-003	2.083E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	2.00	2.083E-003	1.804E-003

ST

SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:44AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV69 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

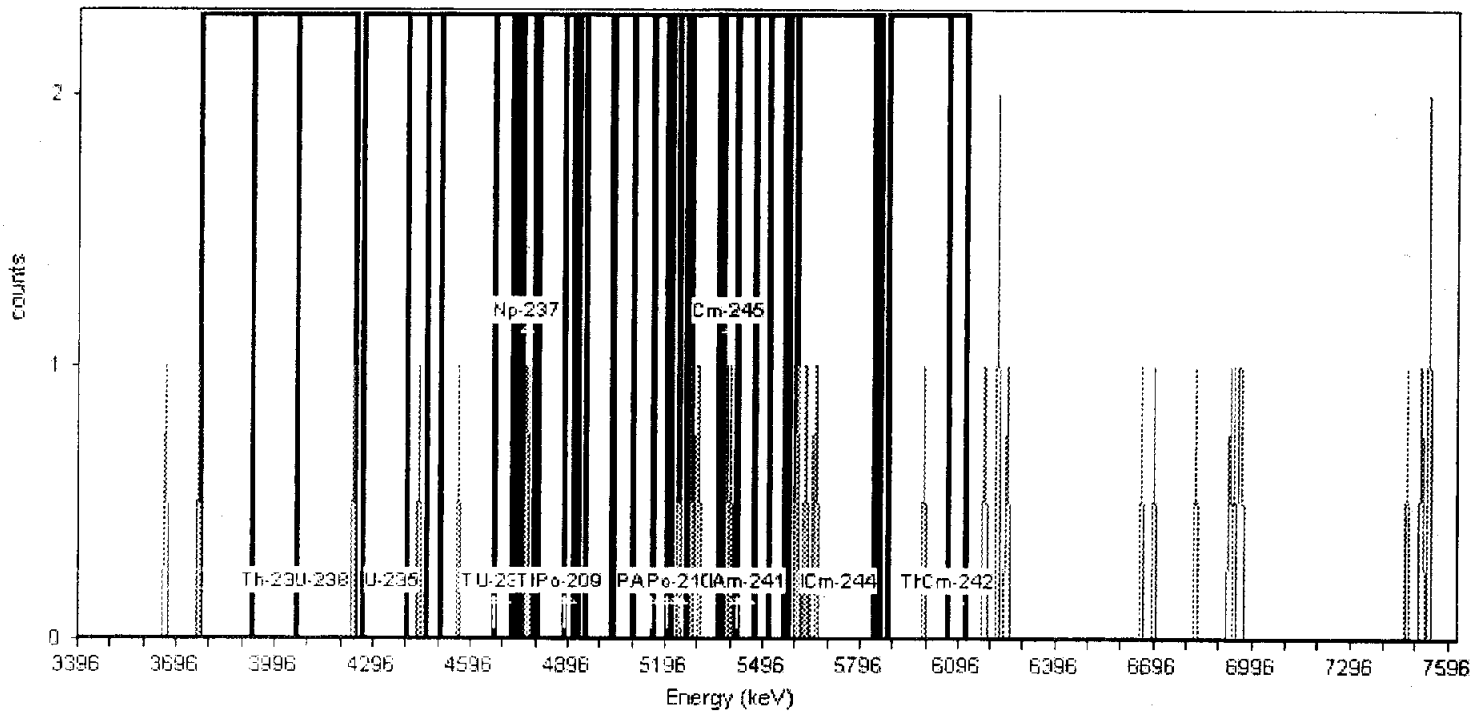
Acquisition

Detector: AV69 , SN:
Acquisition Start Date: 3/24/2007 9:48:05AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV69
Calibration Date: 2/28/2007 2:41:51PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.90% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 34.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	4.00	4.167E-003	2.329E-003
Th-228	5.41	5.16	5.47	6.00	6.250E-003	2.756E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	6.00	6.250E-003	2.756E-003
Am-241	5.45	5.27	5.57	5.00	5.208E-003	2.552E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	5.00	5.208E-003	2.552E-003
Cm-244	5.73	5.60	5.86	5.00	5.208E-003	2.552E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:30:51AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV70
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

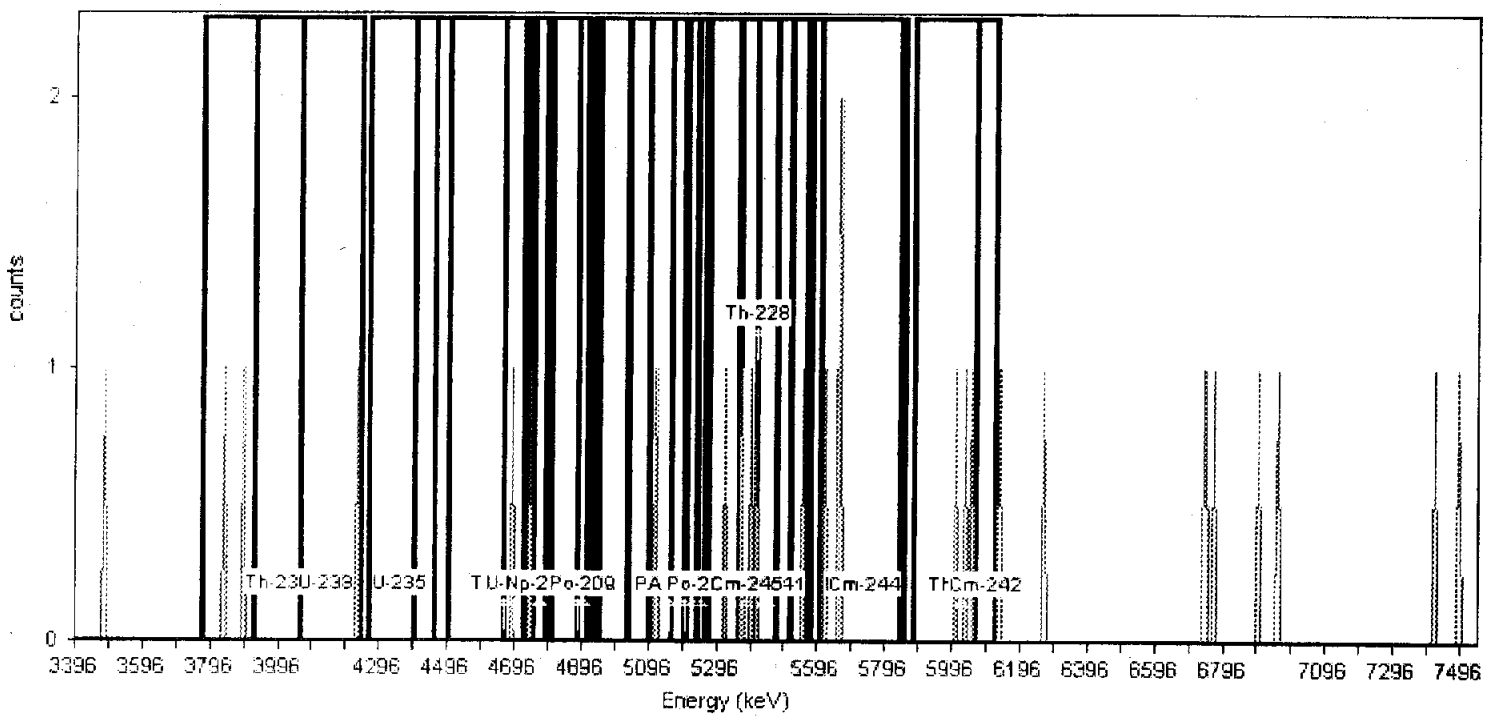
Acquisition

Detector: AV70 , SN:
Acquisition Start Date: 3/24/2007 9:48:07AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV70
Calibration Date: 2/28/2007 2:41:57PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.16% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 27.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	4.00	4.167E-003	2.329E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	4.00	4.167E-003	2.329E-003
Am-241	5.45	5.27	5.57	5.00	5.208E-003	2.552E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	3.00	3.125E-003	2.083E-003
Cm-244	5.73	5.60	5.86	3.00	3.125E-003	2.083E-003
Th-227	6.02	5.89	6.13	3.00	3.125E-003	2.083E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:30:57AM 3/25/2007

Sample

Sample Name: AV71 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

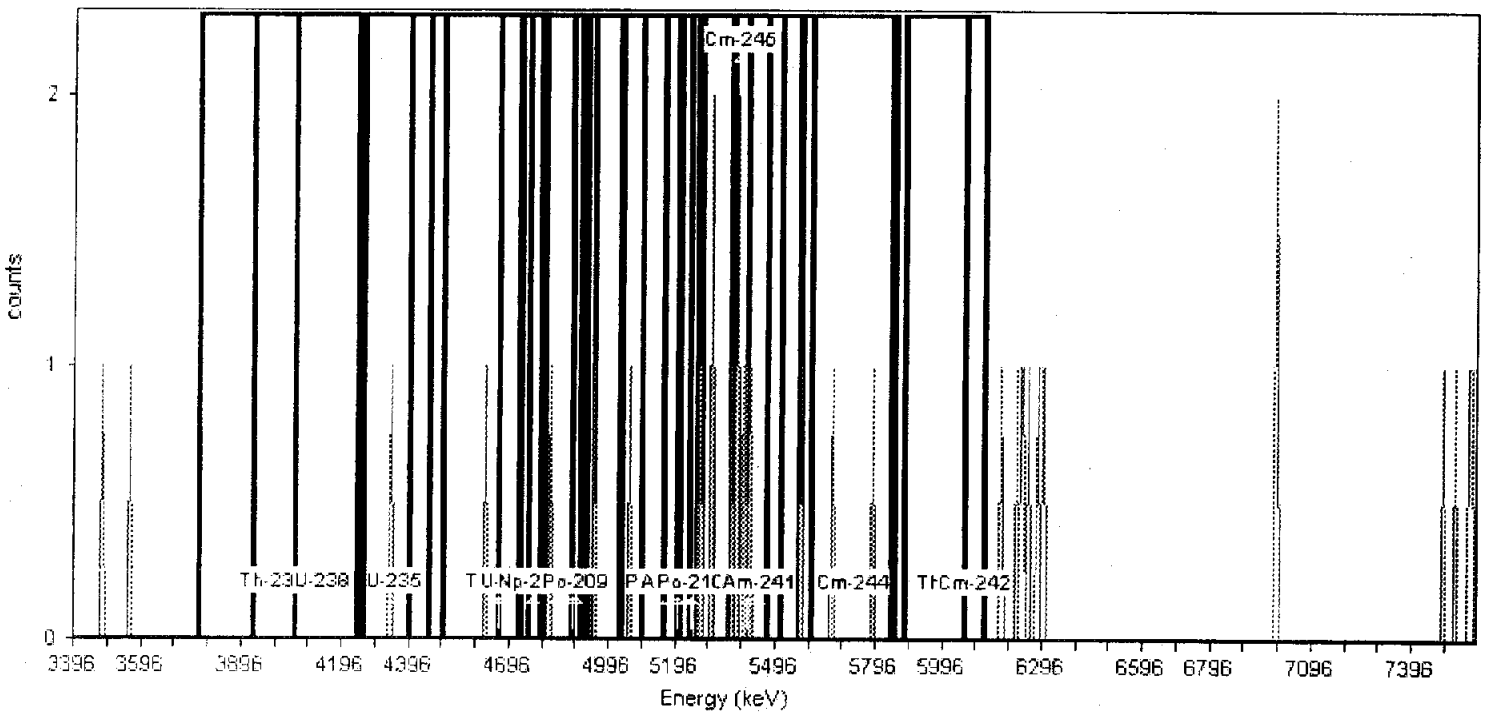
Acquisition

Detector: AV71 , SN:
Acquisition Start Date: 3/24/2007 9:46:59AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV70
Calibration Date: 2/28/2007 2:41:57PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.16% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 34.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	6.00	6.250E-003	2.756E-003
Th-228	5.41	5.16	5.47	10.00	1.042E-002	3.455E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	10.00	1.042E-002	3.455E-003
Am-241	5.45	5.27	5.57	10.00	1.042E-002	3.455E-003
Cm-245	5.39	5.36	5.41	5.00	5.208E-003	2.552E-003
Pu-236	5.72	5.57	5.84	3.00	3.125E-003	2.083E-003
Cm-244	5.73	5.60	5.86	2.00	2.083E-003	1.804E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:31:04AM 3/25/2007

Sample

Sample Name: AV72 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

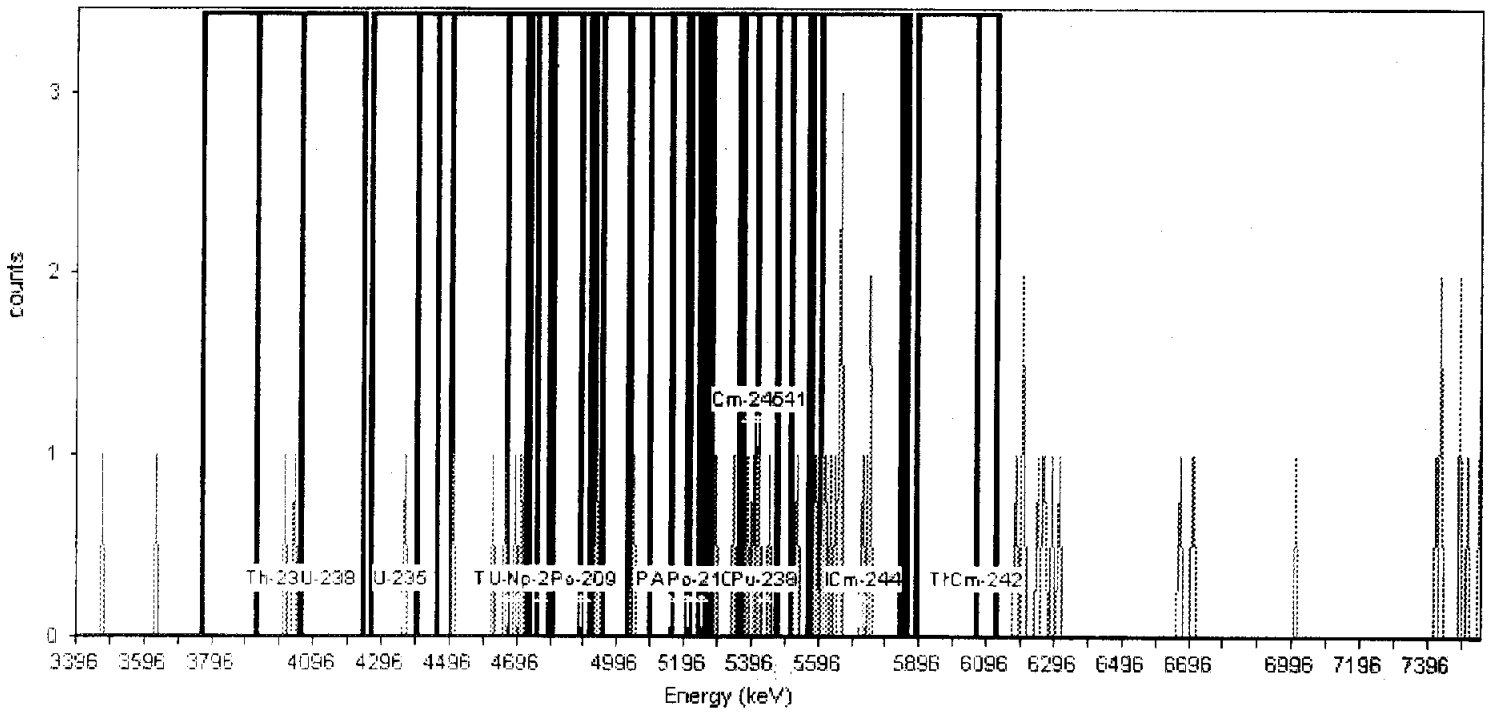
Acquisition

Detector: AV72 , SN:
Acquisition Start Date: 3/24/2007 9:47:01AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV72
Calibration Date: 2/28/2007 11:57:00AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.71% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 50.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	5.00	5.208E-003	2.552E-003
U-234	4.70	4.50	4.80	5.00	5.208E-003	2.552E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	7.00	7.292E-003	2.946E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	7.00	7.292E-003	2.946E-003
Am-241	5.45	5.27	5.57	8.00	8.333E-003	3.125E-003
Cm-245	5.39	5.36	5.41	3.00	3.125E-003	2.083E-003
Pu-236	5.72	5.57	5.84	11.00	1.146E-002	3.608E-003
Cm-244	5.73	5.60	5.86	10.00	1.042E-002	3.455E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:31:10AM 3/25/2007

Analyst: 60040

Sample

Sample Name: AV73

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

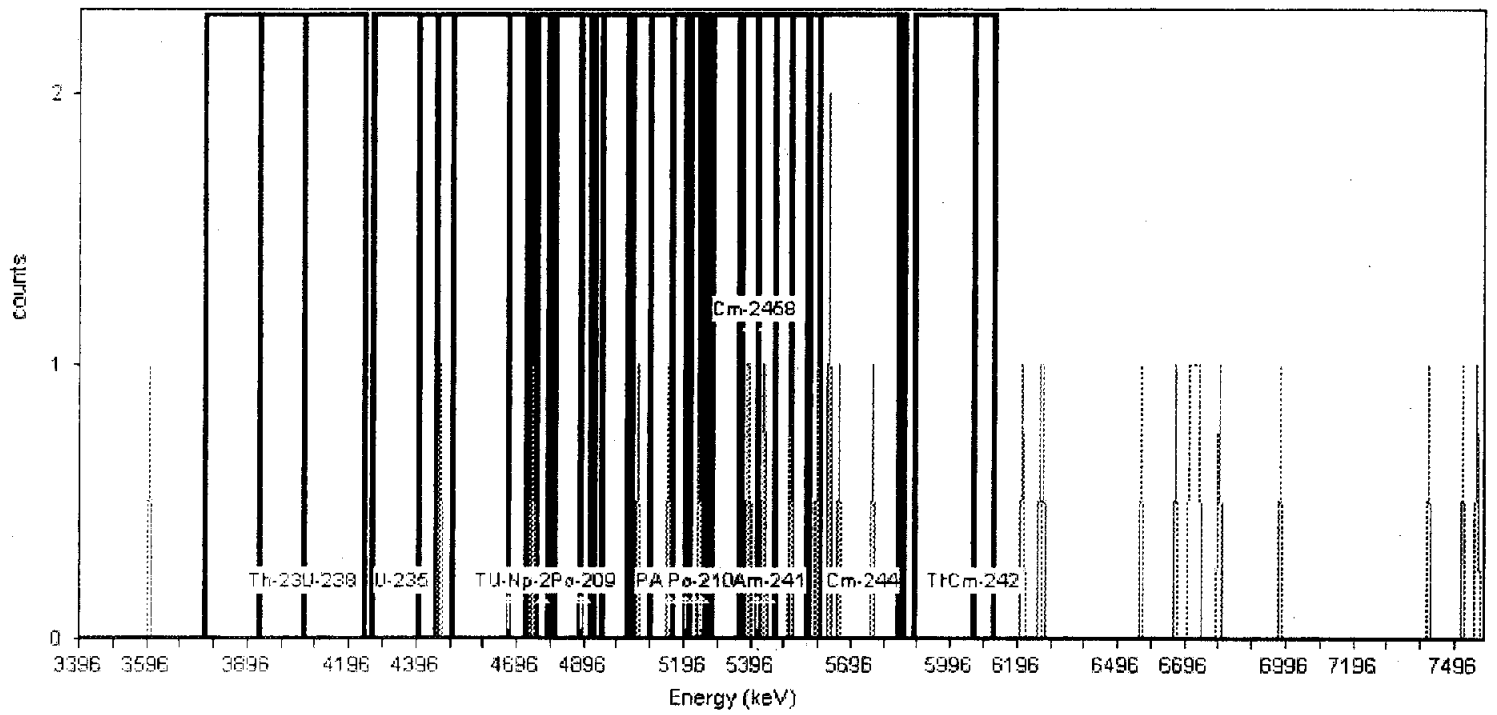
Acquisition

Detector: AV73 , SN:
Acquisition Start Date: 3/24/2007 9:47:03AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV73
Calibration Date: 2/28/2007 5:04:12PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI

Nuclide Library: Background ROI Library

Total Background Counts: 30.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	3.00	3.125E-003	2.083E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	4.00	4.167E-003	2.329E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	5.00	5.208E-003	2.552E-003
Am-241	5.45	5.27	5.57	4.00	4.167E-003	2.329E-003
Cm-245	5.39	5.36	5.41	2.00	2.083E-003	1.804E-003
Pu-236	5.72	5.57	5.84	5.00	5.208E-003	2.552E-003
Cm-244	5.73	5.60	5.86	4.00	4.167E-003	2.329E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:09:47PM 3/23/2007

Analyst: 60040

Sample

Sample Name: AV75
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

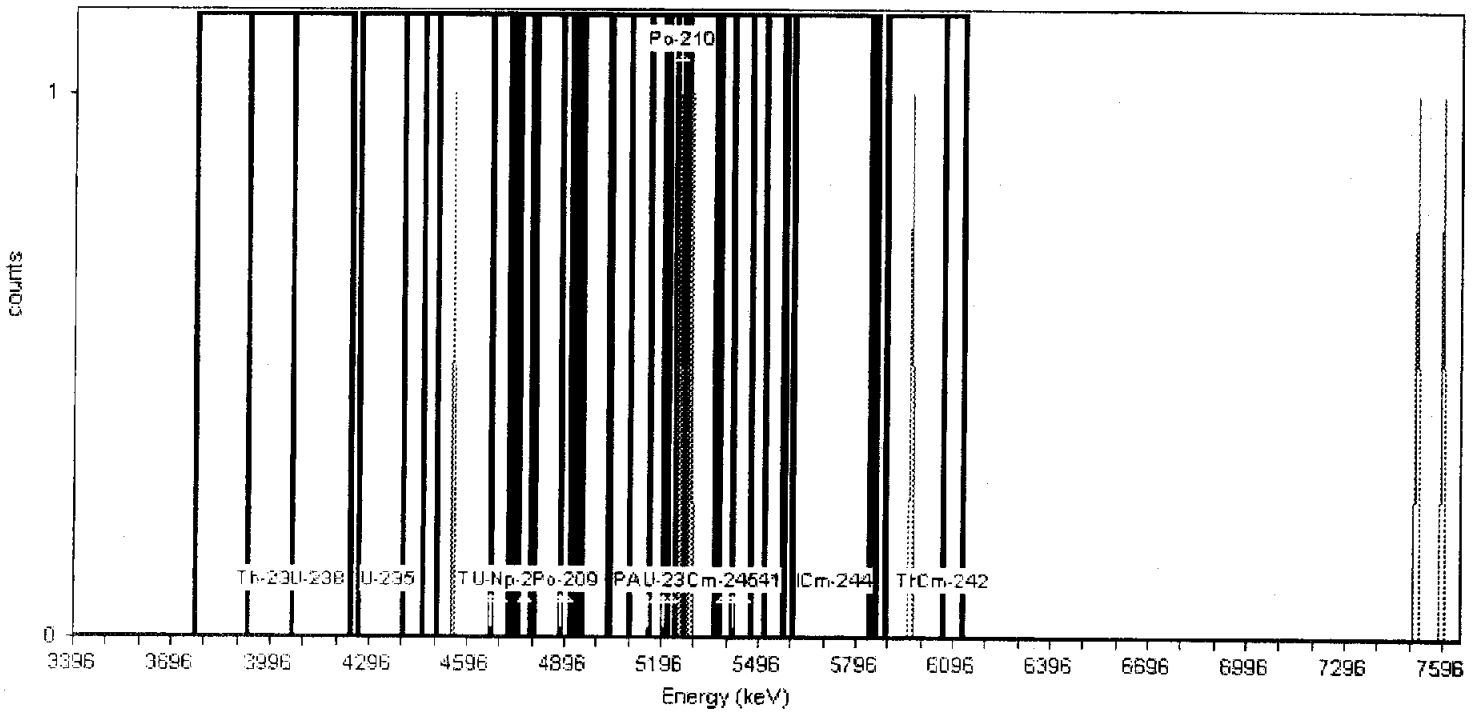
Acquisition

Detector: AV75 , SN: 46-033P6
Acquisition Start Date: 3/22/2007 2:43:25PM
Live Time: 960.00 min.
Real Time: 1,585.65 min.
Calibration Name: Feb2007_AV75
Calibration Date: 2/26/2007 2:24:32PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.50% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 6.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:09:52PM 3/23/2007

Analyst: 60040

Sample

Sample Name: AV76
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

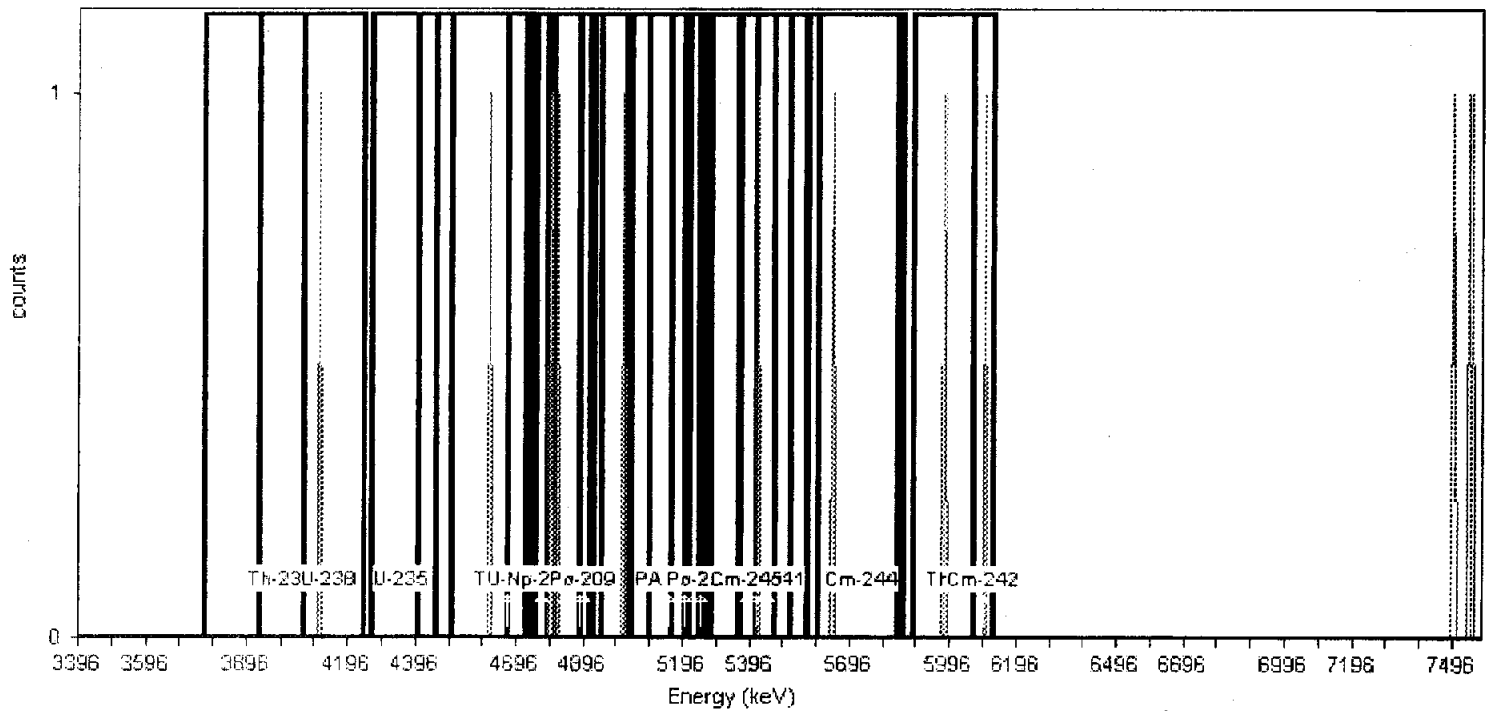
Acquisition

Detector: AV76 , SN: 46-033Q4
Acquisition Start Date: 3/22/2007 2:43:26PM
Live Time: 960.00 min.
Real Time: 1,585.65 min.
Calibration Name: Feb2007_AV76
Calibration Date: 2/26/2007 2:24:39PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.48% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background
Nuclide Library: Background ROI Library
Total Background Counts: 12.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	3.00	3.125E-003	2.083E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

STL

SEVERN TRENT **STL**

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040

5:09:55PM 3/23/2007

Sample

Sample Name: AV77

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

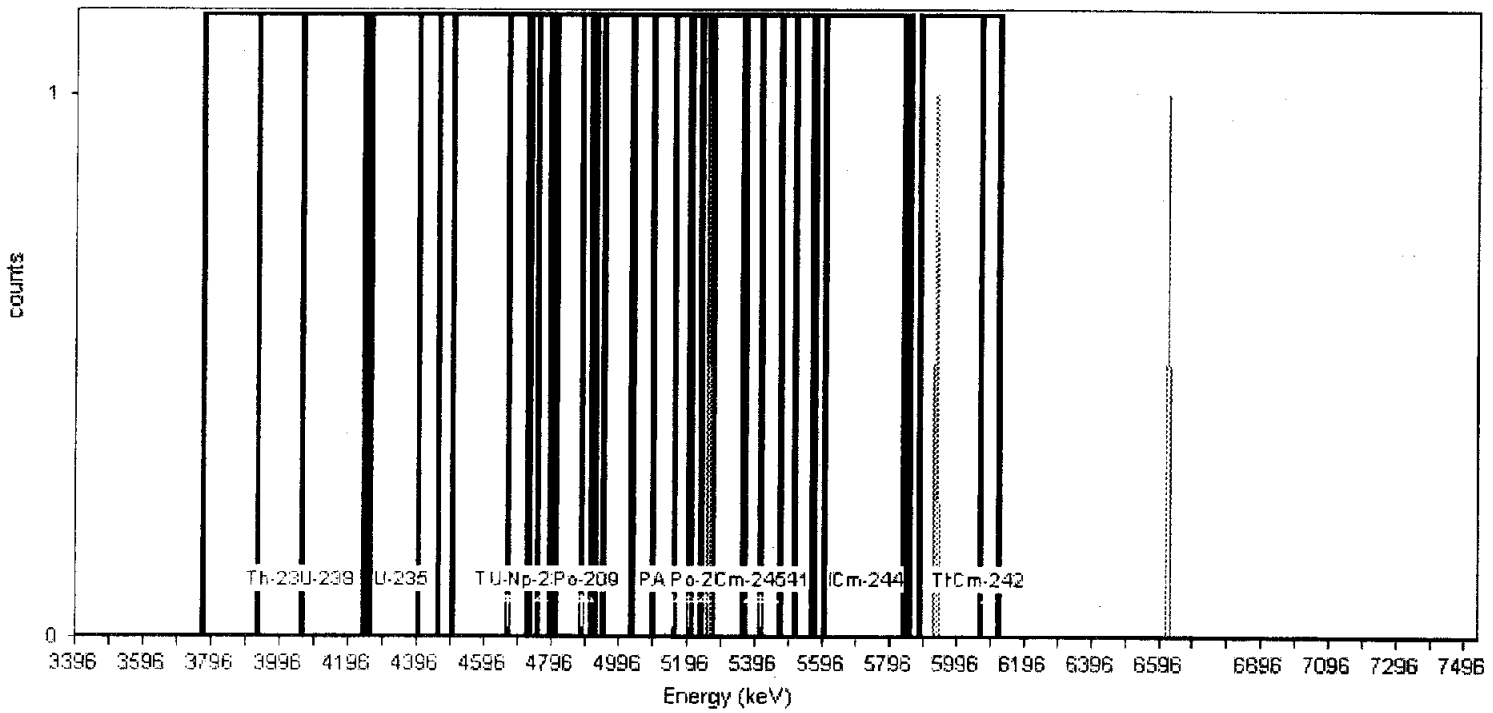
Acquisition

Detector: AV77 , SN: 46-033Q7
Acquisition Start Date: 3/22/2007 2:43:29PM
Live Time: 960.00 min.
Real Time: 1,585.65 min.
Calibration Name: Feb2007_AV77
Calibration Date: 2/26/2007 2:24:47PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.67% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI

Nuclide Library: Background ROI Library

Total Background Counts: 3.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
8:00:47AM 3/29/2007

Analyst: 60040

Sample

Sample Name: AV78
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: March2007c
Description:

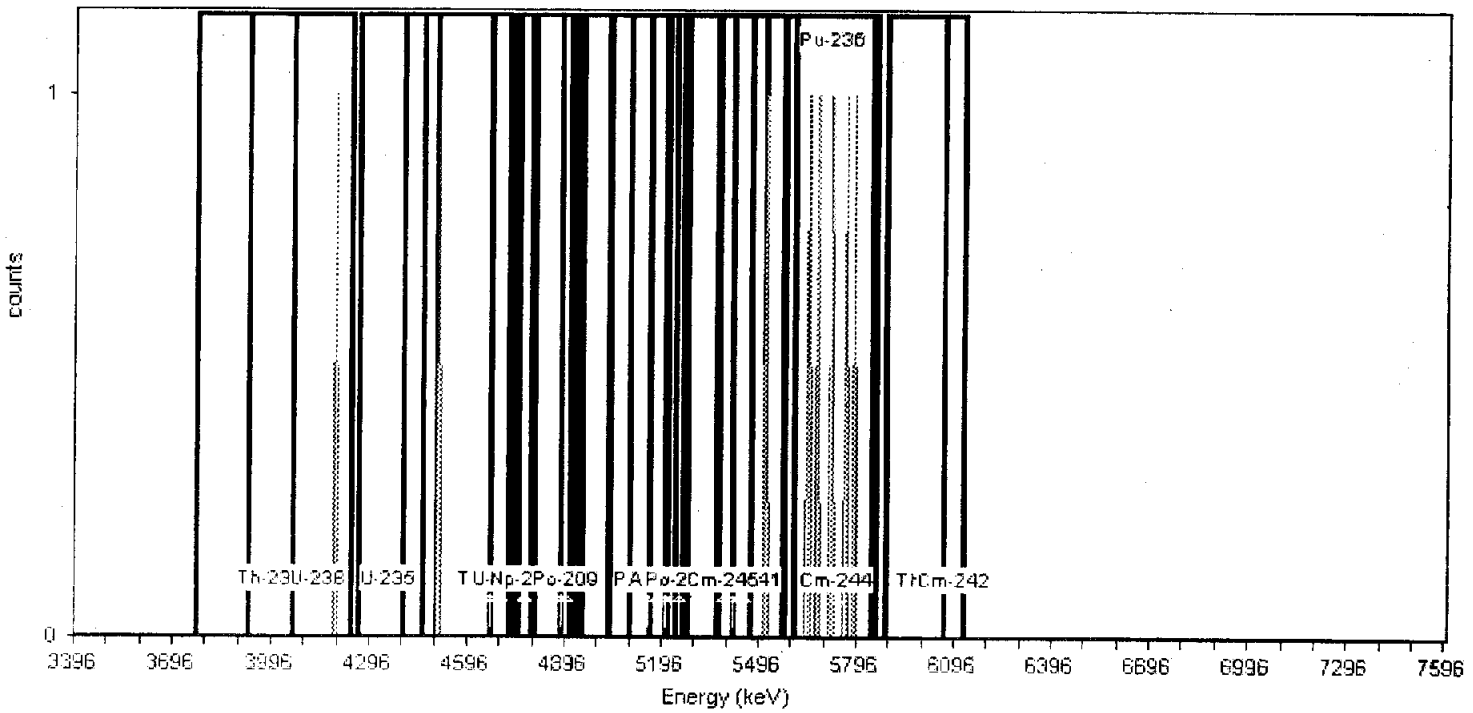
Acquisition

Detector: AV78 , SN: 46-033FF4
Acquisition Start Date: 3/28/2007 11:22:11AM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Mar2007_AV78a
Calibration Date: 3/27/2007 5:30:11PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.83% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background
Nuclide Library: Background ROI Library
Total Background Counts: 8.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	5.00	5.208E-003	2.552E-003
Cm-244	5.73	5.60	5.86	5.00	5.208E-003	2.552E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:12:58AM 3/28/2007

Analyst: 60040

Sample

Sample Name: AV79
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: March2007a
Description:

Acquisition

Detector: AV79 , SN: 46-033Q5
Acquisition Start Date: 3/27/2007 12:54:48PM
Live Time: 960.00 min.
Real Time: 960.12 min.
Calibration Name: Feb2007_AV79
Calibration Date: 2/26/2007 4:48:57PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.18% +/- 0.27% TPU(2 sigma)

General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 10.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:13:02AM 3/28/2007

Analyst: 60040

Sample

Sample Name: AV80
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: March2007a
Description:

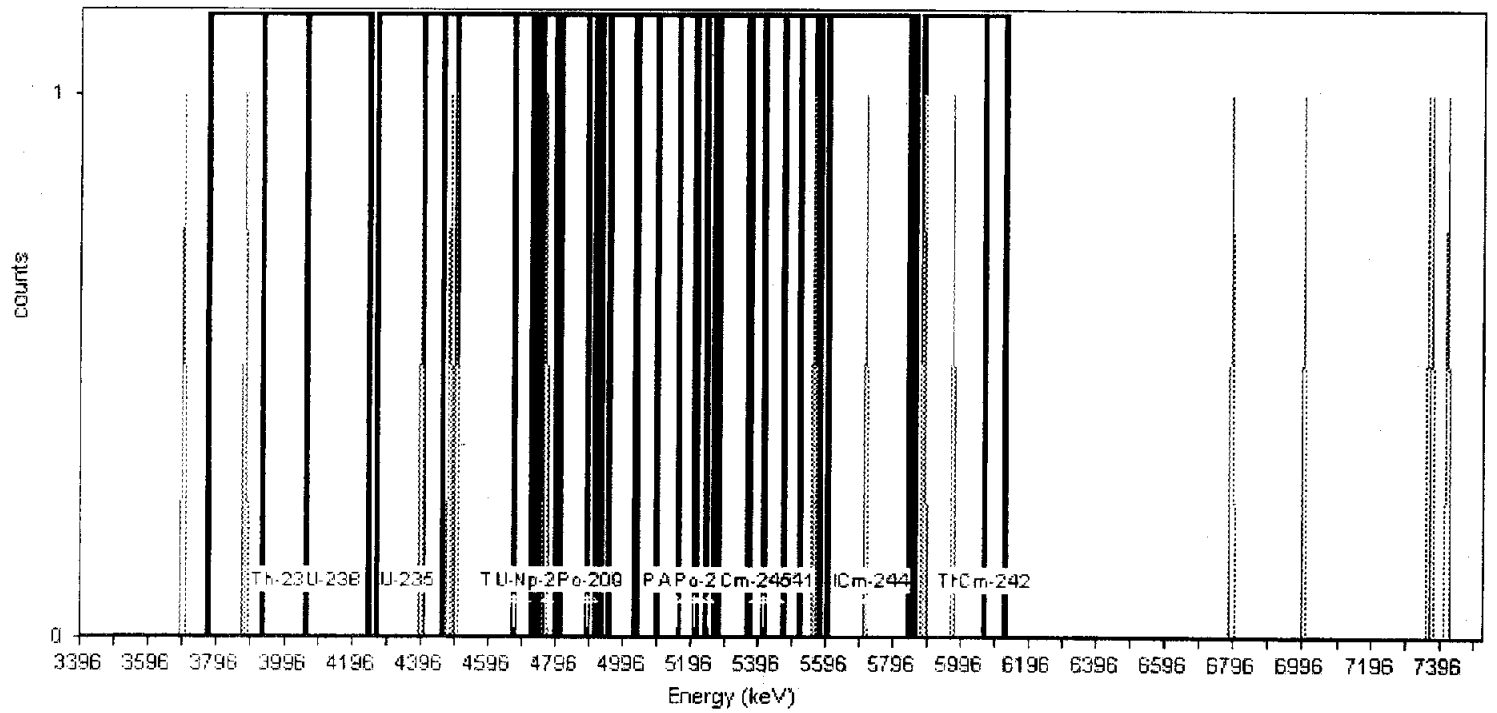
Acquisition

Detector: AV80 , SN: 46-03305
Acquisition Start Date: 3/27/2007 12:54:50PM
Live Time: 960.00 min.
Real Time: 960.12 min.
Calibration Name: Feb2007_AV80
Calibration Date: 2/26/2007 4:49:04PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.95% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 15.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	2.00	2.083E-003	1.804E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	1.00	1.042E-003	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040

7:13:05AM 3/28/2007

Sample

Sample Name: AV81

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: March2007a

Description:

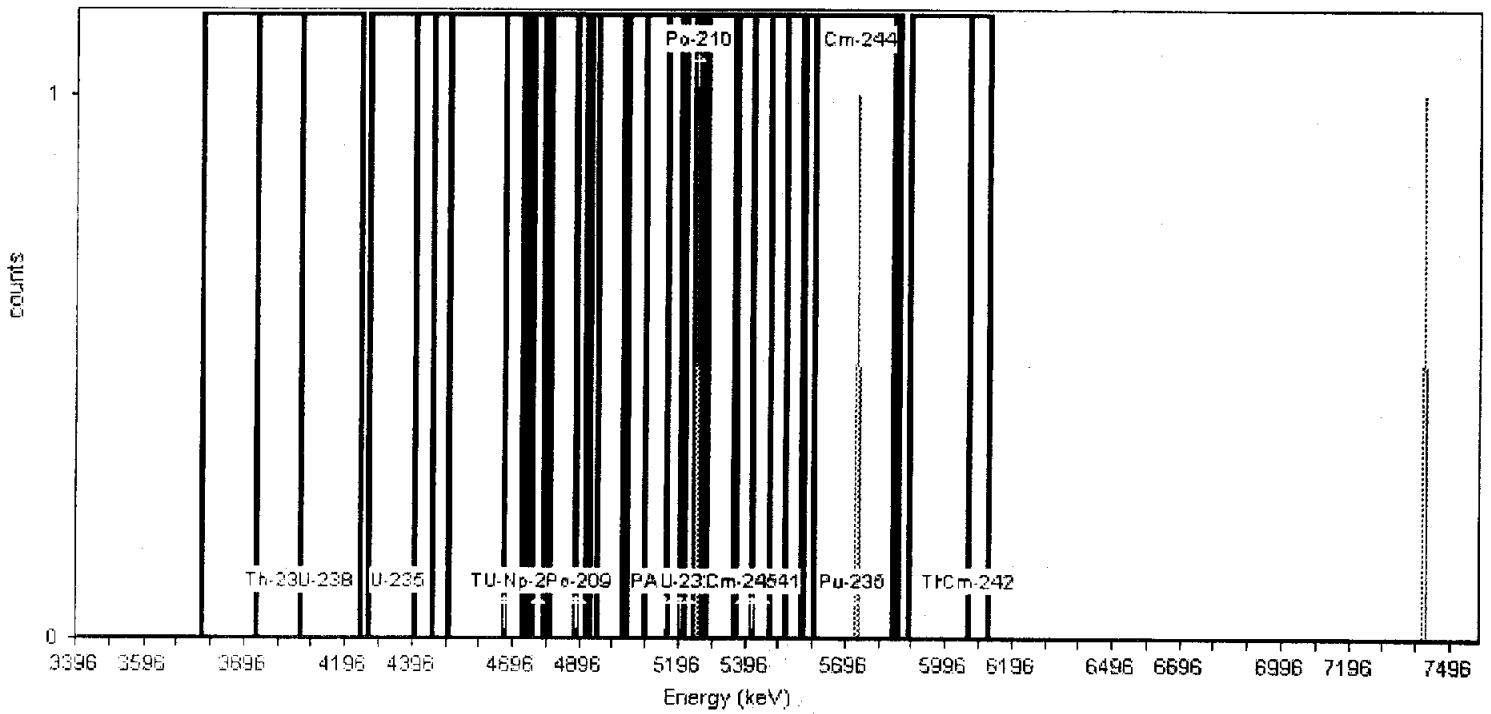
Acquisition

Detector: AV81 , SN: 46-03307
Acquisition Start Date: 3/27/2007 12:54:52PM
Live Time: 960.00 min.
Real Time: 960.12 min.
Calibration Name: Feb2007_AV81
Calibration Date: 2/26/2007 4:49:09PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.15% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI

Nuclide Library: Background ROI Library

Total Background Counts: 3.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 7:13:08AM 3/28/2007

Sample

Sample Name: AV82 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: March2007a

Description:

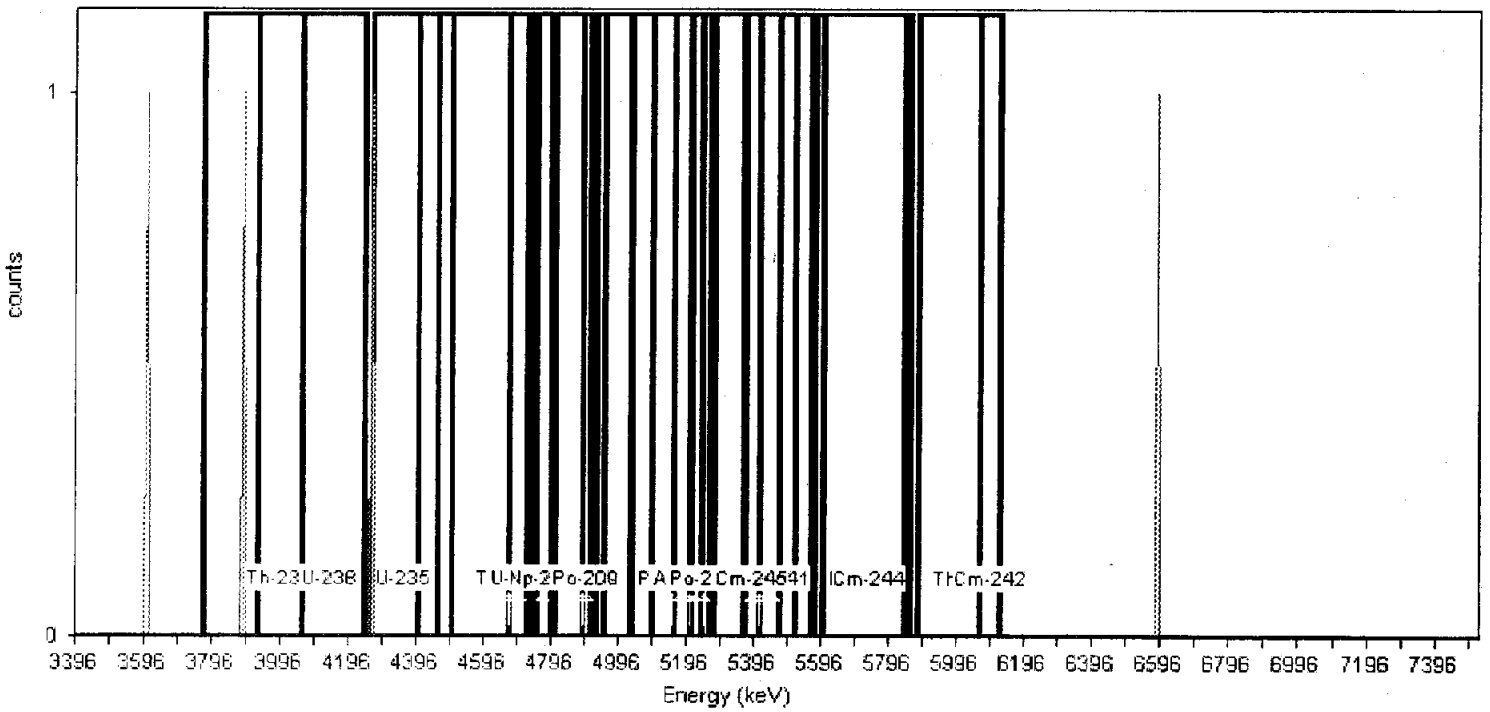
Acquisition

Detector: AV82 , SN: 46-032EE5
Acquisition Start Date: 3/27/2007 12:54:53PM
Live Time: 960.00 min.
Real Time: 960.12 min.
Calibration Name: Feb2007_AV82
Calibration Date: 2/26/2007 4:49:18PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.04% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 4.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003

SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:44:18AM 3/23/2007

Sample

Sample Name: AV83 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

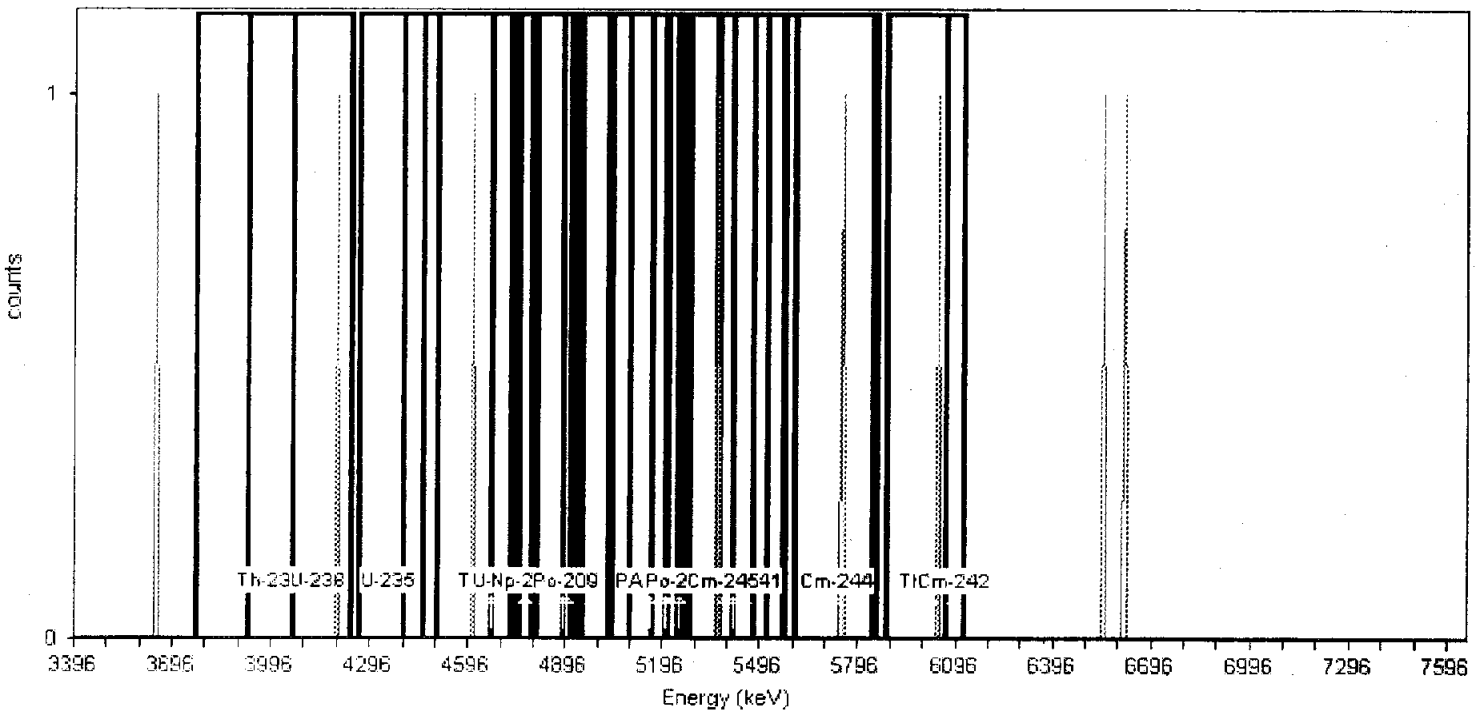
Acquisition

Detector: AV83 , SN: 46-03306
Acquisition Start Date: 3/22/2007 2:43:39PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV83
Calibration Date: 2/26/2007 7:30:41PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.72% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 8.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:44:22AM 3/23/2007

Sample

Sample Name: AV84 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

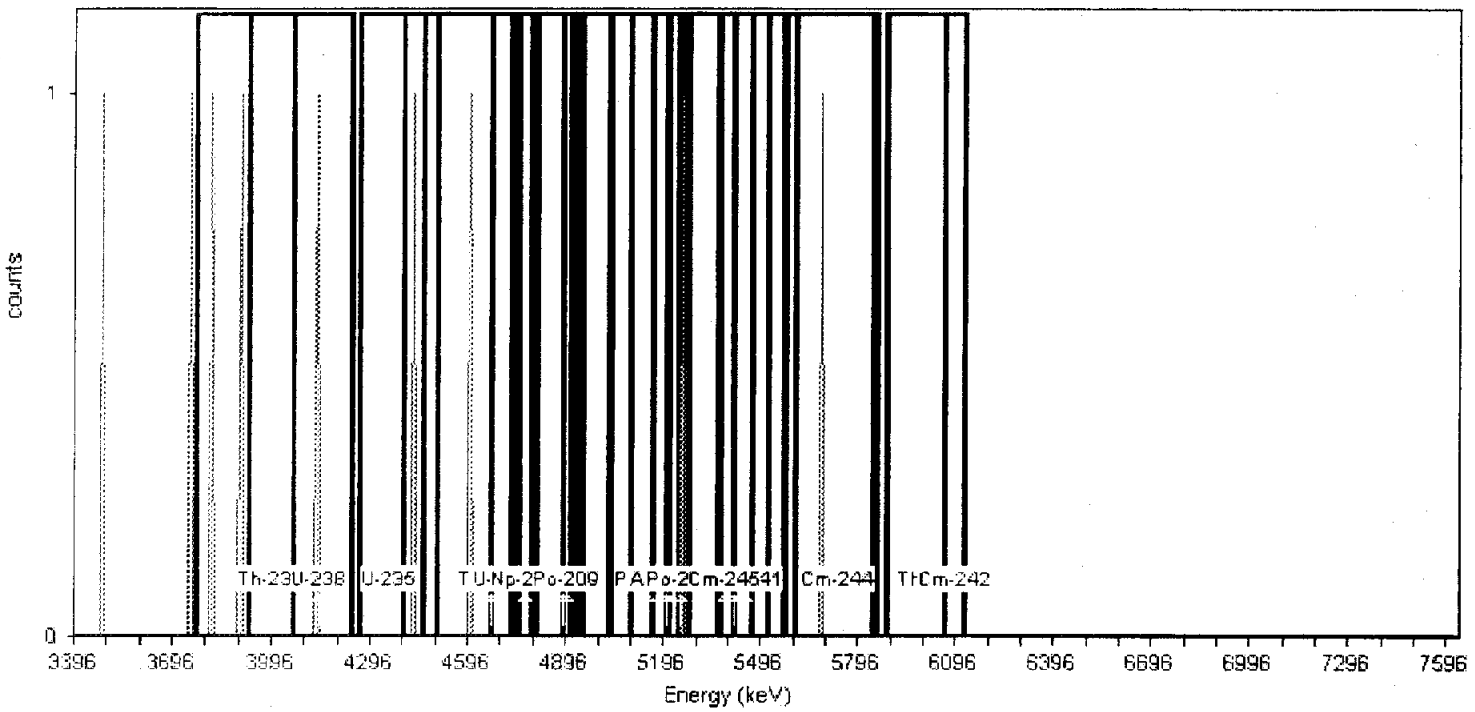
Acquisition

Detector: AV84 , SN: 46-033FF3
Acquisition Start Date: 3/22/2007 2:43:40PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV84
Calibration Date: 2/26/2007 7:30:49PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.17% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 9.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:44:25AM 3/23/2007

Sample

Sample Name: AV85 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

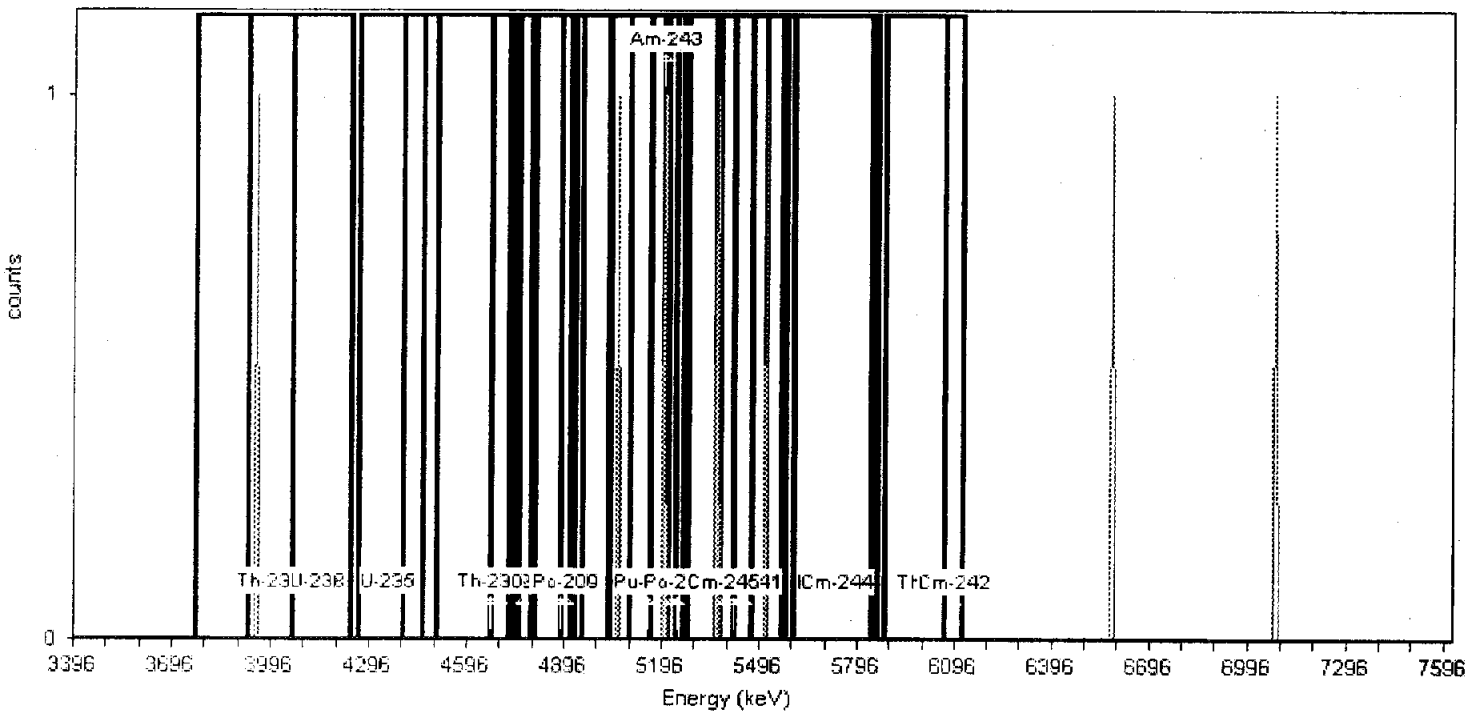
Acquisition

Detector: AV85 , SN: 46-032EE7
Acquisition Start Date: 3/22/2007 2:43:43PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV85
Calibration Date: 2/26/2007 7:30:54PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.69% +/- 0.30% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 7.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	3.00	3.125E-003	2.083E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	1.00	1.042E-003	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	2.00	2.083E-003	1.804E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:44:29AM 3/23/2007

Analyst: 60040

Sample

Sample Name: AV86
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

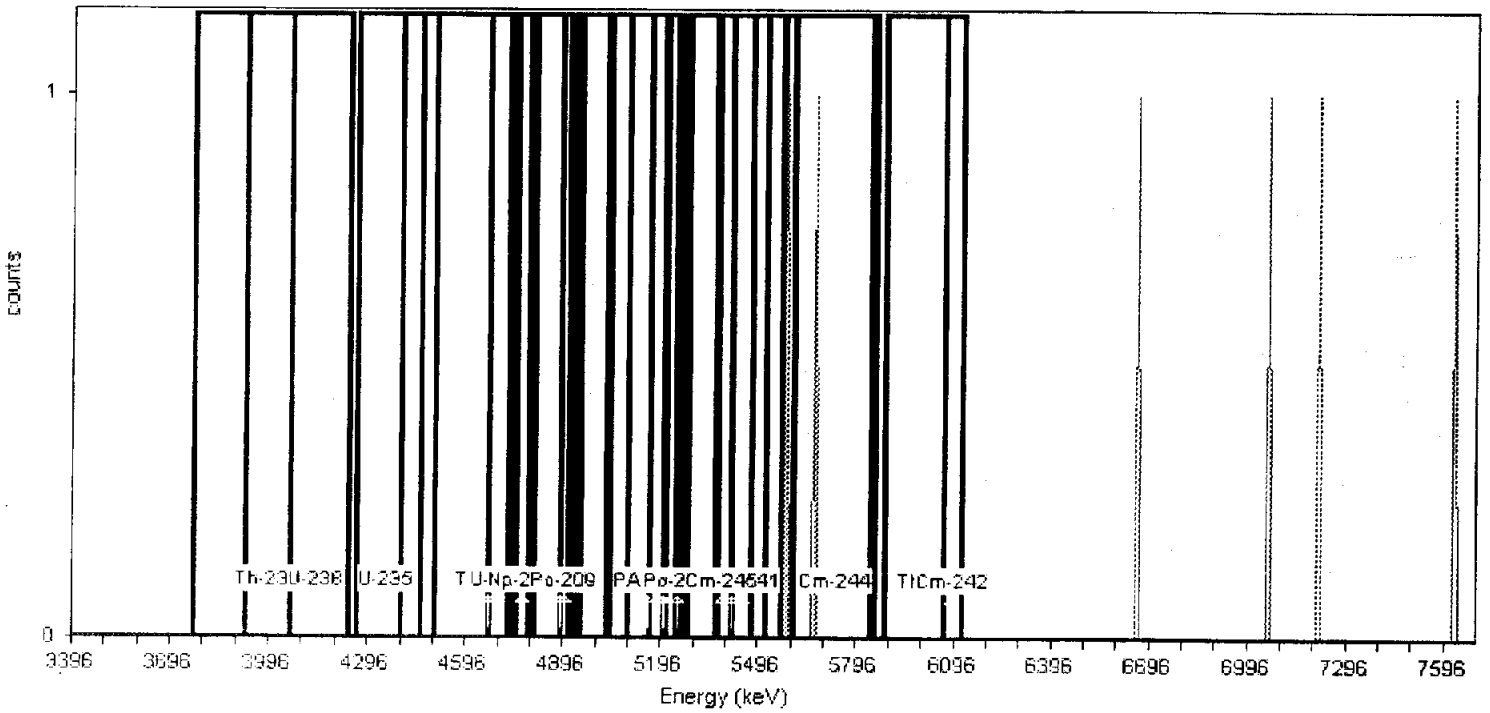
Acquisition

Detector: AV86 , SN: 46-033Q6
Acquisition Start Date: 3/22/2007 2:43:44PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: Feb2007_AV86
Calibration Date: 2/26/2007 7:30:59PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.08% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 6.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	2.00	2.083E-003	1.804E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:44:32AM 3/23/2007

Analyst: 60040

Sample

Sample Name: AV87
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

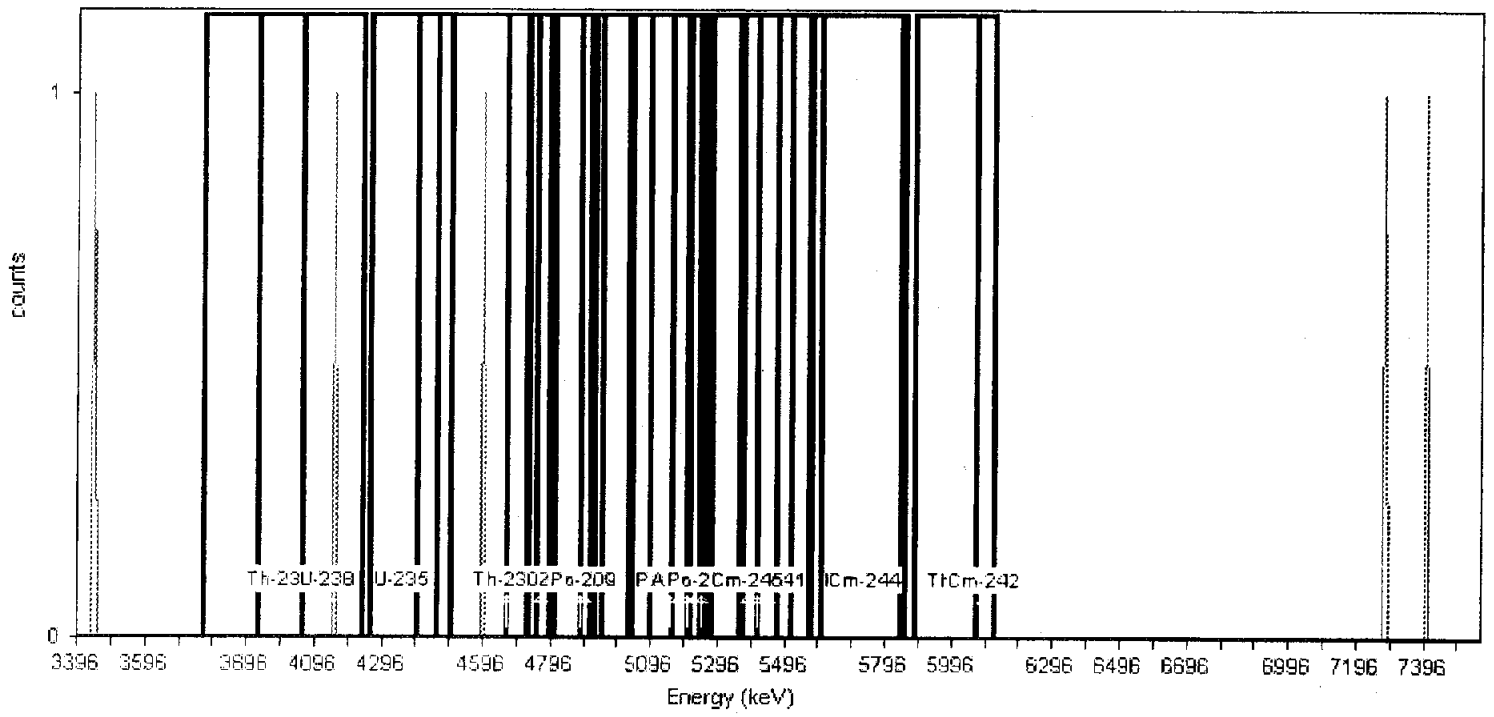
Acquisition

Detector: AV87 , SN: 46-033FF5
Acquisition Start Date: 3/22/2007 2:43:46PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: FEB2007_AV87
Calibration Date: 2/26/2007 10:01:43PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.85% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundRO Nuclide Library: Background ROI Library
Total Background Counts: 5.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003

STL SEVERN TRENT **STL**

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:44:35AM 3/23/2007

Sample

Sample Name: AV88 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

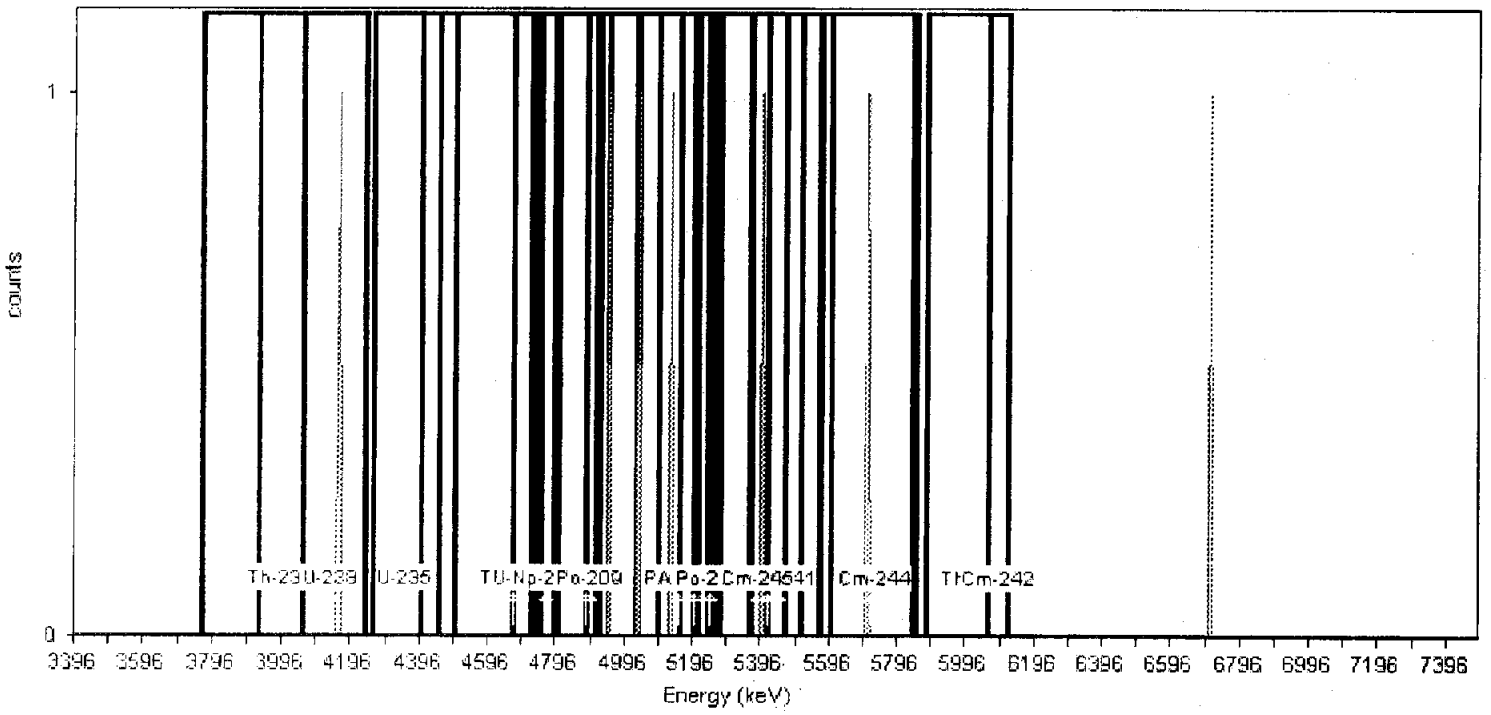
Acquisition

Detector: AV88 , SN: 76-033FF1
Acquisition Start Date: 3/22/2007 2:43:47PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: FEB2007_AV88
Calibration Date: 2/26/2007 10:01:50PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.75% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 7.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	3.00	3.125E-003	2.083E-003
Am-243	5.20	5.03	5.28	2.00	2.083E-003	1.804E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	1.00	1.042E-003	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	1.00	1.042E-003	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:44:38AM 3/23/2007

Analyst: 60040

Sample

Sample Name: AV89 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

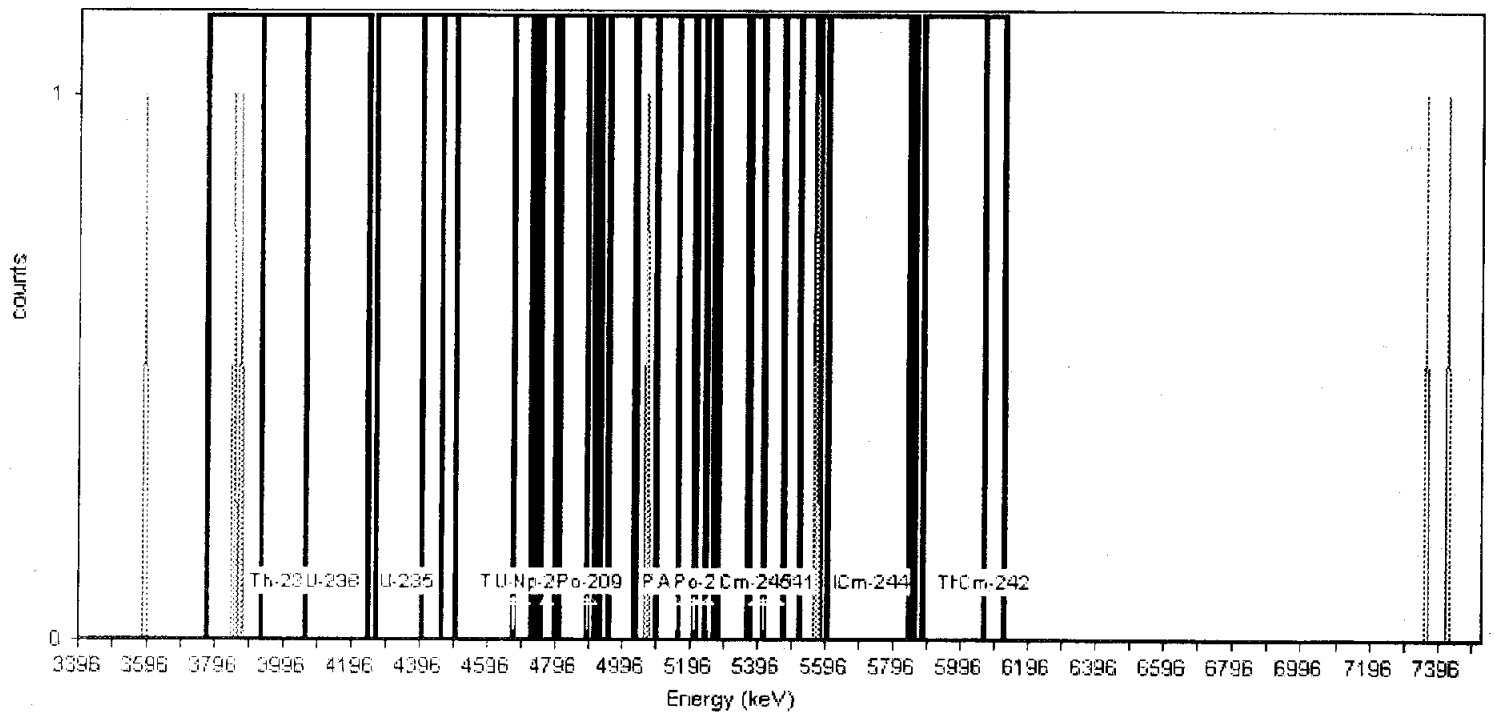
Acquisition

Detector: AV89 , SN: 46-033P5
Acquisition Start Date: 3/22/2007 2:43:50PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: FEB2007_AV89
Calibration Date: 2/26/2007 10:01:55PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.90% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 7.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	2.00	2.083E-003	1.804E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	1.00	1.042E-003	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	1.00	1.042E-003	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:44:42AM 3/23/2007

Sample

Sample Name: AV90 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

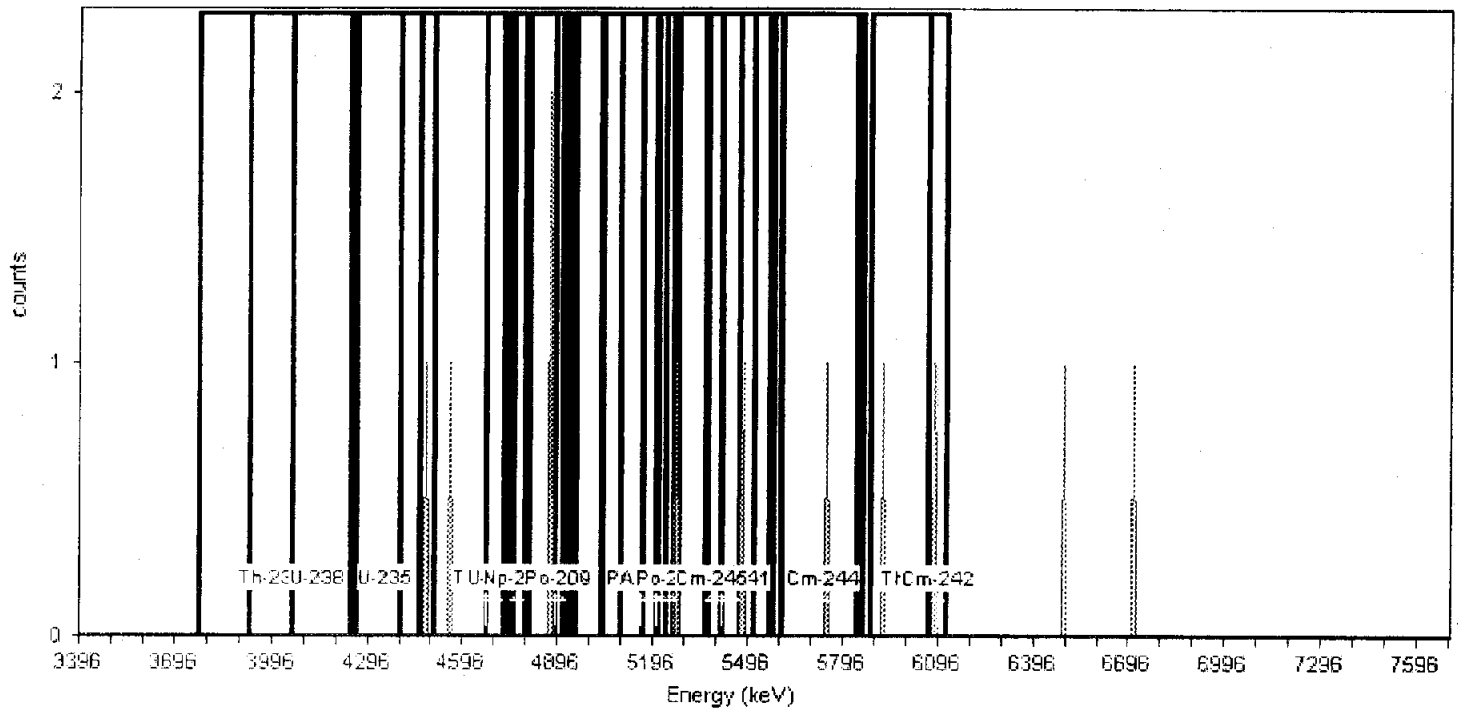
Acquisition

Detector: AV90 , SN: 46-033Q1
Acquisition Start Date: 3/22/2007 2:43:52PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: FEB2007_AV90
Calibration Date: 2/26/2007 10:02:00PM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.35% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 11.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	2.00	2.083E-003	1.804E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	2.00	2.083E-003	1.804E-003
Th-229	4.84	4.72	5.10	2.00	2.083E-003	1.804E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	1.00	1.042E-003	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	2.00	2.083E-003	1.804E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	1.00	1.042E-003	1.473E-003
Cm-244	5.73	5.60	5.86	1.00	1.042E-003	1.473E-003
Th-227	6.02	5.89	6.13	2.00	2.083E-003	1.804E-003
Cm-242	6.10	6.07	6.13	1.00	1.042E-003	1.473E-003

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:43:33AM 3/23/2007

Sample

Sample Name: AV92 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

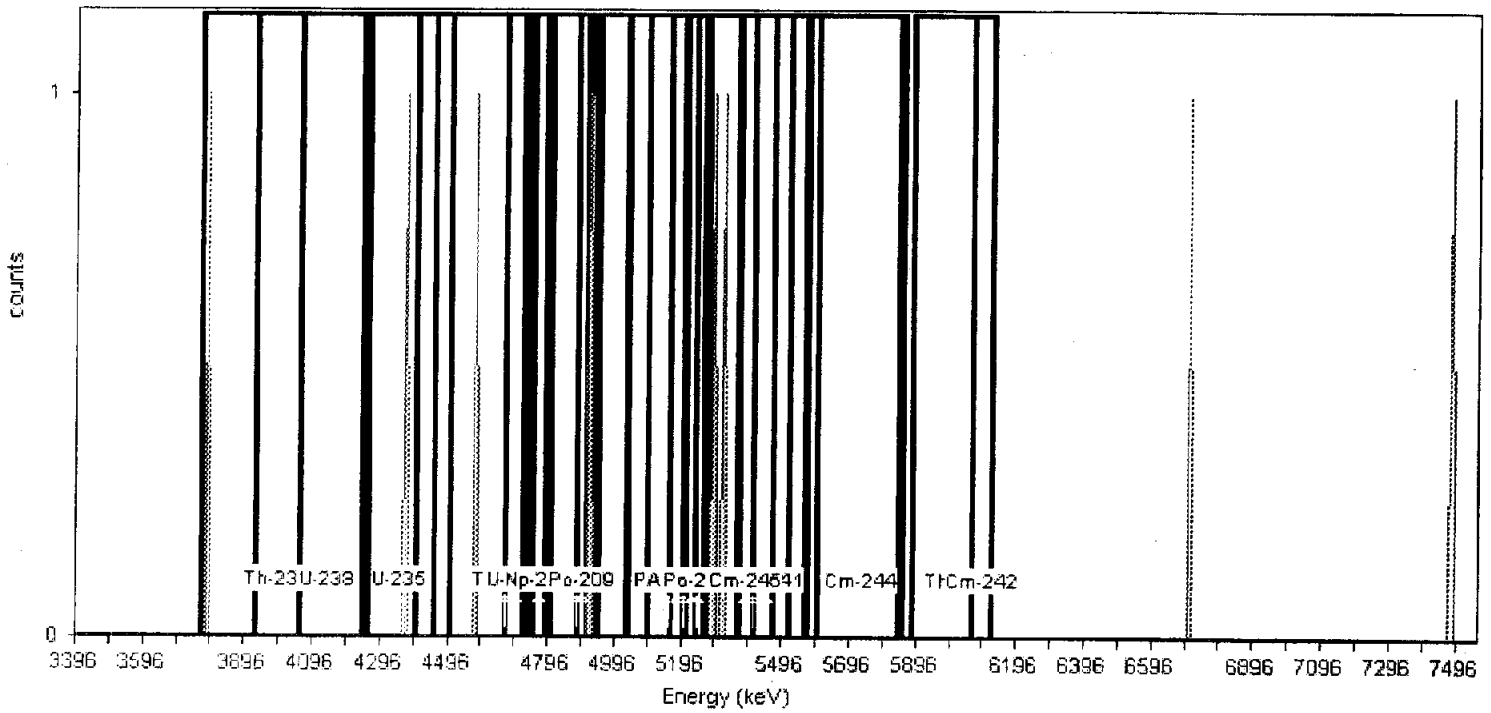
Acquisition

Detector: AV92 , SN: 46-033FF2
Acquisition Start Date: 3/22/2007 2:43:54PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV92
Calibration Date: 2/27/2007 11:22:44AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.58% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 8.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	1.00	1.042E-003	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	1.00	1.042E-003	1.473E-003
Pu-242	4.88	4.67	4.93	1.00	1.042E-003	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	2.00	2.083E-003	1.804E-003
Th-228	5.41	5.16	5.47	2.00	2.083E-003	1.804E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	2.00	2.083E-003	1.804E-003
Am-241	5.45	5.27	5.57	2.00	2.083E-003	1.804E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:43:58AM 3/23/2007

Analyst: 60040

Sample

Sample Name: AV93
Comment:

Spectrum #1 Analysis #1

Batch

Batch Name: Mar2007
Description:

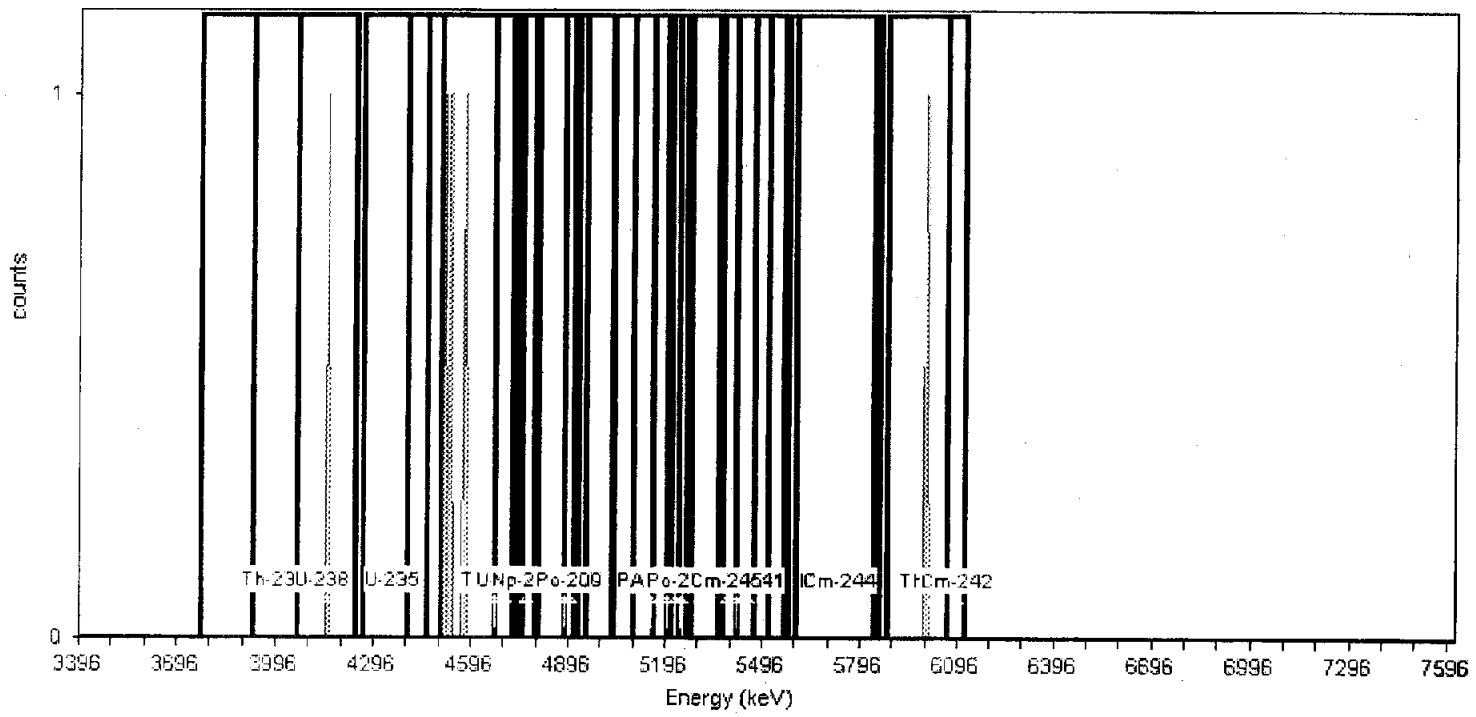
Acquisition

Detector: AV93 , SN: 46-033Q2
Acquisition Start Date: 3/22/2007 2:43:56PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV93
Calibration Date: 2/27/2007 11:22:50AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.57% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background
Nuclide Library: Background ROI Library
Total Background Counts: 5.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	3.00	3.125E-003	2.083E-003
U-234	4.70	4.50	4.80	3.00	3.125E-003	2.083E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

ST SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:44:01AM 3/23/2007

Sample

Sample Name: AV94 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

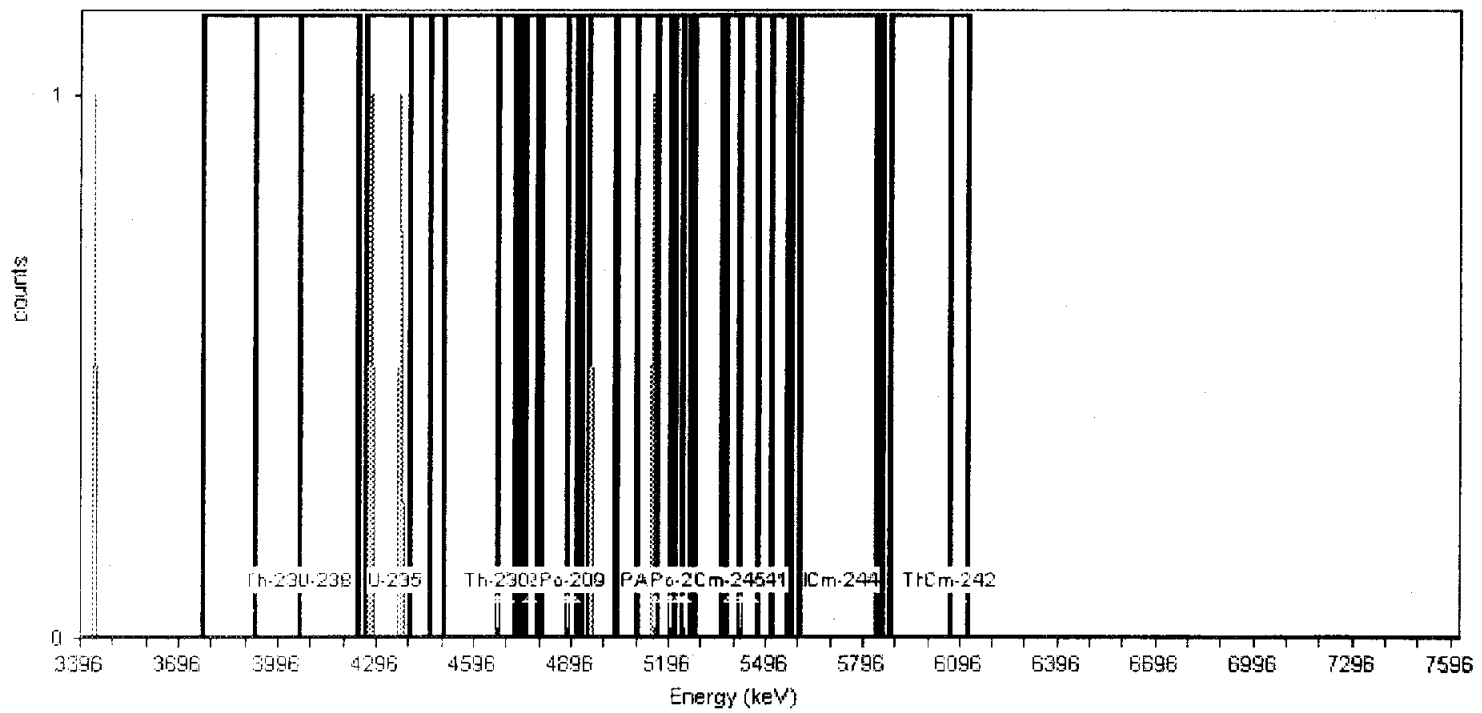
Acquisition

Detector: AV94 , SN: 46-032EE6
Acquisition Start Date: 3/22/2007 2:43:58PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: Feb2007_AV94
Calibration Date: 2/27/2007 11:22:58AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.73% +/- 0.27% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_Background Nuclide Library: Background ROI Library

Total Background Counts: 6.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	2.00	2.083E-003	1.804E-003
Am-243	5.20	5.03	5.28	1.00	1.042E-003	1.473E-003
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	0.00	0.000E+000	1.473E-003
U-235	4.35	4.26	4.46	3.00	3.125E-003	2.083E-003
Th-230	4.67	4.40	4.73	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	1.00	1.042E-003	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

STL SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:44:04AM 3/23/2007

Sample

Sample Name: AV95 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

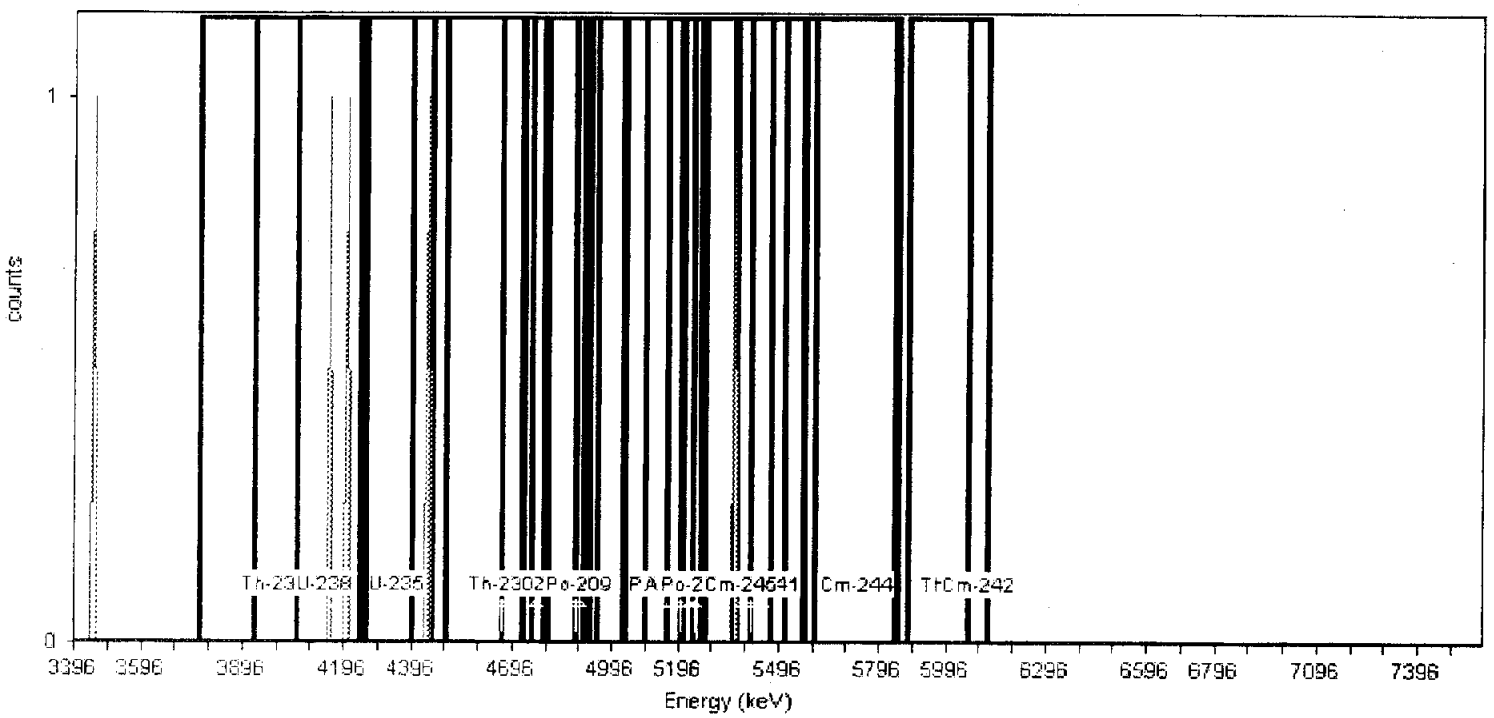
Acquisition

Detector: AV95 , SN: 46-033P4
Acquisition Start Date: 3/22/2007 2:43:59PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: FEB2007_AV95
Calibration Date: 2/27/2007 6:41:17AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.68% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 5.00

STL

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040

6:44:08AM 3/23/2007

Sample

Sample Name: AV96

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

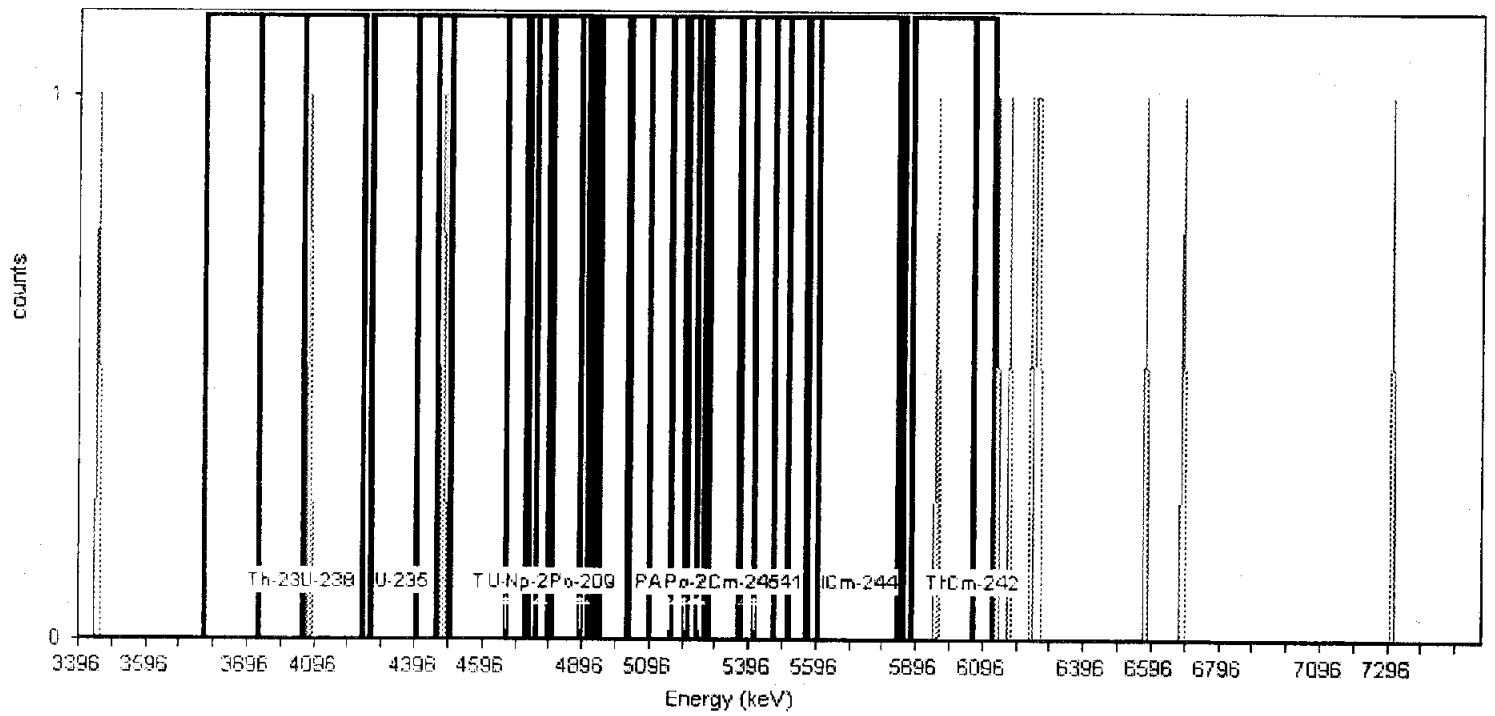
Acquisition

Detector: AV96 , SN: 46-033P1
Acquisition Start Date: 3/22/2007 2:44:02PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: FEB2007_AV96
Calibration Date: 2/27/2007 6:41:24AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²

Efficiency: 26.58% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 12.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	1.00	1.042E-003	1.473E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	1.00	1.042E-003	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Alpha Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040 6:44:11AM 3/23/2007

Sample

Sample Name: AV97 Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

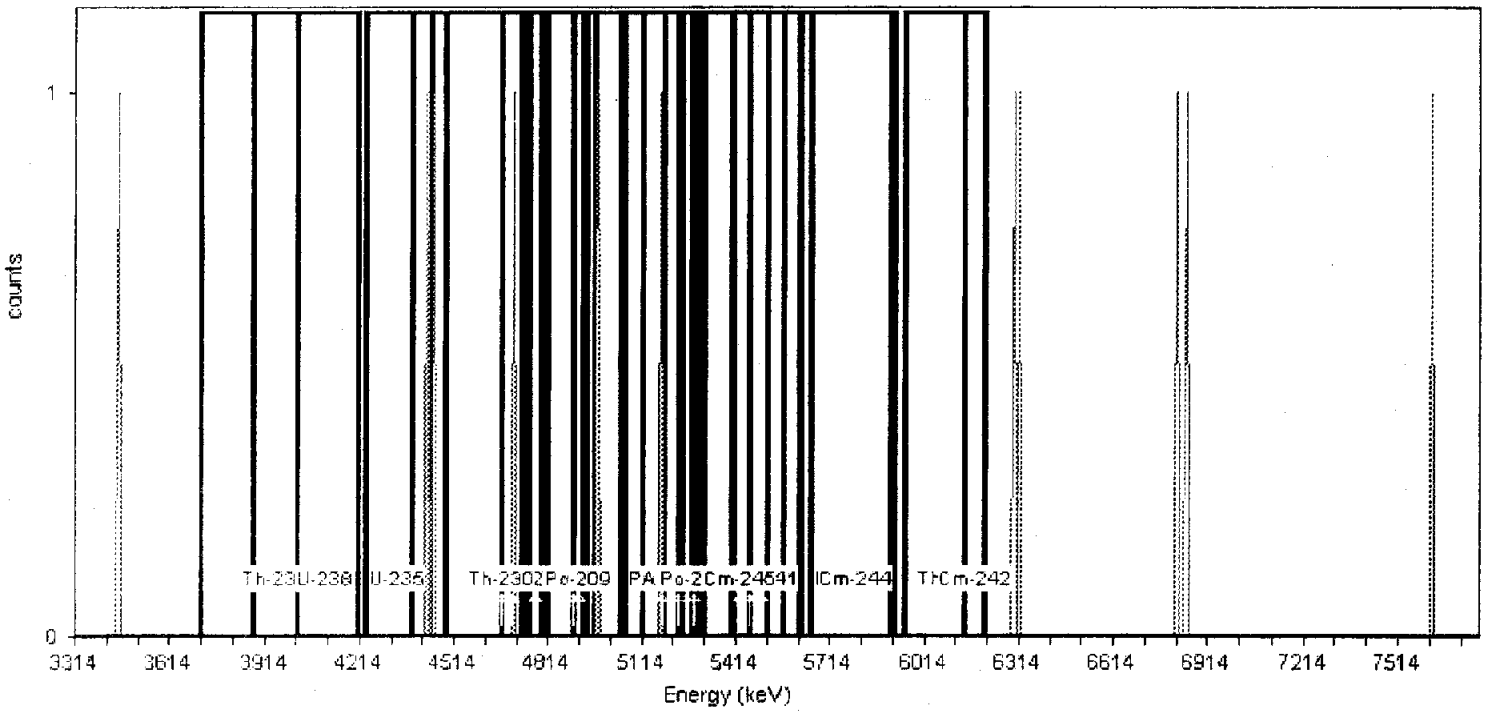
Acquisition

Detector: AV97 , SN: 76-03393
Acquisition Start Date: 3/22/2007 2:44:03PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: FEB2007_AV97
Calibration Date: 2/27/2007 6:41:29AM

Energy Calibration Equation:

Gain = 7.7000 keV / Ch
Offset = 3,306.99 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.63% +/- 0.50% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI Nuclide Library: Background ROI Library

Total Background Counts: 11.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
U-234	4.69	4.49	4.81	1.00	1.042E-003	1.473E-003
Pu-242	4.89	4.66	4.94	1.00	1.042E-003	1.473E-003
Th-229	4.85	4.72	5.12	1.00	1.042E-003	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.91	4.89	4.92	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.96	5.24	2.00	2.083E-003	1.804E-003
Am-243	5.23	5.05	5.31	1.00	1.042E-003	1.473E-003
U-232	5.26	5.05	5.41	1.00	1.042E-003	1.473E-003
Th-228	5.46	5.19	5.52	0.00	0.000E+000	1.473E-003
Po-210	5.28	5.23	5.29	0.00	0.000E+000	1.473E-003
Pu-238	5.48	5.27	5.56	0.00	0.000E+000	1.473E-003
Am-241	5.49	5.30	5.62	0.00	0.000E+000	1.473E-003
Cm-245	5.42	5.40	5.46	0.00	0.000E+000	1.473E-003
Pu-236	5.78	5.62	5.91	0.00	0.000E+000	1.473E-003
Cm-244	5.79	5.66	5.93	0.00	0.000E+000	1.473E-003
Th-227	6.10	5.96	6.21	0.00	0.000E+000	1.473E-003
Cm-242	6.18	6.15	6.21	0.00	0.000E+000	1.473E-003
Th-232	3.95	3.71	4.02	0.00	0.000E+000	1.473E-003
U-238	4.10	3.88	4.21	0.00	0.000E+000	1.473E-003
U-235	4.33	4.23	4.44	1.00	1.042E-003	1.473E-003
Th-230	4.66	4.38	4.73	3.00	3.125E-003	2.083E-003

STL

SEVERN TRENT STL

Alpha-Spectroscopy Background Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040

6:44:14AM 3/23/2007

Sample

Sample Name: AV98

Spectrum #1 Analysis #1

Comment:

Batch

Batch Name: Mar2007

Description:

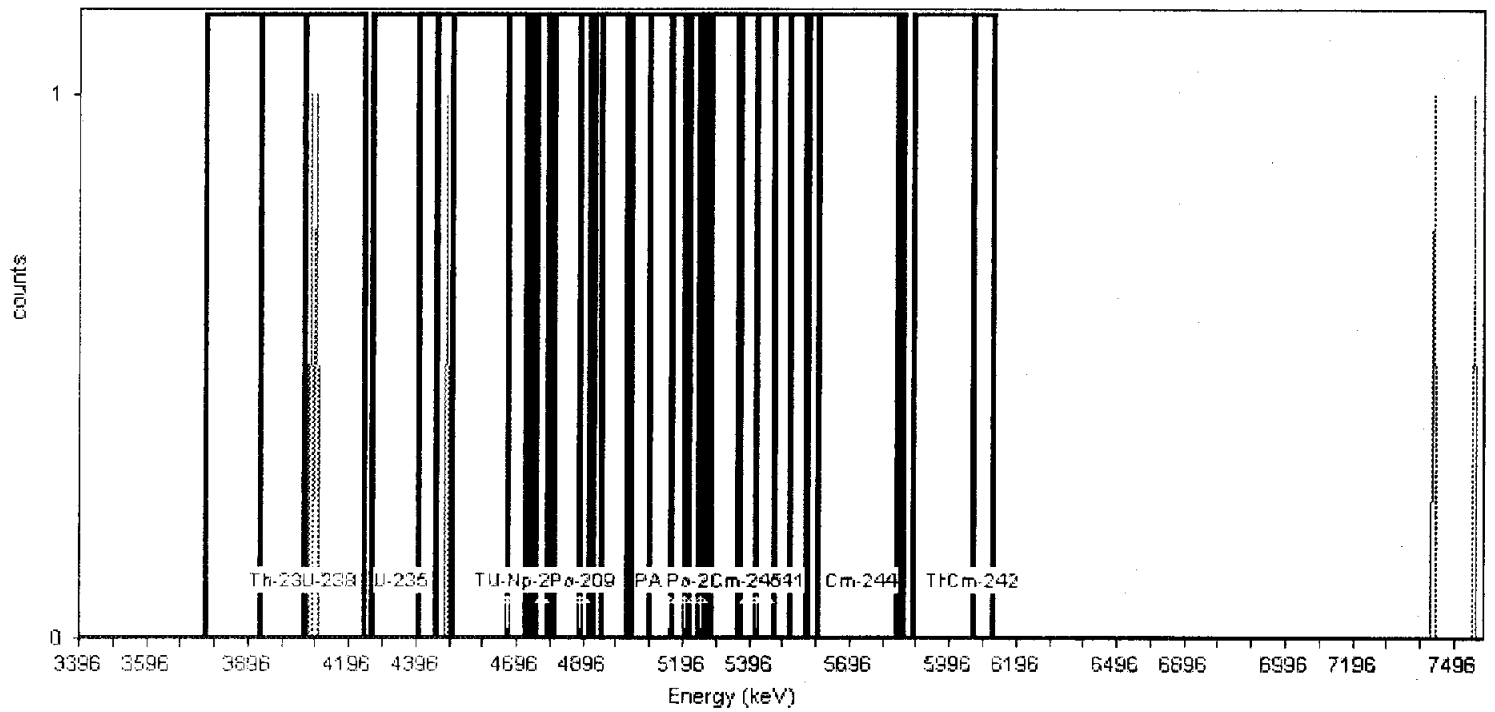
Acquisition

Detector: AV98 , SN: 46-033Q3
Acquisition Start Date: 3/22/2007 2:44:05PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: FEB2007_AV98
Calibration Date: 2/27/2007 6:41:34AM

Energy Calibration Equation:

Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.38% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI

Nuclide Library: Background ROI Library

Total Background Counts: 5.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.77	4.06	0.00	0.000E+000	1.473E-003
U-238	4.14	3.93	4.24	2.00	2.083E-003	1.804E-003
U-235	4.35	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.67	4.40	4.73	1.00	1.042E-003	1.473E-003
U-234	4.70	4.50	4.80	0.00	0.000E+000	1.473E-003
Pu-242	4.88	4.67	4.93	0.00	0.000E+000	1.473E-003
Th-229	4.84	4.72	5.10	0.00	0.000E+000	1.473E-003
Np-237	4.77	4.75	4.79	0.00	0.000E+000	1.473E-003
Po-209	4.90	4.88	4.91	0.00	0.000E+000	1.473E-003
Pu-239	5.15	4.95	5.21	0.00	0.000E+000	1.473E-003
Am-243	5.20	5.03	5.28	0.00	0.000E+000	1.473E-003
U-232	5.23	5.04	5.37	0.00	0.000E+000	1.473E-003
Th-228	5.41	5.16	5.47	0.00	0.000E+000	1.473E-003
Po-210	5.25	5.20	5.26	0.00	0.000E+000	1.473E-003
Pu-238	5.44	5.24	5.52	0.00	0.000E+000	1.473E-003
Am-241	5.45	5.27	5.57	0.00	0.000E+000	1.473E-003
Cm-245	5.39	5.36	5.41	0.00	0.000E+000	1.473E-003
Pu-236	5.72	5.57	5.84	0.00	0.000E+000	1.473E-003
Cm-244	5.73	5.60	5.86	0.00	0.000E+000	1.473E-003
Th-227	6.02	5.89	6.13	0.00	0.000E+000	1.473E-003
Cm-242	6.10	6.07	6.13	0.00	0.000E+000	1.473E-003

SEVERN TRENT STL

Monthly Calibrations
Alphavision
March 2007

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:53:57AM 3/26/2007

Analyst: 60040
Detector: AV1

Calibration

Name: Mar2007_AV1a
Description:

Calibration Date: 3/26/2007 11:53:54AM

Source Info

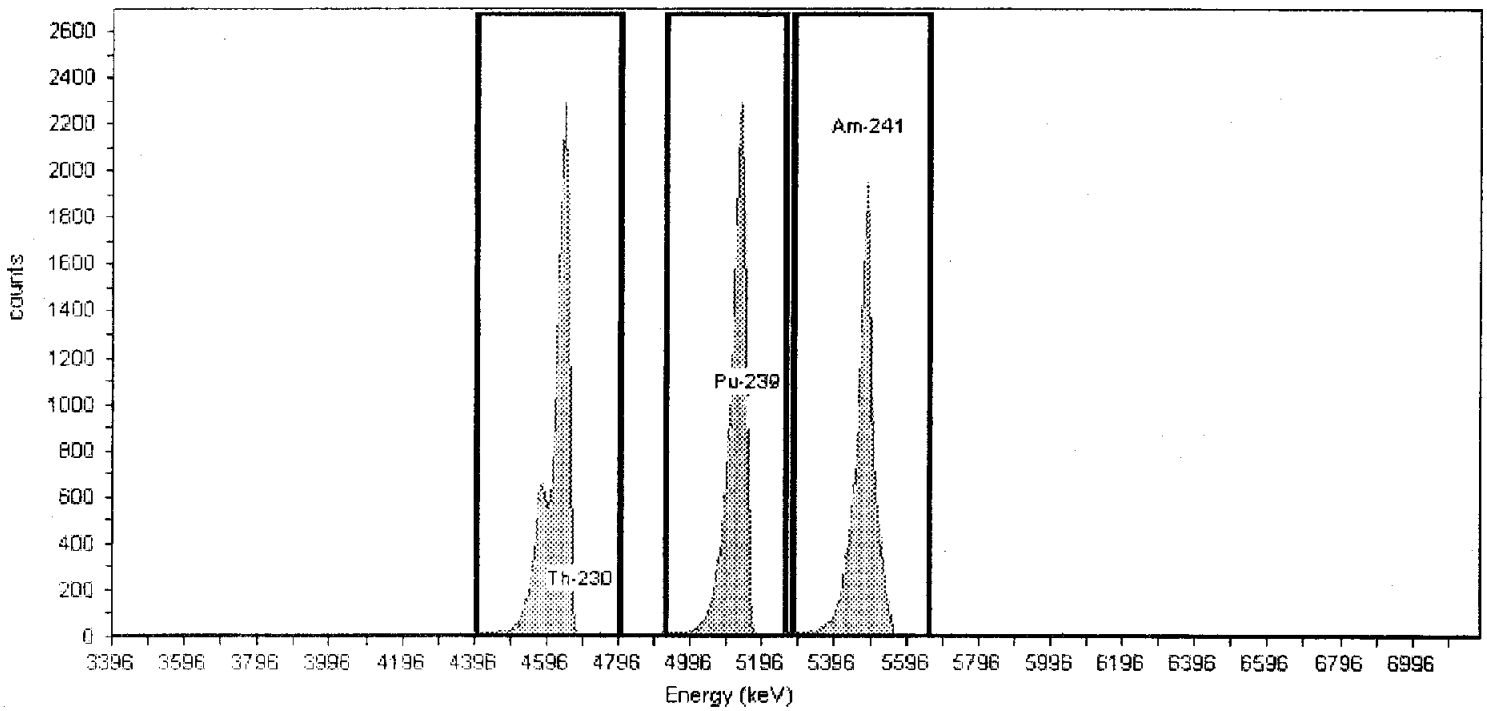
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV1 , SN: 41-158W6
Acquisition Start Date: 3/26/2007 9:29:04AM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.58% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,144.00	115.31
Pu-239	243	5.16	212	258	15,407.00	110.05
Am-241	289	5.49	261	313	14,629.00	104.49

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:54:06AM 3/26/2007

Analyst: 60040
Detector: AV2

Calibration

Name: Mar2007_AV2a
Description:

Calibration Date: 3/26/2007 11:54:01AM

Source Info

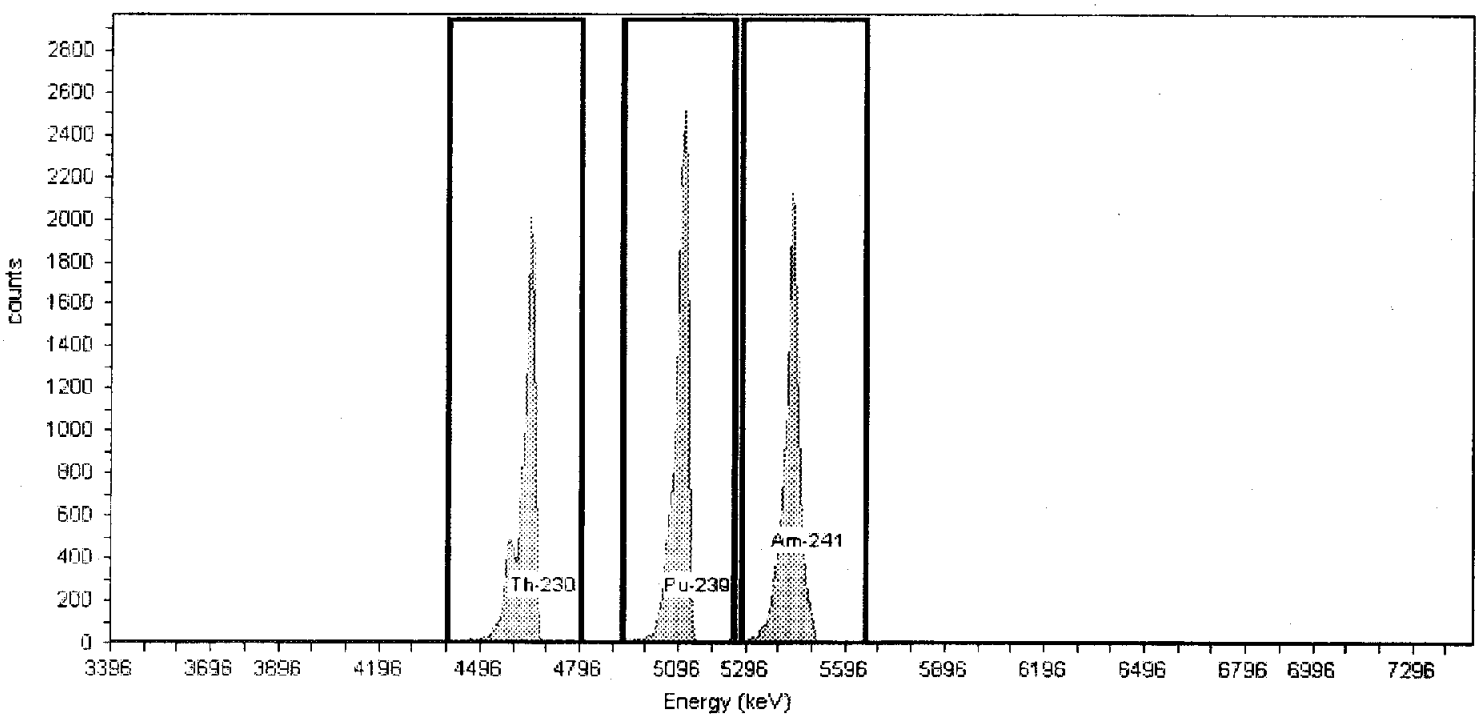
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV2 , SN: 41-158W7
Acquisition Start Date: 3/26/2007 9:29:05AM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.26% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,246.00	87.47
Pu-239	243	5.16	212	258	14,422.00	103.01
Am-241	289	5.49	261	313	14,098.00	100.70

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:28:46AM 3/26/2007

Analyst: 60040
Detector: AV3

Calibration

Name: Mar2007_AV3
Calibration Date: 3/26/2007 11:28:43AM
Description:

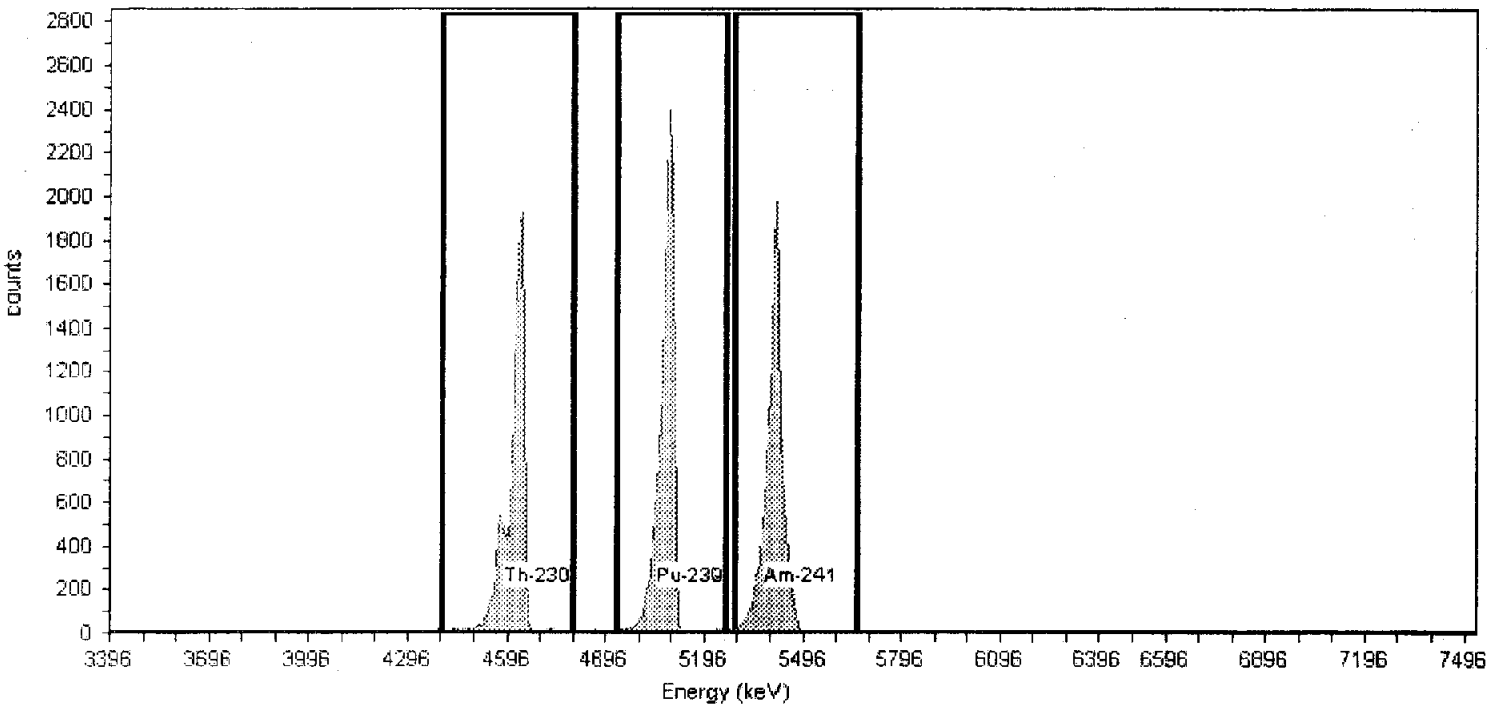
Source Info

Certificate ID: 63508A-334
Certification Date: 5/30/2002 12:00:00PM
Prepared by: Analytics
Description:

Acquisition

Detector: AV3 , SN: 41-158X5
Acquisition Start Date: 3/26/2007 9:05:37AM
Live Time: 140.00 min.
Real Time: 140.16 min.
Efficiency: 27.08% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Initial Calibration: No
Algorithm: Linear
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,656.00	90.40
Pu-239	243	5.16	212	258	14,129.00	100.92
Am-241	289	5.49	261	313	13,200.00	94.29

STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:28:54AM 3/26/2007

Analyst: 60040
Detector: AV4

Calibration

Name: Mar2007_AV4
Description:

Calibration Date: 3/26/2007 11:28:51AM

Source Info

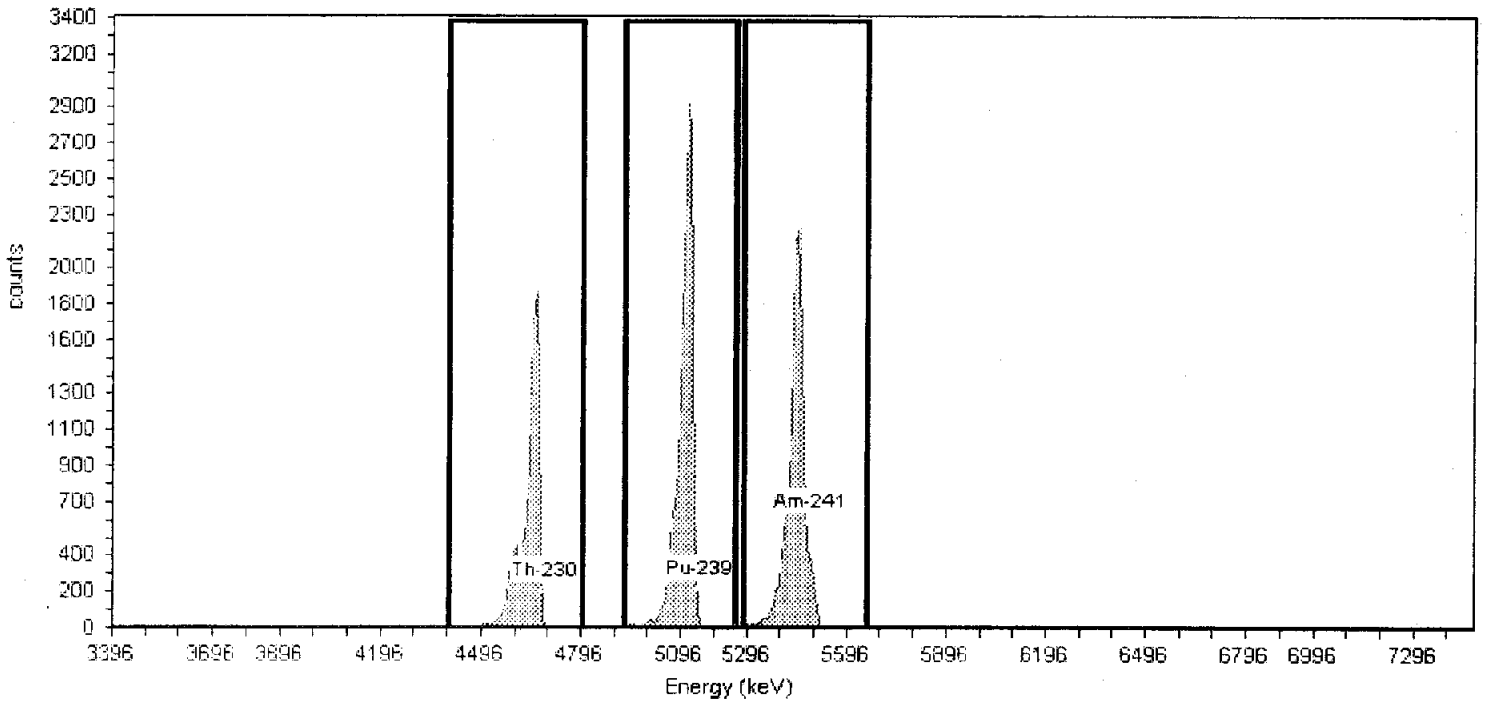
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV4 , SN: 41-172B5
Acquisition Start Date: 3/26/2007 9:05:50AM
Live Time: 140.00 min.
Real Time: 140.16 min.
Efficiency: 26.13% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,230.00	80.21
Pu-239	243	5.16	212	258	16,943.00	121.02
Am-241	289	5.49	261	313	14,776.00	105.54

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV6
2:20:51PM 3/26/2007

Calibration

Name: Mar2007_AV6
Description:

Calibration Date: 3/26/2007 2:20:47PM

Source Info

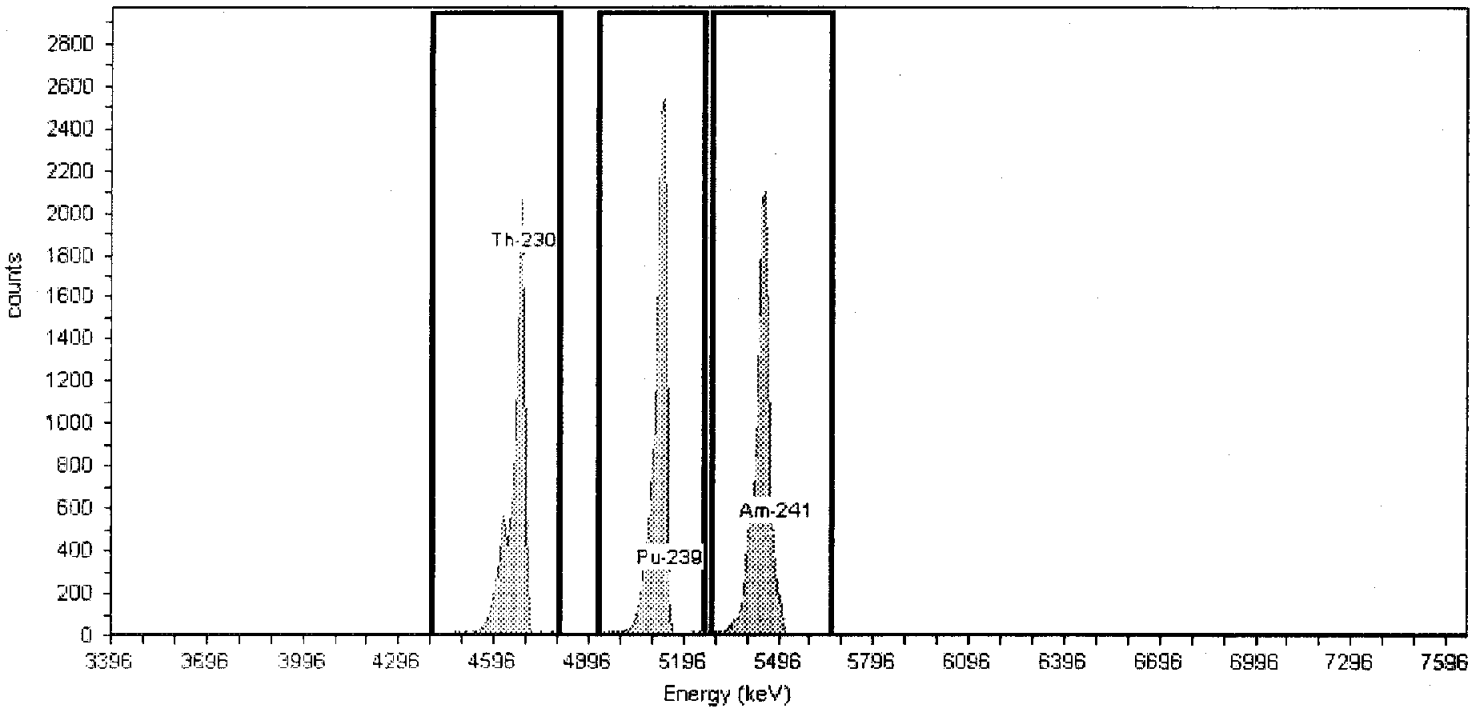
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV6 , SN:
Acquisition Start Date: 3/26/2007 11:55:46AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.79% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,560.00	89.71
Pu-239	243	5.16	212	258	14,791.00	105.65
Am-241	289	5.49	261	313	14,194.00	101.39

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV7

1:58:08PM 3/26/2007

Calibration

Name: Mar2007_AV7
Description:

Calibration Date: 3/26/2007 1:58:05PM

Source Info

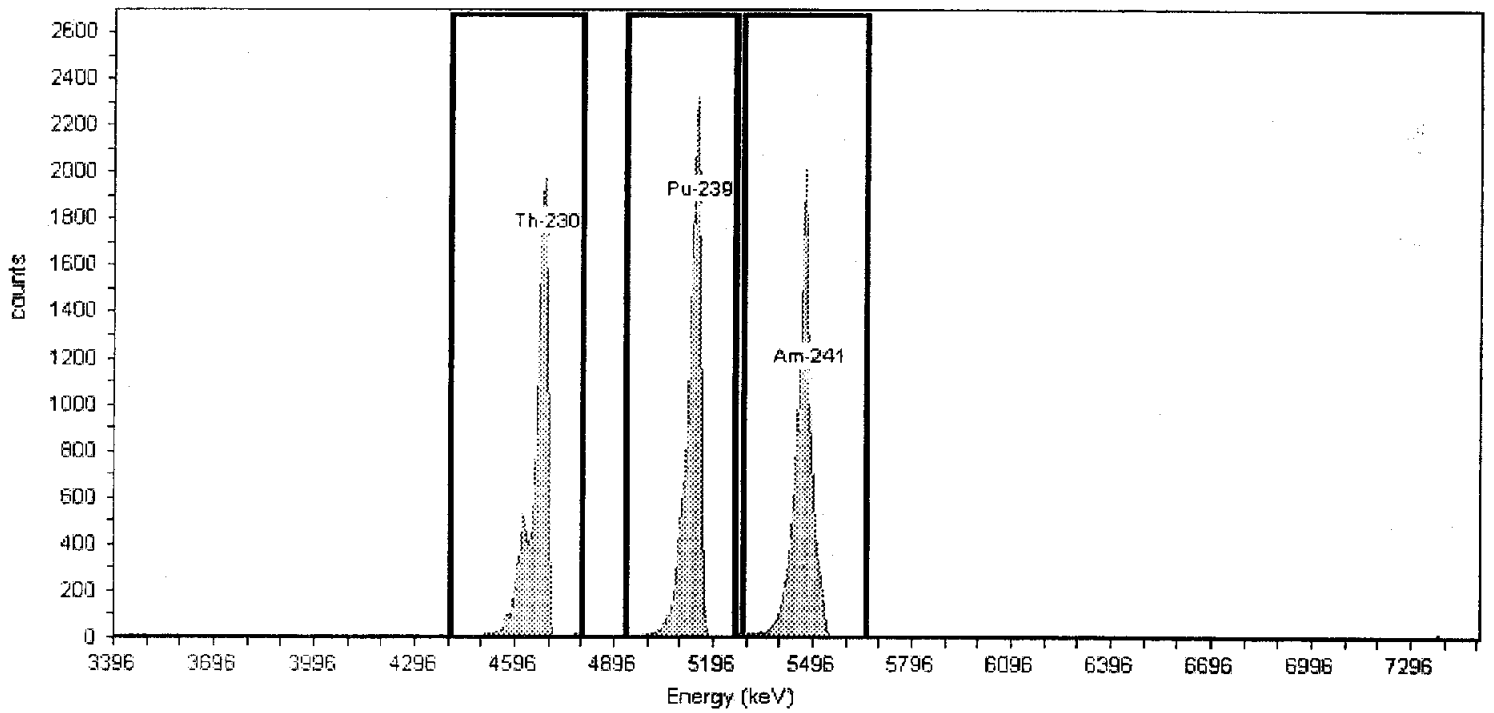
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV7 , SN: 41-158X6
Acquisition Start Date: 3/26/2007 11:33:14AM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 26.79% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,383.00	88.45
Pu-239	243	5.16	212	258	13,814.00	98.67
Am-241	289	5.49	261	313	13,350.00	95.36

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:58:15PM 3/26/2007

Analyst: 60040
Detector: AV8

Calibration

Name: Mar2007_AV8
Description:

Calibration Date: 3/26/2007 1:58:11PM

Source Info

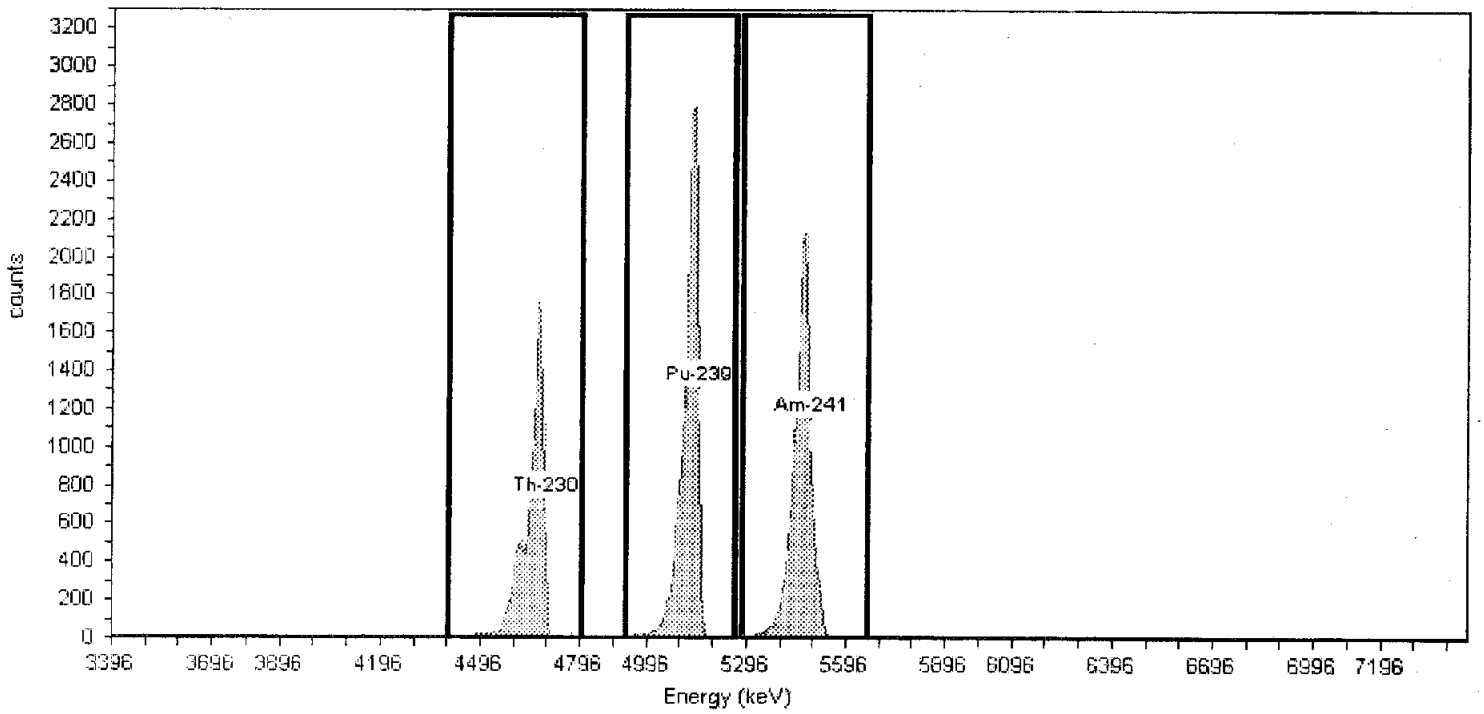
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV8 , SN: 41-158X1
Acquisition Start Date: 3/26/2007 11:33:16AM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 28.43% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,364.00	88.31
Pu-239	243	5.16	212	258	18,455.00	131.82
Am-241	289	5.49	261	313	15,918.00	113.70

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV9

2:20:57PM 3/26/2007

Calibration

Name: Mar2007_AV9
Description:

Calibration Date: 3/26/2007 2:20:54PM

Source Info

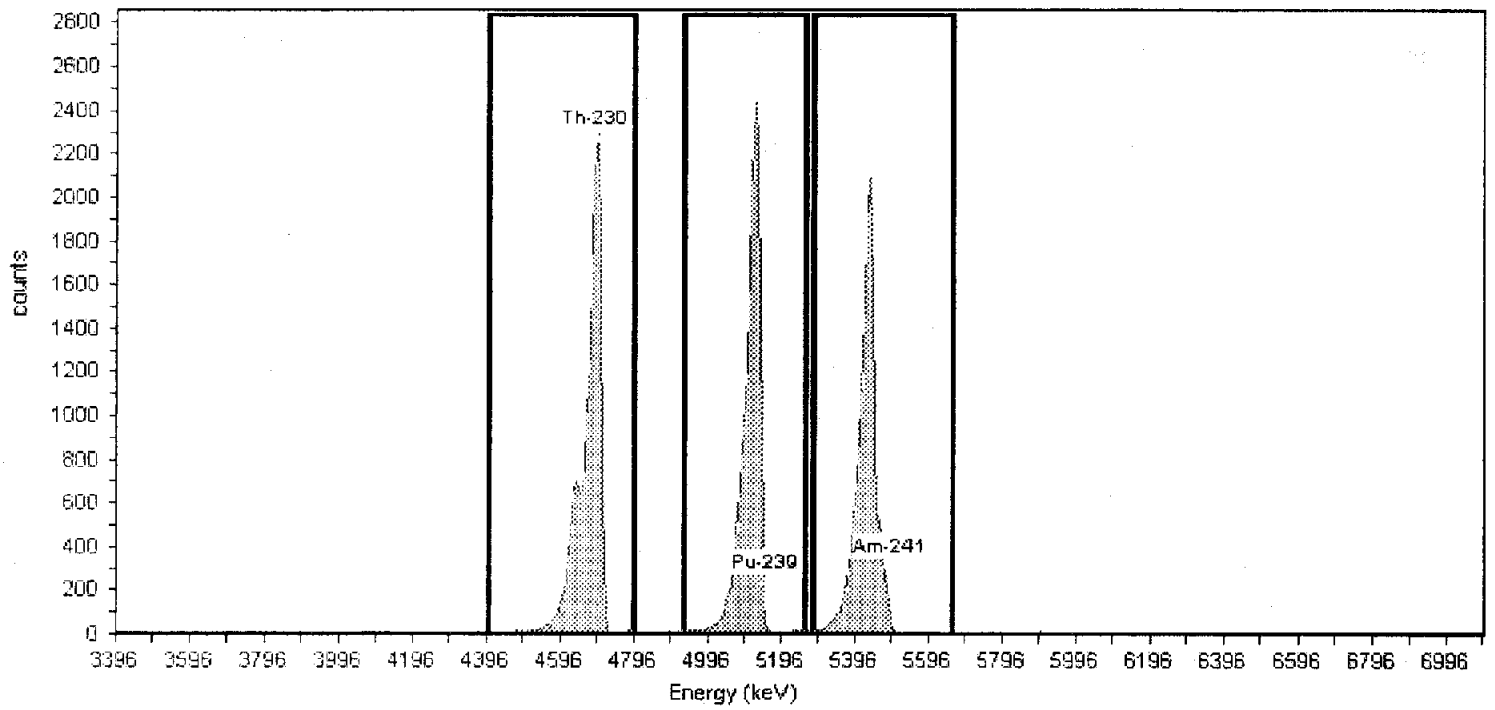
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV9 , SN: 41-172R1
Acquisition Start Date: 3/26/2007 11:55:50AM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 26.52% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	15,993.00	114.24
Pu-239	243	5.16	212	258	15,648.00	111.77
Am-241	289	5.49	261	313	14,415.00	102.96

STL

SEVERN TRENT STL

Alpha Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV11

4:58:25PM 3/26/2007

Calibration

Name: Mar2007_AV11
Description:

Calibration Date: 3/26/2007 4:58:21PM

Source Info

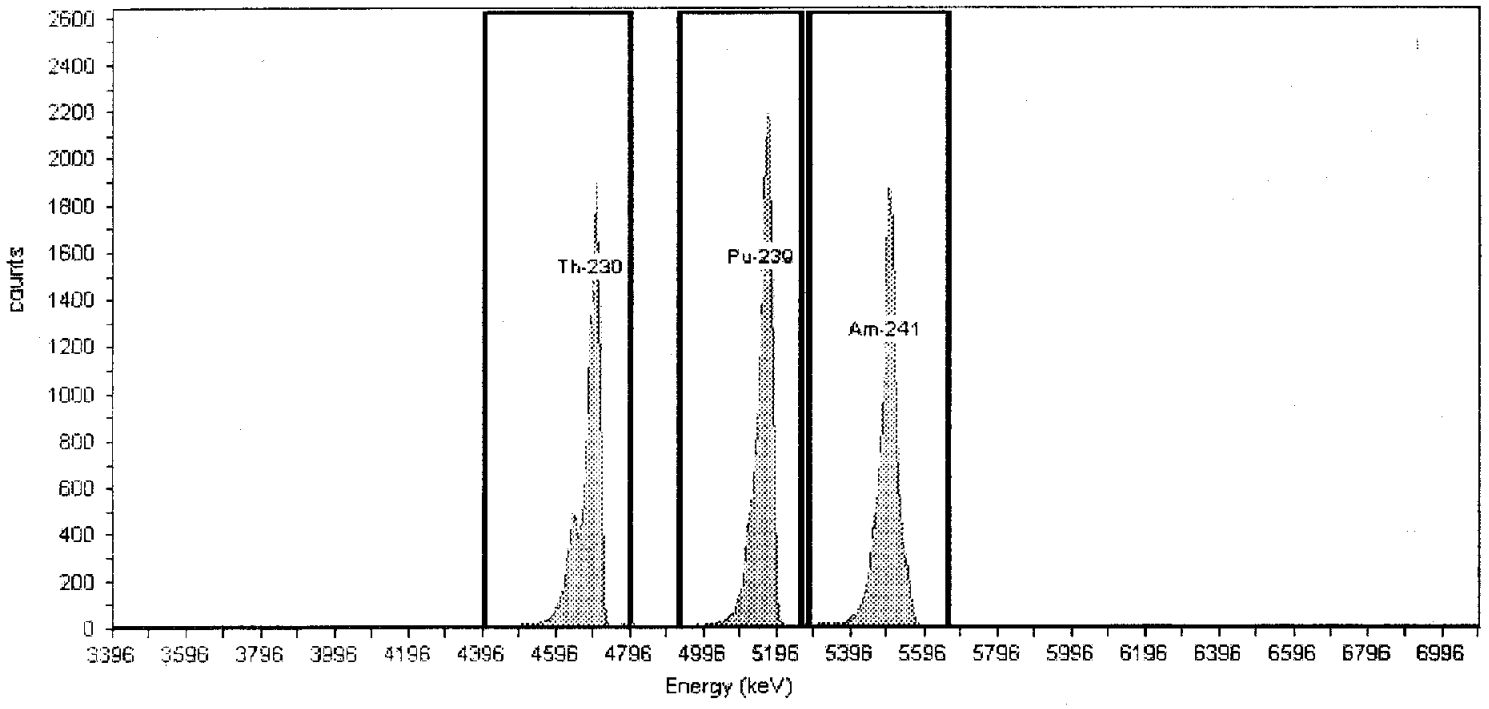
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV11 , SN: 41-172Q3
Acquisition Start Date: 3/26/2007 2:38:18PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.69% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,215.00	87.25
Pu-239	243	5.16	212	258	13,998.00	99.99
Am-241	289	5.49	261	313	13,202.00	94.30

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:59:01PM 3/26/2007

Analyst: 60040
Detector: AV12

Calibration

Name: Mar2007_AV12
Description:

Calibration Date: 3/26/2007 4:58:58PM

Source Info

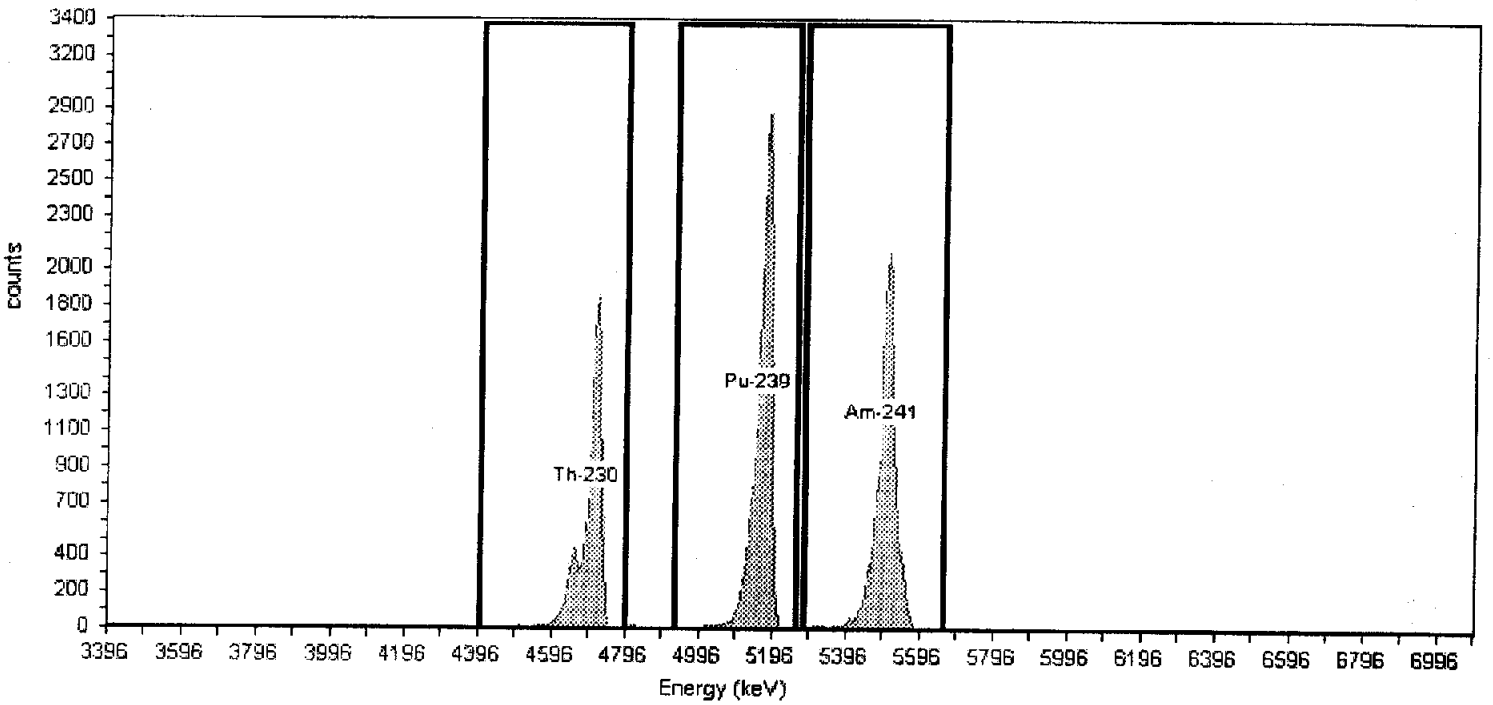
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV12 , SN: 41-172Q2
Acquisition Start Date: 3/26/2007 2:38:19PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.04% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,269.00	80.49
Pu-239	243	5.16	212	258	16,860.00	120.43
Am-241	289	5.49	261	313	14,680.00	104.86

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:58:04PM 3/26/2007

Analyst: 60040
Detector: AV13

Calibration

Name: Mar2007_AV13
Description:

Calibration Date: 3/26/2007 4:58:01PM

Source Info

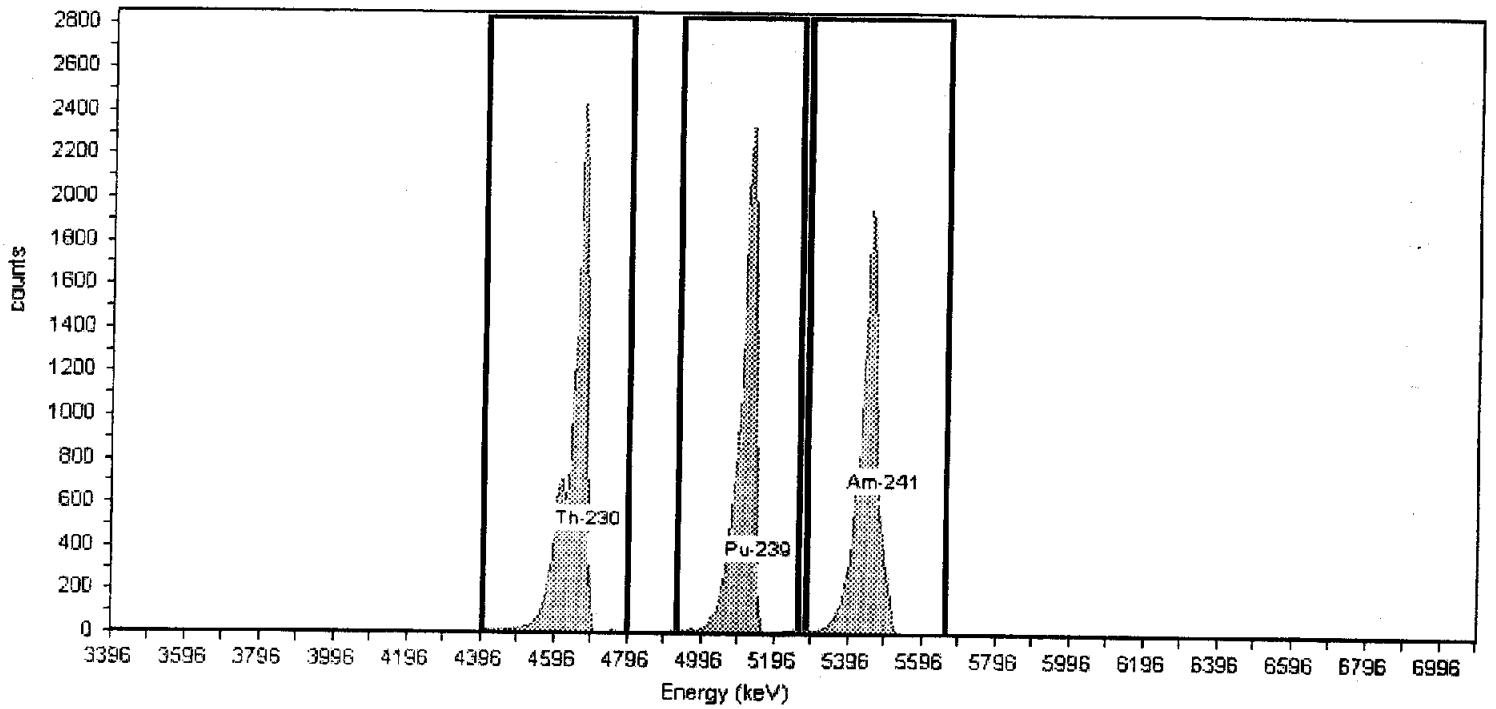
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV13 , SN: 41-172Q1
Acquisition Start Date: 3/26/2007 2:37:45PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.07% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,490.00	117.79
Pu-239	243	5.16	212	258	15,841.00	113.15
Am-241	289	5.49	261	313	14,727.00	105.19

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:58:12PM 3/26/2007

Analyst: 60040
Detector: AV14

Calibration

Name: Mar2007_AV14
Description:

Calibration Date: 3/26/2007 4:58:09PM

Source Info

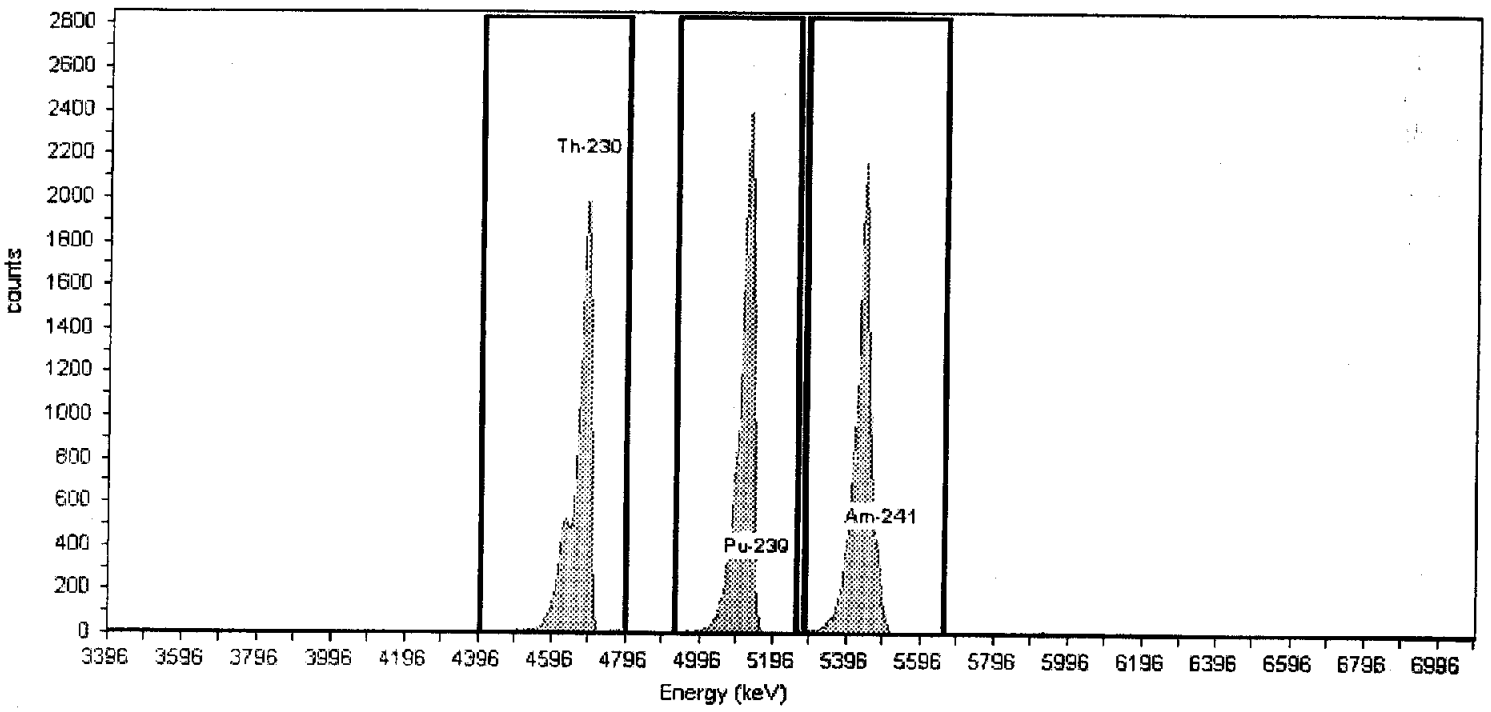
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV14 , SN: 41-172C4
Acquisition Start Date: 3/26/2007 2:37:47PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.56% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,378.00	88.41
Pu-239	243	5.16	212	258	14,747.00	105.34
Am-241	289	5.49	261	313	14,110.00	100.79

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:50:52AM 3/27/2007

Analyst: 60040
Detector: AV15

Calibration

Name: Mar2007_AV15
Description:

Calibration Date: 3/27/2007 6:50:49AM

Source Info

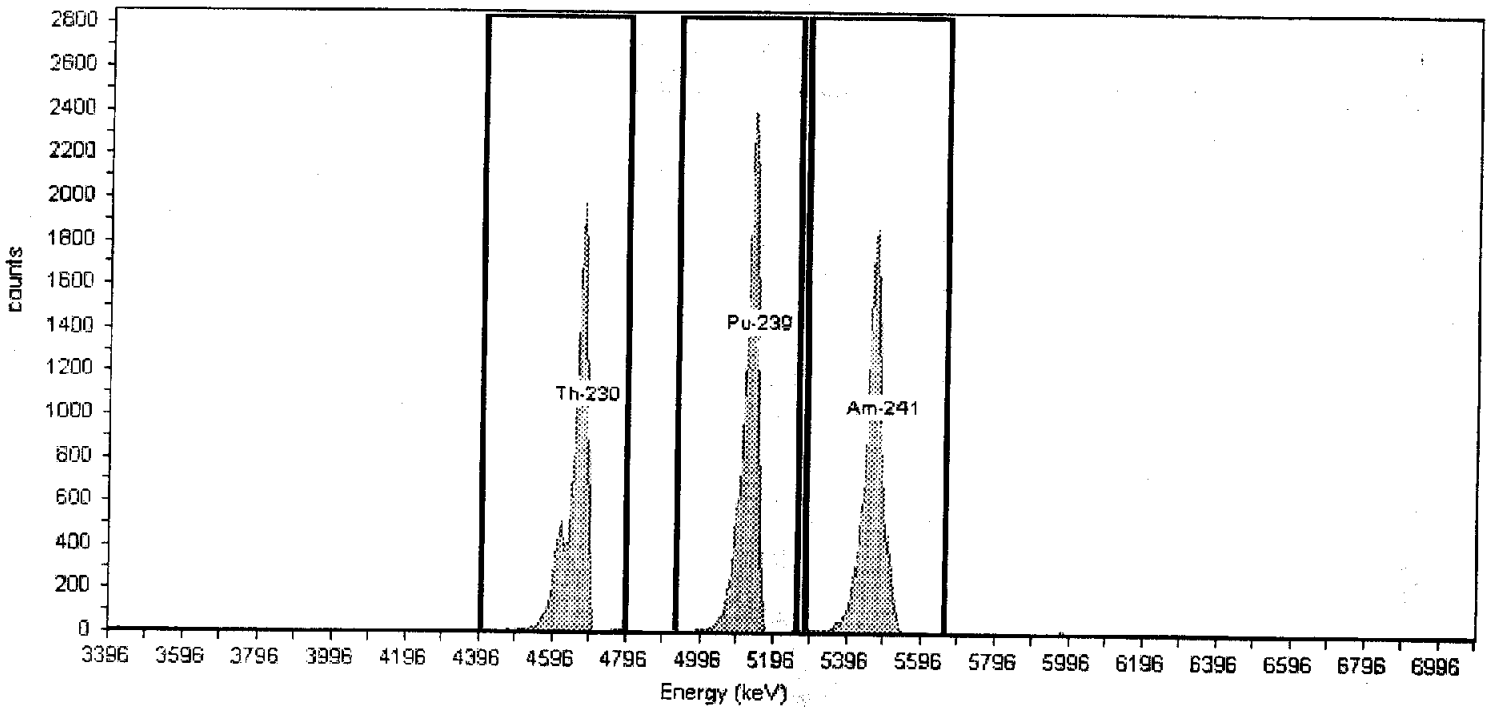
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 3/26/2007 5:01:40PM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 26.85% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,263.00	87.59
Pu-239	243	5.16	212	258	14,207.00	101.48
Am-241	289	5.49	261	313	13,183.00	94.16

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:49:27AM 3/27/2007

Analyst: 60040
Detector: AV17

Calibration

Name: Mar2007_AV17
Description:

Calibration Date: 3/27/2007 6:49:17AM

Source Info

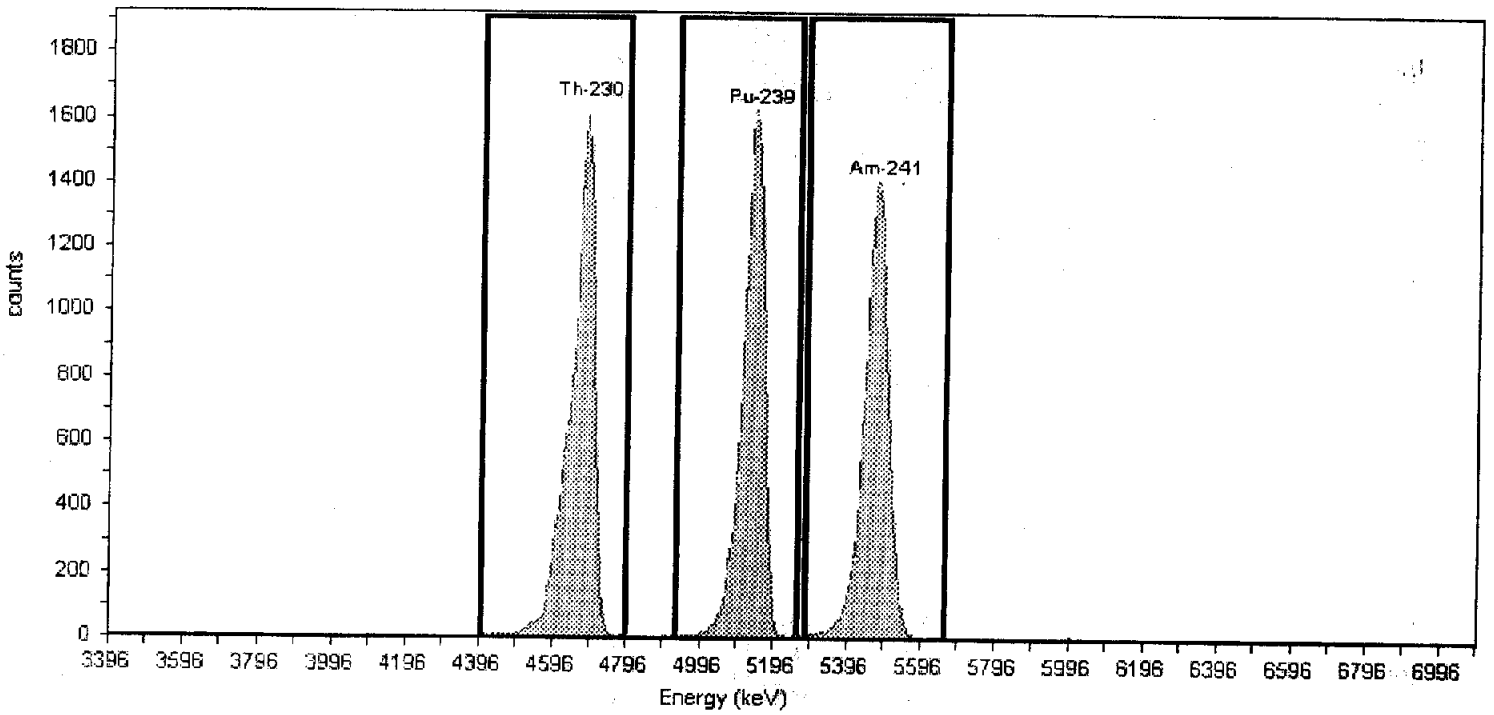
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV17 , SN: 41-172Q4
Acquisition Start Date: 3/26/2007 5:01:00PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.63% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,279.00	116.28
Pu-239	243	5.16	212	258	15,347.00	109.62
Am-241	289	5.49	261	313	14,680.00	104.86

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:50:46AM 3/27/2007

Analyst: 60040
Detector: AV18

Calibration

Name: Mar2007_AV18
Description:

Calibration Date: 3/27/2007 6:50:43AM

Source Info

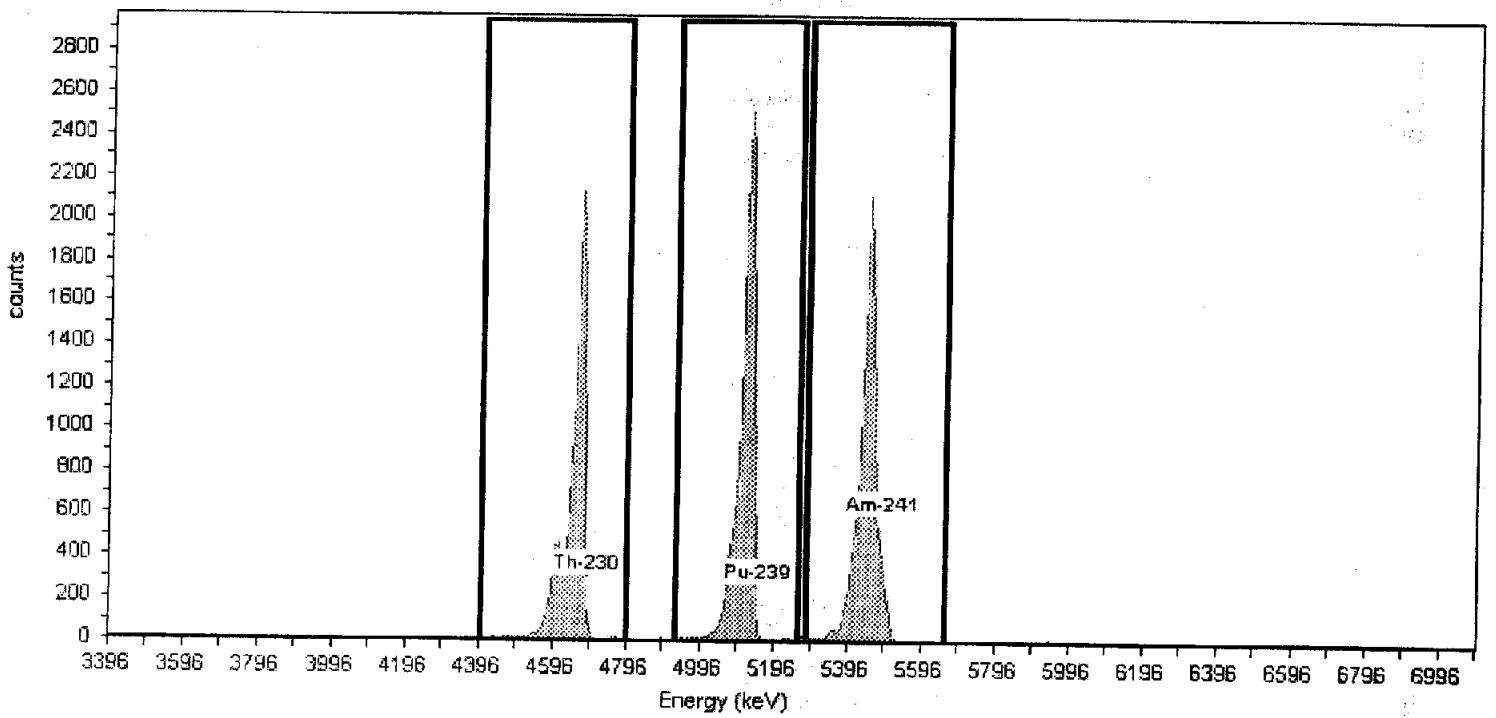
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV18 , SN: 41-172C6
Acquisition Start Date: 3/26/2007 5:01:01PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 25.21% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,881.00	84.86
Pu-239	243	5.16	212	258	13,855.00	98.96
Am-241	289	5.49	261	313	13,307.00	95.05

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV19

5:23:01PM 3/27/2007

Calibration

Name: Mar2007_AV19
Description:

Calibration Date: 3/27/2007 5:22:57PM

Source Info

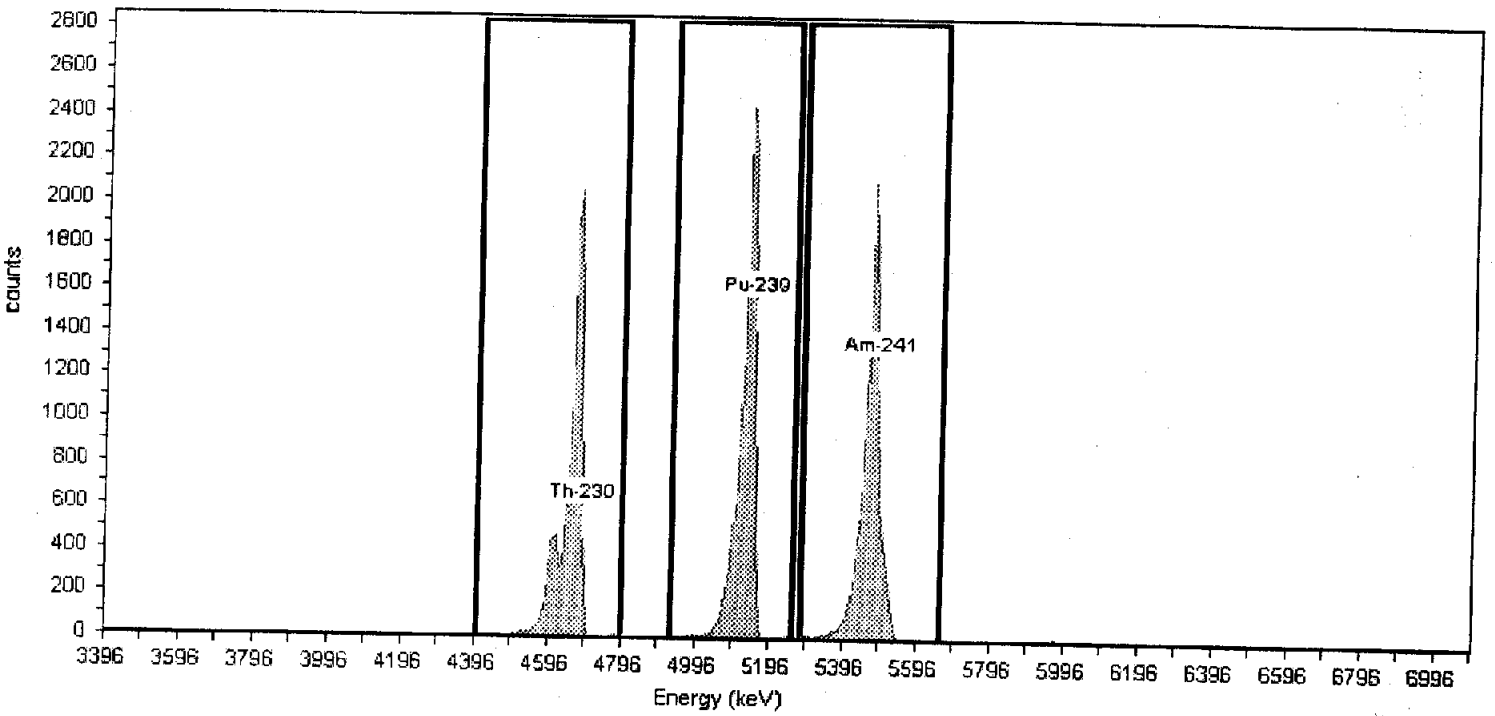
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV19 , SN: 41-172Q6
Acquisition Start Date: 3/27/2007 3:02:52PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.06% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,822.00	84.44
Pu-239	243	5.16	212	258	13,752.00	98.23
Am-241	289	5.49	261	313	12,909.00	92.21

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:50:59AM 3/27/2007

Analyst: 60040
Detector: AV20

Calibration

Name: Mar2007_AV20
Description:

Calibration Date: 3/27/2007 6:50:56AM

Source Info

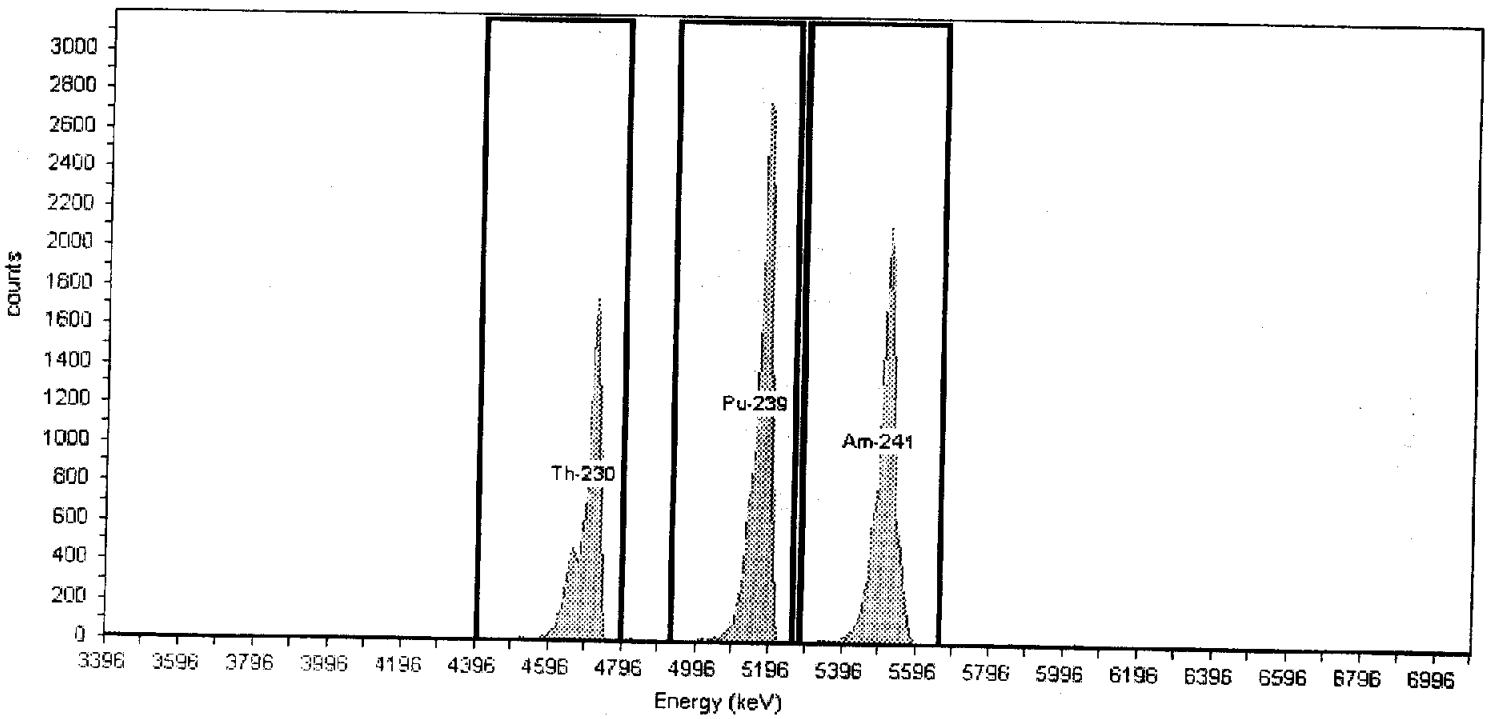
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV20 , SN: 41-172R2
Acquisition Start Date: 3/26/2007 5:01:45PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 27.03% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,596.00	82.83
Pu-239	243	5.16	212	258	17,660.00	126.14
Am-241	289	5.49	261	313	15,168.00	108.34

STL SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:23:08PM 3/27/2007

Analyst: 60040
Detector: AV21

Calibration

Name: Mar2007_AV21
Description:

Calibration Date: 3/27/2007 5:23:05PM

Source Info

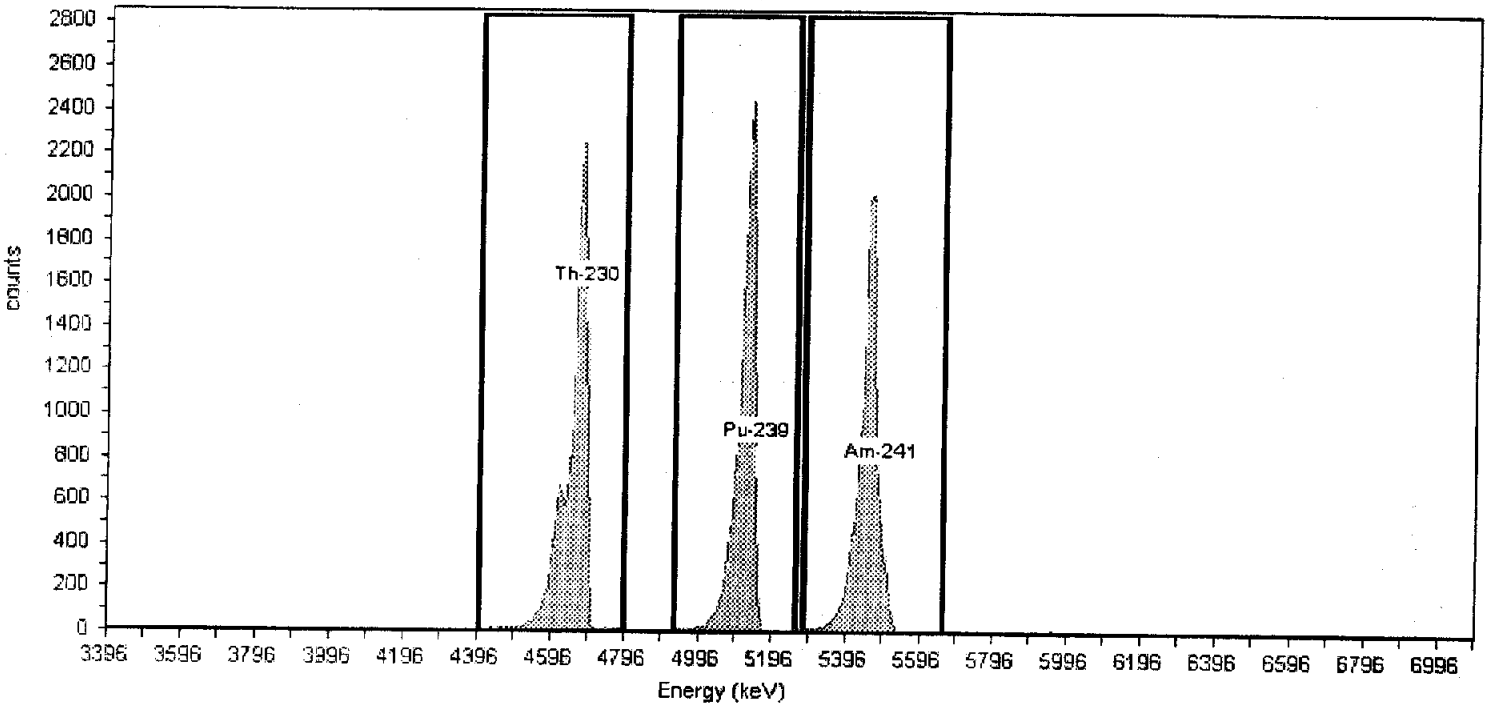
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV21 , SN: 41-172C7
Acquisition Start Date: 3/27/2007 3:02:20PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.40% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	15,962.00	114.01
Pu-239	243	5.16	212	258	15,413.00	110.09
Am-241	289	5.49	261	313	14,460.00	103.29

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:23:15PM 3/27/2007

Analyst: 60040
Detector: AV22

Calibration

Name: Mar2007_AV22
Description:

Calibration Date: 3/27/2007 5:23:12PM

Source Info

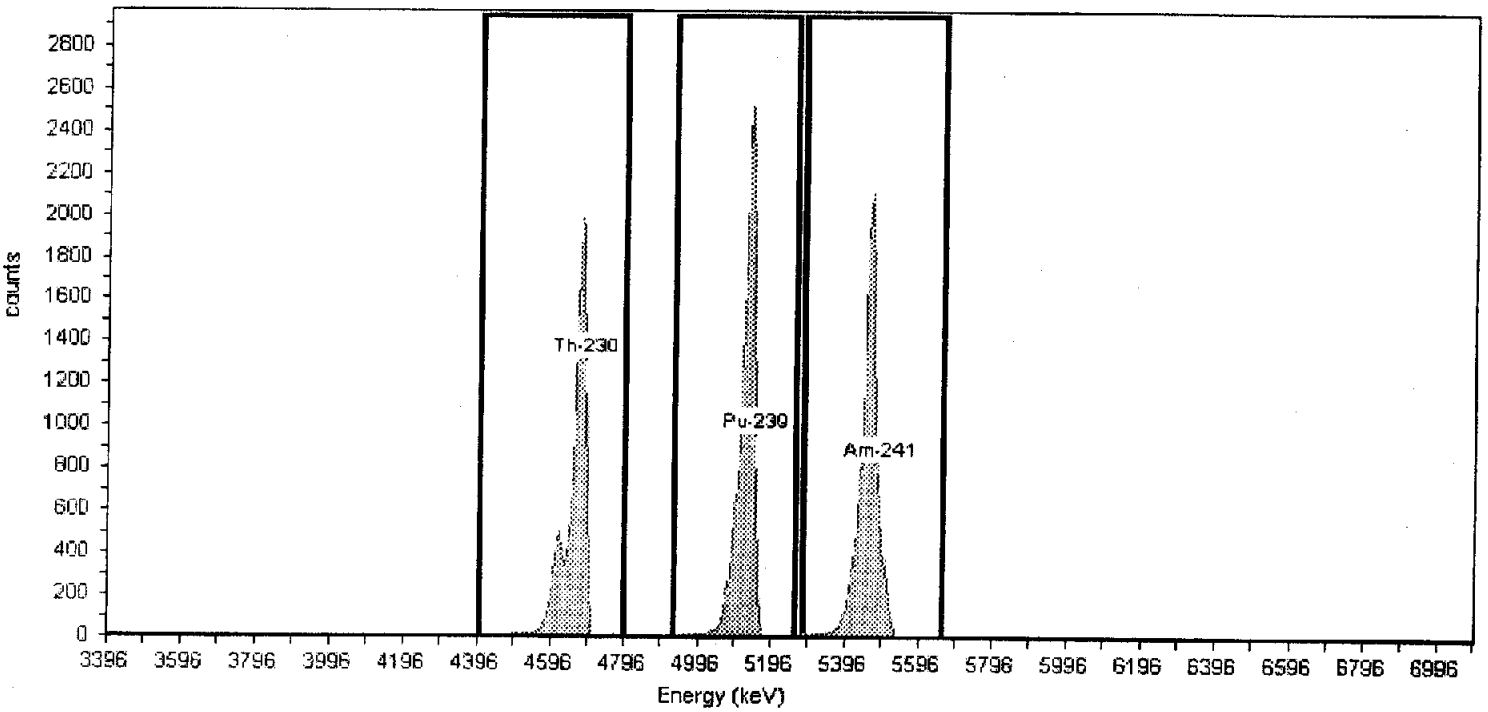
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV22 , SN: 41-172Q5
Acquisition Start Date: 3/27/2007 3:02:23PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 25.63% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,086.00	86.33
Pu-239	243	5.16	212	258	14,154.00	101.10
Am-241	289	5.49	261	313	13,460.00	96.14

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:11:07AM 3/28/2007

Analyst: 60040
Detector: AV23

Calibration

Name: Mar2007_AV23
Description:

Calibration Date: 3/28/2007 7:11:04AM

Source Info

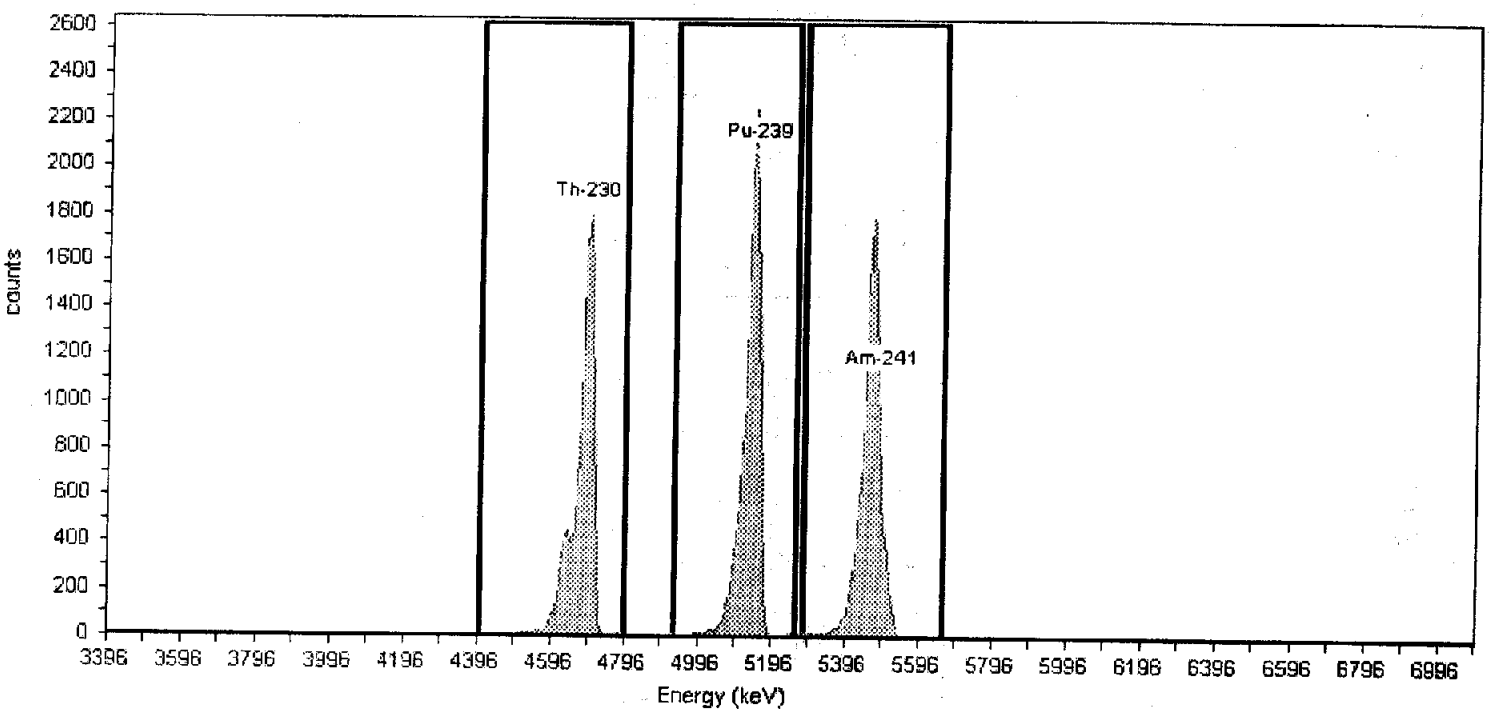
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV23 , SN: 41-172R4
Acquisition Start Date: 3/27/2007 5:34:24PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 26.77% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,313.00	87.95
Pu-239	243	5.16	212	258	14,000.00	100.00
Am-241	289	5.49	261	313	13,211.00	94.36

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:11:16AM 3/28/2007

Analyst: 60040
Detector: AV24

Calibration

Name: Mar2007_AV24
Description:

Calibration Date: 3/28/2007 7:11:08AM

Source Info

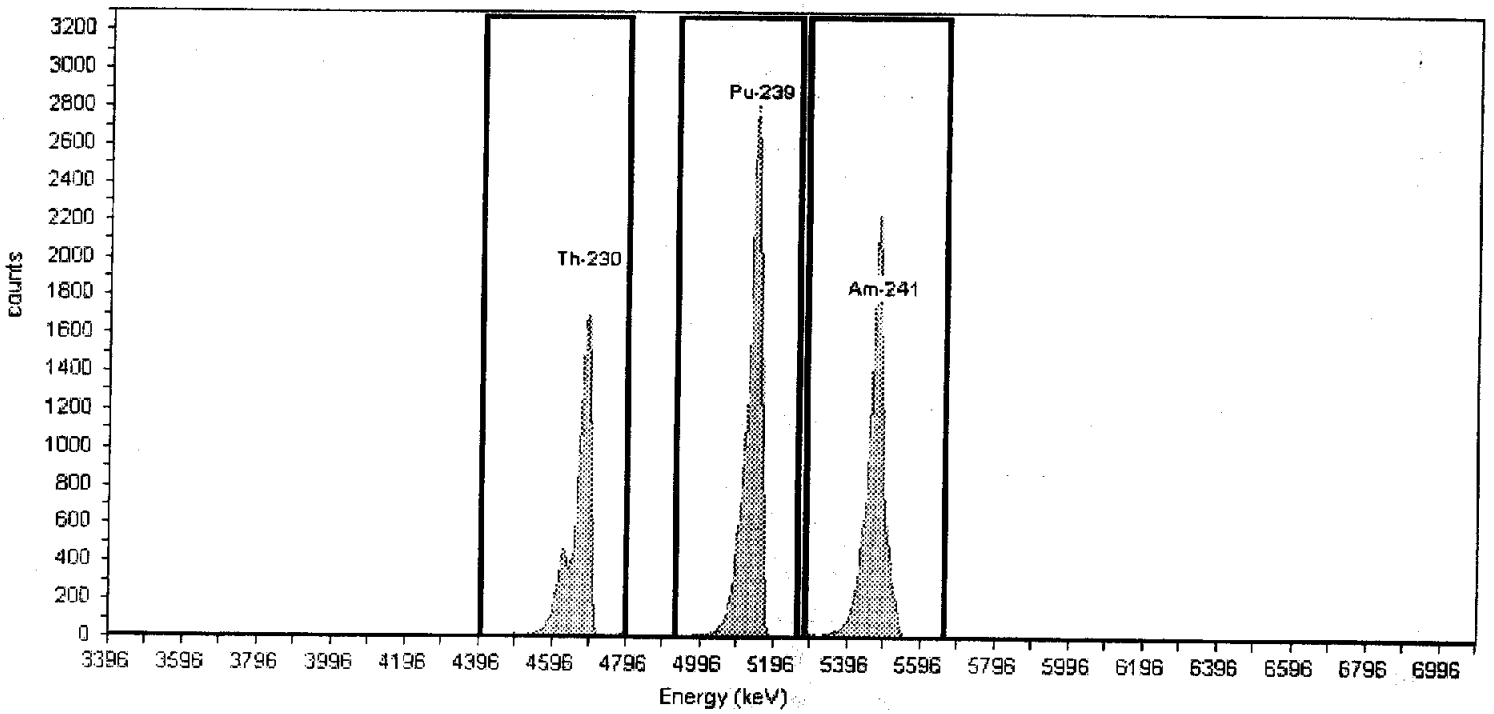
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV24 , SN: 41-172R5
Acquisition Start Date: 3/27/2007 5:34:26PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 26.02% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,109.00	79.35
Pu-239	243	5.16	212	258	17,122.00	122.30
Am-241	289	5.49	261	313	14,539.00	103.85

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:11:57AM 3/28/2007

Analyst: 60040
Detector: AV45

Calibration

Name: Mar2007_AV45
Description:

Calibration Date: 3/28/2007 11:11:54AM

Source Info

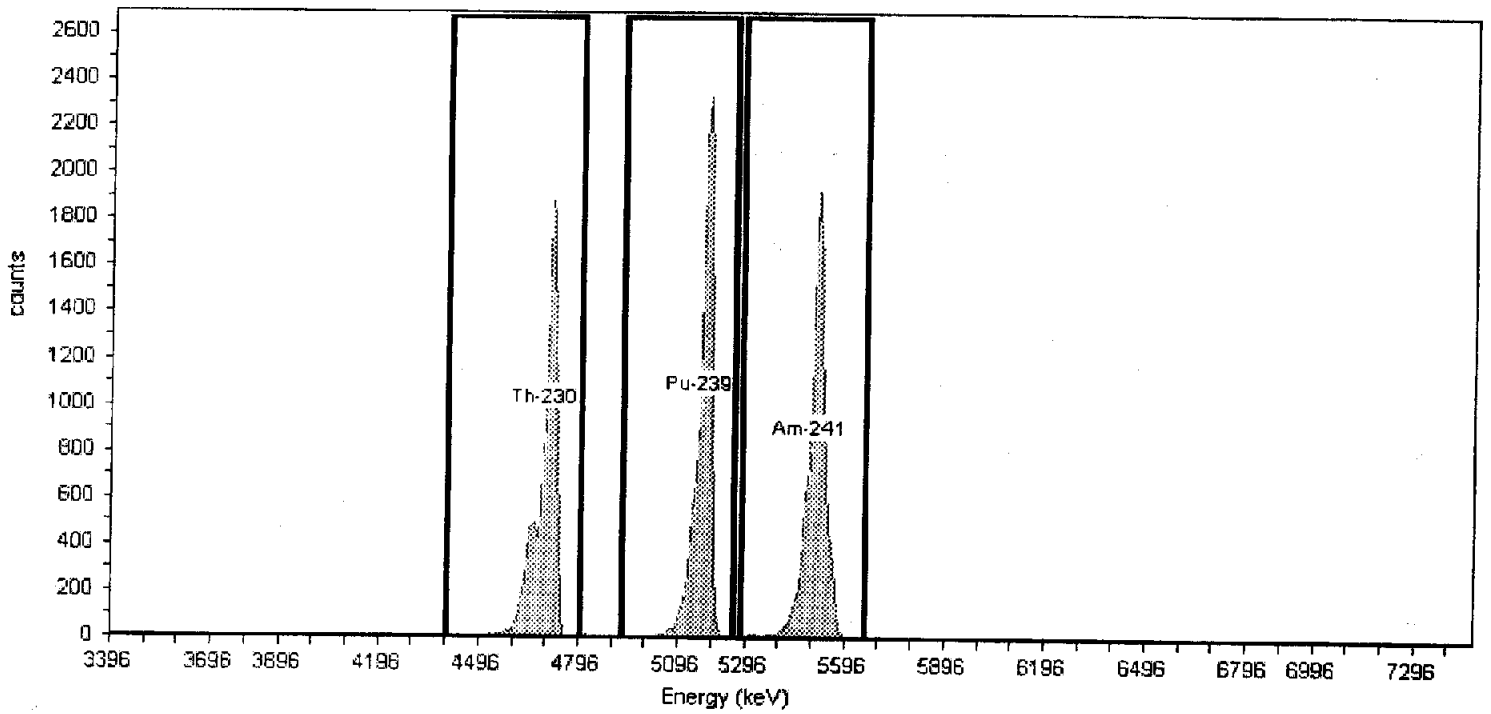
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV45 , SN: AV45
Acquisition Start Date: 3/28/2007 8:51:35AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.62% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,804.00	91.46
Pu-239	243	5.16	212	258	14,312.00	102.23
Am-241	289	5.49	261	313	13,665.00	97.61

STL SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:12:20AM 3/28/2007

Analyst: 60040
Detector: AV46

Calibration

Name: Mar2007_AV46
Description:

Calibration Date: 3/28/2007 11:12:17AM

Source Info

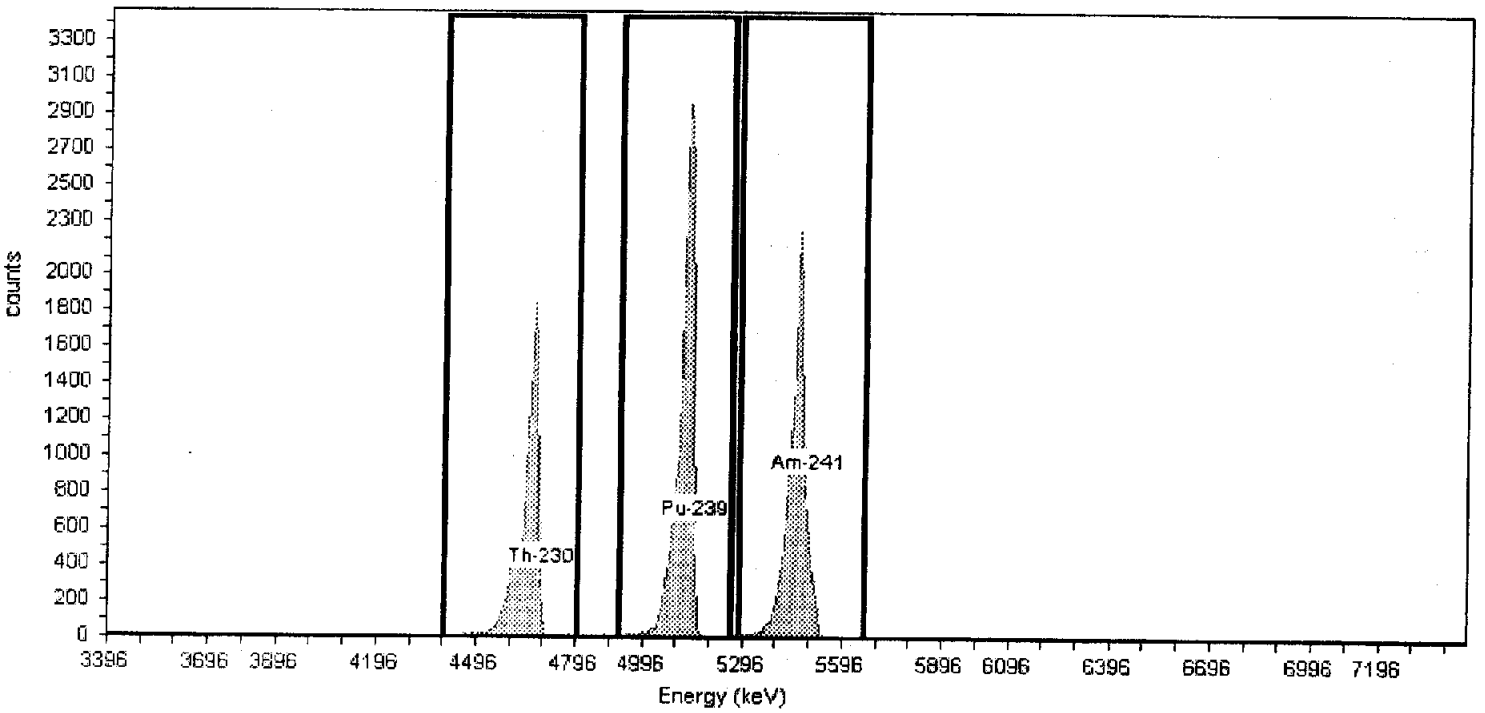
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV46 , SN: AV46
Acquisition Start Date: 3/28/2007 8:52:10AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.48% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,759.00	83.99
Pu-239	243	5.16	212	258	17,987.00	128.48
Am-241	289	5.49	261	313	15,425.00	110.18

ST

SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:12:06AM 3/28/2007

Analyst: 60040
Detector: AV47

Calibration

Name: Mar2007_AV47
Description:

Calibration Date: 3/28/2007 11:12:02AM

Source Info

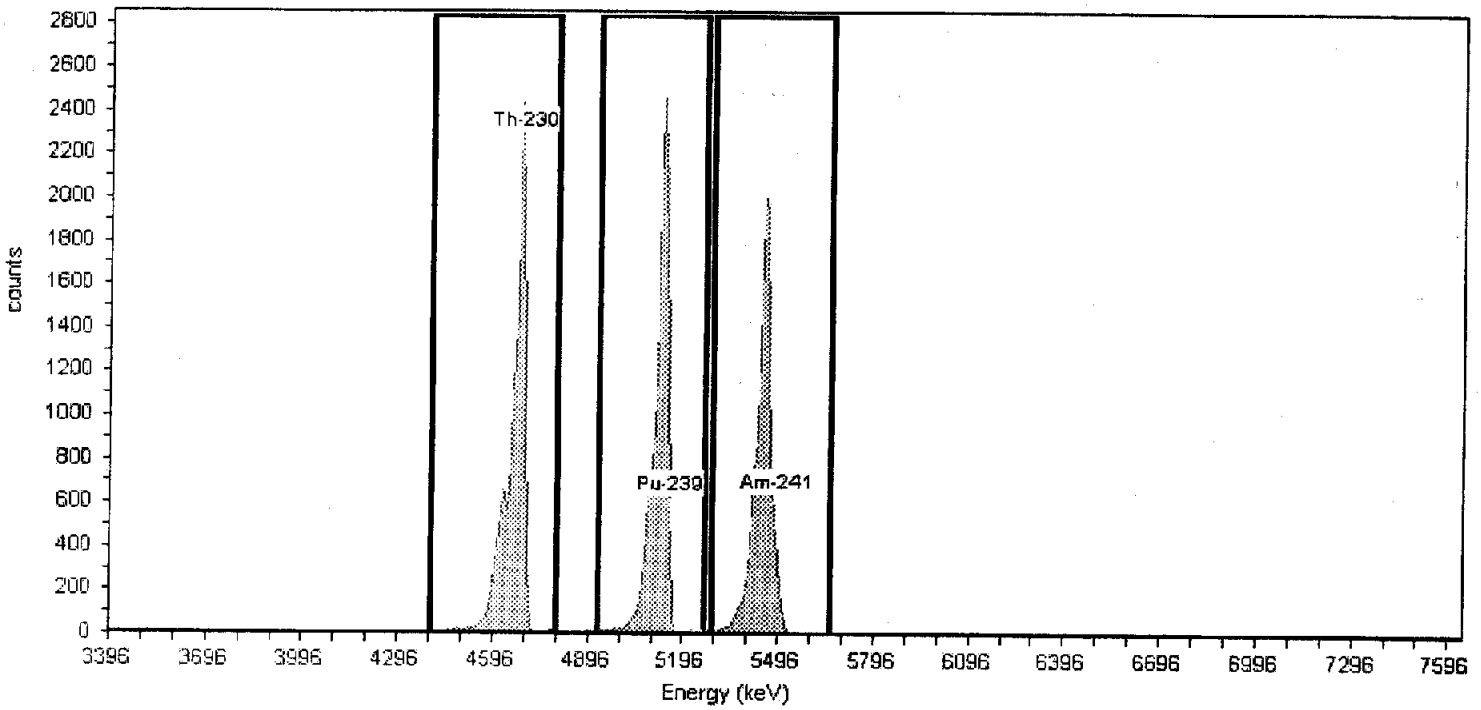
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV47 , SN: AV47
Acquisition Start Date: 3/28/2007 8:51:08AM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.21% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	15,965.00	114.04
Pu-239	243	5.16	212	258	15,280.00	109.14
Am-241	289	5.49	261	313	14,310.00	102.21

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:08:26PM 3/28/2007

Analyst: 60040
Detector: AV48

Calibration

Name: Mar2007_AV48
Description:

Calibration Date: 3/28/2007 4:08:22PM

Source Info

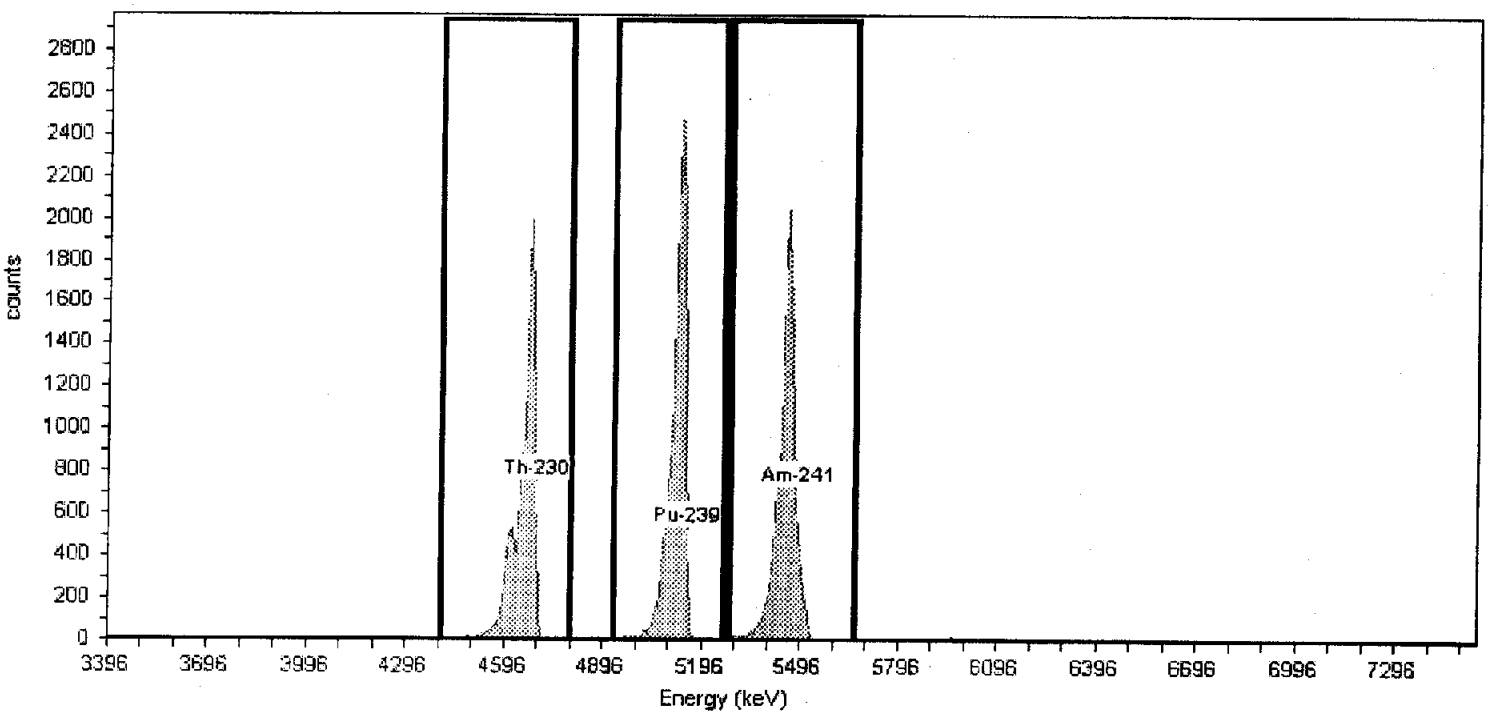
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV48 , SN: AV48
Acquisition Start Date: 3/28/2007 1:47:58PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.56% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,497.00	89.26
Pu-239	243	5.16	212	258	14,655.00	104.68
Am-241	289	5.49	261	313	13,998.00	99.99

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:09:12PM 3/28/2007

Analyst: 60040
Detector: AV49

Calibration

Name: Mar2007_AV49
Description:

Calibration Date: 3/28/2007 4:09:09PM

Source Info

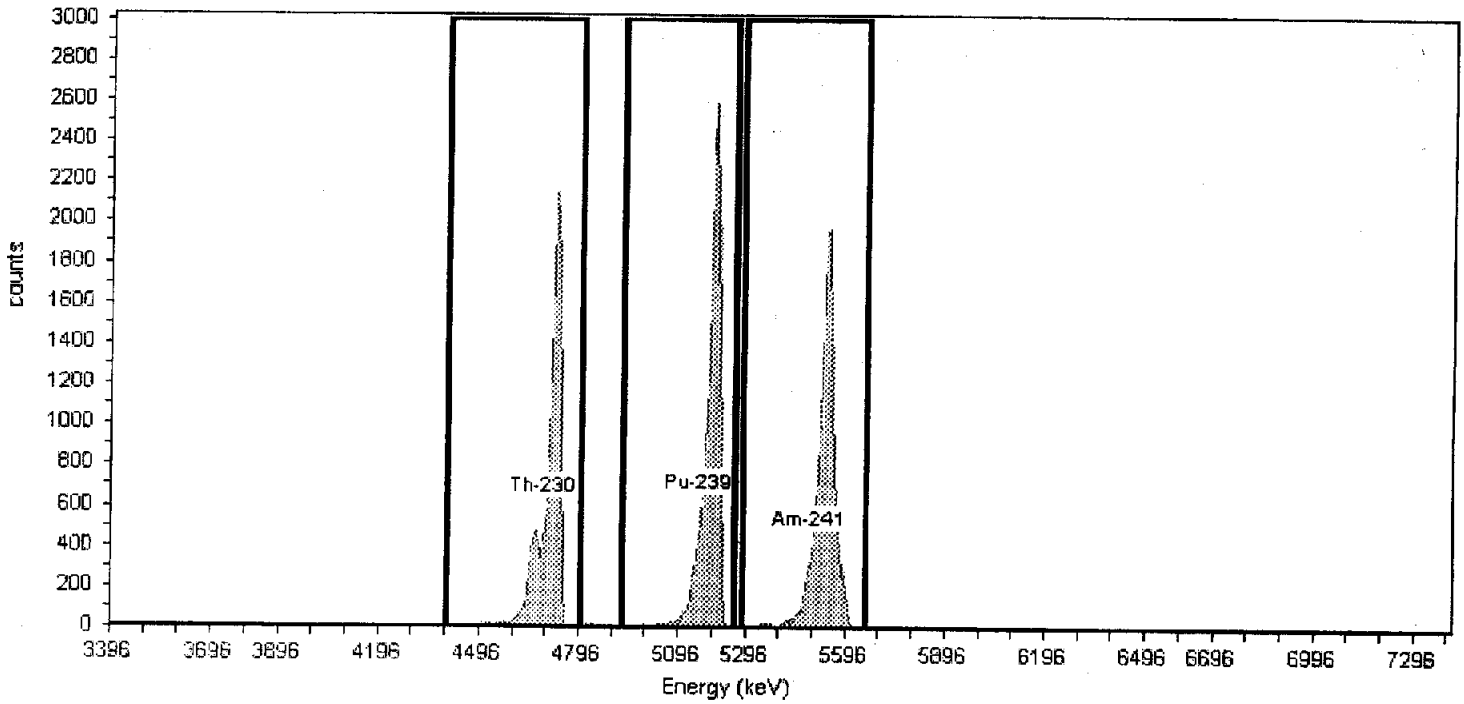
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV49 , SN: AV49
Acquisition Start Date: 3/28/2007 1:48:26PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.73% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,653.00	90.38
Pu-239	243	5.16	212	258	14,619.00	104.42
Am-241	289	5.49	261	313	13,676.00	97.69

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:09:20PM 3/28/2007

Analyst: 60040
Detector: AV50

Calibration

Name: Mar2007_AV50
Description:

Calibration Date: 3/28/2007 4:09:16PM

Source Info

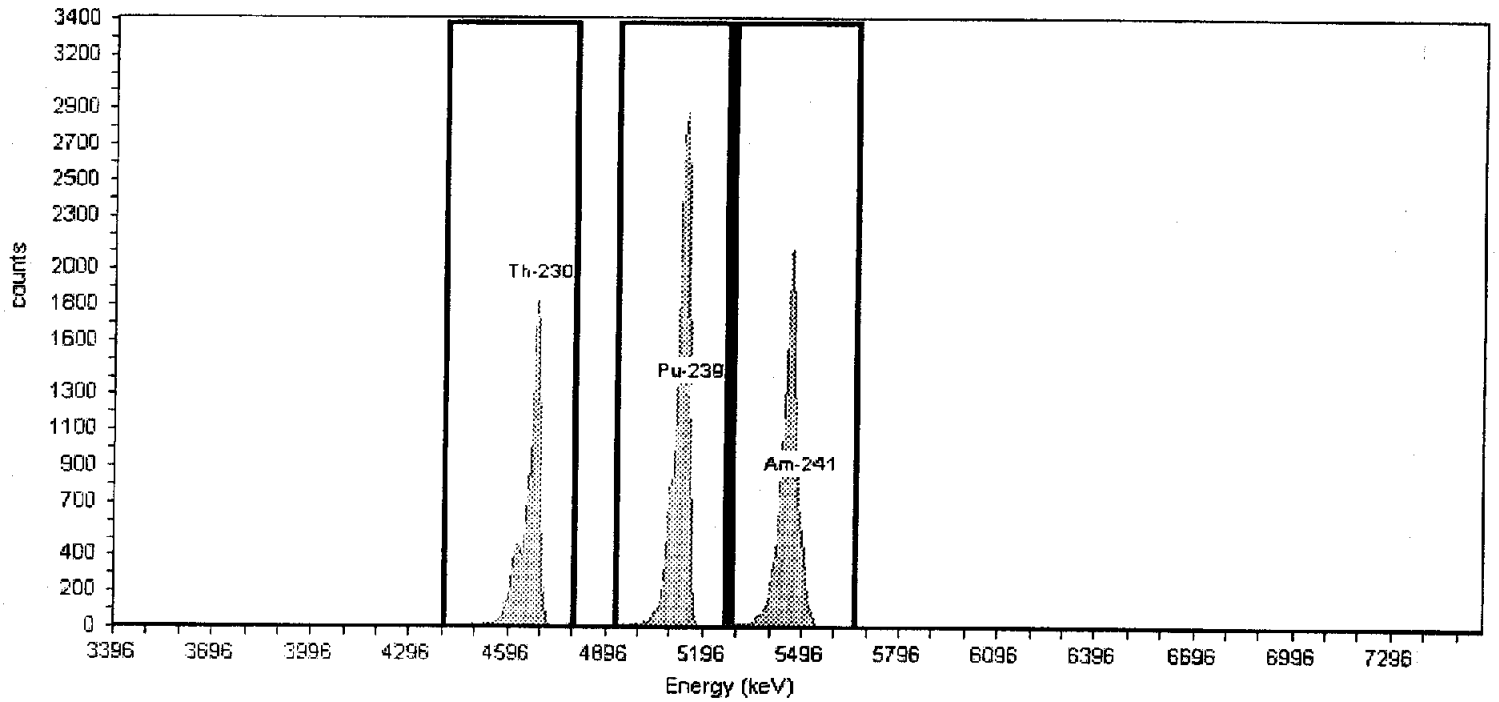
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV50 , SN: AV50
Acquisition Start Date: 3/28/2007 1:48:42PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.19% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,756.00	83.97
Pu-239	243	5.16	212	258	17,625.00	125.89
Am-241	289	5.49	261	313	15,314.00	109.39

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:07:58PM 3/28/2007

Analyst: 60040
Detector: AV51

Calibration

Name: Mar2007_AV51
Description:

Calibration Date: 3/28/2007 4:07:55PM

Source Info

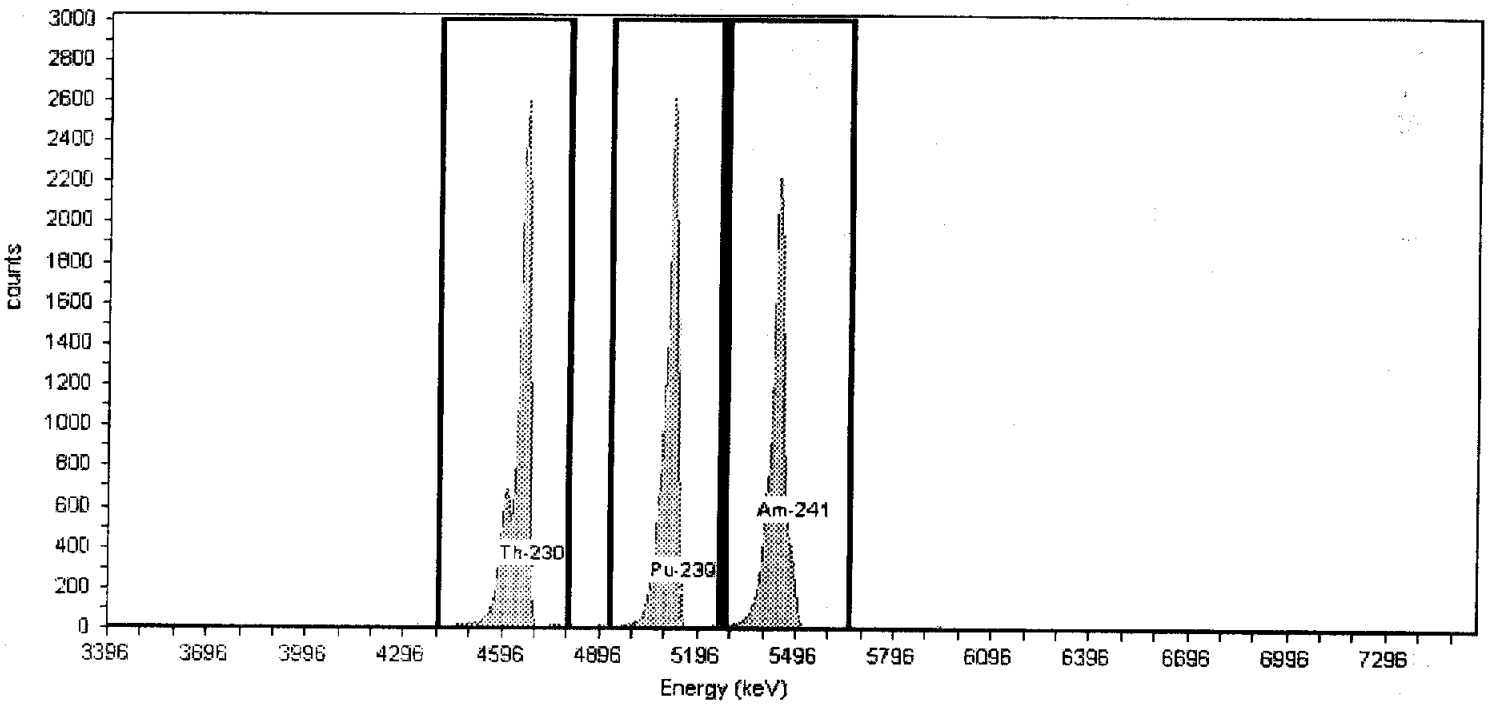
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV51 , SN:
Acquisition Start Date: 3/28/2007 1:47:46PM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 26.74% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,154.00	115.39
Pu-239	243	5.16	212	258	15,511.00	110.79
Am-241	289	5.49	261	313	14,748.00	105.34

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:39:58PM 3/28/2007

Analyst: 60040
Detector: AV52

Calibration

Name: Mar2007_AV52
Description:

Calibration Date: 3/28/2007 1:39:54PM

Source Info

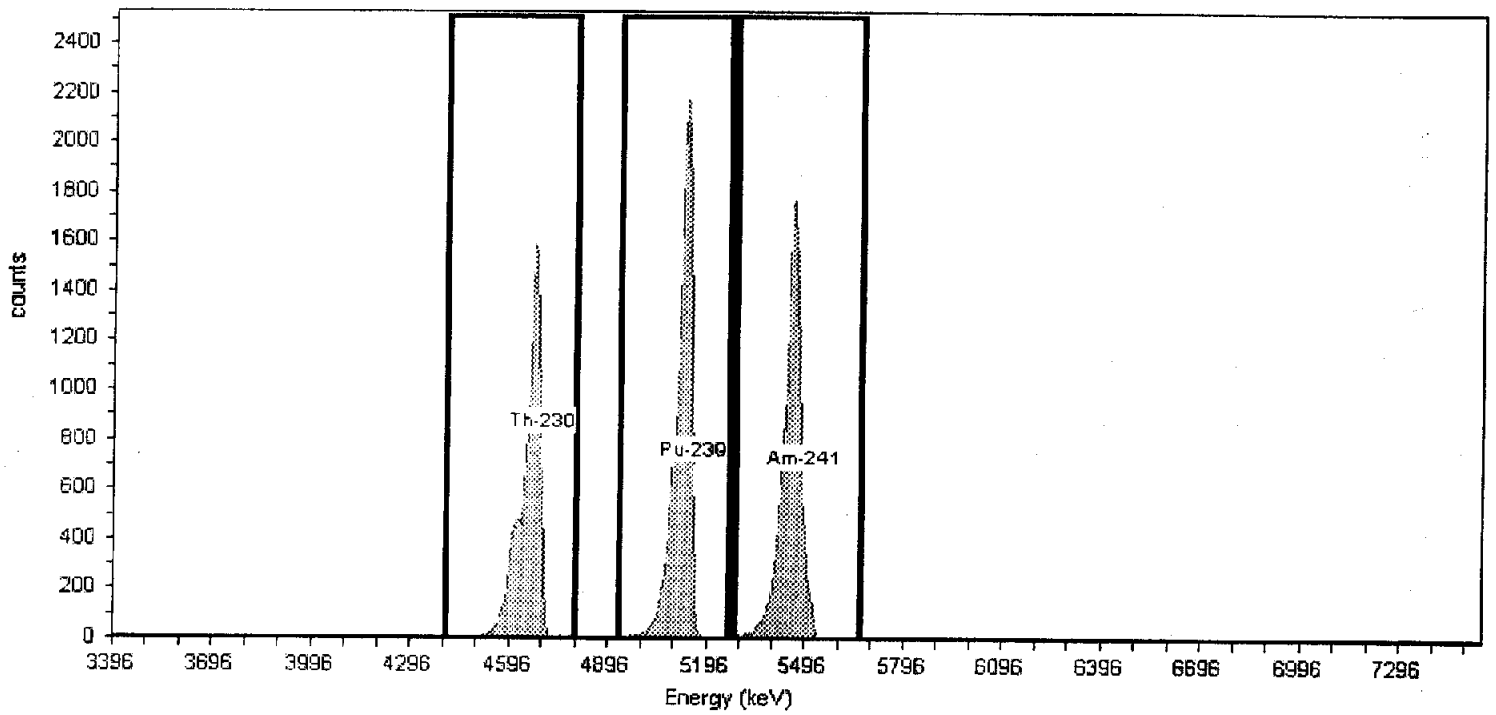
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV52 , SN:
Acquisition Start Date: 3/28/2007 11:19:46AM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 26.48% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,295.00	87.82
Pu-239	243	5.16	212	258	14,702.00	105.01
Am-241	289	5.49	261	313	14,158.00	101.13

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:57:52AM 3/29/2007

Analyst: 60040
Detector: AV53

Calibration

Name: Mar2007_AV53
Description:

Calibration Date: 3/29/2007 7:57:48AM

Source Info

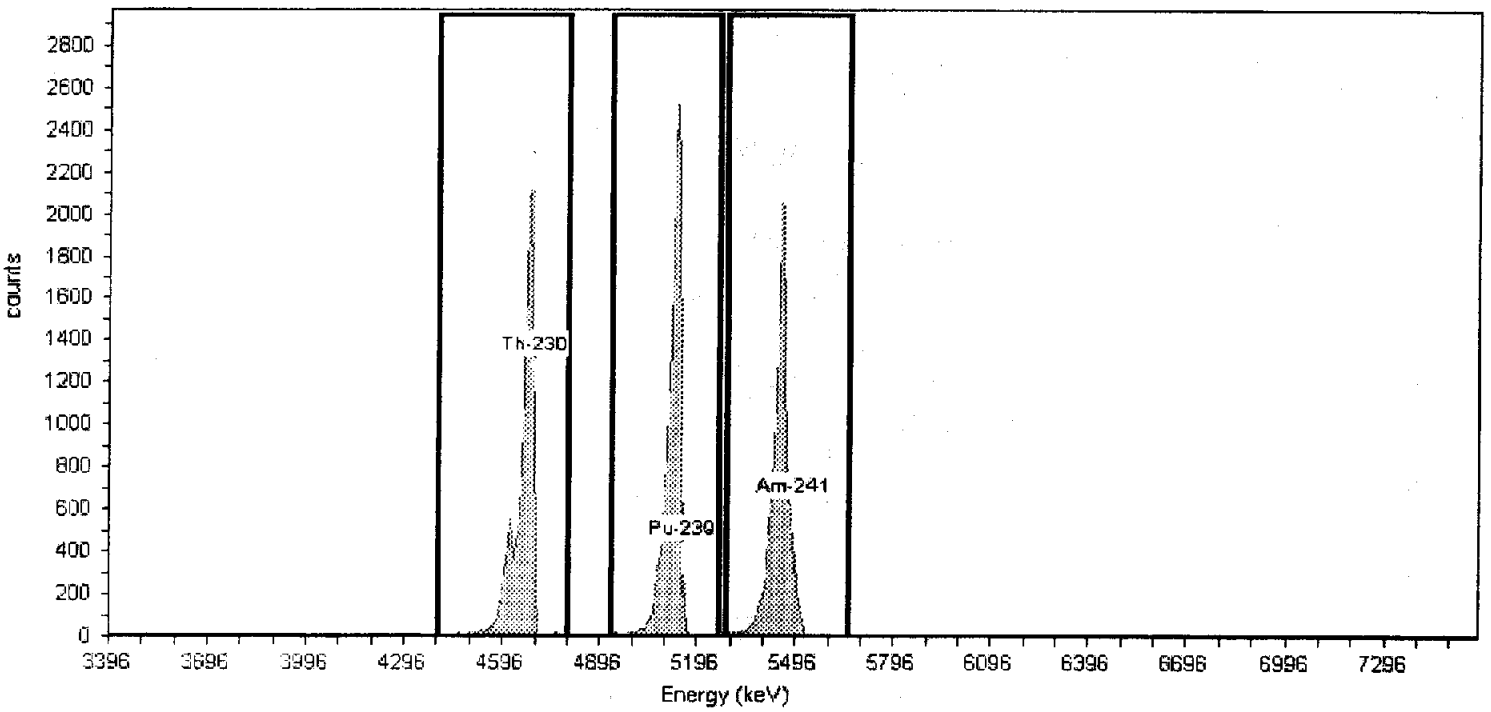
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV53 , SN:
Acquisition Start Date: 3/28/2007 4:15:43PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 27.62% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,716.00	90.83
Pu-239	243	5.16	212	258	14,515.00	103.68
Am-241	289	5.49	261	313	13,548.00	96.77

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:58:09AM 3/29/2007

Analyst: 60040
Detector: AV54

Calibration

Name: Mar2007_AV54
Description:

Calibration Date: 3/29/2007 7:57:55AM

Source Info

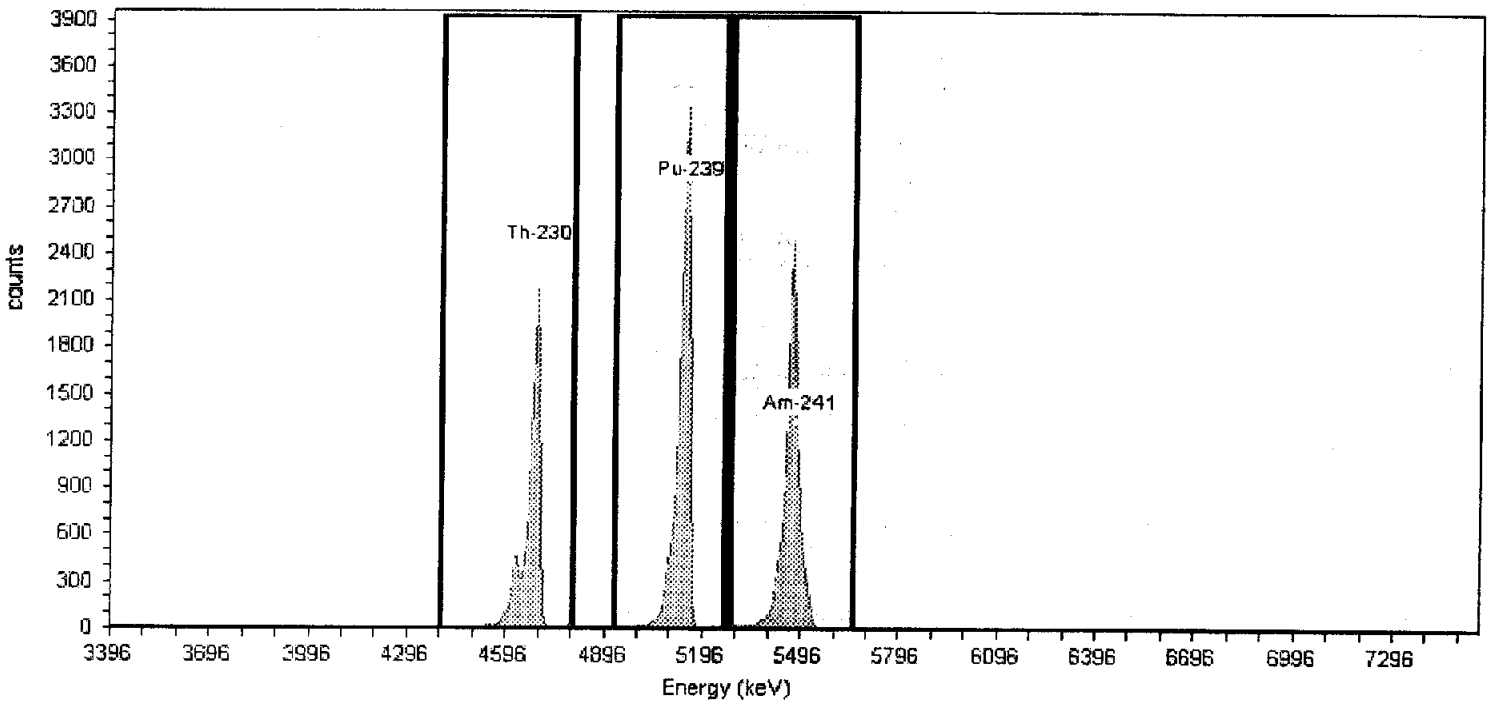
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV54 , SN:
Acquisition Start Date: 3/28/2007 4:15:44PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.90% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,834.00	84.53
Pu-239	243	5.16	212	258	17,374.00	124.10
Am-241	289	5.49	261	313	15,023.00	107.31

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:57:40AM 3/29/2007

Analyst: 60040
Detector: AV55

Calibration

Name: Mar2007_AV55
Description:

Calibration Date: 3/29/2007 7:57:37AM

Source Info

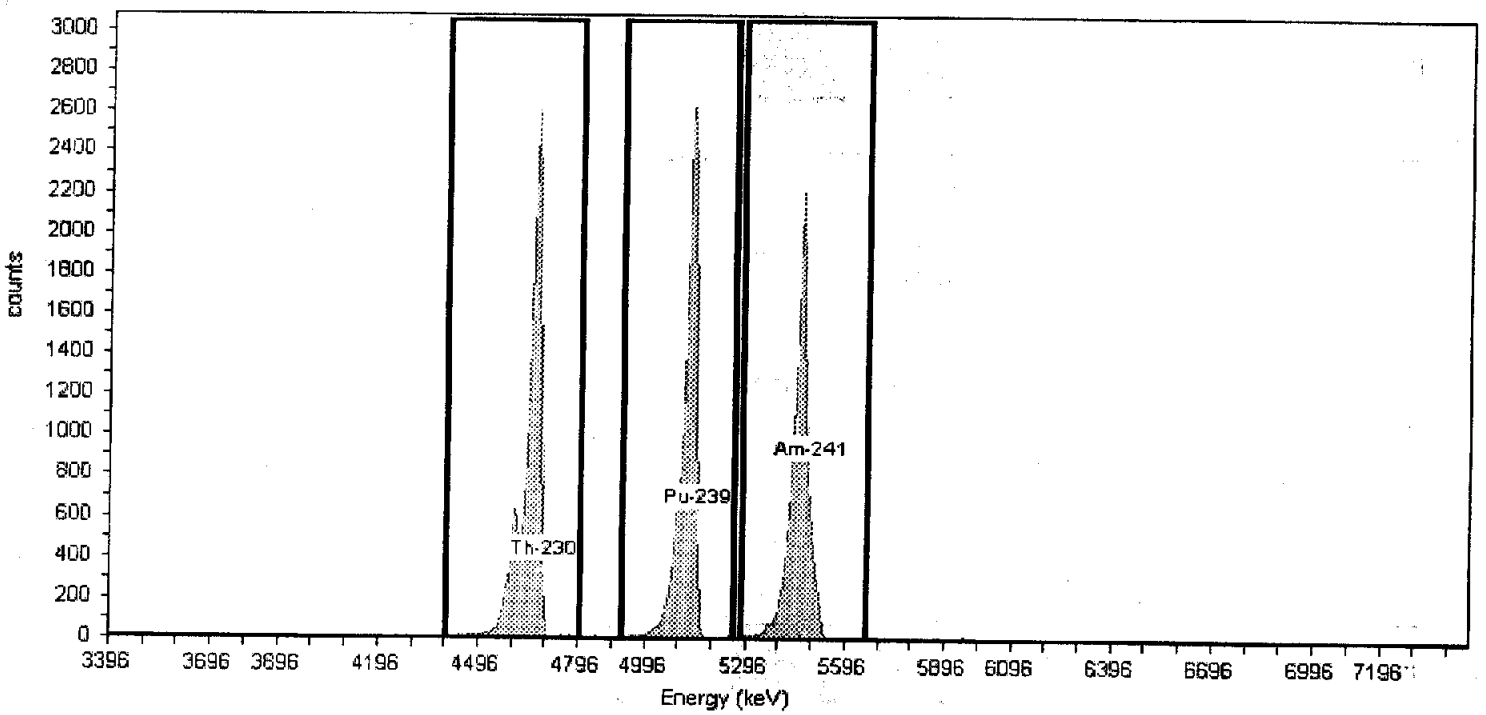
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV55 , SN:
Acquisition Start Date: 3/28/2007 4:14:58PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.62% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,240.00	116.00
Pu-239	243	5.16	212	258	15,304.00	109.31
Am-241	289	5.49	261	313	14,719.00	105.14

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:57:45AM 3/29/2007

Analyst: 60040
Detector: AV56

Calibration

Name: Mar2007_AV56
Description:

Calibration Date: 3/29/2007 7:57:42AM

Source Info

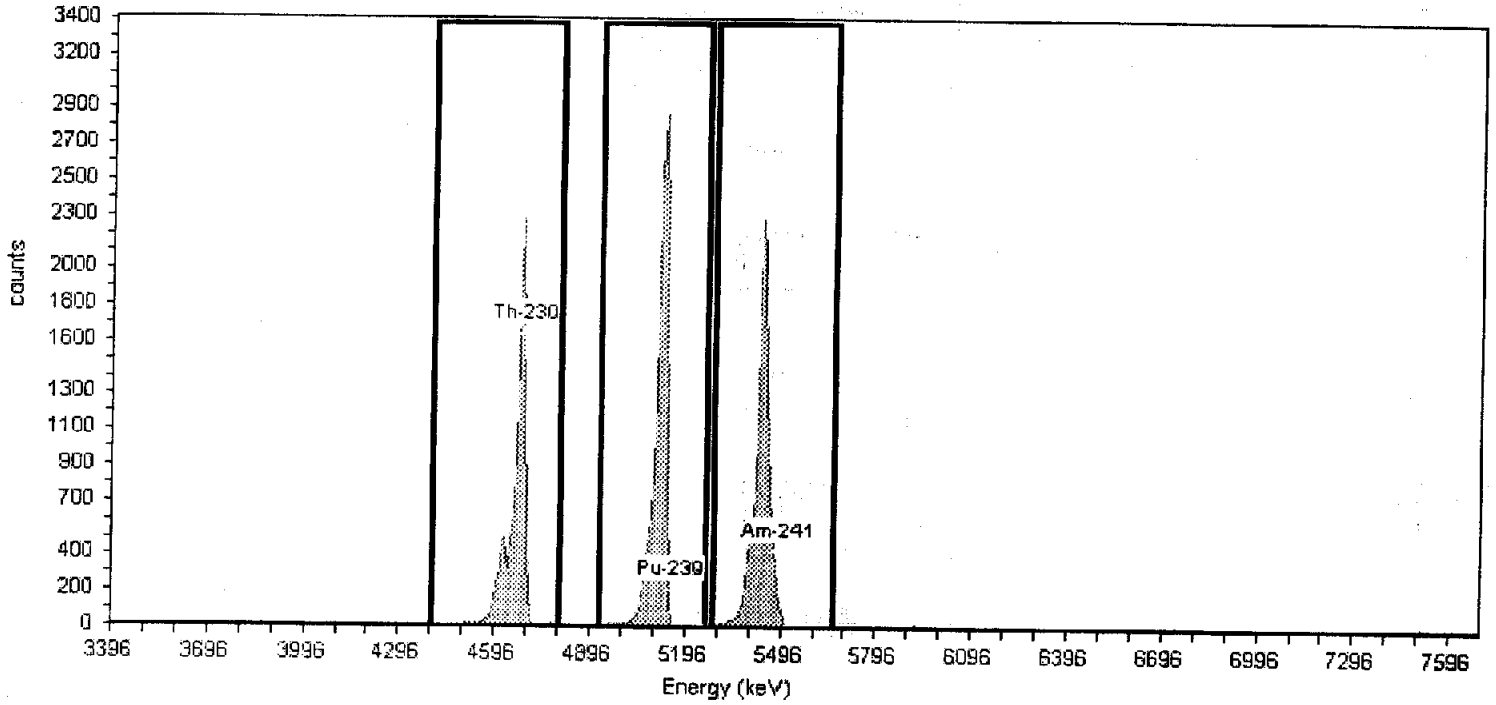
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV56 , SN:
Acquisition Start Date: 3/28/2007 4:15:08PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.20% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,140.00	86.71
Pu-239	243	5.16	212	258	14,589.00	104.21
Am-241	289	5.49	261	313	14,002.00	100.01

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:27:06AM 3/29/2007

Analyst: 60040
Detector: AV57

Calibration

Name: Mar2007_AV57
Description:

Calibration Date: 3/29/2007 11:27:02AM

Source Info

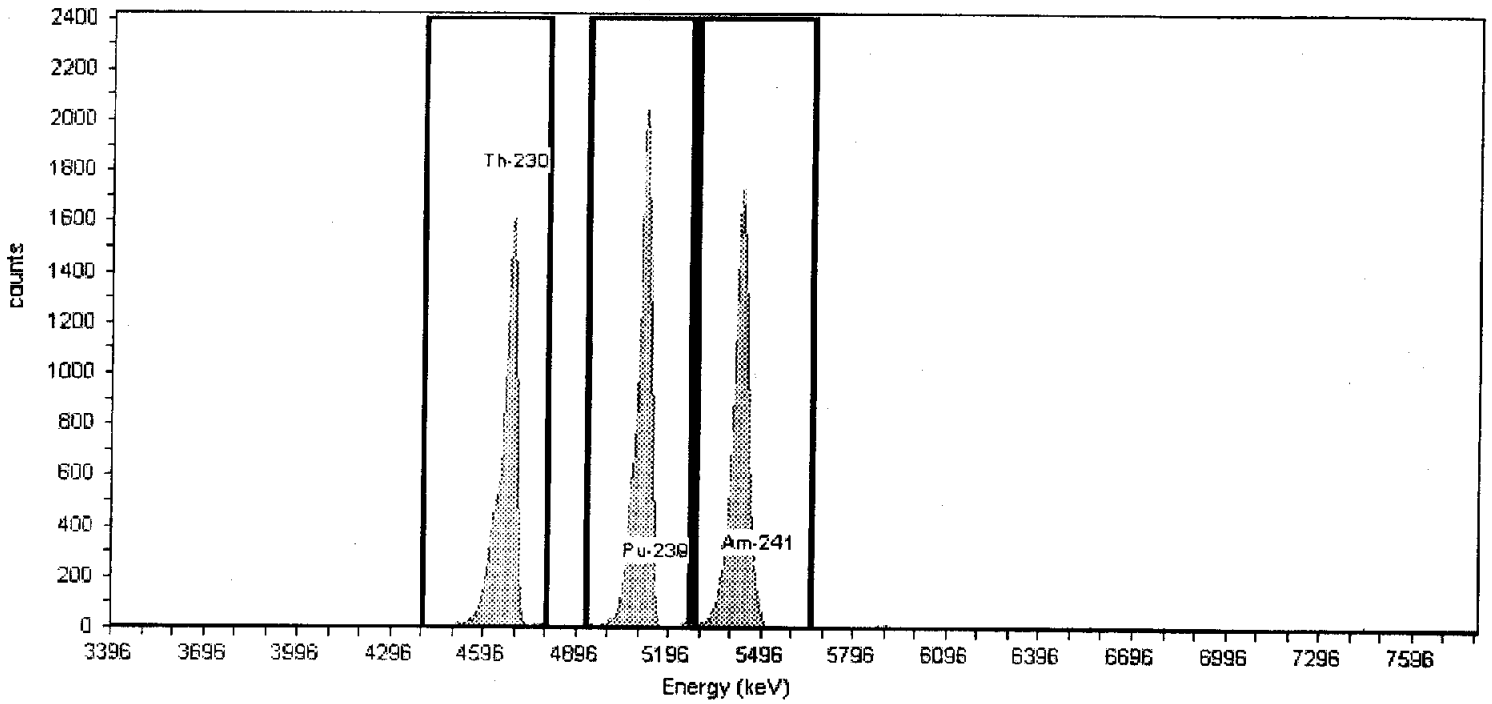
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV57 , SN:
Acquisition Start Date: 3/29/2007 9:05:10AM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 27.21% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,529.00	89.49
Pu-239	243	5.16	212	258	14,285.00	102.04
Am-241	289	5.49	261	313	13,365.00	95.46

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:27:13AM 3/29/2007

Analyst: 60040
Detector: AV58

Calibration

Name: Mar2007_AV58
Description:

Calibration Date: 3/29/2007 11:27:10AM

Source Info

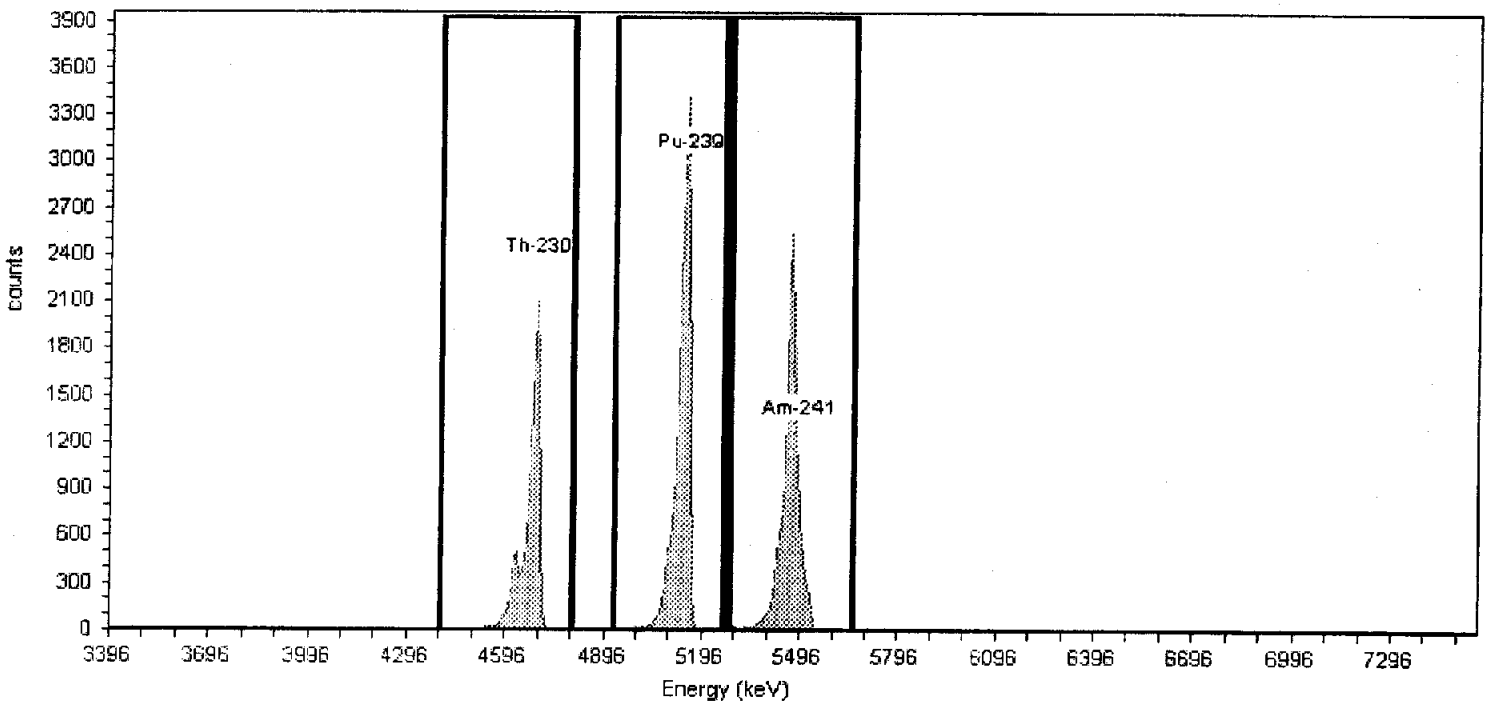
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV58 , SN:
Acquisition Start Date: 3/29/2007 9:05:28AM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 27.69% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,832.00	84.51
Pu-239	243	5.16	212	258	18,235.00	130.25
Am-241	289	5.49	261	313	15,446.00	110.33

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:36:58AM 3/29/2007

Analyst: 60040
Detector: AV59

Calibration

Name: Mar2007_AV59
Description:

Calibration Date: 3/29/2007 11:36:54AM

Source Info

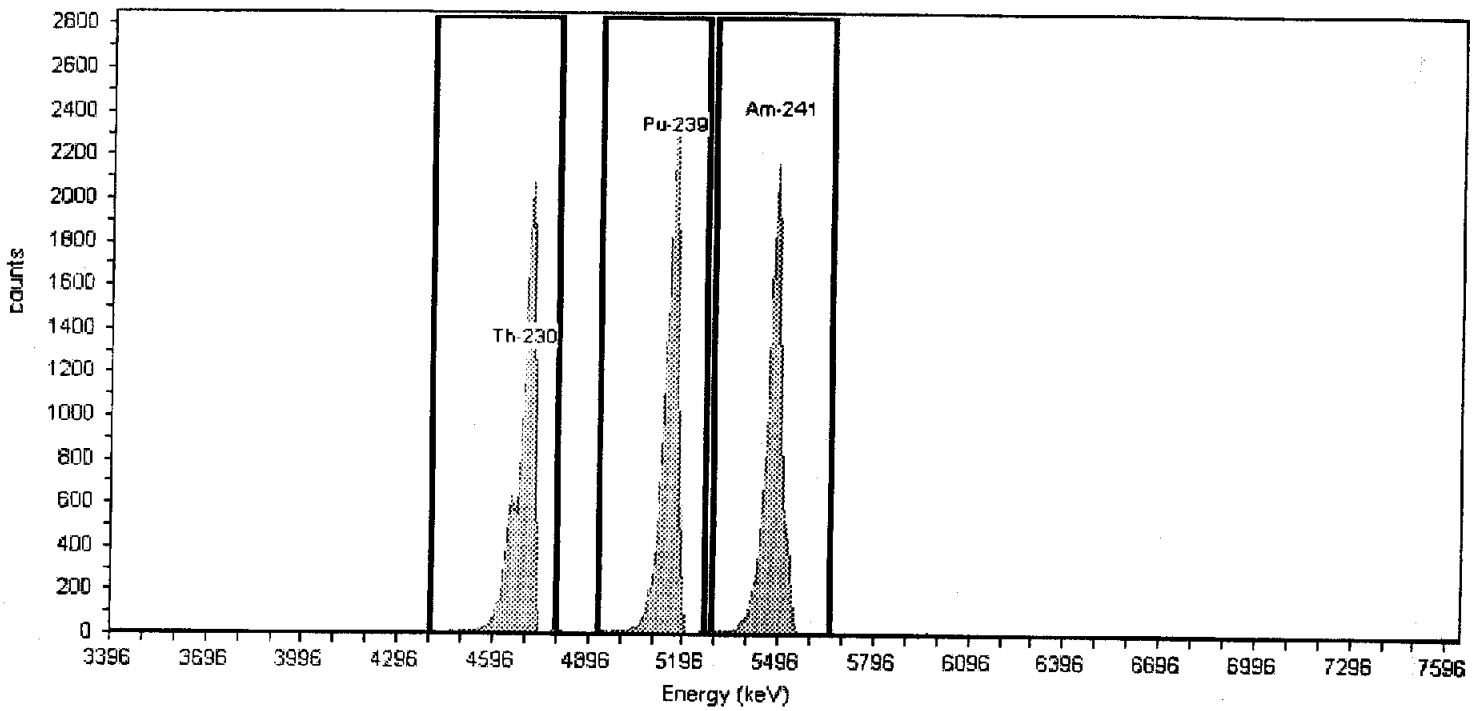
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV59 , SN:
Acquisition Start Date: 3/29/2007 9:04:40AM
Live Time: 140.00 min.
Real Time: 152.15 min.
Efficiency: 26.84% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	14,806.00	105.76
Pu-239	243	5.16	212	258	15,892.00	113.51
Am-241	289	5.49	261	313	15,489.00	110.64

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:16:20AM 3/28/2007

Analyst: 60040
Detector: AV60

Calibration

Name: Mar2007_AV60
Description:

Calibration Date: 3/28/2007 11:16:17AM

Source Info

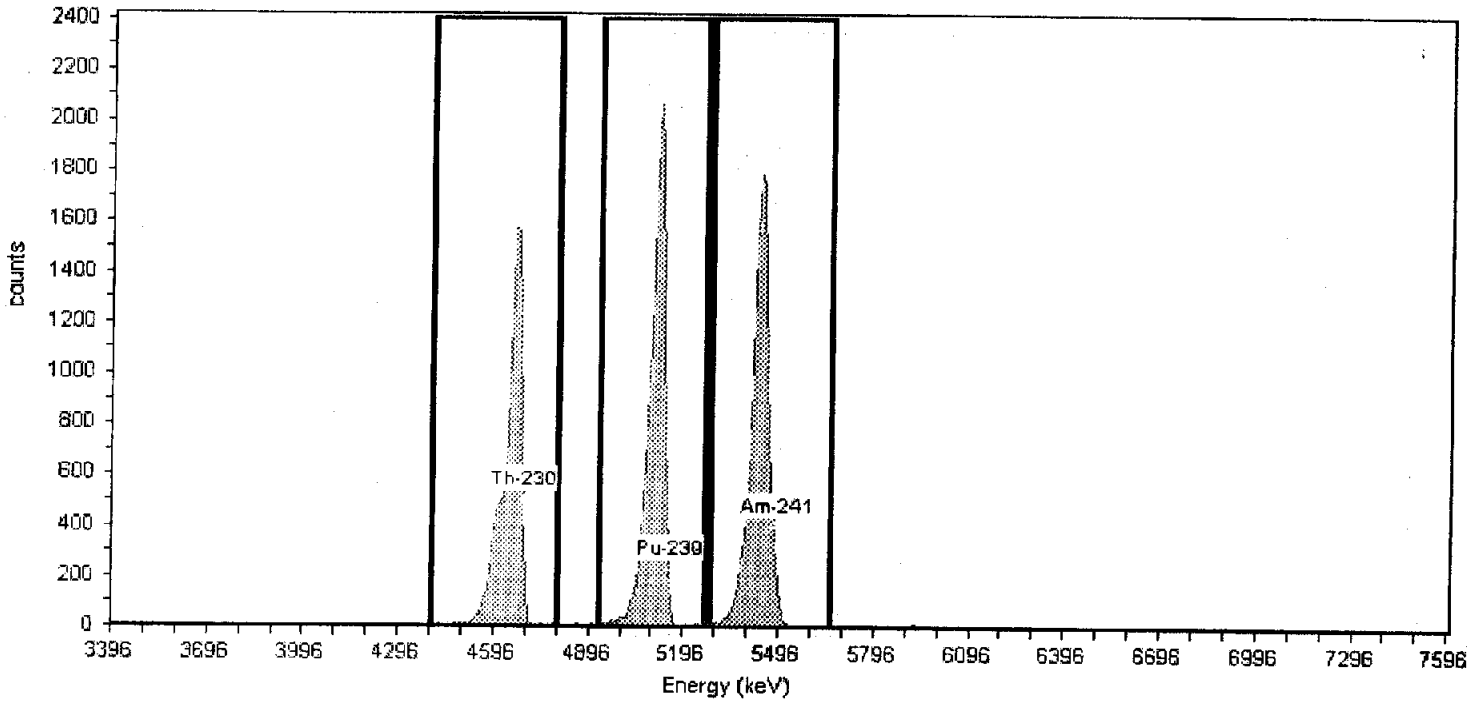
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV60 , SN:
Acquisition Start Date: 3/28/2007 8:51:43AM
Live Time: 140.00 min.
Real Time: 144.57 min.
Efficiency: 27.45% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,526.00	89.47
Pu-239	243	5.16	212	258	15,340.00	109.57
Am-241	289	5.49	261	313	14,990.00	107.07

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:43:51PM 3/28/2007

Analyst: 60040
Detector: AV63

Calibration

Name: Mar2007_AV63
Description:

Calibration Date: 3/28/2007 1:43:48PM

Source Info

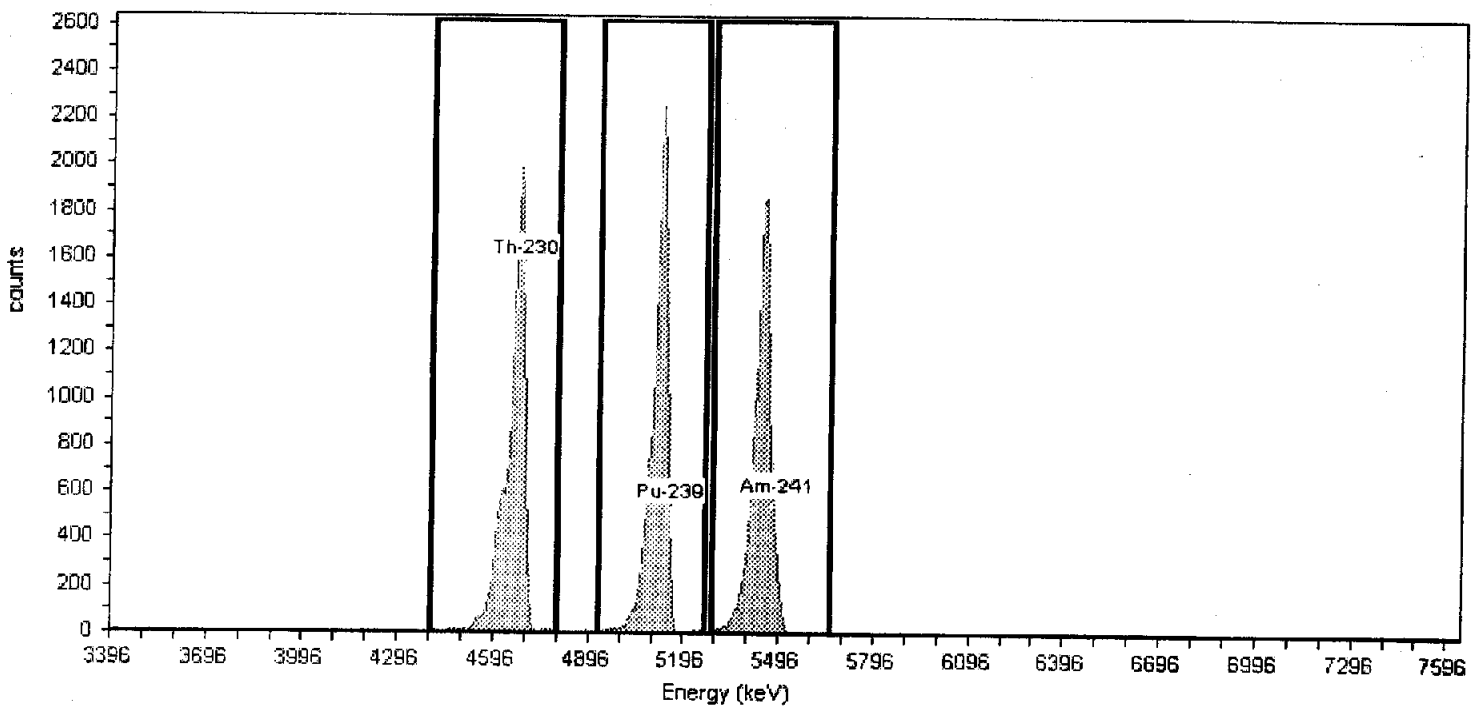
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV63 , SN:
Acquisition Start Date: 3/28/2007 11:19:23AM
Live Time: 140.00 min.
Real Time: 144.35 min.
Efficiency: 26.79% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	15,645.00	111.75
Pu-239	243	5.16	212	258	15,568.00	111.20
Am-241	289	5.49	261	313	15,097.00	107.84

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:37:34AM 3/29/2007

Analyst: 60040
Detector: AV64

Calibration

Name: Mar2007_AV64
Description:

Calibration Date: 3/29/2007 11:37:29AM

Source Info

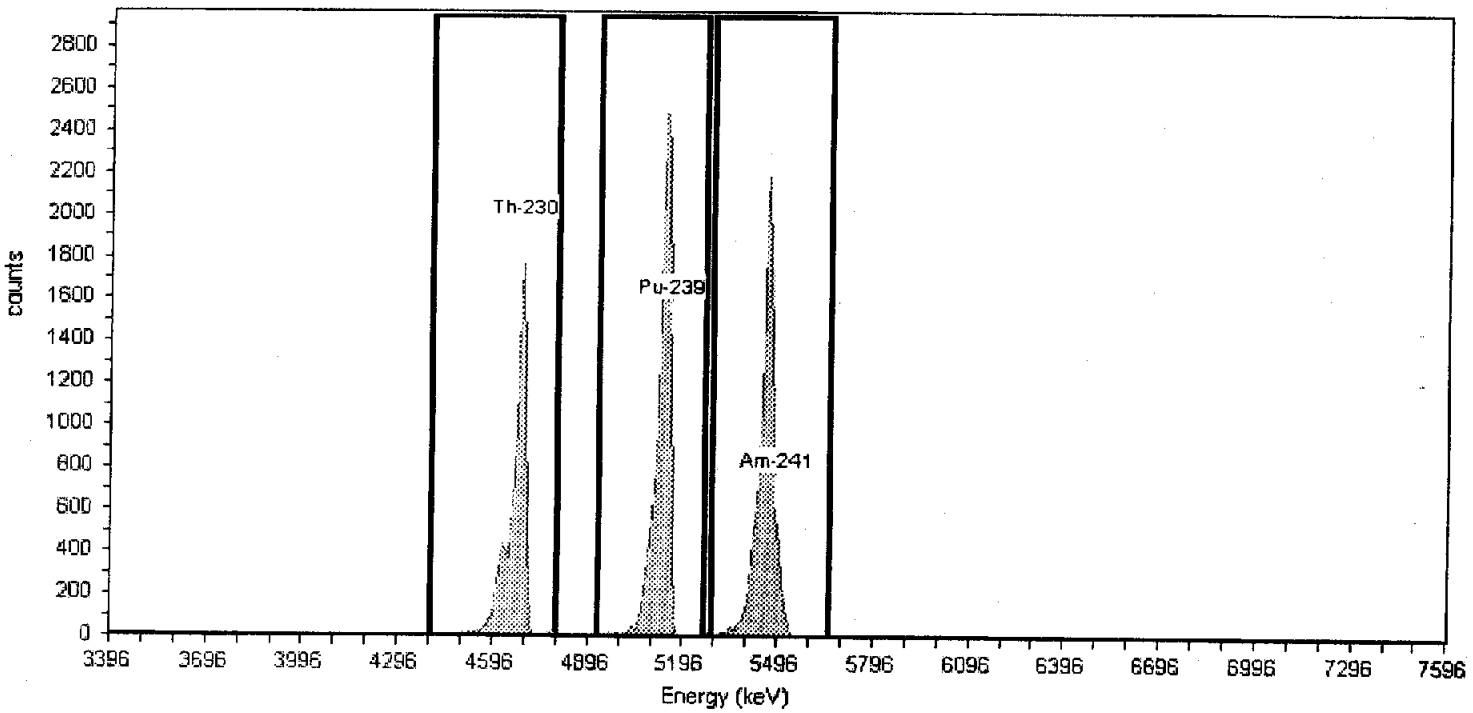
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV64 , SN:
Acquisition Start Date: 3/29/2007 9:04:56AM
Live Time: 140.00 min.
Real Time: 152.14 min.
Efficiency: 25.50% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,175.00	79.82
Pu-239	243	5.16	212	258	14,532.00	103.80
Am-241	289	5.49	261	313	14,616.00	104.40

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:14:40PM 3/29/2007

Analyst: 60040
Detector: AV65

Calibration

Name: Mar2007_AV65
Description:

Calibration Date: 3/29/2007 2:14:37PM

Source Info

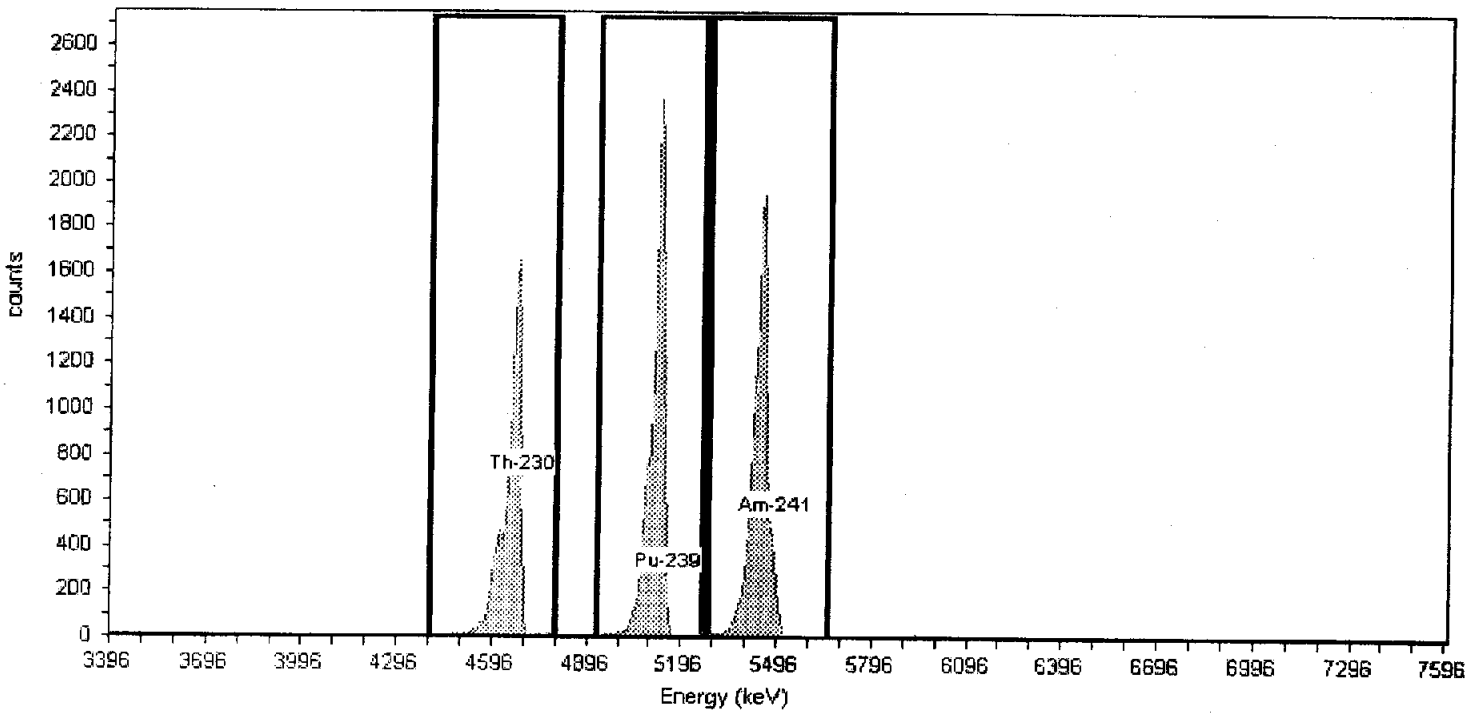
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV65 , SN:
Acquisition Start Date: 3/29/2007 11:42:44AM
Live Time: 140.00 min.
Real Time: 151.84 min.
Efficiency: 26.14% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,005.00	78.61
Pu-239	243	5.16	212	258	14,275.00	101.96
Am-241	289	5.49	261	313	13,514.00	96.53

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:15:04PM 3/29/2007

Analyst: 60040
Detector: AV66

Calibration

Name: Mar2007_AV66
Description:

Calibration Date: 3/29/2007 2:15:00PM

Source Info

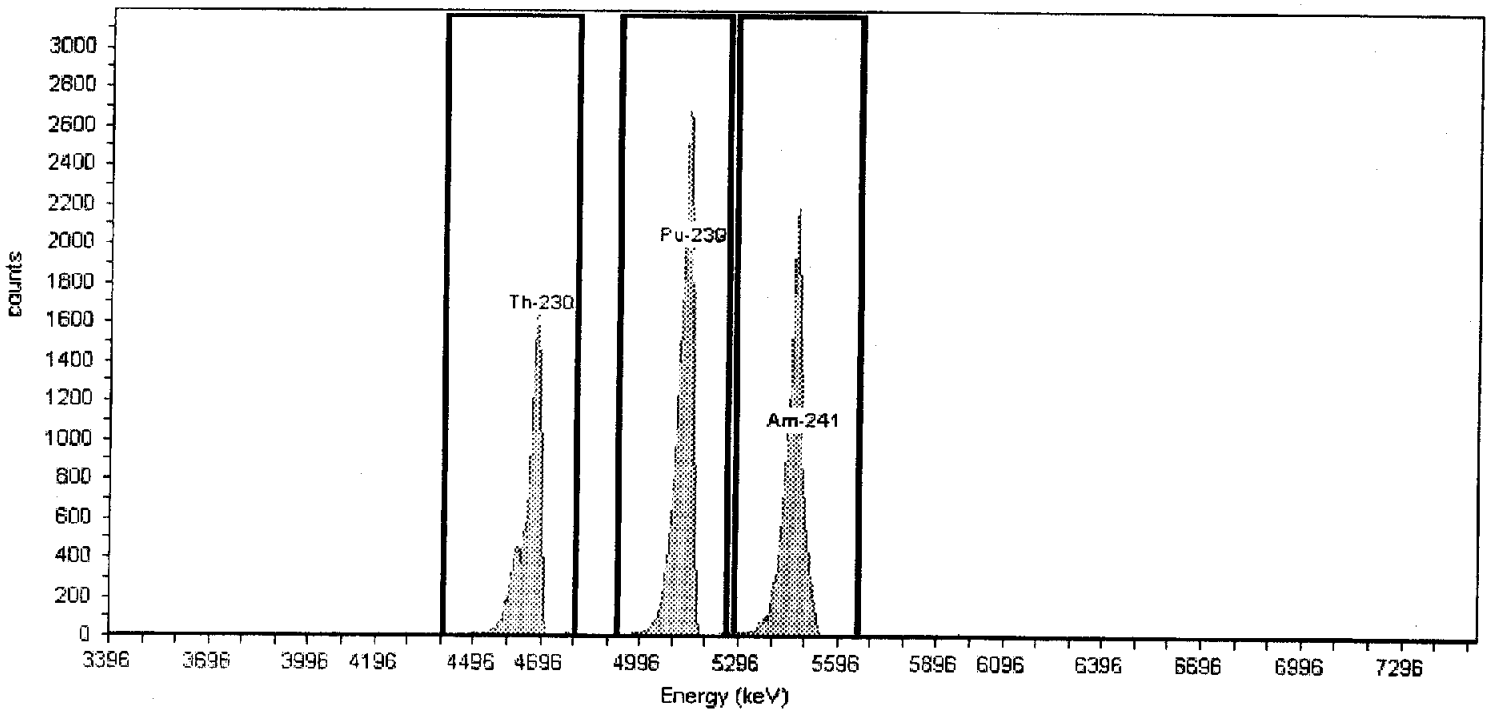
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV66 , SN:
Acquisition Start Date: 3/29/2007 11:42:46AM
Live Time: 140.00 min.
Real Time: 151.84 min.
Efficiency: 27.33% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,046.00	78.90
Pu-239	243	5.16	212	258	18,011.00	128.65
Am-241	289	5.49	261	313	15,920.00	113.71

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:04:00PM 3/29/2007

Analyst: 60040
Detector: AV67

Calibration

Name: Mar2007_AV67
Description:

Calibration Date: 3/29/2007 2:03:55PM

Source Info

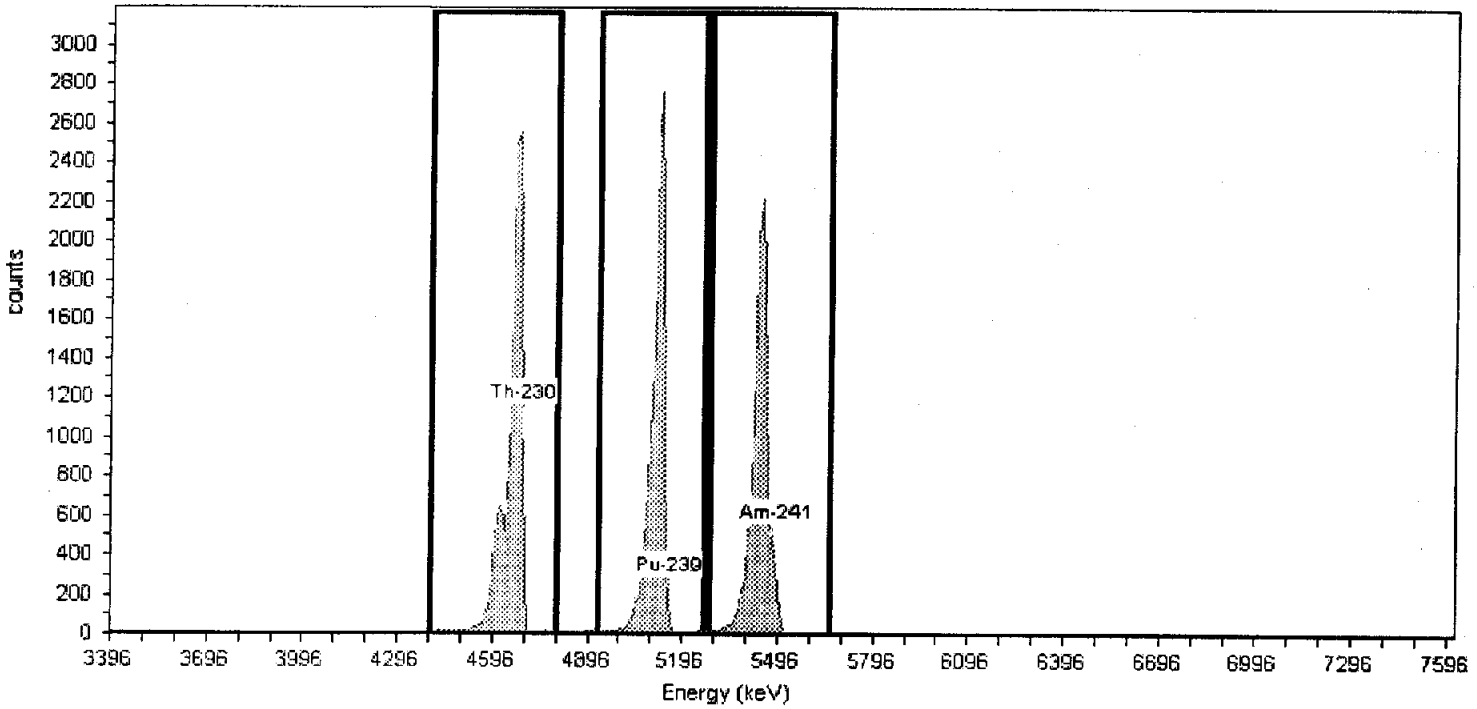
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV67 , SN:
Acquisition Start Date: 3/29/2007 11:42:06AM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 27.69% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,716.00	119.40
Pu-239	243	5.16	212	258	16,144.00	115.31
Am-241	289	5.49	261	313	15,205.00	108.61

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:04:07PM 3/29/2007

Analyst: 60040
Detector: AV68

Calibration

Name: Mar2007_AV68
Description:

Calibration Date: 3/29/2007 2:04:04PM

Source Info

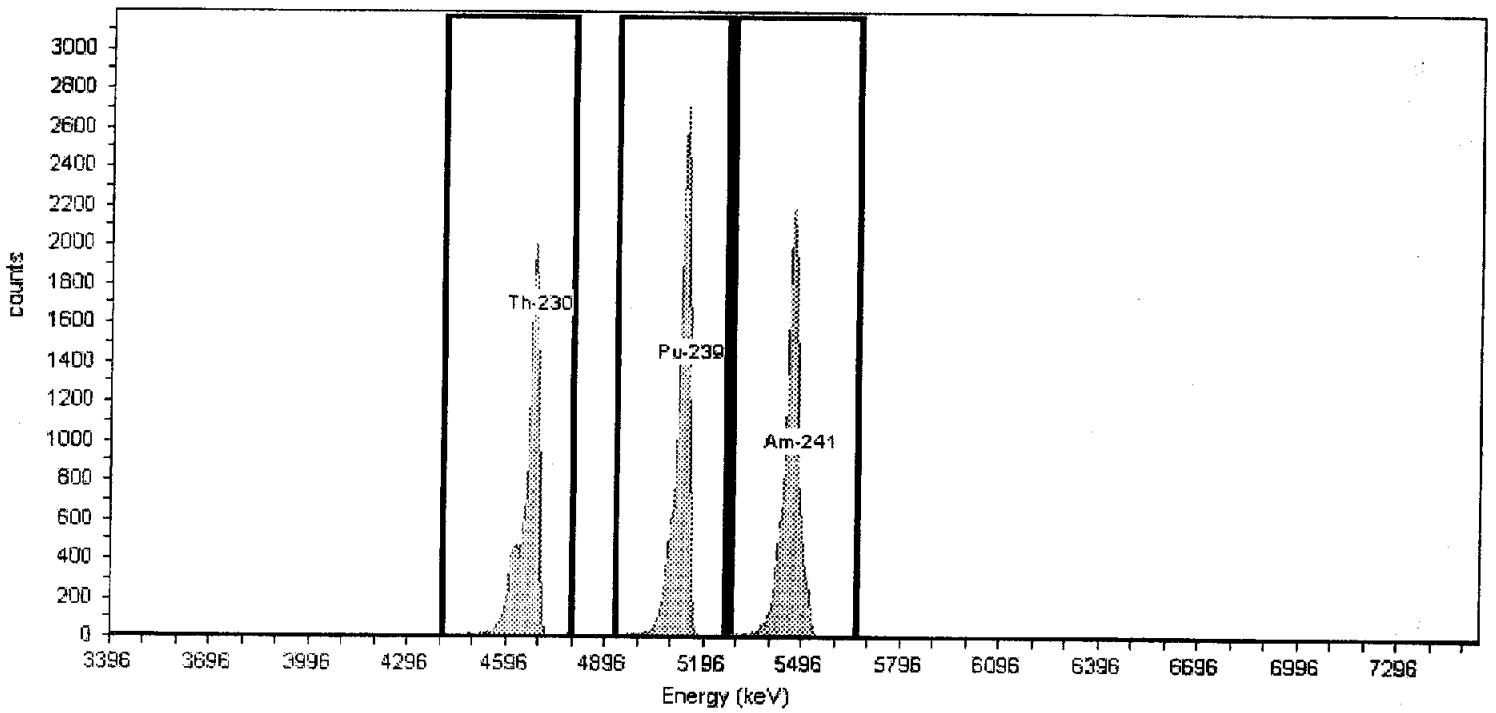
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV68 , SN:
Acquisition Start Date: 3/29/2007 11:42:24AM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 26.80% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,455.00	88.96
Pu-239	243	5.16	212	258	14,882.00	106.30
Am-241	289	5.49	261	313	14,311.00	102.22

ST SEVERN TRENT STL

Alpha Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:41:50PM 3/29/2007

Analyst: 60040
Detector: AV69

Calibration

Name: Mar2007_AV69
Description:

Calibration Date: 3/29/2007 4:41:46PM

Source Info

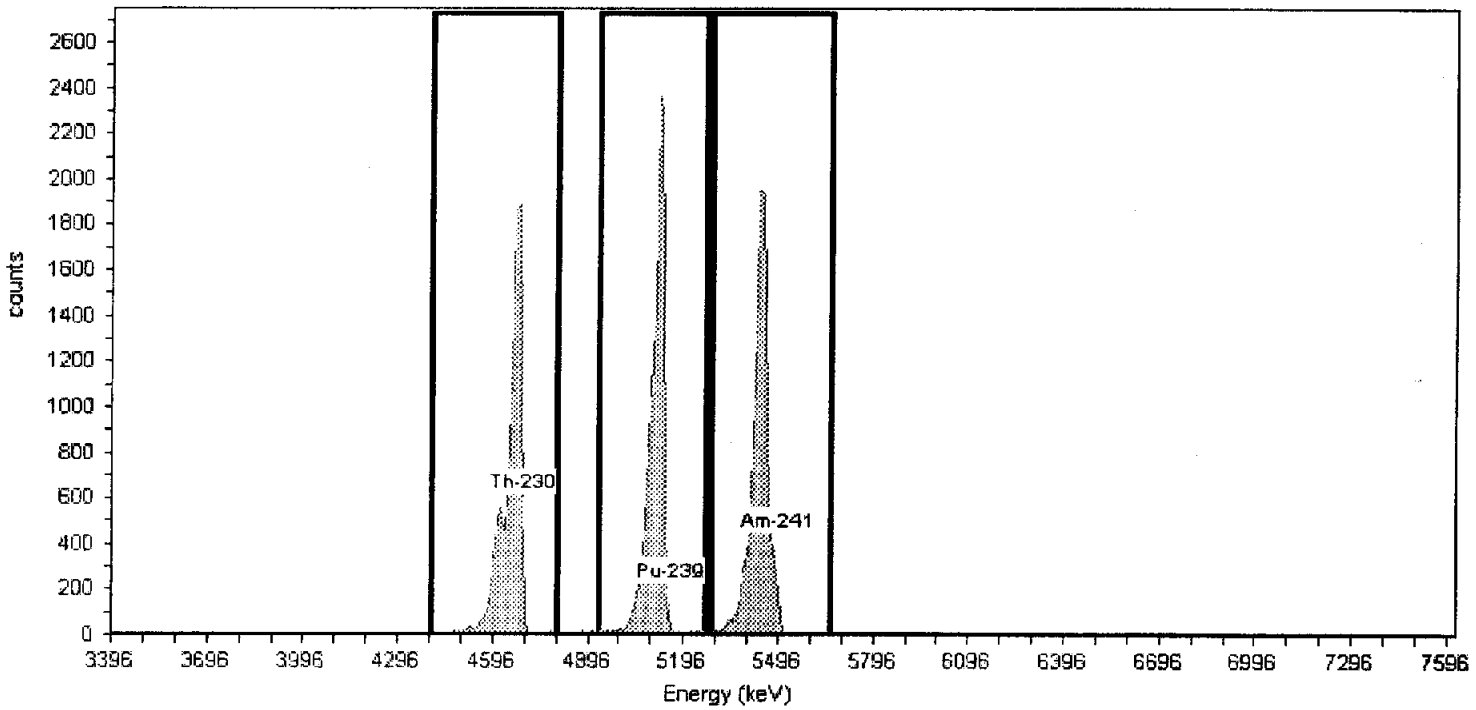
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV69 , SN:
Acquisition Start Date: 3/29/2007 2:20:43PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.79% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,691.00	90.65
Pu-239	243	5.16	212	258	14,560.00	104.00
Am-241	289	5.49	261	313	13,786.00	98.47

STL SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:21PM 3/28/2007

Analyst: 60040
Detector: AV70

Calibration

Name: Mar2007_AV70
Description:

Calibration Date: 3/28/2007 1:40:18PM

Source Info

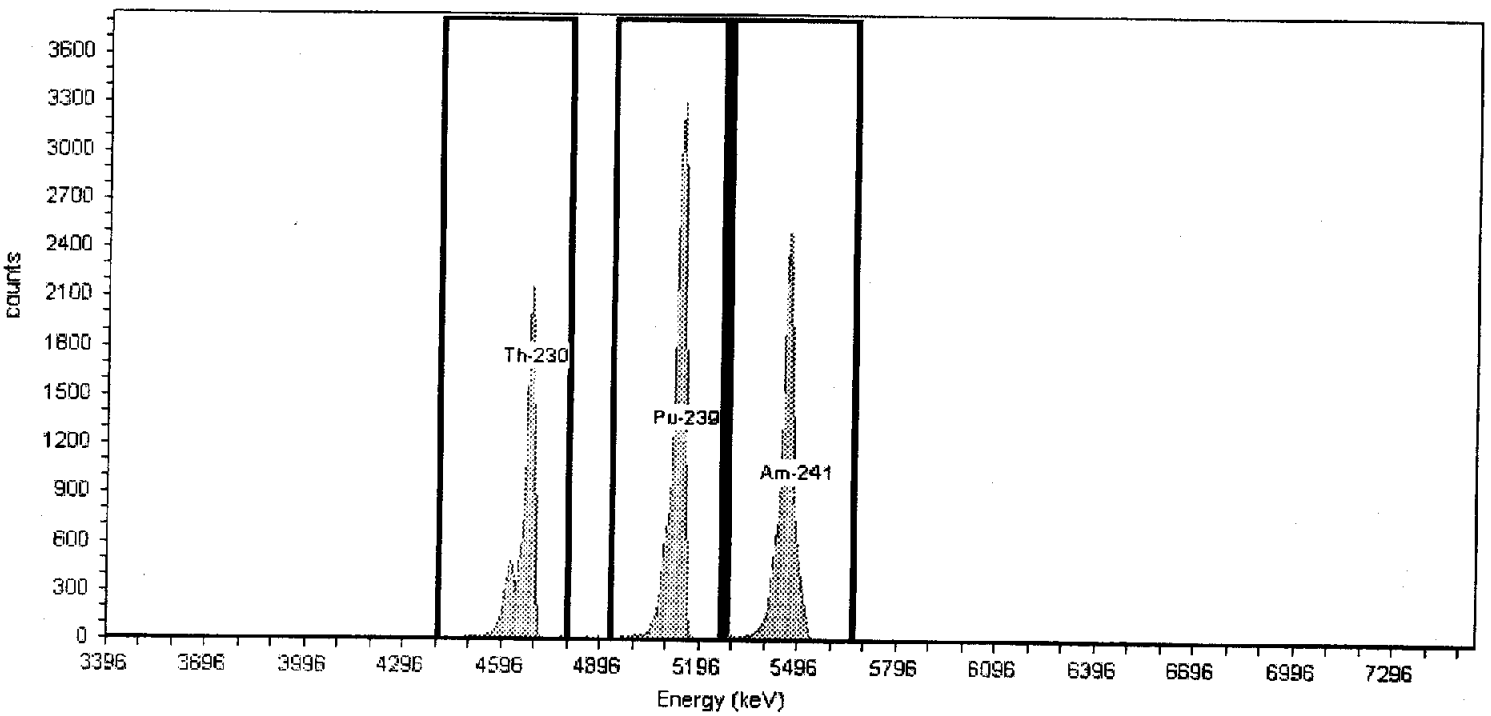
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV70 , SN:
Acquisition Start Date: 3/28/2007 11:20:24AM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 27.29% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,707.00	83.62
Pu-239	243	5.16	212	258	17,846.00	127.47
Am-241	289	5.49	261	313	15,297.00	109.26

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:40:54PM 3/29/2007

Analyst: 60040
Detector: AV71

Calibration

Name: Mar2007_AV71
Description:

Calibration Date: 3/29/2007 4:40:38PM

Source Info

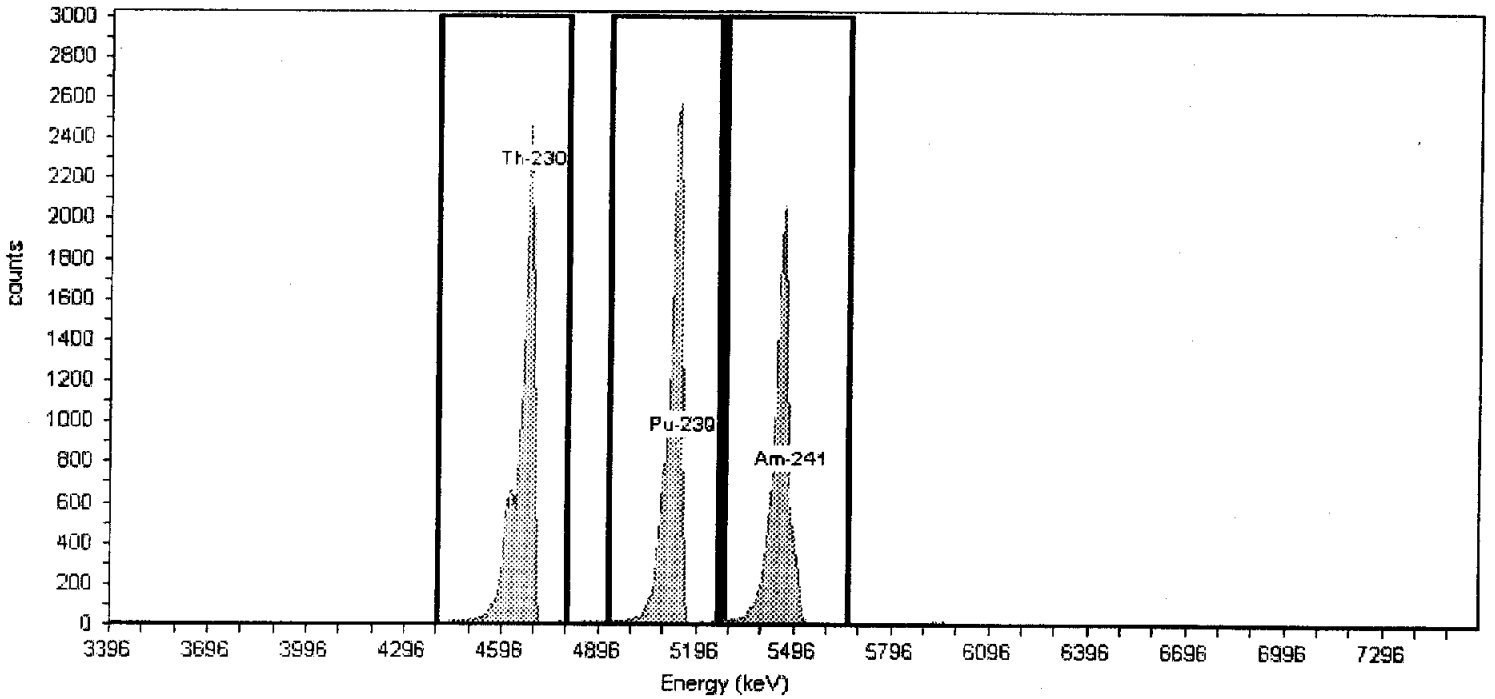
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV71 , SN:
Acquisition Start Date: 3/29/2007 2:19:59PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.05% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,580.00	118.43
Pu-239	243	5.16	212	258	15,728.00	112.34
Am-241	289	5.49	261	313	14,752.00	105.37

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:42:09PM 3/29/2007

Analyst: 60040
Detector: AV72

Calibration

Name: Mar2007_AV72
Description:

Calibration Date: 3/29/2007 4:42:00PM

Source Info

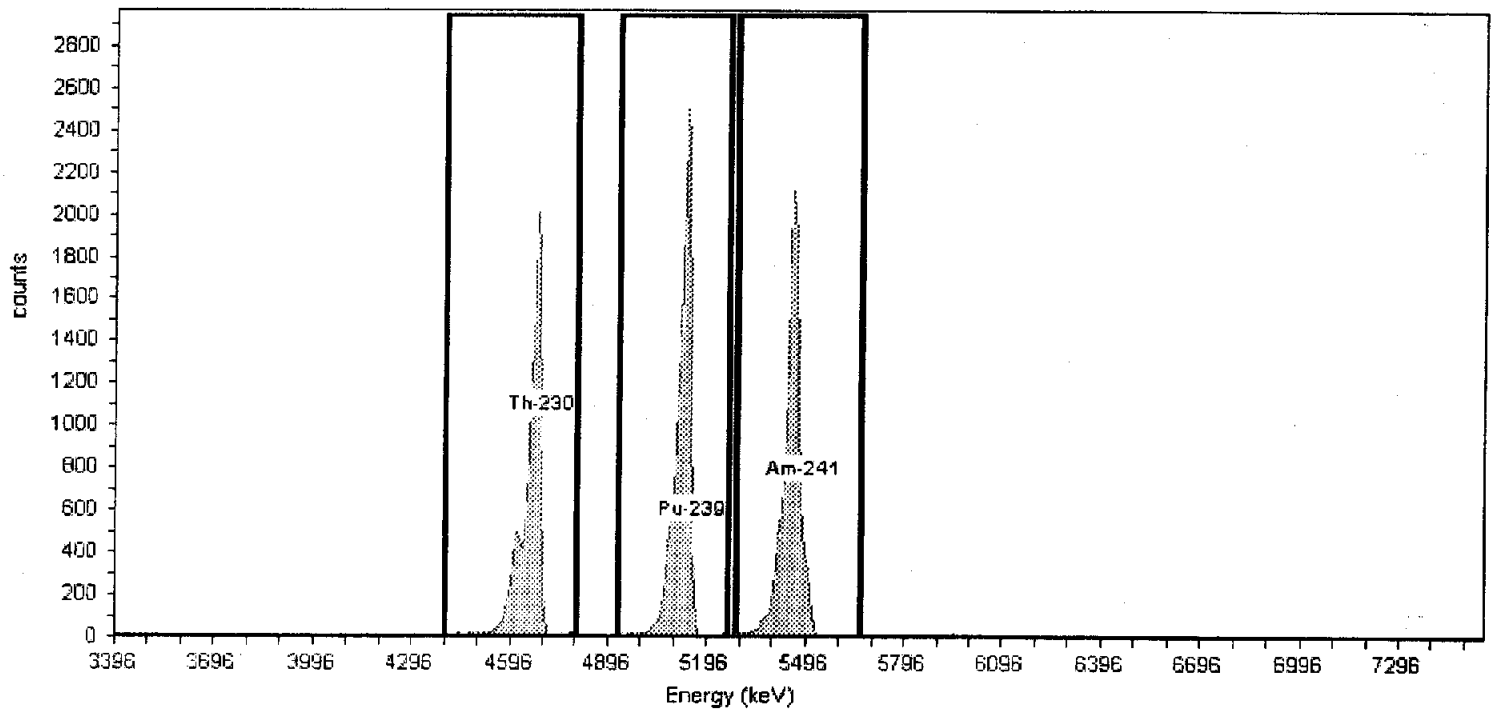
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV72 , SN:
Acquisition Start Date: 3/29/2007 2:20:47PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.71% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,553.00	89.66
Pu-239	243	5.16	212	258	14,592.00	104.23
Am-241	289	5.49	261	313	14,262.00	101.87

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:09:28PM 3/29/2007

Analyst: 60040
Detector: AV73

Calibration

Name: Mar2007_AV73
Description:

Calibration Date: 3/29/2007 7:09:25PM

Source Info

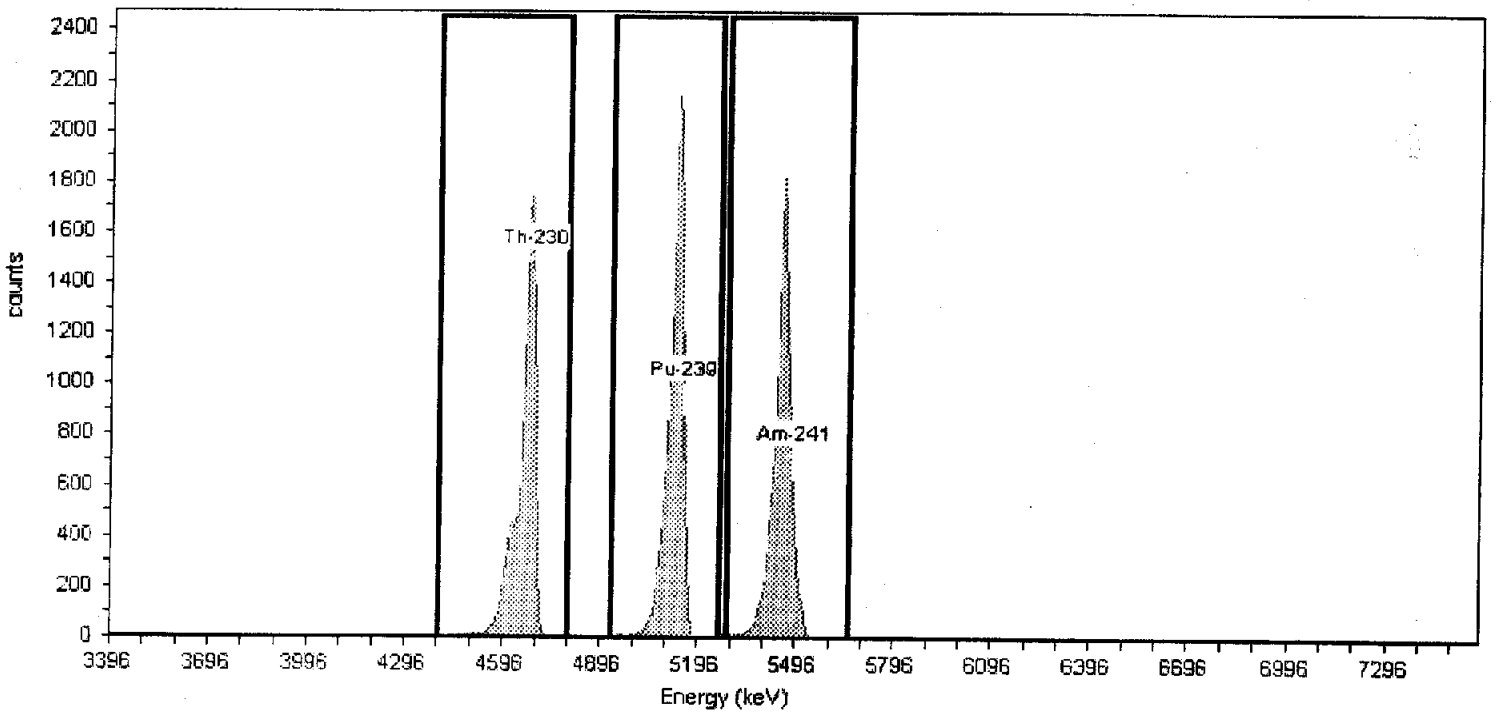
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV73 , SN:
Acquisition Start Date: 3/29/2007 4:45:50PM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 27.08% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,411.00	88.65
Pu-239	243	5.16	212	258	14,141.00	101.01
Am-241	289	5.49	261	313	13,437.00	95.98

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:10:57AM 3/28/2007

Analyst: 60040
Detector: AV75

Calibration

Name: Mar2007_AV75
Description:

Calibration Date: 3/28/2007 7:10:54AM

Source Info

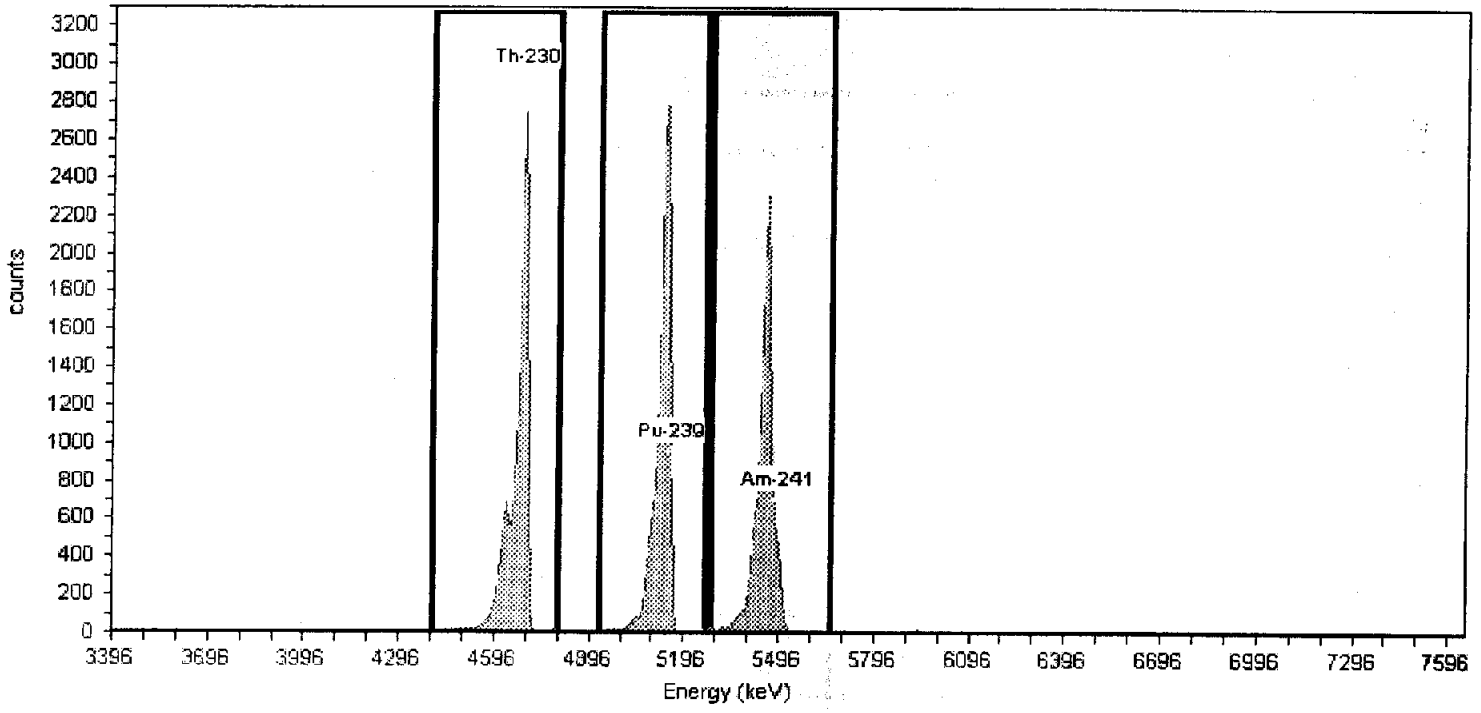
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV75 , SN: 46-033P6
Acquisition Start Date: 3/27/2007 5:33:23PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 26.78% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,124.00	115.17
Pu-239	243	5.16	212	258	15,499.00	110.71
Am-241	289	5.49	261	313	14,835.00	105.96

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:11:02AM 3/28/2007

Analyst: 60040
Detector: AV76

Calibration

Name: Mar2007_AV76
Description:

Calibration Date: 3/28/2007 7:10:59AM

Source Info

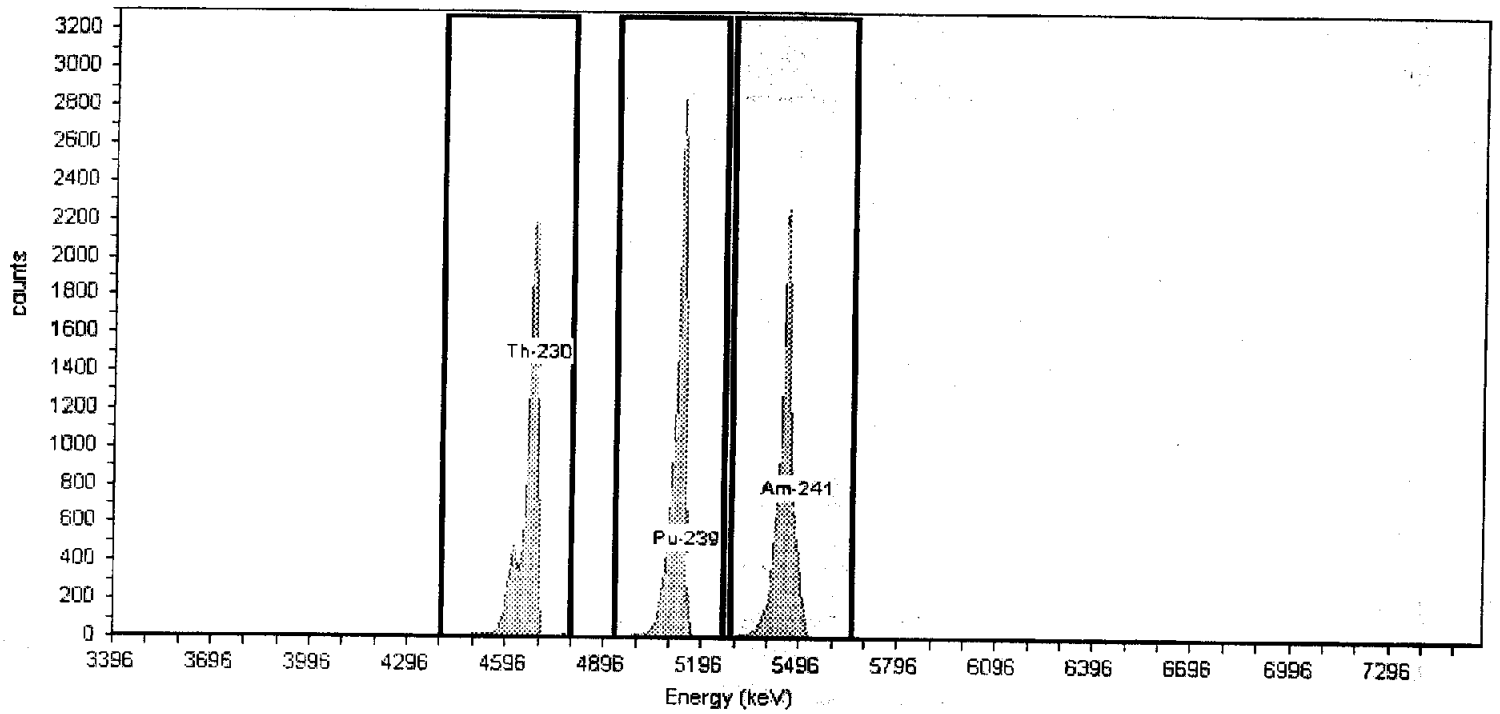
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV76 , SN: 46-033Q4
Acquisition Start Date: 3/27/2007 5:34:02PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 26.36% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,278.00	87.70
Pu-239	243	5.16	212	258	14,599.00	104.28
Am-241	289	5.49	261	313	14,068.00	100.49

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:40:09PM 3/28/2007

Analyst: 60040
Detector: AV77

Calibration

Name: Mar2007_AV77
Description:

Calibration Date: 3/28/2007 1:40:06PM

Source Info

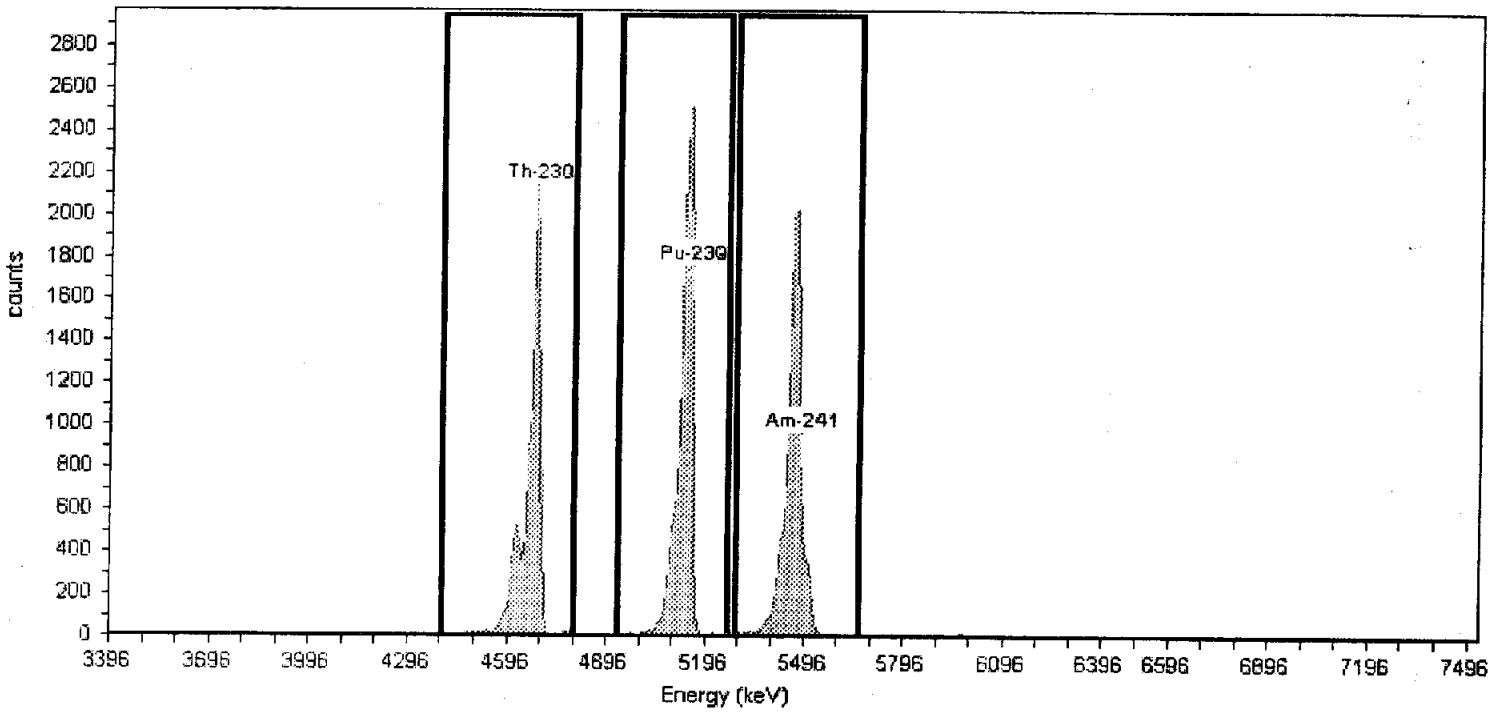
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV77 , SN: 46-033Q7
Acquisition Start Date: 3/28/2007 11:20:02AM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 26.77% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,302.00	87.87
Pu-239	243	5.16	212	258	14,179.00	101.28
Am-241	289	5.49	261	313	13,053.00	93.24

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:30:14PM 3/27/2007

Analyst: 60040
Detector: AV78

Calibration

Name: Mar2007_AV78a
Description:

Calibration Date: 3/27/2007 5:30:11PM

Source Info

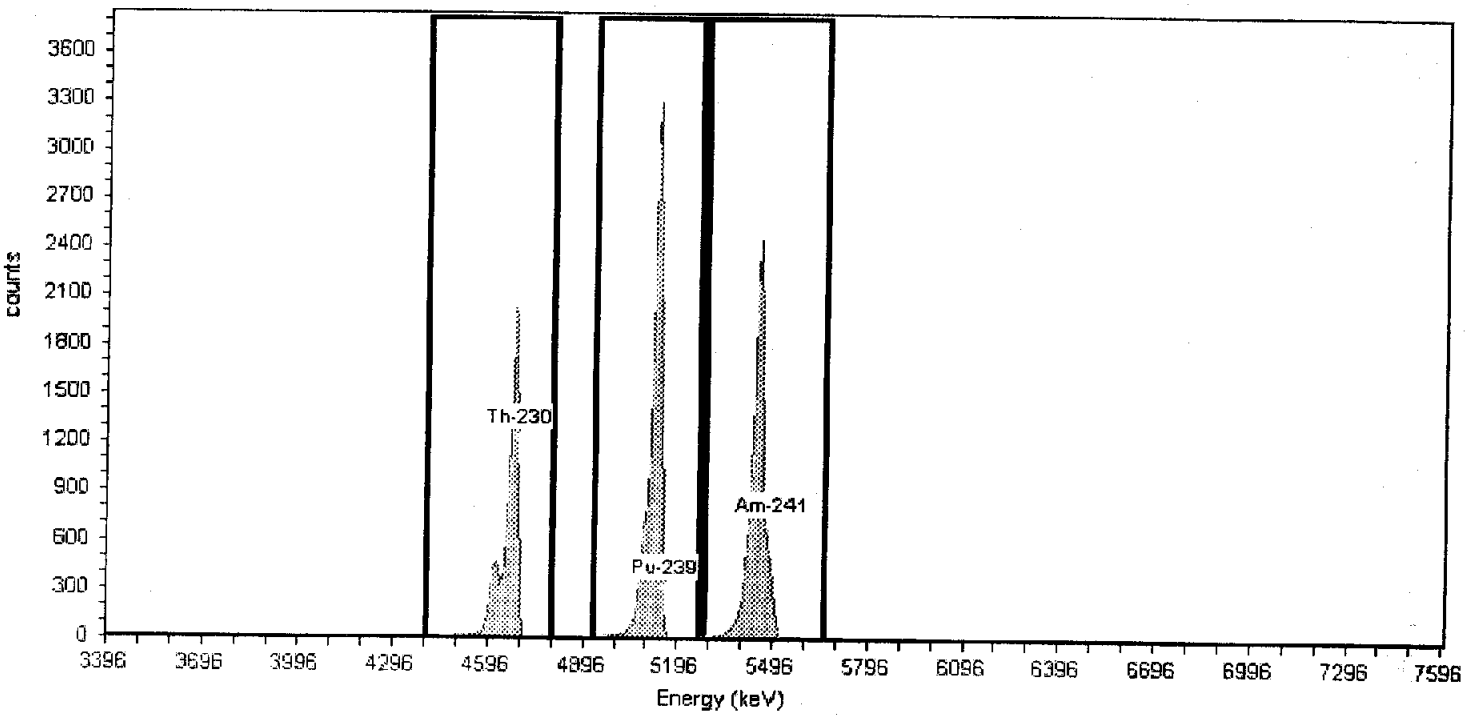
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV78 , SN: 46-033FF4
Acquisition Start Date: 3/27/2007 3:09:41PM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 26.83% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,499.00	82.14
Pu-239	243	5.16	212	258	17,555.00	125.39
Am-241	289	5.49	261	313	15,043.00	107.45

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:09:13PM 3/29/2007

Analyst: 60040
Detector: AV79

Calibration

Name: Mar2007_AV79
Description:

Calibration Date: 3/29/2007 7:09:10PM

Source Info

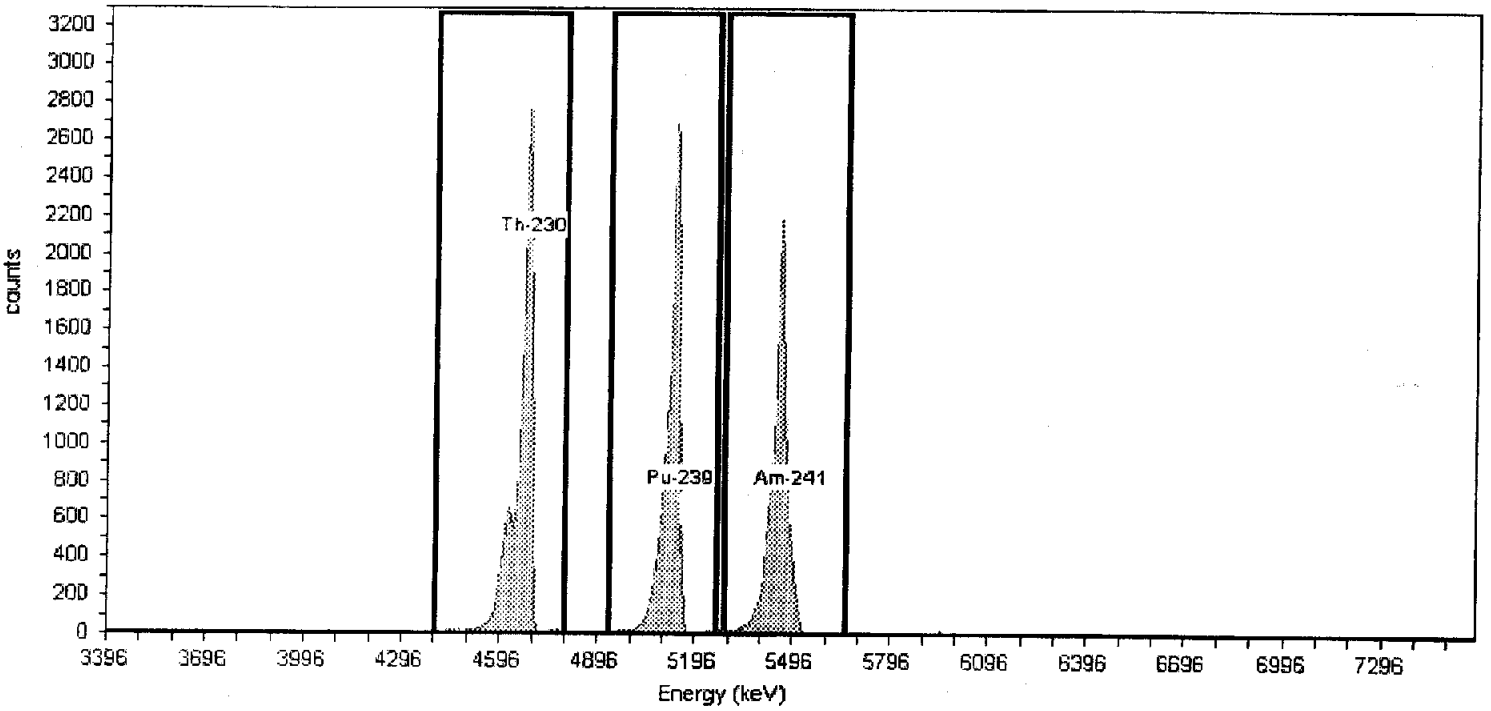
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV79 , SN: 46-033Q5
Acquisition Start Date: 3/29/2007 4:45:14PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 27.00% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,504.00	117.89
Pu-239	243	5.16	212	258	15,807.00	112.91
Am-241	289	5.49	261	313	14,661.00	104.72

ST STERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:09:21PM 3/29/2007

Analyst: 60040
Detector: AV80

Calibration

Name: Mar2007_AV80
Description:

Calibration Date: 3/29/2007 7:09:18PM

Source Info

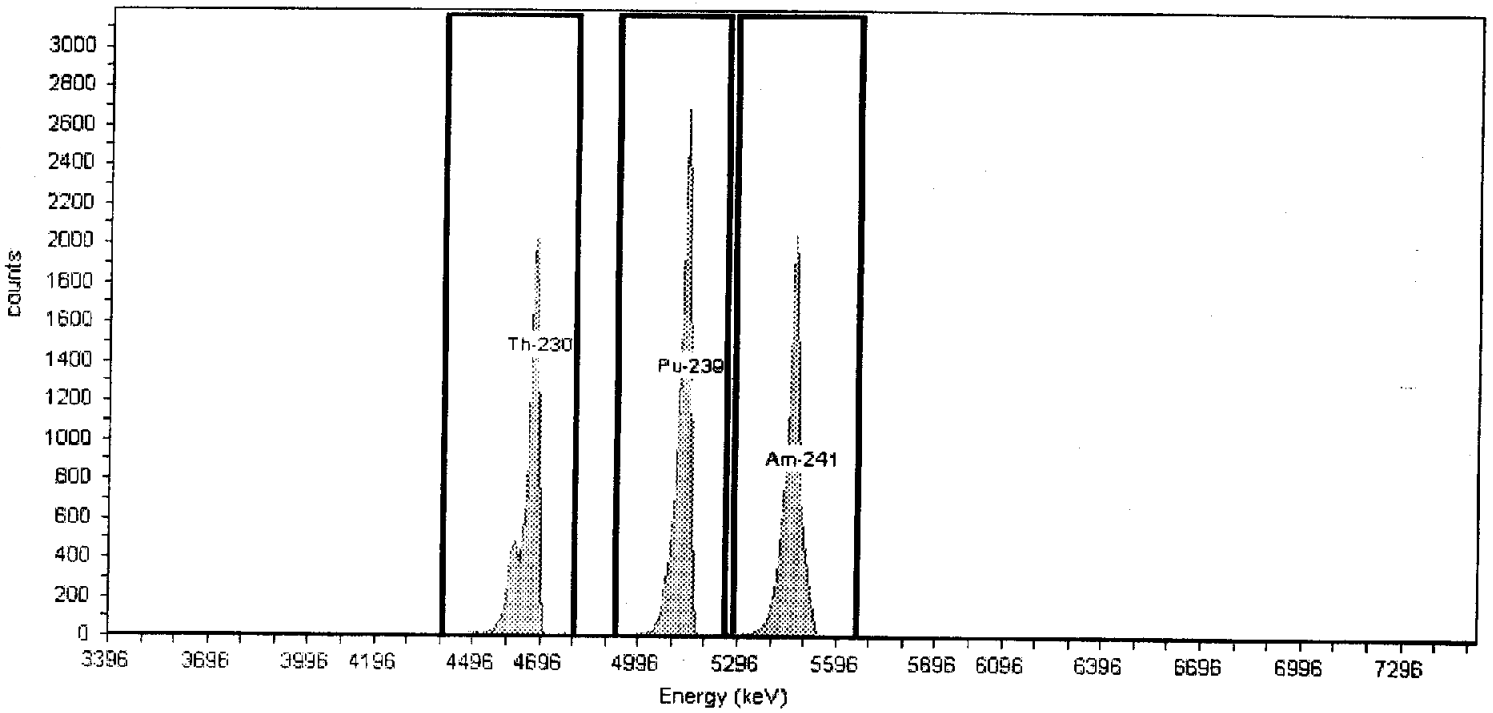
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV80 , SN: 46-03305
Acquisition Start Date: 3/29/2007 4:45:27PM
Live Time: 140.00 min.
Real Time: 140.03 min.
Efficiency: 25.89% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,078.00	86.27
Pu-239	243	5.16	212	258	14,379.00	102.71
Am-241	289	5.49	261	313	13,741.00	98.15

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:32:35PM 3/29/2007

Analyst: 60040
Detector: AV81

Calibration

Name: Mar2007_AV81
Description:

Calibration Date: 3/29/2007 9:32:32PM

Source Info

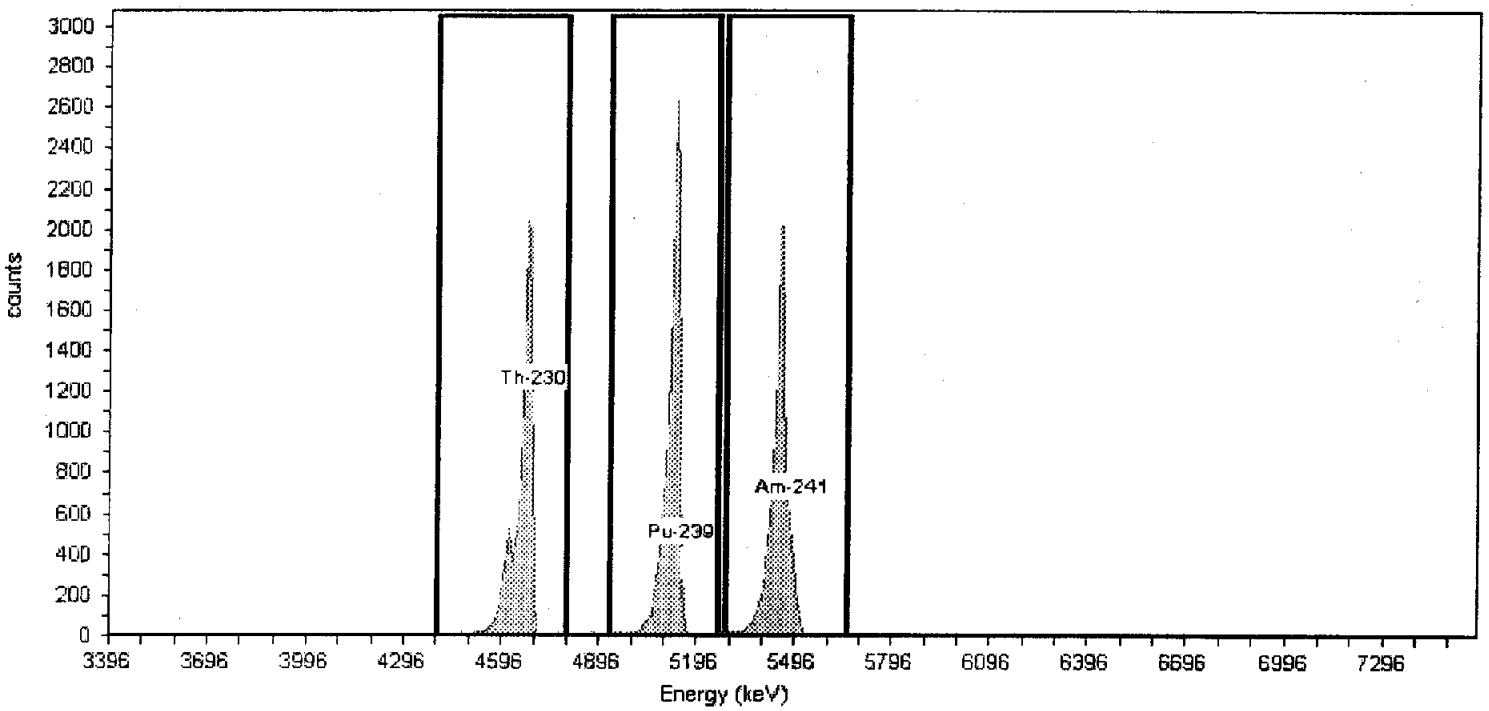
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV81 , SN: 46-03307
Acquisition Start Date: 3/29/2007 7:12:13PM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 27.00% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,324.00	88.03
Pu-239	243	5.16	212	258	14,234.00	101.67
Am-241	289	5.49	261	313	13,308.00	95.06

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
4:42:25PM 3/29/2007

Analyst: 60040
Detector: AV82

Calibration

Name: Mar2007_AV82
Description:

Calibration Date: 3/29/2007 4:42:16PM

Source Info

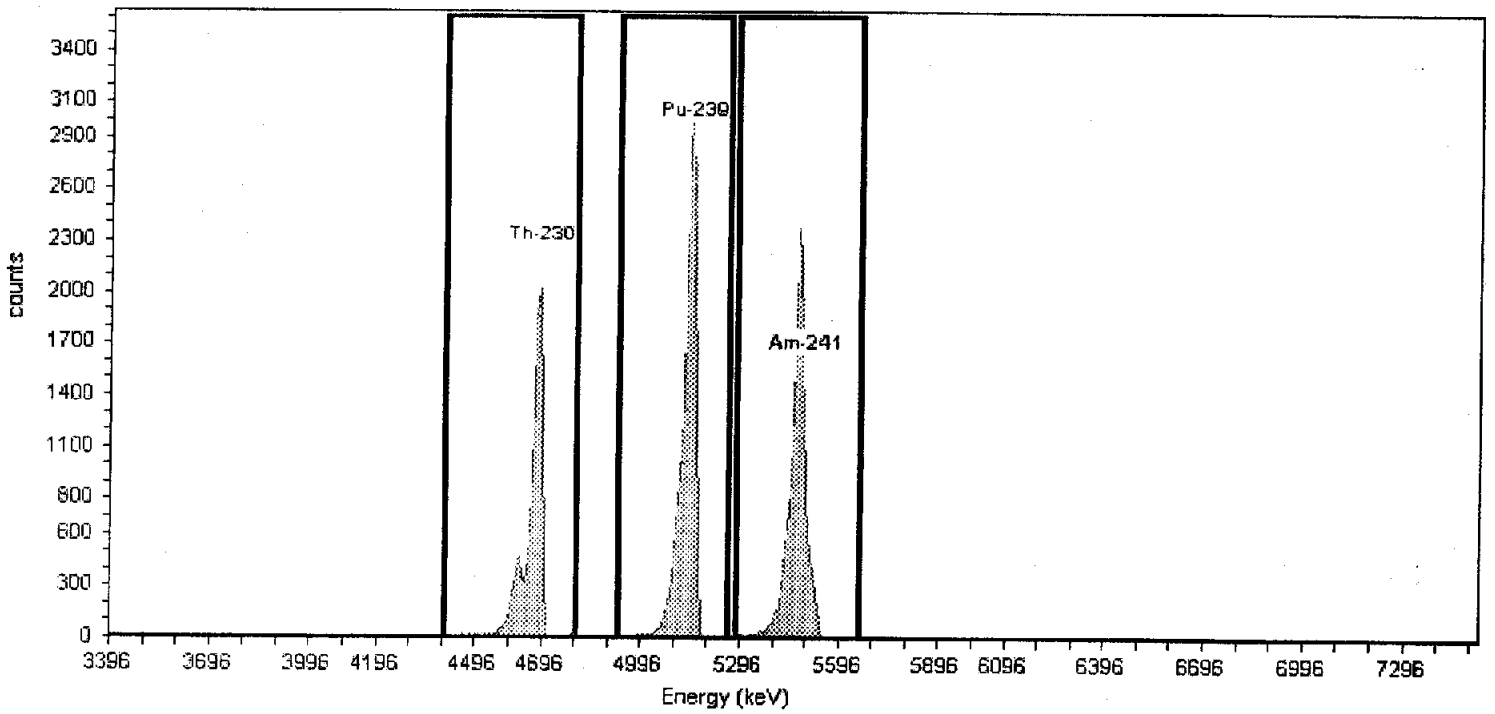
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV82 , SN: 46-032EE5
Acquisition Start Date: 3/29/2007 2:20:48PM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 26.86% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,450.00	81.79
Pu-239	243	5.16	212	258	17,593.00	125.66
Am-241	289	5.49	261	313	15,105.00	107.89

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:32:07PM 3/29/2007

Analyst: 60040
Detector: AV83

Calibration

Name: Mar2007_AV83
Description:

Calibration Date: 3/29/2007 9:32:03PM

Source Info

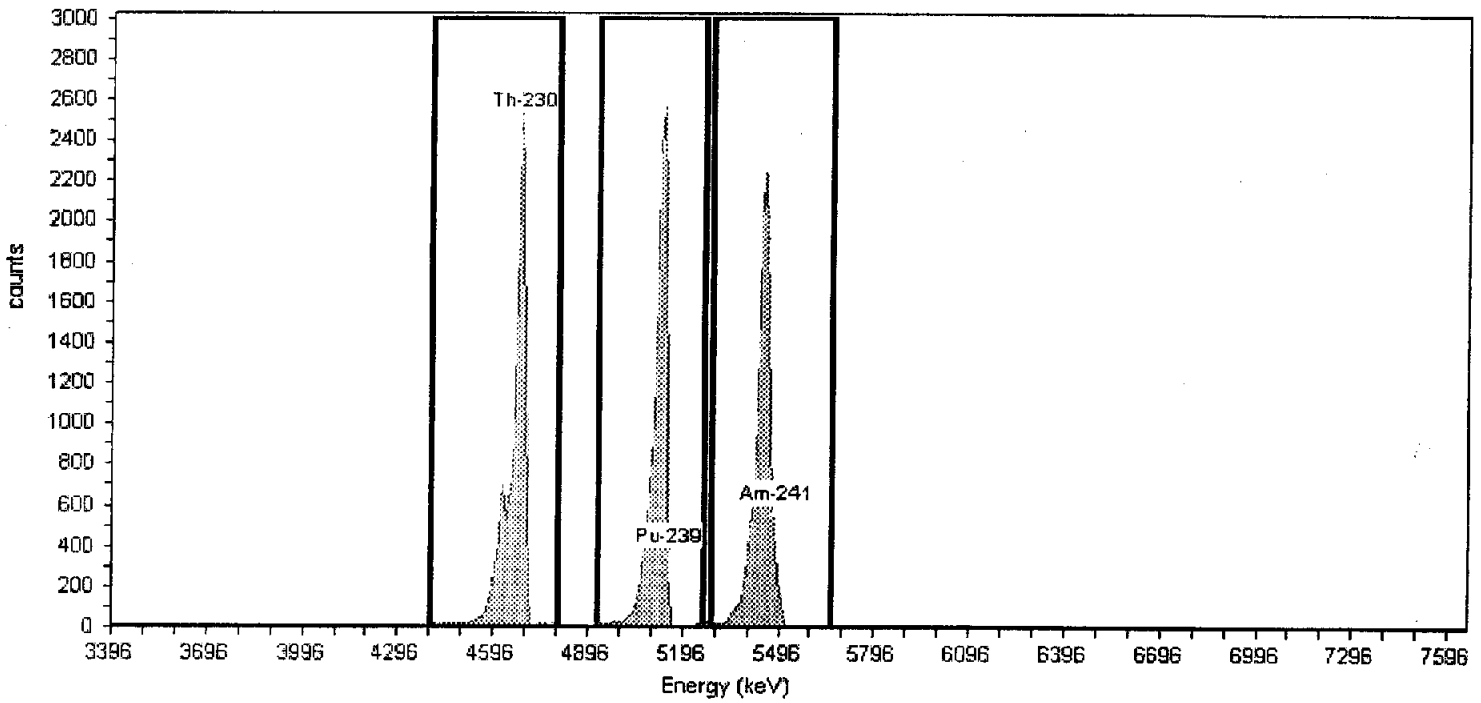
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV83 , SN: 46-03306
Acquisition Start Date: 3/29/2007 7:11:38PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.55% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,060.00	114.71
Pu-239	243	5.16	212	258	15,372.00	109.80
Am-241	289	5.49	261	313	14,657.00	104.69

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:32:22PM 3/29/2007

Analyst: 60040
Detector: AV84

Calibration

Name: Mar2007_AV84
Description:

Calibration Date: 3/29/2007 9:32:20PM

Source Info

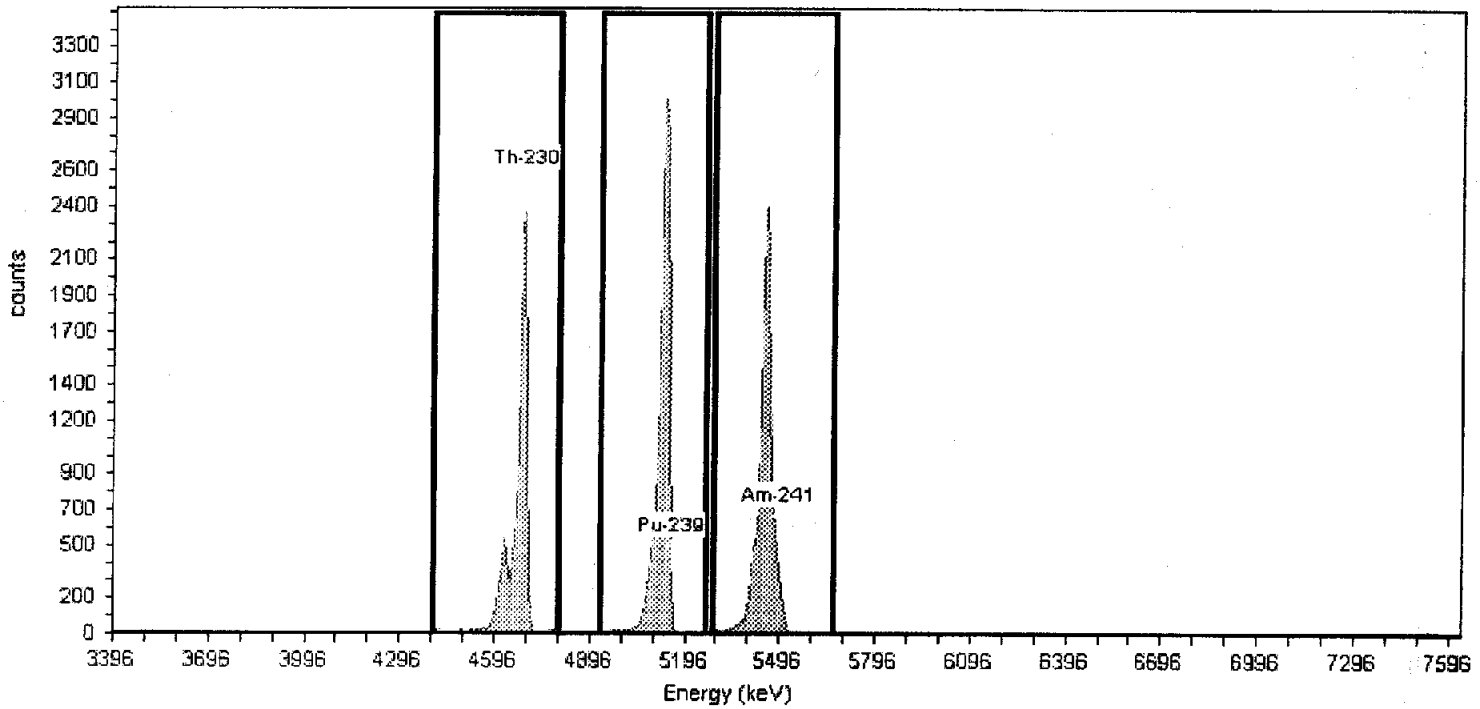
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV84 , SN: 46-033FF3
Acquisition Start Date: 3/29/2007 7:11:58PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 26.63% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,434.00	88.81
Pu-239	243	5.16	212	258	14,766.00	105.47
Am-241	289	5.49	261	313	14,125.00	100.89

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:55:11PM 3/29/2007

Analyst: 60040
Detector: AV85

Calibration

Name: Mar2007_AV85
Description:

Calibration Date: 3/29/2007 11:55:08PM

Source Info

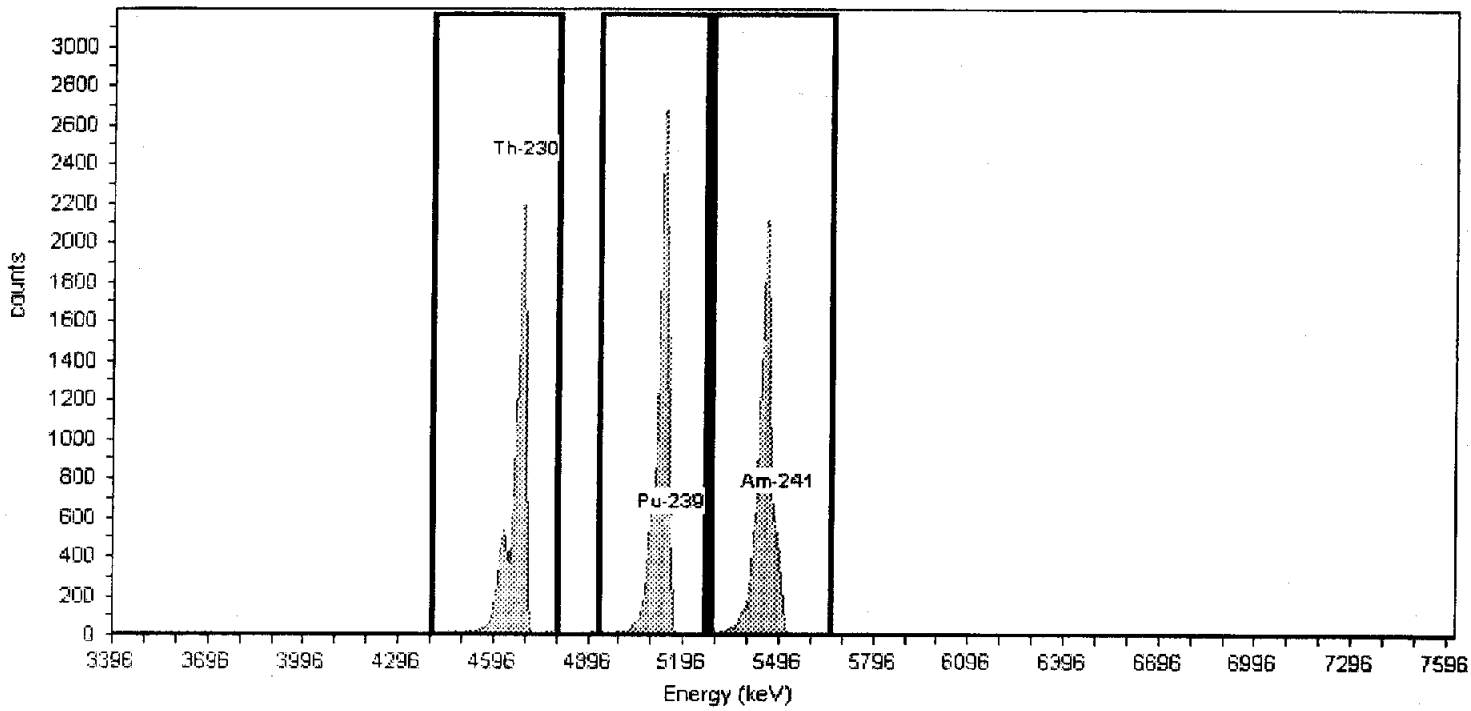
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV85 , SN: 46-032EE7
Acquisition Start Date: 3/29/2007 9:34:58PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 27.76% +/- 0.30% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,652.00	90.37
Pu-239	243	5.16	212	258	14,617.00	104.41
Am-241	289	5.49	261	313	13,723.00	98.02

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
7:09:33PM 3/29/2007

Analyst: 60040
Detector: AV86

Calibration

Name: Mar2007_AV86
Description:

Calibration Date: 3/29/2007 7:09:30PM

Source Info

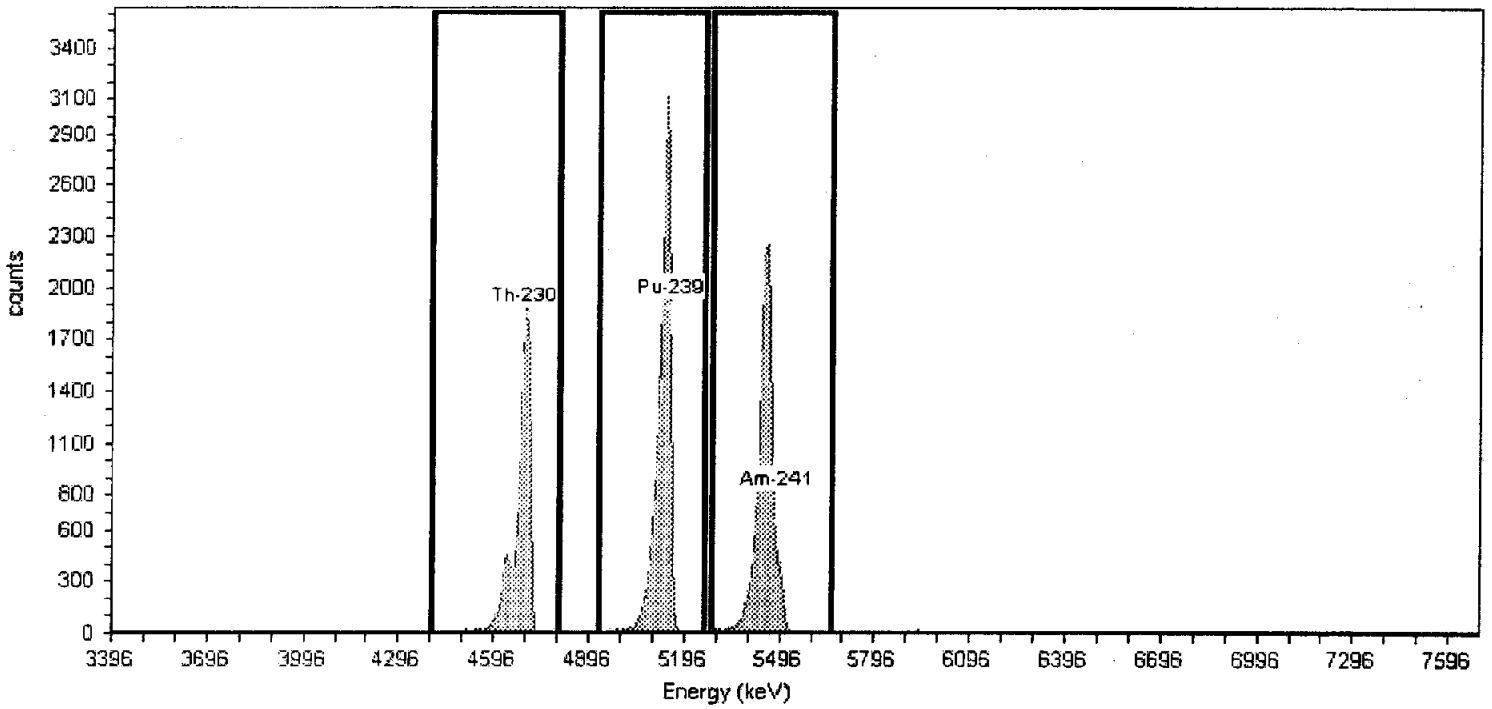
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV86 , SN: 46-033Q6
Acquisition Start Date: 3/29/2007 4:45:55PM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 27.17% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,622.00	83.01
Pu-239	243	5.16	212	258	17,698.00	126.41
Am-241	289	5.49	261	313	15,334.00	109.53

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:54:41PM 3/29/2007

Analyst: 60040
Detector: AV87

Calibration

Name: Mar2007_AV87
Description:

Calibration Date: 3/29/2007 11:54:38PM

Source Info

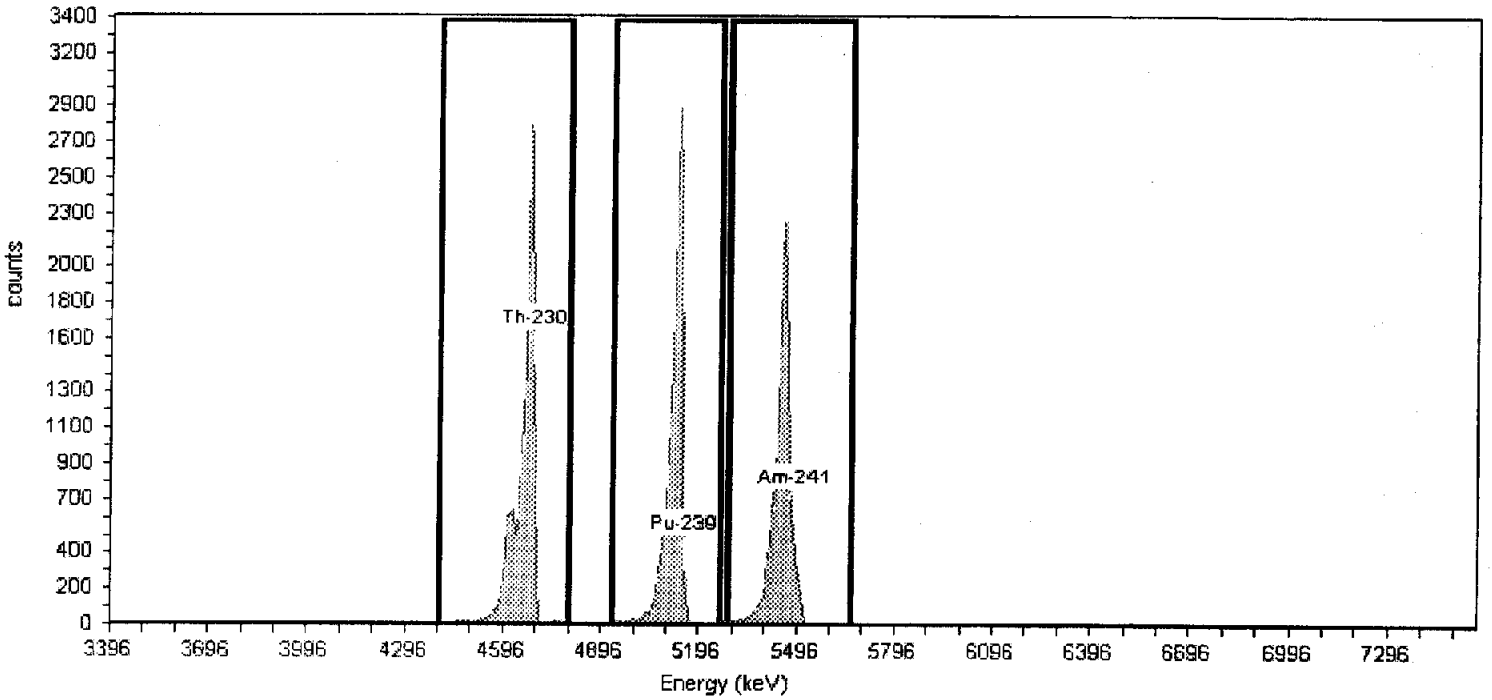
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV87 , SN: 46-033FF5
Acquisition Start Date: 3/29/2007 9:34:22PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.70% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,366.00	116.90
Pu-239	243	5.16	212	258	15,585.00	111.32
Am-241	289	5.49	261	313	14,506.00	103.61

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:55:19PM 3/29/2007

Analyst: 60040
Detector: AV88

Calibration

Name: Mar2007_AV88
Description:

Calibration Date: 3/29/2007 11:55:16PM

Source Info

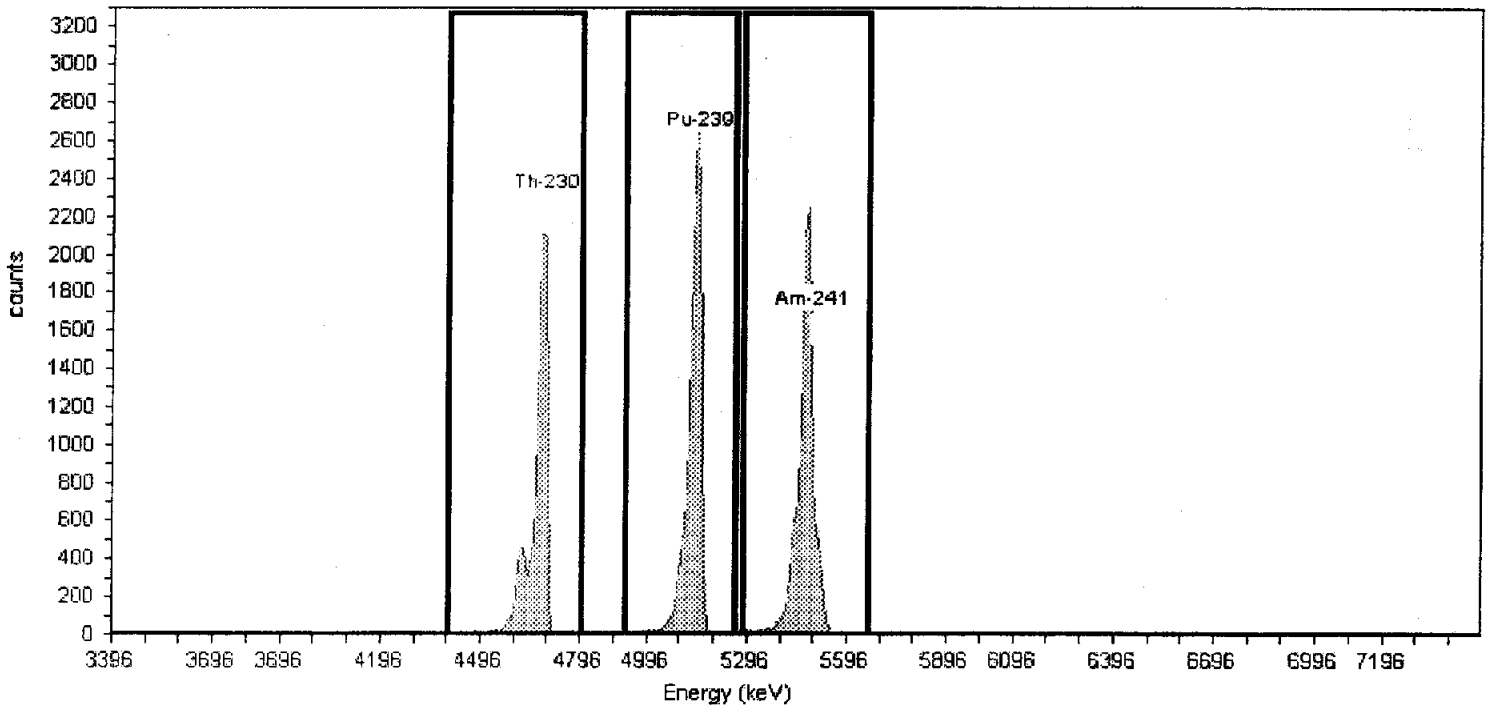
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV88 , SN: 76-033FF1
Acquisition Start Date: 3/29/2007 9:34:34PM
Live Time: 140.00 min.
Real Time: 140.04 min.
Efficiency: 26.30% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,278.00	87.70
Pu-239	243	5.16	212	258	14,505.00	103.61
Am-241	289	5.49	261	313	14,039.00	100.28

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Analyst: 60040
Detector: AV89

2:19:58AM 3/30/2007

Calibration

Name: Mar2007_AV89
Description:

Calibration Date: 3/30/2007 2:19:55AM

Source Info

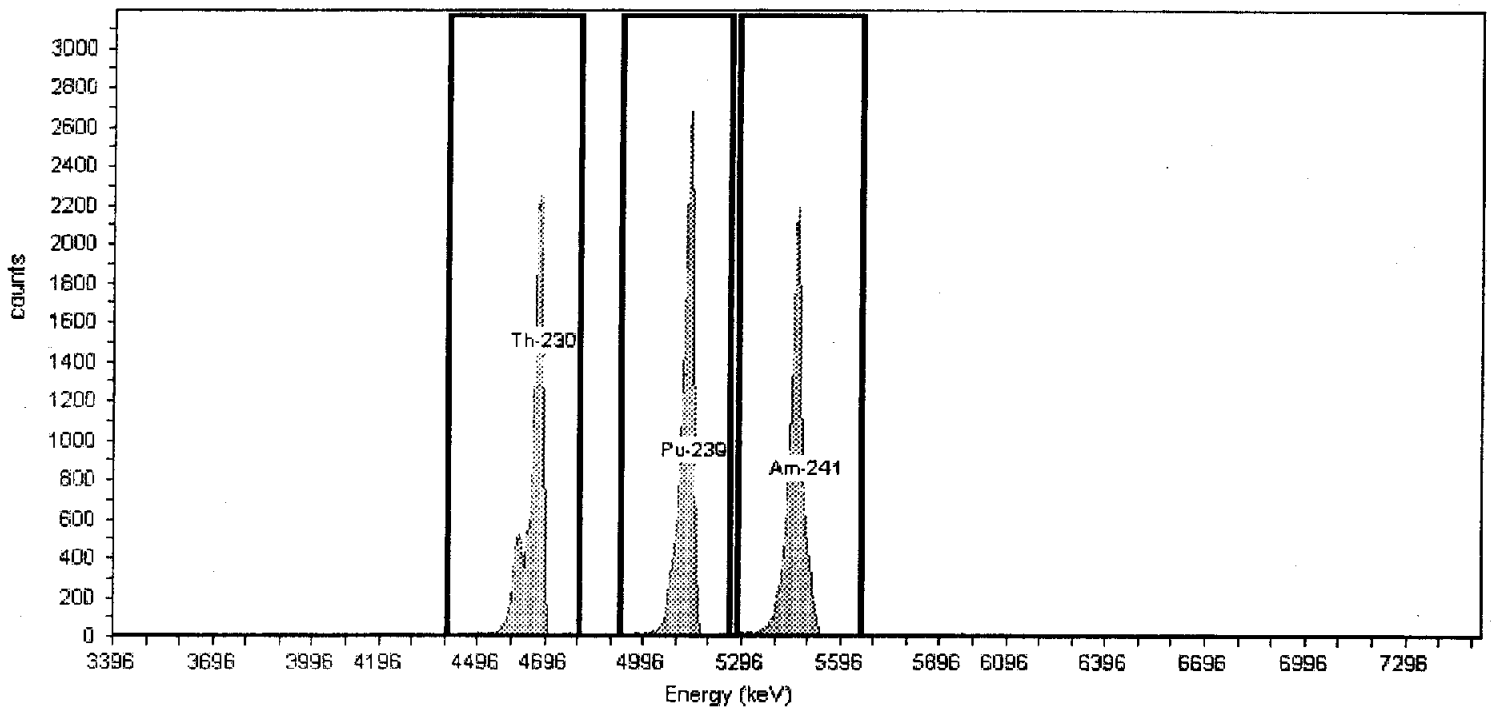
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV89 , SN: 46-033P5
Acquisition Start Date: 3/29/2007 11:58:05PM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 27.25% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,605.00	90.04
Pu-239	243	5.16	212	258	14,309.00	102.21
Am-241	289	5.49	261	313	13,319.00	95.14

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:32:47PM 3/29/2007

Analyst: 60040
Detector: AV90

Calibration

Name: Mar2007_AV90
Description:

Calibration Date: 3/29/2007 9:32:43PM

Source Info

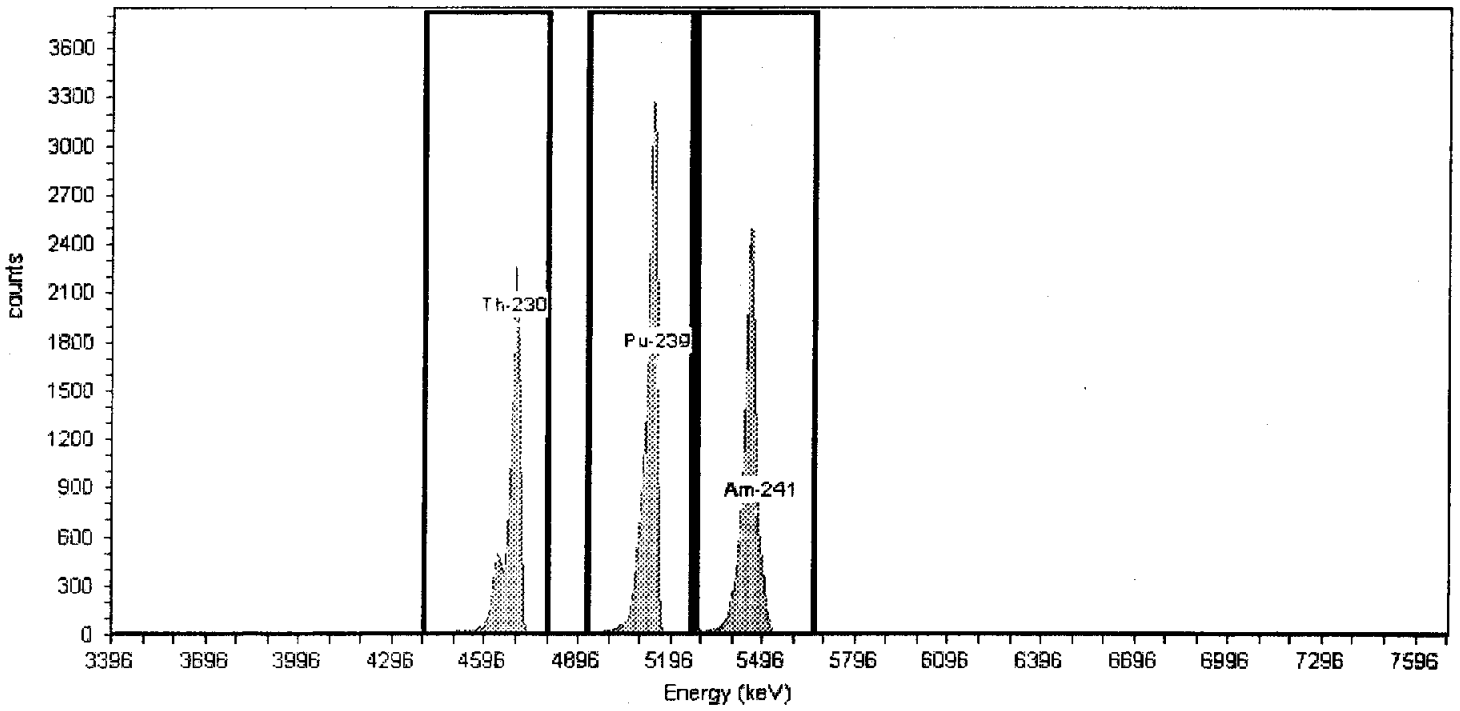
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV90 , SN: 46-033Q1
Acquisition Start Date: 3/29/2007 7:12:31PM
Live Time: 140.00 min.
Real Time: 140.05 min.
Efficiency: 27.80% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,175.00	86.96
Pu-239	243	5.16	212	258	17,924.00	128.03
Am-241	289	5.49	261	313	15,603.00	111.45

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:17:26AM 3/30/2007

Analyst: 60040
Detector: AV92

Calibration

Name: Mar2007_AV92
Description:

Calibration Date: 3/30/2007 2:17:23AM

Source Info

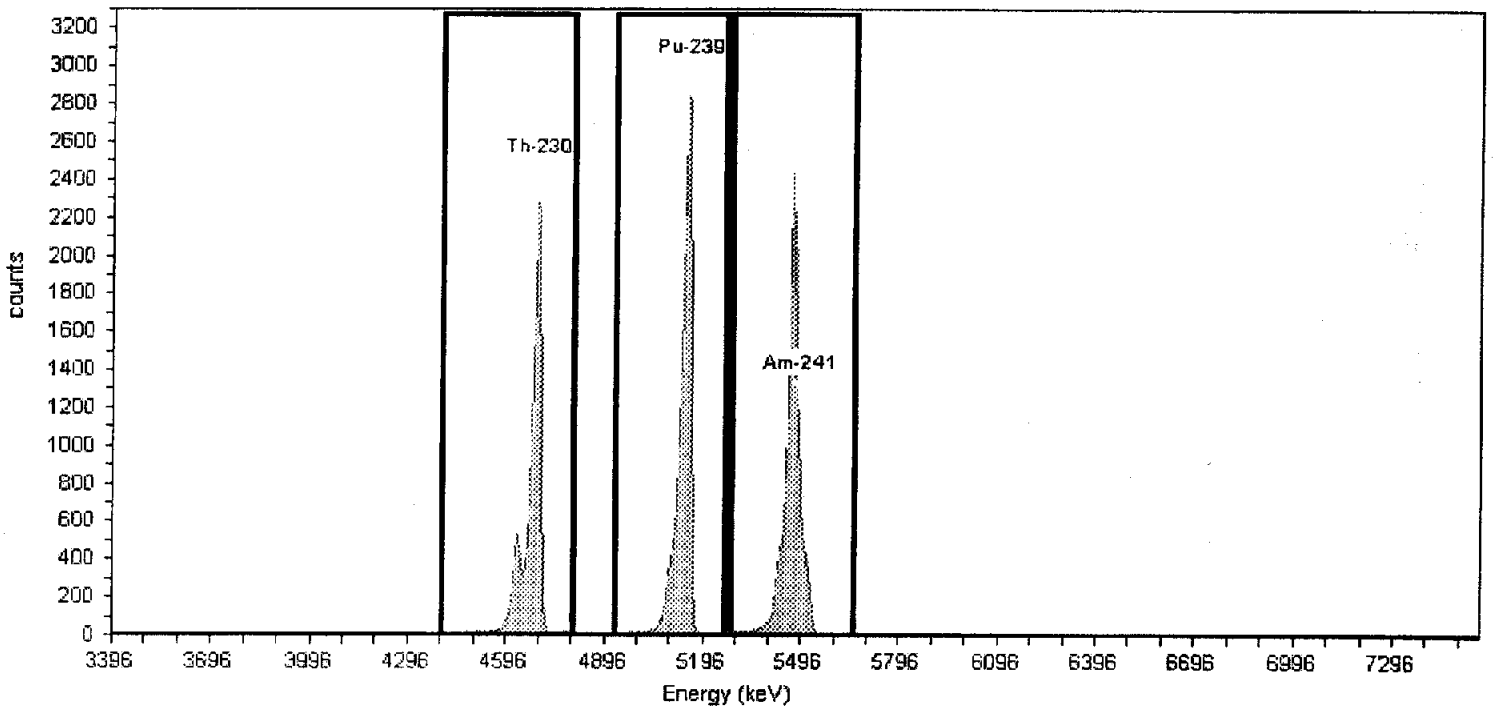
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV92 , SN: 46-033FF2
Acquisition Start Date: 3/29/2007 11:57:32PM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 26.39% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,320.00	88.00
Pu-239	243	5.16	212	258	14,575.00	104.11
Am-241	289	5.49	261	313	14,058.00	100.41

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:23:27AM 3/30/2007

Analyst: 60040
Detector: AV93

Calibration

Name: Mar2007_AV93
Description:

Calibration Date: 3/30/2007 5:23:24AM

Source Info

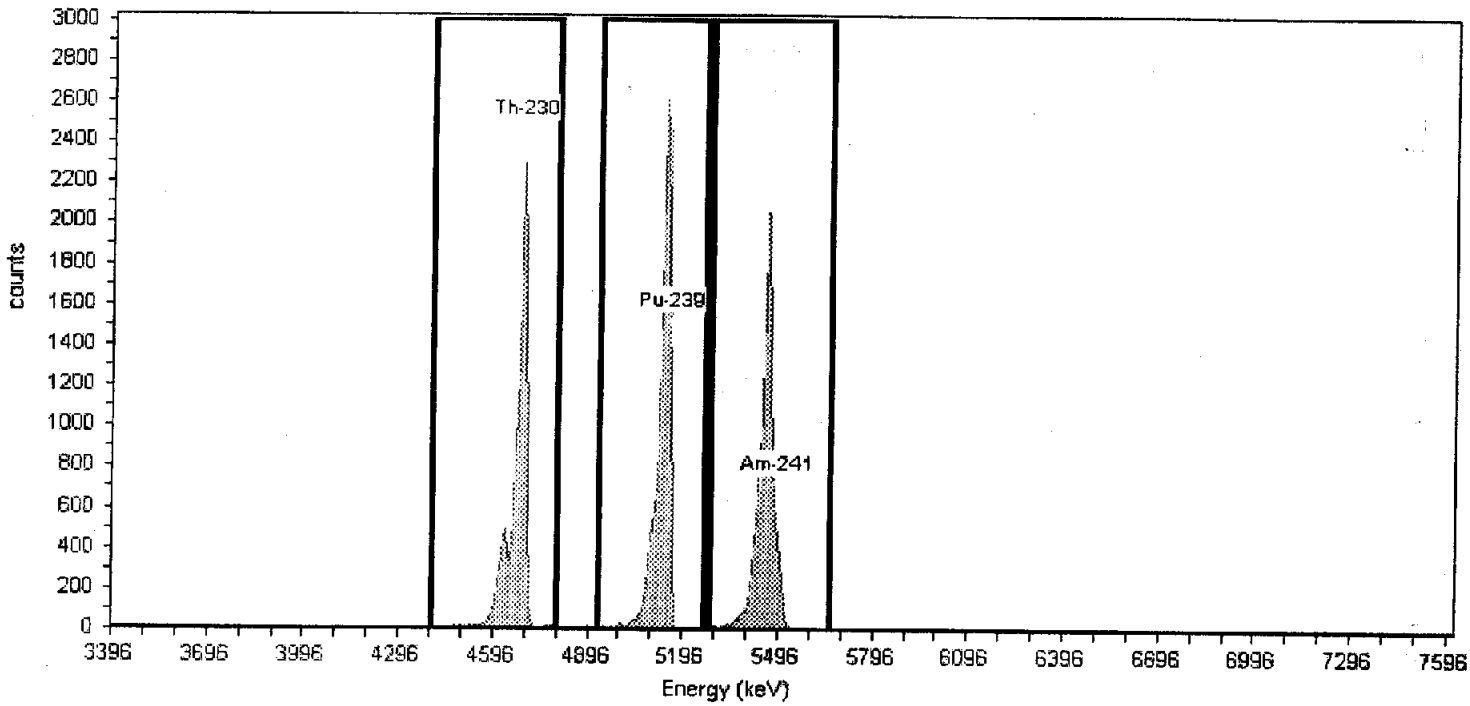
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV93 , SN: 46-033Q2
Acquisition Start Date: 3/30/2007 2:23:28AM
Live Time: 140.00 min.
Real Time: 140.01 min.
Efficiency: 26.61% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch²



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,286.00	87.76
Pu-239	243	5.16	212	258	14,026.00	100.19
Am-241	289	5.49	261	313	12,991.00	92.79

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
11:55:26PM 3/29/2007

Analyst: 60040
Detector: AV94

Calibration

Name: Mar2007_AV94
Description:

Calibration Date: 3/29/2007 11:55:23PM

Source Info

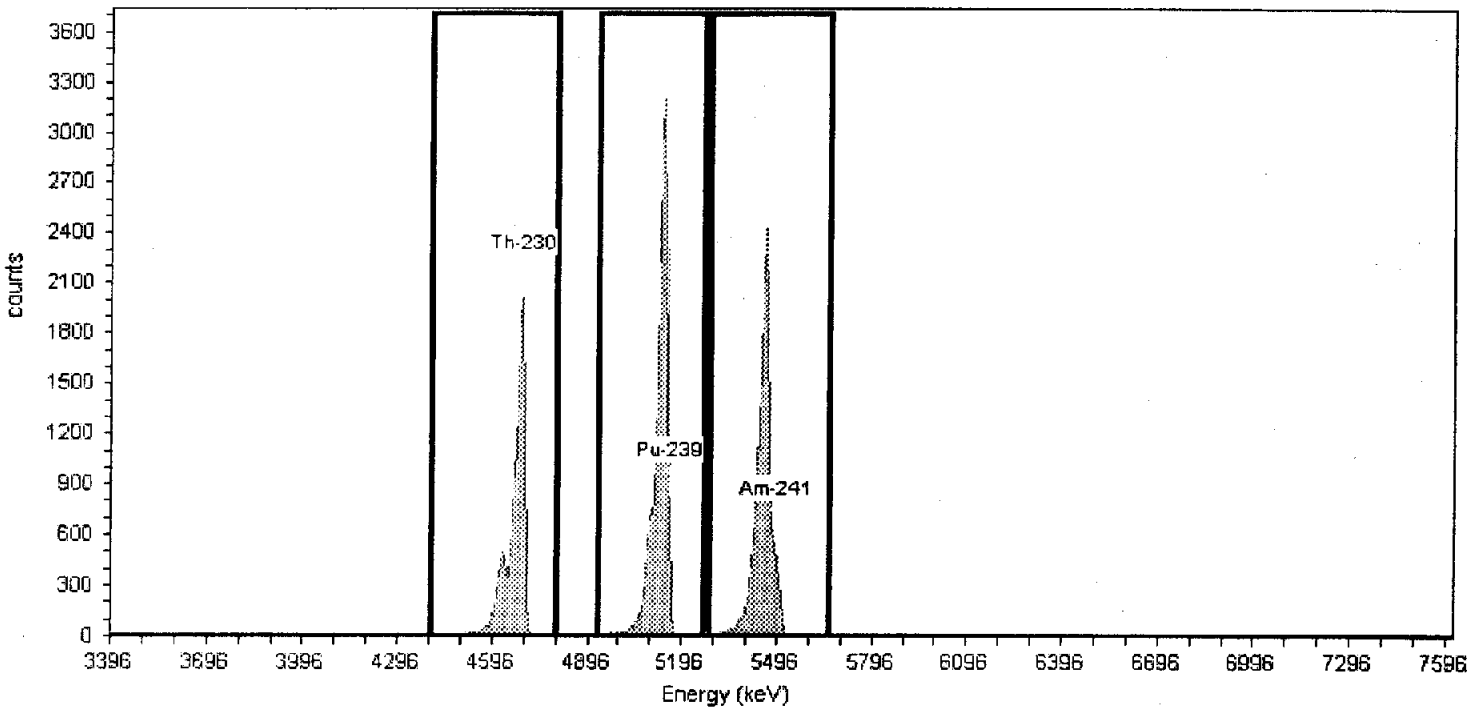
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV94 , SN: 46-032EE6
Acquisition Start Date: 3/29/2007 9:35:04PM
Live Time: 140.00 min.
Real Time: 140.02 min.
Efficiency: 26.63% +/- 0.27% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,527.00	82.34
Pu-239	243	5.16	212	258	17,308.00	123.63
Am-241	289	5.49	261	313	14,937.00	106.69

ST SEVERN TRENT **STL**

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:58:52PM 3/27/2007

Analyst: 60040
Detector: AV95

Calibration

Name: Mar2007_AV95
Description:

Calibration Date: 3/27/2007 2:58:48PM

Source Info

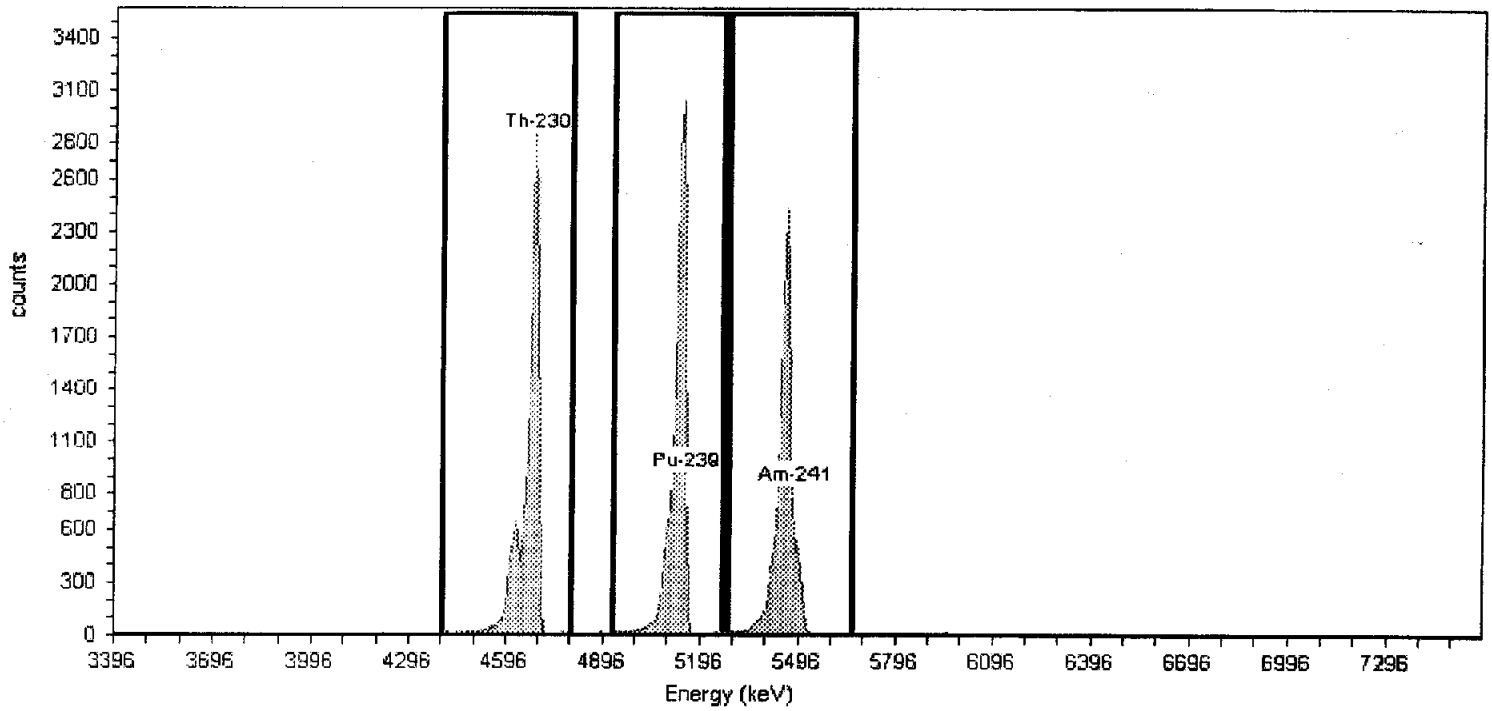
Certificate ID: 63506-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:07PM

Acquisition

Detector: AV95 , SN: 46-033P4
Acquisition Start Date: 3/27/2007 12:33:52PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.83% +/- 0.26% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	16,188.00	115.63
Pu-239	243	5.16	212	258	15,703.00	112.16
Am-241	289	5.49	261	313	14,688.00	104.91

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:59:01PM 3/27/2007

Analyst: 60040
Detector: AV96

Calibration

Name: Mar2007_AV96
Description:

Calibration Date: 3/27/2007 2:58:58PM

Source Info

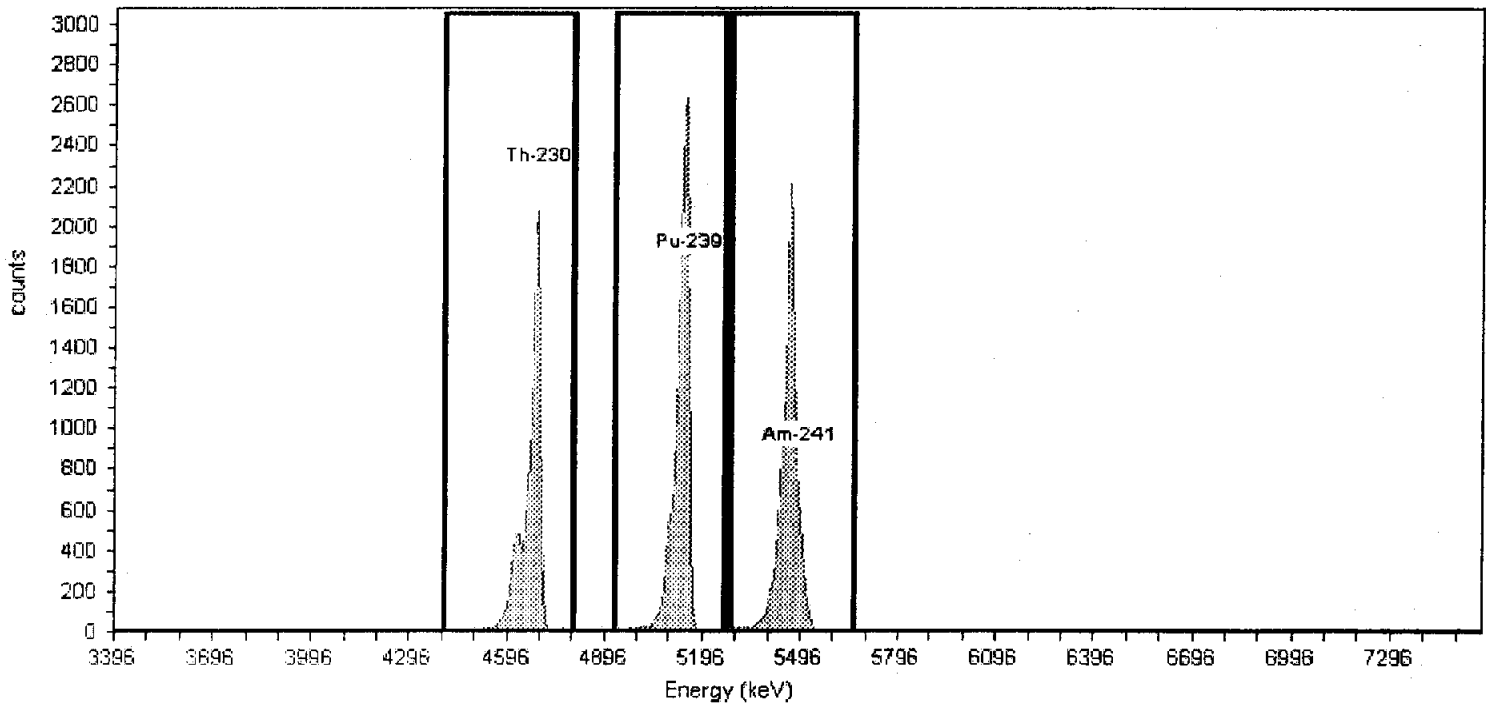
Certificate ID: 63507-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV96 , SN: 46-033P1
Acquisition Start Date: 3/27/2007 12:33:54PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 26.45% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,358.00	88.27
Pu-239	243	5.16	212	258	14,716.00	105.11
Am-241	289	5.49	261	313	13,968.00	99.77

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:59:11PM 3/27/2007

Analyst: 60040
Detector: AV97

Calibration

Name: Mar2007_AV97
Description:

Calibration Date: 3/27/2007 2:59:08PM

Source Info

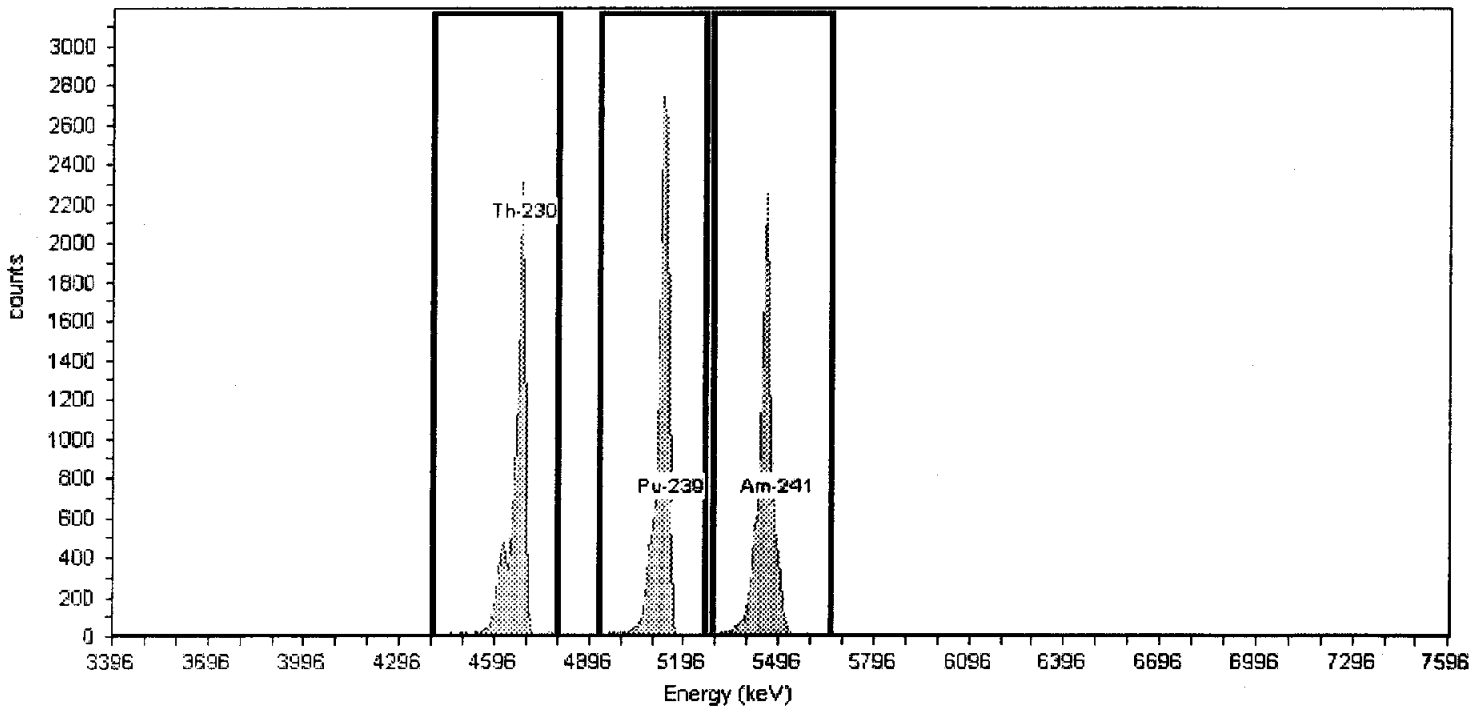
Certificate ID: 63508A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV97 , SN: 76-03393
Acquisition Start Date: 3/27/2007 12:33:54PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 27.14% +/- 0.29% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	12,416.00	88.69
Pu-239	243	5.16	212	258	14,360.00	102.57
Am-241	289	5.49	261	313	13,310.00	95.07

ST SEVERN TRENT STL

Alpha-Spectroscopy Calibration Report

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:59:17PM 3/27/2007

Analyst: 60040
Detector: AV98

Calibration

Name: Mar2007_AV98
Description:

Calibration Date: 3/27/2007 2:59:14PM

Source Info

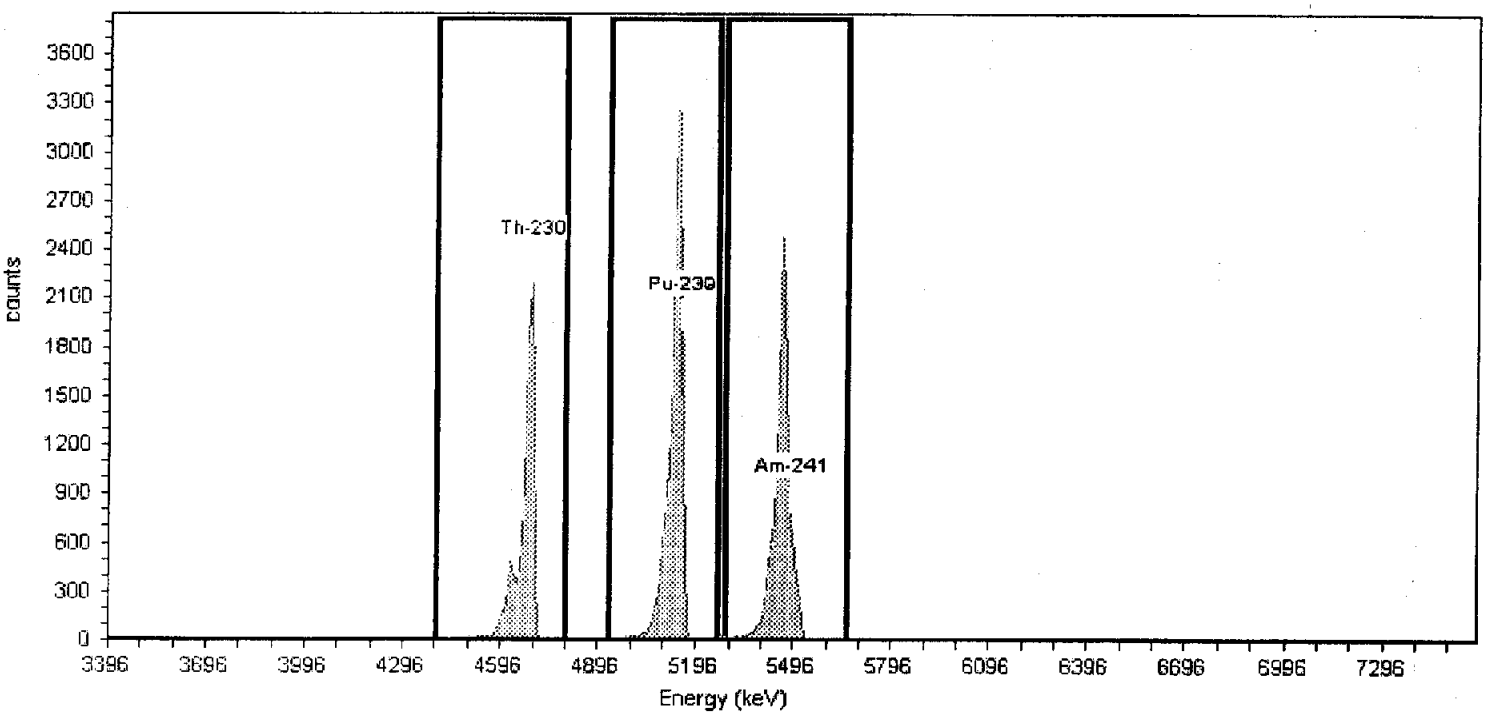
Certificate ID: 63509A-334
Prepared by: Analytics
Description:

Certification Date: 5/30/2002 12:00:00PM

Acquisition

Detector: AV98 , SN: 46-033Q3
Acquisition Start Date: 3/27/2007 12:34:48PM
Live Time: 140.00 min.
Real Time: 140.06 min.
Efficiency: 27.63% +/- 0.28% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.2598 keV / Ch
Offset = 3,388.96 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
Th-230	179	4.69	139	194	11,780.00	84.14
Pu-239	243	5.16	212	258	18,016.00	128.69
Am-241	289	5.49	261	313	15,615.00	111.54

GAS FLOW PROPORTIONAL COUNTING

SEVERN TRENT STL

Gas Flow Proportional Counting Radium

SEVERN TRENT STL

Analysis Report for Radium 226

Batch: 7110210 **Operator:** 402630

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID / WRKNO	Aliquot / Sigma	Truncate Yields / Dilution	Ba Mass / BaYield	Ingrowth / Eff	Cnt Date Time / InstrID	Ba Precip Time / Cal Type	SampCntDur / BkgCntDur	SampCnt / BkgCnt	Activity	UncTotal / UncCount	MDA / DLC
F7C280211-001	1.0160g	False	0.0374	1.1318	5/8/07 14:32	5/8/07 10:15	200	70	**6.791E-001**	1.994E-001	1.570E-001
JRWHL2AA	2.00	1.00	110.32%	0.1657	Protean0	2	1000	33	pCi/g	1.875E-001	6.402E-002
F7C280211-001X	1.0131g	False	0.0364	1.1319	5/8/07 14:32	5/8/07 10:15	200	76	**7.574E-001**	2.162E-001	1.720E-001
JRWHL1AK	2.00	1.00	107.37%	0.1652	Protean1	2	1000	38	pCi/g	2.025E-001	7.102E-002
F7D200000-210B	1.0000g	False	0.0362	1.1319	5/8/07 14:32	5/8/07 10:15	200	10	**6.656E-003**	9.773E-002	1.882E-001
JVA8R1AA	2.00	1.00	106.78%	0.1680	Protean2	2	1000	47	pCi/g	9.773E-002	7.913E-002
F7D200000-210C	1.0000g	False	0.0372	1.1319	5/8/07 14:32	5/8/07 10:15	200	796	**8.738E+000**	1.077E+000	1.777E-001
JVA8R1AC	2.00	1.00	109.73%	0.1635	Protean3	2	1000	41	pCi/g	6.291E-001	7.389E-002

Laboratory Control Sample Information

SampID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL
F7D200000-210C	JVA8R1AC	RA-226	8.738E+000 pCi/g	1.119E+001	78.06 % ✓	53.00	113.00

Sample Duplicate Information

SampID	SampDupID	Activity	DupActivity	RPD	RER	DER
F7C280211-001	F7C280211-001X	6.791E-001	7.574E-001	10.91% ✓	1.885E-001	2.663E-001

Matrix Spike Information

SampID	SampMSID	WRKNO	Analyte	Activity	MSActivity	StdAdded	Recovery

SEVERN TRENT STL

Analysis Report for Radium 226

Batch: 7087259 **Operator:** 402630

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID / WRKNO	Aliquot / Sigma	Truncate Yields / Dilution	Ba Mass / BaYield	Ingrowth / Eff	Cnt Date Time / InstrID	Ba Precip Time / Cal Type	SampCntDur / BkgCntDur	SampCnt / BkgCnt	Activity	UncTotal / UncCount	MDA / DLC
F7C280000-259B	1.0000g	False	0.0313	1.1287	4/17/07 14:53	4/17/07 10:45	200	15	**9.314E-002**	1.164E-001	1.882E-001
JRWKT1AA	2.00	1.00	92.33%	0.1764	Protean0	2	1000	37	pCi/g	1.160E-001	7.756E-002
F7C280000-259C	1.0000g	False	0.0323	1.1287	4/17/07 14:53	4/17/07 10:45	200	1090	**1.313E+001**	1.541E+000	2.099E-001
JRWKT1AC	2.00	1.00	95.28%	0.1723	Protean1	2	1000	49	pCi/g	8.062E-001	8.853E-002
F7C280211-001	1.0136g	False	0.0334	1.1287	4/17/07 14:53	4/17/07 10:45	200	172	**1.887E+000**	3.636E-001	1.908E-001
JRWHL1AA	2.00	1.00	98.53%	0.1729	Protean2	2	1000	44	pCi/g	3.109E-001	7.978E-002
F7C280211-001X	1.0011g	False	0.0328	1.1287	4/17/07 14:53	4/17/07 10:45	200	107	**1.183E+000**	2.843E-001	1.965E-001
JRWHL1AF	2.00	1.00	96.76%	0.1714	Protean3	2	1000	43	pCi/g	2.585E-001	8.202E-002
F7C280211-002	1.0044g	False	0.0332	1.1287	4/17/07 14:53	4/17/07 10:45	200	101	**1.096E+000**	2.802E-001	2.209E-001
JRWHT1AA	2.00	1.00	97.94%	0.1665	Protean5	2	1000	55	pCi/g	2.578E-001	9.399E-002
F7C280211-003	1.0105g	False	0.0319	1.1288	4/17/07 14:53	4/17/07 10:45	200	77	**8.008E-001**	2.440E-001	2.271E-001
JRWHW1AA	2.00	1.00	94.10%	0.1714	Protean6	2	1000	58	pCi/g	2.305E-001	9.702E-002
F7C280211-004	1.0016g	False	0.0327	1.1288	4/17/07 14:53	4/17/07 10:45	200	102	**1.158E+000**	2.913E-001	2.216E-001
JRWHX1AA	2.00	1.00	96.46%	0.1637	Protean8	2	1000	51	pCi/g	2.673E-001	9.375E-002
F7C280211-005	1.0052g	False	0.0333	1.1288	4/17/07 14:53	4/17/07 10:45	200	89	**9.408E-001**	2.550E-001	2.074E-001
JRWH01AA	2.00	1.00	98.23%	0.1697	Protean9	2	1000	50	pCi/g	2.370E-001	8.761E-002
F7C280211-006	1.0055g	False	0.0328	1.1288	4/17/07 14:53	4/17/07 10:45	200	86	**9.658E-001**	2.596E-001	1.989E-001
JRWH31AA	2.00	1.00	96.76%	0.1652	Protean10	2	1000	41	pCi/g	2.410E-001	8.270E-002
F7C280211-007	1.0147g	False	0.0322	1.1288	4/17/07 14:53	4/17/07 10:45	200	84	**9.267E-001**	2.508E-001	1.909E-001
JRWH51AA	2.00	1.00	94.99%	0.1702	Protean11	2	1000	39	pCi/g	2.330E-001	7.901E-002
F7C280211-008	1.0064g	False	0.0326	1.1289	4/17/07 14:53	4/17/07 10:45	200	110	**1.181E+000**	2.969E-001	2.433E-001
JRWH81AA	2.00	1.00	96.17%	0.1683	Protean12	2	1000	68	pCi/g	2.724E-001	1.051E-001
F7C280211-009	1.0072g	False	0.0305	1.1289	4/17/07 14:53	4/17/07 10:45	200	83	**9.364E-001**	2.610E-001	2.133E-001
JRWJA1AA	2.00	1.00	89.97%	0.1735	Protean13	2	1000	46	pCi/g	2.437E-001	8.953E-002
F7C280211-010	1.0068g	False	0.0318	1.1289	4/17/07 14:53	4/17/07 10:45	200	108	**1.087E+000**	2.998E-001	2.903E-001
JRWJC1AA	2.00	1.00	93.81%	0.1711	Protean14	2	1000	100	pCi/g	2.794E-001	1.285E-001
F7C280211-011	1.0024g	False	0.0321	1.1289	4/17/07 14:53	4/17/07 10:45	200	94	**1.006E+000**	2.704E-001	2.265E-001
JRWJE1AA	2.00	1.00	94.69%	0.1721	Protean15	2	1000	58	pCi/g	2.510E-001	9.677E-002
F7C280211-012	1.0047g	False	0.0313	1.1302	4/17/07 14:57	4/17/07 10:45	200	116	**1.193E+000**	2.649E-001	1.409E-001
JRWJG1AA	2.00	1.00	92.33%	0.1998	RedA1	2	1000	25	pCi/g	2.365E-001	5.592E-002

SampID / WRKNO	Aliquot / Sigma	Truncate Yields / Dilution	Ba Mass / BaYield	Ingrowth / Eff	Cnt Date Time / InstrID	Ba Precip Time / Cal Type	SampCntDur / BkgCntDur	SampCnt / BkgCnt	Activity	UncTotal / UncCount	MDA / DLC
F7C280211-013	1.0047g	False	0.0319	1.1302	4/17/07 14:57	4/17/07 10:45	200	119	**1.264E+000**	2.767E-001	1.427E-001
JRWJH1AA	2.00	1.00	94.10%	0.1905	RedA3	2	1000	24	pCi/g	2.462E-001	5.639E-002
F7C280211-014	1.0092g	False	0.0329	1.1302	4/17/07 14:57	4/17/07 10:45	200	102	**1.003E+000**	2.410E-001	1.541E-001
JRWJJ1AA	2.00	1.00	97.05%	0.1935	RedA4	2	1000	33	pCi/g	2.191E-001	6.283E-002
F7C280211-015	1.0149g	False	0.0333	1.1302	4/17/07 14:57	4/17/07 10:45	200	96	**9.603E-001**	2.328E-001	1.383E-001
JRWJK1AA	2.00	1.00	98.23%	0.1894	RedB1	2	1000	25	pCi/g	2.121E-001	5.490E-002

Laboratory Control Sample Information

SampID	WRKNO	Analyte	Activity	StdAdded	Recovery	LCL	UCL
F7C280000-259C	JRWKT1AC	RA-226	1.313E+001 pCi/g	1.119E+001	117.31 %	53.00	113.00

Sample Duplicate Information

SampID	SampDupID	Activity	DupActivity	RPD	RER	DER
F7C280211-001	F7C280211-001X	1.887E+000	1.183E+000	45.84%	1.086E+000	1.524E+000

Matrix Spike Information

SampID	SampMSID	WRKNO	Analyte	Activity	MSActivity	StdAdded	Recovery

SEVERN TRENT STL

Analysis Report for Radium 228

Batch: 7087261 **Operator:** 402630

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID / WRKNO	Aliquot / Mass	Eff	BaYield / YYield	Truncate / Yields	CountDateTime / InstrID	Y Ingrowth Time / Y Precip Time	SampCntD / BkgCntDur	SampCnt / BkgCnt	Cal Type / Sigma	Activity	UncTotal / UncCount	MDA / DLC
F7C280000-261B	1.0000 g	0.4089	92.33	False	4/17/07 11:15	4/3/07 11:00	200	152	1	2.634E-001	3.068E-001	5.007E-001
JRWKX1AA	0.0313 g		106.04		Protean0	4/17/07 8:30	1000	617	2.00	pCi/g	3.057E-001	2.380E-001
F7C280000-261C	1.0000 g	0.4089	95.28	False	4/17/07 11:15	4/3/07 11:00	200	1012	1	8.584E+000	1.061E+000	4.502E-001
JRWKX1AC	0.0323 g		101.10		Protean1	4/17/07 8:30	1000	476	2.00	pCi/g	6.231E-001	2.125E-001
F7C280211-001	1.0136 g	0.4100	98.53	False	4/17/07 11:15	4/3/07 11:00	200	224	1	1.315E+000	3.792E-001	4.739E-001
JRWHL1AC	0.0334 g		90.11		Protean2	4/17/07 8:30	1000	462	2.00	pCi/g	3.556E-001	2.235E-001
F7C280211-001X	1.0011 g	0.3889	96.76	False	4/17/07 11:15	4/3/07 11:00	200	176	1	7.989E-001	3.240E-001	4.546E-001
JRWHL1AG	0.0328 g		102.20		Protean3	4/17/07 8:30	1000	463	2.00	pCi/g	3.140E-001	2.145E-001
F7C280211-002	1.0044 g	0.4118	97.94	False	4/17/07 11:15	4/3/07 11:00	200	192	1	9.869E-001	3.258E-001	4.267E-001
JRWHT1AC	0.0332 g		97.80		Protean4	4/17/07 8:30	1000	430	2.00	pCi/g	3.105E-001	2.009E-001
F7C280211-003	1.0105 g	0.4124	94.10	False	4/17/07 11:15	4/3/07 11:00	200	186	1	1.069E+000	3.189E-001	3.940E-001
JRWHW1AC	0.0319 g		100.55		Protean5	4/17/07 8:30	1000	359	2.00	pCi/g	3.005E-001	1.844E-001
F7C280211-004	1.0016 g	0.4099	96.46	False	4/17/07 11:15	4/3/07 11:00	200	186	1	9.546E-001	3.076E-001	3.965E-001
JRWHX1AC	0.0327 g		103.85		Protean6	4/17/07 8:30	1000	398	2.00	pCi/g	2.924E-001	1.862E-001
F7C280211-005	1.0052 g	0.3967	98.23	False	4/17/07 11:16	4/3/07 11:00	200	165	1	7.709E-001	3.392E-001	4.849E-001
JRWH01AC	0.0333 g		91.21		Protean8	4/17/07 8:30	1000	452	2.00	pCi/g	3.303E-001	2.286E-001
F7C280211-006	1.0055 g	0.4007	96.76	False	4/17/07 11:16	4/3/07 11:00	200	159	1	7.287E-001	2.993E-001	4.179E-001
JRWH31AC	0.0328 g		101.10		Protean9	4/17/07 8:30	1000	406	2.00	pCi/g	2.903E-001	1.964E-001
F7C280211-007	1.0147 g	0.4028	94.99	False	4/17/07 11:16	4/3/07 11:00	200	153	1	6.800E-001	3.286E-001	4.787E-001
JRWH51AC	0.0322 g		91.76		Protean10	4/17/07 8:30	1000	437	2.00	pCi/g	3.214E-001	2.254E-001
F7C280211-008	1.0064 g	0.3966	96.17	False	4/17/07 11:16	4/3/07 11:00	200	165	1	7.964E-001	3.265E-001	4.571E-001
JRWH81AC	0.0326 g		96.15		Protean11	4/17/07 8:30	1000	427	2.00	pCi/g	3.166E-001	2.151E-001
F7C280211-009	1.0072 g	0.4092	89.97	False	4/17/07 11:16	4/3/07 11:00	200	166	1	8.648E-001	3.578E-001	5.026E-001
JRWJA1AC	0.0305 g		91.21		Protean12	4/17/07 8:30	1000	434	2.00	pCi/g	3.472E-001	2.367E-001
F7C280211-010	1.0068 g	0.4112	93.81	False	4/17/07 11:16	4/3/07 11:00	200	127	1	7.309E-001	3.673E-001	5.336E-001
JRWJC1AC	0.0318 g		74.18		Protean13	4/17/07 8:30	1000	350	2.00	pCi/g	3.600E-001	2.496E-001
F7C280211-011	1.0024 g	0.4098	94.69	False	4/17/07 11:16	4/3/07 11:00	200	155	1	5.768E-001	2.818E-001	4.121E-001
JRWJE1AC	0.0321 g		107.69		Protean14	4/17/07 8:30	1000	448	2.00	pCi/g	2.758E-001	1.942E-001
F7C280211-012	1.0047 g	0.4096	92.33	False	4/17/07 11:16	4/3/07 11:00	200	148	1	6.592E-001	3.307E-001	4.852E-001
JRWJG1AC	0.0313 g		91.76		Protean15	4/17/07 8:30	1000	429	2.00	pCi/g	3.241E-001	2.284E-001

SampID / WRKNO	Aliquot / Mass	Eff	BaYield / YYield	Truncate / Yields	CountDateTime / InstrID	Y Ingrowth Time / Y Precip Time	SampCntD / BkgCntDur	SampCnt / BkgCnt	Cal Type / Sigma	Activity	UncTotal / UncCount	MDA / DLC
F7C280211-013	1.0047 g	0.4338	94.10	False	4 / 17 / 07 11:21	4 / 3 / 07 11:00	200	355	1	1.312E+000	5.035E-001	7.314E-001
JRWJH1AC	0.0319 g		90.11		RedA1	4 / 17 / 07 8:30	1000	1125	2.00	pCi/g	4.862E-001	3.522E-001
F7C280211-014	1.0092 g	0.4281	97.05	False	4 / 17 / 07 11:21	4 / 3 / 07 11:00	200	333	1	1.145E+000	5.272E-001	7.917E-001
JRWJJ1AC	0.0329 g		81.87		RedA3	4 / 17 / 07 8:30	1000	1138	2.00	pCi/g	5.146E-001	3.814E-001
F7C280211-015	1.0149 g	0.4295	98.23	False	4 / 17 / 07 11:21	4 / 3 / 07 11:00	200	326	1	1.453E+000	6.213E-001	9.196E-001
JRWJK1AC	0.0333 g		67.03		RedA4	4 / 17 / 07 8:30	1000	1071	2.00	pCi/g	6.040E-001	4.424E-001

Laboratory Control Sample Information

SampID	WRKNO	ComponentName	Activity	StdAdded	Recovery	LCL	UCL
F7C280000-261C	JRWKX1AC	RA-228	8.584E+000 pCi/g	9.056E+000 pCi/g	94.79 %	54.00	130.00

Sample Duplicate Information

SampID	SampDupID	Activity	DupActivity	RPD	RER	DER
F7C280211-001	F7C280211-001X	1.315E+000	7.989E-001	48.86%	7.346E-001	1.036E+000

Matrix Spike Information

SampID	SampMSID	Sample Activity	MS Activity	StdAdded	MSRecovery
					%

TestAmerica STL

Instrument Checks

SEVERN TRENT **STL**

Gas Proportional Counter Daily Quality Control Checks

Tuesday, May 08, 2007

Instrument: ***Protean***

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha Std. Dev.	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta Std. Dev.	Beta Deviation	Beta Flag
0	Efficiency	12255.00	12241.67	48.61	13.33	Pass	38468.24	38645.53	125.88	-177.29	Pass
	Background	0.040	0.060	0.034	-0.020	Pass	0.545	0.617	0.183	-0.072	Pass
1	Efficiency	10854.00	10884.88	86.56	-30.88	Pass	39337.58	39396.03	112.81	-58.44	Pass
	Background	0.065	0.055	0.042	0.010	Pass	0.420	0.487	0.132	-0.067	Pass
10	Efficiency	11280.50	11363.88	69.14	-83.38	Pass	26146.36	26323.28	108.01	-176.92	Pass
	Background	0.050	0.042	0.044	0.008	Pass	0.460	0.535	0.216	-0.075	Pass
11	Efficiency	11282.00	11367.28	98.12	-85.27	Pass	34061.99	33885.50	126.81	176.49	Pass
	Background	0.040	0.068	0.054	-0.028	Pass	0.415	0.552	0.169	-0.137	Pass
12	Efficiency	11747.00	11809.78	110.11	-62.77	Pass	29758.29	29978.88	152.42	-220.59	Pass
	Background	0.050	0.092	0.072	-0.042	Pass	0.465	0.542	0.220	-0.077	Pass
13	Efficiency	11646.00	11751.35	62.39	-105.35	Pass	26176.37	26251.10	134.68	-74.73	Pass
	Background	0.040	0.057	0.034	-0.017	Pass	0.360	0.398	0.168	-0.038	Pass
14	Efficiency	11627.00	11522.85	75.22	104.15	Pass	33138.63	33358.03	149.97	-219.40	Pass
	Background	0.150	0.138	0.091	0.012	Pass	0.440	0.483	0.165	-0.043	Pass
15	Efficiency	12277.50	12350.88	96.26	-73.38	Pass	32411.34	32329.40	134.79	81.94	Pass
	Background	0.040	0.060	0.053	-0.020	Pass	0.325	0.417	0.122	-0.092	Pass
2	Efficiency	11621.50	11651.70	75.14	-30.20	Pass	26899.66	26866.90	132.05	32.76	Pass
	Background	0.055	0.047	0.033	0.008	Pass	0.585	0.620	0.218	-0.035	Pass
3	Efficiency	11574.50	11539.10	68.70	35.40	Pass	33123.62	33232.65	174.40	-109.03	Pass
	Background	0.030	0.048	0.041	-0.018	Pass	0.395	0.458	0.129	-0.063	Pass
4	Efficiency	11572.00	11770.35	90.44	-198.35	WARNING	30085.92	30216.72	127.43	-130.81	Pass
	Background	0.050	0.063	0.055	-0.013	Pass	0.430	0.460	0.162	-0.030	Pass
5	Efficiency	11523.50	11599.85	62.24	-76.35	Pass	26419.97	26436.30	108.77	-16.33	Pass
	Background	0.055	0.073	0.058	-0.018	Pass	0.315	0.550	0.323	-0.235	Pass
6	Efficiency	11471.50	11576.67	83.25	-105.17	Pass	33369.72	33444.18	148.67	-74.46	Pass
	Background	0.050	0.058	0.040	-0.008	Pass	0.340	0.502	0.183	-0.162	Pass
7	Efficiency	12132.00	12181.05	105.74	-49.05	Pass	31465.96	31731.25	165.70	-265.29	Pass
	Background	0.090	0.038	0.041	0.052	Pass	0.450	0.597	0.232	-0.147	Pass
8	Efficiency	11640.00	11725.63	40.77	-85.63	WARNING	37250.26	37169.88	151.40	80.38	Pass
	Background	0.065	0.047	0.042	0.018	Pass	0.405	0.478	0.154	-0.073	Pass
9	Efficiency	10853.50	10773.58	68.72	79.92	Pass	38646.31	38427.53	198.23	218.78	Pass
	Background	0.065	0.070	0.042	-0.005	Pass	0.360	0.447	0.165	-0.087	Pass

5/8/2007 11:16:20 AM

IQC version 2.3, updated 4/5/2006

SEVERN TRENT STL

Gas Proportional Counter Daily Quality Control Checks

Tuesday, April 17, 2007

Instrument: *Protean*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha Std. Dev.	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta Std. Dev.	Beta Deviation	Beta Flag
0	Efficiency	12202.50	12438.95	90.72	-236.45	WARNING	39228.91	39393.30	125.07	-164.39	Pass
	Background	0.033	0.054	0.056	-0.021	Pass	0.533	0.727	0.276	-0.194	Pass
1	Efficiency	10891.50	10948.58	103.93	-57.08	Pass	39804.98	40103.78	148.41	-298.79	WARNING
	Background	0.033	0.085	0.057	-0.052	Pass	0.500	0.585	0.243	-0.085	Pass
10	Efficiency	11391.00	11350.29	72.87	40.71	Pass	26692.57	26788.33	617.21	-95.76	Pass
	Background	0.067	0.048	0.033	0.018	Pass	0.767	0.663	0.376	0.103	Pass
11	Efficiency	11307.50	11416.80	73.68	-109.30	Pass	34452.30	34370.70	170.34	81.60	Pass
	Background	0.033	0.065	0.038	-0.032	Pass	0.667	0.538	0.190	0.128	Pass
12	Efficiency	11862.50	11834.33	77.65	28.17	Pass	30473.97	31028.09	349.77	-554.11	Pass
	Background	0.033	0.082	0.071	-0.048	Pass	0.233	0.505	0.208	-0.272	Pass
13	Efficiency	11840.00	11755.73	59.18	84.27	Pass	26481.48	26744.32	145.13	-262.84	Pass
	Background	0.000	0.063	0.055	-0.063	Pass	0.467	0.370	0.164	0.097	Pass
14	Efficiency	11656.50	11669.92	74.98	-13.42	Pass	33601.35	34102.93	190.40	-501.57	WARNING
	Background	0.133	0.055	0.067	0.078	Pass	0.367	0.308	0.110	0.058	Pass
15	Efficiency	12425.50	12475.03	74.63	-49.52	Pass	32809.13	32925.32	143.10	-116.19	Pass
	Background	0.067	0.070	0.053	-0.003	Pass	0.367	0.420	0.187	-0.053	Pass
2	Efficiency	11673.50	11615.03	64.25	58.48	Pass	27084.88	27229.97	110.97	-145.09	Pass
	Background	0.067	0.067	0.045	0.000	Pass	0.733	0.662	0.184	0.072	Pass
3	Efficiency	11536.50	11621.48	67.85	-84.98	Pass	33960.76	34333.78	172.20	-373.01	WARNING
	Background	0.067	0.047	0.044	0.020	Pass	0.467	0.503	0.132	-0.037	Pass
4	Efficiency	11982.50	11876.42	66.44	106.08	Pass	30664.31	30755.88	142.37	-91.57	Pass
	Background	0.033	0.025	0.026	0.008	Pass	0.600	0.422	0.172	0.178	Pass
5	Efficiency	11602.00	11742.05	100.58	-140.05	Pass	26814.57	26965.53	141.56	-150.96	Pass
	Background	0.100	0.063	0.054	0.037	Pass	0.233	0.455	0.113	-0.222	Pass
6	Efficiency	11579.50	11597.23	93.35	-17.73	Pass	33540.10	33815.97	150.95	-275.87	Pass
	Background	0.033	0.037	0.032	-0.003	Pass	0.800	0.378	0.159	0.422	Pass
7	Efficiency	12247.00	12362.35	80.91	-115.35	Pass	32121.19	32648.92	156.35	-527.74	FAIL
	Background	0.100	0.060	0.041	0.040	Pass	0.433	0.490	0.209	-0.057	Pass
8	Efficiency	11748.50	11879.92	87.36	-131.42	Pass	37579.17	37928.10	223.11	-348.93	Pass
	Background	0.000	0.047	0.042	-0.047	Pass	0.400	0.410	0.129	-0.010	Pass
9	Efficiency	10885.50	10828.78	75.31	56.73	Pass	38874.06	39110.95	193.52	-236.89	Pass
	Background	0.067	0.063	0.057	0.003	Pass	0.333	0.387	0.139	-0.053	Pass

SEVERN TRENT STL

Gas Proportional Counter Daily Quality Control Checks

Tuesday, April 17, 2007

Instrument: *Red*

Detector ID	Check Type	Alpha CPM	Alpha Mean	Alpha Std. Dev.	Alpha Deviation	Alpha Flag	Beta CPM	Beta Mean	Beta Std. Dev.	Beta Deviation	Beta Flag
A1	Efficiency	13362.00	13329.55	85.91	32.45	Pass	42483.17	42313.25	116.45	169.92	Pass
	Background	0.033	0.032	0.025	0.002	Pass	1.300	1.107	0.223	0.193	Pass
A2	Efficiency	11813.50	11853.45	82.05	-39.95	Pass	42923.24	43395.25	143.67	-472.01	FAIL
	Background	0.100	0.038	0.029	0.062	Pass	1.267	1.153	0.223	0.113	Pass
A3	Efficiency	12477.50	12417.85	66.27	59.65	Pass	28841.38	28776.78	98.48	64.60	Pass
	Background	0.067	0.043	0.041	0.023	Pass	1.100	1.117	0.252	-0.017	Pass
A4	Efficiency	12676.50	12623.33	78.88	53.17	Pass	38476.89	38445.45	116.80	31.44	Pass
	Background	0.033	0.038	0.036	-0.005	Pass	0.833	0.998	0.157	-0.165	Pass
B1	Efficiency	12917.50	12857.63	84.18	59.88	Pass	32673.73	32531.30	107.12	142.43	Pass
	Background	0.000	0.055	0.058	-0.055	Pass	1.000	1.047	0.208	-0.047	Pass
B2	Efficiency	12811.50	12719.13	67.48	92.38	Pass	28394.29	28336.95	86.53	57.34	Pass
	Background	0.033	0.042	0.030	-0.008	Pass	1.067	1.108	0.254	-0.042	Pass
B3	Efficiency	12690.00	12578.45	116.33	111.55	Pass	36396.31	36441.40	132.39	-45.09	Pass
	Background	0.033	0.030	0.034	0.003	Pass	1.167	1.153	0.205	0.013	Pass
B4	Efficiency	13972.50	14021.75	77.64	-49.25	Pass	35556.26	35821.15	149.33	-264.89	Pass
	Background	0.033	0.077	0.045	-0.043	Pass	0.967	1.152	0.194	-0.185	Pass
C1	Efficiency	13087.00	13191.25	97.58	-104.25	Pass	41793.98	41823.15	119.67	-29.17	Pass
	Background	0.100	0.040	0.055	0.060	Pass	1.100	1.093	0.244	0.007	Pass
C2	Efficiency	12172.00	12161.95	77.56	10.05	Pass	44525.15	43965.10	126.72	560.05	FAIL
	Background	0.000	0.040	0.043	-0.040	Pass	1.567	1.223	0.210	0.343	Pass
C3	Efficiency	12350.00	12486.35	103.66	-136.35	Pass	28839.37	28775.85	121.78	63.52	Pass
	Background	0.033	0.042	0.026	-0.008	Pass	1.567	1.142	0.145	0.425	Pass
C4	Efficiency	12524.50	12595.53	78.88	-71.02	Pass	38356.10	38190.35	142.11	165.75	Pass
	Background	0.133	0.062	0.049	0.072	Pass	1.367	1.173	0.204	0.193	Pass
D1	Efficiency	13314.00	13252.15	74.78	61.85	Pass	33135.36	33075.80	127.27	59.56	Pass
	Background	0.000	0.048	0.045	-0.048	Pass	1.133	1.107	0.122	0.027	Pass
D2	Efficiency	12854.00	12837.17	75.18	16.83	Pass	28566.21	28629.80	124.53	-63.59	Pass
	Background	0.033	0.043	0.042	-0.010	Pass	1.200	1.015	0.243	0.185	Pass
D3	Efficiency	12872.00	12785.88	90.30	86.13	Pass	36664.47	36599.43	146.33	65.04	Pass
	Background	0.167	0.030	0.036	0.137	FAIL	1.100	1.080	0.315	0.020	Pass
D4	Efficiency	13634.50	13762.60	85.17	-128.10	Pass	36002.85	35883.50	157.75	119.35	Pass
	Background	0.033	0.032	0.041	0.002	Pass	1.100	1.028	0.204	0.072	Pass

4/17/2007 8:56:30 AM

IQC version 2.3, updated 4/5/2006

TestAmerica

STL

Protean Long Backgrounds March 2007

SN	SAMPLE ID	TIME	A	ACPM	B	BCPM	COMMENT	BATCH ID
0	LB0	3/31/2007 9:05:12 AM	37	0.037	617	0.617	Long Background Detector 0	Long Backgrounds
1	LB1	3/31/2007 9:05:44 AM	49	0.049	476	0.476	Long Background Detector 1	Long Backgrounds
2	LB2	3/31/2007 9:05:45 AM	44	0.044	462	0.462	Long Background Detector 2	Long Backgrounds
3	LB3	3/31/2007 9:05:57 AM	43	0.043	463	0.463	Long Background Detector 3	Long Backgrounds
4	LB4	3/31/2007 9:06:13 AM	46	0.046	430	0.43	Long Background Detector 4	Long Backgrounds
5	LB5	3/31/2007 9:06:24 AM	55	0.055	359	0.359	Long Background Detector 5	Long Backgrounds
6	LB6	3/31/2007 9:06:35 AM	58	0.058	398	0.398	Long Background Detector 6	Long Backgrounds
7	LB7	3/31/2007 9:06:44 AM	38	0.038	497	0.497	Long Background Detector 7	Long Backgrounds
8	LB8	3/31/2007 9:06:57 AM	51	0.051	452	0.452	Long Background Detector 8	Long Backgrounds
9	LB9	3/31/2007 9:07:06 AM	50	0.05	406	0.406	Long Background Detector 9	Long Backgrounds
10	LB10	3/31/2007 9:07:15 AM	41	0.041	437	0.437	Long Background Detector 10	Long Backgrounds
11	LB11	3/31/2007 9:07:24 AM	39	0.039	427	0.427	Long Background Detector 11	Long Backgrounds
12	LB12	3/31/2007 9:07:31 AM	68	0.068	434	0.434	Long Background Detector 12	Long Backgrounds
13	LB13	3/31/2007 9:07:40 AM	46	0.046	350	0.35	Long Background Detector 13	Long Backgrounds
14	LB14	3/31/2007 9:07:49 AM	100	0.1	448	0.448	Long Background Detector 14	Long Backgrounds
15	LB15	3/31/2007 9:07:59 AM	58	0.058	429	0.429	Long Background Detector 15	Long Backgrounds

SEVERN TRENT STL

Protean Long Backgrounds April 2007

SN	SAMPLE ID	TIME	CNT TIME	A	ACPM	B	BCPM	COMMENT	BATCH ID
0	LB0	4/28/2007 7:38	1000	33	0.033	606	0.606	Long Background Detector 0	Long Backgrounds
1	LB1	4/28/2007 7:39:13 AM	1000	38	0.038	449	0.449	Long Background Detector 1	Long Backgrounds
2	LB2	4/28/2007 7:39:17 AM	1000	47	0.047	504	0.504	Long Background Detector 2	Long Backgrounds
3	LB3	4/28/2007 7:39:22 AM	1000	41	0.041	466	0.466	Long Background Detector 3	Long Backgrounds
4	LB4	4/28/2007 7:39:30 AM	1000	56	0.056	458	0.458	Long Background Detector 4	Long Backgrounds
5	LB5	4/28/2007 7:39:40 AM	1000	32	0.032	382	0.382	Long Background Detector 5	Long Backgrounds
6	LB6	4/28/2007 7:39:48 AM	1000	48	0.048	380	0.380	Long Background Detector 6	Long Backgrounds
7	LB7	4/28/2007 7:39:57 AM	1000	27	0.027	428	0.428	Long Background Detector 7	Long Backgrounds
8	LB8	4/28/2007 7:40:10 AM	1000	60	0.060	450	0.450	Long Background Detector 8	Long Backgrounds
9	LB9	4/28/2007 7:40:16 AM	1000	48	0.048	371	0.371	Long Background Detector 9	Long Backgrounds
10	LB10	4/28/2007 7:40:28 AM	1000	38	0.038	418	0.418	Long Background Detector 10	Long Backgrounds
11	LB11	4/28/2007 7:40:37 AM	1000	43	0.043	394	0.394	Long Background Detector 11	Long Backgrounds
12	LB12	4/28/2007 7:40:44 AM	1000	68	0.068	419	0.419	Long Background Detector 12	Long Backgrounds
13	LB13	4/28/2007 7:40:53 AM	1000	53	0.053	361	0.361	Long Background Detector 13	Long Backgrounds
14	LB14	4/28/2007 7:41:08 AM	1000	95	0.095	394	0.394	Long Background Detector 14	Long Backgrounds
15	LB15	4/28/2007 7:41:16 AM	1000	38	0.038	376	0.376	Long Background Detector 15	Long Backgrounds

TestAmerica STL

Long Backgrounds – Red
March 2007

Detector ID	Sample ID	Alpha	Beta	Guard	Count Count Time	Event	Voltage	TOD
A1	A1-01	25	1125	528081	1000	0	1380	39172.39
A2	A2-01	35	1094	528075	1000	0	1380	39172.39
A3	A3-01	24	1138	528074	1000	0	1380	39172.39
A4	A4-01	33	1071	528075	1000	0	1380	39172.39
B1	B1-01	25	1087	536299	1000	0	1380	39172.4
B2	B2-01	23	1030	536269	1000	0	1380	39172.4
B3	B3-01	31	1141	536272	1000	0	1380	39172.4
B4	B4-01	52	1098	536269	1000	0	1380	39172.4
C1	C1-01	44	1268	536955	1000	0	1380	39172.39
C2	C2-01	42	1311	536954	1000	0	1380	39172.39
C3	C3-01	32	1192	536954	1000	0	1380	39172.39
C4	C4-01	26	1133	536954	1000	0	1380	39172.39
D1	D1-01	30	1102	537087	1000	0	1380	39172.4
D2	D2-01	24	1139	537088	1000	0	1380	39172.4
D3	D3-01	26	1063	537089	1000	0	1380	39172.4
D4	D4-01	26	1124	537088	1000	0	1380	39172.4

TestAmerica STL

Run Log

Logbook No.: 2906

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
4/16/7	7082218	F7C230136-008	11	200 min	Ra228	SE
		-009	12			
		-010	13			
		-011	14			
		-012	15			
	7082216	F7C230000-216B	0		Ra226	
		-216C	1			
		-216L	2			
		F7C230136-001	5			
		-002	6			
		-003	7			
		-004	8			
		-005	9			
		-006	10			
		-007	11			
		-008	12			
		-009	13			
		-010	14			
		-011	15			
	7095067	F7D040280-001	4		8240	
4/16/07	7095251	F7D050000-251B	0		TSr	W
		-251C	1			
		F7D050167-008	2			
		-008X	5			
4/17/7	Daily	Bkg & Source	0-15	30+2min	QA	SE
	7087261	F7C280000-261B	0	200 min	Ra228	
		-261C	1			

Reviewed By: SE Date: 4/17/7

SOP References: STL-RD-0403 Rev 5 01/16/06
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2906

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
4/17/7	7087261	F7C280211-001	2	200 min	Ra 228	SE
		-001K	3			
		-002	4			
		-003	5			
		-004	6			
		-005	8			
		-006	9			
		-007	10			
		-008	11			
		-009	12			
		-010	13			
		-011	14			
		-012	15			
	7087254	F7C280000-259B	0		Ra 226	
		-259C	1			
		F7C280211-001	2			
		-001K	3			
		-002	5			
		-003	6			
		-004	8			
		-005	9			
		-006	10			
		-007	11			
		-008	12			
		-009	13			
		-010	14			
		-011	15			

Reviewed By: SE Date: 4/17/7

SOP References: STL-RD-0403 Rev 5 01/16/06
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2906

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
4/17/7	7096335	F7D060000-335B	0	200 min	TSR	SE
		↓ -335C	1			
		F7D060205-001	2			
		-001K	3			
		-003	4			
	7103064	F7B230137-002	5	400 min	ABT	
		-002K	6			
		-002Kb	8			
		F7D130000-064B	9			
		-064Ca	10			
		-064Cb	11			
4/18/7	Daily	Bkg + Source	0-15	30+2min	QA	SE
	7088093	F7C280265-001	0	200min	Ra226	
		↓ -001K	1			
		F7C290000-093B	2			
		↓ -093C	3			
	7107162	F7D050167-008	5		ABT	
		↓ -008D	6			
		F7D060205-001	8			
		↓ -003	9			
		F7D170000-162B	11			
		↓ -162C	12			
4-18-7	7103517	F7C280167-001	4	200 min	Ra-228	↓
		F7D130000-317B	7			
		-317C	10			
		-317L	13			
4/18/7	7059185	F7B280000-185B	0	200min	SC90	SE

Reviewed By: SE Date: 4/18/7

SOP References: STL-RD-0403 Rev 5 01/16/06
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2942

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
5-7-07	7095411	F7D050244-019	9	200 min.	^{90}Sr	GS
		-020	10			
		-021	11			
		-022	12			
		-023	13			
		-024	14			
5-7-07	7118136	F7D270241-007	0	200 min.	^{90}Sr	GS
		F7D280000-136B	1			
		-136C	2			
		-136L	3			
		F7D280140-013	4			
5-7-07	7117269	F7D270000-269B	5	200 min.	^{90}Sr	GS
		-269C	6			
		-269L	7			
		F7D270236-001	8			
5/8/7	Daily	Bkgd Source	0-15	200+2min	QA	SE
	7113239	F7D230000-239B	0	200min	Ra228	
		-239C	1			
		-239L	2			
		F7D230102-001	3			
		-002	4			
		-003	5			
		F7D230105-001	7			
		F7D230107-002	8			
		-003	9			
		-004	10			
		-005	11			

Reviewed By: SE Date: 5/8/7

SOP References: STL-RD-0403 Rev 6 03/27/07
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2942

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
5/8/7	7113239	F7D230107-006	12	200min	Ra228	SE
	↓	↓ -007	13		↓	
	7110210	F7C280211-001	0		Ra226	
		↓ -001K	1			
		F7D200000-210B	2			
		↓ -210C	3			
	7109228	F7D190000-228B	4			
		↓ -228C	5			
		F7D190145-001	6			
		-001K	7			
		-002	8			
		-003	9			
	7108238	F7D180000-238B	10			
		↓ -238C	11			
		F7D180171-001	12			
		-001K	13			
		-002	14			
		-003	15			
5-8-07	7113237	F7D230000-237B	0	200 min-	226Ra	GS
		-237C	1			
		-237L	2			
		F7D230102-001	3			
		-002	4			
		-003	5			
		F7D230105-001	6			
		F7D230107-002	7			
		-003	8			

Reviewed By: GS Date: 5-8-07

SOP References: STL-RD-0403 Rev 6 03/27/07
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2942

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
5-8-07	7113237	F7P230107-004	9	200 min.	226Ra	GS
|	|	| -005	10	|	|	|
|	|	| -006	11	|	|	|
|	|	| -007	12	|	|	|
5-8-07	7108237	F7D180155-019	13	200 min.	226Ra	GS
|	|	| -020	14	|	|	|
5-8-07	7128275	F7E080000-275B	0	200 min.	ABT	GS
|	|	| -275G	1	|	|	|
|	|	F7E080172-001	2	|	|	|
|	|	| -001Sa	3	|	|	|
|	|	| -001X	4	|	|	|
5/9/7	Daily	Bkg + Source	D-15	200+2min	QA	SL

Reviewed By:_____ Date:_____

SOP References: STL-RD-0403 Rev 6 03/27/07
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

TestAmerica STL

Run Log

Rec 4/17/07

Logbook No.: 2905

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
4/16/07	7D3063	F7C230153-001	Blue C2	200min	A/ST	LW
		-001Sa	C4			
		-001Sb	Red A1			
		-001X	A2			
		F7D130000-063B	A3			
		-063Ca	A4			
		-063Cb	B1			
4/17/7	Daily	Bkg & Source	Red/Blue	30+2min	QA	SE
	7087861	F7C280211-013	Red/A1	200min	Ra228	
		-014	A3			
		-015	A4			
	7089228	F7C300000-228B	B1			
		-228C	B2			
		F7C300170-001	B3			
		-002	B4			
		-003	C1			
		-004	C3			
		F7C300262-001	C4			
		-001C	D1			
		-002	D2			
		-003	D4			
		-004	Blue A1			
	7089061	D7C290258-001	A2			
		F7C300000-061B	A4			
		-061C	B2			
		-061L	B4			
	7087259	F7C280211-012	Red A1		Ra226	

Reviewed By: SE Date: 4/17/7

SOP References: STL-RD-0403 Rev 5 01/16/06
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

Logbook No.: 2905

STL
St. Louis Laboratory

Gas Proportional Counter Runlog

Date	Batch #	Sample #	Detector	Count Time	Analysis	Initials
4/17/7	7087259	F7C280211-013	Red A3	200 min	Ra226	SE
		-014	A4			
		-015	B1			
	7089060	D7C290258-001	B2			
		F7C300000-060B	B3			
		-060C	B4			
		-060L	C1			
	7089226	F7C300000-226B	C3			
		-226C	C4			
		F7C300170-001	D1			
		-002	D2			
		-003	D3			
		-004	Blue A1			
		F7C300262-001	A2			
		-001K	A4			
		-002	B1			
		-003	B2			
		-004	B4			

end of run log

SE 4/17/7

Reviewed By: SE Date: 4/17/7

SOP References: STL-RD-0403 Rev 5 01/16/06
Form: SL-RAD-0025, Revised 8/14/06
QC Type Suffixes: B=Blank; C=Laboratory Control Sample; L=Laboratory Control Sample Duplicate; S=Matrix Spike; D=Matrix Spike Duplicate; X=Sample Duplicate.

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SEVERN TRENT **STL**

Prep Report for Radium 226

Batch: 7110210 **Prep Analyst:** 403301

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot	Gross / Tare	Mass / Ba Yield	Dilution	Ba Precipitation Time / BaYieldAdjusted	Carrier ID / Carrier Added
F7C280211-001	JRWHL2AA	1.0160g	9.0005g / 8.9631g	0.0374g / 110.32%	1.00	5/8/07 10:15 / 100%	Ba 36 / 0.0339
F7C280211-001X	JRWHL1AK	1.0131g	9.0127g / 8.9763g	0.0364g / 107.37%	1.00	5/8/07 10:15 / 100%	Ba 36 / 0.0339
F7D200000-210B	JVA8R1AA	1.0000g	9.0336g / 8.9974g	0.0362g / 106.78%	1.00	5/8/07 10:15 / 100%	Ba 36 / 0.0339
F7D200000-210C	JVA8R1AC	1.0000g	9.0095g / 8.9723g	0.0372g / 109.73%	1.00	5/8/07 10:15 / 100%	Ba 36 / 0.0339

0
1
2
3

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7D200000-210C	rad06-0058	RA-226	2.502E+001 dpm/mL	1.00 mL	9/9/1991 12:00:00AM	1.119E+001 pCi/g

GWM — Spiked By
JB — Spike Verified By
04-20-07 — Spike Date

Standard Operating Procedures

SOPNumber	Title	Revision
☐ STL-RC-0002	Planchet Preparation For Radiochemistry And Radiological Screening Analysis	4.00
☐ STL-RC-0003	Drying And Grinding Of Soil And Solid Samples	6.00
☐ STL-RC-0004	Preparation Of Soil, Sludge, And Filter Paper Samples For Radiochemical Analysis	10.00
☐ STL-RC-0040	Total Alpha Emitting Isotopes Of Radium	3.00
☐ STL-RD-0403	Daily Calibration Verification And Maintenance Of The Low Background Gas Flow Proportional Counting System	3.00

SR — Reviewed By
5/9/7 — Review Date

GWM — Analyst/Relenquished By
05-08-07 — Release Date
LW — Received By
5/8/07 — Receipt Date

4/18

SEVERN TRENT **STL**

Prep Report for Radium 226

Batch: 7087259 **Prep Analyst:** 403301

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot	Gross / Tare	Mass / Ba Yield	Dilution	Ba Precipitation Time / BaYieldAdjusted	Carrier ID / Carrier Added
F7C280000-259B	JRWKT1AA	1.0000g	9.0104g / 8.9791g	0.0313g / 92.33%	1.00	4/17/07 10:45 / 92.33%	ba36 / 0.0339
F7C280000-259C	JRWKT1AC	1.0000g	9.0329g / 9.0006g	0.0323g / 95.28%	1.00	4/17/07 10:45 / 95.28%	ba36 / 0.0339
F7C280211-001	JRWHL1AA	1.0136g	9.0323g / 8.9989g	0.0334g / 98.53%	1.00	4/17/07 10:45 / 98.53%	ba36 / 0.0339
F7C280211-001X	JRWHL1AF	1.0011g	9.0198g / 8.9870g	0.0328g / 96.76%	1.00	4/17/07 10:45 / 96.76%	ba36 / 0.0339
F7C280211-002	JRWHT1AA	1.0044g	9.0184g / 8.9852g	0.0332g / 97.94%	1.00	4/17/07 10:45 / 97.94%	ba36 / 0.0339
F7C280211-003	JRWHW1AA	1.0105g	8.9965g / 8.9646g	0.0319g / 94.10%	1.00	4/17/07 10:45 / 94.10%	ba36 / 0.0339
F7C280211-004	JRWHX1AA	1.0016g	9.0058g / 8.9731g	0.0327g / 96.46%	1.00	4/17/07 10:45 / 96.46%	ba36 / 0.0339
F7C280211-005	JRWH01AA	1.0052g	9.0381g / 9.0048g	0.0333g / 98.23%	1.00	4/17/07 10:45 / 98.23%	ba36 / 0.0339
F7C280211-006	JRWH31AA	1.0055g	9.0238g / 8.9910g	0.0328g / 96.76%	1.00	4/17/07 10:45 / 96.76%	ba36 / 0.0339
F7C280211-007	JRWH51AA	1.0147g	9.0086g / 8.9764g	0.0322g / 94.99%	1.00	4/17/07 10:45 / 94.99%	ba36 / 0.0339
F7C280211-008	JRWH81AA	1.0064g	9.0146g / 8.9820g	0.0326g / 96.17%	1.00	4/17/07 10:45 / 96.17%	ba36 / 0.0339
F7C280211-009	JRWJA1AA	1.0072g	9.0202g / 8.9897g	0.0305g / 89.97%	1.00	4/17/07 10:45 / 89.97%	ba36 / 0.0339
F7C280211-010	JRWJC1AA	1.0068g	9.0008g / 8.9690g	0.0318g / 93.81%	1.00	4/17/07 10:45 / 93.81%	ba36 / 0.0339
F7C280211-011	JRWJE1AA	1.0024g	9.0241g / 8.9920g	0.0321g / 94.69%	1.00	4/17/07 10:45 / 94.69%	ba36 / 0.0339
F7C280211-012	JRWJG1AA	1.0047g	9.0222g / 8.9909g	0.0313g / 92.33%	1.00	4/17/07 10:45 / 92.33%	ba36 / 0.0339
F7C280211-013	JRWJH1AA	1.0047g	9.0286g / 8.9967g	0.0319g / 94.10%	1.00	4/17/07 10:45 / 94.10%	ba36 / 0.0339
F7C280211-014	JRWJJ1AA	1.0092g	9.0026g / 8.9697g	0.0329g / 97.05%	1.00	4/17/07 10:45 / 97.05%	ba36 / 0.0339

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SampID	WRKNO	Aliquot	Gross / Tare	Mass / Ba Yield	Dilution	Ba Precipitation Time / BaYieldAdjusted	Carrier ID / Carrier Added
F7C280211-015	JRWJK1AA	1.0149g	9.0094g / 8.9761g	0.0333g / 98.23%	1.00	4 / 17 / 07 10:45 / 98.23%	ba36 / 0.0339

B1

Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7C280000-259C	rad06-0058	RA-226	2.502E+001 dpm/mL	1.00 mL	9/9/1991 12:00:00AM	1.119E+001 pCi/g

GWM — Spiked By
SH — Spike Verified By
03-30-07 — Spike Date

Standard Operating Procedures

SOPNumber	Title	Revision
☐ STL-RC-0002	Planchet Preparation For Radiochemistry And Radiological Screening Analysis	4.00
☐ STL-RC-0003	Drying And Grinding Of Soil And Solid Samples	6.00
☐ STL-RC-0004	Preparation Of Soil, Sludge, And Filter Paper Samples For Radiochemical Analysis	10.00
☐ STL-RC-0040	Total Alpha Emitting Isotopes Of Radium	3.00
☐ STL-RD-0403	Daily Calibration Verification And Maintenance Of The Low Background Gas Flow Proportional Counting System	3.00

Reviewed By — Review Date: 4/18/7

GWM — Analyst/Relenquished By
04-17-07 — Release Date
JW — Received By
4/17/07 — Receipt Date

SEVERN TRENT **STL**

Prep Report for Radium 228

Batch: 7087261 **Prep Analyst:** 403301

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

SampID	WRKNO	Aliquot		Carrier ID	Carrier Added	Gross	Tare	Mass	Yield	Adj Yield	Precip Time
F7C280000-261B	JRWKX1AA	1.0000g	Ba:	ba36	0.0339 g	9.0104 g	8.9791 g	0.0313 g	92.33%	92.33%	4/3/07 11:00
			Y:	y42a	0.0182	9.0256	9.0063	0.0193	106.04%	100%	4/17/07 8:30
F7C280000-261C	JRWKX1AC	1.0000g	Ba:	ba36	0.0339 g	9.0329 g	9.0006 g	0.0323 g	95.28%	95.28%	4/3/07 11:00
			Y:	y42a	0.0182	9.0186	9.0002	0.0184	101.10%	100%	4/17/07 8:30
F7C280211-001	JRWHL1AC	1.0136g	Ba:	ba36	0.0339 g	9.0323 g	8.9989 g	0.0334 g	98.53%	98.53%	4/3/07 11:00
			Y:	y42a	0.0182	8.9803	8.9639	0.0164	90.11%	90.11%	4/17/07 8:30
F7C280211-001X	JRWHL1AG	1.0011g	Ba:	ba36	0.0339 g	9.0198 g	8.9870 g	0.0328 g	96.76%	96.76%	4/3/07 11:00
			Y:	y42a	0.0182	9.0312	9.0126	0.0186	102.20%	100%	4/17/07 8:30
F7C280211-002	JRWHT1AC	1.0044g	Ba:	ba36	0.0339 g	9.0184 g	8.9852 g	0.0332 g	97.94%	97.94%	4/3/07 11:00
			Y:	y42a	0.0182	8.9960	8.9782	0.0178	97.80%	97.80%	4/17/07 8:30
F7C280211-003	JRWHW1AC	1.0105g	Ba:	ba36	0.0339 g	8.9965 g	8.9646 g	0.0319 g	94.10%	94.10%	4/3/07 11:00
			Y:	y42a	0.0182	9.0128	8.9945	0.0183	100.55%	100%	4/17/07 8:30
F7C280211-004	JRWHX1AC	1.0016g	Ba:	ba36	0.0339 g	9.0058 g	8.9731 g	0.0327 g	96.46%	96.46%	4/3/07 11:00
			Y:	y42a	0.0182	8.9877	8.9688	0.0189	103.85%	100%	4/17/07 8:30
F7C280211-005	JRWH01AC	1.0052g	Ba:	ba36	0.0339 g	9.0381 g	9.0048 g	0.0333 g	98.23%	98.23%	4/3/07 11:00
			Y:	y42a	0.0182	9.0020	8.9854	0.0166	91.21%	91.21%	4/17/07 8:30
F7C280211-006	JRWH31AC	1.0055g	Ba:	ba36	0.0339 g	9.0238 g	8.9910 g	0.0328 g	96.76%	96.76%	4/3/07 11:00
			Y:	y42a	0.0182	9.0185	9.0001	0.0184	101.10%	100%	4/17/07 8:30
F7C280211-007	JRWH51AC	1.0147g	Ba:	ba36	0.0339 g	9.0086 g	8.9764 g	0.0322 g	94.99%	94.99%	4/3/07 11:00
			Y:	y42a	0.0182	8.9673	8.9506	0.0167	91.76%	91.76%	4/17/07 8:30
F7C280211-008	JRWH81AC	1.0064g	Ba:	ba36	0.0339 g	9.0146 g	8.9820 g	0.0326 g	96.17%	96.17%	4/3/07 11:00
			Y:	y42a	0.0182	8.9629	8.9454	0.0175	96.15%	96.15%	4/17/07 8:30

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SampID	WRKNO	Aliquot		Carrier ID	Carrier Added	Gross	Tare	Mass	Yield	Adj Yield	Precip Time
F7C280211-009	JRWJA1AC	1.0072g	Ba:	ba36	0.0339 g	9.0202 g	8.9897 g	0.0305 g	89.97%	89.97%	4/3/07 11:00
			Y:	y42a	0.0182	8.9755	8.9589	0.0166	91.21%	91.21%	4/17/07 8:30
F7C280211-010	JRWJC1AC	1.0068g	Ba:	ba36	0.0339 g	9.0008 g	8.9690 g	0.0318 g	93.81%	93.81%	4/3/07 11:00
			Y:	y42a	0.0182	8.9771	8.9636	0.0135	74.18%	74.18%	4/17/07 8:30
F7C280211-011	JRWJE1AC	1.0024g	Ba:	ba36	0.0339 g	9.0241 g	8.9920 g	0.0321 g	94.69%	94.69%	4/3/07 11:00
			Y:	y42a	0.0182	9.0021	8.9825	0.0196	107.69%	100%	4/17/07 8:30
F7C280211-012	JRWJG1AC	1.0047g	Ba:	ba36	0.0339 g	9.0222 g	8.9909 g	0.0313 g	92.33%	92.33%	4/3/07 11:00
			Y:	y42a	0.0182	8.9847	8.9680	0.0167	91.76%	91.76%	4/17/07 8:30
F7C280211-013	JRWJH1AC	1.0047g	Ba:	ba36	0.0339 g	9.0286 g	8.9967 g	0.0319 g	94.10%	94.10%	4/3/07 11:00
			Y:	y42a	0.0182	9.0107	8.9943	0.0164	90.11%	90.11%	4/17/07 8:30
F7C280211-014	JRWJJ1AC	1.0092g	Ba:	ba36	0.0339 g	9.0026 g	8.9697 g	0.0329 g	97.05%	97.05%	4/3/07 11:00
			Y:	y42a	0.0182	8.9870	8.9721	0.0149	81.87%	81.87%	4/17/07 8:30
F7C280211-015	JRWJK1AC	1.0149g	Ba:	ba36	0.0339 g	9.0094 g	8.9761 g	0.0333 g	98.23%	98.23%	4/3/07 11:00
			Y:	y42a	0.0182	8.9785	8.9663	0.0122	67.03%	67.03%	4/17/07 8:30

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Spike Information

Sample ID	Standard ID	Analyte	Std Conc	Aliquot	Ref Date	StdAdded
F7C280000-261C	Rad07-0002	RA-228	2.324E+001 dpm/mL	1.00 mL	2/2/2006 12:00:00AM	9.276E+000 pCi/g

GWM — Spiked By

SH — Spike Verified By

03-30-07 — Spike Date

Standard Operating Procedures

SOPNumber	Title	Revision
☑ STL-RC-0002	Planchet Preparation For Radiochemistry And Radiological Screening Analysis	4.00
☐ STL-RC-0003	Drying And Grinding Of Soil And Solid Samples	6.00
☐ STL-RC-0004	Preparation Of Soil, Sludge, And Filter Paper Samples For Radiochemical Analysis	10.00
☑ STL-RC-0041	Radium 228 In Water	3.00
☐ STL-RD-0403	Daily Calibration Verification And Maintenance Of The Low Background Gas Flow Proportional Counting System	3.00

SampID	WRKNO	Aliquot	Carrier ID	Carrier Added	Gross	Tare	Mass	Yield	Adj Yield	Precip Time

Reviewed By: [illegible] Review Date: 4/17/7

Analyst/Relenquished By: GWM Release Date: 04-17-07 Received By: [illegible] Receipt Date: 4/17/7

reprint per missing data
[illegible]
4/17/7

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - C **Address: 2**

Sample ID *F7C280211-001* **Repeat** *2*

Batch ID *7087259*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.044	172	0.860	0.816
sd	0.000			0.007	13.115	0.066	0.066
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.462	213	1.065	0.603
sd	0.000			0.021	14.595	0.073	0.076

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - **Tb = Ts < 10**
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - D

Address: *3*

Sample ID *F7C280211-001X*

Repeat *2*

Batch ID *7087259*

Count Routine *Gross Alpha Beta*

Detector Volts *1,515.0*

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 4/17/2007 14:53

Collection Date 1

Collection Date 2

Half Life 0.00 *days*

Decay Factor 1.000

Sample Count Time 200.00 *mins*

Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.043	107	0.535	0.492
sd	0.000			0.007	10.344	0.052	0.052
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.463	173	0.865	0.402
sd	0.000			0.022	13.153	0.066	0.069

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - A **Address: *0***

Sample ID ***F7C280211-001*** **Repeat** ***3***

Batch ID ***7110210***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 ***mg*** **sd** 0.000 ***mg***

Count Date 5/8/2007 14:32 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.033	70	0.350	0.317
sd	0.000			0.006	8.367	0.042	0.042
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	194	0.970	0.364
sd	0.000			0.025	13.928	0.070	0.074

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - B **Address:** *1*

Sample ID *F7C280211-001X* **Repeat** *3*

Batch ID *7110210*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 5/8/2007 14:32 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	76	0.380	0.342
sd	0.000			0.006	8.718	0.044	0.044
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.449	179	0.895	0.446
sd	0.000			0.021	13.379	0.067	0.070

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 2 - B **Address: 5**

Sample ID *F7C280211-002* **Repeat** *2*

Batch ID *7087259*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.055	101	0.505	0.450
sd	0.000			0.007	10.050	0.050	0.051
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.359	177	0.885	0.526
sd	0.000			0.019	13.304	0.067	0.069

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 2 - C **Address: *6***

Sample ID ***F7C280211-003*** **Repeat** ***2***

Batch ID ***7087259***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	77	0.385	0.327
sd	0.000			0.008	8.775	0.044	0.045
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.398	132	0.660	0.262
sd	0.000			0.020	11.489	0.057	0.061

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 3 - A **Address: *8***

Sample ID ***F7C280211-004*** **Repeat** ***2***

Batch ID ***7087259***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.051	102	0.510	0.459
sd	0.000			0.007	10.100	0.050	0.051
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	170	0.850	0.398
sd	0.000			0.021	13.038	0.065	0.069

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 3 - B **Address: 9**

Sample ID *F7C280211-005* **Repeat** *2*

Batch ID *7087259*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	89	0.445	0.395
sd	0.000			0.007	9.434	0.047	0.048
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.406	157	0.785	0.379
sd	0.000			0.020	12.530	0.063	0.066

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 3 - C

Address: *10*

Sample ID *F7C280211-006* Repeat *2*

Batch ID *7087259*

Count Routine *Gross Alpha Beta* Detector Volts *1,515.0*

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 4/17/2007 14:53 Collection Date 1 Half Life 0.00 *days*
Collection Date 2 Decay Factor 1.000

Sample Count Time 200.00 *mins* Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	86	0.430	0.389
sd	0.000			0.006	9.274	0.046	0.047
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.437	146	0.730	0.293
sd	0.000			0.021	12.083	0.060	0.064

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 3 - D **Address:** *11*

Sample ID *F7C280211-007* **Repeat** *2*

Batch ID *7087259*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.039	84	0.420	0.381
sd	0.000			0.006	9.165	0.046	0.046
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.427	162	0.810	0.383
sd	0.000			0.021	12.728	0.064	0.067

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 4 - A **Address: *12***

Sample ID ***F7C280211-008*** **Repeat** ***2***

Batch ID ***7087259***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.068	110	0.550	0.482
sd	0.000			0.008	10.488	0.052	0.053
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.434	182	0.910	0.476
sd	0.000			0.021	13.491	0.067	0.071

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 4 - B **Address:** *13*

Sample ID *F7C280211-009* **Repeat** *2*

Batch ID *7087259*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.046	83	0.415	0.369
sd	0.000			0.007	9.110	0.046	0.046
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.350	135	0.675	0.325
sd	0.000			0.019	11.619	0.058	0.061

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 4 - C **Address: *14***

Sample ID ***F7C280211-010*** **Repeat** ***2***

Batch ID ***7087259***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 ***mg*** **sd** 0.000 ***mg***

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.100	108	0.540	0.440
sd	0.000			0.010	10.392	0.052	0.053
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.448	175	0.875	0.427
sd	0.000			0.021	13.229	0.066	0.069

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 4 - D **Address: *15***

Sample ID ***F7C280211-011*** **Repeat** ***2***

Batch ID ***7087259***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	94	0.470	0.412
sd	0.000			0.008	9.695	0.048	0.049
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	130	0.650	0.221
sd	0.000			0.021	11.402	0.057	0.061

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - A **Address: *0***

Sample ID ***F7C280000-259B*** **Repeat** ***1***

Batch ID ***7087259***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 ***mg*** **sd** 0.000 ***mg***

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.037	15	0.075	0.038
sd	0.000			0.006	3.873	0.019	0.020
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.617	123	0.615	-0.002
sd	0.000			0.025	11.091	0.055	0.061

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - B **Address:** *1*

Sample ID *F7C280000-259C* **Repeat** *1*

Batch ID *7087259*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 14:53 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.049	1,090	5.450	5.401
sd	0.000			0.007	33.015	0.165	0.165
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	1,324	6.620	6.144
sd	0.000			0.022	36.387	0.182	0.183

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* **Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - C **Address: 2**

Sample ID ***F7D200000-210B*** **Repeat** ***1***

Batch ID ***7110210***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 5/8/2007 14:32 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	10	0.050	0.003
sd	0.000			0.007	3.162	0.016	0.017
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.504	103	0.515	0.011
sd	0.000			0.022	10.149	0.051	0.055

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - D **Address: *3***

Sample ID ***F7D200000-210C*** **Repeat** ***1***

Batch ID ***7110210***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 ***mg*** **sd** 0.000 ***mg***

Count Date 5/8/2007 14:32 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	796	3.980	3.939
sd	0.000			0.006	28.213	0.141	0.141
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.466	220	1.100	0.634
sd	0.000			0.022	14.832	0.074	0.077

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

SEVERN TRENT SERVICES

LB4100/W General Counting Application

Unit Type: LB4100/W
Counting Unit ID: Red
Data file name: 7087259

Batch ID: RA226 04/17/07 SE

Reviewed By: SE

Date: 4/18/07

Sample ID		Det. ID	Count Date/Time	Count Duration	Sample Alpha	Sample Beta	Bkgd Time	Background Alpha	Background Beta	CalType	Net CPM Alpha	Net CPM Beta
F7C280211-012	Red	A1	4/17/2007 14:57	200	116	330	1000	25	1125	1	0.56	0.53
F7C280211-013	Red	A3	4/17/2007 14:57	200	119	362	1000	24	1138	1	0.57	0.67
F7C280211-014	Red	A4	4/17/2007 14:57	200	102	302	1000	33	1071	1	0.48	0.44
F7C280211-015	Red	B1	4/17/2007 14:57	200	96	291	1000	25	1087	1	0.46	0.37

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - C **Address: 2**

Sample ID *F7C280211-001* **Repeat** *1*

Batch ID *7087261*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:15 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.044	38	0.190	0.146
sd	0.000			0.007	6.164	0.031	0.032
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.462	224	1.120	0.658
sd	0.000			0.021	14.967	0.075	0.078

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - D **Address: *3***

Sample ID ***F7C280211-001X*** **Repeat** ***1***

Batch ID ***7087261***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:15 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.043	22	0.110	0.067
sd	0.000			0.007	4.690	0.023	0.024
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.463	176	0.880	0.417
sd	0.000			0.022	13.266	0.066	0.070

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 2 - A **Address: *4***

Sample ID ***F7C280211-002*** **Repeat** ***1***

Batch ID ***7087261***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:15 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.046	37	0.185	0.139
sd	0.000			0.007	6.083	0.030	0.031
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.430	192	0.960	0.530
sd	0.000			0.021	13.856	0.069	0.072

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 2 - B **Address: 5**

Sample ID *F7C280211-003* **Repeat** *1*

Batch ID *7087261*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:15 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.055	26	0.130	0.075
sd	0.000			0.007	5.099	0.025	0.027
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.359	186	0.930	0.571
sd	0.000			0.019	13.638	0.068	0.071

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 2 - C **Address:** *6*

Sample ID *F7C280211-004* **Repeat** *1*

Batch ID *7087261*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:15 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	35	0.175	0.117
sd	0.000			0.008	5.916	0.030	0.031
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.398	186	0.930	0.532
sd	0.000			0.020	13.638	0.068	0.071

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 3 - A **Address: *8***

Sample ID ***F7C280211-005*** **Repeat** ***1***

Batch ID ***7087261***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:16 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.051	27	0.135	0.084
sd	0.000			0.007	5.196	0.026	0.027
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	165	0.825	0.373
sd	0.000			0.021	12.845	0.064	0.068

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - **Tb = Ts < 10**
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 3 - B **Address: 9**

Sample ID *F7C280211-006* **Repeat** *1*

Batch ID *7087261*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:16 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	34	0.170	0.120
sd	0.000			0.007	5.831	0.029	0.030
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.406	159	0.795	0.389
sd	0.000			0.020	12.610	0.063	0.066

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 3 - C **Address:** *10*

Sample ID *F7C280211-007* **Repeat** *1*

Batch ID *7087261*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:16 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.041	26	0.130	0.089
sd	0.000			0.006	5.099	0.025	0.026
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.437	153	0.765	0.328
sd	0.000			0.021	12.369	0.062	0.065

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 3 - D **Address:** *11*

Sample ID *F7C280211-008* **Repeat** *1*

Batch ID *7087261*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:16 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.039	22	0.110	0.071
sd	0.000			0.006	4.690	0.023	0.024
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.427	165	0.825	0.398
sd	0.000			0.021	12.845	0.064	0.067

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 4 - A **Address: *12***

Sample ID ***F7C280211-009*** **Repeat** ***1***

Batch ID ***7087261***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:16 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.068	25	0.125	0.057
sd	0.000			0.008	5.000	0.025	0.026
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.434	166	0.830	0.396
sd	0.000			0.021	12.884	0.064	0.068

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 4 - B

Address: *13*

Sample ID *F7C280211-010* Repeat *1*

Batch ID *7087261*

Count Routine *Gross Alpha Beta* Detector Volts *1,515.0*

Sample Qty 0.000 sd 0.000

Residual Wt 0.000 *mg* sd 0.000 *mg*

Count Date 4/17/2007 11:16 Collection Date 1 Half Life 0.00 *days*
Collection Date 2 Decay Factor 1.000

Sample Count Time 200.00 *mins* Background Count Time 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.046	25	0.125	0.079
sd	0.000			0.007	5.000	0.025	0.026
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.350	127	0.635	0.285
sd	0.000			0.019	11.269	0.056	0.059

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

* Note: Decay Corrected MDC Method - Tb = Ts < 10
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 4 - C **Address:** *14*

Sample ID *F7C280211-011* **Repeat** *1*

Batch ID *7087261*

Count Routine *Gross Alpha Beta* **Detector Volts** *1,515.0*

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:16 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.100	22	0.110	0.010
sd	0.000			0.010	4.690	0.023	0.025
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.448	155	0.775	0.327
sd	0.000			0.021	12.450	0.062	0.066

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 x sd

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 4 - D **Address: *15***

Sample ID ***F7C280211-012*** **Repeat** ***1***

Batch ID ***7087261***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 *mg* **sd** 0.000 *mg*

Count Date 4/17/2007 11:16 **Collection Date 1** **Half Life** 0.00 *days*
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	30	0.150	0.092
sd	0.000			0.008	5.477	0.027	0.028
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.429	148	0.740	0.311
sd	0.000			0.021	12.166	0.061	0.064

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - A **Address: *0***

Sample ID ***F7C280000-261B*** **Repeat** ***1***

Batch ID ***7087261***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 ***mg*** **sd** 0.000 ***mg***

Count Date 4/17/2007 11:15 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.037	15	0.075	0.038
sd	0.000			0.006	3.873	0.019	0.020
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.617	152	0.760	0.143
sd	0.000			0.025	12.329	0.062	0.066

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

Low Level Alpha/Beta Count Results
Sample Activity Report

Instrument 1 - B **Address: *1***

Sample ID ***F7C280000-261C*** **Repeat** ***1***

Batch ID ***7087261***

Count Routine ***Gross Alpha Beta*** **Detector Volts** ***1,515.0***

Sample Qty 0.000 **sd** 0.000

Residual Wt 0.000 ***mg*** **sd** 0.000 ***mg***

Count Date 4/17/2007 11:15 **Collection Date 1** **Half Life** 0.00 ***days***
Collection Date 2 **Decay Factor** 1.000

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.049	54	0.270	0.221
sd	0.000			0.007	7.348	0.037	0.037
Alpha to Beta	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	1,012	5.060	4.584
sd	0.000			0.022	31.812	0.159	0.161

	Net Activity dpm	LLD dpm	Net Concentration *	MDC	Limits	% of Limits
Alpha	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			
Beta	0.000	0.000	0.000 ± 0.000	0.000	1.000	0.000
sd	0.000		0.000			

*** Note: Decay Corrected MDC Method -** **Tb = Ts < 10**
Error = 0.00 **x sd**

SEVERN TRENT SERVICES

LB4100/W General Counting Application

Unit Type: LB4100/W
Counting Unit ID: Red
Data file name: 7087261

Reviewed By: SE

Batch ID: RA226 04/17/07 SE

Date: 4/17/7

Sample ID		Det. ID	Count Date/Time	Count Duration	Sample Alpha	Sample Beta	Bkgd Time	Background Alpha	Background Beta	CalType	Net CPM Alpha	Net CPM Beta
F7C280211-013	Red	A1	4/17/2007 11:21	200	29	355	1000	25	1125	1	0.12	0.65
F7C280211-014	Red	A3	4/17/2007 11:21	200	26	333	1000	24	1138	1	0.11	0.53
F7C280211-015	Red	A4	4/17/2007 11:21	200	20	326	1000	33	1071	1	0.07	0.56

TestAmerica STL

Protean 2007

Alpha and Beta Calibration

with

Crosstalk Correction

TestAmerica STL

Protean

Voltage Plateaus and Discriminator Settings

Unit #1

MPC 9604 FACTORY PERFORMANCE EVALUATION

Factory performed tests for Instrument Serial Number: 233126-BO

Voltage Settings | **ULD Settings**

Alpha & Beta Voltage 1515 | A 7 C 7

Alpha Only Voltage 705 | B 7 D 7

Efficiencies: DETECTOR A

Sr/y 90 56.08 % | Tc-99 36.544 %

Ni-63 16.2 % | Th-230 @ A/B Voltage 24.895 %

Th-230 @ A only Voltage 22.403 %

Efficiencies: DETECTOR B

Sr/y 90 55.438 % | Tc-99 36.418 %

Ni-63 15.62 % | Th-230 @ A/B Voltage 24.341 %

Th-230 @ A only Voltage 22.350 %

Efficiencies: DETECTOR C

Sr/y 90 56.114 % | Tc-99 36.527 %

Ni-63 15.9 % | Th-230 @ A/B Voltage 24.466 %

Th-230 @ A only Voltage 22.627 %

Efficiencies: DETECTOR D

Sr/y 90 53.276 % | Tc-99 34.957 %

Ni-63 15.78 % | Th-230 @ A/B Voltage 24.717 %

Th-230 @ A only Voltage 23.019 %

Backgrounds

Detector A:

Alpha Background 0.07
Beta Background 0.64

Detector B:

Alpha Background 0.05
Beta Background 0.52

Detector C:

Alpha Background 0.06
Beta Background 0.47

Detector D:

Alpha Background 0.05
Beta Background 0.51

Background Count Time was 1000 Minutes.

Tests performed and recorded by: Gregory D. Walker

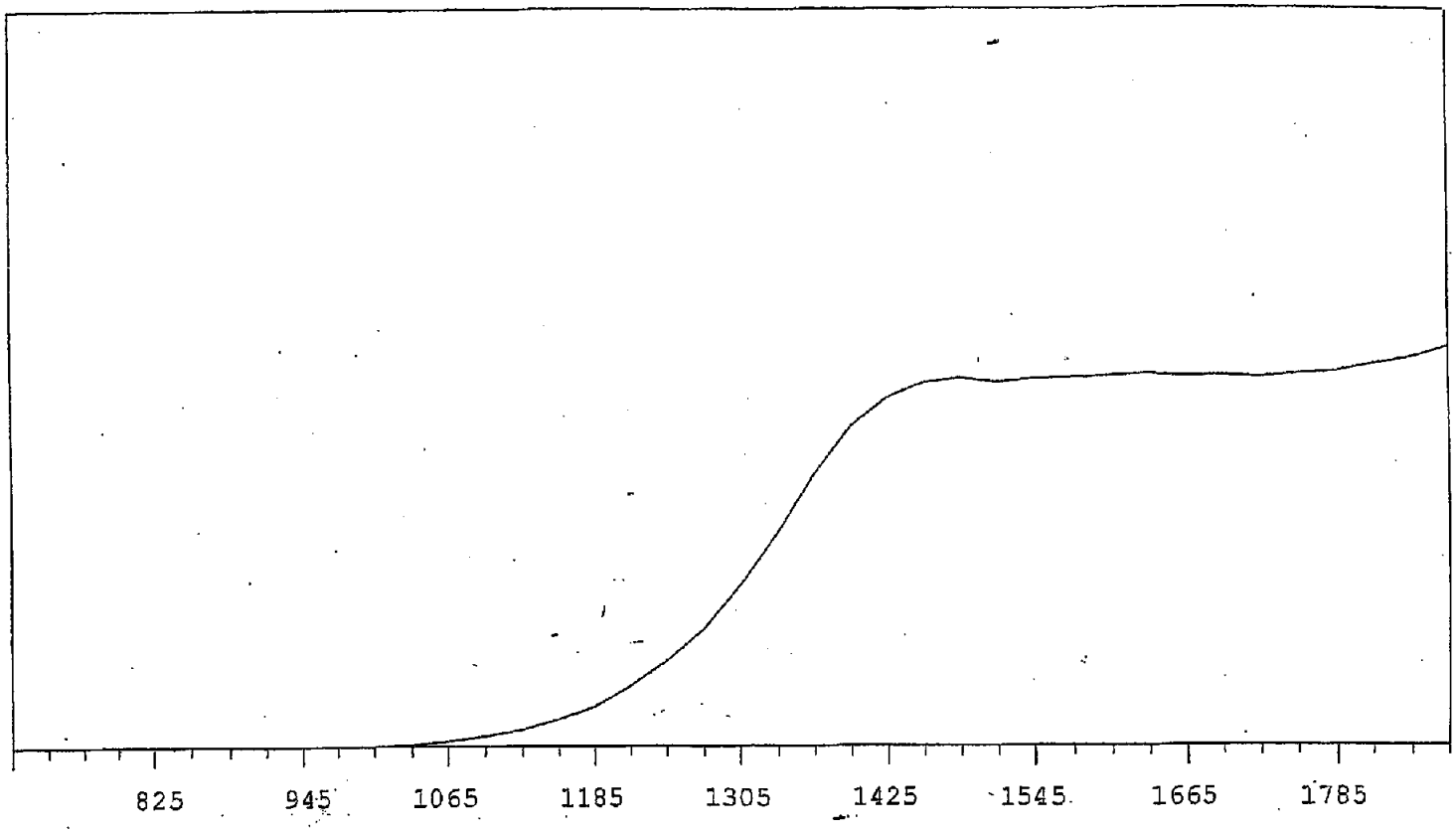
Date: 11/26/02

*ALL EFFICIENCIES WERE OBTAINED USING A 2" DISTRIBUTED SOURCE AT OPTIMAL GEOMETRY EXCEPT Th-230, WHICH WAS AT A DEPTH OF ¼".

STL ST. LOUIS

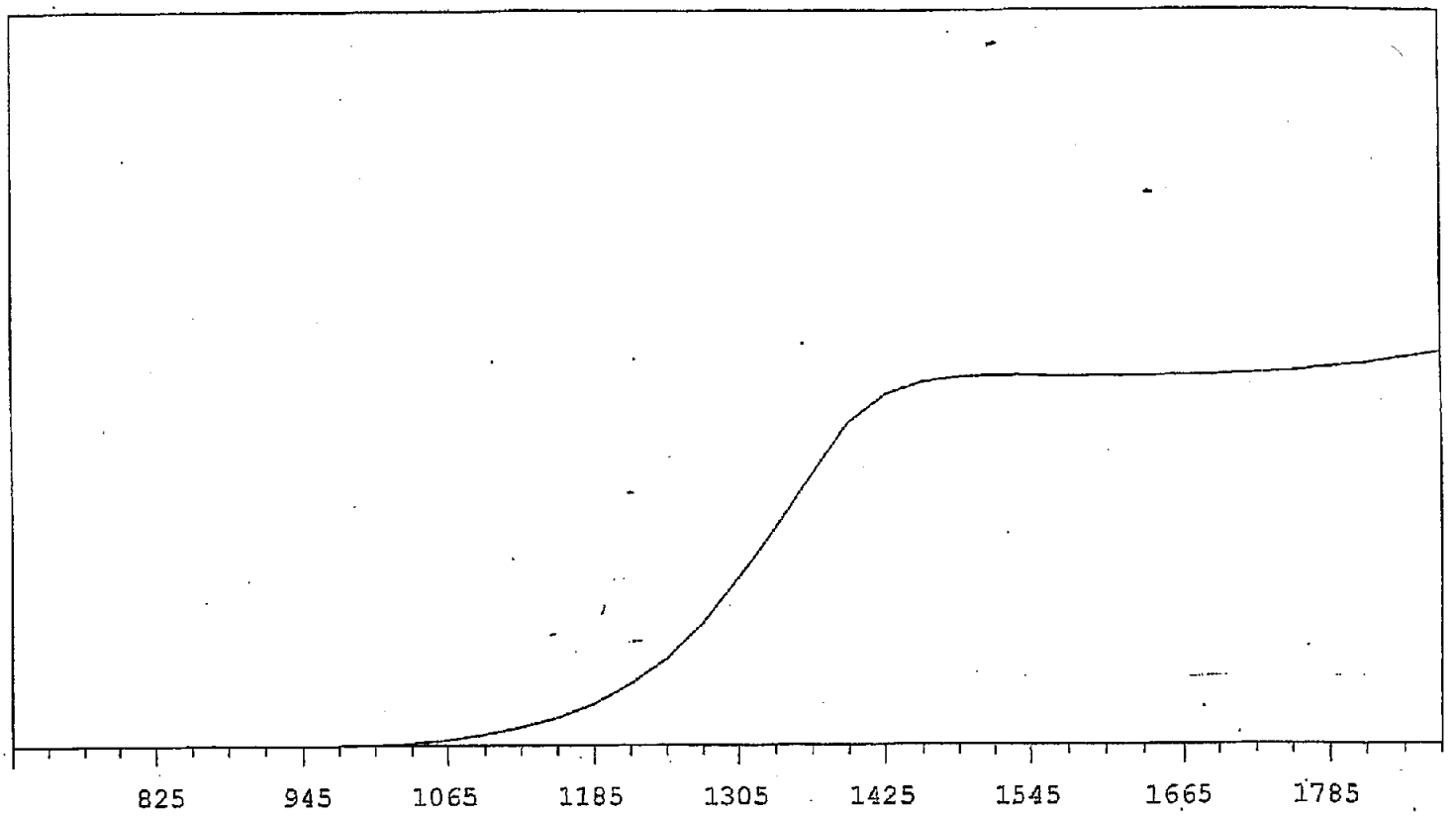
Unit #1

MPC 9604 Plateau 1 MPC 9604 Detector A 11/18/2002
Alpha Volts: 705 Beta Volts: 1515



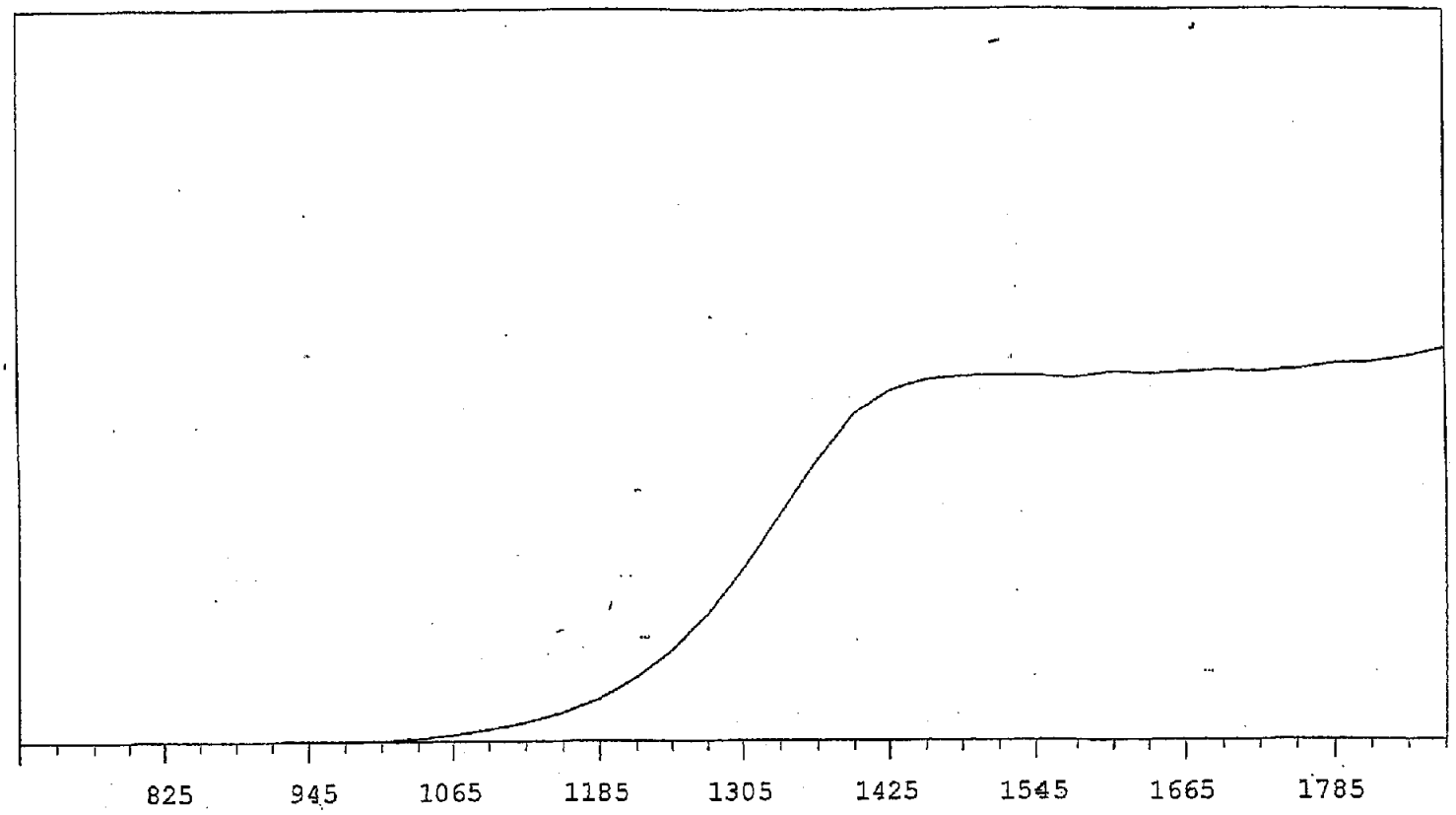
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	16470	+92.44
735	2		1335	21902	+79.58
765	0	-33.33	1365	27818	+60.78
795	1	-33.33	1395	32763	+41.06
825	1	+0.00	1425	35569	+23.50
855	1	>100	1455	37141	+10.27
885	0	+41.67	1485	37680	+3.87
915	0	>100	1515	37264	+1.20
945	2	>100	1545	37658	+1.01
975	13	>100	1575	37826	+1.90
1005	48	>100	1605	37972	+0.72
1035	196	>100	1635	38183	+0.12
1065	548	>100	1665	37888	-0.71
1095	1042	>100	1695	37936	-0.41
1125	1730	>100	1725	37694	+0.85
1155	2776	>100	1755	38048	+2.46
1185	4064	>100	1785	38316	+4.39
1215	6147	>100	1815	39036	+6.01
1245	8704	>100	1845	39740	
1275	11959	>100	1875	40868	
1305	16470	+92.44			
1335	21902	+79.58			

MPC 9604 Plateau 1 MPC 9604 Detector B 11/18/2002
Alpha Volts: 705 Beta Volts: 1515



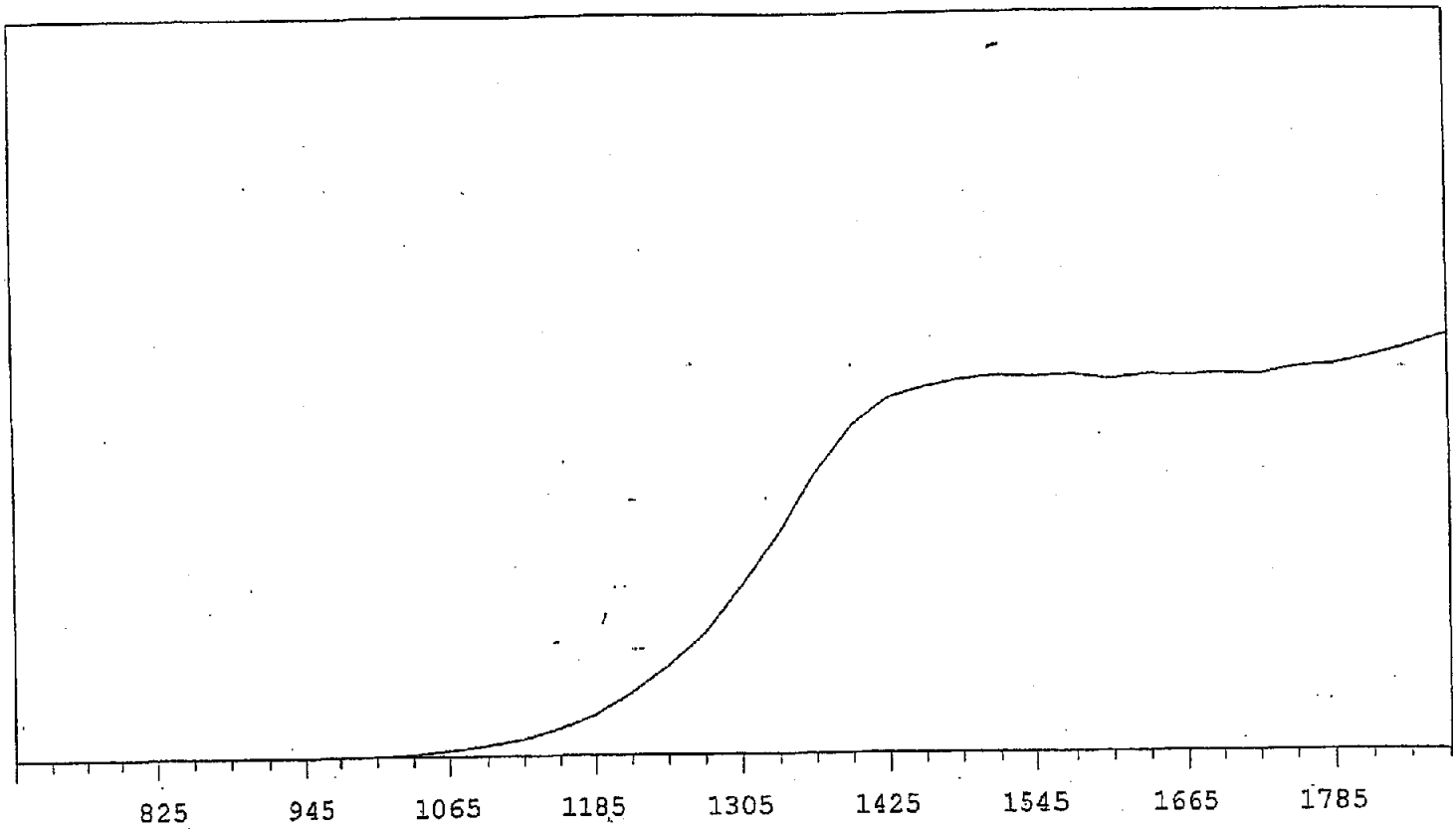
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	3		1305	37846	+89.73
735	2		1335	49400	+76.76
765	2		1365	61824	+59.37
795	0	>100	1395	73411	+40.47
825	0	>100	1425	79657	+23.20
855	0	>100	1455	82603	+10.52
885	1	>100	1485	83765	+4.29
915	0	>100	1515	84094	+1.27
945	1	>100	1545	84247	+0.38
975	20	>100	1575	83954	+0.14
1005	136	>100	1605	84310	+0.17
1035	480	>100	1635	84238	+0.30
1065	1292	>100	1665	84323	+0.33
1095	2449	>100	1695	84330	+0.75
1125	4069	>100	1725	84682	+1.66
1155	6233	>100	1755	85015	+2.61
1185	9445	>100	1785	86099	+3.67
1215	14086	>100	1815	86967	+4.57
1245	19724	>100	1845	88449	
1275	27772	+99.39	1875	89824	
1305	37846	+89.73			
1335	49400	+76.76			

MPC 9604 Plateau 1 MPC 9604 Detector C 11/19/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	2		1305	39510	+89.34
735	1		1335	52183	+75.00
765	2		1365	64681	+56.02
795	0	-83.33	1395	75266	+36.30
825	0	>100	1425	80414	+19.94
855	1	>100	1455	83043	+8.78
885	0	>100	1485	83971	+3.46
915	1	>100	1515	84202	+0.54
945	5	>100	1545	84151	+0.51
975	40	>100	1575	83636	+0.50
1005	178	>100	1605	84901	+0.90
1035	611	>100	1635	84465	+1.26
1065	1455	>100	1665	84881	+0.31
1095	2686	>100	1695	85245	+0.76
1125	4338	>100	1725	84904	+1.52
1155	6682	>100	1755	85423	+2.21
1185	9895	>100	1785	86741	+3.54
1215	14706	>100	1815	87179	+4.71
1245	20868	>100	1845	88620	
1275	29167	+99.72	1875	90675	
1305	39510	+89.34			
1335	52183	+75.00			

MPC 9604 Plateau 1 MPC 9604 Detector D 11/19/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	3	+0.00
795	2	>100
825	0	-95.24
855	0	-83.33
885	2	+0.00
915	0	>100
945	0	>100
975	8	>100
1005	61	>100
1035	224	>100
1065	577	>100
1095	1071	>100
1125	1681	>100
1155	2740	>100
1185	4109	>100
1215	6232	>100
1245	8882	>100
1275	12116	>100
1305	16823	+91.81
1335	22142	+78.78

VOLTS	COUNTS	%/100 Volts
1305	16823	+91.81
1335	22142	+78.78
1365	28133	+59.68
1395	32974	+39.42
1425	35720	+22.04
1455	36766	+10.79
1485	37553	+4.71
1515	37914	+2.42
1545	37768	+0.04
1575	38025	-0.08
1605	37519	+0.04
1635	37994	+0.32
1665	37808	+0.54
1695	38062	+1.00
1725	37790	+2.13
1755	38573	+3.55
1785	38772	+5.80
1815	39626	+7.23
1845	40662	
1875	41958	

#2

MPC 9604 FACTORY PERFORMANCE EVALUATION

Factory performed tests for Instrument Serial Number: 236534

Voltage Settings | **ULD Settings**

Alpha & Beta Voltage 1515 | A 7.0 C 7.0

Alpha Only Voltage 705 | B 7.0 D 7.0

Efficiencies: DETECTOR A

Sr/y 90 55.844 % | Tc-99 36.440 %

Ni-63 16.731 % | Th-230 @ A/B Voltage 25.353 %

Th-230 @ A only Voltage 22.314 %

Efficiencies: DETECTOR B

Sr/y 90 55.898 % | Tc-99 36.482 %

Ni-63 16.599 % | Th-230 @ A/B Voltage 24.934 %

Th-230 @ A only Voltage 22.030 %

Efficiencies: DETECTOR C

Sr/y 90 55.644 % | Tc-99 37.968 %

Ni-63 15.840 % | Th-230 @ A/B Voltage 24.941 %

Th-230 @ A only Voltage 22.747 %

Efficiencies: DETECTOR D

Sr/y 90 54.607 % | Tc-99 37.028 %

Ni-63 16.089 % | Th-230 @ A/B Voltage 24.430 %

Th-230 @ A only Voltage 21.638 %

Backgrounds

Detector A:

Alpha Background 0.06
Beta Background 0.452

Detector B:

Alpha Background 0.07
Beta Background 0.475

Detector C:

Alpha Background 0.08
Beta Background 0.420

Detector D:

Alpha Background 0.083
Beta Background 0.481

Background Count Time was 500 Minutes.

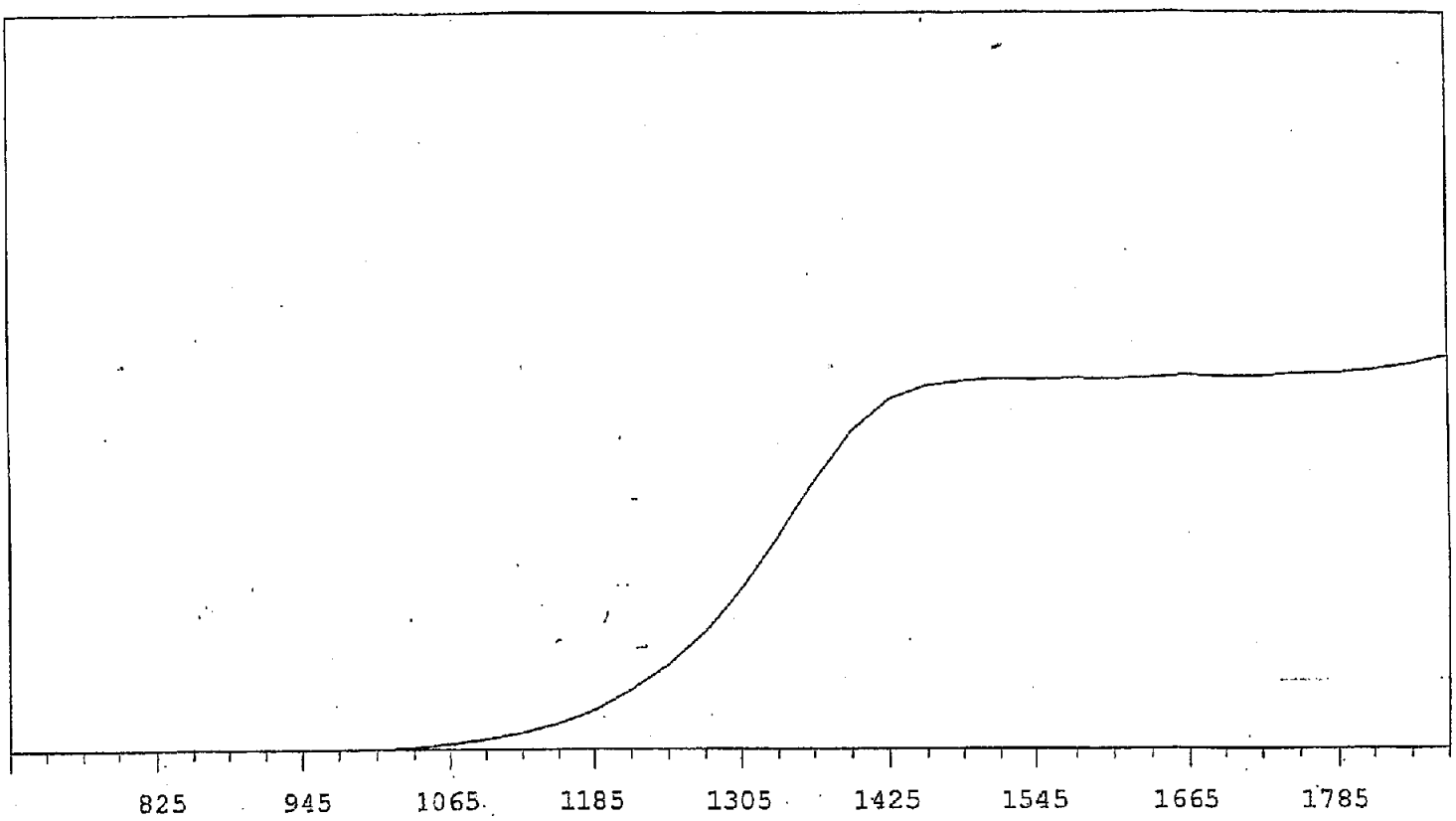
Tests performed and recorded by:

Date: 12/31/02

*ALL EFFICIENCIES WERE OBTAINED USING A 2" DISTRIBUTED SOURCE AT OPTIMAL GEOMETRY EXCEPT Th-230, WHICH WAS AT A DEPTH OF ¼".

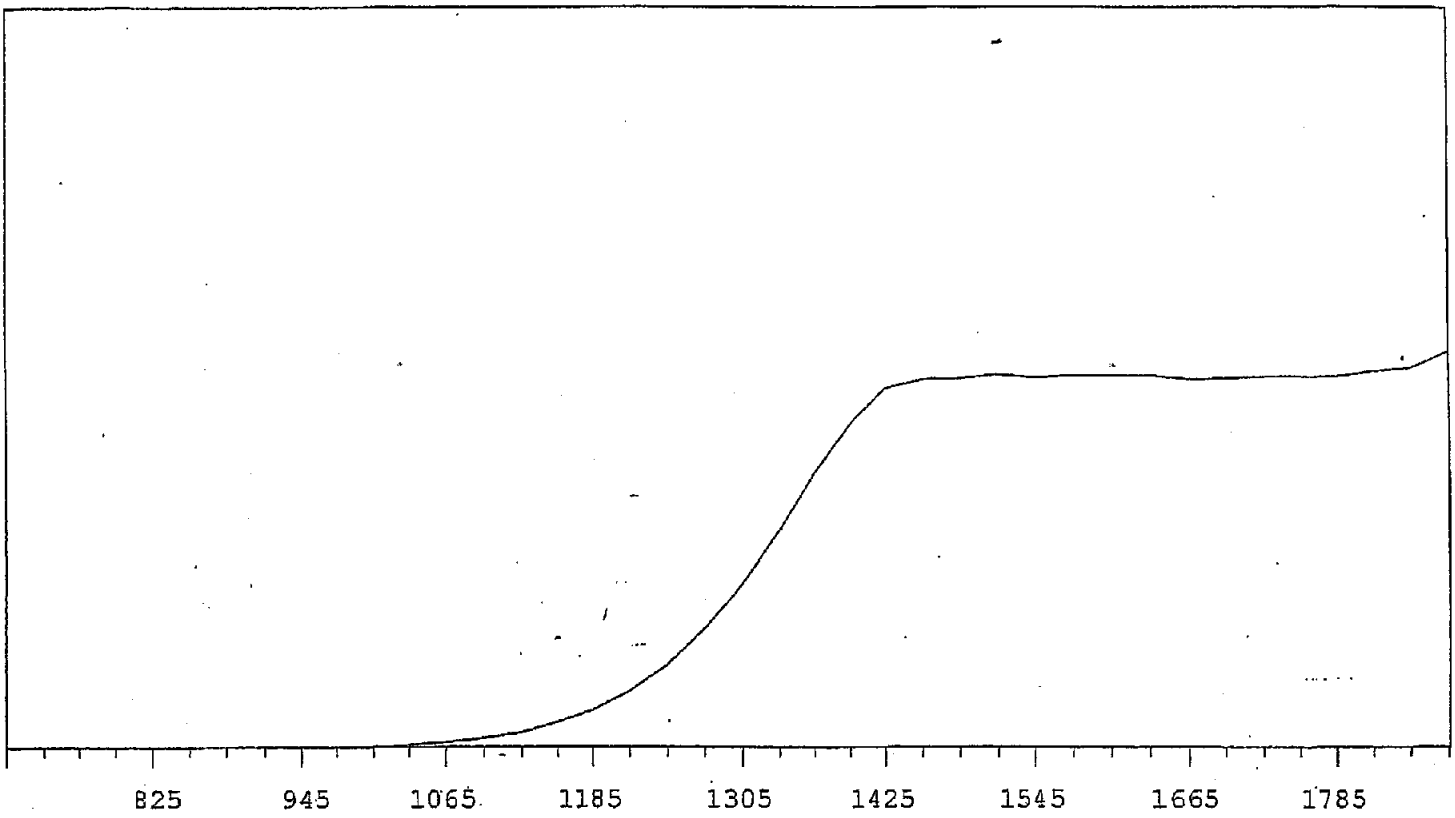
Unit #32 TJK 1-26-04

MPC 9604 Plateau 1 MPC 9604 Detector A 12/16/2002
Alpha Volts: 705 Beta Volts: 1335



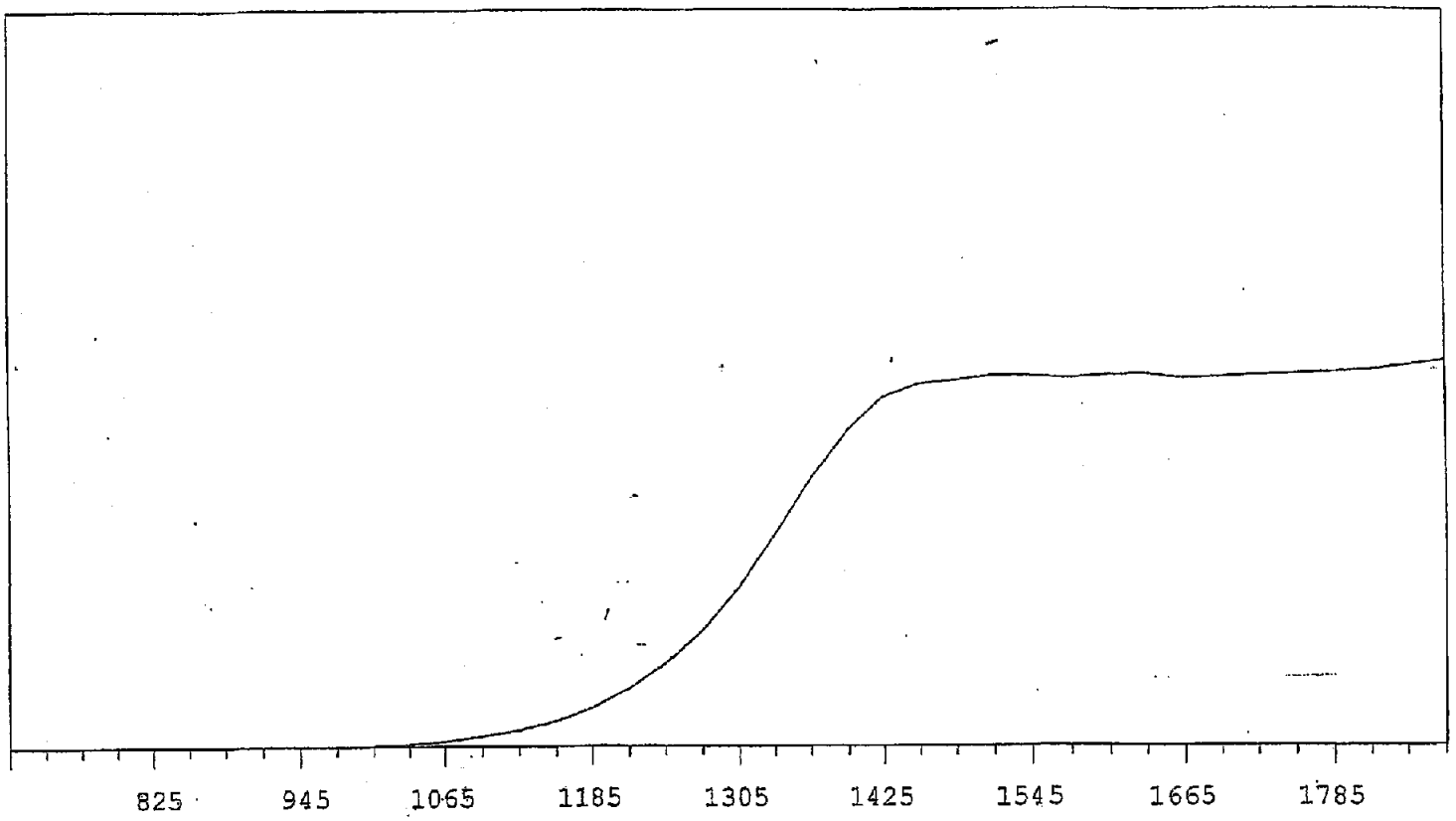
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	36094	+91.50
735	1		1335	47847	+79.16
765	0		1365	60405	+61.85
795	1	>100	1395	71873	+42.39
825	0	+83.33	1425	78827	+24.53
855	0	+55.56	1455	81991	+11.59
885	1	>100	1485	83024	+4.37
915	1	>100	1515	83664	+1.56
945	1	>100	1545	83373	+0.42
975	19	>100	1575	83766	+0.14
1005	129	>100	1605	83496	+0.77
1035	425	>100	1635	83774	+0.43
1065	1183	>100	1665	84339	+0.47
1095	2313	>100	1695	83891	+0.57
1125	3764	>100	1725	84026	+0.69
1155	5857	>100	1755	84655	+1.58
1185	8765	>100	1785	84828	+2.39
1215	13328	>100	1815	85494	+3.58
1245	19028	>100	1845	86654	
1275	26407	>100	1875	88364	
1305	36094	+91.50			
1335	47847	+79.16			

MPC 9604 Plateau 1 MPC 9604 Detector B 12/17/2002
Alpha Volts: 705 Beta Volts: 1335



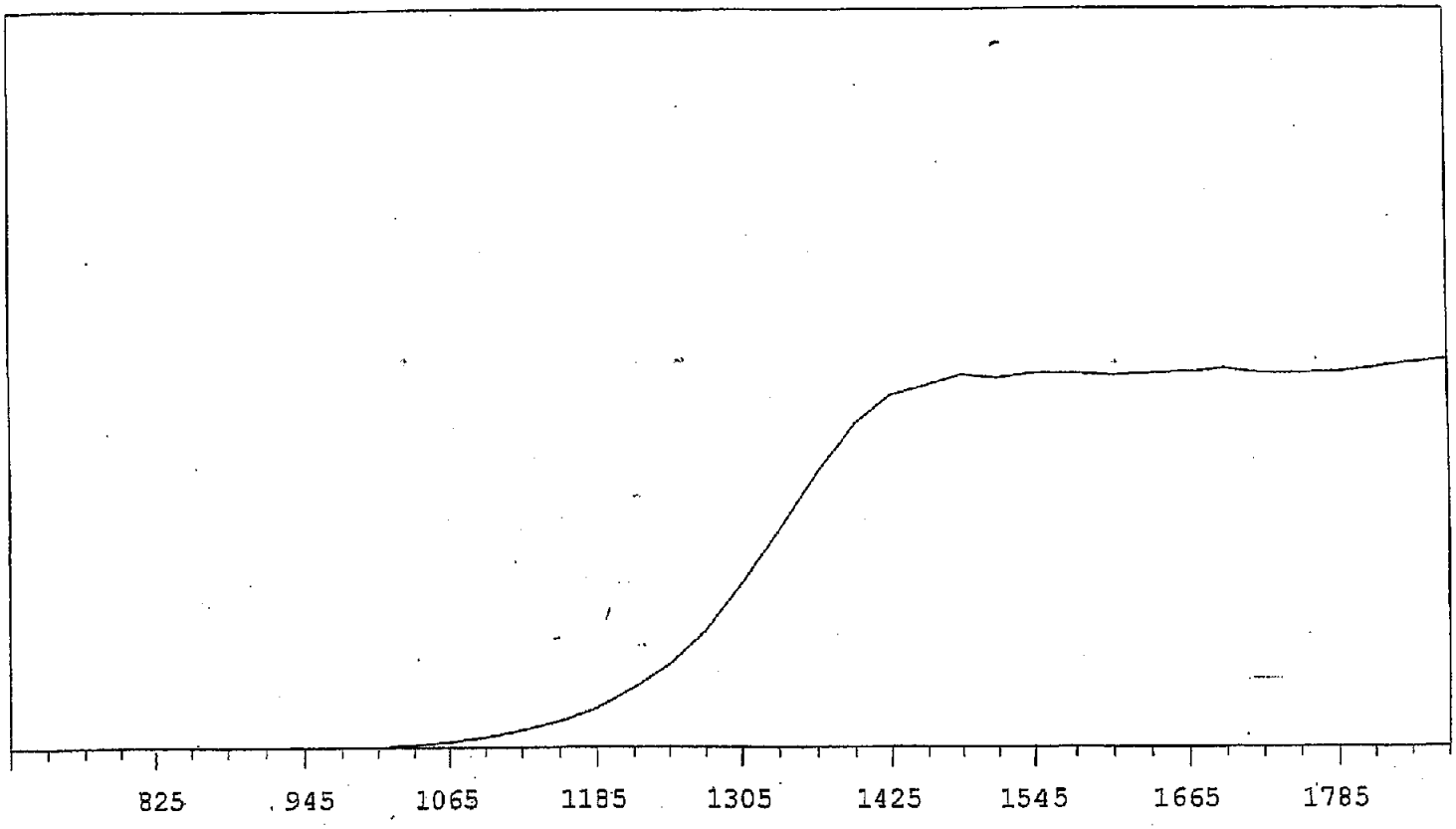
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	18047	+94.23
735	2		1335	23993	+79.11
765	0		1365	30302	+61.92
795	0	>100	1395	35719	+41.62
825	0	>100	1425	39617	+22.93
855	0	>100	1455	40588	+10.10
885	1	>100	1485	40726	+2.37
915	0	>100	1515	41160	+0.87
945	3	>100	1545	40771	+0.55
975	10	>100	1575	41098	+0.19
1005	58	>100	1605	41093	-0.14
1035	228	>100	1635	41116	-0.87
1065	543	>100	1665	40678	-0.49
1095	1009	>100	1695	40773	+0.05
1125	1647	>100	1725	40966	+0.68
1155	2812	>100	1755	41000	+1.27
1185	4080	>100	1785	40979	+1.90
1215	6168	>100	1815	41547	+4.96
1245	9044	>100	1845	41867	
1275	13094	>100	1875	43664	
1305	18047	+94.23			
1335	23993	+79.11			

MPC 9604 Plateau 1 MPC 9604 Detector C 12/16/2002
Alpha Volts: 705 Beta Volts: 1335



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	35990	+92.57
735	1		1335	47931	+79.59
765	0	+83.33	1365	60935	+62.26
795	0	>100	1395	71927	+42.50
825	1	>100	1425	79292	+24.26
855	2	-55.56	1455	82417	+11.85
885	0	>100	1485	83187	+4.61
915	0	>100	1515	84234	+1.35
945	0	>100	1545	84096	+0.71
975	14	>100	1575	83650	+0.45
1005	106	>100	1605	84371	+0.14
1035	468	>100	1635	84668	+0.04
1065	1134	>100	1665	83768	-0.23
1095	2223	>100	1695	83996	+0.27
1125	3673	>100	1725	84414	+1.38
1155	5797	>100	1755	84690	+1.53
1185	8786	>100	1785	85170	+2.05
1215	13052	>100	1815	85563	+2.91
1245	18927	>100	1845	86605	
1275	26347	>100	1875	87723	
1305	35990	+92.57			
1335	47931	+79.59			

MPC 9604 Plateau 1 MPC 9604 Detector D 12/16/2002
Alpha Volts: 705 Beta Volts: 1335



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16474	+93.61
735	1		1335	21880	+79.65
765	0	+0.00	1365	27760	+60.71
795	1	>100	1395	32659	+40.09
825	0	>100	1425	35549	+23.08
855	0	+83.33	1455	36556	+10.47
885	2	>100	1485	37588	+4.60
915	1	>100	1515	37281	+2.31
945	1	>100	1545	37736	+0.31
975	6	>100	1575	37775	+0.67
1005	51	>100	1605	37518	+0.27
1035	240	>100	1635	37766	+1.07
1065	524	>100	1665	37896	+0.77
1095	1011	>100	1695	38192	-0.15
1125	1744	>100	1725	37742	-0.45
1155	2674	>100	1755	37757	+0.29
1185	4004	>100	1785	37860	+2.27
1215	6095	>100	1815	38301	+3.24
1245	8485	>100	1845	38765	
1275	11865	>100	1875	39170	
1305	16474	+93.61			
1335	21880	+79.65			

#3

MPC 9604 FACTORY PERFORMANCE EVALUATION

Factory performed tests for Instrument Serial Number: 236532

Voltage Settings | **ULD Settings**

Alpha & Beta Voltage 1515 | A 7.0 C 7.0

Alpha Only Voltage 705 | B 7.0 D 7.0

Efficiencies: DETECTOR A

Sr/y 90 54.530 % Tc-99 35.69 %

Ni-63 14.385 % Th-230 @ A/B Voltage 24.440 %

Th-230 @ A only Voltage 22.047 %

Efficiencies: DETECTOR B

Sr/y 90 54.993 % Tc-99 36.209 %

Ni-63 15.309 % Th-230 @ A/B Voltage 24.041 %

Th-230 @ A only Voltage 21.872 %

Efficiencies: DETECTOR C

Sr/y 90 54.541 % Tc-99 35.67 %

Ni-63 15.117 % Th-230 @ A/B Voltage 24.212 %

Th-230 @ A only Voltage 21.800 %

Efficiencies: DETECTOR D

Sr/y 90 54.296 % Tc-99 35.380 %

Ni-63 13.326 % Th-230 @ A/B Voltage 24.802 %

Th-230 @ A only Voltage 22.584 %

Backgrounds

Detector A:		Detector B:	
Alpha Background	0.05	Alpha Background	0.06
Beta Background	0.619	Beta Background	0.497

Detector C:		Detector D:	
Alpha Background	0.04	Alpha Background	0.05
Beta Background	0.516	Beta Background	0.716

Background Count Time was 500 Minutes.

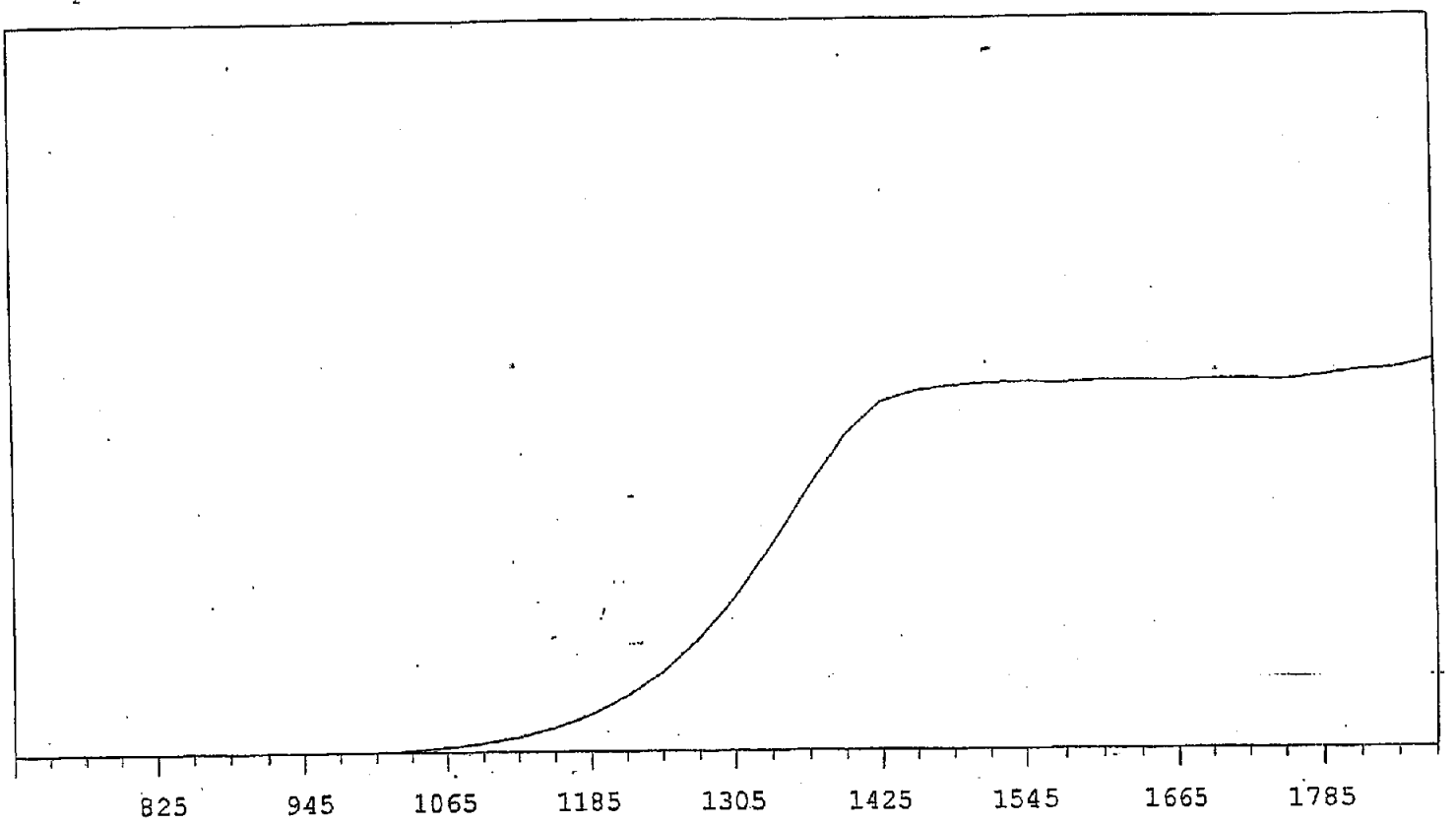
Tests performed and recorded by: [signature]

Date: 12/31/02

*ALL EFFICIENCIES WERE OBTAINED USING A 2" DISTRIBUTED SOURCE AT OPTIMAL GEOMETRY EXCEPT Th-230, WHICH WAS AT A DEPTH OF ¼".

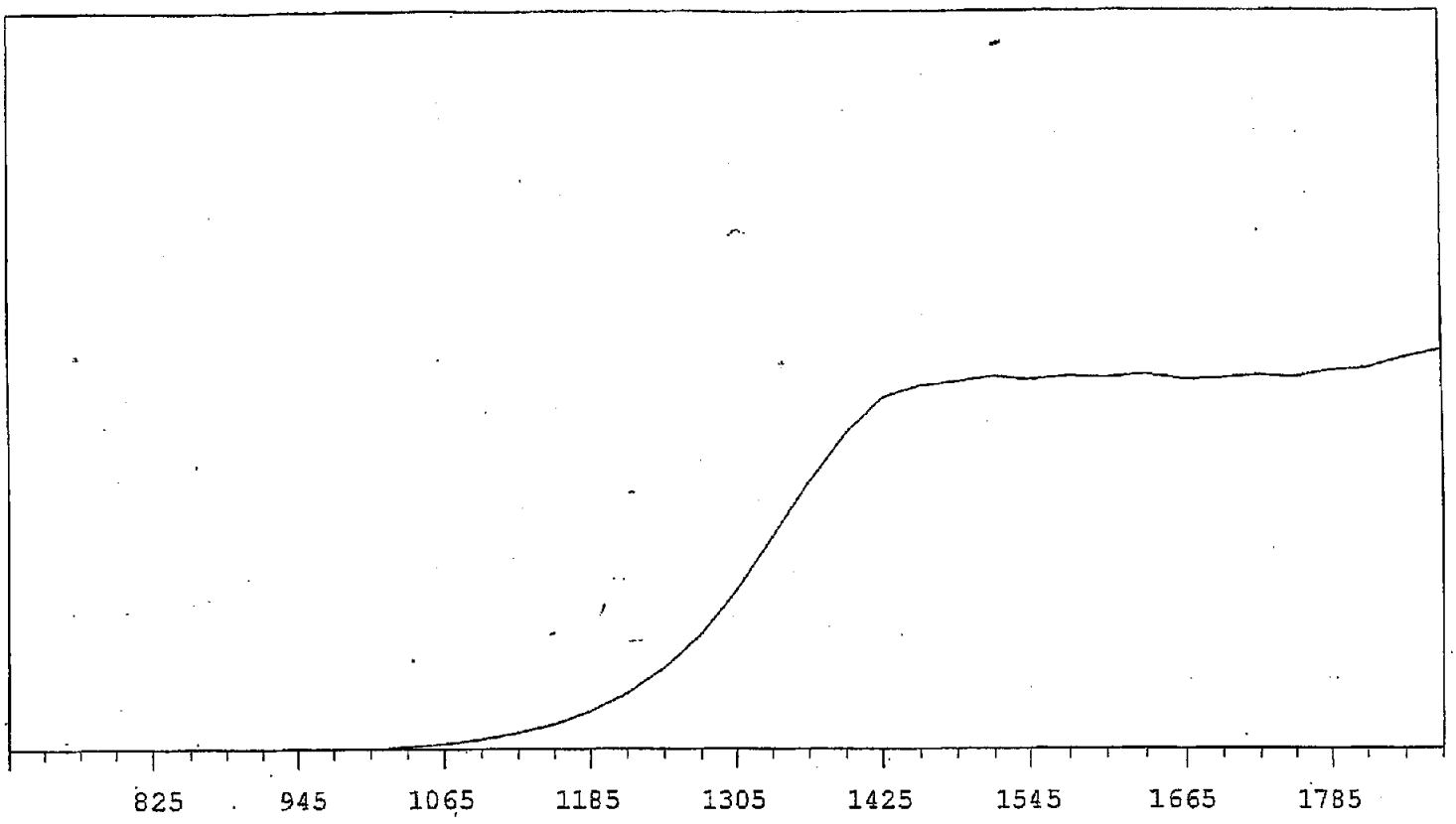
Unit #3

MPC 9604 Plateau 3 MPC 9604 Detector A 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



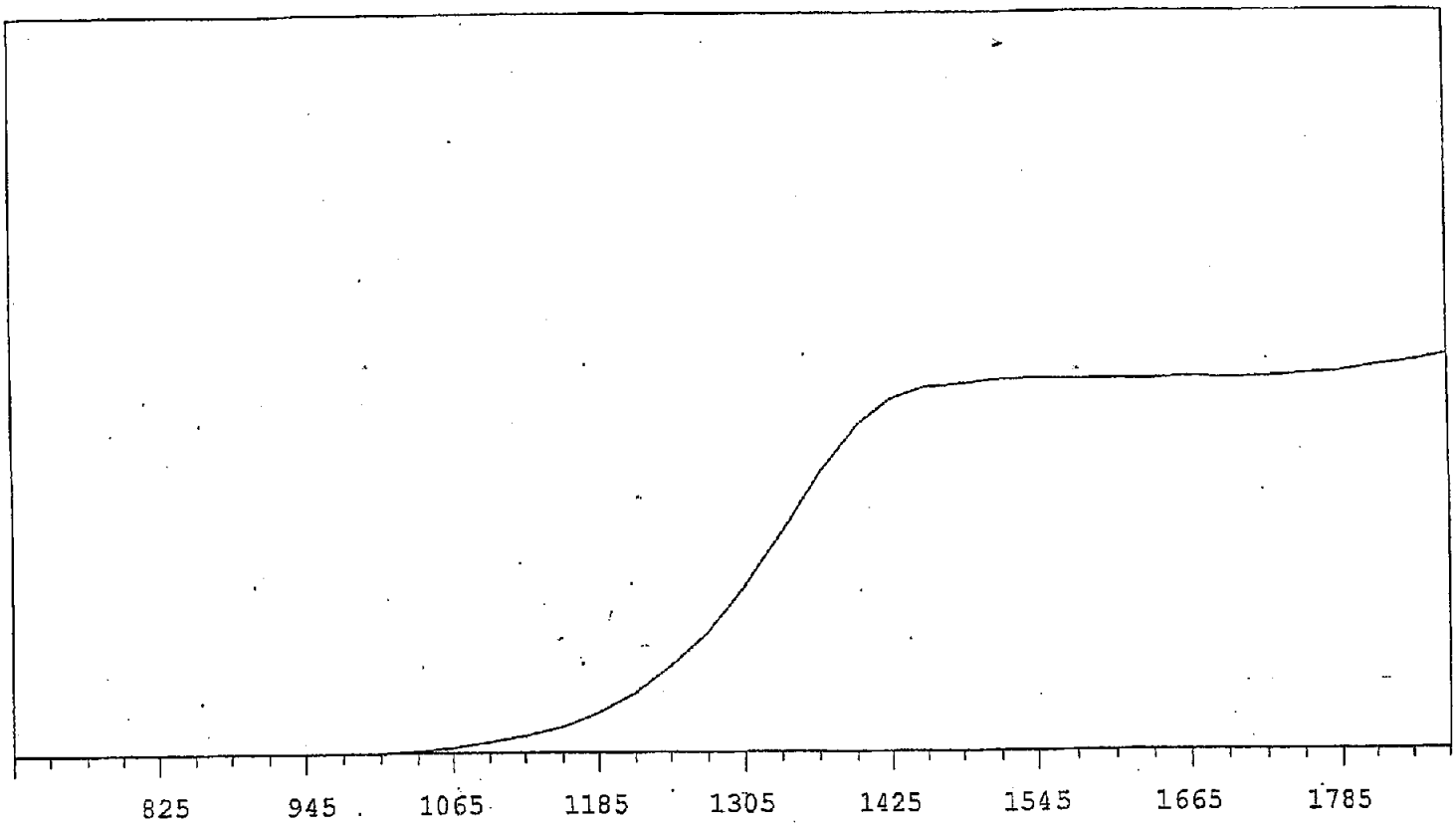
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	35294	+94.49
735	1		1335	47171	+81.80
765	1	-41.67	1365	60476	+64.73
795	0	+0.00	1395	72428	+43.87
825	1	-55.56	1425	80027	+24.74
855	1	-83.33	1455	82481	+11.18
885	0	>100	1485	83577	+4.19
915	0	>100	1515	84156	+1.60
945	4	>100	1545	84396	+0.77
975	3	>100	1575	84086	+0.47
1005	70	>100	1605	84586	+0.33
1035	340	>100	1635	84651	+0.59
1065	1026	>100	1665	84530	+0.30
1095	2029	>100	1695	84858	+0.13
1125	3406	>100	1725	84861	+0.66
1155	5535	>100	1755	84646	+1.63
1185	8369	>100	1785	85477	+2.55
1215	12673	>100	1815	86640	+4.05
1245	18158	>100	1845	87146	
1275	25828	>100	1875	89075	
1305	35294	+94.49			
1335	47171	+81.80			

MPC 9604 Plateau 3 MPC 9604 Detector B 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



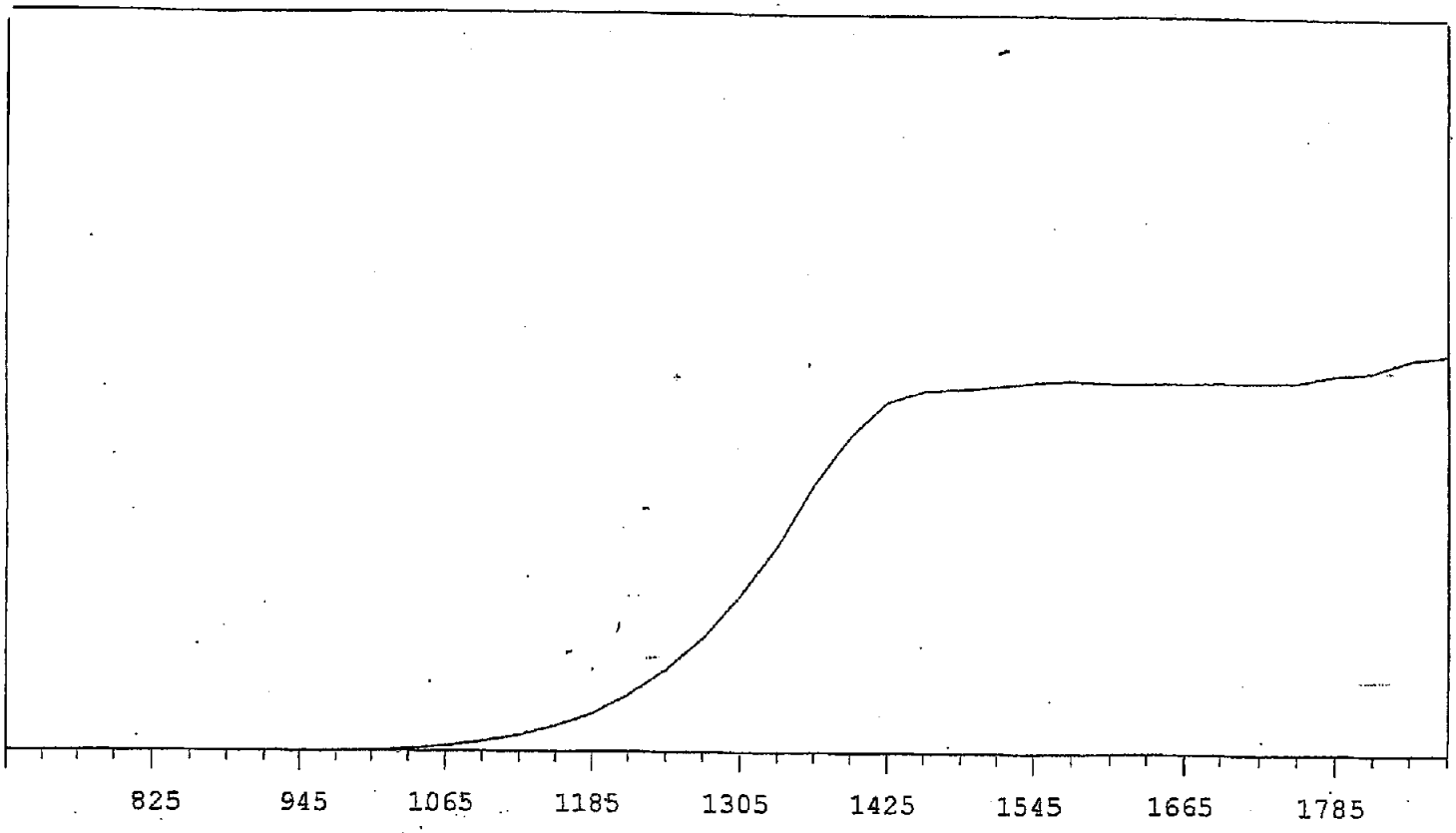
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	2		1305	16243	+93.24
735	1		1335	21731	+79.13
765	0		1365	27200	+62.01
795	0	>100	1395	32178	+42.43
825	1	>100	1425	35788	+25.03
855	4	-33.33	1455	37031	+12.41
885	0	>100	1485	37518	+4.25
915	0	-20.83	1515	38036	+1.82
945	1	>100	1545	37656	+0.52
975	3	>100	1575	37987	+0.42
1005	51	>100	1605	37837	+0.14
1035	181	>100	1635	38182	-0.55
1065	497	>100	1665	37639	+0.15
1095	964	>100	1695	37774	-0.05
1125	1656	>100	1725	38127	+1.81
1155	2551	>100	1755	37910	+2.19
1185	3834	>100	1785	38605	+3.76
1215	5718	>100	1815	38791	+5.71
1245	8336	>100	1845	39868	
1275	11756	>100	1875	40630	
1305	16243	+93.24			
1335	21731	+79.13			

MPC 9604 Plateau 3 MPC 9604 Detector C 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	37587	+92.10
735	1		1335	49689	+78.64
765	0	-55.56	1365	62948	+59.67
795	0	-83.33	1395	73852	+39.59
825	1	+0.00	1425	79926	+21.65
855	0	>100	1455	82659	+10.02
885	0	>100	1485	83402	+4.31
915	0	>100	1515	84267	+1.73
945	3	>100	1545	84482	+0.88
975	22	>100	1575	84291	+0.00
1005	101	>100	1605	84505	+0.24
1035	486	>100	1635	84261	+0.22
1065	1178	>100	1665	84807	+0.24
1095	2481	>100	1695	84420	+0.83
1125	3840	>100	1725	84730	+1.15
1155	5896	>100	1755	85357	+2.52
1185	9085	>100	1785	85810	+3.26
1215	13626	>100	1815	87107	+4.16
1245	19695	>100	1845	88075	
1275	27244	>100	1875	89672	
1305	37587	+92.10			
1335	49689	+78.64			

MPC 9604 Plateau 3 MPC 9604 Detector D 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	9	>100
1005	46	>100
1035	205	>100
1065	519	>100
1095	975	>100
1125	1608	>100
1155	2563	>100
1185	3812	>100
1215	5780	>100
1245	8319	>100
1275	11591	>100
1305	15935	+93.94
1335	21039	+81.17

VOLTS	COUNTS	%/100 Volts
1305	15935	+93.94
1335	21039	+81.17
1365	27326	+63.87
1395	32222	+43.56
1425	35674	+23.86
1455	36879	+11.05
1485	37110	+4.30
1515	37448	+2.64
1545	37776	+1.77
1575	38028	+0.73
1605	37822	-0.15
1635	37836	-0.25
1665	37786	+0.15
1695	37906	+0.36
1725	37873	+1.75
1755	37997	+2.80
1785	38738	+5.15
1815	39085	+6.13
1845	40328	
1875	40827	

#4

MPC 9604 FACTORY PERFORMANCE EVALUATION

Factory performed tests for Instrument Serial Number: 236533

Voltage Settings **ULD Settings**

Alpha & Beta Voltage 1515 A 7.0 C 7.0

Alpha Only Voltage 705 B 7.0 D 7.0

Efficiencies: DETECTOR A

Sr/y 90 55.116 % Tc-99 36.67 %

Ni-63 16.083 % Th-230 @ A/B Voltage 24.835 %

Th-230 @ A only Voltage 21.648 %

Efficiencies: DETECTOR B

Sr/y 90 54.972 % Tc-99 36.409 %

Ni-63 15.648 % Th-230 @ A/B Voltage 24.479 %

Th-230 @ A only Voltage 22.123 %

Efficiencies: DETECTOR C

Sr/y 90 55.152 % Tc-99 36.257 %

Ni-63 15.587 % Th-230 @ A/B Voltage 23.546 %

Th-230 @ A only Voltage 21.714 %

Efficiencies: DETECTOR D

Sr/y 90 54.815 % Tc-99 36.269 %

Ni-63 15.94 % Th-230 @ A/B Voltage 24.314 %

Th-230 @ A only Voltage 22.574 %

Backgrounds

Detector A:		Detector B:	
Alpha Background	0.05	Alpha Background	0.04
Beta Background	0.609	Beta Background	0.718

Detector C:		Detector D:	
Alpha Background	0.06	Alpha Background	0.05
Beta Background	0.462	Beta Background	0.521

Background Count Time was 500 Minutes.

Tests performed and recorded by: [signature]

Date: 12/31/02

*ALL EFFICIENCIES WERE OBTAINED USING A 2" DISTRIBUTED SOURCE AT OPTIMAL GEOMETRY EXCEPT Th-230, WHICH WAS AT A DEPTH OF ¼".

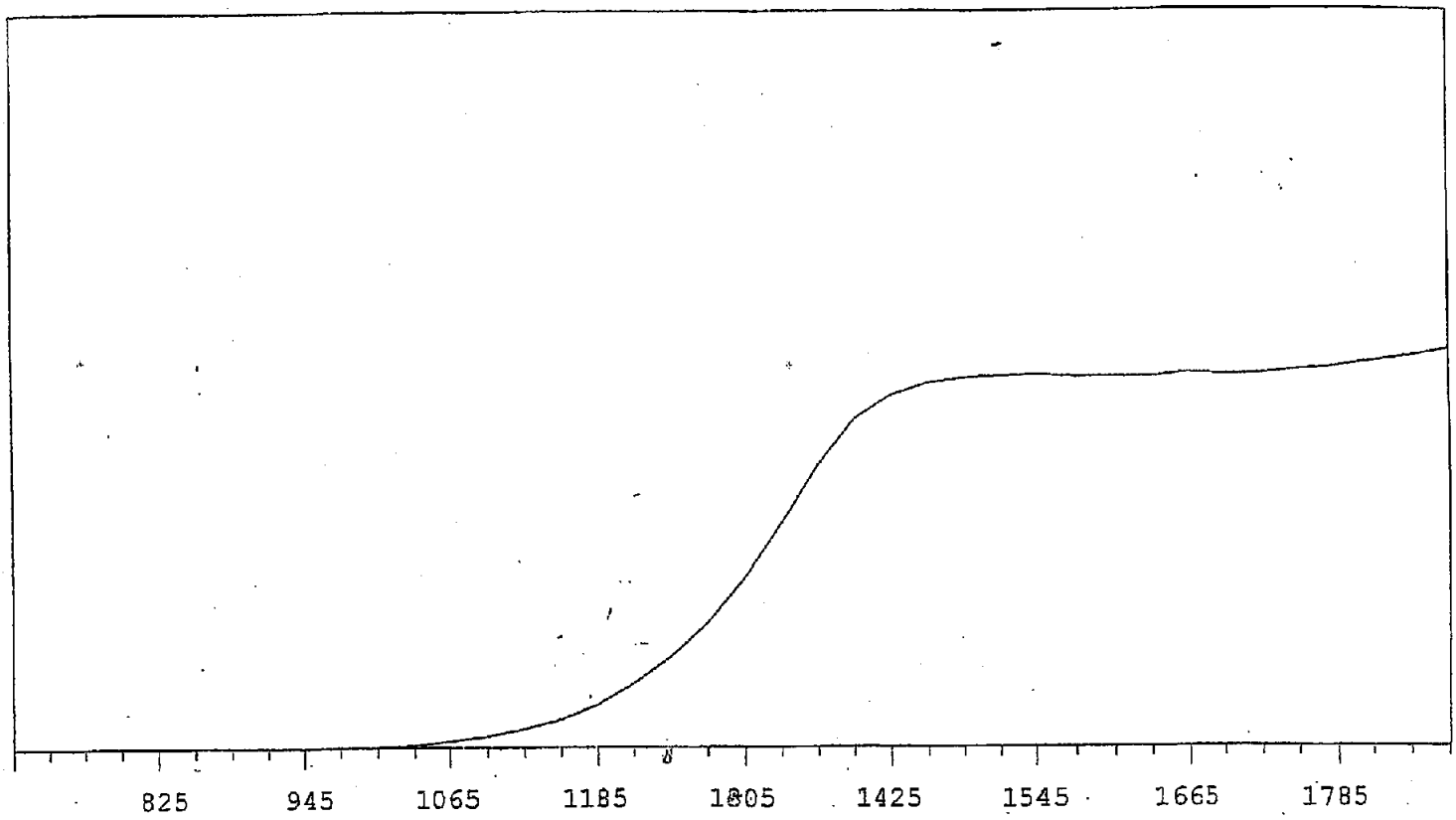
TestAmerica STL

Protean

Alpha Efficiency Curves

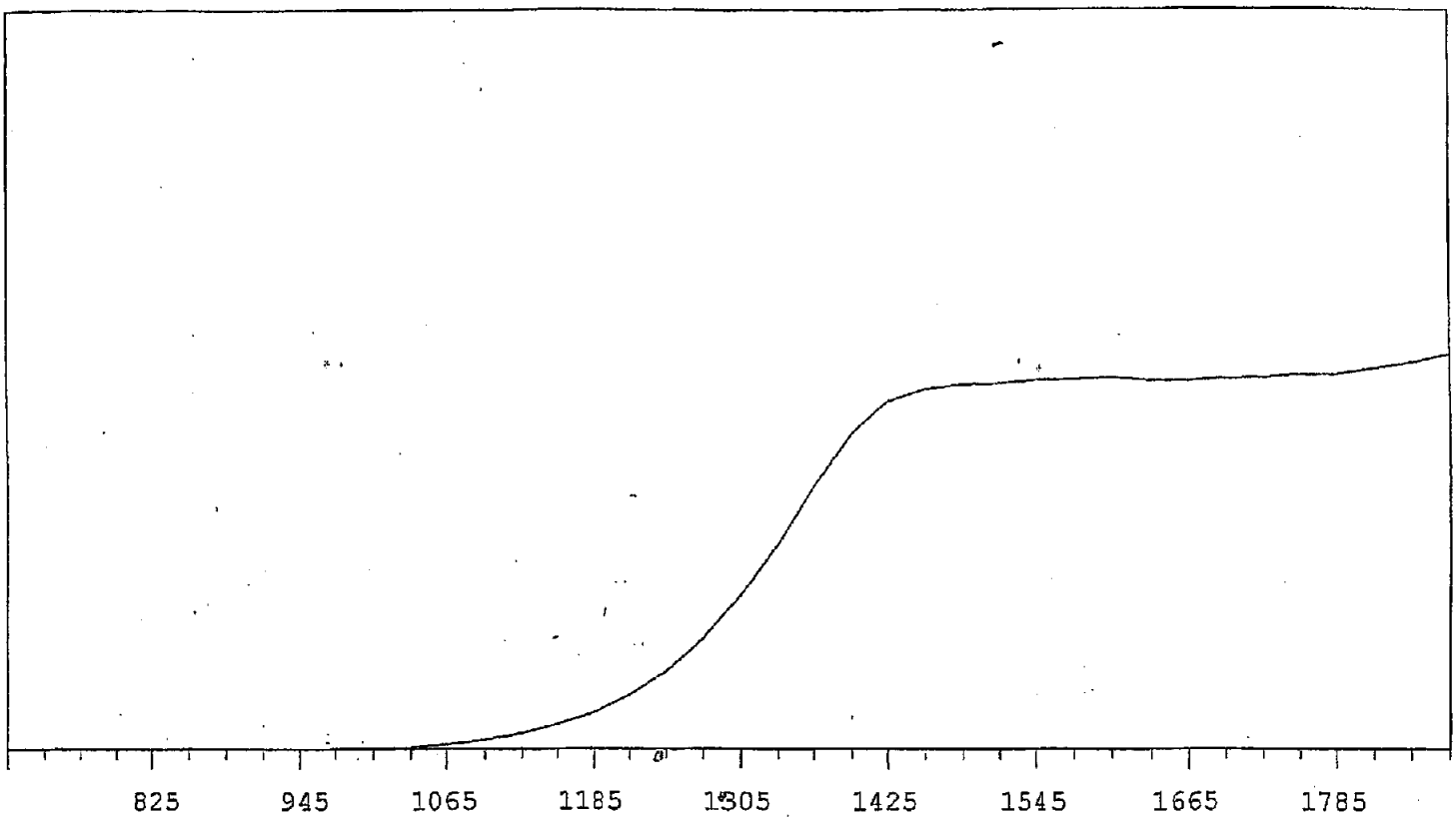
Unit #4

MPC 9604 Plateau PIC MPC 9604 MPC 9604 Detector A 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



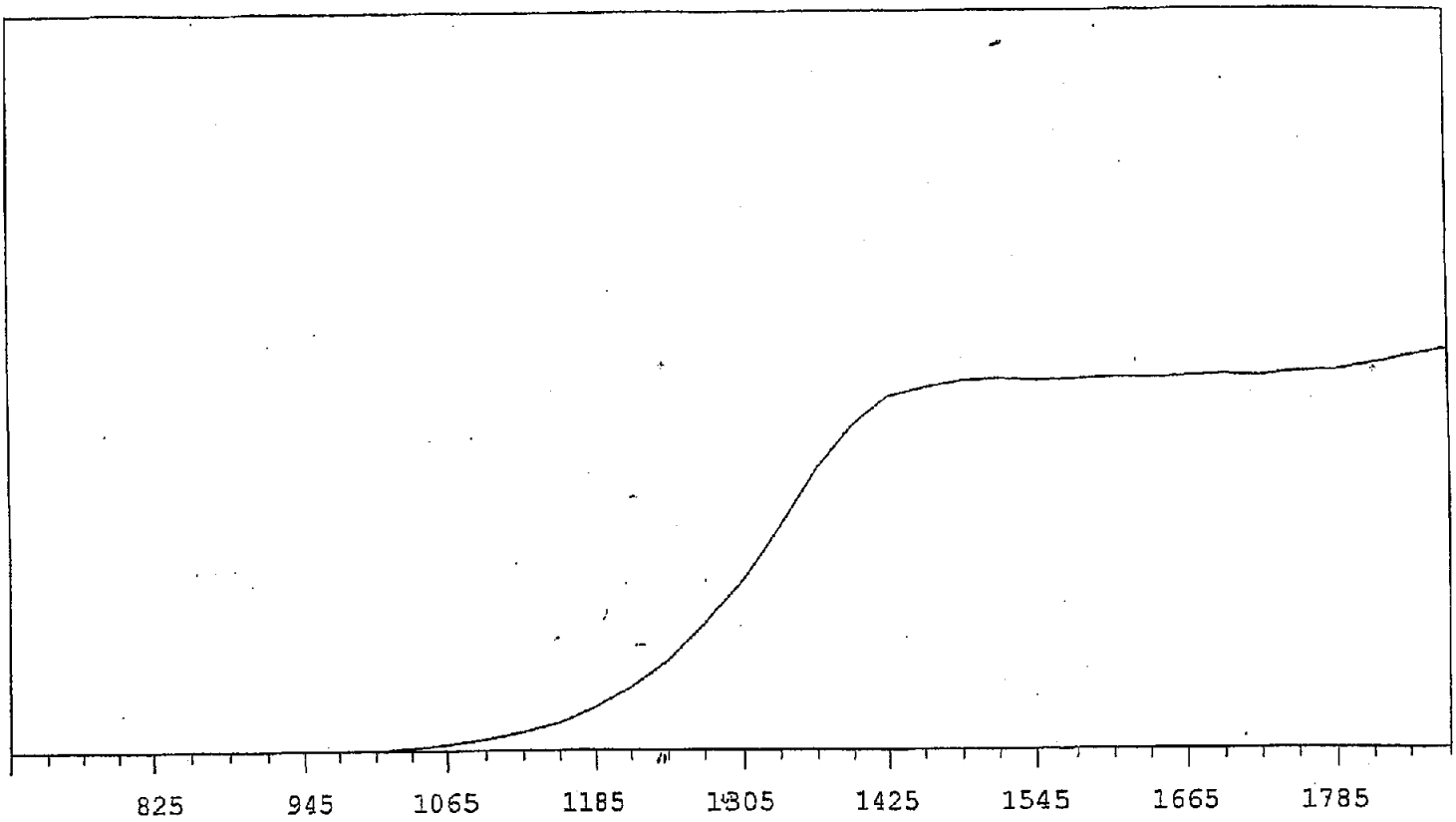
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	38210	+90.30
735	0		1335	50662	+76.50
765	0		1365	63624	+57.39
795	0	>100	1395	73884	+37.39
825	1	+83.33	1425	79213	+20.55
855	1	-83.33	1455	82067	+9.64
885	0	-55.56	1485	83080	+4.47
915	0	>100	1515	83570	+1.53
945	1	>100	1545	83988	+0.34
975	23	>100	1575	83523	-0.31
1005	147	>100	1605	83529	+0.24
1035	549	>100	1635	83417	+0.69
1065	1389	>100	1665	84345	+0.71
1095	2484	>100	1695	83979	+1.14
1125	4165	>100	1725	84139	+1.49
1155	6311	>100	1755	84965	+2.96
1185	9672	>100	1785	85741	+3.84
1215	14399	>100	1815	86960	+4.42
1245	20400	>100	1845	88088	
1275	28174	+99.15	1875	89563	
1305	38210	+90.30			
1335	50662	+76.50			

MPC 9604 Plateau PIC MPC 9604 MPC 9604 Detector B 12/20/2002
Alpha Volts: 705 Beta Volts: 1515



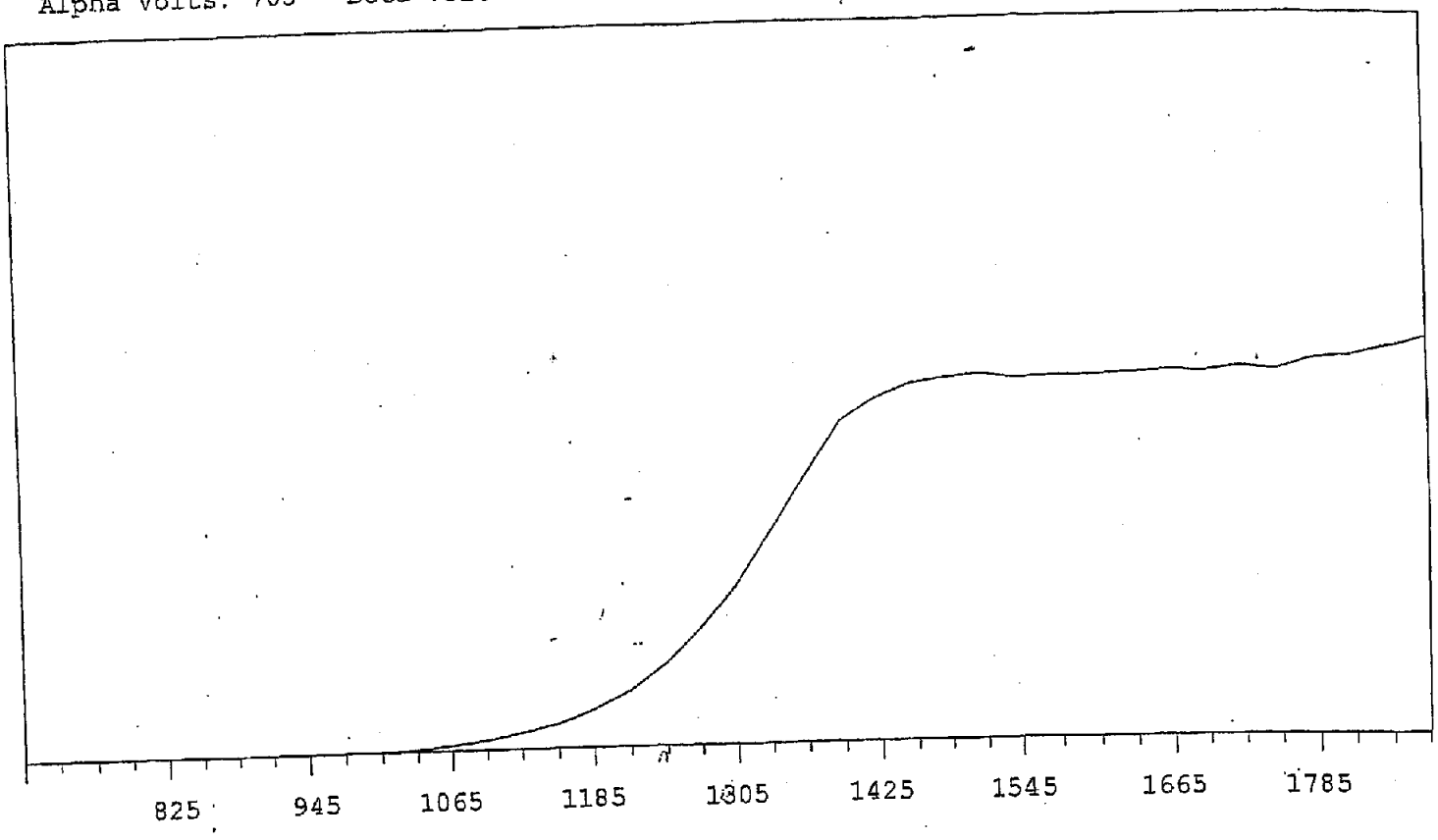
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	28036	+95.44
735	0		1335	37302	+82.32
765	1	+0.00	1365	47958	+64.46
795	0	>100	1395	57350	+44.02
825	0	>100	1425	63237	+24.93
855	0	>100	1455	65497	+11.29
885	0	>100	1485	66351	+4.62
915	1	>100	1515	66601	+2.36
945	1	>100	1545	67246	+1.77
975	8	>100	1575	67408	+0.73
1005	50	>100	1605	67730	-0.41
1035	303	>100	1635	67091	-0.29
1065	774	>100	1665	66992	+0.10
1095	1655	>100	1695	67480	+1.42
1125	2759	>100	1725	67633	+1.52
1155	4503	>100	1755	68211	+1.98
1185	6596	>100	1785	68168	+3.14
1215	9932	>100	1815	69236	+4.56
1245	14227	>100	1845	70353	
1275	20184	>100	1875	71882	
1305	28036	+95.44			
1335	37302	+82.32			

MPC 9604 Plateau PIC MPC 9604 MPC 9604 Detector C 12/19/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	38804	+90.25
735	1		1335	50930	+75.33
765	0		1365	64318	+57.13
795	0	+0.00	1395	73878	+37.15
825	0	>100	1425	80131	+20.35
855	1	+83.33	1455	82188	+9.94
885	1	+55.56	1485	83615	+3.79
915	0	>100	1515	84189	+1.56
945	1	>100	1545	83835	+0.57
975	16	>100	1575	84039	+0.31
1005	161	>100	1605	84413	+0.74
1035	557	>100	1635	84290	+0.90
1065	1352	>100	1665	84650	+0.53
1095	2565	>100	1695	85061	+1.02
1125	4126	>100	1725	84700	+0.98
1155	6348	>100	1755	85564	+2.08
1185	9862	>100	1785	85649	+3.84
1215	14356	>100	1815	87256	+5.01
1245	20454	>100	1845	88828	
1275	28653	+99.54	1875	90557	
1305	38804	+90.25			
1335	50930	+75.33			

MPC 9604 Plateau PIC MPC 9604 MPC 9604 Detector D 12/19/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	1	>100
855	1	+41.67
885	2	-33.33
915	0	>100
945	1	>100
975	4	>100
1005	34	>100
1035	189	>100
1065	520	>100
1095	1010	>100
1125	1686	>100
1155	2549	>100
1185	3953	>100
1215	5794	>100
1245	8550	>100
1275	12147	>100
1305	16347	+92.19
1335	21926	+79.96

VOLTS	COUNTS	%/100 Volts
1305	16347	+92.19
1335	21926	+79.96
1365	27606	+61.43
1395	33199	+40.79
1425	35516	+23.07
1455	36964	+10.43
1485	37545	+4.16
1515	37853	+0.87
1545	37385	-0.13
1575	37533	-0.03
1605	37633	+1.20
1635	37712	+0.83
1665	37973	+1.27
1695	37835	+0.66
1725	38293	+1.93
1755	37926	+3.14
1785	39032	+4.51
1815	39280	+6.41
1845	40250	
1875	41116	

lpha Attenuation Protean 0
3_2007

Data Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
0	A11	0.0094	40.00	32195	804.875	4567.9	0.1762
0	A12	0.0169	40.00	34317	857.925	4567.9	0.1878
0	A13	0.0257	40.00	25070	626.750	4567.9	0.1372
0	A14	0.0421	40.00	22466	561.650	4567.9	0.1230
0	A15	0.0629	40.00	17162	429.050	4567.9	0.0939
0	A16	0.0817	40.00	32473	811.825	9135.8	0.0889
0	A17	0.1052	40.00	27142	678.550	9135.8	0.0743
0	A18	0.1240	40.00	23807	595.175	9135.8	0.0651

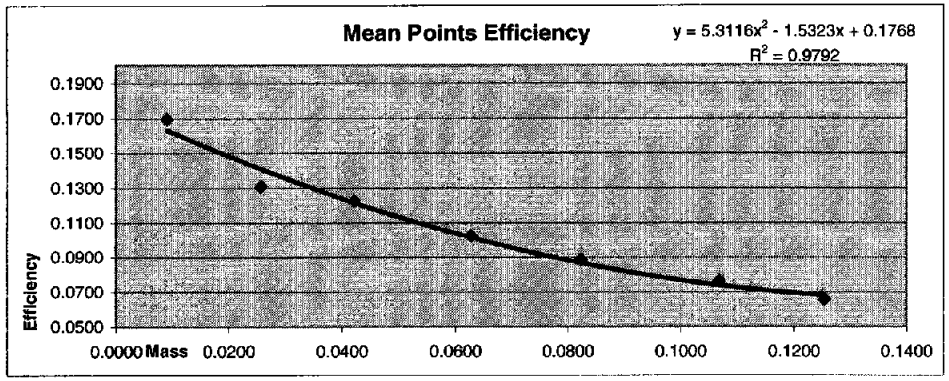
Alpha Attenuation Protean 0
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
0	A21	0.0086	40.00	29818	745.450	4567.9	0.1632
0	A22	0.0172	40.00	24445	611.125	4567.9	0.1338
0	A23	0.0256	40.00	22710	567.750	4567.9	0.1243
0	A24	0.0422	40.00	22373	559.325	4567.9	0.1224
0	A25	0.0628	40.00	20258	506.450	4567.9	0.1109
0	A26	0.0830	40.00	32272	806.800	9135.8	0.0883
0	A27	0.1082	40.00	28455	711.375	9135.8	0.0779
0	A28	0.1269	40.00	24125	603.125	9135.8	0.0660

rotean 0

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1762	0.1632	0.1697	3.83%	-3.83%
0.0257	0.0256	0.0257	0.1372	0.1243	0.1307	4.94%	-4.94%
0.0421	0.0422	0.0421	0.1230	0.1224	0.1227	0.21%	-0.21%
0.0629	0.0628	0.0629	0.0939	0.1109	0.1024	-8.27%	8.27%
0.0817	0.0830	0.0823	0.0889	0.0883	0.0886	0.31%	-0.31%
0.1052	0.1082	0.1067	0.0743	0.0779	0.0761	-2.36%	2.36%
0.1240	0.1269	0.1255	0.0651	0.0660	0.0656	-0.66%	0.66%



lpha Attenuation Protean 1
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
1	A11	0.0094	40.00	31313	782.825	4567.9	0.1714
1	A12	0.0169	40.00	34218	855.450	4567.9	0.1873
1	A13	0.0257	40.00	24383	609.575	4567.9	0.1334
1	A14	0.0421	40.00	22215	555.375	4567.9	0.1216
1	A15	0.0629	40.00	17137	428.425	4567.9	0.0938
1	A16	0.0817	40.00	31946	798.650	9135.8	0.0874
1	A17	0.1052	40.00	26646	666.150	9135.8	0.0729
1	A18	0.1240	40.00	23100	577.500	9135.8	0.0632

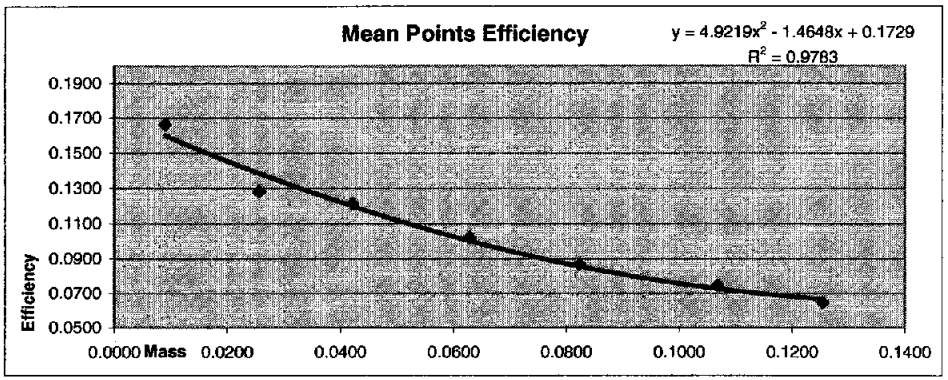
Alpha Attenuation Protean 1
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
1	A21	0.0086	40.00	29451	736.275	4567.9	0.1612
1	A22	0.0172	40.00	23776	594.400	4567.9	0.1301
1	A23	0.0256	40.00	22430	560.750	4567.9	0.1228
1	A24	0.0422	40.00	22128	553.200	4567.9	0.1211
1	A25	0.0628	40.00	20204	505.100	4567.9	0.1106
1	A26	0.0830	40.00	31472	786.800	9135.8	0.0861
1	A27	0.1082	40.00	27752	693.800	9135.8	0.0759
1	A28	0.1269	40.00	24078	601.950	9135.8	0.0659

rotean 1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1714	0.1612	0.1663	3.06%	-3.06%
0.0257	0.0256	0.0257	0.1334	0.1228	0.1281	4.17%	-4.17%
0.0421	0.0422	0.0421	0.1216	0.1211	0.1213	0.20%	-0.20%
0.0629	0.0628	0.0629	0.0938	0.1106	0.1022	-8.21%	8.21%
0.0817	0.0830	0.0823	0.0874	0.0861	0.0868	0.75%	-0.75%
0.1052	0.1082	0.1067	0.0729	0.0759	0.0744	-2.03%	2.03%
0.1240	0.1269	0.1255	0.0632	0.0659	0.0646	-2.07%	2.07%



lpha Attenuation Protean 2
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
2	A11	0.0094	40.00	31960	799.000	4567.9	0.1749
2	A12	0.0169	40.00	34281	857.025	4567.9	0.1876
2	A13	0.0257	40.00	24982	624.550	4567.9	0.1367
2	A14	0.0421	40.00	22613	565.325	4567.9	0.1238
2	A15	0.0629	40.00	16901	422.525	4567.9	0.0925
2	A16	0.0817	40.00	32675	816.875	9135.8	0.0894
2	A17	0.1052	40.00	27190	679.750	9135.8	0.0744
2	A18	0.1240	40.00	23639	590.975	9135.8	0.0647

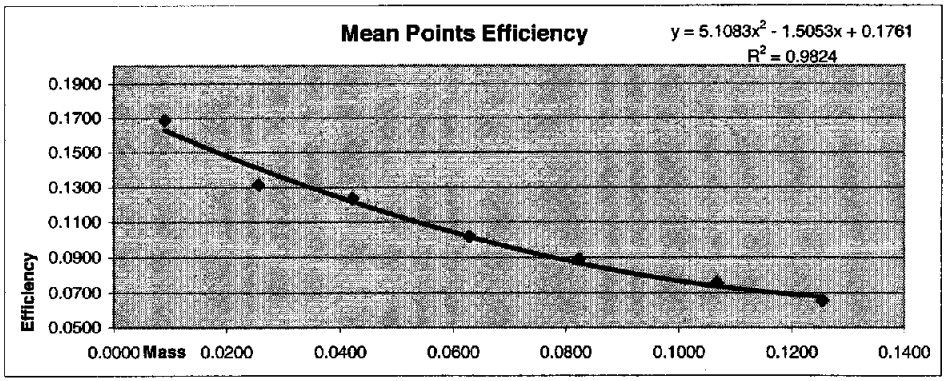
Alpha Attenuation Protean 2
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
2	A21	0.0086	40.00	29638	740.950	4567.9	0.1622
2	A22	0.0172	40.00	23798	594.950	4567.9	0.1302
2	A23	0.0256	40.00	23069	576.725	4567.9	0.1263
2	A24	0.0422	40.00	22459	561.475	4567.9	0.1229
2	A25	0.0628	40.00	20247	506.175	4567.9	0.1108
2	A26	0.0830	40.00	32316	807.900	9135.8	0.0884
2	A27	0.1082	40.00	28164	704.100	9135.8	0.0771
2	A28	0.1269	40.00	24076	601.900	9135.8	0.0659

rotean 2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1749	0.1622	0.1686	3.77%	-3.77%
0.0257	0.0256	0.0257	0.1367	0.1263	0.1315	3.98%	-3.98%
0.0421	0.0422	0.0421	0.1238	0.1229	0.1233	0.34%	-0.34%
0.0629	0.0628	0.0629	0.0925	0.1108	0.1017	-9.01%	9.01%
0.0817	0.0830	0.0823	0.0894	0.0884	0.0889	0.55%	-0.55%
0.1052	0.1082	0.1067	0.0744	0.0771	0.0757	-1.76%	1.76%
0.1240	0.1269	0.1255	0.0647	0.0659	0.0653	-0.92%	0.92%



lpha Attenuation Protean 3
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
3	A11	0.0094	40.00	31977	799.425	4567.9	0.1750
3	A12	0.0169	40.00	34147	853.675	4567.9	0.1869
3	A13	0.0257	40.00	24389	609.725	4567.9	0.1335
3	A14	0.0421	40.00	22249	556.225	4567.9	0.1218
3	A15	0.0629	40.00	17027	425.675	4567.9	0.0932
3	A16	0.0817	40.00	31860	796.500	9135.8	0.0872
3	A17	0.1052	40.00	26780	669.500	9135.8	0.0733
3	A18	0.1240	40.00	23199	579.975	9135.8	0.0635

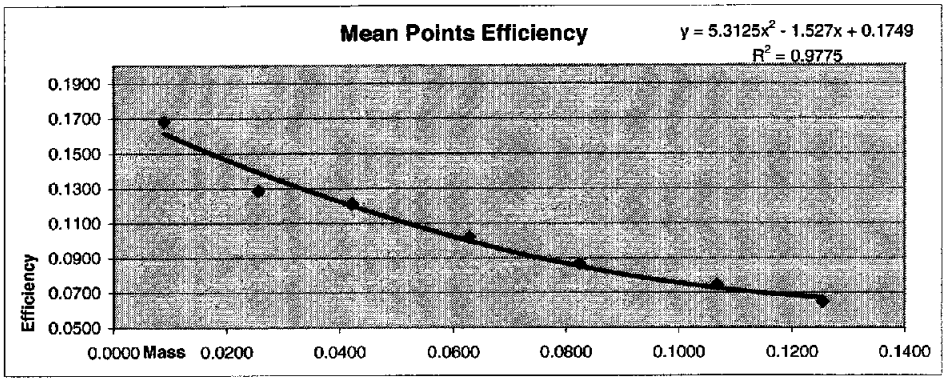
Alpha Attenuation Protean 3
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
3	A21	0.0086	40.00	29449	736.225	4567.9	0.1612
3	A22	0.0172	40.00	23850	596.250	4567.9	0.1305
3	A23	0.0256	40.00	22583	564.575	4567.9	0.1236
3	A24	0.0422	40.00	21876	546.900	4567.9	0.1197
3	A25	0.0628	40.00	20210	505.250	4567.9	0.1106
3	A26	0.0830	40.00	31516	787.900	9135.8	0.0862
3	A27	0.1082	40.00	27581	689.525	9135.8	0.0755
3	A28	0.1269	40.00	24020	600.500	9135.8	0.0657

rotean 3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1750	0.1612	0.1681	4.12%	-4.12%
0.0257	0.0256	0.0257	0.1335	0.1236	0.1285	3.84%	-3.84%
0.0421	0.0422	0.0421	0.1218	0.1197	0.1207	0.85%	-0.85%
0.0629	0.0628	0.0629	0.0932	0.1106	0.1019	-8.55%	8.55%
0.0817	0.0830	0.0823	0.0872	0.0862	0.0867	0.54%	-0.54%
0.1052	0.1082	0.1067	0.0733	0.0755	0.0744	-1.47%	1.47%
0.1240	0.1269	0.1255	0.0635	0.0657	0.0646	-1.74%	1.74%



lpha Attenuation Protean 4
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
4	A11	0.0094	40.00	31352	783.800	4567.9	0.1716
4	A12	0.0169	40.00	34160	854.000	4567.9	0.1870
4	A13	0.0257	40.00	24237	605.925	4567.9	0.1326
4	A14	0.0421	40.00	22082	552.050	4567.9	0.1209
4	A15	0.0629	40.00	16767	419.175	4567.9	0.0918
4	A16	0.0817	40.00	31643	791.075	9135.8	0.0866
4	A17	0.1052	40.00	26393	659.825	9135.8	0.0722
4	A18	0.1240	40.00	23367	584.175	9135.8	0.0639

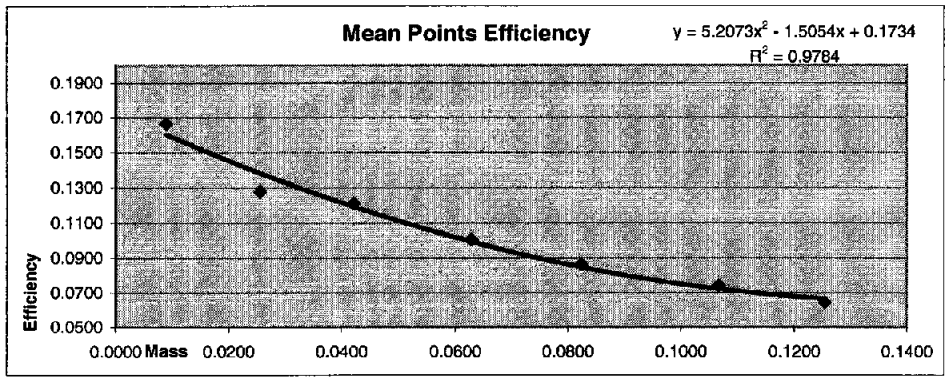
Alpha Attenuation Protean 4
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
4	A21	0.0086	40.00	29483	737.075	4567.9	0.1614
4	A22	0.0172	40.00	23643	591.075	4567.9	0.1294
4	A23	0.0256	40.00	22472	561.800	4567.9	0.1230
4	A24	0.0422	40.00	22132	553.300	4567.9	0.1211
4	A25	0.0628	40.00	19949	498.725	4567.9	0.1092
4	A26	0.0830	40.00	31461	786.525	9135.8	0.0861
4	A27	0.1082	40.00	27819	695.475	9135.8	0.0761
4	A28	0.1269	40.00	23607	590.175	9135.8	0.0646

rotean 4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1716	0.1614	0.1665	3.07%	-3.07%
0.0257	0.0256	0.0257	0.1326	0.1230	0.1278	3.78%	-3.78%
0.0421	0.0422	0.0421	0.1209	0.1211	0.1210	-0.11%	0.11%
0.0629	0.0628	0.0629	0.0918	0.1092	0.1005	-8.67%	8.67%
0.0817	0.0830	0.0823	0.0866	0.0861	0.0863	0.29%	-0.29%
0.1052	0.1082	0.1067	0.0722	0.0761	0.0742	-2.63%	2.63%
0.1240	0.1269	0.1255	0.0639	0.0646	0.0643	-0.51%	0.51%



lpha Attenuation Protean 5
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
5	A11	0.0094	40.00	31655	791.375	4567.9	0.1732
5	A12	0.0169	40.00	33742	843.550	4567.9	0.1847
5	A13	0.0257	40.00	24000	600.000	4567.9	0.1314
5	A14	0.0421	40.00	22061	551.525	4567.9	0.1207
5	A15	0.0629	40.00	16332	408.300	4567.9	0.0894
5	A16	0.0817	40.00	31142	778.550	9135.8	0.0852
5	A17	0.1052	40.00	26057	651.425	9135.8	0.0713
5	A18	0.1240	40.00	22742	568.550	9135.8	0.0622

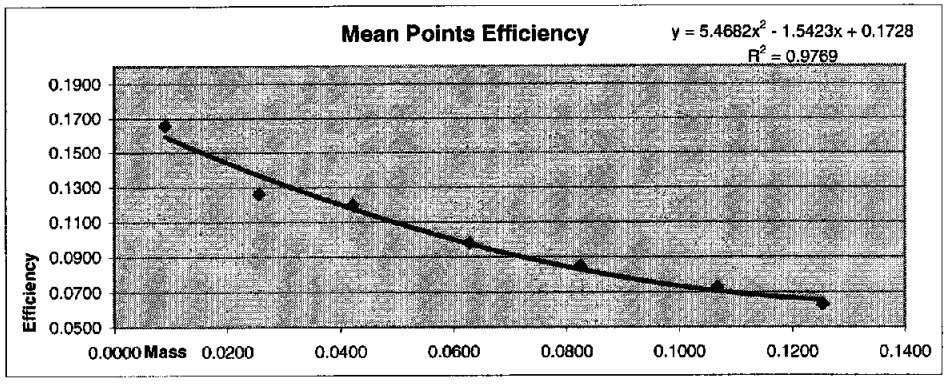
Alpha Attenuation Protean 5
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
5	A21	0.0086	40.00	28896	722.400	4567.9	0.1581
5	A22	0.0172	40.00	23472	586.800	4567.9	0.1285
5	A23	0.0256	40.00	22078	551.950	4567.9	0.1208
5	A24	0.0422	40.00	21633	540.825	4567.9	0.1184
5	A25	0.0628	40.00	19467	486.675	4567.9	0.1065
5	A26	0.0830	40.00	30817	770.425	9135.8	0.0843
5	A27	0.1082	40.00	27174	679.350	9135.8	0.0744
5	A28	0.1269	40.00	23216	580.400	9135.8	0.0635

rotean 5

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1732	0.1581	0.1657	4.56%	-4.56%
0.0257	0.0256	0.0257	0.1314	0.1208	0.1261	4.17%	-4.17%
0.0421	0.0422	0.0421	0.1207	0.1184	0.1196	0.98%	-0.98%
0.0629	0.0628	0.0629	0.0894	0.1065	0.0980	-8.76%	8.76%
0.0817	0.0830	0.0823	0.0852	0.0843	0.0848	0.52%	-0.52%
0.1052	0.1082	0.1067	0.0713	0.0744	0.0728	-2.10%	2.10%
0.1240	0.1269	0.1255	0.0622	0.0635	0.0629	-1.03%	1.03%



lpha Attenuation Protean 6
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
6	A11	0.0094	40.00	31678	791.950	4567.9	0.1734
6	A12	0.0169	40.00	34685	867.125	4567.9	0.1898
6	A13	0.0257	40.00	24202	605.050	4567.9	0.1325
6	A14	0.0421	40.00	22481	562.025	4567.9	0.1230
6	A15	0.0629	40.00	16885	422.125	4567.9	0.0924
6	A16	0.0817	40.00	31940	798.500	9135.8	0.0874
6	A17	0.1052	40.00	27076	676.900	9135.8	0.0741
6	A18	0.1240	40.00	23082	577.050	9135.8	0.0632

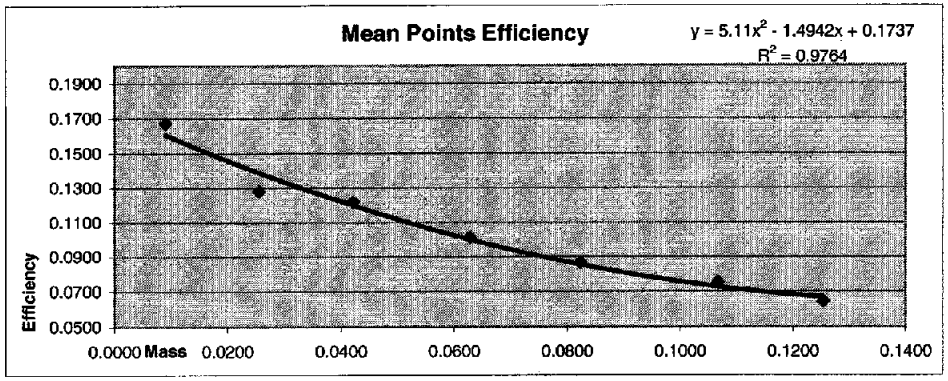
Alpha Attenuation Protean 6
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
6	A21	0.0086	40.00	29399	734.975	4567.9	0.1609
6	A22	0.0172	40.00	23938	598.450	4567.9	0.1310
6	A23	0.0256	40.00	22546	563.650	4567.9	0.1234
6	A24	0.0422	40.00	21982	549.550	4567.9	0.1203
6	A25	0.0628	40.00	20137	503.425	4567.9	0.1102
6	A26	0.0830	40.00	31323	783.075	9135.8	0.0857
6	A27	0.1082	40.00	27820	695.500	9135.8	0.0761
6	A28	0.1269	40.00	23832	595.800	9135.8	0.0652

rotean 6

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1734	0.1609	0.1671	3.73%	-3.73%
0.0257	0.0256	0.0257	0.1325	0.1234	0.1279	3.54%	-3.54%
0.0421	0.0422	0.0421	0.1230	0.1203	0.1217	1.12%	-1.12%
0.0629	0.0628	0.0629	0.0924	0.1102	0.1013	-8.78%	8.78%
0.0817	0.0830	0.0823	0.0874	0.0857	0.0866	0.98%	-0.98%
0.1052	0.1082	0.1067	0.0741	0.0761	0.0751	-1.36%	1.36%
0.1240	0.1269	0.1255	0.0632	0.0652	0.0642	-1.60%	1.60%



lpha Attenuation Protean 7
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
7	A11	0.0094	40.00	30779	769.475	4567.9	0.1685
7	A12	0.0169	40.00	33687	842.175	4567.9	0.1844
7	A13	0.0257	40.00	23935	598.375	4567.9	0.1310
7	A14	0.0421	40.00	21469	536.725	4567.9	0.1175
7	A15	0.0629	40.00	16392	409.800	4567.9	0.0897
7	A16	0.0817	40.00	30997	774.925	9135.8	0.0848
7	A17	0.1052	40.00	25859	646.475	9135.8	0.0708
7	A18	0.1240	40.00	22432	560.800	9135.8	0.0614

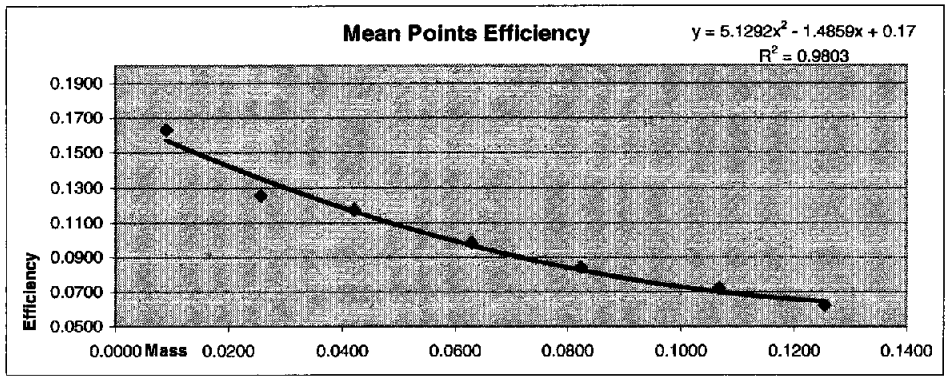
Alpha Attenuation Protean 7
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
7	A21	0.0086	40.00	28816	720.400	4567.9	0.1577
7	A22	0.0172	40.00	23131	578.275	4567.9	0.1266
7	A23	0.0256	40.00	21973	549.325	4567.9	0.1203
7	A24	0.0422	40.00	21371	534.275	4567.9	0.1170
7	A25	0.0628	40.00	19612	490.300	4567.9	0.1073
7	A26	0.0830	40.00	30401	760.025	9135.8	0.0832
7	A27	0.1082	40.00	26711	667.775	9135.8	0.0731
7	A28	0.1269	40.00	22950	573.750	9135.8	0.0628

rotean 7

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1685	0.1577	0.1631	3.29%	-3.29%
0.0257	0.0256	0.0257	0.1310	0.1203	0.1256	4.27%	-4.27%
0.0421	0.0422	0.0421	0.1175	0.1170	0.1172	0.23%	-0.23%
0.0629	0.0628	0.0629	0.0897	0.1073	0.0985	-8.94%	8.94%
0.0817	0.0830	0.0823	0.0848	0.0832	0.0840	0.97%	-0.97%
0.1052	0.1082	0.1067	0.0708	0.0731	0.0719	-1.62%	1.62%
0.1240	0.1269	0.1255	0.0614	0.0628	0.0621	-1.14%	1.14%



lpha Attenuation Protean 8
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
8	A11	0.0094	40.00	30324	758.100	4567.9	0.1660
8	A12	0.0169	40.00	32971	824.275	4567.9	0.1804
8	A13	0.0257	40.00	23154	578.850	4567.9	0.1267
8	A14	0.0421	40.00	21028	525.700	4567.9	0.1151
8	A15	0.0629	40.00	16096	402.400	4567.9	0.0881
8	A16	0.0817	40.00	29729	743.225	9135.8	0.0814
8	A17	0.1052	40.00	25244	631.100	9135.8	0.0691
8	A18	0.1240	40.00	22197	554.925	9135.8	0.0607

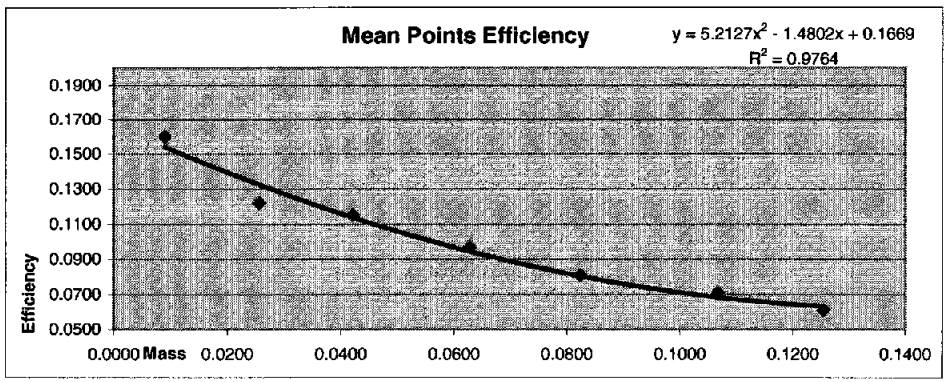
Alpha Attenuation Protean 8
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
8	A21	0.0086	40.00	28207	705.175	4567.9	0.1544
8	A22	0.0172	40.00	22842	571.050	4567.9	0.1250
8	A23	0.0256	40.00	21356	533.900	4567.9	0.1169
8	A24	0.0422	40.00	21060	526.500	4567.9	0.1153
8	A25	0.0628	40.00	19200	480.000	4567.9	0.1051
8	A26	0.0830	40.00	29407	735.175	9135.8	0.0805
8	A27	0.1082	40.00	26355	658.875	9135.8	0.0721
8	A28	0.1269	40.00	22356	558.900	9135.8	0.0612

rotean 8

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1660	0.1544	0.1602	3.62%	-3.62%
0.0257	0.0256	0.0257	0.1267	0.1169	0.1218	4.04%	-4.04%
0.0421	0.0422	0.0421	0.1151	0.1153	0.1152	-0.08%	0.08%
0.0629	0.0628	0.0629	0.0881	0.1051	0.0966	-8.79%	8.79%
0.0817	0.0830	0.0823	0.0814	0.0805	0.0809	0.54%	-0.54%
0.1052	0.1082	0.1067	0.0691	0.0721	0.0706	-2.15%	2.15%
0.1240	0.1269	0.1255	0.0607	0.0612	0.0610	-0.36%	0.36%



Alpha Attenuation Protean 9
03_2007

Data Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
9	A11	0.0094	40.00	31545	788.625	4567.9	0.1726
9	A12	0.0169	40.00	33909	847.725	4567.9	0.1856
9	A13	0.0257	40.00	24624	615.600	4567.9	0.1348
9	A14	0.0421	40.00	22297	557.425	4567.9	0.1220
9	A15	0.0629	40.00	16788	419.700	4567.9	0.0919
9	A16	0.0817	40.00	31685	792.125	9135.8	0.0867
9	A17	0.1052	40.00	26674	666.850	9135.8	0.0730
9	A18	0.1240	40.00	22953	573.825	9135.8	0.0628

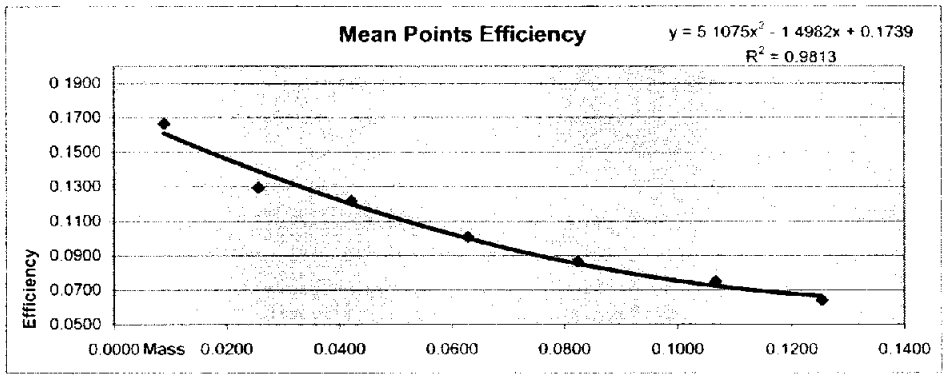
Alpha Attenuation Protean 9
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
9	A21	0.0086	40.00	29327	733.175	4567.9	0.1605
9	A22	0.0172	40.00	23801	595.025	4567.9	0.1303
9	A23	0.0256	40.00	22612	565.300	4567.9	0.1238
9	A24	0.0422	40.00	22134	553.350	4567.9	0.1211
9	A25	0.0628	40.00	20025	500.625	4567.9	0.1096
9	A26	0.0830	40.00	31471	786.775	9135.8	0.0861
9	A27	0.1082	40.00	27977	699.425	9135.8	0.0766
9	A28	0.1269	40.00	23801	595.025	9135.8	0.0651

Protean 9

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1726	0.1605	0.1666	3.64%	-3.64%
0.0257	0.0256	0.0257	0.1348	0.1238	0.1293	4.26%	-4.26%
0.0421	0.0422	0.0421	0.1220	0.1211	0.1216	0.37%	-0.37%
0.0629	0.0628	0.0629	0.0919	0.1096	0.1007	-8.79%	8.79%
0.0817	0.0830	0.0823	0.0867	0.0861	0.0864	0.34%	-0.34%
0.1052	0.1082	0.1067	0.0730	0.0766	0.0748	-2.38%	2.38%
0.1240	0.1269	0.1255	0.0628	0.0651	0.0640	-1.81%	1.81%



lpha Attenuation Protean 10
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
10	A11	0.0094	40.00	31140	778.500	4567.9	0.1704
10	A12	0.0169	40.00	33366	834.150	4567.9	0.1826
10	A13	0.0257	40.00	23890	597.250	4567.9	0.1307
10	A14	0.0421	40.00	21597	539.925	4567.9	0.1182
10	A15	0.0629	40.00	16266	406.650	4567.9	0.0890
10	A16	0.0817	40.00	30905	772.625	9135.8	0.0846
10	A17	0.1052	40.00	25750	643.750	9135.8	0.0705
10	A18	0.1240	40.00	22464	561.600	9135.8	0.0615

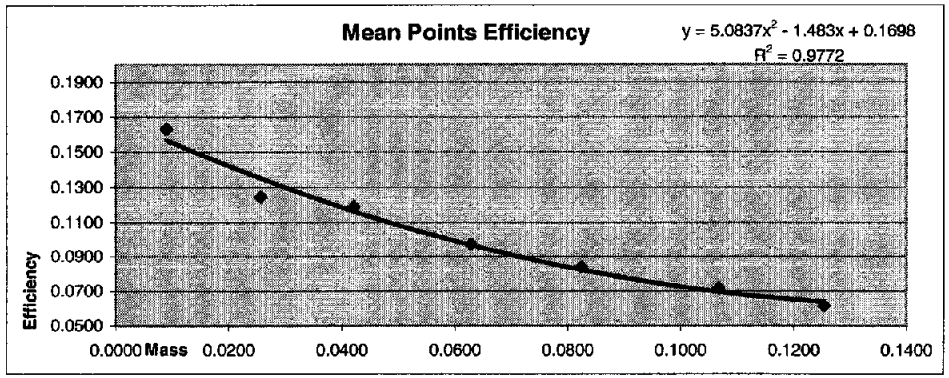
Alpha Attenuation Protean 10
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
10	A21	0.0086	40.00	28425	710.625	4567.9	0.1556
10	A22	0.0172	40.00	22895	572.375	4567.9	0.1253
10	A23	0.0256	40.00	21606	540.150	4567.9	0.1182
10	A24	0.0422	40.00	21781	544.525	4567.9	0.1192
10	A25	0.0628	40.00	19268	481.700	4567.9	0.1055
10	A26	0.0830	40.00	30323	758.075	9135.8	0.0830
10	A27	0.1082	40.00	26620	665.500	9135.8	0.0728
10	A28	0.1269	40.00	22466	561.650	9135.8	0.0615

rotean 10

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1704	0.1556	0.1630	4.56%	-4.56%
0.0257	0.0256	0.0257	0.1307	0.1182	0.1245	5.02%	-5.02%
0.0421	0.0422	0.0421	0.1182	0.1192	0.1187	-0.42%	0.42%
0.0629	0.0628	0.0629	0.0890	0.1055	0.0972	-8.45%	8.45%
0.0817	0.0830	0.0823	0.0846	0.0830	0.0838	0.95%	-0.95%
0.1052	0.1082	0.1067	0.0705	0.0728	0.0717	-1.66%	1.66%
0.1240	0.1269	0.1255	0.0615	0.0615	0.0615	0.00%	0.00%



lpha Attenuation Protean 11
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
11	A11	0.0094	40.00	31253	781.325	4567.9	0.1710
11	A12	0.0169	40.00	33494	837.350	4567.9	0.1833
11	A13	0.0257	40.00	23889	597.225	4567.9	0.1307
11	A14	0.0421	40.00	22084	552.100	4567.9	0.1209
11	A15	0.0629	40.00	16671	416.775	4567.9	0.0912
11	A16	0.0817	40.00	31572	789.300	9135.8	0.0864
11	A17	0.1052	40.00	26675	666.875	9135.8	0.0730
11	A18	0.1240	40.00	22839	570.975	9135.8	0.0625

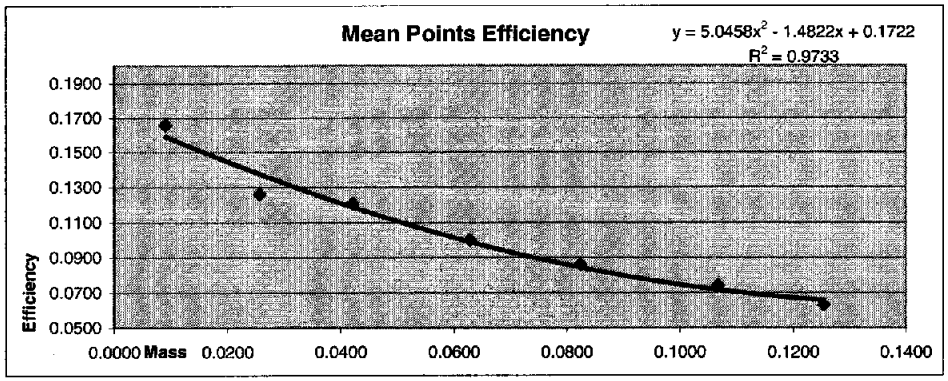
Alpha Attenuation Protean 11
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
11	A21	0.0086	40.00	29433	735.825	4567.9	0.1611
11	A22	0.0172	40.00	23398	584.950	4567.9	0.1281
11	A23	0.0256	40.00	22143	553.575	4567.9	0.1212
11	A24	0.0422	40.00	22015	550.375	4567.9	0.1205
11	A25	0.0628	40.00	19858	496.450	4567.9	0.1087
11	A26	0.0830	40.00	31274	781.850	9135.8	0.0856
11	A27	0.1082	40.00	27501	687.525	9135.8	0.0753
11	A28	0.1269	40.00	23176	579.400	9135.8	0.0634

rotean 11

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1710	0.1611	0.1661	3.00%	-3.00%
0.0257	0.0256	0.0257	0.1307	0.1212	0.1260	3.79%	-3.79%
0.0421	0.0422	0.0421	0.1209	0.1205	0.1207	0.16%	-0.16%
0.0629	0.0628	0.0629	0.0912	0.1087	0.1000	-8.72%	8.72%
0.0817	0.0830	0.0823	0.0864	0.0856	0.0860	0.47%	-0.47%
0.1052	0.1082	0.1067	0.0730	0.0753	0.0741	-1.52%	1.52%
0.1240	0.1269	0.1255	0.0625	0.0634	0.0630	-0.73%	0.73%



lpha Attenuation Protean 12
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
12	A11	0.0094	40.00	30721	768.025	4567.9	0.1681
12	A12	0.0169	40.00	33772	844.300	4567.9	0.1848
12	A13	0.0257	40.00	23971	599.275	4567.9	0.1312
12	A14	0.0421	40.00	21299	532.475	4567.9	0.1166
12	A15	0.0629	40.00	16323	408.075	4567.9	0.0893
12	A16	0.0817	40.00	30770	769.250	9135.8	0.0842
12	A17	0.1052	40.00	26112	652.800	9135.8	0.0715
12	A18	0.1240	40.00	22736	568.400	9135.8	0.0622

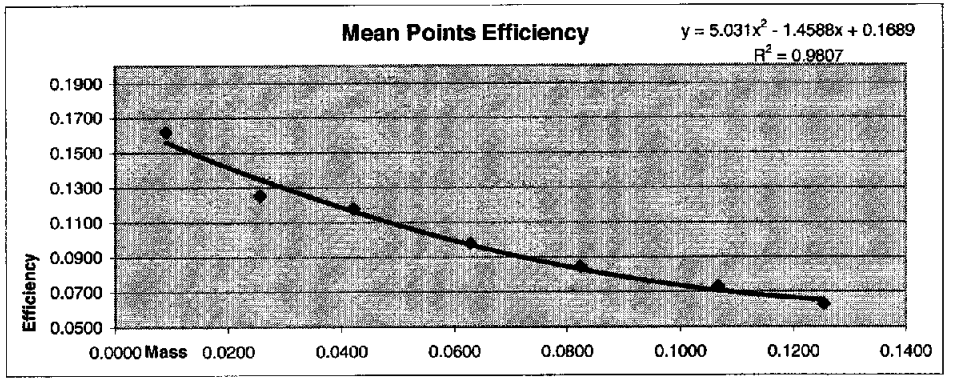
Alpha Attenuation Protean 12
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
12	A21	0.0086	40.00	28431	710.775	4567.9	0.1556
12	A22	0.0172	40.00	23693	592.325	4567.9	0.1297
12	A23	0.0256	40.00	21834	545.850	4567.9	0.1195
12	A24	0.0422	40.00	21694	542.350	4567.9	0.1187
12	A25	0.0628	40.00	19460	486.500	4567.9	0.1065
12	A26	0.0830	40.00	30918	772.950	9135.8	0.0846
12	A27	0.1082	40.00	27086	677.150	9135.8	0.0741
12	A28	0.1269	40.00	23102	577.550	9135.8	0.0632

rotean 12

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1681	0.1556	0.1619	3.87%	-3.87%
0.0257	0.0256	0.0257	0.1312	0.1195	0.1253	4.67%	-4.67%
0.0421	0.0422	0.0421	0.1166	0.1187	0.1176	-0.92%	0.92%
0.0629	0.0628	0.0629	0.0893	0.1065	0.0979	-8.77%	8.77%
0.0817	0.0830	0.0823	0.0842	0.0846	0.0844	-0.24%	0.24%
0.1052	0.1082	0.1067	0.0715	0.0741	0.0728	-1.83%	1.83%
0.1240	0.1269	0.1255	0.0622	0.0632	0.0627	-0.80%	0.80%



lpha Attenuation Protean 13
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
13	A11	0.0094	40.00	31354	783.850	4567.9	0.1716
13	A12	0.0169	40.00	33801	845.025	4567.9	0.1850
13	A13	0.0257	40.00	24258	606.450	4567.9	0.1328
13	A14	0.0421	40.00	22004	550.100	4567.9	0.1204
13	A15	0.0629	40.00	16732	418.300	4567.9	0.0916
13	A16	0.0817	40.00	31490	787.250	9135.8	0.0862
13	A17	0.1052	40.00	26094	652.350	9135.8	0.0714
13	A18	0.1240	40.00	23048	576.200	9135.8	0.0631

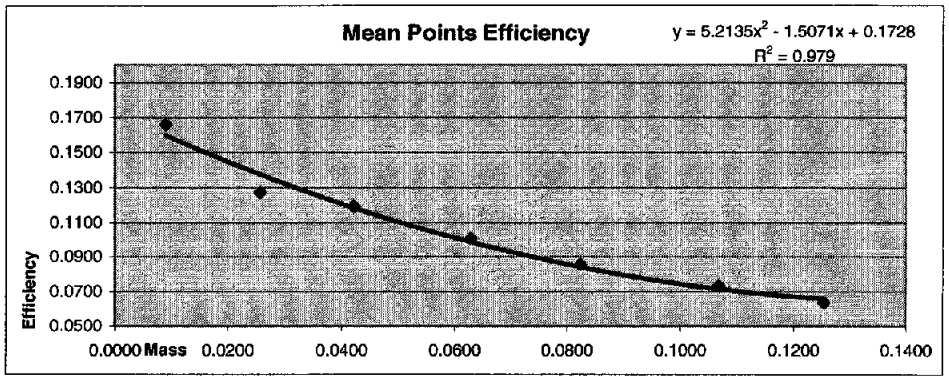
Alpha Attenuation Protean 13
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
13	A21	0.0086	40.00	29290	732.250	4567.9	0.1603
13	A22	0.0172	40.00	23522	588.050	4567.9	0.1287
13	A23	0.0256	40.00	22297	557.425	4567.9	0.1220
13	A24	0.0422	40.00	21587	539.675	4567.9	0.1181
13	A25	0.0628	40.00	20074	501.850	4567.9	0.1099
13	A26	0.0830	40.00	31012	775.300	9135.8	0.0849
13	A27	0.1082	40.00	27442	686.050	9135.8	0.0751
13	A28	0.1269	40.00	23437	585.925	9135.8	0.0641

rotean 13

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1716	0.1603	0.1660	3.40%	-3.40%
0.0257	0.0256	0.0257	0.1328	0.1220	0.1274	4.21%	-4.21%
0.0421	0.0422	0.0421	0.1204	0.1181	0.1193	0.96%	-0.96%
0.0629	0.0628	0.0629	0.0916	0.1099	0.1007	-9.08%	9.08%
0.0817	0.0830	0.0823	0.0862	0.0849	0.0855	0.76%	-0.76%
0.1052	0.1082	0.1067	0.0714	0.0751	0.0733	-2.52%	2.52%
0.1240	0.1269	0.1255	0.0631	0.0641	0.0636	-0.84%	0.84%



lpha Attenuation Protean 14
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
14	A11	0.0094	40.00	31190	779.750	4567.9	0.1707
14	A12	0.0169	40.00	34040	851.000	4567.9	0.1863
14	A13	0.0257	40.00	23964	599.100	4567.9	0.1312
14	A14	0.0421	40.00	21840	546.000	4567.9	0.1195
14	A15	0.0629	40.00	16522	413.050	4567.9	0.0904
14	A16	0.0817	40.00	31605	790.125	9135.8	0.0865
14	A17	0.1052	40.00	26301	657.525	9135.8	0.0720
14	A18	0.1240	40.00	22631	565.775	9135.8	0.0619

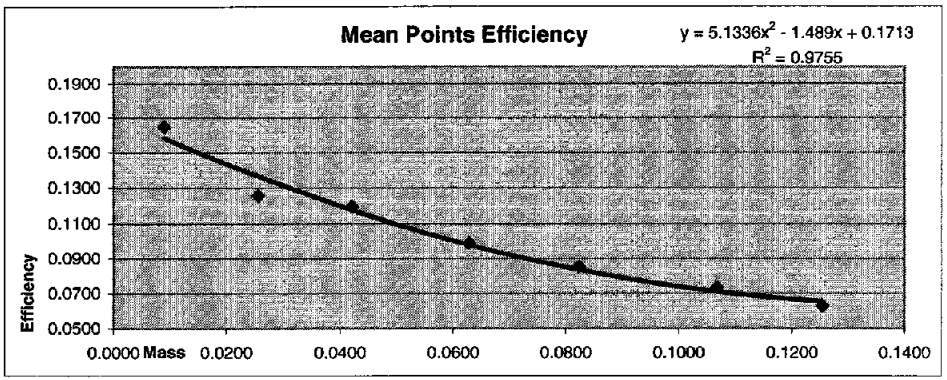
Alpha Attenuation Protean 14
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
14	A21	0.0086	40.00	29049	726.225	4567.9	0.1590
14	A22	0.0172	40.00	23627	590.675	4567.9	0.1293
14	A23	0.0256	40.00	21902	547.550	4567.9	0.1199
14	A24	0.0422	40.00	21856	546.400	4567.9	0.1196
14	A25	0.0628	40.00	19647	491.175	4567.9	0.1075
14	A26	0.0830	40.00	30695	767.375	9135.8	0.0840
14	A27	0.1082	40.00	27206	680.150	9135.8	0.0744
14	A28	0.1269	40.00	23305	582.625	9135.8	0.0638

rotean 14

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1707	0.1590	0.1648	3.55%	-3.55%
0.0257	0.0256	0.0257	0.1312	0.1199	0.1255	4.50%	-4.50%
0.0421	0.0422	0.0421	0.1195	0.1196	0.1196	-0.04%	0.04%
0.0629	0.0628	0.0629	0.0904	0.1075	0.0990	-8.64%	8.64%
0.0817	0.0830	0.0823	0.0865	0.0840	0.0852	1.46%	-1.46%
0.1052	0.1082	0.1067	0.0720	0.0744	0.0732	-1.69%	1.69%
0.1240	0.1269	0.1255	0.0619	0.0638	0.0629	-1.47%	1.47%



lpha Attenuation Protean 15
3_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
15	A11	0.0094	40.00	31592	789.800	4567.9	0.1729
15	A12	0.0169	40.00	34164	854.100	4567.9	0.1870
15	A13	0.0257	40.00	24122	603.050	4567.9	0.1320
15	A14	0.0421	40.00	22313	557.825	4567.9	0.1221
15	A15	0.0629	40.00	16709	417.725	4567.9	0.0914
15	A16	0.0817	40.00	32457	811.425	9135.8	0.0888
15	A17	0.1052	40.00	26595	664.875	9135.8	0.0728
15	A18	0.1240	40.00	23142	578.550	9135.8	0.0633

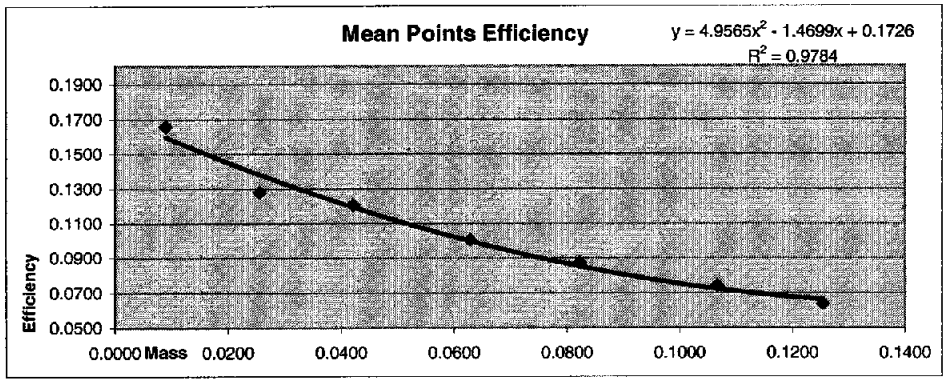
Alpha Attenuation Protean 15
03_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
15	A21	0.0086	40.00	29073	726.825	4567.9	0.1591
15	A22	0.0172	40.00	23479	586.975	4567.9	0.1285
15	A23	0.0256	40.00	22602	565.050	4567.9	0.1237
15	A24	0.0422	40.00	21786	544.650	4567.9	0.1192
15	A25	0.0628	40.00	20038	500.950	4567.9	0.1097
15	A26	0.0830	40.00	31405	785.125	9135.8	0.0859
15	A27	0.1082	40.00	27581	689.525	9135.8	0.0755
15	A28	0.1269	40.00	23482	587.050	9135.8	0.0643

rotean 15

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1729	0.1591	0.1660	4.15%	-4.15%
0.0257	0.0256	0.0257	0.1320	0.1237	0.1279	3.25%	-3.25%
0.0421	0.0422	0.0421	0.1221	0.1192	0.1207	1.20%	-1.20%
0.0629	0.0628	0.0629	0.0914	0.1097	0.1006	-9.06%	9.06%
0.0817	0.0830	0.0823	0.0888	0.0859	0.0874	1.65%	-1.65%
0.1052	0.1082	0.1067	0.0728	0.0755	0.0741	-1.82%	1.82%
0.1240	0.1269	0.1255	0.0633	0.0643	0.0638	-0.73%	0.73%



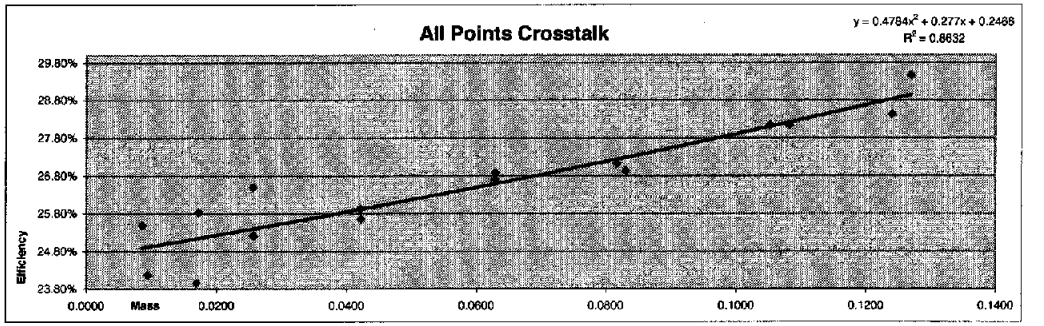
TestAmerica STL

Protean

Crosstalk Correction Curves

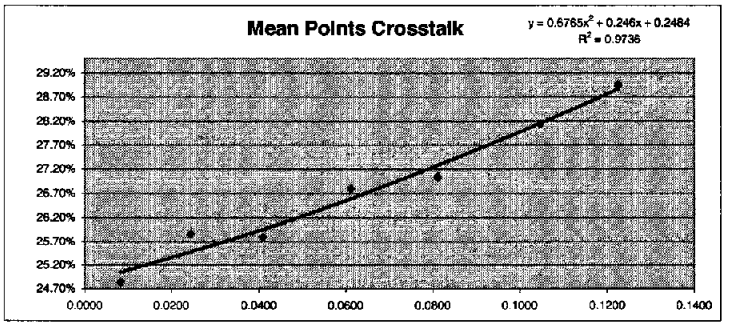
Protean 0

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	32195	10263	804.88	256.58	24.17%	Min
0	A12	0.0169	40.00	34317	10812	857.93	270.30	23.96%	23.96%
0	A13	0.0257	40.00	25070	8455	626.75	211.38	25.22%	
0	A14	0.0421	40.00	22466	7861	561.65	196.53	25.92%	Max
0	A15	0.0629	40.00	17162	6308	429.05	157.70	26.98%	29.46%
0	A16	0.0817	40.00	32473	12085	811.83	302.13	27.12%	
0	A17	0.1052	40.00	27142	10628	678.55	265.70	28.14%	Mean
0	A18	0.1240	40.00	23807	9458	595.18	236.45	28.43%	26.53%
0	A21	0.0086	40.00	29818	10202	745.45	255.05	25.49%	
0	A22	0.0172	40.00	24445	8511	611.13	212.78	25.83%	
0	A23	0.0256	40.00	22710	8165	567.75	204.63	26.49%	
0	A24	0.0422	40.00	22373	7721	559.33	193.03	25.66%	
0	A25	0.0628	40.00	20258	7383	506.45	184.58	26.71%	
0	A26	0.0830	40.00	32272	11895	806.80	297.38	26.93%	
0	A27	0.1082	40.00	28455	11139	711.38	278.48	28.13%	
0	A28	0.1269	40.00	24125	10076	603.13	251.90	29.46%	

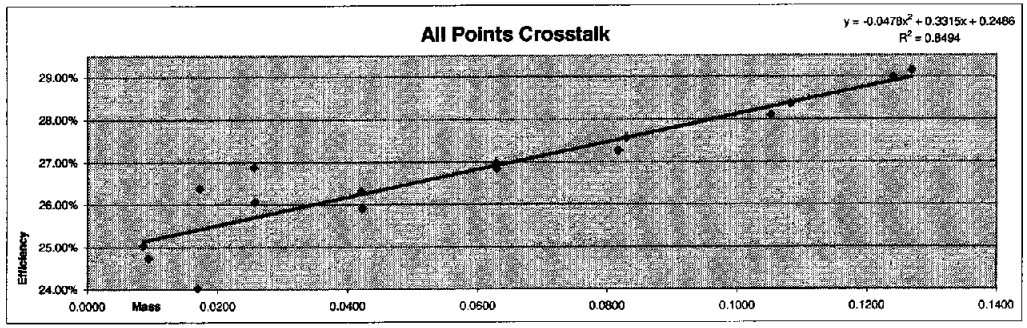


Protean 0

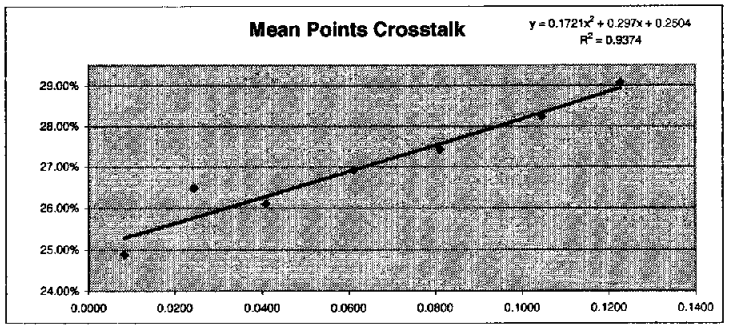
Mean Mass	Mean % α into β	
0.0083	24.83%	Min
0.0245	25.86%	24.83%
0.0409	25.79%	Max
0.0612	26.79%	28.95%
0.0811	27.03%	Mean
0.1046	28.14%	26.53%
0.1226	28.95%	



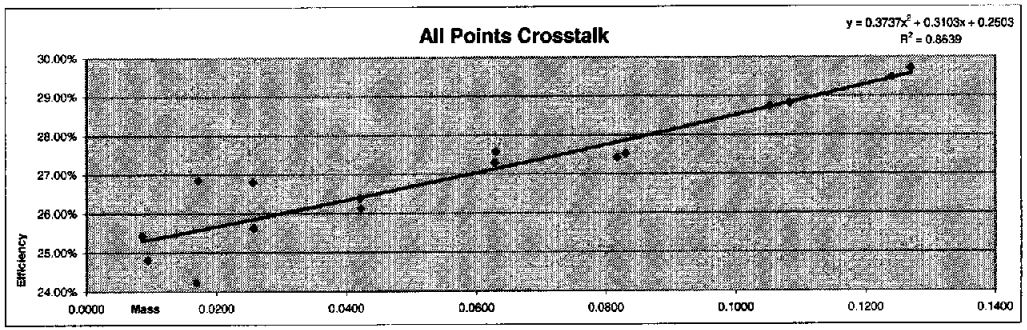
Protean 1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
1	A11	0.0094	40.00	31313	10289	782.83	257.23	24.73%	Min
1	A12	0.0169	40.00	34218	10818	855.45	270.45	24.02%	24.02%
1	A13	0.0257	40.00	24363	8592	609.58	214.80	26.06%	
1	A14	0.0421	40.00	22215	7931	555.38	198.28	26.31%	Max
1	A15	0.0629	40.00	17137	6287	428.43	157.18	26.84%	29.15%
1	A16	0.0817	40.00	31946	11977	798.65	299.43	27.27%	
1	A17	0.1052	40.00	26646	10416	666.15	260.40	28.10%	Mean
1	A18	0.1240	40.00	23100	9429	577.50	235.73	28.99%	26.78%
1	A21	0.0086	40.00	29451	9837	736.28	245.93	25.04%	
1	A22	0.0172	40.00	23776	8518	594.40	212.95	26.38%	
1	A23	0.0256	40.00	22430	8246	560.75	206.15	26.88%	
1	A24	0.0422	40.00	22128	7733	553.20	193.33	25.90%	
1	A25	0.0628	40.00	20204	7465	505.10	186.63	26.98%	
1	A26	0.0830	40.00	31472	11977	786.80	299.43	27.57%	
1	A27	0.1082	40.00	27752	10983	693.80	274.58	28.35%	
1	A28	0.1269	40.00	24078	9906	601.95	247.65	29.15%	



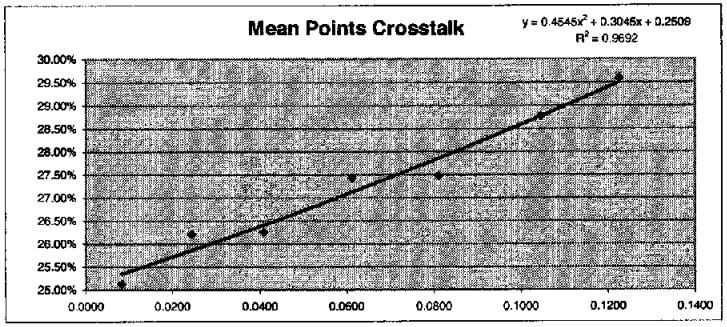
Protean 1 Mean Mass	Mean % α into β	
0.0083	24.89%	Min
0.0245	26.47%	24.89%
0.0409	26.10%	Max
0.0612	26.91%	29.07%
0.0811	27.42%	Mean
0.1046	28.23%	26.78%
0.1226	29.07%	



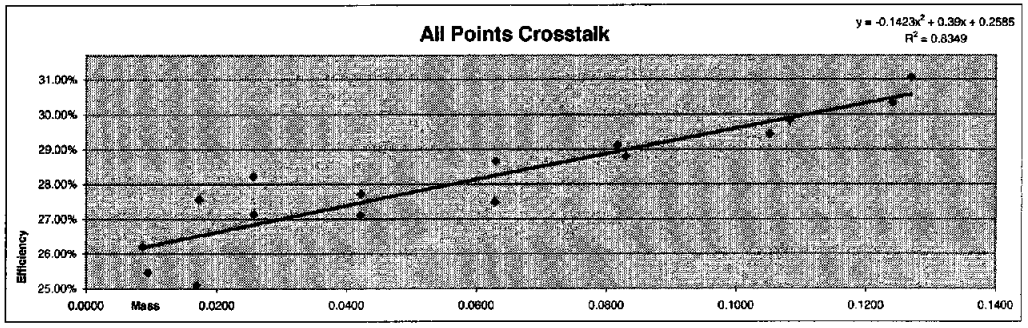
Protean 2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
2	A11	0.0094	40.00	31960	10550	799.00	263.75	24.82%	Min
2	A12	0.0169	40.00	34281	10959	857.03	273.98	24.22%	24.22%
2	A13	0.0257	40.00	24982	8606	624.55	215.15	25.62%	
2	A14	0.0421	40.00	22613	8105	565.33	202.63	26.39%	Max
2	A15	0.0629	40.00	16901	6435	422.53	160.88	27.58%	29.71%
2	A16	0.0817	40.00	32675	12343	816.88	308.58	27.42%	
2	A17	0.1052	40.00	27190	10965	679.75	274.13	28.74%	Mean
2	A18	0.1240	40.00	23639	9881	590.98	247.03	29.48%	27.05%
2	A21	0.0086	40.00	29638	10109	740.95	252.73	25.43%	
2	A22	0.0172	40.00	23798	8735	594.95	218.38	26.85%	
2	A23	0.0256	40.00	23069	8448	576.73	211.20	26.80%	
2	A24	0.0422	40.00	22459	7940	561.48	198.50	26.12%	
2	A25	0.0628	40.00	20247	7599	506.18	189.98	27.29%	
2	A26	0.0830	40.00	32316	12276	807.90	306.90	27.53%	
2	A27	0.1082	40.00	28164	11401	704.10	285.03	28.82%	
2	A28	0.1269	40.00	24076	10176	601.90	254.40	29.71%	



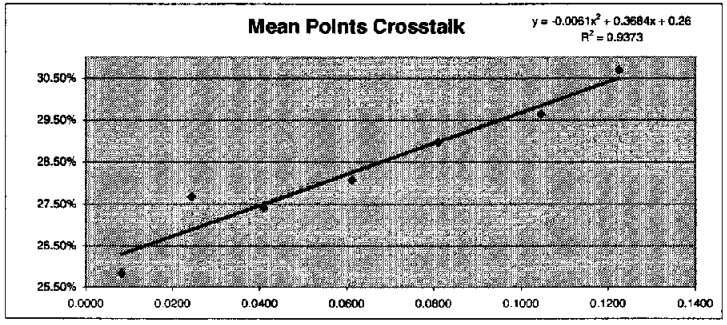
Protean 2 Mean Mass	Mean % α into β	
0.0083	25.13%	Min
0.0245	26.21%	25.13%
0.0409	26.25%	Max
0.0612	27.43%	29.59%
0.0811	27.47%	Mean
0.1046	28.78%	27.05%
0.1226	29.59%	



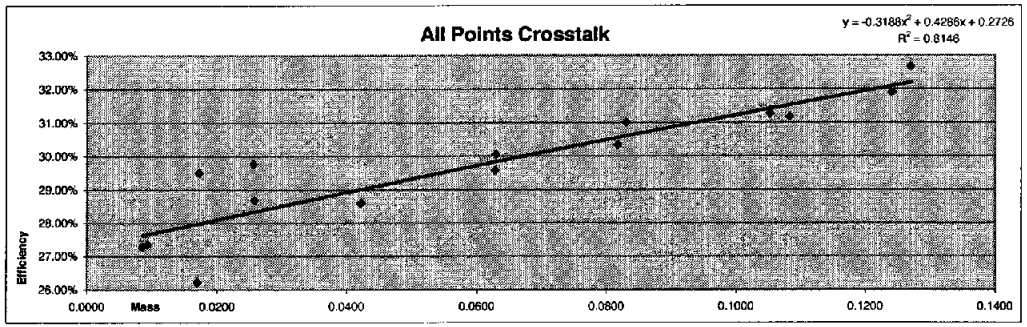
Protean 3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
3	A11	0.0094	40.00	31977	10920	799.43	273.00	25.46%	Min
3	A12	0.0169	40.00	34147	11444	853.68	286.10	25.10%	25.10%
3	A13	0.0257	40.00	24389	9084	609.73	227.10	27.14%	
3	A14	0.0421	40.00	22249	8276	556.23	206.90	27.11%	Max
3	A15	0.0629	40.00	17027	6842	425.68	171.05	28.66%	31.06%
3	A16	0.0817	40.00	31860	13087	796.50	327.18	29.12%	
3	A17	0.1052	40.00	26780	11169	669.50	279.23	29.43%	Mean
3	A18	0.1240	40.00	23199	10099	579.98	252.48	30.33%	28.08%
3	A21	0.0086	40.00	29449	10455	736.23	261.38	26.20%	
3	A22	0.0172	40.00	23850	9074	596.25	226.85	27.56%	
3	A23	0.0256	40.00	22583	8879	564.58	221.98	28.22%	
3	A24	0.0422	40.00	21876	8389	546.90	209.73	27.72%	
3	A25	0.0628	40.00	20210	7658	505.25	191.45	27.48%	
3	A26	0.0830	40.00	31516	12747	787.90	318.68	28.80%	
3	A27	0.1082	40.00	27581	11725	689.53	293.13	29.83%	
3	A28	0.1269	40.00	24020	10820	600.50	270.50	31.06%	



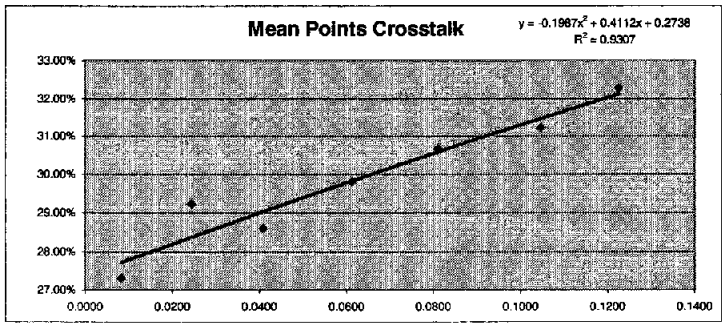
Protean 3 Mean Mass	Mean % α into β	
0.0083	25.83%	Min
0.0245	27.68%	25.83%
0.0409	27.42%	Max
0.0612	28.07%	30.69%
0.0811	28.96%	Mean
0.1046	29.63%	28.08%
0.1226	30.69%	



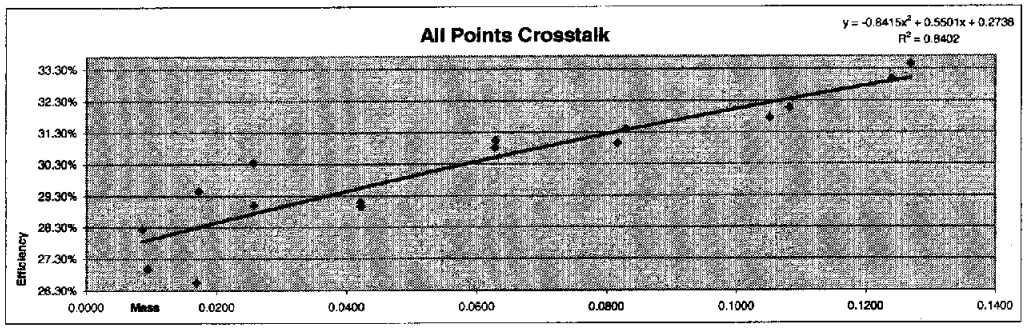
Protean 4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
4	A11	0.0094	40.00	31352	11803	783.80	295.08	27.35%	Min
4	A12	0.0169	40.00	34160	12141	854.00	303.53	28.22%	26.22%
4	A13	0.0257	40.00	24237	9753	605.93	243.83	28.69%	
4	A14	0.0421	40.00	22082	8841	552.05	221.03	28.59%	Max
4	A15	0.0629	40.00	16767	7202	419.18	180.05	30.05%	32.67%
4	A16	0.0817	40.00	31643	13778	791.08	344.45	30.33%	
4	A17	0.1052	40.00	26393	12005	659.83	300.13	31.26%	Mean
4	A18	0.1240	40.00	23367	10944	584.18	273.60	31.90%	29.62%
4	A21	0.0086	40.00	29483	11055	737.08	276.38	27.27%	
4	A22	0.0172	40.00	23643	9891	591.08	247.28	29.50%	
4	A23	0.0256	40.00	22472	9521	561.80	238.03	29.76%	
4	A24	0.0422	40.00	22132	8870	553.30	221.75	28.61%	
4	A25	0.0628	40.00	19949	8377	498.73	209.43	29.57%	
4	A26	0.0830	40.00	31461	14139	786.53	353.48	31.01%	
4	A27	0.1082	40.00	27819	12603	695.48	315.08	31.18%	
4	A28	0.1269	40.00	23607	11454	590.18	286.35	32.67%	



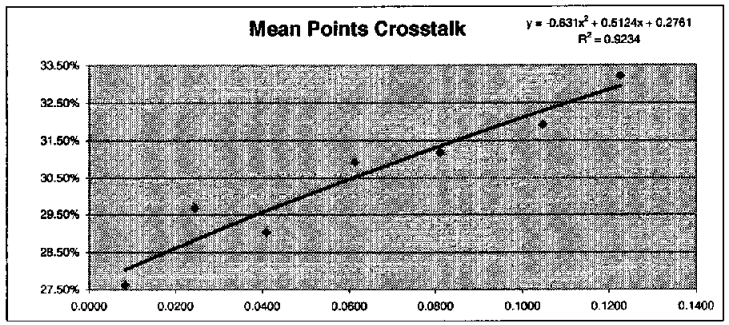
Protean 4 Mean Mass	Mean % α into β	
0.0083	27.31%	Min
0.0245	29.23%	27.31%
0.0409	28.60%	Max
0.0612	29.81%	32.28%
0.0811	30.67%	Mean
0.1046	31.22%	29.62%
0.1226	32.28%	



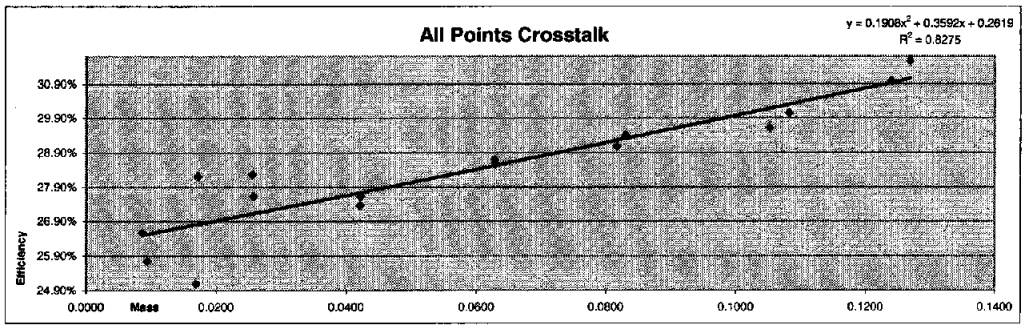
Protean 5 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
5	A11	0.0094	40.00	31655	11703	791.38	292.58	26.99%	Min
5	A12	0.0169	40.00	33742	12201	843.55	305.03	26.56%	26.56%
5	A13	0.0257	40.00	24000	9804	600.00	245.10	29.00%	
5	A14	0.0421	40.00	22061	9054	551.53	226.35	29.10%	Max
5	A15	0.0629	40.00	16332	7353	408.30	183.83	31.04%	33.46%
5	A16	0.0817	40.00	31142	13965	778.55	349.13	30.96%	
5	A17	0.1052	40.00	26057	12125	651.43	303.13	31.76%	Mean
5	A18	0.1240	40.00	22742	11189	568.55	279.73	32.96%	30.20%
5	A21	0.0086	40.00	28896	11372	722.40	284.30	28.24%	
5	A22	0.0172	40.00	23472	9800	586.80	245.00	29.45%	
5	A23	0.0256	40.00	22078	9617	551.95	240.43	30.34%	
5	A24	0.0422	40.00	21633	8821	540.83	220.53	28.96%	
5	A25	0.0628	40.00	19467	8667	486.68	216.68	30.81%	
5	A26	0.0830	40.00	30817	14109	770.43	352.73	31.40%	
5	A27	0.1082	40.00	27174	12829	679.35	320.73	32.07%	
5	A28	0.1269	40.00	23216	11675	580.40	291.88	33.46%	



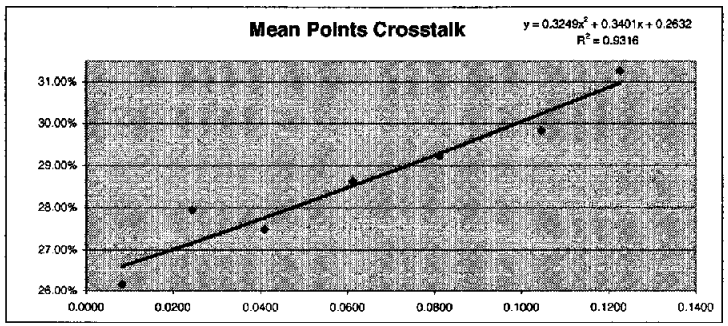
Protean 5 Mean Mass	Mean % α into β	
0.0083	27.62%	Min
0.0245	29.67%	27.62%
0.0409	29.03%	Max
0.0612	30.93%	33.22%
0.0811	31.18%	Mean
0.1046	31.91%	30.20%
0.1226	33.22%	



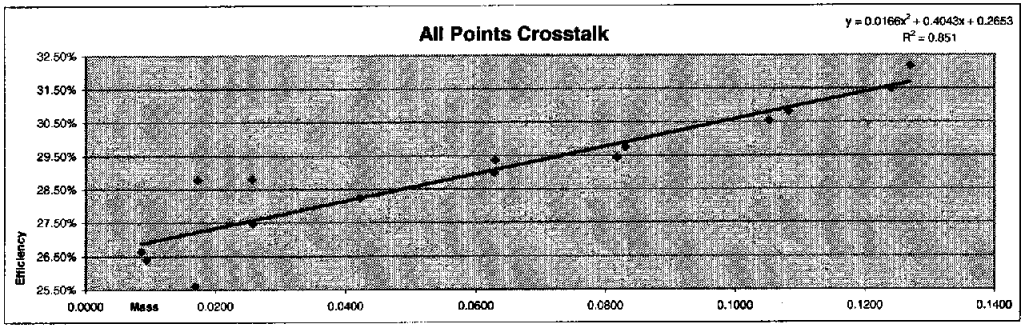
Protean 6 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
6	A11	0.0094	40.00	31678	10987	791.95	274.68	25.75%	Min
6	A12	0.0169	40.00	34685	11614	867.13	290.35	25.08%	25.08%
6	A13	0.0257	40.00	24202	9241	605.05	231.03	27.63%	
6	A14	0.0421	40.00	22481	8469	562.03	211.73	27.36%	Max
6	A15	0.0629	40.00	16885	6755	422.13	168.88	28.57%	31.56%
6	A16	0.0817	40.00	31940	13095	798.50	327.38	29.08%	
6	A17	0.1052	40.00	27076	11391	676.90	284.78	29.61%	Mean
6	A18	0.1240	40.00	23082	10360	577.05	259.00	30.98%	28.40%
6	A21	0.0086	40.00	29399	10636	734.98	265.90	26.57%	
6	A22	0.0172	40.00	23938	9409	598.45	235.23	28.22%	
6	A23	0.0256	40.00	22546	8881	563.65	222.03	28.26%	
6	A24	0.0422	40.00	21982	8389	549.55	209.73	27.62%	
6	A25	0.0628	40.00	20137	8105	503.43	202.63	28.70%	
6	A26	0.0830	40.00	31323	13045	783.08	326.13	29.40%	
6	A27	0.1082	40.00	27820	11947	695.50	298.68	30.04%	
6	A28	0.1269	40.00	23832	10991	595.80	274.78	31.56%	



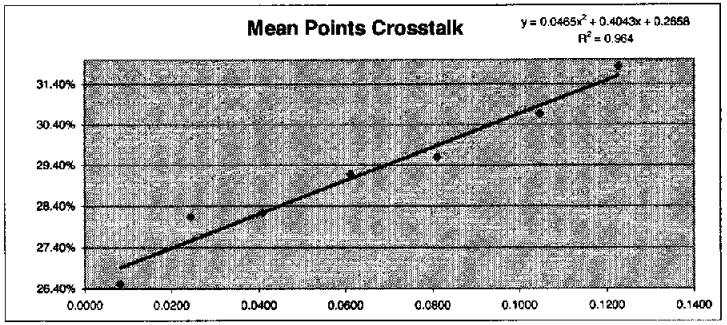
Protean 6 Mean Mass	Mean % α into β	
0.0083	26.16%	Min
0.0245	27.95%	26.16%
0.0409	27.49%	Max
0.0612	28.64%	31.27%
0.0811	29.24%	Mean
0.1046	29.83%	28.40%
0.1226	31.27%	



Protean 7 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
7	A11	0.0094	40.00	30779	11034	769.48	275.85	26.39%	Min
7	A12	0.0169	40.00	33687	11592	842.18	289.80	25.60%	25.60%
7	A13	0.0257	40.00	23935	9067	598.38	226.68	27.47%	
7	A14	0.0421	40.00	21469	8450	536.73	211.25	28.24%	Max
7	A15	0.0629	40.00	16392	6815	409.80	170.38	29.37%	32.17%
7	A16	0.0817	40.00	30997	12935	774.93	323.38	29.44%	
7	A17	0.1052	40.00	25859	11361	646.48	284.03	30.52%	Mean
7	A18	0.1240	40.00	22432	10313	560.80	257.83	31.49%	28.92%
7	A21	0.0086	40.00	28816	10466	720.40	261.65	26.64%	
7	A22	0.0172	40.00	23131	9346	578.28	233.65	28.78%	
7	A23	0.0256	40.00	21973	8889	549.33	222.23	28.80%	
7	A24	0.0422	40.00	21371	8406	534.28	210.15	28.23%	
7	A25	0.0628	40.00	19612	8007	490.30	200.18	28.99%	
7	A26	0.0830	40.00	30401	12879	760.03	321.98	29.76%	
7	A27	0.1082	40.00	26711	11888	667.78	297.20	30.80%	
7	A28	0.1269	40.00	22950	10885	573.75	272.13	32.17%	

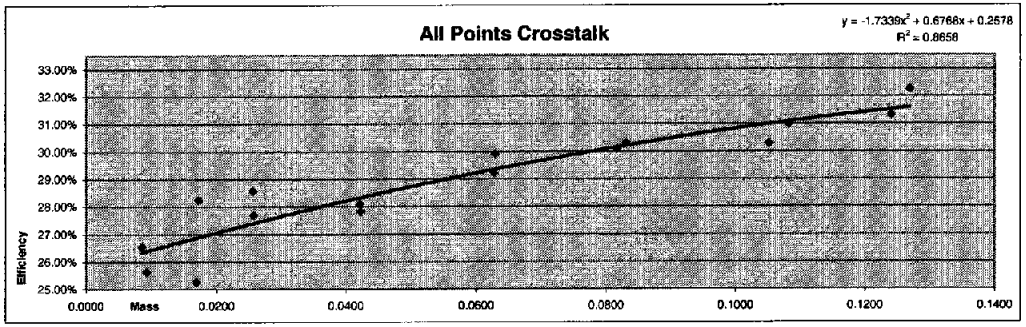


Protean 7 Mean Mass	Mean % α into β	
0.0083	26.52%	Min
0.0246	28.14%	26.52%
0.0409	28.24%	Max
0.0612	29.18%	31.83%
0.0811	29.60%	Mean
0.1046	30.66%	28.92%
0.1226	31.83%	



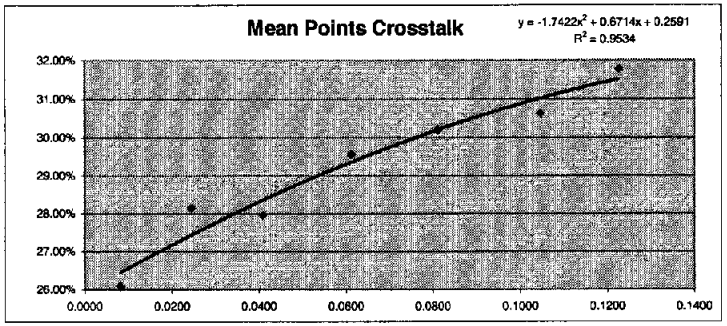
Protean 8

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
8	A11	0.0094	40.00	30324	10451	758.10	261.28	25.63%	Min
8	A12	0.0169	40.00	32971	11144	824.28	278.60	25.26%	25.26%
8	A13	0.0257	40.00	23154	8873	578.85	221.83	27.70%	
8	A14	0.0421	40.00	21028	8218	525.70	205.45	28.10%	Max
8	A15	0.0629	40.00	16096	6865	402.40	171.63	29.90%	32.25%
8	A16	0.0817	40.00	29729	12796	743.23	319.90	30.09%	
8	A17	0.1052	40.00	25244	10964	631.10	274.10	30.28%	Mean
8	A18	0.1240	40.00	22197	10111	554.93	252.78	31.30%	28.89%
8	A21	0.0086	40.00	28207	10193	705.18	254.83	26.64%	
8	A22	0.0172	40.00	22842	8993	571.05	224.83	28.25%	
8	A23	0.0256	40.00	21356	8545	533.90	213.63	28.58%	
8	A24	0.0422	40.00	21060	8121	526.50	203.03	27.83%	
8	A25	0.0628	40.00	19200	7927	480.00	198.18	29.22%	
8	A26	0.0830	40.00	29407	12781	735.18	319.53	30.30%	
8	A27	0.1082	40.00	26355	11830	658.88	295.75	30.98%	
8	A28	0.1269	40.00	22356	10642	558.90	266.05	32.25%	

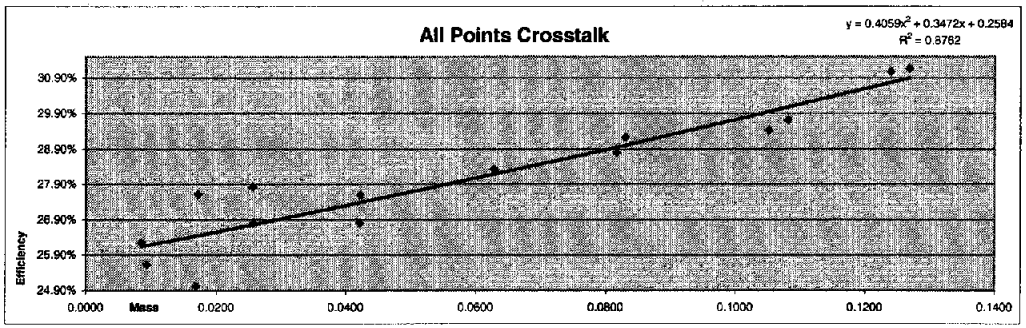


Protean 8

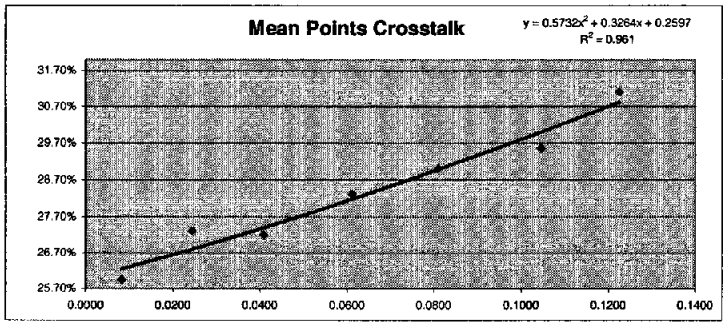
Mean Mass	Mean % α into β	
0.0083	26.09%	Min
0.0245	28.14%	26.09%
0.0409	27.96%	Max
0.0612	29.56%	31.77%
0.0811	30.19%	Mean
0.1046	30.63%	28.89%
0.1226	31.77%	



Protean 9 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
9	A11	0.0094	40.00	31545	10869	788.63	271.73	25.63%	Min
9	A12	0.0169	40.00	33909	11313	847.73	282.83	25.02%	25.02%
9	A13	0.0257	40.00	24624	9016	615.60	225.40	26.80%	
9	A14	0.0421	40.00	22297	8168	557.43	204.20	26.81%	Max
9	A15	0.0629	40.00	16788	6626	419.70	165.65	28.30%	31.15%
9	A16	0.0817	40.00	31685	12812	792.13	320.30	28.79%	
9	A17	0.1052	40.00	26674	11117	666.85	277.93	29.42%	Mean
9	A18	0.1240	40.00	22953	10350	573.83	258.75	31.08%	28.10%
9	A21	0.0086	40.00	29327	10437	733.18	260.93	26.25%	
9	A22	0.0172	40.00	23801	9079	595.03	226.98	27.61%	
9	A23	0.0256	40.00	22612	8716	565.30	217.90	27.82%	
9	A24	0.0422	40.00	22134	8434	553.35	210.85	27.59%	
9	A25	0.0628	40.00	20025	7913	500.63	197.83	28.32%	
9	A26	0.0830	40.00	31471	12998	786.78	324.95	29.23%	
9	A27	0.1082	40.00	27977	11824	699.43	295.60	29.71%	
9	A28	0.1269	40.00	23801	10770	595.03	269.25	31.15%	

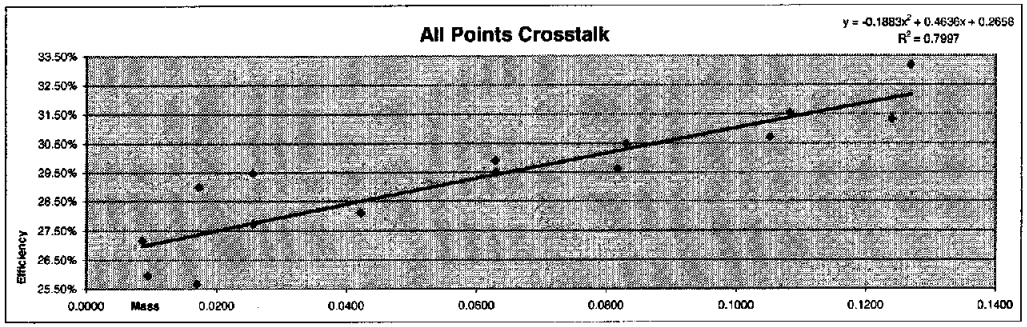


Protean 9 Mean Mass	Mean % α into β	
0.0083	25.94%	Min
0.0245	27.31%	25.94%
0.0409	27.20%	Max
0.0612	28.31%	31.12%
0.0811	29.01%	Mean
0.1046	29.56%	28.10%
0.1226	31.12%	



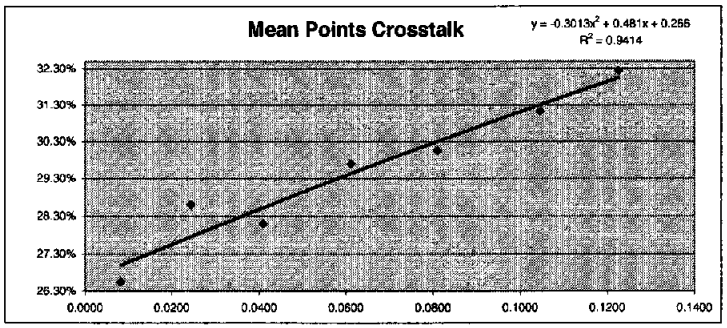
Protean 10

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
10	A11	0.0094	40.00	31140	10910	778.50	272.75	25.95%	Min
10	A12	0.0169	40.00	33366	11528	834.15	288.20	25.68%	25.68%
10	A13	0.0257	40.00	23890	9165	597.25	229.13	27.73%	
10	A14	0.0421	40.00	21597	8449	539.93	211.23	28.12%	Max
10	A15	0.0629	40.00	16266	6802	406.65	170.05	29.49%	33.17%
10	A16	0.0817	40.00	30905	13010	772.63	325.25	29.63%	
10	A17	0.1052	40.00	25750	11412	643.75	285.30	30.71%	Mean
10	A18	0.1240	40.00	22464	10237	561.60	255.93	31.30%	29.21%
10	A21	0.0086	40.00	28425	10597	710.63	264.93	27.16%	
10	A22	0.0172	40.00	22895	9349	572.38	233.73	28.99%	
10	A23	0.0256	40.00	21606	9032	540.15	225.80	29.48%	
10	A24	0.0422	40.00	21781	8508	544.53	212.70	28.09%	
10	A25	0.0628	40.00	19268	8219	481.70	205.48	29.90%	
10	A26	0.0830	40.00	30323	13294	758.08	332.35	30.48%	
10	A27	0.1082	40.00	26620	12258	665.50	306.45	31.53%	
10	A28	0.1269	40.00	22466	11153	561.65	278.83	33.17%	



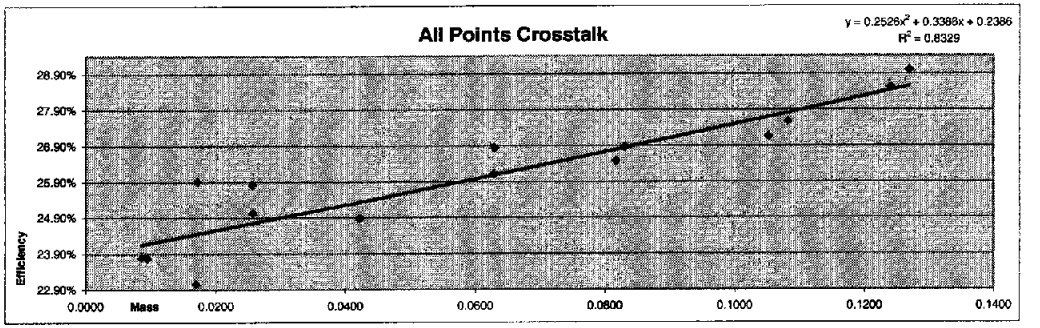
Protean 10

Mean Mass	Mean % α into β	
0.0083	26.55%	Min
0.0245	28.60%	26.55%
0.0409	28.10%	Max
0.0612	29.69%	32.24%
0.0811	30.05%	Mean
0.1046	31.12%	29.21%
0.1226	32.24%	



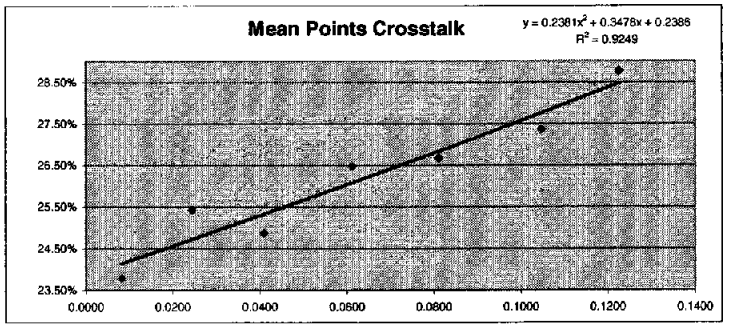
Protean 11

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
11	A11	0.0094	40.00	31253	9749	781.33	243.73	23.78%	Min
11	A12	0.0169	40.00	33494	10039	837.35	250.98	23.06%	23.06%
11	A13	0.0267	40.00	23869	7975	597.23	199.38	25.03%	
11	A14	0.0421	40.00	22084	7310	552.10	182.75	24.87%	Max
11	A15	0.0629	40.00	16671	6115	416.78	152.88	26.84%	29.00%
11	A16	0.0817	40.00	31572	11367	789.30	284.18	26.47%	
11	A17	0.1052	40.00	26675	9944	666.88	248.60	27.16%	Mean
11	A18	0.1240	40.00	22839	9118	570.98	227.95	28.53%	25.98%
11	A21	0.0086	40.00	29433	9194	735.83	229.85	23.80%	
11	A22	0.0172	40.00	23398	8181	584.95	204.53	25.91%	
11	A23	0.0256	40.00	22143	7703	553.58	192.58	25.81%	
11	A24	0.0422	40.00	22015	7289	550.38	182.23	24.87%	
11	A25	0.0628	40.00	19858	7019	496.45	175.48	26.12%	
11	A26	0.0830	40.00	31274	11493	781.85	287.33	26.87%	
11	A27	0.1082	40.00	27501	10472	687.53	261.80	27.58%	
11	A28	0.1269	40.00	23176	9467	579.40	236.68	29.00%	



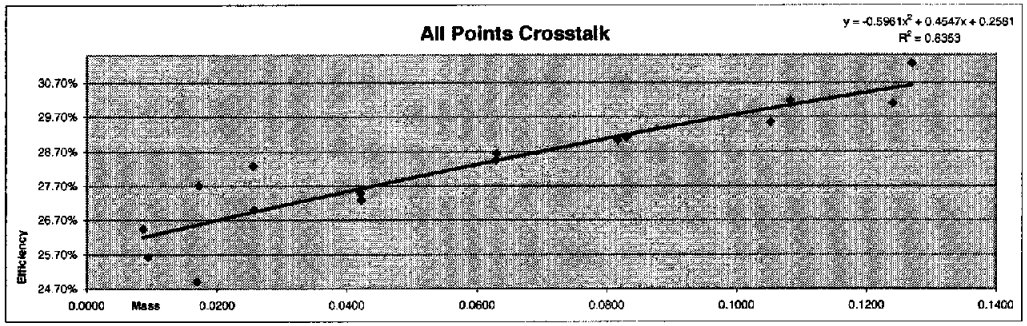
Protean 11

Mean Mass	Mean % α into β	
0.0083	23.79%	Min
0.0245	25.42%	23.79%
0.0409	24.87%	Max
0.0612	26.48%	28.77%
0.0811	26.67%	Mean
0.1046	27.37%	25.98%
0.1226	28.77%	



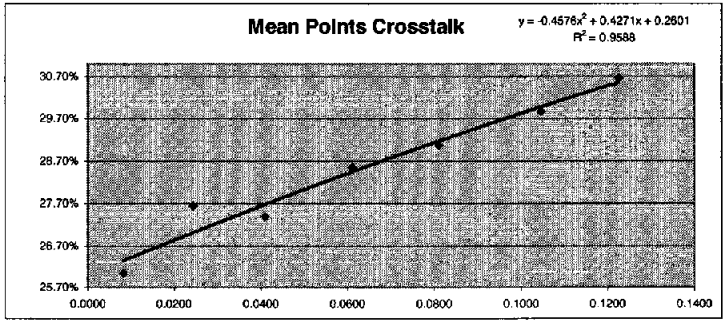
Protean 12

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
12	A11	0.0094	40.00	30721	10590	768.03	264.75	25.63%	Min
12	A12	0.0169	40.00	33772	11200	844.30	280.00	24.90%	24.90%
12	A13	0.0257	40.00	23971	8867	599.28	221.68	27.00%	
12	A14	0.0421	40.00	21299	8075	532.48	201.88	27.49%	Max
12	A15	0.0629	40.00	16323	6550	408.08	163.75	28.64%	31.25%
12	A16	0.0817	40.00	30770	12583	769.25	314.58	29.02%	
12	A17	0.1052	40.00	26112	10947	652.80	273.68	29.54%	Mean
12	A18	0.1240	40.00	22736	9765	568.40	244.63	30.09%	28.19%
12	A21	0.0086	40.00	28431	10219	710.78	255.48	26.44%	
12	A22	0.0172	40.00	23693	9082	592.33	227.05	27.71%	
12	A23	0.0256	40.00	21834	8610	545.85	215.25	28.28%	
12	A24	0.0422	40.00	21694	8143	542.35	203.58	27.29%	
12	A25	0.0628	40.00	19460	7738	486.50	193.45	28.45%	
12	A26	0.0830	40.00	30918	12690	772.95	317.25	29.10%	
12	A27	0.1082	40.00	27086	11704	677.15	292.60	30.17%	
12	A28	0.1269	40.00	23102	10503	577.55	262.58	31.25%	



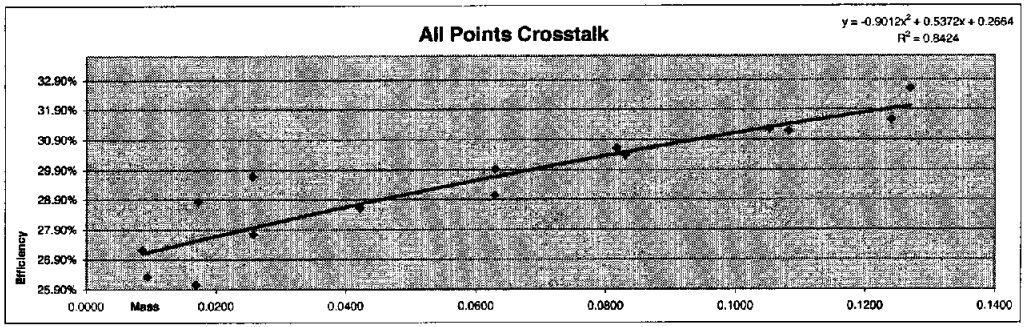
Protean 12

Mean Mass	Mean % α into β	
0.0083	26.04%	Min
0.0245	27.64%	26.04%
0.0409	27.39%	Max
0.0612	28.54%	30.67%
0.0811	29.06%	Mean
0.1046	29.86%	28.19%
0.1226	30.67%	



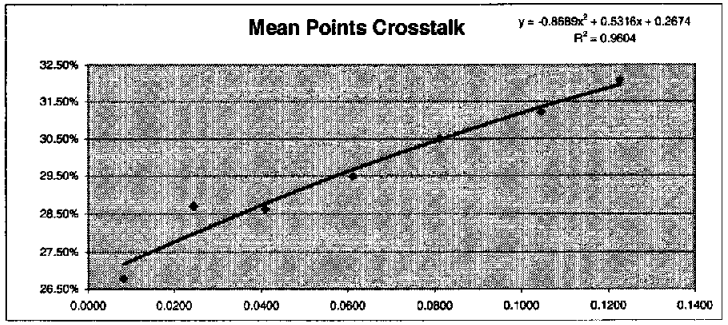
Protean 13

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
13	A11	0.0094	40.00	31354	11206	783.85	280.15	26.33%	Min
13	A12	0.0169	40.00	33801	11913	845.03	297.83	26.06%	26.06%
13	A13	0.0257	40.00	24258	9311	606.45	232.78	27.74%	
13	A14	0.0421	40.00	22004	8831	550.10	220.78	28.64%	Max
13	A15	0.0629	40.00	16732	7144	418.30	178.60	29.92%	32.59%
13	A16	0.0817	40.00	31490	13894	787.25	347.35	30.61%	
13	A17	0.1052	40.00	26094	11857	652.35	296.43	31.24%	Mean
13	A18	0.1240	40.00	23048	10622	576.20	265.55	31.55%	29.35%
13	A21	0.0086	40.00	29290	10950	732.25	273.75	27.21%	
13	A22	0.0172	40.00	23522	9527	588.05	238.18	28.83%	
13	A23	0.0256	40.00	22297	9406	557.43	235.15	29.67%	
13	A24	0.0422	40.00	21587	8649	539.68	216.23	28.60%	
13	A25	0.0628	40.00	20074	8214	501.85	205.35	29.04%	
13	A26	0.0830	40.00	31012	13546	775.30	338.65	30.40%	
13	A27	0.1082	40.00	27442	12432	686.05	310.80	31.18%	
13	A28	0.1269	40.00	23437	11333	585.93	283.33	32.59%	



Protean 13

Mean Mass	Mean % α into β	
0.0083	26.77%	Min
0.0245	26.70%	26.77%
0.0409	28.62%	Max
0.0612	29.48%	32.07%
0.0811	30.51%	Mean
0.1046	31.21%	29.35%
0.1226	32.07%	



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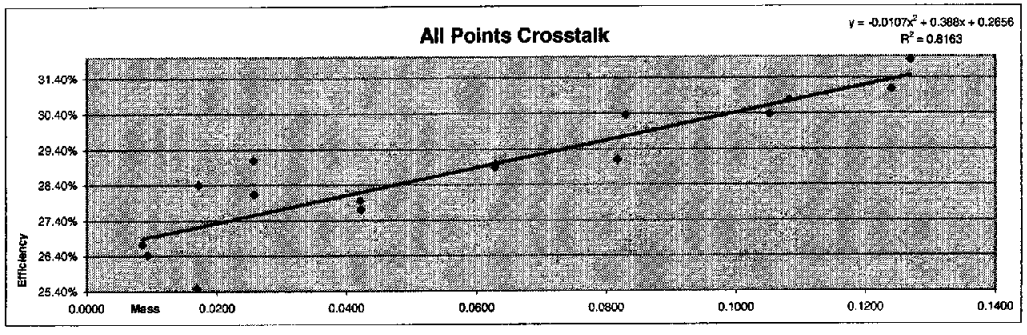
LOT# F7C280211

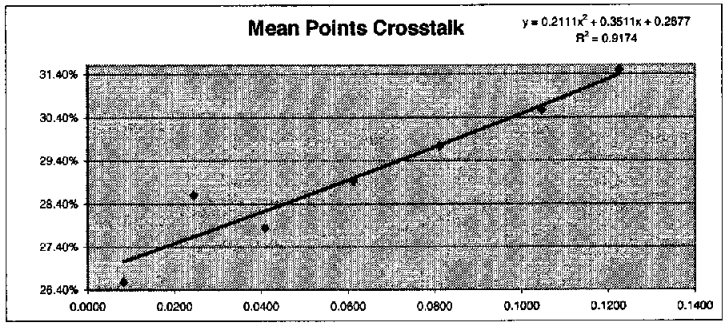
Protean 14

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
14	A11	0.0094	40.00	31190	11199	779.75	279.98	26.42%	Min
14	A12	0.0169	40.00	34040	11645	851.00	291.13	25.49%	25.49%
14	A13	0.0257	40.00	23964	9382	599.10	234.55	28.14%	
14	A14	0.0421	40.00	21840	8477	546.00	211.93	27.96%	Max
14	A15	0.0629	40.00	16522	6738	413.05	168.45	28.97%	31.91%
14	A16	0.0817	40.00	31605	12969	790.13	324.23	29.10%	
14	A17	0.1052	40.00	26301	11476	657.53	286.90	30.38%	Mean
14	A18	0.1240	40.00	22631	10204	565.78	255.10	31.08%	28.84%
14	A21	0.0086	40.00	29049	10598	726.23	264.95	26.73%	
14	A22	0.0172	40.00	23627	9368	590.68	234.20	28.39%	
14	A23	0.0256	40.00	21902	8983	547.55	224.58	29.09%	
14	A24	0.0422	40.00	21856	8377	546.40	209.43	27.71%	
14	A25	0.0628	40.00	19647	7977	491.18	199.43	28.88%	
14	A26	0.0830	40.00	30695	13384	767.38	334.60	30.36%	
14	A27	0.1082	40.00	27206	12095	680.15	302.38	30.78%	
14	A28	0.1269	40.00	23305	10921	582.63	273.03	31.91%	



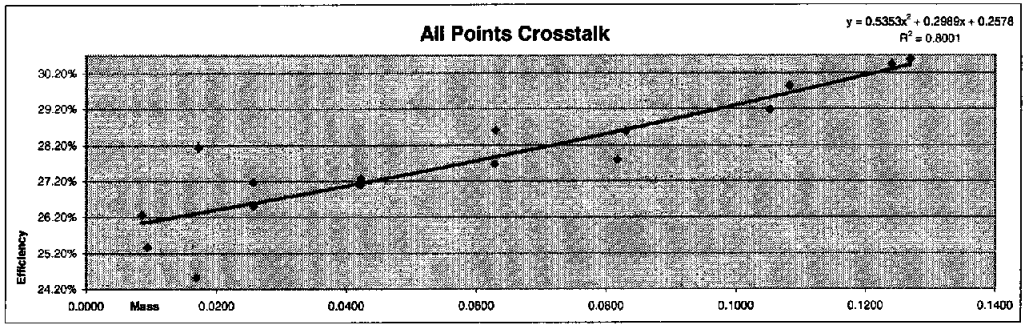
Protean 14

Mean Mass	Mean % α into β	
0.0083	26.58%	Min
0.0245	28.61%	26.58%
0.0409	27.83%	Max
0.0612	28.92%	31.49%
0.0811	29.73%	Mean
0.1046	30.58%	28.84%
0.1226	31.49%	



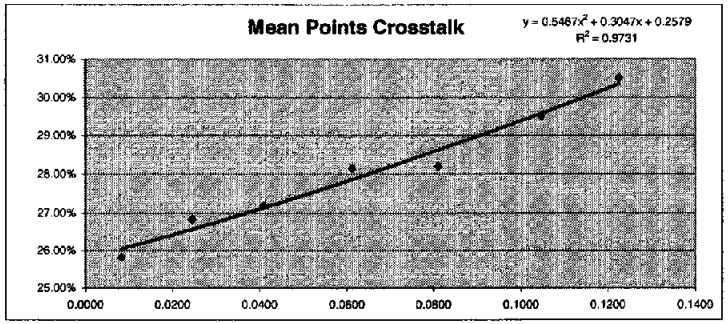
Protean 15

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
15	A11	0.0094	40.00	31592	10740	789.80	268.50	25.37%	Min
15	A12	0.0169	40.00	34164	11093	854.10	277.33	24.51%	24.51%
15	A13	0.0257	40.00	24122	8695	603.05	217.38	26.50%	
15	A14	0.0421	40.00	22313	8288	557.83	207.20	27.08%	Max
15	A15	0.0629	40.00	16709	6695	417.73	167.38	28.61%	30.57%
15	A16	0.0817	40.00	32457	12495	811.43	312.38	27.80%	
15	A17	0.1052	40.00	26595	10956	664.88	273.90	29.18%	Mean
15	A18	0.1240	40.00	23142	10129	578.55	253.23	30.44%	27.81%
15	A21	0.0086	40.00	29073	10354	726.83	258.85	26.26%	
15	A22	0.0172	40.00	23479	9192	586.98	229.80	28.14%	
15	A23	0.0256	40.00	22602	8430	565.05	210.75	27.17%	
15	A24	0.0422	40.00	21766	8170	544.65	204.25	27.27%	
15	A25	0.0628	40.00	20038	7667	500.95	191.68	27.67%	
15	A26	0.0830	40.00	31405	12574	785.13	314.35	28.59%	
15	A27	0.1082	40.00	27581	11730	689.53	293.25	29.84%	
15	A28	0.1269	40.00	23482	10341	587.06	258.53	30.57%	



Protean 15

Mean Mass	Mean % α into β	
0.0083	25.82%	Min
0.0245	26.83%	25.82%
0.0409	27.18%	Max
0.0612	28.14%	30.51%
0.0811	28.19%	Mean
0.1046	29.51%	27.81%
0.1226	30.51%	



TestAmerica STL

Protean

Beta Efficiency Curves

eta Attenuation Protean 0
et 1 03,04/2007

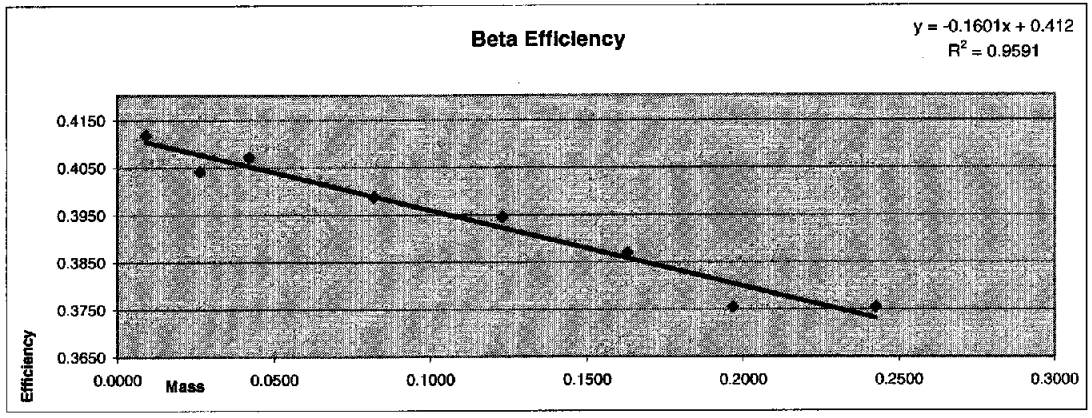
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34135	1706.750	0.4227
B12	0.0264	20	33839	1691.950	0.4190
B13	0.0425	20	33229	1661.450	0.4115
B14	0.0809	20	32328	1616.400	0.4003
B15	0.1227	20	31881	1594.050	0.3948
B16	0.1647	20	30988	1549.400	0.3837
B17	0.2003	20	29932	1496.600	0.3706
B18	0.2429	20	30289	1514.450	0.3750

Beta Attenuation Protean 0
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32383	1619.150	0.4010
B22	0.0265	20	31430	1571.500	0.3892
B23	0.0415	20	32535	1626.750	0.4029
B24	0.0830	20	32078	1603.900	0.3972
B25	0.1230	20	31849	1592.450	0.3944
B26	0.1611	20	31507	1575.350	0.3901
B27	0.1932	20	30713	1535.650	0.3803
B28	0.2421	20	30355	1517.750	0.3759

rotean 0

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4227	0.4010	0.4118	2.63%	-2.63%
0.0264	0.0265	0.0265	0.4190	0.3892	0.4041	3.69%	-3.69%
0.0425	0.0415	0.0420	0.4115	0.4029	0.4072	1.06%	-1.06%
0.0809	0.0830	0.0820	0.4003	0.3972	0.3987	0.39%	-0.39%
0.1227	0.1230	0.1229	0.3948	0.3944	0.3946	0.05%	-0.05%
0.1647	0.1611	0.1629	0.3837	0.3901	0.3869	-0.83%	0.83%
0.2003	0.1932	0.1968	0.3706	0.3803	0.3755	-1.29%	1.29%
0.2429	0.2421	0.2425	0.3750	0.3759	0.3755	-0.11%	0.11%



eta Attenuation Protean 1
et 1 03,04/2007

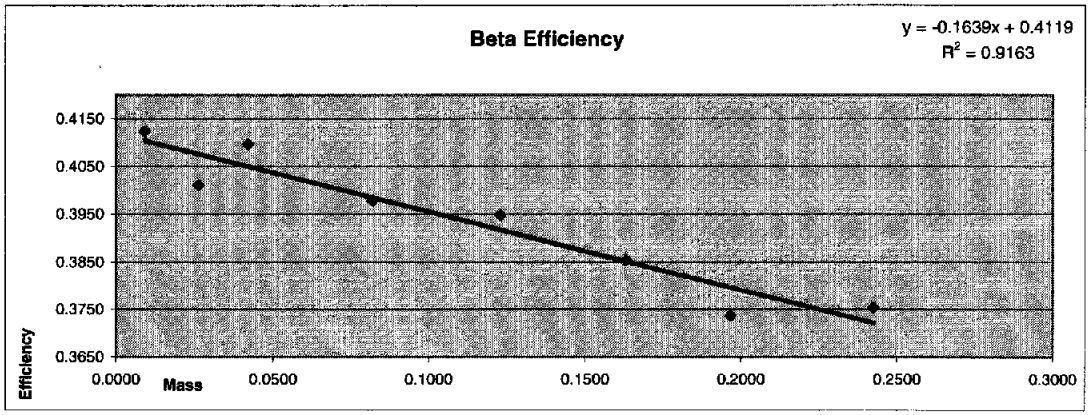
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34368	1718.400	0.4256
B12	0.0264	20	33604	1680.200	0.4161
B13	0.0425	20	33664	1683.200	0.4168
B14	0.0809	20	32234	1611.700	0.3991
B15	0.1227	20	31779	1588.950	0.3935
B16	0.1647	20	30688	1534.400	0.3800
B17	0.2003	20	30072	1503.600	0.3724
B18	0.2429	20	30337	1516.850	0.3756

Beta Attenuation Protean 1
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32223	1611.150	0.3990
B22	0.0265	20	31168	1558.400	0.3859
B23	0.0415	20	32501	1625.050	0.4024
B24	0.0830	20	32026	1601.300	0.3966
B25	0.1230	20	31983	1599.150	0.3960
B26	0.1611	20	31564	1578.200	0.3908
B27	0.1932	20	30267	1513.350	0.3748
B28	0.2421	20	30281	1514.050	0.3750

rotean 1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4256	0.3990	0.4123	3.22%	-3.22%
0.0264	0.0265	0.0265	0.4161	0.3859	0.4010	3.76%	-3.76%
0.0425	0.0415	0.0420	0.4168	0.4024	0.4096	1.76%	-1.76%
0.0809	0.0830	0.0820	0.3991	0.3966	0.3978	0.32%	-0.32%
0.1227	0.1230	0.1229	0.3935	0.3960	0.3948	-0.32%	0.32%
0.1647	0.1611	0.1629	0.3800	0.3908	0.3854	-1.41%	1.41%
0.2003	0.1932	0.1968	0.3724	0.3748	0.3736	-0.32%	0.32%
0.2429	0.2421	0.2425	0.3756	0.3750	0.3753	0.09%	-0.09%



eta Attenuation Protean 2
et 1 03,04/2007

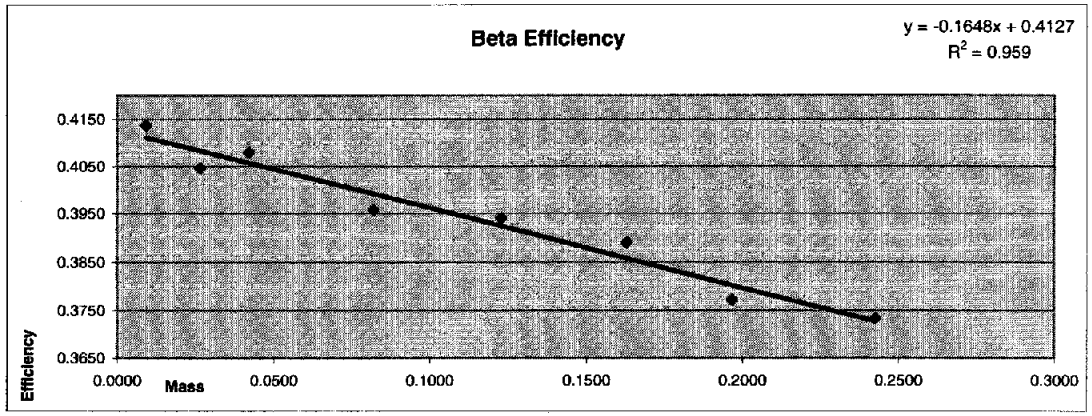
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34414	1720.700	0.4261
B12	0.0264	20	34113	1705.650	0.4224
B13	0.0425	20	33582	1679.100	0.4158
B14	0.0809	20	32025	1601.250	0.3965
B15	0.1227	20	31750	1587.500	0.3931
B16	0.1647	20	31043	1552.150	0.3844
B17	0.2003	20	30176	1508.800	0.3737
B18	0.2429	20	30341	1517.050	0.3757

Beta Attenuation Protean 2
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32412	1620.600	0.4013
B22	0.0265	20	31241	1562.050	0.3868
B23	0.0415	20	32307	1615.350	0.4000
B24	0.0830	20	31897	1594.850	0.3950
B25	0.1230	20	31894	1594.700	0.3949
B26	0.1611	20	31781	1589.050	0.3935
B27	0.1932	20	30749	1537.450	0.3807
B28	0.2421	20	29960	1498.000	0.3710

rotean 2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4261	0.4013	0.4137	3.00%	-3.00%
0.0264	0.0265	0.0265	0.4224	0.3868	0.4046	4.39%	-4.39%
0.0425	0.0415	0.0420	0.4158	0.4000	0.4079	1.94%	-1.94%
0.0809	0.0830	0.0820	0.3965	0.3950	0.3958	0.20%	-0.20%
0.1227	0.1230	0.1229	0.3931	0.3949	0.3940	-0.23%	0.23%
0.1647	0.1611	0.1629	0.3844	0.3935	0.3890	-1.17%	1.17%
0.2003	0.1932	0.1968	0.3737	0.3807	0.3772	-0.94%	0.94%
0.2429	0.2421	0.2425	0.3757	0.3710	0.3733	0.63%	-0.63%



eta Attenuation Protean 3
et 1 03,04/2007

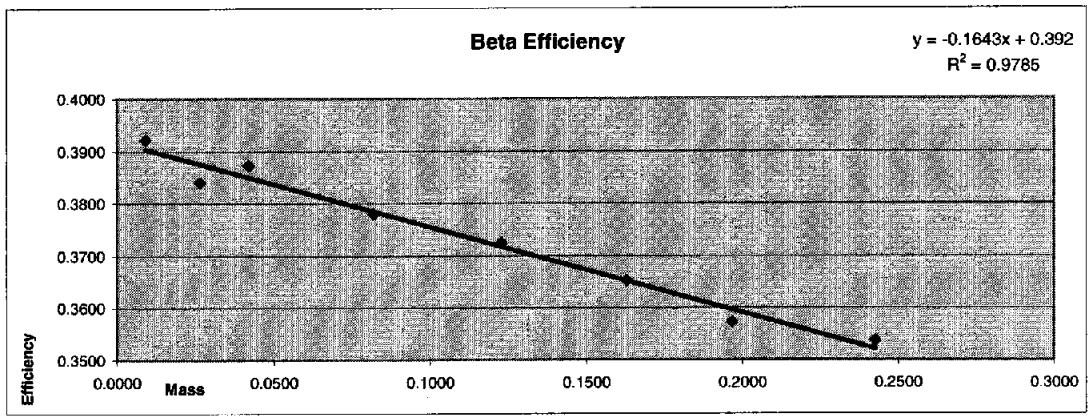
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	32265	1613.250	0.3995
B12	0.0264	20	32327	1616.350	0.4003
B13	0.0425	20	31752	1587.600	0.3932
B14	0.0809	20	30388	1519.400	0.3763
B15	0.1227	20	30157	1507.850	0.3734
B16	0.1647	20	28645	1432.250	0.3547
B17	0.2003	20	28586	1429.300	0.3540
B18	0.2429	20	28572	1428.600	0.3538

Beta Attenuation Protean 3
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	31083	1554.150	0.3849
B22	0.0265	20	29700	1485.000	0.3678
B23	0.0415	20	30809	1540.450	0.3815
B24	0.0830	20	30667	1533.350	0.3797
B25	0.1230	20	30010	1500.500	0.3716
B26	0.1611	20	30350	1517.500	0.3758
B27	0.1932	20	29118	1455.900	0.3605
B28	0.2421	20	28557	1427.850	0.3536

rotean 3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.3995	0.3849	0.3922	1.87%	-1.87%
0.0264	0.0265	0.0265	0.4003	0.3678	0.3840	4.24%	-4.24%
0.0425	0.0415	0.0420	0.3932	0.3815	0.3873	1.51%	-1.51%
0.0809	0.0830	0.0820	0.3763	0.3797	0.3780	-0.46%	0.46%
0.1227	0.1230	0.1229	0.3734	0.3716	0.3725	0.24%	-0.24%
0.1647	0.1611	0.1629	0.3547	0.3758	0.3652	-2.89%	2.89%
0.2003	0.1932	0.1968	0.3540	0.3605	0.3573	-0.92%	0.92%
0.2429	0.2421	0.2425	0.3538	0.3536	0.3537	0.03%	-0.03%



eta Attenuation Protean 4
et 1 03,04/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34597	1729.850	0.4284
B12	0.0264	20	34109	1705.450	0.4224
B13	0.0425	20	33459	1672.950	0.4143
B14	0.0809	20	32375	1618.750	0.4009
B15	0.1227	20	31914	1595.700	0.3952
B16	0.1647	20	30721	1536.050	0.3804
B17	0.2003	20	29934	1496.700	0.3707
B18	0.2429	20	30490	1524.500	0.3775

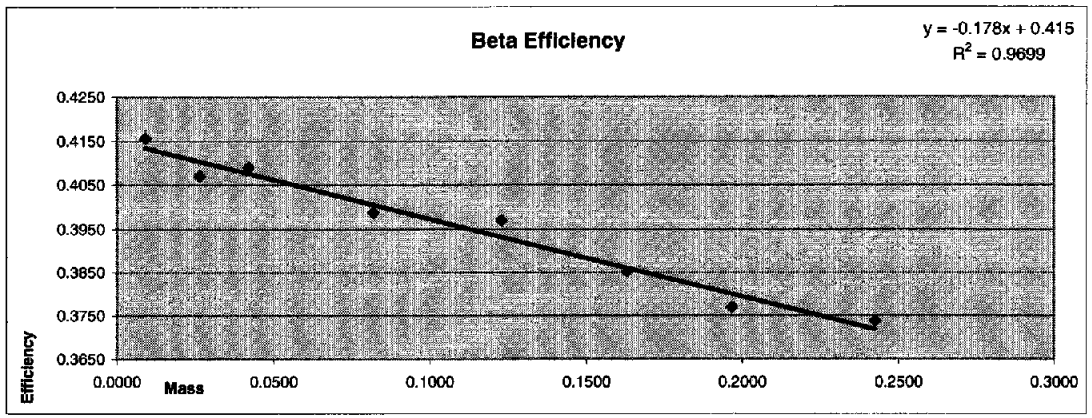
Beta Attenuation Protean 4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32521	1626.050	0.4027
B22	0.0265	20	31618	1580.900	0.3915
B23	0.0415	20	32598	1629.900	0.4036
B24	0.0830	20	32004	1600.200	0.3963
B25	0.1230	20	32195	1609.750	0.3987
B26	0.1611	20	31490	1574.500	0.3899
B27	0.1932	20	30939	1546.950	0.3831
B28	0.2421	20	29876	1493.800	0.3699

34597
34109
33459
32375
31914
30721
29934
30490
32521
31618

rotean 4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4284	0.4027	0.4155	3.09%	-3.09%
0.0264	0.0265	0.0265	0.4224	0.3915	0.4069	3.79%	-3.79%
0.0425	0.0415	0.0420	0.4143	0.4036	0.4090	1.30%	-1.30%
0.0809	0.0830	0.0820	0.4009	0.3963	0.3986	0.58%	-0.58%
0.1227	0.1230	0.1229	0.3952	0.3987	0.3969	-0.44%	0.44%
0.1647	0.1611	0.1629	0.3804	0.3899	0.3852	-1.24%	1.24%
0.2003	0.1932	0.1968	0.3707	0.3831	0.3769	-1.65%	1.65%
0.2429	0.2421	0.2425	0.3775	0.3699	0.3737	1.02%	-1.02%



eta Attenuation Protean 5
et 1 03,04/2007

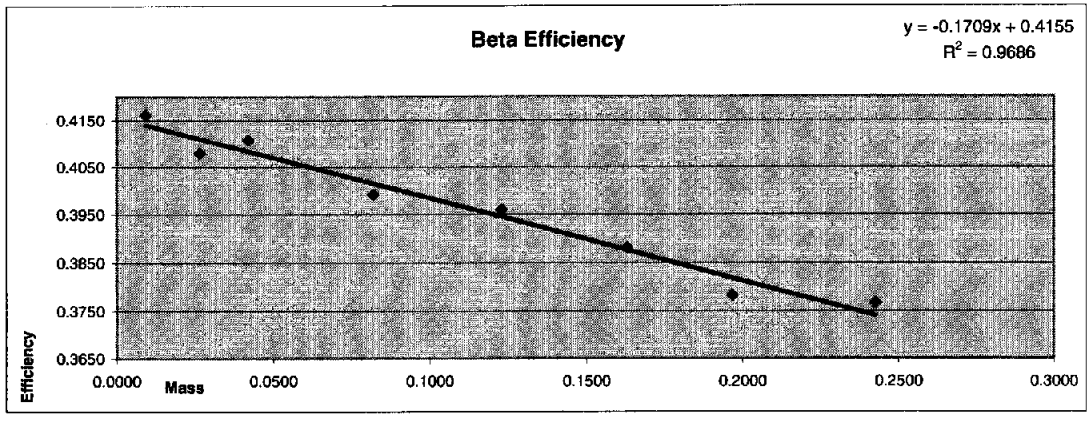
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34461	1723.050	0.4267
B12	0.0264	20	34179	1708.950	0.4232
B13	0.0425	20	33866	1693.300	0.4193
B14	0.0809	20	32150	1607.500	0.3981
B15	0.1227	20	31994	1599.700	0.3962
B16	0.1647	20	30982	1549.100	0.3836
B17	0.2003	20	29941	1497.050	0.3707
B18	0.2429	20	30502	1525.100	0.3777

Beta Attenuation Protean 5
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32753	1637.650	0.4056
B22	0.0265	20	31713	1585.650	0.3927
B23	0.0415	20	32484	1624.200	0.4022
B24	0.0830	20	32319	1615.950	0.4002
B25	0.1230	20	31957	1597.850	0.3957
B26	0.1611	20	31705	1585.250	0.3926
B27	0.1932	20	31151	1557.550	0.3857
B28	0.2421	20	30334	1516.700	0.3756

otean 5

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4267	0.4056	0.4161	2.54%	-2.54%
0.0264	0.0265	0.0265	0.4232	0.3927	0.4079	3.74%	-3.74%
0.0425	0.0415	0.0420	0.4193	0.4022	0.4108	2.08%	-2.08%
0.0809	0.0830	0.0820	0.3981	0.4002	0.3991	-0.26%	0.26%
0.1227	0.1230	0.1229	0.3962	0.3957	0.3959	0.06%	-0.06%
0.1647	0.1611	0.1629	0.3836	0.3926	0.3881	-1.15%	1.15%
0.2003	0.1932	0.1968	0.3707	0.3857	0.3782	-1.98%	1.98%
0.2429	0.2421	0.2425	0.3777	0.3756	0.3766	0.28%	-0.28%



eta Attenuation Protean 6
et 1 03,04/2007

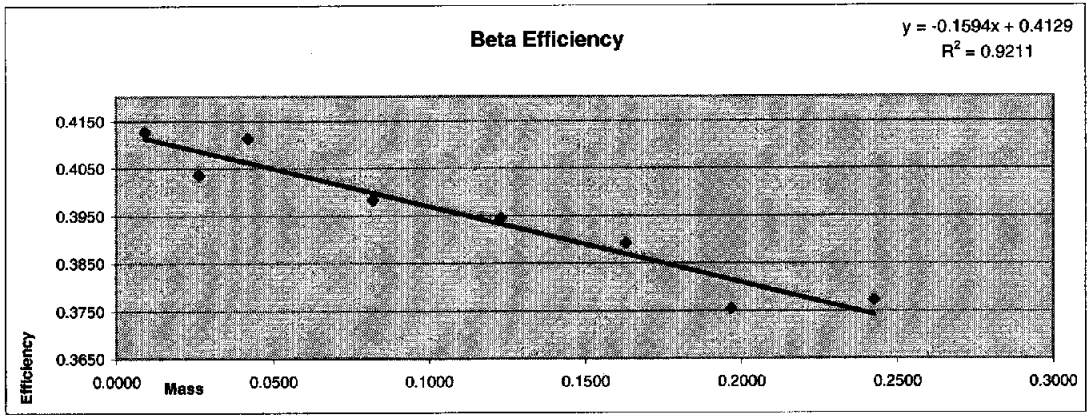
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34497	1724.850	0.4272
B12	0.0264	20	33606	1680.300	0.4161
B13	0.0425	20	33664	1683.200	0.4168
B14	0.0809	20	31959	1597.950	0.3957
B15	0.1227	20	31895	1594.750	0.3949
B16	0.1647	20	31091	1554.550	0.3850
B17	0.2003	20	29954	1497.700	0.3709
B18	0.2429	20	30573	1528.650	0.3786

Beta Attenuation Protean 6
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32167	1608.350	0.3983
B22	0.0265	20	31575	1578.750	0.3910
B23	0.0415	20	32779	1638.950	0.4059
B24	0.0830	20	32370	1618.500	0.4008
B25	0.1230	20	31819	1590.950	0.3940
B26	0.1611	20	31776	1588.800	0.3935
B27	0.1932	20	30688	1534.400	0.3800
B28	0.2421	20	30367	1518.350	0.3760

otean 6

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4272	0.3983	0.4127	3.50%	-3.50%
0.0264	0.0265	0.0265	0.4161	0.3910	0.4035	3.12%	-3.12%
0.0425	0.0415	0.0420	0.4168	0.4059	0.4114	1.33%	-1.33%
0.0809	0.0830	0.0820	0.3957	0.4008	0.3983	-0.64%	0.64%
0.1227	0.1230	0.1229	0.3949	0.3940	0.3945	0.12%	-0.12%
0.1647	0.1611	0.1629	0.3850	0.3935	0.3892	-1.09%	1.09%
0.2003	0.1932	0.1968	0.3709	0.3800	0.3754	-1.21%	1.21%
0.2429	0.2421	0.2425	0.3786	0.3760	0.3773	0.34%	-0.34%



eta Attenuation Protean 7
et 1 03,04/2007

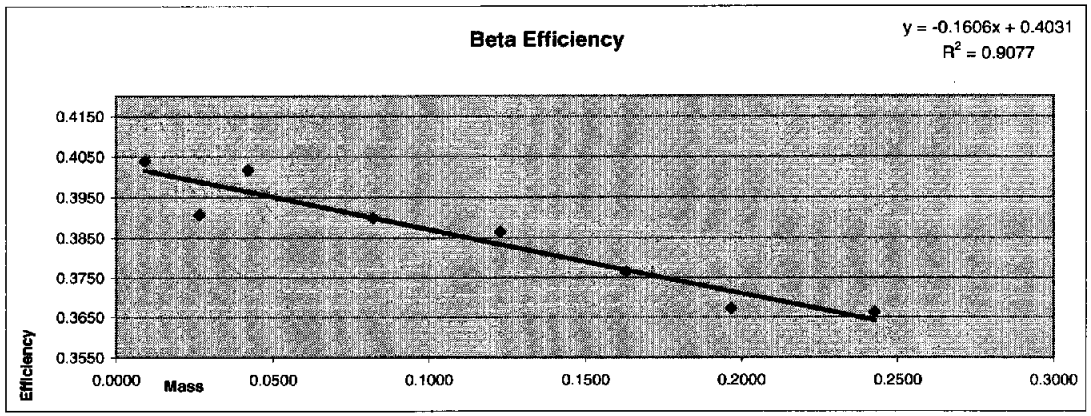
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	33547	1677.350	0.4154
B12	0.0264	20	32922	1646.100	0.4077
B13	0.0425	20	32927	1646.350	0.4077
B14	0.0809	20	31012	1550.600	0.3840
B15	0.1227	20	31162	1558.100	0.3859
B16	0.1647	20	29866	1493.300	0.3698
B17	0.2003	20	29397	1469.850	0.3640
B18	0.2429	20	29639	1481.950	0.3670

Beta Attenuation Protean 7
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	31696	1584.800	0.3925
B22	0.0265	20	30185	1509.250	0.3738
B23	0.0415	20	31963	1598.150	0.3958
B24	0.0830	20	31972	1598.600	0.3959
B25	0.1230	20	31256	1562.800	0.3870
B26	0.1611	20	30957	1547.850	0.3833
B27	0.1932	20	29917	1495.850	0.3704
B28	0.2421	20	29507	1475.350	0.3654

otean 7

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4154	0.3925	0.4039	2.84%	-2.84%
0.0264	0.0265	0.0265	0.4077	0.3738	0.3907	4.34%	-4.34%
0.0425	0.0415	0.0420	0.4077	0.3958	0.4017	1.49%	-1.49%
0.0809	0.0830	0.0820	0.3840	0.3959	0.3899	-1.52%	1.52%
0.1227	0.1230	0.1229	0.3859	0.3870	0.3864	-0.15%	0.15%
0.1647	0.1611	0.1629	0.3698	0.3833	0.3766	-1.79%	1.79%
0.2003	0.1932	0.1968	0.3640	0.3704	0.3672	-0.88%	0.88%
0.2429	0.2421	0.2425	0.3670	0.3654	0.3662	0.22%	-0.22%



eta Attenuation Protean 8
et 1 03,04/2007

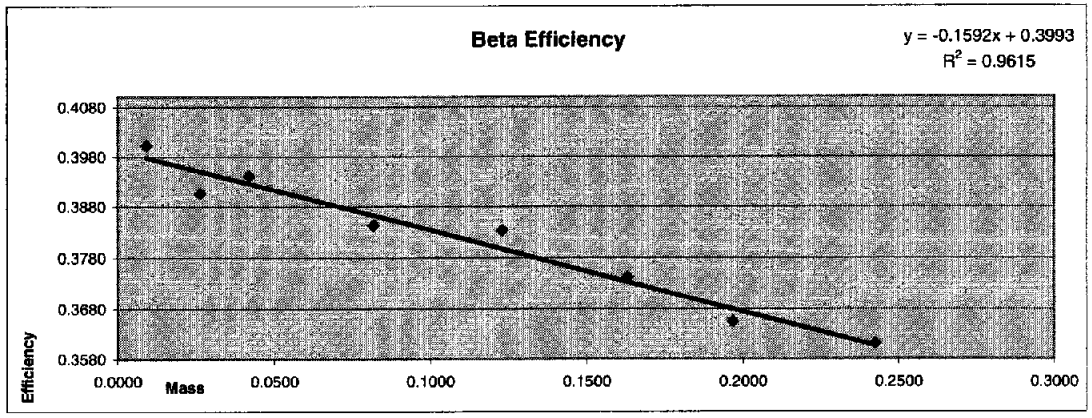
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	33294	1664.700	0.4123
B12	0.0264	20	33004	1650.200	0.4087
B13	0.0425	20	32594	1629.700	0.4036
B14	0.0809	20	30956	1547.800	0.3833
B15	0.1227	20	31157	1557.850	0.3858
B16	0.1647	20	29815	1490.750	0.3692
B17	0.2003	20	29210	1460.500	0.3617
B18	0.2429	20	29214	1460.700	0.3617

Beta Attenuation Protean 8
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	31357	1567.850	0.3883
B22	0.0265	20	30099	1504.950	0.3727
B23	0.0415	20	31074	1553.700	0.3848
B24	0.0830	20	31117	1555.850	0.3853
B25	0.1230	20	30752	1537.600	0.3808
B26	0.1611	20	30634	1531.700	0.3793
B27	0.1932	20	29824	1491.200	0.3693
B28	0.2421	20	29108	1455.400	0.3604

rotean 8

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4123	0.3883	0.4003	3.00%	-3.00%
0.0264	0.0265	0.0265	0.4087	0.3727	0.3907	4.60%	-4.60%
0.0425	0.0415	0.0420	0.4036	0.3848	0.3942	2.39%	-2.39%
0.0809	0.0830	0.0820	0.3833	0.3853	0.3843	-0.26%	0.26%
0.1227	0.1230	0.1229	0.3858	0.3808	0.3833	0.65%	-0.65%
0.1647	0.1611	0.1629	0.3692	0.3793	0.3743	-1.35%	1.35%
0.2003	0.1932	0.1968	0.3617	0.3693	0.3655	-1.04%	1.04%
0.2429	0.2421	0.2425	0.3617	0.3604	0.3611	0.18%	-0.18%



Beta Attenuation Protean 9
Set 1 03,04/2007

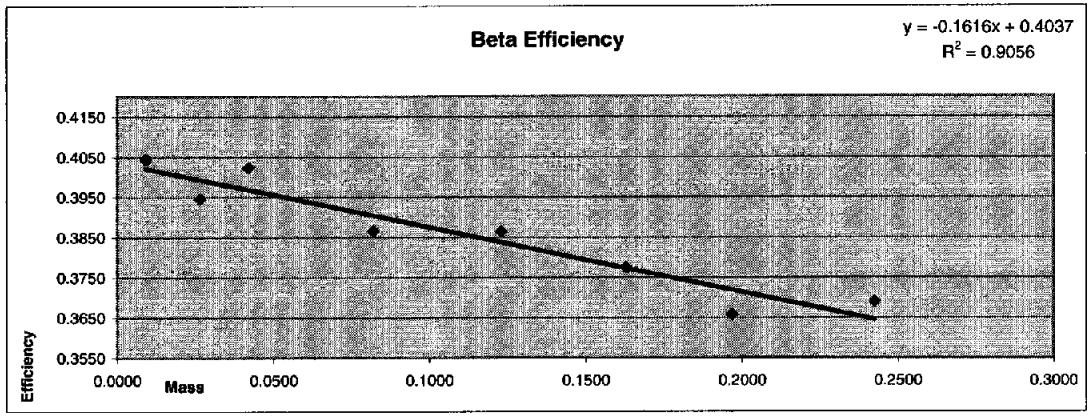
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	33458	1672.900	0.4143
B12	0.0264	20	33181	1659.050	0.4109
B13	0.0425	20	32988	1649.400	0.4085
B14	0.0809	20	31498	1574.900	0.3900
B15	0.1227	20	31243	1562.150	0.3869
B16	0.1647	20	30061	1503.050	0.3722
B17	0.2003	20	29265	1463.250	0.3624
B18	0.2429	20	29954	1497.700	0.3709

Beta Attenuation Protean 9
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	31871	1593.550	0.3946
B22	0.0265	20	30548	1527.400	0.3783
B23	0.0415	20	32010	1600.500	0.3964
B24	0.0830	20	30956	1547.800	0.3833
B25	0.1230	20	31168	1558.400	0.3859
B26	0.1611	20	30906	1545.300	0.3827
B27	0.1932	20	29809	1490.450	0.3691
B28	0.2421	20	29639	1481.950	0.3670

rotean 9

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4143	0.3946	0.4045	2.43%	-2.43%
0.0264	0.0265	0.0265	0.4109	0.3783	0.3946	4.13%	-4.13%
0.0425	0.0415	0.0420	0.4085	0.3964	0.4024	1.50%	-1.50%
0.0809	0.0830	0.0820	0.3900	0.3833	0.3867	0.87%	-0.87%
0.1227	0.1230	0.1229	0.3869	0.3859	0.3864	0.12%	-0.12%
0.1647	0.1611	0.1629	0.3722	0.3827	0.3775	-1.39%	1.39%
0.2003	0.1932	0.1968	0.3624	0.3691	0.3657	-0.92%	0.92%
0.2429	0.2421	0.2425	0.3709	0.3670	0.3690	0.53%	-0.53%



eta Attenuation Protean 10
et 1 03,04/2007

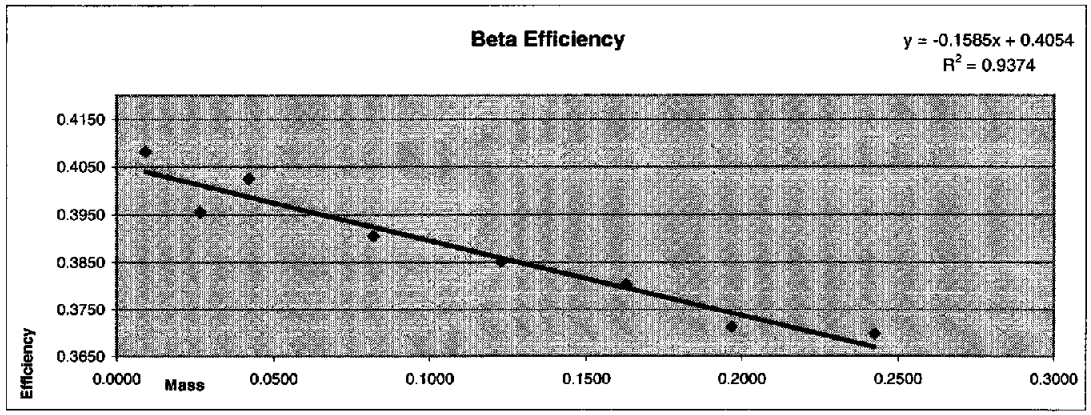
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	33933	1696.650	0.4202
B12	0.0264	20	33270	1663.500	0.4120
B13	0.0425	20	32984	1649.200	0.4084
B14	0.0809	20	31385	1569.250	0.3886
B15	0.1227	20	31028	1551.400	0.3842
B16	0.1647	20	30358	1517.900	0.3759
B17	0.2003	20	29519	1475.950	0.3655
B18	0.2429	20	29968	1498.400	0.3711

Beta Attenuation Protean 10
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	31981	1599.050	0.3960
B22	0.0265	20	30613	1530.650	0.3791
B23	0.0415	20	32015	1600.750	0.3964
B24	0.0830	20	31679	1583.950	0.3923
B25	0.1230	20	31189	1559.450	0.3862
B26	0.1611	20	31078	1553.900	0.3848
B27	0.1932	20	30439	1521.950	0.3769
B28	0.2421	20	29751	1487.550	0.3684

rotean 10

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4202	0.3960	0.4081	2.96%	-2.96%
0.0264	0.0265	0.0265	0.4120	0.3791	0.3955	4.16%	-4.16%
0.0425	0.0415	0.0420	0.4084	0.3964	0.4024	1.49%	-1.49%
0.0809	0.0830	0.0820	0.3886	0.3923	0.3904	-0.47%	0.47%
0.1227	0.1230	0.1229	0.3842	0.3862	0.3852	-0.26%	0.26%
0.1647	0.1611	0.1629	0.3759	0.3848	0.3804	-1.17%	1.17%
0.2003	0.1932	0.1968	0.3655	0.3769	0.3712	-1.53%	1.53%
0.2429	0.2421	0.2425	0.3711	0.3684	0.3697	0.36%	-0.36%



eta Attenuation Protean 11
et 1 03,04/2007

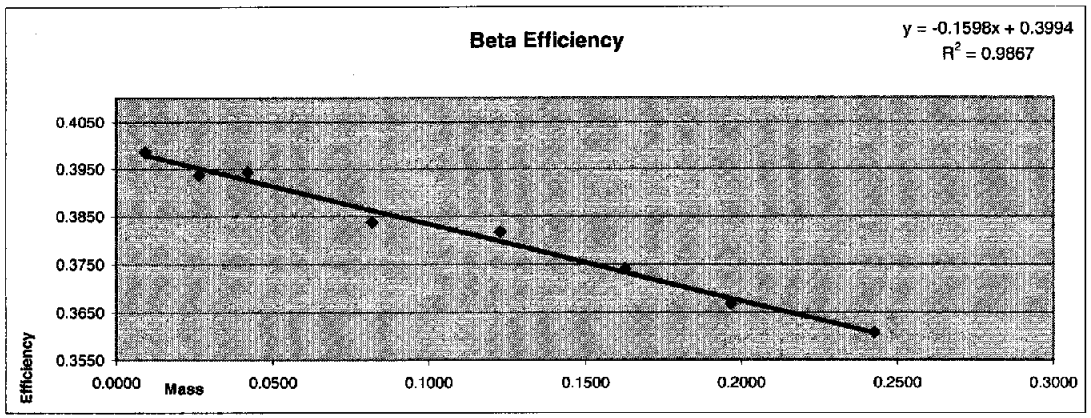
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	33181	1659.050	0.4109
B12	0.0264	20	32821	1641.050	0.4064
B13	0.0425	20	32369	1618.450	0.4008
B14	0.0809	20	31074	1553.700	0.3848
B15	0.1227	20	30998	1549.900	0.3838
B16	0.1647	20	29762	1488.100	0.3685
B17	0.2003	20	29494	1474.700	0.3652
B18	0.2429	20	29163	1458.150	0.3611

Beta Attenuation Protean 11
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	31180	1559.000	0.3861
B22	0.0265	20	30764	1538.200	0.3809
B23	0.0415	20	31322	1566.100	0.3878
B24	0.0830	20	30906	1545.300	0.3827
B25	0.1230	20	30653	1532.650	0.3796
B26	0.1611	20	30660	1533.000	0.3796
B27	0.1932	20	29746	1487.300	0.3683
B28	0.2421	20	29098	1454.900	0.3603

rotean 11

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4109	0.3861	0.3985	3.11%	-3.11%
0.0264	0.0265	0.0265	0.4064	0.3809	0.3937	3.24%	-3.24%
0.0425	0.0415	0.0420	0.4008	0.3878	0.3943	1.64%	-1.64%
0.0809	0.0830	0.0820	0.3848	0.3827	0.3837	0.27%	-0.27%
0.1227	0.1230	0.1229	0.3838	0.3796	0.3817	0.56%	-0.56%
0.1647	0.1611	0.1629	0.3685	0.3796	0.3741	-1.49%	1.49%
0.2003	0.1932	0.1968	0.3652	0.3683	0.3668	-0.43%	0.43%
0.2429	0.2421	0.2425	0.3611	0.3603	0.3607	0.11%	-0.11%



eta Attenuation Protean 12
et 1 03,04/2007

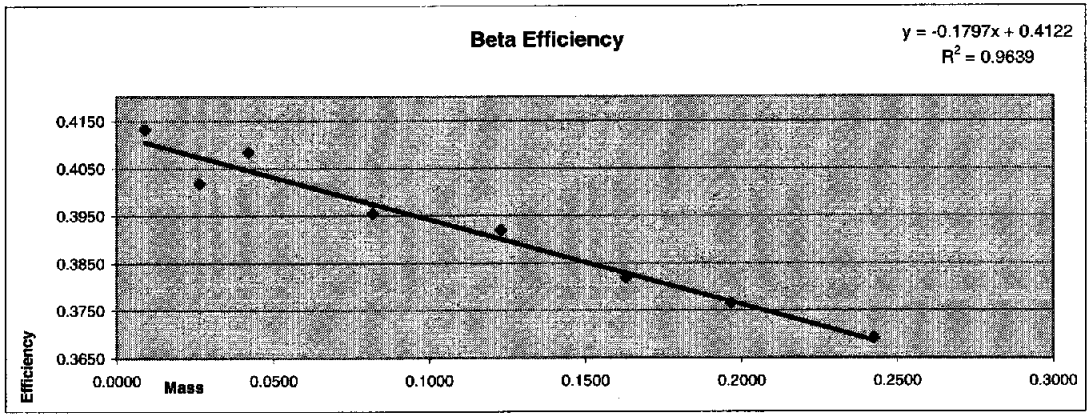
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34394	1719.700	0.4259
B12	0.0264	20	33654	1682.700	0.4167
B13	0.0425	20	33528	1676.400	0.4152
B14	0.0809	20	31739	1586.950	0.3930
B15	0.1227	20	31548	1577.400	0.3906
B16	0.1647	20	30618	1530.900	0.3791
B17	0.2003	20	30010	1500.500	0.3716
B18	0.2429	20	29959	1497.950	0.3710

Beta Attenuation Protean 12
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32356	1617.800	0.4006
B22	0.0265	20	31257	1562.850	0.3870
B23	0.0415	20	32436	1621.800	0.4016
B24	0.0830	20	32134	1606.700	0.3979
B25	0.1230	20	31755	1587.750	0.3932
B26	0.1611	20	31063	1553.150	0.3846
B27	0.1932	20	30793	1539.650	0.3813
B28	0.2421	20	29668	1483.400	0.3674

otean 12

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4259	0.4006	0.4133	3.05%	-3.05%
0.0264	0.0265	0.0265	0.4167	0.3870	0.4019	3.69%	-3.69%
0.0425	0.0415	0.0420	0.4152	0.4016	0.4084	1.66%	-1.66%
0.0809	0.0830	0.0820	0.3930	0.3979	0.3954	-0.62%	0.62%
0.1227	0.1230	0.1229	0.3906	0.3932	0.3919	-0.33%	0.33%
0.1647	0.1611	0.1629	0.3791	0.3846	0.3819	-0.72%	0.72%
0.2003	0.1932	0.1968	0.3716	0.3813	0.3764	-1.29%	1.29%
0.2429	0.2421	0.2425	0.3710	0.3674	0.3692	0.49%	-0.49%



eta Attenuation Protean 13
et 1 03,04/2007

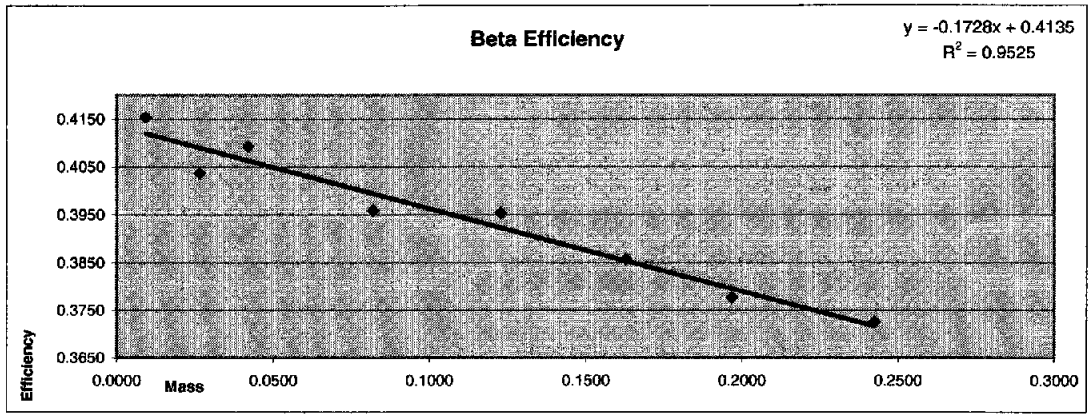
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34704	1735.200	0.4297
B12	0.0264	20	33763	1688.150	0.4181
B13	0.0425	20	33713	1685.650	0.4174
B14	0.0809	20	31905	1595.250	0.3951
B15	0.1227	20	32000	1600.000	0.3962
B16	0.1647	20	30624	1531.200	0.3792
B17	0.2003	20	29955	1497.750	0.3709
B18	0.2429	20	30089	1504.450	0.3726

Beta Attenuation Protean 13
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32390	1619.500	0.4011
B22	0.0265	20	31434	1571.700	0.3892
B23	0.0415	20	32398	1619.900	0.4012
B24	0.0830	20	32037	1601.850	0.3967
B25	0.1230	20	31860	1593.000	0.3945
B26	0.1611	20	31670	1583.500	0.3921
B27	0.1932	20	31043	1552.150	0.3844
B28	0.2421	20	30083	1504.150	0.3725

rotean 13

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4297	0.4011	0.4154	3.45%	-3.45%
0.0264	0.0265	0.0265	0.4181	0.3892	0.4036	3.57%	-3.57%
0.0425	0.0415	0.0420	0.4174	0.4012	0.4093	1.99%	-1.99%
0.0809	0.0830	0.0820	0.3951	0.3967	0.3959	-0.21%	0.21%
0.1227	0.1230	0.1229	0.3962	0.3945	0.3954	0.22%	-0.22%
0.1647	0.1611	0.1629	0.3792	0.3921	0.3857	-1.68%	1.68%
0.2003	0.1932	0.1968	0.3709	0.3844	0.3776	-1.78%	1.78%
0.2429	0.2421	0.2425	0.3726	0.3725	0.3725	0.01%	-0.01%



eta Attenuation Protean 14
et 1 03,04/2007

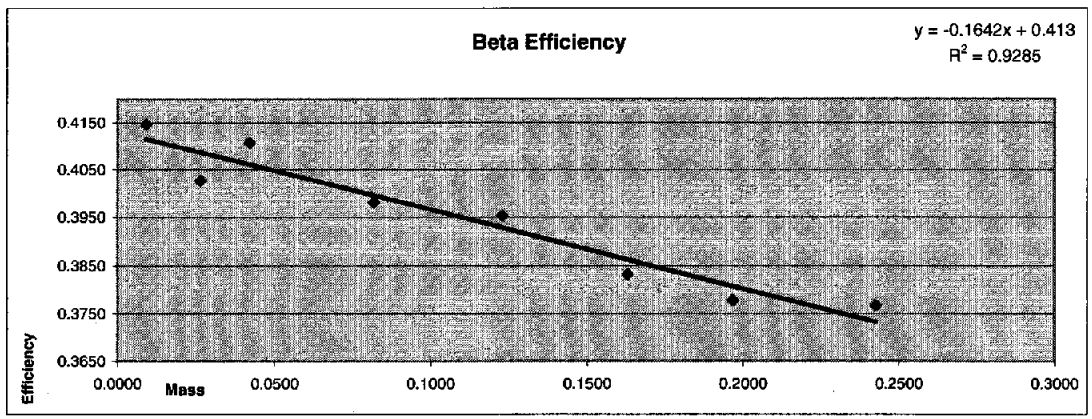
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34313	1715.650	0.4249
B12	0.0264	20	34057	1702.850	0.4217
B13	0.0425	20	33877	1693.850	0.4195
B14	0.0809	20	31919	1595.950	0.3952
B15	0.1227	20	32011	1600.550	0.3964
B16	0.1647	20	30387	1519.350	0.3763
B17	0.2003	20	30287	1514.350	0.3750
B18	0.2429	20	30493	1524.650	0.3776

Beta Attenuation Protean 14
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32651	1632.550	0.4043
B22	0.0265	20	30976	1548.800	0.3836
B23	0.0415	20	32461	1623.050	0.4019
B24	0.0830	20	32377	1618.850	0.4009
B25	0.1230	20	31832	1591.600	0.3942
B26	0.1611	20	31515	1575.750	0.3902
B27	0.1932	20	30730	1536.500	0.3805
B28	0.2421	20	30347	1517.350	0.3758

rotean 14

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4249	0.4043	0.4146	2.48%	-2.48%
0.0264	0.0265	0.0265	0.4217	0.3836	0.4026	4.74%	-4.74%
0.0425	0.0415	0.0420	0.4195	0.4019	0.4107	2.13%	-2.13%
0.0809	0.0830	0.0820	0.3952	0.4009	0.3981	-0.71%	0.71%
0.1227	0.1230	0.1229	0.3964	0.3942	0.3953	0.28%	-0.28%
0.1647	0.1611	0.1629	0.3763	0.3902	0.3832	-1.82%	1.82%
0.2003	0.1932	0.1968	0.3750	0.3805	0.3778	-0.73%	0.73%
0.2429	0.2421	0.2425	0.3776	0.3758	0.3767	0.24%	-0.24%



eta Attenuation Protean 15
et 1 03,04/2007

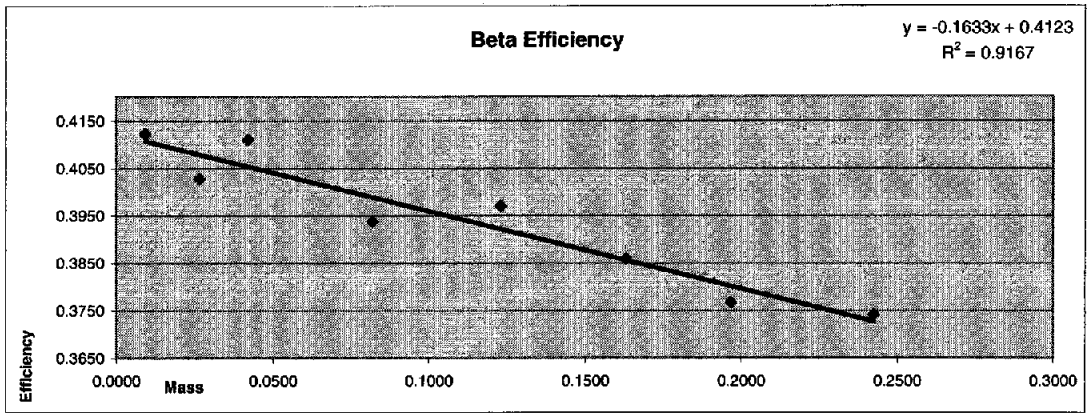
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B11	0.0093	20	34350	1717.500	0.4253
B12	0.0264	20	33838	1691.900	0.4190
B13	0.0425	20	33874	1693.700	0.4194
B14	0.0809	20	31858	1592.900	0.3945
B15	0.1227	20	31977	1598.850	0.3960
B16	0.1647	20	30637	1531.850	0.3794
B17	0.2003	20	30291	1514.550	0.3751
B18	0.2429	20	30338	1516.900	0.3757

Beta Attenuation Protean 15
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4038 CPM	Sr-90 Eff
B21	0.0091	20	32239	1611.950	0.3992
B22	0.0265	20	31229	1561.450	0.3867
B23	0.0415	20	32519	1625.950	0.4027
B24	0.0830	20	31755	1587.750	0.3932
B25	0.1230	20	32148	1607.400	0.3981
B26	0.1611	20	31700	1585.000	0.3925
B27	0.1932	20	30553	1527.650	0.3783
B28	0.2421	20	30085	1504.250	0.3725

rotean 15

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4253	0.3992	0.4123	3.17%	-3.17%
0.0264	0.0265	0.0265	0.4190	0.3867	0.4028	4.01%	-4.01%
0.0425	0.0415	0.0420	0.4194	0.4027	0.4111	2.04%	-2.04%
0.0809	0.0830	0.0820	0.3945	0.3932	0.3938	0.16%	-0.16%
0.1227	0.1230	0.1229	0.3960	0.3981	0.3970	-0.27%	0.27%
0.1647	0.1611	0.1629	0.3794	0.3925	0.3859	-1.71%	1.71%
0.2003	0.1932	0.1968	0.3751	0.3783	0.3767	-0.43%	0.43%
0.2429	0.2421	0.2425	0.3757	0.3725	0.3741	0.42%	-0.42%



Strontium 90

Initial Activity:	23.166 dpm		
Reference Date:	8/7/2001		
Current Date:	4/2/2007	(or date at which you wish to determine activity)	
Elapsed Time:	2064.000 days		
Half Life:	10409.63 days		
Exponential Term:	0.87159		
Corrected Activity:	20.19126 dpm	9.095162 pCi	0.336521 Bq
Activity (Sr/Y-90)	40.38252 dpm	18.19032 pCi	0.673042 Bq

TestAmerica STL

Protean

Calibration Standard Data

Beta calibration stds.	8/31/2005	salt solution SLRB-B		SET 1		
Beta standard, RAD04-0095, 2316.6 dpm/mL Sr/Y90 on 08/07/2001						
Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/7/6	mass 2/7/6
1	1	0.1000	8.8980	8.8888	8.8981	0.0093
2	1	0.3000	8.9490	8.9230	8.9494	0.0264
3	1	0.5000	9.0149	8.9703	9.0128	0.0425
4	1	1.0000	9.0419	8.9602	9.0411	0.0809
5	1	1.5000	9.0033	8.8764	8.9991	0.1227
6	1	2.0000	9.0833	8.9072	9.0719	0.1647
7	1	2.5000	9.1219	8.9194	9.1197	0.2003
8	1	3.0000	9.1769	8.9241	9.167	0.2429

Alpha calibration standards		salt solution SLRB-B		SET 1		
Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 10/07/2003						
Std #	mLs 03-071	mLs salt solution	gross mass	tare mass	reweigh 3/7/7	mass 3/7/7
1	1	0.1000	8.9369	8.9273	8.9367	0.0094
2	1	0.2000	8.9958	8.9783	8.9952	0.0169
3	1	0.3000	8.9737	8.9470	8.9727	0.0257
4	1	0.5000	8.9206	8.8766	8.9187	0.0421
5	1	0.7500	8.9565	8.8888	8.9517	0.0629
6	2	1.0000	9.0043	8.9170	8.9987	0.0817
7	2	1.3000	9.0092	8.8992	9.0044	0.1052
8	2	1.5000	9.0413	8.9088	9.0328	0.1240

spiked by:	Joel Kempema	verified by:	Sarah Hurst

Alpha Beta calibration standards 9/02/05

Beta calibration stds.			salt solution SLRB-B		SET 2	
Beta standard, RAD04-0095, 1043.5 dpm/mL on 08/07/01 Sr/Y90.						
Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/23/7	net mass 2/23/7
1	1	0.1000	8.9140	8.9056	8.9147	0.0091
2	1	0.3000	8.9197	8.8939	8.9204	0.0265
3	1	0.5000	8.8978	8.8559	8.8974	0.0415
4	1	1.0000	8.9580	8.8715	8.9545	0.0830
5	1	1.5000	9.0437	8.9139	9.0369	0.1230
6	1	2.0000	9.0249	8.8592	9.0203	0.1611
7	1	2.5000	9.1269	8.9239	9.1171	0.1932
8	1	3.0000	9.1390	8.8872	9.1293	0.2421

alpha calibration standards			salt solution SLRB-B		SET 2	
Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 12/19/02						
Std #	mLs	mLs salt solution	gross mass	tare mass	reweigh 3/7/7	mass 3/7/7
1	1	0.1000	8.9143	8.9061	8.9147	0.0086
2	1	0.2000	8.9348	8.9182	8.9354	0.0172
3	1	0.3000	8.9231	8.8980	8.9236	0.0256
4	1	0.5000	8.9518	8.9082	8.9504	0.0422
5	1	0.7500	8.9683	8.9026	8.9654	0.0628
6	2	1.0000	9.0179	8.9303	9.0133	0.0830
7	2	1.3000	8.9901	8.8763	8.9845	0.1082
8	2	1.5000	9.0533	8.9206	9.0475	0.1269
spiked by:	Joel Kempema		verified by:	N/A		

alpha beta standards second set

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65090-334

Th-230 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Th-230
ACTIVITY (dps):	7.654 E3
HALF-LIFE:	7.538 E4 Years
CALIBRATION DATE:	December 19, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.5%
SYSTEMATIC:	2.6%
RANDOM:	0.9%

*99% Confidence Level

Impurities: γ-impurities <0.1%, α-impurities <0.05%

5.17738 grams 0.5M HNO_3 solution.

P O NUMBER 1614557-000 OP, Item 3

SOURCE PREPARED BY: M. Taskaeva, Radiochemist

Q A APPROVED: 12-19-02

STL St. Louis

Standards Preparation Logbook Record

Jan-05-2006

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD03-0085, Th 230 03-071 Analyst: hicksb

Vendor: Analytics
Solvent: 0.5M HNO3
Date Prep./Opened: 10-07-2003 Date Received: 12-19-2002
Date Expires(1): 10-07-2008 (5 Years)
Date Expires(2): 10-07-2008 (5 Years)
parent, vial# 65090-334

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Th230	4,567.9	4,567.9

RAD06-0001, Th-230 Analyst: dillardj

Solvent: 0.5M HNO3 Volume (ml): 200.00
Date Prep./Opened: 01-04-2006
Date Expires(1): 01-04-2007 (1 Year)
Date Expires(2): 01-04-2007 (1 Year)

Parent Std No.: RAD03-0085, Th 230 03-071 Aliquot Amount (ml): 1.0000
Parent Date Expires(1): 10-07-2008 Parent Date Expires(2): 10-07-2008

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Th230	4,567.9	22.840

Reviewed By: _____

Thorium 230

10/7/03

ANALYTICS

SOURCE ID: 65090-334

Radioactivity: 7,654 dps

Reference time: 12-19-2002 12:00 EST

Useful life: indefinite

Initial mass = 5.17738 grams

Mass transferred = 5.1498 grams

$$\frac{5.1498\,g}{5.17738\,g} \times 7{,}654\ dps \times \frac{60\ dpm}{1\ dps} \div 100\,mL = \boxed{4{,}567.9\ \frac{dpm}{mL}}$$

ANALYTICS

1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA * 404-352-8677

Th-230

SRS 65090-334 Amount 0.207 µCi QA

Date 12/19/02 12:00 EST Exp. ———

PO # 1614557-000 OP, Item 3

5.17738 grams 0.5M HNO_3 solution

CAUTION RADIOACTIVE MATERIAL

Logbook: 2060

SEVERN TRENT SERVICES

Radiochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T ½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
11.12.03	11.12.04	03.082	P32	IPL 7032	1.103 µCi/g ~~4,991,2 dpm/g~~ ~~11,991 dpm/g~~	15 NOV 03	4.8989 g	100 ml		14.29 d	119,957 dpm/ml ~~119,912.0~~	TK 2-4-04	SDB	MFM	From Pg 10 Steve's
11.12.03	11.12.04	03-083	P32	03052	119,957 dpm/ml ~~119,912.0~~	15 NOV 03	1 ml	50 ml		14.29 d	~~2,398.2~~ dpm/ml	2399.15 TK 2-4-04	SDB	MFM	Lab Book
9-11-03	9-11-04	03-069	Pu238	02-032	68.235 IPC 11-19-03 ~~756.174~~ dpm/ml	11-15-99	95 ml	190 ml	1396 days	87.7 y	decay corr ~~33.5068~~ 16.23	1M HNO3	MFM	TK	from page 28
9-11-03	9-11-04	03-069	Pu239	02-031 ~~02-033~~ TK 11-19-03	64.025 11-19-03 ~~128.05~~ dpm/ml	11-15-99	95 ml	190 ml	1396 days	24110 y	~~32.0254~~ 0.125	1M HNO3	MFM	TK	from page 28
11.21.03	11.21.04	Rad03-0083 ~~03-070~~	Tc-99	02-028	95,341.2 dpm/ml	10.96	1 ml	200 ml		2.1E5	476.7 dpm/ml	KOH	SDB		Rad Capture ID Rad03-0083
12-9-03	12-9-04	03-084	Ra228	01012	1,018 dpm/mL	2/16/01	2 mL	100 mL		5.75 y	20.36 dpm/mL	0.5 M HNO3	BH	~~BHF~~	
12-9-03	12-9-04	03-085	Th230	03-071	4,567.9 dpm/mL	12/19/02	1 mL	200 mL		7.538 E4	22.84 dpm/mL	0.5 M HNO3	BH	LE	
12/31/03	12/31/08	03-086	Fe-55	681-78-3	.203 µCi/g	11/1/2000	4.997 g	100 mL		999 days	10,133.2 pCi/mL	0.5 M HNO3	BH		
12/31/03	12/31/04	03-087	Fe-55	03-086	10,133.2 pCi/mL	11/1/2000	5 mL	100 mL		999 days	506.7 pCi/mL	0.5 M HNO3	BH		
1-5-04	1-5-05	RN04-001	UNAT	01-018	235.76 dpm/mL	3-2-01	20 mL	80 mL	N/A	4.5 E9 yrs	58.94 dpm/mL	0.5 M HNO3	MFM		
1/12/04	1/12/05	Rad04-0007	Ra228	01012	1,018 dpm/mL	2/16/01	2 mL	100 mL		5.75 y	20.36 dpm/mL	0.5 M HNO3	BH	BBF	
2/12/04	2/12/04	RAD-0015	Sr90	03-038	2,316.57 dpm/mL	9/19/01	5 mL	500 mL		28.5 y	23.16 dpm/mL	0.5 M HNO3	BH	BBF	

Additional Comments:

SL-RAD-044, revised 3/2/01
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ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

62204-334

Sr-90 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Sr-90
ACTIVITY (dps):	3.897 E4
HALF-LIFE:	28.79 years
CALIBRATION DATE:	August 7, 2001 12:00 EST
TOTAL UNCERTAINTY*:	4.0%
SYSTEMATIC:	3.5%
RANDOM:	0.5%

*99% Confidence Level

Impurities: γ-impurities <0.1%

4.99897 grams 0.1M HCl solution with 30 μg/g Sr carrier.

P O NUMBER 1097166, Item 1

SOURCE PREPARED BY: M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED: 8-8-01

STL St. Louis

Standards Preparation Logbook Record

Feb-14-2006

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD01-0025, Sr 90 01-093 Analyst: hicksb

Vendor: Analytics Vendor's Expiration Date: 08-07-2006
Solvent: 1M HNO3
Date Prep./Opened: 09-19-2001 Date Received: 08-07-2001
Date Expires(1): 09-19-2006 (5 Years)
Date Expires(2): 09-19-2006 (5 Years)
Current Sr 90, beta spike parent, vial# 62204-334

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	23,166

RAD04-0095, Sr-90 Analyst: hicksb

Solvent: 0.5M HNO3 Volume (ml): 100.00
Date Prep./Opened: 10-07-2004 Date Consumed: 01-05-2006
Date Expires(1): 10-07-2005 (1 Year)
Date Expires(2): 04-17-2004 (1 Year)

Parent Std No.: RAD01-0025, Sr 90 01-093 Aliquot Amount (ml): 10.000
Parent Date Expires(1): 09-19-2006 Parent Date Expires(2): 09-19-2006

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	2,316.6

Reviewed By: _____

Page 1 of 1

Sr-90 Parent Ampoule for 2nd source CPC cal.

9/12/01
BMW

#62204-334

ampoule activity: ~~3,8970 dps~~ 38,970 dps.
½ life: 28.79 yrs
Calibration date: August 7, 2001 12:00 EST
Uncertainty 4.0%

STANDARDS LOG PARENT DILUTION # 01-093

$\left(\frac{38970 \text{ dpsec}}{1 \text{ sec}}\right)\left(\frac{60 \text{ sec}}{1 \text{ min}}\right) = 2,338,200$ dpm in ampoule.

$\left(\frac{2338200}{2.22}\right) = 1053243.2$ pCi/m in ampoule - Actual, 1043553.363 pCi/L
÷100 = 10435.8 pCi/ml

Actual Amount Transferred.... 4.9531 g

093 4.9531 g / 4.99897 actual = 0.9908 0.9908 x 2.3382×10^6 = 2,316,688.56 dpm

-04 $\left(\frac{2,316,688}{100 \text{ ml}}\right)$ = 23,166 dpm/ml or 104.3 pCi/ml

231,166 dpm/ml
MC 12-13-02

ANALYTICS
1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA * 404-352-8677
Sr-90
SRS 62204-334 Amount 1.053 µCi QA VMN
Date 08/07/01 12:00 EST Exp. ———
PO # 1097166, Item 1
4.99897 grams 0.1M HCl solution

CAUTION RADIOACTIVE MATERIAL

SEVERN TRENT SERVICES

R ochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T ½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
9/18/01	12/18/01	01-087	UNAT CAL STD	01085	10 µg/mL	9/18/01	1.5 mL	100 mL	N/A	N/A	150 ng/mL	.8 M HNO3	BMW	JTK	nanogram/mL
		01-088					1.0 mL				100 ng/mL			JTK	
		01-089					0.5 mL				50 ng/mL			JTK	
		01-090		01088	100 ng/mL		10 mL	100 mL			10 ng/mL			JTK	
		01-091		01-089	50 ng/mL		10 mL	100.0 mL			5 ng/mL			JTK	
		01-092		01-088	100 ng/mL		1.0 mL	100.0 mL			1 ng/mL			JTK	
9/19/01	9/19/02	01-093	SR-90	ampule C2204-334	38,897 dps	8/7/01	4.7531 g	100.0 mL	N/A	28.79 K	~~104.3 pCi/mL~~ 10435 pCi/mL 23,166 dpm/mL	.8 M HNO3	BMW	JTK	
9/19/01	9/19/02	01-094	SR90	01093	10435.8 pCi/mL	9/19/01	1.0 mL	100.0 mL	N/A	28.79 K	104.3 pCi/mL 231.66 dpm/mL	.8 M HNO3	BMW	JTK	
9/20/01	9/20/02	Ba-28	STD. Barium Carrier	Mo38-KPCM BaCl2	N/A	3/23/98	28.46 g	1000.0 mL	N/A	N/A	27.2 mg/mL	Reagent H2O	BMW	JTK	See Final capture weight sheet.
10/4/01	10/4/02 ~~10/4/01~~ 2ma 3-10-01	01-095	U-232	97-105	10,994 dpm/mL	9-6-97	1 mL	500 mL	—	70 yr	21.99 dpm	1M HNO3	CMA	JTK	
10/12/01	10/12/02	01-096	Ra226	98-006	1316 dpm/mL	4/13/98	1.0 mL	100.0 mL	—	1600 yr	13.16 dpm/mL	1M HNO3	AM	JTK	
10/18/01	10/18/02 ~~10/18/01~~ 2ma 3-10-03	01-097	(GBT) SR90/Y90	01032	1765.4 dpm/mL	3/28/03	2.0 mL	100.0 mL	N/A	28.5 yr	(35.31) total ~~23.99~~ dpm/mL	~~1M HNO3~~ 1M HNO3	BMW	AW	Decay Correct = 1699.65 dpm/mL

decay corrected 39.83 JTK 10-29-01

Additional Comments:

SL-RAD-044, revised 3/2/01
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TestAmerica STL

Protean 2007

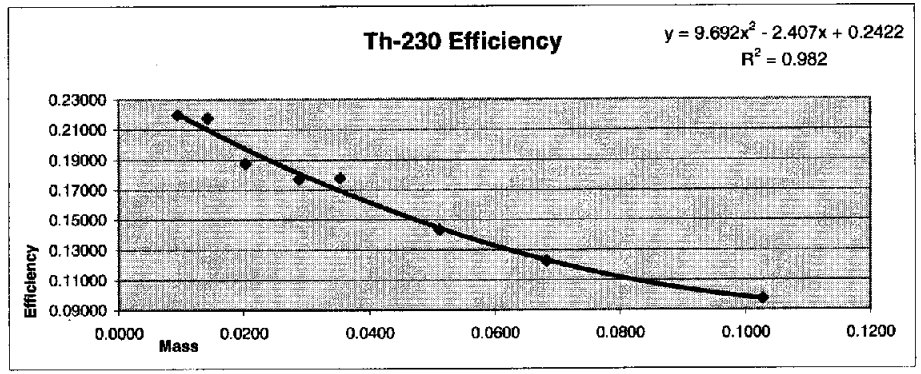
Th-230 $BaSO_4$ Calibration for Ra-226

TestAmerica STL

Detector Efficiency Curves

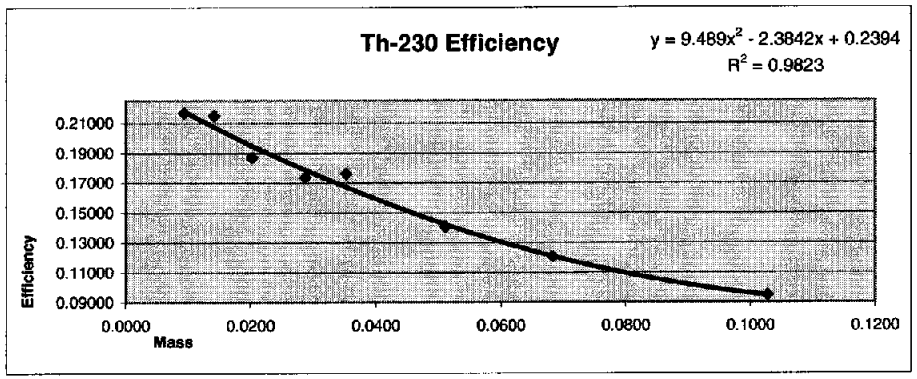
Alpha Th-230 Attenuation Protean 0 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	40152	1003.800	0.21975
A1	0.0142	40.00	39756	993.900	0.21758
A1	0.0203	40.00	34302	857.550	0.18773
A1	0.0287	40.00	32352	808.800	0.17706
A1	0.0353	40.00	32493	812.325	0.17783
A1	0.0512	40.00	26181	654.525	0.14329
A1	0.0683	40.00	22386	559.650	0.12252
A1	0.1028	40.00	17779	444.475	0.09730



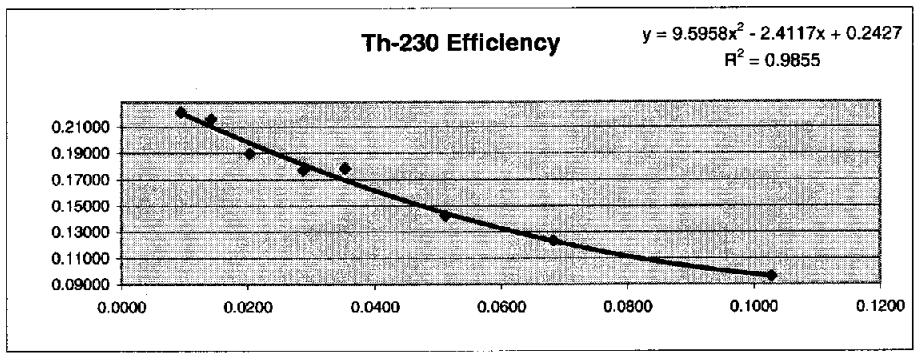
Alpha Th-230 Attenuation Protean 1 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	39581	989.525	0.21663
A2	0.0142	40.00	39262	981.550	0.21488
A2	0.0203	40.00	34138	853.450	0.18684
A2	0.0287	40.00	31715	792.875	0.17358
A2	0.0353	40.00	32200	805.000	0.17623
A2	0.0512	40.00	25667	641.675	0.14047
A2	0.0683	40.00	22033	550.825	0.12059
A2	0.1028	40.00	17300	432.500	0.09468



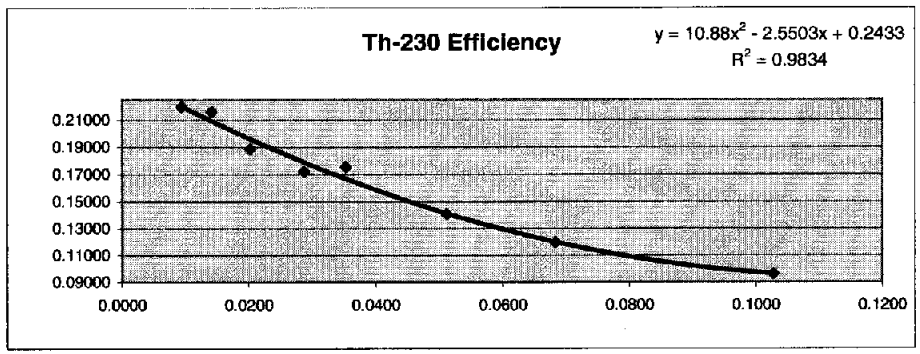
Alpha Th-230 Attenuation Protean 2 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	40436	1010.900	0.22131
A3	0.0142	40.00	39459	986.475	0.21596
A3	0.0203	40.00	34610	865.250	0.18942
A3	0.0287	40.00	32345	808.625	0.17702
A3	0.0353	40.00	32552	813.800	0.17816
A3	0.0512	40.00	26002	650.050	0.14231
A3	0.0683	40.00	22523	563.075	0.12327
A3	0.1028	40.00	17557	438.925	0.09609



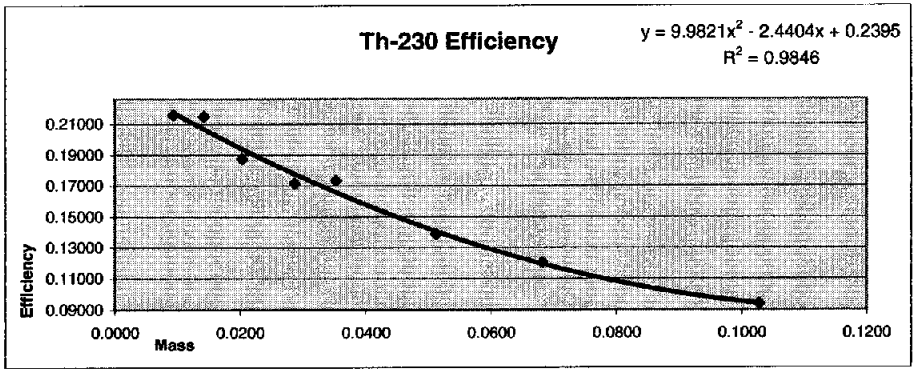
Alpha Th-230 Attenuation Protean 3 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	40158	1003.950	0.21978
A4	0.0142	40.00	39519	987.975	0.21629
A4	0.0203	40.00	34464	861.600	0.18862
A4	0.0287	40.00	31461	786.525	0.17219
A4	0.0353	40.00	32080	802.000	0.17557
A4	0.0512	40.00	25716	642.900	0.14074
A4	0.0683	40.00	21855	546.375	0.11961
A4	0.1028	40.00	17550	438.750	0.09605



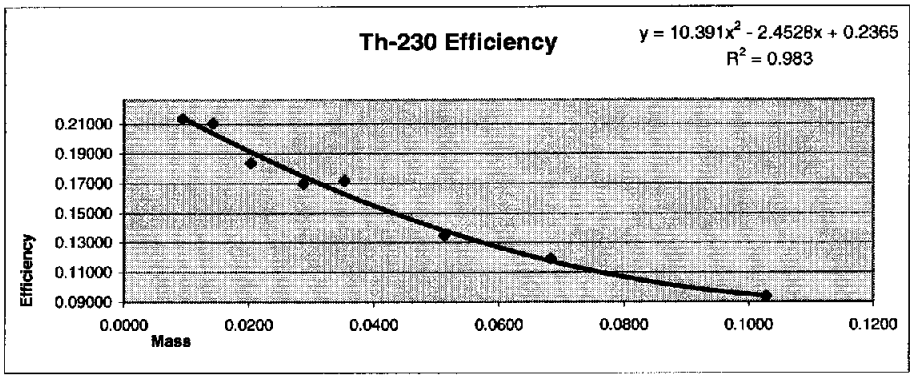
Alpha Th-230 Attenuation Protean 4 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	39436	985.900	0.21583
A1	0.0142	40.00	39244	981.100	0.21478
A1	0.0203	40.00	34286	857.150	0.18765
A1	0.0287	40.00	31325	783.125	0.17144
A1	0.0353	40.00	31665	791.625	0.17330
A1	0.0512	40.00	25393	634.825	0.13898
A1	0.0683	40.00	22011	550.275	0.12047
A1	0.1028	40.00	17145	428.625	0.09383



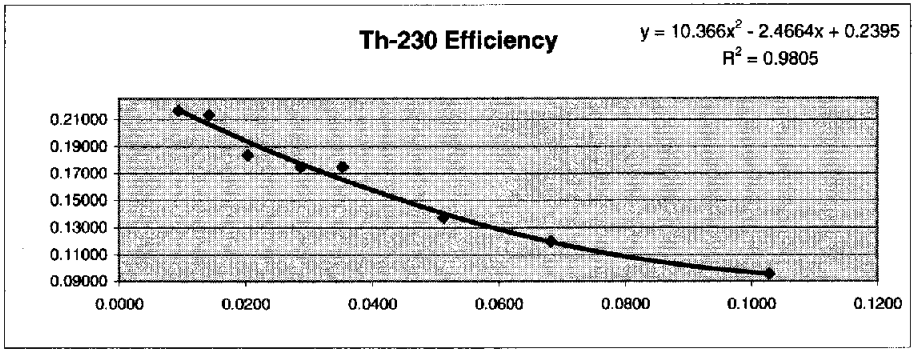
Alpha Th-230 Attenuation Protean 5 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	39009	975.225	0.21350
A2	0.0142	40.00	38471	961.775	0.21055
A2	0.0203	40.00	33542	838.550	0.18357
A2	0.0287	40.00	31018	775.450	0.16976
A2	0.0353	40.00	31367	784.175	0.17167
A2	0.0512	40.00	24592	614.800	0.13459
A2	0.0683	40.00	21755	543.875	0.11906
A2	0.1028	40.00	17155	428.875	0.09389



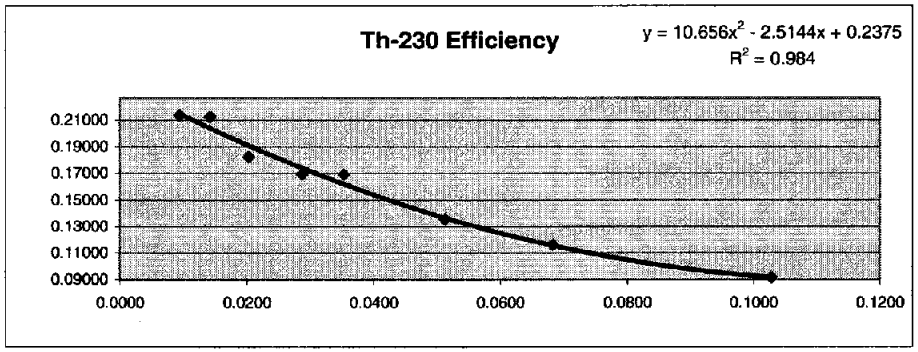
Alpha Th-230 Attenuation Protean 6 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	39601	990.025	0.21674
A3	0.0142	40.00	39007	975.175	0.21348
A3	0.0203	40.00	33555	838.875	0.18365
A3	0.0287	40.00	31873	796.825	0.17444
A3	0.0353	40.00	31941	798.525	0.17481
A3	0.0512	40.00	25074	626.850	0.13723
A3	0.0683	40.00	21878	546.950	0.11974
A3	0.1028	40.00	17462	436.550	0.09557



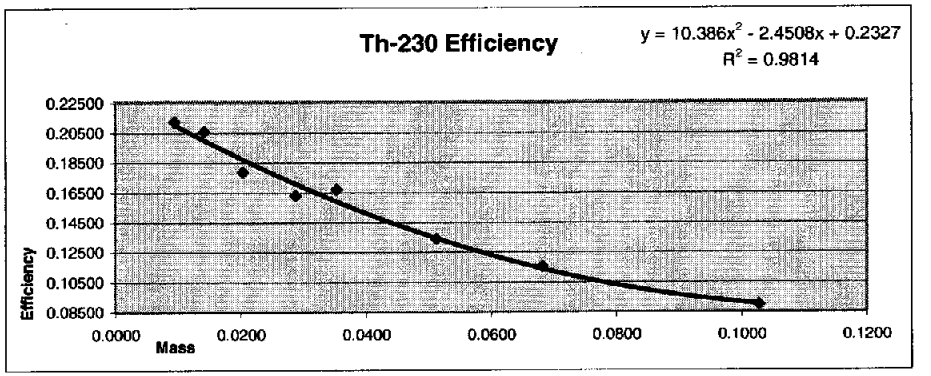
Alpha Th-230 Attenuation Protean 7 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	39002	975.050	0.21346
A4	0.0142	40.00	38777	969.425	0.21223
A4	0.0203	40.00	33331	833.275	0.18242
A4	0.0287	40.00	30958	773.950	0.16943
A4	0.0353	40.00	30912	772.800	0.16918
A4	0.0512	40.00	24773	619.325	0.13558
A4	0.0683	40.00	21161	529.025	0.11581
A4	0.1028	40.00	16713	417.825	0.09147



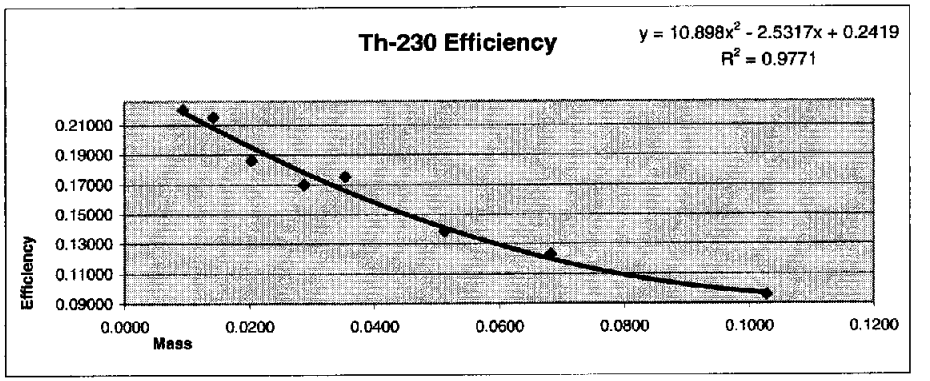
Alpha Th-230 Attenuation Protean 8 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	38811	970.275	0.21241
A1	0.0142	40.00	37666	941.650	0.20615
A1	0.0203	40.00	32650	816.250	0.17869
A1	0.0287	40.00	29841	746.025	0.16332
A1	0.0353	40.00	30539	763.475	0.16714
A1	0.0512	40.00	24481	612.025	0.13398
A1	0.0683	40.00	21082	527.050	0.11538
A1	0.1028	40.00	16416	410.400	0.08984



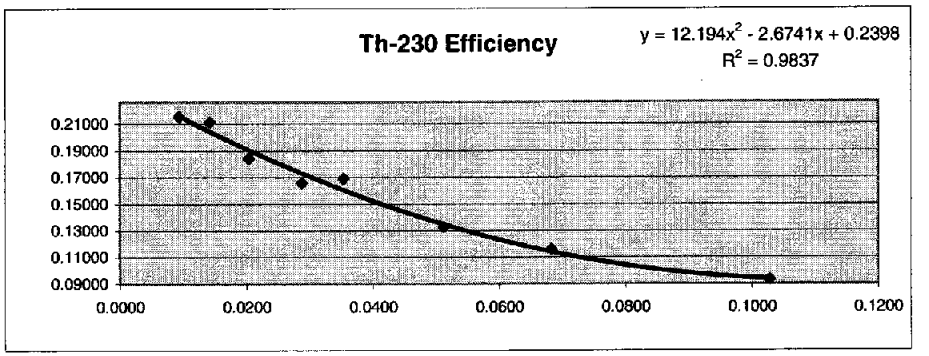
Alpha Th-230 Attenuation Protean 9 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	40269	1006.725	0.22039
A2	0.0142	40.00	39347	983.675	0.21535
A2	0.0203	40.00	33994	849.850	0.18605
A2	0.0287	40.00	31044	776.100	0.16990
A2	0.0353	40.00	32052	801.300	0.17542
A2	0.0512	40.00	25247	631.175	0.13818
A2	0.0683	40.00	22479	561.975	0.12303
A2	0.1028	40.00	17512	437.800	0.09584



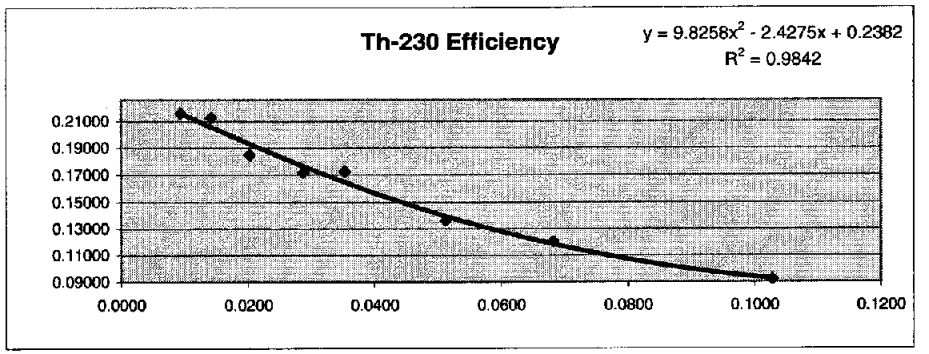
Alpha Th-230 Attenuation Protean 10 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	39337	983.425	0.21529
A3	0.0142	40.00	38596	964.900	0.21123
A3	0.0203	40.00	33631	840.775	0.18406
A3	0.0287	40.00	30265	756.625	0.16564
A3	0.0353	40.00	30819	770.475	0.16867
A3	0.0512	40.00	24242	606.050	0.13268
A3	0.0683	40.00	21183	529.575	0.11593
A3	0.1028	40.00	17023	425.575	0.09317



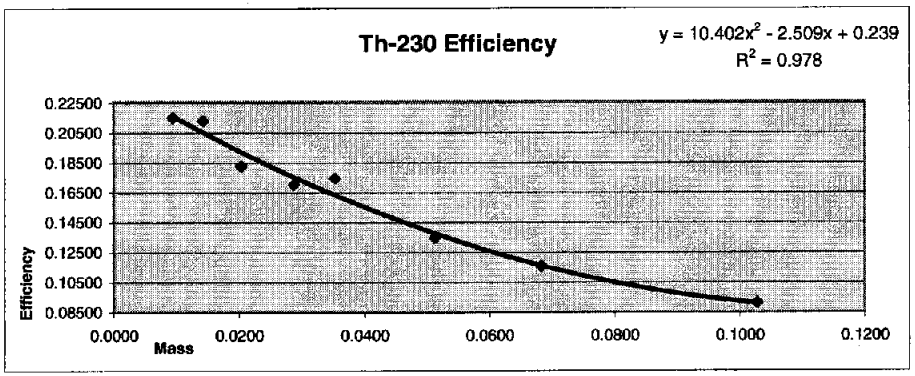
Alpha Th-230 Attenuation Protean 11 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	39449	986.225	0.21590
A4	0.0142	40.00	38835	970.875	0.21254
A4	0.0203	40.00	33774	844.350	0.18484
A4	0.0287	40.00	31396	784.900	0.17183
A4	0.0353	40.00	31538	788.450	0.17261
A4	0.0512	40.00	24920	623.000	0.13639
A4	0.0683	40.00	21988	549.700	0.12034
A4	0.1028	40.00	16799	419.975	0.09194



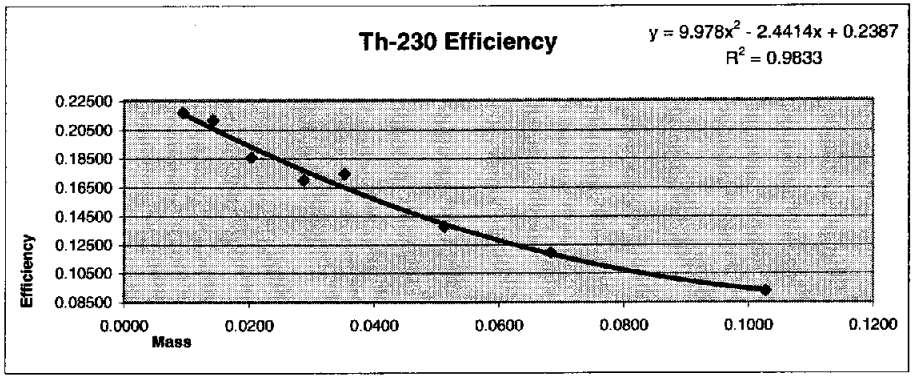
Alpha Th-230 Attenuation Protean 12 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	39295	982.375	0.21506
A1	0.0142	40.00	38949	973.725	0.21317
A1	0.0203	40.00	33442	836.050	0.18303
A1	0.0287	40.00	31137	778.425	0.17041
A1	0.0353	40.00	31886	797.150	0.17451
A1	0.0512	40.00	24623	615.575	0.13476
A1	0.0683	40.00	21187	529.675	0.11596
A1	0.1028	40.00	16657	416.425	0.09116



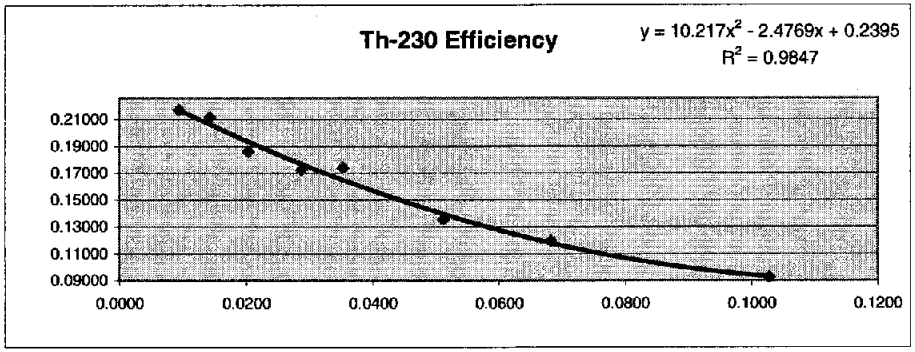
Alpha Th-230 Attenuation Protean 13 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	39672	991.800	0.21712
A2	0.0142	40.00	38730	968.250	0.21197
A2	0.0203	40.00	33934	848.350	0.18572
A2	0.0287	40.00	31105	777.625	0.17024
A2	0.0353	40.00	31817	795.425	0.17413
A2	0.0512	40.00	25209	630.225	0.13797
A2	0.0683	40.00	21832	545.800	0.11949
A2	0.1028	40.00	16969	424.225	0.09287



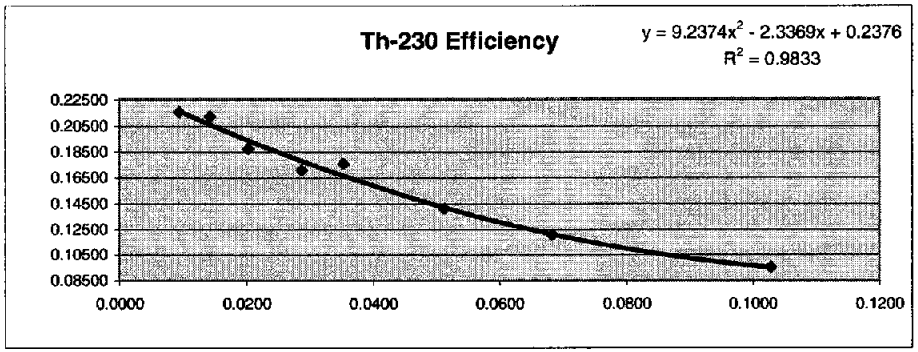
Alpha Th-230 Attenuation Protean 14 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	39676	991.900	0.21715
A3	0.0142	40.00	38679	966.975	0.21169
A3	0.0203	40.00	33971	849.275	0.18592
A3	0.0287	40.00	31499	787.475	0.17239
A3	0.0353	40.00	31810	795.250	0.17410
A3	0.0512	40.00	24757	618.925	0.13549
A3	0.0683	40.00	21843	546.075	0.11955
A3	0.1028	40.00	16918	422.950	0.09259



Alpha Th-230 Attenuation Protean 15 03/2007

Detector ID	Sample Wt	Count Time	Alpha Counts	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	39453	986.325	0.21593
A4	0.0142	40.00	38822	970.550	0.21247
A4	0.0203	40.00	34273	856.825	0.18758
A4	0.0287	40.00	31259	781.475	0.17108
A4	0.0353	40.00	32131	803.275	0.17585
A4	0.0512	40.00	25821	645.525	0.14132
A4	0.0683	40.00	22048	551.200	0.12067
A4	0.1028	40.00	17365	434.125	0.09504



TestAmerica STL

Protean

Voltage Plateaus and Discriminator Settings

Unit #1

MPC 9604 FACTORY PERFORMANCE EVALUATION

Factory performed tests for Instrument Serial Number: 233126-BO

Voltage Settings | **ULD Settings**

Alpha & Beta Voltage 1515 | A 7 C 7

Alpha Only Voltage 705 | B 7 D 7

Efficiencies: DETECTOR A

Sr/y 90 56.08 % | Tc-99 36.544 %

Ni-63 16.2 % | Th-230 @ A/B Voltage 24.895 %

Th-230 @ A only Voltage 22.403 %

Efficiencies: DETECTOR B

Sr/y 90 55.438 % | Tc-99 36.418 %

Ni-63 15.62 % | Th-230 @ A/B Voltage 24.341 %

Th-230 @ A only Voltage 22.350 %

Efficiencies: DETECTOR C

Sr/y 90 56.114 % | Tc-99 36.527 %

Ni-63 15.9 % | Th-230 @ A/B Voltage 24.466 %

Th-230 @ A only Voltage 22.627 %

Efficiencies: DETECTOR D

Sr/y 90 53.276 % | Tc-99 34.957 %

Ni-63 15.78 % | Th-230 @ A/B Voltage 24.717 %

Th-230 @ A only Voltage 23.019 %

Backgrounds

Detector A:

Alpha Background 0.07
Beta Background 0.64

Detector B:

Alpha Background 0.05
Beta Background 0.52

Detector C:

Alpha Background 0.06
Beta Background 0.47

Detector D:

Alpha Background 0.05
Beta Background 0.51

Background Count Time was 1000 Minutes.

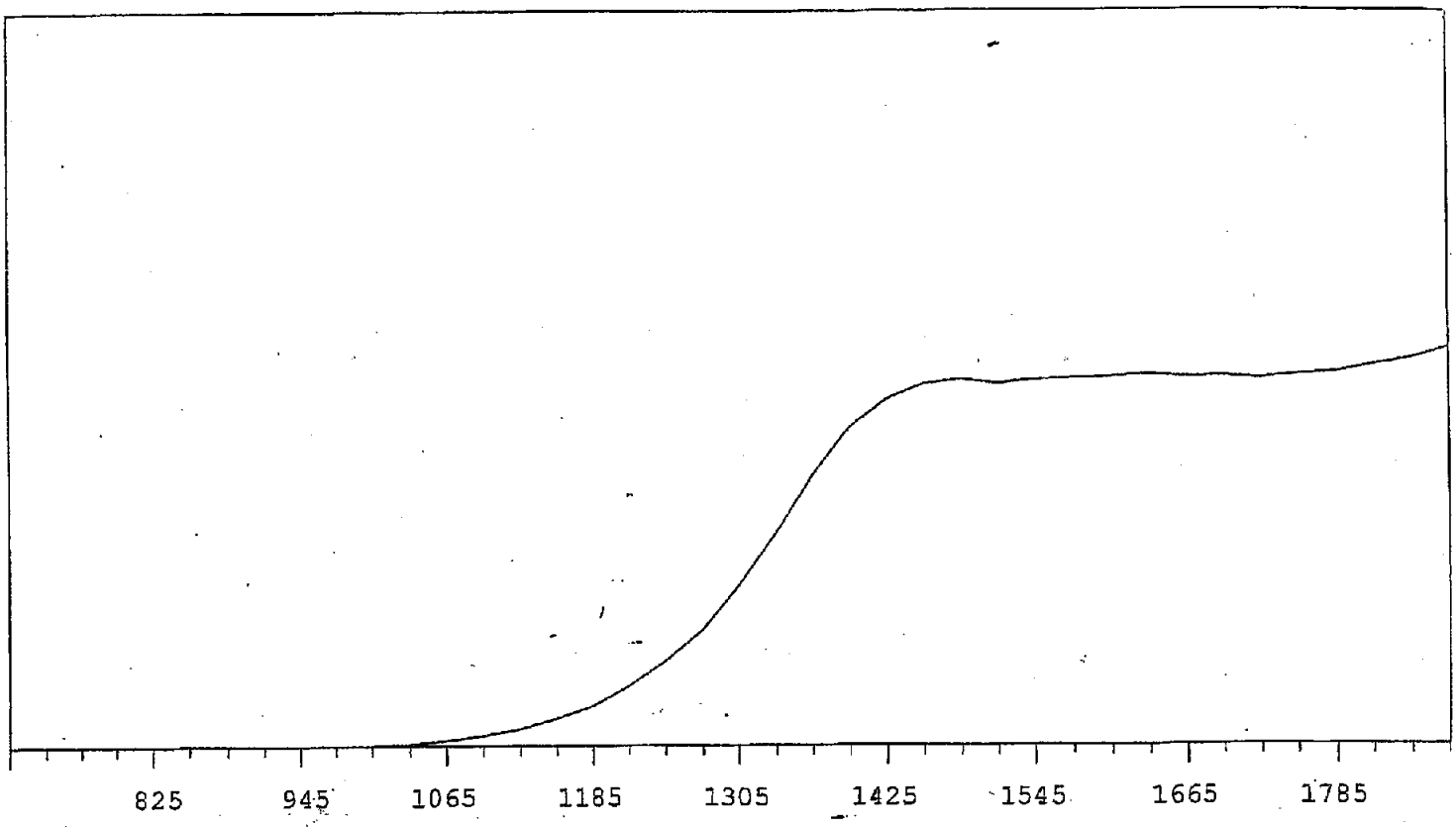
Tests performed and recorded by: Gregory D. Walker

Date: 11/26/02

*ALL EFFICIENCIES WERE OBTAINED USING A 2" DISTRIBUTED SOURCE AT OPTIMAL GEOMETRY EXCEPT Th-230, WHICH WAS AT A DEPTH OF ¼".

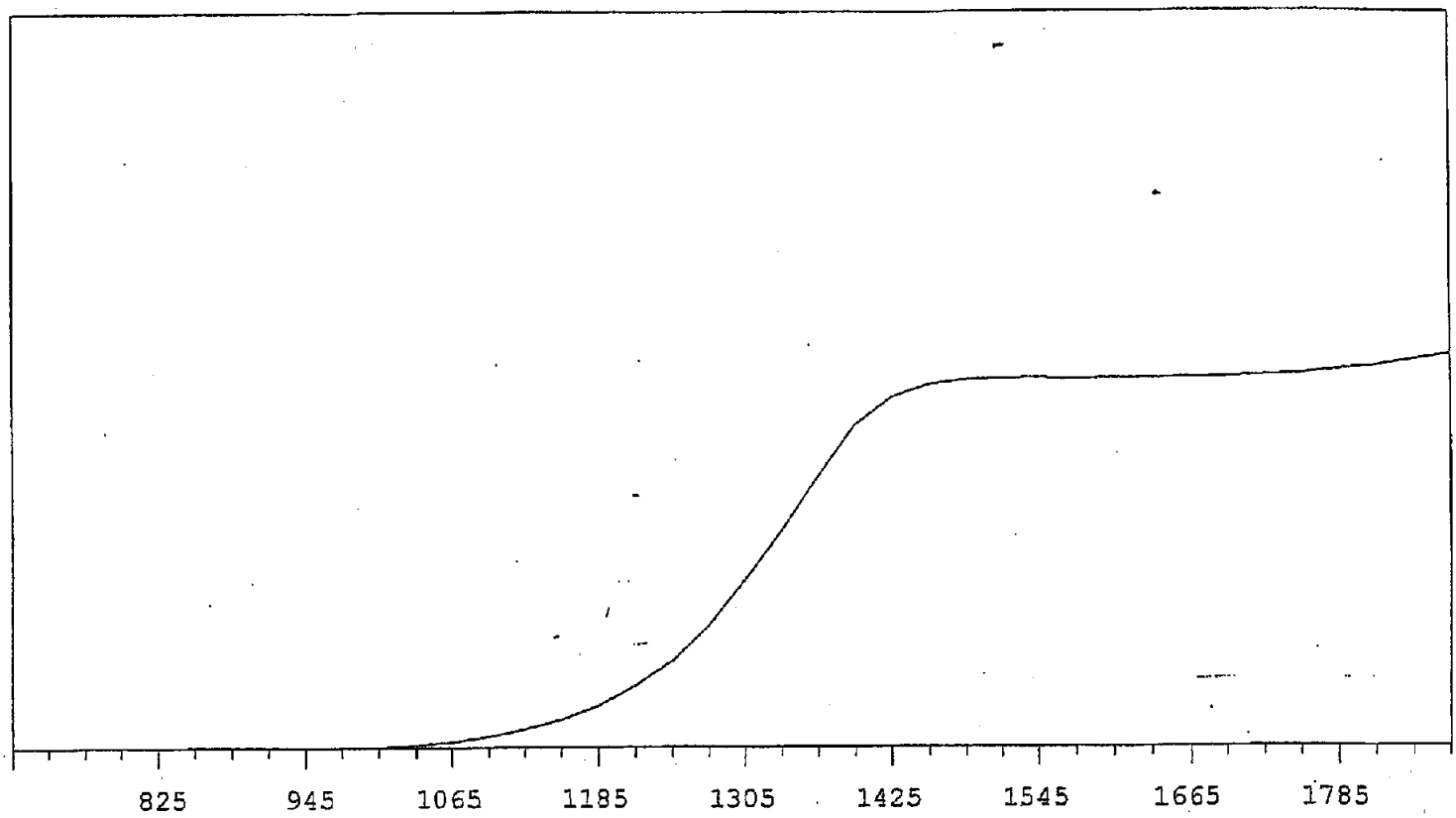
Unit #1

MPC 9604 Plateau 1 MPC 9604 Detector A 11/18/2002
Alpha Volts: 705 Beta Volts: 1515



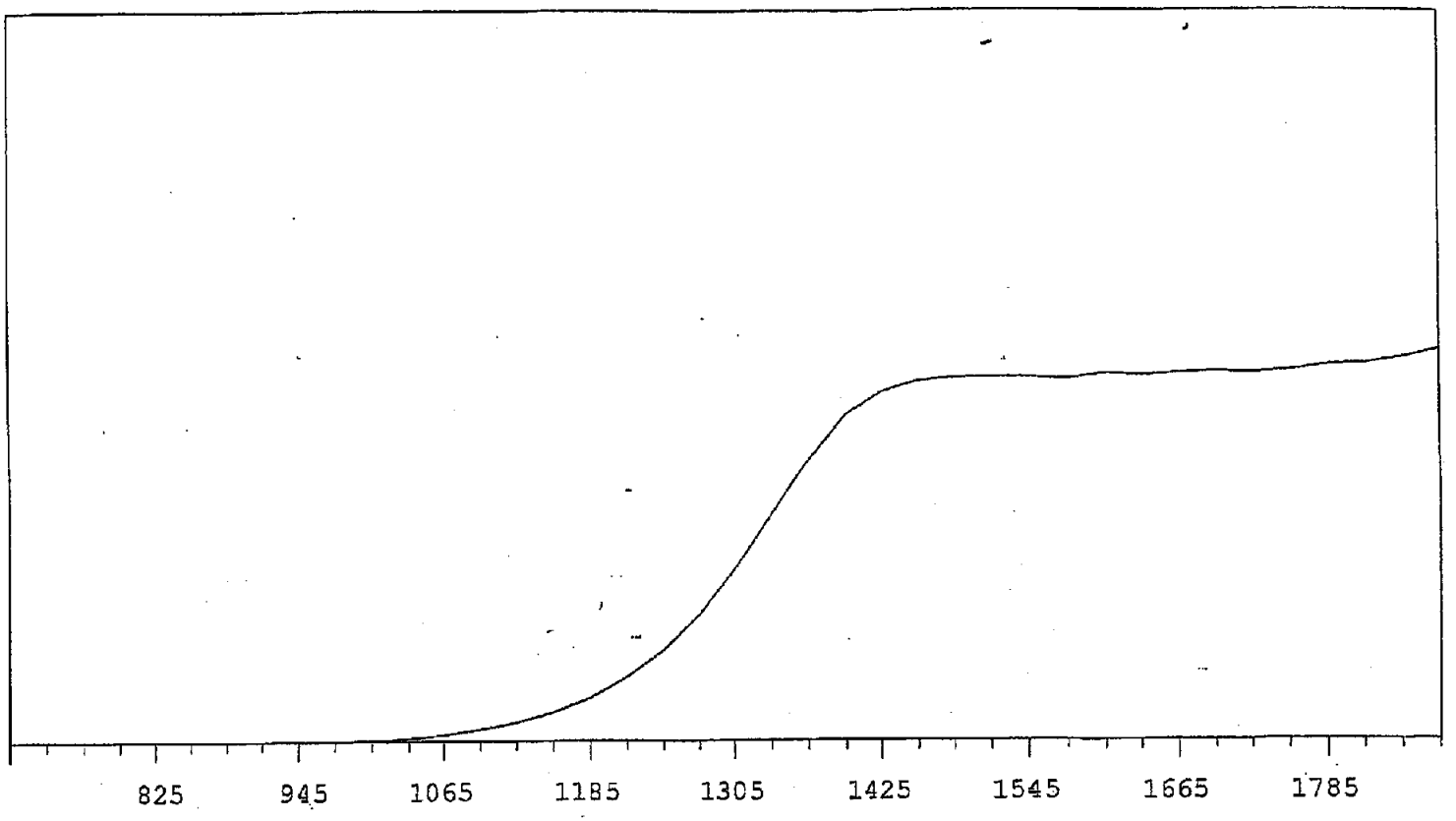
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	16470	+92.44
735	2		1335	21902	+79.58
765	0	-33.33	1365	27818	+60.78
795	1	-33.33	1395	32763	+41.06
825	1	+0.00	1425	35569	+23.50
855	1	>100	1455	37141	+10.27
885	0	+41.67	1485	37680	+3.87
915	0	>100	1515	37264	+1.20
945	2	>100	1545	37658	+1.01
975	13	>100	1575	37826	+1.90
1005	48	>100	1605	37972	+0.72
1035	196	>100	1635	38183	+0.12
1065	548	>100	1665	37888	-0.71
1095	1042	>100	1695	37936	-0.41
1125	1730	>100	1725	37694	+0.85
1155	2776	>100	1755	38048	+2.46
1185	4064	>100	1785	38316	+4.39
1215	6147	>100	1815	39036	+6.01
1245	8704	>100	1845	39740	
1275	11959	>100	1875	40868	
1305	16470	+92.44			
1335	21902	+79.58			

MPC 9604 Plateau 1 MPC 9604 Detector B 11/18/2002
Alpha Volts: 705 Beta Volts: 1515



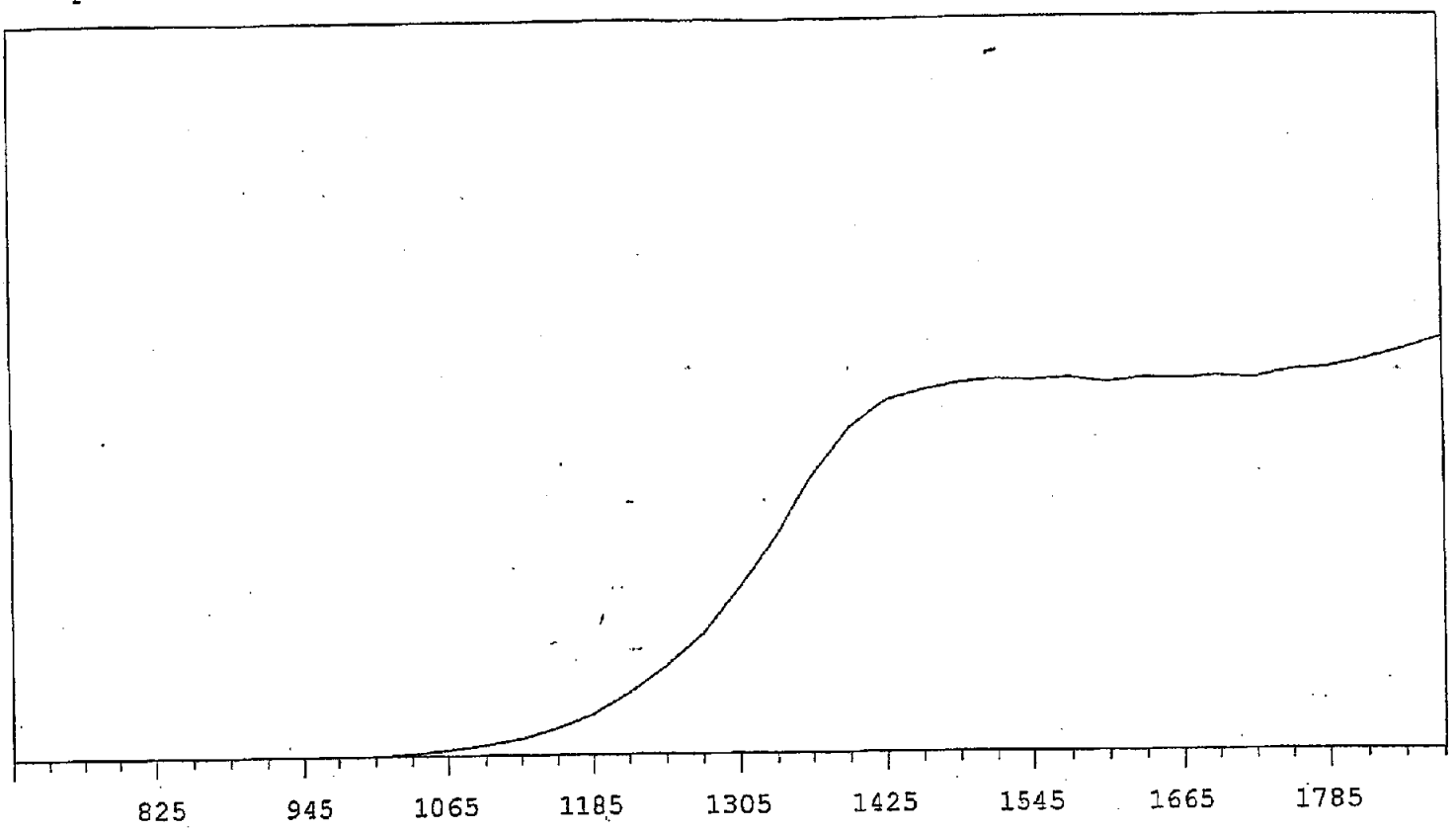
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	3		1305	37846	+89.73
735	2		1335	49400	+76.76
765	2		1365	61824	+59.37
795	0	>100	1395	73411	+40.47
825	0	>100	1425	79657	+23.20
855	0	>100	1455	82603	+10.52
885	1	>100	1485	83765	+4.29
915	0	>100	1515	84094	+1.27
945	1	>100	1545	84247	+0.38
975	20	>100	1575	83954	+0.14
1005	136	>100	1605	84310	+0.17
1035	480	>100	1635	84238	+0.30
1065	1292	>100	1665	84323	+0.33
1095	2449	>100	1695	84330	+0.75
1125	4069	>100	1725	84682	+1.66
1155	6233	>100	1755	85015	+2.61
1185	9445	>100	1785	86099	+3.67
1215	14086	>100	1815	86967	+4.57
1245	19724	>100	1845	88449	
1275	27772	+99.39	1875	89824	
1305	37846	+89.73			
1335	49400	+76.76			

MPC 9604 Plateau 1 MPC 9604 Detector C 11/19/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	2		1305	39510	+89.34
735	1		1335	52183	+75.00
765	2		1365	64681	+56.02
795	0	-83.33	1395	75266	+36.30
825	0	>100	1425	80414	+19.94
855	1	>100	1455	83043	+8.78
885	0	>100	1485	83971	+3.46
915	1	>100	1515	84202	+0.54
945	5	>100	1545	84151	+0.51
975	40	>100	1575	83636	+0.50
1005	178	>100	1605	84901	+0.90
1035	611	>100	1635	84465	+1.26
1065	1455	>100	1665	84881	+0.31
1095	2686	>100	1695	85245	+0.76
1125	4338	>100	1725	84904	+1.52
1155	6682	>100	1755	85423	+2.21
1185	9895	>100	1785	86741	+3.54
1215	14706	>100	1815	87179	+4.71
1245	20868	>100	1845	88620	
1275	29167	+99.72	1875	90675	
1305	39510	+89.34			
1335	52183	+75.00			

MPC 9604 Plateau 1 MPC 9604 Detector D 11/19/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	3	+0.00
795	2	>100
825	0	-95.24
855	0	-83.33
885	2	+0.00
915	0	>100
945	0	>100
975	8	>100
1005	61	>100
1035	224	>100
1065	577	>100
1095	1071	>100
1125	1681	>100
1155	2740	>100
1185	4109	>100
1215	6232	>100
1245	8882	>100
1275	12116	>100
1305	16823	+91.81
1335	22142	+78.78

VOLTS	COUNTS	%/100 Volts
1305	16823	+91.81
1335	22142	+78.78
1365	28133	+59.68
1395	32974	+39.42
1425	35720	+22.04
1455	36766	+10.79
1485	37553	+4.71
1515	37914	+2.42
1545	37768	+0.04
1575	38025	-0.08
1605	37519	+0.04
1635	37994	+0.32
1665	37808	+0.54
1695	38062	+1.00
1725	37790	+2.13
1755	38573	+3.55
1785	38772	+5.80
1815	39626	+7.23
1845	40662	
1875	41958	

#2

MPC 9604 FACTORY PERFORMANCE EVALUATION

Factory performed tests for Instrument Serial Number: 236534

Voltage Settings | **ULD Settings**

Alpha & Beta Voltage 1515 | A 7.0 C 7.0

Alpha Only Voltage 705 | B 7.0 D 7.0

Efficiencies: DETECTOR A

Sr/y 90 55.844 % Tc-99 36.440 %

Ni-63 16.731 % Th-230 @ A/B Voltage 25.353 %

Th-230 @ A only Voltage 22.314 %

Efficiencies: DETECTOR B

Sr/y 90 55.898 % Tc-99 36.482 %

Ni-63 16.599 % Th-230 @ A/B Voltage 24.934 %

Th-230 @ A only Voltage 22.036 %

Efficiencies: DETECTOR C

Sr/y 90 55.644 % Tc-99 37.968 %

Ni-63 15.840 % Th-230 @ A/B Voltage 24.941 %

Th-230 @ A only Voltage 22.747 %

Efficiencies: DETECTOR D

Sr/y 90 54.607 % Tc-99 37.028 %

Ni-63 16.089 % Th-230 @ A/B Voltage 24.430 %

Th-230 @ A only Voltage 21.638 %

Backgrounds

Detector A:

Alpha Background 0.06
Beta Background 0.452

Detector B:

Alpha Background 0.07
Beta Background 0.475

Detector C:

Alpha Background 0.08
Beta Background 0.470

Detector D:

Alpha Background 0.083
Beta Background 0.481

Background Count Time was 500 Minutes.

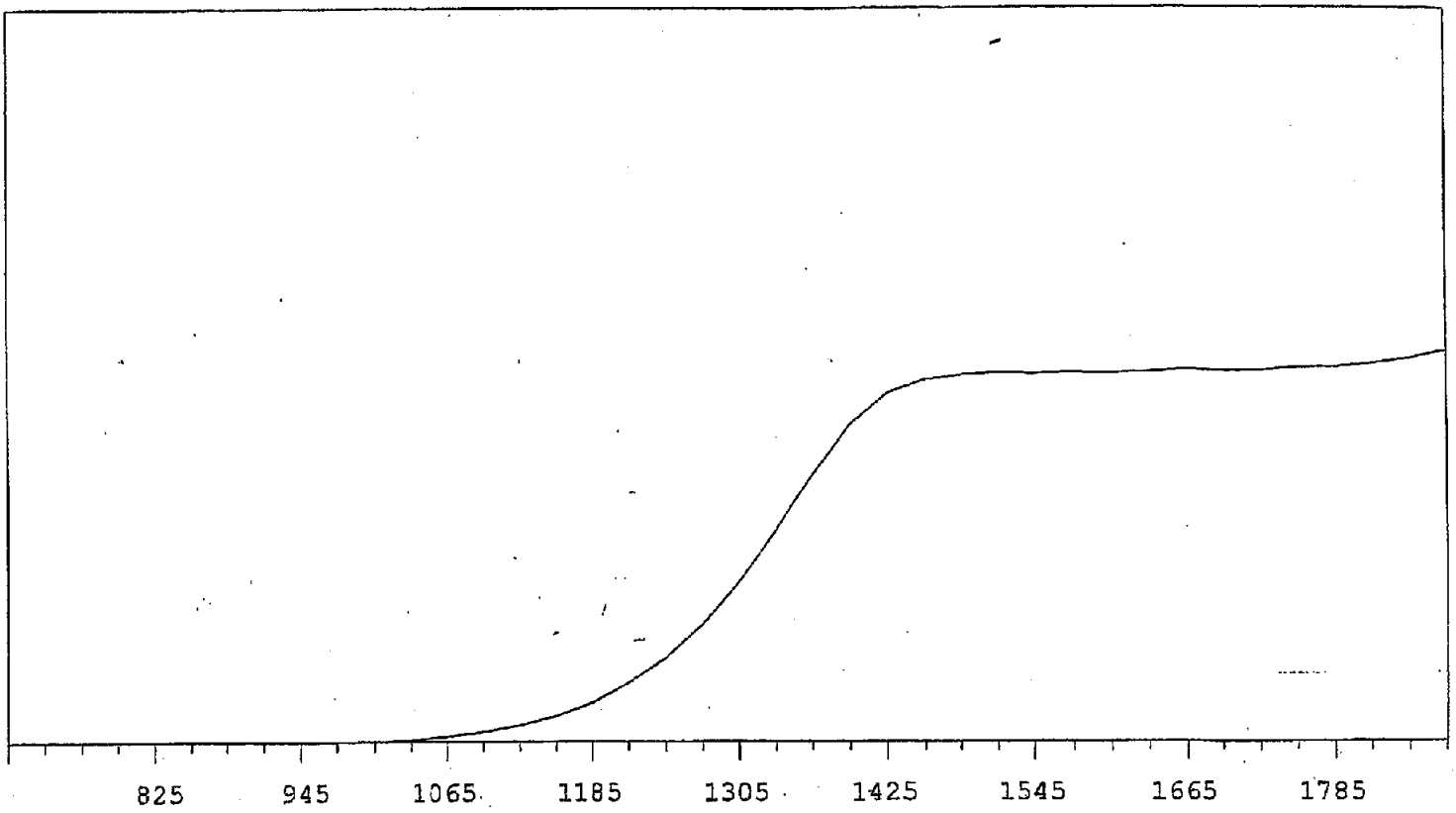
Tests performed and recorded by: [signature]

Date: 12/31/02

*ALL EFFICIENCIES WERE OBTAINED USING A 2" DISTRIBUTED SOURCE AT OPTIMAL GEOMETRY EXCEPT Th-230, WHICH WAS AT A DEPTH OF ¼".

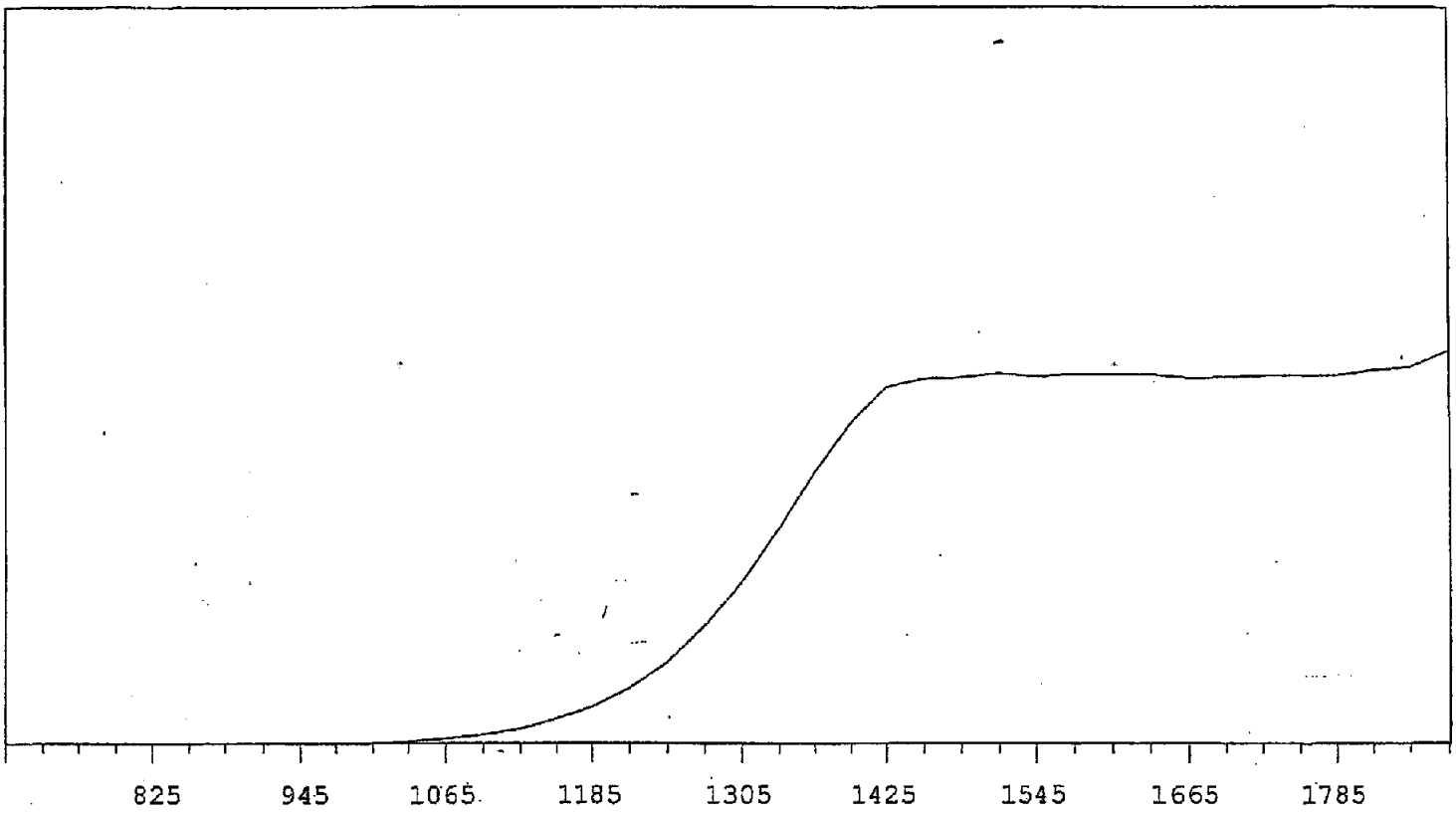
Unit #32 JRC 1-26-04

MPC 9604 Plateau 1 MPC 9604 Detector A 12/16/2002
Alpha Volts: 705 Beta Volts: 1335



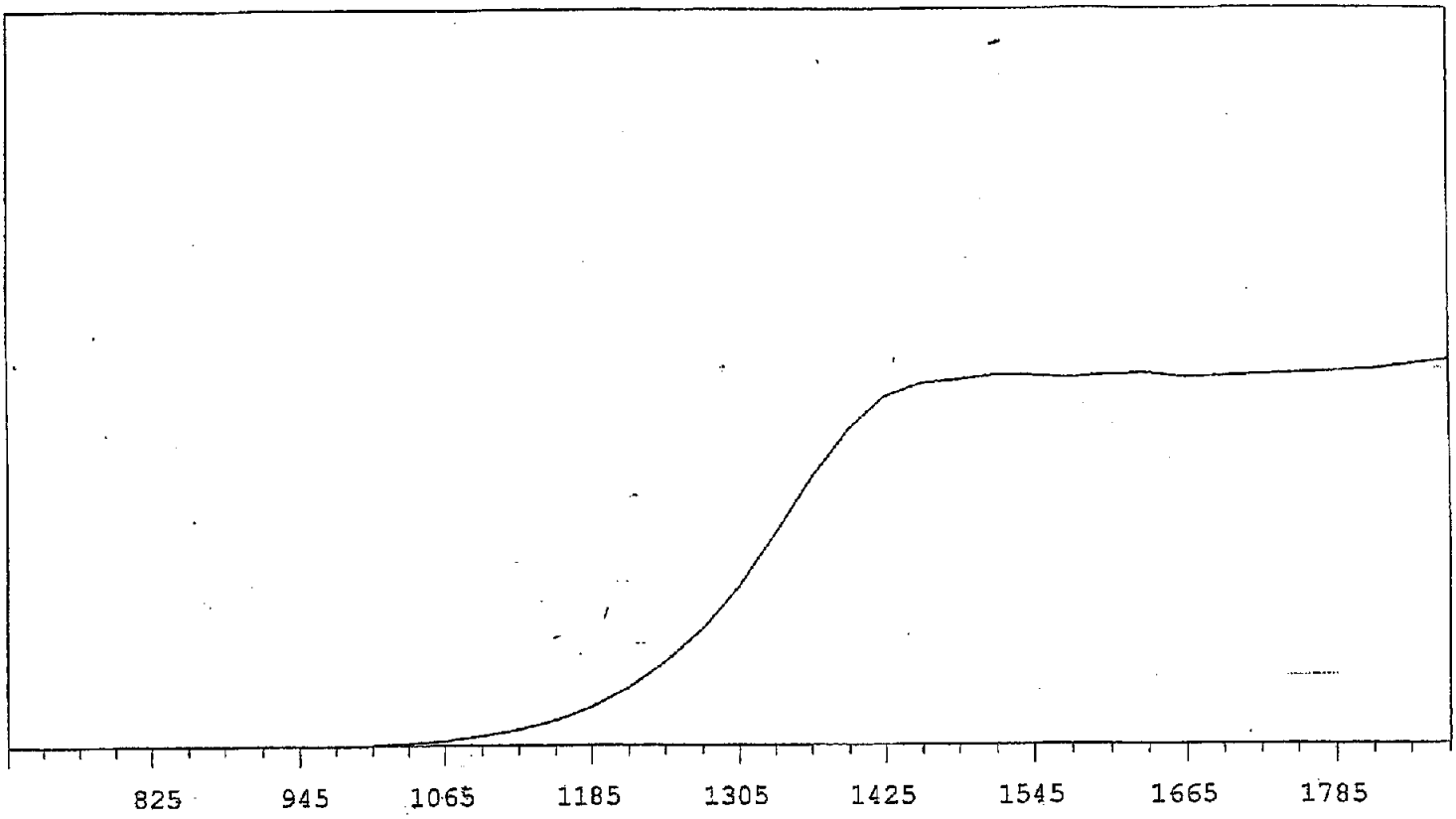
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	36094	+91.50
735	1		1335	47847	+79.16
765	0		1365	60405	+61.85
795	1	>100	1395	71873	+42.39
825	0	+83.33	1425	78827	+24.53
855	0	+55.56	1455	81991	+11.59
885	1	>100	1485	83024	+4.37
915	1	>100	1515	83664	+1.56
945	1	>100	1545	83373	+0.42
975	19	>100	1575	83766	+0.14
1005	129	>100	1605	83496	+0.77
1035	425	>100	1635	83774	+0.43
1065	1183	>100	1665	84339	+0.47
1095	2313	>100	1695	83891	+0.57
1125	3764	>100	1725	84026	+0.69
1155	5857	>100	1755	84655	+1.58
1185	8765	>100	1785	84828	+2.39
1215	13328	>100	1815	85494	+3.58
1245	19028	>100	1845	86654	
1275	26407	>100	1875	88364	
1305	36094	+91.50			
1335	47847	+79.16			

MPC 9604 Plateau 1 MPC 9604 Detector B 12/17/2002
Alpha Volts: 705 Beta Volts: 1335



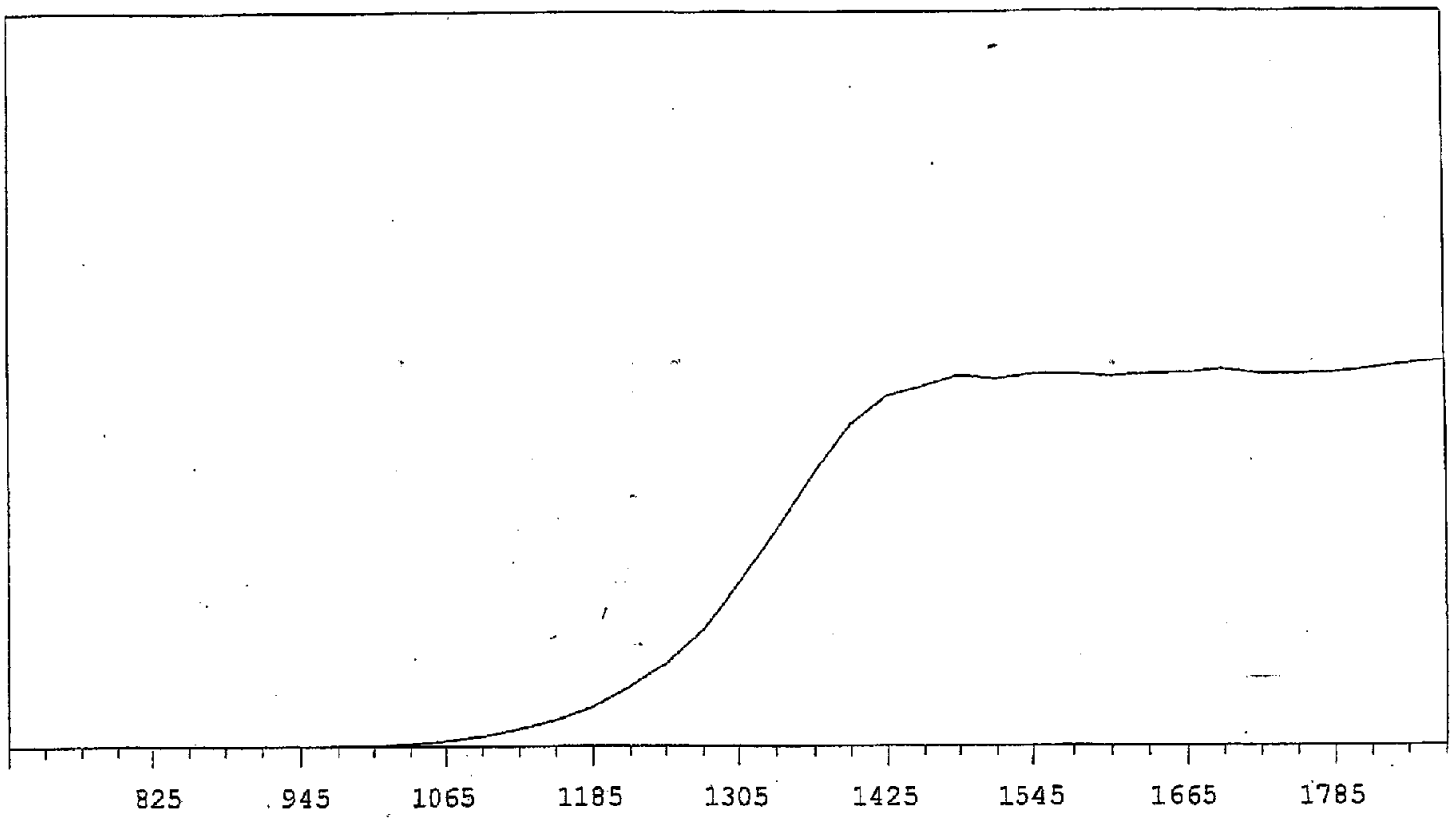
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	18047	+94.23
735	2		1335	23993	+79.11
765	0		1365	30302	+61.92
795	0	>100	1395	35719	+41.62
825	0	>100	1425	39617	+22.93
855	0	>100	1455	40588	+10.10
885	1	>100	1485	40726	+2.37
915	0	>100	1515	41160	+0.87
945	3	>100	1545	40771	+0.55
975	10	>100	1575	41098	+0.19
1005	58	>100	1605	41093	-0.14
1035	228	>100	1635	41116	-0.87
1065	543	>100	1665	40678	-0.49
1095	1009	>100	1695	40773	+0.05
1125	1647	>100	1725	40966	+0.68
1155	2812	>100	1755	41000	+1.27
1185	4080	>100	1785	40979	+1.90
1215	6168	>100	1815	41547	+4.96
1245	9044	>100	1845	41867	
1275	13094	>100	1875	43664	
1305	18047	+94.23			
1335	23993	+79.11			

MPC 9604 Plateau 1 MPC 9604 Detector C 12/16/2002
Alpha Volts: 705 Beta Volts: 1335



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	35990	+92.57
735	1		1335	47931	+79.59
765	0	+83.33	1365	60935	+62.26
795	0	>100	1395	71927	+42.50
825	1	>100	1425	79292	+24.26
855	2	-55.56	1455	82417	+11.85
885	0	>100	1485	83187	+4.61
915	0	>100	1515	84234	+1.35
945	0	>100	1545	84096	+0.71
975	14	>100	1575	83650	+0.45
1005	106	>100	1605	84371	+0.14
1035	468	>100	1635	84668	+0.04
1065	1134	>100	1665	83768	-0.23
1095	2223	>100	1695	83996	+0.27
1125	3673	>100	1725	84414	+1.38
1155	5797	>100	1755	84690	+1.53
1185	8786	>100	1785	85170	+2.05
1215	13052	>100	1815	85563	+2.91
1245	18927	>100	1845	86605	
1275	26347	>100	1875	87723	
1305	35990	+92.57			
1335	47931	+79.59			

MPC 9604 Plateau 1 MPC 9604 Detector D 12/16/2002
Alpha Volts: 705 Beta Volts: 1335



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16474	+93.61
735	1		1335	21880	+79.65
765	0	+0.00	1365	27760	+60.71
795	1	>100	1395	32659	+40.09
825	0	>100	1425	35549	+23.08
855	0	+83.33	1455	36556	+10.47
885	2	>100	1485	37588	+4.60
915	1	>100	1515	37281	+2.31
945	1	>100	1545	37736	+0.31
975	6	>100	1575	37775	+0.67
1005	51	>100	1605	37518	+0.27
1035	240	>100	1635	37766	+1.07
1065	524	>100	1665	37896	+0.77
1095	1011	>100	1695	38192	-0.15
1125	1744	>100	1725	37742	-0.45
1155	2674	>100	1755	37757	+0.29
1185	4004	>100	1785	37860	+2.27
1215	6095	>100	1815	38301	+3.24
1245	8485	>100	1845	38765	
1275	11865	>100	1875	39170	
1305	16474	+93.61			
1335	21880	+79.65			

#3

MPC 9604 FACTORY PERFORMANCE EVALUATION

Factory performed tests for Instrument Serial Number: 236532

Voltage Settings		ULD Settings	
Alpha & Beta Voltage	1515	A 7.0	C 7.0
Alpha Only Voltage	705	B 7.0	D 7.0

Efficiencies: DETECTOR A

Sr/y 90 54.530 % Tc-99 35.69 %

Ni-63 14.385 % Th-230 @ A/B Voltage 24.440 %

Th-230 @ A only Voltage 22.047 %

Efficiencies: DETECTOR B

Sr/y 90 54.993 % Tc-99 36.209 %

Ni-63 15.309 % Th-230 @ A/B Voltage 24.041 %

Th-230 @ A only Voltage 21.872 %

Efficiencies: DETECTOR C

Sr/y 90 54.541 % Tc-99 35.67 %

Ni-63 15.117 % Th-230 @ A/B Voltage 24.212 %

Th-230 @ A only Voltage 21.800 %

Efficiencies: DETECTOR D

Sr/y 90 54.296 % Tc-99 35.380 %

Ni-63 13.326 % Th-230 @ A/B Voltage 24.802 %

Th-230 @ A only Voltage 22.584 %

Backgrounds

Detector A:		Detector B:	
Alpha Background	0.05	Alpha Background	0.06
Beta Background	0.619	Beta Background	0.497

Detector C:		Detector D:	
Alpha Background	0.04	Alpha Background	0.05
Beta Background	0.516	Beta Background	0.716

Background Count Time was 500 Minutes.

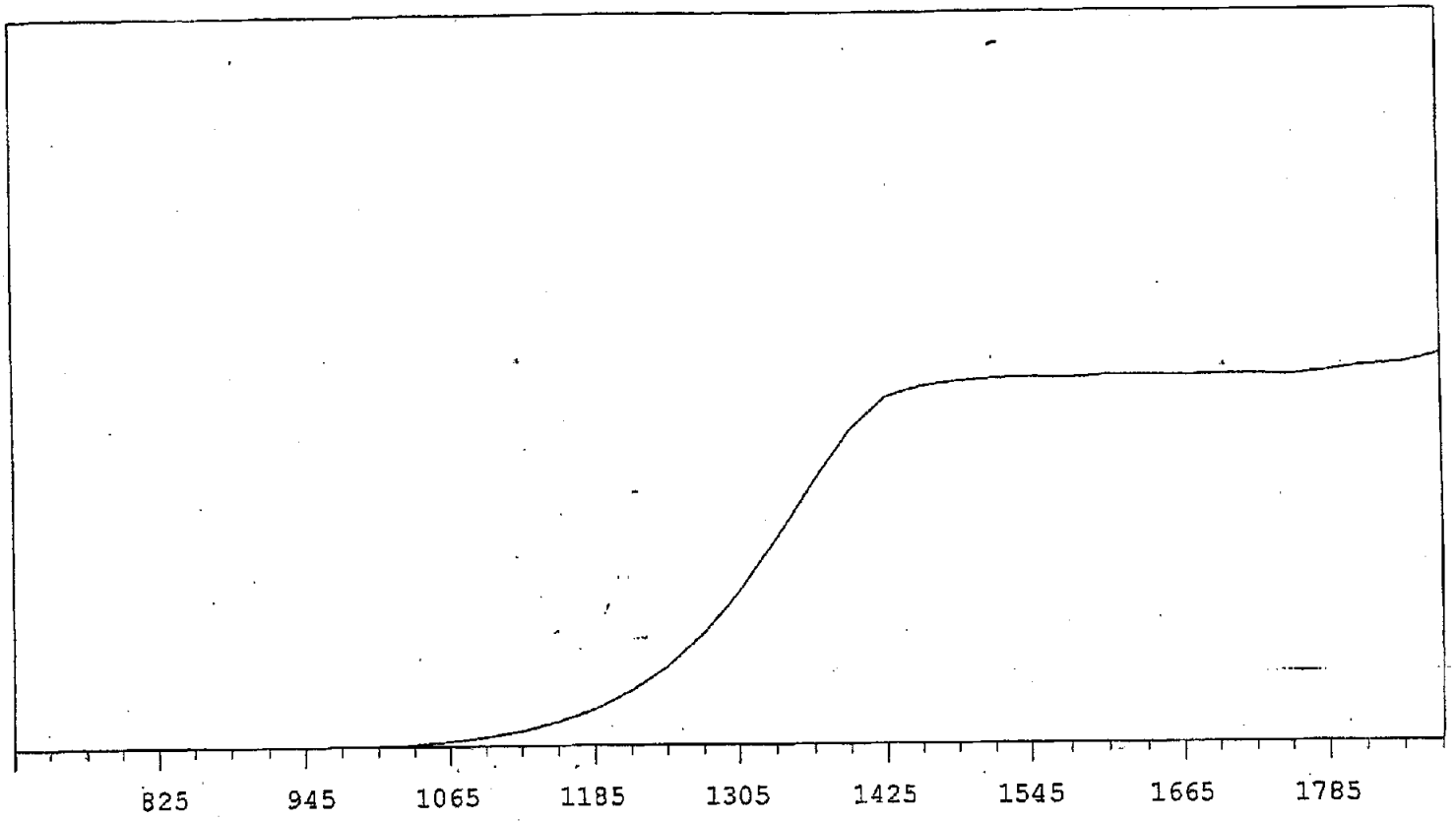
Tests performed and recorded by: [signature]

Date: 12/31/02

*ALL EFFICIENCIES WERE OBTAINED USING A 2" DISTRIBUTED SOURCE AT OPTIMAL GEOMETRY EXCEPT Th-230, WHICH WAS AT A DEPTH OF ¼".

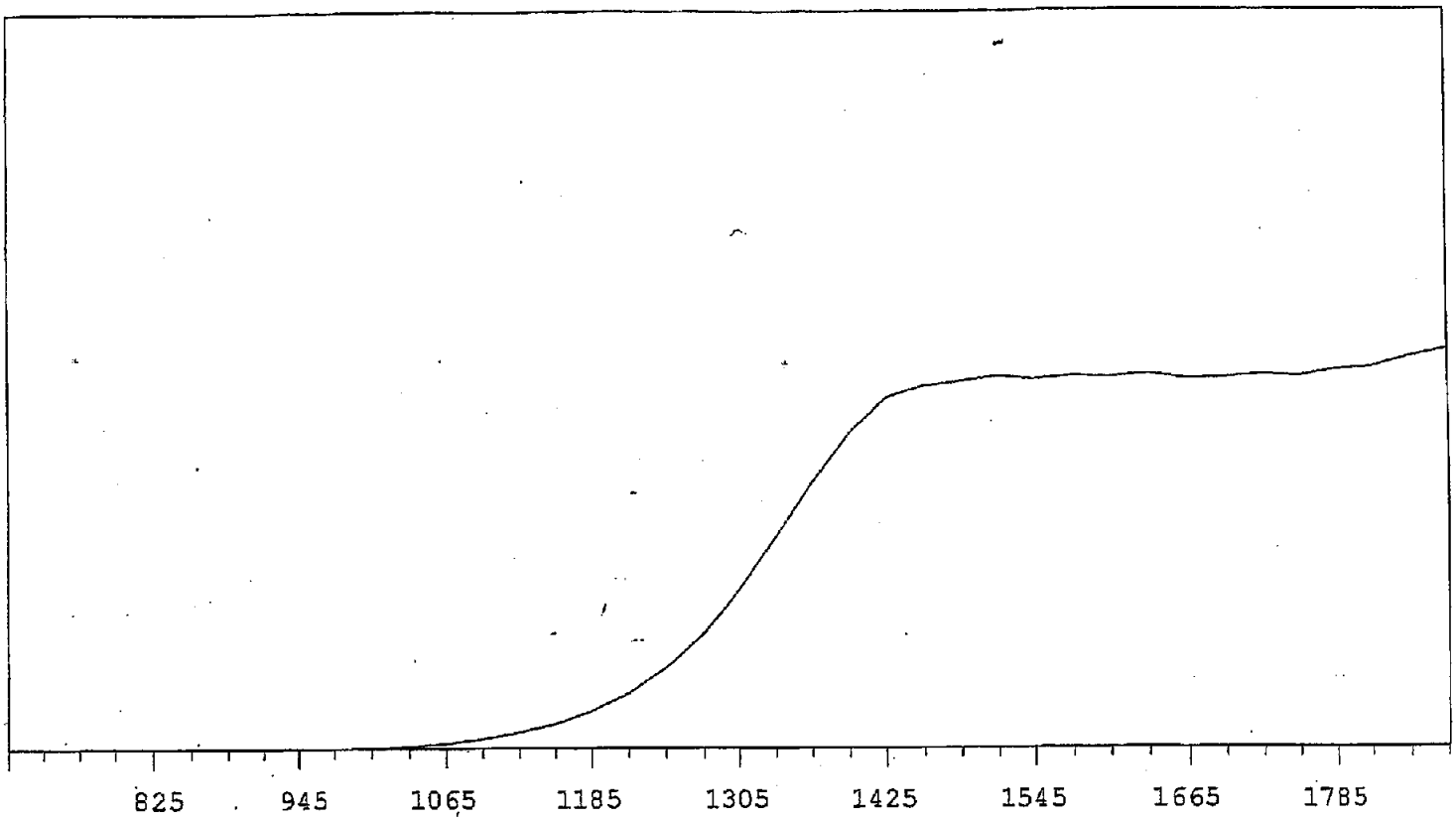
Unit #3

MPC 9604 Plateau 3 MPC 9604 Detector A 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



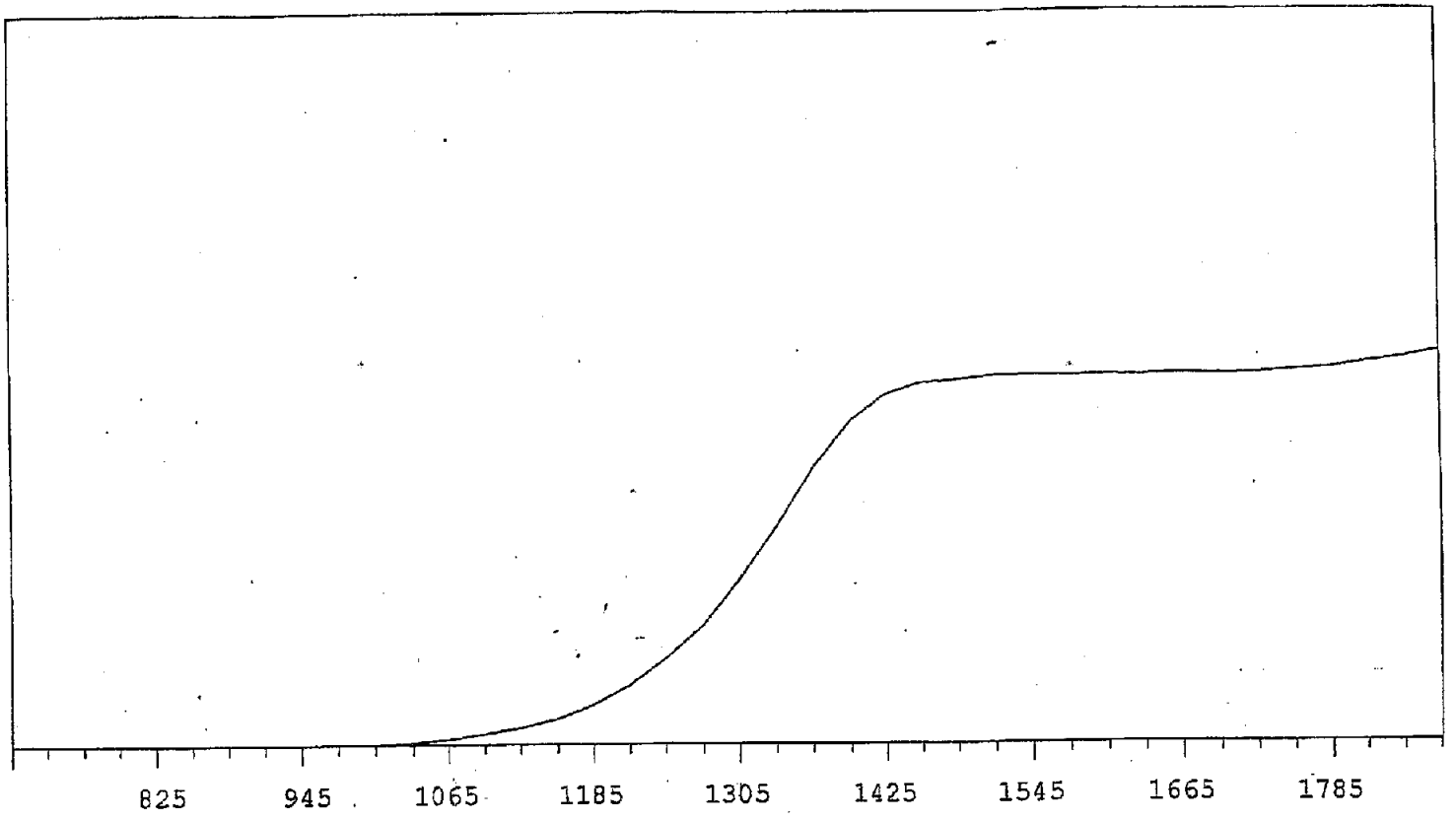
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	35294	+94.49
735	1		1335	47171	+81.80
765	1	-41.67	1365	60476	+64.73
795	0	+0.00	1395	72428	+43.87
825	1	-55.56	1425	80027	+24.74
855	1	-83.33	1455	82481	+11.18
885	0	>100	1485	83577	+4.19
915	0	>100	1515	84156	+1.60
945	4	>100	1545	84396	+0.77
975	3	>100	1575	84086	+0.47
1005	70	>100	1605	84586	+0.33
1035	340	>100	1635	84651	+0.59
1065	1026	>100	1665	84530	+0.30
1095	2029	>100	1695	84858	+0.13
1125	3406	>100	1725	84861	+0.66
1155	5535	>100	1755	84646	+1.63
1185	8369	>100	1785	85477	+2.55
1215	12673	>100	1815	86640	+4.05
1245	18158	>100	1845	87146	
1275	25828	>100	1875	89075	
1305	35294	+94.49			
1335	47171	+81.80			

MPC 9604 Plateau 3 MPC 9604 Detector B 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



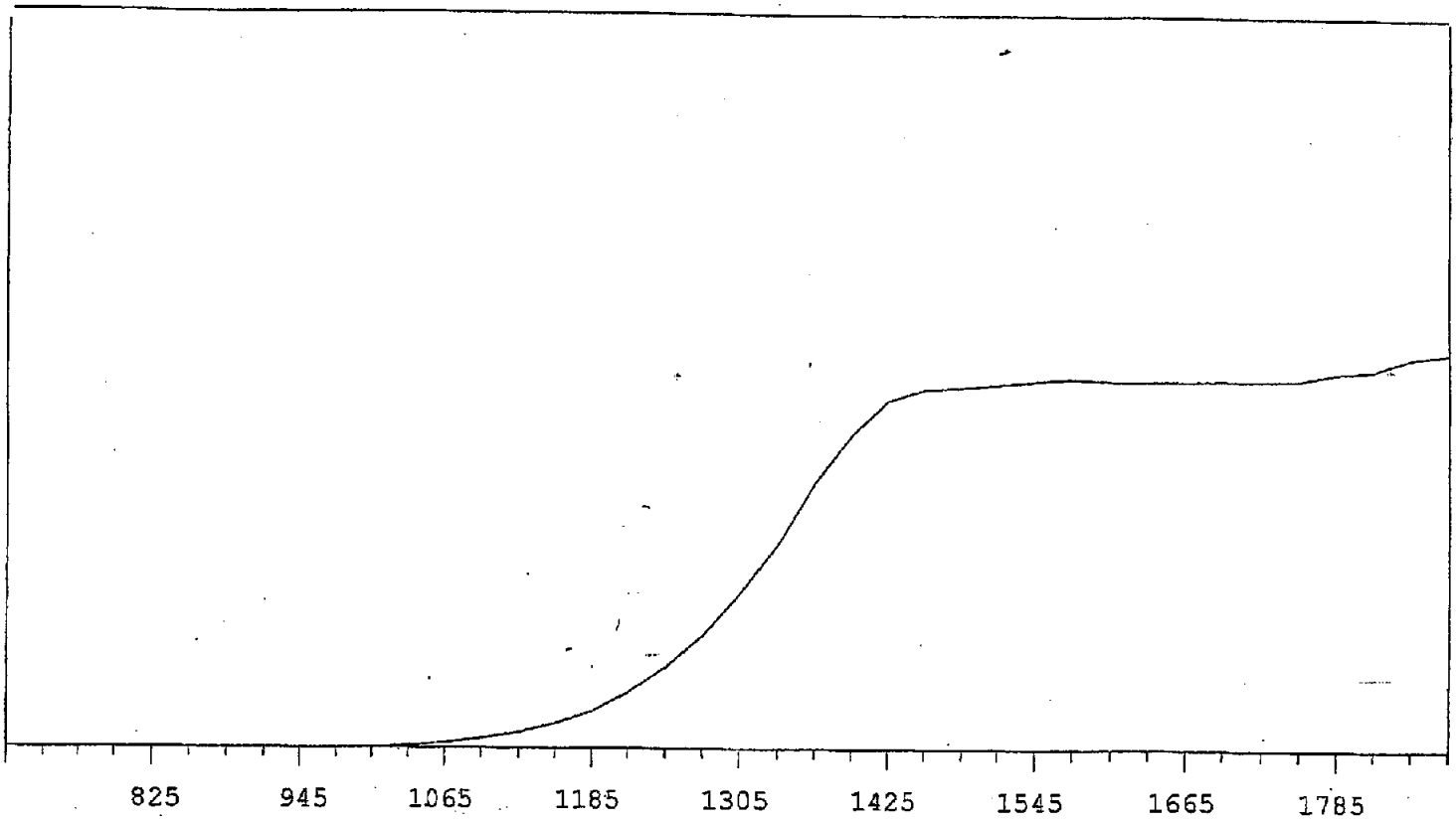
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	2		1305	16243	+93.24
735	1		1335	21731	+79.13
765	0		1365	27200	+62.01
795	0	>100	1395	32178	+42.43
825	1	>100	1425	35788	+25.03
855	4	-33.33	1455	37031	+12.41
885	0	>100	1485	37518	+4.25
915	0	-20.83	1515	38036	+1.82
945	1	>100	1545	37656	+0.52
975	3	>100	1575	37987	+0.42
1005	51	>100	1605	37837	+0.14
1035	181	>100	1635	38182	-0.55
1065	497	>100	1665	37639	+0.15
1095	964	>100	1695	37774	-0.05
1125	1656	>100	1725	38127	+1.81
1155	2551	>100	1755	37910	+2.19
1185	3834	>100	1785	38605	+3.76
1215	5718	>100	1815	38791	+5.71
1245	8336	>100	1845	39868	
1275	11756	>100	1875	40630	
1305	16243	+93.24			
1335	21731	+79.13			

MPC 9604 Plateau 3 MPC 9604 Detector C 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	37587	+92.10
735	1		1335	49689	+78.64
765	0	-55.56	1365	62948	+59.67
795	0	-83.33	1395	73852	+39.59
825	1	+0.00	1425	79926	+21.65
855	0	>100	1455	82659	+10.02
885	0	>100	1485	83402	+4.31
915	0	>100	1515	84267	+1.73
945	3	>100	1545	84482	+0.88
975	22	>100	1575	84291	+0.00
1005	101	>100	1605	84505	+0.24
1035	486	>100	1635	84261	+0.22
1065	1178	>100	1665	84807	+0.24
1095	2481	>100	1695	84420	+0.83
1125	3840	>100	1725	84730	+1.15
1155	5896	>100	1755	85357	+2.52
1185	9085	>100	1785	85810	+3.26
1215	13626	>100	1815	87107	+4.16
1245	19695	>100	1845	88075	
1275	27244	>100	1875	89672	
1305	37587	+92.10			
1335	49689	+78.64			

MPC 9604 Plateau 3 MPC 9604 Detector D 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	9	>100
1005	46	>100
1035	205	>100
1065	519	>100
1095	975	>100
1125	1608	>100
1155	2563	>100
1185	3812	>100
1215	5780	>100
1245	8319	>100
1275	11591	>100
1305	15935	+93.94
1335	21039	+81.17

VOLTS	COUNTS	%/100 Volts
1305	15935	+93.94
1335	21039	+81.17
1365	27326	+63.87
1395	32222	+43.56
1425	35674	+23.86
1455	36879	+11.05
1485	37110	+4.30
1515	37448	+2.64
1545	37776	+1.77
1575	38028	+0.73
1605	37822	-0.15
1635	37836	-0.25
1665	37786	+0.15
1695	37906	+0.36
1725	37873	+1.75
1755	37997	+2.80
1785	38738	+5.15
1815	39085	+6.13
1845	40328	
1875	40827	

#4

MPC 9604 FACTORY PERFORMANCE EVALUATION

Factory performed tests for Instrument Serial Number: 236533

Voltage Settings **ULD Settings**

Alpha & Beta Voltage 1515 A 7.0 C 7.0

Alpha Only Voltage 705 B 7.0 D 7.0

Efficiencies: DETECTOR A

Sr/y 90 55.116 % Tc-99 36.67 %

Ni-63 16.083 % Th-230 @ A/B Voltage 24.835 %

Th-230 @ A only Voltage 21.648 %

Efficiencies: DETECTOR B

Sr/y 90 54.972 % Tc-99 36.409 %

Ni-63 15.648 % Th-230 @ A/B Voltage 24.479 %

Th-230 @ A only Voltage 22.123 %

Efficiencies: DETECTOR C

Sr/y 90 55.152 % Tc-99 36.257 %

Ni-63 15.587 % Th-230 @ A/B Voltage 23.546 %

Th-230 @ A only Voltage 21.714 %

Efficiencies: DETECTOR D

Sr/y 90 54.815 % Tc-99 36.269 %

Ni-63 15.94 % Th-230 @ A/B Voltage 24.314 %

Th-230 @ A only Voltage 22.574 %

Backgrounds

Detector A:		Detector B:	
Alpha Background	0.05	Alpha Background	0.04
Beta Background	0.609	Beta Background	0.718

Detector C:		Detector D:	
Alpha Background	0.06	Alpha Background	0.05
Beta Background	0.462	Beta Background	0.521

Background Count Time was 500 Minutes.

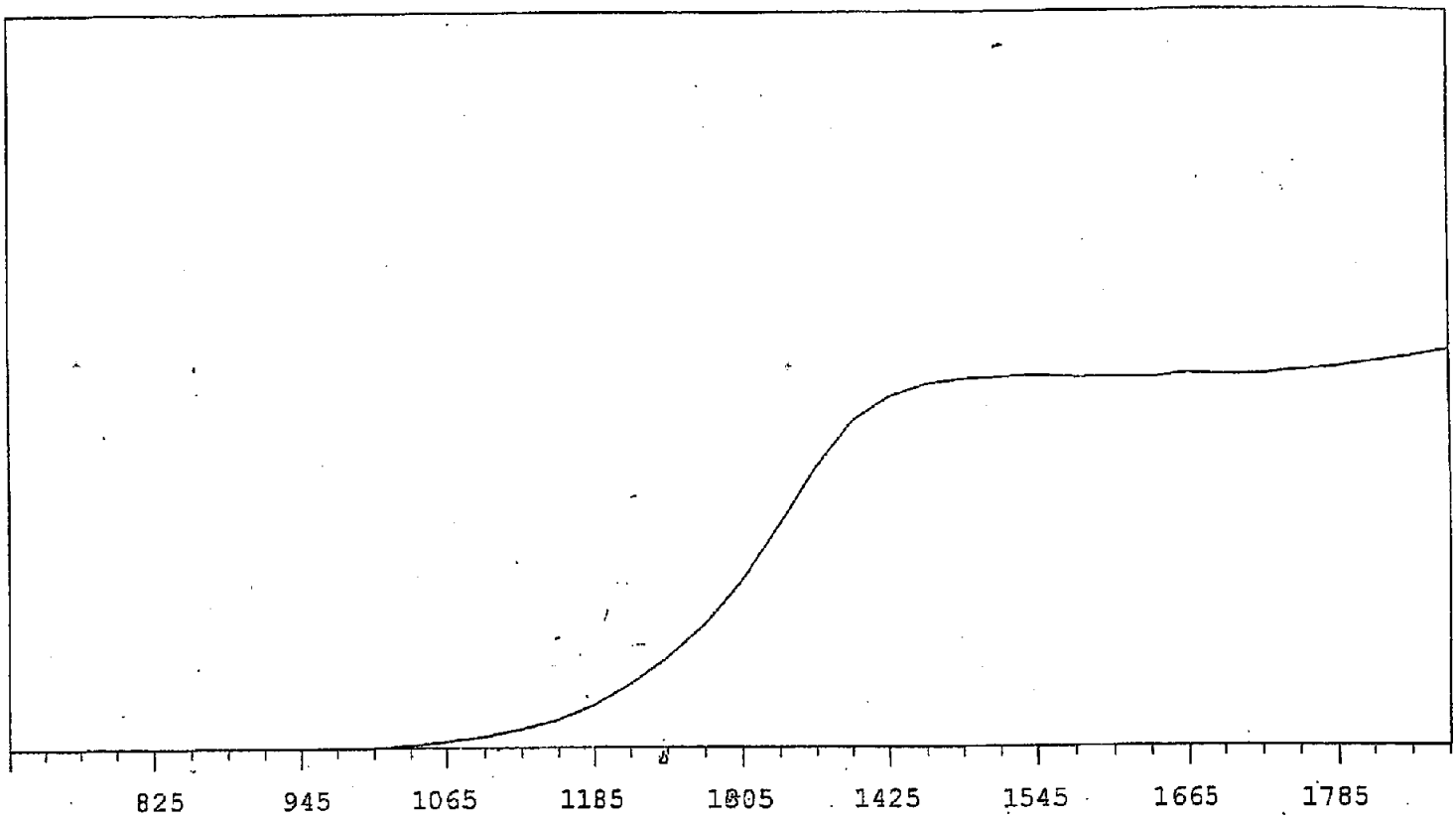
Tests performed and recorded by: [signature]

Date: 12/31/02

*ALL EFFICIENCIES WERE OBTAINED USING A 2" DISTRIBUTED SOURCE AT OPTIMAL GEOMETRY EXCEPT Th-230, WHICH WAS AT A DEPTH OF ¼".

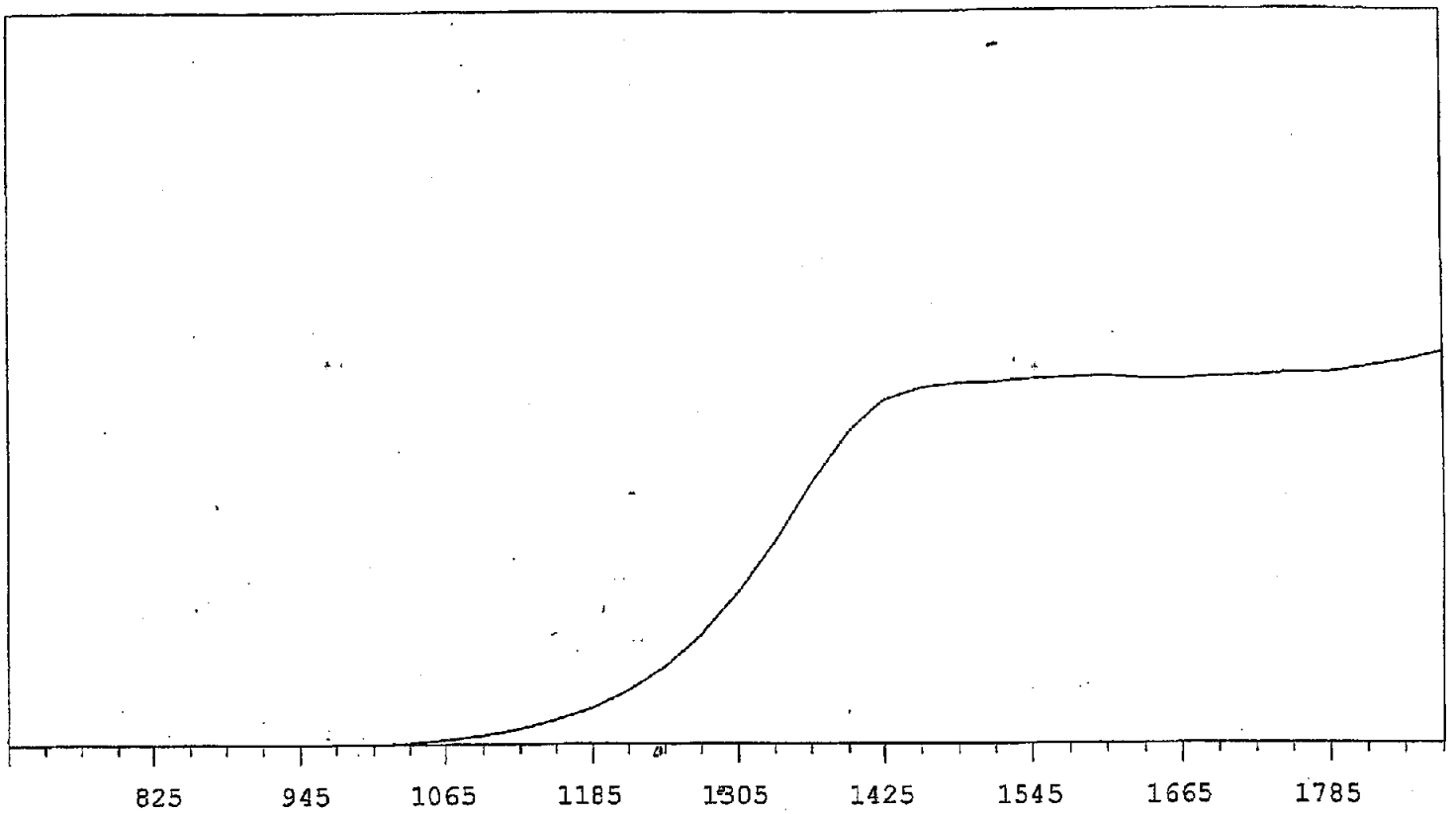
Unit #4

MPC 9604 Plateau PIC MPC 9604 MPC 9604 Detector A 12/18/2002
Alpha Volts: 705 Beta Volts: 1515



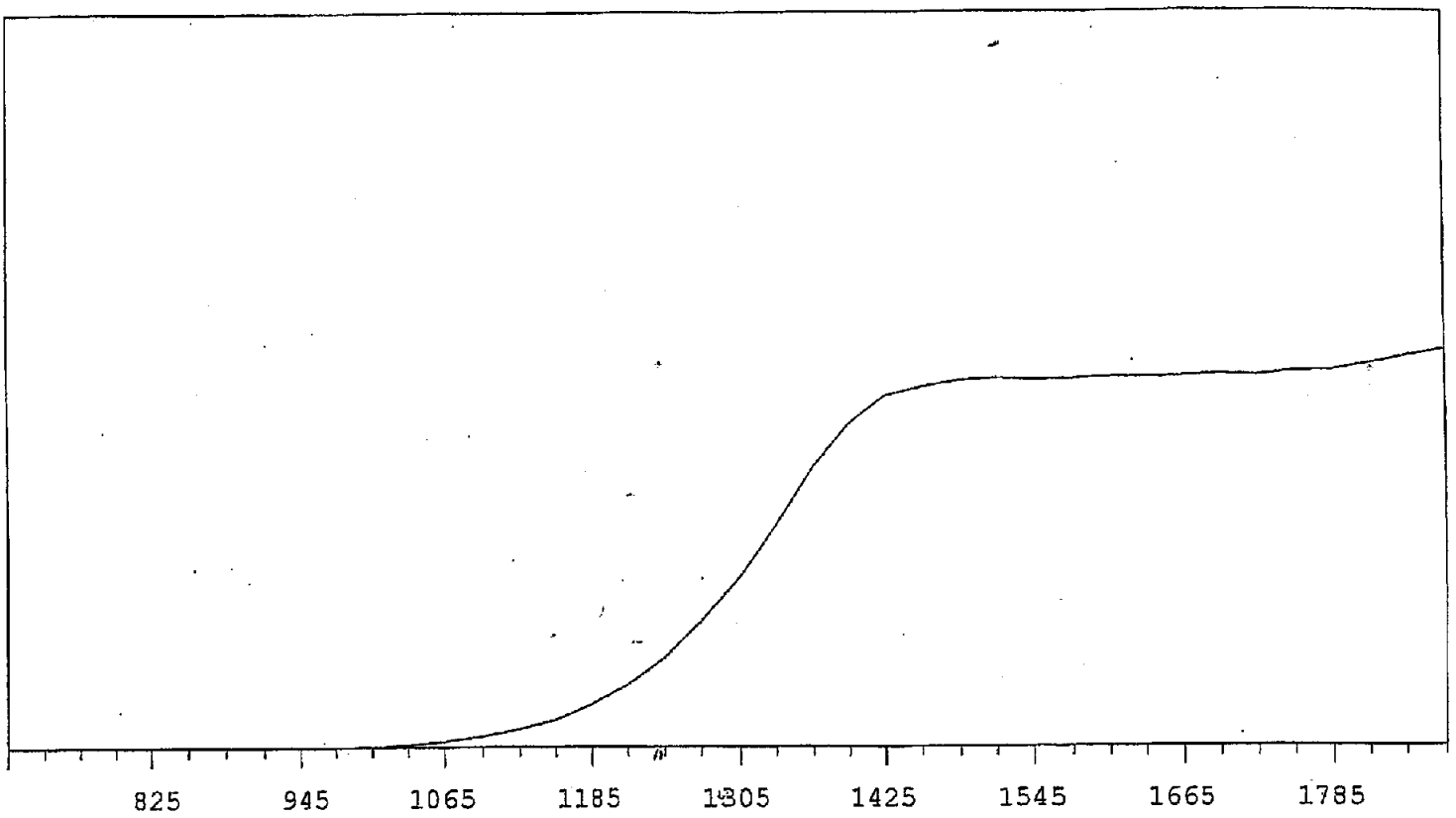
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	38210	+90.30
735	0		1335	50662	+76.50
765	0		1365	63624	+57.39
795	0	>100	1395	73884	+37.39
825	1	+83.33	1425	79213	+20.55
855	1	-83.33	1455	82067	+9.64
885	0	-55.56	1485	83080	+4.47
915	0	>100	1515	83570	+1.53
945	1	>100	1545	83988	+0.34
975	23	>100	1575	83523	-0.31
1005	147	>100	1605	83529	+0.24
1035	549	>100	1635	83417	+0.69
1065	1389	>100	1665	84345	+0.71
1095	2484	>100	1695	83979	+1.14
1125	4165	>100	1725	84139	+1.49
1155	6311	>100	1755	84965	+2.96
1185	9672	>100	1785	85741	+3.84
1215	14399	>100	1815	86960	+4.42
1245	20400	>100	1845	88088	
1275	28174	+99.15	1875	89563	
1305	38210	+90.30			
1335	50662	+76.50			

MPC 9604 Plateau PIC MPC 9604 MPC 9604 Detector B 12/20/2002
Alpha Volts: 705 Beta Volts: 1515



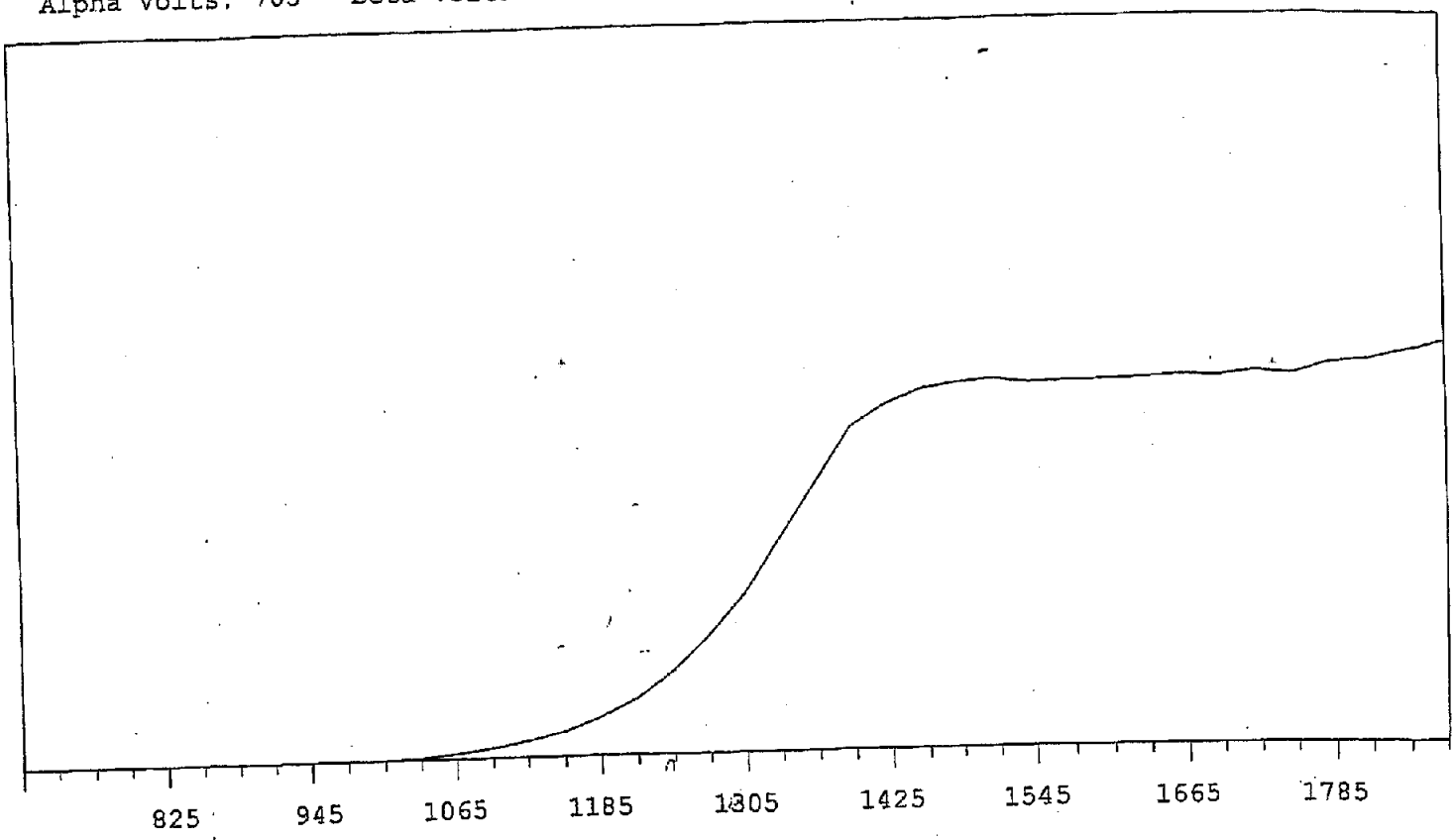
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	28036	+95.44
735	0		1335	37302	+82.32
765	1	+0.00	1365	47958	+64.46
795	0	>100	1395	57350	+44.02
825	0	>100	1425	63237	+24.93
855	0	>100	1455	65497	+11.29
885	0	>100	1485	66351	+4.62
915	1	>100	1515	66601	+2.36
945	1	>100	1545	67246	+1.77
975	8	>100	1575	67408	+0.73
1005	50	>100	1605	67730	-0.41
1035	303	>100	1635	67091	-0.29
1065	774	>100	1665	66992	+0.10
1095	1655	>100	1695	67480	+1.42
1125	2759	>100	1725	67633	+1.52
1155	4503	>100	1755	68211	+1.98
1185	6596	>100	1785	68168	+3.14
1215	9932	>100	1815	69236	+4.56
1245	14227	>100	1845	70353	
1275	20184	>100	1875	71882	
1305	28036	+95.44			
1335	37302	+82.32			

MPC 9604 Plateau PIC MPC 9604 MPC 9604 Detector C 12/19/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	38804	+90.25
735	1		1335	50930	+75.33
765	0		1365	64318	+57.13
795	0	+0.00	1395	73878	+37.15
825	0	>100	1425	80131	+20.35
855	1	+83.33	1455	82188	+9.94
885	1	+55.56	1485	83615	+3.79
915	0	>100	1515	84189	+1.56
945	1	>100	1545	83835	+0.57
975	16	>100	1575	84039	+0.31
1005	161	>100	1605	84413	+0.74
1035	557	>100	1635	84290	+0.90
1065	1352	>100	1665	84650	+0.53
1095	2565	>100	1695	85061	+1.02
1125	4126	>100	1725	84700	+0.98
1155	6348	>100	1755	85564	+2.08
1185	9862	>100	1785	85649	+3.84
1215	14356	>100	1815	87256	+5.01
1245	20454	>100	1845	88828	
1275	28653	+99.54	1875	90557	
1305	38804	+90.25			
1335	50930	+75.33			

MPC 9604 Plateau PIC MPC 9604 MPC 9604 Detector D 12/19/2002
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	1	>100
855	1	+41.67
885	2	-33.33
915	0	>100
945	1	>100
975	4	>100
1005	34	>100
1035	189	>100
1065	520	>100
1095	1010	>100
1125	1686	>100
1155	2549	>100
1185	3953	>100
1215	5794	>100
1245	8550	>100
1275	12147	>100
1305	16347	+92.19
1335	21926	+79.96

VOLTS	COUNTS	%/100 Volts
1305	16347	+92.19
1335	21926	+79.96
1365	27606	+61.43
1395	33199	+40.79
1425	35516	+23.07
1455	36964	+10.43
1485	37545	+4.16
1515	37853	+0.87
1545	37385	-0.13
1575	37533	-0.03
1605	37633	+1.20
1635	37712	+0.83
1665	37973	+1.27
1695	37835	+0.66
1725	38293	+1.93
1755	37926	+3.14
1785	39032	+4.51
1815	39280	+6.41
1845	40250	
1875	41116	

TestAmerica STL

Calibration Standard Data

Alpha Calibration Standards for Ra-226

Standard used: 1mL of Th-230 03-071 4567.9 dpm/mL 12/24/03

Std #	mL Ba Carrier	Gross wt	Tare Wt	Mass BaSO4
1	0.25	8.4779	8.4682	0.0097
2	0.4	8.3925	8.3784	0.0141
3	0.6	8.4768	8.4557	0.0211
4	0.8	8.4605	8.4313	0.0292
5	1	8.4726	8.4372	0.0354
6	1.5	8.4687	8.4173	0.0514
7	2	8.5100	8.4419	0.0681
8	3	8.5684	8.4653	0.1031

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65090-334

Th-230 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Th-230
ACTIVITY (dps):	7.654 E3
HALF-LIFE:	7.538 E4 Years
CALIBRATION DATE:	December 19, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.5%
SYSTEMATIC:	2.6%
RANDOM:	0.9%

*99% Confidence Level

Impurities: γ-impurities <0.1%, α-impurities <0.05%

5.17738 grams 0.5M HNO_3 solution.

P O NUMBER 1614557-000 OP, Item 3

SOURCE PREPARED BY: M. Taskaeva for
M. Taskaeva, Radiochemist

Q A APPROVED: 12-19-02

SEVERN TRENT SERVICES

Logbook: 2060

Radiochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
~~9-11-03~~	~~9-11-08~~	~~03-069~~ ~~03-069~~ MC 9-22 03	~~Pu 238~~	02-026	132.98	2-23-02	25mL	↓	1396 days	32022.4 d, 75	~~3310 dpm/ml~~ ~~66.41 dpm/ml~~	MFM			re-certification of 03-031, 03-03-6 and 66.20 dpm/ml
~~↓~~	~~↓~~	~~↓~~	~~Pu 239~~	~~02-025~~	~~128.05~~	~~2-23-02~~	~~25mL~~	~~150mL~~	11-16-03 MC	~~24110 y~~	~~32.1 dpm/ml~~ ~~66.025 dpm/ml~~	~~MFM~~			↓ 62.025 dpm/ml
9-11-03	9-11-08	03-070 ~~03-070~~ MC 9-22-03	Am 243	98-011	1161 dpm/g	2-28-98	15 ~~16 gm~~	200mL		7.37 E+3 y	87.075 ~~9.288 dpm/ml~~	MFM			
10-6-03	10-6-08	03-071	Th 230	65090-334	7,654 dps	12-19-02	5.1498g	100mL	N/A	7.538E4	4,567.9 dpm/mL	0.5M HNO3	BH	BBF	
10-6-03	10-6-08	03-072	Th 230	03-071	4,567.9 dpm/mL	12-19-02	1mL	200mL	N/A	7.538E4	22.84 dpm/mL	0.5M HNO3	BH	BBF	
10-11-03	10-11-0	03-073	Clean U-232	097-105	10994 dpm/ml	9-16-97	10ml	1000L		70 y	103.85 dpm/mL	DI H2O 2M H2SO4 KOH pH 1.5	MFM BBF		Rad 03-0078 in Rad Capture
10/31/03	10/31/08	03-074	I-129	681-78-4	1.059uCi	1-1-2000	1mL	100mL	N/A	1.57E+07	10.54 nCi/mL	0.1M NaOH	BH	BBF	
10/31/03	10/31/04	03-075	I-129	03-074	10.54 nCi/mL	1-1-2000	1mL	100mL	N/A	1.57E7	105.4 pCi/mL	0.1M NaOH	BH	BBF	
10/31/03	10/31/04	03-076	Ra 228	01012	1,018 dpm/mL	2/16/01	2mL	100mL	NA	5.75y	20.36 dpm/mL	0.5M HNO3	BH	BBF	
10/31/03	10/31/04	03-077	Pu-242	92-240-5-1	129.63 Bq/g	12/18/89	5.0723	100mL	N/A	3.73 X 10^5 y	78.9027	.5M HNO3	MFM	MO	
11/3/03	11/3/04	SR19	Std SR carrier	(Sr(NO3)2)	N/A	N/A	120.77g	1 Liter	N/A	N/A		dilH2O	[illegible]	DBF	Reported in Rad capture
11-5-03	11-5-04	RAD03-0032	Th-229	02-006	2134.75 dpm/g	1-28-02	17.5mL	500mL	N/A	7.3e+3	74.716 dpm/mL	.5M HNO3	MFM	JMW	

Additional Comments:

LIMS # F7C280214

TestAmerica STL

Red 2007

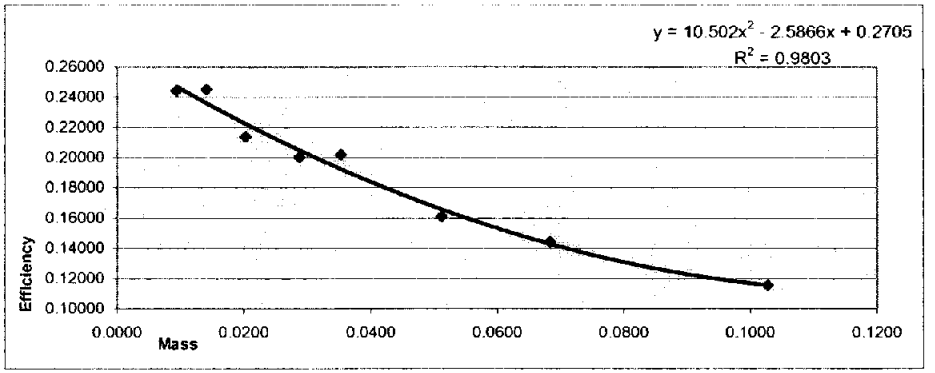
Th-230 $BaSO_4$ Calibration for Ra-226

TestAmerica STL

Detector Efficiency Curves

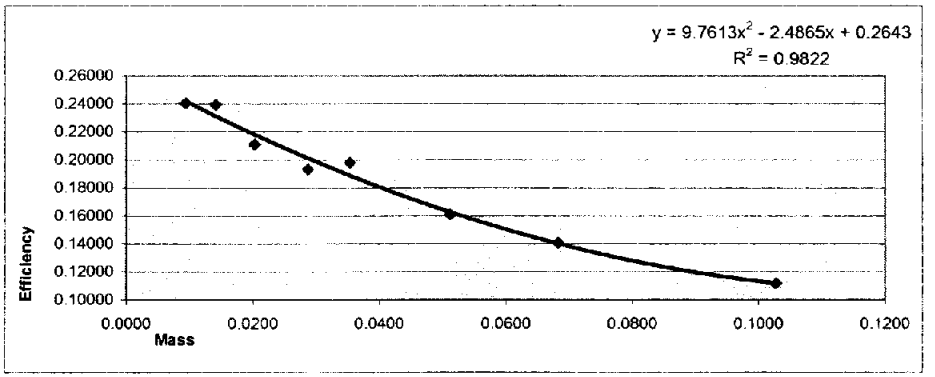
Alpha Th-230 Attenuation Red A1 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	44649	1116.225	0.24436
A1	0.0142	40.00	44771	1119.275	0.24503
A1	0.0203	40.00	39092	977.300	0.21395
A1	0.0287	40.00	36612	915.300	0.20038
A1	0.0353	40.00	36922	923.050	0.20207
A1	0.0512	40.00	29414	735.350	0.16098
A1	0.0683	40.00	26362	659.050	0.14428
A1	0.1028	40.00	21096	527.400	0.11546



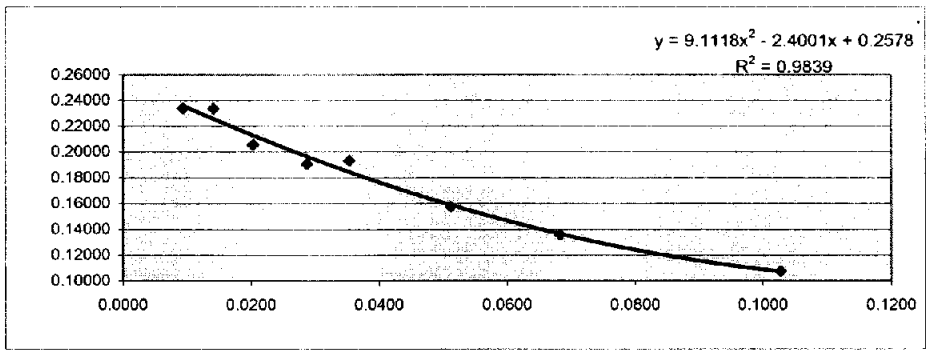
Alpha Th-230 Attenuation Red A2 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	43925	1098.125	0.24040
A2	0.0142	40.00	43691	1092.275	0.23912
A2	0.0203	40.00	38547	963.675	0.21097
A2	0.0287	40.00	35303	882.575	0.19321
A2	0.0353	40.00	36155	903.875	0.19788
A2	0.0512	40.00	29422	735.550	0.16103
A2	0.0683	40.00	25703	642.575	0.14067
A2	0.1028	40.00	20398	509.950	0.11164



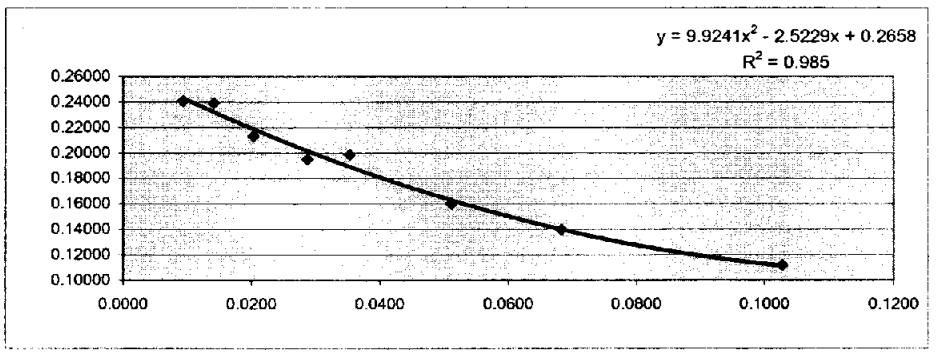
Alpha Th-230 Attenuation Red A3 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	42746	1068.650	0.23395
A3	0.0142	40.00	42674	1066.850	0.23355
A3	0.0203	40.00	37561	939.025	0.20557
A3	0.0287	40.00	34825	870.625	0.19060
A3	0.0353	40.00	35285	882.125	0.19311
A3	0.0512	40.00	28774	719.350	0.15748
A3	0.0683	40.00	24806	620.150	0.13576
A3	0.1028	40.00	19633	490.825	0.10745



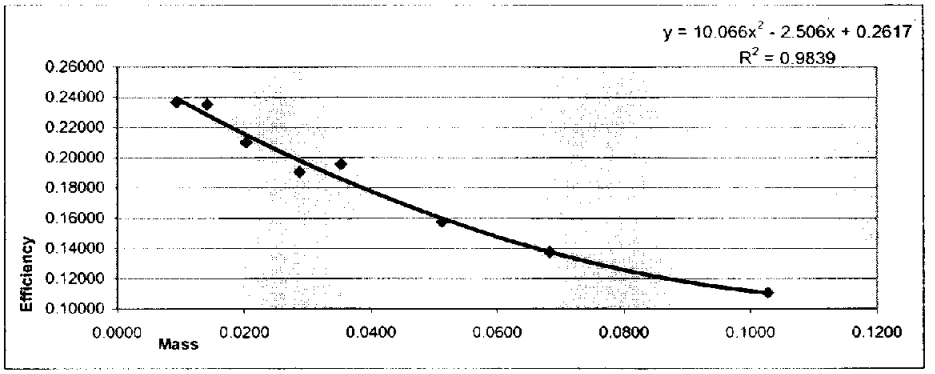
Alpha Th-230 Attenuation Red A4 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	43962	1099.050	0.24060
A4	0.0142	40.00	43676	1091.900	0.23904
A4	0.0203	40.00	38941	973.525	0.21312
A4	0.0287	40.00	35654	891.350	0.19513
A4	0.0353	40.00	36320	908.000	0.19878
A4	0.0512	40.00	29254	731.350	0.16011
A4	0.0683	40.00	25491	637.275	0.13951
A4	0.1028	40.00	20366	509.150	0.11146



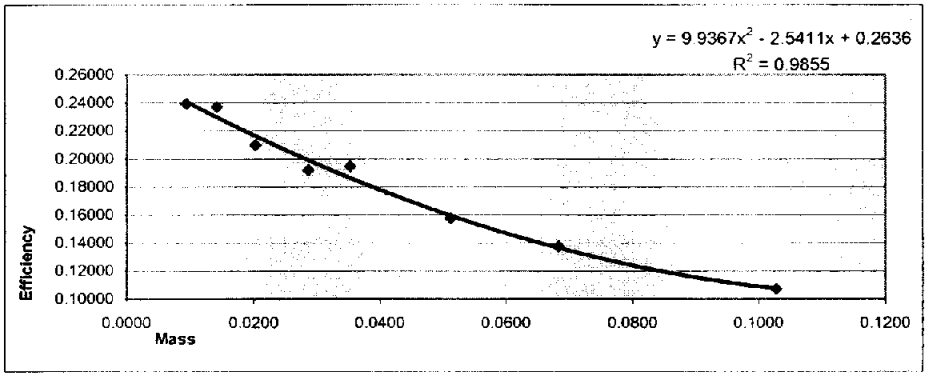
Alpha Th-230 Attenuation Red B1 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	43268	1081.700	0.23680
A1	0.0142	40.00	42945	1073.625	0.23504
A1	0.0203	40.00	38398	959.950	0.21015
A1	0.0287	40.00	34825	870.625	0.19060
A1	0.0353	40.00	35747	893.675	0.19564
A1	0.0512	40.00	28757	718.925	0.15739
A1	0.0683	40.00	25109	627.725	0.13742
A1	0.1028	40.00	20198	504.950	0.11054



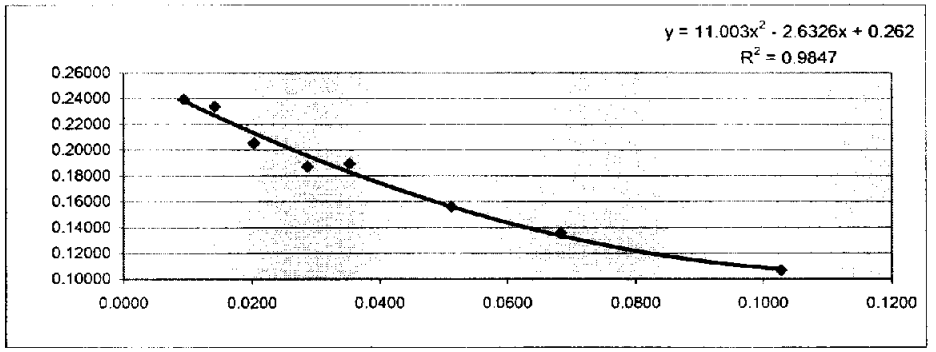
Alpha Th-230 Attenuation Red B2 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	43718	1092.950	0.23927
A2	0.0142	40.00	43313	1082.825	0.23705
A2	0.0203	40.00	38333	958.325	0.20980
A2	0.0287	40.00	35058	876.450	0.19187
A2	0.0353	40.00	35594	889.850	0.19481
A2	0.0512	40.00	28807	720.175	0.15766
A2	0.0683	40.00	25093	627.325	0.13733
A2	0.1028	40.00	19579	489.475	0.10716



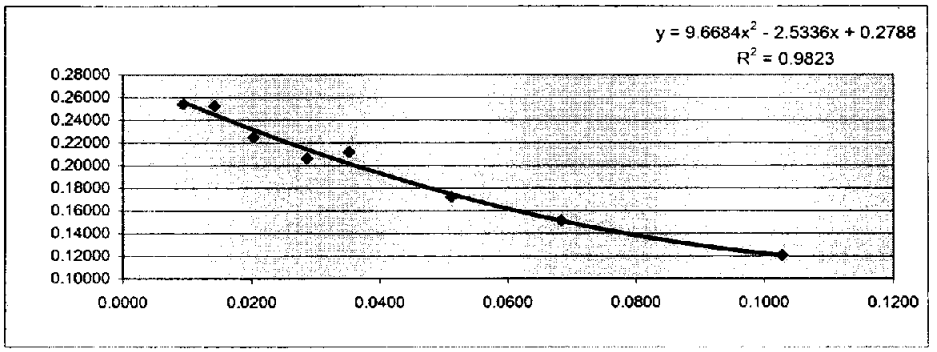
Alpha Th-230 Attenuation Red B3 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	43772	1094.300	0.23956
A3	0.0142	40.00	42748	1068.700	0.23396
A3	0.0203	40.00	37520	938.000	0.20535
A3	0.0287	40.00	34195	854.875	0.18715
A3	0.0353	40.00	34593	864.825	0.18933
A3	0.0512	40.00	28518	712.950	0.15608
A3	0.0683	40.00	24827	620.675	0.13588
A3	0.1028	40.00	19501	487.525	0.10673



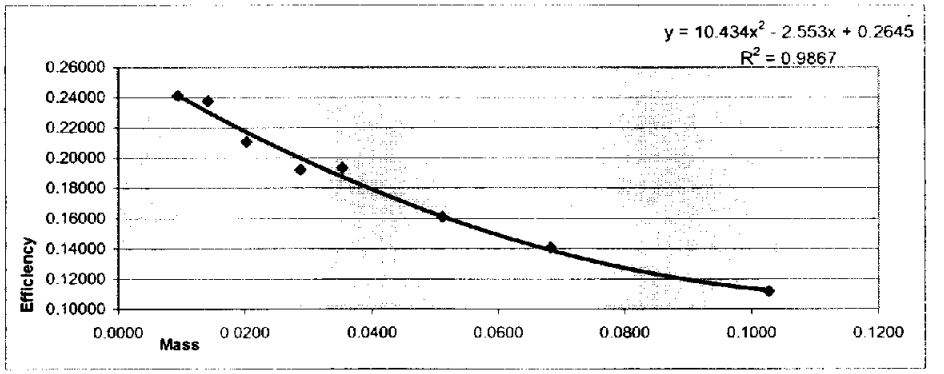
Alpha Th-230 Attenuation Red B4 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	46439	1160.975	0.25416
A4	0.0142	40.00	46134	1153.350	0.25249
A4	0.0203	40.00	41056	1026.400	0.22470
A4	0.0287	40.00	37688	942.200	0.20627
A4	0.0353	40.00	38712	967.800	0.21187
A4	0.0512	40.00	31430	785.750	0.17202
A4	0.0683	40.00	27621	690.525	0.15117
A4	0.1028	40.00	22009	550.225	0.12045



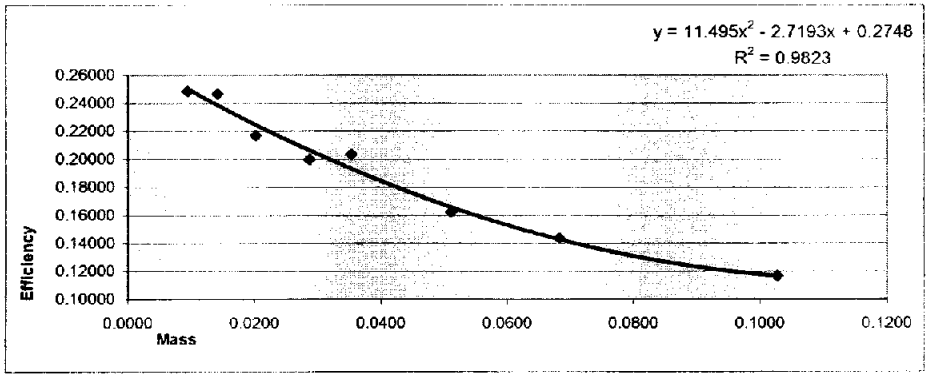
Alpha Th-230 Attenuation Red C1 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	44086	1102.150	0.24128
A1	0.0142	40.00	43436	1085.900	0.23772
A1	0.0203	40.00	38481	962.025	0.21061
A1	0.0287	40.00	35104	877.600	0.19212
A1	0.0353	40.00	35349	883.725	0.19346
A1	0.0512	40.00	29405	735.125	0.16093
A1	0.0683	40.00	25673	641.825	0.14051
A1	0.1028	40.00	20395	509.875	0.11162



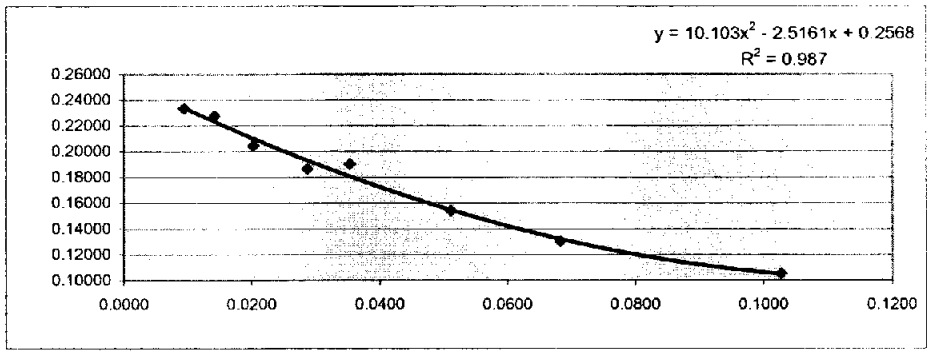
Alpha Th-230 Attenuation Red C2 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	45369	1134.225	0.24830
A2	0.0142	40.00	45039	1125.975	0.24650
A2	0.0203	40.00	39635	990.875	0.21692
A2	0.0287	40.00	36512	912.800	0.19983
A2	0.0353	40.00	37156	928.900	0.20335
A2	0.0512	40.00	29640	741.000	0.16222
A2	0.0683	40.00	26226	655.650	0.14353
A2	0.1028	40.00	21304	532.600	0.11660



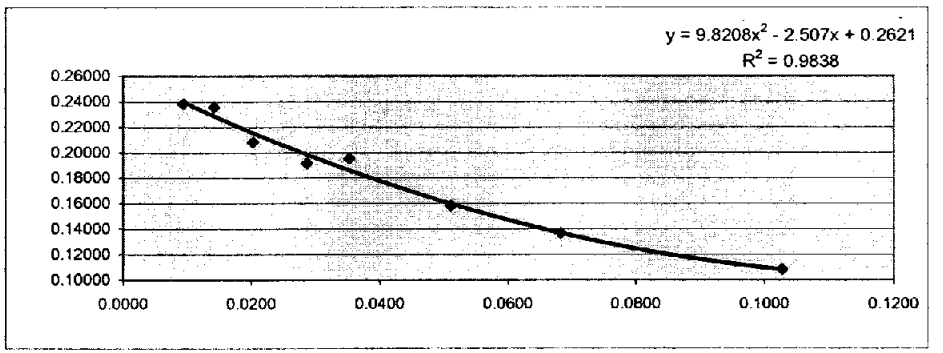
Alpha Th-230 Attenuation Red C3 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	42659	1066.475	0.23347
A3	0.0142	40.00	41616	1040.400	0.22776
A3	0.0203	40.00	37323	933.075	0.20427
A3	0.0287	40.00	34086	852.150	0.18655
A3	0.0353	40.00	34746	868.650	0.19016
A3	0.0512	40.00	28127	703.175	0.15394
A3	0.0683	40.00	23789	594.725	0.13020
A3	0.1028	40.00	19239	480.975	0.10529



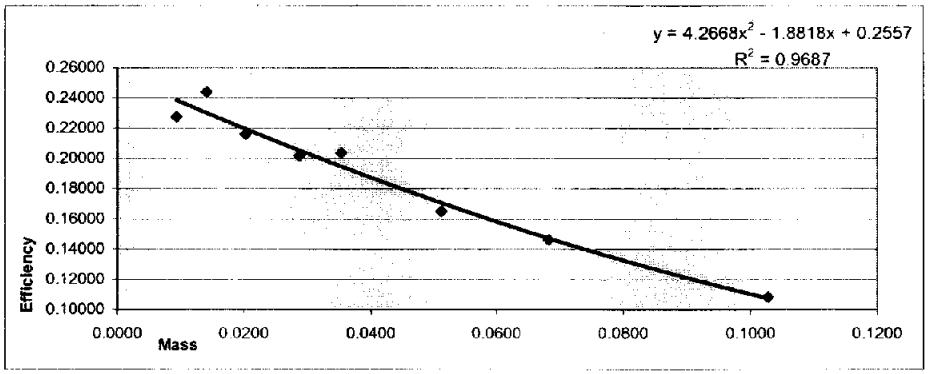
Alpha Th-230 Attenuation Red C4 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	43527	1088.175	0.23822
A4	0.0142	40.00	43089	1077.225	0.23582
A4	0.0203	40.00	38022	950.550	0.20809
A4	0.0287	40.00	35005	875.125	0.19158
A4	0.0353	40.00	35700	892.500	0.19539
A4	0.0512	40.00	28888	722.200	0.15810
A4	0.0683	40.00	24929	623.225	0.13644
A4	0.1028	40.00	19777	494.425	0.10824



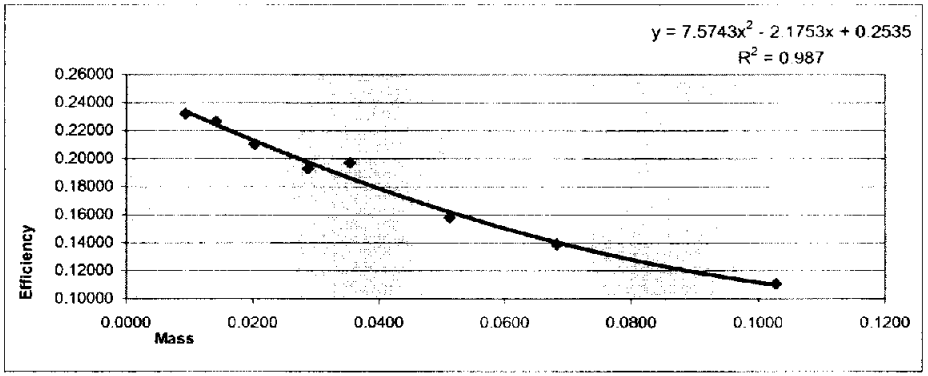
Alpha Th-230 Attenuation Red D1 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A1	0.0094	40.00	41584	1039.600	0.22759
A1	0.0142	40.00	44574	1114.350	0.24395
A1	0.0203	40.00	39465	986.625	0.21599
A1	0.0287	40.00	36873	921.825	0.20180
A1	0.0353	40.00	37226	930.650	0.20374
A1	0.0512	40.00	30143	753.575	0.16497
A1	0.0683	40.00	26706	667.650	0.14616
A1	0.1028	40.00	19794	494.850	0.10833



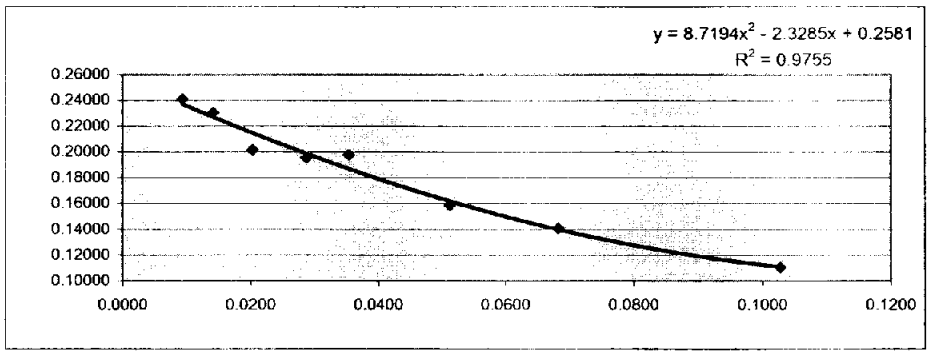
Alpha Th-230 Attenuation Red D2 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A2	0.0094	40.00	42364	1059.100	0.23186
A2	0.0142	40.00	41373	1034.325	0.22643
A2	0.0203	40.00	38425	960.625	0.21030
A2	0.0287	40.00	35233	880.825	0.19283
A2	0.0353	40.00	35995	899.875	0.19700
A2	0.0512	40.00	28846	721.150	0.15787
A2	0.0683	40.00	25365	634.125	0.13882
A2	0.1028	40.00	20219	505.475	0.11066



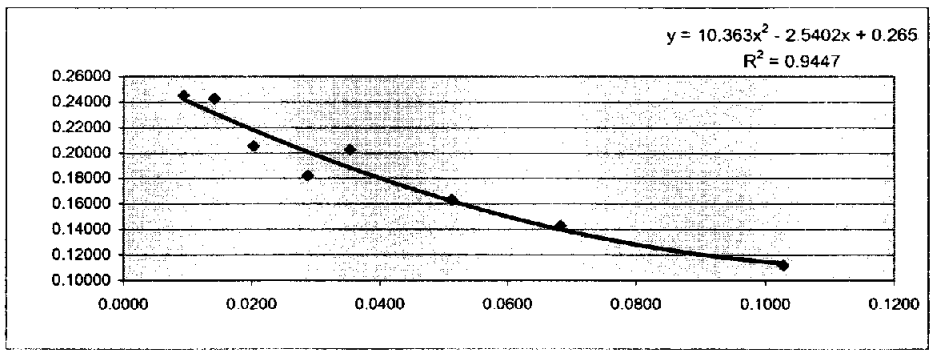
Alpha Th-230 Attenuation Red D3 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A3	0.0094	40.00	44021	1100.525	0.24093
A3	0.0142	40.00	42103	1052.575	0.23043
A3	0.0203	40.00	36792	919.800	0.20136
A3	0.0287	40.00	35701	892.525	0.19539
A3	0.0353	40.00	36134	903.350	0.19776
A3	0.0512	40.00	28971	724.275	0.15856
A3	0.0683	40.00	25736	643.400	0.14085
A3	0.1028	40.00	20196	504.900	0.11053



Alpha Th-230 Attenuation Red D4 2/26,27/2007

Detector ID	Sample Wt	Count Time	Alpha	DPM 4567.9 CPM	Th230 Eff
A4	0.0094	40.00	44747	1118.675	0.24490
A4	0.0142	40.00	44291	1107.275	0.24240
A4	0.0203	40.00	37544	938.600	0.20548
A4	0.0287	40.00	33267	831.675	0.18207
A4	0.0353	40.00	36962	924.050	0.20229
A4	0.0512	40.00	29787	744.675	0.16302
A4	0.0683	40.00	26088	652.200	0.14278
A4	0.1028	40.00	20435	510.875	0.11184



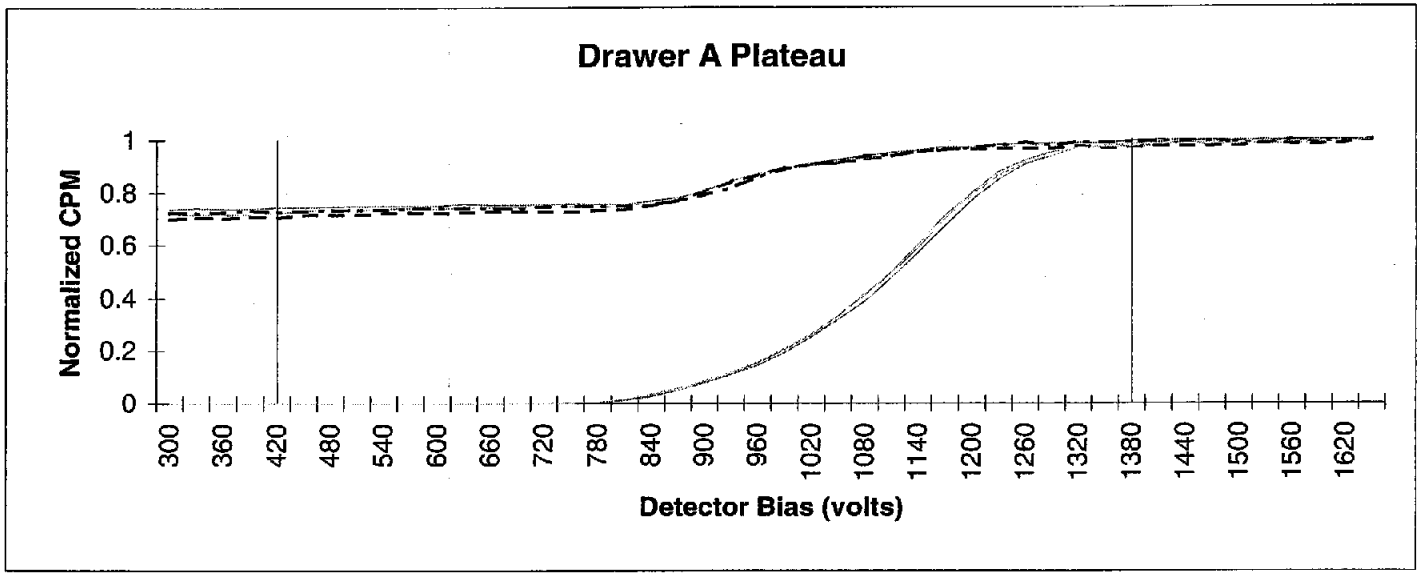
TestAmerica STL

Red 2007

Voltage Plateaus and Discriminator Settings

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

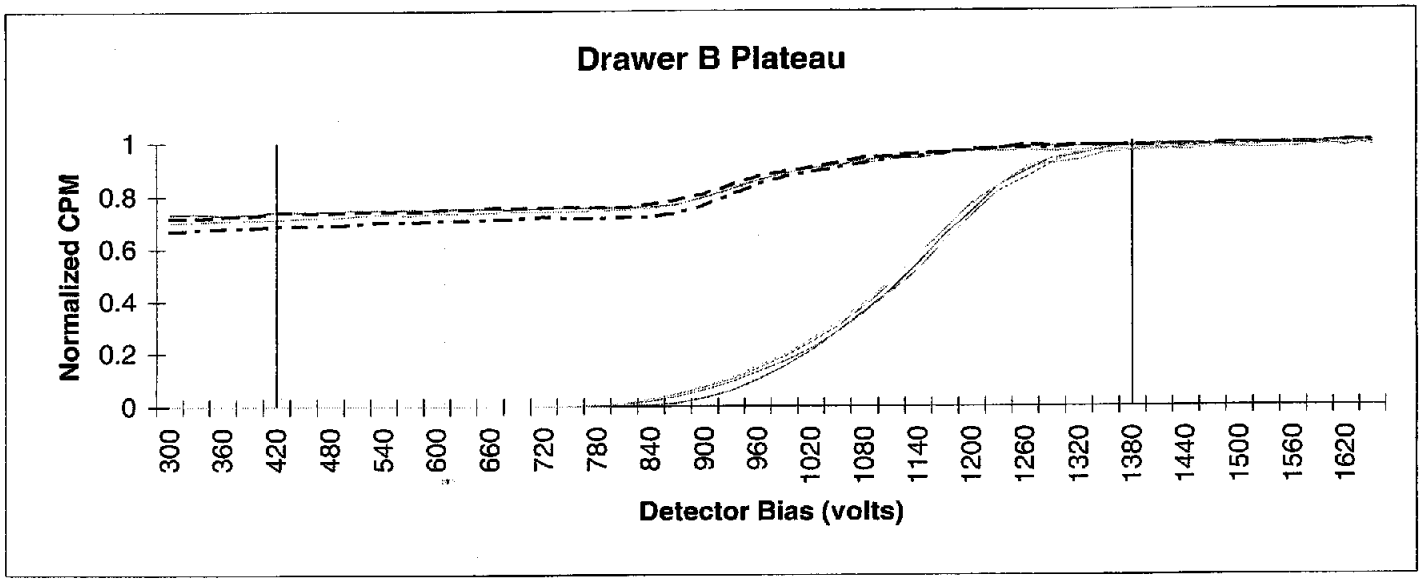
Optimum alpha only operating voltage: 420

	A1	A2	A3	A4
Beta slope at beta voltage	1.90%	2.05%	1.32%	2.19%
Alpha slope at beta voltage	1.02%	0.18%	0.62%	0.32%
Alpha slope at alpha voltage	1.08%	1.54%	2.61%	0.69%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

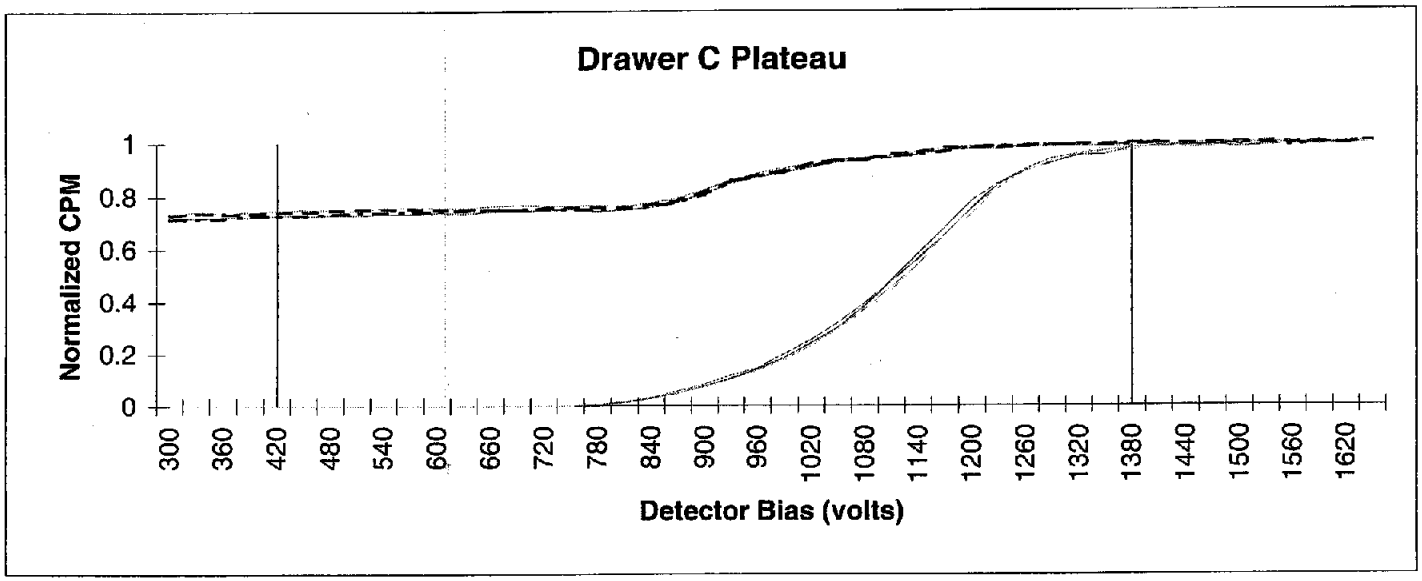
Optimum alpha only operating voltage: 420

	B1	B2	B3	B4
Beta slope at beta voltage	2.29%	3.38%	2.33%	1.55%
Alpha slope at beta voltage	0.81%	0.15%	0.14%	0.26%
Alpha slope at alpha voltage	1.69%	1.63%	1.39%	1.51%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

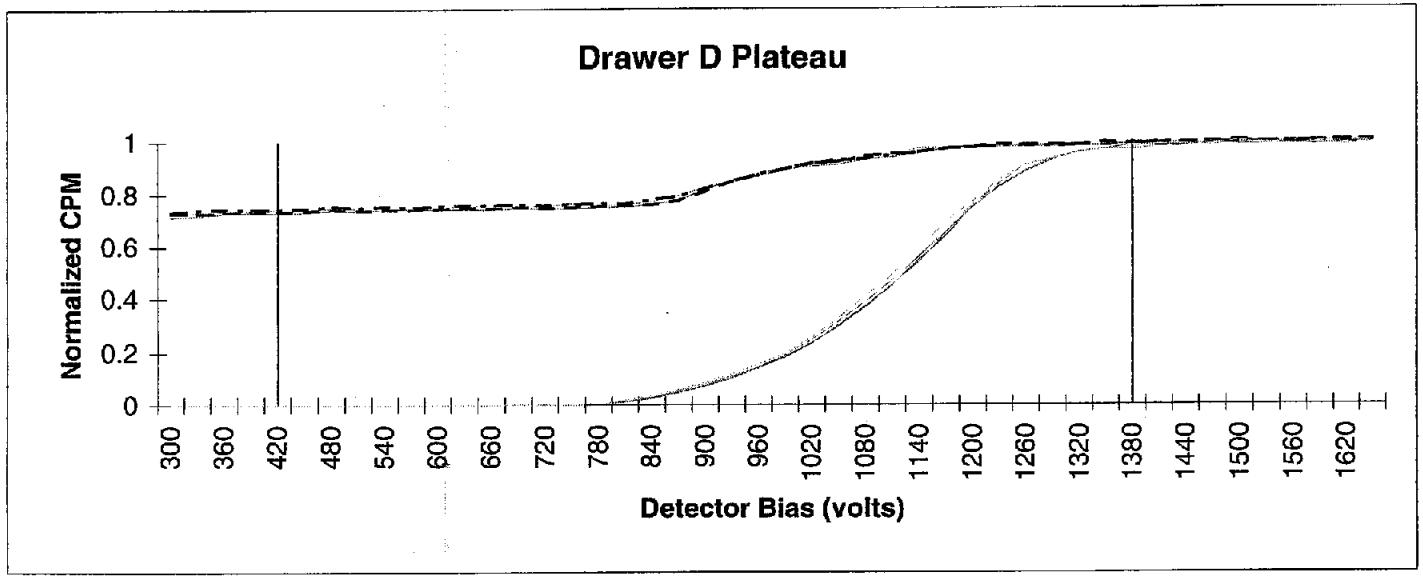
Optimum alpha only operating voltage: 420

	C1	C2	C3	C4
Beta slope at beta voltage	3.13%	2.21%	2.65%	2.67%
Alpha slope at beta voltage	0.40%	-0.09%	0.22%	0.31%
Alpha slope at alpha voltage	0.73%	1.23%	1.51%	1.34%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard

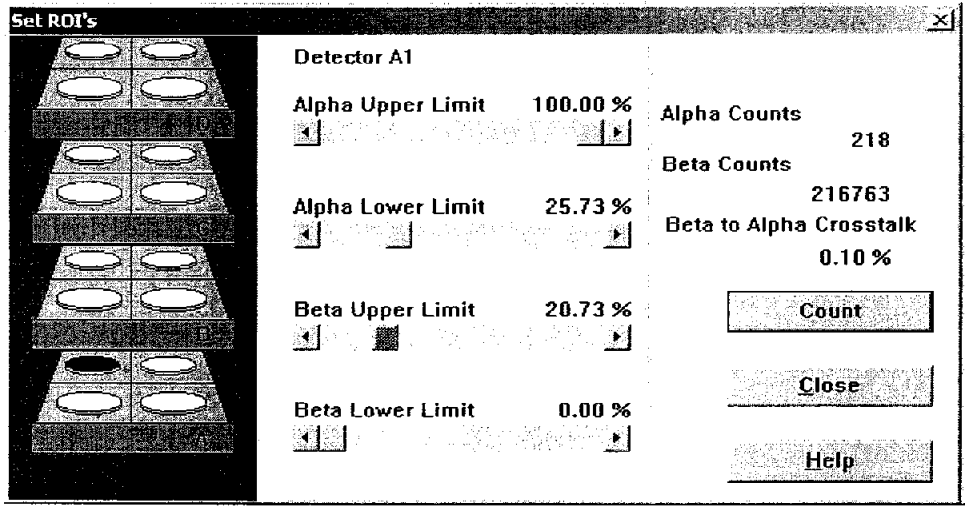


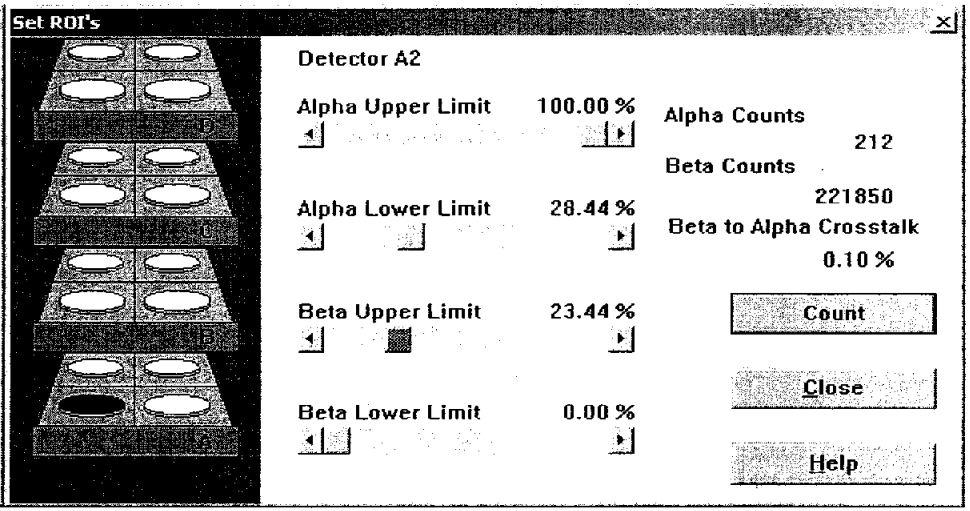
Optimum alpha beta simultaneous operating voltage: 1380

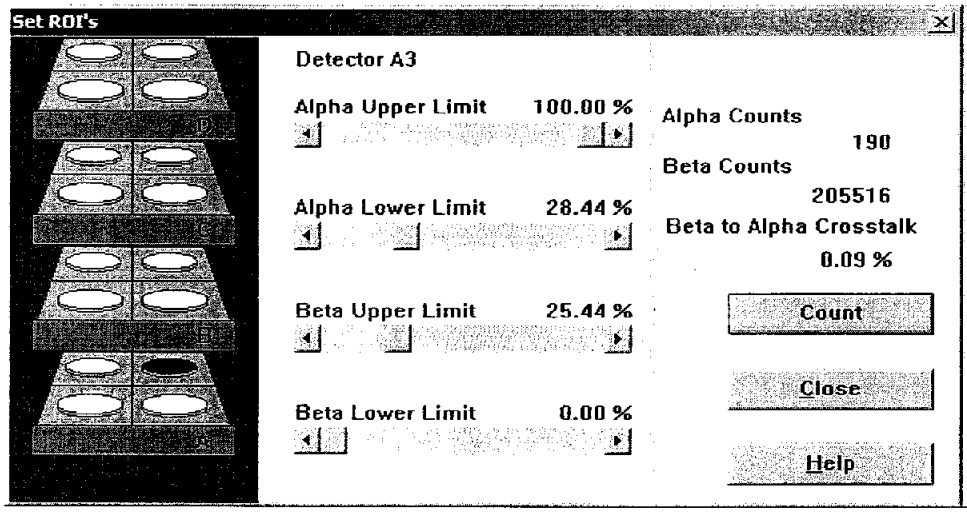
Optimum alpha only operating voltage: 420

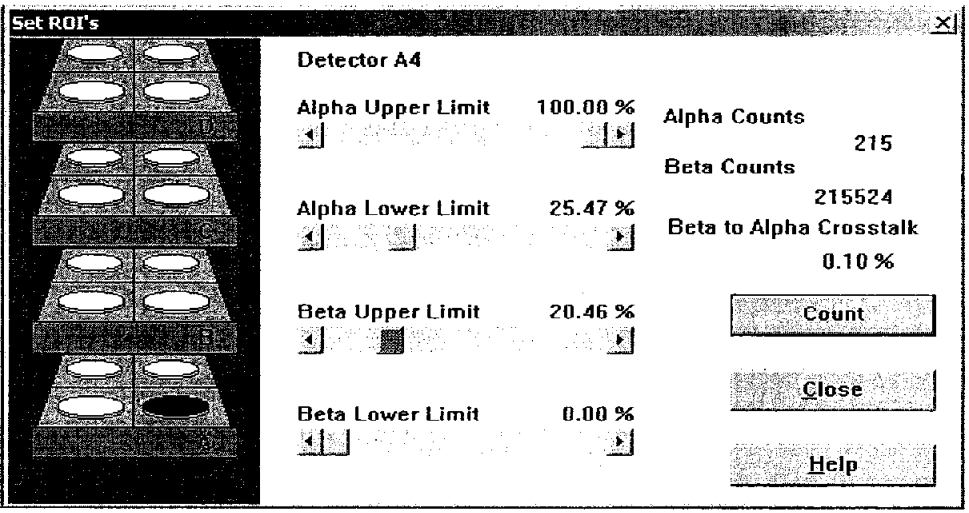
	D1	D2	D3	D4
Beta slope at beta voltage	1.81%	2.24%	2.13%	3.05%
Alpha slope at beta voltage	0.10%	0.43%	0.64%	0.58%
Alpha slope at alpha voltage	1.20%	1.08%	1.08%	1.08%

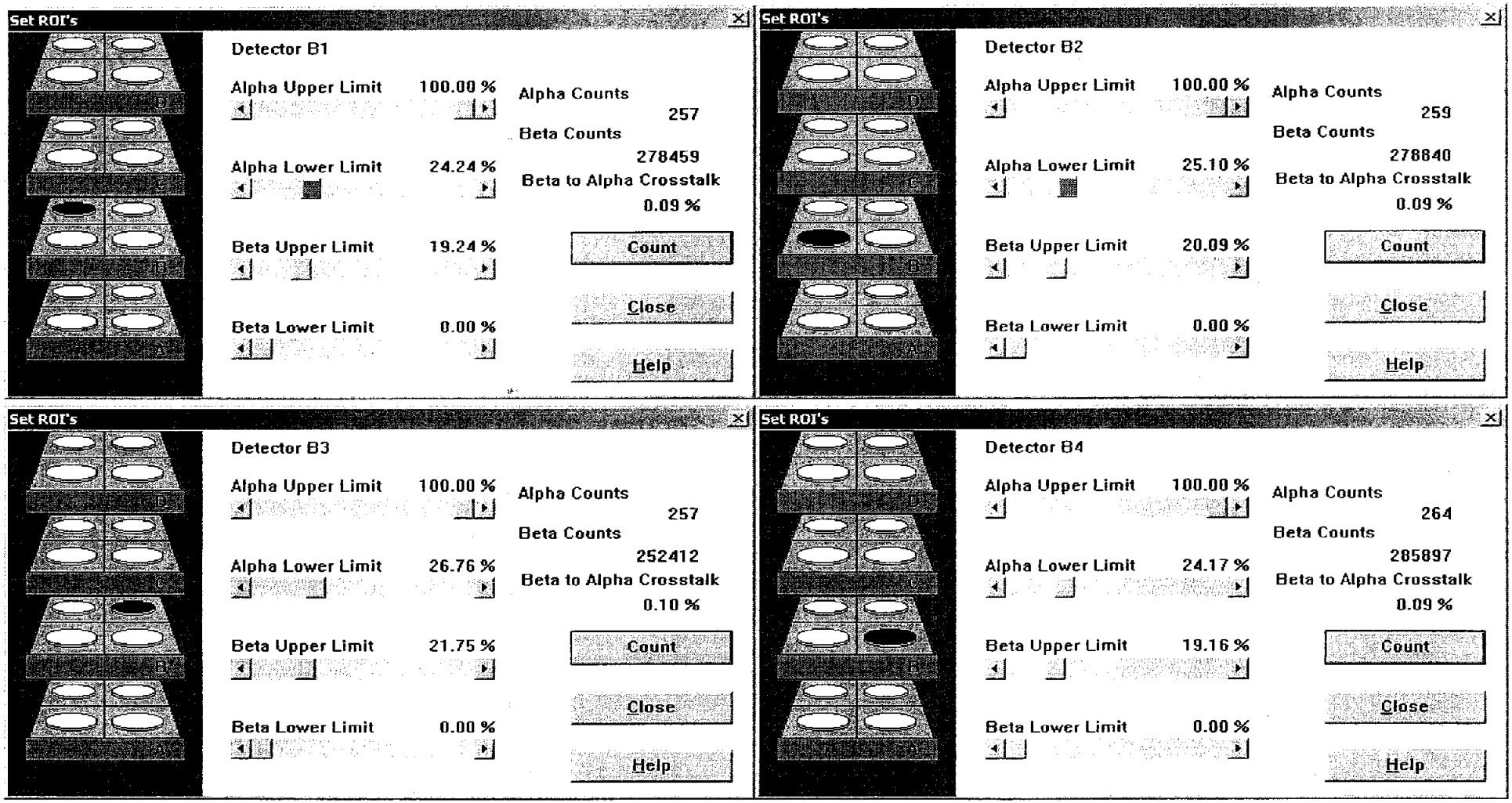
Printed 2/19/2007 4:51 PM

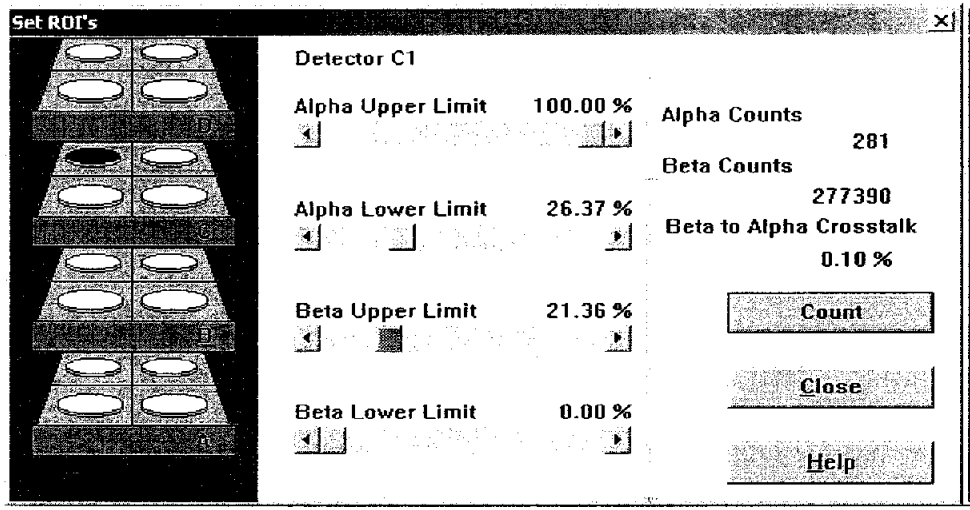

Set ROI's
Detector A1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.73 %
Beta Upper Limit 20.73 %
Beta Lower Limit 0.00 %
Alpha Counts
218
Beta Counts
216763
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

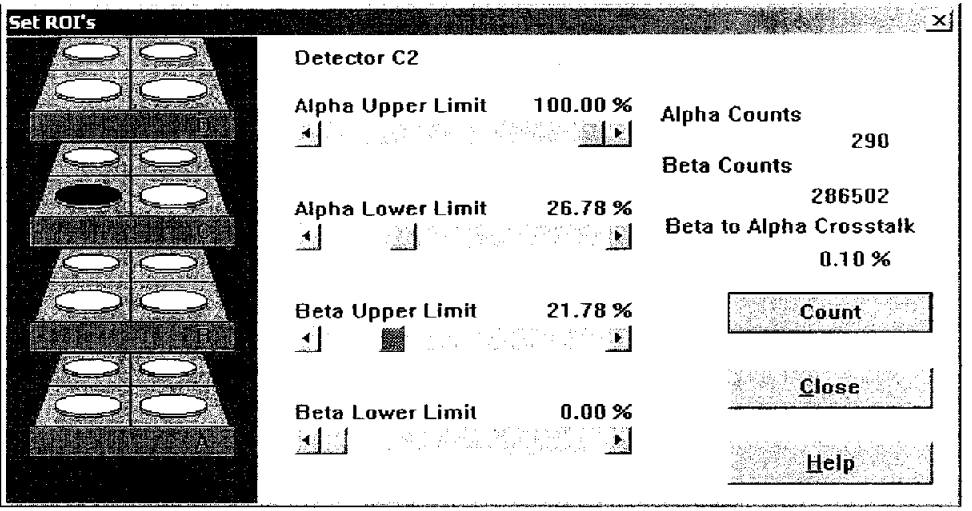

Set ROI's
Detector A2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 28.44 %
Beta Upper Limit 23.44 %
Beta Lower Limit 0.00 %
Alpha Counts
212
Beta Counts
221850
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

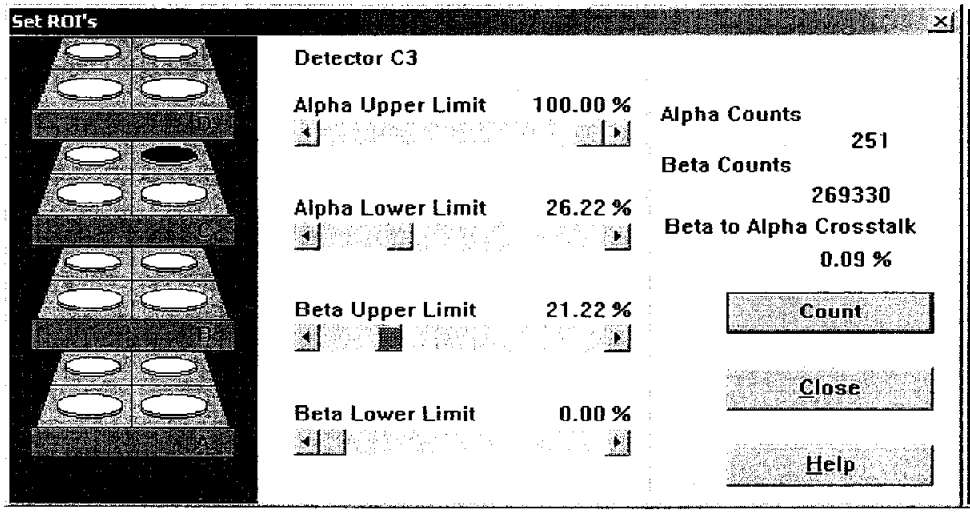

Set ROI's
Detector A3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 28.44 %
Beta Upper Limit 25.44 %
Beta Lower Limit 0.00 %
Alpha Counts
190
Beta Counts
205516
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

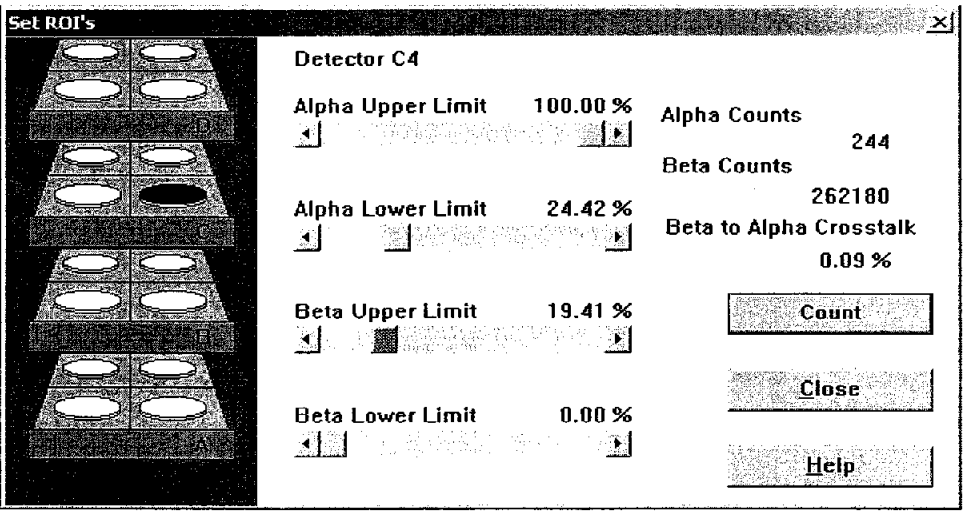

Set ROI's
Detector A4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.47 %
Beta Upper Limit 20.46 %
Beta Lower Limit 0.00 %
Alpha Counts
215
Beta Counts
215524
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

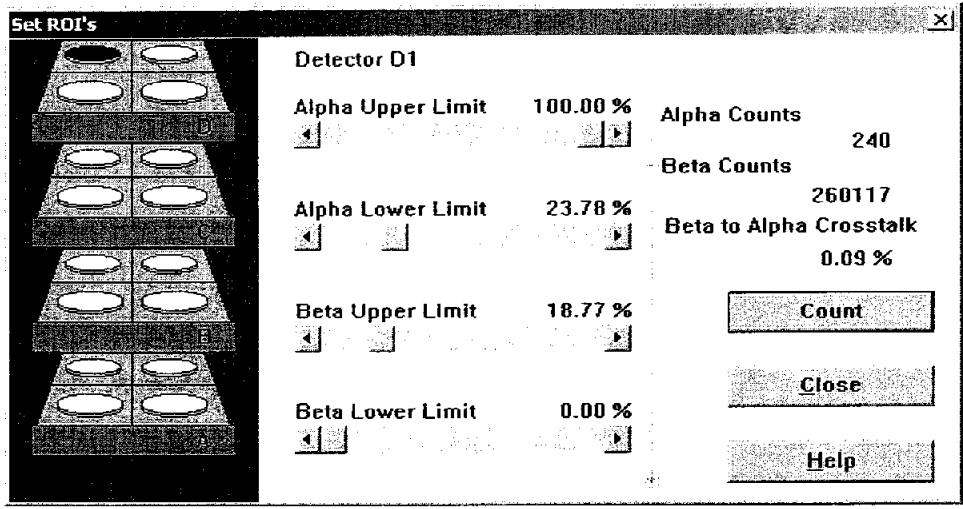

Set ROI's
Detector B1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.24 %
Beta Upper Limit 19.24 %
Beta Lower Limit 0.00 %
Alpha Counts 257
Beta Counts 278459
Beta to Alpha Crosstalk 0.09 %
Count
Close
Help
Set ROI's
Detector B2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.10 %
Beta Upper Limit 20.09 %
Beta Lower Limit 0.00 %
Alpha Counts 259
Beta Counts 278840
Beta to Alpha Crosstalk 0.09 %
Count
Close
Help
Set ROI's
Detector B3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.76 %
Beta Upper Limit 21.75 %
Beta Lower Limit 0.00 %
Alpha Counts 257
Beta Counts 252412
Beta to Alpha Crosstalk 0.10 %
Count
Close
Help
Set ROI's
Detector B4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.17 %
Beta Upper Limit 19.16 %
Beta Lower Limit 0.00 %
Alpha Counts 264
Beta Counts 285897
Beta to Alpha Crosstalk 0.09 %
Count
Close
Help

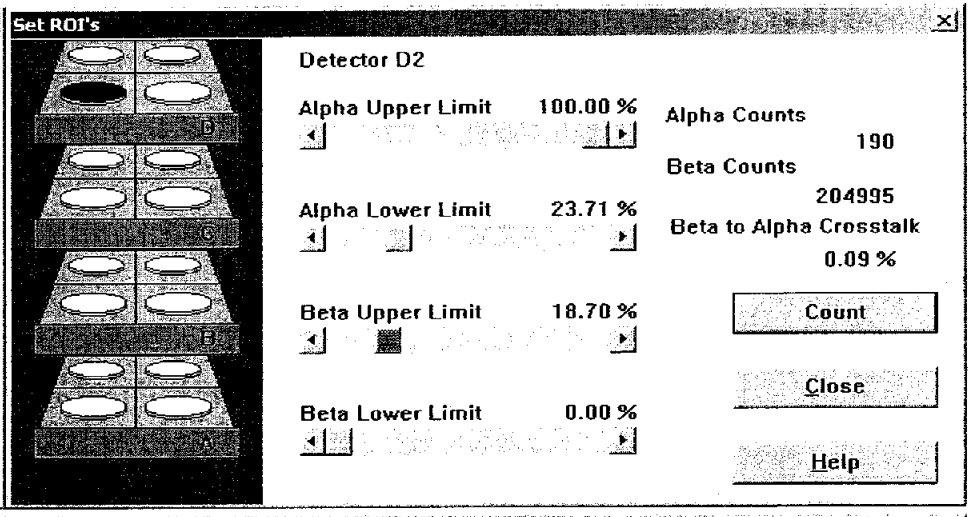

Set ROI's
Detector C1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.37 %
Beta Upper Limit 21.36 %
Beta Lower Limit 0.00 %
Alpha Counts
281
Beta Counts
277390
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

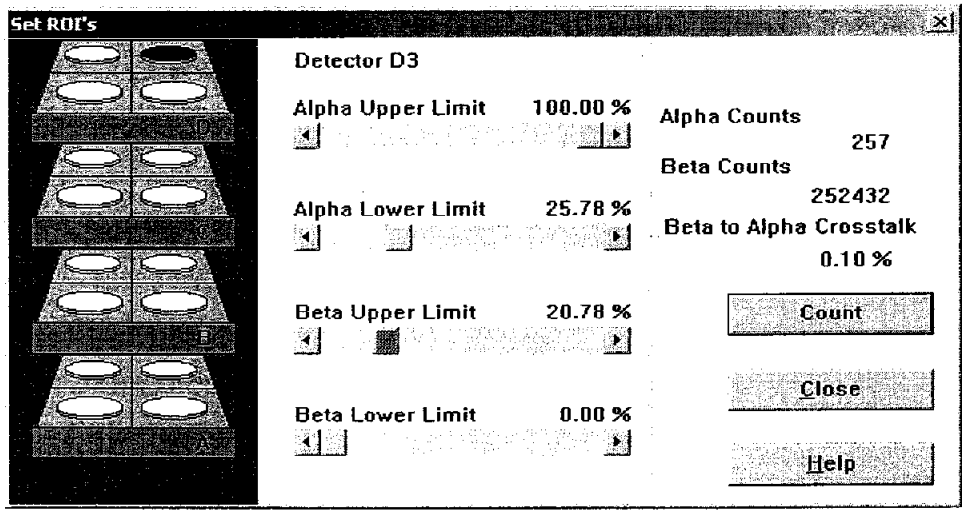

Set ROI's
Detector C2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.78 %
Beta Upper Limit 21.78 %
Beta Lower Limit 0.00 %
Alpha Counts
290
Beta Counts
286502
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

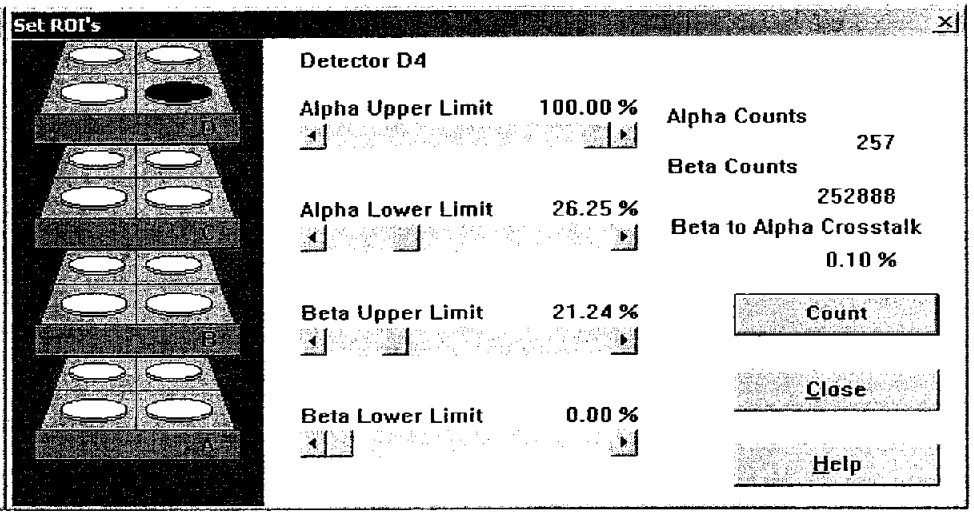

Set ROI's
Detector C3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.22 %
Beta Upper Limit 21.22 %
Beta Lower Limit 0.00 %
Alpha Counts
251
Beta Counts
269330
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector C4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.42 %
Beta Upper Limit 19.41 %
Beta Lower Limit 0.00 %
Alpha Counts
244
Beta Counts
262180
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 23.78 %
Beta Upper Limit 18.77 %
Beta Lower Limit 0.00 %
Alpha Counts
240
Beta Counts
260117
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 23.71 %
Beta Upper Limit 18.70 %
Beta Lower Limit 0.00 %
Alpha Counts
190
Beta Counts
204995
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.78 %
Beta Upper Limit 20.78 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252432
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help


Set ROI's
Detector D4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.25 %
Beta Upper Limit 21.24 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252888
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

TestAmerica STL

Calibration Standard Data

Alpha Calibration Standards for Ra-226

Standard used: 1mL of Th-230 03-071 4567.9 dpm/mL 12/24/03

Std #	mL Ba Carrier	Gross wt	Tare Wt	Mass BaSO4
1	0.25	8.4779	8.4682	0.0097
2	0.4	8.3925	8.3784	0.0141
3	0.6	8.4768	8.4557	0.0211
4	0.8	8.4605	8.4313	0.0292
5	1	8.4726	8.4372	0.0354
6	1.5	8.4687	8.4173	0.0514
7	2	8.5100	8.4419	0.0681
8	3	8.5684	8.4653	0.1031

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65090-334

Th-230 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Th-230
ACTIVITY (dps):	7.654 E3
HALF-LIFE:	7.538 E4 Years
CALIBRATION DATE:	December 19, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.5%
SYSTEMATIC:	2.6%
RANDOM:	0.9%

*99% Confidence Level

Impurities: γ-impurities <0.1%, α-impurities <0.05%

5.17738 grams 0.5M HNO_3 solution.

P O NUMBER 1614557-000 OP, Item 3

SOURCE PREPARED BY: M. N. Currie for
M. Taskaeva, Radiochemist

Q A APPROVED: 12-19-02

SEVERN TRENT SERVICES

Logbook: 2060

Radiochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
											66.201	K9-15-03			
~~9-11-03~~	~~9-11-08~~	03-069 ~~03-0069~~ MC 9-22-03	Pu-238	02-026	132.98	2-23-02	45mL	↓	1.596 dpm/g	32022.4 d, 75	33.10 dpm/g ~~66.41~~ dpm/g		MFM		re-certification of 03-031, 02-03-6 and 66.201
~~↓~~	~~↓~~	~~–~~	~~Pu239~~	~~02-023~~	~~128.05~~	~~2-23-02~~	~~45mL~~	~~1.50mL~~	11-18-03 MC	~~24110 yr~~	~~32.165 dpm/g~~ ~~64.015 dpm/g~~	~~K9-15-03~~	~~MFM~~		~~62.025 dpm/mL~~
9-11-03	9-11-08	03-070 ~~03-0070~~ MC 9-22-03	Am243	98-011	1161 dpm/g	2-28-98	15 ~~16 gram~~	200mL		7.37 E+3 yr	87.075 ~~9.22~~ dpm/g		MFM		
10-6-03	10-6-08	03-071	Th230	65090-334	7,654 dps	12-19-02	5.1498g	100mL	N/A	7.538E4	4,567.9 dpm/mL	0.5M HNO3	BH	BBF	
10-6-03	10-6-08	03-072	Th230	03-071	4,567.9 dpm/mL	12-19-02	1mL	200mL	N/A	7.538E4	22.84 dpm/mL	0.5M HNO3	BH	BBF	
10-11-03	10-11-0	03-073	Clean U-233	047-105	10994 dpm/ml	9-16-97	10mL	1000L		70 yr	103.85 dpm/mL	DI H2O 2M N2SO4 KOH pH 1.5	MFM BBF		Rad 03-0078 in Rad Capture
10/31/03	10/31/08	03-074	I-129	681-78-4	1.059uCi	1-1-2000	1mL	100mL	N/A	1.57E+07	10.54 nCi/mL	0.1M NaOH	BH	BBF	
10/31/03	10/31/04	03-075	I-129	03-074	10.54 nCi/mL	1-1-2000	1mL	100mL	N/A	1.57E7	105.4 pCi/mL	0.1M NaOH	BH	BBF	
10/31/03	10/31/04	03-076	Ra228	01012	1,018 dpm/mL	2/16/01	2mL	100mL	NA	5.75y	20.36 dpm/mL	0.5M HNO3	BH	BBF	
10/31/03	10/31/04	03-081	Pu-242	92-242-5-1	129.63 Bq/g	12/11/89	5.0723	500mL	NA	3.73X 10^5 y	78.9027	.5M HNO3	MFM	MO	
11/3/03	11/3/04	SR19	Std SR carrier	Sr(NO3)2	N/A	N/A	120.77g	1Liter	N/A	N/A		ditto	[illegible]	BBF	Reported in Rad capture
11-5-03	11-5-04	RAD03-0032	Th-229	02-006	2134.75 dpm/mL	1-28-02	17.5mL	500mL	N/A	7.3e+3	74.716 dpm/mL	.5M HNO3	MFM	JMW	

Additional Comments:

LI# F7C28021

TestAmerica STL

Red 2007

Alpha and Beta Calibration

with

Crosstalk Correction

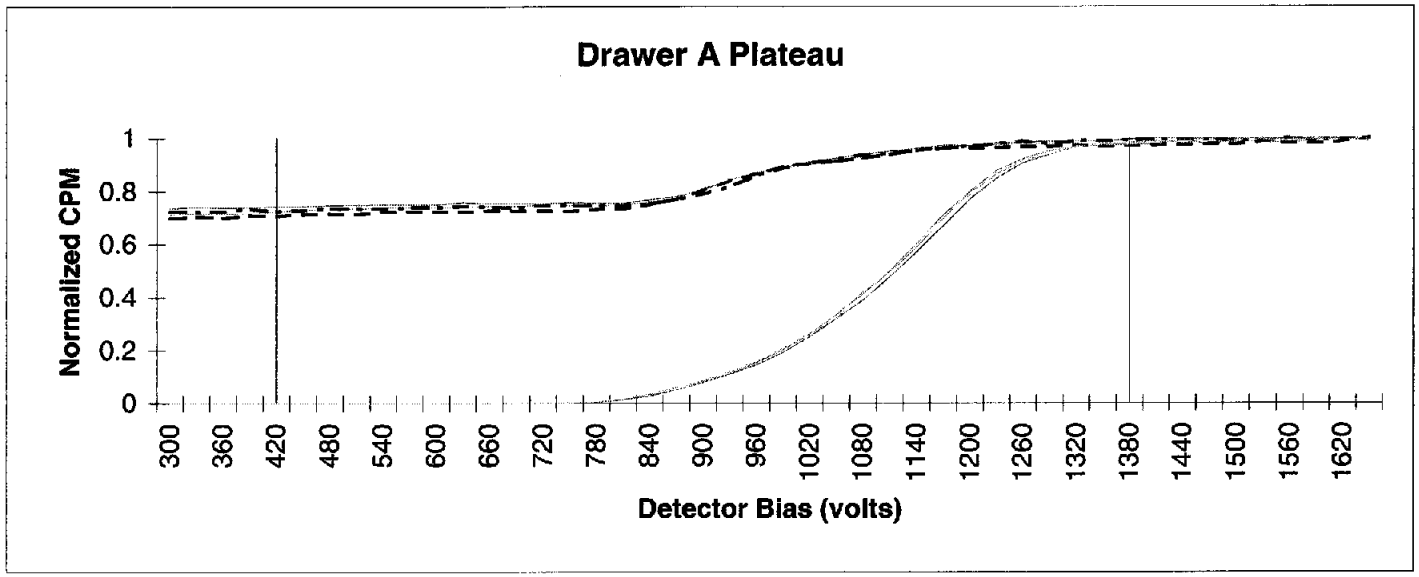
TestAmerica STL

Red 2007

Plateaus and Discriminator Settings

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

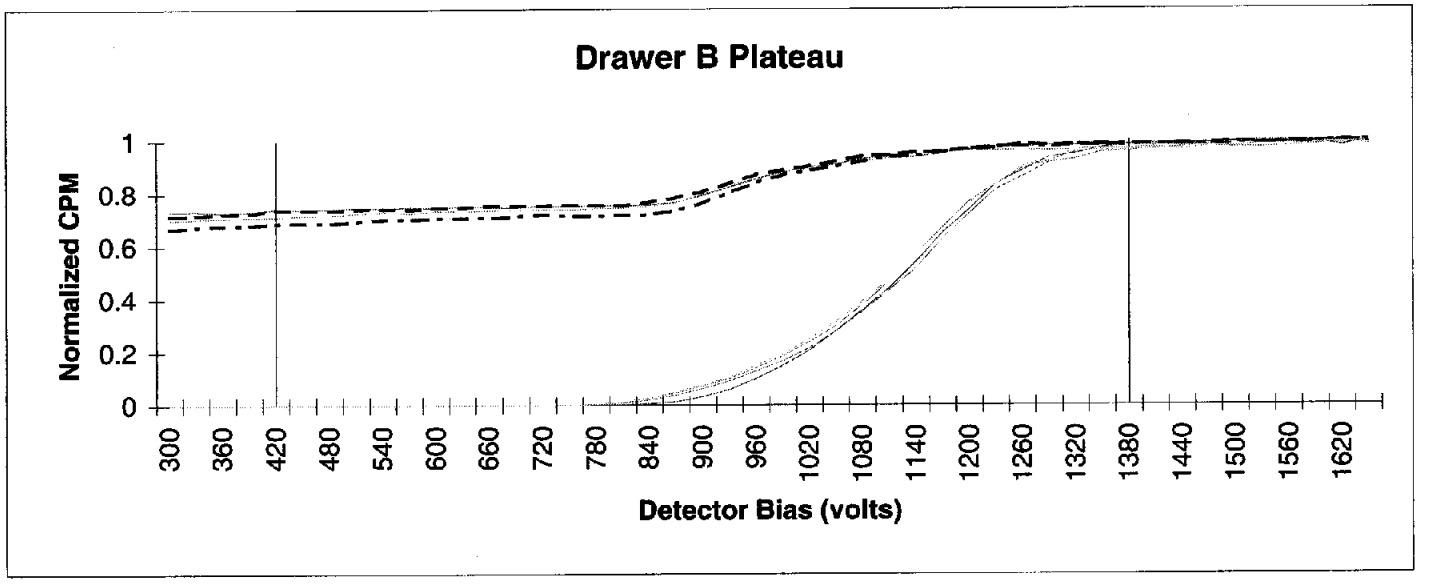
Optimum alpha only operating voltage: 420

	A1	A2	A3	A4
Beta slope at beta voltage	1.90%	2.05%	1.32%	2.19%
Alpha slope at beta voltage	1.02%	0.18%	0.62%	0.32%
Alpha slope at alpha voltage	1.08%	1.54%	2.61%	0.69%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

Optimum alpha only operating voltage: 420

	B1	B2	B3	B4
Beta slope at beta voltage	2.29%	3.38%	2.33%	1.55%
Alpha slope at beta voltage	0.81%	0.15%	0.14%	0.26%
Alpha slope at alpha voltage	1.69%	1.63%	1.39%	1.51%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
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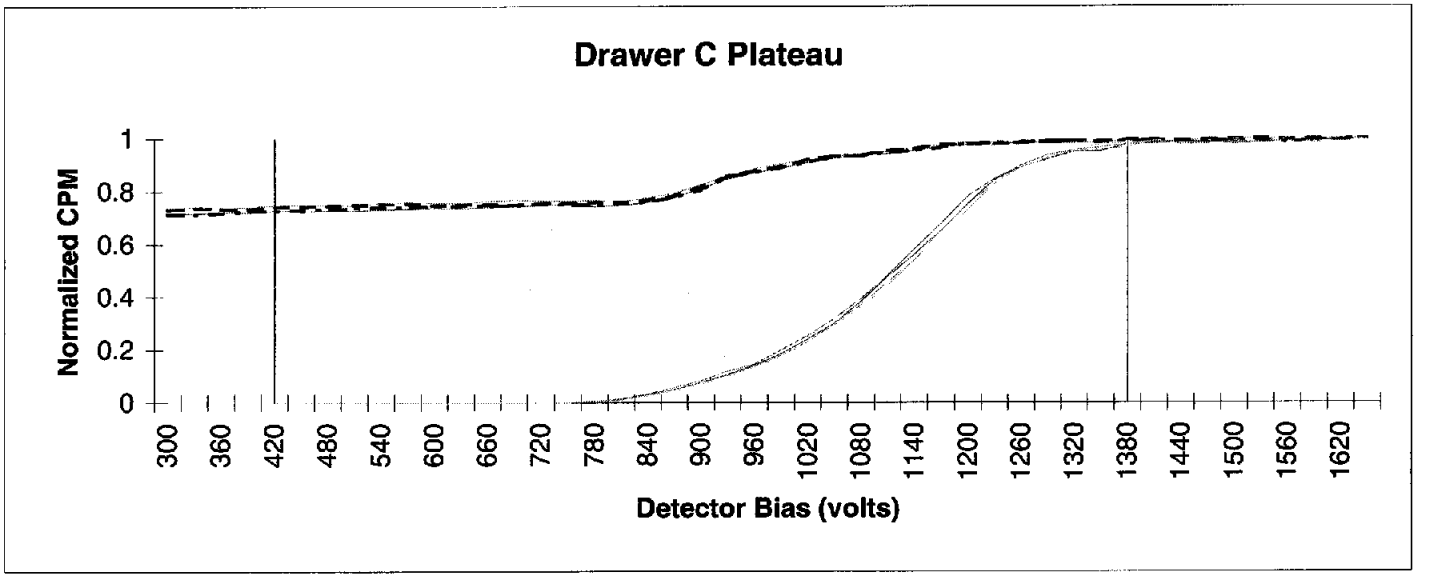
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1380

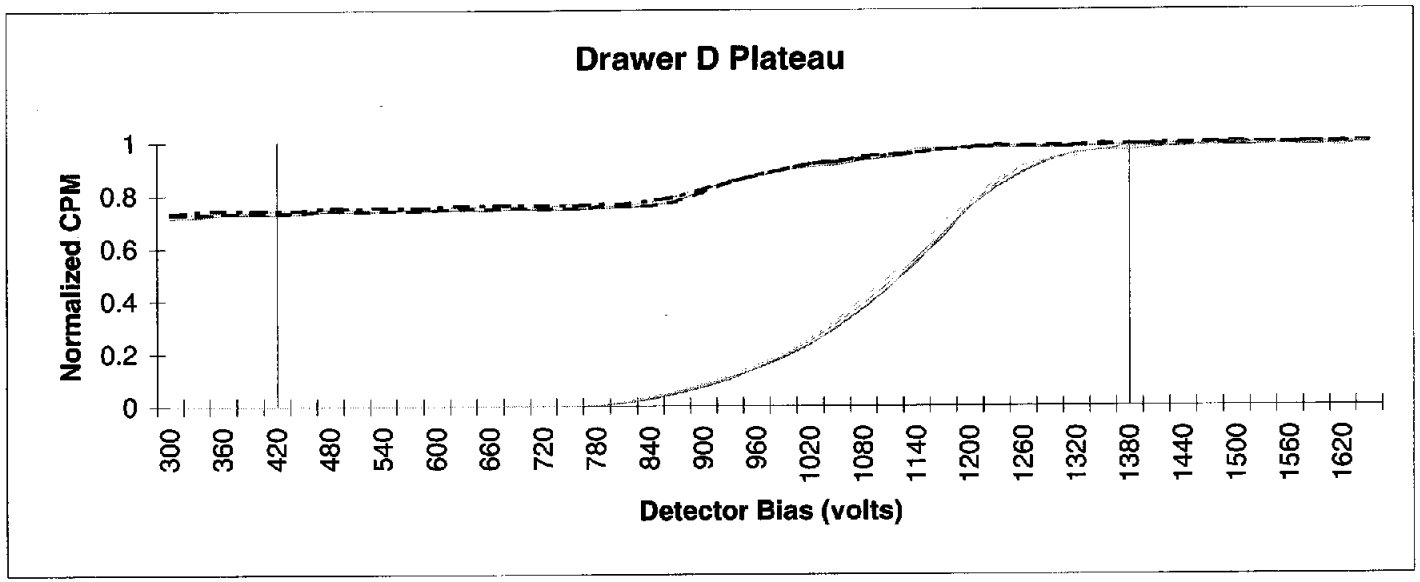
Optimum alpha only operating voltage: 420

	C1	C2	C3	C4
Beta slope at beta voltage	3.13%	2.21%	2.65%	2.67%
Alpha slope at beta voltage	0.40%	-0.09%	0.22%	0.31%
Alpha slope at alpha voltage	0.73%	1.23%	1.51%	1.34%

Printed 2/19/2007 4:51 PM

Unit Type: LB4100/W
Date Performed: 2/19/07 11:58
FileName: PLAT2007
Batch ID:

Unit Id: Red
Application Revision: 2
Application Version: Standard

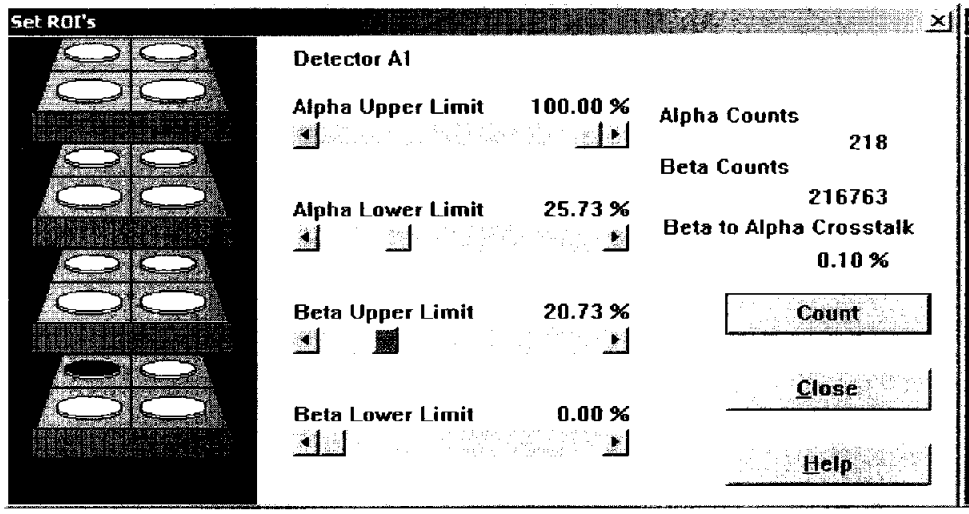


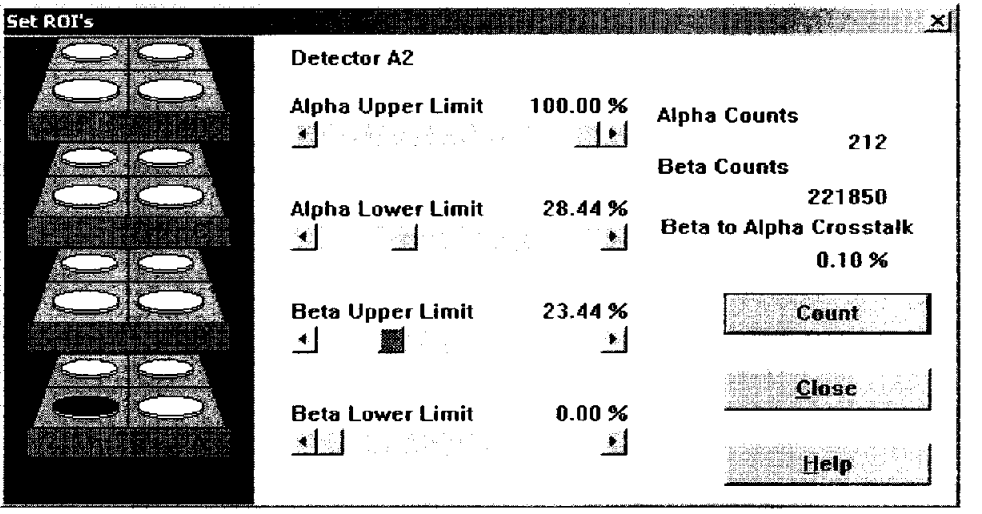
Optimum alpha beta simultaneous operating voltage: 1380

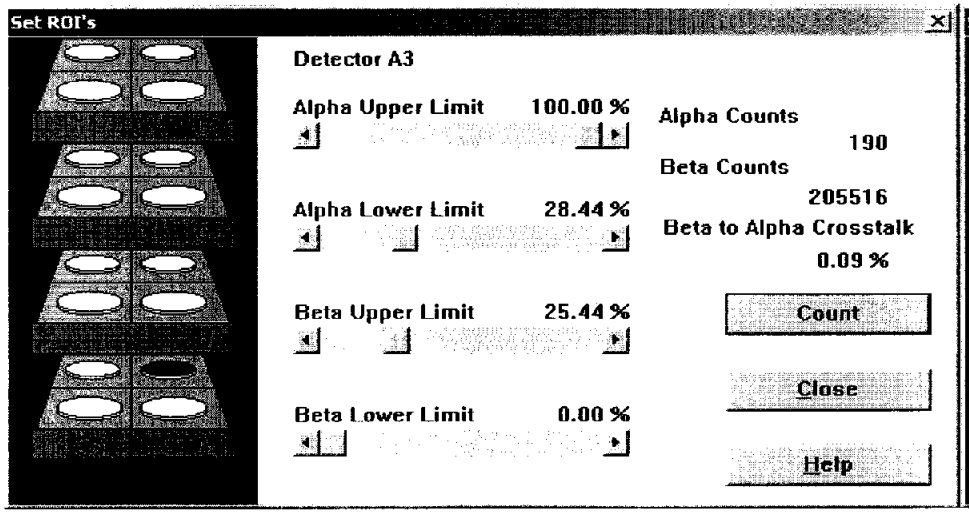
Optimum alpha only operating voltage: 420

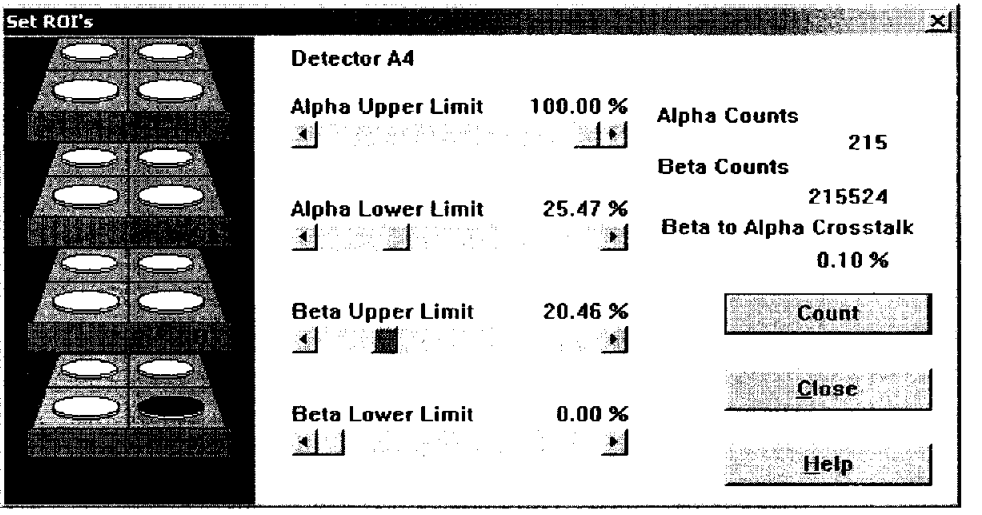
	D1	D2	D3	D4
Beta slope at beta voltage	1.81%	2.24%	2.13%	3.05%
Alpha slope at beta voltage	0.10%	0.43%	0.64%	0.58%
Alpha slope at alpha voltage	1.20%	1.08%	1.08%	1.08%

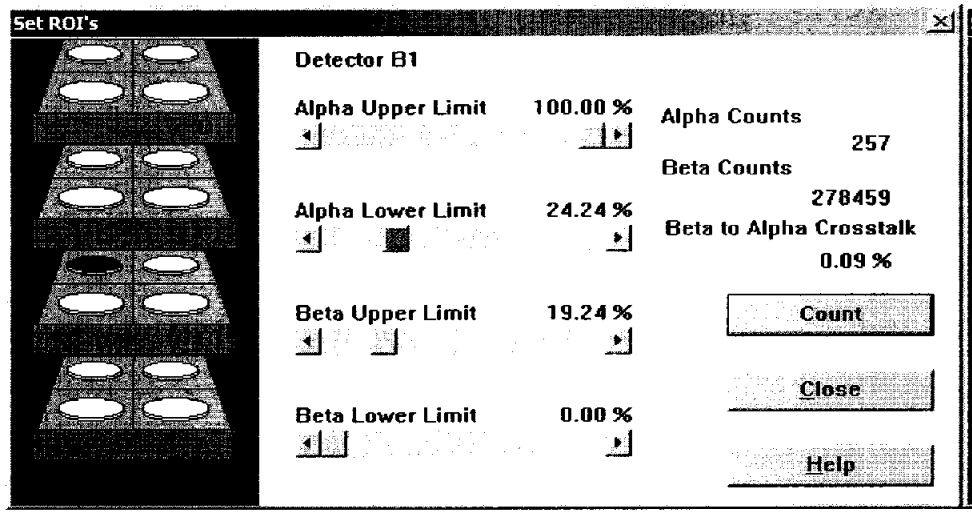
Printed 2/19/2007 4:51 PM

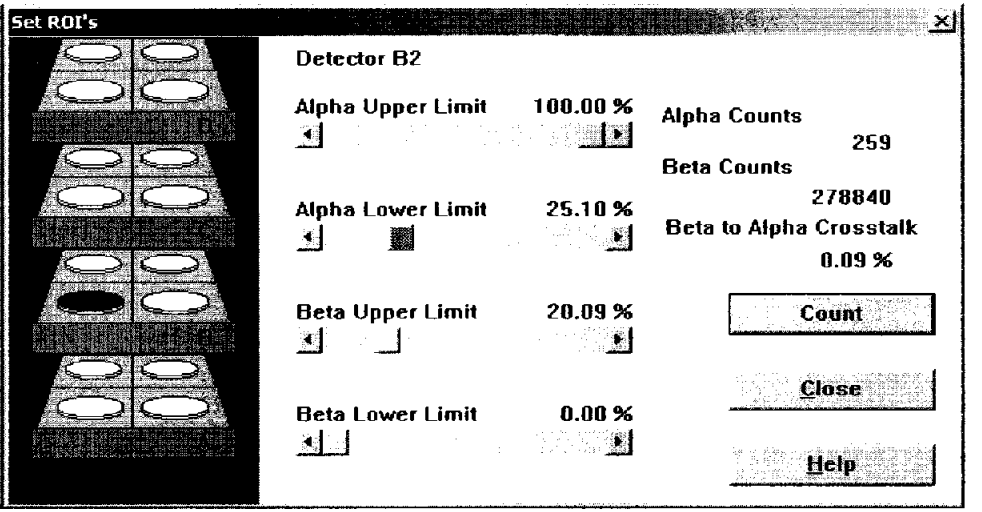

Set ROI's
Detector A1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.73 %
Beta Upper Limit 20.73 %
Beta Lower Limit 0.00 %
Alpha Counts
218
Beta Counts
216763
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

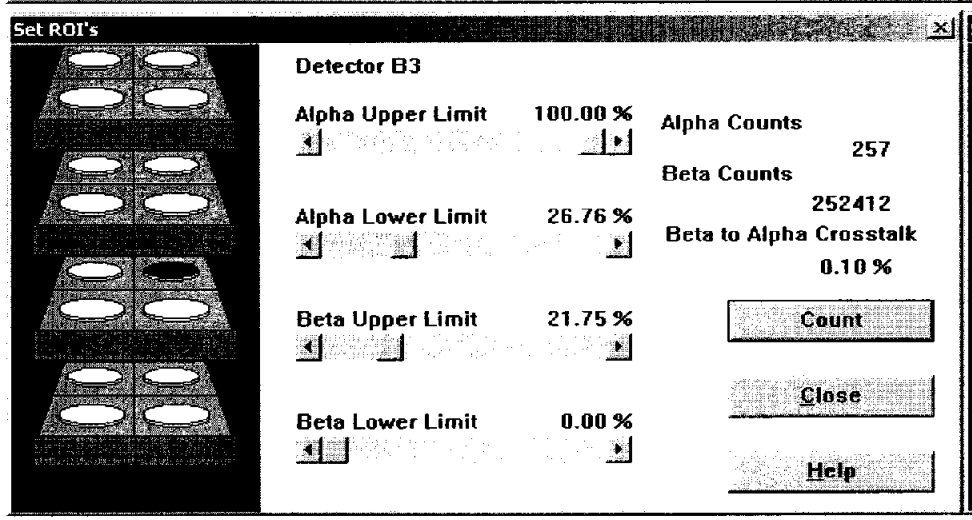

Set ROI's
Detector A2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 28.44 %
Beta Upper Limit 23.44 %
Beta Lower Limit 0.00 %
Alpha Counts
212
Beta Counts
221850
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

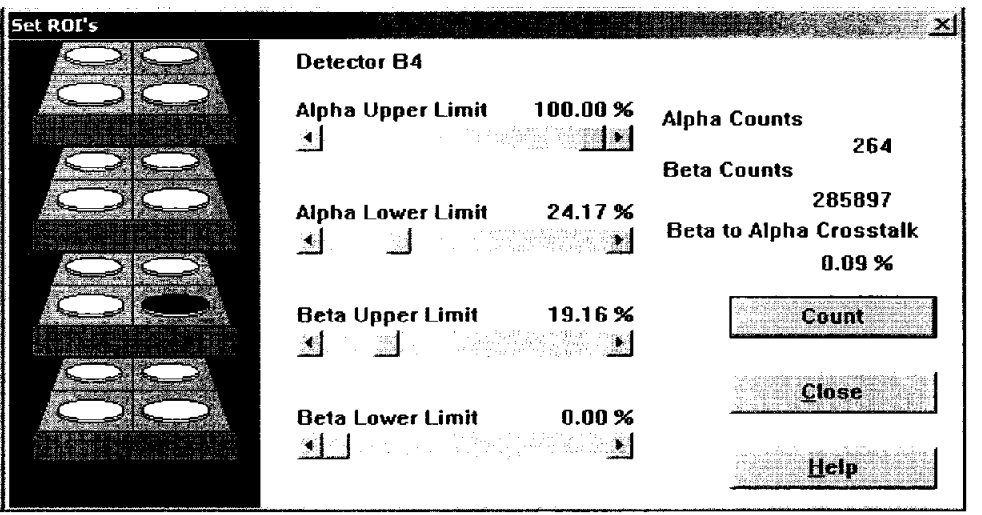

Set ROI's
Detector A3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 28.44 %
Beta Upper Limit 25.44 %
Beta Lower Limit 0.00 %
Alpha Counts
190
Beta Counts
205516
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

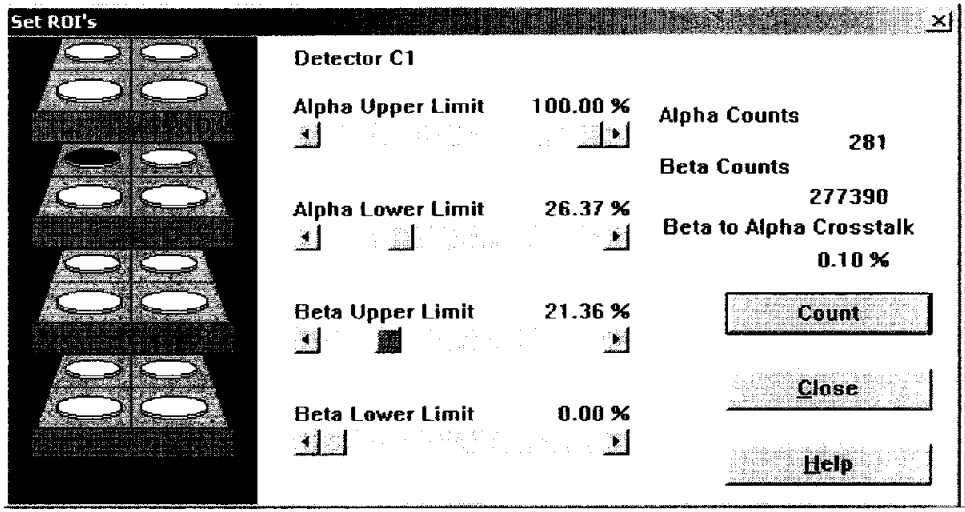

Set ROI's
Detector A4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.47 %
Beta Upper Limit 20.46 %
Beta Lower Limit 0.00 %
Alpha Counts
215
Beta Counts
215524
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

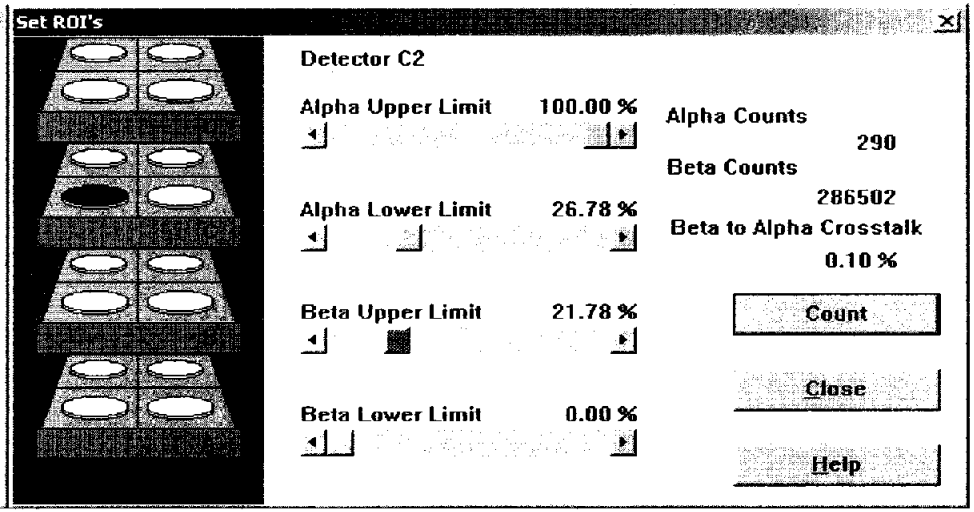

Set ROI's
Detector B1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.24 %
Beta Upper Limit 19.24 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
278459
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

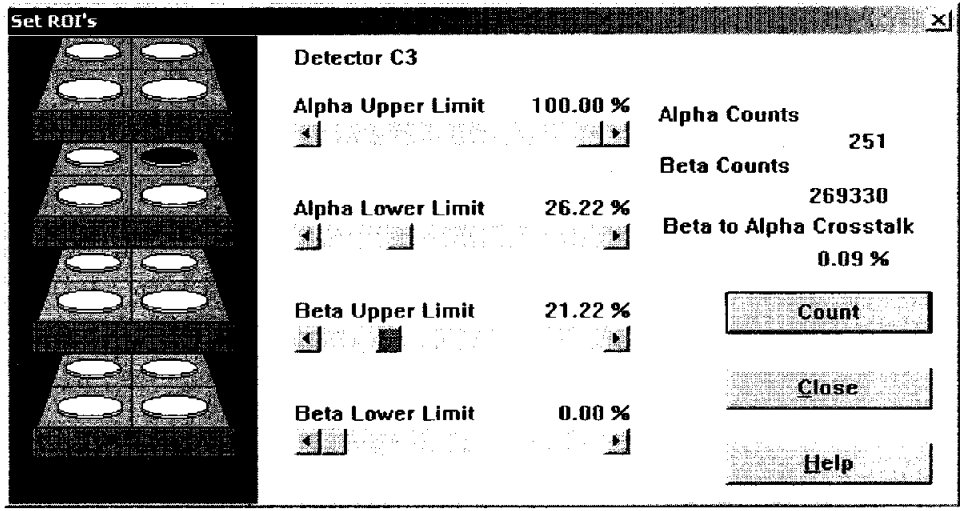

Set ROI's
Detector B2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.10 %
Beta Upper Limit 20.09 %
Beta Lower Limit 0.00 %
Alpha Counts
259
Beta Counts
278840
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

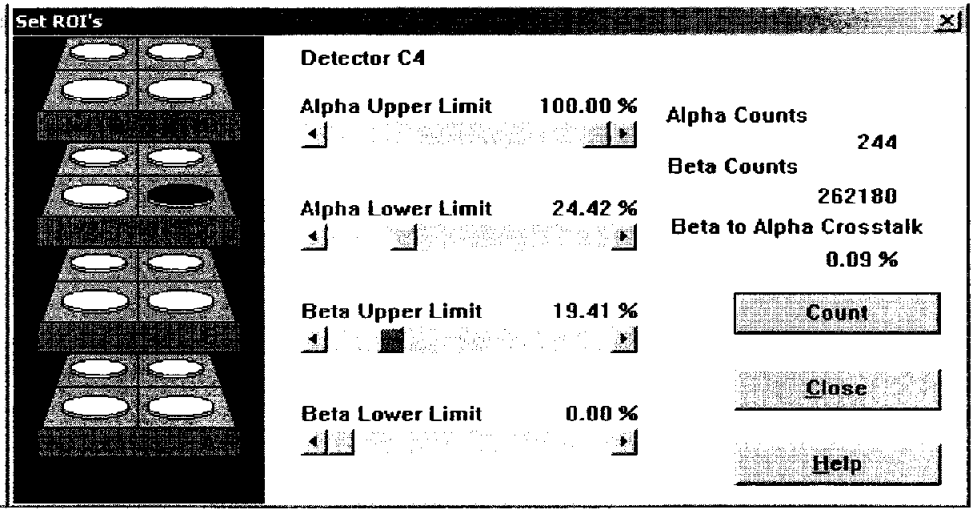

Set ROI's
Detector B3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.76 %
Beta Upper Limit 21.75 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252412
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

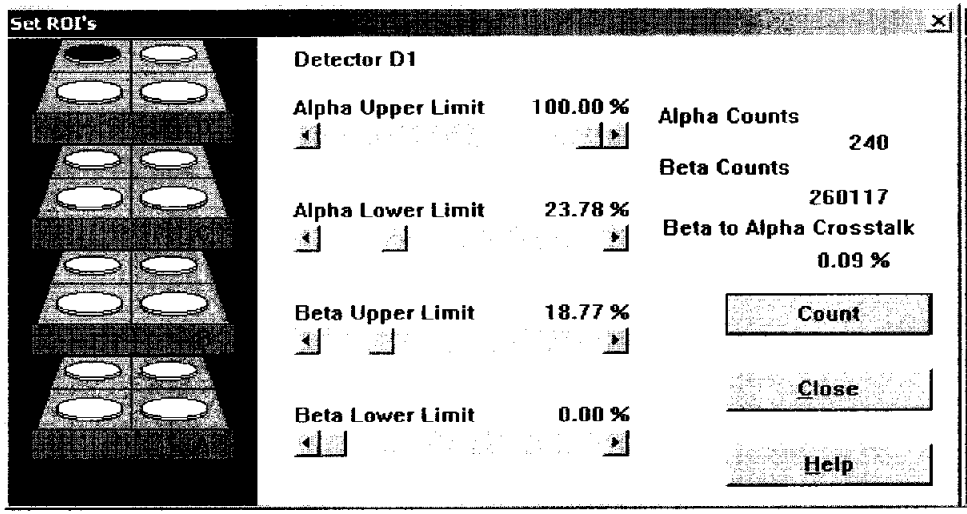

Set ROI's
Detector B4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.17 %
Beta Upper Limit 19.16 %
Beta Lower Limit 0.00 %
Alpha Counts
264
Beta Counts
285897
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help

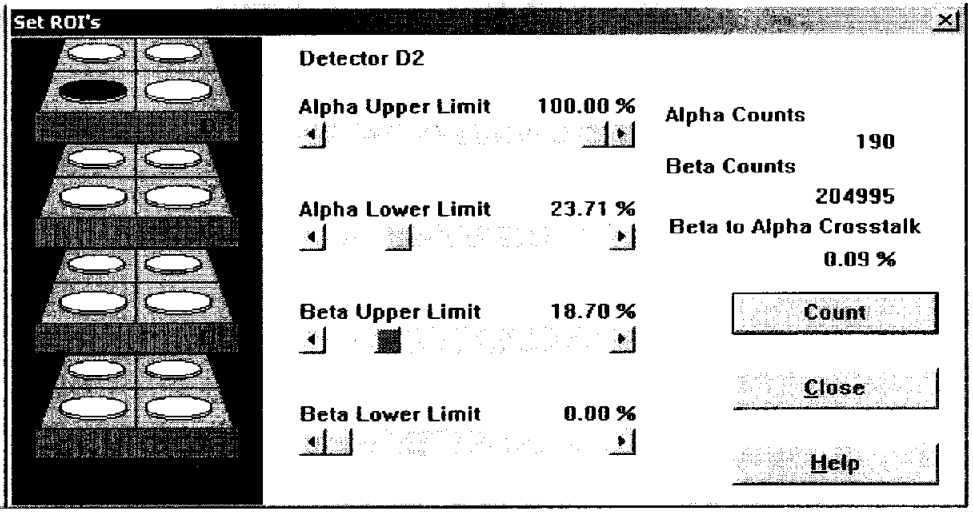

Set ROI's
Detector C1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.37 %
Beta Upper Limit 21.36 %
Beta Lower Limit 0.00 %
Alpha Counts
281
Beta Counts
277390
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

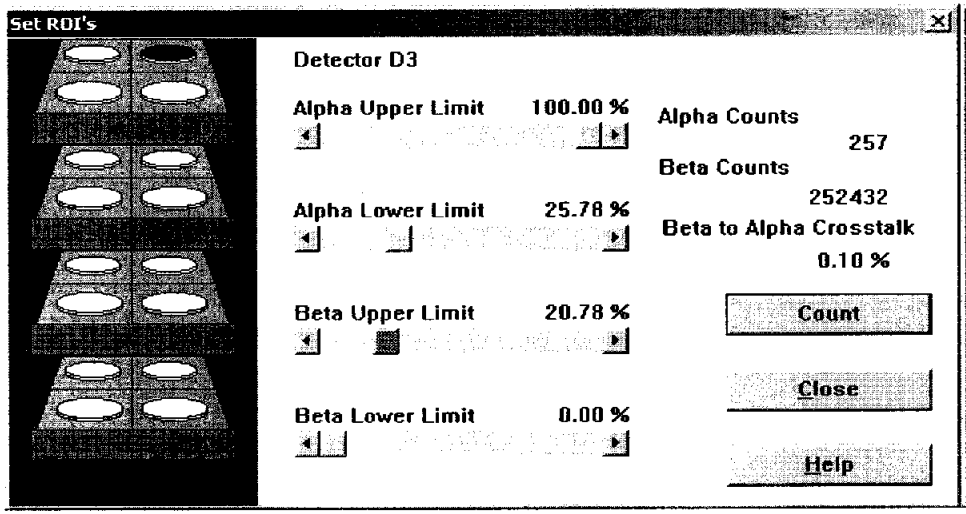

Set ROI's
Detector C2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.78 %
Beta Upper Limit 21.78 %
Beta Lower Limit 0.00 %
Alpha Counts
290
Beta Counts
286502
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

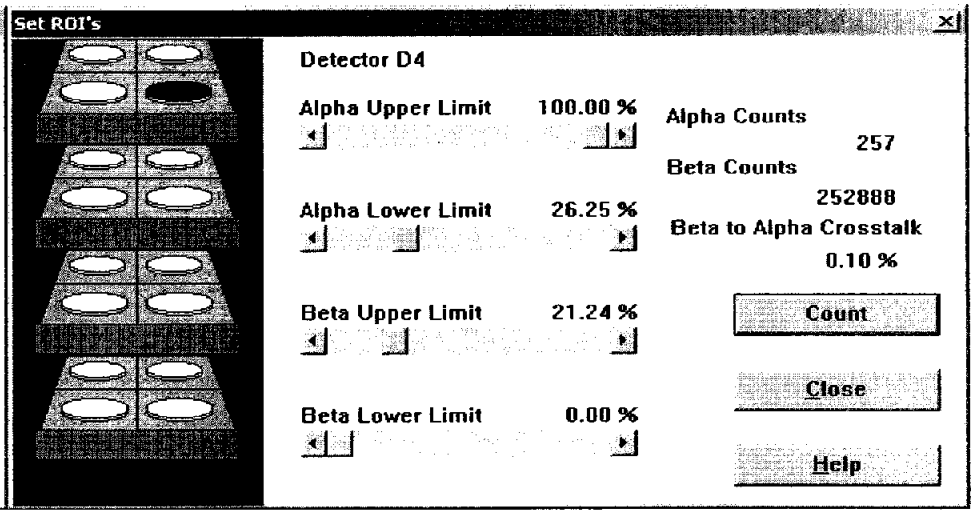

Set ROI's
Detector C3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.22 %
Beta Upper Limit 21.22 %
Beta Lower Limit 0.00 %
Alpha Counts
251
Beta Counts
269330
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector C4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 24.42 %
Beta Upper Limit 19.41 %
Beta Lower Limit 0.00 %
Alpha Counts
244
Beta Counts
262180
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D1
Alpha Upper Limit 100.00 %
Alpha Lower Limit 23.78 %
Beta Upper Limit 18.77 %
Beta Lower Limit 0.00 %
Alpha Counts
240
Beta Counts
260117
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D2
Alpha Upper Limit 100.00 %
Alpha Lower Limit 23.71 %
Beta Upper Limit 18.70 %
Beta Lower Limit 0.00 %
Alpha Counts
190
Beta Counts
204995
Beta to Alpha Crosstalk
0.09 %
Count
Close
Help


Set ROI's
Detector D3
Alpha Upper Limit 100.00 %
Alpha Lower Limit 25.78 %
Beta Upper Limit 20.78 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252432
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help


Set ROI's
Detector D4
Alpha Upper Limit 100.00 %
Alpha Lower Limit 26.25 %
Beta Upper Limit 21.24 %
Beta Lower Limit 0.00 %
Alpha Counts
257
Beta Counts
252888
Beta to Alpha Crosstalk
0.10 %
Count
Close
Help

TestAmerica STL

Red 2007

Alpha Efficiency Curves

lpha Attenuation Red A1
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A11	0.0094	40.00	35745	893.625	4567.9	0.1956
A1	A12	0.0169	40.00	38711	967.775	4567.9	0.2119
A1	A13	0.0257	40.00	27785	694.625	4567.9	0.1521
A1	A14	0.0421	40.00	26048	651.200	4567.9	0.1426
A1	A15	0.0629	40.00	19799	494.975	4567.9	0.1084
A1	A16	0.0817	40.00	37913	947.825	9135.8	0.1037
A1	A17	0.1052	40.00	32238	805.950	9135.8	0.0882
A1	A18	0.1240	40.00	28324	708.100	9135.8	0.0775

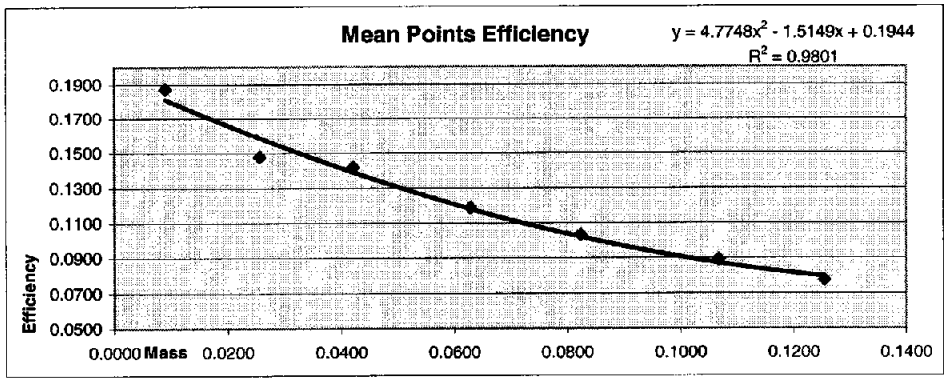
Alpha Attenuation Red A1
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A1	A21	0.0086	40.00	32650	816.250	4567.9	0.1787
A1	A22	0.0172	40.00	27673	691.825	4567.9	0.1515
A1	A23	0.0256	40.00	26220	655.500	4567.9	0.1435
A1	A24	0.0422	40.00	25802	645.050	4567.9	0.1412
A1	A25	0.0628	40.00	23582	589.550	4567.9	0.1291
A1	A26	0.0830	40.00	37518	937.950	9135.8	0.1027
A1	A27	0.1082	40.00	32891	822.275	9135.8	0.0900
A1	A28	0.1269	40.00	28219	705.475	9135.8	0.0772

Red A1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1956	0.1787	0.1872	4.53%	-4.53%
0.0257	0.0256	0.0257	0.1521	0.1435	0.1478	2.90%	-2.90%
0.0421	0.0422	0.0421	0.1426	0.1412	0.1419	0.47%	-0.47%
0.0629	0.0628	0.0629	0.1084	0.1291	0.1187	-8.72%	8.72%
0.0817	0.0830	0.0823	0.1037	0.1027	0.1032	0.52%	-0.52%
0.1052	0.1082	0.1067	0.0882	0.0900	0.0891	-1.00%	1.00%
0.1240	0.1269	0.1255	0.0775	0.0772	0.0774	0.19%	-0.19%



lpha Attenuation Red A2
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A2	A11	0.0094	40.00	34631	865.775	4567.9	0.1895
A2	A12	0.0169	40.00	38079	951.975	4567.9	0.2084
A2	A13	0.0257	40.00	27234	680.850	4567.9	0.1491
A2	A14	0.0421	40.00	25024	625.600	4567.9	0.1370
A2	A15	0.0629	40.00	19303	482.575	4567.9	0.1056
A2	A16	0.0817	40.00	36805	920.125	9135.8	0.1007
A2	A17	0.1052	40.00	30735	768.375	9135.8	0.0841
A2	A18	0.1240	40.00	27563	689.075	9135.8	0.0754

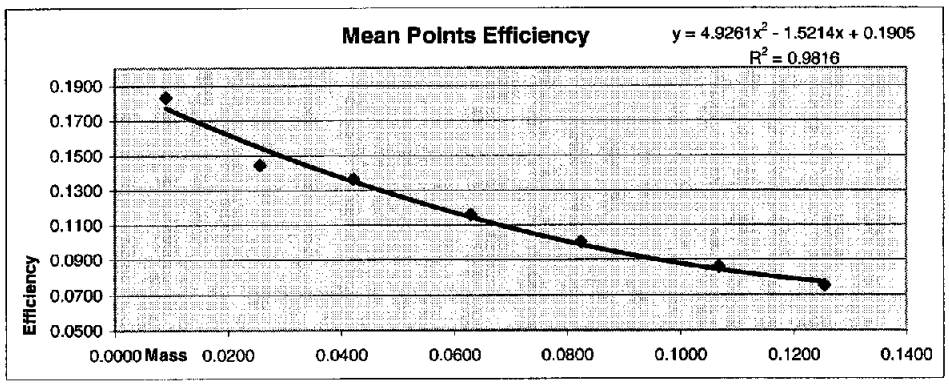
Alpha Attenuation Red A2
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A2	A21	0.0086	40.00	32366	809.150	4567.9	0.1771
A2	A22	0.0172	40.00	26492	662.300	4567.9	0.1450
A2	A23	0.0256	40.00	25566	639.150	4567.9	0.1399
A2	A24	0.0422	40.00	24882	622.050	4567.9	0.1362
A2	A25	0.0628	40.00	23042	576.050	4567.9	0.1261
A2	A26	0.0830	40.00	36455	911.375	9135.8	0.0998
A2	A27	0.1082	40.00	32037	800.925	9135.8	0.0877
A2	A28	0.1269	40.00	27387	684.675	9135.8	0.0749

ed A2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1895	0.1771	0.1833	3.38%	-3.38%
0.0257	0.0256	0.0257	0.1491	0.1399	0.1445	3.16%	-3.16%
0.0421	0.0422	0.0421	0.1370	0.1362	0.1366	0.28%	-0.28%
0.0629	0.0628	0.0629	0.1056	0.1261	0.1159	-8.83%	8.83%
0.0817	0.0830	0.0823	0.1007	0.0998	0.1002	0.48%	-0.48%
0.1052	0.1082	0.1067	0.0841	0.0877	0.0859	-2.07%	2.07%
0.1240	0.1269	0.1255	0.0754	0.0749	0.0752	0.32%	-0.32%



lpha Attenuation Red A3
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A3	A11	0.0094	40.00	34219	855.475	4567.9	0.1873
A3	A12	0.0169	40.00	37272	931.800	4567.9	0.2040
A3	A13	0.0257	40.00	26862	671.550	4567.9	0.1470
A3	A14	0.0421	40.00	24550	613.750	4567.9	0.1344
A3	A15	0.0629	40.00	18535	463.375	4567.9	0.1014
A3	A16	0.0817	40.00	35209	880.225	9135.8	0.0963
A3	A17	0.1052	40.00	29901	747.525	9135.8	0.0818
A3	A18	0.1240	40.00	25821	645.525	9135.8	0.0707

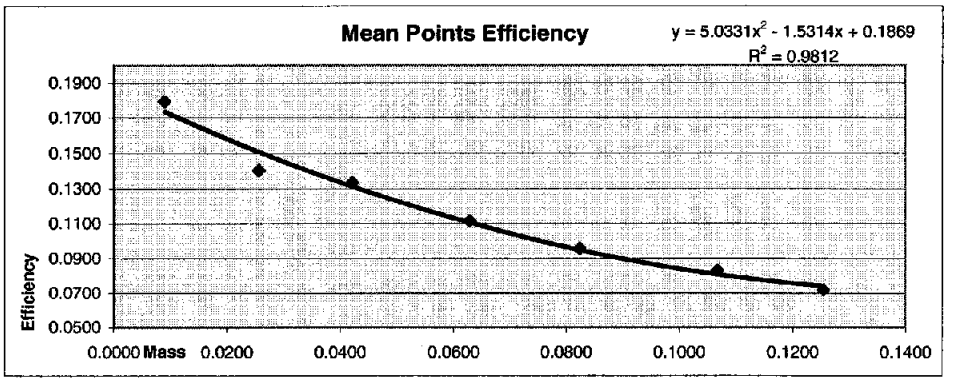
Alpha Attenuation Red A3
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A3	A21	0.0086	40.00	31329	783.225	4567.9	0.1715
A3	A22	0.0172	40.00	25963	649.075	4567.9	0.1421
A3	A23	0.0256	40.00	24528	613.200	4567.9	0.1342
A3	A24	0.0422	40.00	24295	607.375	4567.9	0.1330
A3	A25	0.0628	40.00	22223	555.575	4567.9	0.1216
A3	A26	0.0830	40.00	34783	869.575	9135.8	0.0952
A3	A27	0.1082	40.00	30886	772.150	9135.8	0.0845
A3	A28	0.1269	40.00	26628	665.700	9135.8	0.0729

ed A3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1873	0.1715	0.1794	4.41%	-4.41%
0.0257	0.0256	0.0257	0.1470	0.1342	0.1406	4.54%	-4.54%
0.0421	0.0422	0.0421	0.1344	0.1330	0.1337	0.52%	-0.52%
0.0629	0.0628	0.0629	0.1014	0.1216	0.1115	-9.05%	9.05%
0.0817	0.0830	0.0823	0.0963	0.0952	0.0958	0.61%	-0.61%
0.1052	0.1082	0.1067	0.0818	0.0845	0.0832	-1.62%	1.62%
0.1240	0.1269	0.1255	0.0707	0.0729	0.0718	-1.54%	1.54%



lpha Attenuation Red A4
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A4	A11	0.0094	40.00	34593	864.825	4567.9	0.1893
A4	A12	0.0169	40.00	38096	952.400	4567.9	0.2085
A4	A13	0.0257	40.00	27725	693.125	4567.9	0.1517
A4	A14	0.0421	40.00	25428	635.700	4567.9	0.1392
A4	A15	0.0629	40.00	19354	483.850	4567.9	0.1059
A4	A16	0.0817	40.00	36857	921.425	9135.8	0.1009
A4	A17	0.1052	40.00	31039	775.975	9135.8	0.0849
A4	A18	0.1240	40.00	26757	668.925	9135.8	0.0732

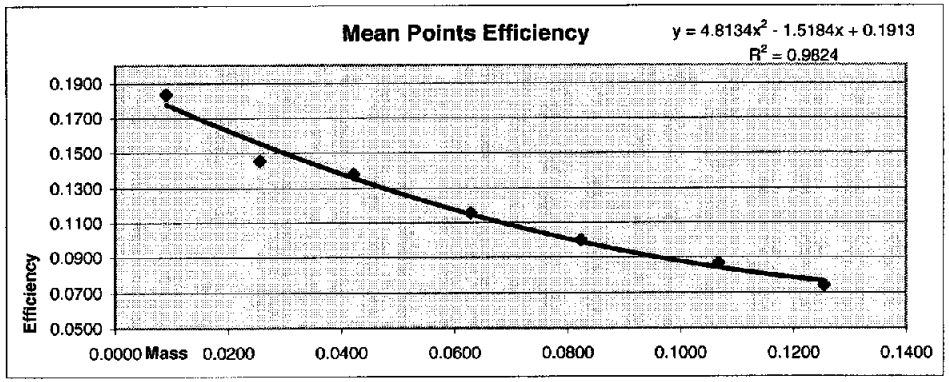
Alpha Attenuation Red A4
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
A4	A21	0.0086	40.00	32565	814.125	4567.9	0.1782
A4	A22	0.0172	40.00	26997	674.925	4567.9	0.1478
A4	A23	0.0256	40.00	25422	635.550	4567.9	0.1391
A4	A24	0.0422	40.00	25015	625.375	4567.9	0.1369
A4	A25	0.0628	40.00	22906	572.650	4567.9	0.1254
A4	A26	0.0830	40.00	36161	904.025	9135.8	0.0990
A4	A27	0.1082	40.00	32177	804.425	9135.8	0.0881
A4	A28	0.1269	40.00	27495	687.375	9135.8	0.0752

ed A4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1893	0.1782	0.1838	3.02%	-3.02%
0.0257	0.0256	0.0257	0.1517	0.1391	0.1454	4.33%	-4.33%
0.0421	0.0422	0.0421	0.1392	0.1369	0.1380	0.82%	-0.82%
0.0629	0.0628	0.0629	0.1059	0.1254	0.1156	-8.41%	8.41%
0.0817	0.0830	0.0823	0.1009	0.0990	0.0999	0.95%	-0.95%
0.1052	0.1082	0.1067	0.0849	0.0881	0.0865	-1.80%	1.80%
0.1240	0.1269	0.1255	0.0732	0.0752	0.0742	-1.36%	1.36%



lpha Attenuation Red B1
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B1	A11	0.0094	40.00	34489	862.225	4567.9	0.1888
B1	A12	0.0169	40.00	37707	942.675	4567.9	0.2064
B1	A13	0.0257	40.00	27207	680.175	4567.9	0.1489
B1	A14	0.0421	40.00	24522	613.050	4567.9	0.1342
B1	A15	0.0629	40.00	19517	487.925	4567.9	0.1068
B1	A16	0.0817	40.00	35833	895.825	9135.8	0.0981
B1	A17	0.1052	40.00	30386	759.650	9135.8	0.0832
B1	A18	0.1240	40.00	26365	659.125	9135.8	0.0721

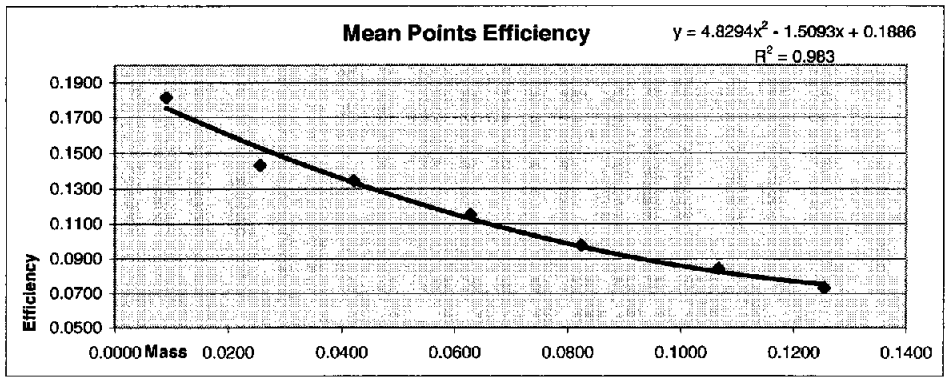
Alpha Attenuation Red B1
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B1	A21	0.0086	40.00	31749	793.725	4567.9	0.1738
B1	A22	0.0172	40.00	26438	660.950	4567.9	0.1447
B1	A23	0.0256	40.00	25150	628.750	4567.9	0.1376
B1	A24	0.0422	40.00	24622	615.550	4567.9	0.1348
B1	A25	0.0628	40.00	22538	563.450	4567.9	0.1233
B1	A26	0.0830	40.00	35668	891.700	9135.8	0.0976
B1	A27	0.1082	40.00	31291	782.275	9135.8	0.0856
B1	A28	0.1269	40.00	27170	679.250	9135.8	0.0744

ed B1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1888	0.1738	0.1813	4.14%	-4.14%
0.0257	0.0256	0.0257	0.1489	0.1376	0.1433	3.93%	-3.93%
0.0421	0.0422	0.0421	0.1342	0.1348	0.1345	-0.20%	0.20%
0.0629	0.0628	0.0629	0.1068	0.1233	0.1151	-7.18%	7.18%
0.0817	0.0830	0.0823	0.0981	0.0976	0.0978	0.23%	-0.23%
0.1052	0.1082	0.1067	0.0832	0.0856	0.0844	-1.47%	1.47%
0.1240	0.1269	0.1255	0.0721	0.0744	0.0732	-1.50%	1.50%



lpha Attenuation Red B2
2_2007

Data Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B2	A11	0.0094	40.00	34228	855.700	4567.9	0.1873
B2	A12	0.0169	40.00	37453	936.325	4567.9	0.2050
B2	A13	0.0257	40.00	27139	678.475	4567.9	0.1485
B2	A14	0.0421	40.00	24918	622.950	4567.9	0.1364
B2	A15	0.0629	40.00	18986	474.650	4567.9	0.1039
B2	A16	0.0817	40.00	36258	906.450	9135.8	0.0992
B2	A17	0.1052	40.00	30293	757.325	9135.8	0.0829
B2	A18	0.1240	40.00	26402	660.050	9135.8	0.0722

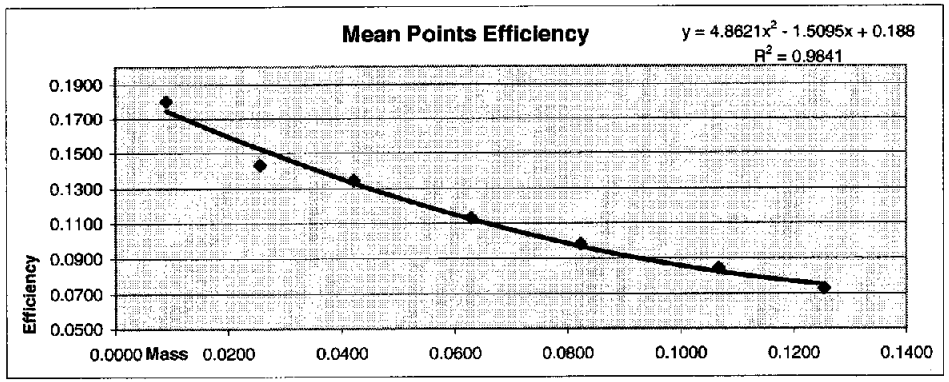
Alpha Attenuation Red B2
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B2	A21	0.0086	40.00	31687	792.175	4567.9	0.1734
B2	A22	0.0172	40.00	26252	656.300	4567.9	0.1437
B2	A23	0.0256	40.00	25168	629.200	4567.9	0.1377
B2	A24	0.0422	40.00	24246	606.150	4567.9	0.1327
B2	A25	0.0628	40.00	22365	559.125	4567.9	0.1224
B2	A26	0.0830	40.00	35428	885.700	9135.8	0.0969
B2	A27	0.1082	40.00	31419	785.475	9135.8	0.0860
B2	A28	0.1269	40.00	26912	672.800	9135.8	0.0736

Red B2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1873	0.1734	0.1804	3.85%	-3.85%
0.0257	0.0256	0.0257	0.1485	0.1377	0.1431	3.77%	-3.77%
0.0421	0.0422	0.0421	0.1364	0.1327	0.1345	1.37%	-1.37%
0.0629	0.0628	0.0629	0.1039	0.1224	0.1132	-8.17%	8.17%
0.0817	0.0830	0.0823	0.0992	0.0969	0.0981	1.16%	-1.16%
0.1052	0.1082	0.1067	0.0829	0.0860	0.0844	-1.82%	1.82%
0.1240	0.1269	0.1255	0.0722	0.0736	0.0729	-0.96%	0.96%



lpha Attenuation Red B3
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B3	A11	0.0094	40.00	33892	847.300	4567.9	0.1855
B3	A12	0.0169	40.00	37656	941.400	4567.9	0.2061
B3	A13	0.0257	40.00	26621	665.525	4567.9	0.1457
B3	A14	0.0421	40.00	24345	608.625	4567.9	0.1332
B3	A15	0.0629	40.00	18733	468.325	4567.9	0.1025
B3	A16	0.0817	40.00	35795	894.875	9135.8	0.0980
B3	A17	0.1052	40.00	29945	748.625	9135.8	0.0819
B3	A18	0.1240	40.00	25815	645.375	9135.8	0.0706

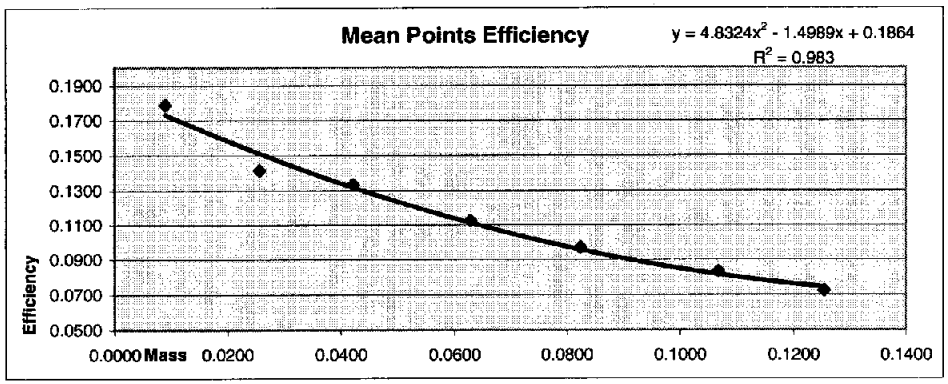
Alpha Attenuation Red B3
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B3	A21	0.0086	40.00	31517	787.925	4567.9	0.1725
B3	A22	0.0172	40.00	26449	661.225	4567.9	0.1448
B3	A23	0.0256	40.00	25043	626.075	4567.9	0.1371
B3	A24	0.0422	40.00	24395	609.875	4567.9	0.1335
B3	A25	0.0628	40.00	22381	559.525	4567.9	0.1225
B3	A26	0.0830	40.00	35117	877.925	9135.8	0.0961
B3	A27	0.1082	40.00	30900	772.500	9135.8	0.0846
B3	A28	0.1269	40.00	27093	677.325	9135.8	0.0741

ed B3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1855	0.1725	0.1790	3.63%	-3.63%
0.0257	0.0256	0.0257	0.1457	0.1371	0.1414	3.05%	-3.05%
0.0421	0.0422	0.0421	0.1332	0.1335	0.1334	-0.10%	0.10%
0.0629	0.0628	0.0629	0.1025	0.1225	0.1125	-8.87%	8.87%
0.0817	0.0830	0.0823	0.0980	0.0961	0.0970	0.96%	-0.96%
0.1052	0.1082	0.1067	0.0819	0.0846	0.0833	-1.57%	1.57%
0.1240	0.1269	0.1255	0.0706	0.0741	0.0724	-2.42%	2.42%



lpha Attenuation Red B4
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B4	A11	0.0094	40.00	36870	921.750	4567.9	0.2018
B4	A12	0.0169	40.00	40325	1008.125	4567.9	0.2207
B4	A13	0.0257	40.00	29207	730.175	4567.9	0.1598
B4	A14	0.0421	40.00	26958	673.950	4567.9	0.1475
B4	A15	0.0629	40.00	20695	517.375	4567.9	0.1133
B4	A16	0.0817	40.00	39988	999.700	9135.8	0.1094
B4	A17	0.1052	40.00	33789	844.725	9135.8	0.0925
B4	A18	0.1240	40.00	29359	733.975	9135.8	0.0803

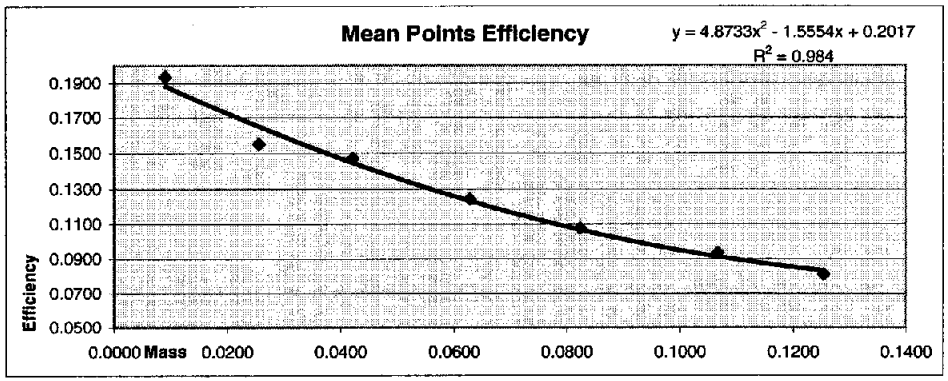
Alpha Attenuation Red B4
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
B4	A21	0.0086	40.00	33963	849.075	4567.9	0.1859
B4	A22	0.0172	40.00	28672	716.800	4567.9	0.1569
B4	A23	0.0256	40.00	27477	686.925	4567.9	0.1504
B4	A24	0.0422	40.00	26784	669.600	4567.9	0.1466
B4	A25	0.0628	40.00	24693	617.325	4567.9	0.1351
B4	A26	0.0830	40.00	38672	966.800	9135.8	0.1058
B4	A27	0.1082	40.00	34584	864.600	9135.8	0.0946
B4	A28	0.1269	40.00	29952	748.800	9135.8	0.0820

ed B4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.2018	0.1859	0.1938	4.10%	-4.10%
0.0257	0.0256	0.0257	0.1598	0.1504	0.1551	3.05%	-3.05%
0.0421	0.0422	0.0421	0.1475	0.1466	0.1471	0.32%	-0.32%
0.0629	0.0628	0.0629	0.1133	0.1351	0.1242	-8.81%	8.81%
0.0817	0.0830	0.0823	0.1094	0.1058	0.1076	1.67%	-1.67%
0.1052	0.1082	0.1067	0.0925	0.0946	0.0936	-1.16%	1.16%
0.1240	0.1269	0.1255	0.0803	0.0820	0.0812	-1.00%	1.00%



lpha Attenuation Red C1
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C1	A11	0.0094	40.00	34400	860.000	4567.9	0.1883
C1	A12	0.0169	40.00	37862	946.550	4567.9	0.2072
C1	A13	0.0257	40.00	27197	679.925	4567.9	0.1488
C1	A14	0.0421	40.00	24720	618.000	4567.9	0.1353
C1	A15	0.0629	40.00	18852	471.300	4567.9	0.1032
C1	A16	0.0817	40.00	36495	912.375	9135.8	0.0999
C1	A17	0.1052	40.00	30705	767.625	9135.8	0.0840
C1	A18	0.1240	40.00	26877	671.925	9135.8	0.0735

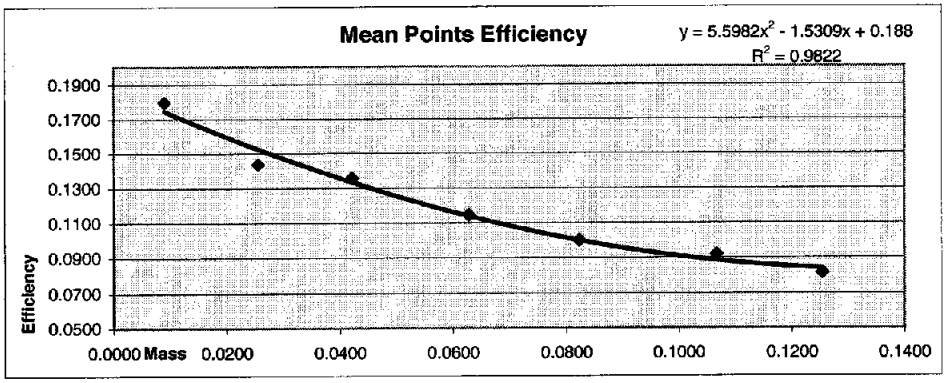
Alpha Attenuation Red C1
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C1	A21	0.0086	40.00	31275	781.875	4567.9	0.1712
C1	A22	0.0172	40.00	26242	656.050	4567.9	0.1436
C1	A23	0.0256	40.00	25308	632.700	4567.9	0.1385
C1	A24	0.0422	40.00	24805	620.125	4567.9	0.1358
C1	A25	0.0628	40.00	22991	574.775	4567.9	0.1258
C1	A26	0.0830	40.00	36530	913.250	9135.8	0.1000
C1	A27	0.1082	40.00	36483	912.075	9135.8	0.0998
C1	A28	0.1269	40.00	32625	815.625	9135.8	0.0893

ed C1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1883	0.1712	0.1797	4.76%	-4.76%
0.0257	0.0256	0.0257	0.1488	0.1385	0.1437	3.60%	-3.60%
0.0421	0.0422	0.0421	0.1353	0.1358	0.1355	-0.17%	0.17%
0.0629	0.0628	0.0629	0.1032	0.1258	0.1145	-9.89%	9.89%
0.0817	0.0830	0.0823	0.0999	0.1000	0.0999	-0.05%	0.05%
0.1052	0.1082	0.1067	0.0840	0.0998	0.0919	-8.60%	8.60%
0.1240	0.1269	0.1255	0.0735	0.0893	0.0814	-9.66%	9.66%



lpha Attenuation Red C2
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C2	A11	0.0094	40.00	35843	896.075	4567.9	0.1962
C2	A12	0.0169	40.00	38834	970.850	4567.9	0.2125
C2	A13	0.0257	40.00	28848	721.200	4567.9	0.1579
C2	A14	0.0421	40.00	25708	642.700	4567.9	0.1407
C2	A15	0.0629	40.00	19870	496.750	4567.9	0.1087
C2	A16	0.0817	40.00	37448	936.200	9135.8	0.1025
C2	A17	0.1052	40.00	32454	811.350	9135.8	0.0888
C2	A18	0.1240	40.00	28289	707.225	9135.8	0.0774

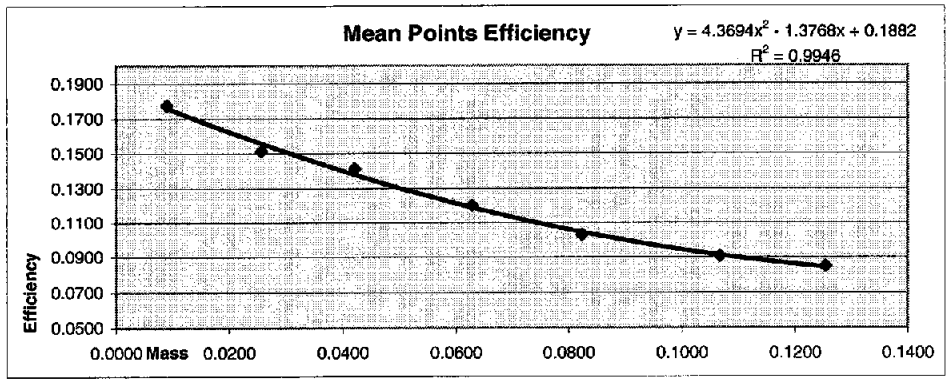
Alpha Attenuation Red C2
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C2	A21	0.0086	40.00	29065	726.625	4567.9	0.1591
C2	A22	0.0172	40.00	27073	676.825	4567.9	0.1482
C2	A23	0.0256	40.00	26428	660.700	4567.9	0.1446
C2	A24	0.0422	40.00	25899	647.475	4567.9	0.1417
C2	A25	0.0628	40.00	24049	601.225	4567.9	0.1316
C2	A26	0.0830	40.00	37778	944.450	9135.8	0.1034
C2	A27	0.1082	40.00	33625	840.625	9135.8	0.0920
C2	A28	0.1269	40.00	33706	842.650	9135.8	0.0922

ed C2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1962	0.1591	0.1776	10.44%	-10.44%
0.0257	0.0256	0.0257	0.1579	0.1446	0.1513	4.38%	-4.38%
0.0421	0.0422	0.0421	0.1407	0.1417	0.1412	-0.37%	0.37%
0.0629	0.0628	0.0629	0.1087	0.1316	0.1202	-9.52%	9.52%
0.0817	0.0830	0.0823	0.1025	0.1034	0.1029	-0.44%	0.44%
0.1052	0.1082	0.1067	0.0888	0.0920	0.0904	-1.77%	1.77%
0.1240	0.1269	0.1255	0.0774	0.0922	0.0848	-8.74%	8.74%



lpha Attenuation Red C3
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C3	A11	0.0094	40.00	33301	832.525	4567.9	0.1823
C3	A12	0.0169	40.00	36527	913.175	4567.9	0.1999
C3	A13	0.0257	40.00	26268	656.700	4567.9	0.1438
C3	A14	0.0421	40.00	24104	602.600	4567.9	0.1319
C3	A15	0.0629	40.00	18012	450.300	4567.9	0.0986
C3	A16	0.0817	40.00	35016	875.400	9135.8	0.0958
C3	A17	0.1052	40.00	28950	723.750	9135.8	0.0792
C3	A18	0.1240	40.00	25436	635.900	9135.8	0.0696

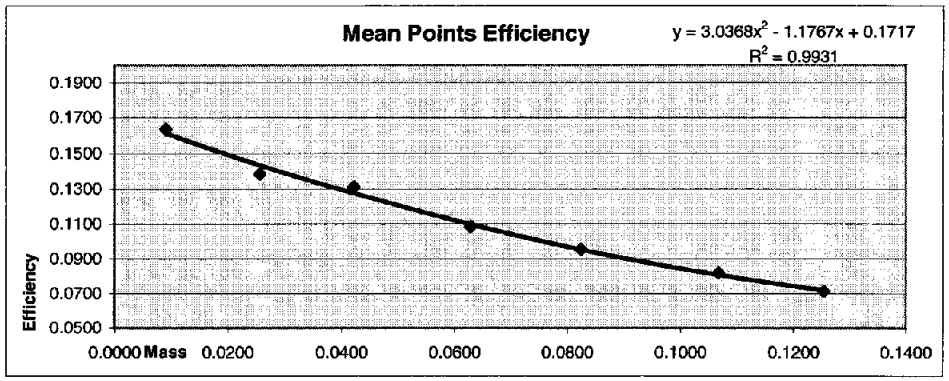
Alpha Attenuation Red C3
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C3	A21	0.0086	40.00	26441	661.025	4567.9	0.1447
C3	A22	0.0172	40.00	31072	776.800	4567.9	0.1701
C3	A23	0.0256	40.00	24341	608.525	4567.9	0.1332
C3	A24	0.0422	40.00	23799	594.975	4567.9	0.1303
C3	A25	0.0628	40.00	21669	541.725	4567.9	0.1186
C3	A26	0.0830	40.00	34778	869.450	9135.8	0.0952
C3	A27	0.1082	40.00	30807	770.175	9135.8	0.0843
C3	A28	0.1269	40.00	26558	663.950	9135.8	0.0727

ed C3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1823	0.1447	0.1635	11.48%	-11.48%
0.0257	0.0256	0.0257	0.1438	0.1332	0.1385	3.81%	-3.81%
0.0421	0.0422	0.0421	0.1319	0.1303	0.1311	0.64%	-0.64%
0.0629	0.0628	0.0629	0.0986	0.1186	0.1086	-9.22%	9.22%
0.0817	0.0830	0.0823	0.0958	0.0952	0.0955	0.34%	-0.34%
0.1052	0.1082	0.1067	0.0792	0.0843	0.0818	-3.11%	3.11%
0.1240	0.1269	0.1255	0.0696	0.0727	0.0711	-2.16%	2.16%



lpha Attenuation Red C4
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C4	A11	0.0094	40.00	34460	861.500	4567.9	0.1886
C4	A12	0.0169	40.00	37771	944.275	4567.9	0.2067
C4	A13	0.0257	40.00	27241	681.025	4567.9	0.1491
C4	A14	0.0421	40.00	24859	621.475	4567.9	0.1361
C4	A15	0.0629	40.00	18747	468.675	4567.9	0.1026
C4	A16	0.0817	40.00	36298	907.450	9135.8	0.0993
C4	A17	0.1052	40.00	30655	766.375	9135.8	0.0839
C4	A18	0.1240	40.00	26777	669.425	9135.8	0.0733

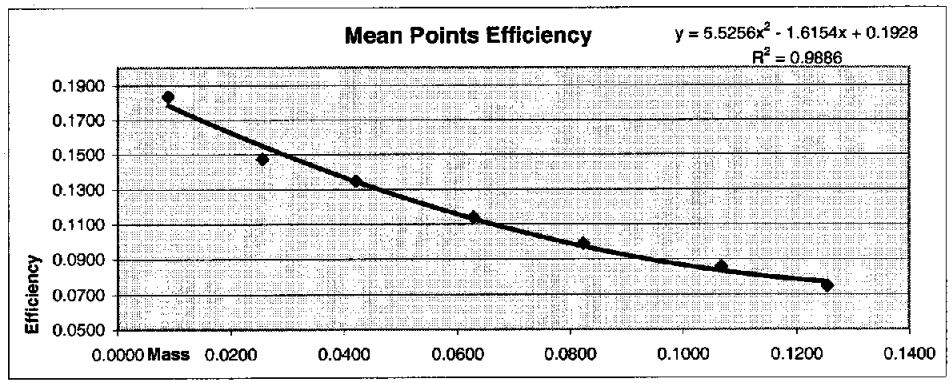
Alpha Attenuation Red C4
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
C4	A21	0.0086	40.00	32665	816.625	4567.9	0.1788
C4	A22	0.0172	40.00	32217	805.425	4567.9	0.1763
C4	A23	0.0256	40.00	26569	664.225	4567.9	0.1454
C4	A24	0.0422	40.00	24373	609.325	4567.9	0.1334
C4	A25	0.0628	40.00	22847	571.175	4567.9	0.1250
C4	A26	0.0830	40.00	35913	897.825	9135.8	0.0983
C4	A27	0.1082	40.00	32001	800.025	9135.8	0.0876
C4	A28	0.1269	40.00	27809	695.225	9135.8	0.0761

ed C4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1886	0.1788	0.1837	2.67%	-2.67%
0.0257	0.0256	0.0257	0.1491	0.1454	0.1473	1.25%	-1.25%
0.0421	0.0422	0.0421	0.1361	0.1334	0.1347	0.99%	-0.99%
0.0629	0.0628	0.0629	0.1026	0.1250	0.1138	-9.86%	9.86%
0.0817	0.0830	0.0823	0.0993	0.0983	0.0988	0.53%	-0.53%
0.1052	0.1082	0.1067	0.0839	0.0876	0.0857	-2.15%	2.15%
0.1240	0.1269	0.1255	0.0733	0.0761	0.0747	-1.89%	1.89%



lpha Attenuation Red D1
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D1	A11	0.0094	40.00	33615	840.375	4567.9	0.1840
D1	A12	0.0169	40.00	37627	940.675	4567.9	0.2059
D1	A13	0.0257	40.00	28030	700.750	4567.9	0.1534
D1	A14	0.0421	40.00	25823	645.575	4567.9	0.1413
D1	A15	0.0629	40.00	19905	497.625	4567.9	0.1089
D1	A16	0.0817	40.00	37645	941.125	9135.8	0.1030
D1	A17	0.1052	40.00	31994	799.850	9135.8	0.0876
D1	A18	0.1240	40.00	28013	700.325	9135.8	0.0767

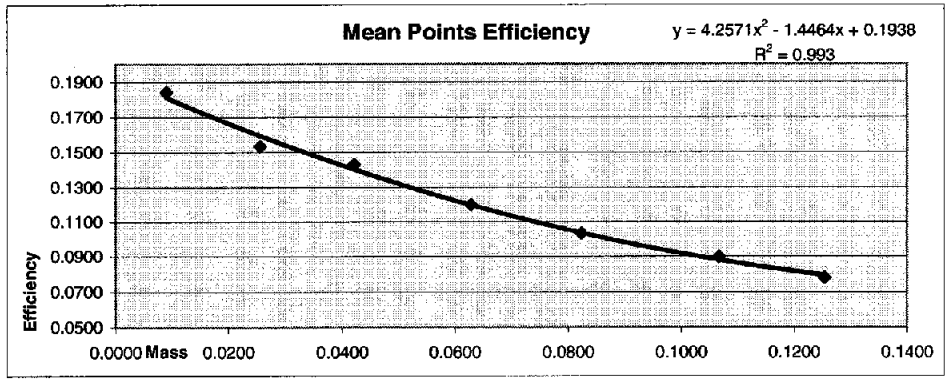
Alpha Attenuation Red D1
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D1	A21	0.0086	40.00	33714	842.850	4567.9	0.1845
D1	A22	0.0172	40.00	27629	690.725	4567.9	0.1512
D1	A23	0.0256	40.00	27990	699.750	4567.9	0.1532
D1	A24	0.0422	40.00	26457	661.425	4567.9	0.1448
D1	A25	0.0628	40.00	23898	597.450	4567.9	0.1308
D1	A26	0.0830	40.00	37824	945.600	9135.8	0.1035
D1	A27	0.1082	40.00	33579	839.475	9135.8	0.0919
D1	A28	0.1269	40.00	29047	726.175	9135.8	0.0795

ed D1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1840	0.1845	0.1842	-0.15%	0.15%
0.0257	0.0256	0.0257	0.1534	0.1532	0.1533	0.07%	-0.07%
0.0421	0.0422	0.0421	0.1413	0.1448	0.1431	-1.21%	1.21%
0.0629	0.0628	0.0629	0.1089	0.1308	0.1199	-9.12%	9.12%
0.0817	0.0830	0.0823	0.1030	0.1035	0.1033	-0.24%	0.24%
0.1052	0.1082	0.1067	0.0876	0.0919	0.0897	-2.42%	2.42%
0.1240	0.1269	0.1255	0.0767	0.0795	0.0781	-1.81%	1.81%



lpha Attenuation Red D2
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D2	A11	0.0094	40.00	34185	854.625	4567.9	0.1871
D2	A12	0.0169	40.00	35278	881.950	4567.9	0.1931
D2	A13	0.0257	40.00	26366	659.150	4567.9	0.1443
D2	A14	0.0421	40.00	25048	626.200	4567.9	0.1371
D2	A15	0.0629	40.00	19363	484.075	4567.9	0.1060
D2	A16	0.0817	40.00	36555	913.875	9135.8	0.1000
D2	A17	0.1052	40.00	30601	765.025	9135.8	0.0837
D2	A18	0.1240	40.00	26880	672.000	9135.8	0.0736

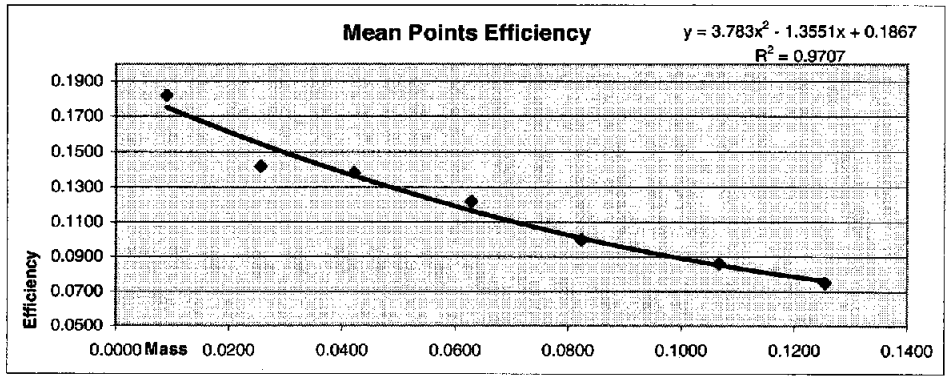
Alpha Attenuation Red D2
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D2	A21	0.0086	40.00	32233	805.825	4567.9	0.1764
D2	A22	0.0172	40.00	26758	668.950	4567.9	0.1464
D2	A23	0.0256	40.00	25474	636.850	4567.9	0.1394
D2	A24	0.0422	40.00	25455	636.375	4567.9	0.1393
D2	A25	0.0628	40.00	25118	627.950	4567.9	0.1375
D2	A26	0.0830	40.00	36313	907.825	9135.8	0.0994
D2	A27	0.1082	40.00	32312	807.800	9135.8	0.0884
D2	A28	0.1269	40.00	27983	699.575	9135.8	0.0766

ed D2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1871	0.1764	0.1818	2.94%	-2.94%
0.0257	0.0256	0.0257	0.1443	0.1394	0.1419	1.72%	-1.72%
0.0421	0.0422	0.0421	0.1371	0.1393	0.1382	-0.81%	0.81%
0.0629	0.0628	0.0629	0.1060	0.1375	0.1217	-12.94%	12.94%
0.0817	0.0830	0.0823	0.1000	0.0994	0.0997	0.33%	-0.33%
0.1052	0.1082	0.1067	0.0837	0.0884	0.0861	-2.72%	2.72%
0.1240	0.1269	0.1255	0.0736	0.0766	0.0751	-2.01%	2.01%



lpha Attenuation Red D3
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D3	A11	0.0094	40.00	35427	885.675	4567.9	0.1939
D3	A12	0.0169	40.00	38747	968.675	4567.9	0.2121
D3	A13	0.0257	40.00	25892	647.300	4567.9	0.1417
D3	A14	0.0421	40.00	24458	611.450	4567.9	0.1339
D3	A15	0.0629	40.00	19326	483.150	4567.9	0.1058
D3	A16	0.0817	40.00	36581	914.525	9135.8	0.1001
D3	A17	0.1052	40.00	31170	779.250	9135.8	0.0853
D3	A18	0.1240	40.00	27160	679.000	9135.8	0.0743

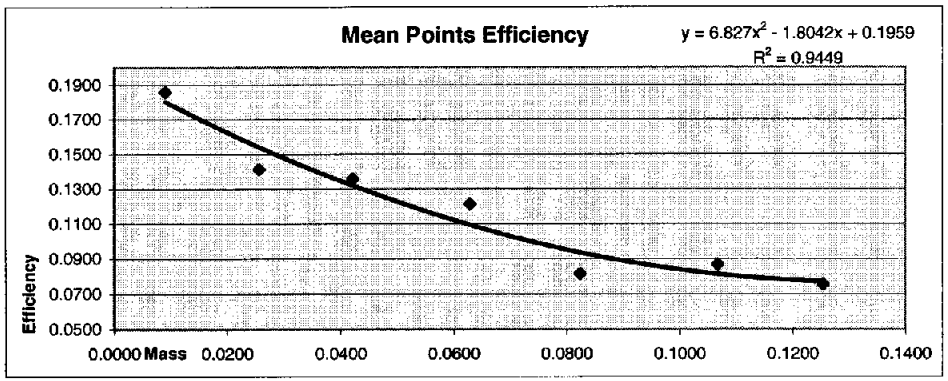
Alpha Attenuation Red D3
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D3	A21	0.0086	40.00	32488	812.200	4567.9	0.1778
D3	A22	0.0172	40.00	27123	678.075	4567.9	0.1484
D3	A23	0.0256	40.00	25739	643.475	4567.9	0.1409
D3	A24	0.0422	40.00	25094	627.350	4567.9	0.1373
D3	A25	0.0628	40.00	24925	623.125	4567.9	0.1364
D3	A26	0.0830	40.00	22899	572.475	9135.8	0.0627
D3	A27	0.1082	40.00	32238	805.950	9135.8	0.0882
D3	A28	0.1269	40.00	27857	696.425	9135.8	0.0762

ed D3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1939	0.1778	0.1858	4.33%	-4.33%
0.0257	0.0256	0.0257	0.1417	0.1409	0.1413	0.30%	-0.30%
0.0421	0.0422	0.0421	0.1339	0.1373	0.1356	-1.28%	1.28%
0.0629	0.0628	0.0629	0.1058	0.1364	0.1211	-12.65%	12.65%
0.0817	0.0830	0.0823	0.1001	0.0627	0.0814	23.00%	-23.00%
0.1052	0.1082	0.1067	0.0853	0.0882	0.0868	-1.68%	1.68%
0.1240	0.1269	0.1255	0.0743	0.0762	0.0753	-1.27%	1.27%



lpha Attenuation Red D4
2_2007

ata Set 1

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D4	A11	0.0094	40.00	35538	888.450	4567.9	0.1945
D4	A12	0.0169	40.00	38571	964.275	4567.9	0.2111
D4	A13	0.0257	40.00	27914	697.850	4567.9	0.1528
D4	A14	0.0421	40.00	23918	597.950	4567.9	0.1309
D4	A15	0.0629	40.00	18894	472.350	4567.9	0.1034
D4	A16	0.0817	40.00	37490	937.250	9135.8	0.1026
D4	A17	0.1052	40.00	31132	778.300	9135.8	0.0852
D4	A18	0.1240	40.00	27415	685.375	9135.8	0.0750

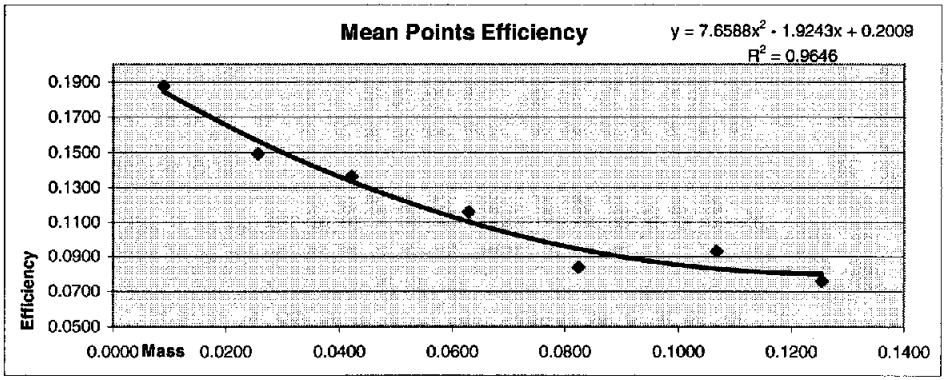
Alpha Attenuation Red D4
02_2007

Data Set 2

Detector ID	Sample ID	Mass	Count Time	Alpha Counts	CPM	DPM	Th-230 Efficiency
D4	A21	0.0086	40.00	33000	825.000	4567.9	0.1806
D4	A22	0.0172	40.00	27885	697.125	4567.9	0.1526
D4	A23	0.0256	40.00	26655	666.375	4567.9	0.1459
D4	A24	0.0422	40.00	25937	648.425	4567.9	0.1420
D4	A25	0.0628	40.00	23448	586.200	4567.9	0.1283
D4	A26	0.0830	40.00	23594	589.850	9135.8	0.0646
D4	A27	0.1082	40.00	36840	921.000	9135.8	0.1008
D4	A28	0.1269	40.00	27990	699.750	9135.8	0.0766

ed D4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0094	0.0086	0.0090	0.1945	0.1806	0.1876	3.70%	-3.70%
0.0257	0.0256	0.0257	0.1528	0.1459	0.1493	2.31%	-2.31%
0.0421	0.0422	0.0421	0.1309	0.1420	0.1364	-4.05%	4.05%
0.0629	0.0628	0.0629	0.1034	0.1283	0.1159	-10.76%	10.76%
0.0817	0.0830	0.0823	0.1026	0.0646	0.0836	22.75%	-22.75%
0.1052	0.1082	0.1067	0.0852	0.1008	0.0930	-8.40%	8.40%
0.1240	0.1269	0.1255	0.0750	0.0766	0.0758	-1.04%	1.04%



TestAmerica STL

Red 2007

Beta Efficiency Curves

eta Attenuation Red A1
et 1 2/20/2007

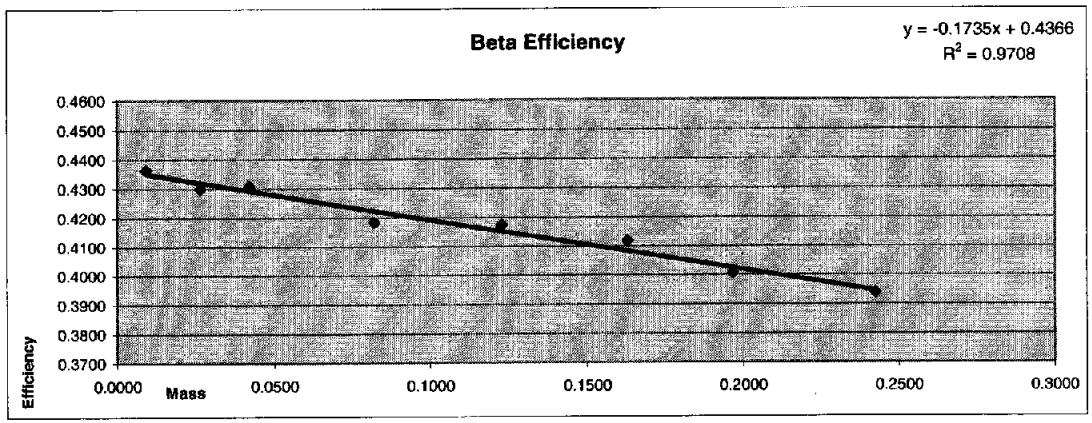
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36641	1832.050	0.4525
B12	0.0264	20	36151	1807.550	0.4464
B13	0.0425	20	35526	1776.300	0.4387
B14	0.0809	20	33781	1689.050	0.4172
B15	0.1227	20	33892	1694.600	0.4185
B16	0.1647	20	32785	1639.250	0.4049
B17	0.2003	20	32086	1604.300	0.3962
B18	0.2429	20	31875	1593.750	0.3936

Beta Attenuation Red A1
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	34015	1700.750	0.4200
B22	0.0265	20	33483	1674.150	0.4135
B23	0.0415	20	34243	1712.150	0.4229
B24	0.0830	20	33981	1699.050	0.4196
B25	0.1230	20	33733	1686.650	0.4166
B26	0.1611	20	33919	1695.950	0.4189
B27	0.1932	20	32780	1639.000	0.4048
B28	0.2421	20	31896	1594.800	0.3939

ed A1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4525	0.4200	0.4363	3.72%	-3.72%
0.0264	0.0265	0.0265	0.4464	0.4135	0.4299	3.83%	-3.83%
0.0425	0.0415	0.0420	0.4387	0.4229	0.4308	1.84%	-1.84%
0.0809	0.0830	0.0820	0.4172	0.4196	0.4184	-0.30%	0.30%
0.1227	0.1230	0.1229	0.4185	0.4166	0.4175	0.24%	-0.24%
0.1647	0.1611	0.1629	0.4049	0.4189	0.4119	-1.70%	1.70%
0.2003	0.1932	0.1968	0.3962	0.4048	0.4005	-1.07%	1.07%
0.2429	0.2421	0.2425	0.3936	0.3939	0.3937	-0.03%	0.03%



Beta Attenuation Red A2
Set 1 2/20/2007

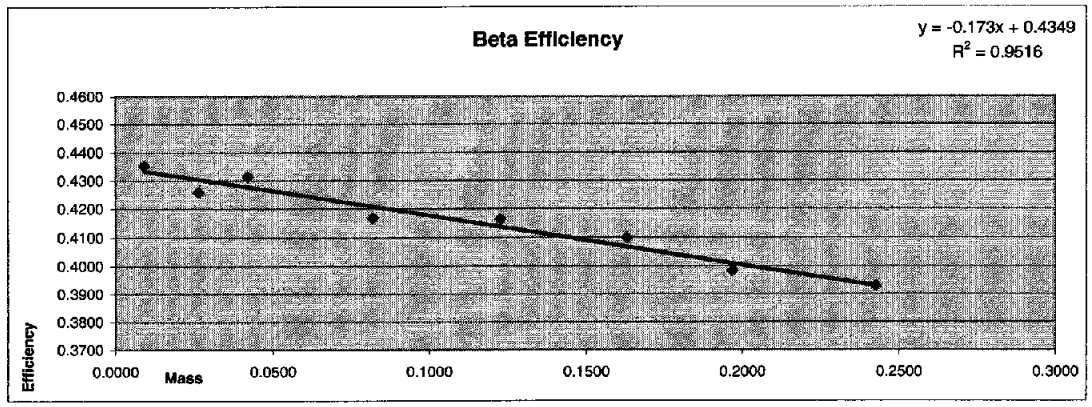
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36483	1824.150	0.45052
B12	0.0264	20	35673	1783.650	0.44052
B13	0.0425	20	35713	1785.650	0.44101
B14	0.0809	20	33707	1685.350	0.41624
B15	0.1227	20	33729	1686.450	0.41651
B16	0.1647	20	32740	1637.000	0.40430
B17	0.2003	20	31770	1588.500	0.39232
B18	0.2429	20	32078	1603.900	0.39612

Beta Attenuation Red A2
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	34007	1700.350	0.41994
B22	0.0265	20	33294	1664.700	0.41114
B23	0.0415	20	34154	1707.700	0.42176
B24	0.0830	20	33794	1689.700	0.41731
B25	0.1230	20	33697	1684.850	0.41612
B26	0.1611	20	33632	1681.600	0.41531
B27	0.1932	20	32731	1636.550	0.40419
B28	0.2421	20	31553	1577.650	0.38964

Red A2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4505	0.4199	0.4352	3.51%	-3.51%
0.0264	0.0265	0.0265	0.4405	0.4111	0.4258	3.45%	-3.45%
0.0425	0.0415	0.0420	0.4410	0.4218	0.4314	2.23%	-2.23%
0.0809	0.0830	0.0820	0.4162	0.4173	0.4168	-0.13%	0.13%
0.1227	0.1230	0.1229	0.4165	0.4161	0.4163	0.05%	-0.05%
0.1647	0.1611	0.1629	0.4043	0.4153	0.4098	-1.34%	1.34%
0.2003	0.1932	0.1968	0.3923	0.4042	0.3983	-1.49%	1.49%
0.2429	0.2421	0.2425	0.3961	0.3896	0.3929	0.83%	-0.83%



Beta Attenuation Red A3
Set 1 2/20/2007

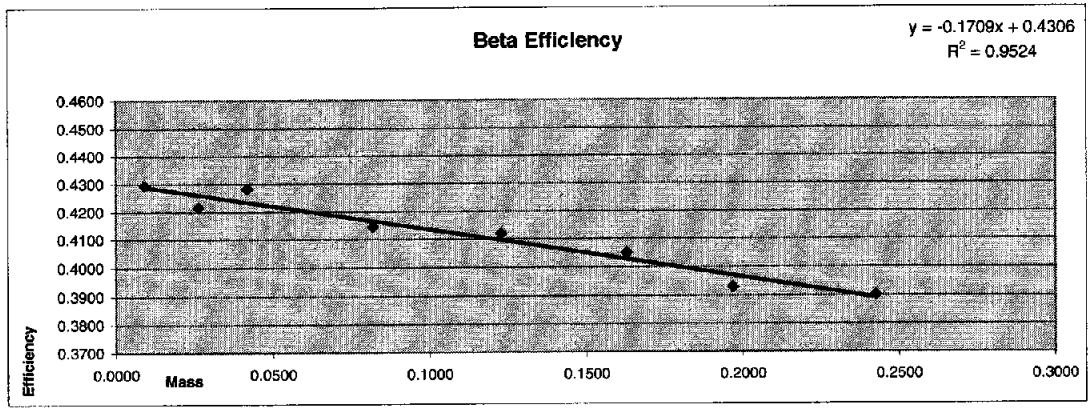
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35970	1798.500	0.44418
B12	0.0264	20	35416	1770.800	0.43734
B13	0.0425	20	35541	1777.050	0.43889
B14	0.0809	20	33676	1683.800	0.41586
B15	0.1227	20	33272	1663.600	0.41087
B16	0.1647	20	32397	1619.850	0.40006
B17	0.2003	20	31279	1563.950	0.38626
B18	0.2429	20	31816	1590.800	0.39289

Beta Attenuation Red A3
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	33560	1678.000	0.41442
B22	0.0265	20	32878	1643.900	0.40600
B23	0.0415	20	33808	1690.400	0.41749
B24	0.0830	20	33446	1672.300	0.41302
B25	0.1230	20	33432	1671.600	0.41284
B26	0.1611	20	33186	1659.300	0.40980
B27	0.1932	20	32362	1618.100	0.39963
B28	0.2421	20	31370	1568.500	0.38738

Red A3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4442	0.4144	0.4293	3.47%	-3.47%
0.0264	0.0265	0.0265	0.4373	0.4060	0.4217	3.72%	-3.72%
0.0425	0.0415	0.0420	0.4389	0.4175	0.4282	2.50%	-2.50%
0.0809	0.0830	0.0820	0.4159	0.4130	0.4144	0.34%	-0.34%
0.1227	0.1230	0.1229	0.4109	0.4128	0.4119	-0.24%	0.24%
0.1647	0.1611	0.1629	0.4001	0.4098	0.4049	-1.20%	1.20%
0.2003	0.1932	0.1968	0.3863	0.3996	0.3929	-1.70%	1.70%
0.2429	0.2421	0.2425	0.3929	0.3874	0.3901	0.71%	-0.71%



Beta Attenuation Red A4
Set 1 2/20/2007

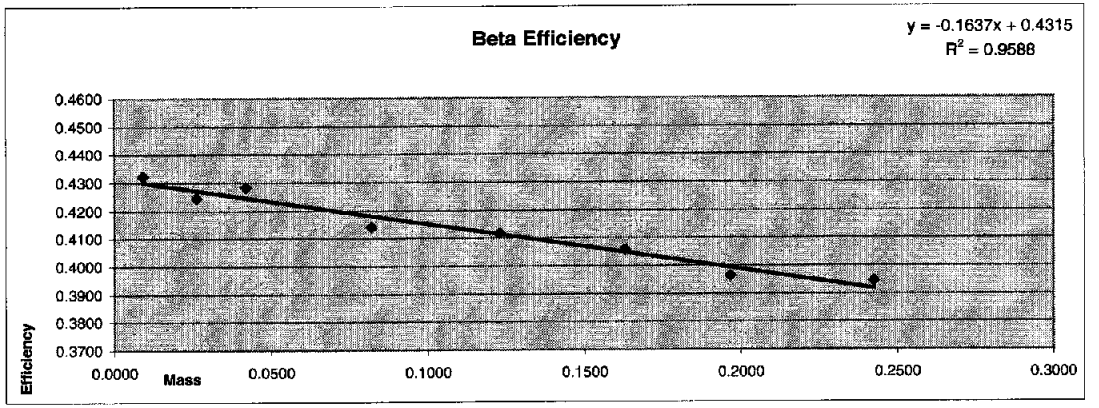
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35901	1795.050	0.44333
B12	0.0264	20	35590	1779.500	0.43949
B13	0.0425	20	35306	1765.300	0.43598
B14	0.0809	20	33738	1686.900	0.41662
B15	0.1227	20	33538	1676.900	0.41415
B16	0.1647	20	32295	1614.750	0.39880
B17	0.2003	20	31822	1591.100	0.39296
B18	0.2429	20	32026	1601.300	0.39548

Beta Attenuation Red A4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	34085	1704.250	0.42091
B22	0.0265	20	33172	1658.600	0.40963
B23	0.0415	20	34073	1703.650	0.42076
B24	0.0830	20	33310	1665.500	0.41134
B25	0.1230	20	33153	1657.650	0.40940
B26	0.1611	20	33405	1670.250	0.41251
B27	0.1932	20	32372	1618.600	0.39975
B28	0.2421	20	31848	1592.400	0.39328

Red A4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4433	0.4209	0.4321	2.59%	-2.59%
0.0264	0.0265	0.0265	0.4395	0.4096	0.4246	3.52%	-3.52%
0.0425	0.0415	0.0420	0.4360	0.4208	0.4284	1.78%	-1.78%
0.0809	0.0830	0.0820	0.4166	0.4113	0.4140	0.64%	-0.64%
0.1227	0.1230	0.1229	0.4142	0.4094	0.4118	0.58%	-0.58%
0.1647	0.1611	0.1629	0.3988	0.4125	0.4057	-1.69%	1.69%
0.2003	0.1932	0.1968	0.3930	0.3998	0.3964	-0.86%	0.86%
0.2429	0.2421	0.2425	0.3955	0.3933	0.3944	0.28%	-0.28%



Beta Attenuation Red B1
Set 1 2/20/2007

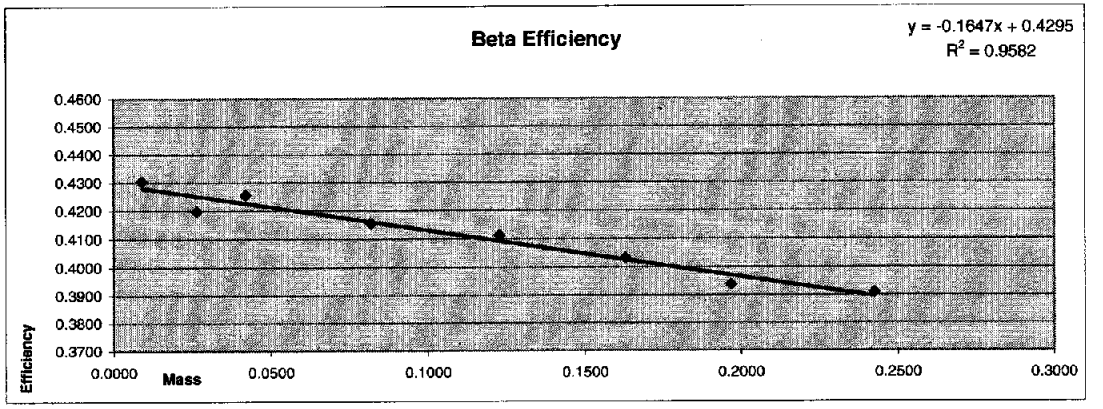
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35948	1797.400	0.44391
B12	0.0264	20	35517	1775.850	0.43859
B13	0.0425	20	35113	1755.650	0.43360
B14	0.0809	20	33515	1675.750	0.41387
B15	0.1227	20	33041	1652.050	0.40801
B16	0.1647	20	32342	1617.100	0.39938
B17	0.2003	20	31314	1565.700	0.38669
B18	0.2429	20	31896	1594.800	0.39388

Beta Attenuation Red B1
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	33747	1687.350	0.41673
B22	0.0265	20	32471	1623.550	0.40098
B23	0.0415	20	33788	1689.400	0.41724
B24	0.0830	20	33772	1688.600	0.41704
B25	0.1230	20	33560	1678.000	0.41442
B26	0.1611	20	32982	1649.100	0.40729
B27	0.1932	20	32462	1623.100	0.40086
B28	0.2421	20	31432	1571.600	0.38815

Red B1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4439	0.4167	0.4303	3.16%	-3.16%
0.0264	0.0265	0.0265	0.4386	0.4010	0.4198	4.48%	-4.48%
0.0425	0.0415	0.0420	0.4336	0.4172	0.4254	1.92%	-1.92%
0.0809	0.0830	0.0820	0.4139	0.4170	0.4155	-0.38%	0.38%
0.1227	0.1230	0.1229	0.4080	0.4144	0.4112	-0.78%	0.78%
0.1647	0.1611	0.1629	0.3994	0.4073	0.4033	-0.98%	0.98%
0.2003	0.1932	0.1968	0.3867	0.4009	0.3938	-1.80%	1.80%
0.2429	0.2421	0.2425	0.3939	0.3881	0.3910	0.73%	-0.73%



Beta Attenuation Red B2
Set 1 2/20/2007

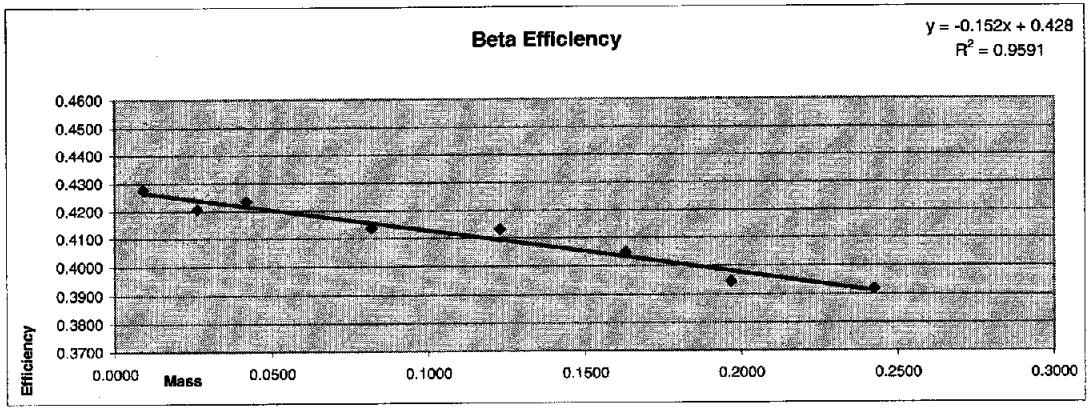
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35896	1794.800	0.44327
B12	0.0264	20	35424	1771.200	0.43744
B13	0.0425	20	34941	1747.050	0.43148
B14	0.0809	20	33501	1675.050	0.41369
B15	0.1227	20	33478	1673.900	0.41341
B16	0.1647	20	32241	1612.050	0.39814
B17	0.2003	20	31771	1588.550	0.39233
B18	0.2429	20	31978	1598.900	0.39489

Beta Attenuation Red B2
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	33363	1668.150	0.41199
B22	0.0265	20	32697	1634.850	0.40377
B23	0.0415	20	33640	1682.000	0.41541
B24	0.0830	20	33508	1675.400	0.41378
B25	0.1230	20	33425	1671.250	0.41276
B26	0.1611	20	33309	1665.450	0.41132
B27	0.1932	20	32100	1605.000	0.39639
B28	0.2421	20	31483	1574.150	0.38878

Red B2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4433	0.4120	0.4276	3.66%	-3.66%
0.0264	0.0265	0.0265	0.4374	0.4038	0.4206	4.00%	-4.00%
0.0425	0.0415	0.0420	0.4315	0.4154	0.4234	1.90%	-1.90%
0.0809	0.0830	0.0820	0.4137	0.4138	0.4137	-0.01%	0.01%
0.1227	0.1230	0.1229	0.4134	0.4128	0.4131	0.08%	-0.08%
0.1647	0.1611	0.1629	0.3981	0.4113	0.4047	-1.63%	1.63%
0.2003	0.1932	0.1968	0.3923	0.3964	0.3944	-0.52%	0.52%
0.2429	0.2421	0.2425	0.3949	0.3888	0.3918	0.78%	-0.78%



Beta Attenuation Red B3
Set 1 2/20/2007

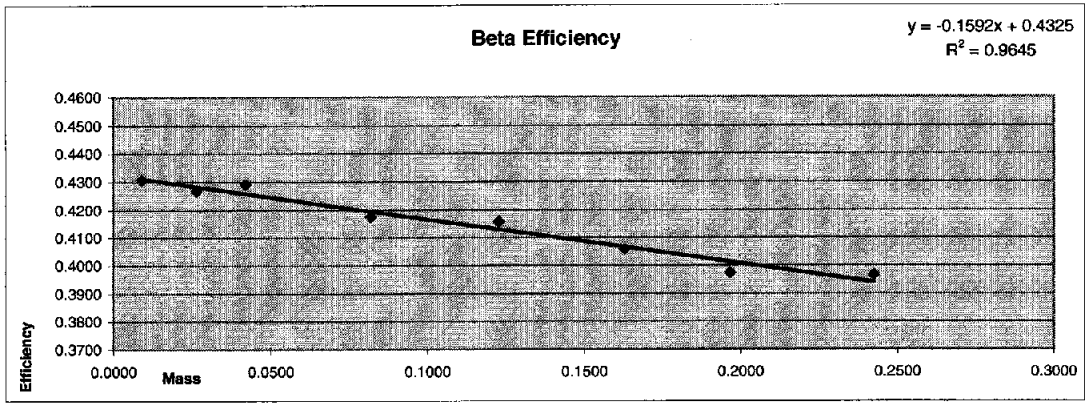
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36165	1808.250	0.44659
B12	0.0264	20	35905	1795.250	0.44338
B13	0.0425	20	35529	1776.450	0.43874
B14	0.0809	20	33494	1674.700	0.41361
B15	0.1227	20	33701	1685.050	0.41616
B16	0.1647	20	32748	1637.400	0.40440
B17	0.2003	20	31786	1589.300	0.39252
B18	0.2429	20	32163	1608.150	0.39717

Beta Attenuation Red B3
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	33597	1679.850	0.41488
B22	0.0265	20	33215	1660.750	0.41016
B23	0.0415	20	33958	1697.900	0.41934
B24	0.0830	20	34130	1706.500	0.42146
B25	0.1230	20	33627	1681.350	0.41525
B26	0.1611	20	32981	1649.050	0.40727
B27	0.1932	20	32552	1627.600	0.40198
B28	0.2421	20	32065	1603.250	0.39596

Red B3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4466	0.4149	0.4307	3.68%	-3.68%
0.0264	0.0265	0.0265	0.4434	0.4102	0.4268	3.89%	-3.89%
0.0425	0.0415	0.0420	0.4387	0.4193	0.4290	2.26%	-2.26%
0.0809	0.0830	0.0820	0.4136	0.4215	0.4175	-0.94%	0.94%
0.1227	0.1230	0.1229	0.4162	0.4153	0.4157	0.11%	-0.11%
0.1647	0.1611	0.1629	0.4044	0.4073	0.4058	-0.35%	0.35%
0.2003	0.1932	0.1968	0.3925	0.4020	0.3972	-1.19%	1.19%
0.2429	0.2421	0.2425	0.3972	0.3960	0.3966	0.15%	-0.15%



Beta Attenuation Red B4
Set 1 2/20/2007

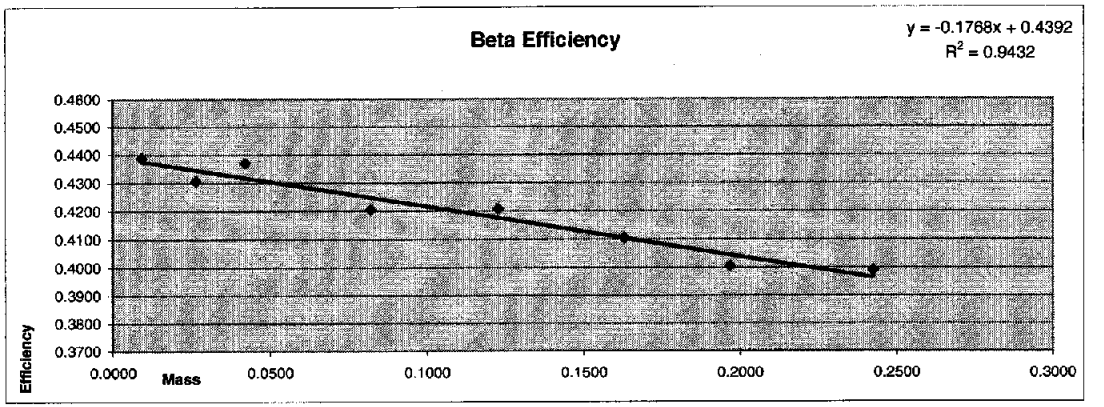
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36737	1836.850	0.45366
B12	0.0264	20	36371	1818.550	0.44914
B13	0.0425	20	36215	1810.750	0.44721
B14	0.0809	20	34203	1710.150	0.42236
B15	0.1227	20	34350	1717.500	0.42418
B16	0.1647	20	32719	1635.950	0.40404
B17	0.2003	20	32068	1603.400	0.39600
B18	0.2429	20	32381	1619.050	0.39986

Beta Attenuation Red B4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B21	0.0091	20	34341	1717.050	0.42407
B22	0.0265	20	33379	1668.950	0.41219
B23	0.0415	20	34576	1728.800	0.42697
B24	0.0830	20	33890	1694.500	0.41850
B25	0.1230	20	33773	1688.650	0.41705
B26	0.1611	20	33753	1687.650	0.41681
B27	0.1932	20	32797	1639.850	0.40500
B28	0.2421	20	32234	1611.700	0.39805

Red B4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4537	0.4241	0.4389	3.37%	-3.37%
0.0264	0.0265	0.0265	0.4491	0.4122	0.4307	4.29%	-4.29%
0.0425	0.0415	0.0420	0.4472	0.4270	0.4371	2.32%	-2.32%
0.0809	0.0830	0.0820	0.4224	0.4185	0.4204	0.46%	-0.46%
0.1227	0.1230	0.1229	0.4242	0.4171	0.4206	0.85%	-0.85%
0.1647	0.1611	0.1629	0.4040	0.4168	0.4104	-1.56%	1.56%
0.2003	0.1932	0.1968	0.3960	0.4050	0.4005	-1.12%	1.12%
0.2429	0.2421	0.2425	0.3999	0.3980	0.3990	0.23%	-0.23%



Beta Attenuation Red C1
Set 1 2/20/2007

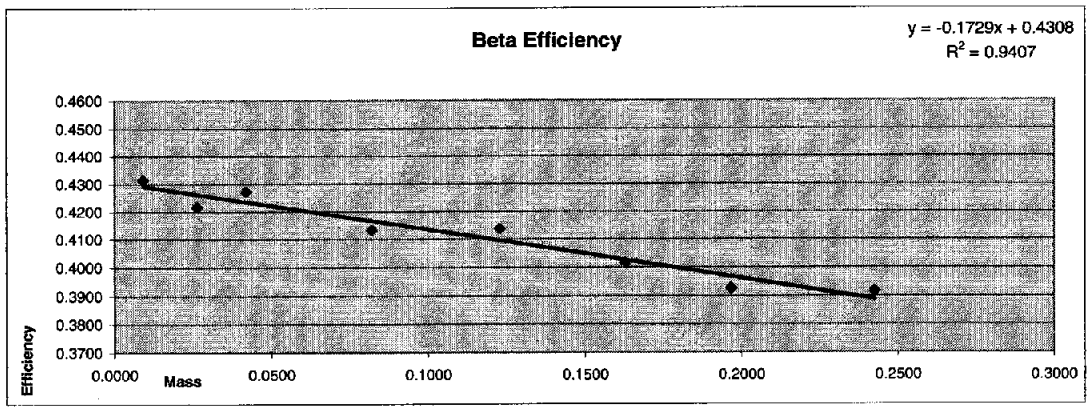
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36130	1806.500	0.44616
B12	0.0264	20	35498	1774.900	0.43836
B13	0.0425	20	35255	1762.750	0.43535
B14	0.0809	20	33516	1675.800	0.41388
B15	0.1227	20	33408	1670.400	0.41255
B16	0.1647	20	32316	1615.800	0.39906
B17	0.2003	20	31331	1566.550	0.38690
B18	0.2429	20	31736	1586.800	0.39190

Beta Attenuation Red C1
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	33737	1686.850	0.41681
B22	0.0265	20	32781	1639.050	0.40500
B23	0.0415	20	33927	1696.350	0.41916
B24	0.0830	20	33397	1669.850	0.41261
B25	0.1230	20	33585	1679.250	0.41494
B26	0.1611	20	32710	1635.500	0.40413
B27	0.1932	20	32233	1611.650	0.39823
B28	0.2421	20	31685	1584.250	0.39146

Red C1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4462	0.4168	0.4315	3.40%	-3.40%
0.0264	0.0265	0.0265	0.4384	0.4050	0.4217	3.95%	-3.95%
0.0425	0.0415	0.0420	0.4354	0.4192	0.4273	1.89%	-1.89%
0.0809	0.0830	0.0820	0.4139	0.4126	0.4132	0.15%	-0.15%
0.1227	0.1230	0.1229	0.4125	0.4149	0.4137	-0.29%	0.29%
0.1647	0.1611	0.1629	0.3991	0.4041	0.4016	-0.63%	0.63%
0.2003	0.1932	0.1968	0.3869	0.3982	0.3926	-1.44%	1.44%
0.2429	0.2421	0.2425	0.3919	0.3915	0.3917	0.06%	-0.06%



Beta Attenuation Red C2
Set 1 2/20/2007

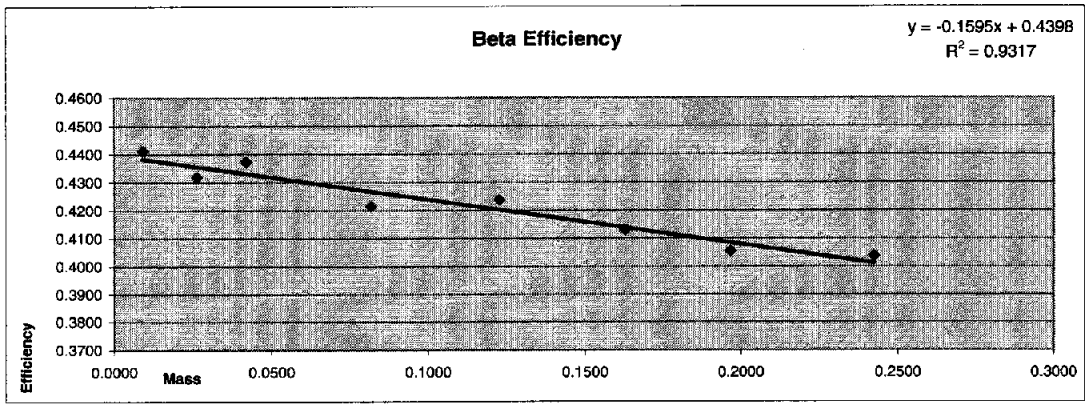
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36818	1840.900	0.45466
B12	0.0264	20	36386	1819.300	0.44932
B13	0.0425	20	36089	1804.450	0.44565
B14	0.0809	20	34199	1709.950	0.42231
B15	0.1227	20	34271	1713.550	0.42320
B16	0.1647	20	32889	1644.450	0.40614
B17	0.2003	20	32319	1615.950	0.39910
B18	0.2429	20	32795	1639.750	0.40498

Beta Attenuation Red C2
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	34591	1729.550	0.42737
B22	0.0265	20	33549	1677.450	0.41449
B23	0.0415	20	34714	1735.700	0.42889
B24	0.0830	20	34049	1702.450	0.42067
B25	0.1230	20	34338	1716.900	0.42424
B26	0.1611	20	33987	1699.350	0.41990
B27	0.1932	20	33331	1666.550	0.41180
B28	0.2421	20	32585	1629.250	0.40258

Red C2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4547	0.4274	0.4410	3.09%	-3.09%
0.0264	0.0265	0.0265	0.4493	0.4145	0.4319	4.03%	-4.03%
0.0425	0.0415	0.0420	0.4457	0.4289	0.4373	1.92%	-1.92%
0.0809	0.0830	0.0820	0.4223	0.4207	0.4215	0.20%	-0.20%
0.1227	0.1230	0.1229	0.4232	0.4242	0.4237	-0.12%	0.12%
0.1647	0.1611	0.1629	0.4061	0.4199	0.4130	-1.67%	1.67%
0.2003	0.1932	0.1968	0.3991	0.4118	0.4054	-1.57%	1.57%
0.2429	0.2421	0.2425	0.4050	0.4026	0.4038	0.30%	-0.30%



Beta Attenuation Red C3
Set 1 2/20/2007

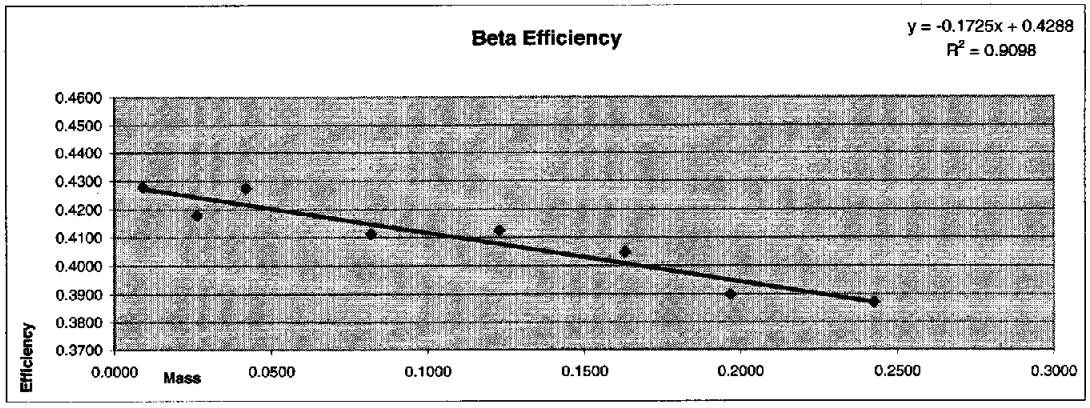
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35516	1775.800	0.43858
B12	0.0264	20	35358	1767.900	0.43663
B13	0.0425	20	35243	1762.150	0.43521
B14	0.0809	20	33214	1660.700	0.41015
B15	0.1227	20	33470	1673.500	0.41331
B16	0.1647	20	32308	1615.400	0.39896
B17	0.2003	20	31172	1558.600	0.38493
B18	0.2429	20	31341	1567.050	0.38702

Beta Attenuation Red C3
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	33752	1687.600	0.41700
B22	0.0265	20	32318	1615.900	0.39928
B23	0.0415	20	33953	1697.650	0.41948
B24	0.0830	20	33375	1668.750	0.41234
B25	0.1230	20	33306	1665.300	0.41149
B26	0.1611	20	33210	1660.500	0.41030
B27	0.1932	20	31939	1596.950	0.39460
B28	0.2421	20	31319	1565.950	0.38694

Red C3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4386	0.4170	0.4278	2.52%	-2.52%
0.0264	0.0265	0.0265	0.4366	0.3993	0.4180	4.47%	-4.47%
0.0425	0.0415	0.0420	0.4352	0.4195	0.4273	1.84%	-1.84%
0.0809	0.0830	0.0820	0.4102	0.4123	0.4112	-0.27%	0.27%
0.1227	0.1230	0.1229	0.4133	0.4115	0.4124	0.22%	-0.22%
0.1647	0.1611	0.1629	0.3990	0.4103	0.4046	-1.40%	1.40%
0.2003	0.1932	0.1968	0.3849	0.3946	0.3898	-1.24%	1.24%
0.2429	0.2421	0.2425	0.3870	0.3869	0.3870	0.01%	-0.01%



Beta Attenuation Red C4
Set 1 2/20/2007

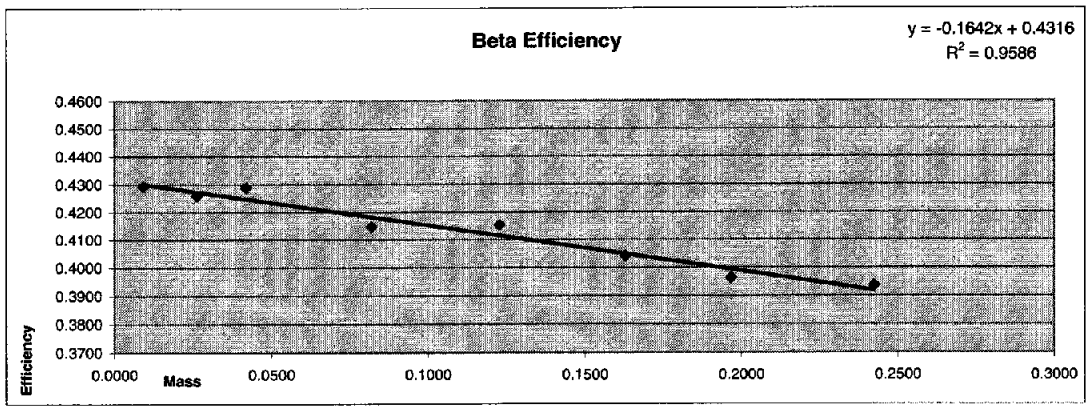
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	35706	1785.300	0.44092
B12	0.0264	20	35907	1795.350	0.44341
B13	0.0425	20	35606	1780.300	0.43969
B14	0.0809	20	33692	1684.600	0.41605
B15	0.1227	20	33731	1686.550	0.41653
B16	0.1647	20	32292	1614.600	0.39877
B17	0.2003	20	31840	1592.000	0.39318
B18	0.2429	20	31816	1590.800	0.39289

Beta Attenuation Red C4
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	33789	1689.450	0.41746
B22	0.0265	20	33056	1652.800	0.40840
B23	0.0415	20	33832	1691.600	0.41799
B24	0.0830	20	33453	1672.650	0.41331
B25	0.1230	20	33489	1674.450	0.41375
B26	0.1611	20	33134	1656.700	0.40936
B27	0.1932	20	32316	1615.800	0.39926
B28	0.2421	20	31918	1595.900	0.39434

Red C4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4409	0.4175	0.4292	2.73%	-2.73%
0.0264	0.0265	0.0265	0.4434	0.4084	0.4259	4.11%	-4.11%
0.0425	0.0415	0.0420	0.4397	0.4180	0.4288	2.53%	-2.53%
0.0809	0.0830	0.0820	0.4161	0.4133	0.4147	0.33%	-0.33%
0.1227	0.1230	0.1229	0.4165	0.4138	0.4151	0.34%	-0.34%
0.1647	0.1611	0.1629	0.3988	0.4094	0.4041	-1.31%	1.31%
0.2003	0.1932	0.1968	0.3932	0.3993	0.3962	-0.77%	0.77%
0.2429	0.2421	0.2425	0.3929	0.3943	0.3936	-0.18%	0.18%



Beta Attenuation Red D1
Set 1 2/20/2007

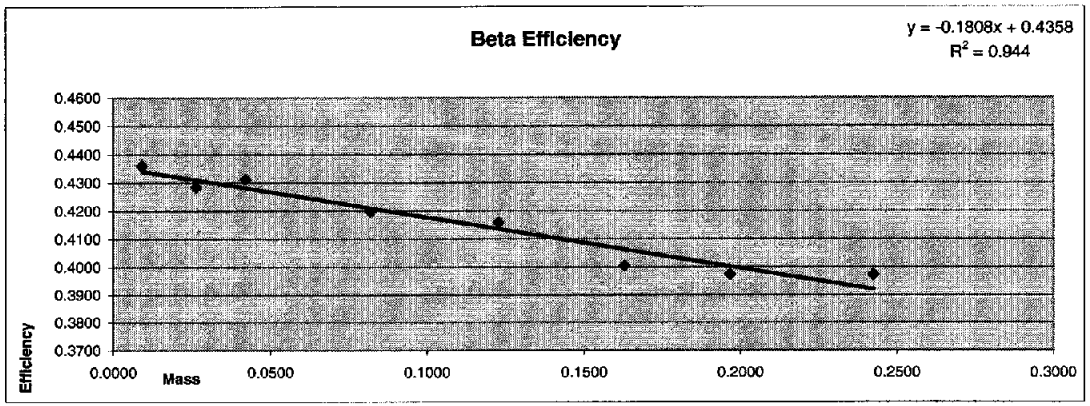
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36492	1824.600	0.45063
B12	0.0264	20	36171	1808.550	0.44667
B13	0.0425	20	35442	1772.100	0.43766
B14	0.0809	20	34013	1700.650	0.42002
B15	0.1227	20	33794	1689.700	0.41731
B16	0.1647	20	32781	1639.050	0.40480
B17	0.2003	20	31870	1593.500	0.39355
B18	0.2429	20	32080	1604.000	0.39615

Beta Attenuation Red D1
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	34113	1705.650	0.42146
B22	0.0265	20	33200	1660.000	0.41018
B23	0.0415	20	34391	1719.550	0.42489
B24	0.0830	20	33941	1697.050	0.41934
B25	0.1230	20	33550	1677.500	0.41450
B26	0.1611	20	32037	1601.850	0.39581
B27	0.1932	20	32472	1623.600	0.40119
B28	0.2421	20	32220	1611.000	0.39807

Red D1

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4506	0.4215	0.4360	3.34%	-3.34%
0.0264	0.0265	0.0265	0.4467	0.4102	0.4284	4.26%	-4.26%
0.0425	0.0415	0.0420	0.4377	0.4249	0.4313	1.48%	-1.48%
0.0809	0.0830	0.0820	0.4200	0.4193	0.4197	0.08%	-0.08%
0.1227	0.1230	0.1229	0.4173	0.4145	0.4159	0.34%	-0.34%
0.1647	0.1611	0.1629	0.4048	0.3958	0.4003	1.12%	-1.12%
0.2003	0.1932	0.1968	0.3936	0.4012	0.3974	-0.96%	0.96%
0.2429	0.2421	0.2425	0.3961	0.3981	0.3971	-0.24%	0.24%



Beta Attenuation Red D2
Set 1 2/20/2007

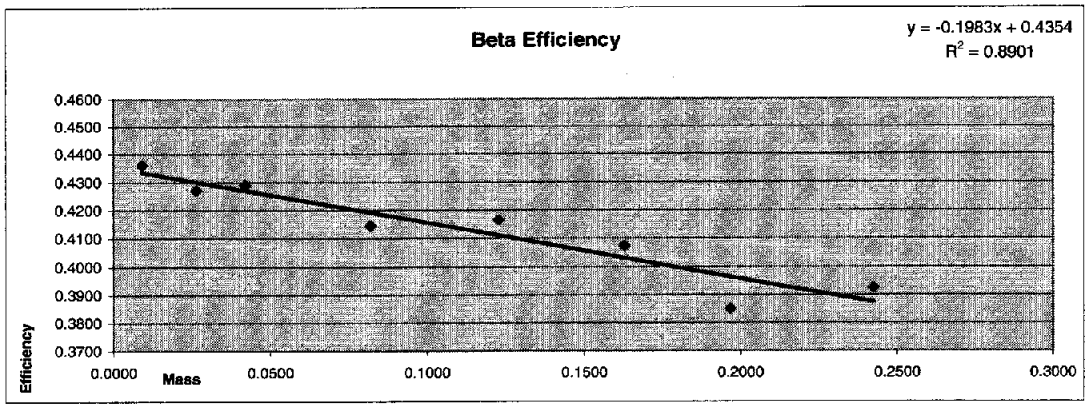
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36492	1824.600	0.45063
B12	0.0264	20	36171	1808.550	0.44667
B13	0.0425	20	35442	1772.100	0.43766
B14	0.0809	20	34013	1700.650	0.42002
B15	0.1227	20	33794	1689.700	0.41731
B16	0.1647	20	32781	1639.050	0.40480
B17	0.2003	20	31870	1593.500	0.39355
B18	0.2429	20	32080	1604.000	0.39615

Beta Attenuation Red D2
Set 2 2/28/2007

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	34105	1705.250	0.42136
B22	0.0265	20	32987	1649.350	0.40755
B23	0.0415	20	34014	1700.700	0.42024
B24	0.0830	20	33086	1654.300	0.40877
B25	0.1230	20	33642	1682.100	0.41564
B26	0.1611	20	33174	1658.700	0.40986
B27	0.1932	20	30463	1523.150	0.37637
B28	0.2421	20	31464	1573.200	0.38873

Red D2

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4506	0.4214	0.4360	3.36%	-3.36%
0.0264	0.0265	0.0265	0.4467	0.4075	0.4271	4.58%	-4.58%
0.0425	0.0415	0.0420	0.4377	0.4202	0.4290	2.03%	-2.03%
0.0809	0.0830	0.0820	0.4200	0.4088	0.4144	1.36%	-1.36%
0.1227	0.1230	0.1229	0.4173	0.4156	0.4165	0.20%	-0.20%
0.1647	0.1611	0.1629	0.4048	0.4099	0.4073	-0.62%	0.62%
0.2003	0.1932	0.1968	0.3936	0.3764	0.3850	2.23%	-2.23%
0.2429	0.2421	0.2425	0.3961	0.3887	0.3924	0.94%	-0.94%



Beta Attenuation Red D3
Set 1 2/20/2007

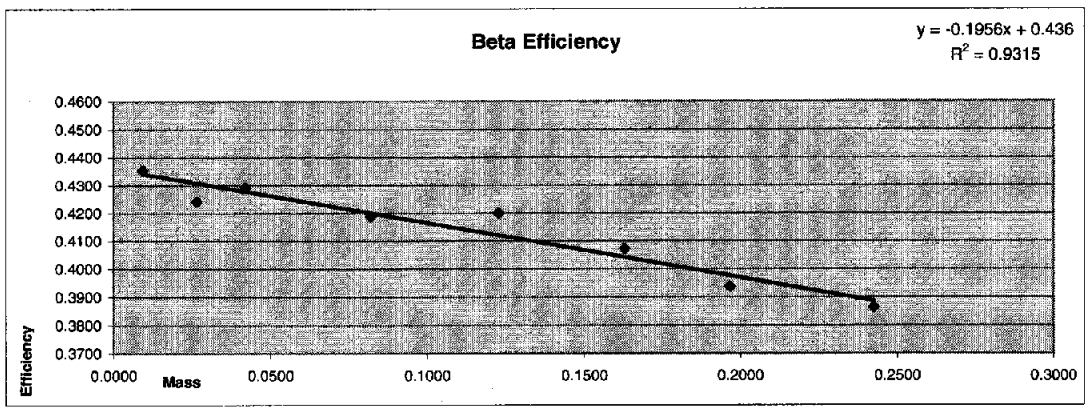
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36168	1808.400	0.44663
B12	0.0264	20	35426	1771.300	0.43747
B13	0.0425	20	35378	1768.900	0.43687
B14	0.0809	20	34054	1702.700	0.42052
B15	0.1227	20	34143	1707.150	0.42162
B16	0.1647	20	32519	1625.950	0.40157
B17	0.2003	20	31724	1586.200	0.39175
B18	0.2429	20	32163	1608.150	0.39717

Beta Attenuation Red D3
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	34339	1716.950	0.42425
B22	0.0265	20	33265	1663.250	0.41098
B23	0.0415	20	34115	1705.750	0.42149
B24	0.0830	20	33751	1687.550	0.41699
B25	0.1230	20	33861	1693.050	0.41835
B26	0.1611	20	33421	1671.050	0.41291
B27	0.1932	20	32016	1600.800	0.39555
B28	0.2421	20	30391	1519.550	0.37548

Red D3

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4466	0.4243	0.4354	2.57%	-2.57%
0.0264	0.0265	0.0265	0.4375	0.4110	0.4242	3.12%	-3.12%
0.0425	0.0415	0.0420	0.4369	0.4215	0.4292	1.79%	-1.79%
0.0809	0.0830	0.0820	0.4205	0.4170	0.4188	0.42%	-0.42%
0.1227	0.1230	0.1229	0.4216	0.4183	0.4200	0.39%	-0.39%
0.1647	0.1611	0.1629	0.4016	0.4129	0.4072	-1.39%	1.39%
0.2003	0.1932	0.1968	0.3918	0.3956	0.3937	-0.48%	0.48%
0.2429	0.2421	0.2425	0.3972	0.3755	0.3863	2.81%	-2.81%



Beta Attenuation Red D4
Set 1 2/20/2007

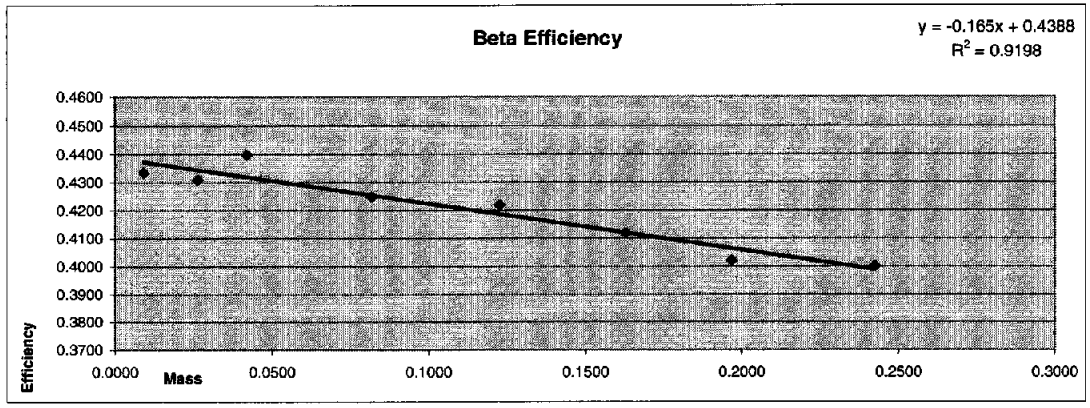
Std ID	Sample Wt	Count Time	Beta Counts	DPM 4049 CPM	Sr-90 Eff
B11	0.0093	20	36834	1841.700	0.45485
B12	0.0264	20	36252	1812.600	0.44767
B13	0.0425	20	36452	1822.600	0.45014
B14	0.0809	20	34339	1716.950	0.42404
B15	0.1227	20	34119	1705.950	0.42133
B16	0.1647	20	32938	1646.900	0.40674
B17	0.2003	20	32132	1606.600	0.39679
B18	0.2429	20	32653	1632.650	0.40322

Beta Attenuation Red D4
Set 2

Std ID	Sample Wt	Count Time	Beta Counts	DPM 4047 CPM	Sr-90 Eff
B21	0.0091	20	33363	1668.150	0.41219
B22	0.0265	20	33515	1675.750	0.41407
B23	0.0415	20	34758	1737.900	0.42943
B24	0.0830	20	34434	1721.700	0.42543
B25	0.1230	20	34169	1708.450	0.42215
B26	0.1611	20	33747	1687.350	0.41694
B27	0.1932	20	32970	1648.500	0.40734
B28	0.2421	20	32139	1606.950	0.39707

Red D4

Mass Set 1	Mass Set 2	Mean Mass	Efficiency Set 1	Efficiency Set 2	Mean Efficiency	Percent Δ Efficiency Set 1	Percent Δ Efficiency Set 2
0.0093	0.0091	0.0092	0.4549	0.4122	0.4335	4.92%	-4.92%
0.0264	0.0265	0.0265	0.4477	0.4141	0.4309	3.90%	-3.90%
0.0425	0.0415	0.0420	0.4501	0.4294	0.4398	2.35%	-2.35%
0.0809	0.0830	0.0820	0.4240	0.4254	0.4247	-0.16%	0.16%
0.1227	0.1230	0.1229	0.4213	0.4222	0.4217	-0.10%	0.10%
0.1647	0.1611	0.1629	0.4067	0.4169	0.4118	-1.24%	1.24%
0.2003	0.1932	0.1968	0.3968	0.4073	0.4021	-1.31%	1.31%
0.2429	0.2421	0.2425	0.4032	0.3971	0.4001	0.77%	-0.77%

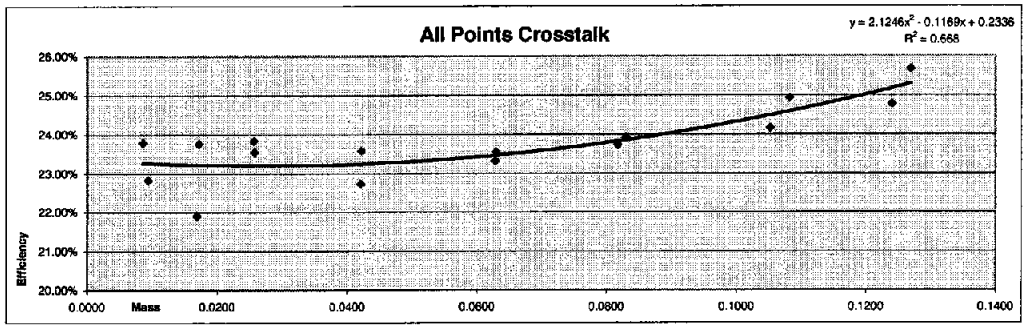


TestAmerica STL

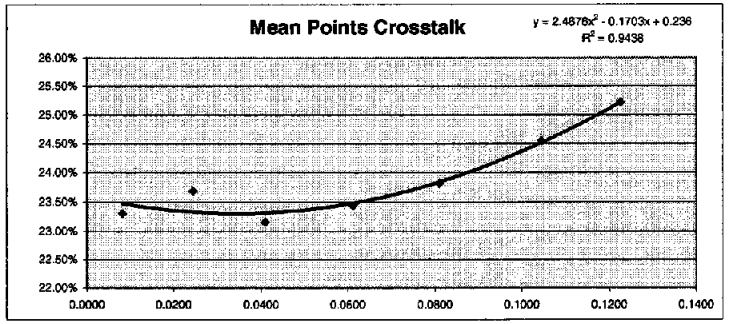
Red 2007

Crosstalk Correction Curves

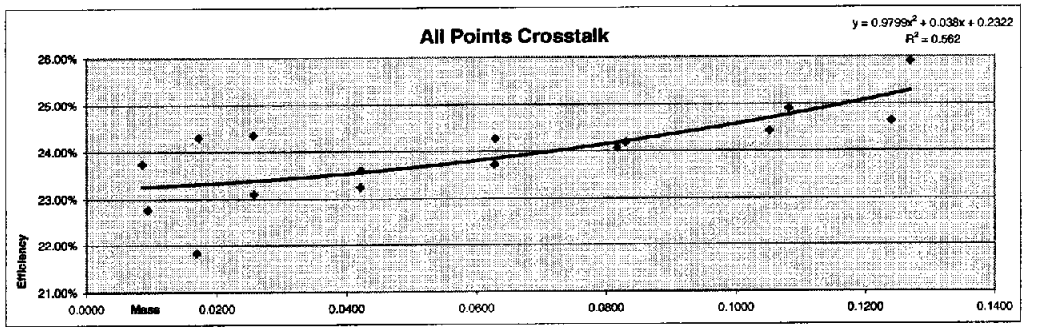
Red A1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35745	10574	893.63	264.35	22.83%	Min
0	A12	0.0169	40.00	38711	10857	967.78	271.43	21.90%	21.90%
0	A13	0.0257	40.00	27785	8558	694.63	213.95	23.55%	
0	A14	0.0421	40.00	26048	7663	651.20	191.58	22.73%	Max
0	A15	0.0629	40.00	19799	6101	494.98	152.53	23.56%	25.68%
0	A16	0.0817	40.00	37913	11792	947.83	294.80	23.72%	
0	A17	0.1052	40.00	32239	10270	805.95	256.75	24.16%	Mean
0	A18	0.1240	40.00	28324	9324	708.10	233.10	24.77%	23.75%
0	A21	0.0086	40.00	32650	10189	816.25	254.73	23.76%	
0	A22	0.0172	40.00	27673	8624	691.83	215.60	23.76%	
0	A23	0.0256	40.00	26220	8205	655.50	205.13	23.83%	
0	A24	0.0422	40.00	25802	7961	645.05	199.03	23.58%	
0	A25	0.0628	40.00	23582	7175	589.55	179.38	23.33%	
0	A26	0.0830	40.00	37518	11793	937.95	294.83	23.92%	
0	A27	0.1082	40.00	32891	10924	822.28	273.10	24.93%	
0	A28	0.1269	40.00	28219	9749	705.48	243.73	25.68%	



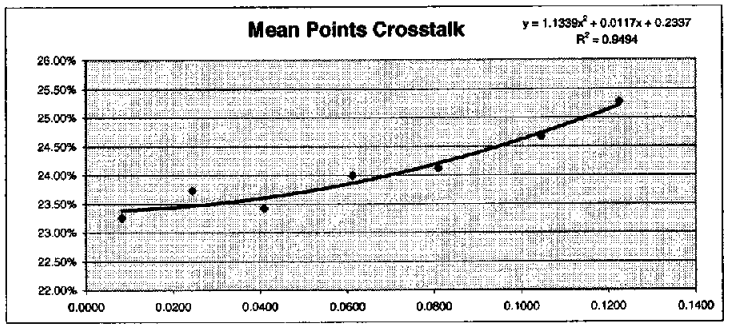
Red A1 Mean Mass	Mean % α into β	
0.0083	23.31%	Min
0.0245	23.69%	22.83%
0.0409	23.16%	Max
0.0612	23.44%	25.22%
0.0811	23.82%	Mean
0.1046	24.55%	23.75%
0.1226	25.22%	



Red A2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34631	10207	865.78	255.18	22.76%	Min
0	A12	0.0169	40.00	38079	10632	951.98	265.80	21.83%	21.83%
0	A13	0.0257	40.00	27234	8181	680.85	204.53	23.10%	
0	A14	0.0421	40.00	25024	7578	625.60	189.45	23.24%	Max
0	A15	0.0629	40.00	19303	6186	482.58	154.65	24.27%	25.90%
0	A16	0.0817	40.00	36805	11662	920.13	291.55	24.06%	
0	A17	0.1052	40.00	30735	9933	768.38	248.33	24.42%	Mean
0	A18	0.1240	40.00	27563	9015	689.08	225.38	24.65%	23.94%
0	A21	0.0086	40.00	32366	10079	809.15	251.98	23.75%	
0	A22	0.0172	40.00	26492	8507	662.30	212.68	24.31%	
0	A23	0.0256	40.00	25568	8232	639.15	205.80	24.36%	
0	A24	0.0422	40.00	24862	7685	622.05	192.13	23.60%	
0	A25	0.0628	40.00	23042	7164	576.05	179.10	23.72%	
0	A26	0.0830	40.00	36455	11629	911.38	290.73	24.18%	
0	A27	0.1082	40.00	32037	10624	800.93	265.60	24.90%	
0	A28	0.1269	40.00	27387	9573	684.68	239.33	25.90%	

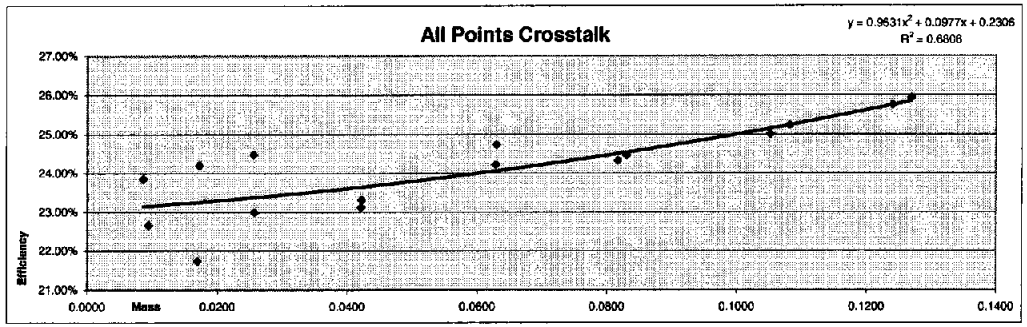


Red A2 Mean Mass	Mean % α into β	
0.0083	23.26%	Min
0.0245	23.73%	23.07%
0.0409	23.42%	Max
0.0612	23.99%	25.27%
0.0811	24.12%	Mean
0.1046	24.66%	23.94%
0.1226	25.27%	

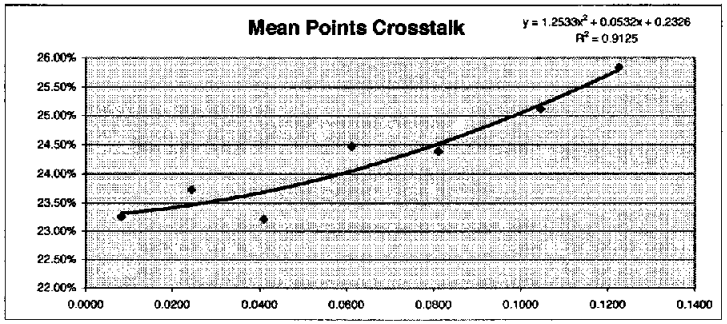


Red A3

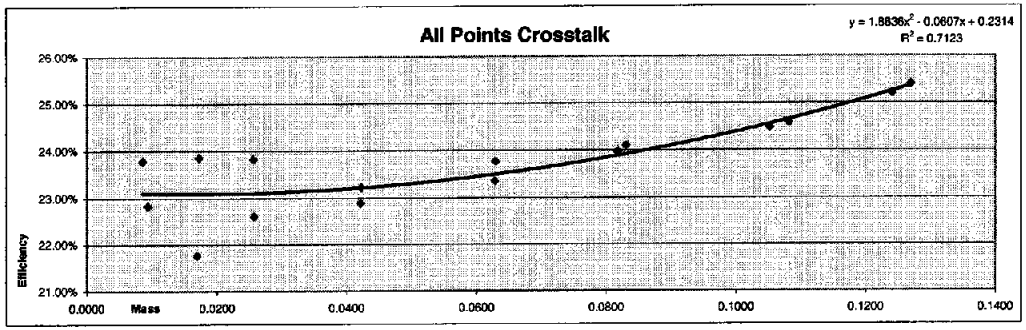
Red A3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34219	10029	855.48	250.73	22.67%	Min
0	A12	0.0169	40.00	37272	10346	931.80	258.65	21.73%	21.73%
0	A13	0.0257	40.00	26862	8020	671.55	200.50	22.99%	
0	A14	0.0421	40.00	24550	7382	613.75	184.55	23.12%	Max
0	A15	0.0629	40.00	18535	6086	463.38	152.20	24.72%	25.93%
0	A16	0.0817	40.00	35209	11310	880.23	282.75	24.31%	
0	A17	0.1052	40.00	29901	9968	747.53	249.20	25.00%	Mean
0	A18	0.1240	40.00	25821	8954	645.53	223.85	25.75%	24.12%
0	A21	0.0085	40.00	31329	9811	783.23	245.28	23.85%	
0	A22	0.0172	40.00	25963	8285	649.08	207.13	24.19%	
0	A23	0.0256	40.00	24528	7947	613.20	198.68	24.47%	
0	A24	0.0422	40.00	24295	7384	607.38	184.60	23.31%	
0	A25	0.0628	40.00	22223	7102	555.58	177.55	24.22%	
0	A26	0.0830	40.00	34783	11262	869.58	281.55	24.46%	
0	A27	0.1082	40.00	30886	10423	772.15	260.58	25.23%	
0	A28	0.1269	40.00	26628	9324	665.70	233.10	25.93%	



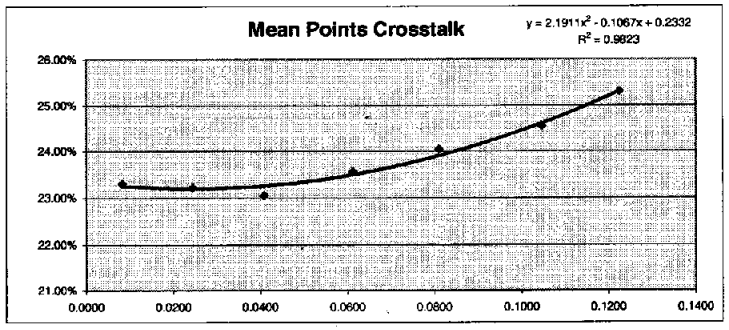
Red A3 Mean Mass	Mean % α into β	
0.0083	23.26%	Min
0.0245	23.73%	22.96%
0.0409	23.21%	Max
0.0612	24.47%	25.84%
0.0811	24.39%	Mean
0.1046	25.12%	24.12%
0.1226	25.84%	



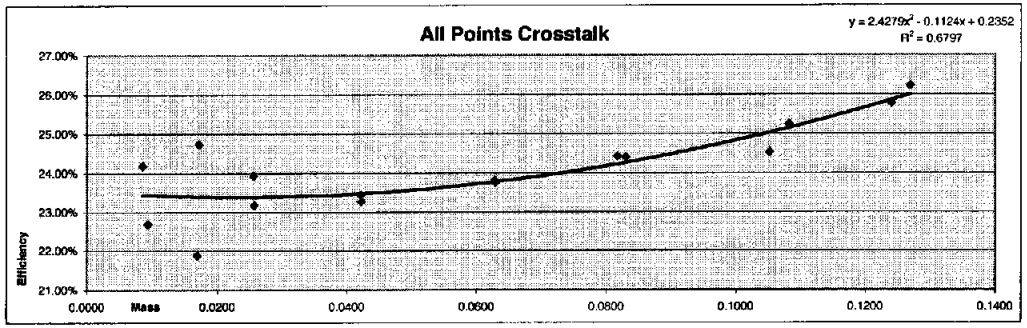
Red A4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34593	10233	864.83	255.83	22.83%	Min
0	A12	0.0169	40.00	38096	10593	952.40	264.83	21.76%	21.76%
0	A13	0.0257	40.00	27725	8100	693.13	202.50	22.61%	
0	A14	0.0421	40.00	25428	7546	635.70	188.65	22.88%	Max
0	A15	0.0629	40.00	19354	6033	483.85	150.83	23.76%	25.39%
0	A16	0.0817	40.00	36857	11618	921.43	290.45	23.97%	
0	A17	0.1052	40.00	31039	10061	775.98	251.53	24.48%	Mean
0	A18	0.1240	40.00	26757	9021	668.93	225.53	25.21%	23.73%
0	A21	0.0086	40.00	32565	10158	814.13	253.95	23.78%	
0	A22	0.0172	40.00	26997	8457	674.93	211.43	23.85%	
0	A23	0.0256	40.00	25422	7949	635.55	198.73	23.82%	
0	A24	0.0422	40.00	25015	7566	625.38	189.15	23.22%	
0	A25	0.0628	40.00	22906	6977	572.65	174.43	23.35%	
0	A26	0.0830	40.00	36161	11485	904.03	287.13	24.10%	
0	A27	0.1082	40.00	32177	10490	804.43	262.25	24.59%	
0	A28	0.1269	40.00	27495	9359	687.38	233.98	25.39%	



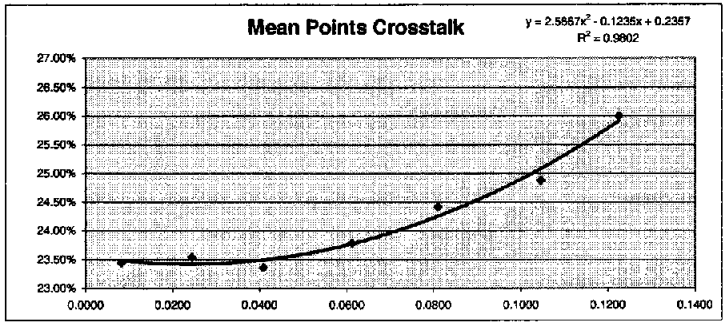
Red A4 Mean Mass	Mean % α into β	
0.0083	23.30%	Min
0.0245	23.21%	22.80%
0.0409	23.05%	Max
0.0612	23.56%	25.30%
0.0811	24.04%	Mean
0.1046	24.53%	23.73%
0.1226	25.30%	



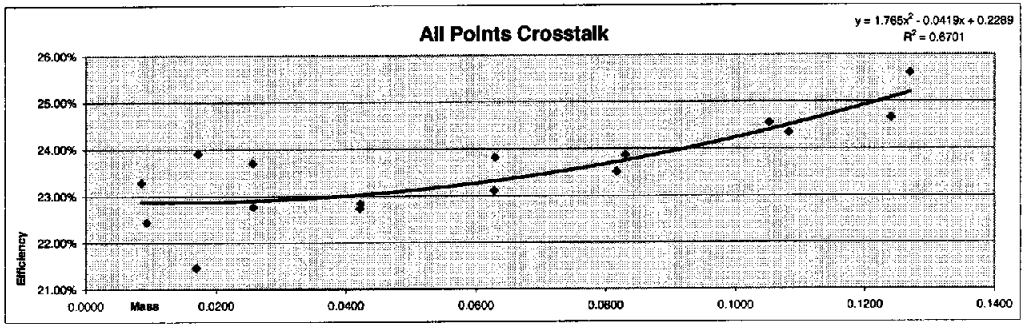
Red B1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34489	10125	862.23	253.13	22.69%	Min
0	A12	0.0169	40.00	37707	10562	942.68	264.05	21.88%	21.88%
0	A13	0.0257	40.00	27207	8206	680.18	205.15	23.17%	
0	A14	0.0421	40.00	24522	7510	613.05	187.75	23.45%	Max
0	A15	0.0629	40.00	19517	6083	487.93	152.08	23.76%	26.22%
0	A16	0.0817	40.00	35833	11581	895.83	289.53	24.43%	
0	A17	0.1052	40.00	30386	9872	759.65	246.80	24.52%	Mean
0	A18	0.1240	40.00	26365	9156	659.13	228.90	25.76%	24.09%
0	A21	0.0086	40.00	31749	10129	793.73	253.23	24.19%	
0	A22	0.0172	40.00	26439	8683	660.95	217.08	24.72%	
0	A23	0.0258	40.00	25150	7910	628.75	197.75	23.93%	
0	A24	0.0422	40.00	24622	7469	615.55	186.73	23.27%	
0	A25	0.0628	40.00	22538	7043	563.45	176.08	23.81%	
0	A26	0.0830	40.00	35668	11512	891.70	287.80	24.40%	
0	A27	0.1082	40.00	31291	10564	782.28	264.10	25.24%	
0	A28	0.1269	40.00	27170	9657	679.25	241.43	26.22%	



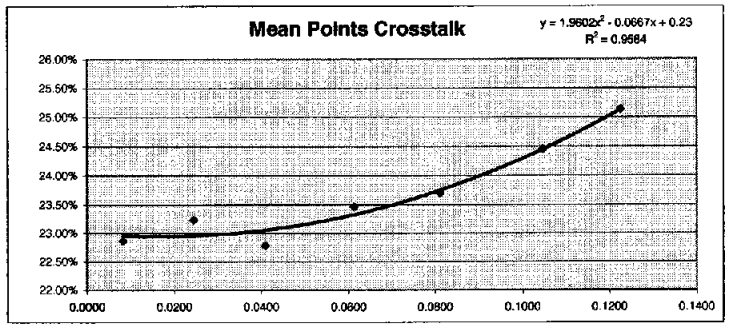
Red B1 Mean Mass	Mean % α into β	
0.0083	23.44%	Min
0.0245	23.55%	23.30%
0.0409	23.36%	Max
0.0612	23.79%	26.00%
0.0811	24.41%	Mean
0.1046	24.88%	24.09%
0.1226	26.00%	



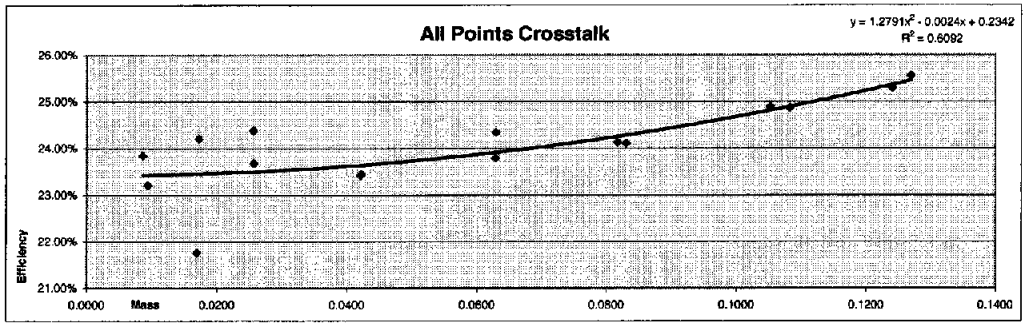
Red B2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34228	9897	855.70	247.43	22.43%	Min
0	A12	0.0169	40.00	37453	10238	936.33	255.95	21.47%	21.47%
0	A13	0.0257	40.00	27139	7995	678.48	199.88	22.76%	
0	A14	0.0421	40.00	24918	7328	622.95	183.20	22.73%	Max
0	A15	0.0629	40.00	18986	5937	474.65	148.43	23.82%	25.62%
0	A16	0.0817	40.00	36258	11150	906.45	278.75	23.52%	
0	A17	0.1052	40.00	30293	9857	757.33	246.43	24.56%	Mean
0	A18	0.1240	40.00	26402	8638	660.05	215.95	24.65%	23.54%
0	A21	0.0086	40.00	31687	9622	792.18	240.55	23.29%	
0	A22	0.0172	40.00	26252	8252	656.30	206.30	23.92%	
0	A23	0.0256	40.00	25168	7820	629.20	195.50	23.71%	
0	A24	0.0422	40.00	24246	7173	606.15	179.33	22.83%	
0	A25	0.0628	40.00	22365	6720	559.13	168.00	23.10%	
0	A26	0.0830	40.00	35428	11111	885.70	277.78	23.87%	
0	A27	0.1082	40.00	31419	10108	785.48	252.70	24.34%	
0	A28	0.1269	40.00	26912	9268	672.80	231.70	25.62%	



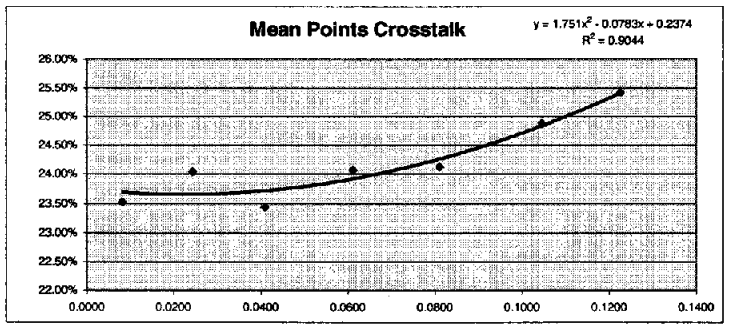
Red B2 Mean Mass	Mean % α into β	
0.0083	22.86%	Min
0.0245	23.23%	22.69%
0.0409	22.78%	Max
0.0612	23.46%	25.13%
0.0811	23.70%	Mean
0.1046	24.45%	23.54%
0.1226	25.13%	



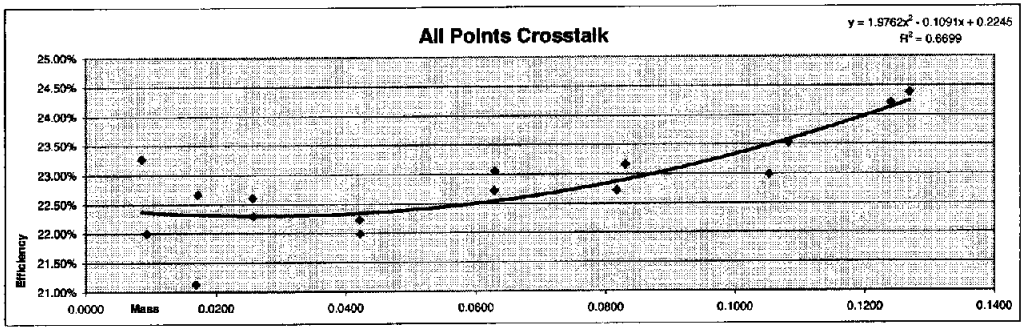
Red B3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	33892	10243	847.30	256.08	23.21%	Min
0	A12	0.0169	40.00	37656	10474	941.40	261.85	21.76%	21.76%
0	A13	0.0257	40.00	26621	8260	665.53	206.50	23.68%	
0	A14	0.0421	40.00	24345	7445	608.63	186.13	23.42%	Max
0	A15	0.0629	40.00	18733	6029	468.33	150.73	24.35%	25.55%
0	A16	0.0817	40.00	35795	11386	894.88	284.65	24.13%	
0	A17	0.1052	40.00	29945	9923	748.63	248.08	24.89%	Mean
0	A18	0.1240	40.00	25815	8739	645.38	218.48	25.29%	24.06%
0	A21	0.0086	40.00	31517	9868	787.93	246.70	23.84%	
0	A22	0.0172	40.00	26449	8448	661.23	211.20	24.21%	
0	A23	0.0256	40.00	25043	8077	626.08	201.93	24.39%	
0	A24	0.0422	40.00	24395	7473	609.88	186.83	23.45%	
0	A25	0.0628	40.00	22381	6986	559.53	174.65	23.79%	
0	A26	0.0830	40.00	35117	11157	877.93	278.93	24.11%	
0	A27	0.1082	40.00	30900	10225	772.50	255.63	24.86%	
0	A28	0.1269	40.00	27093	9300	677.33	232.50	25.55%	



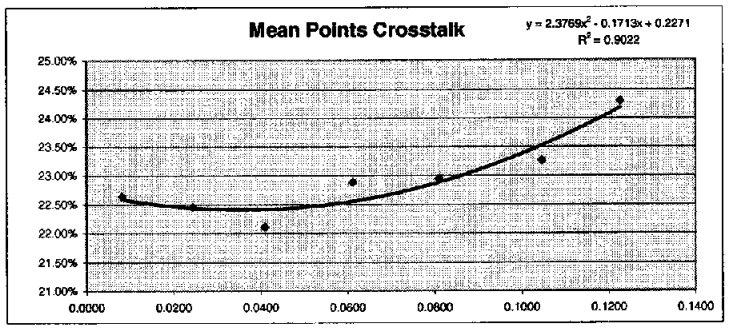
Red B3 Mean Mass	Mean % α into β	
0.0083	23.53%	Min
0.0245	24.03%	22.99%
0.0409	23.43%	Max
0.0612	24.07%	25.42%
0.0811	24.12%	Mean
0.1046	24.88%	24.06%
0.1226	25.42%	



Red B4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	36870	10396	921.75	259.90	21.99%	Min
0	A12	0.0169	40.00	40325	10804	1008.13	270.10	21.13%	21.13%
0	A13	0.0257	40.00	29207	8379	730.18	209.48	22.29%	
0	A14	0.0421	40.00	26958	7703	673.95	192.58	22.22%	Max
0	A15	0.0629	40.00	20695	6198	517.38	154.95	23.05%	24.39%
0	A16	0.0817	40.00	39988	11757	999.70	293.93	22.72%	
0	A17	0.1052	40.00	33789	10085	844.73	252.13	22.99%	Mean
0	A18	0.1240	40.00	29359	9380	733.98	234.50	24.21%	22.81%
0	A21	0.0086	40.00	33963	10301	849.08	257.53	23.27%	
0	A22	0.0172	40.00	28672	8406	716.80	210.15	22.67%	
0	A23	0.0256	40.00	27477	8027	686.93	200.68	22.61%	
0	A24	0.0422	40.00	26784	7547	669.60	188.68	21.98%	
0	A25	0.0628	40.00	24693	7259	617.33	181.48	22.72%	
0	A26	0.0830	40.00	38672	11658	966.80	291.45	23.16%	
0	A27	0.1082	40.00	34584	10637	864.60	265.93	23.52%	
0	A28	0.1269	40.00	29952	9661	748.80	241.53	24.39%	

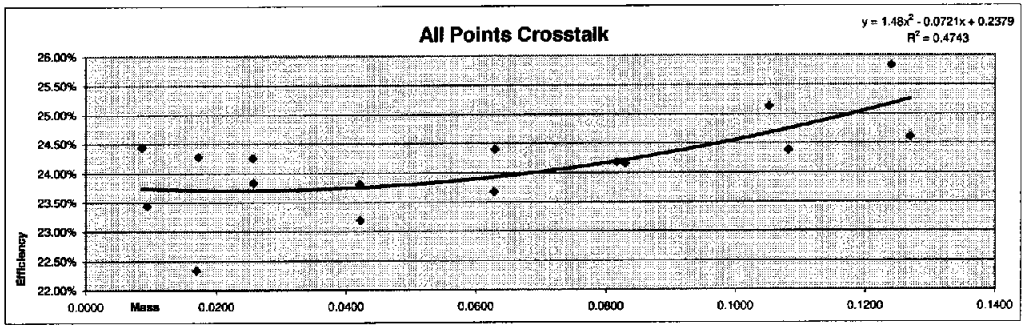


Red B4 Mean Mass	Mean % α into β	
0.0083	22.63%	Min
0.0245	22.45%	21.90%
0.0409	22.10%	Max
0.0612	22.88%	24.30%
0.0811	22.94%	Mean
0.1046	23.25%	22.81%
0.1226	24.30%	

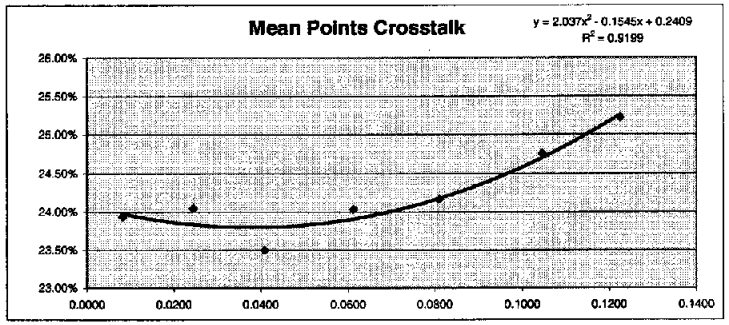


Red C1

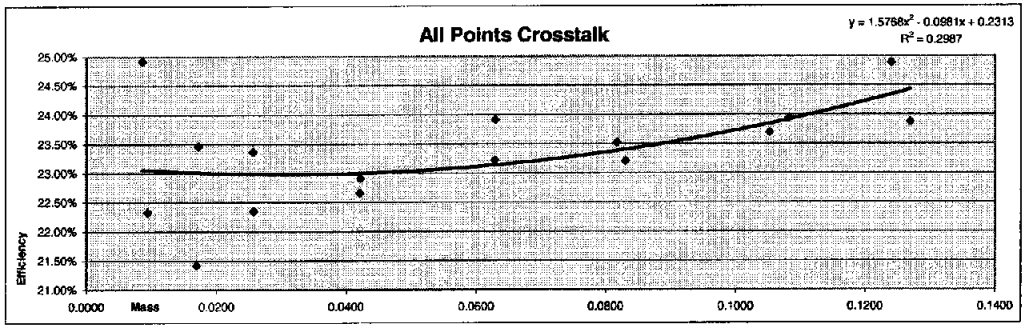
Red C1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34400	10531	860.00	263.28	23.44%	Min
0	A12	0.0169	40.00	37862	10892	946.55	272.30	22.34%	22.34%
0	A13	0.0257	40.00	27197	8511	679.93	212.78	23.83%	
0	A14	0.0421	40.00	24720	7726	618.00	193.15	23.81%	Max
0	A15	0.0629	40.00	18852	6083	471.30	152.08	24.40%	25.83%
0	A16	0.0817	40.00	36495	11636	912.38	290.90	24.18%	
0	A17	0.1052	40.00	30705	10306	767.63	257.65	25.13%	Mean
0	A18	0.1240	40.00	26877	9361	671.93	234.03	25.83%	24.12%
0	A21	0.0086	40.00	31275	10115	781.88	252.88	24.44%	
0	A22	0.0172	40.00	26242	8414	656.05	210.35	24.28%	
0	A23	0.0256	40.00	25308	8105	632.70	202.63	24.26%	
0	A24	0.0422	40.00	24805	7489	620.13	187.23	23.19%	
0	A25	0.0628	40.00	22991	7131	574.78	178.28	23.67%	
0	A26	0.0830	40.00	36530	11631	913.25	290.78	24.15%	
0	A27	0.1082	40.00	36483	11764	912.08	294.10	24.38%	
0	A28	0.1269	40.00	32625	10646	815.63	266.15	24.60%	



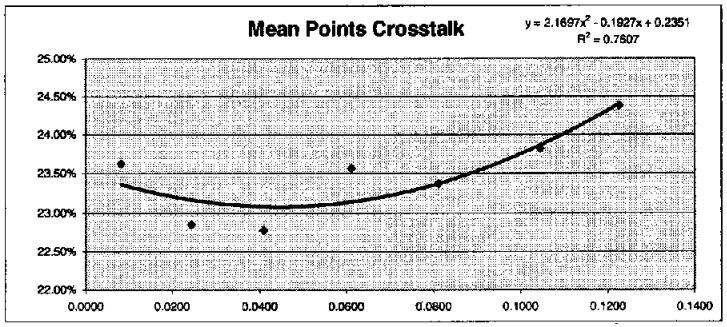
Red C1 Mean Mass	Mean % α into β	
0.0083	23.94%	Min
0.0245	24.05%	23.31%
0.0409	23.50%	Max
0.0612	24.03%	25.22%
0.0811	24.16%	Mean
0.1046	24.76%	24.12%
0.1226	25.22%	



Red C2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35843	10301	896.08	257.53	22.32%	Min
0	A12	0.0169	40.00	38834	10582	970.85	264.55	21.41%	21.41%
0	A13	0.0257	40.00	28848	8301	721.20	207.53	22.35%	
0	A14	0.0421	40.00	25708	7531	642.70	188.28	22.66%	Max
0	A15	0.0629	40.00	19870	6245	496.75	156.13	23.91%	24.92%
0	A16	0.0817	40.00	37448	11519	936.20	287.98	23.52%	
0	A17	0.1052	40.00	32454	10075	811.35	251.88	23.69%	Mean
0	A18	0.1240	40.00	28289	9373	707.23	234.33	24.89%	23.35%
0	A21	0.0086	40.00	29065	9647	726.63	241.18	24.92%	
0	A22	0.0172	40.00	27073	8300	676.83	207.50	23.46%	
0	A23	0.0256	40.00	26428	8058	660.70	201.45	23.37%	
0	A24	0.0422	40.00	25899	7694	647.48	192.35	22.90%	
0	A25	0.0628	40.00	24049	7274	601.23	181.85	23.22%	
0	A26	0.0830	40.00	37778	11417	944.45	285.43	23.21%	
0	A27	0.1082	40.00	33625	10582	840.63	264.55	23.94%	
0	A28	0.1269	40.00	33706	10569	842.65	264.23	23.87%	

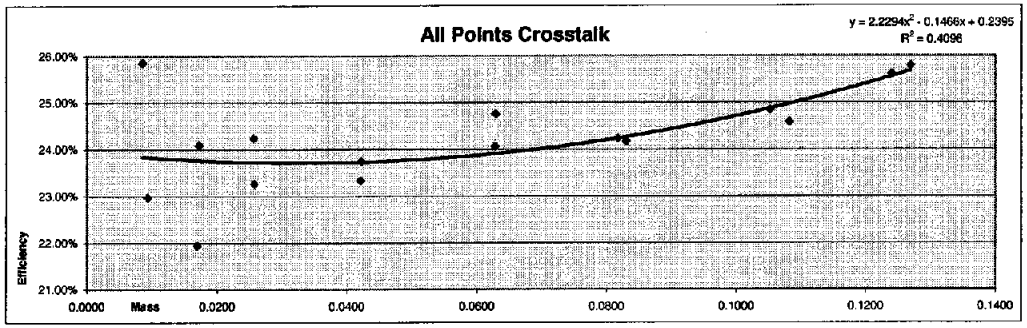


Red C2 Mean Mass	Mean % α into β	
0.0083	23.62%	Min
0.0245	22.86%	22.44%
0.0409	22.78%	Max
0.0612	23.57%	24.38%
0.0811	23.37%	Mean
0.1046	23.81%	23.35%
0.1226	24.38%	

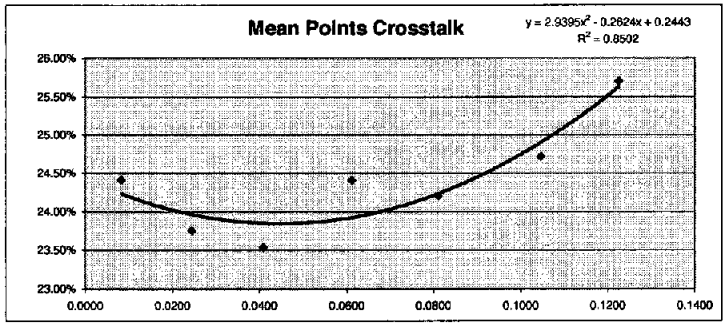


Red C3

Red C3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	33301	9932	832.53	248.30	22.97%	Min
0	A12	0.0169	40.00	36527	10263	913.18	256.58	21.93%	21.93%
0	A13	0.0257	40.00	26268	7964	656.70	199.10	23.26%	
0	A14	0.0421	40.00	24104	7336	602.60	183.40	23.33%	Max
0	A15	0.0629	40.00	18012	5926	450.30	148.15	24.76%	25.86%
0	A16	0.0817	40.00	35016	11199	875.40	279.98	24.23%	
0	A17	0.1052	40.00	28950	9571	723.75	239.28	24.85%	Mean
0	A18	0.1240	40.00	25436	8758	635.90	218.95	25.61%	24.22%
0	A21	0.0086	40.00	26441	9221	661.03	230.53	25.86%	
0	A22	0.0172	40.00	31072	9862	776.80	246.55	24.09%	
0	A23	0.0256	40.00	24341	7790	608.53	194.75	24.24%	
0	A24	0.0422	40.00	23799	7411	594.98	185.28	23.75%	
0	A25	0.0628	40.00	21669	6866	541.73	171.65	24.06%	
0	A26	0.0830	40.00	34778	11089	869.45	277.23	24.18%	
0	A27	0.1082	40.00	30807	10042	770.18	251.05	24.58%	
0	A28	0.1269	40.00	26558	9228	663.95	230.70	25.79%	

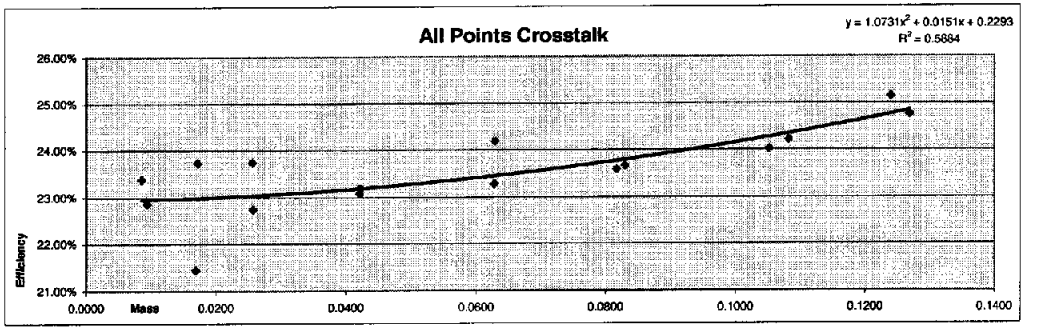


Red C3 Mean Mass	Mean % α into β	
0.0083	24.41%	Min
0.0245	23.75%	23.01%
0.0409	23.54%	Max
0.0612	24.41%	25.70%
0.0811	24.20%	Mean
0.1046	24.71%	24.22%
0.1226	25.70%	

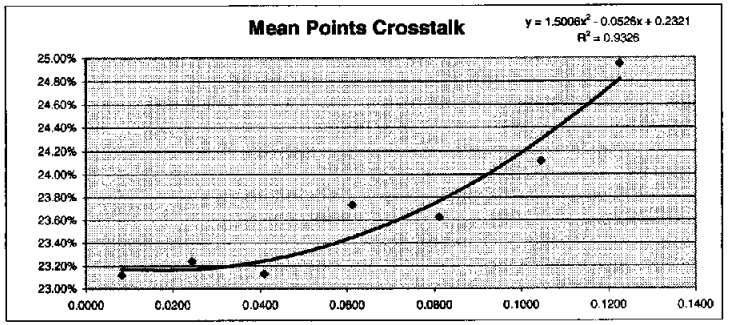


Red C4

Red C4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34460	10211	861.50	255.28	22.86%	Min
0	A12	0.0169	40.00	37771	10305	944.28	257.63	21.43%	21.43%
0	A13	0.0257	40.00	27241	8016	681.03	200.40	22.74%	
0	A14	0.0421	40.00	24859	7455	621.48	186.38	23.07%	Max
0	A15	0.0629	40.00	18747	5982	468.68	149.55	24.19%	25.14%
0	A16	0.0817	40.00	36298	11204	907.45	280.10	23.59%	
0	A17	0.1052	40.00	30655	9689	766.36	242.23	24.02%	Mean
0	A18	0.1240	40.00	26777	8994	669.43	224.85	25.14%	23.56%
0	A21	0.0086	40.00	32665	9967	816.63	249.18	23.38%	
0	A22	0.0172	40.00	32217	10025	805.43	250.63	23.73%	
0	A23	0.0256	40.00	26569	8273	664.23	206.83	23.74%	
0	A24	0.0422	40.00	24373	7359	609.33	183.98	23.19%	
0	A25	0.0628	40.00	22847	6933	571.18	173.33	23.28%	
0	A26	0.0830	40.00	35913	11131	897.83	278.28	23.66%	
0	A27	0.1082	40.00	32001	10224	800.03	255.60	24.21%	
0	A28	0.1269	40.00	27809	9151	695.23	228.78	24.76%	

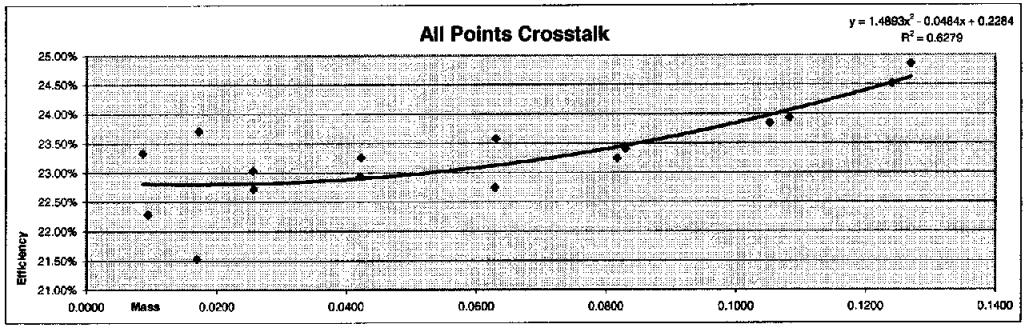


Red C4 Mean Mass	Mean % α into β	
0.0083	23.12%	Min
0.0245	23.24%	22.58%
0.0409	23.13%	Max
0.0612	23.74%	24.95%
0.0811	23.62%	Mean
0.1046	24.11%	23.56%
0.1226	24.95%	

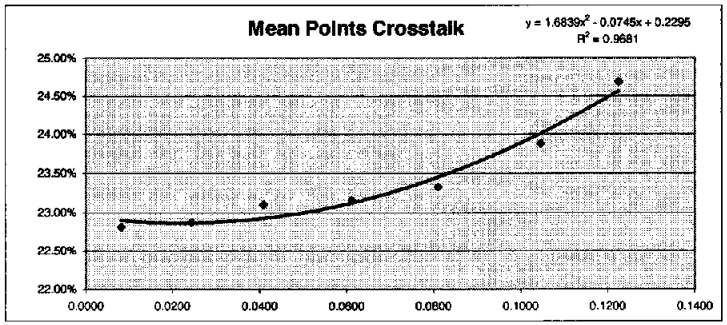


Red D1

Red D1 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	33615	9640	840.38	241.00	22.29%	Min
0	A12	0.0169	40.00	37627	10324	940.68	258.10	21.53%	21.53%
0	A13	0.0257	40.00	28030	8241	700.75	206.03	22.72%	
0	A14	0.0421	40.00	25823	7685	645.58	192.13	22.93%	Max
0	A15	0.0629	40.00	19905	6142	497.63	153.55	23.58%	24.85%
0	A16	0.0817	40.00	37645	11401	941.13	285.03	23.25%	
0	A17	0.1052	40.00	31994	10015	799.85	250.38	23.84%	Mean
0	A18	0.1240	40.00	28013	9098	700.33	227.45	24.52%	23.31%
0	A21	0.0086	40.00	33714	10264	842.85	256.60	23.34%	
0	A22	0.0172	40.00	27629	8587	690.73	214.68	23.71%	
0	A23	0.0256	40.00	27990	8375	699.75	209.38	23.03%	
0	A24	0.0422	40.00	26457	8020	661.43	200.50	23.26%	
0	A25	0.0628	40.00	23898	7034	597.45	175.85	22.74%	
0	A26	0.0830	40.00	37824	11561	945.60	289.03	23.41%	
0	A27	0.1082	40.00	33579	10561	839.48	264.03	23.93%	
0	A28	0.1269	40.00	29047	9606	726.18	240.15	24.85%	

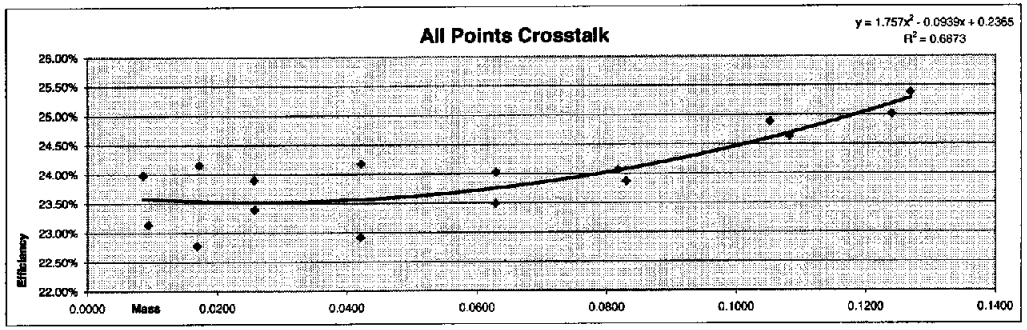


Red D1 Mean Mass	Mean % α into β	
0.0083	22.81%	Min
0.0245	22.88%	22.62%
0.0409	23.10%	Max
0.0612	23.16%	24.68%
0.0811	23.33%	Mean
0.1046	23.88%	23.31%
0.1226	24.68%	

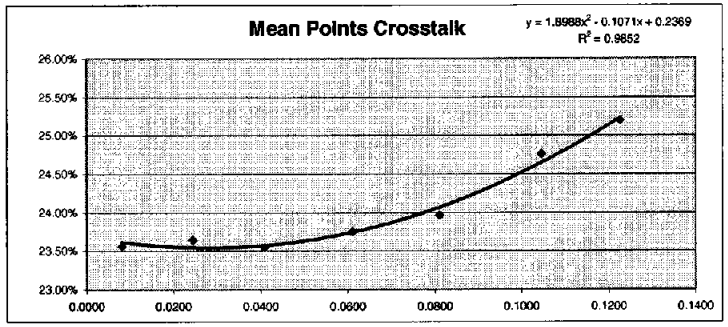


Red D2

Red D2 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	34185	10291	854.63	257.28	23.14%	Min
0	A12	0.0169	40.00	35278	10405	881.95	260.13	22.78%	22.78%
0	A13	0.0257	40.00	26366	8049	659.15	201.23	23.39%	
0	A14	0.0421	40.00	25048	7448	626.20	186.20	22.92%	Max
0	A15	0.0629	40.00	19363	6122	484.08	153.05	24.02%	25.38%
0	A16	0.0817	40.00	36555	11582	913.88	289.55	24.06%	
0	A17	0.1052	40.00	30601	10133	765.03	253.33	24.88%	Mean
0	A18	0.1240	40.00	26880	8965	672.00	224.13	25.01%	23.99%
0	A21	0.0086	40.00	32233	10169	805.83	254.23	23.98%	
0	A22	0.0172	40.00	26758	8523	668.95	213.08	24.16%	
0	A23	0.0256	40.00	25474	7999	636.85	199.98	23.90%	
0	A24	0.0422	40.00	25455	8117	636.38	202.93	24.18%	
0	A25	0.0628	40.00	25118	7711	627.95	192.78	23.49%	
0	A26	0.0830	40.00	36313	11384	907.83	284.60	23.87%	
0	A27	0.1082	40.00	32312	10562	807.80	264.05	24.63%	
0	A28	0.1269	40.00	27983	9516	699.58	237.90	25.38%	

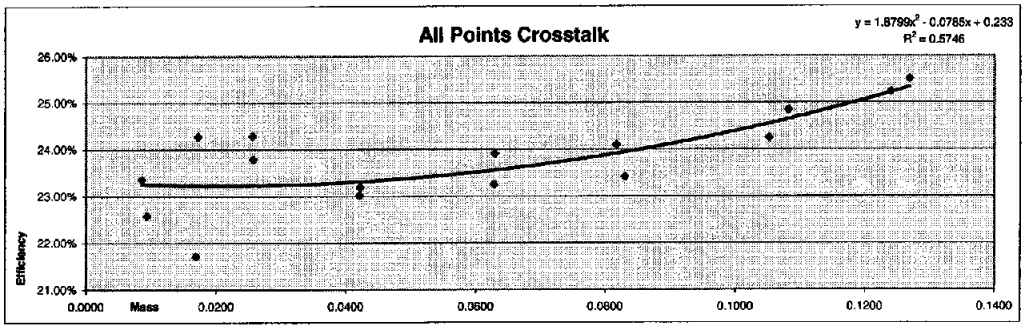


Red D2 Mean Mass	Mean % α into β	
0.0083	23.56%	Min
0.0245	23.64%	23.47%
0.0409	23.55%	Max
0.0612	23.76%	25.19%
0.0811	23.96%	Mean
0.1046	24.76%	23.99%
0.1226	25.19%	

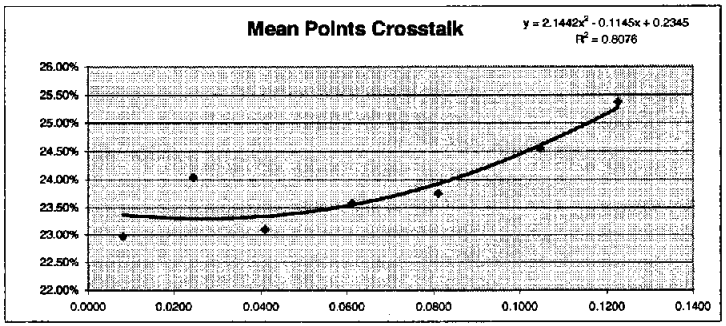


Red D3

Red D3 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35427	10331	885.68	258.28	22.58%	Min
0	A12	0.0169	40.00	38747	10745	968.68	268.63	21.71%	21.71%
0	A13	0.0257	40.00	25892	8079	647.30	201.98	23.78%	
0	A14	0.0421	40.00	24458	7309	611.45	182.73	23.01%	Max
0	A15	0.0629	40.00	19326	6073	483.15	151.83	23.91%	25.51%
0	A16	0.0817	40.00	36581	11615	914.53	290.38	24.10%	
0	A17	0.1052	40.00	31170	9978	779.25	249.45	24.25%	Mean
0	A18	0.1240	40.00	27160	9167	679.00	229.18	25.23%	23.79%
0	A21	0.0086	40.00	32488	9897	812.20	247.43	23.35%	
0	A22	0.0172	40.00	27123	8694	678.08	217.35	24.27%	
0	A23	0.0256	40.00	25739	8260	643.48	206.50	24.29%	
0	A24	0.0422	40.00	25094	7575	627.35	189.38	23.19%	
0	A25	0.0628	40.00	24925	7549	623.13	188.73	23.25%	
0	A26	0.0830	40.00	22899	6998	572.48	174.95	23.41%	
0	A27	0.1082	40.00	32238	10657	805.95	266.43	24.84%	
0	A28	0.1269	40.00	27857	9540	696.43	238.50	25.51%	

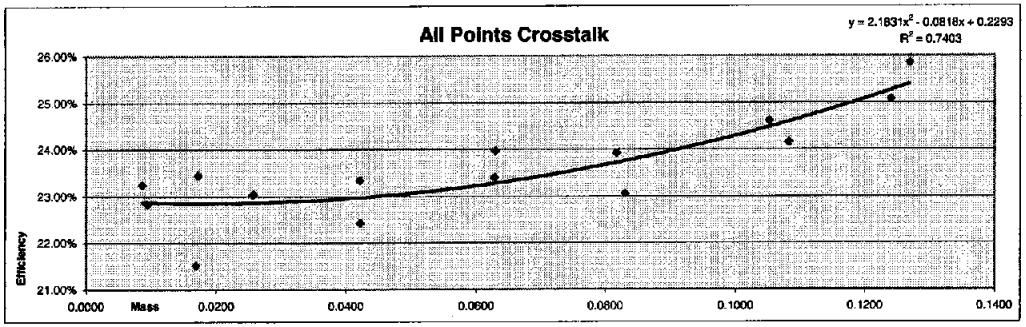


Red D3 Mean Mass	Mean % α into β	
0.0083	22.96%	Min
0.0245	24.04%	22.96%
0.0409	23.10%	Max
0.0612	23.58%	25.37%
0.0811	23.75%	Mean
0.1046	24.55%	23.79%
0.1226	25.37%	

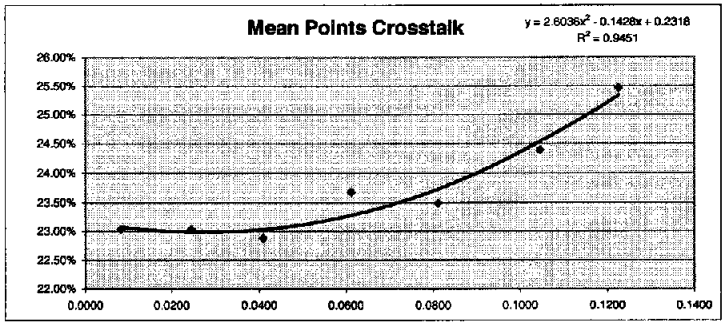


Red D4

Red D4 Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	A11	0.0094	40.00	35538	10512	888.45	262.80	22.83%	Min
0	A12	0.0169	40.00	38571	10571	964.28	264.28	21.51%	21.51%
0	A13	0.0257	40.00	27914	8358	697.85	208.95	23.04%	
0	A14	0.0421	40.00	23918	7281	597.95	182.03	23.34%	Max
0	A15	0.0629	40.00	18894	5954	472.35	148.85	23.96%	25.85%
0	A16	0.0817	40.00	37490	11788	937.25	294.70	23.92%	
0	A17	0.1052	40.00	31132	10167	778.30	254.18	24.62%	Mean
0	A18	0.1240	40.00	27415	9178	685.38	229.45	25.08%	23.56%
0	A21	0.0086	40.00	33000	9993	825.00	249.83	23.24%	
0	A22	0.0172	40.00	27885	8537	697.13	213.43	23.44%	
0	A23	0.0256	40.00	26655	7975	666.38	199.38	23.03%	
0	A24	0.0422	40.00	25937	7497	648.43	187.43	22.42%	
0	A25	0.0628	40.00	23448	7162	586.20	179.05	23.40%	
0	A26	0.0830	40.00	23594	7069	589.85	176.73	23.05%	
0	A27	0.1082	40.00	36840	11730	921.00	293.25	24.15%	
0	A28	0.1269	40.00	27990	9758	699.75	243.95	25.85%	



Red D4 Mean Mass	Mean % α into β	
0.0083	23.04%	Min
0.0245	23.04%	22.48%
0.0409	22.88%	Max
0.0612	23.68%	25.47%
0.0811	23.49%	Mean
0.1046	24.38%	23.56%
0.1226	25.47%	



SEVERN TRENT STL

2007
GFPC Red Alpha Efficiency Curves

TestAmerica STL

Calibration Standard Data

Beta calibration stds.	8/31/2005	salt solution SLRB-B		SET 1		
Beta standard, RAD04-0095, 2316.6 dpm/mL Sr/Y90 on 08/07/2001						
Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/7/6	mass 2/7/6
1	1	0.1000	8.8980	8.8888	8.8981	0.0093
2	1	0.3000	8.9490	8.9230	8.9494	0.0264
3	1	0.5000	9.0149	8.9703	9.0128	0.0425
4	1	1.0000	9.0419	8.9602	9.0411	0.0809
5	1	1.5000	9.0033	8.8764	8.9991	0.1227
6	1	2.0000	9.0833	8.9072	9.0719	0.1647
7	1	2.5000	9.1219	8.9194	9.1197	0.2003
8	1	3.0000	9.1769	8.9241	9.167	0.2429

Alpha calibration standards		salt solution SLRB-B		SET 1		
Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 10/07/2003						
Std #	mLs 03-071	mLs salt solution	gross mass	tare mass	reweigh 3/7/7	mass 3/7/7
1	1	0.1000	8.9369	8.9273	8.9367	0.0094
2	1	0.2000	8.9958	8.9783	8.9952	0.0169
3	1	0.3000	8.9737	8.9470	8.9727	0.0257
4	1	0.5000	8.9206	8.8766	8.9187	0.0421
5	1	0.7500	8.9565	8.8888	8.9517	0.0629
6	2	1.0000	9.0043	8.9170	8.9987	0.0817
7	2	1.3000	9.0092	8.8992	9.0044	0.1052
8	2	1.5000	9.0413	8.9088	9.0328	0.1240

spiked by:	Joel Kempema	verified by:	Sarah Hurst

Alpha Beta calibration standards 9/02/05

Beta calibration stds.			salt solution SLRB-B		SET 2	
Beta standard, RAD04-0095, 1043.5 dpm/mL on 08/07/01 Sr/Y90.						
Std #	mLs RAD04-0095	mLs salt solution	gross mass	tare mass	reweigh 2/23/7	net mass 2/23/7
1	1	0.1000	8.9140	8.9056	8.9147	0.0091
2	1	0.3000	8.9197	8.8939	8.9204	0.0265
3	1	0.5000	8.8978	8.8559	8.8974	0.0415
4	1	1.0000	8.9580	8.8715	8.9545	0.0830
5	1	1.5000	9.0437	8.9139	9.0369	0.1230
6	1	2.0000	9.0249	8.8592	9.0203	0.1611
7	1	2.5000	9.1269	8.9239	9.1171	0.1932
8	1	3.0000	9.1390	8.8872	9.1293	0.2421

alpha calibration standards			salt solution SLRB-B		SET 2	
Alpha standard, 03-071, 4567.9 dpm/mL Th-230 on 12/19/02						
Std #	mLs	mLs salt solution	gross mass	tare mass	reweigh 3/7/7	mass 3/7/7
1	1	0.1000	8.9143	8.9061	8.9147	0.0086
2	1	0.2000	8.9348	8.9182	8.9354	0.0172
3	1	0.3000	8.9231	8.8980	8.9236	0.0256
4	1	0.5000	8.9518	8.9082	8.9504	0.0422
5	1	0.7500	8.9683	8.9026	8.9654	0.0628
6	2	1.0000	9.0179	8.9303	9.0133	0.0830
7	2	1.3000	8.9901	8.8763	8.9845	0.1082
8	2	1.5000	9.0533	8.9206	9.0475	0.1269
spiked by:	Joel Kempema		verified by:	N/A		

alpha beta standards second set

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65090-334

Th-230 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Th-230
ACTIVITY (dps):	7.654 E3
HALF-LIFE:	7.538 E4 Years
CALIBRATION DATE:	December 19, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.5%
SYSTEMATIC:	2.6%
RANDOM:	0.9%

*99% Confidence Level

Impurities: γ-impurities <0.1%, α-impurities <0.05%

5.17738 grams 0.5M HNO_3 solution.

P O NUMBER 1614557-000 OP, Item 3

SOURCE PREPARED BY: M. D. Currie for
M. Taskaeva, Radiochemist

Q A APPROVED: 12-19-02

STL St. Louis

Standards Preparation Logbook Record

Jan-05-2006

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD03-0085, Th 230 03-071 Analyst: hicksb

Vendor: Analytics
Solvent: 0.5M HNO3
Date Prep./Opened: 10-07-2003 Date Received: 12-19-2002
Date Expires(1): 10-07-2008 (5 Years)
Date Expires(2): 10-07-2008 (5 Years)
parent, vial# 65090-334

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Th230	4,567.9	4,567.9

RAD06-0001, Th-230 Analyst: dillardj

Solvent: 0.5M HNO3 Volume (ml): 200.00
Date Prep./Opened: 01-04-2006
Date Expires(1): 01-04-2007 (1 Year)
Date Expires(2): 01-04-2007 (1 Year)

Parent Std No.: RAD03-0085, Th 230 03-071 Aliquot Amount (ml): 1.0000
Parent Date Expires(1): 10-07-2008 Parent Date Expires(2): 10-07-2008

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Th230	4,567.9	22.840

Reviewed By: _____

119

Thorium 230

10/7/03

ANALYTICS

SOURCE ID: 65090-334

Radioactivity: 7,654 dps

Reference time: 12-19-2002 12:00 EST

Useful life: indefinite

Initial mass = 5.17738 grams

Mass transferred = 5.1498 grams

$$\frac{5.1498\,g}{5.17738\,g} \times 7{,}654\ dps \times \frac{60\ dpm}{1\ dps} \div 100\,mL = \boxed{4{,}567.9\ \frac{dpm}{mL}}$$

ANALYTICS

1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA * 404-352-8677

Th-230

SRS 65090-334 Amount 0.207 µCi QA

Date 12/19/02 12:00 EST Exp. ----------

PO # 1614557-000 OP, Item 3

5.17738 grams 0.5M HNO_3 solution

CAUTION RADIOACTIVE MATERIAL

Logbook: 2060

STERN TRENT SERVICES

Radiochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T ½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
11-12-03	11-12-04	03-082	P32	IPL 7032	1.103 µCi/g ~~11,991.2 dpm~~ ~~11,991.264~~	15 NOV 03	4.5989 g	100 ml		14.29 d	119,957 dpm/ml ~~119,912.0~~	1PC2-4-01	SDB	MFM	From Pg 10 STEVE'S
11-12-03	11-12-04	03-083	P32	03-082	119,957 dpm/ml ~~119,912.0~~	15 NOV 03	1 ml	50 ml		14.29 d	dpm/ml ~~2,398.2~~	2399.15 1PC2-4-01	SDB	MFM	LAB Book
9-11-03	9-11-04	03-069	Pu238	02-032	68.235 ~~1PC 11-19-03 7361.174~~	11-15-99 dpm/ml	95 ml	190 ml	1396 day	87.7 y	decay corr ~~33.5069~~ 1622	1M HNO_3	MFM	PC	from page 28
9-11-03	9-11-04	03-069	Pu239	02-033	031 64.025 ~~1238.05~~ 11-19-03 dpm/ml	11-15-99	95 ml	190 ml	1396 day	24110 y	0125 ~~32.6251~~	1M HNO_3	MFM	PC	from page 28
11-7-03	11-21-04	Rad03-0083 ~~03-070~~	Tc-99	02-028	95,341.2 dpm/ml	10-96	1 ml	200 ml		2.1E5	476.7 dpm/ml	KOH	SDB		Rad Gave ID Rad03-0083
12-9-03	12-9-04	03-084	Ra228	01012	1,018 dpm/mL	2/16/01	2 mL	100 mL		5.75 y	20.36 dpm/mL	0.5M HNO_3	BH	BBF	
12-9-03	12-9-04	03-085	Th230	03-071	4,567.9 dpm/mL	12/19/02	1 mL	200 mL		7538 E4	22.84 dpm/mL	0.5M HNO_3	BH	LE	
12/31/03	12/31/08	03-086	Fe-55	681-78-3	.203 µCi/g	1/1/2000	4.9917 g	100 mL		999 days	10,133.2 pCi/mL	0.5M HNO_3	BH		
12/31/03	12/31/04	03-087	Fe-55	03-086	10,133.2 pCi/mL	1/1/2000	5 mL	100 mL		999 days	506.7 pCi/mL	0.5M HNO_3	BH		
1-5-04	1-5-05	Rad04-0001	UNAT	01-018	235.76 dpm/mL	3-2001	20 mL	80 mL	N/A	4.5 E9 yrs	58.94 dpm/mL	0.5M HNO_3	MFM		
1/12/04	1/12/05	Rad04-0003	Ra228	01012	1,018 dpm/mL	2/16/01	2 mL	100 mL		5.75 y	20.36 dpm/mL	0.5M HNO_3	BH	BBF	
2/12/04	2/12/04	RAD-0015	Sr90	03-038	2,314.57 dpm/mL	9/19/01	5 mL	500 mL		28.5 y	23.16 dpm/mL	0.5M HNO_3	BH	BBF	

Additional Comments:

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

62204-334

Sr-90 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Sr-90
ACTIVITY (dps):	3.897 E4
HALF-LIFE:	28.79 years
CALIBRATION DATE:	August 7, 2001 12:00 EST
TOTAL UNCERTAINTY*:	4.0%
SYSTEMATIC:	3.5%
RANDOM:	0.5%

*99% Confidence Level

Impurities: γ-impurities <0.1%

4.99897 grams 0.1M HCl solution with 30 μg/g Sr carrier.

P O NUMBER 1097166, Item 1

SOURCE PREPARED BY: M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED: 8-8-01

STL St. Louis

Standards Preparation Logbook Record

Feb-14-2006

Logbook: \\Qstlmo01\Stdslog\RAD_STD.std

RAD01-0025, Sr 90 01-093 Analyst: hicksb

Vendor: Analytics Vendor's Expiration Date: 08-07-2006
Solvent: 1M HNO3
Date Prep./Opened: 09-19-2001 Date Received: 08-07-2001
Date Expires(1): 09-19-2006 (5 Years)
Date Expires(2): 09-19-2006 (5 Years)
Current Sr 90, beta spike parent, vial# 62204-334

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	23,166

RAD04-0095, Sr-90 Analyst: hicksb

Solvent: 0.5M HNO3 Volume (ml): 100.00
Date Prep./Opened: 10-07-2004 Date Consumed: 01-05-2006
Date Expires(1): 10-07-2005 (1 Year)
Date Expires(2): 04-17-2004 (1 Year)

Parent Std No.: RAD01-0025, Sr 90 01-093 Aliquot Amount (ml): 10.000
Parent Date Expires(1): 09-19-2006 Parent Date Expires(2): 09-19-2006

Component	Initial Conc (dpm/mL)	Final Conc (dpm/mL)
Sr 90	23,166	2,316.6

Reviewed By: _____

49

SR-90 Parent Ampoule for 2nd source CPC cal.

9/19/01
BMW

#62204-334

ampoule activity: ~~3,8970~~ dps 38,970 dps.
½ life : 28.79 yrs
Calibration date: August 7, 2001 12:00 EST
Uncertainty 4.0%

STANDARDS LOG PARENT DILUTION # 01-093

$\left(\frac{38970 \text{ decays}}{1 \text{ sec}}\right)\left(\frac{60 \text{ sec}}{1 \text{ min}}\right) = 2,338,200$ dpm in ampoule.

$\left(\frac{2338200}{2.22}\right) = 1053243.2$ pCi/m in ampoule - Actual, 1043553.363 pCi/L
÷100 = 10435.8 pCi/ml

Actual Amount Transferred.... 4.9531 g

093
FD
-094

4.9531 g / 4.99897 actual = 0.9908 0.9908 x 2.3382x10^6 = 2,316,688.56 dpm

$\left(\frac{2,316,688}{100 \text{ mL}}\right) = \boxed{23,166 \text{ dpm/mL}}$ or $\boxed{104.3 \text{ pCi/mL}}$

231.66 dpm/ml
MK 12-13-02

ANALYTICS
1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA * 404-352-8677
Sr-90
SRS 62204-334 Amount 1.053 µCi QA VMN
Date 08/07/01 12:00 EST Exp. ----------
PO # 1097166, Item 1
4.99897 grams 0.1M HCl solution

CAUTION RADIOACTIVE MATERIAL

SEVERN TRENT SERVICES

R ochemistry
Standards Preparation Logbook

Date Prep'd	Expir. Date	Standard ID Number	Isotope	Parent ID Number	Parent Activity	Parent Ref. Date	Aliquot	Dilution Volume	Change in Time	T ½	Final Activity	Solvent/ Lot #	Prep'd Initials	Cal. Ver. Initials	Comments
9/18/01	12/18/01	01-087	UNAT CAL STD	01085	10 µg/mL	9/18/01	1.5 mL	100 mL	N/A	N/A	150 ng/mL	.8 M HNO3	BMW	JTK	nanogram/mL
		01-088					1.0 mL				100 ng/mL			JTK	
		01-089					0.5 mL				50 ng/mL			JTK	
		01-090		01088	100 ng/mL		10 mL	100 mL			10 ng/mL			JTK	
		01-091		01-089	50 ng/mL		10 mL	100.0 mL			5 ng/mL			JTK	
		01-092		01-088	100 ng/mL		1.0 mL	100.0 mL			1 ng/mL			JTK	
9/19/01	9/19/02	01-093	SR-90	ampoule C2204-334	38,897 dps	8/7/01	4.9531 g	100.0 mL	N/A	28.79 K	~~104.3 pCi/mL~~ 10435 pCi/mL BMW 9/19/01 23,166 dpm/mL	.8 M HNO3	BMW	JTK	
9/19/01	9/19/02	01-094	SR90	01093	10435.8 pCi/mL	9/19/01	1.0 mL	100.0 mL	N/A	28.79 K	104.3 pCi/mL 231.66 dpm/mL	.8 M HNO3	BMW	JTK	
9/20/01	9/20/02	Ba-28	STD. Barium Carrier	Mo28-KPCM BaCl2	N/A	3/23/98	28.46 g	1000.0 mL	N/A	N/A	27.2 mg/mL	Reagent 1/20	BMW	JTK	See Ant capture weight sheet.
10/4/01	10/4/02 ~~10/4/01~~ 2mo 3-10-01	01-095	U-232	97-105	10,994 dpm/mL	9-6-97	1 mL	500 mL	—	70 yr	21.99 dpm	1M HNO3	CAM	JTK	
10/12/01	10/12/02	01-096	Ra226	98-006	1316 dpm/mL	4/12/98	1.0 mL	100.0 mL	—	1600 yr	13.16 dpm/mL	1M HNO3	AM	JTK	
10/18/01	10/18/02 ~~10/18/01~~ 2mo 3-10-01	01-097	(ABT) SR90/Y90	01032	1765.4 dpm/mL	3/28/95	2.0 mL	100.0 mL	N/A	28.5 yr	(35.31) total Y: ~~23.99~~ dpm/mL decay corrected 34.83 JTK 10-29-01	~~1M HNO3~~ 1M HNO3	BMW	AW	Decay Correct = 1699.65 dpm/mL

Additional Comments:

SL-RAD-044, revised 3/2/01
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