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ANALYTICAL REPORT

Job Number: 180-96595-1

Job Description: BRF_BS_20191001_1B

For:
Environmental Standards Inc.
1140 Valley Forge Road
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Valley Forge, PA 19482-0810

Attention: Amanda Cover

Approved for release.
Jennifer L Rumble
Project Manager I
11/21/2019 12:25 PM

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11/21/2019
Revision: 2

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Definitions/Glossary

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job Narrative
180-96595-1

This report was revised to remove the mdc values and to inlude missing daily detector checks.

Receipt
The samples were received on 10/2/2019 9:00 AM; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.1º C and 3.0º C.

RAD
Method 901.1: Gamma Prep Batch 160-445369
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:
Inferred from Reported to Analyte
Ac-228 Ra-228
Bi-214 Ra-226
BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13 (180-96595-1), BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13 (180-96595-2), BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13 (180-96595-3), BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05 (180-96595-4), BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05 (180-96595-5), BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05 (180-96595-5[DU]), BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05 (180-96595-6), BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05 (180-96595-7), BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05 (180-96595-8), (LCS 160-445369/2-A) and (MB 160-445369/1-A)

Method 901.1: Gamma Prep Batch 160-445202
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:
Inferred from Reported to Analyte
Ac-228 Ra-228
Bi-214 Ra-226
BRF-BS-FB02-20191001 ~ BRF BG05 (180-96595-9), (LCS 160-445202/2-A), (MB 160-445202/1-A), (180-96597-A-1-A) and (180-96597-A-1-B DU)

Method Fill_Geo-21: Gamma Prep Batch 160-445369: Samples BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05 (180-96595-4), BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05 (180-96595-7) and BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05 (180-96595-8) are a light powdered soil exhibiting low density.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Client Sample ID: BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13 — Lab Sample ID: 180-96595-1

No Detections.

Client Sample ID: BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13 — Lab Sample ID: 180-96595-2

No Detections.

Client Sample ID: BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13 — Lab Sample ID: 180-96595-3

No Detections.

Client Sample ID: BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-4

No Detections.

Client Sample ID: BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-5

No Detections.

Client Sample ID: BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-6

No Detections.

Client Sample ID: BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-7

No Detections.

Client Sample ID: BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-8

No Detections.

Client Sample ID: BRF-BS-FB02-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-9

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13
Date Collected: 10/01/19 08:40
Date Received: 10/02/19 09:00

Lab Sample ID: 180-96595-1
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.47		0.318	0.369			pCi/g	10/08/19 07:28	10/31/19 02:12	1
Radium-226	0.875		0.201	0.221	1.00	0.155	pCi/g	10/08/19 07:28	10/31/19 02:12	1
Radium-228	1.59		0.247	0.296		0.0803	pCi/g	10/08/19 07:28	10/31/19 02:12	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13
Date Collected: 10/01/19 09:00
Date Received: 10/02/19 09:00

Lab Sample ID: 180-96595-2
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.60		0.393	0.439			pCi/g	10/08/19 07:28	10/31/19 02:25	1
Radium-226	0.921		0.269	0.286	1.00	0.225	pCi/g	10/08/19 07:28	10/31/19 02:25	1
Radium-228	1.68		0.286	0.333		0.289	pCi/g	10/08/19 07:28	10/31/19 02:25	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13
Date Collected: 10/01/19 09:15
Date Received: 10/02/19 09:00

Lab Sample ID: 180-96595-3
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.30		0.372	0.408			pCi/g	10/08/19 07:28	10/31/19 02:24	1
Radium-226	1.09		0.242	0.267	1.00	0.169	pCi/g	10/08/19 07:28	10/31/19 02:24	1
Radium-228	1.21		0.283	0.309		0.273	pCi/g	10/08/19 07:28	10/31/19 02:24	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05
Date Collected: 10/01/19 13:00
Date Received: 10/02/19 09:00

Lab Sample ID: 180-96595-4
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.89		0.512	0.557			pCi/g	10/08/19 07:28	10/31/19 02:59	1
Radium-226	1.02		0.252	0.273	1.00	0.158	pCi/g	10/08/19 07:28	10/31/19 02:59	1
Radium-228	1.87		0.446	0.485		0.233	pCi/g	10/08/19 07:28	10/31/19 02:59	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05
Date Collected: 10/01/19 13:35
Date Received: 10/02/19 09:00

Lab Sample ID: 180-96595-5
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.17		0.302	0.341			pCi/g	10/08/19 07:28	10/31/19 03:01	1
Radium-226	0.960		0.182	0.207	1.00	0.0988	pCi/g	10/08/19 07:28	10/31/19 03:01	1
Radium-228	1.21		0.241	0.271		0.226	pCi/g	10/08/19 07:28	10/31/19 03:01	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05
Date Collected: 10/01/19 14:00
Date Received: 10/02/19 09:00

Lab Sample ID: 180-96595-6
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	1.75		0.296	0.323			pCi/g	10/08/19 07:28	10/31/19 02:47	1
Radium-226	0.650		0.156	0.170	1.00	0.135	pCi/g	10/08/19 07:28	10/31/19 02:47	1
Radium-228	1.10		0.252	0.275		0.156	pCi/g	10/08/19 07:28	10/31/19 02:47	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05
Date Collected: 10/01/19 14:35
Date Received: 10/02/19 09:00

Lab Sample ID: 180-96595-7
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.20		0.440	0.467			pCi/g	10/08/19 07:28	10/31/19 02:50	1
Radium-226	1.14		0.262	0.286	1.00	0.206	pCi/g	10/08/19 07:28	10/31/19 02:50	1
Radium-228	1.06		0.353	0.369		0.376	pCi/g	10/08/19 07:28	10/31/19 02:50	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05
Date Collected: 10/01/19 15:00
Date Received: 10/02/19 09:00

Lab Sample ID: 180-96595-8
Matrix: Solid

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	2.67		0.425	0.481			pCi/g	10/08/19 07:28	10/31/19 03:54	1
Radium-226	0.519		0.221	0.228	1.00	0.507	pCi/g	10/08/19 07:28	10/31/19 03:54	1
Radium-228	2.15		0.363	0.424		0.171	pCi/g	10/08/19 07:28	10/31/19 03:54	1

Client Sample Results

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: BRF-BS-FB02-20191001 ~ BRF BG05
Date Collected: 10/01/19 15:12
Date Received: 10/02/19 09:00

Lab Sample ID: 180-96595-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	18.7	U	30.9	31.1			pCi/L	10/04/19 16:06	10/31/19 07:40	1
Radium-226	**18.7**		18.9	19.0	50.0	17.6	pCi/L	10/04/19 16:06	10/31/19 07:40	1
Radium-228	-6.03	U	24.5	24.6	50.0	31.0	pCi/L	10/04/19 16:06	10/31/19 07:40	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-445202/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 448405 — **Prep Batch: 445202**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	7.792	U	29.9	29.9			pCi/L	10/04/19 16:05	10/31/19 02:21	1
Radium-226	-15.18	U	26.5	26.5	50.0	45.2	pCi/L	10/04/19 16:05	10/31/19 02:21	1
Radium-228	7.792	U	13.8	13.8	50.0	28.7	pCi/L	10/04/19 16:05	10/31/19 02:21	1

Lab Sample ID: LCS 160-445202/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 448405 — **Prep Batch: 445202**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	136000	132000		15200		298	pCi/L	97	90 - 111
Cesium-137	44200	42240		4230		112	pCi/L	96	90 - 111
Cobalt-60	27900	27150		2680		46.8	pCi/L	97	89 - 110

Lab Sample ID: 180-96597-A-1-B DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 448407 — **Prep Batch: 445202**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium 226 and 228 (positive only)	13.2	U	27.52	U	20.0			pCi/L	0.31	
Radium-226	-11.9	U	-17.88	U	14.5	50.0	36.3	pCi/L	0.18	1
Radium-228	13.2	U	27.52		13.8	50.0	23.1	pCi/L	0.45	1

Lab Sample ID: MB 160-445369/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 448217 — **Prep Batch: 445369**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228 (positive only)	0.1276	U	0.181	0.181			pCi/g	10/08/19 07:28	10/30/19 22:38	1
Radium-226	-0.08836	U	0.136	0.136	1.00	0.526	pCi/g	10/08/19 07:28	10/30/19 22:38	1
Radium-228	0.1276	U	0.120	0.120		0.173	pCi/g	10/08/19 07:28	10/30/19 22:38	1

Lab Sample ID: LCS 160-445369/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 448218 — **Prep Batch: 445369**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	96.6	104.4		11.0		1.23	pCi/g	108	87 - 116
Cesium-137	27.4	27.90		2.99		0.231	pCi/g	102	87 - 120
Cobalt-60	11.0	11.11		1.18		0.108	pCi/g	101	87 - 115

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 180-96595-5 DU
Matrix: Solid
Analysis Batch: 448408

Client Sample ID: BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05
Prep Type: Total/NA
Prep Batch: 445369

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium 226 and 228 (positive only)	2.17			2.095		0.398			pCi/g			0.10	
Radium-226	0.960			0.9240		0.240	1.00	0.166	pCi/g			0.08	1
Radium-228	1.21			1.171		0.318		0.159	pCi/g			0.07	1

QC Association Summary

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Rad

Prep Batch: 445202

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-96595-9	BRF-BS-FB02-20191001 ~ BRF BG05	Total/NA	Water	Fill_Geo-21	
MB 160-445202/1-A	Method Blank	Total/NA	Water	Fill_Geo-21	
LCS 160-445202/2-A	Lab Control Sample	Total/NA	Water	Fill_Geo-21	
180-96597-A-1-B DU	Duplicate	Total/NA	Water	Fill_Geo-21	

Leach Batch: 445214

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-96595-1	BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13	Total/NA	Solid	Dry and Grind	
180-96595-2	BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13	Total/NA	Solid	Dry and Grind	
180-96595-3	BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13	Total/NA	Solid	Dry and Grind	
180-96595-4	BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05	Total/NA	Solid	Dry and Grind	
180-96595-5	BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05	Total/NA	Solid	Dry and Grind	
180-96595-6	BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05	Total/NA	Solid	Dry and Grind	
180-96595-7	BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05	Total/NA	Solid	Dry and Grind	
180-96595-8	BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05	Total/NA	Solid	Dry and Grind	
180-96595-5 DU	BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05	Total/NA	Solid	Dry and Grind	

Prep Batch: 445369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-96595-1	BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13	Total/NA	Solid	Fill_Geo-21	445214
180-96595-2	BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13	Total/NA	Solid	Fill_Geo-21	445214
180-96595-3	BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13	Total/NA	Solid	Fill_Geo-21	445214
180-96595-4	BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05	Total/NA	Solid	Fill_Geo-21	445214
180-96595-5	BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05	Total/NA	Solid	Fill_Geo-21	445214
180-96595-6	BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05	Total/NA	Solid	Fill_Geo-21	445214
180-96595-7	BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05	Total/NA	Solid	Fill_Geo-21	445214
180-96595-8	BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05	Total/NA	Solid	Fill_Geo-21	445214
MB 160-445369/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-445369/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
180-96595-5 DU	BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05	Total/NA	Solid	Fill_Geo-21	445214

Lab Chronicle

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Client Sample ID: BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13 — Lab Sample ID: 180-96595-1

Date Collected: 10/01/19 08:40 — **Matrix: Solid**
Date Received: 10/02/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	445214	10/04/19 21:50	KPP	TAL SL
Total/NA	Prep	Fill_Geo-21			351.9 g	1.0 g	445369	10/08/19 07:28	KRS	TAL SL
Total/NA	Analysis	901.1		1			448447	10/31/19 02:12	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13 — Lab Sample ID: 180-96595-2

Date Collected: 10/01/19 09:00 — **Matrix: Solid**
Date Received: 10/02/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	445214	10/04/19 21:50	KPP	TAL SL
Total/NA	Prep	Fill_Geo-21			365 g	1.0 g	445369	10/08/19 07:28	KRS	TAL SL
Total/NA	Analysis	901.1		1			448408	10/31/19 02:25	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13 — Lab Sample ID: 180-96595-3

Date Collected: 10/01/19 09:15 — **Matrix: Solid**
Date Received: 10/02/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	445214	10/04/19 21:50	KPP	TAL SL
Total/NA	Prep	Fill_Geo-21			238.5 g	1.0 g	445369	10/08/19 07:28	KRS	TAL SL
Total/NA	Analysis	901.1		1			448409	10/31/19 02:24	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-4

Date Collected: 10/01/19 13:00 — **Matrix: Solid**
Date Received: 10/02/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	445214	10/04/19 21:50	KPP	TAL SL
Total/NA	Prep	Fill_Geo-21			216.1 g	1.0 g	445369	10/08/19 07:28	KRS	TAL SL
Total/NA	Analysis	901.1		1			448408	10/31/19 02:59	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-5

Date Collected: 10/01/19 13:35 — **Matrix: Solid**
Date Received: 10/02/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	445214	10/04/19 21:50	KPP	TAL SL
Total/NA	Prep	Fill_Geo-21			316.3 g	1.0 g	445369	10/08/19 07:28	KRS	TAL SL
Total/NA	Analysis	901.1		1			448409	10/31/19 03:01	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-6

Date Collected: 10/01/19 14:00 — **Matrix: Solid**
Date Received: 10/02/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	445214	10/04/19 21:50	KPP	TAL SL
Total/NA	Prep	Fill_Geo-21			327.2 g	1.0 g	445369	10/08/19 07:28	KRS	TAL SL
Total/NA	Analysis	901.1		1			448447	10/31/19 02:47	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-7

Date Collected: 10/01/19 14:35 — **Matrix: Solid**
Date Received: 10/02/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	445214	10/04/19 21:50	KPP	TAL SL
Total/NA	Prep	Fill_Geo-21			251.2 g	1.0 g	445369	10/08/19 07:28	KRS	TAL SL
Total/NA	Analysis	901.1		1			448446	10/31/19 02:50	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-8

Date Collected: 10/01/19 15:00 — **Matrix: Solid**
Date Received: 10/02/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	445214	10/04/19 21:50	KPP	TAL SL
Total/NA	Prep	Fill_Geo-21			241.4 g	1.0 g	445369	10/08/19 07:28	KRS	TAL SL
Total/NA	Analysis	901.1		1			448409	10/31/19 03:54	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Client Sample ID: BRF-BS-FB02-20191001 ~ BRF BG05 — Lab Sample ID: 180-96595-9

Date Collected: 10/01/19 15:12 — **Matrix: Water**
Date Received: 10/02/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Fill_Geo-21			1000 mL	1.0 g	445202	10/04/19 16:06	KRS	TAL SL
Total/NA	Analysis	901.1		1			448406	10/31/19 07:40	KLS	TAL SL
	Instrument ID:	GAMMAVISION								

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Analyst References:

Lab: TAL SL

Batch Type: Leach

KPP = Kaushal Patel

Batch Type: Prep

KRS = Kurt Slama

Batch Type: Analysis

KLS = Kody Saulters

Accreditation/Certification Summary

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Laboratory: Eurofins TestAmerica, Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-20
California	State	2891	04-30-20
Connecticut	State	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Georgia	State	PA 02-00416	04-30-20
Illinois	NELAP	004375	06-30-20
Kansas	NELAP	E-10350	03-31-20
Kentucky (UST)	State	162013	04-30-20
Kentucky (WW)	State	KY98043	12-31-19
Louisiana	NELAP	04041	06-30-20
Minnesota	NELAP	042-999-482	12-31-19
Nevada	State	PA00164	07-31-20
New Hampshire	NELAP	2030	04-04-20
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	04-01-20
North Carolina (WW/SW)	State	434	12-31-19
North Dakota	State	R-227	04-30-20
Oregon	NELAP	PA-2151	02-06-20
Pennsylvania	NELAP	02-00416	04-30-20
Rhode Island	State	LAO00362	12-30-19
South Carolina	State	89014	04-30-20
Texas	NELAP	T104704528	03-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-20
Virginia	NELAP	10043	09-15-20
West Virginia DEP	State	142	01-31-20
Wisconsin	State	998027800	08-31-20

Accreditation/Certification Summary

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-19
Iowa	State	373	09-17-20
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	11-03-19
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	10-31-19

Method Summary

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Method	Method Description	Protocol	Laboratory
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency
None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Environmental Standards Inc.
Project/Site: BRF_BS_20191001_1B

Job ID: 180-96595-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-96595-1	BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13	Solid	10/01/19 08:40	10/02/19 09:00	
180-96595-2	BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13	Solid	10/01/19 09:00	10/02/19 09:00	
180-96595-3	BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13	Solid	10/01/19 09:15	10/02/19 09:00	
180-96595-4	BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05	Solid	10/01/19 13:00	10/02/19 09:00	
180-96595-5	BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05	Solid	10/01/19 13:35	10/02/19 09:00	
180-96595-6	BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05	Solid	10/01/19 14:00	10/02/19 09:00	
180-96595-7	BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05	Solid	10/01/19 14:35	10/02/19 09:00	
180-96595-8	BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05	Solid	10/01/19 15:00	10/02/19 09:00	
180-96595-9	BRF-BS-FB02-20191001 ~ BRF BG05	Water	10/01/19 15:12	10/02/19 09:00	

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 180-96595-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
1L Marn LCS_00006	09/18/20	Eckert & Ziegler, Lot 83924-334			(Purchased Reagent)		Americium-241	305.85 dpm/g
							Cesium-137	120.21 dpm/g
							Cobalt-60	197.61 dpm/g
1L Marn_00002	03/02/16	Eckert & Ziegler, Lot 83924-334			(Purchased Reagent)		Americium-241	5097.5 pCi/L
							Ce-139	2399.2 pCi/L
							Cesium-137	2003.5 pCi/L
							Co-57	1564.3 pCi/L
							Cobalt-60	3293.9 pCi/L
							Mn-54	3083.6 pCi/L
							Sn-113	4248.4 pCi/L
							Y-88	6929.6 pCi/L
1L Marn_00003	02/09/17	Eckert & Ziegler, Lot 90062			(Purchased Reagent)		Americium-241	5072.4 Bq
							Cd-109	72078 Bq
							Ce-139	2418 Bq
							Cesium-137	2056.4 Bq
							Co-57	1593.5 Bq
							Cobalt-60	3233.8 Bq
							Hg-203	5155.9 Bq
							Mn-54	3114.6 Bq
							Sn-113	4253.1 Bq
							Y-88	7000 Bq
Source A_00001	04/01/59	02/23/11	water, Lot 79670-334	0.9986 Source	Gamma Ampuole_00001	0.9986 g	Americium-241	9.4429 Bq
							Cd-109	132.909 Bq
							Ce-139	4.4538 Bq
							Cesium-137	3.7296 Bq
							Co-57	2.9513 Bq
							Cobalt-60	6.2002 Bq
							Hg-203	9.6996 Bq
							Sn-113	7.6266 Bq
							Y-88	12.712 Bq
.Gamma Ampuole_00001	04/07/59	Analytics, Lot 79670-334			(Purchased Reagent)		Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source D_00001	04/01/59	02/23/11	water, Lot 79670-334	0.9781 g	Gamma Ampuole_00001	0.9781 g	Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 180-96595-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
.Gamma Ampuole_00001	04/07/59		Analytics, Lot 79670-334		(Purchased Reagent)		Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source E_00001	04/01/59	02/23/11	water, Lot 79670-334	1.0205 g	Gamma Ampuole_00001	1.0205 g	Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
.Gamma Ampuole_00001	04/07/59		Analytics, Lot 79670-334		(Purchased Reagent)		Americium-241	9442.9 Bq
							Cd-109	132909 Bq
							Ce-139	4453.8 Bq
							Cesium-137	3729.6 Bq
							Co-57	2951.3 Bq
							Cobalt-60	6200.2 Bq
							Hg-203	9699.6 Bq
							Sn-113	7626.6 Bq
							Y-88	12712 Bq
Source G_00001	01/01/61	01/01/11	water, Lot 83725-334	10 mL	Gamma Ampuole_00003	1.8639 g	Americium-241	1693.09 Bq
							Cd-109	24592.1 Bq
							Ce-139	816.481 Bq
							Cesium-137	681.815 Bq
							Co-57	532.386 Bq
							Cobalt-60	1120.87 Bq
							Hg-203	1766.08 Bq
							Sn-113	1445.98 Bq
							Y-88	2359.21 Bq
.Gamma Ampuole_00003	01/19/61		Analytics, Lot 83725-334		(Purchased Reagent)		Americium-241	9083.6 Bq
							Cd-109	131939 Bq
							Ce-139	4380.5 Bq
							Cesium-137	3658 Bq
							Co-57	2856.3 Bq
							Cobalt-60	6013.6 Bq
							Hg-203	9475.2 Bq
							Sn-113	7757.8 Bq

REAGENT TRACEABILITY SUMMARY

Lab Name: Eurofins TestAmerica, St. Louis Job No.: 180-96595-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Y-88	12657.4 Bq
Source H_00002	01/01/51	01/01/12	wataer, Lot 83725-334	10 mL	Gamma Ampuole_00003	2.1184 g	Americium-241	1924.27 Bq
							Cd-109	27950 Bq
							Ce-139	927.965 Bq
							Cesium-137	774.911 Bq
							Co-57	605.079 Bq
							Cobalt-60	1273.92 Bq
							Hg-203	2007.23 Bq
							Sn-113	1643.41 Bq
							Y-88	2681.34 Bq
.Gamma Ampuole_00003	01/19/61	Analytics, Lot 83725-334			(Purchased Reagent)		Americium-241	9083.6 Bq
							Cd-109	131939 Bq
							Ce-139	4380.5 Bq
							Cesium-137	3658 Bq
							Co-57	2856.3 Bq
							Cobalt-60	6013.6 Bq
							Hg-203	9475.2 Bq
							Sn-113	7757.8 Bq
							Y-88	12657.4 Bq
Tuna Can LCS_00009	09/13/20	Analytics, Lot 74139-334			(Purchased Reagent)		Americium-241	219 dpm/g
							Cesium-137	82.3 dpm/g
							Cobalt-60	136 dpm/g
Tuna Can_00003	02/09/17	Eckert & Ziegler, Lot 90099			(Purchased Reagent)		Americium-241	1164 Bq
							Cd-109	16373 Bq
							Ce-139	549 Bq
							Cesium-137	467 Bq
							Co-57	362 Bq
							Cobalt-60	735 Bq
							Hg-203	1171 Bq
							Pb-210	14936 Bq
							Sn-113	967 Bq
							Y-88	1590 Bq
Tuna Can_00006	03/01/16	Eckert & Ziegler, Lot 83814-334			(Purchased Reagent)		Americium-241	1195 Bq
							Cd-109	16353 Bq
							Ce-139	543 Bq
							Cesium-137	453 Bq
							Co-57	354 Bq
							Cobalt-60	745 Bq
							Hg-203	1175 Bq
							Pb-210	14606 Bq
							Sn-113	961 Bq
							Y-88	1568 Bq

Reagent

1L Marn_00002

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

83924-334

1.0 Liter Solid in 130G GA-MA Beaker

Customer: Test America St. Louis
P.O. No.: 2401509, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.015372

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101. Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.830E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	2.609E+03	0.8	2.3	4.9	HPGe
Co-57	122.1	2.718E+02	8.711E+04	1.339E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	1.917E+03	0.5	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	4.232E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	2.719E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	1.705E+03	0.7	1.9	4.0	HPGe
Mn-54	834.9	3.121E+02	———	3.083E+03	0.1	1.7	3.3	IC
Y-88	898.0	1.066E+02	4.224E+05	6.493E+03	0.5	1.9	3.9	HPGe
Zn-65	1115.6	2.441E+02	———	3.181E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.142E+05	3.293E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	3.294E+03	0.6	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	6.874E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1960

6675
ID: 1L Marn_00002
Exp 03/02/18 Prpd: JW Open 03/02/11
Mixed Gamma 1L Marn 2011

91608
ID: 1L Marn_00004
Exp:02/15/14 Prpd:JW Opn:03/
Mixed Gamma 1L Marn

ANA Form005 Rev. —

MGS Certificate, Rev 2 09-28-2009

Page 1 of 2

This standard will expire one year after the reference date.

Source Prepared by: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 2/23/11
J. D. McCorvey, QA Manager Alternate

Reagent

1L Marn_00003

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

90062

1.0 Liter Solid in 130G GA-MA Beaker

Customer: TestAmerica St. Louis
P.O. No.: 2455298, Item 1
Reference Date: 01-Jan-2012 12:00 PM EST **Grams of Master Source:** 0.015513

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Am-241	59.5	1.580E+05	———	1.821E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.677E+05	2.602E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.795E+04	1.364E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.245E+05	1.932E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.707E+05	4.200E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.755E+05	2.722E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.128E+05	1.750E+03	0.7	1.9	4.0	HPGe
Mn-54	834.9	3.121E+02	———	3.114E+03	0.1	1.7	3.3	IC
Y-88	898.0	1.066E+02	4.228E+05	6.559E+03	0.5	1.9	3.9	HPGe
Zn-65	1115.6	2.441E+02	———	3.134E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.084E+05	3.233E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	3.233E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.476E+05	6.944E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

This standard will expire one year after the reference date.

Source Prepared by: M. Williford
M. Williford, Radiochemist

QA Approved: J. McCorvey
J.D. McCorvey, Counting Room Manager

Date: 26 Jan 12

Reagent

Gamma Ampuole_00001

Eckert & Ziegler
Analytics

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CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Gamma Ampuole_00003

Eckert & Ziegler
Analytics

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Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

83725-334
5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis/Earth City, MO
P.O. No.: 2397508, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.028066

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	3.261E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	4.763E+03	0.8	1.7	3.8	HPGe
Co-57	122.1	2.718E+02	8.711E+04	2.445E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	3.500E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	7.727E+03	0.4	1.1	2.3	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	4.965E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	3.113E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	1.066E+02	4.224E+05	1.186E+04	0.5	1.1	2.4	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	6.012E+03	0.6	1.1	2.5	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	6.015E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	1.255E+04	0.5	1.1	2.4	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Comments:
5.30203 grams 4M HCl solution with approximately 30 μg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the reference date.

Source Prepared by: MITaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 13/JAN/11
J. D. McCorvey, QA Manager Alternate

Reagent

Source A_00001

Eckert & Ziegler
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www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source D_00001

Eckert & Ziegler
Analytics

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Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source E_00001

Eckert & Ziegler
Analytics

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Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Reagent

Source G_00001

Eckert & Ziegler
Analytics

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Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

79670-334

5 mL Liquid in Flame Sealed Vial

Customer: TestAmerica St. Louis
P.O. No.: 2303925, Item 1
Calibration Date: 01-Apr-2009 12:00 EST **Grams of Master Source:** 0.028371

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	157860	———	3.390E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	462.60	1.691E+05	4.798E+03	0.4	1.7	3.5	HPGe
Co-57	122.1	271.79	8.904E+04	2.526E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	137.6	1.256E+05	3.563E+03	0.4	1.1	2.3	HPGe
Hg-203	279.2	46.61	2.788E+05	7.910E+03	0.3	1.1	2.3	HPGe
Sn-113	391.7	115.1	1.725E+05	4.894E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	10983	1.120E+05	3.178E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.205E+05	1.193E+04	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.184E+05	6.196E+03	0.7	1.1	2.6	HPGe
Co-60	1332.5	1925.4	2.185E+05	6.199E+03	0.7	1.1	2.6	HPGe
Y-88	1836.1	106.6	4.444E+05	1.261E+04	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
5.31740 grams 4M HCl solution with approximately 30 microg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the calibration date.

Source Prepared by: [signature] for
W. Mao, Radiochemist

QA Approved: [signature] Date: 5-13-09
D. M. Montgomery, QA Manager

End of Certificate

Corporate Office
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Eckert & Ziegler
Analytics

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Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

83725-334
5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis/Earth City, MO
P.O. No.: 2397508, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.028066

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	3.261E+03	0.1	0.9	1.8	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	4.763E+03	0.8	1.7	3.8	HPGe
Co-57	122.1	2.718E+02	8.711E+04	2.445E+03	0.5	1.3	2.8	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	3.500E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	7.727E+03	0.4	1.1	2.3	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	4.965E+03	0.5	1.1	2.4	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	3.113E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	1.066E+02	4.224E+05	1.186E+04	0.5	1.1	2.4	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	6.012E+03	0.6	1.1	2.5	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	6.015E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	1.255E+04	0.5	1.1	2.4	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Comments:
5.30203 grams 4M HCl solution with approximately 30 μg/g each of Cd, Co, Ce, Hg, Sn, Cs, and Y carriers.

This standard will expire one year after the reference date.

Source Prepared by: MITaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 13/JAN/11
J. D. McCorvey, QA Manager Alternate

Reagent

Source H_00002

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

83725-334
5 mL Liquid in Flame Sealed Vial

Customer: Test America St. Louis/Earth City, MO
P.O. No.: 2397508, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.028066

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

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Source Prepared by: MITaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: _____ Date: 13/JAN/11
J. D. McCorvey, QA Manager Alternate

Reagent

Tuna Can LCS_00009

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

St. Louis Radiological Standard Verification

Printed: 9/17/2019 12:40 PM

Standard ID Number: 1798543
True Value = 27.51 pCi/L or g
Date Analyzed: 9/13/2019

Radionuclide: Cs-137

	Replicates	
#1	28.54	pCi/L or g
#2	26.76	pCi/L or g
#3	26.73	pCi/L or g

Tuna can LCS-00009

Mean = 27.343333

1 sigma = 1.0364523

1.96 sigma = 2.031446

True Value minus 5% = 26.1345 (True Value - 5%)
True Value plus 5% = 28.8855 (True Value + 5%)

Accuracy:
Mean value within 5% of Certified (True) Value? Yes **(Acceptance Criteria)**

Precision:
1.96 sigma Value Within 10% of Mean Value? Yes **(Acceptance Criteria)**

Standard Reverification Acceptable? Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: cmm 9/17/19

2nd Reviewed By/Date: CJP 9/17/19

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

St. Louis Radiological Standard Verification

Printed: 9/17/2019 12:43 PM

Standard ID Number: 1798543
True Value = 11.16 pCi/L or g
Date Analyzed: 9/13/2019

Radionuclide: Co-60

	Replicates	
#1	11	pCi/L or g
#2	10.57	pCi/L or g
#3	10.6	pCi/L or g

Mean = 10.723333

1 sigma = 0.2400694

1.96 sigma = 0.470536

True Value minus 5% = 10.602 (True Value - 5%)
True Value plus 5% = 11.718 (True Value + 5%)

Accuracy:
Mean value within 5% of Certified (True) Value? Yes **(Acceptance Criteria)**

Precision:
1.96 sigma Value Within 10% of Mean Value? Yes **(Acceptance Criteria)**

Standard Reverification Acceptable? Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: umm 9/17/19

2nd Reviewed By/Date: [illegible] 9/17/19

St. Louis Radiological Standard Verification

Standard ID Number: 1798543
True Value = 96.62 pCi/L or g
Date Analyzed: 9/13/2019

Radionuclide: Am-241

	Replicates	
#1	101.7	pCi/L or g
#2	96.41	pCi/L or g
#3	95.48	pCi/L or g

Mean = 97.863333

1 sigma = 3.355031

1.96 sigma = 6.575861

True Value minus 5% = 91.789 (True Value - 5%)
True Value plus 5% = 101.451 (True Value + 5%)

Accuracy:
Mean value within 5% of Certified (True) Value? Yes **(Acceptance Criteria)**

Precision:
1.96 sigma Value Within 10% of Mean Value? Yes **(Acceptance Criteria)**

Standard Reverification Acceptable? Yes

Note: Criteria for reverification of radiological standards is taken from the DoD/DOE Consolidated QSM and LANL Statements of Work

1st Reviewed By/Date: Cmm 9/17/19

2nd Reviewed By/Date: CJP 9/17/19

eurofins Environment Testing TestAmerica

Analysis Report for Gamma Spectroscopy

Batch: 442821 **Operator:**

MQO

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-442821~2-	LCS	341.90g	1.00	GammaVision	GV05	9 / 13 / 19 11:44	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	4.065E-001pCi/g	3.032E-001	3.025E-001	1.192E+000	5.689E-001	0.34	0.3032
AG-108M	10982	1.185E-001pCi/g	7.877E-002	7.853E-002	3.100E-001	1.503E-001	0.38	0.0788
AG-110M	10973	2.000E-001pCi/g	9.003E-002	8.945E-002	5.914E-001	2.852E-001	0.34	0.0900
AM-241	10818	1.017E+002pCi/g	5.329E+000	7.416E-001	8.130E-001	4.000E-001	125.08	5.3292
BA-133	10469	1.514E-001pCi/g	1.488E-001	1.485E-001	4.938E-001	2.411E-001	0.31	0.1488
BA-140	10463	2.083E-001pCi/g	2.262E-001	2.259E-001	9.621E-001	4.604E-001	0.22	0.2262
BE-7	10435	1.114E+000pCi/g	1.027E+000	1.025E+000	3.407E+000	1.660E+000	0.33	1.0267
BI-207	10195	-2.863E-001pCi/g	2.010E-001	2.004E-001	5.293E-001	2.527E-001	-0.54	0.2010
BI-210M	10173	-1.581E-001pCi/g	2.131E-001	2.129E-001	4.979E-001	2.433E-001	-0.32	0.2131
BI-212	10160	9.310E-001pCi/g	1.149E+000	1.148E+000	3.868E+000	1.848E+000	0.24	1.1488
BI-214	10154	2.326E-001pCi/g	2.064E-001	2.060E-001	1.071E+000	5.232E-001	0.22	0.2064
CD-109	9254	1.444E+000pCi/g	2.033E+000	2.031E+000	6.744E+000	3.327E+000	0.21	2.0327
CD-113M	17462	8.913E+002pCi/g	1.147E+003	1.145E+003	3.822E+003	1.865E+003	0.23	1,146.6992
CE-139	9241	4.620E-002pCi/g	7.074E-002	7.060E-002	2.355E-001	1.154E-001	0.20	0.0707
CE-141	9235	-8.939E-002pCi/g	1.306E-001	1.305E-001	4.344E-001	2.135E-001	-0.21	0.1306
CE-144	9221	-3.028E-002pCi/g	5.116E-001	5.116E-001	1.716E+000	8.424E-001	-0.02	0.5116
CF-249	9215	9.341E-002pCi/g	1.575E-001	1.574E-001	5.640E-001	2.762E-001	0.17	0.1575
CF-251	13690	2.026E-002pCi/g	3.341E-001	3.341E-001	8.977E-001	4.371E-001	0.02	0.3341
CO-56	8704	-5.180E-002pCi/g	6.396E-002	6.391E-002	3.155E-001	1.504E-001	-0.16	0.0640
CO-57	13694	5.022E-002pCi/g	6.294E-002	6.288E-002	2.192E-001	1.077E-001	0.23	0.0629
CO-58	8698	1.213E-001pCi/g	1.166E-001	1.164E-001	3.887E-001	1.872E-001	0.31	0.1166
CO-60	8692	1.100E+001pCi/g	5.892E-001	2.058E-001	5.871E-002	1.856E-002	187.32	0.5892
CR-51	8604	8.324E-001pCi/g	8.498E-001	8.486E-001	2.823E+000	1.378E+000	0.29	0.8498
CS-134	8553	1.015E-001pCi/g	1.246E-001	1.244E-001	4.184E-001	2.010E-001	0.24	0.1246
CS-136	8546	-1.530E-001pCi/g	1.378E-001	1.376E-001	4.578E-001	2.217E-001	-0.33	0.1378
CS-137	8539	2.854E+001pCi/g	1.538E+000	4.012E-001	2.446E-001	1.153E-001	116.69	1.5381
EU-152	7145	3.020E-001pCi/g	2.418E-001	2.413E-001	6.436E-001	3.160E-001	0.47	0.2418
EU-154	7138	2.290E-001pCi/g	2.544E-001	2.542E-001	4.328E-001	2.123E-001	0.53	0.2544
EU-155	7131	-2.454E-001pCi/g	3.675E-001	3.673E-001	1.219E+000	6.019E-001	-0.20	0.3675
FE-59	7073	-3.237E-001pCi/g	3.238E-001	3.234E-001	7.052E-001	3.364E-001	-0.46	0.3238
GA-68	18005	-9.487E-001pCi/g	6.188E+000	6.188E+000	1.372E+001	6.538E+000	-0.07	6.1878
GD-153	6824	1.957E-001pCi/g	1.591E-001	1.586E-001	6.377E-001	3.133E-001	0.31	0.1591
HF-181	6495	-1.709E-001pCi/g	1.588E-001	1.585E-001	5.263E-001	2.574E-001	-0.32	0.1588
HG-203	6466	4.060E-002pCi/g	9.570E-002	9.567E-002	2.441E-001	1.184E-001	0.17	0.0957
I-131	6380	1.133E-001pCi/g	1.081E-001	1.079E-001	2.735E-001	1.323E-001	0.41	0.1081
IR-192	6303	-1.012E-001pCi/g	1.012E-001	1.010E-001	3.357E-001	1.641E-001	-0.30	0.1012
K-40	6148	8.569E-001pCi/g	3.415E-001	3.387E-001	9.090E-001	3.452E-001	0.94	0.3415
KR-85	6111	9.028E+000pCi/g	2.406E+001	2.405E+001	8.100E+001	3.937E+001	0.11	24.0589
LA-140	6096	7.687E-002pCi/g	2.802E-002	2.772E-002	7.164E-002	2.265E-002	1.07	0.0280
MN-54	5382	1.261E-001pCi/g	1.134E-001	1.132E-001	2.567E-001	1.210E-001	0.49	0.1134
NA-22	5201	-5.117E-003pCi/g	3.600E-002	3.600E-002	1.376E-001	5.841E-002	-0.04	0.0360
NB-94	5160	1.661E-002pCi/g	9.748E-002	9.747E-002	2.349E-001	1.110E-001	0.07	0.0975
NB-95	5154	1.187E-001pCi/g	9.088E-002	9.067E-002	3.014E-001	1.439E-001	0.39	0.0909
ND-147	5083	3.185E-001pCi/g	3.051E-001	3.045E-001	1.867E+000	8.952E-001	0.17	0.3051
NP-237	4757	-4.197E-001pCi/g	6.528E-001	6.524E-001	2.166E+000	1.070E+000	-0.19	0.6528
NP-239	4751	2.244E-001pCi/g	3.296E-001	3.293E-001	1.094E+000	5.396E-001	0.21	0.3296
PA-231	4541	1.010E+000pCi/g	4.359E+000	4.359E+000	1.455E+001	7.166E+000	0.07	4.3590
PA-233	4535	2.171E-001pCi/g	3.533E-001	3.532E-001	1.175E+000	5.785E-001	0.18	0.3533
PA-234	4528	2.721E-001pCi/g	3.471E-001	3.468E-001	1.153E+000	5.669E-001	0.24	0.3471

MQO

PA-234M	19453	-2.323E+001pCi/g	1.952E+001	1.948E+001	6.495E+001	3.146E+001	-0.36	19.5162
PB-210	4467	7.535E+002pCi/g	4.494E+001	7.890E+000	1.440E+001	7.124E+000	52.31	44.9442
PB-212	4454	5.468E-001pCi/g	1.146E-001	1.090E-001	3.328E-001	1.605E-001	1.64	0.1146
PB-214	4448	4.716E-001pCi/g	1.908E-001	1.892E-001	8.029E-001	3.920E-001	0.59	0.1908
PM-144	19585	1.555E-002pCi/g	9.547E-002	9.547E-002	2.297E-001	1.085E-001	0.07	0.0955
PM-146	2464	5.132E-002pCi/g	8.496E-002	8.492E-002	4.790E-001	2.327E-001	0.11	0.0850
RH-106	1882	6.982E-001pCi/g	1.483E+000	1.482E+000	4.967E+000	2.426E+000	0.14	1.4829
RU-103	1828	-3.450E-002pCi/g	1.159E-001	1.159E-001	2.848E-001	1.372E-001	-0.12	0.1159
SB-124	1784	1.827E-001pCi/g	1.472E-001	1.469E-001	4.788E-001	2.337E-001	0.38	0.1472
SB-125	1777	2.430E-001pCi/g	3.275E-001	3.273E-001	9.103E-001	4.411E-001	0.27	0.3275
SC-46	1739	-1.702E-001pCi/g	1.569E-001	1.567E-001	5.215E-001	2.531E-001	-0.33	0.1569
SN-113	1570	1.532E-001pCi/g	1.719E-001	1.717E-001	5.714E-001	2.796E-001	0.27	0.1719
SN-126	17459	7.612E-001pCi/g	7.746E-001	7.736E-001	2.567E+000	1.261E+000	0.30	0.7746
TA-182	1301	7.726E-002pCi/g	1.583E-001	1.582E-001	9.973E-001	4.719E-001	0.08	0.1583
TC-99M	17412	5.631E-002pCi/g	7.110E-002	7.103E-002	2.361E-001	1.161E-001	0.24	0.0711
TH-227	1058	4.902E-001pCi/g	6.613E-001	6.606E-001	2.739E+000	1.330E+000	0.18	0.6613
TH-229	1046	5.186E-001pCi/g	1.499E+000	1.498E+000	4.004E+000	1.953E+000	0.13	1.4985
TH-234	1027	4.812E-001pCi/g	1.366E+000	1.366E+000	4.548E+000	2.244E+000	0.11	1.3664
TL-208	929	1.257E-001pCi/g	1.203E-001	1.201E-001	2.658E-001	1.265E-001	0.47	0.1203
TL-210	20861	4.217E-002pCi/g	6.801E-002	6.796E-002	3.680E-001	1.769E-001	0.11	0.0680
U-235	281	5.621E-001pCi/g	5.410E-001	5.402E-001	1.918E+000	9.431E-001	0.29	0.5410
Y-88	74	3.754E-002pCi/g	6.236E-002	6.233E-002	1.503E-001	6.088E-002	0.25	0.0624
ZN-65	31	9.256E-003pCi/g	2.828E-001	2.828E-001	9.678E-001	4.655E-001	0.01	0.2828
ZR-95	7	-1.121E-001pCi/g	1.959E-001	1.958E-001	4.656E-001	2.205E-001	-0.24	0.1959

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	ZFactor
LCS 160-442821~2-A	LCS 160-442821~2-A	CS-137	2.854E-001 pCi/g	2.751E+001	103.76%	0.6435
		CO-60	1.100E+001 pCi/g	1.116E+001	98.53%	-0.2636
		AM-241	1.017E+002 pCi/g	9.662E+001	105.24%	0.9035

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal	ZFactor	
MB 160-442821~1-A	MB	AC-228	4.342E-002	4.965E-002	0.8746	
MB 160-442821~1-A	MB	AG-108M	1.098E-003	9.817E-004	1.1182	
MB 160-442821~1-A	MB	AG-110M	2.340E-002	1.797E-002	1.3022	
MB 160-442821~1-A	MB	AM-241	-5.731E-002	8.274E-002	-0.6926	
MB 160-442821~1-A	MB	BA-133	2.852E-002	3.243E-002	0.8794	
MB 160-442821~1-A	MB	BA-140	5.953E-002	6.662E-002	0.8937	
MB 160-442821~1-A	MB	BE-7	-2.994E-001	3.208E-001	-0.9335	
MB 160-442821~1-A	MB	BI-207	-1.018E-002	4.105E-002	-0.2481	
MB 160-442821~1-A	MB	BI-210M	-9.908E-003	3.572E-002	-0.2774	
MB 160-442821~1-A	MB	BI-212	1.756E-001	3.078E-001	0.5704	
MB 160-442821~1-A	MB	BI-214	1.393E-001	5.312E-002	2.6221	B
MB 160-442821~1-A	MB	CD-109	0.000E+000	1.699E-001	0.0000	
MB 160-442821~1-A	MB	CD-113M	2.503E+002	2.082E+002	1.2023	
MB 160-442821~1-A	MB	CE-139	-2.124E-002	2.417E-002	-0.8787	
MB 160-442821~1-A	MB	CE-141	-2.884E-002	3.258E-002	-0.8852	
MB 160-442821~1-A	MB	CE-144	1.170E-001	2.066E-001	0.5664	
MB 160-442821~1-A	MB	CF-249	1.170E-002	1.645E-002	0.7112	
MB 160-442821~1-A	MB	CF-251	1.837E-002	8.164E-002	0.2250	
MB 160-442821~1-A	MB	CO-56	-4.823E-002	4.988E-002	-0.9671	
MB 160-442821~1-A	MB	CO-57	5.510E-003	2.192E-002	0.2514	
MB 160-442821~1-A	MB	CO-58	4.697E-003	2.933E-002	0.1601	
MB 160-442821~1-A	MB	CO-60	1.531E-002	6.888E-003	2.2223	
MB 160-442821~1-A	MB	CR-51	-3.047E-001	5.786E-001	-0.5267	
MB 160-442821~1-A	MB	CS-134	3.841E-002	1.494E-002	2.5710	
MB 160-442821~1-A	MB	CS-136	1.257E-002	3.856E-003	3.2593	B
MB 160-442821~1-A	MB	CS-137	2.393E-002	2.558E-002	0.9358	
MB 160-442821~1-A	MB	EU-152	6.044E-002	2.721E-002	2.2212	
MB 160-442821~1-A	MB	EU-154	7.072E-002	5.279E-002	1.3396	
MB 160-442821~1-A	MB	EU-155	2.661E-002	4.693E-002	0.5670	
MB 160-442821~1-A	MB	FE-59	2.751E-002	5.674E-002	0.4849	
MB 160-442821~1-A	MB	GA-68	-6.817E-002	1.080E+000	-0.0631	
MB 160-442821~1-A	MB	GD-153	-4.201E-002	6.752E-002	-0.6221	
MB 160-442821~1-A	MB	HF-181	5.102E-003	8.664E-003	0.5889	
MB 160-442821~1-A	MB	HG-203	-1.206E-002	2.101E-002	-0.5742	
MB 160-442821~1-A	MB	I-131	3.155E-003	2.491E-002	0.1267	
MB 160-442821~1-A	MB	IR-192	3.111E-002	6.103E-002	0.5098	
MB 160-442821~1-A	MB	K-40	-5.436E-001	7.228E-001	-0.7520	
MB 160-442821~1-A	MB	KR-85	-4.929E+000	1.024E+001	-0.4813	
MB 160-442821~1-A	MB	LA-140	1.338E-002	1.479E-002	0.9047	
MB 160-442821~1-A	MB	MN-54	-1.909E-002	3.907E-002	-0.4885	
MB 160-442821~1-A	MB	NA-22	1.521E-002	2.411E-002	0.6309	
MB 160-442821~1-A	MB	NB-94	5.593E-002	1.577E-002	3.5459	B
MB 160-442821~1-A	MB	NB-95	7.234E-003	2.219E-002	0.3260	
MB 160-442821~1-A	MB	ND-147	-1.671E-001	2.340E-001	-0.7140	
MB 160-442821~1-A	MB	NP-237	1.084E-001	1.795E-001	0.6038	
MB 160-442821~1-A	MB	NP-239	4.730E-002	7.053E-002	0.6706	
MB 160-442821~1-A	MB	PA-231	-9.465E-001	1.811E+000	-0.5226	
MB 160-442821~1-A	MB	PA-233	0.000E+000	2.543E-002	0.0000	
MB 160-442821~1-A	MB	PA-234	1.397E-001	4.096E-002	3.4108	B
MB 160-442821~1-A	MB	PA-234M	0.000E+000	1.839E+000	0.0000	
MB 160-442821~1-A	MB	PB-210	-1.447E+000	8.300E-001	-1.7435	

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MB 160-442821~1-A	MB	PB-212		-4.364E-002	5.625E-002	-0.7757
MB 160-442821~1-A	MB	PB-214		-1.562E-002	5.292E-002	-0.2952
MB 160-442821~1-A	MB	PM-144		-4.228E-003	3.382E-002	-0.1250
MB 160-442821~1-A	MB	PM-146		1.686E-002	2.497E-002	0.6753
MB 160-442821~1-A	MB	RH-106		-3.312E-001	5.169E-001	-0.6409
MB 160-442821~1-A	MB	RU-103		-2.513E-002	3.575E-002	-0.7031
MB 160-442821~1-A	MB	SB-124		5.135E-002	2.113E-002	2.4307
MB 160-442821~1-A	MB	SB-125		5.517E-002	4.524E-002	1.2193
MB 160-442821~1-A	MB	SC-46		0.000E+000	7.064E-003	0.0000
MB 160-442821~1-A	MB	SN-113		3.065E-002	3.577E-002	0.8568
MB 160-442821~1-A	MB	SN-126		1.684E-001	2.381E-001	0.7074
MB 160-442821~1-A	MB	TA-182		-1.911E-001	1.577E-001	-1.2114
MB 160-442821~1-A	MB	TC-99M		1.568E-009	2.393E-002	0.0000
MB 160-442821~1-A	MB	TH-227		1.868E-001	1.347E-001	1.3870
MB 160-442821~1-A	MB	TH-229		8.086E-001	3.483E-001	2.3215
MB 160-442821~1-A	MB	TH-234		2.642E-001	3.173E-001	0.8327
MB 160-442821~1-A	MB	TL-208		1.480E-002	1.817E-002	0.8144
MB 160-442821~1-A	MB	TL-210		3.150E-002	2.108E-002	1.4946
MB 160-442821~1-A	MB	U-235		-2.885E-002	2.377E-002	-1.2138
MB 160-442821~1-A	MB	Y-88		-3.249E-002	6.078E-002	-0.5346
MB 160-442821~1-A	MB	ZN-65		0.000E+000	1.165E-002	0.0000
MB 160-442821~1-A	MB	ZR-95		3.349E-002	2.726E-002	1.2286

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Analysis Report for Gamma Spectroscopy

Batch: 442120 **Operator:**

MQO

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-442120~2-	LCS	341.90g	1.00	GammaVision	GV09	9 / 14 / 19 8:40	60

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	7.971E-001pCi/g	1.503E-001	1.447E-001	4.116E-001	1.986E-001	1.94	0.1503
AG-108M	10982	3.273E-002pCi/g	4.460E-002	4.457E-002	1.527E-001	7.503E-002	0.21	0.0446
AG-110M	10973	5.611E-002pCi/g	3.263E-002	3.250E-002	2.862E-001	1.403E-001	0.20	0.0326
AM-241	10818	9.641E+001pCi/g	5.030E+000	5.156E-001	7.152E-001	3.553E-001	134.81	5.0300
BA-133	10469	2.162E-002pCi/g	7.888E-002	7.887E-002	2.627E-001	1.297E-001	0.08	0.0789
BA-140	10463	-1.914E-001pCi/g	1.490E-001	1.486E-001	4.960E-001	2.422E-001	-0.39	0.1490
BE-7	10435	-7.246E-001pCi/g	6.106E-001	6.094E-001	2.407E+000	1.191E+000	-0.30	0.6106
BI-207	10195	5.167E-002pCi/g	2.099E-002	2.083E-002	2.146E-001	1.041E-001	0.24	0.0210
BI-210M	10173	-6.957E-002pCi/g	5.753E-002	5.738E-002	2.573E-001	1.269E-001	-0.27	0.0575
BI-212	10160	-5.523E-002pCi/g	5.526E-001	5.526E-001	1.865E+000	9.090E-001	-0.03	0.5526
BI-214	10154	3.852E-001pCi/g	9.766E-002	9.559E-002	1.944E-001	9.385E-002	1.98	0.0977
CD-109	9254	-1.750E-007pCi/g	1.700E+000	1.700E+000	5.634E+000	2.802E+000	0.00	1.7005
CD-113M	17462	-3.881E+002pCi/g	6.515E+002	6.511E+002	2.163E+003	1.067E+003	-0.18	651.5354
CE-139	9241	3.894E-002pCi/g	2.479E-002	2.452E-002	8.082E-002	3.962E-002	0.48	0.0248
CE-141	9235	-1.547E-002pCi/g	6.406E-002	6.405E-002	1.753E-001	8.643E-002	-0.09	0.0641
CE-144	9221	-3.154E-001pCi/g	4.499E-001	4.496E-001	1.487E+000	7.386E-001	-0.21	0.4499
CF-249	9215	1.781E-001pCi/g	7.734E-002	7.680E-002	1.477E-001	7.216E-002	1.21	0.0773
CF-251	13690	4.070E-002pCi/g	1.991E-001	1.991E-001	5.029E-001	2.476E-001	0.08	0.1991
CO-56	8704	4.653E-002pCi/g	2.373E-002	2.361E-002	1.308E-001	6.340E-002	0.36	0.0237
CO-57	13694	-7.288E-003pCi/g	3.710E-002	3.710E-002	1.234E-001	6.105E-002	-0.06	0.0371
CO-58	8698	-1.897E-003pCi/g	4.758E-002	4.758E-002	1.605E-001	7.834E-002	-0.01	0.0476
CO-60	8692	1.057E+001pCi/g	5.418E-001	1.102E-001	6.740E-002	3.087E-002	156.79	0.5418
CR-51	8604	-4.284E-001pCi/g	4.158E-001	4.152E-001	1.418E+000	6.993E-001	-0.30	0.4158
CS-134	8553	1.120E-001pCi/g	6.138E-002	6.111E-002	1.766E-001	8.610E-002	0.63	0.0614
CS-136	8546	5.864E-002pCi/g	5.392E-002	5.381E-002	1.583E-001	7.721E-002	0.37	0.0539
CS-137	8539	2.676E+001pCi/g	1.407E+000	2.042E-001	1.233E-001	5.972E-002	217.05	1.4070
EU-152	7145	2.923E-003pCi/g	2.591E-003	2.586E-003	3.641E-001	1.801E-001	0.01	0.0026
EU-154	7138	1.735E-001pCi/g	1.133E-001	1.130E-001	2.371E-001	1.172E-001	0.73	0.1133
EU-155	7131	-1.792E-001pCi/g	9.195E-002	9.143E-002	8.405E-001	4.176E-001	-0.21	0.0920
FE-59	7073	8.888E-002pCi/g	1.334E-001	1.333E-001	2.797E-001	1.356E-001	0.32	0.1334
GA-68	18005	1.010E+000pCi/g	2.873E+000	2.873E+000	6.059E+000	2.932E+000	0.17	2.8732
GD-153	6824	-1.271E-001pCi/g	1.790E-001	1.788E-001	5.913E-001	2.938E-001	-0.21	0.1790
HF-181	6495	2.184E-001pCi/g	6.810E-002	6.717E-002	1.316E-001	6.420E-002	1.66	0.0681
HG-203	6466	-6.342E-002pCi/g	4.983E-002	4.970E-002	1.642E-001	8.104E-002	-0.39	0.0498
I-131	6380	-7.256E-002pCi/g	6.388E-002	6.377E-002	1.531E-001	7.523E-002	-0.47	0.0639
IR-192	6303	5.827E-002pCi/g	8.760E-002	8.753E-002	2.897E-001	1.438E-001	0.20	0.0876
K-40	6148	-4.085E-001pCi/g	2.930E-001	2.922E-001	8.645E-001	4.037E-001	-0.47	0.2930
KR-85	6111	0.000E+000pCi/g	5.958E+000	5.958E+000	3.921E+001	1.929E+001	0.00	5.9582
LA-140	6096	4.473E-002pCi/g	5.970E-002	5.965E-002	6.482E-002	2.897E-002	0.69	0.0597
MN-54	5382	-7.301E-002pCi/g	4.126E-002	4.109E-002	1.409E-001	6.850E-002	-0.52	0.0413
NA-22	5201	2.624E-002pCi/g	2.169E-002	2.165E-002	7.265E-002	3.359E-002	0.36	0.0217
NB-94	5160	6.374E-002pCi/g	3.242E-002	3.225E-002	1.519E-001	7.421E-002	0.42	0.0324
NB-95	5154	1.963E-003pCi/g	3.822E-002	3.822E-002	1.295E-001	6.292E-002	0.02	0.0382
ND-147	5083	3.119E-001pCi/g	3.848E-001	3.844E-001	8.917E-001	4.351E-001	0.35	0.3848
NP-237	4757	-2.992E-001pCi/g	4.987E-001	4.984E-001	1.648E+000	8.195E-001	-0.18	0.4987
NP-239	4751	1.640E-001pCi/g	2.323E-001	2.321E-001	7.677E-001	3.814E-001	0.21	0.2323
PA-231	4541	0.000E+000pCi/g	8.169E-001	8.169E-001	8.598E+000	4.266E+000	0.00	0.8169
PA-233	4535	-1.500E-003pCi/g	1.125E-001	1.125E-001	7.025E-001	3.486E-001	0.00	0.1125
PA-234	4528	-1.929E-001pCi/g	2.743E-001	2.742E-001	9.070E-001	4.503E-001	-0.21	0.2743

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PA-234M	19453	-6.978E-002pCi/g	7.541E+000	7.541E+000	2.662E+001	1.304E+001	0.00	7.5414
PB-210	4467	7.539E+002pCi/g	4.451E+001	4.662E+000	8.529E+000	4.237E+000	88.39	44.5104
PB-212	4454	4.619E-001pCi/g	6.836E-002	6.148E-002	1.884E-001	9.237E-002	2.45	0.0684
PB-214	4448	5.844E-001pCi/g	1.236E-001	1.198E-001	2.710E-001	1.327E-001	2.16	0.1236
PM-144	19585	-6.206E-002pCi/g	4.852E-002	4.841E-002	1.603E-001	7.840E-002	-0.39	0.0485
PM-146	2464	-6.084E-002pCi/g	1.020E-001	1.019E-001	2.355E-001	1.159E-001	-0.26	0.1020
RH-106	1882	-5.583E-001pCi/g	4.539E-001	4.529E-001	1.500E+000	7.343E-001	-0.37	0.4539
RU-103	1828	1.549E-002pCi/g	6.208E-002	6.208E-002	1.443E-001	7.070E-002	0.11	0.0621
SB-124	1784	1.007E-001pCi/g	7.453E-002	7.434E-002	2.350E-001	1.160E-001	0.43	0.0745
SB-125	1777	3.494E-002pCi/g	3.557E-002	3.553E-002	4.848E-001	2.384E-001	0.07	0.0356
SC-46	1739	-8.326E-002pCi/g	6.719E-002	6.705E-002	2.219E-001	1.089E-001	-0.38	0.0672
SN-113	1570	2.746E-002pCi/g	8.897E-002	8.896E-002	2.960E-001	1.462E-001	0.09	0.0890
SN-126	17459	-9.609E-001pCi/g	2.197E+000	2.197E+000	7.250E+000	3.617E+000	-0.13	2.1975
TA-182	1301	1.103E-001pCi/g	1.129E-001	1.128E-001	6.531E-001	3.195E-001	0.17	0.1129
TC-99M	17412	0.000E+000pCi/g	2.204E-002	2.204E-002	2.009E-001	9.974E-002	0.00	0.0220
TH-227	1058	1.587E-001pCi/g	6.160E-001	6.159E-001	1.487E+000	7.316E-001	0.11	0.6160
TH-229	1046	8.150E-002pCi/g	9.665E-001	9.665E-001	2.331E+000	1.150E+000	0.03	0.9665
TH-234	1027	-6.906E-001pCi/g	9.853E-001	9.845E-001	3.256E+000	1.618E+000	-0.21	0.9853
TL-208	929	2.594E-001pCi/g	5.669E-002	5.507E-002	1.124E-001	5.442E-002	2.31	0.0567
TL-210	20861	6.163E-002pCi/g	4.864E-002	4.851E-002	1.607E-001	7.843E-002	0.38	0.0486
U-235	281	-7.046E-003pCi/g	2.801E-001	2.801E-001	1.559E+000	7.744E-001	0.00	0.2801
Y-88	74	-2.679E-002pCi/g	3.451E-002	3.447E-002	7.939E-002	3.598E-002	-0.34	0.0345
ZN-65	31	0.000E+000pCi/g	5.246E-002	5.246E-002	4.458E-001	2.180E-001	0.00	0.0525
ZR-95	7	-4.438E-002pCi/g	9.905E-002	9.902E-002	2.154E-001	1.044E-001	-0.21	0.0990

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	ZFactor
LCS 160-442120~2-A	LCS 160-442120~2-A	CS-137	2.676E+001 pCi/g	2.751E+001	97.29%	-0.5032
		CO-60	1.057E+001 pCi/g	1.116E+001	94.72%	-1.0238
		AM-241	9.641E+001 pCi/g	9.662E+001	99.78%	-0.0397

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal	ZFactor	
MB 160-442120~1-A	MB	AC-228	5.038E-002	6.932E-002	0.7269	
MB 160-442120~1-A	MB	AG-108M	-2.019E-003	1.779E-002	-0.1135	
MB 160-442120~1-A	MB	AG-110M	1.355E-002	8.550E-003	1.5843	
MB 160-442120~1-A	MB	AM-241	8.122E-002	3.041E-002	2.6706	B
MB 160-442120~1-A	MB	BA-133	3.808E-002	3.757E-002	1.0134	
MB 160-442120~1-A	MB	BA-140	5.589E-002	6.413E-002	0.8716	
MB 160-442120~1-A	MB	BE-7	-2.362E-001	2.241E-001	-1.0541	
MB 160-442120~1-A	MB	BI-207	-3.482E-002	3.785E-002	-0.9199	
MB 160-442120~1-A	MB	BI-210M	2.544E-002	3.260E-002	0.7805	
MB 160-442120~1-A	MB	BI-212	-8.612E-002	2.928E-001	-0.2941	
MB 160-442120~1-A	MB	BI-214	5.043E-002	2.960E-002	1.7036	
MB 160-442120~1-A	MB	CD-109	0.000E+000	5.558E-002	0.0000	
MB 160-442120~1-A	MB	CD-113M	-2.718E+002	2.332E+002	-1.1655	
MB 160-442120~1-A	MB	CE-139	8.248E-003	1.261E-002	0.6540	
MB 160-442120~1-A	MB	CE-141	1.554E-002	2.028E-002	0.7666	
MB 160-442120~1-A	MB	CE-144	-8.111E-002	1.145E-001	-0.7084	
MB 160-442120~1-A	MB	CF-249	-1.188E-002	1.048E-002	-1.1341	
MB 160-442120~1-A	MB	CF-251	5.139E-002	5.501E-002	0.9341	
MB 160-442120~1-A	MB	CO-56	-2.889E-002	2.222E-002	-1.3004	
MB 160-442120~1-A	MB	CO-57	0.000E+000	3.364E-003	0.0000	
MB 160-442120~1-A	MB	CO-58	-3.584E-002	3.227E-002	-1.1107	
MB 160-442120~1-A	MB	CO-60	4.012E-002	1.616E-002	2.4828	
MB 160-442120~1-A	MB	CR-51	-1.270E-001	1.698E-001	-0.7477	
MB 160-442120~1-A	MB	CS-134	-1.612E-002	1.891E-002	-0.8523	
MB 160-442120~1-A	MB	CS-136	-3.609E-002	3.421E-002	-1.0549	
MB 160-442120~1-A	MB	CS-137	-1.037E-002	2.149E-002	-0.4826	
MB 160-442120~1-A	MB	EU-152	3.567E-002	4.750E-002	0.7510	
MB 160-442120~1-A	MB	EU-154	-2.863E-003	3.819E-003	-0.7496	
MB 160-442120~1-A	MB	EU-155	3.121E-002	5.034E-002	0.6200	
MB 160-442120~1-A	MB	FE-59	0.000E+000	1.408E-002	0.0000	
MB 160-442120~1-A	MB	GA-68	-3.205E-001	1.137E+000	-0.2819	
MB 160-442120~1-A	MB	GD-153	-8.809E-003	2.630E-002	-0.3350	
MB 160-442120~1-A	MB	HF-181	-7.435E-003	1.632E-002	-0.4555	
MB 160-442120~1-A	MB	HG-203	-3.647E-003	1.563E-002	-0.2334	
MB 160-442120~1-A	MB	I-131	1.087E-002	2.227E-002	0.4882	
MB 160-442120~1-A	MB	IR-192	1.725E-002	1.795E-002	0.9608	
MB 160-442120~1-A	MB	K-40	-3.512E-001	2.481E-001	-1.4153	
MB 160-442120~1-A	MB	KR-85	4.077E-001	7.276E+000	0.0560	
MB 160-442120~1-A	MB	LA-140	2.570E-002	3.839E-002	0.6695	
MB 160-442120~1-A	MB	MN-54	3.578E-002	1.805E-002	1.9827	
MB 160-442120~1-A	MB	NA-22	2.253E-002	1.014E-002	2.2222	
MB 160-442120~1-A	MB	NB-94	6.478E-003	2.167E-002	0.2990	
MB 160-442120~1-A	MB	NB-95	1.486E-002	1.298E-002	1.1450	
MB 160-442120~1-A	MB	ND-147	-6.652E-002	1.630E-001	-0.4081	
MB 160-442120~1-A	MB	NP-237	-6.577E-002	1.185E-001	-0.5549	
MB 160-442120~1-A	MB	NP-239	2.935E-002	4.639E-002	0.6326	
MB 160-442120~1-A	MB	PA-231	4.500E-001	7.725E-001	0.5825	
MB 160-442120~1-A	MB	PA-233	-3.527E-003	4.296E-003	-0.8211	
MB 160-442120~1-A	MB	PA-234	7.125E-002	2.403E-002	2.9648	B
MB 160-442120~1-A	MB	PA-234M	-3.788E-001	3.085E+000	-0.1228	
MB 160-442120~1-A	MB	PB-210	4.436E-001	4.168E-001	1.0644	

			MQO		
MB 160-442120~1-A	MB	PB-212	2.139E-002	3.051E-002	0.7012
MB 160-442120~1-A	MB	PB-214	-8.911E-002	4.874E-002	-1.8281
MB 160-442120~1-A	MB	PM-144	-1.187E-002	2.398E-002	-0.4951
MB 160-442120~1-A	MB	PM-146	2.447E-002	2.423E-002	1.0103
MB 160-442120~1-A	MB	RH-106	1.992E-001	2.993E-001	0.6655
MB 160-442120~1-A	MB	RU-103	1.656E-002	1.646E-002	1.0059
MB 160-442120~1-A	MB	SB-124	0.000E+000	2.446E-003	0.0000
MB 160-442120~1-A	MB	SB-125	-2.440E-002	6.866E-002	-0.3554
MB 160-442120~1-A	MB	SC-46	3.218E-002	3.784E-002	0.8503
MB 160-442120~1-A	MB	SN-113	2.292E-002	3.145E-002	0.7289
MB 160-442120~1-A	MB	SN-126	-8.506E-002	1.236E-001	-0.6881
MB 160-442120~1-A	MB	TA-182	3.492E-002	3.263E-002	1.0702
MB 160-442120~1-A	MB	TC-99M	8.082E-003	1.222E-002	0.6612
MB 160-442120~1-A	MB	TH-227	9.868E-002	7.124E-002	1.3853
MB 160-442120~1-A	MB	TH-229	-1.062E-001	2.439E-001	-0.4355
MB 160-442120~1-A	MB	TH-234	3.187E-001	1.473E-001	2.1643
MB 160-442120~1-A	MB	TL-208	2.143E-002	2.075E-002	1.0326
MB 160-442120~1-A	MB	TL-210	0.000E+000	6.153E-003	0.0000
MB 160-442120~1-A	MB	U-235	0.000E+000	6.083E-002	0.0000
MB 160-442120~1-A	MB	Y-88	-8.251E-003	3.406E-002	-0.2423
MB 160-442120~1-A	MB	ZN-65	0.000E+000	1.591E-002	0.0000
MB 160-442120~1-A	MB	ZR-95	-5.364E-002	4.850E-002	-1.1060

eurofins

Environment Testing
TestAmerica

Analysis Report for Gamma Spectroscopy

Batch: 442823 **Operator:**

MQO

SampID	WRKNO	Aliquot	Sigma	Instrument	Detector	CountDateTime	CountDuration
LCS 160-442823~2-	LCS	341.90g	1.00	GammaVision	GV09	9 / 16 / 19 12:14	30

Analyte	Cmpnd#	Activity	TotalUnc	CountUnc	MDA	MLCC	Act/MDA	
AC-228	11136	6.724E-001pCi/g	2.591E-001	2.568E-001	7.430E-001	3.570E-001	0.91	0.2591
AG-108M	10982	-1.190E-001pCi/g	9.958E-002	9.939E-002	2.499E-001	1.223E-001	-0.48	0.0996
AG-110M	10973	1.853E-001pCi/g	9.373E-002	9.325E-002	2.068E-001	9.777E-002	0.90	0.0937
AM-241	10818	9.548E+001pCi/g	5.008E+000	7.231E-001	1.000E+000	4.956E-001	95.46	5.0078
BA-133	10469	-1.290E-001pCi/g	1.142E-001	1.140E-001	3.776E-001	1.854E-001	-0.34	0.1142
BA-140	10463	1.955E-001pCi/g	2.786E-001	2.784E-001	6.644E-001	3.207E-001	0.29	0.2786
BE-7	10435	-9.489E-001pCi/g	9.176E-001	9.163E-001	3.134E+000	1.542E+000	-0.30	0.9176
BI-207	10195	2.664E-001pCi/g	1.265E-001	1.258E-001	2.603E-001	1.238E-001	1.02	0.1265
BI-210M	10173	1.661E-001pCi/g	1.132E-001	1.127E-001	3.306E-001	1.619E-001	0.50	0.1132
BI-212	10160	2.393E-001pCi/g	7.710E-001	7.709E-001	2.616E+000	1.261E+000	0.09	0.7710
BI-214	10154	7.373E-001pCi/g	1.497E-001	1.447E-001	3.057E-001	1.462E-001	2.41	0.1497
CD-109	9254	0.000E+000pCi/g	2.460E+000	2.460E+000	8.144E+000	4.041E+000	0.00	2.4597
CD-113M	17462	6.783E+002pCi/g	7.899E+002	7.887E+002	2.626E+003	1.285E+003	0.26	789.9314
CE-139	9241	1.721E-002pCi/g	5.608E-002	5.606E-002	1.873E-001	9.206E-002	0.09	0.0561
CE-141	9235	1.046E-001pCi/g	1.449E-001	1.448E-001	4.799E-001	2.375E-001	0.22	0.1449
CE-144	9221	-4.470E-001pCi/g	6.207E-001	6.203E-001	2.056E+000	1.017E+000	-0.22	0.6207
CF-249	9215	1.160E-001pCi/g	1.282E-001	1.280E-001	4.248E-001	2.090E-001	0.27	0.1282
CF-251	13690	5.206E-001pCi/g	2.747E-001	2.708E-001	6.761E-001	3.304E-001	0.77	0.2747
CO-56	8704	-8.547E-002pCi/g	1.448E-002	1.380E-002	2.127E-001	1.024E-001	-0.40	0.0145
CO-57	13694	2.886E-002pCi/g	4.356E-002	4.353E-002	1.450E-001	7.119E-002	0.20	0.0436
CO-58	8698	-9.765E-002pCi/g	7.729E-002	7.712E-002	2.558E-001	1.241E-001	-0.38	0.0773
CO-60	8692	1.060E+001pCi/g	5.540E-001	1.547E-001	9.301E-002	4.084E-002	113.91	0.5540
CR-51	8604	7.292E-001pCi/g	1.114E+000	1.113E+000	3.690E+000	1.826E+000	0.20	1.1135
CS-134	8553	7.654E-002pCi/g	7.075E-002	7.064E-002	2.642E-001	1.277E-001	0.29	0.0708
CS-136	8546	6.184E-002pCi/g	7.324E-002	7.315E-002	1.602E-001	7.624E-002	0.39	0.0732
CS-137	8539	2.673E+001pCi/g	1.418E+000	2.785E-001	1.324E-001	6.235E-002	201.85	1.4182
EU-152	7145	2.260E-001pCi/g	1.711E-001	1.706E-001	5.105E-001	2.513E-001	0.44	0.1711
EU-154	7138	2.733E-001pCi/g	2.123E-001	2.119E-001	3.313E-001	1.629E-001	0.82	0.2123
EU-155	7131	-7.752E-004pCi/g	8.424E-001	8.424E-001	9.424E-001	4.659E-001	0.00	0.8424
FE-59	7073	1.249E-001pCi/g	1.787E-001	1.786E-001	3.787E-001	1.808E-001	0.33	0.1787
GA-68	18005	3.556E+000pCi/g	3.616E+000	3.610E+000	7.614E+000	3.637E+000	0.47	3.6158
GD-153	6824	-1.813E-003pCi/g	3.058E-001	3.058E-001	1.015E+000	5.038E-001	0.00	0.3058
HF-181	6495	-5.114E-002pCi/g	3.197E-002	3.186E-002	4.147E-001	2.041E-001	-0.12	0.0320
HG-203	6466	0.000E+000pCi/g	4.588E-002	4.588E-002	2.137E-001	1.047E-001	0.00	0.0459
I-131	6380	-2.889E-002pCi/g	8.399E-002	8.398E-002	2.043E-001	9.955E-002	-0.14	0.0840
IR-192	6303	2.376E-002pCi/g	2.199E-002	2.194E-002	4.211E-001	2.083E-001	0.06	0.0220
K-40	6148	6.048E-001pCi/g	4.192E-001	4.181E-001	9.646E-001	4.251E-001	0.63	0.4192
KR-85	6111	1.568E+001pCi/g	1.702E+001	1.700E+001	5.656E+001	2.765E+001	0.28	17.0214
LA-140	6096	3.176E-002pCi/g	2.687E-002	2.682E-002	1.433E-001	6.478E-002	0.22	0.0269
MN-54	5382	8.473E-002pCi/g	7.587E-002	7.575E-002	1.653E-001	7.874E-002	0.51	0.0759
NA-22	5201	2.692E-002pCi/g	3.216E-002	3.213E-002	1.111E-001	5.008E-002	0.24	0.0322
NB-94	5160	5.878E-002pCi/g	6.815E-002	6.808E-002	2.277E-001	1.103E-001	0.26	0.0682
NB-95	5154	-4.254E-002pCi/g	6.355E-002	6.351E-002	2.136E-001	1.031E-001	-0.20	0.0636
ND-147	5083	6.142E-001pCi/g	5.324E-001	5.312E-001	1.235E+000	5.958E-001	0.50	0.5324
NP-237	4757	0.000E+000pCi/g	7.137E-001	7.137E-001	2.363E+000	1.173E+000	0.00	0.7137
NP-239	4751	2.218E-001pCi/g	2.468E-001	2.465E-001	8.166E-001	4.034E-001	0.27	0.2468
PA-231	4541	1.832E-007pCi/g	3.612E+000	3.612E+000	1.203E+001	5.951E+000	0.00	3.6123
PA-233	4535	-2.068E-001pCi/g	1.061E-001	1.055E-001	1.003E+000	4.961E-001	-0.21	0.1061
PA-234	4528	1.581E-001pCi/g	1.386E-001	1.383E-001	1.273E+000	6.304E-001	0.12	0.1386

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PA-234M	19453	1.368E+001pCi/g	1.117E+001	1.115E+001	3.699E+001	1.796E+001	0.37	11.1677
PB-210	4467	7.468E+002pCi/g	4.435E+001	6.596E+000	1.224E+001	6.066E+000	61.01	44.3456
PB-212	4454	1.469E-001pCi/g	1.416E-001	1.412E-001	4.680E-001	2.303E-001	0.31	0.1416
PB-214	4448	3.138E-001pCi/g	1.033E-001	1.020E-001	3.489E-001	1.689E-001	0.90	0.1033
PM-144	19585	-7.643E-002pCi/g	6.127E-002	6.114E-002	2.031E-001	9.808E-002	-0.38	0.0613
PM-146	2464	-1.680E-001pCi/g	1.637E-001	1.635E-001	5.415E-001	2.669E-001	-0.31	0.1637
RA-226	1950	-6.088E-001pCi/g	1.720E+000	1.719E+000	4.352E+000	2.135E+000	-0.14	1.7203
RH-106	1882	-1.486E-002pCi/g	1.004E+000	1.004E+000	3.371E+000	1.654E+000	0.00	1.0040
RU-103	1828	-7.203E-002pCi/g	8.998E-002	8.990E-002	2.091E-001	1.016E-001	-0.34	0.0900
SB-124	1784	6.042E-002pCi/g	5.935E-002	5.926E-002	1.535E-001	6.235E-002	0.39	0.0594
SB-125	1777	6.502E-002pCi/g	8.889E-002	8.883E-002	6.829E-001	3.334E-001	0.10	0.0889
SC-46	1739	9.829E-002pCi/g	7.906E-002	7.890E-002	2.619E-001	1.268E-001	0.38	0.0791
SN-113	1570	1.196E-001pCi/g	1.325E-001	1.324E-001	4.393E-001	2.161E-001	0.27	0.1325
SN-126	17459	-1.363E+000pCi/g	3.097E+000	3.097E+000	1.023E+001	5.098E+000	-0.13	3.0975
TA-182	1301	9.317E-002pCi/g	1.172E-001	1.171E-001	4.631E-001	2.120E-001	0.20	0.1172
TC-99M	17412	9.948E-003pCi/g	8.246E-002	8.246E-002	2.742E-001	1.358E-001	0.04	0.0825
TH-227	1058	4.056E-001pCi/g	8.725E-001	8.721E-001	2.114E+000	1.033E+000	0.19	0.8725
TH-229	1046	2.328E-001pCi/g	1.336E+000	1.336E+000	3.238E+000	1.587E+000	0.07	1.3360
TH-234	1027	1.014E+000pCi/g	1.182E+000	1.181E+000	3.911E+000	1.935E+000	0.26	1.1823
TL-208	929	9.316E-002pCi/g	9.328E-002	9.316E-002	2.088E-001	1.009E-001	0.45	0.0933
TL-210	20861	-6.981E-002pCi/g	6.709E-002	6.697E-002	2.234E-001	1.079E-001	-0.31	0.0671
U-235	281	2.461E-001pCi/g	6.522E-001	6.520E-001	2.165E+000	1.072E+000	0.11	0.6522
Y-88	74	1.431E-002pCi/g	3.545E-002	3.544E-002	7.939E-002	3.227E-002	0.18	0.0355
ZN-65	31	2.116E-001pCi/g	1.817E-001	1.814E-001	6.031E-001	2.918E-001	0.35	0.1817
ZR-95	7	9.079E-002pCi/g	6.198E-002	6.180E-002	3.173E-001	1.520E-001	0.29	0.0620

Laboratory Control Sample Information

Sample ID	WRKNO	Analyte	Activity	StdAdded	Recovery	ZFactor
LCS 160-442823~2-A	LCS 160-442823~2-A	CS-137	2.673E+001 pCi/g	2.750E+001	97.19%	-0.5172
		CO-60	1.060E+001 pCi/g	1.115E+001	95.04%	-0.9417
		AM-241	9.548E+001 pCi/g	9.662E+001	98.82%	-0.2149

Sample Duplicate Information

Sample ID	Dup Sample ID	Analyte	Samp Activity	Dup Activity	RPD	RER	DER	Flag	ZFactor

Blanks Information

SampID	WRKNO	Analyte	Activity	UncTotal	ZFactor	
MB 160-442823~1-A	MB	AC-228	-2.670E-001	1.221E-001	-2.1868	
MB 160-442823~1-A	MB	AG-108M	8.076E-003	2.308E-002	0.3499	
MB 160-442823~1-A	MB	AG-110M	2.302E-002	2.088E-002	1.1024	
MB 160-442823~1-A	MB	AM-241	-9.497E-003	4.616E-002	-0.2058	
MB 160-442823~1-A	MB	BA-133	2.048E-002	2.342E-002	0.8744	
MB 160-442823~1-A	MB	BA-140	-5.370E-002	1.253E-001	-0.4285	
MB 160-442823~1-A	MB	BE-7	4.138E-001	1.266E-001	3.2697	B
MB 160-442823~1-A	MB	BI-207	-3.668E-003	2.589E-002	-0.1417	
MB 160-442823~1-A	MB	BI-210M	-1.420E-002	3.524E-002	-0.4029	
MB 160-442823~1-A	MB	BI-212	-4.888E-002	4.215E-001	-0.1160	
MB 160-442823~1-A	MB	BI-214	-3.981E-002	6.986E-002	-0.5698	
MB 160-442823~1-A	MB	CD-109	1.223E-001	5.078E-001	0.2408	
MB 160-442823~1-A	MB	CD-113M	2.431E+002	2.488E+002	0.9773	
MB 160-442823~1-A	MB	CE-139	9.176E-003	1.152E-002	0.7962	
MB 160-442823~1-A	MB	CE-141	1.703E-002	1.988E-002	0.8563	
MB 160-442823~1-A	MB	CE-144	0.000E+000	3.266E-002	0.0000	
MB 160-442823~1-A	MB	CF-249	1.966E-002	3.165E-002	0.6213	
MB 160-442823~1-A	MB	CF-251	4.419E-002	7.716E-002	0.5727	
MB 160-442823~1-A	MB	CO-56	4.158E-002	1.830E-002	2.2722	
MB 160-442823~1-A	MB	CO-57	8.727E-003	1.124E-002	0.7767	
MB 160-442823~1-A	MB	CO-58	2.064E-002	2.951E-002	0.6997	
MB 160-442823~1-A	MB	CO-60	-6.800E-004	1.850E-003	-0.3677	
MB 160-442823~1-A	MB	CR-51	-5.597E-002	2.692E-001	-0.2079	
MB 160-442823~1-A	MB	CS-134	5.739E-002	2.362E-002	2.4301	
MB 160-442823~1-A	MB	CS-136	4.922E-003	1.775E-002	0.2773	
MB 160-442823~1-A	MB	CS-137	-1.613E-002	3.318E-002	-0.4862	
MB 160-442823~1-A	MB	EU-152	2.338E-001	7.497E-002	3.1193	B
MB 160-442823~1-A	MB	EU-154	-2.806E-002	3.302E-002	-0.8499	
MB 160-442823~1-A	MB	EU-155	2.834E-002	4.016E-002	0.7056	
MB 160-442823~1-A	MB	FE-59	7.038E-002	3.167E-002	2.2222	
MB 160-442823~1-A	MB	GA-68	2.782E-001	1.396E+000	0.1993	
MB 160-442823~1-A	MB	GD-153	-3.444E-002	4.289E-002	-0.8028	
MB 160-442823~1-A	MB	HF-181	-9.881E-003	1.492E-002	-0.6621	
MB 160-442823~1-A	MB	HG-203	1.554E-003	1.954E-002	0.0796	
MB 160-442823~1-A	MB	I-131	-3.610E-002	4.098E-002	-0.8810	
MB 160-442823~1-A	MB	IR-192	-4.305E-003	2.237E-002	-0.1924	
MB 160-442823~1-A	MB	K-40	-3.196E-001	3.711E-001	-0.8614	
MB 160-442823~1-A	MB	KR-85	-3.262E-001	9.021E+000	-0.0362	
MB 160-442823~1-A	MB	LA-140	5.449E-002	2.532E-002	2.1521	
MB 160-442823~1-A	MB	MN-54	2.105E-002	3.117E-002	0.6753	
MB 160-442823~1-A	MB	NA-22	4.506E-002	2.028E-002	2.2222	
MB 160-442823~1-A	MB	NB-94	-3.259E-002	3.136E-002	-1.0392	
MB 160-442823~1-A	MB	NB-95	3.923E-003	2.587E-002	0.1516	
MB 160-442823~1-A	MB	ND-147	-9.977E-002	2.329E-001	-0.4284	
MB 160-442823~1-A	MB	NP-237	5.696E-002	1.302E-001	0.4375	
MB 160-442823~1-A	MB	NP-239	1.829E-002	6.185E-002	0.2957	
MB 160-442823~1-A	MB	PA-231	5.165E-001	7.402E-001	0.6977	
MB 160-442823~1-A	MB	PA-233	5.654E-002	9.581E-002	0.5902	
MB 160-442823~1-A	MB	PA-234	5.529E-002	7.081E-002	0.7808	
MB 160-442823~1-A	MB	PA-234M	-3.788E-001	4.634E+000	-0.0817	
MB 160-442823~1-A	MB	PB-210	-5.436E-001	5.026E-001	-1.0817	

			MQO		
MB 160-442823~1-A	MB	PB-212	2.182E-002	5.574E-002	0.3915
MB 160-442823~1-A	MB	PB-214	-1.606E-002	2.120E-002	-0.7576
MB 160-442823~1-A	MB	PM-144	2.009E-002	2.556E-002	0.7861
MB 160-442823~1-A	MB	PM-146	0.000E+000	1.429E-002	0.0000
MB 160-442823~1-A	MB	RA-226	-8.911E-001	5.769E-001	-1.5448
MB 160-442823~1-A	MB	RH-106	-3.984E-001	5.691E-001	-0.7001
MB 160-442823~1-A	MB	RU-103	-1.800E-002	3.639E-002	-0.4947
MB 160-442823~1-A	MB	SB-124	-1.501E-002	3.062E-002	-0.4903
MB 160-442823~1-A	MB	SB-125	7.401E-002	1.104E-001	0.6704
MB 160-442823~1-A	MB	SC-46	0.000E+000	6.658E-003	0.0000
MB 160-442823~1-A	MB	SN-113	2.050E-002	3.589E-002	0.5713
MB 160-442823~1-A	MB	SN-126	-1.522E-001	2.089E-001	-0.7283
MB 160-442823~1-A	MB	TA-182	-2.146E-001	2.532E-001	-0.8474
MB 160-442823~1-A	MB	TC-99M	1.200E-002	8.068E-003	1.4873
MB 160-442823~1-A	MB	TH-227	5.859E-002	4.199E-002	1.3951
MB 160-442823~1-A	MB	TH-229	2.743E-001	2.554E-001	1.0741
MB 160-442823~1-A	MB	TH-234	4.142E-001	2.246E-001	1.8439
MB 160-442823~1-A	MB	TL-208	1.547E-002	2.050E-002	0.7547
MB 160-442823~1-A	MB	TL-210	2.520E-002	2.582E-002	0.9760
MB 160-442823~1-A	MB	U-235	-7.543E-003	1.229E-001	-0.0613
MB 160-442823~1-A	MB	Y-88	-2.074E-003	4.228E-002	-0.0491
MB 160-442823~1-A	MB	ZN-65	0.000E+000	3.183E-002	0.0000
MB 160-442823~1-A	MB	ZR-95	0.000E+000	1.068E-002	0.0000

Reagent

Tuna Can_00003

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

90099

1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: TestAmerica St. Louis / Earth City, MO
P.O. No.: 2454150, Item 1
Reference Date: 01-Jan-2012 12:00 PM EST **Grams of Master Source:** 0.017180

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	3.094E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.037E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.677E+05	2.881E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.795E+04	1.511E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.245E+05	2.139E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.707E+05	4.651E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.755E+05	3.015E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.128E+05	1.938E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.228E+05	7.264E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.084E+05	3.580E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	3.581E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.476E+05	7.690E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Comments:
1550 grams of sand. Homogenous down to 10 grams aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 30 JAN 12
J.D. McCorvey, Counting Room Manager

Reagent

Tuna Can_00006

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

83814-334

1.0 Liter Sand in 1 Liter Wide Mouth HDPE Silgan Jar

Customer: Test America St. Louis
P.O. No.: 2395112, Item 1
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.016927

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Pb-210	46.5	8.120E+03	———	3.021E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	2.090E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	2.873E+03	0.8	2.3	4.9	HPGe
Co-57	122.1	2.718E+02	8.711E+04	1.475E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	2.111E+03	0.5	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	4.660E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	2.994E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	1.877E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.224E+05	7.150E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	3.626E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	3.627E+03	0.6	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	7.570E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Corporate Office
Laboratory

Comments:
1550 grams of sand. Homogeneous down to 10 gram aliquot.
This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 2/11/11
J. D. McCorvey, QA Manager Alternate

GAMMA SPECTROSCOPY

Method 901.1
Ra-226

Radium-226 & Other Gamma Emitters (GS) by Method 901.1

Prep Batch: 445202

Fill Geometry, 21-Day In-Growth

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 445202

Lab Id: MB 160-445202/1-A | Analyzed: 10/31/19 02:21 | Ts: 120 | Sigma: 2
Client ID: | Detector: GV14 | Decay Corrected: | Ingrowth:

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	7.792	29.9	29.9	U	pCi/L		45.2	448405
Radium-226	-15.18	26.5	26.5	U	pCi/L	50.0	45.2	448405
Radium-228	7.792	13.8	13.8	U	pCi/L	50.0	28.7	448405

Lab Id: LCS 160-445202/2-A | Analyzed: 10/31/19 05:04 | Ts: 120 | Sigma: 2
Client ID: | Detector: GV14 | Decay Corrected: No | Ingrowth:

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Americium-241	132000	432	15200		pCi/L		298	448405
Cesium-137	42240	234	4230		pCi/L		112	448405
Cobalt-60	27150	164	2680		pCi/L		46.8	448405

Lab Id: 180-96597-A-1-B DU | Analyzed: 10/31/19 05:07 | Ts: 120 | Sigma: 2
Client ID: | Detector: GV17 | Decay Corrected: | Ingrowth:

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	27.52	19.7	20.0	U	pCi/L		36.3	448407
Radium-226	-17.88	14.4	14.5	U	pCi/L	50.0	36.3	448407
Radium-228	27.52	13.5	13.8		pCi/L	50.0	23.1	448407

Lab Id: 180-96595-9 | Analyzed: 10/31/19 07:40 | Ts: 120 | Sigma: 2
Client ID: BRF-BS-FB02-20191001 ~ BRF BG05 | Detector: GV16 | Decay Corrected: | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	18.7	30.9	31.1	U	pCi/L		31.0	448406
Radium-226	18.7	18.9	19.0		pCi/L	50.0	17.6	448406
Radium-228	-6.03	24.5	24.6	U	pCi/L	50.0	31.0	448406

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 445202

Quality Control Summary

Method Blank ID:	Analyte	Parent Result	Spike Added	MB Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
MB 160-445202/1-A	Radium 226 and 228 (positive only)			7.792	U	pCi/L							
MB 160-445202/1-A	Radium-226			-15.18	U	pCi/L							-1.1444
MB 160-445202/1-A	Radium-228			7.792	U	pCi/L							1.1313
Lab Control Sample ID:	**Analyte**	**Parent Result**	**Spike Added**	**LCS Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
LCS 160-445202/2-A	Americium-241		136000	132000		pCi/L	97	90 - 111					-.4831
LCS 160-445202/2-A	Cesium-137		44200	42240		pCi/L	96	90 - 111					-.8462
LCS 160-445202/2-A	Cobalt-60		27900	27150		pCi/L	97	89 - 110					-.505
Duplicate ID:	**Analyte**	**Parent Result**	**Spike Added**	**DU Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
180-96597-A-1-B DU	Radium 226 and 228 (positive only)	13.2		27.52	U	pCi/L			70	0.31	0.86		
180-96597-A-1-B DU	Radium-226	-11.9		-17.88	U	pCi/L			40	0.18	0.49	1	.4932
180-96597-A-1-B DU	Radium-228	13.2		27.52		pCi/L			70	0.45	1.26	1	1.2597

Glossary:

Ts = Count Duration, Sample

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 180-96595-1

SDG No.:

Batch Number: 445202 Batch Start Date: 10/04/19 16:05 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 10/04/19 16:13

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	IngDecDate1	IngDecDate3	Geometry	1L Marn LCS 00006	
MB 160-445202/1		Fill_Geo-21, 901.1		1000 mL	10/04/19 16:13	10/25/19 16:13	1L Marn		
LCS 160-445202/2		Fill_Geo-21, 901.1		1000 mL	10/04/19 16:13	10/25/19 16:13	1L Marn	# mL	
180-96597-A-1 DU		Fill_Geo-21, 901.1	T	1000 mL	10/04/19 16:13	10/25/19 16:13	1L Marn		
180-96595-B-9	BRF-BS-FB02-2019 1001 ~ BRF BG05	Fill_Geo-21, 901.1	T	1000 mL	10/04/19 16:13	10/25/19 16:13	1L Marn		

Batch Notes	
Balance ID	1121432711
SOP Number	ST-RC-0025

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Sample Description: 445202_Gamma_MB 160-445202~1-A
Detector: Detector #14
Batch ID: 445202
Work Order Number: Gamma
Lot Number: MB 160-445202~1-A

Decay to Time: 10/31/2019 02:20 Live Time: 7200 sec
Acquisition Time: 10/31/2019 02:21:56 Real Time: 7203 sec
Analysis Time: 10/31/2019 04:22 Dead Time: 0.04 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 14_Liquid_Marinelli 1L.Clb
Efficiency Cal Desc: 14_1LMarinelli_90062_030612
Efficiency Cal Date: 3/14/2012 16:58
Energy Cal Date: 2/28/2012 10:48
Library: Client_Long_Rev15.lib
Bkgd Correction File: 14_2019-10-06_1924.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	8.412E-01	96.9	8.153E-01	8.164E-01	2.753E+00
NA-22	1.147E-01	89.2	1.023E-01	1.025E-01	3.499E-01
K-40	2.546E-01	430.9	1.097E+00	1.097E+00	3.658E+00
Sc-46	-1.197E-02	1284.5	1.537E-01	1.537E-01	5.375E-01
CR-51	-3.208E-01	252.8	8.110E-01	8.112E-01	2.783E+00
MN-54	8.080E-02	122.0	9.856E-02	9.864E-02	2.413E-01
FE-59	0.000E+00	1.#INF	6.229E-02	6.229E-02	5.279E-01
Co-56	3.829E-03	2755.0	1.055E-01	1.055E-01	2.624E-01
CO-57	-5.106E-01	134.0	6.844E-01	6.850E-01	2.298E+00
CO-58	-2.782E-02	395.0	1.099E-01	1.099E-01	3.875E-01
CO-60	1.884E-01	34.1	6.417E-02	6.484E-02	1.256E-01
ZN-65	-3.140E-01	126.9	3.983E-01	3.986E-01	1.353E+00
NB-94	5.353E-02	229.5	1.228E-01	1.229E-01	3.026E-01
ZR-95	5.823E-02	249.2	1.451E-01	1.451E-01	3.743E-01
NB-95	7.452E-02	100.4	7.479E-02	7.489E-02	2.571E-01
RU-103	-1.119E-01	80.5	9.003E-02	9.021E-02	2.991E-01
RH-106	1.601E+00	91.6	1.466E+00	1.468E+00	4.289E+00
AG-108M	1.456E-01	41.1	5.984E-02	6.028E-02	1.827E-01
AG-110M	1.127E-01	55.8	6.289E-02	6.313E-02	7.276E-01
SN-113	-1.933E-01	79.9	1.544E-01	1.547E-01	6.272E-01
SB-124	6.815E-02	61.4	4.184E-02	4.198E-02	7.041E-01
SB-125	2.496E-01	72.9	1.820E-01	1.824E-01	7.237E-01
I-131	-4.251E-02	193.2	8.215E-02	8.218E-02	2.929E-01
Gd-153	1.220E-01	122.5	1.495E-01	1.497E-01	5.643E-01
Ga-68	1.515E+00	431.6	6.539E+00	6.539E+00	1.573E+01
Tc-99m	3.908E-03	2455.6	9.597E-02	9.597E-02	3.266E-01
BA-133	-6.646E-02	228.1	1.516E-01	1.516E-01	5.180E-01
CS-134	3.226E-01	48.8	1.575E-01	1.583E-01	3.314E-01
CS-137	6.769E-02	159.3	1.078E-01	1.079E-01	3.735E-01
CE-139	0.000E+00	1.#INF	2.081E-02	2.081E-02	2.665E-01
Ba-140	-9.236E-02	685.5	6.331E-01	6.331E-01	1.006E+00
La-140	-9.124E-02	188.4	1.719E-01	1.720E-01	3.874E-01
CE-141	1.129E-01	104.6	1.181E-01	1.182E-01	3.964E-01

CE-144	3.992E-01	143.4	5.726E-01	5.730E-01	1.929E+00
PM-144	-6.166E-02	419.3	2.585E-01	2.585E-01	3.322E-01
EU-152	8.501E-02	66.4	5.643E-02	5.661E-02	1.462E+00
EU-154	1.801E-01	133.2	2.399E-01	2.401E-01	4.561E-01
EU-155	-1.233E-01	218.0	2.688E-01	2.689E-01	9.120E-01
HF-181	4.785E-03	138.6	6.634E-03	6.639E-03	4.061E-01
Ta-182	5.796E-01	44.3	2.568E-01	2.583E-01	2.003E+00
Hg-203	7.612E-02	104.5	7.954E-02	7.966E-02	2.687E-01
TL-208	-2.519E-01	53.4	1.345E-01	1.351E-01	3.944E-01
PM-146	1.211E-01	102.0	1.236E-01	1.237E-01	3.103E-01
Y-88	4.361E-02	219.5	9.572E-02	9.575E-02	3.531E-01
Cd-113m	4.647E+02	198.6	9.229E+02	9.234E+02	3.186E+03
Cd-109	0.000E+00	1.#INF	2.468E+00	2.469E+00	8.289E+00
Cf-251	-1.386E-01	290.9	4.033E-01	4.035E-01	1.103E+00
Cf-249	1.061E-01	123.0	1.306E-01	1.307E-01	4.430E-01
Sn-126	4.431E-01	139.5	6.182E-01	6.186E-01	2.084E+00
PB-210	1.872E+00	105.0	1.966E+00	1.973E+00	5.312E+00
PB-212	-1.962E-01	117.0	2.296E-01	2.299E-01	7.857E-01
PB-214	-2.927E-01	80.7	2.363E-01	2.368E-01	8.256E-01
BI-207	-7.496E-02	250.8	1.880E-01	1.881E-01	4.413E-01
BI-212	-2.554E-07	569522531.5	1.454E+00	1.454E+00	5.155E+00
U-235	2.280E-01	105.7	2.410E-01	2.413E-01	2.425E+00
BI-214	-5.616E-01	87.2	4.899E-01	4.908E-01	1.673E+00
BI-210M	1.048E-01	101.6	1.064E-01	1.066E-01	3.604E-01
AC-228	2.883E-01	88.3	2.545E-01	2.549E-01	1.062E+00
TH-227	3.743E-01	135.5	5.070E-01	5.075E-01	2.999E+00
TH-229	-2.439E-01	235.0	5.730E-01	5.733E-01	4.482E+00
TH-234	1.219E+00	103.0	1.255E+00	1.257E+00	3.393E+00
PA-231	0.000E+00	1.#INF	1.181E+00	1.181E+00	1.525E+01
PA-233	-2.589E-01	141.7	3.670E-01	3.673E-01	1.312E+00
PA-234	3.714E-01	93.6	3.474E-01	3.480E-01	1.092E+00
PA-234M	2.820E+00	717.4	2.023E+01	2.023E+01	7.027E+01
AM-241	1.738E-02	889.5	1.546E-01	1.546E-01	4.503E-01
Np-237	-4.628E-01	170.9	7.909E-01	7.913E-01	2.644E+00
Ir-192	7.487E-02	93.5	6.999E-02	7.013E-02	2.361E-01
Cs-136	-8.367E-02	152.3	1.274E-01	1.275E-01	4.379E-01
Np-239	1.210E-01	210.1	2.542E-01	2.543E-01	8.621E-01
Nd-147	-9.615E-01	95.3	9.160E-01	9.176E-01	2.267E+00
TL-210	-1.947E-01	80.9	1.576E-01	1.579E-01	5.261E-01
Kr-85	0.000E+00	1.#INF	1.205E+01	1.205E+01	1.254E+02
Total	4.802E+02				

Analyst: Justin Banner

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Sample description
445202_Gamma_MB 160-445202~1-A

Spectrum Filename: C:\User\SPC\Det14\14_Gamma_20192329.An1

Acquisition information
Start time: 10/31/2019 2:21:56 AM
Live time: 7200
Real time: 7203
Dead time: 0.04 %
Detector ID: 14

Detector system
Ge14 SN/11080670

Calibration
Filename: 14_Liquid_Marinelli 1L.Clb
14_1LMarinelli_90062_030612

Energy Calibration
Created: 2/28/2012 10:48:23 AM
Zero offset: 0.130 keV
Gain: 0.250 keV/channel
Quadratic: -2.050E-08 keV/channel^2

Efficiency Calibration
Created: 3/14/2012 4:58:47 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.64 %
Log(Eff): -1.428037E+00 + (-4.136370E-02*Log(E)) + (-5.958012E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 0.07 %
Log(Eff): -1.383299E+01 + (4.786779E+00*Log(E)) + (-5.293738E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.14keV)
Stop channel: 8000 (1999.51keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 2:20:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	14_2019-10-06_1924.PBC 10/6/2019 7:24:09 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0045

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.51	22.	104.98	1.37	3.849E-02	46.54	4.250	PBC<MDA	PB210
50.14	7.	219.69	0.75	4.049E-02	50.14	8.000	PBC<MDA	TH227
59.54	2.	889.52	0.76	4.451E-02	59.54	35.900	PBC<MDA	AM241
63.15	-39.	53.71	0.77	4.569E-02	63.29	3.810	PBC<MDA	TH234
64.14	14.	139.50	0.77	4.596E-02	64.28	9.700	PBC<MDA	Sn126
80.99	10.	183.28	0.78	4.877E-02	80.99	34.060	PBC<MDA	BA133
87.39	8.	159.91	0.79	4.913E-02	87.57	37.500	PBC<MDA	Sn126
91.10	7.	415.55	0.79	4.919E-02	91.10	28.300	PBC<MDA	Nd147
92.59	24.	103.02	1.32	4.919E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	1.224E+00	AC228
97.50	6.	308.87	0.80	4.910E-02	97.50	30.000	PBC<MDA	Gd153
99.50	3.	563.38	0.80	4.903E-02	99.50	15.000	PBC<MDA	Np239
103.20	17.	122.54	0.81	4.884E-02	103.20	21.800	PBC<MDA	Gd153
103.70	12.	174.06	0.81	4.881E-02	103.70	24.000	PBC<MDA	Np239
106.13	10.	210.13	0.81	4.866E-02	106.13	22.700	PBC<MDA	Np239
121.84	8.	148.29	0.83	4.718E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.840E-02	CO57
123.10	11.	174.10	0.83	4.702E-02	123.10	40.790	PBC<MDA	EU154
131.10	17.	112.66	0.84	4.599E-02	131.29	18.000	PBC<MDA	PA234
133.02	15.	138.65	0.84	4.576E-02	133.02	43.300	PBC<MDA	HF181
133.54	15.	143.43	0.84	4.569E-02	133.54	11.090	PBC<MDA	CE144
143.79	-7.	346.61	0.85	4.425E-02	143.79	10.960	PBC<MDA	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
145.44	17.	104.63	0.85	4.401E-02	145.44	48.200	PBC<MDA	CE141
185.72	3.	738.09	0.89	3.800E-02	185.72	54.000	PBC<MDA	U235
205.33	15.	105.70	0.91	3.553E-02	205.33	5.010	PBC<MDA	U235
210.85	4.	405.53	0.92	3.489E-02	210.85	2.990	PBC<MDA	TH229
227.00	33.	41.92	0.93	3.318E-02	227.00	6.300	PBC<MDA	Cf251
235.97	16.	135.47	0.94	3.230E-02	235.97	12.300	PBC<MDA	TH227
238.63	-20.	117.01	0.94	3.205E-02	238.63	43.300	PBC<MDA	PB212
256.24	2.	713.00	0.96	3.050E-02	256.24	7.000	PBC<MDA	TH227
263.70	6.	198.61	0.97	2.989E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	11.	101.56	0.97	2.972E-02	265.83	50.000	PBC<MDA	BI210M
277.28	13.	96.52	0.98	2.884E-02	277.28	6.310	PBC<MDA	TL208
279.20	13.	104.49	0.99	2.870E-02	279.20	81.460	PBC<MDA	Hg203
284.30	2.	763.22	0.99	2.833E-02	284.30	6.140	PBC<MDA	I131
295.09	-10.	242.43	1.00	2.759E-02	295.09	19.300	PBC<MDA	PB214
296.00	15.	165.29	1.00	2.753E-02	296.00	79.000	PBC<MDA	TL210
300.03	10.	246.03	1.01	2.726E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
316.49	12.	93.47	1.02	2.622E-02	316.49	87.040	PBC<MDA	Ir192
351.93	-19.	80.71	1.06	2.426E-02	351.93	37.600	PBC<MDA	PB214
383.84	11.	116.11	1.09	2.274E-02	383.84	8.940	PBC<MDA	BA133
387.95	11.	123.05	1.09	2.256E-02	387.95	66.000	PBC<MDA	Cf249
433.94	25.	41.10	1.13	2.072E-02	433.94	90.480	1.838E-01	AG108M
453.88	11.	102.04	1.15	2.002E-02	453.88	65.000	PBC<MDA	PM146
463.37	9.	117.85	1.16	1.970E-02	463.37	10.470	PBC<MDA	SB125
477.60	12.	96.92	1.18	1.925E-02	477.60	10.520	PBC<MDA	BE7
511.86	76.	25.48	2.46	1.823E-02	511.86	20.000	2.899E+00	RH106
563.24	9.	128.80	1.25	1.691E-02	563.24	8.350	PBC<MDA	CS134
569.32	11.	71.41	1.26	1.676E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.085E+00	PA234
					569.70	97.740	9.104E-02	BI207
569.47	3.	293.64	1.26	1.676E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.134E-01	PA234
					569.70	97.740	2.630E-02	BI207
609.31	-30.	87.24	1.30	1.587E-02	609.31	46.090	PBC<MDA	BI214
621.92	8.	175.70	1.31	1.561E-02	621.92	9.930	PBC<MDA	RH106
635.89	12.	72.90	1.32	1.534E-02	635.89	11.310	PBC<MDA	SB125
661.66	6.	159.30	1.34	1.485E-02	661.66	85.210	PBC<MDA	CS137
702.63	5.	229.47	1.38	1.414E-02	702.63	97.900	PBC<MDA	NB94
722.79	14.	61.39	1.40	1.381E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.536E-01	AG108M
					723.36	20.220	6.905E-01	EU154
722.94	10.	100.96	1.40	1.381E-02	722.79	10.810	9.035E-01	SB124
					722.94	90.840	1.075E-01	AG108M
					723.36	20.220	4.834E-01	EU154
723.36	6.	173.97	1.40	1.380E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	6.734E-02	AG108M
					723.36	20.220	3.027E-01	EU154

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
756.73	3.	249.17	1.43	1.329E-02	756.73	54.460	PBC<MDA	ZR95
763.94	10.	55.81	1.43	1.319E-02	763.94	22.280	PBC<MDA	AG110M
765.79	7.	100.37	1.43	1.316E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.70	9.	104.98	1.44	1.298E-02	778.92	12.940	PBC<MDA	EU152
785.42	4.	154.07	1.45	1.289E-02	785.42	1.280	PBC<MDA	BI212
795.87	9.	87.26	1.46	1.275E-02	795.87	85.530	PBC<MDA	CS134
801.95	11.	93.82	1.46	1.267E-02	801.95	8.690	PBC<MDA	CS134
834.85	7.	121.98	1.49	1.224E-02	834.85	99.980	PBC<MDA	MN54
860.56	2.	430.47	1.51	1.193E-02	860.56	12.420	PBC<MDA	TL208
873.23	3.	314.64	1.52	1.179E-02	873.23	12.270	PBC<MDA	EU154
898.04	4.	225.99	1.54	1.151E-02	898.04	93.700	PBC<MDA	Y88
911.07	3.	389.11	1.55	1.137E-02	911.07	29.000	PBC<MDA	AC228
946.02	6.	93.56	1.58	1.101E-02	946.02	13.400	PBC<MDA	PA234
964.11	5.	128.35	1.60	1.083E-02	964.11	14.605	PBC<MDA	EU152
968.97	8.	88.26	1.60	1.079E-02	968.97	17.460	PBC<MDA	AC228
1001.00	2.	717.40	1.63	1.049E-02	1001.00	0.837	PBC<MDA	PA234M
1050.36	8.	91.56	1.66	1.006E-02	1050.36	1.560	PBC<MDA	RH106
1077.40	2.	431.57	1.69	9.838E-03	1077.40	3.300	PBC<MDA	Ga68
1121.30	9.	161.54	1.72	9.500E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	3.631E-01	Ta182
1189.05	6.	89.49	1.77	9.021E-03	1189.05	16.200	PBC<MDA	Ta182
1221.41	15.	44.30	1.79	8.808E-03	1221.41	27.000	8.565E-01	Ta182
1274.53	7.	89.21	1.83	8.481E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	3.258E-01	EU154
1313.00	2.	324.82	1.86	8.258E-03	1313.00	21.000	PBC<MDA	TL210
1332.50	11.	34.06	1.87	8.149E-03	1332.50	99.980	1.884E-01	CO60
1408.15	1.	914.69	1.92	7.754E-03	1408.00	21.005	PBC<MDA	EU152
1460.83	1.	430.89	1.96	7.499E-03	1460.83	10.670	PBC<MDA	K40
1690.98	5.	113.28	2.10	6.556E-03	1690.98	47.790	PBC<MDA	SB124
1836.06	2.	376.36	2.19	6.072E-03	1836.06	99.200	PBC<MDA	Y88

No unknown peaks passed sensitivity test.

This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.46	46.51	165.	22.	0.003	104.98	1.366s
TH-227	199.98	50.14	81.	7.	0.001	219.69	0.751s
AM-241	237.55	59.54	111.	2.	0.000	889.52	0.761s
TH-234	252.55	63.29	229.	-39.	-0.005	53.71	0.765s
Sn-126	256.52	64.28	190.	14.	0.002	139.50	0.766
BA-133	323.33	80.99	109.	10.	0.001	183.28	0.784s
Np-237	345.33	86.49	660.	-21.	-0.003	170.90	0.789s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	345.54	86.54	638.	-21.	-0.003	168.09	0.790s
Sn-126	347.13	86.94	606.	-21.	-0.003	163.75	0.790s
Sn-126	349.65	87.57	584.	8.	0.001	159.91	0.791D
Cd-109	351.53	88.04	542.	0.	0.000	263.40	0.791A
Nd-147	363.77	91.10	461.	7.	0.001	415.55	0.794s
TH-234	369.71	92.59	191.	24.	0.003	103.02	1.321s
AC-228	372.76	93.35	419.	20.	0.003	148.11	0.797s
Gd-153	389.36	97.50	150.	6.	0.001	308.87	0.801s
Np-239	397.36	99.50	175.	3.	0.000	563.38	0.803s
Gd-153	412.15	103.20	198.	17.	0.002	122.54	0.807s
Np-239	414.15	103.70	215.	12.	0.002	174.06	0.807s
EU-155	420.60	105.31	195.	-9.	-0.001	218.05	0.809s
Np-239	423.87	106.13	194.	10.	0.001	210.13	0.810s
EU-152	486.45	121.78	162.	8.	0.001	148.29	0.826D
EU-154	491.73	123.10	167.	11.	0.001	174.10	0.828s
PA-234	524.50	131.29	179.	17.	0.002	112.66	0.836
HF-181	531.42	133.02	196.	15.	0.002	138.65	0.838s
CE-144	533.47	133.54	211.	15.	0.002	143.43	0.838s
HF-181	544.52	136.30	293.	-18.	-0.002	138.17	0.841s
CO-57	545.21	136.47	275.	-18.	-0.002	134.03	0.841s
U-235	574.45	143.79	309.	-7.	-0.001	346.61	0.849s
CE-141	581.07	145.44	154.	17.	0.002	104.63	0.850s
U-235	652.81	163.38	197.	-4.	-0.001	706.43	0.869s
CE-139	662.70	165.85	166.	0.	0.000	1000.00	0.871s
Cf-251	705.68	176.60	117.	-7.	-0.001	290.90	0.882s
U-235	742.15	185.72	151.	3.	0.000	738.09	0.892s
TH-229	773.30	193.51	114.	-9.	-0.001	237.52	0.899s
U-235	820.58	205.33	77.	15.	0.002	105.70	0.912s
TH-229	842.65	210.85	85.	4.	0.001	405.53	0.917
Cf-251	907.23	227.00	50.	33.	0.005	41.92	0.933s
TH-227	943.11	235.97	218.	16.	0.002	135.47	0.942
PB-212	953.75	238.63	265.	-20.	-0.003	117.01	0.945s
EU-152	977.99	244.69	91.	-17.	-0.002	104.58	0.951s
TH-227	1024.17	256.24	87.	2.	0.000	713.00	0.962s
Cd-113m	1054.01	263.70	68.	6.	0.001	198.61	0.970s
BI-210M	1062.53	265.83	59.	11.	0.002	101.56	0.972s
TL-208	1108.33	277.28	75.	13.	0.002	96.52	0.983s
Hg-203	1115.99	279.20	83.	13.	0.002	104.49	0.985s
I-131	1136.39	284.30	66.	2.	0.000	763.22	0.990s
PB-214	1179.54	295.09	301.	-10.	-0.001	242.43	1.001s
TL-210	1183.18	296.00	291.	15.	0.002	165.29	1.002s
PB-212	1199.30	300.03	307.	10.	0.001	246.03	1.006s
PA-231	1199.46	300.07	317.	0.	0.000	1000.00	1.006s
PA-233	1199.90	300.18	317.	0.	0.000	1000.00	1.006s
PA-231	1209.78	302.65	317.	0.	0.000	1000.00	1.008s
BA-133	1210.59	302.85	317.	0.	0.000	1000.00	1.009s
Ba-140	1218.57	304.85	317.	0.	0.000	1000.00	1.011s
BI-210M	1218.76	304.90	317.	0.	0.000	1000.00	1.011s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ir-192	1232.94	308.44	386.	-17.	-0.002	166.15	1.014s
PA-233	1247.22	312.01	352.	-18.	-0.002	141.74	1.018s
Ir-192	1265.13	316.49	60.	12.	0.002	93.47	1.022s
CR-51	1279.51	320.08	111.	-6.	-0.001	252.79	1.026s
La-140	1314.21	328.76	84.	-14.	-0.002	122.74	1.034s
Cf-249	1332.92	333.44	66.	-4.	-0.001	383.24	1.039s
Cs-136	1361.44	340.57	186.	-19.	-0.003	106.79	1.045
EU-152	1376.30	344.29	201.	-19.	-0.003	110.31	1.049s
HF-181	1382.47	345.83	217.	-18.	-0.003	116.43	1.050s
PB-214	1406.88	351.93	122.	-19.	-0.003	80.71	1.056s
BA-133	1423.15	356.00	129.	-7.	-0.001	228.11	1.060s
I-131	1457.08	364.48	66.	-8.	-0.001	193.25	1.069s
BA-133	1534.50	383.84	81.	11.	0.002	116.11	1.087s
Cf-249	1550.94	387.95	92.	11.	0.002	123.05	1.091s
SN-113	1565.90	391.69	177.	-20.	-0.003	79.87	1.095s
SB-125	1710.63	427.88	40.	-6.	-0.001	191.76	1.129
AG-108M	1734.87	433.94	22.	25.	0.003	41.10	1.135s
PM-146	1814.64	453.88	32.	11.	0.002	102.04	1.154s
SB-125	1852.59	463.37	53.	9.	0.001	117.85	1.163s
Ir-192	1871.36	468.06	81.	-3.	0.000	475.39	1.167
BE-7	1909.50	477.60	64.	12.	0.002	96.92	1.176s
HF-181	1927.10	482.00	82.	-5.	-0.001	247.58	1.180s
La-140	1947.19	487.02	56.	-15.	-0.002	98.43	1.185s
RU-103	1987.33	497.05	53.	-14.	-0.002	80.48	1.194
RH-106	2046.57	511.86	136.	76.	0.011	25.48	2.458s
Kr-85	2055.03	513.98	212.	0.	0.000	1000.00	1.210
Nd-147	2123.11	531.00	56.	-16.	-0.002	95.27	1.225s
Ba-140	2148.15	537.26	37.	-3.	0.000	685.51	1.231s
CS-134	2252.06	563.24	31.	9.	0.001	128.80	1.255
CS-134	2276.40	569.32	24.	11.	0.001	71.41	1.260s
PA-234	2276.99	569.47	40.	3.	0.000	293.64	1.261
BI-207	2277.92	569.70	48.	-4.	0.000	286.43	1.261s
TL-208	2331.20	583.02	62.	-25.	-0.004	53.39	1.273s
SB-125	2401.12	600.50	257.	-17.	-0.002	137.36	1.289
SB-124	2410.04	602.73	273.	-17.	-0.002	141.42	1.291s
CS-134	2417.96	604.71	290.	-16.	-0.002	151.55	1.292s
BI-214	2436.36	609.31	336.	-30.	-0.004	87.24	1.296s
PM-144	2471.37	618.06	259.	-20.	-0.003	132.05	1.304s
RH-106	2486.79	621.92	94.	8.	0.001	175.70	1.308s
SB-125	2542.69	635.89	30.	12.	0.002	72.90	1.320
I-131	2547.03	636.97	57.	-11.	-0.001	104.40	1.321s
AG-110M	2630.18	657.76	51.	-4.	-0.001	661.39	1.339s
CS-137	2645.77	661.66	45.	6.	0.001	159.30	1.343s
PM-144	2785.32	696.54	44.	-6.	-0.001	419.31	1.374s
NB-94	2809.67	702.63	35.	5.	0.001	229.47	1.379s
SB-124	2890.31	722.79	29.	14.	0.002	61.39	1.396s
AG-108M	2890.91	722.94	43.	10.	0.001	100.96	1.397s
EU-154	2892.60	723.36	53.	6.	0.001	173.97	1.397s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-146	2942.05	735.72	39.	-12.	-0.002	215.40	1.408s
ZR-95	3026.09	756.73	13.	3.	0.000	249.17	1.426s
AG-110M	3054.96	763.94	11.	10.	0.001	55.81	1.432s
NB-95	3062.34	765.79	21.	7.	0.001	100.37	1.433s
PA-234M	3064.83	766.41	49.	-13.	-0.002	197.71	1.434
EU-152	3114.87	778.92	17.	9.	0.001	104.98	1.444s
BI-212	3140.88	785.42	9.	4.	0.001	154.07	1.450s
CS-134	3182.68	795.87	25.	9.	0.001	87.26	1.459s
TL-210	3197.61	799.60	93.	-18.	-0.002	80.94	1.462s
CS-134	3207.01	801.95	51.	11.	0.002	93.82	1.464s
CO-58	3242.31	810.77	48.	-2.	0.000	394.97	1.471s
La-140	3262.30	815.77	50.	0.	0.000	1000.00	1.475s
Cs-136	3273.22	818.50	62.	-8.	-0.001	152.32	1.478s
MN-54	3338.63	834.85	16.	7.	0.001	121.98	1.492
TL-208	3441.51	860.56	20.	2.	0.000	430.47	1.513s
NB-94	3483.65	871.10	37.	-11.	-0.002	81.83	1.522s
EU-154	3492.19	873.23	53.	3.	0.000	314.64	1.523s
PA-234	3521.39	880.53	64.	-13.	-0.002	90.88	1.529s
PA-234	3532.24	883.24	74.	-6.	-0.001	207.71	1.531s
AG-110M	3538.01	884.68	80.	0.	0.000	1000.00	1.533s
Y-88	3591.45	898.04	16.	4.	0.001	225.99	1.543
AC-228	3643.58	911.07	23.	3.	0.000	389.11	1.554s
AG-110M	3749.30	937.49	34.	-8.	-0.001	110.14	1.576s
PA-234	3783.42	946.02	5.	6.	0.001	93.56	1.582
EU-152	3855.80	964.11	15.	5.	0.001	128.35	1.597
AC-228	3875.25	968.97	20.	8.	0.001	88.26	1.601s
EU-154	3984.71	996.33	74.	-15.	-0.002	85.24	1.622s
PA-234M	4003.39	1001.00	80.	2.	0.000	717.40	1.626s
Co-56	4150.81	1037.84	21.	-5.	-0.001	264.23	1.655s
Cs-136	4191.74	1048.07	30.	-11.	-0.002	76.60	1.663s
RH-106	4200.91	1050.36	24.	8.	0.001	91.56	1.665s
BI-207	4254.12	1063.66	20.	-4.	-0.001	250.83	1.675s
Ga-68	4309.10	1077.40	15.	2.	0.000	431.57	1.685s
FE-59	4396.54	1099.25	15.	0.	0.000	1000.00	1.702s
EU-152	4447.85	1112.07	75.	-16.	-0.002	81.58	1.712
ZN-65	4461.74	1115.55	90.	-11.	-0.002	126.85	1.714s
BI-214	4480.72	1120.29	111.	-9.	-0.001	148.62	1.718s
Sc-46	4481.77	1120.55	101.	0.	0.000	1000.00	1.718s
Ta-182	4484.77	1121.30	94.	9.	0.001	161.54	1.719s
CO-60	4692.60	1173.24	10.	0.	0.000	1000.00	1.757s
Ta-182	4755.88	1189.05	5.	6.	0.001	89.49	1.769s
Ta-182	4885.38	1221.41	5.	15.	0.002	44.30	1.792s
Co-56	4952.89	1238.28	29.	-12.	-0.002	122.54	1.805s
NA-22	5097.96	1274.53	16.	7.	0.001	89.21	1.831s
EU-154	5098.00	1274.54	23.	0.	0.000	1000.00	1.831s
FE-59	5166.25	1291.60	22.	-8.	-0.001	190.18	1.843s
TL-210	5251.92	1313.00	11.	2.	0.000	324.82	1.858s
CO-60	5329.96	1332.50	1.	11.	0.002	34.06	1.871s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	5537.26	1384.30	28.	-5.	-0.001	87.37	1.907s
EU-152	5632.13	1408.00	16.	1.	0.000	914.69	1.923s
K-40	5843.58	1460.83	16.	1.	0.000	430.89	1.958s
La-140	6385.44	1596.21	11.	-4.	-0.001	188.42	2.044s
SB-124	6764.81	1690.98	6.	5.	0.001	113.28	2.102s
BI-214	7059.07	1764.49	34.	-18.	-0.002	49.59	2.145s
Co-56	7086.53	1771.35	25.	-2.	0.000	431.28	2.149s
Y-88	7345.59	1836.06	7.	2.	0.000	376.36	2.185s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample		COMMENTS
BE-7	C	8.4123E-01					5.31E+01	
			477.60	8.412E-01	?(	2.753E+00	9.69E+01	1.05E+01 G
NA-22	C	1.1471E-01					9.50E+02	
			1274.53	1.147E-01	?(	3.499E-01	8.92E+01	9.99E+01 G
K-40	N	2.5458E-01					4.66E+11	
			1460.83	2.546E-01	?(P	3.658E+00	4.31E+02	1.07E+01 G
Sc-46	F	-1.1968E-02					8.38E+01	
			889.28	-1.197E-02	%(	5.375E-01	1.28E+03	1.00E+02 G
			1120.55	0.000E+00	+	7.251E-01	1.00E+03	1.00E+02 G
CR-51	F	-3.2083E-01					2.77E+01	
			320.08	-3.208E-01	?(	2.783E+00	2.53E+02	9.94E+00 G
MN-54	C	8.0800E-02					3.12E+02	
			834.85	8.080E-02	?(P	2.413E-01	1.22E+02	1.00E+02 G
Co-56	C	3.8289E-03					7.73E+01	
			846.77	3.829E-03	%(	2.624E-01	2.76E+03	9.99E+01 G
			1238.28	-2.800E-01	+ P	6.674E-01	1.23E+02	6.61E+01 G
			1037.84	-4.729E-01	+ P	2.322E+00	2.64E+02	1.41E+01 G
			1771.35	-2.381E-01	+	3.716E+00	4.31E+02	1.55E+01 A
CO-57	C	-5.1064E-01					2.72E+02	
			122.06	2.213E-03	}	2.187E-01	1.25E+03	8.56E+01 G
			136.47	-5.106E-01	?(	2.298E+00	1.34E+02	1.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-58	C	-2.7818E-02					7.09E+01	
			810.78	-2.782E-02	?(	3.875E-01	3.95E+02	9.95E+01 G
CO-60	F	1.8838E-01					1.93E+03	
			1332.50	1.884E-01	&(P	1.256E-01	3.41E+01	1.00E+02 G
			1173.24	0.000E+00	-	2.657E-01	1.00E+03	9.99E+01 G
ZN-65	F	-3.1400E-01					2.44E+02	
			1115.55	-3.140E-01	?(	1.353E+00	1.27E+02	5.06E+01 G
NB-94	I	5.3528E-02					7.41E+06	
			702.63	5.353E-02	?(	3.026E-01	2.29E+02	9.79E+01 G
			871.10	-1.334E-01	&	3.670E-01	8.18E+01	9.99E+01 G
ZR-95	I	5.8228E-02					6.40E+01	
			756.73	5.823E-02	?(	3.743E-01	2.49E+02	5.45E+01 G
			724.20	4.352E-08	%	8.786E-01	5.70E+08	4.42E+01 G
NB-95	I	7.4518E-02					6.40E+01	
			765.79	7.452E-02	?(	2.571E-01	1.00E+02	9.98E+01 G
RU-103	I	-1.1188E-01					3.93E+01	
			497.05	-1.119E-01	?(P	2.991E-01	8.05E+01	9.09E+01 G
			610.30	-5.812E-07	%	1.284E+01	6.49E+08	5.75E+00 GA
RH-106	I	1.6006E+00					3.74E+02	
			621.92	7.136E-01	?(	4.289E+00	1.76E+02	9.93E+00 G
			1050.36	7.247E+00	?(	2.261E+01	9.16E+01	1.56E+00 G
			511.86	2.899E+00	? P	2.172E+00	2.55E+01	2.00E+01 GA
AG-108M	C	1.4560E-01					1.53E+05	
			433.94	1.838E-01	&(P	1.827E-01	4.11E+01	9.05E+01 G
			722.94	1.075E-01	?(	3.692E-01	1.01E+02	9.08E+01 G
			614.28	3.739E-08	%	8.260E-01	6.49E+08	8.98E+01 G
AG-110M	F	1.1268E-01					2.50E+02	
			884.68	0.000E+00	?(	7.276E-01	1.00E+03	7.27E+01 G
			657.76	-3.882E-02	+ P	3.538E-01	6.61E+02	9.46E+01 G
			937.49	-2.917E-01	+ P	1.089E+00	1.10E+02	3.44E+01 G
			1384.30	-3.576E-01	+ P	1.985E+00	8.74E+01	2.43E+01 G
			763.94	4.803E-01	?(	8.585E-01	5.58E+01	2.23E+01 G
SN-113	F	-1.9333E-01					1.15E+02	
			391.69	-1.933E-01	(P	6.272E-01	7.99E+01	6.40E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-124	F	6.8155E-02					6.02E+01	
			602.73	-1.482E-01	&(	7.041E-01	1.41E+02	9.83E+01 G
			1690.98	2.364E-01	?(	6.119E-01	1.13E+02	4.78E+01 G
			722.79	1.291E+00	?(	2.600E+00	6.14E+01	1.08E+01 G
SB-125	I	2.4963E-01					1.01E+03	
			427.88	-1.419E-01	?(	7.237E-01	1.92E+02	2.96E+01 G
			600.50	-8.116E-01	&	3.746E+00	1.37E+02	1.79E+01 G
			635.89	9.342E-01	?(	2.272E+00	7.29E+01	1.13E+01 G
			463.37	6.169E-01	?(P	2.464E+00	1.18E+02	1.05E+01 G
I-131	I	-4.2511E-02					8.02E+00	
			364.48	-5.775E-02	?(	2.929E-01	1.93E+02	8.17E+01 G
			284.30	1.603E-01	&(	3.251E+00	7.63E+02	6.14E+00 G
			636.97	-1.354E+00	+	4.798E+00	1.04E+02	7.17E+00 G
Gd-153	F	1.2201E-01					2.42E+02	
			97.50	5.343E-02	?(	5.643E-01	3.09E+02	3.00E+01 G
			103.20	2.164E-01	?(	8.914E-01	1.23E+02	2.18E+01 G
Ga-68	C	1.5152E+00					4.71E-02	
			1077.40	1.515E+00	?(	1.573E+01	4.32E+02	3.30E+00 G
Tc-99m	I	3.9082E-03					2.51E-01	
			140.51	3.908E-03	%(	3.266E-01	2.46E+03	8.93E+01 G
BA-133	F	-6.6459E-02					3.85E+03	
			356.00	-6.646E-02	?(	5.180E-01	2.28E+02	6.20E+01 G
			302.85	0.000E+00	&	2.398E+00	1.00E+03	1.83E+01 G
			383.84	7.747E-01	?	3.050E+00	1.16E+02	8.94E+00 GA
			80.99	8.180E-02	? P	4.298E-01	1.83E+02	3.41E+01 GA
CS-134	I	3.2265E-01					7.54E+02	
			795.87	1.119E-01	?(	3.314E-01	8.73E+01	8.55E+01 G
			604.71	-1.436E-01	&	7.313E-01	1.52E+02	9.76E+01 G
			569.32	5.782E-01	(	1.376E+00	7.14E+01	1.54E+01 G
			801.95	1.436E+00	?(	4.555E+00	9.38E+01	8.69E+00 G
			563.24	8.512E-01	&(P	2.815E+00	1.29E+02	8.35E+00 G
CS-137	I	6.7695E-02					1.10E+04	
			661.66	6.769E-02	&(	3.735E-01	1.59E+02	8.52E+01 G
Ba-140	I	-9.2357E-02					1.28E+01	
			537.26	-9.236E-02	(P	1.006E+00	6.86E+02	2.44E+01 G
			162.66	5.393E-02	&	3.629E+00	1.96E+03	6.22E+00 G
			304.85	0.000E+00	+	1.029E+01	1.00E+03	4.29E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
La-140	I	-9.1238E-02					1.28E+01	
			1596.21	-9.124E-02	?(	3.874E-01	1.88E+02	9.54E+01 G
			487.02	-2.482E-01	+	6.052E-01	9.84E+01	4.55E+01 G
			328.76	-3.845E-01	+	1.221E+00	1.23E+02	2.03E+01 G
			815.77	0.000E+00	+	1.704E+00	1.00E+03	2.33E+01 G
CE-141	I	1.1286E-01					3.25E+01	
			145.44	1.129E-01	?(	3.964E-01	1.05E+02	4.82E+01 G
CE-144	I	3.9920E-01					2.85E+02	
			133.54	3.992E-01	*(	1.929E+00	1.43E+02	1.11E+01 G
PM-144	C	-6.1655E-02					3.63E+02	
			696.54	-6.166E-02	?(P	3.322E-01	4.19E+02	9.90E+01 G
			618.06	-1.759E-01	& P	6.945E-01	1.32E+02	9.91E+01 G
EU-152	F	8.5010E-02					4.94E+03	
			121.78	8.501E-02	}	6.389E-01	1.48E+02	2.86E+01 G
			344.29	-3.952E-01	?(	1.462E+00	1.10E+02	2.65E+01 G
			1112.07	-1.676E+00	+	4.572E+00	8.16E+01	1.36E+01 G
			778.92	7.151E-01	?(P	1.830E+00	1.05E+02	1.29E+01 G
			964.11	3.981E-01	(	1.805E+00	1.28E+02	1.46E+01 G
			244.69	-9.695E-01	+	2.739E+00	1.05E+02	7.58E+00 G
			1408.00	8.527E-02	?	1.821E+00	9.15E+02	2.10E+01 GA
EU-154	I	1.8013E-01					3.14E+03	
			123.10	7.729E-02	(	4.561E-01	1.74E+02	4.08E+01 G
			1274.54	0.000E+00	-	1.166E+00	1.00E+03	3.52E+01 G
			723.36	3.027E-01	?(	1.822E+00	1.74E+02	2.02E+01 G
			873.23	3.201E-01	?(	3.528E+00	3.15E+02	1.23E+01 G
			1004.77	-7.378E-02	&	3.137E+00	1.21E+03	1.80E+01 G
			996.33	-1.858E+00	+	5.309E+00	8.52E+01	1.06E+01 G
EU-155	I	-1.2328E-01					1.81E+03	
			105.31	-1.233E-01	(	9.120E-01	2.18E+02	2.12E+01 G
			86.54	-1.975E-01	&	1.110E+00	1.68E+02	3.07E+01 G
HF-181	F	4.7850E-03					4.24E+01	
			482.00	-4.752E-02	?(	4.061E-01	2.48E+02	8.05E+01 G
			133.02	1.020E-01	?(	4.767E-01	1.39E+02	4.33E+01 G
			345.83	-6.847E-01	&	2.675E+00	1.16E+02	1.51E+01 G
			136.30	-9.318E-01	+	4.321E+00	1.38E+02	5.85E+00 G
Ta-182	F	5.7965E-01					1.14E+02	
			1121.30	3.631E-01	?(	2.003E+00	1.62E+02	3.49E+01 G
			1221.41	8.565E-01	?(	7.867E-01	4.43E+01	2.70E+01 G
			1189.05	5.848E-01	?(	1.248E+00	8.95E+01	1.62E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Hg-203	F	7.6123E-02					4.66E+01	
			279.20	7.612E-02	(	2.687E-01	1.04E+02	8.15E+01 G
TL-208	N	-2.5186E-01					6.98E+02	
			583.02	-2.519E-01	?(P	3.944E-01	5.34E+01	8.45E+01 G
			277.28	1.010E+00	+	3.287E+00	9.65E+01	6.31E+00 G
			860.56	2.065E-01	+ P	2.197E+00	4.30E+02	1.24E+01 G
PM-146	C	1.2109E-01					2.02E+03	
			453.88	1.211E-01	&(	3.103E-01	1.02E+02	6.50E+01 G
			747.16	2.027E-02	%	8.627E-01	1.69E+03	3.40E+01 G
			735.72	-5.540E-01	+ P	1.447E+00	2.15E+02	2.25E+01 G
Y-88	F	4.3608E-02					1.07E+02	
			1836.06	3.883E-02	?(P	3.531E-01	3.76E+02	9.92E+01 G
			898.04	4.866E-02	&(P	2.766E-01	2.26E+02	9.37E+01 G
Cd-113m		4.6470E+02					5.33E+03	
			263.70	4.647E+02	(	3.186E+03	1.99E+02	6.00E-03 K
Cf-251	T	-1.3865E-01					3.28E+05	
			176.60	-1.386E-01	?(	1.103E+00	2.91E+02	1.70E+01 G
			227.00	2.193E+00	*	2.370E+00	4.19E+01	6.30E+00 GA
Cf-249	T	1.0615E-01					1.28E+05	
			387.95	1.061E-01	?(	4.430E-01	1.23E+02	6.60E+01 G
			333.44	-1.419E-01	&	1.439E+00	3.83E+02	1.55E+01 G
Sn-126		4.4313E-01					3.65E+07	
			87.57	6.001E-02	}	8.696E-01	1.60E+02	3.75E+01 GA
			64.28	4.431E-01	&(	2.084E+00	1.39E+02	9.70E+00 G
			86.94	-6.708E-01	&	3.673E+00	1.64E+02	9.04E+00 GA
PB-210	N	1.8724E+00					8.14E+03	
			46.54	1.872E+00	*(P	5.312E+00	1.05E+02	4.25E+00 G
PB-212	N	-1.9621E-01					6.98E+02	
			238.63	-1.962E-01	?(P	7.857E-01	1.17E+02	4.33E+01 G
			300.03	1.581E+00	? P	1.310E+01	2.46E+02	3.28E+00 GA
PB-214	N	-2.9272E-01					5.84E+05	
			351.93	-2.927E-01	@(P	8.256E-01	8.07E+01	3.76E+01 G
			295.09	-2.675E-01	& P	2.180E+00	2.42E+02	1.93E+01 G
			242.00	3.926E-02	&	4.177E+00	3.11E+03	7.43E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-207	C	-7.4957E-02					1.18E+04	
			1063.66	-7.496E-02	&(	4.413E-01	2.51E+02	7.45E+01 G
			569.70	-2.969E-02	&	2.983E-01	2.86E+02	9.77E+01 G
BI-212	N	-2.5535E-07					6.98E+02	
			727.17	-2.554E-07	&(	5.155E+00	5.70E+08	7.55E+00 G
			785.42	3.466E+00	?	1.383E+01	1.54E+02	1.28E+00 GA
U-235	N	2.2804E-01					2.57E+11	
			143.79	-2.097E-01	*(P	2.425E+00	3.47E+02	1.10E+01 G
			205.33	1.186E+00	&(	3.395E+00	1.06E+02	5.01E+00 G
			163.38	-2.414E-01	+ P	4.506E+00	7.06E+02	5.08E+00 G
			185.72	1.952E-02	- P	4.061E-01	7.38E+02	5.40E+01 GA
BI-214	N	-5.6160E-01					5.84E+05	
			609.31	-5.616E-01	*(P	1.673E+00	8.72E+01	4.61E+01 G
			1120.29	-9.094E-01	+ P	5.006E+00	1.49E+02	1.51E+01 G
			1764.49	-2.557E+00	+ P	4.269E+00	4.96E+01	1.54E+01 G
BI-210M	T	1.0475E-01					1.10E+09	
			265.83	1.048E-01	?(	3.604E-01	1.02E+02	5.00E+01 G
			304.90	0.000E+00	-	1.577E+00	1.00E+03	2.80E+01 G
AC-228	N	2.8830E-01					2.10E+03	
			911.07	1.123E-01	?(	1.062E+00	3.89E+02	2.90E+01 G
			968.97	5.806E-01	&(	1.745E+00	8.83E+01	1.75E+01 G
			338.32	-2.315E-02	%	2.764E+00	3.46E+03	1.20E+01 G
			93.35	1.004E+00	&	4.981E+00	1.48E+02	5.56E+00 XA
TH-227	N	3.7425E-01					7.95E+03	
			256.24	1.518E-01	?(	2.999E+00	7.13E+02	7.00E+00 G
			235.97	5.491E-01	(	2.503E+00	1.35E+02	1.23E+01 G
			50.14	3.001E-01	?(	1.914E+00	2.20E+02	8.00E+00 G
TH-229	N	-2.4386E-01					2.68E+06	
			193.51	-7.801E-01	&(P	4.482E+00	2.38E+02	4.40E+00 G
			210.85	5.453E-01	?(P	6.077E+00	4.06E+02	2.99E+00 G
TH-234	N	1.2186E+00					1.63E+12	
			92.59	1.219E+00	(P	3.393E+00	1.03E+02	5.58E+00 G
			63.29	-3.134E+00	+ P	5.838E+00	5.37E+01	3.81E+00 G
PA-233	C	-2.5891E-01					7.82E+08	
			312.01	-2.589E-01	&(P	1.312E+00	1.42E+02	3.60E+01 G
			300.18	0.000E+00	+	7.044E+00	1.00E+03	6.20E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234	N	3.7135E-01					1.63E+12	
			131.29	2.886E-01	?(	1.092E+00	1.13E+02	1.80E+01 G
			946.02	5.180E-01	(	1.203E+00	9.36E+01	1.34E+01 G
			569.47	3.134E-01	(	3.249E+00	2.94E+02	8.20E+00 G
			883.24	-7.404E-01	+	5.304E+00	2.08E+02	9.60E+00 G
			880.53	-2.576E+00	+	7.882E+00	9.09E+01	6.00E+00 GA
PA-234M	N	2.8199E+00					1.63E+12	
			1001.00	2.820E+00	?(P	7.027E+01	7.17E+02	8.37E-01 G
			766.41	-4.807E+01	+ P	1.274E+02	1.98E+02	2.94E-01 G
AM-241	T	1.7384E-02					1.58E+05	
			59.54	1.738E-02	*(	4.503E-01	8.90E+02	3.59E+01 G
Np-237	F	-4.6275E-01					2.14E+06	
			86.49	-4.628E-01	&(	2.644E+00	1.71E+02	1.31E+01 G
Ir-192	F	7.4874E-02					7.40E+01	
			316.49	7.487E-02	?(	2.361E-01	9.35E+01	8.70E+01 G
			468.06	-3.699E-02	-	6.119E-01	4.75E+02	5.18E+01 G
			308.44	-2.768E-01	+	1.543E+00	1.66E+02	3.18E+01 G
Cs-136	F	-8.3671E-02					1.30E+01	
			818.50	-8.367E-02	?(	4.379E-01	1.52E+02	1.00E+02 G
			1048.07	-1.895E-01	+	4.864E-01	7.66E+01	8.00E+01 G
			340.57	-2.208E-01	&	7.906E-01	1.07E+02	4.69E+01 G
Np-239	T	1.2098E-01					2.36E+00	
			103.70	1.450E-01	?	8.527E-01	1.74E+02	2.40E+01 X
			106.13	1.210E-01	&(	8.621E-01	2.10E+02	2.27E+01 G
			99.50	6.375E-02	?	1.230E+00	5.63E+02	1.50E+01 X
Nd-147		-9.6146E-01					1.11E+01	
			531.00	-9.615E-01	?(	2.267E+00	9.53E+01	1.30E+01 G
			91.10	7.318E-02	+	1.025E+00	4.16E+02	2.83E+01 G
TL-210	N	-1.9466E-01					5.84E+05	
			799.60	-1.947E-01	?(	5.261E-01	8.09E+01	9.90E+01 G
			296.00	9.436E-02	+	5.248E-01	1.65E+02	7.90E+01 G
			1313.00	1.869E-01	+	1.436E+00	3.25E+02	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.

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@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-227	50.14	81.	7.	0.001	219.69	3.001E-01	
AM-241	59.54	111.	2.	0.000	889.52	1.738E-02	
BA-133	80.99	109.	10.	0.001	183.28	8.180E-02	P
Np-237	86.49	660.	-21.	-0.003	170.90	-4.628E-01	
EU-155	86.54	638.	-21.	-0.003	168.09	-1.975E-01	
Nd-147	91.10	461.	7.	0.001	415.55	7.318E-02	
AC-228	93.35	419.	20.	0.003	148.11	1.004E+00	
Gd-153	97.50	150.	6.	0.001	308.87	5.343E-02	
Np-239	99.50	175.	3.	0.000	563.38	6.375E-02	
Gd-153	103.20	198.	17.	0.002	122.54	2.164E-01	
Np-239	103.70	215.	12.	0.002	174.06	1.450E-01	
EU-155	105.31	195.	-9.	-0.001	218.05	-1.233E-01	
Np-239	106.13	194.	10.	0.001	210.13	1.210E-01	
EU-154	123.10	167.	11.	0.001	174.10	7.729E-02	
HF-181	133.02	196.	15.	0.002	138.65	1.020E-01	
CE-144	133.54	211.	15.	0.002	143.43	3.992E-01	
HF-181	136.30	293.	-18.	-0.002	138.17	-9.318E-01	
U-235	143.79	309.	-7.	-0.001	346.61	-2.097E-01	P
CE-141	145.44	154.	17.	0.002	104.63	1.129E-01	
U-235	163.38	197.	-4.	-0.001	706.43	-2.414E-01	P
Cf-251	176.60	117.	-7.	-0.001	290.90	-1.386E-01	
U-235	185.72	151.	3.	0.000	738.09	1.952E-02	P
TH-229	193.51	114.	-9.	-0.001	237.52	-7.801E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
U-235	205.33	77.	15.	0.002	105.70	1.186E+00	
TH-229	210.85	85.	4.	0.001	405.53	5.453E-01	P
Cf-251	227.00	50.	33.	0.005	41.92	2.193E+00	
TH-227	235.97	218.	16.	0.002	135.47	5.491E-01	
PB-212	238.63	265.	-20.	-0.003	117.01	-1.962E-01	P
TH-227	256.24	87.	2.	0.000	713.00	1.518E-01	
Cd-113m	263.70	68.	6.	0.001	198.61	4.647E+02	
BI-210M	265.83	59.	11.	0.002	101.56	1.048E-01	
TL-208	277.28	75.	13.	0.002	96.52	1.010E+00	
Hg-203	279.20	83.	13.	0.002	104.49	7.612E-02	
I-131	284.30	66.	2.	0.000	763.22	1.603E-01	
PB-214	295.09	301.	-10.	-0.001	242.43	-2.675E-01	P
TL-210	296.00	291.	15.	0.002	165.29	9.436E-02	
PB-212	300.03	307.	10.	0.001	246.03	1.581E+00	P
Ir-192	308.44	386.	-17.	-0.002	166.15	-2.768E-01	
PA-233	312.01	352.	-18.	-0.002	141.74	-2.589E-01	P
Ir-192	316.49	60.	12.	0.002	93.47	7.487E-02	
CR-51	320.08	111.	-6.	-0.001	252.79	-3.208E-01	
La-140	328.76	84.	-14.	-0.002	122.74	-3.845E-01	
Cf-249	333.44	66.	-4.	-0.001	383.24	-1.419E-01	
Cs-136	340.57	186.	-19.	-0.003	106.79	-2.208E-01	
HF-181	345.83	217.	-18.	-0.003	116.43	-6.847E-01	
PB-214	351.93	122.	-19.	-0.003	80.71	-2.927E-01	P
BA-133	356.00	129.	-7.	-0.001	228.11	-6.646E-02	
I-131	364.48	66.	-8.	-0.001	193.25	-5.775E-02	
BA-133	383.84	81.	11.	0.002	116.11	7.747E-01	
Cf-249	387.95	92.	11.	0.002	123.05	1.061E-01	
SN-113	391.69	177.	-20.	-0.003	79.87	-1.933E-01	P
SB-125	427.88	40.	-6.	-0.001	191.76	-1.419E-01	
AG-108M	433.94	22.	25.	0.003	41.10	1.838E-01	P
PM-146	453.88	32.	11.	0.002	102.04	1.211E-01	
SB-125	463.37	53.	9.	0.001	117.85	6.169E-01	P
Ir-192	468.06	81.	-3.	0.000	475.39	-3.699E-02	
BE-7	477.60	64.	12.	0.002	96.92	8.412E-01	
HF-181	482.00	82.	-5.	-0.001	247.58	-4.752E-02	
La-140	487.02	56.	-15.	-0.002	98.43	-2.482E-01	
RU-103	497.05	53.	-14.	-0.002	80.48	-1.119E-01	P
RH-106	511.86	136.	76.	0.011	25.48	2.899E+00	P
Nd-147	531.00	56.	-16.	-0.002	95.27	-9.615E-01	
Ba-140	537.26	37.	-3.	0.000	685.51	-9.236E-02	P
CS-134	563.24	31.	9.	0.001	128.80	8.512E-01	P
CS-134	569.32	24.	11.	0.001	71.41	5.782E-01	
BI-207	569.70	48.	-4.	0.000	286.43	-2.969E-02	
TL-208	583.02	62.	-25.	-0.004	53.39	-2.519E-01	P
SB-125	600.50	257.	-17.	-0.002	137.36	-8.116E-01	
SB-124	602.73	273.	-17.	-0.002	141.42	-1.482E-01	
CS-134	604.71	290.	-16.	-0.002	151.55	-1.436E-01	
BI-214	609.31	336.	-30.	-0.004	87.24	-5.616E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-144	618.06	259.	-20.	-0.003	132.05	-1.759E-01	P
RH-106	621.92	94.	8.	0.001	175.70	7.136E-01	
SB-125	635.89	30.	12.	0.002	72.90	9.342E-01	
I-131	636.97	57.	-11.	-0.001	104.40	-1.354E+00	
AG-110M	657.76	51.	-4.	-0.001	661.39	-3.882E-02	P
CS-137	661.66	45.	6.	0.001	159.30	6.769E-02	
PM-144	696.54	44.	-6.	-0.001	419.31	-6.166E-02	P
NB-94	702.63	35.	5.	0.001	229.47	5.353E-02	
SB-124	722.79	29.	14.	0.002	61.39	1.291E+00	
AG-108M	722.94	43.	10.	0.001	100.96	1.075E-01	
EU-154	723.36	53.	6.	0.001	173.97	3.027E-01	
PM-146	735.72	39.	-12.	-0.002	215.40	-5.540E-01	P
ZR-95	756.73	13.	3.	0.000	249.17	5.823E-02	
AG-110M	763.94	11.	10.	0.001	55.81	4.803E-01	
NB-95	765.79	21.	7.	0.001	100.37	7.452E-02	
PA-234M	766.41	49.	-13.	-0.002	197.71	-4.807E+01	P
BI-212	785.42	9.	4.	0.001	154.07	3.466E+00	
CS-134	795.87	25.	9.	0.001	87.26	1.119E-01	
TL-210	799.60	93.	-18.	-0.002	80.94	-1.947E-01	
CS-134	801.95	51.	11.	0.002	93.82	1.436E+00	
CO-58	810.77	48.	-2.	0.000	394.97	-2.782E-02	
Cs-136	818.50	62.	-8.	-0.001	152.32	-8.367E-02	
MN-54	834.85	16.	7.	0.001	121.98	8.080E-02	P
TL-208	860.56	20.	2.	0.000	430.47	2.065E-01	P
NB-94	871.10	37.	-11.	-0.002	81.83	-1.334E-01	
EU-154	873.23	53.	3.	0.000	314.64	3.201E-01	
Y-88	898.04	16.	4.	0.001	225.99	4.866E-02	P
AC-228	911.07	23.	3.	0.000	389.11	1.123E-01	
AG-110M	937.49	34.	-8.	-0.001	110.14	-2.917E-01	P
AC-228	968.97	20.	8.	0.001	88.26	5.806E-01	
EU-154	996.33	74.	-15.	-0.002	85.24	-1.858E+00	
PA-234M	1001.00	80.	2.	0.000	717.40	2.820E+00	P
Co-56	1037.84	21.	-5.	-0.001	264.23	-4.729E-01	P
Cs-136	1048.07	30.	-11.	-0.002	76.60	-1.895E-01	
RH-106	1050.36	24.	8.	0.001	91.56	7.247E+00	
BI-207	1063.66	20.	-4.	-0.001	250.83	-7.496E-02	
Ga-68	1077.40	15.	2.	0.000	431.57	1.515E+00	
ZN-65	1115.55	90.	-11.	-0.002	126.85	-3.140E-01	
BI-214	1120.29	111.	-9.	-0.001	148.62	-9.094E-01	P
Ta-182	1121.30	94.	9.	0.001	161.54	3.631E-01	
Ta-182	1189.05	5.	6.	0.001	89.49	5.848E-01	
Ta-182	1221.41	5.	15.	0.002	44.30	8.565E-01	
Co-56	1238.28	29.	-12.	-0.002	122.54	-2.800E-01	P
NA-22	1274.53	16.	7.	0.001	89.21	1.147E-01	
FE-59	1291.60	22.	-8.	-0.001	190.18	-2.881E-01	P
TL-210	1313.00	11.	2.	0.000	324.82	1.869E-01	
AG-110M	1384.30	28.	-5.	-0.001	87.37	-3.576E-01	P
K-40	1460.83	16.	1.	0.000	430.89	2.546E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
La-140	1596.21	11.	-4.	-0.001	188.42	-9.124E-02		
SB-124	1690.98	6.	5.	0.001	113.28	2.364E-01		
BI-214	1764.49	34.	-18.	-0.002	49.59	-2.557E+00		P
Co-56	1771.35	25.	-2.	0.000	431.28	-2.381E-01		
Y-88	1836.06	7.	2.	0.000	376.36	3.883E-02		P

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

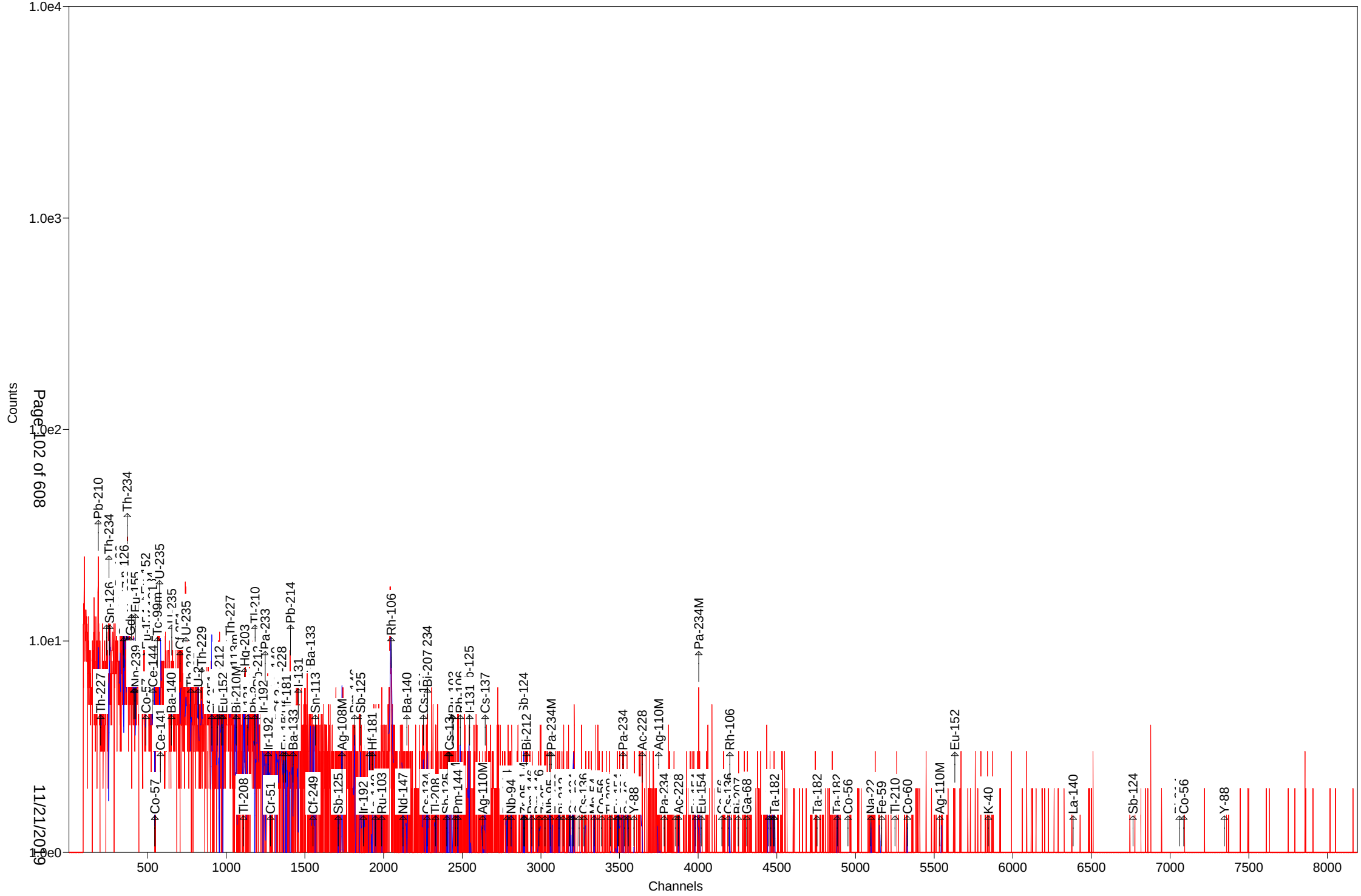
Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma MDA Bq/Sample
BE-7	#A	8.4122E-01	8.4123E-01	9.692E+01%	2.75E+00
NA-22	#A	1.1471E-01	1.1471E-01	8.921E+01%	3.50E-01
K-40	#A	2.5458E-01	2.5458E-01	4.309E+02%	3.66E+00
Sc-46	#A	-1.1968E-02	-1.1968E-02	1.285E+03%	5.37E-01
CR-51	#A	-3.2082E-01	-3.2083E-01	2.528E+02%	2.78E+00
MN-54	#A	8.0800E-02	8.0800E-02	1.220E+02%	2.41E-01
FE-59	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.28E-01
Co-56	#A	3.8289E-03	3.8289E-03	2.755E+03%	2.62E-01
CO-57	#A	-5.1064E-01	-5.1064E-01	1.340E+02%	2.30E+00
CO-58	#A	-2.7817E-02	-2.7818E-02	3.950E+02%	3.88E-01
CO-60	#	1.8838E-01	1.8838E-01	3.406E+01%	1.26E-01
ZN-65	#A	-3.1400E-01	-3.1400E-01	1.269E+02%	1.35E+00
NB-94	#A	5.3528E-02	5.3528E-02	2.295E+02%	3.03E-01
ZR-95	#A	5.8227E-02	5.8228E-02	2.492E+02%	3.74E-01
NB-95	#A	7.4517E-02	7.4518E-02	1.004E+02%	2.57E-01
RU-103	#A	-1.1187E-01	-1.1188E-01	8.048E+01%	2.99E-01
RH-106	#A	1.6006E+00	1.6006E+00	9.156E+01%	4.29E+00
AG-108M	#A	1.4560E-01	1.4560E-01	4.110E+01%	1.83E-01
AG-110M	#A	1.1268E-01	1.1268E-01	5.581E+01%	7.28E-01
SN-113	#A	-1.9333E-01	-1.9333E-01	7.987E+01%	6.27E-01
SB-124	#A	6.8153E-02	6.8155E-02	6.139E+01%	7.04E-01
SB-125	#A	2.4963E-01	2.4963E-01	7.290E+01%	7.24E-01
I-131	#A	-4.2506E-02	-4.2511E-02	1.932E+02%	2.93E-01
Gd-153	#A	1.2201E-01	1.2201E-01	1.225E+02%	5.64E-01
Ga-68	#A	1.4855E+00	1.5152E+00	4.316E+02%	1.57E+01
Tc-99m	#A	3.8937E-03	3.9082E-03	2.456E+03%	3.27E-01
BA-133	#A	-6.6459E-02	-6.6459E-02	2.281E+02%	5.18E-01
CS-134	#A	3.2265E-01	3.2265E-01	4.880E+01%	3.31E-01
CS-137	#A	6.7695E-02	6.7695E-02	1.593E+02%	3.74E-01
CE-139	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.66E-01
Ba-140	#A	-9.2350E-02	-9.2357E-02	6.855E+02%	1.01E+00
La-140	#A	-9.1231E-02	-9.1238E-02	1.884E+02%	3.87E-01
CE-141	#A	1.1285E-01	1.1286E-01	1.046E+02%	3.96E-01
CE-144	#A	3.9920E-01	3.9920E-01	1.434E+02%	1.93E+00
PM-144	#A	-6.1655E-02	-6.1655E-02	4.193E+02%	3.32E-01

EU-152 A	8.5010E-02	8.5010E-02	6.638E+01%		1.46E+00
EU-154 #A	1.8013E-01	1.8013E-01	1.332E+02%		4.56E-01
EU-155 #A	-1.2328E-01	-1.2328E-01	2.180E+02%		9.12E-01
HF-181 #A	4.7849E-03	4.7850E-03	1.386E+02%		4.06E-01
Ta-182 #A	5.7964E-01	5.7965E-01	4.430E+01%		2.00E+00
Hg-203 #A	7.6121E-02	7.6123E-02	1.045E+02%		2.69E-01
TL-208 #A	-2.5186E-01	-2.5186E-01	5.339E+01%		3.94E-01
PM-146 #A	1.2109E-01	1.2109E-01	1.020E+02%		3.10E-01
Y-88 #A	4.3608E-02	4.3608E-02	2.195E+02%		3.53E-01
Cd-113m#A	4.6470E+02	4.6470E+02	1.986E+02%		3.19E+03
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		8.29E+00
Cf-251 #A	-1.3865E-01	-1.3865E-01	2.909E+02%		1.10E+00
Cf-249 #A	1.0615E-01	1.0615E-01	1.230E+02%		4.43E-01
Sn-126 #A	4.4313E-01	4.4313E-01	1.395E+02%		2.08E+00
PB-210 #A	1.8724E+00	1.8724E+00	1.050E+02%		5.31E+00
PB-212 #A	-1.9621E-01	-1.9621E-01	1.170E+02%		7.86E-01
PB-214 #A	-2.9272E-01	-2.9272E-01	8.071E+01%		8.26E-01
BI-207 #A	-7.4957E-02	-7.4957E-02	2.508E+02%		4.41E-01
BI-212 #A	-2.5535E-07	-2.5535E-07	5.695E+08%		5.15E+00
U-235 #A	2.2804E-01	2.2804E-01	1.057E+02%		2.42E+00
BI-214 #A	-5.6160E-01	-5.6160E-01	8.724E+01%		1.67E+00
BI-210M#A	1.0475E-01	1.0475E-01	1.016E+02%		3.60E-01
AC-228 #A	2.8830E-01	2.8830E-01	8.826E+01%		1.06E+00
TH-227 #A	3.7425E-01	3.7425E-01	1.355E+02%		3.00E+00
TH-229 #A	-2.4386E-01	-2.4386E-01	2.350E+02%		4.48E+00
TH-234 A	1.2186E+00	1.2186E+00	1.030E+02%		3.39E+00
PA-231 #A	0.0000E+00	0.0000E+00	7.071E+02%		1.53E+01
PA-233 #A	-2.5891E-01	-2.5891E-01	1.417E+02%		1.31E+00
PA-234 A	3.7135E-01	3.7135E-01	9.356E+01%		1.09E+00
PA-234M#A	2.8199E+00	2.8199E+00	7.174E+02%		7.03E+01
AM-241 #A	1.7384E-02	1.7384E-02	8.895E+02%		4.50E-01
Np-237 #A	-4.6275E-01	-4.6275E-01	1.709E+02%		2.64E+00
Ir-192 #A	7.4874E-02	7.4874E-02	9.347E+01%		2.36E-01
Cs-136 #A	-8.3665E-02	-8.3671E-02	1.523E+02%		4.38E-01
Np-239 #A	1.2093E-01	1.2098E-01	2.101E+02%		8.62E-01
Nd-147 #A	-9.6138E-01	-9.6146E-01	9.527E+01%		2.27E+00
TL-210 #A	-1.9466E-01	-1.9466E-01	8.094E+01%		5.26E-01
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.25E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

```
-----------------------------   S U M M A R Y   -----------------------------
Total Activity (   25.1 to  1999.5 keV)     0.000E+00  Bq/Sample
Total Decayed Activity (   25.1 to  1999.5 keV) 0.0000000E+00  Bq/Sample
```

445202_Gamma_MB 160-445202~1-A. 14_Gamma_20192329.spc.



Sample Description: 445202_Gamma_LCS 160-445202~2-A
Detector: Detector #14
Batch ID: 445202
Work Order Number: Gamma
Lot Number: LCS 160-445202~2-A

Decay to Time: 10/31/2019 05:04 Live Time: 7200 sec
Acquisition Time: 10/31/2019 05:04:29 Real Time: 7318 sec
Analysis Time: 10/31/2019 07:07 Dead Time: 1.62 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 14_Liquid_Marinelli 1L.Clb
Efficiency Cal Desc: 14_1LMarinelli_90062_030612
Efficiency Cal Date: 3/14/2012 16:58
Energy Cal Date: 2/28/2012 10:48
Library: Client_Long_Rev15.lib
Bkgd Correction File: 14_2019-10-06_1924.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-1.303E+01	92.9	1.210E+01	1.212E+01	3.995E+01
NA-22	5.551E-02	1150.8	6.389E-01	6.389E-01	2.147E+00
K-40	4.198E+00	138.5	5.815E+00	5.819E+00	1.214E+01
Sc-46	-1.472E+00	119.6	1.761E+00	1.763E+00	5.819E+00
CR-51	3.187E+00	286.2	9.122E+00	9.123E+00	3.017E+01
MN-54	3.080E+00	40.7	1.254E+00	1.263E+00	2.807E+00
FE-59	-4.305E+00	67.5	2.905E+00	2.913E+00	9.580E+00
Co-56	1.069E-01	109.5	1.171E-01	1.172E-01	4.124E+00
CO-57	1.257E+00	504.0	6.333E+00	6.334E+00	2.094E+01
CO-58	8.827E-01	166.4	1.469E+00	1.469E+00	3.249E+00
CO-60	1.004E+03	0.3	3.035E+00	4.966E+01	1.730E+00
ZN-65	4.429E+00	82.3	3.644E+00	3.650E+00	1.203E+01
NB-94	1.117E+00	102.1	1.141E+00	1.143E+00	2.621E+00
ZR-95	1.010E+00	223.3	2.256E+00	2.256E+00	5.192E+00
NB-95	1.281E+00	77.4	9.911E-01	9.932E-01	3.272E+00
RU-103	-1.391E+00	57.5	8.000E-01	8.031E-01	3.341E+00
RH-106	1.591E+01	87.9	1.399E+01	1.402E+01	2.686E+01
AG-108M	-3.965E-01	182.4	7.232E-01	7.235E-01	3.270E+00
AG-110M	3.555E+00	68.9	2.451E+00	2.457E+00	7.669E+00
SN-113	-4.954E-01	190.9	9.458E-01	9.461E-01	6.340E+00
SB-124	5.051E-08	3277596173.0	1.655E+00	1.655E+00	5.479E+00
SB-125	-4.301E+00	91.5	3.937E+00	3.943E+00	9.837E+00
I-131	1.610E+00	70.4	1.134E+00	1.137E+00	3.021E+00
Gd-153	3.948E-01	118.6	4.684E-01	4.691E-01	4.570E+00
Ga-68	-1.254E+02	69.5	8.713E+01	8.740E+01	2.873E+02
Tc-99m	-6.325E-01	140.1	8.860E-01	8.867E-01	2.925E+00
BA-133	2.717E+00	53.9	1.464E+00	1.471E+00	2.968E+00
CS-134	-1.895E+00	80.9	1.533E+00	1.536E+00	5.060E+00
CS-137	1.563E+03	0.3	4.327E+00	7.827E+01	4.154E+00
CE-139	0.000E+00	1.#INF	4.860E-01	4.860E-01	2.671E+00
Ba-140	6.472E-01	64.4	4.166E-01	4.179E-01	1.105E+01
La-140	6.316E-02	1118.0	7.062E-01	7.062E-01	1.458E+00
CE-141	1.145E+00	124.3	1.424E+00	1.425E+00	4.701E+00

CE-144	1.819E+00	332.3	6.044E+00	6.045E+00	1.998E+01
PM-144	2.504E-01	446.1	1.117E+00	1.117E+00	2.574E+00
EU-152	1.314E+01	32.6	4.286E+00	4.340E+00	7.912E+00
EU-154	8.169E+00	36.1	2.946E+00	2.980E+00	4.364E+00
EU-155	-1.016E+00	320.4	3.257E+00	3.257E+00	1.076E+01
HF-181	-7.530E-01	92.1	6.933E-01	6.944E-01	5.174E+00
Ta-182	4.406E-01	104.7	4.611E-01	4.616E-01	1.768E+01
Hg-203	4.479E-01	222.4	9.963E-01	9.967E-01	3.295E+00
TL-208	-1.582E+00	81.0	1.283E+00	1.285E+00	3.897E+00
PM-146	1.717E+00	86.7	1.488E+00	1.491E+00	5.008E+00
Y-88	7.536E-01	83.0	6.256E-01	6.271E-01	1.246E+00
Cd-113m	-7.229E+02	1876.9	1.357E+04	1.357E+04	4.491E+04
Cd-109	5.505E+02	2.8	1.536E+01	3.504E+01	3.418E+01
Cf-251	-3.293E+00	117.9	3.884E+00	3.894E+00	1.020E+01
Cf-249	-1.665E+00	111.7	1.859E+00	1.861E+00	6.138E+00
Sn-126	3.510E+00	140.1	4.915E+00	4.919E+00	1.624E+01
PB-210	1.087E+03	5.4	5.902E+01	1.146E+02	1.921E+02
PB-212	-3.042E-01	642.3	1.954E+00	1.954E+00	8.311E+00
PB-214	-7.831E-01	106.0	8.297E-01	8.307E-01	8.326E+00
BI-207	5.195E-01	117.4	6.098E-01	6.103E-01	5.497E+00
BI-212	-5.177E+00	274.5	1.421E+01	1.421E+01	4.711E+01
U-235	2.368E+00	128.7	3.048E+00	3.050E+00	2.092E+01
BI-214	4.084E+00	88.2	3.603E+00	3.609E+00	1.188E+01
BI-210M	6.628E-01	128.5	8.514E-01	8.523E-01	4.294E+00
AC-228	3.783E+00	118.6	4.488E+00	4.492E+00	1.393E+01
TH-227	-3.166E+00	365.7	1.158E+01	1.158E+01	3.047E+01
TH-229	4.482E+00	103.5	4.639E+00	4.652E+00	4.543E+01
TH-234	-4.799E+00	132.8	6.375E+00	6.381E+00	4.433E+01
PA-231	3.054E+01	129.9	3.968E+01	3.971E+01	1.310E+02
PA-233	2.089E+00	153.3	3.202E+00	3.204E+00	1.057E+01
PA-234	9.153E+00	77.9	7.132E+00	7.149E+00	1.264E+01
PA-234M	-5.435E+01	453.9	2.467E+02	2.467E+02	6.214E+02
AM-241	4.883E+03	0.2	7.991E+00	2.820E+02	1.104E+01
Np-237	-6.407E-01	893.4	5.724E+00	5.724E+00	1.892E+01
Ir-192	1.180E+00	92.9	1.097E+00	1.099E+00	3.324E+00
Cs-136	-1.706E+00	87.1	1.485E+00	1.488E+00	4.904E+00
Np-239	4.075E-01	777.2	3.167E+00	3.167E+00	1.047E+01
Nd-147	5.730E+00	147.5	8.454E+00	8.460E+00	2.024E+01
TL-210	-1.648E+00	81.5	1.344E+00	1.347E+00	4.436E+00
Kr-85	0.000E+00	1.#INF	1.361E+02	1.361E+02	8.299E+02
Total	9.230E+03				

Analyst: Justin Banner

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Sample description
445202_Gamma_LCS 160-445202~2-A

Spectrum Filename: C:\User\SPC\Det14\14_Gamma_20192330.An1

Acquisition information
Start time: 10/31/2019 5:04:29 AM
Live time: 7200
Real time: 7318
Dead time: 1.62 %
Detector ID: 14

Detector system
Ge14 SN/11080670

Calibration
Filename: 14_Liquid_Marinelli 1L.Clb
14_1LMarinelli_90062_030612

Energy Calibration
Created: 2/28/2012 10:48:23 AM
Zero offset: 0.130 keV
Gain: 0.250 keV/channel
Quadratic: -2.050E-08 keV/channel^2

Efficiency Calibration
Created: 3/14/2012 4:58:47 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.64 %
Log(Eff): -1.428037E+00 + (-4.136370E-02*Log(E)) + (-5.958012E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 0.07 %
Log(Eff): -1.383299E+01 + (4.786779E+00*Log(E)) + (-5.293738E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.14keV)
Stop channel: 8000 (1999.51keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 5:04:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	14_2019-10-06_1924.PBC 10/6/2019 7:24:09 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 39 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1711

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
26.43	7312.	3.63	0.71	2.161E-02				
32.11	17486.	1.79	1.02	2.738E-02				
36.57	3962.	6.46	0.99	3.137E-02				
42.32	296.	88.34	0.76	3.602E-02				
46.54	12805.	5.43	0.75	3.849E-02	46.54	4.250	1.087E+03	PB210
49.57	19148.	3.18	1.61	4.019E-02	50.14	8.000	8.210E+02	TH227
59.59	561804.	0.16	0.90	4.453E-02	59.54	35.900	4.883E+03	AM241
64.28	113.	140.05	0.77	4.596E-02	64.28	9.700	PBC<MDA	Sn126
72.28	78.	109.09	0.59	4.771E-02				
81.06	197.	63.48	1.59	4.877E-02	80.99	34.060	PBC<MDA	BA133
88.01	7393.	2.91	0.96	4.914E-02	87.57	37.500	5.573E+01	Sn126
					88.04	3.790	5.513E+02	Cd109
92.59	-95.	132.84	0.80	4.919E-02	92.59	5.584	PBC<MDA	TH234
93.35	120.	219.36	0.80	4.918E-02	93.35	5.561	PBC<MDA	AC228
99.50	163.	106.11	0.80	4.903E-02	99.50	15.000	PBC<MDA	Np239
103.06	459.	29.16	1.14	4.885E-02	103.20	21.800	5.987E+00	Gd153
					103.70	24.000	5.510E+00	Np239
106.13	32.	777.21	0.81	4.866E-02	106.13	22.700	PBC<MDA	Np239
121.49	639.	19.33	0.83	4.722E-02	121.78	28.580	6.583E+00	EU152
					122.06	85.600	2.199E+00	CO57
122.98	852.	14.53	0.83	4.704E-02	123.10	40.790	6.172E+00	EU154
131.29	174.	130.83	0.84	4.599E-02	131.29	18.000	PBC<MDA	PA234

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
133.54	66.	332.33	0.84	4.569E-02	133.54	11.090	PBC<MDA	CE144
136.47	44.	504.03	0.84	4.529E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.257E+00	CO57
146.05	175.	124.35	0.85	4.401E-02	145.44	48.200	PBC<MDA	CE141
163.20	117.	102.70	0.43	4.132E-02	162.66	6.220	6.328E+00	Ba140
					163.38	5.080	PBC<MDA	U235
185.72	81.	246.67	0.89	3.800E-02	185.72	54.000	PBC<MDA	U235
205.33	153.	128.72	0.91	3.553E-02	205.33	5.010	PBC<MDA	U235
210.85	188.	103.49	0.92	3.489E-02	210.85	2.990	PBC<MDA	TH229
217.16	273.	47.17	0.98	3.420E-02				
225.76	213.	59.55	0.36	3.330E-02				
231.36	205.	50.54	0.57	3.275E-02				
261.55	55.	136.97	0.34	3.006E-02				
279.20	75.	222.44	0.99	2.870E-02	279.20	81.460	PBC<MDA	Hg203
295.09	148.	184.34	1.00	2.759E-02	295.09	19.300	PBC<MDA	PB214
296.00	154.	176.90	1.00	2.753E-02	296.00	79.000	PBC<MDA	TL210
302.65	172.	129.91	1.01	2.709E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	4.801E+00	BA133
302.85	172.	130.33	1.01	2.708E-02	302.65	2.880	3.055E+01	PA231
					302.85	18.330	4.802E+00	BA133
304.85	172.	130.52	1.01	2.695E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	3.165E+00	BI210M
304.90	172.	130.97	1.01	2.694E-02	304.85	4.290	2.066E+01	Ba140
					304.90	28.000	3.165E+00	BI210M
308.44	32.	712.08	1.01	2.672E-02	308.44	31.750	PBC<MDA	Ir192
312.01	143.	153.27	1.02	2.650E-02	312.01	36.000	PBC<MDA	PA233
316.49	73.	226.82	1.02	2.622E-02	316.49	87.040	PBC<MDA	Ir192
320.08	59.	286.17	1.03	2.601E-02	320.08	9.940	PBC<MDA	CR51
333.44	23.	736.44	1.04	2.524E-02	333.44	15.510	PBC<MDA	Cf249
338.32	171.	118.64	1.04	2.498E-02	338.32	12.010	PBC<MDA	AC228
340.57	170.	117.86	1.05	2.485E-02	340.57	46.900	PBC<MDA	Cs136
343.97	481.	32.61	1.27	2.466E-02	344.29	26.500	1.022E+01	EU152
345.83	115.	173.40	1.05	2.458E-02	345.83	15.070	PBC<MDA	HF181
355.88	226.	53.88	0.44	2.405E-02	356.00	62.050	PBC<MDA	BA133
364.48	30.	562.94	1.07	2.364E-02	364.48	81.700	PBC<MDA	I131
384.22	175.	113.68	1.09	2.274E-02	383.84	8.940	PBC<MDA	BA133
421.64	69.	97.04	0.33	2.118E-02				
427.80	155.	64.58	1.40	2.095E-02	427.88	29.600	3.465E+00	SB125
453.88	46.	426.31	1.15	2.002E-02	453.88	65.000	PBC<MDA	PM146
468.06	206.	92.93	1.17	1.955E-02	468.06	51.750	PBC<MDA	Ir192
499.23	82.	76.90	0.44	1.859E-02				
511.86	290.	48.24	2.46	1.823E-02	511.86	20.000	PBC<MDA	RH106
531.00	95.	147.54	1.23	1.771E-02	531.00	13.000	PBC<MDA	Nd147
563.24	28.	455.76	1.25	1.691E-02	563.24	8.350	PBC<MDA	CS134
569.70	83.	117.38	1.26	1.675E-02	569.32	15.380	4.454E+00	CS134
					569.47	8.200	8.355E+00	PA234
					569.70	97.740	7.012E-01	BI207
586.70	201.	44.76	1.18	1.636E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
610.66	44.	433.61	1.30	1.587E-02	609.31	46.090	PBC<MDA	BI214
					610.30	5.750	PBC<MDA	RU103
621.92	22.	583.09	1.31	1.561E-02	621.92	9.930	PBC<MDA	RH106
636.97	138.	70.43	1.32	1.531E-02	636.97	7.170	PBC<MDA	I131
657.62	340.	160.59	1.34	1.492E-02	657.76	94.640	PBC<MDA	AG110M
661.51	146696.	0.28	1.42	1.485E-02	661.66	85.210	1.610E+03	CS137
696.54	25.	446.10	1.37	1.424E-02	696.54	99.000	PBC<MDA	PM144
702.63	111.	102.14	1.38	1.414E-02	702.63	97.900	PBC<MDA	NB94
723.66	186.	40.40	0.91	1.380E-02	723.36	20.220	PBC<MDA	EU154
736.66	133.	66.54	0.44	1.359E-02	735.72	22.500	PBC<MDA	PM146
747.16	134.	86.65	1.42	1.344E-02	747.16	34.000	PBC<MDA	PM146
756.73	53.	223.29	1.43	1.329E-02	756.73	54.460	PBC<MDA	ZR95
765.79	121.	77.36	1.43	1.316E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	65.	185.81	1.44	1.298E-02	778.92	12.940	PBC<MDA	EU152
810.78	79.	166.39	1.47	1.255E-02	810.78	99.460	PBC<MDA	CO58
834.49	271.	40.72	1.23	1.224E-02	834.85	99.980	3.080E+00	MN54
842.46	107.	48.15	0.71	1.215E-02				
859.14	78.	55.41	0.57	1.195E-02	860.56	12.420	PBC<MDA	TL208
873.27	163.	66.60	1.52	1.179E-02	873.23	12.270	PBC<MDA	EU154
883.24	168.	84.71	1.53	1.167E-02	883.24	9.600	PBC<MDA	PA234
884.40	143.	99.12	1.53	1.166E-02	884.68	72.680	PBC<MDA	AG110M
900.59	108.	79.87	0.48	1.148E-02				
911.07	49.	305.11	1.55	1.137E-02	911.07	29.000	PBC<MDA	AC228
937.49	184.	84.58	1.58	1.110E-02	937.49	34.360	PBC<MDA	AG110M
964.11	176.	71.67	1.60	1.083E-02	964.11	14.605	PBC<MDA	EU152
996.33	138.	92.91	1.62	1.053E-02	996.33	10.600	PBC<MDA	EU154
1004.77	165.	81.74	1.63	1.045E-02	1004.77	18.010	PBC<MDA	EU154
1050.36	118.	87.95	1.66	1.006E-02	1050.36	1.560	PBC<MDA	RH106
1063.66	15.	914.49	1.67	9.948E-03	1063.66	74.500	PBC<MDA	BI207
1078.82	155.	44.45	1.69	9.826E-03	1077.40	3.300	1.164E+02	Ga68
1083.83	73.	88.33	1.69	9.787E-03				
1105.15	69.	77.70	0.69	9.621E-03				
1112.07	154.	81.60	1.71	9.569E-03	1112.07	13.644	PBC<MDA	EU152
1115.55	154.	82.27	1.71	9.543E-03	1115.55	50.600	PBC<MDA	ZN65
1120.49	145.	88.23	1.72	9.507E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	PBC<MDA	Ta182
1120.55	72.	177.99	1.72	9.505E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	1.057E+00	Sc46
					1121.30	34.900	3.029E+00	Ta182
1173.28	65246.	0.43	1.81	9.128E-03	1173.24	99.900	9.938E+02	CO60
1221.41	66.	104.65	1.79	8.808E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	53.	115.81	1.80	8.702E-03	1238.28	66.070	PBC<MDA	Co56
1274.84	176.	36.10	2.43	8.481E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.228E+01	EU154
1289.28	59.	83.20	1.84	8.380E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	18.	277.67	1.86	8.258E-03	1313.00	21.000	PBC<MDA	TL210

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1332.64	59542.	0.42	1.89	8.148E-03	1332.50	99.980	1.015E+03	CO60
1408.27	46.	79.84	1.92	7.754E-03	1408.00	21.005	PBC<MDA	EU152
1460.78	24.	138.52	1.96	7.499E-03	1460.83	10.670	PBC<MDA	K40
1771.35	32.	78.81	2.15	6.279E-03	1771.35	15.480	PBC<MDA	Co56
1836.06	33.	83.01	2.19	6.072E-03	1836.06	99.200	PBC<MDA	Y88

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
105.18	26.43	23690.	7312.	3.384E+05	3.63	0.708	-	
127.89	32.11	23052.	17486.	6.386E+05	1.79	1.019	-	s
145.71	36.57	21742.	3962.	1.263E+05	6.46	0.990	-	s
168.70	42.68	29180.	296.	8.218E+03	88.34	0.761	-	sc
197.70	49.57	110747.	19148.	4.764E+05	3.18	1.605	-	s
288.53	72.28	3581.	78.	1.635E+03	109.09	0.588	-	sc
411.07	103.06	5076.	434.	8.880E+03	23.72	0.807	-	sD
652.08	163.20	5402.	117.	2.839E+03	102.70	0.433	-	sc
867.87	217.16	6132.	273.	7.992E+03	47.17	0.978	-	s
902.29	225.76	5972.	213.	6.406E+03	59.55	0.358	-	s
924.67	231.36	4497.	205.	6.250E+03	50.54	0.570	-	s
1045.39	261.55	2810.	55.	1.830E+03	136.97	0.339	-	sc
1685.69	421.64	2207.	69.	3.258E+03	97.04	0.330	-	sc
1996.02	499.23	1805.	82.	4.419E+03	76.90	0.441	-	sc
2345.92	586.70	2255.	201.	1.228E+04	44.76	1.179	-	sM
2945.80	736.66	2003.	133.	9.771E+03	66.54	0.437	-	s
3369.10	842.46	1099.	107.	8.833E+03	48.15	0.706	-	s
3435.83	859.67	895.	78.	6.530E+03	55.41	0.565	-	s
3601.66	900.59	2186.	108.	9.376E+03	79.87	0.475	-	sc
4316.27	1078.82	2490.	89.	9.037E+03	80.18	1.687	-	sc
4336.33	1083.83	1909.	62.	6.312E+03	100.84	1.691	-	sc
4418.19	1105.15	2265.	169.	1.761E+04	40.45	1.706	-	sD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.58	46.54	235134.	12805.	1.778	5.43	0.750s
TH-227	199.98	50.14	247939.	0.	0.000	1000.00	0.751s
AM-241	237.75	59.59	73919.	561804.	78.028	0.16	0.901s
TH-234	252.55	63.29	10182.	-123.	-0.017	566.49	0.765s
Sn-126	256.52	64.28	12393.	113.	0.016	140.05	0.766
BA-133	323.60	81.06	5776.	197.	0.027	63.48	1.588s
Np-237	345.33	86.49	35112.	-30.	-0.004	893.43	0.789s
EU-155	345.54	86.54	35082.	0.	0.000	1000.00	0.790
Sn-126	347.13	86.94	35082.	0.	0.000	1000.00	0.790
Sn-126	349.65	87.57	35082.	0.	0.000	1000.00	0.791
Cd-109	351.37	88.00	9557.	7382.	1.025	2.79	0.961s
Nd-147	363.77	91.10	35082.	0.	0.000	1000.00	0.794s
TH-234	369.72	92.59	35177.	-95.	-0.013	132.84	0.796s
AC-228	372.76	93.35	34392.	120.	0.017	219.36	0.797s
Gd-153	389.36	97.50	10695.	-91.	-0.013	191.58	0.801
Np-239	397.36	99.50	14833.	163.	0.023	106.11	0.803
Gd-153	412.15	103.20	25790.	162.	0.023	140.03	0.807s
Np-239	414.15	103.70	25952.	163.	0.023	140.38	0.807
EU-155	420.60	105.31	29281.	-76.	-0.010	320.44	0.809s
Np-239	423.87	106.13	30912.	32.	0.004	777.21	0.810
EU-152	486.45	121.78	14766.	468.	0.065	26.72	0.826D
CO-57	487.58	122.06	15290.	357.	0.050	35.67	0.826D
EU-154	491.73	123.10	16575.	173.	0.024	105.50	0.828s
PA-234	524.50	131.29	25949.	174.	0.024	130.83	0.836s
HF-181	531.42	133.02	24541.	-176.	-0.024	126.43	0.838
CE-144	533.47	133.54	24283.	66.	0.009	332.33	0.838s
HF-181	544.52	136.30	24349.	0.	0.000	1000.00	0.841s
CO-57	545.21	136.47	24305.	44.	0.006	504.03	0.841s
Tc-99m	561.35	140.51	25666.	-162.	-0.022	140.08	0.845s
U-235	574.45	143.79	24380.	-67.	-0.009	188.83	0.849s
CE-141	581.07	145.44	23562.	175.	0.024	124.35	0.850s
Ba-140	649.93	162.66	17849.	171.	0.024	110.55	0.868s
U-235	652.81	163.38	18024.	33.	0.005	581.00	0.869s
CE-139	662.70	165.85	18057.	0.	0.000	1000.00	0.871s
Cf-251	705.68	176.60	10963.	-158.	-0.022	117.95	0.882
U-235	742.15	185.72	12658.	81.	0.011	246.67	0.892s
TH-229	773.30	193.51	12907.	-111.	-0.015	179.76	0.899s
U-235	820.58	205.33	12200.	153.	0.021	128.72	0.912s
TH-229	842.65	210.85	11948.	188.	0.026	103.49	0.917s
Cf-251	907.23	227.00	14393.	-197.	-0.027	86.30	0.933s
TH-227	943.11	235.97	31606.	-165.	-0.023	152.57	0.942s
PB-212	953.75	238.63	31555.	-30.	-0.004	642.26	0.945s
PB-214	967.21	242.00	28025.	-191.	-0.027	124.17	0.948s
EU-152	977.99	244.69	31110.	-97.	-0.013	256.90	0.951s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-227	1024.17	256.24	9987.	-49.	-0.007	365.69	0.962s
BI-210M	1062.53	265.83	9603.	-79.	-0.011	221.02	0.972s
TL-208	1108.33	277.28	10917.	-182.	-0.025	81.35	0.983
Hg-203	1115.99	279.20	14027.	75.	0.010	222.44	0.985s
PB-214	1179.54	295.09	37000.	148.	0.021	184.34	1.001s
TL-210	1183.18	296.00	37148.	154.	0.021	176.90	1.002s
PA-231	1209.78	302.65	24748.	172.	0.024	129.91	1.008s
BA-133	1210.59	302.85	24920.	172.	0.024	130.33	1.009
Ba-140	1218.57	304.85	25091.	172.	0.024	130.52	1.011s
BI-210M	1218.76	304.90	25263.	172.	0.024	130.97	1.011s
Ir-192	1232.94	308.44	25435.	32.	0.004	712.08	1.014s
PA-233	1247.22	312.01	24104.	143.	0.020	153.27	1.018s
Ir-192	1265.13	316.49	13609.	73.	0.010	226.82	1.022s
CR-51	1279.51	320.08	14386.	59.	0.008	286.17	1.026s
La-140	1314.21	328.76	8793.	-161.	-0.022	109.47	1.034s
Cf-249	1332.92	333.44	8430.	23.	0.003	736.44	1.039s
AC-228	1352.44	338.32	20578.	171.	0.024	118.64	1.043s
Cs-136	1361.44	340.57	19980.	170.	0.024	117.86	1.045s
EU-152	1375.04	343.97	6287.	481.	0.067	32.61	1.274s
HF-181	1382.47	345.83	19889.	115.	0.016	173.40	1.050s
PB-214	1406.88	351.93	13634.	-208.	-0.029	105.95	1.056s
BA-133	1422.66	355.88	4604.	226.	0.031	53.88	0.443s
I-131	1457.08	364.48	7960.	30.	0.004	562.94	1.069s
BA-133	1534.50	383.84	19734.	175.	0.024	113.68	1.087s
Cf-249	1550.94	387.95	19776.	-178.	-0.025	111.70	1.091s
SN-113	1565.90	391.69	19556.	-51.	-0.007	190.91	1.095s
SB-125	1710.63	427.88	8771.	-192.	-0.027	91.54	1.129s
AG-108M	1734.87	433.94	8863.	-54.	-0.007	182.42	1.135s
PM-146	1814.64	453.88	10020.	46.	0.006	426.31	1.154s
SB-125	1852.59	463.37	19156.	-171.	-0.024	57.05	1.163
Ir-192	1871.36	468.06	18181.	206.	0.029	92.93	1.167s
BE-7	1909.50	477.60	15473.	-190.	-0.026	92.90	1.176
HF-181	1927.10	482.00	14981.	-189.	-0.026	92.08	1.180s
La-140	1947.19	487.02	7172.	-96.	-0.013	173.02	1.185
RU-103	1987.33	497.05	7562.	-170.	-0.024	57.50	1.194s
RH-106	2046.57	511.86	9636.	290.	0.040	48.24	2.458s
Kr-85	2055.03	513.98	9926.	0.	0.000	1000.00	1.210s
Nd-147	2123.11	531.00	5100.	95.	0.013	147.54	1.225s
Ba-140	2148.15	537.26	5261.	-156.	-0.022	89.70	1.231
CS-134	2252.06	563.24	4275.	28.	0.004	455.76	1.255s
CS-134	2276.40	569.32	4272.	-122.	-0.017	76.30	1.260s
BI-207	2277.92	569.70	4666.	83.	0.011	117.38	1.261s
TL-208	2331.20	583.02	6906.	-158.	-0.022	81.05	1.273s
SB-125	2401.12	600.50	17672.	-132.	-0.018	143.05	1.289
CS-134	2417.96	604.71	17590.	-140.	-0.019	134.51	1.292
BI-214	2436.36	609.31	17868.	44.	0.006	433.61	1.296s
RU-103	2440.31	610.30	17765.	0.	0.000	1000.00	1.297s
AG-108M	2456.25	614.28	17765.	0.	0.000	1000.00	1.301s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	2486.79	621.92	4065.	22.	0.003	583.09	1.308s
SB-125	2542.69	635.89	4099.	-141.	-0.020	64.68	1.320
I-131	2547.03	636.97	4651.	138.	0.019	70.43	1.321s
AG-110M	2630.18	657.76	148506.	340.	0.047	160.59	1.339s
CS-137	2645.77	661.66	6500.	142375.	19.774	0.28	1.343D
PM-144	2785.32	696.54	3078.	25.	0.004	446.10	1.374
NB-94	2809.67	702.63	3077.	111.	0.015	102.14	1.379s
SB-124	2890.31	722.79	5464.	-133.	-0.019	78.89	1.396s
AG-108M	2890.91	722.94	5331.	-19.	-0.003	552.99	1.397s
EU-154	2893.82	723.66	1638.	186.	0.026	40.40	0.909s
ZR-95	2895.96	724.20	5312.	0.	0.000	1000.00	1.398s
BI-212	2907.84	727.17	5615.	-39.	-0.005	274.53	1.400s
PM-146	2942.05	735.72	3522.	-127.	-0.018	89.59	1.408s
PM-146	2987.81	747.16	3185.	134.	0.019	86.65	1.417s
ZR-95	3026.09	756.73	3306.	53.	0.007	223.29	1.426
AG-110M	3054.96	763.94	4252.	-88.	-0.012	104.73	1.432s
NB-95	3062.34	765.79	4333.	121.	0.017	77.36	1.433s
PA-234M	3064.83	766.41	4679.	-141.	-0.020	80.46	1.434s
EU-152	3114.87	778.92	3519.	65.	0.009	185.81	1.444
CS-134	3182.68	795.87	7167.	-149.	-0.021	80.90	1.459
TL-210	3197.61	799.60	7315.	-149.	-0.021	81.55	1.462s
CS-134	3207.01	801.95	7701.	-96.	-0.013	130.15	1.464s
CO-58	3242.31	810.77	3855.	79.	0.011	166.39	1.471s
La-140	3262.30	815.77	8876.	-156.	-0.022	85.72	1.475
Cs-136	3273.22	818.50	8789.	-153.	-0.021	87.06	1.478s
MN-54	3337.20	834.49	2759.	271.	0.038	40.72	1.230
Co-56	3386.32	846.77	5845.	-58.	-0.008	185.82	1.501s
TL-208	3441.51	860.56	4452.	15.	0.002	621.20	1.513
NB-94	3483.65	871.10	4828.	-130.	-0.018	76.39	1.522s
EU-154	3492.19	873.23	5812.	163.	0.023	66.60	1.523s
PA-234	3521.39	880.53	10594.	-171.	-0.024	85.47	1.529s
PA-234	3532.24	883.24	10049.	168.	0.023	84.71	1.531s
AG-110M	3538.01	884.68	9963.	143.	0.020	99.12	1.533s
Sc-46	3556.40	889.28	10766.	-123.	-0.017	119.64	1.536s
Y-88	3591.45	898.04	5300.	-175.	-0.024	53.95	1.543s
AC-228	3643.58	911.07	4956.	49.	0.007	305.11	1.554s
AG-110M	3749.30	937.49	5359.	184.	0.026	84.58	1.576
PA-234	3783.42	946.02	5931.	-196.	-0.027	83.59	1.582s
EU-152	3855.80	964.11	7865.	176.	0.024	71.67	1.597
AC-228	3875.25	968.97	8330.	-180.	-0.025	72.26	1.601s
EU-154	3984.71	996.33	8174.	138.	0.019	92.91	1.622
PA-234M	4003.39	1001.00	7003.	-34.	-0.005	453.87	1.626s
EU-154	4018.51	1004.77	9053.	165.	0.023	81.74	1.629
Co-56	4150.81	1037.84	4176.	-58.	-0.008	269.33	1.655s
Cs-136	4191.74	1048.07	5810.	-61.	-0.008	177.18	1.663s
RH-106	4200.91	1050.36	5326.	118.	0.016	87.95	1.665s
BI-207	4254.12	1063.66	3890.	15.	0.002	914.49	1.675s
Ga-68	4309.10	1077.40	6623.	-167.	-0.023	69.47	1.685s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
FE-59	4396.54	1099.25	6441.	-169.	-0.024	67.48	1.702s
EU-152	4447.85	1112.07	7793.	154.	0.021	81.60	1.712
ZN-65	4461.74	1115.55	7947.	154.	0.021	82.27	1.714s
BI-214	4480.72	1120.29	8099.	145.	0.020	88.23	1.718s
Sc-46	4481.77	1120.55	8244.	72.	0.010	177.99	1.718s
Ta-182	4484.77	1121.30	8094.	-52.	-0.007	244.29	1.719s
CO-60	4692.79	1173.28	2152.	65246.	9.062	0.43	1.814
Ta-182	4755.88	1189.05	1640.	-92.	-0.013	97.33	1.769s
Ta-182	4885.38	1221.41	901.	66.	0.009	104.65	1.792s
Co-56	4952.89	1238.28	722.	53.	0.007	115.81	1.805s
EU-154	5098.00	1274.54	439.	176.	0.024	36.10	2.428A
FE-59	5166.25	1291.60	448.	59.	0.008	83.20	1.843s
TL-210	5251.92	1313.00	480.	18.	0.002	277.67	1.858s
CO-60	5330.53	1332.64	449.	59542.	8.270	0.42	1.892
AG-110M	5537.26	1384.30	225.	-10.	-0.001	93.74	1.907s
EU-152	5632.13	1408.00	256.	46.	0.006	79.84	1.923
K-40	5843.58	1460.83	208.	24.	0.003	138.52	1.958s
SB-124	6764.81	1690.98	147.	-23.	-0.003	123.74	2.102s
BI-214	7059.07	1764.49	289.	-28.	-0.004	120.82	2.145
Co-56	7086.53	1771.35	302.	32.	0.004	78.81	2.149s
Y-88	7345.59	1836.06	121.	33.	0.005	83.01	2.185s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	-1.3029E+01				5.31E+01	
			477.60	-1.303E+01	?(	3.995E+01 9.29E+01 1.05E+01	G
NA-22	C	5.5513E-02				9.50E+02	
						Derived Ave Activity	
			1274.53	5.551E-02	}(	2.147E+00 1.15E+03 9.99E+01	G
K-40	N	4.1979E+00				4.66E+11	
			1460.83	4.198E+00	?(P	1.214E+01 1.39E+02 1.07E+01	G
Sc-46	F	-1.4720E+00				8.38E+01	
			889.28	-1.472E+00	&(	5.819E+00 1.20E+02 1.00E+02	G
			1120.55	1.057E+00	+	6.223E+00 1.78E+02 1.00E+02	G
CR-51	F	3.1874E+00				2.77E+01	
			320.08	3.187E+00	(	3.017E+01 2.86E+02 9.94E+00	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	C	3.0798E+00					3.12E+02	
			834.85	3.080E+00	(P	2.807E+00	4.07E+01	1.00E+02 G
FE-59	F	-4.3054E+00					4.45E+01	
			1099.25	-4.305E+00	?(	9.580E+00	6.75E+01	5.65E+01 G
			1291.60	2.247E+00	& P	3.889E+00	8.32E+01	4.32E+01 G
Co-56	C	1.0695E-01					7.73E+01	
			846.77	-6.701E-01	&(	4.124E+00	1.86E+02	9.99E+01 G
			1238.28	1.282E+00	?(P	3.090E+00	1.16E+02	6.61E+01 G
			1037.84	-5.599E+00	+ P	2.939E+01	2.69E+02	1.41E+01 G
			1771.35	4.572E+00	?	1.196E+01	7.88E+01	1.55E+01 A
CO-57	C	1.2566E+00					2.72E+02	
			122.06	1.228E+00	}	1.993E+00	3.57E+01	8.56E+01 G
			136.47	1.257E+00	?(	2.094E+01	5.04E+02	1.07E+01 G
CO-58	C	8.8274E-01					7.09E+01	
			810.78	8.827E-01	?(	3.249E+00	1.66E+02	9.95E+01 G
CO-60	F	1.0044E+03					1.93E+03	
			1332.50	1.015E+03	(P	1.730E+00	4.21E-01	1.00E+02 G
			1173.24	9.938E+02	(	3.334E+00	4.33E-01	9.99E+01 G
ZN-65	F	4.4292E+00					2.44E+02	
			1115.55	4.429E+00	?(	1.203E+01	8.23E+01	5.06E+01 G
NB-94	I	1.1174E+00					7.41E+06	
			702.63	1.117E+00	&(	2.621E+00	1.02E+02	9.79E+01 G
			871.10	-1.524E+00	&	3.843E+00	7.64E+01	9.99E+01 G
ZR-95	I	1.0103E+00					6.40E+01	
			756.73	1.010E+00	(	5.192E+00	2.23E+02	5.45E+01 G
			724.20	0.000E+00	-	7.811E+00	1.00E+03	4.42E+01 G
NB-95	I	1.2811E+00					6.40E+01	
			765.79	1.281E+00	?(	3.272E+00	7.74E+01	9.98E+01 G
RU-103	I	-1.3913E+00					3.93E+01	
			497.05	-1.391E+00	?(P	3.341E+00	5.75E+01	9.09E+01 G
			610.30	0.000E+00	+	9.505E+01	1.00E+03	5.75E+00 GA
RH-106	I	1.5910E+01					3.74E+02	
			621.92	2.001E+00	?(	2.686E+01	5.83E+02	9.93E+00 G
			1050.36	1.045E+02	&(	3.034E+02	8.79E+01	1.56E+00 G
			511.86	1.105E+01	P	1.753E+01	4.82E+01	2.00E+01 GA

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-108M	C -3.9645E-01					1.53E+05	
		433.94	-3.965E-01	*(P	3.270E+00	1.82E+02	9.05E+01 G
		722.94	-2.069E-01	&	3.798E+00	5.53E+02	9.08E+01 G
		614.28	0.000E+00	&	6.115E+00	1.00E+03	8.98E+01 G
AG-110M	F 3.5554E+00					2.50E+02	
		884.68	2.343E+00	?(	7.669E+00	9.91E+01	7.27E+01 G
		657.76	3.340E+00	?(P	1.769E+01	1.61E+02	9.46E+01 G
		937.49	6.714E+00	(P	1.253E+01	8.46E+01	3.44E+01 G
		1384.30	-7.449E-01	- P	5.276E+00	9.37E+01	2.43E+01 G
		763.94	-4.183E+00	&	1.449E+01	1.05E+02	2.23E+01 G
SN-113	F -4.9540E-01					1.15E+02	
		391.69	-4.954E-01	?(P	6.340E+00	1.91E+02	6.40E+01 G
SB-124	F 5.0509E-08					6.02E+01	
		602.73	5.051E-08	%(	5.479E+00	3.28E+09	9.83E+01 G
		1690.98	-1.034E+00	+	2.627E+00	1.24E+02	4.78E+01 G
		722.79	-1.240E+01	&	3.230E+01	7.89E+01	1.08E+01 G
SB-125	I -4.3011E+00					1.01E+03	
		427.88	-4.301E+00	?(	9.837E+00	9.15E+01	2.96E+01 G
		600.50	-6.375E+00	+	3.013E+01	1.43E+02	1.79E+01 G
		635.89	-1.131E+01	+	2.411E+01	6.47E+01	1.13E+01 G
		463.37	-1.153E+01	+ P	4.361E+01	5.70E+01	1.05E+01 G
I-131	I 1.6099E+00					8.02E+00	
		364.48	2.142E-01	?(	3.021E+00	5.63E+02	8.17E+01 G
		284.30	1.603E-01	&	3.685E+01	9.18E+03	6.14E+00 G
		636.97	1.751E+01	&(	4.069E+01	7.04E+01	7.17E+00 G
Gd-153	F 3.9481E-01					2.42E+02	
		97.50	-8.580E-01	?(	4.570E+00	1.92E+02	3.00E+01 G
		103.20	2.119E+00	(	9.797E+00	1.40E+02	2.18E+01 G
Ga-68	C -1.2542E+02					4.71E-02	
		1077.40	-1.254E+02	&(	2.873E+02	6.95E+01	3.30E+00 G
Tc-99m	I -6.3248E-01					2.51E-01	
		140.51	-6.325E-01	*(	2.925E+00	1.40E+02	8.93E+01 G
BA-133	F 2.7173E+00					3.85E+03	
		356.00	2.101E+00	@(	2.968E+00	5.39E+01	6.20E+01 G
		302.85	4.802E+00	(	2.066E+01	1.30E+02	1.83E+01 G
		383.84	1.197E+01	?	4.491E+01	1.14E+02	8.94E+00 GA
		80.99	1.645E+00	P	2.984E+00	6.35E+01	3.41E+01 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	I	-1.8951E+00					7.54E+02	
			795.87	-1.895E+00	&(	5.060E+00	8.09E+01	8.55E+01 G
			604.71	-1.245E+00	+	5.530E+00	1.35E+02	9.76E+01 G
			569.32	-6.573E+00	+	1.656E+01	7.63E+01	1.54E+01 G
			801.95	-1.207E+01	+	5.195E+01	1.30E+02	8.69E+00 G
			563.24	2.766E+00	+ P	3.024E+01	4.56E+02	8.35E+00 G
CS-137	I	1.5629E+03					1.10E+04	
			661.66	1.563E+03	(	4.154E+00	2.77E-01	8.52E+01 G
Ba-140	I	6.4716E-01					1.28E+01	
			537.26	-5.063E+00	(P	1.105E+01	8.97E+01	2.44E+01 G
			162.66	9.240E+00	(	3.372E+01	1.11E+02	6.22E+00 G
			304.85	2.066E+01	(	8.901E+01	1.31E+02	4.29E+00 G
La-140	I	6.3161E-02					1.28E+01	
			1596.21	6.316E-02	&(	1.458E+00	1.12E+03	9.54E+01 G
			487.02	-1.546E+00	+	6.399E+00	1.73E+02	4.55E+01 G
			328.76	-4.310E+00	+	1.179E+01	1.09E+02	2.03E+01 G
			815.77	-7.460E+00	+	2.111E+01	8.57E+01	2.33E+01 G
CE-141	I	1.1452E+00					3.25E+01	
			145.44	1.145E+00	&(	4.701E+00	1.24E+02	4.82E+01 G
CE-144	I	1.8188E+00					2.85E+02	
			133.54	1.819E+00	?(	1.998E+01	3.32E+02	1.11E+01 G
PM-144	C	2.5039E-01					3.63E+02	
			696.54	2.504E-01	&(P	2.574E+00	4.46E+02	9.90E+01 G
			618.06	-2.437E-02	% P	5.572E+00	6.94E+03	9.91E+01 G
EU-152	F	1.3144E+01					4.94E+03	
			121.78	4.825E+00	}	5.861E+00	2.67E+01	2.86E+01 G
			344.29	1.022E+01	@(	7.912E+00	3.26E+01	2.65E+01 G
			1112.07	1.636E+01	(	4.405E+01	8.16E+01	1.36E+01 G
			778.92	5.402E+00	- P	2.309E+01	1.86E+02	1.29E+01 G
			964.11	1.545E+01	(	3.652E+01	7.17E+01	1.46E+01 G
			244.69	-5.653E+00	-	4.797E+01	2.57E+02	7.58E+00 G
			1408.00	3.952E+00	-	6.589E+00	7.98E+01	2.10E+01 GA
EU-154	I	8.1693E+00					3.14E+03	
			123.10	1.253E+00	?(	4.364E+00	1.06E+02	4.08E+01 G
			1274.54	8.169E+00	}	4.671E+00	3.61E+01	3.52E+01 G
			723.36	9.258E+00	(	9.522E+00	4.04E+01	2.02E+01 G
			873.23	1.565E+01	?(	3.437E+01	6.66E+01	1.23E+01 G
			1004.77	1.220E+01	(	3.291E+01	8.17E+01	1.80E+01 G
			996.33	1.720E+01	(	5.276E+01	9.29E+01	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	-1.0163E+00					1.81E+03	
			105.31	-1.016E+00	?(	1.076E+01	3.20E+02	2.12E+01 G
			86.54	0.000E+00	+	8.068E+00	1.00E+03	3.07E+01 G
HF-181	F	-7.5296E-01					4.24E+01	
			482.00	-1.703E+00	?(	5.174E+00	9.21E+01	8.05E+01 G
			133.02	-1.230E+00	&	5.136E+00	1.26E+02	4.33E+01 G
			345.83	4.320E+00	&(	2.475E+01	1.73E+02	1.51E+01 G
			136.30	0.000E+00	+	3.824E+01	1.00E+03	5.85E+00 G
Ta-182	F	4.4057E-01					1.14E+02	
			1121.30	-2.185E+00	&(	1.768E+01	2.44E+02	3.49E+01 G
			1221.41	3.835E+00	&(	8.328E+00	1.05E+02	2.70E+01 G
			1189.05	-8.744E+00	&	1.819E+01	9.73E+01	1.62E+01 G
Hg-203	F	4.4791E-01					4.66E+01	
			279.20	4.479E-01	&(	3.295E+00	2.22E+02	8.15E+01 G
TL-208	N	-1.5825E+00					6.98E+02	
			583.02	-1.582E+00	?(P	3.897E+00	8.10E+01	8.45E+01 G
			277.28	-1.392E+01	+	3.736E+01	8.13E+01	6.31E+00 G
			860.56	1.425E+00	& P	2.939E+01	6.21E+02	1.24E+01 G
PM-146	C	1.7175E+00					2.02E+03	
			453.88	4.910E-01	&(	5.008E+00	4.26E+02	6.50E+01 G
			747.16	4.062E+00	&(	8.078E+00	8.67E+01	3.40E+01 G
			735.72	-5.740E+00	& P	1.267E+01	8.96E+01	2.25E+01 G
Y-88	F	7.5364E-01					1.07E+02	
			1836.06	7.536E-01	&(P	1.246E+00	8.30E+01	9.92E+01 G
			898.04	-2.255E+00	+ P	4.404E+00	5.39E+01	9.37E+01 G
Cd-113m		-7.2290E+02					5.33E+03	
			263.70	-7.229E+02	&(	4.491E+04	1.88E+03	6.00E-03 K
Cd-109	F	5.5048E+02					4.53E+02	
			88.04	5.505E+02	(	3.418E+01	2.79E+00	3.79E+00 G
Cf-251	T	-3.2929E+00					3.28E+05	
			176.60	-3.293E+00	?(	1.020E+01	1.18E+02	1.70E+01 G
			227.00	-1.311E+01	+	3.733E+01	8.63E+01	6.30E+00 GA
Cf-249	T	-1.6645E+00					1.28E+05	
			387.95	-1.665E+00	*(	6.138E+00	1.12E+02	6.60E+01 G
			333.44	8.277E-01	+	1.527E+01	7.36E+02	1.55E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		3.5097E+00					3.65E+07	
			87.57	0.000E+00	-	6.601E+00	1.00E+03	3.75E+01 GA
			64.28	3.510E+00	(	1.624E+01	1.40E+02	9.70E+00 G
			86.94	0.000E+00	-	2.739E+01	1.00E+03	9.04E+00 GA
PB-210	N	1.0873E+03					8.14E+03	
			46.54	1.087E+03	?(P	1.921E+02	5.43E+00	4.25E+00 G
PB-212	N	-3.0423E-01					6.98E+02	
			238.63	-3.042E-01	?(P	8.311E+00	6.42E+02	4.33E+01 G
			300.03	-1.995E-01	& P	1.402E+02	2.12E+04	3.28E+00 GA
PB-214	N	-7.8305E-01					5.84E+05	
			351.93	-3.163E+00	?(P	8.326E+00	1.06E+02	3.76E+01 G
			295.09	3.854E+00	?(P	2.345E+01	1.84E+02	1.93E+01 G
			242.00	-1.125E+01	+	4.610E+01	1.24E+02	7.43E+00 GA
BI-207	C	5.1949E-01					1.18E+04	
			1063.66	2.811E-01	?(	5.497E+00	9.14E+02	7.45E+01 G
			569.70	7.012E-01	&(	2.723E+00	1.17E+02	9.77E+01 G
BI-212	N	-5.1766E+00					6.98E+02	
			727.17	-5.177E+00	&(	4.711E+01	2.75E+02	7.55E+00 G
			785.42	-3.929E+00	%	2.298E+02	2.54E+03	1.28E+00 GA
U-235	N	2.3676E+00					2.57E+11	
			143.79	-1.914E+00	*(P	2.092E+01	1.89E+02	1.10E+01 G
			205.33	1.194E+01	?(	4.038E+01	1.29E+02	5.01E+00 G
			163.38	2.165E+00	?(P	4.160E+01	5.81E+02	5.08E+00 G
			185.72	5.497E-01	? P	3.567E+00	2.47E+02	5.40E+01 GA
BI-214	N	4.0836E+00					5.84E+05	
			609.31	8.284E-01	&(P	1.188E+01	4.34E+02	4.61E+01 G
			1120.29	1.402E+01	?(P	4.084E+01	8.82E+01	1.51E+01 G
			1764.49	-4.036E+00	+ P	1.173E+01	1.21E+02	1.54E+01 G
BI-210M	T	6.6283E-01					1.10E+09	
			265.83	-7.384E-01	?(	4.294E+00	2.21E+02	5.00E+01 G
			304.90	3.165E+00	(	1.369E+01	1.31E+02	2.80E+01 G
AC-228	N	3.7829E+00					2.10E+03	
			911.07	2.064E+00	?(	1.393E+01	3.05E+02	2.90E+01 G
			968.97	-1.325E+01	&	3.157E+01	7.23E+01	1.75E+01 G
			338.32	7.934E+00	&(	3.108E+01	1.19E+02	1.20E+01 G
			93.35	6.077E+00	*	4.402E+01	2.19E+02	5.56E+00 XA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	-3.1661E+00					7.95E+03	
			256.24	-3.166E+00	?(	3.047E+01	3.66E+02	7.00E+00 G
			235.97	-5.768E+00	+	2.906E+01	1.53E+02	1.23E+01 G
			50.14	0.000E+00	+	9.961E+01	1.00E+03	8.00E+00 G
TH-229	N	4.4824E+00					2.68E+06	
			193.51	-9.517E+00	?(P	4.543E+01	1.80E+02	4.40E+00 G
			210.85	2.508E+01	*(P	6.817E+01	1.03E+02	2.99E+00 G
TH-234	N	-4.7987E+00					1.63E+12	
			92.59	-4.799E+00	&(P	4.433E+01	1.33E+02	5.58E+00 G
			63.29	-9.791E+00	+ P	3.773E+01	5.66E+02	3.81E+00 G
PA-231	N	3.0540E+01					1.20E+07	
			302.65	3.054E+01	(	1.310E+02	1.30E+02	2.88E+00 G
			300.07	-2.660E-01	& P	1.870E+02	2.12E+04	2.46E+00 G
PA-233	C	2.0889E+00					7.82E+08	
			312.01	2.089E+00	&(P	1.057E+01	1.53E+02	3.60E+01 G
			300.18	-1.056E-01	& P	7.421E+01	2.12E+04	6.20E+00 G
PA-234	N	9.1526E+00					1.63E+12	
			131.29	2.926E+00	?(	1.264E+01	1.31E+02	1.80E+01 G
			946.02	-1.847E+01	&	3.404E+01	8.36E+01	1.34E+01 G
			569.47	-3.032E-01	&	3.212E+01	3.19E+03	8.20E+00 G
			883.24	2.083E+01	*(	5.823E+01	8.47E+01	9.60E+00 G
			880.53	-3.381E+01	+	9.539E+01	8.55E+01	6.00E+00 GA
PA-234M	N	-5.4351E+01					1.63E+12	
			1001.00	-5.435E+01	&(P	6.214E+02	4.54E+02	8.37E-01 G
			766.41	-5.062E+02	+ P	1.154E+03	8.05E+01	2.94E-01 G
AM-241	T	4.8832E+03					1.58E+05	
			59.54	4.883E+03	*(	1.104E+01	1.64E-01	3.59E+01 G
Np-237	F	-6.4070E-01					2.14E+06	
			86.49	-6.407E-01	?(	1.892E+01	8.93E+02	1.31E+01 G
Ir-192	F	1.1800E+00					7.40E+01	
			316.49	4.432E-01	&(	3.324E+00	2.27E+02	8.70E+01 G
			468.06	2.825E+00	&(	8.663E+00	9.29E+01	5.18E+01 G
			308.44	5.187E-01	&(	1.221E+01	7.12E+02	3.18E+01 G
Cs-136	F	-1.7063E+00					1.30E+01	
			818.50	-1.706E+00	?(	4.904E+00	8.71E+01	1.00E+02 G
			1048.07	-1.051E+00	+	6.166E+00	1.77E+02	8.00E+01 G
			340.57	2.025E+00	+	7.881E+00	1.18E+02	4.69E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Np-239	T	4.0747E-01					2.36E+00	
			103.70	1.951E+00		9.045E+00	1.40E+02	2.40E+01 X
			106.13	4.075E-01	(	1.047E+01	7.77E+02	2.27E+01 G
			99.50	3.113E+00		1.091E+01	1.06E+02	1.50E+01 X
Nd-147		5.7299E+00					1.11E+01	
			531.00	5.730E+00	(	2.024E+01	1.48E+02	1.30E+01 G
			91.10	0.000E+00	-	8.736E+00	1.00E+03	2.83E+01 G
TL-210	N	-1.6479E+00					5.84E+05	
			799.60	-1.648E+00	?(	4.436E+00	8.15E+01	9.90E+01 G
			296.00	9.851E-01	&	5.754E+00	1.77E+02	7.90E+01 G
			1313.00	1.442E+00	+	8.394E+00	2.78E+02	2.10E+01 GA

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-234	63.29	10182.	-123.	-0.017	566.49	-9.791E+00	P
Np-237	86.49	35112.	-30.	-0.004	893.43	-6.407E-01	
TH-234	92.59	35177.	-95.	-0.013	132.84	-4.799E+00	P
AC-228	93.35	34392.	120.	0.017	219.36	6.077E+00	
Gd-153	97.50	10695.	-91.	-0.013	191.58	-8.580E-01	
Gd-153	103.20	25790.	162.	0.023	140.03	2.119E+00	
EU-155	105.31	29281.	-76.	-0.010	320.44	-1.016E+00	
PA-234	131.29	25949.	174.	0.024	130.83	2.926E+00	
HF-181	133.02	24541.	-176.	-0.024	126.43	-1.230E+00	
Tc-99m	140.51	25666.	-162.	-0.022	140.08	-6.325E-01	
U-235	143.79	24380.	-67.	-0.009	188.83	-1.914E+00	P
Ba-140	162.66	17849.	171.	0.024	110.55	9.240E+00	
U-235	163.38	18024.	33.	0.005	581.00	2.165E+00	P
Cf-251	176.60	10963.	-158.	-0.022	117.95	-3.293E+00	
U-235	185.72	12658.	81.	0.011	246.67	5.497E-01	P
TH-229	193.51	12907.	-111.	-0.015	179.76	-9.517E+00	P
U-235	205.33	12200.	153.	0.021	128.72	1.194E+01	
TH-229	210.85	11948.	188.	0.026	103.49	2.508E+01	P
Cf-251	227.00	14393.	-197.	-0.027	86.30	-1.311E+01	
TH-227	235.97	31606.	-165.	-0.023	152.57	-5.768E+00	
PB-212	238.63	31555.	-30.	-0.004	642.26	-3.042E-01	P
PB-214	242.00	28025.	-191.	-0.027	124.17	-1.125E+01	
TH-227	256.24	9987.	-49.	-0.007	365.69	-3.166E+00	
BI-210M	265.83	9603.	-79.	-0.011	221.02	-7.384E-01	
TL-208	277.28	10917.	-182.	-0.025	81.35	-1.392E+01	
Hg-203	279.20	14027.	75.	0.010	222.44	4.479E-01	
PB-214	295.09	37000.	148.	0.021	184.34	3.854E+00	P
TL-210	296.00	37148.	154.	0.021	176.90	9.851E-01	
PA-231	302.65	24748.	172.	0.024	129.91	3.054E+01	
Ba-140	304.85	25091.	172.	0.024	130.52	2.066E+01	
BI-210M	304.90	25263.	172.	0.024	130.97	3.165E+00	
Ir-192	308.44	25435.	32.	0.004	712.08	5.187E-01	
PA-233	312.01	24104.	143.	0.020	153.27	2.089E+00	P
Ir-192	316.49	13609.	73.	0.010	226.82	4.432E-01	
CR-51	320.08	14386.	59.	0.008	286.17	3.187E+00	
La-140	328.76	8793.	-161.	-0.022	109.47	-4.310E+00	
Cf-249	333.44	8430.	23.	0.003	736.44	8.277E-01	
AC-228	338.32	20578.	171.	0.024	118.64	7.934E+00	
Cs-136	340.57	19980.	170.	0.024	117.86	2.025E+00	
HF-181	345.83	19889.	115.	0.016	173.40	4.320E+00	
PB-214	351.93	13634.	-208.	-0.029	105.95	-3.163E+00	P
I-131	364.48	7960.	30.	0.004	562.94	2.142E-01	
Cf-249	387.95	19776.	-178.	-0.025	111.70	-1.665E+00	
SN-113	391.69	19556.	-51.	-0.007	190.91	-4.954E-01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	427.88	8771.	-192.	-0.027	91.54	-4.301E+00	
AG-108M	433.94	8863.	-54.	-0.007	182.42	-3.965E-01	P
PM-146	453.88	10020.	46.	0.006	426.31	4.910E-01	
SB-125	463.37	19156.	-171.	-0.024	57.05	-1.153E+01	P
Ir-192	468.06	18181.	206.	0.029	92.93	2.825E+00	
BE-7	477.60	15473.	-190.	-0.026	92.90	-1.303E+01	
HF-181	482.00	14981.	-189.	-0.026	92.08	-1.703E+00	
La-140	487.02	7172.	-96.	-0.013	173.02	-1.546E+00	
RU-103	497.05	7562.	-170.	-0.024	57.50	-1.391E+00	P
RH-106	511.86	9636.	290.	0.040	48.24	1.105E+01	P
Nd-147	531.00	5100.	95.	0.013	147.54	5.730E+00	
Ba-140	537.26	5261.	-156.	-0.022	89.70	-5.063E+00	P
CS-134	563.24	4275.	28.	0.004	455.76	2.766E+00	P
CS-134	569.32	4272.	-122.	-0.017	76.30	-6.573E+00	
BI-207	569.70	4666.	83.	0.011	117.38	7.012E-01	
TL-208	583.02	6906.	-158.	-0.022	81.05	-1.582E+00	P
SB-125	600.50	17672.	-132.	-0.018	143.05	-6.375E+00	
CS-134	604.71	17590.	-140.	-0.019	134.51	-1.245E+00	
RH-106	621.92	4065.	22.	0.003	583.09	2.001E+00	
SB-125	635.89	4099.	-141.	-0.020	64.68	-1.131E+01	
I-131	636.97	4651.	138.	0.019	70.43	1.751E+01	
PM-144	696.54	3078.	25.	0.004	446.10	2.504E-01	P
NB-94	702.63	3077.	111.	0.015	102.14	1.117E+00	
SB-124	722.79	5464.	-133.	-0.019	78.89	-1.240E+01	
AG-108M	722.94	5331.	-19.	-0.003	552.99	-2.069E-01	
BI-212	727.17	5615.	-39.	-0.005	274.53	-5.177E+00	
PM-146	735.72	3522.	-127.	-0.018	89.59	-5.740E+00	P
PM-146	747.16	3185.	134.	0.019	86.65	4.062E+00	
ZR-95	756.73	3306.	53.	0.007	223.29	1.010E+00	
NB-95	765.79	4333.	121.	0.017	77.36	1.281E+00	
PA-234M	766.41	4679.	-141.	-0.020	80.46	-5.062E+02	P
CS-134	795.87	7167.	-149.	-0.021	80.90	-1.895E+00	
TL-210	799.60	7315.	-149.	-0.021	81.55	-1.648E+00	
CS-134	801.95	7701.	-96.	-0.013	130.15	-1.207E+01	
CO-58	810.77	3855.	79.	0.011	166.39	8.827E-01	
La-140	815.77	8876.	-156.	-0.022	85.72	-7.460E+00	
Cs-136	818.50	8789.	-153.	-0.021	87.06	-1.706E+00	
Co-56	846.77	5845.	-58.	-0.008	185.82	-6.701E-01	
TL-208	860.56	4452.	15.	0.002	621.20	1.425E+00	P
NB-94	871.10	4828.	-130.	-0.018	76.39	-1.524E+00	
PA-234	880.53	10594.	-171.	-0.024	85.47	-3.381E+01	
PA-234	883.24	10049.	168.	0.023	84.71	2.083E+01	
Sc-46	889.28	10766.	-123.	-0.017	119.64	-1.472E+00	
Y-88	898.04	5300.	-175.	-0.024	53.95	-2.255E+00	P
AC-228	911.07	4956.	49.	0.007	305.11	2.064E+00	
PA-234	946.02	5931.	-196.	-0.027	83.59	-1.847E+01	
AC-228	968.97	8330.	-180.	-0.025	72.26	-1.325E+01	
PA-234M	1001.00	7003.	-34.	-0.005	453.87	-5.435E+01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	1037.84	4176.	-58.	-0.008	269.33	-5.599E+00	P
Cs-136	1048.07	5810.	-61.	-0.008	177.18	-1.051E+00	
RH-106	1050.36	5326.	118.	0.016	87.95	1.045E+02	
BI-207	1063.66	3890.	15.	0.002	914.49	2.811E-01	
Ga-68	1077.40	6623.	-167.	-0.023	69.47	-1.254E+02	
ZN-65	1115.55	7947.	154.	0.021	82.27	4.429E+00	
Sc-46	1120.55	8244.	72.	0.010	177.99	1.057E+00	
Ta-182	1121.30	8094.	-52.	-0.007	244.29	-2.185E+00	
Ta-182	1189.05	1640.	-92.	-0.013	97.33	-8.744E+00	
Ta-182	1221.41	901.	66.	0.009	104.65	3.835E+00	
Co-56	1238.28	722.	53.	0.007	115.81	1.282E+00	P
TL-210	1313.00	480.	18.	0.002	277.67	1.442E+00	
SB-124	1690.98	147.	-23.	-0.003	123.74	-1.034E+00	
Co-56	1771.35	302.	32.	0.004	78.81	4.572E+00	
Y-88	1836.06	121.	33.	0.005	83.01	7.536E-01	P

P - Peakbackground subtraction

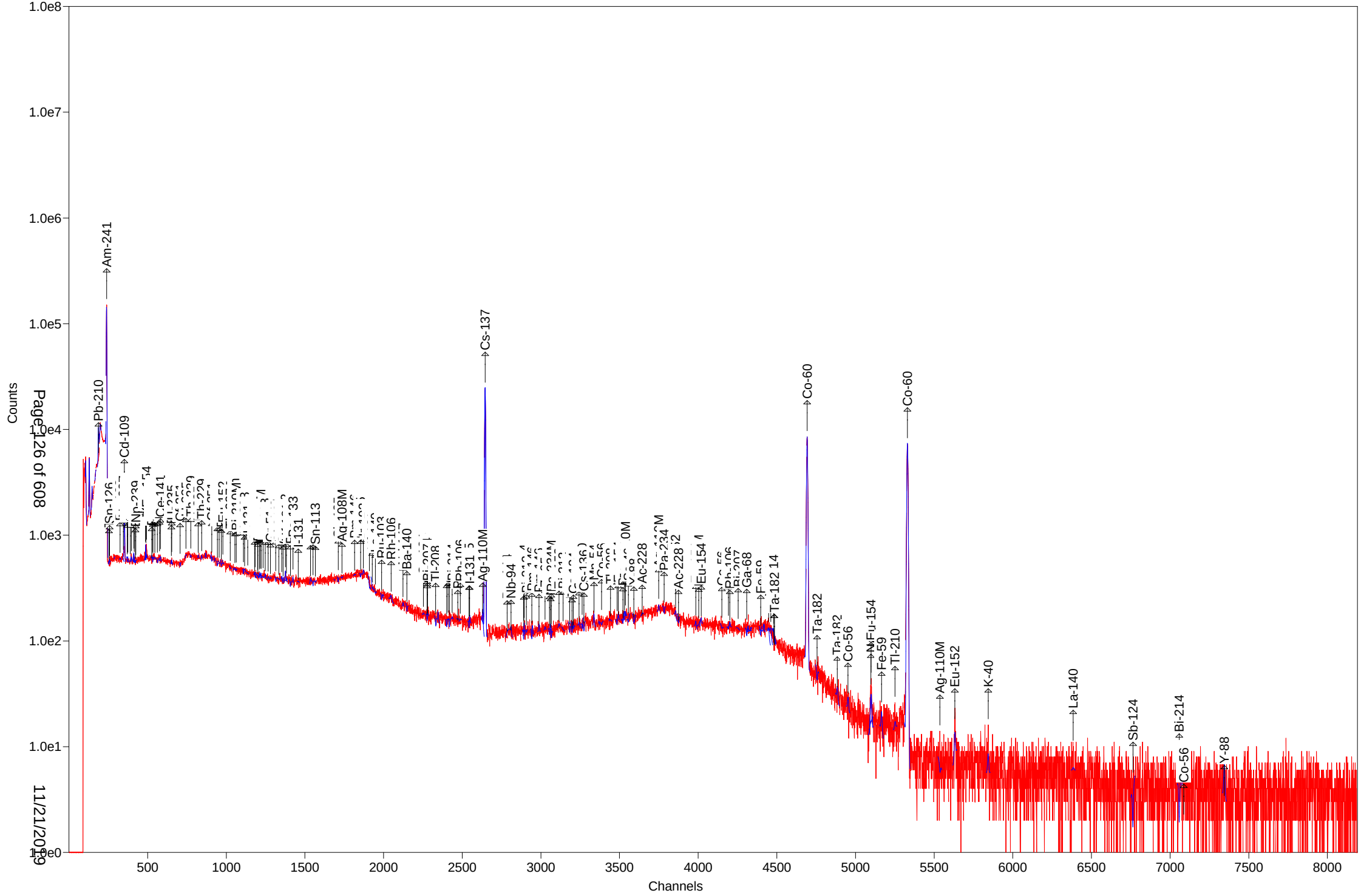
***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-1.3029E+01	-1.3029E+01	9.290E+01%	3.99E+01
NA-22	#A	5.5513E-02	5.5513E-02	1.151E+03%	2.15E+00
K-40	#A	4.1979E+00	4.1979E+00	1.385E+02%	1.21E+01
Sc-46	#A	-1.4720E+00	-1.4720E+00	1.196E+02%	5.82E+00
CR-51	#A	3.1874E+00	3.1874E+00	2.862E+02%	3.02E+01
MN-54		3.0798E+00	3.0798E+00	4.072E+01%	2.81E+00
FE-59	#A	-4.3054E+00	-4.3054E+00	6.748E+01%	9.58E+00
Co-56	#A	1.0695E-01	1.0695E-01	1.095E+02%	4.12E+00
CO-57	#A	1.2566E+00	1.2566E+00	5.040E+02%	2.09E+01
CO-58	#A	8.8274E-01	8.8274E-01	1.664E+02%	3.25E+00
CO-60		1.0044E+03	1.0044E+03	3.022E-01%	1.73E+00
ZN-65	#A	4.4292E+00	4.4292E+00	8.227E+01%	1.20E+01
NB-94	#A	1.1174E+00	1.1174E+00	1.021E+02%	2.62E+00
ZR-95	#A	1.0103E+00	1.0103E+00	2.233E+02%	5.19E+00
NB-95	#A	1.2811E+00	1.2811E+00	7.736E+01%	3.27E+00
RU-103	#A	-1.3913E+00	-1.3913E+00	5.750E+01%	3.34E+00
RH-106	#A	1.5910E+01	1.5910E+01	8.795E+01%	2.69E+01
AG-108M	#A	-3.9645E-01	-3.9645E-01	1.824E+02%	3.27E+00
AG-110M	A	3.5554E+00	3.5554E+00	6.893E+01%	7.67E+00
SN-113	#A	-4.9540E-01	-4.9540E-01	1.909E+02%	6.34E+00
SB-124	#A	5.0509E-08	5.0509E-08	3.278E+09%	5.48E+00
SB-125	#A	-4.3011E+00	-4.3011E+00	9.154E+01%	9.84E+00
I-131	#A	1.6098E+00	1.6099E+00	7.043E+01%	3.02E+00
Gd-153	#A	3.9481E-01	3.9481E-01	1.186E+02%	4.57E+00
Ga-68	#A	-1.2480E+02	-1.2542E+02	6.947E+01%	2.87E+02

Tc-99m #A	-6.3190E-01	-6.3248E-01	1.401E+02%		2.93E+00
BA-133 A	2.7173E+00	2.7173E+00	5.388E+01%		2.97E+00
CS-134 #A	-1.8951E+00	-1.8951E+00	8.090E+01%		5.06E+00
CS-137	1.5629E+03	1.5629E+03	2.769E-01%		4.15E+00
CE-139 #A	0.0000E+00	0.0000E+00	1.000E+03%		2.67E+00
Ba-140 #A	6.4715E-01	6.4716E-01	6.438E+01%		1.11E+01
La-140 A	6.3160E-02	6.3161E-02	1.118E+03%		1.46E+00
CE-141 #A	1.1452E+00	1.1452E+00	1.243E+02%		4.70E+00
CE-144 #A	1.8188E+00	1.8188E+00	3.323E+02%		2.00E+01
PM-144 #A	2.5039E-01	2.5039E-01	4.461E+02%		2.57E+00
EU-152	1.3144E+01	1.3144E+01	3.261E+01%		7.91E+00
EU-154 C	8.1693E+00	8.1693E+00	3.606E+01%		4.36E+00
EU-155 #A	-1.0163E+00	-1.0163E+00	3.204E+02%		1.08E+01
HF-181 #A	-7.5295E-01	-7.5296E-01	9.208E+01%		5.17E+00
Ta-182 #A	4.4057E-01	4.4057E-01	1.047E+02%		1.77E+01
Hg-203 #A	4.4791E-01	4.4791E-01	2.224E+02%		3.29E+00
TL-208 #A	-1.5825E+00	-1.5825E+00	8.105E+01%		3.90E+00
PM-146 #A	1.7175E+00	1.7175E+00	8.665E+01%		5.01E+00
Y-88 #A	7.5364E-01	7.5364E-01	8.301E+01%		1.25E+00
Cd-113m#B	-7.2290E+02	-7.2290E+02	1.877E+03%		4.49E+04
Cd-109	5.5048E+02	5.5048E+02	2.790E+00%		3.42E+01
Cf-251 #A	-3.2929E+00	-3.2929E+00	1.179E+02%		1.02E+01
Cf-249 #A	-1.6645E+00	-1.6645E+00	1.117E+02%		6.14E+00
Sn-126 A	3.5097E+00	3.5097E+00	1.401E+02%		1.62E+01
PB-210 #	1.0873E+03	1.0873E+03	5.428E+00%		1.92E+02
PB-212 #A	-3.0423E-01	-3.0423E-01	6.423E+02%		8.31E+00
PB-214 #A	-7.8305E-01	-7.8305E-01	1.060E+02%		8.33E+00
BI-207 #A	5.1949E-01	5.1949E-01	1.174E+02%		5.50E+00
BI-212 #A	-5.1766E+00	-5.1766E+00	2.745E+02%		4.71E+01
U-235 #A	2.3676E+00	2.3676E+00	1.287E+02%		2.09E+01
BI-214 #A	4.0836E+00	4.0836E+00	8.823E+01%		1.19E+01
BI-210M#A	6.6283E-01	6.6283E-01	1.285E+02%		4.29E+00
AC-228 #A	3.7829E+00	3.7829E+00	1.186E+02%		1.39E+01
TH-227 #A	-3.1661E+00	-3.1661E+00	3.657E+02%		3.05E+01
TH-229 #A	4.4824E+00	4.4824E+00	1.035E+02%		4.54E+01
TH-234 #A	-4.7987E+00	-4.7987E+00	1.328E+02%		4.43E+01
PA-231 #A	3.0540E+01	3.0540E+01	1.299E+02%		1.31E+02
PA-233 #A	2.0889E+00	2.0889E+00	1.533E+02%		1.06E+01
PA-234 #A	9.1526E+00	9.1526E+00	7.793E+01%		1.26E+01
PA-234M#A	-5.4351E+01	-5.4351E+01	4.539E+02%		6.21E+02
AM-241 #	4.8832E+03	4.8832E+03	1.636E-01%		1.10E+01
Np-237 #A	-6.4070E-01	-6.4070E-01	8.934E+02%		1.89E+01
Ir-192 #A	1.1800E+00	1.1800E+00	9.293E+01%		3.32E+00
Cs-136 #A	-1.7063E+00	-1.7063E+00	8.706E+01%		4.90E+00
Np-239 A	4.0743E-01	4.0747E-01	7.772E+02%		1.05E+01
Nd-147 #A	5.7298E+00	5.7299E+00	1.475E+02%		2.02E+01
TL-210 #A	-1.6479E+00	-1.6479E+00	8.155E+01%		4.44E+00
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%		8.30E+02

```
  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded
-----------------------------   S U M M A R Y   ----------------------------
Total Activity (   25.1 to  1999.5 keV)     8.020E+03  Bq/Sample
Total Decayed Activity (   25.1 to  1999.5 keV) 8.0198838E+03  Bq/Sample
```

445202_Gamma_LCS 160-445202~2-A. 14_Gamma_20192330.spc.



Test America St. Louis Spectrum ID: 17_Gamma_20192077

Sample Description: 445202_Gamma_180-96597-A-1-B DU
Detector: Detector #17
Batch ID: 445202
Work Order Number: Gamma
Lot Number: 180-96597-A-1-B DU

Decay to Time: 10/31/2019 05:07 Live Time: 7200 sec
Acquisition Time: 10/31/2019 05:07:31 Real Time: 7223 sec
Analysis Time: 10/31/2019 07:08 Dead Time: 0.32 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 17_Liquid_Marinelli 1L.Clb
Efficiency Cal Desc: 17_1L marn_90062_030512
Efficiency Cal Date: 3/7/2012 11:47
Energy Cal Date: 2/29/2012 10:33
Library: Client_Long_Rev15.lib
Bkgd Correction File: 17_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-2.274E-01	341.0	7.753E-01	7.754E-01	2.681E+00
NA-22	-1.691E-01	67.5	1.142E-01	1.145E-01	3.782E-01
K-40	-2.745E-02	5635.2	1.547E+00	1.547E+00	4.377E+00
Sc-46	4.314E-02	95.6	4.123E-02	4.129E-02	5.545E-01
CR-51	5.146E-01	155.8	8.019E-01	8.023E-01	2.717E+00
MN-54	-1.250E-01	109.4	1.368E-01	1.369E-01	3.159E-01
FE-59	1.300E-01	86.7	1.127E-01	1.129E-01	5.772E-01
Co-56	-1.959E-01	54.5	1.068E-01	1.072E-01	3.783E-01
CO-57	8.901E-03	97.8	8.701E-03	8.715E-03	2.725E-01
CO-58	-8.982E-03	1063.0	9.548E-02	9.548E-02	3.375E-01
CO-60	1.117E-01	98.9	1.105E-01	1.106E-01	2.519E-01
ZN-65	-3.132E-01	115.9	3.629E-01	3.632E-01	1.225E+00
NB-94	9.786E-02	59.8	5.848E-02	5.868E-02	2.458E-01
ZR-95	-1.864E-02	961.4	1.792E-01	1.792E-01	4.591E-01
NB-95	-1.711E-02	578.8	9.904E-02	9.904E-02	3.471E-01
RU-103	-3.602E-02	271.5	9.777E-02	9.778E-02	2.634E-01
RH-106	1.045E+00	88.5	9.248E-01	9.263E-01	3.106E+00
AG-108M	-1.272E-01	85.9	1.093E-01	1.095E-01	2.984E-01
AG-110M	1.248E-01	44.3	5.528E-02	5.561E-02	7.271E-01
SN-113	1.236E-01	117.9	1.457E-01	1.459E-01	4.908E-01
SB-124	1.204E-01	138.6	1.669E-01	1.670E-01	5.609E-01
SB-125	3.562E-02	79.2	2.823E-02	2.829E-02	8.270E-01
I-131	-2.508E-03	219.4	5.503E-03	5.504E-03	2.591E-01
Gd-153	-2.354E-02	82.5	1.943E-02	1.949E-02	7.948E-01
Ga-68	5.372E+00	100.3	5.389E+00	5.397E+00	1.239E+01
Tc-99m	3.166E-02	300.0	9.497E-02	9.499E-02	3.205E-01
BA-133	-4.432E-02	103.5	4.589E-02	4.595E-02	5.222E-01
CS-134	-2.114E-01	54.5	1.151E-01	1.156E-01	5.242E-01
CS-137	0.000E+00	1.#INF	1.789E-02	1.789E-02	3.550E-01
CE-139	7.301E-02	110.2	8.049E-02	8.076E-02	2.698E-01
Ba-140	3.670E-01	89.0	3.267E-01	3.273E-01	7.420E-01
La-140	8.790E-02	105.6	9.283E-02	9.294E-02	2.412E-01
CE-141	-3.437E-02	501.4	1.723E-01	1.723E-01	5.819E-01

CE-144	-5.289E-01	149.8	7.921E-01	7.926E-01	2.650E+00
PM-144	1.060E-01	96.0	1.017E-01	1.018E-01	2.420E-01
EU-152	-2.093E-02	94.0	1.967E-02	1.970E-02	7.865E-01
EU-154	1.431E-01	88.0	1.259E-01	1.262E-01	5.743E-01
EU-155	1.631E-01	187.4	3.057E-01	3.059E-01	1.026E+00
HF-181	9.281E-02	103.0	9.562E-02	9.573E-02	3.211E-01
Ta-182	-1.514E-01	66.0	1.000E-01	1.003E-01	1.768E+00
Hg-203	6.283E-02	147.1	9.240E-02	9.247E-02	3.125E-01
TL-208	2.479E-01	55.9	1.385E-01	1.390E-01	2.419E-01
PM-146	1.722E-01	81.7	1.407E-01	1.409E-01	3.221E-01
Y-88	-1.807E-01	81.5	1.473E-01	1.476E-01	5.194E-01
Cd-113m	-5.335E+02	226.4	1.208E+03	1.208E+03	4.112E+03
Cd-109	-5.067E-01	519.2	2.631E+00	2.631E+00	8.832E+00
Cf-251	-3.079E-02	1380.6	4.251E-01	4.251E-01	1.162E+00
Cf-249	1.223E-01	118.9	1.455E-01	1.456E-01	4.897E-01
Sn-126	1.649E-01	492.1	8.117E-01	8.118E-01	2.742E+00
PB-210	3.043E+00	76.2	2.319E+00	2.335E+00	5.957E+00
PB-212	4.472E-02	473.6	2.118E-01	2.118E-01	6.948E-01
PB-214	-2.918E-01	76.1	2.220E-01	2.225E-01	7.628E-01
BI-207	9.567E-02	165.8	1.586E-01	1.587E-01	3.794E-01
BI-212	-1.817E+00	87.1	1.584E+00	1.586E+00	5.303E+00
U-235	1.912E-01	134.0	2.562E-01	2.564E-01	2.331E+00
BI-214	-6.615E-01	40.4	2.670E-01	2.691E-01	1.342E+00
BI-210M	-1.612E-01	47.0	7.570E-02	7.629E-02	5.234E-01
AC-228	1.018E+00	24.6	2.504E-01	2.554E-01	8.534E-01
TH-227	-1.290E+00	38.4	4.953E-01	5.014E-01	3.260E+00
TH-229	1.213E+00	117.1	1.421E+00	1.424E+00	4.595E+00
TH-234	1.757E+00	86.2	1.514E+00	1.518E+00	3.985E+00
PA-231	2.726E+00	158.4	4.320E+00	4.322E+00	1.449E+01
PA-233	-1.298E-01	232.7	3.020E-01	3.021E-01	1.020E+00
PA-234	-3.584E-01	129.1	4.629E-01	4.633E-01	1.547E+00
PA-234M	-1.424E+01	60.7	8.641E+00	8.669E+00	6.726E+01
AM-241	6.280E-02	282.2	1.772E-01	1.772E-01	5.079E-01
Np-237	-2.310E-01	339.5	7.843E-01	7.844E-01	2.628E+00
Ir-192	8.371E-02	100.2	8.386E-02	8.401E-02	2.910E-01
Cs-136	1.642E-01	25.2	4.142E-02	4.241E-02	2.641E-01
Np-239	1.982E-01	141.7	2.808E-01	2.811E-01	9.432E-01
Nd-147	4.969E-01	115.2	5.723E-01	5.730E-01	1.445E+00
TL-210	2.456E-02	217.4	5.340E-02	5.342E-02	4.827E-01
Kr-85	-2.213E+01	172.4	3.814E+01	3.816E+01	1.282E+02
Total	2.068E+01				

Analyst: Justin Banner

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Sample description
445202_Gamma_180-96597-A-1-B DU

Spectrum Filename: C:\User\SPC\Det17\17_Gamma_20192077.An1

Acquisition information
Start time: 10/31/2019 5:07:31 AM
Live time: 7200
Real time: 7223
Dead time: 0.32 %
Detector ID: 17

Detector system
Ge17 SN/11080671

Calibration
Filename: 17_Liquid_Marinelli 1L.Clb
17_1L marn_90062_030512

Energy Calibration
Created: 2/29/2012 10:33:23 AM
Zero offset: 0.108 keV
Gain: 0.250 keV/channel
Quadratic: -2.584E-08 keV/channel^2

Efficiency Calibration
Created: 3/7/2012 11:47:27 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.09 %
Log(Eff): -2.094103E+00 + (1.788156E-01*Log(E)) + (-7.283143E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 0.66 %
Log(Eff): -1.201018E+01 + (4.016685E+00*Log(E)) + (-4.439774E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.12keV)
Stop channel: 8000 (1999.54keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

(Page 3 of 22)

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 5:07:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	17_2019-10-06_1931.PBC 10/6/2019 7:31:18 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.65	41.	76.21	1.27	4.367E-02	46.54	4.250	PBC<MDA	PB210
59.54	8.	282.15	0.79	4.928E-02	59.54	35.900	PBC<MDA	AM241
63.18	7.	404.20	1.40	5.038E-02	63.29	3.810	PBC<MDA	TH234
64.28	6.	492.14	0.79	5.064E-02	64.28	9.700	PBC<MDA	Sn126
70.37	21.	58.68	0.66	5.194E-02				
80.99	22.	106.11	0.81	5.325E-02	80.99	34.060	PBC<MDA	BA133
92.67	38.	86.21	1.34	5.364E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	1.764E+00	AC228
103.20	19.	119.16	0.83	5.334E-02	103.20	21.800	PBC<MDA	Gd153
103.70	19.	123.36	0.83	5.331E-02	103.70	24.000	PBC<MDA	Np239
105.31	13.	187.39	0.83	5.322E-02	105.31	21.200	PBC<MDA	EU155
106.13	17.	141.66	0.83	5.317E-02	106.13	22.700	PBC<MDA	Np239
136.47	21.	137.35	0.86	5.010E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	5.483E-01	CO57
140.51	9.	300.00	0.86	4.957E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	-7.	393.03	0.87	4.913E-02	143.79	10.960	PBC<MDA	U235
162.66	20.	115.76	0.88	4.648E-02	162.66	6.220	PBC<MDA	Ba140
165.85	19.	110.24	0.89	4.583E-02	165.85	79.900	PBC<MDA	CE139
185.72	63.	37.35	0.91	4.295E-02	185.72	54.000	3.793E-01	U235
193.51	11.	198.76	0.91	4.193E-02	193.51	4.400	PBC<MDA	TH229
205.33	14.	133.98	0.92	4.048E-02	205.33	5.010	PBC<MDA	U235
210.85	15.	123.74	0.93	3.985E-02	210.85	2.990	PBC<MDA	TH229

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
236.09	13.	179.53	0.95	3.721E-02	235.97	12.300	PBC<MDA	TH227
238.75	5.	473.55	0.95	3.695E-02	238.63	43.300	PBC<MDA	PB212
242.00	16.	150.52	0.96	3.663E-02	242.00	7.430	PBC<MDA	PB214
279.20	12.	147.07	0.99	3.347E-02	279.20	81.460	PBC<MDA	Hg203
284.30	6.	316.90	1.00	3.308E-02	284.30	6.140	PBC<MDA	I131
296.00	13.	217.44	1.01	3.223E-02	296.00	79.000	PBC<MDA	TL210
302.65	18.	158.45	1.01	3.177E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	4.285E-01	BA133
302.85	13.	219.52	1.01	3.175E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	3.152E-01	BA133
316.49	17.	100.19	1.03	3.085E-02	316.49	87.040	PBC<MDA	Ir192
320.08	11.	155.82	1.03	3.062E-02	320.08	9.940	PBC<MDA	CR51
328.76	16.	105.60	1.04	3.008E-02	328.76	20.300	PBC<MDA	La140
337.91	26.	42.93	0.45	2.951E-02	338.32	12.010	PBC<MDA	AC228
351.93	-23.	76.08	1.06	2.874E-02	351.93	37.600	PBC<MDA	PB214
389.62	16.	118.93	1.09	2.689E-02	387.95	66.000	PBC<MDA	Cf249
391.69	15.	117.92	1.09	2.671E-02	391.69	64.000	PBC<MDA	SN113
453.88	11.	131.84	1.15	2.409E-02	453.88	65.000	PBC<MDA	PM146
468.06	7.	236.70	1.16	2.356E-02	468.06	51.750	PBC<MDA	Ir192
482.00	12.	103.03	1.18	2.307E-02	482.00	80.500	PBC<MDA	HF181
510.89	256.	8.80	2.38	2.212E-02	511.86	20.000	8.049E+00	RH106
531.00	10.	115.18	1.22	2.150E-02	531.00	13.000	PBC<MDA	Nd147
537.26	8.	135.29	1.22	2.132E-02	537.26	24.390	PBC<MDA	Ba140
563.24	4.	342.78	1.25	2.058E-02	563.24	8.350	PBC<MDA	CS134
569.32	4.	239.79	1.25	2.042E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.318E-01	PA234
					569.70	97.740	2.785E-02	BI207
583.02	19.	62.71	1.26	2.006E-02	583.02	84.500	PBC<MDA	TL208
602.73	17.	138.57	1.28	1.957E-02	602.73	98.260	PBC<MDA	SB124
604.71	13.	177.11	1.28	1.952E-02	604.71	97.620	PBC<MDA	CS134
609.31	-43.	40.37	1.29	1.941E-02	609.31	46.090	PBC<MDA	BI214
621.92	14.	88.50	1.30	1.911E-02	621.92	9.930	PBC<MDA	RH106
635.89	11.	79.25	1.31	1.879E-02	635.89	11.310	PBC<MDA	SB125
657.76	1.	848.91	1.33	1.831E-02	657.76	94.640	PBC<MDA	AG110M
696.29	13.	95.98	1.36	1.752E-02	696.54	99.000	PBC<MDA	PM144
702.63	13.	93.38	1.37	1.740E-02	702.63	97.900	PBC<MDA	NB94
735.72	11.	96.43	1.40	1.679E-02	735.72	22.500	PBC<MDA	PM146
756.73	-1.	961.40	1.41	1.642E-02	756.73	54.460	PBC<MDA	ZR95
766.41	13.	83.70	1.42	1.626E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	6.	155.20	1.43	1.605E-02	778.92	12.940	PBC<MDA	EU152
785.42	10.	90.59	1.44	1.595E-02	785.42	1.280	PBC<MDA	BI212
801.95	12.	91.11	1.45	1.568E-02	801.95	8.690	PBC<MDA	CS134
815.77	1.	858.37	1.47	1.547E-02	815.77	23.280	PBC<MDA	La140
818.50	4.	226.54	1.47	1.543E-02	818.50	100.000	PBC<MDA	Cs136
860.56	12.	92.44	1.50	1.482E-02	860.56	12.420	PBC<MDA	TL208
871.10	9.	74.58	1.51	1.468E-02	871.10	99.890	PBC<MDA	NB94
873.23	9.	87.98	1.51	1.465E-02	873.23	12.270	PBC<MDA	EU154

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
898.04	2.	548.59	1.53	1.432E-02	898.04	93.700	PBC<MDA	Y88
911.19	22.	51.94	1.55	1.415E-02	911.07	29.000	PBC<MDA	AC228
937.49	7.	158.51	1.57	1.383E-02	937.49	34.360	PBC<MDA	AG110M
969.19	25.	30.07	3.87	1.346E-02	968.97	17.460	1.478E+00	AC228
1037.84	3.	332.78	1.65	1.271E-02	1037.84	14.130	PBC<MDA	Co56
1048.07	24.	25.23	1.66	1.261E-02	1048.07	80.000	3.281E-01	Cs136
1063.66	6.	165.83	1.67	1.246E-02	1063.66	74.500	PBC<MDA	BI207
1077.40	9.	100.31	1.68	1.232E-02	1077.40	3.300	PBC<MDA	Ga68
1120.55	16.	95.58	1.72	1.192E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	1.841E-01	Sc46
					1121.30	34.900	5.277E-01	Ta182
1189.05	9.	86.63	1.77	1.134E-02	1189.05	16.200	PBC<MDA	Ta182
1221.41	6.	189.97	1.80	1.108E-02	1221.41	27.000	PBC<MDA	Ta182
1238.28	6.	123.77	1.81	1.095E-02	1238.28	66.070	PBC<MDA	Co56
1291.60	11.	86.74	1.85	1.056E-02	1291.60	43.200	PBC<MDA	FE59
1313.00	4.	291.05	1.87	1.041E-02	1313.00	21.000	PBC<MDA	TL210
1332.50	8.	98.91	1.89	1.028E-02	1332.50	99.980	PBC<MDA	CO60
1384.30	15.	44.30	1.93	9.942E-03	1384.30	24.290	8.435E-01	AG110M
1408.00	5.	187.26	1.94	9.796E-03	1408.00	21.005	PBC<MDA	EU152
1596.21	3.	234.56	2.09	8.765E-03	1596.21	95.400	PBC<MDA	La140
1764.49	15.	52.34	2.21	8.006E-03	1764.49	15.400	PBC<MDA	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
280.90	70.37	58.	21.	3.979E+02	58.68	0.664	- s
2042.47	510.89	36.	256.	1.157E+04	8.80	2.385	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	186.09	46.65	271.	41.	0.006	76.21	1.272s
TH-227	200.03	50.14	189.	-16.	-0.002	146.78	0.778s
AM-241	237.59	59.54	177.	8.	0.001	282.15	0.787
TH-234	252.14	63.18	260.	7.	0.001	404.20	1.399s
Sn-126	256.56	64.28	409.	6.	0.001	492.14	0.792s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	323.36	80.99	180.	22.	0.003	106.11	0.807s
Np-237	345.35	86.49	779.	-12.	-0.002	339.52	0.813s
EU-155	345.56	86.54	767.	0.	0.000	1000.00	0.813s
Sn-126	347.15	86.94	786.	-25.	-0.003	160.20	0.813s
Sn-126	349.67	87.57	761.	-25.	-0.003	157.54	0.814s
Cd-109	351.55	88.04	736.	-7.	-0.001	519.15	0.814s
Nd-147	363.79	91.10	729.	0.	0.000	1000.00	0.817s
TH-234	370.06	92.67	319.	38.	0.005	86.21	1.338s
AC-228	372.78	93.35	742.	-4.	-0.001	964.36	0.819
Gd-153	389.37	97.50	367.	-24.	-0.003	114.25	0.823
Np-239	397.37	99.50	346.	-24.	-0.003	112.40	0.825s
Gd-153	412.16	103.20	255.	19.	0.003	119.16	0.828s
Np-239	414.16	103.70	274.	19.	0.003	123.36	0.829s
EU-155	420.61	105.31	300.	13.	0.002	187.39	0.830s
Np-239	423.88	106.13	282.	17.	0.002	141.66	0.831s
EU-152	486.45	121.78	303.	-24.	-0.003	105.97	0.846s
CO-57	487.57	122.06	327.	-19.	-0.003	139.14	0.846s
EU-154	491.73	123.10	329.	-4.	-0.001	644.16	0.847s
PA-234	524.49	131.29	452.	-24.	-0.003	129.14	0.855s
HF-181	531.41	133.02	475.	-24.	-0.003	132.13	0.856s
CE-144	533.46	133.54	499.	-21.	-0.003	149.76	0.857s
HF-181	544.50	136.30	520.	0.	0.000	1000.00	0.859s
CO-57	545.20	136.47	410.	21.	0.003	137.35	0.859s
Tc-99m	561.34	140.51	360.	9.	0.001	300.00	0.863s
U-235	574.43	143.79	354.	-7.	-0.001	393.03	0.866s
CE-141	581.05	145.44	425.	-6.	-0.001	501.41	0.868
Ba-140	649.90	162.66	258.	20.	0.003	115.76	0.884
U-235	652.78	163.38	233.	-22.	-0.003	121.35	0.885s
CE-139	662.67	165.85	216.	19.	0.003	110.24	0.887
U-235	742.10	185.72	157.	63.	0.009	37.35	0.905s
TH-229	773.25	193.51	157.	11.	0.002	198.76	0.913s
U-235	820.52	205.33	114.	14.	0.002	133.98	0.924s
TH-229	842.58	210.85	103.	15.	0.002	123.74	0.929s
Cf-251	907.16	227.00	117.	-9.	-0.001	224.37	0.944s
TH-227	943.03	235.97	259.	13.	0.002	179.53	0.952s
PB-212	953.67	238.63	275.	5.	0.001	473.55	0.955s
PB-214	967.13	242.00	281.	16.	0.002	150.52	0.958s
EU-152	977.91	244.69	397.	-22.	-0.003	114.19	0.960s
TH-227	1024.08	256.24	141.	-23.	-0.003	38.41	0.971
Cd-113m	1053.91	263.70	160.	-8.	-0.001	226.38	0.978s
BI-210M	1062.44	265.83	179.	-20.	-0.003	46.97	0.979s
TL-208	1108.23	277.28	134.	-18.	-0.003	92.41	0.990s
Hg-203	1115.89	279.20	158.	12.	0.002	147.07	0.992s
I-131	1136.28	284.30	93.	6.	0.001	316.90	0.996s
TL-210	1183.07	296.00	414.	13.	0.002	217.44	1.007s
PA-231	1209.66	302.65	396.	18.	0.002	158.45	1.013s
BA-133	1210.47	302.85	414.	13.	0.002	219.52	1.013s
Ba-140	1218.46	304.85	427.	0.	0.000	1000.00	1.015s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1218.64	304.90	301.	-20.	-0.003	126.96	1.015s
Ir-192	1232.82	308.44	282.	-20.	-0.003	122.51	1.019s
PA-233	1247.10	312.01	292.	-10.	-0.001	232.72	1.022s
Ir-192	1265.01	316.49	132.	17.	0.002	100.19	1.026s
CR-51	1279.38	320.08	149.	11.	0.002	155.82	1.029
La-140	1314.07	328.76	77.	16.	0.002	105.60	1.037
Cf-249	1332.79	333.44	84.	-6.	-0.001	274.16	1.041
AC-228	1350.66	337.91	32.	26.	0.004	42.93	0.454s
Cs-136	1361.30	340.57	300.	-20.	-0.003	122.90	1.048s
EU-152	1376.16	344.29	280.	-20.	-0.003	118.44	1.051s
HF-181	1382.33	345.83	257.	-15.	-0.002	157.95	1.053s
PB-214	1406.74	351.93	148.	-23.	-0.003	76.08	1.058s
BA-133	1423.00	356.00	188.	-19.	-0.003	103.53	1.062s
I-131	1456.93	364.48	73.	-5.	-0.001	303.50	1.070s
BA-133	1534.34	383.84	179.	-6.	-0.001	301.66	1.087
Cf-249	1550.77	387.95	165.	16.	0.002	118.93	1.091s
SN-113	1565.73	391.69	153.	15.	0.002	117.92	1.094s
SB-125	1710.44	427.88	80.	-13.	-0.002	140.24	1.127s
AG-108M	1734.69	433.94	96.	-21.	-0.003	85.93	1.132s
PM-146	1814.44	453.88	52.	11.	0.002	131.84	1.150
SB-125	1852.38	463.37	125.	-17.	-0.002	98.23	1.158s
Ir-192	1871.15	468.06	131.	7.	0.001	236.70	1.163s
BE-7	1909.29	477.59	91.	-4.	-0.001	340.95	1.171s
HF-181	1926.89	482.00	75.	12.	0.002	103.03	1.175s
RU-103	1987.11	497.05	60.	-5.	-0.001	271.45	1.188s
RH-106	2046.35	511.86	350.	-30.	-0.004	91.49	2.452s
Kr-85	2054.81	513.98	330.	-15.	-0.002	172.37	1.203s
Nd-147	2122.88	531.00	32.	10.	0.001	115.18	1.219s
Ba-140	2147.92	537.26	29.	8.	0.001	135.29	1.224s
CS-134	2251.82	563.24	48.	4.	0.001	342.78	1.247
CS-134	2276.15	569.32	44.	4.	0.001	239.79	1.252s
PA-234	2276.75	569.47	54.	-4.	-0.001	264.58	1.253s
BI-207	2277.67	569.70	65.	-11.	-0.002	107.95	1.253s
TL-208	2330.95	583.02	33.	19.	0.003	62.71	1.264s
SB-125	2400.86	600.50	354.	-25.	-0.004	50.46	1.280s
SB-124	2409.78	602.73	259.	17.	0.002	138.57	1.282s
CS-134	2417.70	604.71	267.	13.	0.002	177.11	1.284s
BI-214	2436.10	609.31	323.	-43.	-0.006	40.37	1.287s
PM-144	2471.11	618.06	200.	-6.	-0.001	335.82	1.295s
RH-106	2486.52	621.92	73.	14.	0.002	88.50	1.299s
SB-125	2542.41	635.89	35.	11.	0.002	79.25	1.311s
I-131	2546.75	636.97	53.	-2.	0.000	620.65	1.312s
AG-110M	2629.90	657.76	62.	1.	0.000	848.91	1.330s
CS-137	2645.49	661.66	63.	0.	0.000	1000.00	1.333s
PM-144	2785.03	696.54	35.	13.	0.002	95.98	1.363s
NB-94	2809.38	702.63	35.	13.	0.002	93.38	1.368s
SB-124	2890.01	722.79	56.	-10.	-0.001	110.45	1.386s
AG-108M	2890.61	722.94	66.	0.	0.000	1000.00	1.386s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	2892.30	723.36	66.	0.	0.000	1000.00	1.386s
ZR-95	2895.66	724.20	66.	0.	0.000	1000.00	1.387s
BI-212	2907.54	727.17	98.	-17.	-0.002	87.14	1.390s
PM-146	2941.74	735.72	22.	11.	0.001	96.43	1.397s
ZR-95	3025.79	756.73	33.	-1.	0.000	961.40	1.415s
AG-110M	3054.64	763.94	61.	-6.	-0.001	197.08	1.421s
NB-95	3062.03	765.79	66.	-2.	0.000	578.79	1.423s
PA-234M	3064.52	766.41	50.	13.	0.002	83.70	1.423
EU-152	3114.56	778.92	22.	6.	0.001	155.20	1.434s
BI-212	3140.56	785.42	17.	10.	0.001	90.59	1.440s
CS-134	3182.36	795.87	107.	-21.	-0.003	54.47	1.448s
CS-134	3206.69	801.95	28.	12.	0.002	91.11	1.454s
La-140	3261.97	815.77	25.	1.	0.000	858.37	1.465s
Cs-136	3272.90	818.50	33.	4.	0.001	226.54	1.467s
MN-54	3338.30	834.85	47.	-14.	-0.002	109.43	1.481s
Co-56	3385.99	846.77	67.	-21.	-0.003	54.51	1.491s
TL-208	3441.18	860.56	23.	12.	0.002	92.44	1.503s
NB-94	3483.32	871.10	18.	9.	0.001	74.58	1.512s
EU-154	3491.85	873.23	28.	9.	0.001	87.98	1.514s
PA-234	3521.06	880.53	103.	-17.	-0.002	89.44	1.520s
PA-234	3531.90	883.24	120.	-7.	-0.001	237.19	1.522s
AG-110M	3537.67	884.68	127.	0.	0.000	1000.00	1.523s
Sc-46	3556.06	889.28	139.	-10.	-0.001	166.88	1.527s
Y-88	3591.11	898.04	30.	2.	0.000	548.59	1.534s
AC-228	3643.24	911.07	23.	22.	0.003	51.94	1.545s
AG-110M	3748.95	937.49	23.	7.	0.001	158.51	1.567s
PA-234	3783.07	946.02	33.	-2.	0.000	731.57	1.574s
EU-152	3855.45	964.11	80.	-15.	-0.002	90.28	1.589s
AC-228	3875.76	969.19	7.	25.	0.003	30.07	3.874s
EU-154	3984.36	996.33	103.	-17.	-0.002	88.42	1.616s
PA-234M	4003.04	1001.00	117.	-11.	-0.002	60.69	1.620s
EU-154	4018.15	1004.77	135.	-19.	-0.003	90.77	1.623s
Co-56	4150.45	1037.84	20.	3.	0.000	332.78	1.650s
Cs-136	4191.39	1048.07	6.	24.	0.003	25.23	1.658s
RH-106	4200.55	1050.36	44.	-10.	-0.001	98.81	1.661s
BI-207	4253.77	1063.66	24.	6.	0.001	165.83	1.671s
Ga-68	4308.74	1077.40	15.	9.	0.001	100.31	1.683s
FE-59	4396.18	1099.25	31.	-2.	0.000	716.82	1.700s
EU-152	4447.49	1112.07	100.	-18.	-0.002	82.89	1.711s
ZN-65	4461.38	1115.55	118.	-14.	-0.002	115.88	1.713s
BI-214	4480.35	1120.29	135.	-3.	0.000	332.06	1.717
Sc-46	4481.41	1120.55	106.	16.	0.002	95.58	1.717
Ta-182	4484.41	1121.30	116.	-16.	-0.002	99.70	1.718s
CO-60	4692.24	1173.24	37.	-10.	-0.001	120.49	1.760s
Ta-182	4755.52	1189.05	10.	9.	0.001	86.63	1.772s
Ta-182	4885.02	1221.41	21.	6.	0.001	189.97	1.798s
Co-56	4952.53	1238.28	11.	6.	0.001	123.77	1.812s
NA-22	5097.60	1274.53	32.	-13.	-0.002	67.50	1.840s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	5097.64	1274.54	45.	0.	0.000	1000.00	1.840s
FE-59	5165.90	1291.60	16.	11.	0.002	86.74	1.854s
TL-210	5251.56	1313.00	21.	4.	0.001	291.05	1.870s
CO-60	5329.61	1332.50	12.	8.	0.001	98.91	1.886s
AG-110M	5536.92	1384.30	5.	15.	0.002	44.30	1.926s
EU-152	5631.79	1408.00	16.	5.	0.001	187.26	1.944s
La-140	6385.15	1596.21	6.	3.	0.000	234.56	2.087s
SB-124	6764.55	1690.98	30.	-11.	-0.002	123.98	2.157s
BI-214	7058.84	1764.49	21.	15.	0.002	52.34	2.211
Y-88	7345.39	1836.06	31.	-10.	-0.001	81.50	2.262s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	-2.2738E-01				5.31E+01	
			477.60	-2.274E-01	?(	2.681E+00 3.41E+02 1.05E+01	G
NA-22	C	-1.6913E-01				9.50E+02	
			1274.53	-1.691E-01	?(	3.782E-01 6.75E+01 9.99E+01	G
K-40	N	-2.7453E-02				4.66E+11	
			1460.83	-2.745E-02	%(P	4.377E+00 5.64E+03 1.07E+01	G
Sc-46	F	4.3136E-02				8.38E+01	
			889.28	-9.784E-02	?(	5.545E-01 1.67E+02 1.00E+02	G
			1120.55	1.841E-01	&(	5.910E-01 9.56E+01 1.00E+02	G
CR-51	F	5.1461E-01				2.77E+01	
			320.08	5.146E-01	?(	2.717E+00 1.56E+02 9.94E+00	G
MN-54	C	-1.2500E-01				3.12E+02	
			834.85	-1.250E-01	?(	3.159E-01 1.09E+02 1.00E+02	G
FE-59	F	1.2995E-01				4.45E+01	
			1099.25	-3.065E-02	?(P	5.772E-01 7.17E+02 5.65E+01	G
			1291.60	3.400E-01	?(	6.500E-01 8.67E+01 4.32E+01	G
Co-56	C	-1.9587E-01				7.73E+01	
			846.77	-1.959E-01	?(P	3.783E-01 5.45E+01 9.99E+01	G
			1238.28	1.216E-01	+	3.442E-01 1.24E+02 6.61E+01	G
			1037.84	2.319E-01	+	1.821E+00 3.33E+02 1.41E+01	G
			1771.35	-7.497E-02	&	3.478E+00 1.29E+03 1.55E+01	A

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Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	C 8.9007E-03				2.72E+02		
		122.06	-5.839E-02	?(	2.725E-01	1.39E+02	8.56E+01 G
		136.47	5.483E-01	?(	2.520E+00	1.37E+02	1.07E+01 G
CO-58	C -8.9816E-03				7.09E+01		
		810.78	-8.982E-03	&(	3.375E-01	1.06E+03	9.95E+01 G
CO-60	F 1.1170E-01				1.93E+03		
		1332.50	1.117E-01	?(P	2.519E-01	9.89E+01	1.00E+02 G
		1173.24	-1.173E-01	& P	3.750E-01	1.20E+02	9.99E+01 G
ZN-65	F -3.1315E-01				2.44E+02		
		1115.55	-3.132E-01	?(	1.225E+00	1.16E+02	5.06E+01 G
NB-94	I 9.7861E-02				7.41E+06		
		702.63	1.097E-01	?(	2.458E-01	9.34E+01	9.79E+01 G
		871.10	8.625E-02	&(	2.155E-01	7.46E+01	9.99E+01 G
ZR-95	I -1.8638E-02				6.40E+01		
		756.73	-1.864E-02	?(P	4.591E-01	9.61E+02	5.45E+01 G
		724.20	0.000E+00	+	7.509E-01	1.00E+03	4.42E+01 G
NB-95	I -1.7112E-02				6.40E+01		
		765.79	-1.711E-02	?(	3.471E-01	5.79E+02	9.98E+01 G
RU-103	I -3.6016E-02				3.93E+01		
		497.05	-3.602E-02	?(P	2.634E-01	2.71E+02	9.09E+01 G
		610.30	-2.377E-07	&	1.006E+01	1.24E+09	5.75E+00 GA
RH-106	I 1.0450E+00				3.74E+02		
		621.92	1.045E+00	?(	3.106E+00	8.85E+01	9.93E+00 G
		1050.36	-7.074E+00	+	2.374E+01	9.88E+01	1.56E+00 G
		511.86	-9.282E-01	-	2.826E+00	9.15E+01	2.00E+01 GA
AG-108M	C -1.2719E-01				1.53E+05		
		433.94	-1.272E-01	?(P	2.984E-01	8.59E+01	9.05E+01 G
		722.94	0.000E+00	&	3.645E-01	1.00E+03	9.08E+01 G
		614.28	-1.529E-08	%	6.467E-01	1.24E+09	8.98E+01 G
AG-110M	F 1.2477E-01				2.50E+02		
		884.68	0.000E+00	?(	7.271E-01	1.00E+03	7.27E+01 G
		657.76	1.066E-02	?(P	3.151E-01	8.49E+02	9.46E+01 G
		937.49	1.949E-01	&(	7.372E-01	1.59E+02	3.44E+01 G
		1384.30	8.435E-01	?(	7.748E-01	4.43E+01	2.43E+01 G
		763.94	-2.283E-01	+ P	1.495E+00	1.97E+02	2.23E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	F	1.2359E-01					1.15E+02	
			391.69	1.236E-01	?(	4.908E-01	1.18E+02	6.40E+01 G
SB-124	F	1.2044E-01					6.02E+01	
			602.73	1.204E-01	?(	5.609E-01	1.39E+02	9.83E+01 G
			1690.98	-3.842E-01	&	9.861E-01	1.24E+02	4.78E+01 G
			722.79	-7.548E-01	&	2.837E+00	1.10E+02	1.08E+01 G
SB-125	I	3.5624E-02					1.01E+03	
			427.88	-2.338E-01	&(P	8.270E-01	1.40E+02	2.96E+01 G
			600.50	-9.997E-01	+ P	3.583E+00	5.05E+01	1.79E+01 G
			635.89	7.408E-01	&(	1.970E+00	7.92E+01	1.13E+01 G
			463.37	-9.279E-01	+	3.060E+00	9.82E+01	1.05E+01 G
I-131	I	-2.5081E-03					8.02E+00	
			364.48	-3.243E-02	?(	2.591E-01	3.03E+02	8.17E+01 G
			284.30	3.956E-01	?(P	3.274E+00	3.17E+02	6.14E+00 G
			636.97	-1.727E-01	+	3.785E+00	6.21E+02	7.17E+00 G
Gd-153	F	-2.3542E-02					2.42E+02	
			97.50	-2.082E-01	&(	7.948E-01	1.14E+02	3.00E+01 G
			103.20	2.306E-01	?(	9.212E-01	1.19E+02	2.18E+01 G
Ga-68	C	5.3723E+00					4.71E-02	
			1077.40	5.372E+00	?(	1.239E+01	1.00E+02	3.30E+00 G
Tc-99m	I	3.1657E-02					2.51E-01	
			140.51	3.166E-02	(	3.205E-01	3.00E+02	8.93E+01 G
BA-133	F	-4.4325E-02					3.85E+03	
			356.00	-1.505E-01	?(	5.222E-01	1.04E+02	6.20E+01 G
			302.85	3.152E-01	?(	2.327E+00	2.20E+02	1.83E+01 G
			383.84	-3.633E-01	&	3.735E+00	3.02E+02	8.94E+00 GA
			80.99	1.664E-01	?	4.995E-01	1.06E+02	3.41E+01 GA
CS-134	I	-2.1137E-01					7.54E+02	
			795.87	-2.114E-01	?(P	5.242E-01	5.45E+01	8.55E+01 G
			604.71	9.625E-02	+	5.746E-01	1.77E+02	9.76E+01 G
			569.32	1.769E-01	+	1.487E+00	2.40E+02	1.54E+01 G
			801.95	1.262E+00	&	2.769E+00	9.11E+01	8.69E+00 G
			563.24	3.232E-01	+	2.828E+00	3.43E+02	8.35E+00 G
CE-139	F	7.3013E-02					1.38E+02	
			165.85	7.301E-02	?(	2.698E-01	1.10E+02	7.99E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ba-140	I	3.6702E-01					1.28E+01	
			537.26	2.156E-01	&(P	7.420E-01	1.35E+02	2.44E+01 G
			162.66	9.608E-01	?(	3.726E+00	1.16E+02	6.22E+00 G
			304.85	0.000E+00	-	1.014E+01	1.00E+03	4.29E+00 G
La-140	I	8.7900E-02					1.28E+01	
			1596.21	4.277E-02	?(P	2.412E-01	2.35E+02	9.54E+01 G
			487.02	-1.332E-03	% P	4.888E-01	1.43E+04	4.55E+01 G
			328.76	3.639E-01	?(	9.918E-01	1.06E+02	2.03E+01 G
			815.77	3.213E-02	?(	1.006E+00	8.58E+02	2.33E+01 G
CE-141	I	-3.4368E-02					3.25E+01	
			145.44	-3.437E-02	(	5.819E-01	5.01E+02	4.82E+01 G
CE-144	I	-5.2890E-01					2.85E+02	
			133.54	-5.289E-01	?(	2.650E+00	1.50E+02	1.11E+01 G
PM-144	C	1.0597E-01					3.63E+02	
			696.54	1.060E-01	?(P	2.420E-01	9.60E+01	9.90E+01 G
			618.06	-4.380E-02	&	5.009E-01	3.36E+02	9.91E+01 G
EU-152	F	-2.0931E-02					4.94E+03	
			121.78	-2.222E-01	?(	7.865E-01	1.06E+02	2.86E+01 G
			344.29	-3.655E-01	&	1.450E+00	1.18E+02	2.65E+01 G
			1112.07	-1.514E+00	+	4.193E+00	8.29E+01	1.36E+01 G
			778.92	4.235E-01	&(	1.632E+00	1.55E+02	1.29E+01 G
			964.11	-1.029E+00	+	3.121E+00	9.03E+01	1.46E+01 G
			244.69	-1.088E+00	& P	4.812E+00	1.14E+02	7.58E+00 G
			1408.00	3.375E-01	?	1.441E+00	1.87E+02	2.10E+01 GA
EU-154	I	1.4313E-01					3.14E+03	
			123.10	-2.571E-02	&(P	5.743E-01	6.44E+02	4.08E+01 G
			1274.54	0.000E+00	+	1.255E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	1.638E+00	1.00E+03	2.02E+01 G
			873.23	7.044E-01	(	2.101E+00	8.80E+01	1.23E+01 G
			1004.77	-1.105E+00	+	3.357E+00	9.08E+01	1.80E+01 G
			996.33	-1.680E+00	+	4.974E+00	8.84E+01	1.06E+01 G
EU-155	I	1.6315E-01					1.81E+03	
			105.31	1.631E-01	(P	1.026E+00	1.87E+02	2.12E+01 G
			86.54	0.000E+00	&	1.113E+00	1.00E+03	3.07E+01 G
HF-181	F	9.2808E-02					4.24E+01	
			482.00	9.281E-02	?(P	3.211E-01	1.03E+02	8.05E+01 G
			133.02	-1.499E-01	&	6.620E-01	1.32E+02	4.33E+01 G
			345.83	-4.612E-01	+	2.453E+00	1.58E+02	1.51E+01 G
			136.30	0.000E+00	-	5.162E+00	1.00E+03	5.85E+00 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ta-182	F -1.5142E-01					1.14E+02	
		1121.30	-5.277E-01	?(	1.768E+00	9.97E+01	3.49E+01 G
		1221.41	2.631E-01	+	1.125E+00	1.90E+02	2.70E+01 G
		1189.05	6.593E-01	?(	1.319E+00	8.66E+01	1.62E+01 G
Hg-203	F 6.2830E-02					4.66E+01	
		279.20	6.283E-02	?(	3.125E-01	1.47E+02	8.15E+01 G
TL-208	N 2.4791E-01					6.98E+02	
		583.02	1.548E-01	?(P	2.419E-01	6.27E+01	8.45E+01 G
		277.28	-1.200E+00	+	3.714E+00	9.24E+01	6.31E+00 G
		860.56	8.816E-01	?(	1.903E+00	9.24E+01	1.24E+01 G
PM-146	C 1.7224E-01					2.02E+03	
		453.88	9.758E-02	?(	3.221E-01	1.32E+02	6.50E+01 G
		747.16	1.163E-02	% P	7.009E-01	2.41E+03	3.40E+01 G
		735.72	3.879E-01	?(P	9.029E-01	9.64E+01	2.25E+01 G
Y-88	F -1.8068E-01					1.07E+02	
		1836.06	-1.807E-01	?(P	5.194E-01	8.15E+01	9.92E+01 G
		898.04	2.185E-02	+ P	2.917E-01	5.49E+02	9.37E+01 G
Cd-113m	-5.3352E+02					5.33E+03	
		263.70	-5.335E+02	?(	4.112E+03	2.26E+02	6.00E-03 K
Cd-109	F -5.0674E-01					4.53E+02	
		88.04	-5.067E-01	@(	8.832E+00	5.19E+02	3.79E+00 G
Cf-251	T -3.0792E-02					3.28E+05	
		176.60	-3.079E-02	%(	1.162E+00	1.38E+03	1.70E+01 G
		227.00	-5.014E-01	+	3.069E+00	2.24E+02	6.30E+00 GA
Cf-249	T 1.2234E-01					1.28E+05	
		387.95	1.223E-01	&(	4.897E-01	1.19E+02	6.60E+01 G
		333.44	-1.903E-01	+	1.368E+00	2.74E+02	1.55E+01 G
Sn-126	1.6494E-01					3.65E+07	
		87.57	-1.726E-01	+	9.075E-01	1.58E+02	3.75E+01 GA
		64.28	1.649E-01	?(	2.742E+00	4.92E+02	9.70E+00 G
		86.94	-7.157E-01	+	3.826E+00	1.60E+02	9.04E+00 GA
PB-210	N 3.0429E+00					8.14E+03	
		46.54	3.043E+00	*(P	5.957E+00	7.62E+01	4.25E+00 G
PB-212	N 4.4725E-02					6.98E+02	
		238.63	4.472E-02	(P	6.948E-01	4.74E+02	4.33E+01 G
		300.03	-1.837E-01	& P	1.314E+01	2.12E+03	3.28E+00 GA

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	N	-2.9178E-01					5.84E+05	
			351.93	-2.918E-01	*(P	7.628E-01	7.61E+01	3.76E+01 G
			295.09	-5.128E-02	% P	2.178E+00	1.27E+03	1.93E+01 G
			242.00	8.144E-01		4.121E+00	1.51E+02	7.43E+00 GA
BI-207	C	9.5668E-02					1.18E+04	
			1063.66	9.567E-02	?(P	3.794E-01	1.66E+02	7.45E+01 G
			569.70	-7.658E-02	&	2.804E-01	1.08E+02	9.77E+01 G
BI-212	N	-1.8174E+00					6.98E+02	
			727.17	-1.817E+00	?(	5.303E+00	8.71E+01	7.55E+00 G
			785.42	6.812E+00	&	1.505E+01	9.06E+01	1.28E+00 GA
U-235	N	1.9124E-01					2.57E+11	
			143.79	-1.748E-01	&(P	2.331E+00	3.93E+02	1.10E+01 G
			205.33	9.920E-01	?(P	3.592E+00	1.34E+02	5.01E+00 G
			163.38	-1.309E+00	+ P	4.350E+00	1.21E+02	5.08E+00 G
			185.72	3.793E-01	*	3.655E-01	3.73E+01	5.40E+01 GA
BI-214	N	-6.6150E-01					5.84E+05	
			609.31	-6.615E-01	@(P	1.342E+00	4.04E+01	4.61E+01 G
			1120.29	-2.639E-01	& P	4.392E+00	3.32E+02	1.51E+01 G
			1764.49	1.701E+00	+ P	2.705E+00	5.23E+01	1.54E+01 G
BI-210M	T	-1.6118E-01					1.10E+09	
			265.83	-1.612E-01	?(P	5.234E-01	4.70E+01	5.00E+01 G
			304.90	-3.083E-01	&	1.312E+00	1.27E+02	2.80E+01 G
AC-228	N	1.0182E+00					2.10E+03	
			911.07	7.331E-01	?(	8.534E-01	5.19E+01	2.90E+01 G
			968.97	1.478E+00	*(	8.889E-01	3.01E+01	1.75E+01 G
			338.32	1.039E+00	*(	1.147E+00	4.29E+01	1.20E+01 G
			93.35	-1.862E-01	-	6.037E+00	9.64E+02	5.56E+00 XA
TH-227	N	-1.2896E+00					7.95E+03	
			256.24	-1.290E+00	?(P	3.260E+00	3.84E+01	7.00E+00 G
			235.97	3.894E-01	+	2.358E+00	1.80E+02	1.23E+01 G
			50.14	-6.104E-01	&	2.547E+00	1.47E+02	8.00E+00 G
TH-229	N	1.2134E+00					2.68E+06	
			193.51	8.532E-01	?(	4.595E+00	1.99E+02	4.40E+00 G
			210.85	1.744E+00	&(P	5.822E+00	1.24E+02	2.99E+00 G
TH-234	N	1.7565E+00					1.63E+12	
			92.59	1.757E+00	*(P	3.985E+00	8.62E+01	5.58E+00 G
			63.29	5.113E-01	- P	5.632E+00	4.04E+02	3.81E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-231	N	2.7262E+00					1.20E+07	
			302.65	2.726E+00	?(	1.449E+01	1.58E+02	2.88E+00 G
			300.07	-5.101E-01	& P	1.756E+01	1.02E+03	2.46E+00 G
PA-233	C	-1.2978E-01					7.82E+08	
			312.01	-1.298E-01	&(	1.020E+00	2.33E+02	3.60E+01 G
			300.18	-2.024E-01	& P	6.967E+00	1.03E+03	6.20E+00 G
PA-234	N	-3.5843E-01					1.63E+12	
			131.29	-3.584E-01	?(	1.547E+00	1.29E+02	1.80E+01 G
			946.02	-1.259E-01	+	2.216E+00	7.32E+02	1.34E+01 G
			569.47	-3.318E-01	+	3.066E+00	2.65E+02	8.20E+00 G
			883.24	-6.601E-01	+	5.359E+00	2.37E+02	9.60E+00 G
			880.53	-2.658E+00	+	7.967E+00	8.94E+01	6.00E+00 GA
PA-234M	N	-1.4237E+01					1.63E+12	
			1001.00	-1.424E+01	&(P	6.726E+01	6.07E+01	8.37E-01 G
			766.41	3.719E+01	+ P	1.034E+02	8.37E+01	2.94E-01 G
AM-241	T	6.2799E-02					1.58E+05	
			59.54	6.280E-02	(	5.079E-01	2.82E+02	3.59E+01 G
Np-237	F	-2.3099E-01					2.14E+06	
			86.49	-2.310E-01	&(	2.628E+00	3.40E+02	1.31E+01 G
Ir-192	F	8.3706E-02					7.40E+01	
			316.49	8.651E-02	&(	2.910E-01	1.00E+02	8.70E+01 G
			468.06	7.899E-02	?(	6.390E-01	2.37E+02	5.18E+01 G
			308.44	-2.748E-01	&	1.128E+00	1.23E+02	3.18E+01 G
Cs-136	F	1.6416E-01					1.30E+01	
			818.50	3.300E-02	?(	2.641E-01	2.27E+02	1.00E+02 G
			1048.07	3.281E-01	&(	1.966E-01	2.52E+01	8.00E+01 G
			340.57	-2.044E-01	+	8.414E-01	1.23E+02	4.69E+01 G
Np-239	T	1.9824E-01					2.36E+00	
			103.70	2.123E-01	?	8.780E-01	1.23E+02	2.40E+01 X
			106.13	1.982E-01	&(	9.432E-01	1.42E+02	2.27E+01 G
			99.50	-4.171E-01	+	1.566E+00	1.12E+02	1.50E+01 X
Nd-147		4.9690E-01					1.11E+01	
			531.00	4.969E-01	?(	1.445E+00	1.15E+02	1.30E+01 G
			91.10	0.000E+00	-	1.176E+00	1.00E+03	2.83E+01 G
TL-210	N	2.4560E-02					5.84E+05	
			799.60	-1.390E-02	%(	4.827E-01	1.00E+03	9.90E+01 G
			296.00	7.274E-02	*(	5.318E-01	2.17E+02	7.90E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          1313.00 2.329E-01 &   1.539E+00 2.91E+02 2.10E+01 GA

Kr-85    I  -2.2126E+01                                      3.92E+03
                          513.98-2.213E+01 ?(  1.282E+02 1.72E+02 4.30E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity
AM-241	59.54	177.	8.	0.001	282.15	6.280E-02
Sn-126	64.28	409.	6.	0.001	492.14	1.649E-01
BA-133	80.99	180.	22.	0.003	106.11	1.664E-01
Np-237	86.49	779.	-12.	-0.002	339.52	-2.310E-01
Sn-126	86.94	786.	-25.	-0.003	160.20	-7.157E-01
Sn-126	87.57	761.	-25.	-0.003	157.54	-1.726E-01
Cd-109	88.04	736.	-7.	-0.001	519.15	-5.067E-01
Gd-153	97.50	367.	-24.	-0.003	114.25	-2.082E-01
Np-239	99.50	346.	-24.	-0.003	112.40	-4.171E-01
Gd-153	103.20	255.	19.	0.003	119.16	2.306E-01
Np-239	103.70	274.	19.	0.003	123.36	2.123E-01

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	105.31	300.	13.	0.002	187.39	1.631E-01	P
Np-239	106.13	282.	17.	0.002	141.66	1.982E-01	
EU-152	121.78	303.	-24.	-0.003	105.97	-2.222E-01	
CO-57	122.06	327.	-19.	-0.003	139.14	-5.839E-02	
EU-154	123.10	329.	-4.	-0.001	644.16	-2.571E-02	P
PA-234	131.29	452.	-24.	-0.003	129.14	-3.584E-01	
HF-181	133.02	475.	-24.	-0.003	132.13	-1.499E-01	
CE-144	133.54	499.	-21.	-0.003	149.76	-5.289E-01	
CO-57	136.47	410.	21.	0.003	137.35	5.483E-01	
Tc-99m	140.51	360.	9.	0.001	300.00	3.166E-02	
U-235	143.79	354.	-7.	-0.001	393.03	-1.748E-01	P
CE-141	145.44	425.	-6.	-0.001	501.41	-3.437E-02	
Ba-140	162.66	258.	20.	0.003	115.76	9.608E-01	
U-235	163.38	233.	-22.	-0.003	121.35	-1.309E+00	P
CE-139	165.85	216.	19.	0.003	110.24	7.301E-02	
U-235	185.72	157.	63.	0.009	37.35	3.793E-01	
TH-229	193.51	157.	11.	0.002	198.76	8.532E-01	
U-235	205.33	114.	14.	0.002	133.98	9.920E-01	P
TH-229	210.85	103.	15.	0.002	123.74	1.744E+00	P
Cf-251	227.00	117.	-9.	-0.001	224.37	-5.014E-01	
PB-214	242.00	281.	16.	0.002	150.52	8.144E-01	
EU-152	244.69	397.	-22.	-0.003	114.19	-1.088E+00	P
Cd-113m	263.70	160.	-8.	-0.001	226.38	-5.335E+02	
BI-210M	265.83	179.	-20.	-0.003	46.97	-1.612E-01	P
Hg-203	279.20	158.	12.	0.002	147.07	6.283E-02	
I-131	284.30	93.	6.	0.001	316.90	3.956E-01	P
TL-210	296.00	414.	13.	0.002	217.44	7.274E-02	
PA-231	302.65	396.	18.	0.002	158.45	2.726E+00	
BA-133	302.85	414.	13.	0.002	219.52	3.152E-01	
BI-210M	304.90	301.	-20.	-0.003	126.96	-3.083E-01	
Ir-192	308.44	282.	-20.	-0.003	122.51	-2.748E-01	
PA-233	312.01	292.	-10.	-0.001	232.72	-1.298E-01	
Ir-192	316.49	132.	17.	0.002	100.19	8.651E-02	
CR-51	320.08	149.	11.	0.002	155.82	5.146E-01	
La-140	328.76	77.	16.	0.002	105.60	3.639E-01	
Cs-136	340.57	300.	-20.	-0.003	122.90	-2.044E-01	
EU-152	344.29	280.	-20.	-0.003	118.44	-3.655E-01	
HF-181	345.83	257.	-15.	-0.002	157.95	-4.612E-01	
PB-214	351.93	148.	-23.	-0.003	76.08	-2.918E-01	P
BA-133	356.00	188.	-19.	-0.003	103.53	-1.505E-01	
I-131	364.48	73.	-5.	-0.001	303.50	-3.243E-02	
BA-133	383.84	179.	-6.	-0.001	301.66	-3.633E-01	
SN-113	391.69	153.	15.	0.002	117.92	1.236E-01	
SB-125	427.88	80.	-13.	-0.002	140.24	-2.338E-01	P
AG-108M	433.94	96.	-21.	-0.003	85.93	-1.272E-01	P
PM-146	453.88	52.	11.	0.002	131.84	9.758E-02	
SB-125	463.37	125.	-17.	-0.002	98.23	-9.279E-01	
Ir-192	468.06	131.	7.	0.001	236.70	7.899E-02	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BE-7	477.59	91.	-4.	-0.001	340.95	-2.274E-01	
HF-181	482.00	75.	12.	0.002	103.03	9.281E-02	P
RU-103	497.05	60.	-5.	-0.001	271.45	-3.602E-02	P
RH-106	511.86	350.	-30.	-0.004	91.49	-9.282E-01	
Kr-85	513.98	330.	-15.	-0.002	172.37	-2.213E+01	
Nd-147	531.00	32.	10.	0.001	115.18	4.969E-01	
Ba-140	537.26	29.	8.	0.001	135.29	2.156E-01	P
CS-134	563.24	48.	4.	0.001	342.78	3.232E-01	
CS-134	569.32	44.	4.	0.001	239.79	1.769E-01	
PA-234	569.47	54.	-4.	-0.001	264.58	-3.318E-01	
BI-207	569.70	65.	-11.	-0.002	107.95	-7.658E-02	
SB-125	600.50	354.	-25.	-0.004	50.46	-9.997E-01	P
SB-124	602.73	259.	17.	0.002	138.57	1.204E-01	
CS-134	604.71	267.	13.	0.002	177.11	9.625E-02	
BI-214	609.31	323.	-43.	-0.006	40.37	-6.615E-01	P
RH-106	621.92	73.	14.	0.002	88.50	1.045E+00	
SB-125	635.89	35.	11.	0.002	79.25	7.408E-01	
I-131	636.97	53.	-2.	0.000	620.65	-1.727E-01	
AG-110M	657.76	62.	1.	0.000	848.91	1.066E-02	P
NB-94	702.63	35.	13.	0.002	93.38	1.097E-01	
SB-124	722.79	56.	-10.	-0.001	110.45	-7.548E-01	
BI-212	727.17	98.	-17.	-0.002	87.14	-1.817E+00	
PM-146	735.72	22.	11.	0.001	96.43	3.879E-01	P
ZR-95	756.73	33.	-1.	0.000	961.40	-1.864E-02	P
AG-110M	763.94	61.	-6.	-0.001	197.08	-2.283E-01	P
NB-95	765.79	66.	-2.	0.000	578.79	-1.711E-02	
EU-152	778.92	22.	6.	0.001	155.20	4.235E-01	
BI-212	785.42	17.	10.	0.001	90.59	6.812E+00	
CS-134	795.87	107.	-21.	-0.003	54.47	-2.114E-01	P
CS-134	801.95	28.	12.	0.002	91.11	1.262E+00	
La-140	815.77	25.	1.	0.000	858.37	3.213E-02	
Cs-136	818.50	33.	4.	0.001	226.54	3.300E-02	
MN-54	834.85	47.	-14.	-0.002	109.43	-1.250E-01	
Co-56	846.77	67.	-21.	-0.003	54.51	-1.959E-01	P
NB-94	871.10	18.	9.	0.001	74.58	8.625E-02	
EU-154	873.23	28.	9.	0.001	87.98	7.044E-01	
PA-234	880.53	103.	-17.	-0.002	89.44	-2.658E+00	
PA-234	883.24	120.	-7.	-0.001	237.19	-6.601E-01	
Sc-46	889.28	139.	-10.	-0.001	166.88	-9.784E-02	
Y-88	898.04	30.	2.	0.000	548.59	2.185E-02	P
AG-110M	937.49	23.	7.	0.001	158.51	1.949E-01	
PA-234	946.02	33.	-2.	0.000	731.57	-1.259E-01	
EU-152	964.11	80.	-15.	-0.002	90.28	-1.029E+00	
EU-154	996.33	103.	-17.	-0.002	88.42	-1.680E+00	
EU-154	1004.77	135.	-19.	-0.003	90.77	-1.105E+00	
Co-56	1037.84	20.	3.	0.000	332.78	2.319E-01	
Cs-136	1048.07	6.	24.	0.003	25.23	3.281E-01	
RH-106	1050.36	44.	-10.	-0.001	98.81	-7.074E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	1063.66	24.	6.	0.001	165.83	9.567E-02	P
Ga-68	1077.40	15.	9.	0.001	100.31	5.372E+00	
FE-59	1099.25	31.	-2.	0.000	716.82	-3.065E-02	P
EU-152	1112.07	100.	-18.	-0.002	82.89	-1.514E+00	
ZN-65	1115.55	118.	-14.	-0.002	115.88	-3.132E-01	
BI-214	1120.29	135.	-3.	0.000	332.06	-2.639E-01	P
Sc-46	1120.55	106.	16.	0.002	95.58	1.841E-01	
Ta-182	1121.30	116.	-16.	-0.002	99.70	-5.277E-01	
CO-60	1173.24	37.	-10.	-0.001	120.49	-1.173E-01	P
Ta-182	1189.05	10.	9.	0.001	86.63	6.593E-01	
Ta-182	1221.41	21.	6.	0.001	189.97	2.631E-01	
Co-56	1238.28	11.	6.	0.001	123.77	1.216E-01	
NA-22	1274.53	32.	-13.	-0.002	67.50	-1.691E-01	
FE-59	1291.60	16.	11.	0.002	86.74	3.400E-01	
TL-210	1313.00	21.	4.	0.001	291.05	2.329E-01	
CO-60	1332.50	12.	8.	0.001	98.91	1.117E-01	P
AG-110M	1384.30	5.	15.	0.002	44.30	8.435E-01	
EU-152	1408.00	16.	5.	0.001	187.26	3.375E-01	
La-140	1596.21	6.	3.	0.000	234.56	4.277E-02	P
SB-124	1690.98	30.	-11.	-0.002	123.98	-3.842E-01	
BI-214	1764.49	21.	15.	0.002	52.34	1.701E+00	P
Y-88	1836.06	31.	-10.	-0.001	81.50	-1.807E-01	P

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-2.2738E-01	-2.2738E-01	3.410E+02%	2.68E+00
NA-22	#A	-1.6913E-01	-1.6913E-01	6.750E+01%	3.78E-01
K-40	#A	-2.7453E-02	-2.7453E-02	5.635E+03%	4.38E+00
Sc-46	#A	4.3136E-02	4.3136E-02	9.558E+01%	5.54E-01
CR-51	#A	5.1460E-01	5.1461E-01	1.558E+02%	2.72E+00
MN-54	#A	-1.2500E-01	-1.2500E-01	1.094E+02%	3.16E-01
FE-59	#A	1.2995E-01	1.2995E-01	8.674E+01%	5.77E-01
Co-56	#A	-1.9587E-01	-1.9587E-01	5.451E+01%	3.78E-01
CO-57	#A	8.9006E-03	8.9007E-03	9.776E+01%	2.72E-01
CO-58	#A	-8.9816E-03	-8.9816E-03	1.063E+03%	3.38E-01
CO-60	#A	1.1170E-01	1.1170E-01	9.891E+01%	2.52E-01
ZN-65	#A	-3.1315E-01	-3.1315E-01	1.159E+02%	1.22E+00
NB-94	#A	9.7861E-02	9.7861E-02	5.975E+01%	2.46E-01
ZR-95	#A	-1.8638E-02	-1.8638E-02	9.614E+02%	4.59E-01
NB-95	#A	-1.7112E-02	-1.7112E-02	5.788E+02%	3.47E-01
RU-103	#A	-3.6015E-02	-3.6016E-02	2.715E+02%	2.63E-01
RH-106	#A	1.0450E+00	1.0450E+00	8.850E+01%	3.11E+00
AG-108M	#A	-1.2719E-01	-1.2719E-01	8.593E+01%	2.98E-01

AG-110M#A	1.2476E-01	1.2477E-01	4.430E+01%	7.27E-01
SN-113 #A	1.2359E-01	1.2359E-01	1.179E+02%	4.91E-01
SB-124 #A	1.2044E-01	1.2044E-01	1.386E+02%	5.61E-01
SB-125 #A	3.5624E-02	3.5624E-02	7.925E+01%	8.27E-01
I-131 #A	-2.5080E-03	-2.5081E-03	2.194E+02%	2.59E-01
Gd-153 #A	-2.3542E-02	-2.3542E-02	8.254E+01%	7.95E-01
Ga-68 #A	5.3440E+00	5.3723E+00	1.003E+02%	1.24E+01
Tc-99m #A	3.1626E-02	3.1657E-02	3.000E+02%	3.21E-01
BA-133 #A	-4.4325E-02	-4.4325E-02	1.035E+02%	5.22E-01
CS-134 #A	-2.1137E-01	-2.1137E-01	5.447E+01%	5.24E-01
CS-137 #A	0.0000E+00	0.0000E+00	1.000E+03%	3.55E-01
CE-139 #A	7.3013E-02	7.3013E-02	1.102E+02%	2.70E-01
Ba-140 #A	3.6701E-01	3.6702E-01	8.903E+01%	7.42E-01
La-140 #A	8.7898E-02	8.7900E-02	1.056E+02%	2.41E-01
CE-141 #A	-3.4368E-02	-3.4368E-02	5.014E+02%	5.82E-01
CE-144 #A	-5.2890E-01	-5.2890E-01	1.498E+02%	2.65E+00
PM-144 #A	1.0597E-01	1.0597E-01	9.598E+01%	2.42E-01
EU-152 #A	-2.0931E-02	-2.0931E-02	9.396E+01%	7.86E-01
EU-154 #A	1.4313E-01	1.4313E-01	8.798E+01%	5.74E-01
EU-155 #A	1.6315E-01	1.6315E-01	1.874E+02%	1.03E+00
HF-181 #A	9.2807E-02	9.2808E-02	1.030E+02%	3.21E-01
Ta-182 #A	-1.5142E-01	-1.5142E-01	6.604E+01%	1.77E+00
Hg-203 #A	6.2829E-02	6.2830E-02	1.471E+02%	3.13E-01
TL-208 #	2.4791E-01	2.4791E-01	5.585E+01%	2.42E-01
PM-146 #A	1.7224E-01	1.7224E-01	8.167E+01%	3.22E-01
Y-88 #A	-1.8068E-01	-1.8068E-01	8.150E+01%	5.19E-01
Cd-113m#A	-5.3352E+02	-5.3352E+02	2.264E+02%	4.11E+03
Cd-109 #A	-5.0674E-01	-5.0674E-01	5.192E+02%	8.83E+00
Cf-251 #A	-3.0792E-02	-3.0792E-02	1.381E+03%	1.16E+00
Cf-249 #A	1.2234E-01	1.2234E-01	1.189E+02%	4.90E-01
Sn-126 #A	1.6494E-01	1.6494E-01	4.921E+02%	2.74E+00
PB-210 #A	3.0429E+00	3.0429E+00	7.621E+01%	5.96E+00
PB-212 #A	4.4725E-02	4.4725E-02	4.736E+02%	6.95E-01
PB-214 #A	-2.9178E-01	-2.9178E-01	7.608E+01%	7.63E-01
BI-207 #A	9.5668E-02	9.5668E-02	1.658E+02%	3.79E-01
BI-212 #A	-1.8174E+00	-1.8174E+00	8.714E+01%	5.30E+00
U-235 #A	1.9124E-01	1.9124E-01	1.340E+02%	2.33E+00
BI-214 #A	-6.6150E-01	-6.6150E-01	4.037E+01%	1.34E+00
BI-210M#A	-1.6118E-01	-1.6118E-01	4.697E+01%	5.23E-01
AC-228 #	1.0182E+00	1.0182E+00	2.460E+01%	8.53E-01
TH-227 #A	-1.2896E+00	-1.2896E+00	3.841E+01%	3.26E+00
TH-229 #A	1.2134E+00	1.2134E+00	1.171E+02%	4.59E+00
TH-234 #A	1.7565E+00	1.7565E+00	8.621E+01%	3.99E+00
PA-231 #A	2.7262E+00	2.7262E+00	1.584E+02%	1.45E+01
PA-233 #A	-1.2978E-01	-1.2978E-01	2.327E+02%	1.02E+00
PA-234 #A	-3.5843E-01	-3.5843E-01	1.291E+02%	1.55E+00
PA-234M A	-1.4237E+01	-1.4237E+01	6.069E+01%	6.73E+01
AM-241 #A	6.2799E-02	6.2799E-02	2.822E+02%	5.08E-01
Np-237 #A	-2.3099E-01	-2.3099E-01	3.395E+02%	2.63E+00

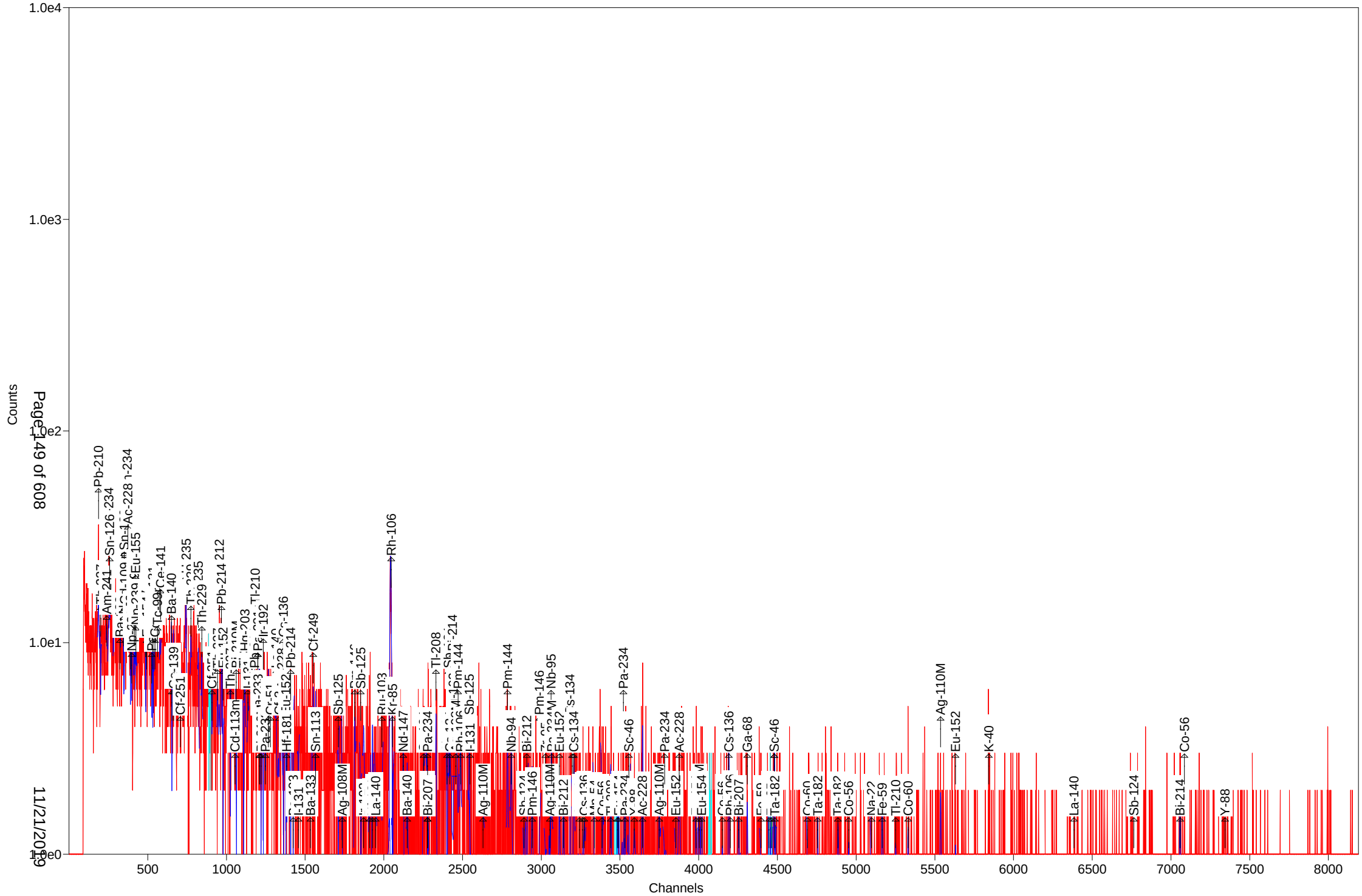
Ir-192	#A	8.3706E-02	8.3706E-02	1.002E+02%	2.91E-01
Cs-136	#A	1.6416E-01	1.6416E-01	2.523E+01%	2.64E-01
Np-239	#A	1.9822E-01	1.9824E-01	1.417E+02%	9.43E-01
Nd-147	#A	4.9689E-01	4.9690E-01	1.152E+02%	1.44E+00
TL-210	#A	2.4560E-02	2.4560E-02	2.174E+02%	4.83E-01
Kr-85	#A	-2.2126E+01	-2.2126E+01	1.724E+02%	1.28E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.5 keV) 4.061E+00 Bq/Sample
Total Decayed Activity (25.1 to 1999.5 keV) 4.0611401E+00 Bq/Sample

445202_Gamma_180-96597-A-1-B DU. 17_Gamma_20192077.spc.



Test America St. Louis Spectrum ID: 16_Gamma_20191902

Sample Description: 445202_Gamma_180-96595-B-9-A
Detector: Detector #16
Batch ID: 445202
Work Order Number: Gamma
Lot Number: 180-96595-B-9-A

Decay to Time: 10/31/2019 07:39 Live Time: 7200 sec
Acquisition Time: 10/31/2019 07:40:37 Real Time: 7207 sec
Analysis Time: 10/31/2019 09:41 Dead Time: 0.09 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 16_Liquid_Marinelli 1L.Clb
Efficiency Cal Desc: 16_1Lmarn_90062_032712
Efficiency Cal Date: 4/2/2012 18:09
Energy Cal Date: 2/28/2012 09:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 16_2019-10-06_1926.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	8.888E-01	102.0	9.062E-01	9.073E-01	3.040E+00
NA-22	-1.958E-01	85.7	1.678E-01	1.681E-01	4.103E-01
K-40	-4.386E-01	372.0	1.631E+00	1.631E+00	4.367E+00
Sc-46	1.249E-01	83.7	1.045E-01	1.047E-01	3.503E-01
CR-51	-8.387E-01	180.0	1.510E+00	1.511E+00	5.048E+00
MN-54	5.253E-02	194.3	1.020E-01	1.021E-01	2.353E-01
FE-59	2.233E-01	99.3	2.219E-01	2.221E-01	4.848E-01
Co-56	-4.121E-02	343.5	1.416E-01	1.416E-01	3.199E-01
CO-57	-8.145E-02	86.4	7.035E-02	7.049E-02	2.340E-01
CO-58	1.208E-01	82.4	9.960E-02	9.978E-02	3.335E-01
CO-60	3.413E-02	410.7	1.402E-01	1.402E-01	3.155E-01
ZN-65	0.000E+00	1.#INF	8.190E-02	8.190E-02	9.606E-01
NB-94	-5.199E-02	259.3	1.348E-01	1.349E-01	3.128E-01
ZR-95	-2.976E-01	19.6	5.845E-02	6.030E-02	5.612E-01
NB-95	0.000E+00	1.#INF	6.726E-02	6.726E-02	3.046E-01
RU-103	4.419E-02	219.9	9.718E-02	9.720E-02	2.350E-01
RH-106	-1.248E-01	1049.6	1.310E+00	1.310E+00	6.556E+00
AG-108M	-6.800E-03	1394.4	9.482E-02	9.483E-02	2.325E-01
AG-110M	0.000E+00	1.#INF	6.644E-02	6.644E-02	5.624E-01
SN-113	1.433E-01	87.6	1.256E-01	1.258E-01	4.196E-01
SB-124	-1.496E-01	131.9	1.973E-01	1.974E-01	6.595E-01
SB-125	4.297E-01	66.0	2.835E-01	2.843E-01	6.700E-01
I-131	-3.251E-02	308.8	1.004E-01	1.004E-01	2.516E-01
Gd-153	-2.354E-01	176.4	4.154E-01	4.156E-01	1.382E+00
Ga-68	4.948E+00	87.2	4.315E+00	4.323E+00	9.648E+00
Tc-99m	0.000E+00	1.#INF	6.183E-02	6.184E-02	4.390E-01
BA-133	-1.510E-01	108.7	1.641E-01	1.643E-01	5.491E-01
CS-134	1.836E-01	98.3	1.805E-01	1.808E-01	3.915E-01
CS-137	-9.283E-02	145.2	1.348E-01	1.349E-01	4.566E-01
CE-139	-8.783E-02	128.5	1.128E-01	1.131E-01	3.152E-01
Ba-140	-5.290E-01	81.9	4.335E-01	4.343E-01	1.157E+00
La-140	1.462E-01	111.5	1.631E-01	1.633E-01	2.875E-01
CE-141	1.476E-01	142.1	2.097E-01	2.098E-01	6.991E-01

CE-144	0.000E+00	1.#INF	3.454E-01	3.454E-01	3.079E+00
PM-144	-6.612E-03	2191.7	1.449E-01	1.449E-01	3.479E-01
EU-152	4.107E-01	64.4	2.644E-01	2.654E-01	6.762E-01
EU-154	4.118E-01	75.7	3.119E-01	3.127E-01	4.597E-01
EU-155	-1.799E-01	180.8	3.252E-01	3.254E-01	1.608E+00
HF-181	1.591E-01	119.4	1.899E-01	1.901E-01	4.215E-01
Ta-182	3.216E-01	84.1	2.705E-01	2.710E-01	1.246E+00
Hg-203	9.446E-02	108.3	1.023E-01	1.024E-01	2.504E-01
TL-208	-4.908E-02	209.2	1.027E-01	1.027E-01	2.730E-01
PM-146	-1.907E-01	72.8	1.387E-01	1.391E-01	4.062E-01
Y-88	3.392E-02	120.2	4.078E-02	4.083E-02	3.841E-01
Cd-113m	-1.024E+03	131.5	1.346E+03	1.348E+03	4.522E+03
Cd-109	-1.838E+00	172.5	3.172E+00	3.174E+00	1.056E+01
Cf-251	1.331E-01	331.0	4.404E-01	4.405E-01	1.136E+00
Cf-249	-1.011E-01	135.4	1.369E-01	1.370E-01	4.614E-01
Sn-126	-8.044E-01	115.5	9.292E-01	9.302E-01	3.093E+00
PB-210	-3.216E+00	71.4	2.296E+00	2.314E+00	7.650E+00
PB-212	-2.459E-01	85.3	2.098E-01	2.104E-01	7.169E-01
PB-214	5.985E-01	35.5	2.127E-01	2.150E-01	5.504E-01
BI-207	1.559E-01	107.6	1.676E-01	1.678E-01	3.739E-01
BI-212	1.583E+00	80.2	1.270E+00	1.272E+00	4.243E+00
U-235	-2.364E-01	163.7	3.869E-01	3.871E-01	3.254E+00
BI-214	6.932E-01	50.4	3.494E-01	3.512E-01	6.524E-01
BI-210M	2.920E-01	37.3	1.088E-01	1.102E-01	4.833E-01
AC-228	-2.231E-01	203.5	4.541E-01	4.542E-01	1.146E+00
TH-227	5.248E-01	118.3	6.206E-01	6.214E-01	3.059E+00
TH-229	2.706E-01	622.5	1.685E+00	1.685E+00	4.366E+00
TH-234	9.777E-01	105.7	1.033E+00	1.035E+00	3.074E+00
PA-231	2.452E+00	160.0	3.924E+00	3.926E+00	1.662E+01
PA-233	1.828E-01	181.9	3.323E-01	3.325E-01	1.370E+00
PA-234	-1.489E-01	380.2	5.662E-01	5.662E-01	1.896E+00
PA-234M	-1.313E+01	116.3	1.526E+01	1.528E+01	5.344E+01
AM-241	-3.858E-01	64.4	2.486E-01	2.496E-01	9.580E-01
Np-237	-5.313E-01	180.1	9.568E-01	9.573E-01	3.184E+00
Ir-192	0.000E+00	1.#INF	5.304E-02	5.304E-02	5.718E-01
Cs-136	1.226E-01	63.8	7.828E-02	7.857E-02	3.405E-01
Np-239	-3.311E-01	145.0	4.801E-01	4.805E-01	1.598E+00
Nd-147	-2.210E-01	332.2	7.342E-01	7.343E-01	1.781E+00
TL-210	9.867E-02	102.1	1.008E-01	1.009E-01	3.638E-01
Kr-85	0.000E+00	1.#INF	8.045E+00	8.045E+00	1.142E+02
Total	1.700E+01				

Analyst: Jasmine Stewart

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Sample description
445202_Gamma_180-96595-B-9-A

Spectrum Filename: C:\User\SPC\Det16\16_Gamma_20191902.An1

Acquisition information
Start time: 10/31/2019 7:40:37 AM
Live time: 7200
Real time: 7207
Dead time: 0.09 %
Detector ID: 16

Detector system
Ge16 SN/11012217

Calibration
Filename: 16_Liquid_Marinelli 1L.Clb
16_1Lmarn_90062_032712

Energy Calibration
Created: 2/28/2012 9:35:31 AM
Zero offset: 0.050 keV
Gain: 0.250 keV/channel
Quadratic: -2.285E-08 keV/channel^2

Efficiency Calibration
Created: 4/2/2012 6:09:24 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.42 %
Log(Eff): -2.314705E+00 + (2.848008E-01*Log(E)) +
(-8.114986E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 0.26 %
Log(Eff): -1.260350E+01 + (4.382261E+00*Log(E)) +
(-4.889120E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.06keV)
Stop channel: 8000 (1999.64keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 7:39:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	16_2019-10-06_1926.PBC 10/6/2019 7:26:53 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1139

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.41	-50.	71.38	0.96	5.055E-02	46.54	4.250	PBC<MDA	PB210
50.14	16.	195.46	0.96	5.283E-02	50.14	8.000	PBC<MDA	TH227
63.28	17.	174.37	0.70	5.853E-02	63.29	3.810	PBC<MDA	TH234
92.54	22.	119.55	1.34	6.175E-02	92.59	5.584	PBC<MDA	TH234
121.78	26.	93.41	1.03	5.878E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	7.257E-02	CO57
123.10	27.	88.90	1.03	5.858E-02	123.10	40.790	PBC<MDA	EU154
133.02	7.	591.79	1.04	5.696E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	1.545E-01	CE144
136.30	17.	249.19	1.04	5.639E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	3.853E-01	CO57
145.44	28.	142.09	1.05	5.475E-02	145.44	48.200	PBC<MDA	CE141
176.60	8.	330.96	1.08	4.912E-02	176.60	17.000	PBC<MDA	Cf251
185.72	-8.	358.42	1.09	4.776E-02	185.72	54.000	PBC<MDA	U235
193.51	4.	622.49	1.09	4.666E-02	193.51	4.400	PBC<MDA	TH229
205.33	4.	675.08	1.11	4.510E-02	205.33	5.010	PBC<MDA	U235
227.00	25.	93.78	1.13	4.251E-02	227.00	6.300	PBC<MDA	Cf251
235.97	24.	118.26	1.13	4.154E-02	235.97	12.300	PBC<MDA	TH227
238.63	-32.	85.32	1.14	4.126E-02	238.63	43.300	PBC<MDA	PB212
242.50	7.	366.11	1.14	4.091E-02	242.00	7.430	PBC<MDA	PB214
256.24	6.	409.61	1.15	3.951E-02	256.24	7.000	PBC<MDA	TH227
266.63	19.	108.28	1.16	3.862E-02	265.83	50.000	PBC<MDA	BI210M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
279.20	21.	108.29	1.17	3.745E-02	279.20	81.460	PBC<MDA	Hg203
295.39	31.	65.69	1.59	3.616E-02	295.09	19.300	PBC<MDA	PB214
					296.00	79.000	PBC<MDA	TL210
296.00	20.	173.92	1.19	3.609E-02	296.00	79.000	PBC<MDA	TL210
300.03	17.	204.92	1.19	3.578E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
300.07	20.	179.07	1.19	3.578E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	3.134E+00	PA231
					300.18	6.200	1.244E+00	PA233
300.18	20.	181.86	1.19	3.577E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	3.134E+00	PA231
					300.18	6.200	1.244E+00	PA233
302.65	14.	265.24	1.19	3.558E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	2.938E-01	BA133
304.35	41.	37.27	2.66	3.541E-02	304.85	4.290	3.748E+00	Ba140
					304.90	28.000	5.743E-01	BI210M
338.32	-4.	817.42	1.23	3.309E-02	338.32	12.010	PBC<MDA	AC228
344.29	19.	140.29	1.23	3.271E-02	344.29	26.500	PBC<MDA	EU152
345.83	21.	135.81	1.23	3.261E-02	345.83	15.070	PBC<MDA	HF181
351.87	51.	35.54	1.01	3.223E-02	351.93	37.600	5.890E-01	PB214
392.67	20.	87.63	1.27	2.999E-02	391.69	64.000	PBC<MDA	SN113
427.96	17.	99.80	1.31	2.821E-02	427.88	29.600	PBC<MDA	SB125
477.60	18.	101.96	1.35	2.610E-02	477.60	10.520	PBC<MDA	BE7
481.77	16.	119.40	1.35	2.593E-02	482.00	80.500	PBC<MDA	HF181
497.05	7.	219.93	1.37	2.536E-02	497.05	90.900	PBC<MDA	RU103
511.86	212.	10.01	2.63	2.482E-02	511.86	20.000	5.930E+00	RH106
563.24	17.	98.33	1.43	2.314E-02	563.24	8.350	PBC<MDA	CS134
569.32	1.	830.66	1.43	2.295E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	9.840E-02	PA234
					569.70	97.740	PBC<MDA	BI207
583.02	-7.	209.18	1.44	2.255E-02	583.02	84.500	PBC<MDA	TL208
608.96	38.	52.74	2.10	2.181E-02	609.31	46.090	PBC<MDA	BI214
635.89	14.	86.31	1.49	2.112E-02	635.89	11.310	PBC<MDA	SB125
727.17	16.	80.24	1.57	1.904E-02	727.17	7.550	PBC<MDA	BI212
735.72	11.	96.64	1.58	1.886E-02	735.72	22.500	PBC<MDA	PM146
747.16	6.	232.56	1.59	1.863E-02	747.16	34.000	PBC<MDA	PM146
785.42	12.	92.70	1.62	1.791E-02	785.42	1.280	PBC<MDA	BI212
795.87	12.	109.47	1.63	1.772E-02	795.87	85.530	PBC<MDA	CS134
799.60	13.	107.15	1.63	1.766E-02	799.60	98.960	PBC<MDA	TL210
810.78	15.	82.42	1.64	1.746E-02	810.78	99.460	PBC<MDA	CO58
815.77	7.	193.18	1.65	1.738E-02	815.77	23.280	PBC<MDA	La140
818.50	13.	98.18	1.65	1.733E-02	818.50	100.000	PBC<MDA	Cs136
834.85	6.	194.26	1.66	1.706E-02	834.85	99.980	PBC<MDA	MN54
873.23	6.	193.95	1.70	1.645E-02	873.23	12.270	PBC<MDA	EU154
880.53	2.	681.91	1.70	1.633E-02	880.53	6.000	PBC<MDA	PA234
889.28	15.	83.68	1.71	1.620E-02	889.28	99.984	PBC<MDA	Sc46
898.04	11.	120.25	1.72	1.607E-02	898.04	93.700	PBC<MDA	Y88

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
911.07	-7.	203.51	1.73	1.588E-02	911.07	29.000	PBC<MDA	AC228
996.33	15.	78.04	1.80	1.475E-02	996.33	10.600	PBC<MDA	EU154
1001.00	-12.	116.26	1.81	1.469E-02	1001.00	0.837	PBC<MDA	PA234M
1048.07	12.	81.65	1.84	1.414E-02	1048.07	80.000	PBC<MDA	Cs136
1063.66	12.	107.55	1.86	1.396E-02	1063.66	74.500	PBC<MDA	BI207
1077.40	9.	87.21	1.87	1.381E-02	1077.40	3.300	PBC<MDA	Ga68
1099.25	12.	99.34	1.89	1.358E-02	1099.25	56.500	PBC<MDA	FE59
1112.07	14.	94.37	1.90	1.344E-02	1112.07	13.644	PBC<MDA	EU152
1120.98	15.	84.11	1.91	1.335E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	4.420E-01	Ta182
1222.22	4.	345.51	1.99	1.240E-02	1221.41	27.000	PBC<MDA	Ta182
1332.50	3.	410.68	2.08	1.149E-02	1332.50	99.980	PBC<MDA	CO60
1408.00	16.	44.63	2.14	1.094E-02	1408.00	21.005	9.670E-01	EU152
1460.79	-4.	371.97	2.19	1.059E-02	1460.83	10.670	PBC<MDA	K40
1596.21	8.	111.57	2.29	9.770E-03	1596.21	95.400	PBC<MDA	La140
1764.34	12.	85.91	2.43	8.909E-03	1764.49	15.400	PBC<MDA	BI214

No unknown peaks passed sensitivity test.

This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.86	46.54	616.	-50.	-0.007	71.38	0.959s
TH-227	200.26	50.14	481.	16.	0.002	195.46	0.963
AM-241	237.83	59.54	891.	-57.	-0.008	64.44	0.971
TH-234	252.78	63.28	280.	17.	0.002	174.37	0.697s
Sn-126	256.79	64.28	712.	-33.	-0.005	115.50	0.976s
BA-133	323.60	80.99	315.	-32.	-0.005	94.96	0.991s
Np-237	345.59	86.49	1540.	-31.	-0.004	180.10	0.996s
EU-155	345.80	86.54	1509.	-31.	-0.004	178.30	0.996s
Sn-126	347.39	86.94	1478.	-31.	-0.004	176.44	0.997s
Sn-126	349.91	87.57	1447.	-31.	-0.004	174.48	0.997s
Cd-109	351.79	88.04	1416.	-31.	-0.004	172.54	0.998s
TH-234	369.78	92.54	250.	22.	0.003	119.55	1.340s
AC-228	373.02	93.35	1569.	-61.	-0.009	48.70	1.003s
Gd-153	389.61	97.50	1508.	-31.	-0.004	176.44	1.007s
Np-239	397.61	99.50	1476.	-31.	-0.004	174.30	1.008s
Gd-153	412.40	103.20	1445.	-31.	-0.004	171.92	1.012s
Np-239	414.40	103.70	1414.	-30.	-0.004	180.03	1.012
EU-155	420.85	105.31	992.	-17.	-0.002	180.79	1.014s
Np-239	424.11	106.13	1094.	-32.	-0.005	144.99	1.014s
EU-152	486.69	121.78	288.	26.	0.004	93.41	1.029s
CO-57	487.81	122.06	310.	-29.	-0.004	86.37	1.029s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	491.96	123.10	269.	27.	0.004	88.90	1.030s
PA-234	524.73	131.29	877.	-11.	-0.002	380.22	1.038s
HF-181	531.64	133.02	859.	7.	0.001	591.79	1.039s
CE-144	533.70	133.54	866.	0.	0.000	1000.00	1.040s
HF-181	544.74	136.30	857.	17.	0.002	249.19	1.042s
CO-57	545.43	136.47	866.	0.	0.000	1000.00	1.042s
Tc-99m	561.57	140.51	866.	0.	0.000	1000.00	1.046s
U-235	574.67	143.79	886.	-20.	-0.003	163.67	1.049s
CE-141	581.29	145.44	780.	28.	0.004	142.09	1.050s
Ba-140	650.14	162.66	380.	-8.	-0.001	403.12	1.066s
U-235	653.01	163.38	389.	-7.	-0.001	498.22	1.067s
CE-139	662.90	165.85	369.	-26.	-0.004	128.46	1.069s
Cf-251	705.88	176.60	198.	8.	0.001	330.96	1.079s
U-235	742.34	185.72	282.	-8.	-0.001	358.42	1.087
TH-229	773.49	193.51	176.	4.	0.001	622.49	1.094s
U-235	820.76	205.33	177.	4.	0.001	675.08	1.105s
TH-229	842.82	210.85	176.	0.	0.000	1000.00	1.110s
Cf-251	907.40	227.00	150.	25.	0.003	93.78	1.125s
TH-227	943.27	235.97	389.	24.	0.003	118.26	1.133s
PB-212	953.91	238.63	369.	-32.	-0.004	85.32	1.136s
PB-214	967.37	242.00	346.	7.	0.001	366.11	1.139s
EU-152	978.14	244.69	476.	-26.	-0.004	121.61	1.141s
TH-227	1024.32	256.24	156.	6.	0.001	409.61	1.152s
Cd-113m	1054.15	263.70	246.	-17.	-0.002	131.49	1.158s
BI-210M	1062.67	265.83	192.	19.	0.003	108.28	1.160s
Hg-203	1116.13	279.20	126.	21.	0.003	108.29	1.173s
I-131	1136.52	284.30	128.	-16.	-0.002	140.68	1.177s
PB-214	1180.87	295.39	99.	31.	0.004	65.69	1.592s
TL-210	1183.31	296.00	583.	20.	0.003	173.92	1.188s
PB-212	1199.42	300.03	605.	17.	0.002	204.92	1.191s
PA-231	1199.58	300.07	622.	20.	0.003	179.07	1.192s
PA-233	1200.02	300.18	642.	20.	0.003	181.86	1.192s
PA-231	1209.90	302.65	662.	14.	0.002	265.24	1.194s
BA-133	1210.70	302.85	676.	0.	0.000	1000.00	1.194s
Ba-140	1218.69	304.85	676.	0.	0.000	1000.00	1.196s
BI-210M	1216.70	304.35	55.	41.	0.006	37.27	2.656s
Ir-192	1233.05	308.44	676.	0.	0.000	1000.00	1.199s
PA-233	1247.34	312.01	676.	0.	0.000	1000.00	1.202s
Ir-192	1265.24	316.49	676.	0.	0.000	1000.00	1.206
CR-51	1279.62	320.08	677.	-21.	-0.003	180.03	1.210s
La-140	1314.31	328.76	460.	-24.	-0.003	130.38	1.217s
Cf-249	1333.02	333.44	483.	-18.	-0.003	171.72	1.222s
AC-228	1352.54	338.32	506.	-4.	-0.001	817.42	1.226s
Cs-136	1361.54	340.57	502.	0.	0.000	1000.00	1.228s
EU-152	1376.40	344.29	329.	19.	0.003	140.29	1.231s
HF-181	1382.56	345.83	379.	21.	0.003	135.81	1.233
PB-214	1406.72	351.87	95.	51.	0.007	35.54	1.008
BA-133	1423.24	356.00	264.	-22.	-0.003	108.69	1.242s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	1457.16	364.48	88.	-6.	-0.001	308.82	1.250s
Cf-249	1551.01	387.95	186.	-14.	-0.002	135.41	1.271s
SN-113	1565.96	391.69	141.	20.	0.003	87.63	1.274s
SB-125	1710.67	427.88	65.	17.	0.002	99.80	1.307s
PM-146	1814.67	453.88	109.	-24.	-0.003	72.75	1.330s
SB-125	1852.61	463.37	145.	-16.	-0.002	110.45	1.338
Ir-192	1871.38	468.06	168.	-8.	-0.001	242.04	1.342s
BE-7	1909.51	477.60	152.	18.	0.002	101.96	1.351s
HF-181	1927.12	482.00	169.	16.	0.002	119.40	1.355s
RU-103	1987.33	497.05	61.	7.	0.001	219.93	1.368s
RH-106	2046.57	511.86	119.	212.	0.029	10.01	2.631
Kr-85	2055.03	513.98	331.	0.	0.000	1000.00	1.383s
Nd-147	2123.10	531.00	65.	-5.	-0.001	332.16	1.398s
Ba-140	2148.14	537.26	97.	-22.	-0.003	81.94	1.404s
CS-134	2252.03	563.24	62.	17.	0.002	98.33	1.427s
CS-134	2276.36	569.32	61.	1.	0.000	830.66	1.432s
PA-234	2276.96	569.47	69.	-4.	-0.001	310.31	1.432s
BI-207	2277.89	569.70	75.	-3.	0.000	547.68	1.432s
TL-208	2331.16	583.02	56.	-7.	-0.001	209.18	1.444s
SB-125	2401.07	600.50	485.	-26.	-0.004	56.86	1.460s
SB-124	2409.99	602.73	460.	-23.	-0.003	131.85	1.462s
CS-134	2417.91	604.71	436.	-23.	-0.003	128.40	1.463s
BI-214	2434.90	608.96	91.	38.	0.005	52.74	2.096s
RU-103	2440.26	610.30	413.	-23.	-0.003	124.61	1.468s
AG-108M	2456.19	614.28	401.	-23.	-0.003	122.61	1.472s
PM-144	2471.31	618.06	425.	-16.	-0.002	182.13	1.475s
SB-125	2542.62	635.89	66.	14.	0.002	86.31	1.491
I-131	2546.96	636.97	89.	-11.	-0.001	128.54	1.492s
AG-110M	2630.10	657.76	110.	-13.	-0.002	117.42	1.510s
CS-137	2645.69	661.66	138.	-12.	-0.002	145.21	1.513s
NB-94	2809.57	702.63	75.	-7.	-0.001	259.33	1.549s
AG-108M	2890.80	722.94	103.	0.	0.000	1000.00	1.567s
EU-154	2892.49	723.36	83.	-10.	-0.001	134.47	1.567s
ZR-95	2895.84	724.20	92.	0.	0.000	1000.00	1.568s
BI-212	2907.73	727.17	78.	16.	0.002	80.24	1.570s
PM-146	2941.93	735.72	24.	11.	0.002	96.64	1.578s
PM-146	2987.69	747.16	37.	6.	0.001	232.56	1.588s
ZR-95	3025.97	756.73	66.	-22.	-0.003	19.64	1.596s
NB-95	3062.21	765.79	64.	0.	0.000	1000.00	1.604s
EU-152	3114.73	778.92	37.	-4.	-0.001	302.94	1.615s
BI-212	3140.74	785.42	26.	12.	0.002	92.70	1.621s
CS-134	3182.54	795.87	74.	12.	0.002	109.47	1.630s
TL-210	3197.46	799.60	85.	13.	0.002	107.15	1.633s
CO-58	3242.16	810.78	70.	15.	0.002	82.42	1.643
La-140	3262.14	815.77	85.	7.	0.001	193.18	1.647s
Cs-136	3273.06	818.50	73.	13.	0.002	98.18	1.649s
MN-54	3338.46	834.85	32.	6.	0.001	194.26	1.663s
Co-56	3386.15	846.77	60.	-5.	-0.001	343.51	1.674

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	3441.33	860.56	56.	-8.	-0.001	154.55	1.685s
NB-94	3483.47	871.10	63.	-14.	-0.002	82.84	1.695s
EU-154	3492.00	873.23	73.	6.	0.001	193.95	1.696s
PA-234	3521.21	880.53	92.	2.	0.000	681.91	1.703s
PA-234	3532.05	883.24	94.	0.	0.000	1000.00	1.705s
AG-110M	3537.82	884.68	94.	0.	0.000	1000.00	1.706s
Sc-46	3556.21	889.28	67.	15.	0.002	83.68	1.710s
Y-88	3591.26	898.04	36.	11.	0.002	120.25	1.718
AC-228	3643.38	911.07	57.	-7.	-0.001	203.51	1.729s
PA-234	3783.21	946.02	45.	0.	0.000	1000.00	1.759s
EU-152	3855.58	964.11	77.	-14.	-0.002	92.58	1.774s
EU-154	3984.48	996.33	64.	15.	0.002	78.04	1.801s
PA-234M	4003.15	1001.00	92.	-12.	-0.002	116.26	1.805s
EU-154	4018.27	1004.77	104.	-18.	-0.002	84.48	1.808s
Co-56	4150.56	1037.84	50.	-16.	-0.002	85.98	1.836s
Cs-136	4191.49	1048.07	42.	12.	0.002	81.65	1.845
RH-106	4200.65	1050.36	54.	0.	0.000	1000.00	1.847s
BI-207	4253.86	1063.66	29.	12.	0.002	107.55	1.858s
Ga-68	4308.84	1077.40	11.	9.	0.001	87.21	1.870s
FE-59	4396.27	1099.25	27.	12.	0.002	99.34	1.888s
EU-152	4447.58	1112.07	76.	14.	0.002	94.37	1.899s
ZN-65	4461.46	1115.55	90.	0.	0.000	1000.00	1.901s
Ta-182	4484.49	1121.30	70.	15.	0.002	84.11	1.906s
CO-60	4692.30	1173.24	51.	-2.	0.000	840.39	1.950s
Ta-182	4755.57	1189.05	40.	-13.	-0.002	119.95	1.963s
Ta-182	4885.06	1221.41	34.	4.	0.001	345.51	1.990s
Co-56	4952.57	1238.28	51.	-8.	-0.001	212.32	2.004s
NA-22	5097.62	1274.53	49.	-17.	-0.002	85.69	2.034s
EU-154	5097.66	1274.54	47.	0.	0.000	1000.00	2.034s
FE-59	5165.91	1291.60	35.	-7.	-0.001	220.25	2.048
TL-210	5251.57	1313.00	28.	-3.	0.000	378.48	2.066s
CO-60	5329.61	1332.50	25.	3.	0.000	410.68	2.081s
AG-110M	5536.89	1384.30	30.	-8.	-0.001	169.10	2.124s
EU-152	5631.75	1408.00	6.	16.	0.002	44.63	2.143s
K-40	5843.19	1460.83	50.	-4.	0.000	371.97	2.186
La-140	6385.02	1596.21	13.	8.	0.001	111.57	2.294s
SB-124	6764.37	1690.98	26.	-4.	-0.001	328.63	2.369s
BI-214	7058.61	1764.49	41.	12.	0.002	85.91	2.427s
Co-56	7086.08	1771.35	65.	-11.	-0.002	109.41	2.433s
Y-88	7345.12	1836.06	20.	-2.	0.000	574.46	2.483s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	8.8882E-01				5.31E+01	
			477.60	8.888E-01	(	3.040E+00 1.02E+02 1.05E+01	G
NA-22	C	-1.9581E-01				9.50E+02	
			1274.53	-1.958E-01	?(P	4.103E-01 8.57E+01 9.99E+01	G
K-40	N	-4.3857E-01				4.66E+11	
			1460.83	-4.386E-01	?(P	4.367E+00 3.72E+02 1.07E+01	G
Sc-46	F	1.2488E-01				8.38E+01	
			889.28	1.249E-01	&(	3.503E-01 8.37E+01 1.00E+02	G
			1120.55	-9.960E-03	% P	4.904E-01 1.38E+03 1.00E+02	G
CR-51	F	-8.3870E-01				2.77E+01	
			320.08	-8.387E-01	&(	5.048E+00 1.80E+02 9.94E+00	G
MN-54	C	5.2528E-02				3.12E+02	
			834.85	5.253E-02	?(P	2.353E-01 1.94E+02 1.00E+02	G
FE-59	F	2.2333E-01				4.45E+01	
			1099.25	2.233E-01	&(	4.848E-01 9.93E+01 5.65E+01	G
			1291.60	-1.803E-01	& P	8.203E-01 2.20E+02 4.32E+01	G
Co-56	C	-4.1213E-02				7.73E+01	
			846.77	-4.121E-02	?(	3.199E-01 3.44E+02 9.99E+01	G
			1238.28	-1.373E-01	+	6.175E-01 2.12E+02 6.61E+01	G
			1037.84	-1.111E+00	& P	2.462E+00 8.60E+01 1.41E+01	G
			1771.35	-1.095E+00	+	4.066E+00 1.09E+02 1.55E+01	A
CO-57	C	-8.1454E-02				2.72E+02	
			122.06	-8.145E-02	?(	2.340E-01 8.64E+01 8.56E+01	G
			136.47	0.000E+00	&	3.227E+00 1.00E+03 1.07E+01	G
CO-58	C	1.2085E-01				7.09E+01	
			810.78	1.208E-01	&(	3.335E-01 8.24E+01 9.95E+01	G
CO-60	F	3.4134E-02				1.93E+03	
			1332.50	3.413E-02	?(P	3.155E-01 4.11E+02 1.00E+02	G
			1173.24	-2.166E-02	+	3.897E-01 8.40E+02 9.99E+01	G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	I	-5.1994E-02					7.41E+06	
			702.63	-5.199E-02	?(	3.128E-01	2.59E+02	9.79E+01 G
			871.10	-1.209E-01	+	3.358E-01	8.28E+01	9.99E+01 G
ZR-95	I	-2.9763E-01					6.40E+01	
			756.73	-2.976E-01	?(P	5.612E-01	1.96E+01	5.45E+01 G
			724.20	0.000E+00	+	7.822E-01	1.00E+03	4.42E+01 G
RU-103	I	4.4186E-02					3.93E+01	
			497.05	4.419E-02	&(	2.350E-01	2.20E+02	9.09E+01 G
			610.30	-2.593E+00	+	1.080E+01	1.25E+02	5.75E+00 GA
RH-106	I	-1.2479E-01					3.74E+02	
			621.92	-1.248E-01	%(P	6.556E+00	1.05E+03	9.93E+00 G
			1050.36	0.000E+00	+	2.332E+01	1.00E+03	1.56E+00 G
			511.86	5.930E+00		1.498E+00	1.00E+01	2.00E+01 GA
AG-108M	C	-6.8002E-03					1.53E+05	
			433.94	-6.800E-03	&(P	2.325E-01	1.39E+03	9.05E+01 G
			722.94	0.000E+00	&	3.992E-01	1.00E+03	9.08E+01 G
			614.28	-1.672E-01	+	6.850E-01	1.23E+02	8.98E+01 G
SN-113	F	1.4332E-01					1.15E+02	
			391.69	1.433E-01	&(	4.196E-01	8.76E+01	6.40E+01 G
SB-124	F	-1.4963E-01					6.02E+01	
			602.73	-1.496E-01	&(	6.595E-01	1.32E+02	9.83E+01 G
			1690.98	-1.279E-01	+ P	8.313E-01	3.29E+02	4.78E+01 G
			722.79	-5.598E-02	&	3.341E+00	1.72E+03	1.08E+01 G
SB-125	I	4.2966E-01					1.01E+03	
			427.88	2.828E-01	?(	6.700E-01	9.98E+01	2.96E+01 G
			600.50	-9.071E-01	+ P	3.715E+00	5.69E+01	1.79E+01 G
			635.89	8.141E-01	(	2.359E+00	8.63E+01	1.13E+01 G
			463.37	-8.076E-01	+ P	2.928E+00	1.10E+02	1.05E+01 G
I-131	I	-3.2514E-02					8.02E+00	
			364.48	-3.251E-02	?(	2.516E-01	3.09E+02	8.17E+01 G
			284.30	-9.811E-01	+	3.399E+00	1.41E+02	6.14E+00 G
			636.97	-9.833E-01	+	4.295E+00	1.29E+02	7.17E+00 G
Gd-153	F	-2.3541E-01					2.42E+02	
			97.50	-2.354E-01	?(	1.382E+00	1.76E+02	3.00E+01 G
			103.20	-3.279E-01	&	1.876E+00	1.72E+02	2.18E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ga-68	C	4.9479E+00					4.71E-02	
			1077.40	4.948E+00	&(	9.648E+00	8.72E+01	3.30E+00 G
BA-133	F	-1.5102E-01					3.85E+03	
			356.00	-1.510E-01	?(	5.491E-01	1.09E+02	6.20E+01 G
			302.85	0.000E+00	+	2.639E+00	1.00E+03	1.83E+01 G
			383.84	1.018E-01	% P	3.904E+00	1.13E+03	8.94E+00 GA
			80.99	-2.152E-01	+ P	5.660E-01	9.50E+01	3.41E+01 GA
CS-134	I	1.8359E-01					7.54E+02	
			795.87	1.065E-01	?(P	3.915E-01	1.09E+02	8.55E+01 G
			604.71	-1.512E-01	+	6.488E-01	1.28E+02	9.76E+01 G
			569.32	5.245E-02	?(	1.535E+00	8.31E+02	1.54E+01 G
			801.95	3.024E-02	%	4.488E+00	4.26E+03	8.69E+00 G
			563.24	1.215E+00	@(P	2.835E+00	9.83E+01	8.35E+00 G
CS-137	I	-9.2828E-02					1.10E+04	
			661.66	-9.283E-02	?(	4.566E-01	1.45E+02	8.52E+01 G
CE-139	F	-8.7833E-02					1.38E+02	
			165.85	-8.783E-02	&(P	3.152E-01	1.28E+02	7.99E+01 G
Ba-140	I	-5.2898E-01					1.28E+01	
			537.26	-5.290E-01	?(P	1.157E+00	8.19E+01	2.44E+01 G
			162.66	-3.468E-01	+ P	4.054E+00	4.03E+02	6.22E+00 G
			304.85	0.000E+00	+	1.132E+01	1.00E+03	4.29E+00 G
La-140	I	1.4623E-01					1.28E+01	
			1596.21	1.242E-01	?(	2.875E-01	1.12E+02	9.54E+01 G
			487.02	-3.954E-03	&	7.745E-01	5.70E+03	4.55E+01 G
			328.76	-4.780E-01	+	2.083E+00	1.30E+02	2.03E+01 G
			815.77	2.365E-01	&(	1.569E+00	1.93E+02	2.33E+01 G
CE-141	I	1.4757E-01					3.25E+01	
			145.44	1.476E-01	?(	6.991E-01	1.42E+02	4.82E+01 G
PM-144	C	-6.6119E-03					3.63E+02	
			696.54	-6.612E-03	%(P	3.479E-01	2.19E+03	9.90E+01 G
			618.06	-1.049E-01	+	6.414E-01	1.82E+02	9.91E+01 G
EU-152	F	4.1070E-01					4.94E+03	
			121.78	2.172E-01	?(	6.762E-01	9.34E+01	2.86E+01 G
			344.29	2.980E-01	(P	1.398E+00	1.40E+02	2.65E+01 G
			1112.07	1.035E+00	?(	3.288E+00	9.44E+01	1.36E+01 G
			778.92	-2.580E-01	-	1.856E+00	3.03E+02	1.29E+01 G
			964.11	-8.782E-01	&	2.735E+00	9.26E+01	1.46E+01 G
			244.69	-1.159E+00	+	4.705E+00	1.22E+02	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	9.670E-01	?	8.537E-01	4.46E+01	2.10E+01 GA
EU-154	I	4.1182E-01					3.14E+03	
			123.10	1.553E-01	&(	4.597E-01	8.89E+01	4.08E+01 G
			1274.54	0.000E+00	-	1.149E+00	1.00E+03	3.52E+01 G
			723.36	-3.534E-01	&	1.618E+00	1.34E+02	2.02E+01 G
			873.23	4.430E-01	?(P	2.931E+00	1.94E+02	1.23E+01 G
			1004.77	-9.365E-01	+	2.645E+00	8.45E+01	1.80E+01 G
			996.33	1.363E+00	?(	3.552E+00	7.80E+01	1.06E+01 G
EU-155	I	-1.7989E-01					1.81E+03	
			105.31	-1.799E-01	?(P	1.608E+00	1.81E+02	2.12E+01 G
			86.54	-2.267E-01	&	1.345E+00	1.78E+02	3.07E+01 G
HF-181	F	1.5907E-01					4.24E+01	
			482.00	1.049E-01	?(	4.215E-01	1.19E+02	8.05E+01 G
			133.02	3.952E-02	&(	7.844E-01	5.92E+02	4.33E+01 G
			345.83	5.808E-01	(	2.641E+00	1.36E+02	1.51E+01 G
			136.30	7.030E-01	&(	5.859E+00	2.49E+02	5.85E+00 G
Ta-182	F	3.2159E-01					1.14E+02	
			1121.30	4.420E-01	?(	1.246E+00	8.41E+01	3.49E+01 G
			1221.41	1.659E-01	?(	1.240E+00	3.46E+02	2.70E+01 G
			1189.05	-8.557E-01	+	2.166E+00	1.20E+02	1.62E+01 G
Hg-203	F	9.4464E-02					4.66E+01	
			279.20	9.446E-02	&(P	2.504E-01	1.08E+02	8.15E+01 G
TL-208	N	-4.9083E-02					6.98E+02	
			583.02	-4.908E-02	&(P	2.730E-01	2.09E+02	8.45E+01 G
			277.28	-8.133E-02	& P	4.123E+00	1.47E+03	6.31E+00 G
			860.56	-5.616E-01	+ P	2.533E+00	1.55E+02	1.24E+01 G
PM-146	C	-1.9071E-01					2.02E+03	
			453.88	-1.907E-01	?(P	4.062E-01	7.28E+01	6.50E+01 G
			747.16	1.242E-01	+	6.836E-01	2.33E+02	3.40E+01 G
			735.72	3.717E-01	+ P	8.395E-01	9.66E+01	2.25E+01 G
Y-88	F	3.3916E-02					1.07E+02	
			1836.06	-3.262E-02	?(	3.841E-01	5.74E+02	9.92E+01 G
			898.04	1.044E-01	?(P	2.817E-01	1.20E+02	9.37E+01 G
Cd-113m		-1.0238E+03					5.33E+03	
			263.70	-1.024E+03	&(	4.522E+03	1.31E+02	6.00E-03 K
Cd-109	F	-1.8385E+00					4.53E+02	
			88.04	-1.838E+00	?(	1.056E+01	1.73E+02	3.79E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-251	T	1.3306E-01					3.28E+05	
			176.60	1.331E-01	?(	1.136E+00	3.31E+02	1.70E+01 G
			227.00	1.298E+00	*	3.103E+00	9.38E+01	6.30E+00 GA
Cf-249	T	-1.0109E-01					1.28E+05	
			387.95	-1.011E-01	?(	4.614E-01	1.35E+02	6.60E+01 G
			333.44	-4.899E-01	+	2.819E+00	1.72E+02	1.55E+01 G
Sn-126		-8.0445E-01					3.65E+07	
			87.57	-1.857E-01	+	1.078E+00	1.74E+02	3.75E+01 GA
			64.28	-8.044E-01	?(	3.093E+00	1.16E+02	9.70E+00 G
			86.94	-7.700E-01	&	4.521E+00	1.76E+02	9.04E+00 GA
PB-210	N	-3.2161E+00					8.14E+03	
			46.54	-3.216E+00	(P	7.650E+00	7.14E+01	4.25E+00 G
PB-212	N	-2.4592E-01					6.98E+02	
			238.63	-2.459E-01	(P	7.169E-01	8.53E+01	4.33E+01 G
			300.03	2.028E+00	& P	1.389E+01	2.05E+02	3.28E+00 GA
PB-214	N	5.9848E-01					5.84E+05	
			351.93	5.890E-01	(P	5.504E-01	3.55E+01	3.76E+01 G
			295.09	6.169E-01	@(P	9.767E-01	6.57E+01	1.93E+01 G
			242.00	3.341E-01	- P	4.083E+00	3.66E+02	7.43E+00 GA
BI-207	C	1.5586E-01					1.18E+04	
			1063.66	1.559E-01	&(P	3.739E-01	1.08E+02	7.45E+01 G
			569.70	-1.925E-02	- P	2.669E-01	5.48E+02	9.77E+01 G
BI-212	N	1.5828E+00					6.98E+02	
			727.17	1.583E+00	?(	4.243E+00	8.02E+01	7.55E+00 G
			785.42	7.323E+00	? P	1.609E+01	9.27E+01	1.28E+00 GA
U-235	N	-2.3639E-01					2.57E+11	
			143.79	-4.488E-01	(P	3.254E+00	1.64E+02	1.10E+01 G
			205.33	2.284E-01	(P	3.981E+00	6.75E+02	5.01E+00 G
			163.38	-3.494E-01	+ P	5.031E+00	4.98E+02	5.08E+00 G
			185.72	-4.529E-02	+ P	4.364E-01	3.58E+02	5.40E+01 GA
BI-214	N	6.9325E-01					5.84E+05	
			609.31	5.212E-01	(P	6.524E-01	5.27E+01	4.61E+01 G
			1120.29	-6.594E-02	& P	3.247E+00	1.35E+03	1.51E+01 G
			1764.49	1.208E+00	?(P	3.297E+00	8.59E+01	1.54E+01 G
BI-210M	T	2.9202E-01					1.10E+09	
			265.83	1.339E-01	&(P	4.833E-01	1.08E+02	5.00E+01 G
			304.90	5.743E-01	(	5.221E-01	3.73E+01	2.80E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AC-228	N	-2.2312E-01					2.10E+03	
			911.07	-2.231E-01	&(P	1.146E+00	2.04E+02	2.90E+01 G
			968.97	3.975E-02	& P	2.552E+00	1.86E+03	1.75E+01 G
			338.32	-1.513E-01	+ P	3.758E+00	8.17E+02	1.20E+01 G
			93.35	-2.483E+00	+ P	7.579E+00	4.87E+01	5.56E+00 XA
TH-227	N	5.2475E-01					7.95E+03	
			256.24	3.013E-01	*(	3.059E+00	4.10E+02	7.00E+00 G
			235.97	6.512E-01	?(	2.573E+00	1.18E+02	1.23E+01 G
			50.14	5.258E-01	(	3.448E+00	1.95E+02	8.00E+00 G
TH-229	N	2.7061E-01					2.68E+06	
			193.51	2.706E-01	&(	4.366E+00	6.22E+02	4.40E+00 G
			210.85	0.000E+00	-	6.751E+00	1.00E+03	2.99E+00 G
TH-234	N	9.7766E-01					1.63E+12	
			92.59	9.061E-01	(P	3.074E+00	1.20E+02	5.58E+00 G
			63.29	1.082E+00	@(P	5.022E+00	1.74E+02	3.81E+00 G
PA-231	N	2.4520E+00					1.20E+07	
			302.65	1.869E+00	?(	1.662E+01	2.65E+02	2.88E+00 G
			300.07	3.134E+00	&(	1.878E+01	1.79E+02	2.46E+00 G
PA-233	C	1.8275E-01					7.82E+08	
			312.01	0.000E+00	?(	1.370E+00	1.00E+03	3.60E+01 G
			300.18	1.244E+00	&(	7.567E+00	1.82E+02	6.20E+00 G
PA-234	N	-1.4891E-01					1.63E+12	
			131.29	-1.489E-01	?(	1.896E+00	3.80E+02	1.80E+01 G
			946.02	0.000E+00	+	2.286E+00	1.00E+03	1.34E+01 G
			569.47	-2.829E-01	+	3.053E+00	3.10E+02	8.20E+00 G
			883.24	0.000E+00	+	4.252E+00	1.00E+03	9.60E+00 G
			880.53	2.834E-01	?	6.718E+00	6.82E+02	6.00E+00 GA
PA-234M	N	-1.3130E+01					1.63E+12	
			1001.00	-1.313E+01	(P	5.344E+01	1.16E+02	8.37E-01 G
			766.41	-9.032E-01	% P	9.908E+01	3.13E+03	2.94E-01 G
AM-241	T	-3.8579E-01					1.58E+05	
			59.54	-3.858E-01	(P	9.580E-01	6.44E+01	3.59E+01 G
Np-237	F	-5.3128E-01					2.14E+06	
			86.49	-5.313E-01	&(	3.184E+00	1.80E+02	1.31E+01 G
Cs-136	F	1.2261E-01					1.30E+01	
			818.50	1.028E-01	&(	3.405E-01	9.82E+01	1.00E+02 G
			1048.07	1.474E-01	&(	4.042E-01	8.16E+01	8.00E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                          340.57 0.000E+00 -   9.626E-01 1.00E+03 4.69E+01 G

Np-239   T  -3.3112E-01                                     2.36E+00
                          103.70-2.850E-01 +   1.708E+00 1.80E+02 2.40E+01 X
                          106.13-3.311E-01 &(  1.598E+00 1.45E+02 2.27E+01 G
                           99.50-4.787E-01 +   2.776E+00 1.74E+02 1.50E+01 X

Nd-147      -2.2105E-01                                     1.11E+01
                          531.00-2.210E-01 ?(  1.781E+00 3.32E+02 1.30E+01 G
                           91.10-7.274E-03 %   1.414E+00 5.81E+03 2.83E+01 G

TL-210   N   9.8669E-02                                     5.84E+05
                          799.60 1.005E-01  (  3.638E-01 1.07E+02 9.90E+01 G
                          296.00 9.644E-02 &(  5.612E-01 1.74E+02 7.90E+01 G
                         1313.00-1.894E-01 &   1.563E+00 3.78E+02 2.10E+01 GA
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	616.	-50.	-0.007	71.38	-3.216E+00	P
TH-227	50.14	481.	16.	0.002	195.46	5.258E-01	
AM-241	59.54	891.	-57.	-0.008	64.44	-3.858E-01	P
Sn-126	64.28	712.	-33.	-0.005	115.50	-8.044E-01	
BA-133	80.99	315.	-32.	-0.005	94.96	-2.152E-01	P
Np-237	86.49	1540.	-31.	-0.004	180.10	-5.313E-01	
EU-155	86.54	1509.	-31.	-0.004	178.30	-2.267E-01	
Sn-126	86.94	1478.	-31.	-0.004	176.44	-7.700E-01	
Sn-126	87.57	1447.	-31.	-0.004	174.48	-1.857E-01	
Cd-109	88.04	1416.	-31.	-0.004	172.54	-1.838E+00	
AC-228	93.35	1569.	-61.	-0.009	48.70	-2.483E+00	P
Gd-153	97.50	1508.	-31.	-0.004	176.44	-2.354E-01	
Np-239	99.50	1476.	-31.	-0.004	174.30	-4.787E-01	
Gd-153	103.20	1445.	-31.	-0.004	171.92	-3.279E-01	
Np-239	103.70	1414.	-30.	-0.004	180.03	-2.850E-01	
EU-155	105.31	992.	-17.	-0.002	180.79	-1.799E-01	P
Np-239	106.13	1094.	-32.	-0.005	144.99	-3.311E-01	
EU-152	121.78	288.	26.	0.004	93.41	2.172E-01	
CO-57	122.06	310.	-29.	-0.004	86.37	-8.145E-02	
EU-154	123.10	269.	27.	0.004	88.90	1.553E-01	
PA-234	131.29	877.	-11.	-0.002	380.22	-1.489E-01	
U-235	143.79	886.	-20.	-0.003	163.67	-4.488E-01	P
CE-141	145.44	780.	28.	0.004	142.09	1.476E-01	
Ba-140	162.66	380.	-8.	-0.001	403.12	-3.468E-01	P
U-235	163.38	389.	-7.	-0.001	498.22	-3.494E-01	P
CE-139	165.85	369.	-26.	-0.004	128.46	-8.783E-02	P
Cf-251	176.60	198.	8.	0.001	330.96	1.331E-01	
U-235	185.72	282.	-8.	-0.001	358.42	-4.529E-02	P
TH-229	193.51	176.	4.	0.001	622.49	2.706E-01	
U-235	205.33	177.	4.	0.001	675.08	2.284E-01	P
Cf-251	227.00	150.	25.	0.003	93.78	1.298E+00	
TH-227	235.97	389.	24.	0.003	118.26	6.512E-01	
PB-212	238.63	369.	-32.	-0.004	85.32	-2.459E-01	P
EU-152	244.69	476.	-26.	-0.004	121.61	-1.159E+00	
TH-227	256.24	156.	6.	0.001	409.61	3.013E-01	
Cd-113m	263.70	246.	-17.	-0.002	131.49	-1.024E+03	
Hg-203	279.20	126.	21.	0.003	108.29	9.446E-02	P
I-131	284.30	128.	-16.	-0.002	140.68	-9.811E-01	
TL-210	296.00	583.	20.	0.003	173.92	9.644E-02	
PB-212	300.03	605.	17.	0.002	204.92	2.028E+00	P
PA-231	300.07	622.	20.	0.003	179.07	3.134E+00	
PA-233	300.18	642.	20.	0.003	181.86	1.244E+00	
PA-231	302.65	662.	14.	0.002	265.24	1.869E+00	
CR-51	320.08	677.	-21.	-0.003	180.03	-8.387E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
La-140	328.76	460.	-24.	-0.003	130.38	-4.780E-01		
Cf-249	333.44	483.	-18.	-0.003	171.72	-4.899E-01		
AC-228	338.32	506.	-4.	-0.001	817.42	-1.513E-01		P
EU-152	344.29	329.	19.	0.003	140.29	2.980E-01		P
BA-133	356.00	264.	-22.	-0.003	108.69	-1.510E-01		
I-131	364.48	88.	-6.	-0.001	308.82	-3.251E-02		
Cf-249	387.95	186.	-14.	-0.002	135.41	-1.011E-01		
PM-146	453.88	109.	-24.	-0.003	72.75	-1.907E-01		P
Ir-192	468.06	168.	-8.	-0.001	242.04	-7.771E-02		
BE-7	477.60	152.	18.	0.002	101.96	8.888E-01		
RU-103	497.05	61.	7.	0.001	219.93	4.419E-02		
RH-106	511.86	119.	212.	0.029	10.01	5.930E+00		
Nd-147	531.00	65.	-5.	-0.001	332.16	-2.210E-01		
Ba-140	537.26	97.	-22.	-0.003	81.94	-5.290E-01		P
CS-134	563.24	62.	17.	0.002	98.33	1.215E+00		P
CS-134	569.32	61.	1.	0.000	830.66	5.245E-02		
PA-234	569.47	69.	-4.	-0.001	310.31	-2.829E-01		
BI-207	569.70	75.	-3.	0.000	547.68	-1.925E-02		P
TL-208	583.02	56.	-7.	-0.001	209.18	-4.908E-02		P
SB-124	602.73	460.	-23.	-0.003	131.85	-1.496E-01		
CS-134	604.71	436.	-23.	-0.003	128.40	-1.512E-01		
RU-103	610.30	413.	-23.	-0.003	124.61	-2.593E+00		
AG-108M	614.28	401.	-23.	-0.003	122.61	-1.672E-01		
PM-144	618.06	425.	-16.	-0.002	182.13	-1.049E-01		
I-131	636.97	89.	-11.	-0.001	128.54	-9.833E-01		
AG-110M	657.76	110.	-13.	-0.002	117.42	-9.271E-02		
CS-137	661.66	138.	-12.	-0.002	145.21	-9.283E-02		
NB-94	702.63	75.	-7.	-0.001	259.33	-5.199E-02		
EU-154	723.36	83.	-10.	-0.001	134.47	-3.534E-01		
BI-212	727.17	78.	16.	0.002	80.24	1.583E+00		
PM-146	735.72	24.	11.	0.002	96.64	3.717E-01		P
PM-146	747.16	37.	6.	0.001	232.56	1.242E-01		
ZR-95	756.73	66.	-22.	-0.003	19.64	-2.976E-01		P
EU-152	778.92	37.	-4.	-0.001	302.94	-2.580E-01		
BI-212	785.42	26.	12.	0.002	92.70	7.323E+00		P
CS-134	795.87	74.	12.	0.002	109.47	1.065E-01		P
TL-210	799.60	85.	13.	0.002	107.15	1.005E-01		
CO-58	810.78	70.	15.	0.002	82.42	1.208E-01		
La-140	815.77	85.	7.	0.001	193.18	2.365E-01		
Cs-136	818.50	73.	13.	0.002	98.18	1.028E-01		
MN-54	834.85	32.	6.	0.001	194.26	5.253E-02		P
Co-56	846.77	60.	-5.	-0.001	343.51	-4.121E-02		
TL-208	860.56	56.	-8.	-0.001	154.55	-5.616E-01		P
NB-94	871.10	63.	-14.	-0.002	82.84	-1.209E-01		
EU-154	873.23	73.	6.	0.001	193.95	4.430E-01		P
PA-234	880.53	92.	2.	0.000	681.91	2.834E-01		
Sc-46	889.28	67.	15.	0.002	83.68	1.249E-01		
Y-88	898.04	36.	11.	0.002	120.25	1.044E-01		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	911.07	57.	-7.	-0.001	203.51	-2.231E-01	P
EU-152	964.11	77.	-14.	-0.002	92.58	-8.782E-01	
EU-154	996.33	64.	15.	0.002	78.04	1.363E+00	
PA-234M	1001.00	92.	-12.	-0.002	116.26	-1.313E+01	P
EU-154	1004.77	104.	-18.	-0.002	84.48	-9.365E-01	
Co-56	1037.84	50.	-16.	-0.002	85.98	-1.111E+00	P
Cs-136	1048.07	42.	12.	0.002	81.65	1.474E-01	
BI-207	1063.66	29.	12.	0.002	107.55	1.559E-01	P
Ga-68	1077.40	11.	9.	0.001	87.21	4.948E+00	
FE-59	1099.25	27.	12.	0.002	99.34	2.233E-01	
EU-152	1112.07	76.	14.	0.002	94.37	1.035E+00	
CO-60	1173.24	51.	-2.	0.000	840.39	-2.166E-02	
Co-56	1238.28	51.	-8.	-0.001	212.32	-1.373E-01	
NA-22	1274.53	49.	-17.	-0.002	85.69	-1.958E-01	P
FE-59	1291.60	35.	-7.	-0.001	220.25	-1.803E-01	P
TL-210	1313.00	28.	-3.	0.000	378.48	-1.894E-01	
CO-60	1332.50	25.	3.	0.000	410.68	3.413E-02	P
AG-110M	1384.30	30.	-8.	-0.001	169.10	-4.118E-01	
EU-152	1408.00	6.	16.	0.002	44.63	9.670E-01	
K-40	1460.83	50.	-4.	0.000	371.97	-4.386E-01	P
La-140	1596.21	13.	8.	0.001	111.57	1.242E-01	
SB-124	1690.98	26.	-4.	-0.001	328.63	-1.279E-01	P
Co-56	1771.35	65.	-11.	-0.002	109.41	-1.095E+00	
Y-88	1836.06	20.	-2.	0.000	574.46	-3.262E-02	

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	8.8880E-01	8.8882E-01	1.020E+02%	3.04E+00
NA-22	#A	-1.9581E-01	-1.9581E-01	8.569E+01%	4.10E-01
K-40	#A	-4.3857E-01	-4.3857E-01	3.720E+02%	4.37E+00
Sc-46	#A	1.2487E-01	1.2488E-01	8.368E+01%	3.50E-01
CR-51	#A	-8.3868E-01	-8.3870E-01	1.800E+02%	5.05E+00
MN-54	#A	5.2528E-02	5.2528E-02	1.943E+02%	2.35E-01
FE-59	#A	2.2332E-01	2.2333E-01	9.934E+01%	4.85E-01
Co-56	#A	-4.1213E-02	-4.1213E-02	3.435E+02%	3.20E-01
CO-57	#A	-8.1453E-02	-8.1454E-02	8.637E+01%	2.34E-01
CO-58	#A	1.2084E-01	1.2085E-01	8.242E+01%	3.33E-01
CO-60	#A	3.4134E-02	3.4134E-02	4.107E+02%	3.15E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	9.61E-01
NB-94	#A	-5.1994E-02	-5.1994E-02	2.593E+02%	3.13E-01
ZR-95	#A	-2.9763E-01	-2.9763E-01	1.964E+01%	5.61E-01
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.05E-01
RU-103	#A	4.4185E-02	4.4186E-02	2.199E+02%	2.35E-01

RH-106 #A	-1.2479E-01	-1.2479E-01	1.050E+03%	6.56E+00
AG-108M#A	-6.8002E-03	-6.8002E-03	1.394E+03%	2.33E-01
AG-110M#A	0.0000E+00	0.0000E+00	1.000E+03%	5.62E-01
SN-113 #A	1.4332E-01	1.4332E-01	8.763E+01%	4.20E-01
SB-124 #A	-1.4963E-01	-1.4963E-01	1.319E+02%	6.59E-01
SB-125 A	4.2966E-01	4.2966E-01	6.597E+01%	6.70E-01
I-131 #A	-3.2511E-02	-3.2514E-02	3.088E+02%	2.52E-01
Gd-153 #A	-2.3541E-01	-2.3541E-01	1.764E+02%	1.38E+00
Ga-68 #A	4.8668E+00	4.9479E+00	8.721E+01%	9.65E+00
Tc-99m #A	0.0000E+00	0.0000E+00	1.000E+03%	4.39E-01
BA-133 #A	-1.5102E-01	-1.5102E-01	1.087E+02%	5.49E-01
CS-134 #A	1.8359E-01	1.8359E-01	9.833E+01%	3.91E-01
CS-137 #A	-9.2828E-02	-9.2828E-02	1.452E+02%	4.57E-01
CE-139 #A	-8.7832E-02	-8.7833E-02	1.285E+02%	3.15E-01
Ba-140 #A	-5.2895E-01	-5.2898E-01	8.194E+01%	1.16E+00
La-140 #A	1.4622E-01	1.4623E-01	1.115E+02%	2.88E-01
CE-141 #A	1.4757E-01	1.4757E-01	1.421E+02%	6.99E-01
CE-144 #A	0.0000E+00	0.0000E+00	1.000E+03%	3.08E+00
PM-144 #A	-6.6119E-03	-6.6119E-03	2.192E+03%	3.48E-01
EU-152 #A	4.1070E-01	4.1070E-01	6.439E+01%	6.76E-01
EU-154 #A	4.1182E-01	4.1182E-01	7.573E+01%	4.60E-01
EU-155 #A	-1.7989E-01	-1.7989E-01	1.808E+02%	1.61E+00
HF-181 A	1.5907E-01	1.5907E-01	1.194E+02%	4.21E-01
Ta-182 #A	3.2159E-01	3.2159E-01	8.411E+01%	1.25E+00
Hg-203 #A	9.4462E-02	9.4464E-02	1.083E+02%	2.50E-01
TL-208 #A	-4.9083E-02	-4.9083E-02	2.092E+02%	2.73E-01
PM-146 #A	-1.9071E-01	-1.9071E-01	7.275E+01%	4.06E-01
Y-88 #A	3.3916E-02	3.3916E-02	1.202E+02%	3.84E-01
Cd-113m#A	-1.0238E+03	-1.0238E+03	1.315E+02%	4.52E+03
Cd-109 #A	-1.8385E+00	-1.8385E+00	1.725E+02%	1.06E+01
Cf-251 #A	1.3306E-01	1.3306E-01	3.310E+02%	1.14E+00
Cf-249 #A	-1.0109E-01	-1.0109E-01	1.354E+02%	4.61E-01
Sn-126 #A	-8.0445E-01	-8.0445E-01	1.155E+02%	3.09E+00
PB-210 #A	-3.2161E+00	-3.2161E+00	7.138E+01%	7.65E+00
PB-212 #A	-2.4592E-01	-2.4592E-01	8.532E+01%	7.17E-01
PB-214	5.9848E-01	5.9848E-01	3.554E+01%	5.50E-01
BI-207 #A	1.5586E-01	1.5586E-01	1.076E+02%	3.74E-01
BI-212 #A	1.5828E+00	1.5828E+00	8.024E+01%	4.24E+00
U-235 #A	-2.3639E-01	-2.3639E-01	1.637E+02%	3.25E+00
BI-214	6.9325E-01	6.9325E-01	5.041E+01%	6.52E-01
BI-210M#A	2.9202E-01	2.9202E-01	3.727E+01%	4.83E-01
AC-228 #A	-2.2312E-01	-2.2312E-01	2.035E+02%	1.15E+00
TH-227 #A	5.2475E-01	5.2475E-01	1.183E+02%	3.06E+00
TH-229 #A	2.7061E-01	2.7061E-01	6.225E+02%	4.37E+00
TH-234 A	9.7766E-01	9.7766E-01	1.057E+02%	3.07E+00
PA-231 #A	2.4520E+00	2.4520E+00	1.600E+02%	1.66E+01
PA-233 #A	1.8275E-01	1.8275E-01	1.819E+02%	1.37E+00
PA-234 #A	-1.4891E-01	-1.4891E-01	3.802E+02%	1.90E+00
PA-234M#A	-1.3130E+01	-1.3130E+01	1.163E+02%	5.34E+01

AM-241	#A	-3.8579E-01	-3.8579E-01	6.444E+01%	9.58E-01
Np-237	#A	-5.3128E-01	-5.3128E-01	1.801E+02%	3.18E+00
Ir-192	#A	0.0000E+00	0.0000E+00	7.071E+02%	5.72E-01
Cs-136	#A	1.2260E-01	1.2261E-01	6.385E+01%	3.40E-01
Np-239	#A	-3.3101E-01	-3.3112E-01	1.450E+02%	1.60E+00
Nd-147	#A	-2.2103E-01	-2.2105E-01	3.322E+02%	1.78E+00
TL-210	#A	9.8669E-02	9.8669E-02	1.021E+02%	3.64E-01
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.14E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.6 keV) 1.292E+00 Bq/Sample
Total Decayed Activity (25.1 to 1999.6 keV) 1.2917256E+00 Bq/Sample

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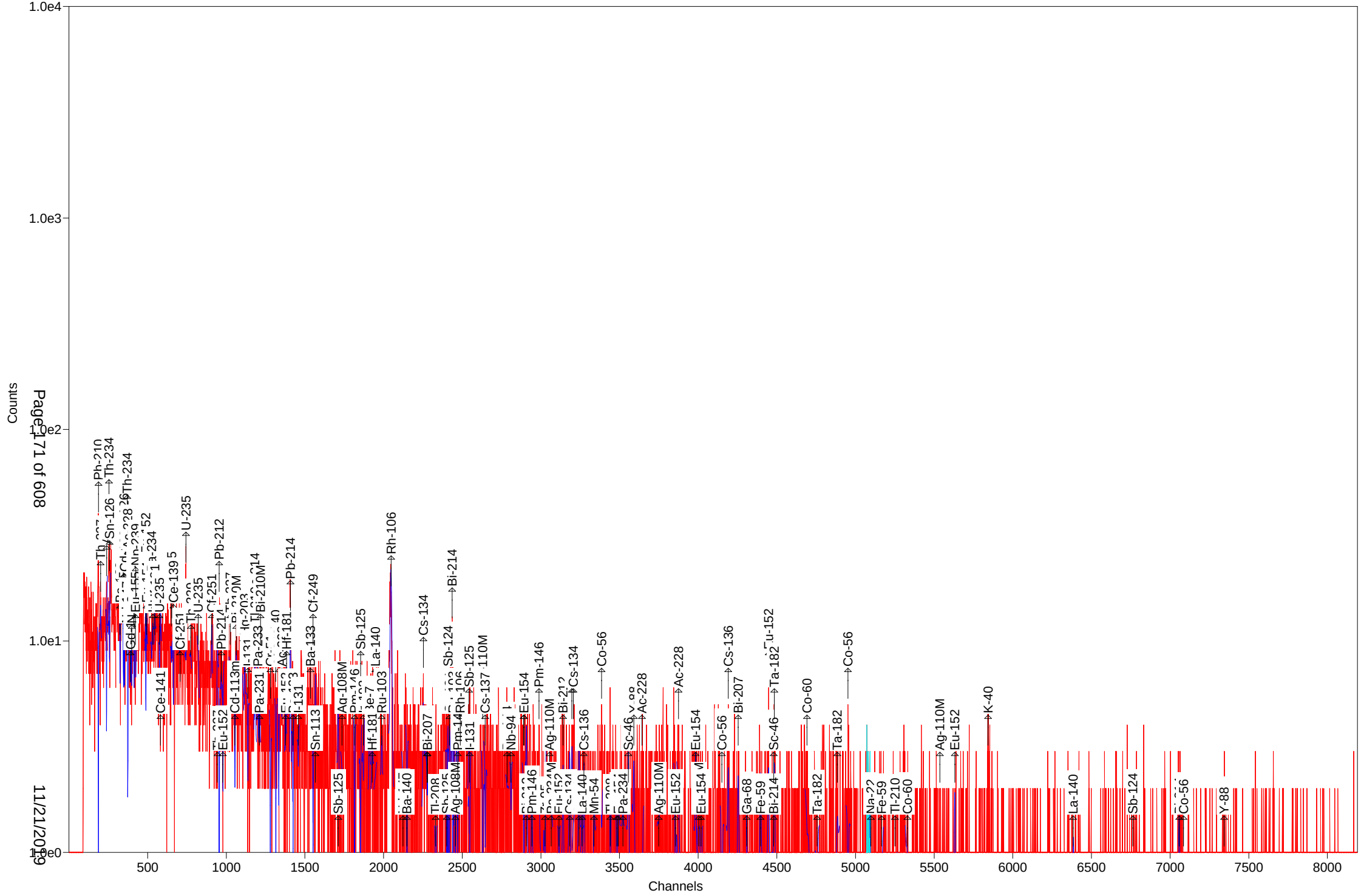
445202_Gamma_180-96595-B-9-A. 16_Gamma_20191902.spc.



Prep Batch: 445369

Fill Geometry, 21-Day In-Growth

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 445369

Lab Id: MB 160-445369/1-A Analyzed: 10/30/19 22:38 Ts: 30 Sigma: 2
Client ID: Detector: GV5 Decay Corrected: Ingrowth:

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	0.1276	0.181	0.181	U	pCi/g		0.526	448217
Radium-226	-0.08836	0.136	0.136	U	pCi/g	1.00	0.526	448217
Radium-228	0.1276	0.120	0.120	U	pCi/g		0.173	448217

Lab Id: LCS 160-445369/2-A Analyzed: 10/30/19 22:38 Ts: 30 Sigma: 2
Client ID: Detector: GV8 Decay Corrected: No Ingrowth:

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Americium-241	104.4	1.73	11.0		pCi/g		1.23	448218
Cesium-137	27.90	0.725	2.99		pCi/g		0.231	448218
Cobalt-60	11.11	0.390	1.18		pCi/g		0.108	448218

Lab Id: 180-96595-1 Analyzed: 10/31/19 02:12 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13 Detector: GV9 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.47	0.318	0.369		pCi/g		0.155	448447
Radium-226	0.875	0.201	0.221		pCi/g	1.00	0.155	448447
Radium-228	1.59	0.247	0.296		pCi/g		0.0803	448447

Lab Id: 180-96595-2 Analyzed: 10/31/19 02:25 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13 Detector: GV5 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.60	0.393	0.439		pCi/g		0.289	448408
Radium-226	0.921	0.269	0.286		pCi/g	1.00	0.225	448408
Radium-228	1.68	0.286	0.333		pCi/g		0.289	448408

Lab Id: 180-96595-3 Analyzed: 10/31/19 02:24 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13 Detector: GV8 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.30	0.372	0.408		pCi/g		0.273	448409

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 445369

Lab Id: 180-96595-3 Analyzed: 10/31/19 02:24 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13 Detector: GV8 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium-226	1.09	0.242	0.267		pCi/g	1.00	0.169	448409
Radium-228	1.21	0.283	0.309		pCi/g		0.273	448409

Lab Id: 180-96595-4 Analyzed: 10/31/19 02:59 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05 Detector: GV5 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.89	0.512	0.557		pCi/g		0.233	448408
Radium-226	1.02	0.252	0.273		pCi/g	1.00	0.158	448408
Radium-228	1.87	0.446	0.485		pCi/g		0.233	448408

Lab Id: 180-96595-5 Analyzed: 10/31/19 03:01 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05 Detector: GV8 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.17	0.302	0.341		pCi/g		0.226	448409
Radium-226	0.960	0.182	0.207		pCi/g	1.00	0.0988	448409
Radium-228	1.21	0.241	0.271		pCi/g		0.226	448409

Lab Id: 180-96595-5 DU Analyzed: 10/31/19 03:55 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05 Detector: GV5 Decay Corrected: Ingrowth:

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.095	0.368	0.398		pCi/g		0.166	448408
Radium-226	0.9240	0.220	0.240		pCi/g	1.00	0.166	448408
Radium-228	1.171	0.295	0.318		pCi/g		0.159	448408

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 445369

Lab Id: 180-96595-6 Analyzed: 10/31/19 02:47 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05 Detector: GV9 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	1.75	0.296	0.323		pCi/g		0.156	448447
Radium-226	0.650	0.156	0.170		pCi/g	1.00	0.135	448447
Radium-228	1.10	0.252	0.275		pCi/g		0.156	448447

Lab Id: 180-96595-7 Analyzed: 10/31/19 02:50 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05 Detector: GV12 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.20	0.440	0.467		pCi/g		0.376	448446
Radium-226	1.14	0.262	0.286		pCi/g	1.00	0.206	448446
Radium-228	1.06	0.353	0.369		pCi/g		0.376	448446

Lab Id: 180-96595-8 Analyzed: 10/31/19 03:54 Ts: 30 Sigma: 2
Client ID: BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05 Detector: GV8 Decay Corrected: Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	RL	MDC	Anly Batch
Radium 226 and 228 (positive only)	2.67	0.425	0.481		pCi/g		0.507	448409
Radium-226	0.519	0.221	0.228		pCi/g	1.00	0.507	448409
Radium-228	2.15	0.363	0.424		pCi/g		0.171	448409

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 445369

Quality Control Summary

Method Blank ID:	Analyte	Parent Result	Spike Added	MB Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
MB 160-445369/1-A	Radium 226 and 228 (positive only)			0.1276	U	pCi/g							
MB 160-445369/1-A	Radium-226			-0.08836	U	pCi/g							-1.2993
MB 160-445369/1-A	Radium-228			0.1276	U	pCi/g							2.1207
Lab Control Sample ID:	**Analyte**	**Parent Result**	**Spike Added**	**LCS Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
LCS 160-445369/2-A	Americium-241		96.6	104.4		pCi/g	108	87 - 116					1.3577
LCS 160-445369/2-A	Cesium-137		27.4	27.90		pCi/g	102	87 - 120					.3043
LCS 160-445369/2-A	Cobalt-60		11.0	11.11		pCi/g	101	87 - 115					.2202
Duplicate ID:	**Analyte**	**Parent Result**	**Spike Added**	**DU Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
180-96595-5	Radium 226 and 228 (positive only)	2.17		2.095		pCi/g			4	0.10	0.29		
180-96595-5	Radium-226	0.960		0.9240		pCi/g			4	0.08	0.23	1	.2274
180-96595-5	Radium-228	1.21		1.171		pCi/g			4	0.07	0.21	1	.2073

Glossary:

Ts = Count Duration, Sample

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 180-96595-1

SDG No.:

Batch Number: 445369 Batch Start Date: 10/08/19 07:28 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 10/08/19 08:09

Lab Sample ID	Client Sample ID	Method Chain	Basis	TareWeight	GrossWeight	InitialAmount	IngDecDate1	IngDecDate3	Geometry
MB 160-445369/1		Fill_Geo-21, 901.1				291.18 g	10/08/19 08:06	10/29/19 08:06	tuna can
LCS 160-445369/2		Fill_Geo-21, 901.1				341.9 g	10/08/19 08:06	10/29/19 08:06	tuna can
180-96595-A-1-A	BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13	Fill_Geo-21, 901.1	T	46.6 g	398.5 g	351.9 g	10/08/19 08:06	10/29/19 08:06	tuna can
180-96595-A-2-A	BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13	Fill_Geo-21, 901.1	T	46.3 g	411.3 g	365 g	10/08/19 08:06	10/29/19 08:06	tuna can
180-96595-A-3-A	BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13	Fill_Geo-21, 901.1	T	46.2 g	284.7 g	238.5 g	10/08/19 08:06	10/29/19 08:06	tuna can
180-96595-A-4-A	BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T	46.5 g	262.6 g	216.1 g	10/08/19 08:06	10/29/19 08:06	tuna can
180-96595-A-5-A	BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T	46.2 g	362.5 g	316.3 g	10/08/19 08:06	10/29/19 08:06	tuna can
180-96595-A-5-B DU	BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T	46.2 g	362.5 g	316.3 g	10/08/19 08:06	10/29/19 08:06	tuna can
180-96595-A-6-A	BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T	46.2 g	373.4 g	327.2 g	10/08/19 08:06	10/29/19 08:06	tuna can
180-96595-A-7-A	BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T	46.2 g	297.4 g	251.2 g	10/08/19 08:06	10/29/19 08:06	tuna can
180-96595-A-8-A	BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T	46.5 g	287.9 g	241.4 g	10/08/19 08:06	10/29/19 08:06	tuna can

Lab Sample ID	Client Sample ID	Method Chain	Basis	Tuna Can LCS 00009					
MB 160-445369/1		Fill_Geo-21, 901.1							
LCS 160-445369/2		Fill_Geo-21, 901.1		# g					
180-96595-A-1-A	BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13	Fill_Geo-21, 901.1	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 180-96595-1

SDG No.:

Batch Number: 445369 Batch Start Date: 10/08/19 07:28 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 10/08/19 08:09

Lab Sample ID	Client Sample ID	Method Chain	Basis	Tuna Can LCS 00009					
180-96595-A-2-A	BRF-BS-BG13-5.0/ 6.6-20191001 ~ BRF BG13	Fill_Geo-21, 901.1	T						
180-96595-A-3-A	BRF-BS-BG13-0.0/ 0.5-20191001 ~ BRF BG13	Fill_Geo-21, 901.1	T						
180-96595-A-4-A	BRF-BS-BG05-3.5/ 5.0-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T						
180-96595-A-5-A	BRF-BS-BG05-6.5/ 8.5-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T						
180-96595-A-5-B DU	BRF-BS-BG05-6.5/ 8.5-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T						
180-96595-A-6-A	BRF-BS-BG05-11.5 /13.5-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T						
180-96595-A-7-A	BRF-BS-BG05-15.0 /17.0-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T						
180-96595-A-8-A	BRF-BS-BG05-0.0/ 0.5-20191001 ~ BRF BG05	Fill_Geo-21, 901.1	T						

Batch Notes	
Balance ID	1121432711
SOP Number	ST-RC-0003, ST-RC-0025

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Test America St. Louis Spectrum ID: 5_Gamma_20192833

Sample Description: 445369_Gamma_MB 160-445369~1-A
Detector: Detector # 5
Batch ID: 445369
Work Order Number: Gamma
Lot Number: MB 160-445369~1-A

Decay to Time: 10/30/2019 22:38 Live Time: 1800 sec
Acquisition Time: 10/30/2019 22:38:52 Real Time: 1817 sec
Analysis Time: 10/30/2019 23:09 Dead Time: 0.94 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 5_2019-10-06_1911.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-3.794E+00	94.2	3.572E+00	3.578E+00	1.214E+01
NA-22	-6.473E-01	79.4	5.138E-01	5.148E-01	1.741E+00
K-40	0.000E+00	1.#INF	1.443E+00	1.443E+00	7.519E+00
Sc-46	-1.195E-02	3203.1	3.829E-01	3.829E-01	1.452E+00
CR-51	-1.812E+00	154.6	2.800E+00	2.802E+00	8.924E+00
MN-54	1.454E-01	227.4	3.306E-01	3.307E-01	8.834E-01
FE-59	1.517E-01	501.7	7.608E-01	7.608E-01	1.991E+00
Co-56	-2.817E-01	119.8	3.374E-01	3.377E-01	1.391E+00
CO-57	1.214E-01	107.0	1.299E-01	1.300E-01	4.481E-01
CO-58	3.454E-01	95.6	3.303E-01	3.308E-01	1.148E+00
CO-60	-1.791E-01	270.0	4.835E-01	4.836E-01	1.402E+00
ZN-65	0.000E+00	1.#INF	1.714E-01	1.714E-01	2.861E+00
NB-94	-5.812E-01	103.4	6.011E-01	6.019E-01	1.467E+00
ZR-95	-7.760E-02	700.7	5.438E-01	5.438E-01	8.477E-01
NB-95	-6.403E-01	73.7	4.720E-01	4.732E-01	1.578E+00
RU-103	-4.398E-01	48.6	2.137E-01	2.149E-01	1.144E+00
RH-106	-5.542E+00	155.2	8.598E+00	8.603E+00	2.921E+01
AG-108M	7.399E-02	409.0	3.026E-01	3.027E-01	8.289E-01
AG-110M	2.866E-01	33.3	9.554E-02	9.666E-02	1.979E+00
SN-113	-5.411E-01	117.0	6.329E-01	6.335E-01	2.157E+00
SB-124	2.397E-01	40.8	9.785E-02	9.864E-02	2.356E+00
SB-125	2.132E-01	106.2	2.265E-01	2.267E-01	2.493E+00
I-131	3.797E-01	103.6	3.933E-01	3.938E-01	7.683E-01
Gd-153	2.381E-01	86.7	2.063E-01	2.068E-01	1.090E+00
Ga-68	0.000E+00	1.#INF	4.236E+00	4.236E+00	3.933E+01
Tc-99m	-3.761E-02	552.3	2.077E-01	2.077E-01	7.298E-01
BA-133	1.076E-01	353.6	3.804E-01	3.805E-01	1.374E+00
CS-134	6.230E-01	100.5	6.263E-01	6.271E-01	1.675E+00
CS-137	-4.248E-01	95.1	4.042E-01	4.048E-01	1.382E+00
CE-139	4.439E-02	456.4	2.026E-01	2.026E-01	7.197E-01
Ba-140	-6.950E-01	131.4	9.133E-01	9.140E-01	4.118E+00
La-140	1.785E-01	221.8	3.959E-01	3.960E-01	9.063E-01
CE-141	-4.101E-09	9341158422.6	3.831E-01	3.831E-01	1.355E+00

CE-144	0.000E+00	1.#INF	2.873E-01	2.873E-01	6.003E+00
PM-144	1.564E-01	239.4	3.746E-01	3.747E-01	1.001E+00
EU-152	1.536E+00	33.3	5.121E-01	5.184E-01	1.617E+00
EU-154	-2.625E-01	153.9	4.040E-01	4.042E-01	1.106E+00
EU-155	1.776E-01	202.7	3.600E-01	3.601E-01	2.145E+00
HF-181	-5.144E-01	110.0	5.657E-01	5.664E-01	1.927E+00
Ta-182	0.000E+00	1.#INF	2.497E-01	2.497E-01	4.167E+00
Hg-203	-2.796E-01	110.9	3.100E-01	3.104E-01	1.061E+00
TL-208	6.464E-02	535.7	3.463E-01	3.463E-01	9.908E-01
PM-146	4.327E-01	84.2	3.643E-01	3.650E-01	8.037E-01
Y-88	0.000E+00	1.#INF	1.882E-01	1.882E-01	9.809E-01
Cd-113m	1.852E+03	48.4	8.962E+02	9.042E+02	3.196E+03
Cd-109	5.457E-01	952.6	5.198E+00	5.198E+00	1.820E+01
Cf-251	2.197E-01	404.1	8.880E-01	8.882E-01	2.587E+00
Cf-249	2.005E-01	255.8	5.127E-01	5.128E-01	1.801E+00
Sn-126	-8.311E-01	229.1	1.904E+00	1.905E+00	6.686E+00
PB-210	-4.283E+00	169.3	7.253E+00	7.257E+00	2.349E+01
PB-212	3.260E-01	148.3	4.834E-01	4.839E-01	1.680E+00
PB-214	4.397E-01	121.7	5.349E-01	5.354E-01	1.878E+00
BI-207	-3.951E-02	1103.9	4.362E-01	4.362E-01	8.245E-01
BI-212	0.000E+00	1.#INF	1.135E+00	1.135E+00	1.339E+01
U-235	2.012E-01	157.9	3.177E-01	3.178E-01	6.089E+00
BI-214	-9.519E-01	76.8	7.310E-01	7.326E-01	5.664E+00
BI-210M	-3.634E-01	108.7	3.949E-01	3.955E-01	1.361E+00
AC-228	1.374E+00	46.9	6.443E-01	6.481E-01	1.860E+00
TH-227	1.556E+00	85.0	1.323E+00	1.326E+00	6.594E+00
TH-229	-7.438E-02	157.8	1.173E-01	1.175E-01	1.086E+01
TH-234	-6.068E+00	48.8	2.962E+00	2.982E+00	1.374E+01
PA-231	0.000E+00	1.#INF	1.432E+00	1.432E+00	5.531E+01
PA-233	-7.180E-01	105.2	7.550E-01	7.560E-01	4.349E+00
PA-234	-7.535E-01	126.8	9.550E-01	9.558E-01	3.269E+00
PA-234M	6.236E+00	90.3	5.632E+00	5.640E+00	1.004E+02
AM-241	-9.952E-02	506.6	5.042E-01	5.042E-01	1.607E+00
Np-237	2.170E-01	413.3	8.967E-01	8.968E-01	3.240E+00
Ir-192	2.284E-01	177.7	4.058E-01	4.060E-01	9.207E-01
Cs-136	2.251E-02	642.9	1.447E-01	1.447E-01	1.025E+00
Np-239	1.987E-01	262.0	5.206E-01	5.208E-01	1.856E+00
Nd-147	1.560E+00	101.9	1.590E+00	1.592E+00	4.310E+00
TL-210	0.000E+00	1.#INF	6.629E-02	6.629E-02	1.526E+00
Kr-85	5.622E+01	214.3	1.205E+02	1.205E+02	4.174E+02
Total	1.927E+03				

Analyst: Shiloh Smith

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Sample description
445369_Gamma_MB 160-445369~1-A

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20192833.An1

Acquisition information
Start time: 10/30/2019 10:38:52 PM
Live time: 1800
Real time: 1817
Dead time: 0.94 %
Detector ID: 5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_Soil_TunaCan.Clb
5_Soil_TunaCan_90099_032612

Energy Calibration
Created: 2/28/2012 7:35:48 PM
Zero offset: 0.158 keV
Gain: 0.250 keV/channel
Quadratic: 3.911E-08 keV/channel^2

Efficiency Calibration
Created: 3/27/2012 5:20:37 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.466115E-01 + (-7.830454E-01*Log(E)) +
(-4.117504E-03*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.43 %
Log(Eff): -2.462251E+01 + (9.075211E+00*Log(E)) +
(-9.664422E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.62keV)
Stop channel: 8000 (2000.81keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/30/2019 10:38:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-10-06_1911.PBC 10/6/2019 7:11:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 0 cutoff: 5.00E+01 %

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.54	-6.	169.35	0.78	1.788E-02	46.54	4.250	PBC<MDA	PB210
59.54	-2.	506.63	0.80	2.533E-02	59.54	35.900	PBC<MDA	AM241
63.29	4.	197.67	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
80.99	1.	802.08	0.82	3.320E-02	80.99	34.060	PBC<MDA	BA133
86.49	2.	413.33	0.82	3.435E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	9.255E-02	EU155
86.54	2.	426.87	0.82	3.436E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	9.255E-02	EU155
					86.94	9.040	3.137E-01	Sn126
86.94	8.	148.16	0.83	3.443E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	1.356E+00	Sn126
87.57	8.	156.66	0.83	3.454E-02	87.57	37.500	PBC<MDA	Sn126
88.04	1.	952.63	0.83	3.462E-02	88.04	3.790	PBC<MDA	Cd109
97.50	5.	119.15	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
99.50	4.	139.02	0.84	3.592E-02	99.50	15.000	PBC<MDA	Np239
103.20	3.	125.87	0.84	3.612E-02	103.20	21.800	PBC<MDA	Gd153
103.70	3.	150.48	0.84	3.614E-02	103.70	24.000	PBC<MDA	Np239
105.31	4.	202.70	0.84	3.618E-02	105.31	21.200	PBC<MDA	EU155
106.13	3.	261.98	0.84	3.620E-02	106.13	22.700	PBC<MDA	Np239
122.06	7.	106.98	0.86	3.582E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.214E-01	CO57
143.79	-4.	294.06	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235
162.66	4.	224.42	0.90	3.113E-02	162.66	6.220	PBC<MDA	Ba140

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
165.85	2.	456.44	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139
176.60	2.	404.15	0.92	2.975E-02	176.60	17.000	PBC<MDA	Cf251
205.33	4.	157.85	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
210.85	4.	236.76	0.95	2.569E-02	210.85	2.990	PBC<MDA	TH229
227.00	3.	109.00	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
235.97	6.	128.59	0.98	2.341E-02	235.97	12.300	PBC<MDA	TH227
238.63	6.	148.30	0.98	2.319E-02	238.63	43.300	PBC<MDA	PB212
242.00	6.	158.83	0.98	2.293E-02	242.00	7.430	PBC<MDA	PB214
244.69	6.	167.85	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
256.24	6.	111.26	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
263.70	4.	48.39	1.00	2.135E-02	263.70	0.006	PBC<MDA	Cd113m
308.44	8.	177.66	1.05	1.875E-02	308.44	31.750	PBC<MDA	Ir192
316.49	1.	728.01	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
328.76	3.	221.81	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.32	6.	121.13	1.07	1.736E-02	338.32	12.010	PBC<MDA	AC228
340.57	1.	808.30	1.08	1.727E-02	340.57	46.900	PBC<MDA	Cs136
351.93	5.	121.66	1.09	1.680E-02	351.93	37.600	PBC<MDA	PB214
356.00	2.	353.55	1.09	1.664E-02	356.00	62.050	PBC<MDA	BA133
364.48	3.	248.55	1.10	1.632E-02	364.48	81.700	PBC<MDA	I131
387.95	4.	255.79	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
433.94	2.	409.02	1.16	1.411E-02	433.94	90.480	PBC<MDA	AG108M
453.88	3.	134.75	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
463.37	4.	106.21	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
513.98	5.	214.33	1.24	1.226E-02	513.98	0.430	PBC<MDA	Kr85
531.00	4.	101.92	1.25	1.193E-02	531.00	13.000	PBC<MDA	Nd147
563.24	4.	101.12	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
569.32	1.	300.00	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	6.022E-01	PA234
					569.70	97.740	5.054E-02	BI207
583.02	1.	535.74	1.30	1.103E-02	583.02	84.500	PBC<MDA	TL208
636.97	5.	103.59	1.34	1.025E-02	636.97	7.170	PBC<MDA	I131
657.76	9.	33.33	1.36	9.974E-03	657.76	94.640	5.297E-01	AG110M
661.66	-6.	95.15	1.37	9.924E-03	661.66	85.210	PBC<MDA	CS137
696.54	3.	239.44	1.40	9.507E-03	696.54	99.000	PBC<MDA	PM144
722.79	2.	219.32	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.217E-01	AG108M
					723.36	20.220	5.469E-01	EU154
735.72	3.	171.72	1.43	9.081E-03	735.72	22.500	PBC<MDA	PM146
747.16	4.	127.11	1.44	8.965E-03	747.16	34.000	PBC<MDA	PM146
763.94	1.	458.26	1.45	8.799E-03	763.94	22.280	PBC<MDA	AG110M
766.41	5.	127.55	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	1.	707.09	1.46	8.657E-03	778.92	12.940	PBC<MDA	EU152
795.87	2.	300.00	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
801.95	5.	100.52	1.48	8.448E-03	801.95	8.690	PBC<MDA	CS134
810.78	5.	95.64	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58
815.77	2.	261.63	1.49	8.328E-03	815.77	23.280	PBC<MDA	La140
834.85	2.	227.43	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
880.53	4.	134.53	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
911.07	5.	46.88	1.57	7.591E-03	911.07	29.000	PBC<MDA	AC228
964.11	2.	205.30	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
968.97	-1.	401.14	1.61	7.209E-03	968.97	17.460	PBC<MDA	AC228
1001.00	-3.	127.88	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1099.25	1.	501.66	1.71	6.484E-03	1099.25	56.500	PBC<MDA	FE59
1112.07	9.	33.33	1.72	6.421E-03	1112.07	13.644	5.707E+00	EU152
1690.98	6.	40.82	2.08	4.511E-03	1690.98	47.790	PBC<MDA	SB124

No unknown peaks passed sensitivity test.

This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.69	46.54	40.	-6.	-0.003	169.35	0.783
TH-227	200.11	50.14	18.	-3.	-0.002	244.95	0.787s
AM-241	237.72	59.54	26.	-2.	-0.001	506.63	0.797s
TH-234	252.74	63.29	29.	4.	0.002	197.67	0.801s
Sn-126	256.71	64.28	40.	-4.	-0.002	229.13	0.802s
BA-133	323.61	80.99	20.	1.	0.001	802.08	0.819s
Np-237	345.63	86.49	26.	2.	0.001	413.33	0.825s
EU-155	345.84	86.54	27.	2.	0.001	426.87	0.825s
Sn-126	347.43	86.94	60.	8.	0.004	148.16	0.825s
Sn-126	349.95	87.57	67.	8.	0.004	156.66	0.826
Cd-109	351.83	88.04	75.	1.	0.001	952.63	0.826s
Nd-147	364.08	91.10	76.	0.	0.000	1000.00	0.829s
TH-234	370.05	92.59	98.	-22.	-0.012	48.82	0.831s
Gd-153	389.70	97.50	16.	5.	0.003	119.15	0.836s
Np-239	397.71	99.50	14.	4.	0.002	139.02	0.838s
Gd-153	412.52	103.20	5.	3.	0.002	125.87	0.842s
Np-239	414.52	103.70	8.	3.	0.002	150.48	0.842
EU-155	420.98	105.31	33.	4.	0.002	202.70	0.844s
Np-239	424.25	106.13	28.	3.	0.002	261.98	0.845s
EU-152	486.90	121.78	34.	-5.	-0.003	176.17	0.861s
CO-57	488.03	122.06	22.	7.	0.004	106.98	0.861s
EU-154	492.18	123.10	32.	-7.	-0.004	153.89	0.862s
PA-234	524.99	131.29	55.	-9.	-0.005	126.75	0.871s
HF-181	531.91	133.02	63.	-7.	-0.004	162.77	0.872s
CE-144	533.97	133.54	70.	0.	0.000	1000.00	0.873s
HF-181	545.02	136.30	70.	0.	0.000	1000.00	0.876s
CO-57	545.72	136.47	70.	0.	0.000	1000.00	0.876s
Tc-99m	561.88	140.51	60.	-2.	-0.001	552.27	0.880s
U-235	574.99	143.79	66.	-4.	-0.002	294.06	0.883s
Ba-140	650.54	162.66	36.	4.	0.002	224.42	0.902

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
U-235	653.42	163.38	35.	-8.	-0.004	116.78	0.903s
CE-139	663.32	165.85	41.	2.	0.001	456.44	0.905s
Cf-251	706.34	176.60	20.	2.	0.001	404.15	0.916s
TH-229	774.03	193.51	20.	-4.	-0.002	208.58	0.933s
U-235	821.35	205.33	15.	4.	0.002	157.85	0.945s
TH-229	843.44	210.85	24.	4.	0.002	236.76	0.950s
Cf-251	908.08	227.00	3.	3.	0.002	109.00	0.966s
TH-227	943.98	235.97	29.	6.	0.003	128.59	0.975s
PB-212	954.64	238.63	35.	6.	0.003	148.30	0.978s
PB-214	968.10	242.00	41.	6.	0.003	158.83	0.981s
EU-152	978.89	244.69	47.	6.	0.003	167.85	0.984s
TH-227	1025.11	256.24	11.	6.	0.003	111.26	0.995s
Cd-113m	1054.97	263.70	0.	4.	0.002	48.39	1.002
BI-210M	1063.50	265.83	25.	-7.	-0.004	108.65	1.005s
TL-208	1109.33	277.28	31.	-9.	-0.005	97.14	1.016s
Hg-203	1117.00	279.20	39.	-8.	-0.005	110.87	1.017s
I-131	1137.41	284.30	23.	-6.	-0.003	161.51	1.022s
PB-214	1180.60	295.09	92.	-9.	-0.005	157.77	1.033s
TL-210	1184.24	296.00	101.	-9.	-0.005	164.70	1.034s
PB-212	1200.37	300.03	110.	-9.	-0.005	170.83	1.038s
PA-231	1200.53	300.07	118.	-6.	-0.003	280.46	1.038s
PA-233	1200.97	300.18	124.	0.	0.000	1000.00	1.038s
PA-231	1210.86	302.65	124.	0.	0.000	1000.00	1.040s
BA-133	1211.66	302.85	124.	0.	0.000	1000.00	1.040s
Ba-140	1219.66	304.85	124.	0.	0.000	1000.00	1.042s
BI-210M	1219.85	304.90	124.	0.	0.000	1000.00	1.042s
Ir-192	1234.03	308.44	100.	8.	0.005	177.66	1.046s
PA-233	1248.32	312.01	113.	-9.	-0.005	105.15	1.049s
Ir-192	1266.25	316.49	26.	1.	0.001	728.01	1.053s
CR-51	1280.63	320.08	32.	-6.	-0.003	154.56	1.057s
La-140	1315.35	328.76	15.	3.	0.002	221.81	1.065s
Cf-249	1334.08	333.44	18.	-1.	-0.001	606.99	1.070s
AC-228	1353.61	338.32	28.	6.	0.004	121.13	1.074s
Cs-136	1362.62	340.57	34.	1.	0.001	808.30	1.077s
EU-152	1377.49	344.29	35.	0.	0.000	1000.00	1.080s
HF-181	1383.66	345.83	42.	-8.	-0.004	127.39	1.082
PB-214	1408.09	351.93	16.	5.	0.003	121.66	1.087s
BA-133	1424.36	356.00	24.	2.	0.001	353.55	1.091s
I-131	1458.32	364.48	11.	3.	0.001	248.55	1.099s
BA-133	1535.78	383.84	48.	-9.	-0.005	117.18	1.117
Cf-249	1552.22	387.95	43.	4.	0.002	255.79	1.121s
SN-113	1567.19	391.69	58.	-10.	-0.005	116.97	1.125s
SB-125	1711.99	427.88	12.	-2.	-0.001	301.07	1.158s
AG-108M	1736.25	433.94	12.	2.	0.001	409.02	1.164s
PM-146	1816.05	453.88	5.	3.	0.002	134.75	1.182s
SB-125	1854.01	463.37	7.	4.	0.002	106.21	1.191s
BE-7	1910.94	477.59	34.	-9.	-0.005	94.16	1.204s
HF-181	1928.56	482.00	51.	-10.	-0.005	109.97	1.208s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
La-140	1948.65	487.02	20.	-8.	-0.004	54.24	1.212s
RU-103	1988.80	497.05	20.	-9.	-0.005	48.58	1.221s
RH-106	2048.06	511.86	60.	-8.	-0.004	141.42	2.485
Kr-85	2056.53	513.98	63.	5.	0.003	214.33	1.237s
Nd-147	2124.62	531.00	4.	4.	0.002	101.92	1.252s
Ba-140	2149.67	537.26	16.	-6.	-0.003	136.76	1.258s
CS-134	2253.60	563.24	4.	4.	0.002	101.12	1.280s
CS-134	2277.94	569.32	4.	1.	0.001	300.00	1.286s
PA-234	2278.54	569.47	9.	-3.	-0.002	140.71	1.286s
BI-207	2279.47	569.70	11.	0.	0.000	1000.00	1.286s
TL-208	2332.76	583.02	9.	1.	0.001	535.74	1.298s
SB-125	2402.69	600.50	56.	-8.	-0.004	137.88	1.313s
SB-124	2411.61	602.73	81.	-9.	-0.005	143.25	1.315s
CS-134	2419.53	604.71	90.	-9.	-0.005	150.49	1.317s
BI-214	2437.93	609.31	103.	-8.	-0.005	76.79	1.321s
RU-103	2441.89	610.30	105.	0.	0.000	1000.00	1.322s
AG-108M	2457.82	614.28	105.	0.	0.000	1000.00	1.325s
PM-144	2472.94	618.06	105.	0.	0.000	1000.00	1.328s
RH-106	2488.37	621.92	124.	-10.	-0.006	155.16	1.332
SB-125	2544.26	635.89	10.	-4.	-0.002	171.48	1.344s
I-131	2548.61	636.97	9.	5.	0.003	103.59	1.345s
AG-110M	2631.76	657.76	0.	9.	0.005	33.33	1.362s
CS-137	2647.36	661.66	15.	-6.	-0.004	95.15	1.366s
PM-144	2786.90	696.54	9.	3.	0.001	239.44	1.395s
NB-94	2811.25	702.63	22.	-10.	-0.005	103.42	1.400s
SB-124	2891.88	722.79	7.	2.	0.001	219.32	1.417s
AG-108M	2892.48	722.94	9.	0.	0.000	1000.00	1.417s
EU-154	2894.17	723.36	9.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	9.	0.	0.000	1000.00	1.418s
BI-212	2909.41	727.17	9.	0.	0.000	1000.00	1.421s
PM-146	2943.61	735.72	4.	3.	0.001	171.72	1.428s
PM-146	2989.37	747.16	4.	4.	0.002	127.11	1.437s
ZR-95	3027.65	756.73	1.	-1.	0.000	700.75	1.445s
AG-110M	3056.50	763.94	4.	1.	0.000	458.26	1.451s
NB-95	3063.89	765.79	23.	-10.	-0.006	73.72	1.453s
PA-234M	3066.38	766.41	16.	5.	0.003	127.55	1.453s
EU-152	3116.41	778.92	5.	1.	0.000	707.09	1.463s
CS-134	3184.20	795.87	17.	2.	0.001	300.00	1.477s
TL-210	3199.12	799.60	19.	0.	0.000	1000.00	1.480s
CS-134	3208.53	801.95	11.	5.	0.003	100.52	1.482s
CO-58	3243.82	810.78	10.	5.	0.003	95.64	1.489s
La-140	3263.80	815.77	15.	2.	0.001	261.63	1.493s
Cs-136	3274.72	818.50	7.	0.	0.000	1000.00	1.495s
MN-54	3340.10	834.85	5.	2.	0.001	227.43	1.508s
Co-56	3387.78	846.77	14.	-4.	-0.002	119.76	1.518s
TL-208	3442.95	860.56	5.	-1.	0.000	698.21	1.529s
NB-94	3485.08	871.10	18.	-9.	-0.005	71.89	1.537s
EU-154	3493.61	873.23	34.	-6.	-0.004	134.37	1.539s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234	3522.80	880.53	10.	4.	0.002	134.53	1.544s
PA-234	3533.64	883.24	14.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	14.	0.	0.000	1000.00	1.547s
Y-88	3592.83	898.04	0.	0.	0.000	1000.00	1.558s
AC-228	3644.94	911.07	0.	5.	0.003	46.88	1.568s
AG-110M	3750.60	937.49	0.	0.	0.000	1000.00	1.589s
PA-234	3784.70	946.02	14.	-8.	-0.005	29.13	1.595s
EU-152	3857.05	964.11	6.	2.	0.001	205.30	1.609s
AC-228	3876.48	968.97	2.	-1.	0.000	401.14	1.612s
EU-154	3985.88	996.33	0.	0.	0.000	1000.00	1.633s
PA-234M	4004.55	1001.00	3.	-3.	-0.002	127.88	1.636s
EU-154	4019.65	1004.77	0.	0.	0.000	1000.00	1.639s
Co-56	4151.87	1037.84	10.	-6.	-0.003	60.16	1.664s
Cs-136	4192.77	1048.07	12.	-3.	-0.002	173.21	1.671s
Ga-68	4310.04	1077.40	5.	0.	0.000	1000.00	1.692s
FE-59	4397.41	1099.25	5.	1.	0.001	501.66	1.708s
EU-152	4448.68	1112.07	0.	9.	0.005	33.33	1.717
ZN-65	4462.56	1115.55	9.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	11.	-2.	-0.001	194.47	1.723s
Sc-46	4482.57	1120.55	9.	0.	0.000	1000.00	1.723s
Ta-182	4485.56	1121.30	9.	0.	0.000	1000.00	1.724s
CO-60	4693.21	1173.24	5.	-2.	-0.001	255.77	1.760s
Ta-182	4756.42	1189.05	5.	-1.	-0.001	501.66	1.771s
Ta-182	4885.79	1221.41	5.	-1.	-0.001	403.11	1.793s
Co-56	4953.23	1238.28	11.	-5.	-0.003	88.85	1.804s
NA-22	5098.13	1274.53	11.	-7.	-0.004	79.37	1.828s
EU-154	5098.17	1274.54	17.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	11.	-9.	-0.005	53.75	1.840s
TL-210	5251.91	1313.00	11.	-5.	-0.003	165.68	1.854s
CO-60	5329.85	1332.50	6.	-2.	-0.001	269.98	1.866s
AG-110M	5536.88	1384.30	0.	0.	0.000	1000.00	1.899s
EU-152	5631.62	1408.00	0.	0.	0.000	993.06	1.914s
K-40	5842.75	1460.83	0.	0.	0.000	1000.00	1.946s
La-140	6383.73	1596.21	0.	0.	0.000	1000.00	2.024s
SB-124	6762.39	1690.98	0.	6.	0.003	40.82	2.076s
BI-214	7056.06	1764.49	10.	-6.	-0.003	85.55	2.114s
Co-56	7083.46	1771.35	4.	0.	0.000	1000.00	2.117s
Y-88	7341.96	1836.06	0.	0.	0.000	1000.00	2.149s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	-3.7940E+00				5.31E+01	
			477.60	-3.794E+00	?(	1.214E+01 9.42E+01 1.05E+01	G
NA-22	C	-6.4734E-01				9.50E+02	
			1274.53	-6.473E-01	?(	1.741E+00 7.94E+01 9.99E+01	G
Sc-46	F	-1.1954E-02				8.38E+01	
			889.28	-1.195E-02	%(	1.452E+00 3.20E+03 1.00E+02	G
			1120.55	0.000E+00	+	1.454E+00 1.00E+03 1.00E+02	G
CR-51	F	-1.8118E+00				2.77E+01	
			320.08	-1.812E+00	?(P	8.924E+00 1.55E+02 9.94E+00	G
MN-54	C	1.4538E-01				3.12E+02	
			834.85	1.454E-01	?(P	8.834E-01 2.27E+02 1.00E+02	G
FE-59	F	1.5166E-01				4.45E+01	
			1099.25	1.517E-01	?(	1.991E+00 5.02E+02 5.65E+01	G
			1291.60	-1.982E+00	+ P	4.083E+00 5.37E+01 4.32E+01	G
Co-56	C	-2.8174E-01				7.73E+01	
			846.77	-2.817E-01	?(P	1.391E+00 1.20E+02 9.99E+01	G
			1238.28	-7.525E-01	+ P	2.629E+00 8.88E+01 6.61E+01	G
			1037.84	-3.602E+00	+ P	1.018E+01 6.02E+01 1.41E+01	G
			1771.35	0.000E+00	+	1.011E+01 1.00E+03 1.55E+01	A
CO-57	C	1.2139E-01				2.72E+02	
			122.06	1.214E-01	?(	4.481E-01 1.07E+02 8.56E+01	G
			136.47	0.000E+00	-	6.289E+00 1.00E+03 1.07E+01	G
CO-58	C	3.4540E-01				7.09E+01	
			810.78	3.454E-01	?(	1.148E+00 9.56E+01 9.95E+01	G
CO-60	F	-1.7910E-01				1.93E+03	
			1332.50	-1.791E-01	?(P	1.402E+00 2.70E+02 1.00E+02	G
			1173.24	-1.812E-01	+	1.190E+00 2.56E+02 9.99E+01	G
NB-94	I	-5.8123E-01				7.41E+06	
			702.63	-5.812E-01	?(	1.467E+00 1.03E+02 9.79E+01	G
			871.10	-6.529E-01	+	1.567E+00 7.19E+01 9.99E+01	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
ZR-95	I	-7.7599E-02					6.40E+01	
			756.73	-7.760E-02	?(P	8.477E-01	7.01E+02	5.45E+01 G
			724.20	0.000E+00	+	2.282E+00	1.00E+03	4.42E+01 G
NB-95	I	-6.4030E-01					6.40E+01	
			765.79	-6.403E-01	?(	1.578E+00	7.37E+01	9.98E+01 G
RU-103	I	-4.3985E-01					3.93E+01	
			497.05	-4.398E-01	?(P	1.144E+00	4.86E+01	9.09E+01 G
			610.30	0.000E+00	+	4.585E+01	1.00E+03	5.75E+00 GA
RH-106	I	-5.5415E+00					3.74E+02	
			621.92	-5.542E+00	?(	2.921E+01	1.55E+02	9.93E+00 G
			1050.36	-7.451E-02	% P	1.129E+02	2.68E+04	1.56E+00 G
			511.86	-1.807E+00	+	8.765E+00	1.41E+02	2.00E+01 GA
AG-108M	C	7.3992E-02					1.53E+05	
			433.94	7.399E-02	?(P	8.289E-01	4.09E+02	9.05E+01 G
			722.94	0.000E+00	-	1.108E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	-	2.950E+00	1.00E+03	8.98E+01 G
AG-110M	F	2.8661E-01					2.50E+02	
			884.68	0.000E+00	?(	1.979E+00	1.00E+03	7.27E+01 G
			657.76	5.297E-01	?(	4.338E-01	3.33E+01	9.46E+01 G
			937.49	0.000E+00	-	1.608E+00	1.00E+03	3.44E+01 G
			1384.30	0.000E+00	-	3.157E+00	1.00E+03	2.43E+01 G
			763.94	1.889E-01	?(	3.517E+00	4.58E+02	2.23E+01 G
SN-113	F	-5.4108E-01					1.15E+02	
			391.69	-5.411E-01	?(	2.157E+00	1.17E+02	6.40E+01 G
SB-124	F	2.3968E-01					6.02E+01	
			602.73	-4.819E-01	?(	2.356E+00	1.43E+02	9.83E+01 G
			1690.98	1.546E+00	?(	1.899E+00	4.08E+01	4.78E+01 G
			722.79	1.022E+00	?(	8.467E+00	2.19E+02	1.08E+01 G
SB-125	I	2.1321E-01					1.01E+03	
			427.88	-2.849E-01	?(P	2.493E+00	3.01E+02	2.96E+01 G
			600.50	-2.286E+00	+	1.082E+01	1.38E+02	1.79E+01 G
			635.89	-1.810E+00	+ P	8.275E+00	1.71E+02	1.13E+01 G
			463.37	1.621E+00	?(P	6.079E+00	1.06E+02	1.05E+01 G
I-131	I	3.7970E-01					8.02E+00	
			364.48	1.087E-01	?(P	7.683E-01	2.49E+02	8.17E+01 G
			284.30	-2.516E+00	+ P	1.121E+01	1.62E+02	6.14E+00 G
			636.97	3.468E+00	?(P	1.258E+01	1.04E+02	7.17E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Gd-153	F	2.3805E-01					2.42E+02	
			97.50	2.608E-01	?(	1.090E+00	1.19E+02	3.00E+01 G
			103.20	2.067E-01	?(	9.506E-01	1.26E+02	2.18E+01 G
Tc-99m	I	-3.7610E-02					2.51E-01	
			140.51	-3.761E-02	?(	7.298E-01	5.52E+02	8.93E+01 G
BA-133	F	1.0760E-01					3.85E+03	
			356.00	1.076E-01	&(	1.374E+00	3.54E+02	6.20E+01 G
			302.85	0.000E+00	-	8.694E+00	1.00E+03	1.83E+01 G
			383.84	-3.455E+00	+	1.385E+01	1.17E+02	8.94E+00 GA
			80.99	4.913E-02	&	1.157E+00	8.02E+02	3.41E+01 GA
CS-134	I	6.2304E-01					7.54E+02	
			795.87	1.528E-01	?(	1.675E+00	3.00E+02	8.55E+01 G
			604.71	-4.871E-01	+	2.500E+00	1.50E+02	9.76E+01 G
			569.32	3.210E-01	?(	3.862E+00	3.00E+02	1.54E+01 G
			801.95	3.899E+00	?(	1.366E+01	1.01E+02	8.69E+00 G
			563.24	2.587E+00	?(P	7.075E+00	1.01E+02	8.35E+00 G
CS-137	I	-4.2483E-01					1.10E+04	
			661.66	-4.248E-01	?(P	1.382E+00	9.51E+01	8.52E+01 G
CE-139	F	4.4386E-02					1.38E+02	
			165.85	4.439E-02	?(	7.197E-01	4.56E+02	7.99E+01 G
Ba-140	I	-6.9501E-01					1.28E+01	
			537.26	-1.157E+00	?(	4.118E+00	1.37E+02	2.44E+01 G
			162.66	1.117E+00	?(P	8.812E+00	2.24E+02	6.22E+00 G
			304.85	0.000E+00	+	3.735E+01	1.00E+03	4.29E+00 G
La-140	I	1.7847E-01					1.28E+01	
			1596.21	0.000E+00	?(	9.063E-01	1.00E+03	9.54E+01 G
			487.02	-7.676E-01	+ P	2.246E+00	5.42E+01	4.55E+01 G
			328.76	5.131E-01	(	3.164E+00	2.22E+02	2.03E+01 G
			815.77	6.180E-01	?(	5.921E+00	2.62E+02	2.33E+01 G
CE-141	I	-4.1007E-09					3.25E+01	
			145.44	-4.101E-09	%(	1.355E+00	9.34E+09	4.82E+01 G
PM-144	C	1.5645E-01					3.63E+02	
			696.54	1.564E-01	?(P	1.001E+00	2.39E+02	9.90E+01 G
			618.06	0.000E+00	-	2.688E+00	1.00E+03	9.91E+01 G
EU-152	F	1.5362E+00					4.94E+03	
			121.78	-2.622E-01	?(	1.617E+00	1.76E+02	2.86E+01 G
			344.29	0.000E+00	+	3.710E+00	1.00E+03	2.65E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1112.07	5.707E+00	?(	4.674E+00	3.33E+01	1.36E+01 G
			778.92	3.369E-01	- P	6.675E+00	7.07E+02	1.29E+01 G
			964.11	9.633E-01	?(	7.505E+00	2.05E+02	1.46E+01 G
			244.69	1.913E+00	?(	1.113E+01	1.68E+02	7.58E+00 G
			1408.00	-2.485E-01	- P	3.703E+00	9.93E+02	2.10E+01 GA
EU-154	I	-2.6253E-01					3.14E+03	
			123.10	-2.625E-01	?(P	1.106E+00	1.54E+02	4.08E+01 G
			1274.54	0.000E+00	+	6.098E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	4.979E+00	1.00E+03	2.02E+01 G
			873.23	-3.691E+00	+	1.718E+01	1.34E+02	1.23E+01 G
			1004.77	0.000E+00	+	3.251E+00	1.00E+03	1.80E+01 G
			996.33	0.000E+00	+	5.485E+00	1.00E+03	1.06E+01 G
EU-155	I	1.7760E-01					1.81E+03	
			105.31	3.008E-01	?(	2.145E+00	2.03E+02	2.12E+01 G
			86.54	9.255E-02	?(	1.424E+00	4.27E+02	3.07E+01 G
HF-181	F	-5.1444E-01					4.24E+01	
			482.00	-5.144E-01	&(	1.927E+00	1.10E+02	8.05E+01 G
			133.02	-2.609E-01	+	1.461E+00	1.63E+02	4.33E+01 G
			345.83	-1.627E+00	&	7.130E+00	1.27E+02	1.51E+01 G
			136.30	0.000E+00	+	1.148E+01	1.00E+03	5.85E+00 G
Hg-203	F	-2.7957E-01					4.66E+01	
			279.20	-2.796E-01	?(	1.061E+00	1.11E+02	8.15E+01 G
TL-208	N	6.4638E-02					6.98E+02	
			583.02	6.464E-02	?(P	9.908E-01	5.36E+02	8.45E+01 G
			277.28	-3.720E+00	+	1.232E+01	9.71E+01	6.31E+00 G
			860.56	-3.745E-01	+	7.177E+00	6.98E+02	1.24E+01 G
PM-146	C	4.3271E-01					2.02E+03	
			453.88	2.092E-01	?(P	8.037E-01	1.35E+02	6.50E+01 G
			747.16	6.683E-01	?(	2.262E+00	1.27E+02	3.40E+01 G
			735.72	7.224E-01	?(P	3.377E+00	1.72E+02	2.25E+01 G
Cd-113m		1.8521E+03					5.33E+03	
			263.70	1.852E+03	?(	3.196E+03	4.84E+01	6.00E-03 K
Cd-109	F	5.4567E-01					4.53E+02	
			88.04	5.457E-01	*(	1.820E+01	9.53E+02	3.79E+00 G
Cf-251	T	2.1971E-01					3.28E+05	
			176.60	2.197E-01	?(	2.587E+00	4.04E+02	1.70E+01 G
			227.00	1.252E+00	&	4.092E+00	1.09E+02	6.30E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-249	T	2.0046E-01					1.28E+05	
			387.95	2.005E-01	?(	1.801E+00	2.56E+02	6.60E+01 G
			333.44	-2.718E-01	+	4.620E+00	6.07E+02	1.55E+01 G
Sn-126		-8.3106E-01					3.65E+07	
			87.57	3.261E-01		1.754E+00	1.57E+02	3.75E+01 GA
			64.28	-8.311E-01	?(	6.686E+00	2.29E+02	9.70E+00 G
			86.94	1.356E+00	?	6.900E+00	1.48E+02	9.04E+00 GA
PB-210	N	-4.2826E+00					8.14E+03	
			46.54	-4.283E+00	?(P	2.349E+01	1.69E+02	4.25E+00 G
PB-212	N	3.2597E-01					6.98E+02	
			238.63	3.260E-01	?(	1.680E+00	1.48E+02	4.33E+01 G
			300.03	-7.805E+00	+	4.547E+01	1.71E+02	3.28E+00 GA
PB-214	N	4.3970E-01					5.84E+05	
			351.93	4.397E-01	?(	1.878E+00	1.22E+02	3.76E+01 G
			295.09	-1.303E+00	+	7.017E+00	1.58E+02	1.93E+01 G
			242.00	1.928E+00	&	1.063E+01	1.59E+02	7.43E+00 GA
BI-207	C	-3.9513E-02					1.18E+04	
			1063.66	-3.951E-02	%(P	8.245E-01	1.10E+03	7.45E+01 G
			569.70	0.000E+00	+	9.061E-01	1.00E+03	9.77E+01 G
U-235	N	2.0124E-01					2.57E+11	
			143.79	-5.657E-01	&(P	6.089E+00	2.94E+02	1.10E+01 G
			205.33	1.879E+00	?(P	8.649E+00	1.58E+02	5.01E+00 G
			163.38	-2.652E+00	+ P	1.061E+01	1.17E+02	5.08E+00 G
			185.72	-8.576E-03	% P	9.887E-01	3.76E+03	5.40E+01 GA
BI-214	N	-9.5191E-01					5.84E+05	
			609.31	-9.519E-01	?(P	5.664E+00	7.68E+01	4.61E+01 G
			1120.29	-1.341E+00	+ P	1.060E+01	1.94E+02	1.51E+01 G
			1764.49	-5.175E+00	+ P	1.461E+01	8.56E+01	1.54E+01 G
BI-210M	T	-3.6344E-01					1.10E+09	
			265.83	-3.634E-01	?(	1.361E+00	1.09E+02	5.00E+01 G
			304.90	0.000E+00	+	5.724E+00	1.00E+03	2.80E+01 G
AC-228	N	1.3744E+00					2.10E+03	
			911.07	1.229E+00	?(P	1.860E+00	4.69E+01	2.90E+01 G
			968.97	-2.924E-01	- P	4.446E+00	4.01E+02	1.75E+01 G
			338.32	1.725E+00	?(	7.233E+00	1.21E+02	1.20E+01 G
			93.35	3.296E-01	%	1.215E+01	1.05E+03	5.56E+00 XA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	1.5557E+00					7.95E+03	
			256.24	2.176E+00	&(	6.594E+00	1.11E+02	7.00E+00 G
			235.97	1.203E+00	&(	5.365E+00	1.29E+02	1.23E+01 G
			50.14	-1.036E+00	-	7.760E+00	2.45E+02	8.00E+00 G
TH-229	N	-7.4381E-02					2.68E+06	
			193.51	-1.978E+00	?(P	1.086E+01	2.09E+02	4.40E+00 G
			210.85	2.726E+00	&(P	1.855E+01	2.37E+02	2.99E+00 G
TH-234	N	-6.0679E+00					1.63E+12	
			92.59	-6.068E+00	*(P	1.374E+01	4.88E+01	5.58E+00 G
			63.29	2.166E+00	+ P	1.494E+01	1.98E+02	3.81E+00 G
PA-233	C	-7.1802E-01					7.82E+08	
			312.01	-7.180E-01	?(P	4.349E+00	1.05E+02	3.60E+01 G
			300.18	0.000E+00	+	2.552E+01	1.00E+03	6.20E+00 G
PA-234	N	-7.5348E-01					1.63E+12	
			131.29	-7.535E-01	?(	3.269E+00	1.27E+02	1.80E+01 G
			946.02	-4.568E+00	+ P	1.139E+01	2.91E+01	1.34E+01 G
			569.47	-2.007E+00	+	1.021E+01	1.41E+02	8.20E+00 G
			883.24	0.000E+00	+	1.496E+01	1.00E+03	9.60E+00 G
			880.53	4.346E+00	?	2.097E+01	1.35E+02	6.00E+00 GA
PA-234M	N	6.2358E+00					1.63E+12	
			1001.00	-2.717E+01	?(P	1.004E+02	1.28E+02	8.37E-01 G
			766.41	1.013E+02	?(P	4.548E+02	1.28E+02	2.94E-01 G
AM-241	T	-9.9520E-02					1.58E+05	
			59.54	-9.952E-02	?(P	1.607E+00	5.07E+02	3.59E+01 G
Np-237	F	2.1696E-01					2.14E+06	
			86.49	2.170E-01	?(	3.240E+00	4.13E+02	1.31E+01 G
Ir-192	F	2.2838E-01					7.40E+01	
			316.49	3.478E-02	?(	9.207E-01	7.28E+02	8.70E+01 G
			468.06	2.213E-02	%	2.134E+00	2.63E+03	5.18E+01 G
			308.44	7.591E-01	&(	4.610E+00	1.78E+02	3.18E+01 G
Cs-136	F	2.2506E-02					1.30E+01	
			818.50	0.000E+00	?(	1.025E+00	1.00E+03	1.00E+02 G
			1048.07	-3.087E-01	+	1.940E+00	1.73E+02	8.00E+01 G
			340.57	7.049E-02	?(	2.049E+00	8.08E+02	4.69E+01 G
Np-239	T	1.9873E-01					2.36E+00	
			103.70	1.878E-01	?	1.032E+00	1.50E+02	2.40E+01 X
			106.13	1.987E-01	?(	1.856E+00	2.62E+02	2.27E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		99.50	4.253E-01		2.101E+00	1.39E+02	1.50E+01 X
Nd-147	1.5599E+00						1.11E+01
		531.00	1.560E+00	?(	4.310E+00	1.02E+02	1.30E+01 G
		91.10	0.000E+00	-	2.425E+00	1.00E+03	2.83E+01 G
Kr-85 I	5.6222E+01						3.92E+03
		513.98	5.622E+01	?(	4.174E+02	2.14E+02	4.30E-01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	40.	-6.	-0.003	169.35	-4.283E+00	P
TH-227	50.14	18.	-3.	-0.002	244.95	-1.036E+00	
AM-241	59.54	26.	-2.	-0.001	506.63	-9.952E-02	P
TH-234	63.29	29.	4.	0.002	197.67	2.166E+00	P
Sn-126	64.28	40.	-4.	-0.002	229.13	-8.311E-01	
BA-133	80.99	20.	1.	0.001	802.08	4.913E-02	
Np-237	86.49	26.	2.	0.001	413.33	2.170E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	86.54	27.	2.	0.001	426.87	9.255E-02	
Sn-126	86.94	60.	8.	0.004	148.16	1.356E+00	
Sn-126	87.57	67.	8.	0.004	156.66	3.261E-01	
Cd-109	88.04	75.	1.	0.001	952.63	5.457E-01	
TH-234	92.59	98.	-22.	-0.012	48.82	-6.068E+00	P
Gd-153	97.50	16.	5.	0.003	119.15	2.608E-01	
Np-239	99.50	14.	4.	0.002	139.02	4.253E-01	
Gd-153	103.20	5.	3.	0.002	125.87	2.067E-01	
Np-239	103.70	8.	3.	0.002	150.48	1.878E-01	
EU-155	105.31	33.	4.	0.002	202.70	3.008E-01	
Np-239	106.13	28.	3.	0.002	261.98	1.987E-01	
EU-152	121.78	34.	-5.	-0.003	176.17	-2.622E-01	
CO-57	122.06	22.	7.	0.004	106.98	1.214E-01	
EU-154	123.10	32.	-7.	-0.004	153.89	-2.625E-01	P
PA-234	131.29	55.	-9.	-0.005	126.75	-7.535E-01	
HF-181	133.02	63.	-7.	-0.004	162.77	-2.609E-01	
Tc-99m	140.51	60.	-2.	-0.001	552.27	-3.761E-02	
U-235	143.79	66.	-4.	-0.002	294.06	-5.657E-01	P
Ba-140	162.66	36.	4.	0.002	224.42	1.117E+00	P
U-235	163.38	35.	-8.	-0.004	116.78	-2.652E+00	P
CE-139	165.85	41.	2.	0.001	456.44	4.439E-02	
Cf-251	176.60	20.	2.	0.001	404.15	2.197E-01	
TH-229	193.51	20.	-4.	-0.002	208.58	-1.978E+00	P
U-235	205.33	15.	4.	0.002	157.85	1.879E+00	P
TH-229	210.85	24.	4.	0.002	236.76	2.726E+00	P
Cf-251	227.00	3.	3.	0.002	109.00	1.252E+00	
TH-227	235.97	29.	6.	0.003	128.59	1.203E+00	
PB-212	238.63	35.	6.	0.003	148.30	3.260E-01	
PB-214	242.00	41.	6.	0.003	158.83	1.928E+00	
EU-152	244.69	47.	6.	0.003	167.85	1.913E+00	
TH-227	256.24	11.	6.	0.003	111.26	2.176E+00	
Cd-113m	263.70	0.	4.	0.002	48.39	1.852E+03	
BI-210M	265.83	25.	-7.	-0.004	108.65	-3.634E-01	
TL-208	277.28	31.	-9.	-0.005	97.14	-3.720E+00	
Hg-203	279.20	39.	-8.	-0.005	110.87	-2.796E-01	
I-131	284.30	23.	-6.	-0.003	161.51	-2.516E+00	P
PB-214	295.09	92.	-9.	-0.005	157.77	-1.303E+00	
TL-210	296.00	101.	-9.	-0.005	164.70	-3.193E-01	
PB-212	300.03	110.	-9.	-0.005	170.83	-7.805E+00	
PA-231	300.07	118.	-6.	-0.003	280.46	-6.537E+00	
Ir-192	308.44	100.	8.	0.005	177.66	7.591E-01	
PA-233	312.01	113.	-9.	-0.005	105.15	-7.180E-01	P
Ir-192	316.49	26.	1.	0.001	728.01	3.478E-02	
CR-51	320.08	32.	-6.	-0.003	154.56	-1.812E+00	P
La-140	328.76	15.	3.	0.002	221.81	5.131E-01	
Cf-249	333.44	18.	-1.	-0.001	606.99	-2.718E-01	
AC-228	338.32	28.	6.	0.004	121.13	1.725E+00	
Cs-136	340.57	34.	1.	0.001	808.30	7.049E-02	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
HF-181	345.83	42.	-8.	-0.004	127.39	-1.627E+00		
PB-214	351.93	16.	5.	0.003	121.66	4.397E-01		
BA-133	356.00	24.	2.	0.001	353.55	1.076E-01		
I-131	364.48	11.	3.	0.001	248.55	1.087E-01		P
BA-133	383.84	48.	-9.	-0.005	117.18	-3.455E+00		
Cf-249	387.95	43.	4.	0.002	255.79	2.005E-01		
SN-113	391.69	58.	-10.	-0.005	116.97	-5.411E-01		
SB-125	427.88	12.	-2.	-0.001	301.07	-2.849E-01		P
AG-108M	433.94	12.	2.	0.001	409.02	7.399E-02		P
PM-146	453.88	5.	3.	0.002	134.75	2.092E-01		P
SB-125	463.37	7.	4.	0.002	106.21	1.621E+00		P
BE-7	477.59	34.	-9.	-0.005	94.16	-3.794E+00		
HF-181	482.00	51.	-10.	-0.005	109.97	-5.144E-01		
La-140	487.02	20.	-8.	-0.004	54.24	-7.676E-01		P
RU-103	497.05	20.	-9.	-0.005	48.58	-4.398E-01		P
RH-106	511.86	60.	-8.	-0.004	141.42	-1.807E+00		
Kr-85	513.98	63.	5.	0.003	214.33	5.622E+01		
Nd-147	531.00	4.	4.	0.002	101.92	1.560E+00		
Ba-140	537.26	16.	-6.	-0.003	136.76	-1.157E+00		
CS-134	563.24	4.	4.	0.002	101.12	2.587E+00		P
CS-134	569.32	4.	1.	0.001	300.00	3.210E-01		
PA-234	569.47	9.	-3.	-0.002	140.71	-2.007E+00		
TL-208	583.02	9.	1.	0.001	535.74	6.464E-02		P
SB-125	600.50	56.	-8.	-0.004	137.88	-2.286E+00		
SB-124	602.73	81.	-9.	-0.005	143.25	-4.819E-01		
CS-134	604.71	90.	-9.	-0.005	150.49	-4.871E-01		
BI-214	609.31	103.	-8.	-0.005	76.79	-9.519E-01		P
RH-106	621.92	124.	-10.	-0.006	155.16	-5.542E+00		
SB-125	635.89	10.	-4.	-0.002	171.48	-1.810E+00		P
I-131	636.97	9.	5.	0.003	103.59	3.468E+00		P
AG-110M	657.76	0.	9.	0.005	33.33	5.297E-01		
CS-137	661.66	15.	-6.	-0.004	95.15	-4.248E-01		P
PM-144	696.54	9.	3.	0.001	239.44	1.564E-01		P
NB-94	702.63	22.	-10.	-0.005	103.42	-5.812E-01		
SB-124	722.79	7.	2.	0.001	219.32	1.022E+00		
PM-146	735.72	4.	3.	0.001	171.72	7.224E-01		P
PM-146	747.16	4.	4.	0.002	127.11	6.683E-01		
ZR-95	756.73	1.	-1.	0.000	700.75	-7.760E-02		P
AG-110M	763.94	4.	1.	0.000	458.26	1.889E-01		
NB-95	765.79	23.	-10.	-0.006	73.72	-6.403E-01		
PA-234M	766.41	16.	5.	0.003	127.55	1.013E+02		P
EU-152	778.92	5.	1.	0.000	707.09	3.369E-01		P
CS-134	795.87	17.	2.	0.001	300.00	1.528E-01		
CS-134	801.95	11.	5.	0.003	100.52	3.899E+00		
CO-58	810.78	10.	5.	0.003	95.64	3.454E-01		
La-140	815.77	15.	2.	0.001	261.63	6.180E-01		
MN-54	834.85	5.	2.	0.001	227.43	1.454E-01		P
Co-56	846.77	14.	-4.	-0.002	119.76	-2.817E-01		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
TL-208	860.56	5.	-1.	0.000	698.21	-3.745E-01		
NB-94	871.10	18.	-9.	-0.005	71.89	-6.529E-01		
EU-154	873.23	34.	-6.	-0.004	134.37	-3.691E+00		
PA-234	880.53	10.	4.	0.002	134.53	4.346E+00		
AC-228	911.07	0.	5.	0.003	46.88	1.229E+00		P
PA-234	946.02	14.	-8.	-0.005	29.13	-4.568E+00		P
EU-152	964.11	6.	2.	0.001	205.30	9.633E-01		
AC-228	968.97	2.	-1.	0.000	401.14	-2.924E-01		P
PA-234M	1001.00	3.	-3.	-0.002	127.88	-2.717E+01		P
Co-56	1037.84	10.	-6.	-0.003	60.16	-3.602E+00		P
Cs-136	1048.07	12.	-3.	-0.002	173.21	-3.087E-01		
FE-59	1099.25	5.	1.	0.001	501.66	1.517E-01		
EU-152	1112.07	0.	9.	0.005	33.33	5.707E+00		
BI-214	1120.29	11.	-2.	-0.001	194.47	-1.341E+00		P
CO-60	1173.24	5.	-2.	-0.001	255.77	-1.812E-01		
Ta-182	1189.05	5.	-1.	-0.001	501.66	-5.650E-01		
Ta-182	1221.41	5.	-1.	-0.001	403.11	-4.624E-01		
Co-56	1238.28	11.	-5.	-0.003	88.85	-7.525E-01		P
NA-22	1274.53	11.	-7.	-0.004	79.37	-6.473E-01		
FE-59	1291.60	11.	-9.	-0.005	53.75	-1.982E+00		P
TL-210	1313.00	11.	-5.	-0.003	165.68	-2.211E+00		
CO-60	1332.50	6.	-2.	-0.001	269.98	-1.791E-01		P
EU-152	1408.00	0.	0.	0.000	993.06	-2.485E-01		P
SB-124	1690.98	0.	6.	0.003	40.82	1.546E+00		
BI-214	1764.49	10.	-6.	-0.003	85.55	-5.175E+00		P

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-3.7940E+00	-3.7940E+00	9.416E+01%	1.21E+01
NA-22	#A	-6.4734E-01	-6.4734E-01	7.937E+01%	1.74E+00
K-40	#A	0.0000E+00	0.0000E+00	1.000E+03%	7.52E+00
Sc-46	#A	-1.1954E-02	-1.1954E-02	3.203E+03%	1.45E+00
CR-51	#A	-1.8118E+00	-1.8118E+00	1.546E+02%	8.92E+00
MN-54	#A	1.4538E-01	1.4538E-01	2.274E+02%	8.83E-01
FE-59	#A	1.5166E-01	1.5166E-01	5.017E+02%	1.99E+00
Co-56	#A	-2.8174E-01	-2.8174E-01	1.198E+02%	1.39E+00
CO-57	#A	1.2139E-01	1.2139E-01	1.070E+02%	4.48E-01
CO-58	#A	3.4540E-01	3.4540E-01	9.564E+01%	1.15E+00
CO-60	#A	-1.7910E-01	-1.7910E-01	2.700E+02%	1.40E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.86E+00
NB-94	#A	-5.8123E-01	-5.8123E-01	1.034E+02%	1.47E+00
ZR-95	#A	-7.7598E-02	-7.7599E-02	7.007E+02%	8.48E-01
NB-95	#A	-6.4030E-01	-6.4030E-01	7.372E+01%	1.58E+00

RU-103 #A	-4.3984E-01	-4.3985E-01	4.858E+01%	1.14E+00
RH-106 #A	-5.5415E+00	-5.5415E+00	1.552E+02%	2.92E+01
AG-108M#A	7.3992E-02	7.3992E-02	4.090E+02%	8.29E-01
AG-110M#A	2.8661E-01	2.8661E-01	3.333E+01%	1.98E+00
SN-113 #A	-5.4108E-01	-5.4108E-01	1.170E+02%	2.16E+00
SB-124 #A	2.3967E-01	2.3968E-01	4.082E+01%	2.36E+00
SB-125 #A	2.1321E-01	2.1321E-01	1.062E+02%	2.49E+00
I-131 #A	3.7968E-01	3.7970E-01	1.036E+02%	7.68E-01
Gd-153 #A	2.3805E-01	2.3805E-01	8.666E+01%	1.09E+00
Ga-68 #A	0.0000E+00	0.0000E+00	1.000E+03%	3.93E+01
Tc-99m #A	-3.7548E-02	-3.7610E-02	5.523E+02%	7.30E-01
BA-133 #A	1.0760E-01	1.0760E-01	3.536E+02%	1.37E+00
CS-134 #A	6.2304E-01	6.2304E-01	1.005E+02%	1.67E+00
CS-137 #A	-4.2483E-01	-4.2483E-01	9.515E+01%	1.38E+00
CE-139 #A	4.4386E-02	4.4386E-02	4.564E+02%	7.20E-01
Ba-140 #A	-6.9499E-01	-6.9501E-01	1.314E+02%	4.12E+00
La-140 #A	1.7846E-01	1.7847E-01	2.218E+02%	9.06E-01
CE-141 #A	-4.1006E-09	-4.1007E-09	9.341E+09%	1.36E+00
CE-144 #A	0.0000E+00	0.0000E+00	1.000E+03%	6.00E+00
PM-144 #A	1.5645E-01	1.5645E-01	2.394E+02%	1.00E+00
EU-152 #A	1.5362E+00	1.5362E+00	3.333E+01%	1.62E+00
EU-154 #A	-2.6253E-01	-2.6253E-01	1.539E+02%	1.11E+00
EU-155 #A	1.7760E-01	1.7760E-01	2.027E+02%	2.15E+00
HF-181 #A	-5.1443E-01	-5.1444E-01	1.100E+02%	1.93E+00
Ta-182 #A	0.0000E+00	0.0000E+00	1.000E+03%	4.17E+00
Hg-203 #A	-2.7957E-01	-2.7957E-01	1.109E+02%	1.06E+00
TL-208 #A	6.4638E-02	6.4638E-02	5.357E+02%	9.91E-01
PM-146 #A	4.3271E-01	4.3271E-01	8.420E+01%	8.04E-01
Y-88 #A	0.0000E+00	0.0000E+00	7.071E+02%	9.81E-01
Cd-113m#A	1.8521E+03	1.8521E+03	4.839E+01%	3.20E+03
Cd-109 #A	5.4567E-01	5.4567E-01	9.526E+02%	1.82E+01
Cf-251 #A	2.1971E-01	2.1971E-01	4.041E+02%	2.59E+00
Cf-249 #A	2.0046E-01	2.0046E-01	2.558E+02%	1.80E+00
Sn-126 #A	-8.3106E-01	-8.3106E-01	2.291E+02%	6.69E+00
PB-210 #A	-4.2826E+00	-4.2826E+00	1.693E+02%	2.35E+01
PB-212 #A	3.2597E-01	3.2597E-01	1.483E+02%	1.68E+00
PB-214 #A	4.3970E-01	4.3970E-01	1.217E+02%	1.88E+00
BI-207 #A	-3.9513E-02	-3.9513E-02	1.104E+03%	8.25E-01
BI-212 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.34E+01
U-235 #A	2.0124E-01	2.0124E-01	1.579E+02%	6.09E+00
BI-214 #A	-9.5191E-01	-9.5191E-01	7.679E+01%	5.66E+00
BI-210M#A	-3.6344E-01	-3.6344E-01	1.087E+02%	1.36E+00
AC-228 #A	1.3744E+00	1.3744E+00	4.688E+01%	1.86E+00
TH-227 #A	1.5557E+00	1.5557E+00	8.502E+01%	6.59E+00
TH-229 #A	-7.4381E-02	-7.4381E-02	1.578E+02%	1.09E+01
TH-234 #A	-6.0679E+00	-6.0679E+00	4.882E+01%	1.37E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%	5.53E+01
PA-233 #A	-7.1802E-01	-7.1802E-01	1.052E+02%	4.35E+00
PA-234 #A	-7.5348E-01	-7.5348E-01	1.268E+02%	3.27E+00

PA-234M#A	6.2358E+00	6.2358E+00	9.031E+01%	1.00E+02
AM-241 #A	-9.9520E-02	-9.9520E-02	5.066E+02%	1.61E+00
Np-237 #A	2.1696E-01	2.1696E-01	4.133E+02%	3.24E+00
Ir-192 #A	2.2838E-01	2.2838E-01	1.777E+02%	9.21E-01
Cs-136 #A	2.2505E-02	2.2506E-02	6.429E+02%	1.03E+00
Np-239 #A	1.9870E-01	1.9873E-01	2.620E+02%	1.86E+00
Nd-147 #A	1.5599E+00	1.5599E+00	1.019E+02%	4.31E+00
TL-210 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.53E+00
Kr-85 #A	5.6222E+01	5.6222E+01	2.143E+02%	4.17E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 2000.8 keV) 0.000E+00 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 0.0000000E+00 Bq/Sample

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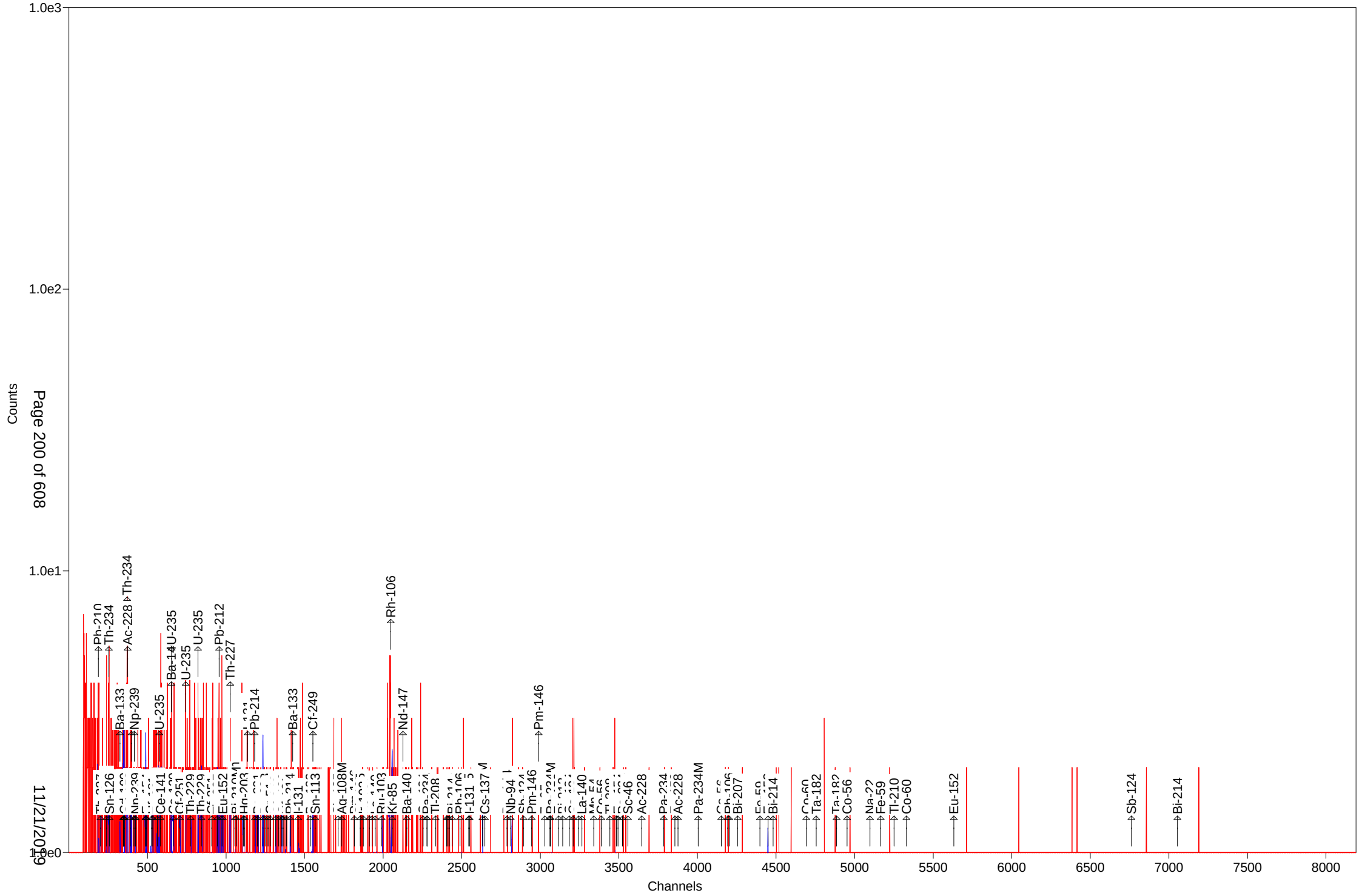
445369_Gamma_MB 160-445369~1-A. 5_Gamma_20192833.spc.



Sample Description: 445369_Gamma_LCS 160-445369~2-A
Detector: Detector # 8
Batch ID: 445369
Work Order Number: Gamma
Lot Number: LCS 160-445369~2-A

Decay to Time: 10/30/2019 22:37 Live Time: 1800 sec
Acquisition Time: 10/30/2019 22:38:02 Real Time: 1848 sec
Analysis Time: 10/30/2019 23:09 Dead Time: 2.62 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 8_Soil_TunaCan.Clb
Efficiency Cal Desc: 8_Soil_TunaCan_90099_032712
Efficiency Cal Date: 3/28/2012 10:35
Energy Cal Date: 2/28/2012 10:34
Library: Client_Long_Rev15.lib
Bkgd Correction File: 8_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	1.542E+00	948.4	1.463E+01	1.463E+01	4.904E+01
NA-22	5.340E-02	987.4	5.273E-01	5.273E-01	1.941E+00
K-40	9.934E+00	36.6	3.634E+00	3.670E+00	9.370E+00
Sc-46	8.831E-02	1710.8	1.511E+00	1.511E+00	5.132E+00
CR-51	-1.031E+01	167.1	1.724E+01	1.724E+01	5.724E+01
MN-54	-1.926E+00	85.7	1.651E+00	1.654E+00	3.705E+00
FE-59	-2.870E+00	118.9	3.412E+00	3.415E+00	7.459E+00
Co-56	6.332E-02	110.6	7.000E-02	7.007E-02	3.271E+00
CO-57	-3.470E-01	192.8	6.691E-01	6.693E-01	2.234E+00
CO-58	-1.750E+00	84.0	1.469E+00	1.472E+00	4.881E+00
CO-60	1.405E+02	1.8	2.467E+00	7.473E+00	1.372E+00
ZN-65	3.498E+00	86.5	3.027E+00	3.032E+00	1.008E+01
NB-94	-5.121E-01	819.5	4.197E+00	4.197E+00	2.571E+00
ZR-95	2.229E+00	89.2	1.988E+00	1.991E+00	4.504E+00
NB-95	1.202E+00	70.7	8.496E-01	8.519E-01	2.816E+00
RU-103	2.129E+00	45.6	9.715E-01	9.776E-01	2.363E+00
RH-106	1.049E+01	84.0	8.810E+00	8.827E+00	2.935E+01
AG-108M	-1.178E+00	116.1	1.367E+00	1.369E+00	3.689E+00
AG-110M	5.809E-01	89.2	5.179E-01	5.188E-01	7.076E+00
SN-113	1.918E+00	99.3	1.904E+00	1.906E+00	6.322E+00
SB-124	1.108E+00	133.0	1.473E+00	1.475E+00	4.918E+00
SB-125	7.417E+00	61.5	4.564E+00	4.579E+00	1.027E+01
I-131	2.417E+00	67.6	1.634E+00	1.639E+00	3.189E+00
Gd-153	-2.766E+00	142.2	3.935E+00	3.938E+00	1.303E+01
Ga-68	3.216E+01	167.1	5.375E+01	5.378E+01	1.191E+02
Tc-99m	4.966E-07	267629840.6	1.329E+00	1.329E+00	4.423E+00
BA-133	2.049E+00	110.6	2.267E+00	2.269E+00	5.585E+00
CS-134	3.730E-01	67.0	2.498E-01	2.505E-01	5.081E+00
CS-137	3.530E+02	1.3	4.587E+00	1.893E+01	2.916E+00
CE-139	-1.011E+00	91.9	9.292E-01	9.341E-01	3.079E+00
Ba-140	8.111E+00	71.5	5.800E+00	5.815E+00	1.004E+01
La-140	4.423E-01	137.5	6.081E-01	6.085E-01	1.409E+00
CE-141	-1.269E+00	110.2	1.399E+00	1.400E+00	4.645E+00

CE-144	-6.928E+00	142.5	9.874E+00	9.880E+00	3.273E+01
PM-144	8.140E-02	77.3	6.291E-02	6.305E-02	2.712E+00
EU-152	4.642E+00	81.4	3.779E+00	3.787E+00	7.861E+00
EU-154	5.661E+00	55.1	3.122E+00	3.136E+00	4.980E+00
EU-155	-2.650E+00	213.8	5.666E+00	5.668E+00	1.879E+01
HF-181	1.629E+00	129.8	2.115E+00	2.116E+00	6.424E+00
Ta-182	-4.828E+00	103.9	5.018E+00	5.024E+00	1.676E+01
Hg-203	-8.089E-01	133.5	1.080E+00	1.081E+00	3.599E+00
TL-208	-2.082E-02	6885.2	1.433E+00	1.433E+00	3.420E+00
PM-146	-1.891E+00	104.4	1.974E+00	1.977E+00	5.609E+00
Y-88	5.550E-01	44.7	2.482E-01	2.503E-01	8.180E-01
Cd-113m	-1.636E+04	117.5	1.922E+04	1.925E+04	6.381E+04
Cd-109	0.000E+00	1.#INF	3.904E+01	3.904E+01	1.296E+02
Cf-251	1.543E+00	281.1	4.337E+00	4.339E+00	1.102E+01
Cf-249	0.000E+00	1.#INF	1.116E+00	1.116E+00	6.496E+00
Sn-126	-2.108E+01	220.6	4.650E+01	4.651E+01	1.536E+02
PB-210	1.055E+04	1.1	1.210E+02	6.311E+02	2.070E+02
PB-212	7.351E+00	18.6	1.370E+00	1.450E+00	4.201E+00
PB-214	2.375E+00	144.4	3.431E+00	3.433E+00	9.408E+00
BI-207	-2.953E+00	69.8	2.062E+00	2.067E+00	5.414E+00
BI-212	8.790E-06	156631175.4	1.377E+01	1.377E+01	4.715E+01
U-235	-3.840E-01	113.4	4.353E-01	4.357E-01	1.915E+01
BI-214	4.678E+00	33.7	1.577E+00	1.596E+00	1.108E+01
BI-210M	-1.950E+00	66.2	1.291E+00	1.296E+00	7.906E+00
AC-228	1.782E+01	23.3	4.156E+00	4.254E+00	9.410E+00
TH-227	-1.421E+01	115.3	1.638E+01	1.640E+01	5.437E+01
TH-229	-8.088E+00	228.4	1.847E+01	1.848E+01	4.686E+01
TH-234	-2.674E+01	186.8	4.996E+01	4.998E+01	7.101E+01
PA-231	3.599E+01	114.6	4.123E+01	4.127E+01	1.776E+02
PA-233	3.907E+00	147.5	5.762E+00	5.765E+00	1.524E+01
PA-234	6.020E+00	61.1	3.677E+00	3.690E+00	1.990E+01
PA-234M	1.635E+02	98.8	1.616E+02	1.618E+02	5.815E+02
AM-241	1.321E+03	0.8	1.096E+01	6.942E+01	1.556E+01
Np-237	-6.384E+00	180.7	1.153E+01	1.154E+01	3.820E+01
Ir-192	6.695E-01	85.6	5.730E-01	5.743E-01	6.734E+00
Cs-136	-7.044E-01	221.9	1.563E+00	1.564E+00	5.259E+00
Np-239	1.676E+00	312.9	5.243E+00	5.244E+00	1.740E+01
Nd-147	-8.354E+00	115.7	9.670E+00	9.682E+00	2.258E+01
TL-210	1.203E+00	94.3	1.134E+00	1.136E+00	4.045E+00
Kr-85	1.562E+02	167.2	2.613E+02	2.614E+02	8.758E+02
Total	1.287E+04				

Analyst: Shiloh Smith

Sample description
445369_Gamma_LCS 160-445369~2-A

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20191805.An1

Acquisition information
Start time: 10/30/2019 10:38:02 PM
Live time: 1800
Real time: 1848
Dead time: 2.62 %
Detector ID: 8

Detector system
Ge 8 SN/174

Calibration
Filename: 8_Soil_TunaCan.Clb
8_Soil_TunaCan_90099_032712

Energy Calibration
Created: 2/28/2012 10:34:41 AM
Zero offset: 0.052 keV
Gain: 0.250 keV/channel
Quadratic: 5.282E-10 keV/channel^2

Efficiency Calibration
Created: 3/28/2012 10:35:20 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.39 %
Log(Eff): -1.098764E-01 + (-4.958544E-01*Log(E)) + (-2.572270E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.71 %
Log(Eff): -2.525301E+01 + (9.398253E+00*Log(E)) + (-1.000034E+00*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.55keV)
Stop channel: 8000 (1999.97keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/30/2019 10:37:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-10-06_1931.PBC 10/6/2019 7:31:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 29 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1935

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.48	16183.	1.15	0.92	2.001E-02	46.54	4.250	1.055E+04	PB210
59.48	24593.	0.83	0.93	2.878E-02	59.54	35.900	1.321E+03	AM241
79.63	38.	81.24	1.04	3.783E-02				
84.01	65.	56.31	1.04	3.903E-02				
87.51	60.	61.01	1.04	3.982E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	2.190E+01	Cd109
106.13	29.	312.85	1.06	4.187E-02	106.13	22.700	PBC<MDA	Np239
123.10	55.	82.89	1.07	4.138E-02	123.10	40.790	PBC<MDA	EU154
162.66	47.	100.86	1.10	3.593E-02	162.66	6.220	PBC<MDA	Ba140
176.60	16.	281.11	1.11	3.460E-02	176.60	17.000	PBC<MDA	Cf251
185.72	23.	216.17	1.12	3.329E-02	185.72	54.000	PBC<MDA	U235
205.33	41.	113.36	1.13	3.083E-02	205.33	5.010	PBC<MDA	U235
238.37	203.	20.19	1.16	2.747E-02	238.63	43.300	9.192E+00	PB212
244.69	44.	127.84	1.16	2.691E-02	244.69	7.580	PBC<MDA	EU152
259.68	47.	46.21	0.70	2.569E-02				
295.15	38.	167.78	1.20	2.324E-02	295.09	19.300	PBC<MDA	PB214
296.00	40.	158.62	1.20	2.318E-02	296.00	79.000	PBC<MDA	TL210
300.07	40.	160.82	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	3.977E+01	PA231
					300.18	6.200	1.579E+01	PA233
300.09	40.	161.69	1.20	2.294E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					300.18	6.200	PBC<MDA	PA233
300.18	40.	162.33	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	3.978E+01	PA231
					300.18	6.200	1.579E+01	PA233
302.65	39.	163.21	1.21	2.278E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	5.148E+00	BA133
302.85	39.	164.76	1.21	2.277E-02	302.65	2.880	3.275E+01	PA231
					302.85	18.330	5.149E+00	BA133
304.85	39.	166.12	1.21	2.265E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	3.393E+00	BI210M
304.90	39.	167.67	1.21	2.265E-02	304.85	4.290	2.214E+01	Ba140
					304.90	28.000	3.393E+00	BI210M
308.44	39.	168.82	1.21	2.244E-02	308.44	31.750	PBC<MDA	Ir192
312.01	27.	246.26	1.21	2.224E-02	312.01	36.000	PBC<MDA	PA233
338.18	91.	36.03	1.49	2.085E-02	338.32	12.010	2.019E+01	AC228
344.29	42.	127.24	1.24	2.057E-02	344.29	26.500	PBC<MDA	EU152
345.83	38.	129.77	1.24	2.049E-02	345.83	15.070	PBC<MDA	HF181
351.75	16.	235.15	1.24	2.021E-02	351.93	37.600	PBC<MDA	PB214
355.82	25.	147.59	1.25	2.002E-02	356.00	62.050	PBC<MDA	BA133
364.48	33.	113.53	1.25	1.965E-02	364.48	81.700	PBC<MDA	I131
391.69	41.	99.26	1.27	1.855E-02	391.69	64.000	PBC<MDA	SN113
426.99	27.	144.13	1.30	1.728E-02	427.88	29.600	PBC<MDA	SB125
463.37	48.	89.75	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
468.06	38.	111.19	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
477.60	5.	948.35	1.33	1.580E-02	477.60	10.520	PBC<MDA	BE7
481.89	14.	301.05	1.34	1.569E-02	482.00	80.500	PBC<MDA	HF181
496.74	53.	45.63	0.34	1.530E-02	497.05	90.900	PBC<MDA	RU103
511.86	57.	51.30	2.61	1.494E-02	511.86	20.000	PBC<MDA	RH106
513.98	18.	167.22	1.36	1.489E-02	513.98	0.430	PBC<MDA	Kr85
537.26	30.	90.86	1.37	1.436E-02	537.26	24.390	PBC<MDA	Ba140
563.24	4.	621.76	1.39	1.381E-02	563.24	8.350	PBC<MDA	CS134
569.32	27.	66.97	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.315E+01	PA234
					569.70	97.740	PBC<MDA	BI207
569.47	22.	82.88	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.110E+01	PA234
					569.70	97.740	PBC<MDA	BI207
600.97	42.	72.43	1.42	1.310E-02	600.50	17.860	PBC<MDA	SB125
602.73	26.	132.99	1.42	1.306E-02	602.73	98.260	PBC<MDA	SB124
604.71	26.	133.22	1.42	1.303E-02	604.71	97.620	PBC<MDA	CS134
609.31	22.	163.13	1.42	1.294E-02	609.31	46.090	PBC<MDA	BI214
610.30	26.	138.50	1.42	1.293E-02	610.30	5.750	PBC<MDA	RU103
618.06	24.	80.50	1.43	1.279E-02	618.06	99.100	PBC<MDA	PM144
621.92	24.	84.00	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
636.97	27.	73.49	1.44	1.248E-02	635.89	11.310	PBC<MDA	SB125
					636.97	7.170	1.675E+01	I131
661.55	6546.	1.30	1.42	1.209E-02	661.66	85.210	3.530E+02	CS137
756.73	24.	89.15	1.52	1.081E-02	756.73	54.460	PBC<MDA	ZR95

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
765.79	23.	70.66	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
766.25	7.	252.56	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
785.42	26.	88.67	1.54	1.048E-02	785.42	1.280	PBC<MDA	BI212
799.60	22.	101.88	1.55	1.032E-02	799.60	98.960	PBC<MDA	TL210
801.95	13.	169.21	1.55	1.030E-02	801.95	8.690	PBC<MDA	CS134
873.23	19.	115.26	1.59	9.584E-03	873.23	12.270	PBC<MDA	EU154
880.53	29.	85.22	1.60	9.517E-03	880.53	6.000	PBC<MDA	PA234
883.24	16.	157.95	1.60	9.493E-03	883.24	9.600	PBC<MDA	PA234
910.98	92.	24.60	2.80	9.247E-03	911.07	29.000	1.906E+01	AC228
946.02	30.	88.24	1.64	8.957E-03	946.02	13.400	PBC<MDA	PA234
964.11	8.	278.78	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
969.75	39.	54.69	1.19	8.776E-03	968.97	17.460	PBC<MDA	AC228
996.33	26.	81.43	1.67	8.571E-03	996.33	10.600	PBC<MDA	EU154
1001.00	23.	98.81	1.67	8.537E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	16.	147.84	1.67	8.509E-03	1004.77	18.010	PBC<MDA	EU154
1077.40	13.	167.15	1.72	8.017E-03	1077.40	3.300	PBC<MDA	Ga68
1112.07	25.	81.41	1.74	7.803E-03	1112.07	13.644	PBC<MDA	EU152
1115.55	25.	86.53	1.74	7.782E-03	1115.55	50.600	PBC<MDA	ZN65
1120.29	24.	94.61	1.74	7.754E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1173.14	1877.	2.51	1.79	7.453E-03	1173.24	99.900	1.400E+02	CO60
1238.28	9.	110.55	1.81	7.114E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	1.	987.42	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.517E-01	EU154
1313.00	7.	135.27	1.85	6.763E-03	1313.00	21.000	PBC<MDA	TL210
1332.41	1694.	2.45	1.83	6.678E-03	1332.50	99.980	1.410E+02	CO60
1384.30	7.	89.15	1.88	6.460E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	5.	121.64	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152
1460.83	12.	36.59	1.92	6.165E-03	1460.83	10.670	9.934E+00	K40
1596.21	4.	137.50	1.99	5.706E-03	1596.21	95.400	PBC<MDA	La140
1764.49	9.	33.71	2.07	5.226E-03	1764.49	15.400	6.076E+00	BI214
1836.06	5.	44.72	2.10	5.046E-03	1836.06	99.200	PBC<MDA	Y88

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
318.40	79.71	451.	35.	9.382E+02	86.31	1.038	-	c
335.93	84.09	674.	43.	1.113E+03	85.84	1.041	-	c
1038.58	259.68	162.	47.	1.842E+03	46.21	0.702	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

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This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.72	46.48	4567.	16183.	8.990	1.15	0.919
TH-227	200.36	50.14	27324.	-144.	-0.080	162.30	1.015s
AM-241	237.74	59.48	3793.	24593.	13.663	0.83	0.933
TH-234	252.96	63.29	32573.	-141.	-0.079	144.38	1.025s
Sn-126	256.93	64.28	32567.	-116.	-0.064	220.58	1.026
BA-133	323.77	80.99	5828.	-59.	-0.033	182.34	1.039
Np-237	345.77	86.49	5768.	-60.	-0.033	180.67	1.043
EU-155	345.98	86.54	5709.	-57.	-0.032	188.86	1.043s
Sn-126	350.09	87.57	5661.	60.	0.033	61.01	1.044D
TH-234	370.17	92.59	3817.	-109.	-0.061	186.79	1.048s
AC-228	373.21	93.35	3751.	-62.	-0.034	141.32	1.049s
Gd-153	389.81	97.50	3825.	-62.	-0.034	142.25	1.052s
Np-239	397.81	99.50	3887.	-62.	-0.034	143.17	1.053s
Gd-153	412.62	103.20	3949.	-62.	-0.034	143.90	1.056
Np-239	414.62	103.70	4011.	-62.	-0.034	144.96	1.057s
EU-155	421.07	105.31	4073.	-42.	-0.024	213.84	1.058s
Np-239	424.34	106.13	4007.	29.	0.016	312.85	1.058s
EU-152	486.94	121.78	1254.	-9.	-0.005	557.44	1.071
CO-57	488.06	122.06	902.	-22.	-0.012	192.80	1.071
EU-154	492.22	123.10	1017.	55.	0.031	82.89	1.072s
PA-234	525.00	131.29	3091.	-56.	-0.031	141.77	1.078s
HF-181	531.92	133.02	3079.	-56.	-0.031	141.32	1.079
CE-144	533.98	133.54	3135.	-56.	-0.031	142.53	1.080s
HF-181	545.02	136.30	3224.	-56.	-0.031	144.26	1.082s
CO-57	545.72	136.47	3280.	-55.	-0.031	147.97	1.082s
U-235	574.97	143.79	963.	-56.	-0.031	365.80	1.087
CE-141	581.59	145.44	1084.	-43.	-0.024	110.20	1.089
Ba-140	650.47	162.66	1100.	47.	0.026	100.86	1.102s
CE-139	663.24	165.85	1150.	-53.	-0.029	91.88	1.104s
Cf-251	706.23	176.60	598.	16.	0.009	281.11	1.112s
U-235	742.71	185.72	687.	23.	0.013	216.17	1.119s
TH-229	773.87	193.51	631.	-21.	-0.011	228.40	1.125
U-235	821.17	205.33	600.	41.	0.023	113.36	1.134s
Cf-251	907.84	227.00	640.	-13.	-0.007	382.02	1.151s
TH-227	943.73	235.97	1698.	-50.	-0.028	118.35	1.157s
PB-212	954.37	238.63	350.	157.	0.087	18.63	1.159D
PB-214	967.84	242.00	1634.	-33.	-0.018	174.00	1.162
EU-152	978.62	244.69	1536.	44.	0.024	127.84	1.164s
TH-227	1024.81	256.24	1412.	-46.	-0.026	115.30	1.172
Cd-113m	1054.65	263.70	1366.	-45.	-0.025	117.46	1.178s
BI-210M	1063.18	265.83	1439.	-44.	-0.025	66.19	1.179

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1108.99	277.28	510.	-47.	-0.026	62.63	1.188
Hg-203	1116.66	279.20	724.	-29.	-0.016	133.47	1.189s
I-131	1137.05	284.30	461.	-17.	-0.009	174.55	1.193s
PB-214	1180.22	295.09	1984.	38.	0.021	167.78	1.201s
TL-210	1183.86	296.00	2022.	40.	0.022	158.62	1.202s
PB-212	1199.98	300.03	2050.	40.	0.022	161.69	1.205s
PA-231	1200.14	300.07	2089.	40.	0.022	160.82	1.205s
PA-233	1200.58	300.18	2130.	40.	0.022	162.33	1.205s
PA-231	1210.46	302.65	1973.	39.	0.021	163.21	1.207s
BA-133	1211.27	302.85	2011.	39.	0.021	164.76	1.207
Ba-140	1219.26	304.85	2050.	39.	0.022	166.12	1.208s
BI-210M	1219.45	304.90	2089.	39.	0.022	167.67	1.208s
Ir-192	1233.62	308.44	2127.	39.	0.022	168.82	1.211s
PA-233	1247.91	312.01	2166.	27.	0.015	246.26	1.214
Ir-192	1265.82	316.49	2420.	-44.	-0.025	158.25	1.217s
CR-51	1280.20	320.08	2238.	-40.	-0.022	167.10	1.219
La-140	1314.91	328.76	1756.	-44.	-0.025	145.65	1.226
Cf-249	1333.63	333.44	1712.	-44.	-0.024	135.10	1.229s
AC-228	1352.57	338.18	246.	91.	0.051	36.03	1.491s
Cs-136	1362.15	340.57	1668.	-44.	-0.024	132.84	1.234s
EU-152	1377.01	344.29	1401.	42.	0.023	127.24	1.237
HF-181	1383.19	345.83	1229.	38.	0.021	129.77	1.238
PB-214	1407.60	351.93	731.	16.	0.009	235.15	1.243s
BA-133	1423.87	356.00	688.	25.	0.014	147.59	1.245
I-131	1457.81	364.48	369.	33.	0.019	113.53	1.252s
BA-133	1535.24	383.84	918.	-4.	-0.002	863.62	1.266
Cf-249	1551.68	387.95	923.	0.	0.000	1000.00	1.269s
SN-113	1566.64	391.69	807.	41.	0.023	99.26	1.271s
SB-125	1711.39	427.88	388.	27.	0.015	144.13	1.297s
AG-108M	1735.64	433.94	460.	-33.	-0.018	116.12	1.301
PM-146	1815.41	453.88	511.	-36.	-0.020	104.44	1.315s
SB-125	1853.36	463.37	904.	48.	0.027	89.75	1.322
Ir-192	1872.14	468.06	850.	38.	0.021	111.19	1.325s
BE-7	1910.28	477.60	955.	5.	0.003	948.35	1.332s
HF-181	1927.89	482.00	946.	14.	0.008	301.05	1.335s
RU-103	1986.86	496.74	147.	53.	0.030	45.63	0.339s
RH-106	2047.36	511.86	399.	57.	0.032	51.30	2.606s
Kr-85	2055.83	513.98	444.	18.	0.010	167.22	1.357s
Nd-147	2123.91	531.00	251.	-28.	-0.016	115.75	1.369s
Ba-140	2148.95	537.26	169.	30.	0.017	90.86	1.373
CS-134	2252.86	563.24	165.	4.	0.002	621.76	1.391s
CS-134	2277.20	569.32	145.	27.	0.015	66.97	1.395s
PA-234	2277.80	569.47	162.	22.	0.012	82.88	1.395s
BI-207	2278.73	569.70	196.	-7.	-0.004	360.64	1.396s
SB-125	2401.92	600.50	442.	42.	0.023	72.43	1.416s
SB-124	2410.85	602.73	566.	26.	0.014	132.99	1.418s
CS-134	2418.76	604.71	592.	26.	0.015	133.22	1.419s
BI-214	2437.17	609.31	622.	22.	0.012	163.13	1.422s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RU-103	2441.12	610.30	644.	26.	0.015	138.50	1.423
PM-144	2472.18	618.06	180.	24.	0.014	80.50	1.428s
RH-106	2487.60	621.92	189.	24.	0.013	84.00	1.431
SB-125	2543.49	635.89	242.	-33.	-0.018	68.48	1.440
I-131	2547.83	636.97	183.	27.	0.015	73.49	1.441
AG-110M	2630.98	657.76	6803.	-30.	-0.017	384.81	1.455s
CS-137	2646.15	661.55	121.	6546.	3.636	1.30	1.420
PM-144	2786.11	696.54	131.	-19.	-0.010	131.95	1.480s
NB-94	2810.46	702.63	112.	-10.	-0.006	819.49	1.484s
SB-124	2891.09	722.79	199.	-19.	-0.011	105.75	1.497s
AG-108M	2891.70	722.94	219.	0.	0.000	1000.00	1.498s
EU-154	2893.39	723.36	219.	0.	0.000	1000.00	1.498s
ZR-95	2896.74	724.20	219.	0.	0.000	1000.00	1.498s
PM-146	2942.83	735.72	122.	-11.	-0.006	768.28	1.506s
PM-146	2988.59	747.16	159.	-31.	-0.017	275.67	1.513s
ZR-95	3026.87	756.73	93.	24.	0.013	89.15	1.519s
AG-110M	3055.73	763.94	159.	-20.	-0.011	90.55	1.524s
NB-95	3063.11	765.79	122.	23.	0.013	70.66	1.525s
PA-234M	3065.60	766.41	162.	7.	0.004	252.56	1.526s
BI-212	3141.64	785.42	112.	26.	0.014	88.67	1.538s
CS-134	3183.44	795.87	283.	-29.	-0.016	85.02	1.544s
TL-210	3198.36	799.60	237.	22.	0.012	101.88	1.547s
CS-134	3207.77	801.95	254.	13.	0.007	169.21	1.548s
CO-58	3243.06	810.78	344.	-32.	-0.018	83.97	1.554s
La-140	3263.04	815.77	376.	-13.	-0.007	209.51	1.557s
Cs-136	3273.97	818.50	399.	-13.	-0.007	221.93	1.559s
MN-54	3339.36	834.85	187.	-35.	-0.019	85.71	1.569s
Co-56	3387.05	846.77	140.	-10.	-0.006	227.26	1.577s
NB-94	3484.36	871.10	228.	-33.	-0.018	66.71	1.592s
EU-154	3492.89	873.23	243.	19.	0.011	115.26	1.593s
PA-234	3522.10	880.53	288.	29.	0.016	85.22	1.598
PA-234	3532.94	883.24	317.	16.	0.009	157.95	1.599s
AG-110M	3538.71	884.68	333.	0.	0.000	1000.00	1.600
Y-88	3592.14	898.04	150.	-18.	-0.010	144.69	1.608s
AC-228	3643.92	910.98	84.	92.	0.051	24.60	2.805s
AG-110M	3749.96	937.49	200.	-28.	-0.016	112.64	1.633s
PA-234	3784.07	946.02	140.	30.	0.017	88.24	1.638s
EU-152	3856.43	964.11	276.	8.	0.005	278.78	1.649s
AC-228	3878.99	969.75	78.	39.	0.022	54.69	1.191s
EU-154	3985.31	996.33	210.	26.	0.014	81.43	1.668
PA-234M	4003.99	1001.00	239.	23.	0.013	98.81	1.671s
EU-154	4019.10	1004.77	287.	16.	0.009	147.84	1.673s
Co-56	4151.36	1037.84	135.	-26.	-0.014	86.03	1.693
RH-106	4201.45	1050.36	141.	-11.	-0.006	239.23	1.700s
BI-207	4254.65	1063.66	145.	-32.	-0.018	69.83	1.708s
Ga-68	4309.61	1077.40	95.	13.	0.007	167.15	1.716s
FE-59	4397.02	1099.25	150.	-23.	-0.013	118.91	1.728s
EU-152	4448.32	1112.07	193.	25.	0.014	81.41	1.736s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZN-65	4462.20	1115.55	218.	25.	0.014	86.53	1.738s
BI-214	4481.17	1120.29	243.	24.	0.013	94.61	1.740s
Sc-46	4482.22	1120.55	267.	0.	0.000	1000.00	1.740s
Ta-182	4485.22	1121.30	286.	-24.	-0.013	103.93	1.741s
CO-60	4692.60	1173.14	53.	1877.	1.043	2.51	1.787
Ta-182	4885.67	1221.41	37.	-10.	-0.006	137.96	1.797s
Co-56	4953.16	1238.28	16.	9.	0.005	110.55	1.806s
NA-22	5098.16	1274.53	21.	1.	0.000	987.42	1.826s
EU-154	5098.20	1274.54	22.	0.	0.000	1000.00	1.826s
FE-59	5166.43	1291.60	16.	-1.	-0.001	860.18	1.835s
TL-210	5252.05	1313.00	16.	7.	0.004	135.27	1.847s
CO-60	5329.68	1332.41	9.	1694.	0.941	2.45	1.829
AG-110M	5537.25	1384.30	5.	7.	0.004	89.15	1.884s
EU-152	5632.07	1408.00	5.	5.	0.003	121.64	1.896s
K-40	5843.40	1460.83	3.	12.	0.007	36.59	1.923s
La-140	6384.93	1596.21	6.	4.	0.002	137.50	1.990s
BI-214	7058.07	1764.49	0.	9.	0.005	33.71	2.067s
Co-56	7085.51	1771.35	9.	0.	0.000	1000.00	2.070s
Y-88	7344.36	1836.06	0.	5.	0.003	44.72	2.098s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	1.5422E+00				5.31E+01	
			477.60	1.542E+00	&(P	4.904E+01	9.48E+02 1.05E+01 G
NA-22	C	5.3404E-02				9.50E+02	
			1274.53	5.340E-02	?(	1.941E+00	9.87E+02 9.99E+01 G
K-40	N	9.9339E+00				4.66E+11	
			1460.83	9.934E+00	?(P	9.370E+00	3.66E+01 1.07E+01 G
Sc-46	F	8.8309E-02				8.38E+01	
			889.28	8.831E-02	%(	5.132E+00	1.71E+03 1.00E+02 G
			1120.55	0.000E+00	-	5.652E+00	1.00E+03 1.00E+02 G
CR-51	F	-1.0315E+01				2.77E+01	
			320.08	-1.031E+01	(	5.724E+01	1.67E+02 9.94E+00 G
MN-54	C	-1.9258E+00				3.12E+02	
			834.85	-1.926E+00	&(	3.705E+00	8.57E+01 1.00E+02 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
FE-59	F	-2.8697E+00					4.45E+01	
			1099.25	-2.870E+00	?(	7.459E+00	1.19E+02	5.65E+01 G
			1291.60	-2.095E-01	+ P	4.015E+00	8.60E+02	4.32E+01 G
Co-56	C	6.3315E-02					7.73E+01	
			846.77	-5.730E-01	?(P	3.271E+00	2.27E+02	9.99E+01 G
			1238.28	1.026E+00	?(P	2.545E+00	1.11E+02	6.61E+01 G
			1037.84	-1.237E+01	+ P	2.701E+01	8.60E+01	1.41E+01 G
			1771.35	0.000E+00	-	1.139E+01	1.00E+03	1.55E+01 A
CO-57	C	-3.4703E-01					2.72E+02	
			122.06	-3.470E-01	(	2.234E+00	1.93E+02	8.56E+01 G
			136.47	-7.150E+00	&	3.507E+01	1.48E+02	1.07E+01 G
CO-58	C	-1.7498E+00					7.09E+01	
			810.78	-1.750E+00	?(	4.881E+00	8.40E+01	9.95E+01 G
CO-60	F	1.4052E+02					1.93E+03	
			1332.50	1.410E+02	(P	1.372E+00	2.45E+00	1.00E+02 G
			1173.24	1.400E+02	(P	2.737E+00	2.51E+00	9.99E+01 G
ZN-65	F	3.4978E+00					2.44E+02	
			1115.55	3.498E+00	?(P	1.008E+01	8.65E+01	5.06E+01 G
NB-94	I	-5.1212E-01					7.41E+06	
			702.63	-5.121E-01	?(P	2.571E+00	8.19E+02	9.79E+01 G
			871.10	-1.921E+00	+	4.233E+00	6.67E+01	9.99E+01 G
ZR-95	I	2.2293E+00					6.40E+01	
			756.73	2.229E+00	?(	4.504E+00	8.92E+01	5.45E+01 G
			724.20	0.000E+00	-	8.036E+00	1.00E+03	4.42E+01 G
NB-95	I	1.2023E+00					6.40E+01	
			765.79	1.202E+00	?(	2.816E+00	7.07E+01	9.98E+01 G
RU-103	I	2.1289E+00					3.93E+01	
			497.05	2.129E+00	(P	2.363E+00	4.56E+01	9.09E+01 G
			610.30	1.957E+01		9.043E+01	1.39E+02	5.75E+00 GA
RH-106	I	1.0488E+01					3.74E+02	
			621.92	1.049E+01	?(	2.935E+01	8.40E+01	9.93E+00 G
			1050.36	-4.781E+01	+	2.523E+02	2.39E+02	1.56E+00 G
			511.86	1.060E+01	&	1.782E+01	5.13E+01	2.00E+01 GA
AG-108M	C	-1.1777E+00					1.53E+05	
			433.94	-1.178E+00	(P	3.689E+00	1.16E+02	9.05E+01 G
			722.94	0.000E+00	+	3.900E+00	1.00E+03	9.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	1.715E-01 %		5.933E+00	1.03E+03	8.98E+01 G
AG-110M	F	5.8091E-01						2.50E+02
			884.68	0.000E+00 &(		7.076E+00	1.00E+03	7.27E+01 G
			657.76	-1.466E+00 &		1.870E+01	3.85E+02	9.46E+01 G
			937.49	-5.016E+00 +		1.229E+01	1.13E+02	3.44E+01 G
			1384.30	2.319E+00 ?(		4.769E+00	8.92E+01	2.43E+01 G
			763.94	-4.727E+00 +		1.431E+01	9.06E+01	2.23E+01 G
SN-113	F	1.9180E+00						1.15E+02
			391.69	1.918E+00 ?(		6.322E+00	9.93E+01	6.40E+01 G
SB-124	F	1.1079E+00						6.02E+01
			602.73	1.108E+00 ?(P		4.918E+00	1.33E+02	9.83E+01 G
			1690.98	6.480E-02 % P		2.964E+00	1.86E+03	4.78E+01 G
			722.79	-8.845E+00 +		3.134E+01	1.06E+02	1.08E+01 G
SB-125	I	7.4169E+00						1.01E+03
			427.88	2.933E+00 &(		1.027E+01	1.44E+02	2.96E+01 G
			600.50	9.977E+00 ?(P		2.391E+01	7.24E+01	1.79E+01 G
			635.89	-1.306E+01 &		2.956E+01	6.85E+01	1.13E+01 G
			463.37	1.573E+01 (		4.679E+01	8.98E+01	1.05E+01 G
I-131	I	2.4170E+00						8.02E+00
			364.48	1.159E+00 ?(P		3.189E+00	1.14E+02	8.17E+01 G
			284.30	-6.360E+00 + P		3.885E+01	1.75E+02	6.14E+00 G
			636.97	1.675E+01 ?(		4.084E+01	7.35E+01	7.17E+00 G
Gd-153	F	-2.7662E+00						2.42E+02
			97.50	-2.766E+00 &(		1.303E+01	1.42E+02	3.00E+01 G
			103.20	-3.784E+00 +		1.804E+01	1.44E+02	2.18E+01 G
Ga-68	C	3.2159E+01						4.71E-02
			1077.40	3.216E+01 ?(		1.191E+02	1.67E+02	3.30E+00 G
Tc-99m	I	4.9657E-07						2.51E-01
			140.51	4.966E-07 %(		4.423E+00	2.68E+08	8.93E+01 G
BA-133	F	2.0494E+00						3.85E+03
			356.00	1.134E+00 ?(		5.585E+00	1.48E+02	6.20E+01 G
			302.85	5.149E+00 (		2.818E+01	1.65E+02	1.83E+01 G
			383.84	-1.451E+00 + P		4.744E+01	8.64E+02	8.94E+00 GA
			80.99	-2.534E+00 +		1.530E+01	1.82E+02	3.41E+01 GA
CS-134	I	3.7297E-01						7.54E+02
			795.87	-1.797E+00 ?(		5.081E+00	8.50E+01	8.55E+01 G
			604.71	1.141E+00 &		5.072E+00	1.33E+02	9.76E+01 G
			569.32	7.011E+00 ?(		1.552E+01	6.70E+01	1.54E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	8.382E+00	?(	4.781E+01	1.69E+02	8.69E+00 G
			563.24	2.036E+00	&(P	3.012E+01	6.22E+02	8.35E+00 G
CS-137	I	3.5298E+02						1.10E+04
			661.66	3.530E+02	(P	2.916E+00	1.30E+00	8.52E+01 G
CE-139	F	-1.0113E+00						1.38E+02
			165.85	-1.011E+00	?(	3.079E+00	9.19E+01	7.99E+01 G
Ba-140	I	8.1108E+00						1.28E+01
			537.26	4.731E+00	(	1.004E+01	9.09E+01	2.44E+01 G
			162.66	1.168E+01	&(	3.910E+01	1.01E+02	6.22E+00 G
			304.85	2.214E+01	?(	1.222E+02	1.66E+02	4.29E+00 G
La-140	I	4.4226E-01						1.28E+01
			1596.21	4.423E-01	?(	1.409E+00	1.37E+02	9.54E+01 G
			487.02	-3.024E-01	& P	1.122E+01	1.14E+03	4.55E+01 G
			328.76	-5.668E+00	+ P	2.540E+01	1.46E+02	2.03E+01 G
			815.77	-3.105E+00	+	2.189E+01	2.10E+02	2.33E+01 G
CE-141	I	-1.2694E+00						3.25E+01
			145.44	-1.269E+00	&(	4.645E+00	1.10E+02	4.82E+01 G
CE-144	I	-6.9276E+00						2.85E+02
			133.54	-6.928E+00	*(	3.273E+01	1.43E+02	1.11E+01 G
PM-144	C	8.1400E-02						3.63E+02
			696.54	-9.042E-01	?(	2.712E+00	1.32E+02	9.90E+01 G
			618.06	1.066E+00	&(	2.855E+00	8.05E+01	9.91E+01 G
EU-152	F	4.6423E+00						4.94E+03
			121.78	-4.218E-01	(	7.861E+00	5.57E+02	2.86E+01 G
			344.29	4.273E+00	&(	1.806E+01	1.27E+02	2.65E+01 G
			1112.07	1.298E+01	&(	3.517E+01	8.14E+01	1.36E+01 G
			778.92	1.356E-01	&	2.158E+01	6.88E+03	1.29E+01 G
			964.11	3.668E+00	?(	3.461E+01	2.79E+02	1.46E+01 G
			244.69	1.189E+01	&(	5.048E+01	1.28E+02	7.58E+00 G
			1408.00	1.939E+00	?	5.597E+00	1.22E+02	2.10E+01 GA
EU-154	I	5.6615E+00						3.14E+03
			123.10	1.815E+00	?(	4.980E+00	8.29E+01	4.08E+01 G
			1274.54	0.000E+00	-	5.589E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	1.753E+01	1.00E+03	2.02E+01 G
			873.23	9.212E+00	?(	3.559E+01	1.15E+02	1.23E+01 G
			1004.77	5.954E+00	?(	2.958E+01	1.48E+02	1.80E+01 G
			996.33	1.586E+01	&(	4.295E+01	8.14E+01	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	-2.6499E+00					1.81E+03	
			105.31	-2.650E+00	?(	1.879E+01	2.14E+02	2.12E+01 G
			86.54	-2.591E+00	+	1.621E+01	1.89E+02	3.07E+01 G
HF-181	F	1.6295E+00					4.24E+01	
			482.00	6.380E-01	?(	6.424E+00	3.01E+02	8.05E+01 G
			133.02	-1.771E+00	+	8.296E+00	1.41E+02	4.33E+01 G
			345.83	6.926E+00	(	2.987E+01	1.30E+02	1.51E+01 G
			136.30	-1.327E+01	&	6.345E+01	1.44E+02	5.85E+00 G
Ta-182	F	-4.8282E+00					1.14E+02	
			1121.30	-4.828E+00	?(	1.676E+01	1.04E+02	3.49E+01 G
			1221.41	-2.953E+00	+	8.913E+00	1.38E+02	2.70E+01 G
			1189.05	4.655E-01	%	1.498E+01	1.39E+03	1.62E+01 G
Hg-203	F	-8.0892E-01					4.66E+01	
			279.20	-8.089E-01	?(	3.599E+00	1.33E+02	8.15E+01 G
TL-208	N	-2.0816E-02					6.98E+02	
			583.02	-2.082E-02	%(P	3.420E+00	6.89E+03	8.45E+01 G
			277.28	-1.689E+01	& P	3.895E+01	6.26E+01	6.31E+00 G
			860.56	3.814E-02	% P	2.755E+01	3.14E+04	1.24E+01 G
PM-146	C	-1.8906E+00					2.02E+03	
			453.88	-1.891E+00	?(P	5.609E+00	1.04E+02	6.50E+01 G
			747.16	-4.615E+00	+ P	9.189E+00	2.76E+02	3.40E+01 G
			735.72	-2.470E+00	+ P	1.209E+01	7.68E+02	2.25E+01 G
Y-88	F	5.5498E-01					1.07E+02	
			1836.06	5.550E-01	?(	8.180E-01	4.47E+01	9.92E+01 G
			898.04	-1.137E+00	- P	3.786E+00	1.45E+02	9.37E+01 G
Cd-113m		-1.6363E+04					5.33E+03	
			263.70	-1.636E+04	*(	6.381E+04	1.17E+02	6.00E-03 K
Cf-251	T	1.5428E+00					3.28E+05	
			176.60	1.543E+00	&(	1.102E+01	2.81E+02	1.70E+01 G
			227.00	-4.019E+00	+	3.728E+01	3.82E+02	6.30E+00 GA
Sn-126		-2.1081E+01					3.65E+07	
			87.57	2.219E+00	}	1.314E+01	6.10E+01	3.75E+01 GA
			64.28	-2.108E+01	&(	1.536E+02	2.21E+02	9.70E+00 G
			86.94	1.772E-06	%	5.466E+01	9.29E+08	9.04E+00 GA
PB-210	N	1.0548E+04					8.14E+03	
			46.54	1.055E+04	(P	2.070E+02	1.15E+00	4.25E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PB-212   N   7.3509E+00                                     6.98E+02
                         238.63 7.351E+00  (P 4.201E+00 1.86E+01 4.33E+01 G
                         300.03 2.938E+01 & P 1.578E+02 1.62E+02 3.28E+00 GA

PB-214   N   2.3752E+00                                     5.84E+05
                         351.93 1.196E+00 &(P 9.408E+00 2.35E+02 3.76E+01 G
                         295.09 4.674E+00 &(P 2.605E+01 1.68E+02 1.93E+01 G
                         242.00-9.096E+00 &   5.263E+01 1.74E+02 7.43E+00 GA

BI-207   C  -2.9530E+00                                     1.18E+04
                        1063.66-2.953E+00  (P 5.414E+00 6.98E+01 7.45E+01 G
                         569.70-3.042E-01 & P 2.825E+00 3.61E+02 9.77E+01 G

BI-212   N   8.7903E-06                                     6.98E+02
                         727.17 8.790E-06 &(  4.715E+01 1.57E+08 7.55E+00 G
                         785.42 1.076E+02 & P 2.157E+02 8.87E+01 1.28E+00 GA

U-235    N  -3.8398E-01                                     2.57E+11
                         143.79-7.268E+00 ?(P 1.915E+01 3.66E+02 1.10E+01 G
                         205.33 1.468E+01 &(P 4.204E+01 1.13E+02 5.01E+00 G
                         163.38-3.765E-01 & P 4.906E+01 1.66E+04 5.08E+00 G
                         185.72 7.025E-01 & P 3.859E+00 2.16E+02 5.40E+01 GA

BI-214   N   4.6783E+00                                     5.84E+05
                         609.31 2.033E+00 *(P 1.108E+01 1.63E+02 4.61E+01 G
                        1120.29 1.133E+01 ?(P 3.576E+01 9.46E+01 1.51E+01 G
                        1764.49 6.076E+00 ?(  5.088E+00 3.37E+01 1.54E+01 G

BI-210M  T  -1.9504E+00                                     1.10E+09
                         265.83-1.950E+00 &(P 7.906E+00 6.62E+01 5.00E+01 G
                         304.90 3.393E+00 +   1.890E+01 1.68E+02 2.80E+01 G

AC-228   N   1.7822E+01                                     2.10E+03
                         911.07 1.906E+01 @(  9.410E+00 2.46E+01 2.90E+01 G
                         968.97 1.414E+01  (  1.590E+01 5.47E+01 1.75E+01 G
                         338.32 2.019E+01  (  1.681E+01 3.60E+01 1.20E+01 G
                          93.35-1.506E+01 &   7.050E+01 1.41E+02 5.56E+00 XA

TH-227   N  -1.4207E+01                                     7.95E+03
                         256.24-1.421E+01 ?(  5.437E+01 1.15E+02 7.00E+00 G
                         235.97-8.094E+00 +   3.178E+01 1.18E+02 1.23E+01 G
                          50.14-4.419E+01 &   2.368E+02 1.62E+02 8.00E+00 G

TH-229   N  -8.0880E+00                                     2.68E+06
                         193.51-8.088E+00 ?(  4.686E+01 2.28E+02 4.40E+00 G
                         210.85-1.230E+00 %   8.049E+01 2.69E+03 2.99E+00 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	N	-2.6745E+01					1.63E+12	
			92.59	-2.674E+01	*(P	7.101E+01	1.87E+02	5.58E+00 G
			63.29	-6.666E+01	& P	3.977E+02	1.44E+02	3.81E+00 G
PA-231	N	3.5985E+01					1.20E+07	
			302.65	3.275E+01	*(	1.776E+02	1.63E+02	2.88E+00 G
			300.07	3.977E+01	&(	2.124E+02	1.61E+02	2.46E+00 G
PA-233	C	3.9068E+00					7.82E+08	
			312.01	1.861E+00	&(	1.524E+01	2.46E+02	3.60E+01 G
			300.18	1.579E+01	&(	8.511E+01	1.62E+02	6.20E+00 G
PA-234	N	6.0197E+00					1.63E+12	
			131.29	-4.234E+00	?(	1.990E+01	1.42E+02	1.80E+01 G
			946.02	1.395E+01	*(	2.678E+01	8.82E+01	1.34E+01 G
			569.47	1.110E+01	?(	3.066E+01	8.29E+01	8.20E+00 G
			883.24	9.839E+00	?(	5.222E+01	1.58E+02	9.60E+00 G
			880.53	2.808E+01		7.958E+01	8.52E+01	6.00E+00 GA
PA-234M	N	1.6351E+02					1.63E+12	
			1001.00	1.762E+02	?(P	5.815E+02	9.88E+01	8.37E-01 G
			766.41	1.272E+02	?(P	1.095E+03	2.53E+02	2.94E-01 G
AM-241	T	1.3209E+03					1.58E+05	
			59.54	1.321E+03	(P	1.556E+01	8.30E-01	3.59E+01 G
Np-237	F	-6.3838E+00					2.14E+06	
			86.49	-6.384E+00	(	3.820E+01	1.81E+02	1.31E+01 G
Ir-192	F	6.6954E-01					7.40E+01	
			316.49	-1.282E+00	?(	6.734E+00	1.58E+02	8.70E+01 G
			468.06	2.506E+00	&(	9.263E+00	1.11E+02	5.18E+01 G
			308.44	3.027E+00	(	1.697E+01	1.69E+02	3.18E+01 G
Cs-136	F	-7.0442E-01					1.30E+01	
			818.50	-7.044E-01	?(	5.259E+00	2.22E+02	1.00E+02 G
			1048.07	8.460E-02	%	4.548E+00	1.55E+03	8.00E+01 G
			340.57	-2.499E+00	&	1.102E+01	1.33E+02	4.69E+01 G
Np-239	T	1.6759E+00					2.36E+00	
			103.70	-3.437E+00	+	1.650E+01	1.45E+02	2.40E+01 X
			106.13	1.676E+00	?(	1.740E+01	3.13E+02	2.27E+01 G
			99.50	-5.517E+00	&	2.617E+01	1.43E+02	1.50E+01 X
Nd-147		-8.3543E+00					1.11E+01	
			531.00	-8.354E+00	&(	2.258E+01	1.16E+02	1.30E+01 G
			91.10	1.430E-01	%	1.712E+01	3.61E+03	2.83E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-210 N	1.2029E+00					5.84E+05	
		799.60	1.187E+00	&(	4.045E+00	1.02E+02	9.90E+01 G
		296.00	1.222E+00	(	6.439E+00	1.59E+02	7.90E+01 G
		1313.00	2.738E+00	?	8.351E+00	1.35E+02	2.10E+01 GA
Kr-85 I	1.5623E+02					3.92E+03	
		513.98	1.562E+02	(	8.758E+02	1.67E+02	4.30E-01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-227	50.14	27324.	-144.	-0.080	162.30	-4.419E+01	
TH-234	63.29	32573.	-141.	-0.079	144.38	-6.666E+01	P
Np-237	86.49	5768.	-60.	-0.033	180.67	-6.384E+00	
EU-155	86.54	5709.	-57.	-0.032	188.86	-2.591E+00	
TH-234	92.59	3817.	-109.	-0.061	186.79	-2.674E+01	P
Gd-153	97.50	3825.	-62.	-0.034	142.25	-2.766E+00	
Np-239	99.50	3887.	-62.	-0.034	143.17	-5.517E+00	

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Gd-153	103.20	3949.	-62.	-0.034	143.90	-3.784E+00	
Np-239	103.70	4011.	-62.	-0.034	144.96	-3.437E+00	
EU-155	105.31	4073.	-42.	-0.024	213.84	-2.650E+00	
Np-239	106.13	4007.	29.	0.016	312.85	1.676E+00	
EU-152	121.78	1254.	-9.	-0.005	557.44	-4.218E-01	
CO-57	122.06	902.	-22.	-0.012	192.80	-3.470E-01	
PA-234	131.29	3091.	-56.	-0.031	141.77	-4.234E+00	
CE-144	133.54	3135.	-56.	-0.031	142.53	-6.928E+00	
CO-57	136.47	3280.	-55.	-0.031	147.97	-7.150E+00	
U-235	143.79	963.	-56.	-0.031	365.80	-7.268E+00	P
CE-141	145.44	1084.	-43.	-0.024	110.20	-1.269E+00	
Ba-140	162.66	1100.	47.	0.026	100.86	1.168E+01	
CE-139	165.85	1150.	-53.	-0.029	91.88	-1.011E+00	
Cf-251	176.60	598.	16.	0.009	281.11	1.543E+00	
U-235	185.72	687.	23.	0.013	216.17	7.025E-01	P
TH-229	193.51	631.	-21.	-0.011	228.40	-8.088E+00	
U-235	205.33	600.	41.	0.023	113.36	1.468E+01	P
Cf-251	227.00	640.	-13.	-0.007	382.02	-4.019E+00	
TH-227	235.97	1698.	-50.	-0.028	118.35	-8.094E+00	
EU-152	244.69	1536.	44.	0.024	127.84	1.189E+01	
TH-227	256.24	1412.	-46.	-0.026	115.30	-1.421E+01	
Cd-113m	263.70	1366.	-45.	-0.025	117.46	-1.636E+04	
BI-210M	265.83	1439.	-44.	-0.025	66.19	-1.950E+00	P
TL-208	277.28	510.	-47.	-0.026	62.63	-1.689E+01	P
Hg-203	279.20	724.	-29.	-0.016	133.47	-8.089E-01	
I-131	284.30	461.	-17.	-0.009	174.55	-6.360E+00	P
TL-210	296.00	2022.	40.	0.022	158.62	1.222E+00	
PA-231	300.07	2089.	40.	0.022	160.82	3.977E+01	
PA-233	300.18	2130.	40.	0.022	162.33	1.579E+01	
PA-231	302.65	1973.	39.	0.021	163.21	3.275E+01	
Ba-140	304.85	2050.	39.	0.022	166.12	2.214E+01	
BI-210M	304.90	2089.	39.	0.022	167.67	3.393E+00	
Ir-192	308.44	2127.	39.	0.022	168.82	3.027E+00	
PA-233	312.01	2166.	27.	0.015	246.26	1.861E+00	
Ir-192	316.49	2420.	-44.	-0.025	158.25	-1.282E+00	
CR-51	320.08	2238.	-40.	-0.022	167.10	-1.031E+01	
La-140	328.76	1756.	-44.	-0.025	145.65	-5.668E+00	P
Cf-249	333.44	1712.	-44.	-0.024	135.10	-7.400E+00	
Cs-136	340.57	1668.	-44.	-0.024	132.84	-2.499E+00	
EU-152	344.29	1401.	42.	0.023	127.24	4.273E+00	
I-131	364.48	369.	33.	0.019	113.53	1.159E+00	P
SN-113	391.69	807.	41.	0.023	99.26	1.918E+00	
AG-108M	433.94	460.	-33.	-0.018	116.12	-1.178E+00	P
PM-146	453.88	511.	-36.	-0.020	104.44	-1.891E+00	P
Ir-192	468.06	850.	38.	0.021	111.19	2.506E+00	
BE-7	477.60	955.	5.	0.003	948.35	1.542E+00	P
RH-106	511.86	399.	57.	0.032	51.30	1.060E+01	
Kr-85	513.98	444.	18.	0.010	167.22	1.562E+02	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Nd-147	531.00	251.	-28.	-0.016	115.75	-8.354E+00		
Ba-140	537.26	169.	30.	0.017	90.86	4.731E+00		
CS-134	563.24	165.	4.	0.002	621.76	2.036E+00		P
CS-134	569.32	145.	27.	0.015	66.97	7.011E+00		
PA-234	569.47	162.	22.	0.012	82.88	1.110E+01		
BI-207	569.70	196.	-7.	-0.004	360.64	-3.042E-01		P
SB-124	602.73	566.	26.	0.014	132.99	1.108E+00		P
CS-134	604.71	592.	26.	0.015	133.22	1.141E+00		
BI-214	609.31	622.	22.	0.012	163.13	2.033E+00		P
PM-144	618.06	180.	24.	0.014	80.50	1.066E+00		
RH-106	621.92	189.	24.	0.013	84.00	1.049E+01		
I-131	636.97	183.	27.	0.015	73.49	1.675E+01		
AG-110M	657.76	6803.	-30.	-0.017	384.81	-1.466E+00		
PM-144	696.54	131.	-19.	-0.010	131.95	-9.042E-01		
NB-94	702.63	112.	-10.	-0.006	819.49	-5.121E-01		P
SB-124	722.79	199.	-19.	-0.011	105.75	-8.845E+00		
PM-146	735.72	122.	-11.	-0.006	768.28	-2.470E+00		P
PM-146	747.16	159.	-31.	-0.017	275.67	-4.615E+00		P
ZR-95	756.73	93.	24.	0.013	89.15	2.229E+00		
AG-110M	763.94	159.	-20.	-0.011	90.55	-4.727E+00		
NB-95	765.79	122.	23.	0.013	70.66	1.202E+00		
BI-212	785.42	112.	26.	0.014	88.67	1.076E+02		P
CS-134	795.87	283.	-29.	-0.016	85.02	-1.797E+00		
TL-210	799.60	237.	22.	0.012	101.88	1.187E+00		
CS-134	801.95	254.	13.	0.007	169.21	8.382E+00		
CO-58	810.78	344.	-32.	-0.018	83.97	-1.750E+00		
La-140	815.77	376.	-13.	-0.007	209.51	-3.105E+00		
Cs-136	818.50	399.	-13.	-0.007	221.93	-7.044E-01		
MN-54	834.85	187.	-35.	-0.019	85.71	-1.926E+00		
Co-56	846.77	140.	-10.	-0.006	227.26	-5.730E-01		P
NB-94	871.10	228.	-33.	-0.018	66.71	-1.921E+00		
PA-234	880.53	288.	29.	0.016	85.22	2.808E+01		
PA-234	883.24	317.	16.	0.009	157.95	9.839E+00		
Y-88	898.04	150.	-18.	-0.010	144.69	-1.137E+00		P
AG-110M	937.49	200.	-28.	-0.016	112.64	-5.016E+00		
PA-234	946.02	140.	30.	0.017	88.24	1.395E+01		
EU-152	964.11	276.	8.	0.005	278.78	3.668E+00		
Co-56	1037.84	135.	-26.	-0.014	86.03	-1.237E+01		P
RH-106	1050.36	141.	-11.	-0.006	239.23	-4.781E+01		
BI-207	1063.66	145.	-32.	-0.018	69.83	-2.953E+00		P
Ga-68	1077.40	95.	13.	0.007	167.15	3.216E+01		
FE-59	1099.25	150.	-23.	-0.013	118.91	-2.870E+00		
EU-152	1112.07	193.	25.	0.014	81.41	1.298E+01		
ZN-65	1115.55	218.	25.	0.014	86.53	3.498E+00		P
BI-214	1120.29	243.	24.	0.013	94.61	1.133E+01		P
Ta-182	1121.30	286.	-24.	-0.013	103.93	-4.828E+00		
Ta-182	1221.41	37.	-10.	-0.006	137.96	-2.953E+00		
Co-56	1238.28	16.	9.	0.005	110.55	1.026E+00		P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
NA-22	1274.53	21.	1.	0.000	987.42	5.340E-02		
FE-59	1291.60	16.	-1.	-0.001	860.18	-2.095E-01		P
TL-210	1313.00	16.	7.	0.004	135.27	2.738E+00		
AG-110M	1384.30	5.	7.	0.004	89.15	2.319E+00		
EU-152	1408.00	5.	5.	0.003	121.64	1.939E+00		
La-140	1596.21	6.	4.	0.002	137.50	4.423E-01		
BI-214	1764.49	0.	9.	0.005	33.71	6.076E+00		
Y-88	1836.06	0.	5.	0.003	44.72	5.550E-01		

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	1.5422E+00	1.5422E+00	9.484E+02%	4.90E+01
NA-22	#A	5.3404E-02	5.3404E-02	9.874E+02%	1.94E+00
K-40	#	9.9339E+00	9.9339E+00	3.659E+01%	9.37E+00
Sc-46	#A	8.8308E-02	8.8309E-02	1.711E+03%	5.13E+00
CR-51	#A	-1.0315E+01	-1.0315E+01	1.671E+02%	5.72E+01
MN-54	#A	-1.9258E+00	-1.9258E+00	8.571E+01%	3.71E+00
FE-59	#A	-2.8697E+00	-2.8697E+00	1.189E+02%	7.46E+00
Co-56	#A	6.3315E-02	6.3315E-02	1.106E+02%	3.27E+00
CO-57	#A	-3.4703E-01	-3.4703E-01	1.928E+02%	2.23E+00
CO-58	#A	-1.7498E+00	-1.7498E+00	8.397E+01%	4.88E+00
CO-60		1.4052E+02	1.4052E+02	1.756E+00%	1.37E+00
ZN-65	#A	3.4978E+00	3.4978E+00	8.653E+01%	1.01E+01
NB-94	#A	-5.1212E-01	-5.1212E-01	8.195E+02%	2.57E+00
ZR-95	#A	2.2293E+00	2.2293E+00	8.915E+01%	4.50E+00
NB-95	#A	1.2023E+00	1.2023E+00	7.066E+01%	2.82E+00
RU-103	A	2.1288E+00	2.1289E+00	4.563E+01%	2.36E+00
RH-106	#A	1.0488E+01	1.0488E+01	8.400E+01%	2.93E+01
AG-108M	#A	-1.1777E+00	-1.1777E+00	1.161E+02%	3.69E+00
AG-110M	#A	5.8091E-01	5.8091E-01	8.915E+01%	7.08E+00
SN-113	#A	1.9180E+00	1.9180E+00	9.926E+01%	6.32E+00
SB-124	#A	1.1079E+00	1.1079E+00	1.330E+02%	4.92E+00
SB-125	A	7.4169E+00	7.4169E+00	6.153E+01%	1.03E+01
I-131	#A	2.4169E+00	2.4170E+00	6.762E+01%	3.19E+00
Gd-153	#A	-2.7662E+00	-2.7662E+00	1.422E+02%	1.30E+01
Ga-68	#A	3.1821E+01	3.2159E+01	1.671E+02%	1.19E+02
Tc-99m	#A	4.9559E-07	4.9657E-07	2.676E+08%	4.42E+00
BA-133	A	2.0494E+00	2.0494E+00	1.106E+02%	5.58E+00
CS-134	#A	3.7297E-01	3.7297E-01	6.697E+01%	5.08E+00
CS-137		3.5298E+02	3.5298E+02	1.299E+00%	2.92E+00
CE-139	#A	-1.0113E+00	-1.0113E+00	9.188E+01%	3.08E+00
Ba-140	#A	8.1105E+00	8.1108E+00	7.151E+01%	1.00E+01
La-140	#A	4.4224E-01	4.4226E-01	1.375E+02%	1.41E+00

CE-141 #A	-1.2694E+00	-1.2694E+00	1.102E+02%		4.65E+00
CE-144 #A	-6.9276E+00	-6.9276E+00	1.425E+02%		3.27E+01
PM-144 #A	8.1400E-02	8.1400E-02	7.728E+01%		2.71E+00
EU-152 #A	4.6423E+00	4.6423E+00	8.141E+01%		7.86E+00
EU-154 #C	5.6615E+00	5.6615E+00	5.514E+01%		4.98E+00
EU-155 #A	-2.6499E+00	-2.6499E+00	2.138E+02%		1.88E+01
HF-181 A	1.6295E+00	1.6295E+00	1.298E+02%		6.42E+00
Ta-182 #A	-4.8282E+00	-4.8282E+00	1.039E+02%		1.68E+01
Hg-203 #A	-8.0891E-01	-8.0892E-01	1.335E+02%		3.60E+00
TL-208 #A	-2.0816E-02	-2.0816E-02	6.885E+03%		3.42E+00
PM-146 #A	-1.8906E+00	-1.8906E+00	1.044E+02%		5.61E+00
Y-88 #A	5.5498E-01	5.5498E-01	4.472E+01%		8.18E-01
Cd-113m#A	-1.6363E+04	-1.6363E+04	1.175E+02%		6.38E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.30E+02
Cf-251 #A	1.5428E+00	1.5428E+00	2.811E+02%		1.10E+01
Cf-249 #A	0.0000E+00	0.0000E+00	1.000E+03%		6.50E+00
Sn-126 #A	-2.1081E+01	-2.1081E+01	2.206E+02%		1.54E+02
PB-210	1.0548E+04	1.0548E+04	1.147E+00%		2.07E+02
PB-212	7.3509E+00	7.3509E+00	1.863E+01%		4.20E+00
PB-214 A	2.3752E+00	2.3752E+00	1.444E+02%		9.41E+00
BI-207 #A	-2.9530E+00	-2.9530E+00	6.983E+01%		5.41E+00
BI-212 #A	8.7903E-06	8.7903E-06	1.566E+08%		4.72E+01
U-235 #A	-3.8398E-01	-3.8398E-01	1.134E+02%		1.92E+01
BI-214 #A	4.6783E+00	4.6783E+00	3.371E+01%		1.11E+01
BI-210M#A	-1.9504E+00	-1.9504E+00	6.619E+01%		7.91E+00
AC-228	1.7822E+01	1.7822E+01	2.332E+01%		9.41E+00
TH-227 #A	-1.4207E+01	-1.4207E+01	1.153E+02%		5.44E+01
TH-229 #A	-8.0880E+00	-8.0880E+00	2.284E+02%		4.69E+01
TH-234 #A	-2.6745E+01	-2.6745E+01	1.868E+02%		7.10E+01
PA-231 #A	3.5985E+01	3.5985E+01	1.146E+02%		1.78E+02
PA-233 #A	3.9068E+00	3.9068E+00	1.475E+02%		1.52E+01
PA-234 #A	6.0197E+00	6.0197E+00	6.109E+01%		1.99E+01
PA-234M#A	1.6351E+02	1.6351E+02	9.881E+01%		5.81E+02
AM-241	1.3209E+03	1.3209E+03	8.297E-01%		1.56E+01
Np-237 #A	-6.3838E+00	-6.3838E+00	1.807E+02%		3.82E+01
Ir-192 #A	6.6954E-01	6.6954E-01	8.557E+01%		6.73E+00
Cs-136 #A	-7.0439E-01	-7.0442E-01	2.219E+02%		5.26E+00
Np-239 #A	1.6756E+00	1.6759E+00	3.129E+02%		1.74E+01
Nd-147 #A	-8.3539E+00	-8.3543E+00	1.157E+02%		2.26E+01
TL-210 #A	1.2029E+00	1.2029E+00	9.426E+01%		4.04E+00
Kr-85 #A	1.5623E+02	1.5623E+02	1.672E+02%		8.76E+02

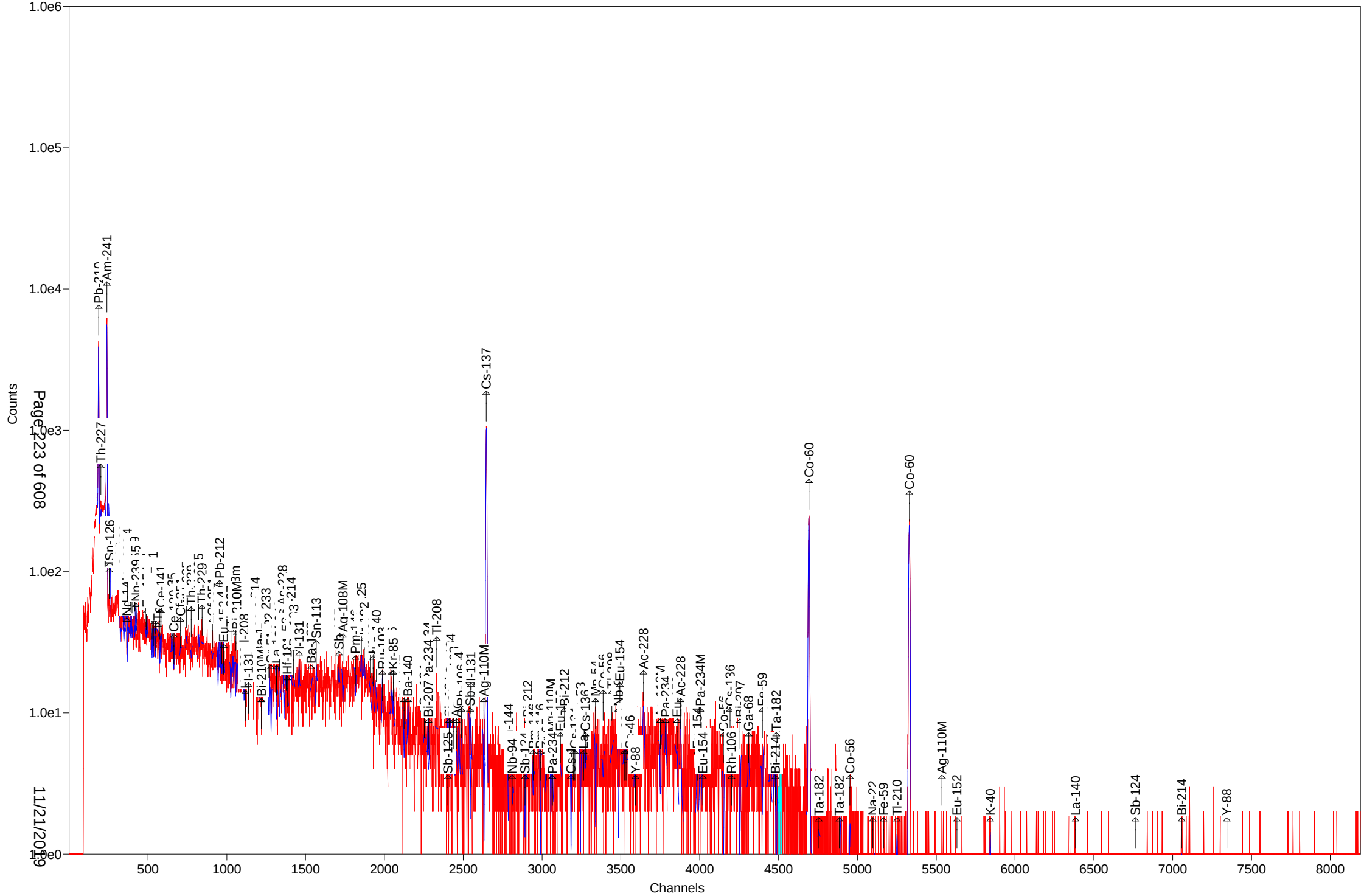
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.5 to 2000.0 keV) 1.239E+04 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 1.2390190E+04 Bq/Sample

445369_Gamma_LCS 160-445369~2-A. 8_Gamma_20191805.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193115

Sample Description: 445369_Gamma_180-96595-A-1-B
Detector: Detector # 9
Batch ID: 445369
Work Order Number: Gamma
Lot Number: 180-96595-A-1-B

Decay to Time: 10/31/2019 02:12 Live Time: 1800 sec
Acquisition Time: 10/31/2019 02:12:53 Real Time: 1804 sec
Analysis Time: 10/31/2019 02:43 Dead Time: 0.21 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 9_Soil_TunaCan.Clb
Efficiency Cal Desc: 9_Soil_TunaCan_90099_050312
Efficiency Cal Date: 6/14/2012 10:19
Energy Cal Date: 3/1/2012 13:57
Library: Client_Long_Rev15.lib
Bkgd Correction File: 9_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	3.333E+00	101.1	3.369E+00	3.373E+00	1.134E+01
NA-22	-7.151E-01	69.3	4.952E-01	4.965E-01	1.644E+00
K-40	3.497E+02	3.9	1.380E+01	2.260E+01	7.638E+00
Sc-46	-6.937E-01	93.0	6.454E-01	6.464E-01	2.162E+00
CR-51	3.086E+00	111.8	3.449E+00	3.453E+00	1.159E+01
MN-54	-5.269E-02	863.5	4.550E-01	4.550E-01	1.115E+00
FE-59	8.031E-02	1289.7	1.036E+00	1.036E+00	2.335E+00
Co-56	1.921E-01	101.6	1.952E-01	1.955E-01	1.053E+00
CO-57	1.979E-01	124.3	2.459E-01	2.462E-01	8.272E-01
CO-58	-6.264E-01	80.7	5.058E-01	5.069E-01	1.689E+00
CO-60	1.750E-01	86.0	1.506E-01	1.508E-01	1.456E+00
ZN-65	0.000E+00	1.#INF	3.143E-01	3.143E-01	4.819E+00
NB-94	-5.741E-01	89.8	5.157E-01	5.166E-01	1.727E+00
ZR-95	8.340E-01	81.3	6.777E-01	6.791E-01	1.761E+00
NB-95	5.515E-01	79.8	4.401E-01	4.410E-01	1.471E+00
RU-103	1.823E-01	205.2	3.741E-01	3.742E-01	9.127E-01
RH-106	-4.936E+00	117.1	5.779E+00	5.784E+00	2.701E+01
AG-108M	8.577E-02	156.4	1.342E-01	1.342E-01	9.712E-01
AG-110M	7.841E-01	28.9	2.263E-01	2.299E-01	2.147E+00
SN-113	5.803E-01	99.6	5.781E-01	5.788E-01	1.939E+00
SB-124	7.049E-02	37.8	2.664E-02	2.689E-02	1.496E+00
SB-125	2.280E-01	72.9	1.663E-01	1.667E-01	3.305E+00
I-131	2.810E-02	406.7	1.143E-01	1.143E-01	1.002E+00
Gd-153	4.803E-01	389.3	1.870E+00	1.870E+00	6.242E+00
Ga-68	4.177E+01	48.6	2.032E+01	2.046E+01	4.247E+01
Tc-99m	-4.206E-01	141.3	5.943E-01	5.948E-01	1.978E+00
BA-133	-3.261E-01	272.9	8.897E-01	8.899E-01	2.998E+00
CS-134	9.549E-01	54.4	5.195E-01	5.218E-01	1.937E+00
CS-137	-1.873E-01	219.9	4.118E-01	4.120E-01	1.610E+00
CE-139	-4.282E-01	94.0	4.024E-01	4.044E-01	1.340E+00
Ba-140	1.200E+00	95.7	1.148E+00	1.150E+00	3.447E+00
La-140	-4.899E-01	339.1	1.661E+00	1.661E+00	1.466E+00
CE-141	-7.857E-01	136.1	1.069E+00	1.070E+00	3.558E+00

CE-144	0.000E+00	1.#INF	1.406E+00	1.406E+00	1.330E+01
PM-144	-6.983E-02	647.0	4.518E-01	4.518E-01	1.568E+00
EU-152	1.559E+00	116.8	1.821E+00	1.823E+00	2.943E+00
EU-154	1.138E+00	70.5	8.023E-01	8.045E-01	1.932E+00
EU-155	-2.550E-02	7239.2	1.846E+00	1.846E+00	7.786E+00
HF-181	-1.398E-01	86.7	1.212E-01	1.215E-01	1.853E+00
Ta-182	-3.314E-01	109.3	3.621E-01	3.625E-01	7.394E+00
Hg-203	-5.154E-01	87.4	4.506E-01	4.516E-01	1.501E+00
TL-208	6.978E+00	7.9	5.532E-01	6.611E-01	7.042E-01
PM-146	1.147E-01	444.0	5.091E-01	5.092E-01	1.250E+00
Y-88	1.652E-01	151.3	2.500E-01	2.502E-01	5.109E-01
Cd-113m	-4.600E+03	101.9	4.687E+03	4.697E+03	1.573E+04
Cd-109	0.000E+00	1.#INF	1.610E+01	1.610E+01	5.356E+01
Cf-251	-1.879E+00	86.5	1.626E+00	1.634E+00	5.414E+00
Cf-249	-6.438E-01	98.2	6.324E-01	6.333E-01	2.116E+00
Sn-126	-1.507E+00	312.4	4.707E+00	4.708E+00	1.582E+01
PB-210	4.566E+00	301.6	1.377E+01	1.378E+01	4.648E+01
PB-212	1.901E+01	4.9	9.388E-01	1.547E+00	1.662E+00
PB-214	1.295E+01	10.3	1.330E+00	1.490E+00	2.323E+00
BI-207	5.592E-02	1483.5	8.296E-01	8.296E-01	1.867E+00
BI-212	3.209E+01	15.0	4.797E+00	5.078E+00	7.775E+00
U-235	-3.368E+00	138.8	4.674E+00	4.677E+00	1.555E+01
BI-214	1.139E+01	11.5	1.310E+00	1.437E+00	2.022E+00
BI-210M	9.326E-01	36.9	3.443E-01	3.487E-01	9.103E-01
AC-228	2.076E+01	7.7	1.609E+00	1.926E+00	1.045E+00
TH-227	-1.115E+00	458.8	5.118E+00	5.119E+00	1.273E+01
TH-229	3.786E-01	96.7	3.660E-01	3.673E-01	1.921E+01
TH-234	7.889E+00	80.3	6.335E+00	6.350E+00	2.380E+01
PA-231	-1.306E+01	164.4	2.148E+01	2.149E+01	7.180E+01
PA-233	-1.053E+00	70.1	7.374E-01	7.396E-01	3.307E+00
PA-234	2.143E+00	91.8	1.968E+00	1.971E+00	7.881E+00
PA-234M	-1.156E+02	53.9	6.229E+01	6.256E+01	2.772E+02
AM-241	8.386E-01	168.1	1.409E+00	1.410E+00	4.717E+00
Np-237	0.000E+00	1.#INF	4.705E+00	4.705E+00	1.566E+01
Ir-192	-1.257E-01	339.3	4.264E-01	4.265E-01	1.451E+00
Cs-136	7.214E-02	755.0	5.446E-01	5.447E-01	1.885E+00
Np-239	1.242E+00	108.8	1.351E+00	1.353E+00	4.506E+00
Nd-147	3.343E-01	809.9	2.708E+00	2.708E+00	6.697E+00
TL-210	0.000E+00	1.#INF	7.160E-02	7.161E-02	1.765E+00
Kr-85	9.269E+01	101.9	9.442E+01	9.457E+01	3.175E+02
Total	6.218E+02				

Analyst: Justin Banner

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Sample description
445369_Gamma_180-96595-A-1-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193115.An1

Acquisition information
Start time: 10/31/2019 2:12:53 AM
Live time: 1800
Real time: 1804
Dead time: 0.21 %
Detector ID: 9

Detector system
Ge9 S/N100228730

Calibration
Filename: 9_Soil_TunaCan.Clb
9_Soil_TunaCan_90099_050312

Energy Calibration
Created: 3/1/2012 1:57:17 PM
Zero offset: 0.074 keV
Gain: 0.250 keV/channel
Quadratic: -2.269E-08 keV/channel^2

Efficiency Calibration
Created: 6/14/2012 10:19:51 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.30 %
Log(Eff): -8.079856E-01 + (-2.367265E-01*Log(E)) + (-3.950640E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.42 %
Log(Eff): -2.387916E+01 + (8.875647E+00*Log(E)) + (-9.401100E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.08keV)
Stop channel: 8000 (1999.34keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 2:12:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-10-06_1923.PBC 10/6/2019 7:23:18 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 31 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1574

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.54	9.	301.64	1.00	2.577E-02	46.54	4.250	PBC<MDA	PB210
59.54	20.	168.05	1.01	3.659E-02	59.54	35.900	PBC<MDA	AM241
63.37	35.	44.29	0.64	3.927E-02	63.29	3.810	1.301E+01	TH234
					64.28	9.700	5.028E+00	Sn126
74.87	202.	12.08	1.03	4.577E-02				
77.16	282.	9.00	1.03	4.679E-02				
87.22	113.	16.83	1.04	5.027E-02	86.49	13.100	9.560E+00	Np237
					86.54	30.700	4.078E+00	EU155
					86.94	9.040	1.382E+01	Sn126
					87.57	37.500	3.320E+00	Sn126
					88.04	3.790	3.277E+01	Cd109
89.88	74.	25.08	1.04	5.095E-02				
92.59	33.	112.69	1.04	5.156E-02	92.59	5.584	PBC<MDA	TH234
93.34	32.	117.54	1.04	5.171E-02	93.35	5.561	PBC<MDA	AC228
97.50	14.	389.27	1.05	5.240E-02	97.50	30.000	PBC<MDA	Gd153
106.13	27.	108.80	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
121.78	14.	174.44	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.673E-01	CO57
122.06	16.	124.30	1.07	5.303E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.979E-01	CO57
131.29	28.	142.36	1.08	5.216E-02	131.29	18.000	PBC<MDA	PA234
133.02	28.	145.49	1.08	5.195E-02	133.02	43.300	PBC<MDA	HF181

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					133.54	11.090	2.697E+00	CE144
162.66	25.	95.68	1.11	4.690E-02	162.66	6.220	PBC<MDA	Ba140
163.38	3.	764.44	1.11	4.676E-02	163.38	5.080	PBC<MDA	U235
179.16	25.	45.61	0.60	4.507E-02				
185.72	65.	36.82	1.13	4.403E-02	185.72	54.000	1.527E+00	U235
210.85	20.	133.23	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
238.52	507.	6.28	1.11	3.733E-02	238.63	43.300	1.744E+01	PB212
241.92	63.	27.44	1.18	3.697E-02	242.00	7.430	1.278E+01	PB214
244.69	23.	187.72	1.18	3.670E-02	244.69	7.580	PBC<MDA	EU152
265.48	31.	36.92	0.85	3.470E-02	265.83	50.000	9.776E-01	BI210M
277.35	47.	25.14	1.21	3.372E-02	277.28	6.310	1.232E+01	TL208
295.23	124.	16.73	0.88	3.231E-02	295.09	19.300	1.101E+01	PB214
					296.00	79.000	2.694E+00	TL210
300.04	43.	27.69	1.24	3.195E-02	300.03	3.280	2.260E+01	PB212
					300.07	2.460	3.014E+01	PA231
					300.18	6.200	1.196E+01	PA233
304.90	14.	67.69	1.24	3.160E-02	304.85	4.290	5.562E+00	Ba140
					304.90	28.000	8.523E-01	BI210M
320.08	17.	111.75	1.25	3.056E-02	320.08	9.940	PBC<MDA	CR51
338.14	143.	13.05	0.95	2.941E-02	338.32	12.010	2.250E+01	AC228
351.92	251.	10.26	1.23	2.860E-02	351.93	37.600	1.295E+01	PB214
383.84	16.	102.67	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
391.81	18.	99.61	1.32	2.653E-02	391.69	64.000	PBC<MDA	SN113
453.88	3.	443.95	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
477.60	15.	101.09	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
497.05	7.	205.24	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	49.	27.91	2.67	2.188E-02	511.86	20.000	6.258E+00	RH106
513.98	16.	101.87	1.42	2.182E-02	513.98	0.430	PBC<MDA	Kr85
531.00	2.	809.94	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
537.26	3.	498.25	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
563.24	22.	54.40	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
569.32	15.	67.98	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	5.134E+00	PA234
					569.70	97.740	4.308E-01	BI207
583.27	211.	7.93	1.20	1.989E-02	583.02	84.500	6.978E+00	TL208
604.68	15.	169.44	1.50	1.936E-02	604.71	97.620	PBC<MDA	CS134
609.29	170.	11.50	1.45	1.925E-02	609.31	46.090	1.063E+01	BI214
610.30	15.	172.84	1.51	1.922E-02	610.30	5.750	PBC<MDA	RU103
614.28	11.	231.41	1.51	1.913E-02	614.28	89.850	PBC<MDA	AG108M
634.41	11.	72.94	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
636.97	2.	406.72	1.53	1.862E-02	636.97	7.170	PBC<MDA	I131
657.76	15.	77.40	1.54	1.818E-02	657.76	94.640	PBC<MDA	AG110M
724.20	16.	86.05	1.60	1.691E-02	724.20	44.150	PBC<MDA	ZR95
727.24	74.	14.95	1.21	1.686E-02	727.17	7.550	3.209E+01	BI212
756.73	9.	137.89	1.62	1.635E-02	756.73	54.460	PBC<MDA	ZR95
766.17	16.	79.81	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.873E+02	PA234M
766.41	15.	73.84	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					766.41	0.294	1.752E+02	PA234M
784.78	3.	411.64	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
795.87	10.	137.84	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
801.95	7.	196.40	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
818.50	2.	754.98	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136
859.46	9.	167.22	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
873.11	12.	70.53	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
880.53	12.	82.35	1.72	1.456E-02	880.53	6.000	PBC<MDA	PA234
883.24	12.	91.82	1.72	1.453E-02	883.24	9.600	PBC<MDA	PA234
884.68	10.	115.67	1.73	1.451E-02	884.68	72.680	PBC<MDA	AG110M
898.04	8.	151.31	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88
911.26	150.	8.24	1.56	1.418E-02	911.07	29.000	2.024E+01	AC228
946.02	3.	437.37	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
969.12	87.	17.38	1.54	1.352E-02	968.97	17.460	2.044E+01	AC228
1001.74	8.	231.28	1.82	1.314E-02	1001.00	0.837	PBC<MDA	PA234M
					1004.77	18.010	1.796E+00	EU154
1037.84	12.	101.64	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1077.40	26.	48.65	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1112.07	6.	238.78	1.89	1.213E-02	1112.07	13.644	PBC<MDA	EU152
1120.47	13.	101.05	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	16.	86.72	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	7.462E-01	Sc46
					1121.30	34.900	2.139E+00	Ta182
1173.24	14.	86.05	1.94	1.163E-02	1173.24	99.900	PBC<MDA	CO60
1188.99	8.	166.78	1.95	1.150E-02	1189.05	16.200	PBC<MDA	Ta182
1238.28	2.	983.98	1.98	1.114E-02	1238.28	66.070	PBC<MDA	Co56
1313.00	3.	327.45	2.03	1.063E-02	1313.00	21.000	PBC<MDA	TL210
1384.30	12.	28.87	2.08	1.018E-02	1384.30	24.290	2.695E+00	AG110M
1408.00	9.	97.22	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.91	655.	3.95	1.93	9.749E-03	1460.83	10.670	3.497E+02	K40
1690.89	7.	37.80	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124
1764.17	32.	20.18	2.31	8.350E-03	1764.49	15.400	1.366E+01	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
253.36	63.37	117.	47.	1.198E+03	35.71	1.014	- sD
299.10	74.89	196.	204.	4.448E+03	11.99	1.025	- D
308.23	77.17	174.	288.	6.150E+03	8.77	1.027	- D
358.79	89.81	141.	97.	1.896E+03	20.16	1.039	- sD
716.67	179.16	72.	26.	5.661E+02	51.06	1.124	- sD

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s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.80	46.54	364.	9.	0.005	301.64	0.998s
TH-227	200.20	50.14	333.	-10.	-0.006	260.00	1.001s
AM-241	237.77	59.54	545.	20.	0.011	168.05	1.010
TH-234	252.77	63.29	474.	27.	0.015	114.43	1.014s
Sn-126	256.74	64.28	531.	-10.	-0.006	312.36	1.015
BA-133	323.56	80.99	1174.	-34.	-0.019	144.34	1.031
Np-237	345.55	86.49	1529.	0.	0.000	185.70	1.036A
EU-155	345.76	86.54	1657.	-32.	-0.018	178.43	1.036
Sn-126	347.35	86.94	1555.	-32.	-0.018	172.87	1.037
Sn-126	349.87	87.57	1426.	-32.	-0.018	165.51	1.037s
Cd-109	351.75	88.04	1522.	0.	0.000	170.88	1.038A
Nd-147	363.99	91.10	1393.	-18.	-0.010	289.23	1.041s
TH-234	369.94	92.59	670.	33.	0.018	112.69	1.042s
AC-228	372.98	93.35	685.	32.	0.018	117.54	1.043s
Gd-153	389.58	97.50	1393.	14.	0.008	389.27	1.047
Gd-153	412.37	103.20	1066.	-32.	-0.018	144.05	1.052
Np-239	414.37	103.70	1098.	-12.	-0.007	401.48	1.053s
Np-239	424.09	106.13	418.	27.	0.015	108.80	1.055s
EU-152	486.67	121.78	277.	14.	0.008	174.44	1.070s
CO-57	487.80	122.06	194.	16.	0.009	124.30	1.070s
PA-234	524.72	131.29	784.	28.	0.016	142.36	1.079s
HF-181	531.64	133.02	812.	28.	0.016	145.49	1.081
CE-144	533.69	133.54	840.	0.	0.000	1000.00	1.081
HF-181	544.74	136.30	840.	0.	0.000	1000.00	1.084s
CO-57	545.43	136.47	840.	0.	0.000	1000.00	1.084s
Tc-99m	561.57	140.51	1096.	-33.	-0.019	141.29	1.088s
U-235	574.67	143.79	1063.	-33.	-0.019	138.77	1.091s
CE-141	581.29	145.44	1064.	-34.	-0.019	136.10	1.092
Ba-140	650.15	162.66	280.	25.	0.014	95.68	1.108s
U-235	653.03	163.38	305.	3.	0.002	764.44	1.109s
CE-139	662.92	165.85	361.	-29.	-0.016	93.97	1.111s
Cf-251	705.90	176.60	243.	-26.	-0.015	86.55	1.122s
U-235	742.37	185.72	147.	65.	0.036	36.82	1.130s
TH-229	773.52	193.51	180.	-19.	-0.011	140.14	1.137s
U-235	820.80	205.33	177.	-18.	-0.010	209.14	1.148s
TH-229	842.87	210.85	180.	20.	0.011	133.23	1.153s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-251	907.45	227.00	168.	-17.	-0.009	151.23	1.168
TH-227	943.33	235.97	1033.	-26.	-0.014	176.87	1.176
PB-212	953.97	238.63	96.	553.	0.307	4.94	1.179D
PB-214	967.43	242.00	119.	63.	0.035	27.44	1.182D
EU-152	978.21	244.69	899.	23.	0.013	187.72	1.185
TH-227	1024.39	256.24	136.	-5.	-0.003	458.84	1.195s
Cd-113m	1054.23	263.70	147.	-17.	-0.010	101.90	1.202s
BI-210M	1061.33	265.48	30.	31.	0.017	36.92	0.845s
TL-208	1108.55	277.28	47.	47.	0.026	25.14	1.214D
Hg-203	1116.22	279.20	233.	-25.	-0.014	87.43	1.216s
I-131	1136.61	284.30	108.	0.	0.000	1000.00	1.221s
PB-214	1179.77	295.09	49.	120.	0.067	12.35	1.231D
TL-210	1183.41	296.00	679.	-21.	-0.012	173.51	1.231s
PB-212	1199.52	300.03	48.	43.	0.024	27.69	1.235D
PA-231	1199.68	300.07	657.	-21.	-0.012	170.27	1.235
PA-233	1200.12	300.18	636.	-21.	-0.012	167.51	1.235
PA-231	1210.00	302.65	614.	-22.	-0.012	164.41	1.237s
BA-133	1210.81	302.85	593.	-22.	-0.012	161.53	1.238s
Ba-140	1218.80	304.85	571.	-7.	-0.004	457.39	1.240s
BI-210M	1218.99	304.90	35.	14.	0.008	67.69	1.240D
PA-233	1247.44	312.01	188.	-21.	-0.012	70.06	1.246s
Ir-192	1265.35	316.49	209.	-6.	-0.003	339.27	1.250s
CR-51	1279.73	320.08	169.	17.	0.009	111.75	1.253s
La-140	1314.43	328.76	624.	-24.	-0.014	146.10	1.261s
Cf-249	1333.15	333.44	599.	-24.	-0.014	142.79	1.265s
AC-228	1351.93	338.14	44.	143.	0.079	13.05	0.950s
Cs-136	1361.66	340.57	575.	-25.	-0.014	139.19	1.272s
EU-152	1376.53	344.29	550.	-25.	-0.014	135.89	1.275s
HF-181	1382.70	345.83	525.	-25.	-0.014	132.73	1.276
PB-214	1407.06	351.92	82.	251.	0.139	10.26	1.230
BA-133	1423.37	356.00	392.	-10.	-0.006	272.86	1.285s
I-131	1457.31	364.48	68.	-2.	-0.001	810.35	1.293s
BA-133	1534.73	383.84	123.	16.	0.009	102.67	1.310s
Cf-249	1551.17	387.95	191.	-20.	-0.011	98.24	1.314
SN-113	1566.12	391.69	147.	18.	0.010	99.61	1.317s
SB-125	1710.86	427.88	78.	-10.	-0.006	183.03	1.349s
AG-108M	1735.10	433.94	61.	-8.	-0.004	210.50	1.354
PM-146	1814.87	453.88	48.	3.	0.002	443.95	1.372s
SB-125	1852.82	463.37	136.	-6.	-0.003	277.89	1.380
BE-7	1909.73	477.60	100.	15.	0.008	101.09	1.392s
HF-181	1927.34	482.00	159.	-19.	-0.011	94.48	1.396s
La-140	1947.43	487.02	194.	-21.	-0.011	97.84	1.400s
RU-103	1987.56	497.05	43.	7.	0.004	205.24	1.409s
RH-106	2046.81	511.86	70.	49.	0.027	27.91	2.672s
Kr-85	2055.27	513.98	119.	16.	0.009	101.87	1.424s
Nd-147	2123.35	531.00	43.	2.	0.001	809.94	1.438
Ba-140	2148.39	537.26	39.	3.	0.001	498.25	1.444s
CS-134	2252.30	563.24	29.	22.	0.012	54.40	1.466

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2276.64	569.32	47.	15.	0.009	67.98	1.471
PA-234	2277.24	569.47	62.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	78.	-11.	-0.006	115.90	1.471s
TL-208	2332.43	583.27	16.	211.	0.117	7.93	1.195s
SB-125	2401.36	600.50	66.	-16.	-0.009	74.51	1.497s
SB-124	2410.29	602.73	109.	-12.	-0.007	125.22	1.499s
CS-134	2418.21	604.71	305.	15.	0.008	169.44	1.500
BI-214	2436.53	609.29	40.	170.	0.094	11.50	1.450s
RU-103	2440.56	610.30	320.	15.	0.008	172.84	1.505s
AG-108M	2456.49	614.28	335.	11.	0.006	231.41	1.508
PM-144	2471.62	618.06	346.	0.	0.000	1000.00	1.512s
RH-106	2487.04	621.92	363.	-17.	-0.009	117.07	1.515s
SB-125	2542.94	635.89	25.	11.	0.006	72.94	1.526s
I-131	2547.28	636.97	38.	2.	0.001	406.72	1.527s
AG-110M	2630.43	657.76	58.	15.	0.008	77.40	1.544s
CS-137	2646.03	661.66	81.	-5.	-0.003	219.90	1.548s
PM-144	2785.58	696.54	97.	-2.	-0.001	646.98	1.576s
NB-94	2809.93	702.63	115.	-18.	-0.010	89.84	1.581s
SB-124	2890.57	722.79	175.	-20.	-0.011	96.12	1.598
AG-108M	2891.17	722.94	143.	-19.	-0.011	90.93	1.598s
EU-154	2892.86	723.36	124.	-9.	-0.005	174.00	1.598
ZR-95	2896.22	724.20	84.	16.	0.009	86.05	1.599s
BI-212	2908.39	727.24	10.	74.	0.041	14.95	1.209s
PM-146	2942.31	735.72	42.	-13.	-0.007	86.58	1.608s
PM-146	2988.08	747.16	56.	-11.	-0.006	147.43	1.617s
ZR-95	3026.36	756.73	30.	9.	0.005	137.89	1.625s
AG-110M	3055.23	763.94	115.	-23.	-0.013	68.00	1.631s
NB-95	3062.61	765.79	74.	16.	0.009	79.81	1.632s
PA-234M	3065.10	766.41	54.	15.	0.008	73.84	1.633s
EU-152	3115.14	778.92	45.	0.	0.000	1000.00	1.643s
BI-212	3141.15	785.42	75.	3.	0.002	411.64	1.648s
CS-134	3182.96	795.87	90.	10.	0.006	137.84	1.656
TL-210	3197.88	799.60	100.	0.	0.000	1000.00	1.659s
CS-134	3207.29	801.95	91.	7.	0.004	196.40	1.661
CO-58	3242.59	810.78	90.	-17.	-0.010	80.75	1.668s
La-140	3262.58	815.77	107.	-6.	-0.003	265.10	1.672s
Cs-136	3273.50	818.50	113.	2.	0.001	754.98	1.674s
MN-54	3338.91	834.85	35.	-1.	-0.001	863.50	1.687s
Co-56	3386.61	846.77	30.	-7.	-0.004	167.33	1.696
TL-208	3441.80	860.56	45.	9.	0.005	167.22	1.707s
NB-94	3483.94	871.10	35.	0.	0.000	1000.00	1.715s
EU-154	3492.47	873.23	32.	12.	0.007	70.53	1.717s
PA-234	3521.68	880.53	43.	12.	0.007	82.35	1.722s
PA-234	3532.53	883.24	55.	12.	0.007	91.82	1.724s
AG-110M	3538.30	884.68	67.	10.	0.006	115.67	1.725
Sc-46	3556.69	889.28	132.	-18.	-0.010	93.05	1.729
Y-88	3591.74	898.04	31.	8.	0.005	151.31	1.736
AC-228	3644.65	911.26	1.	150.	0.083	8.24	1.562

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	3749.60	937.49	45.	-15.	-0.008	101.65	1.766s
PA-234	3783.72	946.02	35.	3.	0.002	437.37	1.772s
AC-228	3876.16	969.12	24.	87.	0.048	17.38	1.539
EU-154	3985.03	996.33	81.	-20.	-0.011	67.81	1.810s
PA-234M	4003.71	1001.00	126.	-23.	-0.013	53.90	1.814s
EU-154	4018.82	1004.77	153.	8.	0.004	231.28	1.816s
Co-56	4151.13	1037.84	27.	12.	0.007	101.64	1.841s
Cs-136	4192.07	1048.07	53.	-14.	-0.008	76.74	1.848
Ga-68	4309.44	1077.40	27.	26.	0.015	48.65	1.870s
EU-152	4448.20	1112.07	111.	6.	0.004	238.78	1.895s
ZN-65	4462.09	1115.55	117.	0.	0.000	1000.00	1.897s
BI-214	4481.06	1120.29	78.	13.	0.007	101.05	1.901s
Sc-46	4482.12	1120.55	91.	16.	0.009	86.72	1.901s
Ta-182	4485.12	1121.30	131.	-12.	-0.007	141.17	1.901s
CO-60	4692.96	1173.24	27.	14.	0.008	86.05	1.938s
Ta-182	4756.25	1189.05	28.	8.	0.004	166.78	1.949s
Ta-182	4885.75	1221.41	74.	-20.	-0.011	104.80	1.972
Co-56	4953.27	1238.28	69.	2.	0.001	983.98	1.984s
NA-22	5098.35	1274.53	40.	-14.	-0.008	69.25	2.008s
FE-59	5166.65	1291.60	28.	-2.	-0.001	538.99	2.020s
TL-210	5252.32	1313.00	17.	3.	0.002	327.45	2.034s
CO-60	5330.37	1332.50	28.	-6.	-0.004	201.07	2.047s
AG-110M	5537.69	1384.30	0.	12.	0.007	28.87	2.082s
EU-152	5632.56	1408.00	11.	9.	0.005	97.22	2.097s
K-40	5844.33	1460.91	6.	655.	0.364	3.95	1.933
La-140	6385.95	1596.21	19.	-8.	-0.004	339.07	2.215s
SB-124	6765.35	1690.98	0.	7.	0.004	37.80	2.272s
BI-214	7059.65	1764.49	4.	32.	0.018	20.18	2.314s
Co-56	7087.11	1771.35	36.	0.	0.000	1000.00	2.318
Y-88	7346.20	1836.06	0.	0.	0.000	1000.00	2.354s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	3.3325E+00				5.31E+01	
			477.60	3.333E+00	?(	1.134E+01 1.01E+02 1.05E+01	G
NA-22	C	-7.1507E-01				9.50E+02	
			1274.53	-7.151E-01	?(	1.644E+00 6.93E+01 9.99E+01	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	N	3.4973E+02					4.66E+11	
			1460.83	3.497E+02	(P	7.638E+00	3.95E+00	1.07E+01 G
Sc-46	F	-6.9366E-01					8.38E+01	
			889.28	-6.937E-01	?(	2.162E+00	9.30E+01	1.00E+02 G
			1120.55	7.462E-01	+	2.168E+00	8.67E+01	1.00E+02 G
CR-51	F	3.0864E+00					2.77E+01	
			320.08	3.086E+00	?(	1.159E+01	1.12E+02	9.94E+00 G
MN-54	C	-5.2691E-02					3.12E+02	
			834.85	-5.269E-02	?(P	1.115E+00	8.63E+02	1.00E+02 G
FE-59	F	8.0312E-02					4.45E+01	
			1099.25	8.031E-02	%(	2.335E+00	1.29E+03	5.65E+01 G
			1291.60	-2.787E-01	+	3.286E+00	5.39E+02	4.32E+01 G
Co-56	C	1.9208E-01					7.73E+01	
			846.77	-2.761E-01	?(P	1.053E+00	1.67E+02	9.99E+01 G
			1238.28	1.492E-01	&(P	3.127E+00	9.84E+02	6.61E+01 G
			1037.84	3.704E+00	?(P	8.254E+00	1.02E+02	1.41E+01 G
			1771.35	0.000E+00	-	1.322E+01	1.00E+03	1.55E+01 A
CO-57	C	1.9785E-01					2.72E+02	
			122.06	1.979E-01	&(	8.272E-01	1.24E+02	8.56E+01 G
			136.47	0.000E+00	-	1.392E+01	1.00E+03	1.07E+01 G
CO-58	C	-6.2644E-01					7.09E+01	
			810.78	-6.264E-01	?(	1.689E+00	8.07E+01	9.95E+01 G
CO-60	F	1.7500E-01					1.93E+03	
			1332.50	-3.351E-01	?(	1.456E+00	2.01E+02	1.00E+02 G
			1173.24	6.855E-01	?(	1.281E+00	8.60E+01	9.99E+01 G
NB-94	I	-5.7407E-01					7.41E+06	
			702.63	-5.741E-01	?(	1.727E+00	8.98E+01	9.79E+01 G
			871.10	0.000E+00	+	1.147E+00	1.00E+03	9.99E+01 G
ZR-95	I	8.3396E-01					6.40E+01	
			756.73	5.614E-01	?(	1.761E+00	1.38E+02	5.45E+01 G
			724.20	1.170E+00	?(	3.374E+00	8.61E+01	4.42E+01 G
NB-95	I	5.5147E-01					6.40E+01	
			765.79	5.515E-01	?(	1.471E+00	7.98E+01	9.98E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RU-103	I	1.8225E-01					3.93E+01	
			497.05	1.823E-01	?(	9.127E-01	2.05E+02	9.09E+01 G
			610.30	7.440E+00	?	4.325E+01	1.73E+02	5.75E+00 GA
RH-106	I	-4.9359E+00					3.74E+02	
			621.92	-4.936E+00	&(P	2.701E+01	1.17E+02	9.93E+00 G
			1050.36	-9.354E-01	%	1.162E+02	3.53E+03	1.56E+00 G
			511.86	6.258E+00	?	5.293E+00	2.79E+01	2.00E+01 GA
AG-108M	C	8.5774E-02					1.53E+05	
			433.94	-1.909E-01	?(	9.712E-01	2.10E+02	9.05E+01 G
			722.94	-6.952E-01	+	2.114E+00	9.09E+01	9.08E+01 G
			614.28	3.644E-01	(	2.843E+00	2.31E+02	8.98E+01 G
AG-110M	F	7.8408E-01					2.50E+02	
			884.68	5.459E-01	&(	2.147E+00	1.16E+02	7.27E+01 G
			657.76	4.765E-01	?(P	1.231E+00	7.74E+01	9.46E+01 G
			937.49	-1.749E+00	+	3.960E+00	1.02E+02	3.44E+01 G
			1384.30	2.695E+00	?(	1.655E+00	2.89E+01	2.43E+01 G
			763.94	-3.590E+00	&	8.080E+00	6.80E+01	2.23E+01 G
SN-113	F	5.8034E-01					1.15E+02	
			391.69	5.803E-01	?(	1.939E+00	9.96E+01	6.40E+01 G
SB-124	F	7.0490E-02					6.02E+01	
			602.73	-3.528E-01	?(	1.496E+00	1.25E+02	9.83E+01 G
			1690.98	9.409E-01	?(	9.906E-01	3.78E+01	4.78E+01 G
			722.79	-6.079E+00	+	1.955E+01	9.61E+01	1.08E+01 G
SB-125	I	2.2795E-01					1.01E+03	
			427.88	-7.535E-01	?(	3.305E+00	1.83E+02	2.96E+01 G
			600.50	-2.621E+00	&	6.504E+00	7.45E+01	1.79E+01 G
			635.89	2.797E+00	&(	6.811E+00	7.29E+01	1.13E+01 G
			463.37	-1.353E+00	+	1.287E+01	2.78E+02	1.05E+01 G
I-131	I	2.8099E-02					8.02E+00	
			364.48	-4.873E-02	*(	1.002E+00	8.10E+02	8.17E+01 G
			284.30	0.000E+00	+	1.396E+01	1.00E+03	6.14E+00 G
			636.97	9.036E-01	*(P	1.305E+01	4.07E+02	7.17E+00 G
Gd-153	F	4.8030E-01					2.42E+02	
			97.50	4.803E-01	(	6.242E+00	3.89E+02	3.00E+01 G
			103.20	-1.552E+00	+	7.442E+00	1.44E+02	2.18E+01 G
Ga-68	C	4.1772E+01					4.71E-02	
			1077.40	4.177E+01	?(	4.247E+01	4.86E+01	3.30E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Tc-99m	I	-4.2061E-01					2.51E-01	
			140.51	-4.206E-01	?(	1.978E+00	1.41E+02	8.93E+01 G
BA-133	F	-3.2607E-01					3.85E+03	
			356.00	-3.261E-01	?(	2.998E+00	2.73E+02	6.20E+01 G
			302.85	-2.054E+00	+	1.109E+01	1.62E+02	1.83E+01 G
			383.84	3.644E+00	?	1.258E+01	1.03E+02	8.94E+00 GA
			80.99	-1.142E+00	+	5.483E+00	1.44E+02	3.41E+01 GA
CS-134	I	9.5487E-01					7.54E+02	
			795.87	4.128E-01	(	1.937E+00	1.38E+02	8.55E+01 G
			604.71	4.338E-01	(	2.473E+00	1.69E+02	9.76E+01 G
			569.32	2.737E+00	(	6.165E+00	6.80E+01	1.54E+01 G
			801.95	2.860E+00	(	1.927E+01	1.96E+02	8.69E+00 G
			563.24	7.334E+00	(P	8.999E+00	5.44E+01	8.35E+00 G
CS-137	I	-1.8728E-01					1.10E+04	
			661.66	-1.873E-01	&(P	1.610E+00	2.20E+02	8.52E+01 G
CE-139	F	-4.2818E-01					1.38E+02	
			165.85	-4.282E-01	&(	1.340E+00	9.40E+01	7.99E+01 G
Ba-140	I	1.1999E+00					1.28E+01	
			537.26	2.789E-01	?(P	3.447E+00	4.98E+02	2.44E+01 G
			162.66	4.811E+00	?(	1.535E+01	9.57E+01	6.22E+00 G
			304.85	-3.039E+00	+	4.676E+01	4.57E+02	4.29E+00 G
La-140	I	-4.8986E-01					1.28E+01	
			1596.21	-4.899E-01	?(P	1.466E+00	3.39E+02	9.54E+01 G
			487.02	-1.112E+00	&	3.638E+00	9.78E+01	4.55E+01 G
			328.76	-2.227E+00	&	1.086E+01	1.46E+02	2.03E+01 G
			815.77	-8.655E-01	+	7.882E+00	2.65E+02	2.33E+01 G
CE-141	I	-7.8574E-01					3.25E+01	
			145.44	-7.857E-01	?(	3.558E+00	1.36E+02	4.82E+01 G
PM-144	C	-6.9826E-02					3.63E+02	
			696.54	-6.983E-02	?(	1.568E+00	6.47E+02	9.90E+01 G
			618.06	0.000E+00	+	2.631E+00	1.00E+03	9.91E+01 G
EU-152	F	1.5595E+00					4.94E+03	
			121.78	5.008E-01	?(	2.943E+00	1.74E+02	2.86E+01 G
			344.29	-1.781E+00	+	8.084E+00	1.36E+02	2.65E+01 G
			1112.07	2.121E+00	&(	1.736E+01	2.39E+02	1.36E+01 G
			778.92	0.000E+00	-	9.117E+00	1.00E+03	1.29E+01 G
			964.11	-4.671E-02	%	1.729E+01	1.07E+04	1.46E+01 G
			244.69	4.540E+00	?(P	2.845E+01	1.88E+02	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	2.282E+00	?	4.845E+00	9.72E+01	2.10E+01 GA
EU-154	I	1.1375E+00					3.14E+03	
			123.10	4.287E-02	%(	1.932E+00	1.32E+03	4.08E+01 G
			1274.54	4.835E-02	%	5.345E+00	3.11E+03	3.52E+01 G
			723.36	-1.498E+00	+	8.873E+00	1.74E+02	2.02E+01 G
			873.23	3.811E+00	?(	8.939E+00	7.05E+01	1.23E+01 G
			1004.77	1.796E+00	&(	1.415E+01	2.31E+02	1.80E+01 G
			996.33	-7.888E+00	+	1.771E+01	6.78E+01	1.06E+01 G
EU-155	I	-2.5498E-02					1.81E+03	
			105.31	-2.550E-02	%(P	7.786E+00	7.24E+03	2.12E+01 G
			86.54	-1.171E+00	&	6.949E+00	1.78E+02	3.07E+01 G
HF-181	F	-1.3978E-01					4.24E+01	
			482.00	-5.861E-01	?(	1.853E+00	9.45E+01	8.05E+01 G
			133.02	6.900E-01	?(	3.346E+00	1.45E+02	4.33E+01 G
			345.83	-3.145E+00	&	1.394E+01	1.33E+02	1.51E+01 G
			136.30	0.000E+00	+	2.539E+01	1.00E+03	5.85E+00 G
Ta-182	F	-3.3144E-01					1.14E+02	
			1121.30	-1.546E+00	?(	7.394E+00	1.41E+02	3.49E+01 G
			1221.41	-3.594E+00	+	7.804E+00	1.05E+02	2.70E+01 G
			1189.05	2.285E+00	?(	8.202E+00	1.67E+02	1.62E+01 G
Hg-203	F	-5.1538E-01					4.66E+01	
			279.20	-5.154E-01	?(	1.501E+00	8.74E+01	8.15E+01 G
TL-208	N	6.9782E+00					6.98E+02	
			583.02	6.978E+00	@(P	7.042E-01	7.93E+00	8.45E+01 G
			277.28	1.232E+01	+	9.030E+00	2.51E+01	6.31E+00 G
			860.56	2.716E+00	&	1.025E+01	1.67E+02	1.24E+01 G
PM-146	C	1.1468E-01					2.02E+03	
			453.88	1.147E-01	?(P	1.250E+00	4.44E+02	6.50E+01 G
			747.16	-1.088E+00	&	3.719E+00	1.47E+02	3.40E+01 G
			735.72	-1.957E+00	+ P	4.877E+00	8.66E+01	2.25E+01 G
Y-88	F	1.6522E-01					1.07E+02	
			1836.06	0.000E+00	?(	5.109E-01	1.00E+03	9.92E+01 G
			898.04	3.401E-01	(P	1.181E+00	1.51E+02	9.37E+01 G
Cd-113m		-4.5997E+03					5.33E+03	
			263.70	-4.600E+03	?(	1.573E+04	1.02E+02	6.00E-03 K
Cf-251	T	-1.8786E+00					3.28E+05	
			176.60	-1.879E+00	&(	5.414E+00	8.65E+01	1.70E+01 G
			227.00	-3.885E+00	+	1.442E+01	1.51E+02	6.30E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cf-249	T	-6.4378E-01					1.28E+05	
			387.95	-6.438E-01	?(	2.116E+00	9.82E+01	6.60E+01 G
			333.44	-2.953E+00	+	1.408E+01	1.43E+02	1.55E+01 G
Sn-126		-1.5069E+00					3.65E+07	
			87.57	-9.541E-01	}	5.254E+00	1.66E+02	3.75E+01 GA
			64.28	-1.507E+00	&(	1.582E+01	3.12E+02	9.70E+00 G
			86.94	-3.969E+00	}	2.282E+01	1.73E+02	9.04E+00 GA
PB-210	N	4.5659E+00					8.14E+03	
			46.54	4.566E+00	*(	4.648E+01	3.02E+02	4.25E+00 G
PB-212	N	1.9011E+01					6.98E+02	
			238.63	1.901E+01	(P	1.662E+00	4.94E+00	4.33E+01 G
			300.03	2.260E+01	+	1.862E+01	2.77E+01	3.28E+00 GA
PB-214	N	1.2955E+01					5.84E+05	
			351.93	1.295E+01	(P	2.323E+00	1.03E+01	3.76E+01 G
			295.09	1.068E+01	- P	3.148E+00	1.24E+01	1.93E+01 G
			242.00	1.278E+01		1.082E+01	2.74E+01	7.43E+00 GA
BI-207	C	5.5920E-02					1.18E+04	
			1063.66	5.592E-02	%(P	1.867E+00	1.48E+03	7.45E+01 G
			569.70	-3.137E-01	+	1.234E+00	1.16E+02	9.77E+01 G
BI-212	N	3.2086E+01					6.98E+02	
			727.17	3.209E+01	(	7.775E+00	1.50E+01	7.55E+00 G
			785.42	8.207E+00	- P	1.176E+02	4.12E+02	1.28E+00 GA
U-235	N	-3.3681E+00					2.57E+11	
			143.79	-3.368E+00	&(	1.555E+01	1.39E+02	1.10E+01 G
			205.33	-4.821E+00	& P	1.740E+01	2.09E+02	5.01E+00 G
			163.38	7.574E-01	&	1.966E+01	7.64E+02	5.08E+00 G
			185.72	1.527E+00	+	1.382E+00	3.68E+01	5.40E+01 GA
BI-214	N	1.1387E+01					5.84E+05	
			609.31	1.063E+01	*(P	2.022E+00	1.15E+01	4.61E+01 G
			1120.29	3.923E+00	- P	1.335E+01	1.01E+02	1.51E+01 G
			1764.49	1.366E+01	?(P	5.390E+00	2.02E+01	1.54E+01 G
BI-210M	T	9.3262E-01					1.10E+09	
			265.83	9.776E-01	(P	9.103E-01	3.69E+01	5.00E+01 G
			304.90	8.523E-01	(	1.912E+00	6.77E+01	2.80E+01 G
AC-228	N	2.0764E+01					2.10E+03	
			911.07	2.024E+01	(P	1.045E+00	8.24E+00	2.90E+01 G
			968.97	2.044E+01	(	6.030E+00	1.74E+01	1.75E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			338.32	2.250E+01	(	5.290E+00	1.31E+01	1.20E+01 G
			93.35	6.154E+00	& P	2.408E+01	1.18E+02	5.56E+00 XA
TH-227	N	-1.1154E+00					7.95E+03	
			256.24	-1.115E+00	&(	1.273E+01	4.59E+02	7.00E+00 G
			235.97	-3.107E+00	+	1.832E+01	1.77E+02	1.23E+01 G
			50.14	-2.395E+00	+	2.101E+01	2.60E+02	8.00E+00 G
TH-229	N	3.7856E-01					2.68E+06	
			193.51	-5.597E+00	&(	1.921E+01	1.40E+02	4.40E+00 G
			210.85	9.171E+00	?(	2.991E+01	1.33E+02	2.99E+00 G
TH-234	N	7.8890E+00					1.63E+12	
			92.59	6.345E+00	*(P	2.380E+01	1.13E+02	5.58E+00 G
			63.29	1.015E+01	?(	3.875E+01	1.14E+02	3.81E+00 G
PA-231	N	-1.3063E+01					1.20E+07	
			302.65	-1.306E+01	?(	7.180E+01	1.64E+02	2.88E+00 G
			300.07	-1.518E+01	+	8.637E+01	1.70E+02	2.46E+00 G
PA-233	C	-1.0525E+00					7.82E+08	
			312.01	-1.053E+00	&(P	3.307E+00	7.01E+01	3.60E+01 G
			300.18	-6.023E+00	+	3.373E+01	1.68E+02	6.20E+00 G
PA-234	N	2.1429E+00					1.63E+12	
			131.29	1.660E+00	?(	7.881E+00	1.42E+02	1.80E+01 G
			946.02	9.031E-01	?(	9.115E+00	4.37E+02	1.34E+01 G
			569.47	0.000E+00	-	1.319E+01	1.00E+03	8.20E+00 G
			883.24	4.778E+00	?(	1.480E+01	9.18E+01	9.60E+00 G
			880.53	7.617E+00	?	2.108E+01	8.24E+01	6.00E+00 GA
PA-234M	N	-1.1557E+02					1.63E+12	
			1001.00	-1.156E+02	?(P	2.772E+02	5.39E+01	8.37E-01 G
			766.41	1.752E+02	+	4.311E+02	7.38E+01	2.94E-01 G
AM-241	T	8.3860E-01					1.58E+05	
			59.54	8.386E-01	(	4.717E+00	1.68E+02	3.59E+01 G
Ir-192	F	-1.2568E-01					7.40E+01	
			316.49	-1.257E-01	?(	1.451E+00	3.39E+02	8.70E+01 G
			468.06	6.896E-02	%	2.600E+00	1.09E+03	5.18E+01 G
			308.44	-4.259E-07	%	6.329E+00	4.40E+08	3.18E+01 G
Cs-136	F	7.2141E-02					1.30E+01	
			818.50	7.214E-02	(	1.885E+00	7.55E+02	1.00E+02 G
			1048.07	-7.830E-01	+	2.007E+00	7.67E+01	8.00E+01 G
			340.57	-9.963E-01	+	4.631E+00	1.39E+02	4.69E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Np-239   T   1.2417E+00                                      2.36E+00
                          103.70-5.106E-01 -   6.855E+00 4.01E+02 2.40E+01 X
                          106.13 1.242E+00  (  4.506E+00 1.09E+02 2.27E+01 G
                           99.50-1.342E-07 &   1.236E+01 2.75E+09 1.50E+01 X

Nd-147       3.3434E-01                                      1.11E+01
                          531.00 3.343E-01 &(  6.697E+00 8.10E+02 1.30E+01 G
                           91.10-7.015E-01 +   6.768E+00 2.89E+02 2.83E+01 G

Kr-85    I   9.2687E+01                                      3.92E+03
                          513.98 9.269E+01 ?(  3.175E+02 1.02E+02 4.30E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	364.	9.	0.005	301.64	4.566E+00	
TH-227	50.14	333.	-10.	-0.006	260.00	-2.395E+00	
AM-241	59.54	545.	20.	0.011	168.05	8.386E-01	
TH-234	63.29	474.	27.	0.015	114.43	1.015E+01	
Sn-126	64.28	531.	-10.	-0.006	312.36	-1.507E+00	
BA-133	80.99	1174.	-34.	-0.019	144.34	-1.142E+00	
EU-155	86.54	1657.	-32.	-0.018	178.43	-1.171E+00	
Sn-126	86.94	1555.	-32.	-0.018	172.87	-3.969E+00	
Sn-126	87.57	1426.	-32.	-0.018	165.51	-9.541E-01	
Nd-147	91.10	1393.	-18.	-0.010	289.23	-7.015E-01	
TH-234	92.59	670.	33.	0.018	112.69	6.345E+00	P
Np-239	103.70	1098.	-12.	-0.007	401.48	-5.106E-01	
Np-239	106.13	418.	27.	0.015	108.80	1.242E+00	
EU-152	121.78	277.	14.	0.008	174.44	5.008E-01	
CO-57	122.06	194.	16.	0.009	124.30	1.979E-01	
PA-234	131.29	784.	28.	0.016	142.36	1.660E+00	
HF-181	133.02	812.	28.	0.016	145.49	6.900E-01	
Tc-99m	140.51	1096.	-33.	-0.019	141.29	-4.206E-01	
U-235	143.79	1063.	-33.	-0.019	138.77	-3.368E+00	
CE-141	145.44	1064.	-34.	-0.019	136.10	-7.857E-01	
Ba-140	162.66	280.	25.	0.014	95.68	4.811E+00	
U-235	163.38	305.	3.	0.002	764.44	7.574E-01	
CE-139	165.85	361.	-29.	-0.016	93.97	-4.282E-01	
Cf-251	176.60	243.	-26.	-0.015	86.55	-1.879E+00	
U-235	185.72	147.	65.	0.036	36.82	1.527E+00	
TH-229	193.51	180.	-19.	-0.011	140.14	-5.597E+00	
U-235	205.33	177.	-18.	-0.010	209.14	-4.821E+00	P
TH-229	210.85	180.	20.	0.011	133.23	9.171E+00	
Cf-251	227.00	168.	-17.	-0.009	151.23	-3.885E+00	
TH-227	235.97	1033.	-26.	-0.014	176.87	-3.107E+00	
EU-152	244.69	899.	23.	0.013	187.72	4.540E+00	P
TH-227	256.24	136.	-5.	-0.003	458.84	-1.115E+00	
Cd-113m	263.70	147.	-17.	-0.010	101.90	-4.600E+03	
Hg-203	279.20	233.	-25.	-0.014	87.43	-5.154E-01	
TL-210	296.00	679.	-21.	-0.012	173.51	-4.667E-01	
PA-231	300.07	657.	-21.	-0.012	170.27	-1.518E+01	
PA-233	300.18	636.	-21.	-0.012	167.51	-6.023E+00	
PA-231	302.65	614.	-22.	-0.012	164.41	-1.306E+01	
BA-133	302.85	593.	-22.	-0.012	161.53	-2.054E+00	
Ba-140	304.85	571.	-7.	-0.004	457.39	-3.039E+00	
PA-233	312.01	188.	-21.	-0.012	70.06	-1.053E+00	P
Ir-192	316.49	209.	-6.	-0.003	339.27	-1.257E-01	
CR-51	320.08	169.	17.	0.009	111.75	3.086E+00	
La-140	328.76	624.	-24.	-0.014	146.10	-2.227E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-249	333.44	599.	-24.	-0.014	142.79	-2.953E+00	
Cs-136	340.57	575.	-25.	-0.014	139.19	-9.963E-01	
EU-152	344.29	550.	-25.	-0.014	135.89	-1.781E+00	
HF-181	345.83	525.	-25.	-0.014	132.73	-3.145E+00	
BA-133	356.00	392.	-10.	-0.006	272.86	-3.261E-01	
I-131	364.48	68.	-2.	-0.001	810.35	-4.873E-02	
BA-133	383.84	123.	16.	0.009	102.67	3.644E+00	
Cf-249	387.95	191.	-20.	-0.011	98.24	-6.438E-01	
AG-108M	433.94	61.	-8.	-0.004	210.50	-1.909E-01	
PM-146	453.88	48.	3.	0.002	443.95	1.147E-01	P
BE-7	477.60	100.	15.	0.008	101.09	3.333E+00	
HF-181	482.00	159.	-19.	-0.011	94.48	-5.861E-01	
La-140	487.02	194.	-21.	-0.011	97.84	-1.112E+00	
RU-103	497.05	43.	7.	0.004	205.24	1.823E-01	
RH-106	511.86	70.	49.	0.027	27.91	6.258E+00	
Kr-85	513.98	119.	16.	0.009	101.87	9.269E+01	
Nd-147	531.00	43.	2.	0.001	809.94	3.343E-01	
Ba-140	537.26	39.	3.	0.001	498.25	2.789E-01	P
CS-134	563.24	29.	22.	0.012	54.40	7.334E+00	P
CS-134	569.32	47.	15.	0.009	67.98	2.737E+00	
BI-207	569.70	78.	-11.	-0.006	115.90	-3.137E-01	
CS-134	604.71	305.	15.	0.008	169.44	4.338E-01	
RU-103	610.30	320.	15.	0.008	172.84	7.440E+00	
AG-108M	614.28	335.	11.	0.006	231.41	3.644E-01	
RH-106	621.92	363.	-17.	-0.009	117.07	-4.936E+00	P
I-131	636.97	38.	2.	0.001	406.72	9.036E-01	P
AG-110M	657.76	58.	15.	0.008	77.40	4.765E-01	P
CS-137	661.66	81.	-5.	-0.003	219.90	-1.873E-01	P
PM-144	696.54	97.	-2.	-0.001	646.98	-6.983E-02	
NB-94	702.63	115.	-18.	-0.010	89.84	-5.741E-01	
AG-108M	722.94	143.	-19.	-0.011	90.93	-6.952E-01	
ZR-95	724.20	84.	16.	0.009	86.05	1.170E+00	
PM-146	735.72	42.	-13.	-0.007	86.58	-1.957E+00	P
PM-146	747.16	56.	-11.	-0.006	147.43	-1.088E+00	
ZR-95	756.73	30.	9.	0.005	137.89	5.614E-01	
AG-110M	763.94	115.	-23.	-0.013	68.00	-3.590E+00	
PA-234M	766.41	54.	15.	0.008	73.84	1.752E+02	
CS-134	795.87	90.	10.	0.006	137.84	4.128E-01	
CS-134	801.95	91.	7.	0.004	196.40	2.860E+00	
CO-58	810.78	90.	-17.	-0.010	80.75	-6.264E-01	
La-140	815.77	107.	-6.	-0.003	265.10	-8.655E-01	
Cs-136	818.50	113.	2.	0.001	754.98	7.214E-02	
MN-54	834.85	35.	-1.	-0.001	863.50	-5.269E-02	P
Co-56	846.77	30.	-7.	-0.004	167.33	-2.761E-01	P
PA-234	880.53	43.	12.	0.007	82.35	7.617E+00	
PA-234	883.24	55.	12.	0.007	91.82	4.778E+00	
AG-110M	884.68	67.	10.	0.006	115.67	5.459E-01	
Sc-46	889.28	132.	-18.	-0.010	93.05	-6.937E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Y-88	898.04	31.	8.	0.005	151.31	3.401E-01		P
AG-110M	937.49	45.	-15.	-0.008	101.65	-1.749E+00		
PA-234	946.02	35.	3.	0.002	437.37	9.031E-01		
PA-234M	1001.00	126.	-23.	-0.013	53.90	-1.156E+02		P
Co-56	1037.84	27.	12.	0.007	101.64	3.704E+00		P
Cs-136	1048.07	53.	-14.	-0.008	76.74	-7.830E-01		
Ga-68	1077.40	27.	26.	0.015	48.65	4.177E+01		
EU-152	1112.07	111.	6.	0.004	238.78	2.121E+00		
Sc-46	1120.55	91.	16.	0.009	86.72	7.462E-01		
CO-60	1173.24	27.	14.	0.008	86.05	6.855E-01		
Co-56	1238.28	69.	2.	0.001	983.98	1.492E-01		P
NA-22	1274.53	40.	-14.	-0.008	69.25	-7.151E-01		
FE-59	1291.60	28.	-2.	-0.001	538.99	-2.787E-01		
TL-210	1313.00	17.	3.	0.002	327.45	7.468E-01		
CO-60	1332.50	28.	-6.	-0.004	201.07	-3.351E-01		
AG-110M	1384.30	0.	12.	0.007	28.87	2.695E+00		
EU-152	1408.00	11.	9.	0.005	97.22	2.282E+00		
La-140	1596.21	19.	-8.	-0.004	339.07	-4.899E-01		P

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma MDA Bq/Sample
BE-7	#A	3.3325E+00	3.3325E+00	1.011E+02%	1.13E+01
NA-22	#A	-7.1507E-01	-7.1507E-01	6.925E+01%	1.64E+00
K-40		3.4973E+02	3.4973E+02	3.946E+00%	7.64E+00
Sc-46	#A	-6.9365E-01	-6.9366E-01	9.305E+01%	2.16E+00
CR-51	#A	3.0863E+00	3.0864E+00	1.118E+02%	1.16E+01
MN-54	#A	-5.2691E-02	-5.2691E-02	8.635E+02%	1.12E+00
FE-59	#A	8.0311E-02	8.0312E-02	1.290E+03%	2.33E+00
Co-56	#A	1.9208E-01	1.9208E-01	1.016E+02%	1.05E+00
CO-57	#A	1.9785E-01	1.9785E-01	1.243E+02%	8.27E-01
CO-58	#A	-6.2644E-01	-6.2644E-01	8.075E+01%	1.69E+00
CO-60	#A	1.7500E-01	1.7500E-01	8.605E+01%	1.46E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.82E+00
NB-94	#A	-5.7407E-01	-5.7407E-01	8.984E+01%	1.73E+00
ZR-95	#A	8.3395E-01	8.3396E-01	8.127E+01%	1.76E+00
NB-95	#A	5.5147E-01	5.5147E-01	7.981E+01%	1.47E+00
RU-103	#A	1.8225E-01	1.8225E-01	2.052E+02%	9.13E-01
RH-106	#A	-4.9358E+00	-4.9359E+00	1.171E+02%	2.70E+01
AG-108M	#A	8.5774E-02	8.5774E-02	1.564E+02%	9.71E-01
AG-110M	#A	7.8408E-01	7.8408E-01	2.887E+01%	2.15E+00
SN-113	#A	5.8034E-01	5.8034E-01	9.961E+01%	1.94E+00
SB-124	#A	7.0489E-02	7.0490E-02	3.780E+01%	1.50E+00
SB-125	#A	2.2795E-01	2.2795E-01	7.294E+01%	3.31E+00

I-131	#A	2.8097E-02	2.8099E-02	4.067E+02%	1.00E+00
Gd-153	A	4.8030E-01	4.8030E-01	3.893E+02%	6.24E+00
Ga-68	#A	4.1397E+01	4.1772E+01	4.865E+01%	4.25E+01
Tc-99m	#A	-4.1989E-01	-4.2061E-01	1.413E+02%	1.98E+00
BA-133	#A	-3.2607E-01	-3.2607E-01	2.729E+02%	3.00E+00
CS-134	#A	9.5487E-01	9.5487E-01	5.440E+01%	1.94E+00
CS-137	#A	-1.8728E-01	-1.8728E-01	2.199E+02%	1.61E+00
CE-139	#A	-4.2818E-01	-4.2818E-01	9.397E+01%	1.34E+00
Ba-140	#A	1.1998E+00	1.1999E+00	9.568E+01%	3.45E+00
La-140	#A	-4.8984E-01	-4.8986E-01	3.391E+02%	1.47E+00
CE-141	#A	-7.8573E-01	-7.8574E-01	1.361E+02%	3.56E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.33E+01
PM-144	#A	-6.9826E-02	-6.9826E-02	6.470E+02%	1.57E+00
EU-152	#A	1.5595E+00	1.5595E+00	1.168E+02%	2.94E+00
EU-154	#A	1.1375E+00	1.1375E+00	7.053E+01%	1.93E+00
EU-155	#A	-2.5498E-02	-2.5498E-02	7.239E+03%	7.79E+00
HF-181	#A	-1.3978E-01	-1.3978E-01	8.674E+01%	1.85E+00
Ta-182	#A	-3.3144E-01	-3.3144E-01	1.093E+02%	7.39E+00
Hg-203	#A	-5.1537E-01	-5.1538E-01	8.743E+01%	1.50E+00
TL-208		6.9782E+00	6.9782E+00	7.928E+00%	7.04E-01
PM-146	#A	1.1468E-01	1.1468E-01	4.440E+02%	1.25E+00
Y-88	#A	1.6522E-01	1.6522E-01	1.513E+02%	5.11E-01
Cd-113m	#A	-4.5997E+03	-4.5997E+03	1.019E+02%	1.57E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.36E+01
Cf-251	#A	-1.8786E+00	-1.8786E+00	8.655E+01%	5.41E+00
Cf-249	#A	-6.4378E-01	-6.4378E-01	9.824E+01%	2.12E+00
Sn-126	#A	-1.5069E+00	-1.5069E+00	3.124E+02%	1.58E+01
PB-210	#A	4.5659E+00	4.5659E+00	3.016E+02%	4.65E+01
PB-212		1.9011E+01	1.9011E+01	4.938E+00%	1.66E+00
PB-214		1.2955E+01	1.2955E+01	1.026E+01%	2.32E+00
BI-207	#A	5.5920E-02	5.5920E-02	1.483E+03%	1.87E+00
BI-212		3.2086E+01	3.2086E+01	1.495E+01%	7.78E+00
U-235	#A	-3.3681E+00	-3.3681E+00	1.388E+02%	1.56E+01
BI-214	#	1.1387E+01	1.1387E+01	1.150E+01%	2.02E+00
BI-210M		9.3262E-01	9.3262E-01	3.692E+01%	9.10E-01
AC-228		2.0764E+01	2.0764E+01	7.748E+00%	1.04E+00
TH-227	#A	-1.1154E+00	-1.1154E+00	4.588E+02%	1.27E+01
TH-229	#A	3.7856E-01	3.7856E-01	9.668E+01%	1.92E+01
TH-234	#A	7.8890E+00	7.8890E+00	8.030E+01%	2.38E+01
PA-231	#A	-1.3063E+01	-1.3063E+01	1.644E+02%	7.18E+01
PA-233	#A	-1.0525E+00	-1.0525E+00	7.006E+01%	3.31E+00
PA-234	#A	2.1429E+00	2.1429E+00	9.182E+01%	7.88E+00
PA-234M	#A	-1.1557E+02	-1.1557E+02	5.390E+01%	2.77E+02
AM-241	#A	8.3860E-01	8.3860E-01	1.681E+02%	4.72E+00
Np-237	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.57E+01
Ir-192	#A	-1.2568E-01	-1.2568E-01	3.393E+02%	1.45E+00
Cs-136	#A	7.2138E-02	7.2141E-02	7.550E+02%	1.88E+00
Np-239	#A	1.2415E+00	1.2417E+00	1.088E+02%	4.51E+00
Nd-147	#A	3.3433E-01	3.3434E-01	8.099E+02%	6.70E+00

TL-210 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.77E+00
Kr-85 #A	9.2687E+01	9.2687E+01	1.019E+02%		3.17E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.3 keV) 4.538E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 4.5384412E+02 Bq/Sample

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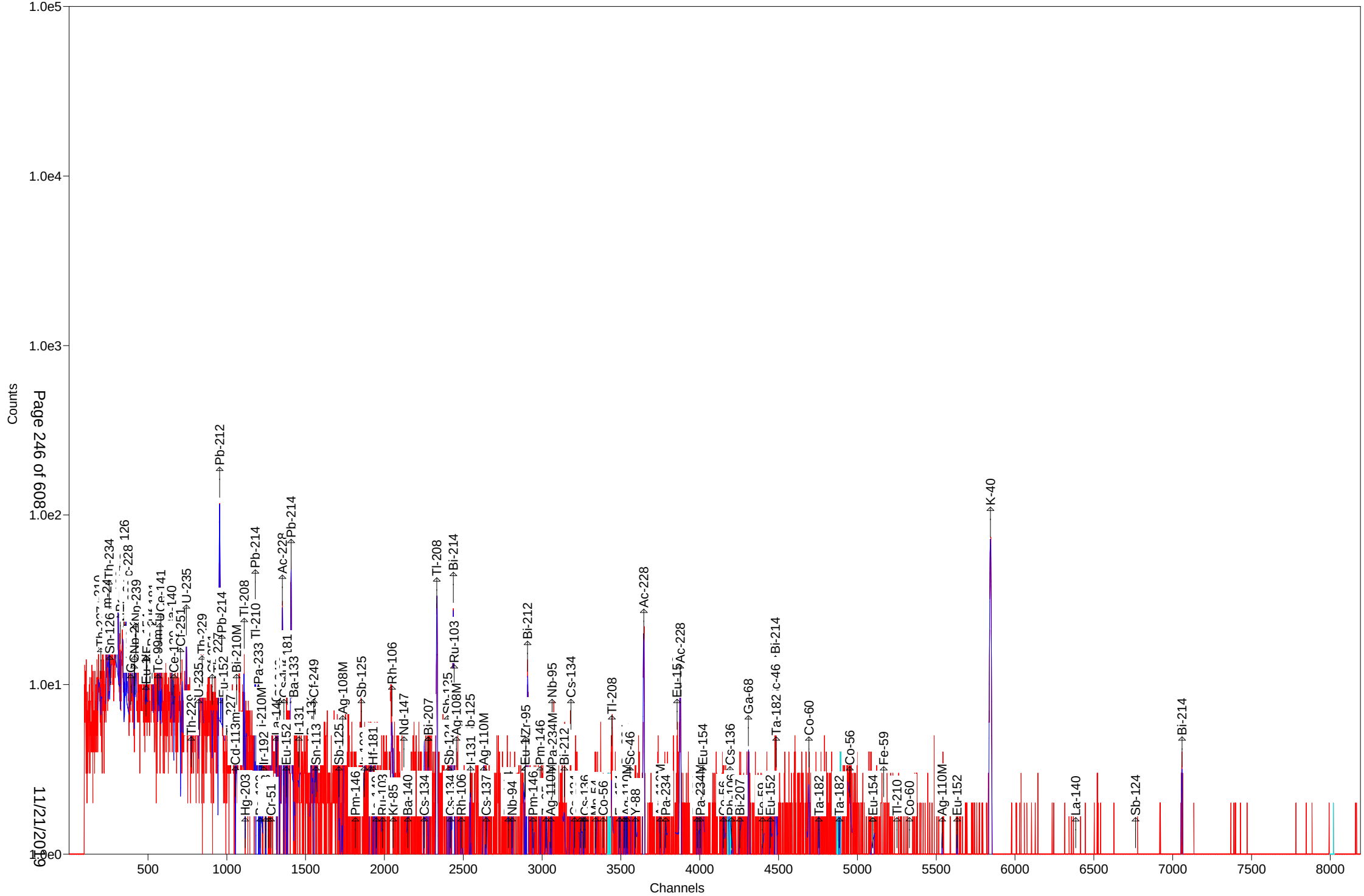
445369_Gamma_180-96595-A-1-B. 9_Gamma_20193115.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20192836

Sample Description: 445369_Gamma_180-96595-A-2-B
Detector: Detector # 5
Batch ID: 445369
Work Order Number: Gamma
Lot Number: 180-96595-A-2-B

Decay to Time: 10/31/2019 02:25 Live Time: 1800 sec
Acquisition Time: 10/31/2019 02:25:50 Real Time: 1807 sec
Analysis Time: 10/31/2019 02:56 Dead Time: 0.40 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 5_2019-10-06_1911.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	4.188E+00	109.3	4.579E+00	4.584E+00	1.556E+01
NA-22	3.237E-01	149.0	4.823E-01	4.825E-01	1.741E+00
K-40	3.612E+02	5.3	1.920E+01	2.665E+01	7.519E+00
Sc-46	-6.575E-01	121.2	7.971E-01	7.978E-01	2.721E+00
CR-51	-5.198E+00	152.4	7.924E+00	7.928E+00	1.803E+01
MN-54	4.911E-01	97.7	4.796E-01	4.803E-01	1.163E+00
FE-59	-1.062E+00	176.1	1.870E+00	1.871E+00	4.282E+00
Co-56	1.073E+00	48.8	5.238E-01	5.267E-01	1.172E+00
CO-57	1.655E-01	389.0	6.437E-01	6.437E-01	1.297E+00
CO-58	-1.245E+00	88.0	1.096E+00	1.098E+00	3.666E+00
CO-60	-1.773E+00	48.9	8.672E-01	8.718E-01	3.159E+00
ZN-65	-1.020E+00	220.4	2.248E+00	2.248E+00	7.741E+00
NB-94	-1.804E-01	428.8	7.735E-01	7.736E-01	1.913E+00
ZR-95	1.031E+00	82.9	8.546E-01	8.563E-01	2.586E+00
NB-95	8.453E-02	722.0	6.103E-01	6.103E-01	2.168E+00
RU-103	1.906E-01	319.3	6.086E-01	6.086E-01	1.562E+00
RH-106	-6.557E+00	188.5	1.236E+01	1.237E+01	4.171E+01
AG-108M	4.731E-01	95.5	4.519E-01	4.526E-01	1.339E+00
AG-110M	3.464E-01	101.2	3.505E-01	3.510E-01	3.371E+00
SN-113	7.652E-01	112.3	8.594E-01	8.603E-01	2.901E+00
SB-124	8.790E-01	105.5	9.273E-01	9.284E-01	3.890E+00
SB-125	1.692E+00	64.1	1.086E+00	1.089E+00	4.427E+00
I-131	3.865E-01	114.5	4.427E-01	4.432E-01	1.172E+00
Gd-153	1.088E+00	82.0	8.921E-01	8.946E-01	3.520E+00
Ga-68	-3.889E+01	110.5	4.297E+01	4.303E+01	9.628E+01
Tc-99m	6.612E-01	39.5	2.612E-01	2.639E-01	6.694E-01
BA-133	-7.907E-01	161.8	1.279E+00	1.280E+00	4.306E+00
CS-134	4.738E-01	147.4	6.984E-01	6.988E-01	1.675E+00
CS-137	-8.737E-01	66.4	5.801E-01	5.818E-01	2.763E+00
CE-139	-4.476E-01	114.0	5.102E-01	5.120E-01	1.709E+00
Ba-140	-3.538E-01	90.8	3.211E-01	3.216E-01	6.207E+00
La-140	2.882E-01	99.1	2.856E-01	2.861E-01	9.063E-01
CE-141	5.991E-01	127.1	7.615E-01	7.621E-01	2.558E+00

CE-144	-2.053E+00	213.0	4.372E+00	4.374E+00	1.469E+01
PM-144	-5.999E-02	878.0	5.267E-01	5.267E-01	1.692E+00
EU-152	1.204E+00	87.6	1.054E+00	1.056E+00	4.116E+00
EU-154	1.255E+00	66.1	8.300E-01	8.326E-01	2.865E+00
EU-155	-1.534E+00	151.5	2.323E+00	2.324E+00	7.771E+00
HF-181	5.492E-01	104.2	5.722E-01	5.729E-01	1.944E+00
Ta-182	2.774E+00	87.4	2.425E+00	2.429E+00	1.050E+01
Hg-203	-6.272E-01	101.0	6.338E-01	6.348E-01	2.124E+00
TL-208	8.011E+00	11.1	8.891E-01	9.814E-01	1.326E+00
PM-146	3.474E-01	183.3	6.369E-01	6.371E-01	2.039E+00
Y-88	1.434E-01	361.4	5.183E-01	5.184E-01	1.880E+00
Cd-113m	2.891E+02	2138.9	6.184E+03	6.184E+03	2.152E+04
Cd-109	-1.061E+01	152.2	1.616E+01	1.617E+01	5.393E+01
Cf-251	-2.215E+00	104.3	2.311E+00	2.319E+00	6.209E+00
Cf-249	0.000E+00	1.#INF	4.414E-01	4.414E-01	3.100E+00
Sn-126	-5.606E-01	853.2	4.784E+00	4.784E+00	1.629E+01
PB-210	3.202E+00	440.4	1.410E+01	1.410E+01	4.125E+01
PB-212	2.259E+01	5.4	1.220E+00	1.904E+00	1.759E+00
PB-214	1.414E+01	9.8	1.384E+00	1.567E+00	2.355E+00
BI-207	7.616E-01	40.6	3.089E-01	3.113E-01	8.245E-01
BI-212	-5.598E+00	183.0	1.024E+01	1.025E+01	3.519E+01
U-235	1.265E+00	89.1	1.128E+00	1.130E+00	1.248E+01
BI-214	1.243E+01	14.6	1.819E+00	1.930E+00	3.032E+00
BI-210M	-8.780E-01	105.8	9.287E-01	9.302E-01	2.393E+00
AC-228	2.266E+01	8.5	1.931E+00	2.250E+00	3.896E+00
TH-227	5.400E+00	76.4	4.127E+00	4.140E+00	1.434E+01
TH-229	3.084E+00	156.9	4.838E+00	4.845E+00	2.151E+01
TH-234	-1.264E+01	49.7	6.279E+00	6.318E+00	2.676E+01
PA-231	0.000E+00	1.#INF	8.595E+00	8.595E+00	9.205E+01
PA-233	1.348E+00	158.9	2.141E+00	2.142E+00	7.193E+00
PA-234	-6.785E-01	128.2	8.697E-01	8.704E-01	8.544E+00
PA-234M	9.751E+01	79.7	7.767E+01	7.783E+01	2.721E+02
AM-241	-1.606E-01	865.3	1.390E+00	1.390E+00	4.034E+00
Np-237	-2.984E+00	161.8	4.827E+00	4.830E+00	1.611E+01
Ir-192	-5.043E-01	105.8	5.338E-01	5.346E-01	1.798E+00
Cs-136	-1.205E+00	96.0	1.157E+00	1.159E+00	3.876E+00
Np-239	-1.433E+00	146.9	2.105E+00	2.106E+00	7.042E+00
Nd-147	-3.583E+00	121.7	4.359E+00	4.364E+00	1.099E+01
TL-210	4.823E-01	96.9	4.671E-01	4.679E-01	1.602E+00
Kr-85	1.014E+02	157.6	1.597E+02	1.599E+02	5.438E+02
Total	9.660E+02				

Analyst: Justin Banner

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Sample description
445369_Gamma_180-96595-A-2-B

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20192836.An1

Acquisition information

Start time:	10/31/2019 2:25:50 AM
Live time:	1800
Real time:	1807
Dead time:	0.40 %
Detector ID:	5

Detector system
Ge 5 SN/157

Calibration

Filename:	5_Soil_TunaCan.Clb

5_Soil_TunaCan_90099_032612

Energy Calibration

Created:	2/28/2012 7:35:48 PM
Zero offset:	0.158 keV
Gain:	0.250 keV/channel
Quadratic:	3.911E-08 keV/channel^2

Efficiency Calibration

Created:	3/27/2012 5:20:37 PM
Knee Energy:	165.85 keV
Above the Knee:	Quadratic Uncertainty = 0.87 %
Log(Eff):	6.466115E-01 + (-7.830454E-01*Log(E)) + (-4.117504E-03*Log(E)^2)
Below the Knee:	Quadratic Uncertainty = 1.43 %
Log(Eff):	-2.462251E+01 + (9.075211E+00*Log(E)) + (-9.664422E-01*Log(E)^2)

Library Files

Main analysis library:	Client_Long_Rev15.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	150 (37.62keV)
Stop channel:	8000 (2000.81keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 2:25:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-10-06_1911.PBC 10/6/2019 7:11:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1871

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.54	4.	440.43	0.78	1.788E-02	46.54	4.250	PBC<MDA	PB210
50.14	16.	109.33	0.79	2.012E-02	50.14	8.000	PBC<MDA	TH227
59.54	-3.	865.35	0.80	2.533E-02	59.54	35.900	PBC<MDA	AM241
63.43	30.	58.87	1.50	2.719E-02	63.29	3.810	PBC<MDA	TH234
74.74	152.	12.80	0.81	3.149E-02				
77.08	222.	9.54	0.81	3.218E-02				
92.80	25.	101.74	0.83	3.536E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	6.937E+00	AC228
97.50	18.	113.00	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
103.20	19.	118.89	0.84	3.612E-02	103.20	21.800	PBC<MDA	Gd153
103.70	10.	223.57	0.84	3.614E-02	103.70	24.000	PBC<MDA	Np239
122.06	2.	838.57	0.86	3.582E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	4.530E-02	CO57
136.47	8.	389.00	0.88	3.457E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.129E+00	CO57
140.58	35.	39.50	0.33	3.411E-02	140.51	89.300	PBC<MDA	Tc99m
145.44	17.	127.10	0.88	3.351E-02	145.44	48.200	PBC<MDA	CE141
162.66	18.	113.60	0.90	3.113E-02	162.66	6.220	PBC<MDA	Ba140
163.38	18.	119.02	0.90	3.102E-02	163.38	5.080	PBC<MDA	U235
185.72	40.	53.24	0.93	2.854E-02	185.72	54.000	PBC<MDA	U235
205.33	10.	193.25	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
210.85	12.	156.89	0.95	2.569E-02	210.85	2.990	PBC<MDA	TH229

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
227.00	11.	147.80	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
238.45	391.	6.55	0.64	2.321E-02	238.63	43.300	2.163E+01	PB212
241.86	38.	32.56	0.98	2.293E-02	242.00	7.430	PBC<MDA	PB214
256.24	14.	106.82	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
277.28	25.	65.12	1.73	2.048E-02	277.28	6.310	PBC<MDA	TL208
295.08	84.	16.87	0.61	1.945E-02	295.09	19.300	1.251E+01	PB214
					296.00	79.000	3.063E+00	TL210
312.01	16.	158.89	1.05	1.857E-02	312.01	36.000	PBC<MDA	PA233
328.19	54.	24.43	0.81	1.781E-02	328.76	20.300	8.312E+00	La140
337.89	78.	16.13	0.93	1.738E-02	338.32	12.010	2.065E+01	AC228
340.57	3.	597.49	1.08	1.727E-02	340.57	46.900	PBC<MDA	Cs136
344.29	12.	150.21	1.08	1.711E-02	344.29	26.500	PBC<MDA	EU152
351.81	170.	9.93	1.17	1.681E-02	351.93	37.600	1.498E+01	PB214
364.48	9.	114.54	1.10	1.632E-02	364.48	81.700	PBC<MDA	I131
391.69	14.	112.31	1.12	1.537E-02	391.69	64.000	PBC<MDA	SN113
433.94	7.	179.95	1.16	1.411E-02	433.94	90.480	PBC<MDA	AG108M
463.37	10.	98.17	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
468.06	4.	334.09	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
477.60	10.	109.34	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
482.00	10.	104.20	1.21	1.293E-02	482.00	80.500	PBC<MDA	HF181
487.02	9.	99.12	1.21	1.282E-02	487.02	45.500	PBC<MDA	La140
497.05	4.	319.34	1.22	1.260E-02	497.05	90.900	PBC<MDA	RU103
511.86	76.	15.74	2.48	1.230E-02	511.86	20.000	1.713E+01	RH106
513.98	10.	157.57	1.24	1.226E-02	513.98	0.430	PBC<MDA	Kr85
563.24	3.	329.25	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
569.32	2.	430.12	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.204E+00	PA234
					569.70	97.740	1.011E-01	BI207
569.47	4.	235.14	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.208E+00	PA234
					569.70	97.740	1.853E-01	BI207
583.04	134.	11.10	1.40	1.103E-02	583.02	84.500	8.011E+00	TL208
600.50	11.	190.62	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
602.73	9.	238.18	1.32	1.073E-02	602.73	98.260	PBC<MDA	SB124
609.14	107.	14.63	1.20	1.063E-02	609.31	46.090	1.217E+01	BI214
					610.30	5.750	9.772E+01	RU103
635.89	10.	79.80	1.34	1.026E-02	635.89	11.310	PBC<MDA	SB125
657.76	10.	101.19	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
722.79	8.	105.50	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	5.339E-01	AG108M
					723.36	20.220	2.400E+00	EU154
722.94	10.	95.53	1.42	9.215E-03	722.79	10.810	5.494E+00	SB124
					722.94	90.840	6.539E-01	AG108M
					723.36	20.220	2.939E+00	EU154
723.36	9.	111.35	1.42	9.211E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	5.665E-01	AG108M
					723.36	20.220	2.546E+00	EU154
724.20	9.	121.34	1.42	9.202E-03	724.20	44.150	PBC<MDA	ZR95

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
747.16	5.	183.34	1.44	8.965E-03	747.16	34.000	PBC<MDA	PM146
756.73	8.	113.07	1.45	8.869E-03	756.73	54.460	PBC<MDA	ZR95
763.94	2.	473.71	1.45	8.799E-03	763.94	22.280	PBC<MDA	AG110M
765.79	1.	721.98	1.45	8.781E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
766.41	11.	79.66	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	6.	176.33	1.46	8.657E-03	778.92	12.940	PBC<MDA	EU152
785.42	3.	310.90	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
795.87	4.	147.41	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
799.60	7.	96.85	1.48	8.469E-03	799.60	98.960	PBC<MDA	TL210
834.85	7.	97.67	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54
846.77	16.	48.83	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
857.87	2.	781.54	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
880.53	5.	200.25	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
898.04	2.	403.11	1.56	7.684E-03	898.04	93.700	PBC<MDA	Y88
910.80	86.	12.81	1.45	7.591E-03	911.07	29.000	2.159E+01	AC228
964.11	6.	211.82	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
968.65	59.	15.14	1.35	7.209E-03	968.97	17.460	2.582E+01	AC228
996.33	8.	86.94	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1001.00	5.	159.39	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1048.07	10.	71.78	1.67	6.749E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	7.	40.56	1.68	6.666E-03	1063.66	74.500	PBC<MDA	BI207
1120.18	14.	60.80	1.72	6.381E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.20	14.	87.41	1.72	6.376E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	3.579E+00	Ta182
1173.24	7.	36.54	1.76	6.138E-03	1173.24	99.900	6.786E-01	CO60
1221.39	5.	261.02	1.79	5.934E-03	1221.41	27.000	PBC<MDA	Ta182
1274.53	3.	149.00	1.83	5.725E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	9.192E-01	EU154
1384.30	1.	796.87	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	2.	414.14	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1460.30	354.	5.31	1.93	5.103E-03	1460.83	10.670	3.612E+02	K40
1764.22	16.	28.22	2.11	4.351E-03	1764.49	15.400	1.320E+01	BI214
1836.06	1.	600.00	2.15	4.208E-03	1836.06	99.200	PBC<MDA	Y88

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
253.33	63.43	92.	44.	1.631E+03	39.33	1.504	- s
298.60	74.73	113.	152.	4.824E+03	12.80	0.813	- sD
307.97	77.07	113.	222.	6.900E+03	9.54	0.815	- D
1313.06	328.19	30.	54.	3.033E+03	24.43	0.805	-

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s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.69	46.54	133.	4.	0.002	440.43	0.783
TH-227	200.11	50.14	105.	16.	0.009	109.33	0.787s
AM-241	237.72	59.54	185.	-3.	-0.001	865.35	0.797s
TH-234	252.74	63.29	256.	-37.	-0.020	63.98	0.801s
Sn-126	256.71	64.28	264.	-3.	-0.001	853.24	0.802s
BA-133	323.61	80.99	247.	-21.	-0.011	137.01	0.819
Np-237	345.63	86.49	752.	-24.	-0.013	161.78	0.825
EU-155	345.84	86.54	728.	0.	0.000	1000.00	0.825
Sn-126	347.43	86.94	728.	0.	0.000	1000.00	0.825s
Sn-126	349.95	87.57	728.	0.	0.000	1000.00	0.826s
Cd-109	351.83	88.04	716.	-25.	-0.014	152.24	0.826s
TH-234	370.05	92.59	391.	-45.	-0.025	49.67	0.831s
AC-228	373.09	93.35	300.	25.	0.014	101.74	0.832s
Gd-153	389.70	97.50	196.	18.	0.010	113.00	0.836s
Np-239	397.71	99.50	228.	-20.	-0.011	111.46	0.838
Gd-153	412.52	103.20	233.	19.	0.010	118.89	0.842s
Np-239	414.52	103.70	252.	10.	0.006	223.57	0.842s
EU-155	420.98	105.31	504.	-21.	-0.012	151.45	0.844s
Np-239	424.25	106.13	474.	-21.	-0.012	146.86	0.845s
EU-152	486.90	121.78	246.	-14.	-0.008	155.36	0.861s
CO-57	488.03	122.06	218.	2.	0.001	838.57	0.861s
EU-154	492.18	123.10	242.	-16.	-0.009	139.21	0.862s
PA-234	524.99	131.29	411.	-23.	-0.013	128.18	0.871
HF-181	531.91	133.02	433.	-23.	-0.013	131.31	0.872s
CE-144	533.97	133.54	456.	-14.	-0.008	212.98	0.873s
CO-57	545.72	136.47	422.	8.	0.004	389.00	0.876s
Tc-99m	562.15	140.58	50.	35.	0.020	39.50	0.331s
U-235	574.99	143.79	297.	-16.	-0.009	141.45	0.883s
CE-141	581.61	145.44	236.	17.	0.010	127.10	0.885s
Ba-140	650.54	162.66	192.	18.	0.010	113.60	0.902s
U-235	653.42	163.38	210.	18.	0.010	119.02	0.903s
CE-139	663.32	165.85	254.	-20.	-0.011	113.99	0.905
Cf-251	706.34	176.60	133.	-20.	-0.011	104.34	0.916s
U-235	742.85	185.72	135.	40.	0.022	53.24	0.925s
U-235	821.35	205.33	118.	10.	0.006	193.25	0.945s
TH-229	843.44	210.85	104.	12.	0.007	156.89	0.950s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-251	908.08	227.00	80.	11.	0.006	147.80	0.966
TH-227	943.98	235.97	708.	-18.	-0.010	214.75	0.975s
PB-212	954.64	238.63	39.	408.	0.227	5.40	0.978D
PB-214	968.10	242.00	59.	38.	0.021	32.56	0.981D
EU-152	978.89	244.69	714.	-19.	-0.010	202.93	0.984s
TH-227	1025.11	256.24	62.	14.	0.008	106.82	0.995s
BI-210M	1063.50	265.83	85.	-17.	-0.009	105.78	1.005s
TL-208	1109.32	277.28	60.	25.	0.014	65.12	1.728s
Hg-203	1117.00	279.20	170.	-19.	-0.010	101.04	1.017s
I-131	1137.41	284.30	81.	-12.	-0.007	151.14	1.022s
PB-214	1180.56	295.08	28.	84.	0.047	16.87	0.609s
TL-210	1184.24	296.00	463.	-17.	-0.009	182.04	1.034s
PB-212	1200.37	300.03	409.	-17.	-0.009	170.63	1.038s
PA-231	1200.53	300.07	392.	-17.	-0.009	167.09	1.038s
PA-233	1200.97	300.18	375.	-17.	-0.009	165.00	1.038s
PA-231	1210.86	302.65	358.	0.	0.000	1000.00	1.040s
BA-133	1211.66	302.85	358.	0.	0.000	1000.00	1.040s
Ba-140	1219.66	304.85	358.	0.	0.000	1000.00	1.042s
BI-210M	1219.85	304.90	358.	0.	0.000	1000.00	1.042s
Ir-192	1234.03	308.44	392.	-18.	-0.010	155.74	1.046s
PA-233	1248.32	312.01	324.	16.	0.009	158.89	1.049
Ir-192	1266.25	316.49	110.	-14.	-0.008	105.83	1.053s
CR-51	1280.63	320.08	144.	-17.	-0.009	152.43	1.057s
La-140	1315.35	328.76	130.	-16.	-0.009	102.91	1.065s
Cf-249	1334.08	333.44	62.	-12.	-0.007	123.10	1.070
AC-228	1351.91	337.89	22.	78.	0.043	16.13	0.927
Cs-136	1362.62	340.57	197.	3.	0.002	597.49	1.077s
EU-152	1377.49	344.29	169.	12.	0.007	150.21	1.080s
HF-181	1383.66	345.83	212.	-12.	-0.007	167.89	1.082s
PB-214	1407.60	351.81	27.	170.	0.095	9.93	1.171s
BA-133	1424.36	356.00	275.	-15.	-0.008	161.79	1.091
I-131	1458.32	364.48	30.	9.	0.005	114.54	1.099s
BA-133	1535.78	383.84	133.	-3.	-0.002	546.71	1.117s
Cf-249	1552.22	387.95	136.	0.	0.000	1000.00	1.121s
SN-113	1567.19	391.69	109.	14.	0.008	112.31	1.125s
SB-125	1711.99	427.88	44.	-9.	-0.005	116.17	1.158s
AG-108M	1736.25	433.94	36.	7.	0.004	179.95	1.164s
SB-125	1854.01	463.37	43.	10.	0.006	98.17	1.191s
Ir-192	1872.79	468.06	67.	4.	0.002	334.09	1.195s
BE-7	1910.94	477.59	59.	10.	0.006	109.34	1.204
HF-181	1928.56	482.00	52.	10.	0.006	104.20	1.208s
La-140	1948.65	487.02	20.	9.	0.005	99.12	1.212s
RU-103	1988.80	497.05	40.	4.	0.002	319.34	1.221s
RH-106	2048.06	511.86	33.	76.	0.042	15.74	2.485s
Kr-85	2056.53	513.98	110.	10.	0.005	157.57	1.237s
Nd-147	2124.62	531.00	36.	-10.	-0.006	121.66	1.252
Ba-140	2149.67	537.26	40.	-9.	-0.005	141.57	1.258s
CS-134	2253.60	563.24	24.	3.	0.002	329.25	1.280

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2277.94	569.32	36.	2.	0.001	430.12	1.286s
PA-234	2278.54	569.47	35.	4.	0.002	235.14	1.286s
BI-207	2279.47	569.70	39.	0.	0.000	1000.00	1.286s
TL-208	2332.83	583.04	18.	134.	0.075	11.10	1.400s
SB-125	2402.69	600.50	222.	11.	0.006	190.62	1.313
SB-124	2411.61	602.73	233.	9.	0.005	238.18	1.315s
CS-134	2419.53	604.71	242.	0.	0.000	1000.00	1.317s
BI-214	2437.26	609.14	27.	107.	0.060	14.63	1.199
RU-103	2441.89	610.30	242.	0.	0.000	1000.00	1.322s
AG-108M	2457.82	614.28	242.	0.	0.000	1000.00	1.325
PM-144	2472.94	618.06	242.	0.	0.000	1000.00	1.328s
RH-106	2488.37	621.92	260.	-12.	-0.007	188.52	1.332s
SB-125	2544.26	635.89	26.	10.	0.005	79.80	1.344
AG-110M	2631.76	657.76	48.	10.	0.006	101.19	1.362s
CS-137	2647.36	661.66	71.	-13.	-0.007	66.39	1.366s
PM-144	2786.90	696.54	31.	-1.	-0.001	878.00	1.395s
NB-94	2811.25	702.63	39.	-3.	-0.002	428.82	1.400s
SB-124	2891.88	722.79	32.	8.	0.004	105.50	1.417s
AG-108M	2892.48	722.94	39.	10.	0.005	95.53	1.417s
EU-154	2894.17	723.36	41.	9.	0.005	111.35	1.418s
ZR-95	2897.53	724.20	49.	9.	0.005	121.34	1.418s
BI-212	2909.41	727.17	78.	-7.	-0.004	182.97	1.421s
PM-146	2943.61	735.72	26.	-5.	-0.003	178.31	1.428s
PM-146	2989.37	747.16	22.	5.	0.003	183.34	1.437s
ZR-95	3027.65	756.73	18.	8.	0.004	113.07	1.445s
AG-110M	3056.50	763.94	30.	2.	0.001	473.71	1.451s
NB-95	3063.89	765.79	46.	1.	0.001	721.98	1.453s
PA-234M	3066.38	766.41	33.	11.	0.006	79.66	1.453s
EU-152	3116.41	778.92	24.	6.	0.003	176.33	1.463s
BI-212	3142.41	785.42	24.	3.	0.002	310.90	1.468s
CS-134	3184.20	795.87	17.	4.	0.002	147.41	1.477s
TL-210	3199.12	799.60	21.	7.	0.004	96.85	1.480s
CS-134	3208.53	801.95	82.	-15.	-0.008	91.77	1.482s
CO-58	3243.82	810.78	126.	-19.	-0.010	88.04	1.489s
La-140	3263.80	815.77	92.	-4.	-0.002	357.60	1.493s
Cs-136	3274.72	818.50	140.	-18.	-0.010	96.03	1.495s
MN-54	3340.10	834.85	10.	7.	0.004	97.67	1.508
Co-56	3387.78	846.77	9.	16.	0.009	48.83	1.518s
TL-208	3442.95	860.56	37.	2.	0.001	781.54	1.529s
NB-94	3485.08	871.10	29.	-8.	-0.005	99.85	1.537s
EU-154	3493.61	873.23	45.	-6.	-0.003	168.11	1.539s
PA-234	3522.80	880.53	41.	5.	0.003	200.25	1.544s
PA-234	3533.64	883.24	46.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	46.	0.	0.000	1000.00	1.547s
Sc-46	3557.79	889.28	57.	-9.	-0.005	121.23	1.551s
Y-88	3592.83	898.04	14.	2.	0.001	403.11	1.558s
AC-228	3643.88	910.80	7.	86.	0.048	12.81	1.450
AG-110M	3750.60	937.49	42.	-17.	-0.009	86.56	1.589s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234	3784.70	946.02	28.	-5.	-0.003	215.05	1.595s
EU-152	3857.05	964.11	67.	6.	0.003	211.82	1.609s
AC-228	3875.21	968.65	4.	59.	0.033	15.14	1.346
EU-154	3985.88	996.33	20.	8.	0.004	86.94	1.633s
PA-234M	4004.55	1001.00	31.	5.	0.003	159.39	1.636s
EU-154	4019.65	1004.77	59.	-11.	-0.006	105.47	1.639s
Co-56	4151.87	1037.84	35.	-6.	-0.003	132.83	1.664s
Cs-136	4192.77	1048.07	18.	10.	0.005	71.78	1.671s
BI-207	4255.11	1063.66	0.	7.	0.004	40.56	1.682s
Ga-68	4310.04	1077.40	40.	-13.	-0.007	110.49	1.692
FE-59	4397.41	1099.25	30.	-7.	-0.004	176.13	1.708s
EU-152	4448.68	1112.07	98.	-15.	-0.008	99.08	1.717s
ZN-65	4462.56	1115.55	83.	-6.	-0.003	220.37	1.720s
BI-214	4481.51	1120.29	29.	14.	0.008	60.80	1.723D
Sc-46	4482.57	1120.55	77.	0.	0.000	1000.00	1.723s
Ta-182	4485.56	1121.30	71.	14.	0.008	87.41	1.724s
CO-60	4693.21	1173.24	0.	7.	0.004	36.54	1.760s
Ta-182	4885.79	1221.41	32.	5.	0.003	261.02	1.793s
Co-56	4953.23	1238.28	54.	-15.	-0.008	57.20	1.804s
NA-22	5098.13	1274.53	11.	3.	0.002	149.00	1.828s
EU-154	5098.17	1274.54	14.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	21.	-3.	-0.002	251.94	1.840s
TL-210	5251.91	1313.00	16.	0.	0.000	1000.00	1.854s
CO-60	5329.85	1332.50	38.	-18.	-0.010	48.91	1.866s
AG-110M	5536.88	1384.30	5.	1.	0.000	796.87	1.899s
EU-152	5631.62	1408.00	11.	2.	0.001	414.14	1.914s
K-40	5840.63	1460.30	0.	354.	0.197	5.31	1.933
La-140	6383.73	1596.21	0.	0.	0.000	1000.00	2.024s
SB-124	6762.39	1690.98	11.	-6.	-0.004	130.84	2.076s
BI-214	7056.06	1764.49	2.	16.	0.009	28.22	2.114s
Co-56	7083.46	1771.35	18.	0.	0.000	1000.00	2.117s
Y-88	7341.96	1836.06	6.	1.	0.001	600.00	2.149s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	4.1880E+00				5.31E+01	
			477.60	4.188E+00	&(	1.556E+01	1.09E+02 1.05E+01 G
NA-22	C	3.2367E-01				9.50E+02	
			1274.53	3.237E-01	?(	1.741E+00	1.49E+02 9.99E+01 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
K-40	N	3.6118E+02					4.66E+11	
			1460.83	3.612E+02	(	7.519E+00	5.31E+00	1.07E+01 G
Sc-46	F	-6.5747E-01					8.38E+01	
			889.28	-6.575E-01	?(	2.721E+00	1.21E+02	1.00E+02 G
			1120.55	0.000E+00	+	3.797E+00	1.00E+03	1.00E+02 G
CR-51	F	-5.1981E+00					2.77E+01	
			320.08	-5.198E+00	?(P	1.803E+01	1.52E+02	9.94E+00 G
MN-54	C	4.9105E-01					3.12E+02	
			834.85	4.911E-01	?(P	1.163E+00	9.77E+01	1.00E+02 G
FE-59	F	-1.0616E+00					4.45E+01	
			1099.25	-1.062E+00	?(	4.282E+00	1.76E+02	5.65E+01 G
			1291.60	-7.706E-01	+ P	5.512E+00	2.52E+02	4.32E+01 G
Co-56	C	1.0727E+00					7.73E+01	
			846.77	1.073E+00	?(P	1.172E+00	4.88E+01	9.99E+01 G
			1238.28	-2.138E+00	& P	5.294E+00	5.72E+01	6.61E+01 G
			1037.84	-3.602E+00	- P	1.755E+01	1.33E+02	1.41E+01 G
			1771.35	0.000E+00	-	1.860E+01	1.00E+03	1.55E+01 A
CO-57	C	1.6547E-01					2.72E+02	
			122.06	4.530E-02	?(	1.297E+00	8.39E+02	8.56E+01 G
			136.47	1.129E+00	&(	1.481E+01	3.89E+02	1.07E+01 G
CO-58	C	-1.2454E+00					7.09E+01	
			810.78	-1.245E+00	?(	3.666E+00	8.80E+01	9.95E+01 G
CO-60	F	-1.7731E+00					1.93E+03	
			1332.50	-1.773E+00	?(P	3.159E+00	4.89E+01	1.00E+02 G
			1173.24	6.786E-01	+	6.677E-01	3.65E+01	9.99E+01 G
ZN-65	F	-1.0199E+00					2.44E+02	
			1115.55	-1.020E+00	?(	7.741E+00	2.20E+02	5.06E+01 G
NB-94	I	-1.8038E-01					7.41E+06	
			702.63	-1.804E-01	?(	1.913E+00	4.29E+02	9.79E+01 G
			871.10	-5.762E-01	+	1.967E+00	9.99E+01	9.99E+01 G
ZR-95	I	1.0306E+00					6.40E+01	
			756.73	9.192E-01	&(P	2.586E+00	1.13E+02	5.45E+01 G
			724.20	1.168E+00	?(	4.851E+00	1.21E+02	4.42E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-95	I	8.4531E-02					6.40E+01	
			765.79	8.453E-02	?(	2.168E+00	7.22E+02	9.98E+01 G
RU-103	I	1.9057E-01					3.93E+01	
			497.05	1.906E-01	(P	1.562E+00	3.19E+02	9.09E+01 G
			610.30	0.000E+00	-	6.843E+01	1.00E+03	5.75E+00 GA
RH-106	I	-6.5568E+00					3.74E+02	
			621.92	-6.557E+00	?(	4.171E+01	1.89E+02	9.93E+00 G
			1050.36	-7.451E-02	& P	1.470E+02	5.88E+04	1.56E+00 G
			511.86	1.713E+01	?	6.689E+00	1.57E+01	2.00E+01 GA
AG-108M	C	4.7308E-01					1.53E+05	
			433.94	2.915E-01	?(P	1.339E+00	1.80E+02	9.05E+01 G
			722.94	6.539E-01	&(	2.121E+00	9.55E+01	9.08E+01 G
			614.28	0.000E+00	-	4.403E+00	1.00E+03	8.98E+01 G
AG-110M	F	3.4639E-01					2.50E+02	
			884.68	0.000E+00	?(	3.371E+00	1.00E+03	7.27E+01 G
			657.76	5.984E-01	?(	2.056E+00	1.01E+02	9.46E+01 G
			937.49	-3.614E+00	+	7.180E+00	8.66E+01	3.44E+01 G
			1384.30	2.855E-01	?(	5.770E+00	7.97E+02	2.43E+01 G
			763.94	4.723E-01	?(	8.041E+00	4.74E+02	2.23E+01 G
SN-113	F	7.6521E-01					1.15E+02	
			391.69	7.652E-01	?(	2.901E+00	1.12E+02	6.40E+01 G
SB-124	F	8.7895E-01					6.02E+01	
			602.73	4.821E-01	?(	3.890E+00	2.38E+02	9.83E+01 G
			1690.98	-1.632E+00	+	4.742E+00	1.31E+02	4.78E+01 G
			722.79	4.486E+00	&(	1.621E+01	1.06E+02	1.08E+01 G
SB-125	I	1.6923E+00					1.01E+03	
			427.88	-1.205E+00	&(P	4.427E+00	1.16E+02	2.96E+01 G
			600.50	3.232E+00	&(	2.084E+01	1.91E+02	1.79E+01 G
			635.89	4.733E+00	&(P	1.270E+01	7.98E+01	1.13E+01 G
			463.37	3.971E+00	(P	1.323E+01	9.82E+01	1.05E+01 G
I-131	I	3.8650E-01					8.02E+00	
			364.48	3.865E-01	&(P	1.172E+00	1.15E+02	8.17E+01 G
			284.30	-5.524E+00	& P	2.017E+01	1.51E+02	6.14E+00 G
			636.97	-1.945E-01	% P	2.602E+01	3.08E+03	7.17E+00 G
Gd-153	F	1.0878E+00					2.42E+02	
			97.50	9.283E-01	&(	3.520E+00	1.13E+02	3.00E+01 G
			103.20	1.307E+00	&(	5.214E+00	1.19E+02	2.18E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ga-68	C -3.8892E+01					4.71E-02	
		1077.40	-3.889E+01	?(	9.628E+01	1.10E+02	3.30E+00 G
Tc-99m	I 6.6117E-01					2.51E-01	
		140.51	6.612E-01	*(	6.694E-01	3.95E+01	8.93E+01 G
BA-133	F -7.9067E-01					3.85E+03	
		356.00	-7.907E-01	&(	4.306E+00	1.62E+02	6.20E+01 G
		302.85	0.000E+00	+	1.447E+01	1.00E+03	1.83E+01 G
		383.84	-1.193E+00	+	2.244E+01	5.47E+02	8.94E+00 GA
		80.99	-1.015E+00	+	3.729E+00	1.37E+02	3.41E+01 GA
CS-134	I 4.7375E-01					7.54E+02	
		795.87	3.203E-01	?(	1.675E+00	1.47E+02	8.55E+01 G
		604.71	0.000E+00	-	4.000E+00	1.00E+03	9.76E+01 G
		569.32	6.420E-01	&(	9.845E+00	4.30E+02	1.54E+01 G
		801.95	-1.103E+01	+	3.401E+01	9.18E+01	8.69E+00 G
		563.24	1.736E+00	?(P	1.498E+01	3.29E+02	8.35E+00 G
CS-137	I -8.7374E-01					1.10E+04	
		661.66	-8.737E-01	?(P	2.763E+00	6.64E+01	8.52E+01 G
CE-139	F -4.4761E-01					1.38E+02	
		165.85	-4.476E-01	(	1.709E+00	1.14E+02	7.99E+01 G
Ba-140	I -3.5376E-01					1.28E+01	
		537.26	-1.736E+00	?(	6.207E+00	1.42E+02	2.44E+01 G
		162.66	5.065E+00	&(P	1.931E+01	1.14E+02	6.22E+00 G
		304.85	0.000E+00	&	6.217E+01	1.00E+03	4.29E+00 G
La-140	I 2.8817E-01					1.28E+01	
		1596.21	0.000E+00	?(	9.063E-01	1.00E+03	9.54E+01 G
		487.02	8.924E-01	?(P	2.246E+00	9.91E+01	4.55E+01 G
		328.76	-2.486E+00	+	8.596E+00	1.03E+02	2.03E+01 G
		815.77	-1.099E+00	&	1.360E+01	3.58E+02	2.33E+01 G
CE-141	I 5.9913E-01					3.25E+01	
		145.44	5.991E-01	?(	2.558E+00	1.27E+02	4.82E+01 G
CE-144	I -2.0529E+00					2.85E+02	
		133.54	-2.053E+00	(	1.469E+01	2.13E+02	1.11E+01 G
PM-144	C -5.9988E-02					3.63E+02	
		696.54	-5.999E-02	?(P	1.692E+00	8.78E+02	9.90E+01 G
		618.06	0.000E+00	+	4.013E+00	1.00E+03	9.91E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-152	F	1.2037E+00					4.94E+03	
			121.78	-7.865E-01	?(	4.116E+00	1.55E+02	2.86E+01 G
			344.29	1.526E+00	&(	7.751E+00	1.50E+02	2.65E+01 G
			1112.07	-9.269E+00	+	3.091E+01	9.91E+01	1.36E+01 G
			778.92	2.982E+00	?(P	1.266E+01	1.76E+02	1.29E+01 G
			964.11	2.938E+00	?(	2.152E+01	2.12E+02	1.46E+01 G
			244.69	-6.048E+00	+	4.105E+01	2.03E+02	7.58E+00 G
			1408.00	9.239E-01	? P	9.184E+00	4.14E+02	2.10E+01 GA
EU-154	I	1.2554E+00					3.14E+03	
			123.10	-6.105E-01	(P	2.865E+00	1.39E+02	4.08E+01 G
			1274.54	0.000E+00	+	5.556E+00	1.00E+03	3.52E+01 G
			723.36	2.546E+00	?(	9.698E+00	1.11E+02	2.02E+01 G
			873.23	-3.358E+00	+	1.959E+01	1.68E+02	1.23E+01 G
			1004.77	-4.736E+00	+	1.695E+01	1.05E+02	1.80E+01 G
			996.33	5.973E+00	?(	1.766E+01	8.69E+01	1.06E+01 G
EU-155	I	-1.5336E+00					1.81E+03	
			105.31	-1.534E+00	&(	7.771E+00	1.51E+02	2.12E+01 G
			86.54	0.000E+00	&	6.765E+00	1.00E+03	3.07E+01 G
HF-181	F	5.4916E-01					4.24E+01	
			482.00	5.492E-01	&(	1.944E+00	1.04E+02	8.05E+01 G
			133.02	-8.344E-01	+	3.663E+00	1.31E+02	4.33E+01 G
			345.83	-2.694E+00	+	1.527E+01	1.68E+02	1.51E+01 G
			136.30	-1.048E-06	%	2.850E+01	8.04E+08	5.85E+00 G
Ta-182	F	2.7741E+00					1.14E+02	
			1121.30	3.579E+00	&(	1.050E+01	8.74E+01	3.49E+01 G
			1221.41	1.734E+00	?(	1.008E+01	2.61E+02	2.70E+01 G
			1189.05	-5.650E-01	&	1.470E+01	1.10E+03	1.62E+01 G
Hg-203	F	-6.2725E-01					4.66E+01	
			279.20	-6.272E-01	?(	2.124E+00	1.01E+02	8.15E+01 G
TL-208	N	8.0110E+00					6.98E+02	
			583.02	8.011E+00	(P	1.326E+00	1.11E+01	8.45E+01 G
			277.28	1.075E+01	+	1.668E+01	6.51E+01	6.31E+00 G
			860.56	9.362E-01	&	1.752E+01	7.82E+02	1.24E+01 G
PM-146	C	3.4737E-01					2.02E+03	
			453.88	2.058E-02	%(P	2.039E+00	3.80E+03	6.50E+01 G
			747.16	9.721E-01	?(	4.448E+00	1.83E+02	3.40E+01 G
			735.72	-1.362E+00	+ P	7.199E+00	1.78E+02	2.25E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	F	1.4341E-01					1.07E+02	
			1836.06	1.331E-01	?(	1.880E+00	6.00E+02	9.92E+01 G
			898.04	1.543E-01	?(	1.555E+00	4.03E+02	9.37E+01 G
Cd-113m		2.8912E+02					5.33E+03	
			263.70	2.891E+02	%(	2.152E+04	2.14E+03	6.00E-03 K
Cd-109	F	-1.0613E+01					4.53E+02	
			88.04	-1.061E+01	?(	5.393E+01	1.52E+02	3.79E+00 G
Cf-251	T	-2.2145E+00					3.28E+05	
			176.60	-2.215E+00	?(	6.209E+00	1.04E+02	1.70E+01 G
			227.00	4.013E+00	?	1.619E+01	1.48E+02	6.30E+00 GA
Sn-126		-5.6063E-01					3.65E+07	
			87.57	0.000E+00	+	5.509E+00	1.00E+03	3.75E+01 GA
			64.28	-5.606E-01	?(	1.629E+01	8.53E+02	9.70E+00 G
			86.94	0.000E+00	+	2.293E+01	1.00E+03	9.04E+00 GA
PB-210	N	3.2020E+00					8.14E+03	
			46.54	3.202E+00	(P	4.125E+01	4.40E+02	4.25E+00 G
PB-212	N	2.2593E+01					6.98E+02	
			238.63	2.259E+01	(	1.759E+00	5.40E+00	4.33E+01 G
			300.03	-1.495E+01	&	8.557E+01	1.71E+02	3.28E+00 GA
PB-214	N	1.4141E+01					5.84E+05	
			351.93	1.498E+01	(	2.355E+00	9.93E+00	3.76E+01 G
			295.09	1.251E+01	(	4.083E+00	1.69E+01	1.93E+01 G
			242.00	1.250E+01		1.253E+01	3.26E+01	7.43E+00 GA
BI-207	C	7.6159E-01					1.18E+04	
			1063.66	7.616E-01	?(P	8.245E-01	4.06E+01	7.45E+01 G
			569.70	0.000E+00	-	1.608E+00	1.00E+03	9.77E+01 G
BI-212	N	-5.5976E+00					6.98E+02	
			727.17	-5.598E+00	(	3.519E+01	1.83E+02	7.55E+00 G
			785.42	1.696E+01	& P	1.281E+02	3.11E+02	1.28E+00 GA
U-235	N	1.2652E+00					2.57E+11	
			143.79	-2.395E+00	*(P	1.248E+01	1.41E+02	1.10E+01 G
			205.33	4.272E+00	&(P	2.251E+01	1.93E+02	5.01E+00 G
			163.38	6.197E+00	?(P	2.476E+01	1.19E+02	5.08E+00 G
			185.72	1.450E+00	& P	2.048E+00	5.32E+01	5.40E+01 GA

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

BI-214   N   1.2432E+01                                     5.84E+05
                          609.31 1.217E+01  (P 3.032E+00 1.46E+01 4.61E+01 G
                         1120.29 8.017E+00 - P 1.594E+01 6.08E+01 1.51E+01 G
                         1764.49 1.320E+01 ?(P 7.812E+00 2.82E+01 1.54E+01 G

BI-210M  T  -8.7801E-01                                     1.10E+09
                          265.83-8.780E-01 &(  2.393E+00 1.06E+02 5.00E+01 G
                          304.90 0.000E+00 &   9.527E+00 1.00E+03 2.80E+01 G

AC-228   N   2.2659E+01                                     2.10E+03
                          911.07 2.159E+01  (P 3.896E+00 1.28E+01 2.90E+01 G
                          968.97 2.582E+01  (P 5.558E+00 1.51E+01 1.75E+01 G
                          338.32 2.065E+01  (  6.611E+00 1.61E+01 1.20E+01 G
                           93.35 6.937E+00 &   2.356E+01 1.02E+02 5.56E+00 XA

TH-227   N   5.4002E+00                                     7.95E+03
                          256.24 5.181E+00 &(  1.434E+01 1.07E+02 7.00E+00 G
                          235.97-3.401E+00 &   2.444E+01 2.15E+02 1.23E+01 G
                           50.14 5.592E+00 @(  1.742E+01 1.09E+02 8.00E+00 G

TH-229   N   3.0839E+00                                     2.68E+06
                          193.51-6.043E-01 %(P 2.151E+01 1.62E+03 4.40E+00 G
                          210.85 8.511E+00 &(P 3.636E+01 1.57E+02 2.99E+00 G

TH-234   N  -1.2643E+01                                     1.63E+12
                           92.59-1.264E+01 *(P 2.676E+01 4.97E+01 5.58E+00 G
                           63.29-1.968E+01 + P 4.156E+01 6.40E+01 3.81E+00 G

PA-233   C   1.3476E+00                                     7.82E+08
                          312.01 1.348E+00 ?(P 7.193E+00 1.59E+02 3.60E+01 G
                          300.18-7.840E+00 +   4.342E+01 1.65E+02 6.20E+00 G

PA-234   N  -6.7852E-01                                     1.63E+12
                          131.29-1.994E+00 ?(  8.544E+00 1.28E+02 1.80E+01 G
                          946.02-2.877E+00 + P 1.545E+01 2.15E+02 1.34E+01 G
                          569.47 2.208E+00 ?(  1.831E+01 2.35E+02 8.20E+00 G
                          883.24 0.000E+00 +   2.549E+01 1.00E+03 9.60E+00 G
                          880.53 5.532E+00 ?   3.872E+01 2.00E+02 6.00E+00 GA

PA-234M  N   9.7510E+01                                     1.63E+12
                         1001.00 4.894E+01 ?(P 2.721E+02 1.59E+02 8.37E-01 G
                          766.41 2.358E+02 ?(P 6.305E+02 7.97E+01 2.94E-01 G

AM-241   T  -1.6061E-01                                     1.58E+05
                           59.54-1.606E-01 ?(P 4.034E+00 8.65E+02 3.59E+01 G
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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Np-237   F  -2.9836E+00                                      2.14E+06
                          86.49-2.984E+00 &(  1.611E+01 1.62E+02 1.31E+01 G

Ir-192   F  -5.0434E-01                                      7.40E+01
                         316.49-5.043E-01 ?(  1.798E+00 1.06E+02 8.70E+01 G
                         468.06 2.854E-01 &   3.321E+00 3.34E+02 5.18E+01 G
                         308.44-1.697E+00 +   8.864E+00 1.56E+02 3.18E+01 G

Cs-136   F  -1.2046E+00                                      1.30E+01
                         818.50-1.205E+00 ?(  3.876E+00 9.60E+01 1.00E+02 G
                        1048.07 9.776E-01 +   2.341E+00 7.18E+01 8.00E+01 G
                         340.57 2.287E-01 +   4.670E+00 5.97E+02 4.69E+01 G

Np-239   T  -1.4331E+00                                      2.36E+00
                         103.70 6.496E-01 +   4.912E+00 2.24E+02 2.40E+01 X
                         106.13-1.433E+00 ?(  7.042E+00 1.47E+02 2.27E+01 G
                          99.50-2.017E+00 +   7.535E+00 1.11E+02 1.50E+01 X

Nd-147      -3.5831E+00                                      1.11E+01
                         531.00-3.583E+00 &(  1.099E+01 1.22E+02 1.30E+01 G
                          91.10-2.440E-02 %   7.004E+00 8.52E+03 2.83E+01 G

TL-210   N   4.8231E-01                                      5.84E+05
                         799.60 4.823E-01 ?(  1.602E+00 9.69E+01 9.90E+01 G
                         296.00-6.113E-01 +   3.732E+00 1.82E+02 7.90E+01 G
                        1313.00 0.000E+00 -   1.012E+01 1.00E+03 2.10E+01 GA

Kr-85    I   1.0138E+02                                      3.92E+03
                         513.98 1.014E+02 ?(  5.438E+02 1.58E+02 4.30E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
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} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	133.	4.	0.002	440.43	3.202E+00	P
TH-227	50.14	105.	16.	0.009	109.33	5.592E+00	
AM-241	59.54	185.	-3.	-0.001	865.35	-1.606E-01	P
TH-234	63.29	256.	-37.	-0.020	63.98	-1.968E+01	P
Sn-126	64.28	264.	-3.	-0.001	853.24	-5.606E-01	
BA-133	80.99	247.	-21.	-0.011	137.01	-1.015E+00	
Np-237	86.49	752.	-24.	-0.013	161.78	-2.984E+00	
Cd-109	88.04	716.	-25.	-0.014	152.24	-1.061E+01	
TH-234	92.59	391.	-45.	-0.025	49.67	-1.264E+01	P
Gd-153	97.50	196.	18.	0.010	113.00	9.283E-01	
Np-239	99.50	228.	-20.	-0.011	111.46	-2.017E+00	
Gd-153	103.20	233.	19.	0.010	118.89	1.307E+00	
Np-239	103.70	252.	10.	0.006	223.57	6.496E-01	
EU-155	105.31	504.	-21.	-0.012	151.45	-1.534E+00	
Np-239	106.13	474.	-21.	-0.012	146.86	-1.433E+00	
EU-152	121.78	246.	-14.	-0.008	155.36	-7.865E-01	
CO-57	122.06	218.	2.	0.001	838.57	4.530E-02	
EU-154	123.10	242.	-16.	-0.009	139.21	-6.105E-01	P
PA-234	131.29	411.	-23.	-0.013	128.18	-1.994E+00	
HF-181	133.02	433.	-23.	-0.013	131.31	-8.344E-01	
CE-144	133.54	456.	-14.	-0.008	212.98	-2.053E+00	
CO-57	136.47	422.	8.	0.004	389.00	1.129E+00	
U-235	143.79	297.	-16.	-0.009	141.45	-2.395E+00	P
CE-141	145.44	236.	17.	0.010	127.10	5.991E-01	
Ba-140	162.66	192.	18.	0.010	113.60	5.065E+00	P
U-235	163.38	210.	18.	0.010	119.02	6.197E+00	P
CE-139	165.85	254.	-20.	-0.011	113.99	-4.476E-01	
Cf-251	176.60	133.	-20.	-0.011	104.34	-2.215E+00	
U-235	185.72	135.	40.	0.022	53.24	1.450E+00	P
U-235	205.33	118.	10.	0.006	193.25	4.272E+00	P
TH-229	210.85	104.	12.	0.007	156.89	8.511E+00	P
Cf-251	227.00	80.	11.	0.006	147.80	4.013E+00	
TH-227	235.97	708.	-18.	-0.010	214.75	-3.401E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	244.69	714.	-19.	-0.010	202.93	-6.048E+00	
TH-227	256.24	62.	14.	0.008	106.82	5.181E+00	
BI-210M	265.83	85.	-17.	-0.009	105.78	-8.780E-01	
Hg-203	279.20	170.	-19.	-0.010	101.04	-6.272E-01	
I-131	284.30	81.	-12.	-0.007	151.14	-5.524E+00	P
TL-210	296.00	463.	-17.	-0.009	182.04	-6.113E-01	
PA-231	300.07	392.	-17.	-0.009	167.09	-1.994E+01	
PA-233	300.18	375.	-17.	-0.009	165.00	-7.840E+00	
Ir-192	308.44	392.	-18.	-0.010	155.74	-1.697E+00	
PA-233	312.01	324.	16.	0.009	158.89	1.348E+00	P
Ir-192	316.49	110.	-14.	-0.008	105.83	-5.043E-01	
CR-51	320.08	144.	-17.	-0.009	152.43	-5.198E+00	P
La-140	328.76	130.	-16.	-0.009	102.91	-2.486E+00	
Cf-249	333.44	62.	-12.	-0.007	123.10	-2.514E+00	
Cs-136	340.57	197.	3.	0.002	597.49	2.287E-01	
EU-152	344.29	169.	12.	0.007	150.21	1.526E+00	
HF-181	345.83	212.	-12.	-0.007	167.89	-2.694E+00	
BA-133	356.00	275.	-15.	-0.008	161.79	-7.907E-01	
I-131	364.48	30.	9.	0.005	114.54	3.865E-01	P
BA-133	383.84	133.	-3.	-0.002	546.71	-1.193E+00	
SN-113	391.69	109.	14.	0.008	112.31	7.652E-01	
SB-125	427.88	44.	-9.	-0.005	116.17	-1.205E+00	P
AG-108M	433.94	36.	7.	0.004	179.95	2.915E-01	P
SB-125	463.37	43.	10.	0.006	98.17	3.971E+00	P
Ir-192	468.06	67.	4.	0.002	334.09	2.854E-01	
BE-7	477.59	59.	10.	0.006	109.34	4.188E+00	
HF-181	482.00	52.	10.	0.006	104.20	5.492E-01	
La-140	487.02	20.	9.	0.005	99.12	8.924E-01	P
RU-103	497.05	40.	4.	0.002	319.34	1.906E-01	P
RH-106	511.86	33.	76.	0.042	15.74	1.713E+01	
Kr-85	513.98	110.	10.	0.005	157.57	1.014E+02	
Nd-147	531.00	36.	-10.	-0.006	121.66	-3.583E+00	
Ba-140	537.26	40.	-9.	-0.005	141.57	-1.736E+00	
CS-134	563.24	24.	3.	0.002	329.25	1.736E+00	P
CS-134	569.32	36.	2.	0.001	430.12	6.420E-01	
PA-234	569.47	35.	4.	0.002	235.14	2.208E+00	
SB-125	600.50	222.	11.	0.006	190.62	3.232E+00	
SB-124	602.73	233.	9.	0.005	238.18	4.821E-01	
RH-106	621.92	260.	-12.	-0.007	188.52	-6.557E+00	
SB-125	635.89	26.	10.	0.005	79.80	4.733E+00	P
AG-110M	657.76	48.	10.	0.006	101.19	5.984E-01	
CS-137	661.66	71.	-13.	-0.007	66.39	-8.737E-01	P
PM-144	696.54	31.	-1.	-0.001	878.00	-5.999E-02	P
NB-94	702.63	39.	-3.	-0.002	428.82	-1.804E-01	
SB-124	722.79	32.	8.	0.004	105.50	4.486E+00	
AG-108M	722.94	39.	10.	0.005	95.53	6.539E-01	
EU-154	723.36	41.	9.	0.005	111.35	2.546E+00	
ZR-95	724.20	49.	9.	0.005	121.34	1.168E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	727.17	78.	-7.	-0.004	182.97	-5.598E+00	
PM-146	735.72	26.	-5.	-0.003	178.31	-1.362E+00	P
PM-146	747.16	22.	5.	0.003	183.34	9.721E-01	
ZR-95	756.73	18.	8.	0.004	113.07	9.192E-01	P
AG-110M	763.94	30.	2.	0.001	473.71	4.723E-01	
NB-95	765.79	46.	1.	0.001	721.98	8.453E-02	
PA-234M	766.41	33.	11.	0.006	79.66	2.358E+02	P
EU-152	778.92	24.	6.	0.003	176.33	2.982E+00	P
BI-212	785.42	24.	3.	0.002	310.90	1.696E+01	P
CS-134	795.87	17.	4.	0.002	147.41	3.203E-01	
TL-210	799.60	21.	7.	0.004	96.85	4.823E-01	
CS-134	801.95	82.	-15.	-0.008	91.77	-1.103E+01	
CO-58	810.78	126.	-19.	-0.010	88.04	-1.245E+00	
La-140	815.77	92.	-4.	-0.002	357.60	-1.099E+00	
Cs-136	818.50	140.	-18.	-0.010	96.03	-1.205E+00	
MN-54	834.85	10.	7.	0.004	97.67	4.911E-01	P
Co-56	846.77	9.	16.	0.009	48.83	1.073E+00	P
NB-94	871.10	29.	-8.	-0.005	99.85	-5.762E-01	
EU-154	873.23	45.	-6.	-0.003	168.11	-3.358E+00	
PA-234	880.53	41.	5.	0.003	200.25	5.532E+00	
Sc-46	889.28	57.	-9.	-0.005	121.23	-6.575E-01	
Y-88	898.04	14.	2.	0.001	403.11	1.543E-01	
AG-110M	937.49	42.	-17.	-0.009	86.56	-3.614E+00	
PA-234	946.02	28.	-5.	-0.003	215.05	-2.877E+00	P
EU-152	964.11	67.	6.	0.003	211.82	2.938E+00	
EU-154	996.33	20.	8.	0.004	86.94	5.973E+00	
PA-234M	1001.00	31.	5.	0.003	159.39	4.894E+01	P
EU-154	1004.77	59.	-11.	-0.006	105.47	-4.736E+00	
Co-56	1037.84	35.	-6.	-0.003	132.83	-3.602E+00	P
Cs-136	1048.07	18.	10.	0.005	71.78	9.776E-01	
BI-207	1063.66	0.	7.	0.004	40.56	7.616E-01	P
Ga-68	1077.40	40.	-13.	-0.007	110.49	-3.889E+01	
FE-59	1099.25	30.	-7.	-0.004	176.13	-1.062E+00	
EU-152	1112.07	98.	-15.	-0.008	99.08	-9.269E+00	
ZN-65	1115.55	83.	-6.	-0.003	220.37	-1.020E+00	
CO-60	1173.24	0.	7.	0.004	36.54	6.786E-01	
Co-56	1238.28	54.	-15.	-0.008	57.20	-2.138E+00	P
NA-22	1274.53	11.	3.	0.002	149.00	3.237E-01	
FE-59	1291.60	21.	-3.	-0.002	251.94	-7.706E-01	P
CO-60	1332.50	38.	-18.	-0.010	48.91	-1.773E+00	P
AG-110M	1384.30	5.	1.	0.000	796.87	2.855E-01	
EU-152	1408.00	11.	2.	0.001	414.14	9.239E-01	P
SB-124	1690.98	11.	-6.	-0.004	130.84	-1.632E+00	
Y-88	1836.06	6.	1.	0.001	600.00	1.331E-01	

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	4.1880E+00	4.1880E+00	1.093E+02%	1.56E+01
NA-22	#A	3.2367E-01	3.2367E-01	1.490E+02%	1.74E+00
K-40		3.6118E+02	3.6118E+02	5.315E+00%	7.52E+00
Sc-46	#A	-6.5747E-01	-6.5747E-01	1.212E+02%	2.72E+00
CR-51	#A	-5.1980E+00	-5.1981E+00	1.524E+02%	1.80E+01
MN-54	#A	4.9105E-01	4.9105E-01	9.767E+01%	1.16E+00
FE-59	#A	-1.0616E+00	-1.0616E+00	1.761E+02%	4.28E+00
Co-56	#A	1.0727E+00	1.0727E+00	4.883E+01%	1.17E+00
CO-57	#A	1.6547E-01	1.6547E-01	3.890E+02%	1.30E+00
CO-58	#A	-1.2453E+00	-1.2454E+00	8.804E+01%	3.67E+00
CO-60	#A	-1.7731E+00	-1.7731E+00	4.891E+01%	3.16E+00
ZN-65	#A	-1.0199E+00	-1.0199E+00	2.204E+02%	7.74E+00
NB-94	#A	-1.8038E-01	-1.8038E-01	4.288E+02%	1.91E+00
ZR-95	#A	1.0306E+00	1.0306E+00	8.293E+01%	2.59E+00
NB-95	#A	8.4530E-02	8.4531E-02	7.220E+02%	2.17E+00
RU-103	#A	1.9057E-01	1.9057E-01	3.193E+02%	1.56E+00
RH-106	#A	-6.5568E+00	-6.5568E+00	1.885E+02%	4.17E+01
AG-108M	#A	4.7308E-01	4.7308E-01	9.553E+01%	1.34E+00
AG-110M	#A	3.4639E-01	3.4639E-01	1.012E+02%	3.37E+00
SN-113	#A	7.6520E-01	7.6521E-01	1.123E+02%	2.90E+00
SB-124	#A	8.7895E-01	8.7895E-01	1.055E+02%	3.89E+00
SB-125	#A	1.6923E+00	1.6923E+00	6.415E+01%	4.43E+00
I-131	#A	3.8648E-01	3.8650E-01	1.145E+02%	1.17E+00
Gd-153	#A	1.0878E+00	1.0878E+00	8.201E+01%	3.52E+00
Ga-68	#A	-3.8562E+01	-3.8892E+01	1.105E+02%	9.63E+01
Tc-99m	#A	6.6011E-01	6.6117E-01	3.950E+01%	6.69E-01
BA-133	#A	-7.9067E-01	-7.9067E-01	1.618E+02%	4.31E+00
CS-134	#A	4.7375E-01	4.7375E-01	1.474E+02%	1.67E+00
CS-137	#A	-8.7374E-01	-8.7374E-01	6.639E+01%	2.76E+00
CE-139	#A	-4.4761E-01	-4.4761E-01	1.140E+02%	1.71E+00
Ba-140	#A	-3.5375E-01	-3.5376E-01	9.075E+01%	6.21E+00
La-140	#A	2.8816E-01	2.8817E-01	9.912E+01%	9.06E-01
CE-141	#A	5.9912E-01	5.9913E-01	1.271E+02%	2.56E+00
CE-144	#A	-2.0529E+00	-2.0529E+00	2.130E+02%	1.47E+01
PM-144	#A	-5.9988E-02	-5.9988E-02	8.780E+02%	1.69E+00
EU-152	#A	1.2037E+00	1.2037E+00	8.756E+01%	4.12E+00
EU-154	#A	1.2554E+00	1.2554E+00	6.611E+01%	2.86E+00
EU-155	#A	-1.5336E+00	-1.5336E+00	1.515E+02%	7.77E+00
HF-181	#A	5.4916E-01	5.4916E-01	1.042E+02%	1.94E+00
Ta-182	#A	2.7740E+00	2.7741E+00	8.741E+01%	1.05E+01
Hg-203	#A	-6.2724E-01	-6.2725E-01	1.010E+02%	2.12E+00
TL-208	#	8.0110E+00	8.0110E+00	1.110E+01%	1.33E+00
PM-146	#A	3.4737E-01	3.4737E-01	1.833E+02%	2.04E+00

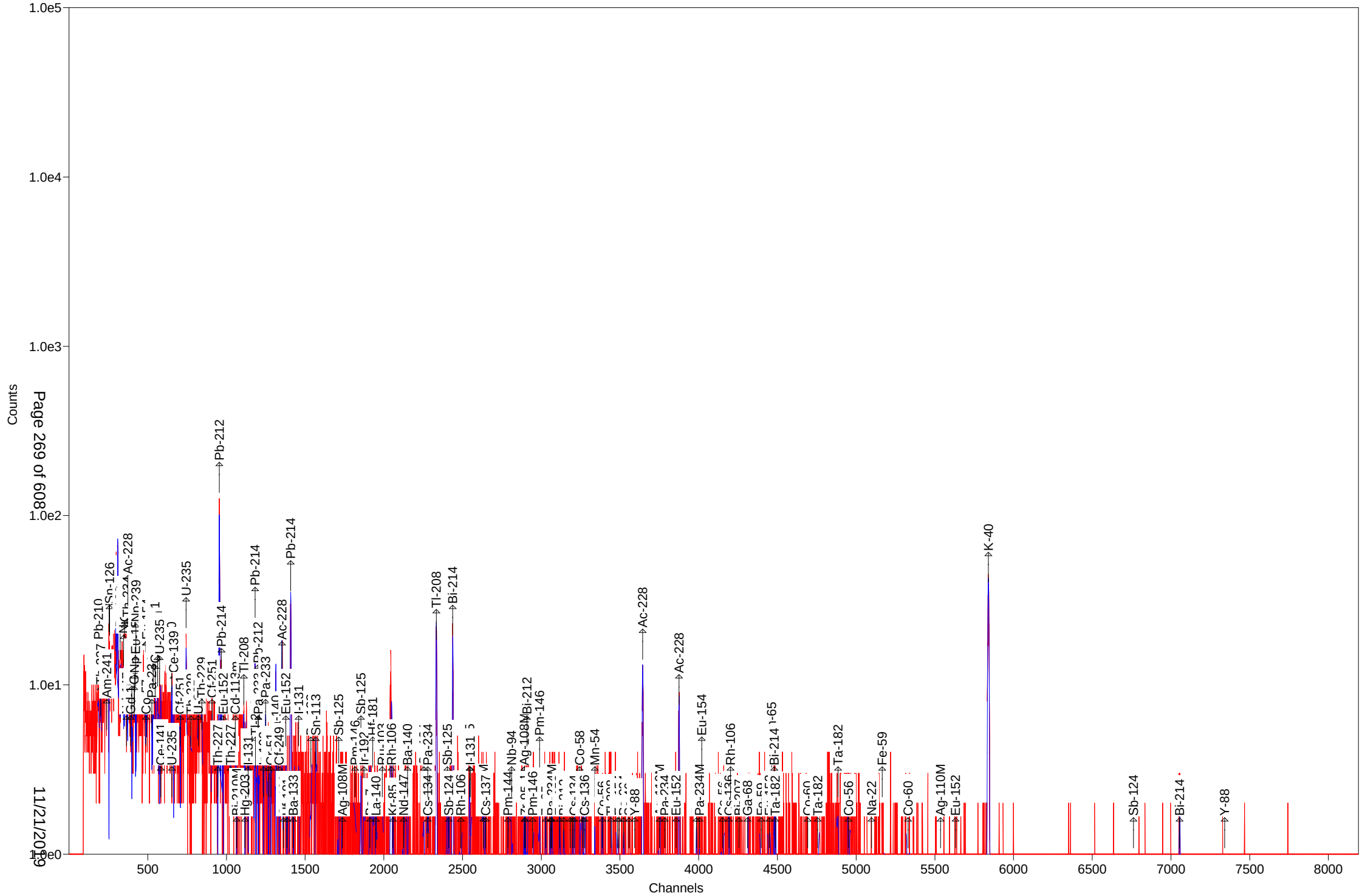
Y-88 #A	1.4341E-01	1.4341E-01	3.614E+02%		1.88E+00
Cd-113m#B	2.8912E+02	2.8912E+02	2.139E+03%		2.15E+04
Cd-109 #A	-1.0613E+01	-1.0613E+01	1.522E+02%		5.39E+01
Cf-251 #A	-2.2145E+00	-2.2145E+00	1.043E+02%		6.21E+00
Cf-249 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.10E+00
Sn-126 #A	-5.6063E-01	-5.6063E-01	8.532E+02%		1.63E+01
PB-210 #A	3.2020E+00	3.2020E+00	4.404E+02%		4.12E+01
PB-212	2.2593E+01	2.2593E+01	5.400E+00%		1.76E+00
PB-214	1.4141E+01	1.4141E+01	9.788E+00%		2.35E+00
BI-207 #A	7.6159E-01	7.6159E-01	4.056E+01%		8.25E-01
BI-212 #A	-5.5976E+00	-5.5976E+00	1.830E+02%		3.52E+01
U-235 #A	1.2652E+00	1.2652E+00	8.914E+01%		1.25E+01
BI-214	1.2432E+01	1.2432E+01	1.463E+01%		3.03E+00
BI-210M#A	-8.7801E-01	-8.7801E-01	1.058E+02%		2.39E+00
AC-228	2.2659E+01	2.2659E+01	8.521E+00%		3.90E+00
TH-227 #A	5.4002E+00	5.4002E+00	7.643E+01%		1.43E+01
TH-229 #A	3.0839E+00	3.0839E+00	1.569E+02%		2.15E+01
TH-234 #A	-1.2643E+01	-1.2643E+01	4.967E+01%		2.68E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%		9.21E+01
PA-233 #A	1.3476E+00	1.3476E+00	1.589E+02%		7.19E+00
PA-234 #A	-6.7852E-01	-6.7852E-01	1.282E+02%		8.54E+00
PA-234M#A	9.7510E+01	9.7510E+01	7.966E+01%		2.72E+02
AM-241 #A	-1.6061E-01	-1.6061E-01	8.653E+02%		4.03E+00
Np-237 #A	-2.9836E+00	-2.9836E+00	1.618E+02%		1.61E+01
Ir-192 #A	-5.0434E-01	-5.0434E-01	1.058E+02%		1.80E+00
Cs-136 #A	-1.2045E+00	-1.2046E+00	9.603E+01%		3.88E+00
Np-239 #A	-1.4328E+00	-1.4331E+00	1.469E+02%		7.04E+00
Nd-147 #A	-3.5830E+00	-3.5831E+00	1.217E+02%		1.10E+01
TL-210 #A	4.8231E-01	4.8231E-01	9.685E+01%		1.60E+00
Kr-85 #A	1.0138E+02	1.0138E+02	1.576E+02%		5.44E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 2000.8 keV) 4.417E+02 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 4.4167450E+02 Bq/Sample

445369_Gamma_180-96595-A-2-B. 5_Gamma_20192836.spc.



Sample Description: 445369_Gamma_180-96595-A-3-B
Detector: Detector # 8
Batch ID: 445369
Work Order Number: Gamma
Lot Number: 180-96595-A-3-B

Decay to Time: 10/31/2019 02:24 Live Time: 1800 sec
Acquisition Time: 10/31/2019 02:24:28 Real Time: 1843 sec
Analysis Time: 10/31/2019 02:55 Dead Time: 2.33 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 8_Soil_TunaCan.Clb
Efficiency Cal Desc: 8_Soil_TunaCan_90099_032712
Efficiency Cal Date: 3/28/2012 10:35
Energy Cal Date: 2/28/2012 10:34
Library: Client_Long_Rev15.lib
Bkgd Correction File: 8_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	7.068E-01	583.0	4.120E+00	4.121E+00	1.438E+01
NA-22	5.085E-01	65.0	3.304E-01	3.314E-01	1.079E+00
K-40	9.946E+01	9.5	9.424E+00	1.071E+01	9.370E+00
Sc-46	1.962E-02	2156.4	4.232E-01	4.232E-01	1.549E+00
CR-51	-3.606E+00	197.3	7.114E+00	7.117E+00	2.392E+01
MN-54	-3.721E-02	1380.2	5.136E-01	5.136E-01	1.275E+00
FE-59	8.734E-01	127.4	1.112E+00	1.113E+00	2.590E+00
Co-56	4.936E-01	99.7	4.922E-01	4.929E-01	9.637E-01
CO-57	-1.044E-02	2288.0	2.388E-01	2.388E-01	8.282E-01
CO-58	-6.614E-01	87.0	5.753E-01	5.763E-01	1.937E+00
CO-60	5.763E-01	56.6	3.264E-01	3.277E-01	1.008E+00
ZN-65	-1.721E+00	70.8	1.218E+00	1.221E+00	6.051E+00
NB-94	1.566E-01	141.4	2.214E-01	2.216E-01	1.006E+00
ZR-95	1.164E+00	46.8	5.448E-01	5.481E-01	1.206E+00
NB-95	-4.421E-01	132.8	5.873E-01	5.878E-01	2.011E+00
RU-103	1.180E-01	256.5	3.026E-01	3.026E-01	7.808E-01
RH-106	9.314E+00	79.7	7.424E+00	7.440E+00	2.438E+01
AG-108M	-2.311E-01	204.3	4.721E-01	4.722E-01	1.149E+00
AG-110M	0.000E+00	1.#INF	8.064E-02	8.064E-02	2.135E+00
SN-113	0.000E+00	1.#INF	1.621E-01	1.621E-01	2.161E+00
SB-124	-4.985E-01	80.7	4.026E-01	4.034E-01	2.861E+00
SB-125	1.263E+00	93.1	1.176E+00	1.178E+00	2.775E+00
I-131	3.806E-01	107.6	4.094E-01	4.099E-01	1.068E+00
Gd-153	-9.095E-01	184.0	1.673E+00	1.674E+00	5.595E+00
Ga-68	1.229E+01	108.0	1.328E+01	1.329E+01	3.228E+01
Tc-99m	-3.047E-01	191.8	5.845E-01	5.847E-01	1.956E+00
BA-133	-6.421E-01	164.1	1.054E+00	1.054E+00	3.548E+00
CS-134	7.478E-01	65.9	4.926E-01	4.941E-01	1.038E+00
CS-137	1.354E-01	478.2	6.474E-01	6.474E-01	2.256E+00
CE-139	2.752E-01	101.8	2.801E-01	2.813E-01	9.433E-01
Ba-140	1.261E+00	86.3	1.089E+00	1.091E+00	3.508E+00
La-140	2.802E-01	105.7	2.963E-01	2.966E-01	1.878E+00
CE-141	6.850E-01	154.7	1.060E+00	1.061E+00	3.541E+00

CE-144	-2.910E+00	145.1	4.223E+00	4.226E+00	1.411E+01
PM-144	5.974E-01	46.8	2.797E-01	2.814E-01	6.189E-01
EU-152	6.314E-01	119.2	7.525E-01	7.532E-01	2.340E+00
EU-154	4.417E-01	72.7	3.212E-01	3.221E-01	1.989E+00
EU-155	-6.643E-02	125.2	8.318E-02	8.326E-02	8.893E+00
HF-181	0.000E+00	1.#INF	2.328E-01	2.328E-01	1.918E+00
Ta-182	7.789E-01	93.1	7.248E-01	7.259E-01	8.095E+00
Hg-203	-3.231E-01	107.4	3.470E-01	3.475E-01	1.175E+00
TL-208	3.636E+00	12.2	4.444E-01	4.828E-01	5.752E-01
PM-146	9.323E-01	47.7	4.448E-01	4.473E-01	1.150E+00
Y-88	0.000E+00	1.#INF	1.570E-01	1.570E-01	8.180E-01
Cd-113m	5.175E+03	88.7	4.588E+03	4.600E+03	1.541E+04
Cd-109	0.000E+00	1.#INF	6.318E+00	6.318E+00	5.080E+01
Cf-251	1.448E+00	112.5	1.630E+00	1.635E+00	4.209E+00
Cf-249	3.905E-01	166.9	6.519E-01	6.523E-01	2.079E+00
Sn-126	3.842E+00	121.4	4.664E+00	4.668E+00	1.561E+01
PB-210	-1.560E+01	42.5	6.631E+00	6.694E+00	5.395E+01
PB-212	9.918E+00	8.0	7.895E-01	1.017E+00	1.431E+00
PB-214	1.341E+01	9.9	1.333E+00	1.504E+00	2.084E+00
BI-207	-1.177E-02	6726.7	7.919E-01	7.919E-01	6.780E-01
BI-212	5.048E+00	143.5	7.242E+00	7.247E+00	2.488E+01
U-235	1.045E+00	111.7	1.168E+00	1.169E+00	1.594E+01
BI-214	9.576E+00	11.1	1.067E+00	1.177E+00	1.493E+00
BI-210M	2.349E-02	2354.6	5.531E-01	5.531E-01	1.938E+00
AC-228	1.064E+01	11.8	1.250E+00	1.363E+00	2.410E+00
TH-227	2.460E+00	135.5	3.334E+00	3.337E+00	1.223E+01
TH-229	-7.305E+00	98.7	7.211E+00	7.235E+00	1.852E+01
TH-234	1.146E+01	40.3	4.614E+00	4.658E+00	1.652E+01
PA-231	8.156E+00	195.0	1.590E+01	1.591E+01	7.647E+01
PA-233	7.606E-01	198.8	1.512E+00	1.513E+00	6.307E+00
PA-234	9.489E-02	90.3	8.571E-02	8.585E-02	8.283E+00
PA-234M	2.867E+01	89.3	2.560E+01	2.564E+01	3.215E+02
AM-241	5.220E-01	253.8	1.325E+00	1.325E+00	4.472E+00
Np-237	2.265E+00	180.7	4.093E+00	4.095E+00	1.368E+01
Ir-192	1.148E-01	133.8	1.536E-01	1.537E-01	2.638E+00
Cs-136	-5.896E-01	101.1	5.961E-01	5.970E-01	2.021E+00
Np-239	-4.224E-02	5679.7	2.399E+00	2.399E+00	8.061E+00
Nd-147	1.403E+00	100.4	1.408E+00	1.411E+00	3.659E+00
TL-210	2.088E-01	193.9	4.048E-01	4.050E-01	1.535E+00
Kr-85	-7.094E+01	189.5	1.344E+02	1.345E+02	4.588E+02
Total	5.424E+03				

Analyst: Justin Banner

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Sample description
445369_Gamma_180-96595-A-3-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20191808.An1

Acquisition information
Start time: 10/31/2019 2:24:28 AM
Live time: 1800
Real time: 1843
Dead time: 2.33 %
Detector ID: 8

Detector system
Ge 8 SN/174

Calibration
Filename: 8_Soil_TunaCan.Clb
8_Soil_TunaCan_90099_032712

Energy Calibration
Created: 2/28/2012 10:34:41 AM
Zero offset: 0.052 keV
Gain: 0.250 keV/channel
Quadratic: 5.282E-10 keV/channel^2

Efficiency Calibration
Created: 3/28/2012 10:35:20 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.39 %
Log(Eff): -1.098764E-01 + (-4.958544E-01*Log(E)) + (-2.572270E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.71 %
Log(Eff): -2.525301E+01 + (9.398253E+00*Log(E)) + (-1.000034E+00*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.55keV)
Stop channel: 8000 (1999.97keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 2:24:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-10-06_1931.PBC 10/6/2019 7:31:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1621

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.48	32.	31.68	0.74	2.001E-02	46.54	4.250	PBC<MDA	PB210
50.14	17.	135.50	1.01	2.267E-02	50.14	8.000	PBC<MDA	TH227
59.54	10.	253.77	1.02	2.881E-02	59.54	35.900	PBC<MDA	AM241
63.46	33.	54.48	0.76	3.103E-02	63.29	3.810	PBC<MDA	TH234
					64.28	9.700	6.090E+00	Sn126
74.70	133.	13.84	1.03	3.613E-02				
77.09	162.	12.39	1.04	3.698E-02				
80.99	10.	352.78	1.04	3.821E-02	80.99	34.060	PBC<MDA	BA133
86.49	21.	180.67	1.04	3.959E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	9.664E-01	EU155
					86.94	9.040	3.275E+00	Sn126
86.54	21.	183.27	1.04	3.961E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	9.664E-01	EU155
					86.94	9.040	3.275E+00	Sn126
92.44	35.	59.27	1.05	4.072E-02	92.59	5.584	PBC<MDA	TH234
93.20	23.	173.77	1.05	4.083E-02	93.35	5.561	PBC<MDA	AC228
99.50	16.	261.49	1.05	4.151E-02	99.50	15.000	PBC<MDA	Np239
103.26	17.	236.23	1.06	4.178E-02	103.20	21.800	PBC<MDA	Gd153
					103.70	24.000	9.604E-01	Np239
145.44	23.	154.73	1.09	3.874E-02	145.44	48.200	PBC<MDA	CE141
162.66	16.	86.30	1.10	3.593E-02	162.66	6.220	PBC<MDA	Ba140
165.85	14.	101.76	1.10	3.629E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
176.60	15.	112.52	1.11	3.460E-02	176.60	17.000	PBC<MDA	Cf251
185.94	46.	35.79	0.99	3.326E-02	185.72	54.000	PBC<MDA	U235
205.33	14.	111.69	1.13	3.083E-02	205.33	5.010	PBC<MDA	U235
227.00	15.	101.14	1.15	2.853E-02	227.00	6.300	PBC<MDA	Cf251
238.64	189.	10.16	0.94	2.744E-02	238.63	43.300	8.841E+00	PB212
242.04	19.	157.77	1.16	2.714E-02	242.00	7.430	PBC<MDA	PB214
244.69	17.	168.29	1.16	2.691E-02	244.69	7.580	PBC<MDA	EU152
263.70	14.	88.66	1.18	2.539E-02	263.70	0.006	PBC<MDA	Cd113m
277.59	27.	34.99	1.26	2.440E-02	277.28	6.310	9.641E+00	TL208
284.30	10.	107.57	1.19	2.393E-02	284.30	6.140	PBC<MDA	I131
295.29	102.	15.64	0.87	2.323E-02	295.09	19.300	1.269E+01	PB214
					296.00	79.000	3.108E+00	TL210
300.08	13.	200.25	1.20	2.294E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
300.18	13.	198.78	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.304E+01	PA231
					300.18	6.200	5.177E+00	PA233
302.65	5.	567.02	1.21	2.278E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	6.261E-01	BA133
328.76	11.	172.97	1.23	2.133E-02	328.76	20.300	PBC<MDA	La140
333.44	12.	166.95	1.23	2.110E-02	333.44	15.510	PBC<MDA	Cf249
338.29	62.	15.77	1.82	2.085E-02	338.32	12.010	1.364E+01	AC228
340.57	6.	324.41	1.23	2.074E-02	340.57	46.900	PBC<MDA	Cs136
351.80	183.	9.94	0.85	2.021E-02	351.93	37.600	1.341E+01	PB214
364.48	3.	342.69	1.25	1.965E-02	364.48	81.700	PBC<MDA	I131
383.84	3.	446.61	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
427.88	9.	111.67	1.30	1.728E-02	427.88	29.600	PBC<MDA	SB125
453.88	9.	99.89	1.32	1.647E-02	453.88	65.000	PBC<MDA	PM146
463.37	9.	93.07	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
468.06	5.	133.77	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
477.60	2.	582.97	1.33	1.580E-02	477.60	10.520	PBC<MDA	BE7
497.05	3.	256.53	1.35	1.530E-02	497.05	90.900	PBC<MDA	RU103
510.88	57.	23.56	0.81	1.496E-02	511.86	20.000	1.069E+01	RH106
531.00	5.	100.35	1.37	1.449E-02	531.00	13.000	PBC<MDA	Nd147
537.26	4.	237.58	1.37	1.436E-02	537.26	24.390	PBC<MDA	Ba140
569.47	8.	114.97	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	4.208E+00	PA234
					569.70	97.740	PBC<MDA	BI207
582.90	74.	12.22	0.93	1.342E-02	583.02	84.500	3.636E+00	TL208
609.09	103.	11.14	0.82	1.295E-02	609.31	46.090	9.576E+00	BI214
					610.30	5.750	7.686E+01	RU103
621.92	9.	188.91	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
635.89	1.	519.62	1.44	1.250E-02	635.89	11.310	PBC<MDA	SB125
661.66	3.	478.17	1.46	1.209E-02	661.66	85.210	PBC<MDA	CS137
696.54	12.	46.81	1.48	1.158E-02	696.54	99.000	PBC<MDA	PM144
702.63	2.	499.35	1.48	1.150E-02	702.63	97.900	PBC<MDA	NB94
727.17	8.	143.48	1.50	1.118E-02	727.17	7.550	PBC<MDA	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
747.16	12.	47.70	1.51	1.093E-02	747.16	34.000	PBC<MDA	PM146
756.73	12.	46.81	1.52	1.081E-02	756.73	54.460	PBC<MDA	ZR95
766.41	12.	89.28	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
785.42	13.	28.55	1.54	1.048E-02	785.42	1.280	5.294E+01	BI212
795.87	5.	87.79	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134
799.60	1.	765.65	1.55	1.032E-02	799.60	98.960	PBC<MDA	TL210
801.95	8.	98.25	1.55	1.030E-02	801.95	8.690	PBC<MDA	CS134
815.77	8.	107.57	1.56	1.015E-02	815.77	23.280	PBC<MDA	La140
846.77	4.	192.04	1.58	9.836E-03	846.77	99.935	PBC<MDA	Co56
859.87	15.	47.15	0.30	9.703E-03	860.56	12.420	PBC<MDA	TL208
871.10	4.	141.42	1.59	9.604E-03	871.10	99.890	PBC<MDA	NB94
873.23	6.	91.84	1.59	9.584E-03	873.23	12.270	PBC<MDA	EU154
880.53	5.	147.43	1.60	9.517E-03	880.53	6.000	PBC<MDA	PA234
911.07	45.	17.43	1.26	9.247E-03	911.07	29.000	9.392E+00	AC228
968.73	11.	87.55	1.65	8.776E-03	968.97	17.460	PBC<MDA	AC228
1037.84	1.	896.13	1.69	8.278E-03	1037.84	14.130	PBC<MDA	Co56
1050.36	10.	79.71	1.70	8.193E-03	1050.36	1.560	PBC<MDA	RH106
1077.40	5.	108.01	1.72	8.017E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	7.	127.38	1.73	7.881E-03	1099.25	56.500	PBC<MDA	FE59
1119.96	39.	16.24	1.54	7.754E-03	1120.29	15.100	1.866E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1221.41	6.	93.06	1.80	7.199E-03	1221.41	27.000	PBC<MDA	Ta182
1238.28	8.	99.72	1.81	7.114E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	6.	64.98	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.444E+00	EU154
1274.54	3.	155.67	1.83	6.939E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	7.549E-01	EU154
1332.50	7.	56.65	1.86	6.678E-03	1332.50	99.980	PBC<MDA	CO60
1408.00	1.	796.87	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152
1460.80	118.	9.48	1.21	6.165E-03	1460.83	10.670	9.946E+01	K40
1764.43	7.	67.49	2.07	5.226E-03	1764.49	15.400	PBC<MDA	BI214
1771.35	6.	99.43	2.07	5.208E-03	1771.35	15.480	PBC<MDA	Co56

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
298.60	74.69	102.	133.	3.675E+03	13.84	1.034	-	sD
308.15	77.08	119.	162.	4.368E+03	12.39	1.036	-	sD
743.59	185.94	42.	73.	2.195E+03	19.99	0.995	-	
2043.44	510.88	43.	57.	3.841E+03	23.56	0.811	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

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This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.96	46.54	295.	-24.	-0.013	42.52	1.012s
TH-227	200.36	50.14	251.	17.	0.009	135.50	1.015s
AM-241	237.95	59.54	299.	10.	0.005	253.77	1.022s
TH-234	253.64	63.46	108.	33.	0.019	54.48	0.765s
Sn-126	256.93	64.28	318.	21.	0.012	121.41	1.026s
BA-133	323.77	80.99	643.	10.	0.006	352.78	1.039
Np-237	345.77	86.49	720.	21.	0.012	180.67	1.043s
EU-155	345.98	86.54	741.	21.	0.012	183.27	1.043s
Sn-126	347.57	86.94	858.	-11.	-0.006	372.06	1.044s
Sn-126	350.09	87.57	847.	0.	0.000	1000.00	1.044s
Cd-109	351.97	88.04	847.	0.	0.000	1000.00	1.044s
Nd-147	364.21	91.10	847.	0.	0.000	1000.00	1.047s
TH-234	370.17	92.59	194.	35.	0.019	59.27	1.048D
AC-228	373.21	93.35	811.	23.	0.013	173.77	1.049s
Gd-153	389.81	97.50	687.	-20.	-0.011	183.99	1.052s
Np-239	397.81	99.50	831.	16.	0.009	261.49	1.053
Gd-153	412.62	103.20	847.	0.	0.000	1000.00	1.056s
Np-239	414.62	103.70	830.	17.	0.010	236.23	1.057s
EU-155	421.07	105.31	894.	-25.	-0.014	170.67	1.058s
EU-152	486.94	121.78	103.	-9.	-0.005	168.79	1.071s
EU-154	492.22	123.10	153.	-15.	-0.008	122.22	1.072s
PA-234	525.00	131.29	520.	-23.	-0.013	139.34	1.078s
HF-181	531.92	133.02	543.	-23.	-0.013	142.20	1.079s
CE-144	533.98	133.54	567.	-23.	-0.013	145.12	1.080s
HF-181	545.02	136.30	590.	-23.	-0.013	147.74	1.082s
CO-57	545.72	136.47	614.	-23.	-0.013	150.57	1.082s
Tc-99m	561.86	140.51	637.	-19.	-0.010	191.82	1.085s
U-235	574.97	143.79	662.	-6.	-0.003	337.61	1.087s
CE-141	581.59	145.44	623.	23.	0.013	154.73	1.089s
Ba-140	650.47	162.66	85.	16.	0.009	86.30	1.102s
CE-139	663.24	165.85	100.	14.	0.008	101.76	1.104s
Cf-251	706.23	176.60	81.	15.	0.009	112.52	1.112s
U-235	742.71	185.72	170.	-27.	-0.015	68.51	1.119
TH-229	773.87	193.51	92.	-19.	-0.010	98.71	1.125s
U-235	821.17	205.33	69.	14.	0.008	111.69	1.134s
TH-229	843.24	210.85	96.	-3.	-0.002	642.05	1.138s
Cf-251	907.84	227.00	60.	15.	0.009	101.14	1.151s
TH-227	943.73	235.97	500.	-18.	-0.010	173.06	1.157
PB-212	954.37	238.63	36.	212.	0.118	7.96	1.159D
PB-214	967.84	242.00	417.	19.	0.010	157.77	1.162
EU-152	978.62	244.69	386.	17.	0.009	168.29	1.164s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-227	1024.81	256.24	64.	-2.	-0.001	786.34	1.172s
Cd-113m	1054.65	263.70	72.	14.	0.008	88.66	1.178s
TL-208	1110.21	277.59	15.	27.	0.015	34.99	1.264
Hg-203	1116.66	279.20	70.	-12.	-0.006	107.38	1.189s
I-131	1137.05	284.30	29.	10.	0.006	107.57	1.193
PB-214	1180.22	295.09	23.	83.	0.046	13.70	1.201D
TL-210	1183.86	296.00	322.	13.	0.007	193.89	1.202s
PB-212	1199.98	300.03	314.	13.	0.007	200.25	1.205
PA-231	1200.14	300.07	327.	13.	0.007	194.97	1.205
PA-233	1200.58	300.18	340.	13.	0.007	198.78	1.205s
PA-231	1210.46	302.65	353.	5.	0.003	567.02	1.207s
BA-133	1211.27	302.85	358.	0.	0.000	1000.00	1.207s
Ba-140	1219.26	304.85	358.	0.	0.000	1000.00	1.208s
BI-210M	1219.45	304.90	358.	0.	0.000	1000.00	1.208s
Ir-192	1233.62	308.44	358.	0.	0.000	1000.00	1.211s
PA-233	1247.91	312.01	358.	0.	0.000	1000.00	1.214s
Ir-192	1265.82	316.49	358.	0.	0.000	1000.00	1.217s
CR-51	1280.20	320.08	378.	-14.	-0.008	197.28	1.219s
La-140	1314.91	328.76	186.	11.	0.006	172.97	1.226s
Cf-249	1333.63	333.44	198.	12.	0.007	166.95	1.229s
AC-228	1353.03	338.29	8.	62.	0.034	15.77	1.817s
Cs-136	1362.15	340.57	210.	6.	0.004	324.41	1.234s
EU-152	1377.01	344.29	216.	0.	0.000	1000.00	1.237s
HF-181	1383.19	345.83	245.	-14.	-0.008	164.98	1.238s
PB-214	1407.07	351.80	31.	183.	0.102	9.94	0.854s
BA-133	1423.87	356.00	270.	-14.	-0.008	164.09	1.245s
I-131	1457.81	364.48	37.	3.	0.002	342.69	1.252
BA-133	1535.24	383.84	84.	3.	0.002	446.61	1.266s
Cf-249	1551.68	387.95	87.	0.	0.000	1000.00	1.269s
SN-113	1566.64	391.69	87.	0.	0.000	1000.00	1.271s
SB-125	1711.39	427.88	24.	9.	0.005	111.67	1.297s
AG-108M	1735.64	433.94	39.	-6.	-0.004	204.30	1.301s
PM-146	1815.41	453.88	17.	9.	0.005	99.89	1.315s
SB-125	1853.36	463.37	32.	9.	0.005	93.07	1.322s
Ir-192	1872.14	468.06	17.	5.	0.003	133.77	1.325s
BE-7	1910.28	477.60	75.	2.	0.001	582.97	1.332
HF-181	1927.89	482.00	77.	0.	0.000	1000.00	1.335s
RU-103	1988.12	497.05	13.	3.	0.002	256.53	1.346s
Kr-85	2055.83	513.98	116.	-8.	-0.005	189.47	1.357s
Nd-147	2123.91	531.00	4.	5.	0.003	100.35	1.369s
Ba-140	2148.95	537.26	17.	4.	0.002	237.58	1.373s
CS-134	2252.86	563.24	39.	-9.	-0.005	148.85	1.391s
CS-134	2277.20	569.32	39.	-12.	-0.007	79.06	1.395s
PA-234	2277.80	569.47	44.	8.	0.005	114.97	1.395s
BI-207	2278.73	569.70	43.	-6.	-0.004	212.51	1.396s
TL-208	2331.50	582.90	4.	74.	0.041	12.22	0.932s
SB-125	2401.92	600.50	197.	-12.	-0.007	75.53	1.416s
SB-124	2410.85	602.73	185.	-12.	-0.006	80.75	1.418s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2436.27	609.09	8.	103.	0.057	11.14	0.820s
RU-103	2441.12	610.30	167.	-11.	-0.006	167.69	1.423s
AG-108M	2457.05	614.28	155.	-8.	-0.005	210.95	1.426s
PM-144	2472.18	618.06	147.	0.	0.000	1000.00	1.428s
RH-106	2487.60	621.92	128.	9.	0.005	188.91	1.431s
SB-125	2543.49	635.89	13.	1.	0.001	519.62	1.440s
I-131	2547.83	636.97	22.	-3.	-0.001	254.34	1.441s
AG-110M	2630.98	657.76	62.	-16.	-0.009	73.80	1.455s
CS-137	2646.58	661.66	70.	3.	0.001	478.17	1.457
PM-144	2786.11	696.54	5.	12.	0.007	46.81	1.480s
NB-94	2810.46	702.63	14.	2.	0.001	499.35	1.484s
SB-124	2891.09	722.79	54.	-11.	-0.006	101.84	1.497s
AG-108M	2891.70	722.94	64.	0.	0.000	1000.00	1.498s
EU-154	2893.39	723.36	64.	0.	0.000	1000.00	1.498s
ZR-95	2896.74	724.20	64.	0.	0.000	1000.00	1.498s
BI-212	2908.63	727.17	57.	8.	0.004	143.48	1.500s
PM-146	2942.83	735.72	19.	-6.	-0.004	127.95	1.506s
PM-146	2988.59	747.16	5.	12.	0.007	47.70	1.513s
ZR-95	3026.87	756.73	5.	12.	0.007	46.81	1.519s
AG-110M	3055.73	763.94	35.	-7.	-0.004	125.36	1.524s
NB-95	3063.11	765.79	60.	-8.	-0.005	132.84	1.525s
PA-234M	3065.60	766.41	54.	12.	0.007	89.28	1.526s
EU-152	3115.64	778.92	19.	-3.	-0.001	349.11	1.534s
BI-212	3141.64	785.42	0.	13.	0.007	28.55	1.538s
CS-134	3183.44	795.87	9.	5.	0.003	87.79	1.544s
TL-210	3198.36	799.60	30.	1.	0.001	765.65	1.547s
CS-134	3207.77	801.95	24.	8.	0.004	98.25	1.548s
CO-58	3243.06	810.78	49.	-12.	-0.007	86.98	1.554s
La-140	3263.04	815.77	30.	8.	0.004	107.57	1.557s
Cs-136	3273.97	818.50	54.	-11.	-0.006	101.09	1.559s
Co-56	3387.05	846.77	9.	4.	0.002	192.04	1.577s
TL-208	3439.44	859.87	8.	15.	0.008	47.15	0.299s
NB-94	3484.36	871.10	14.	4.	0.002	141.42	1.592s
EU-154	3492.89	873.23	10.	6.	0.003	91.84	1.593s
PA-234	3522.10	880.53	21.	5.	0.003	147.43	1.598s
PA-234	3532.94	883.24	26.	0.	0.000	1000.00	1.599s
AG-110M	3538.71	884.68	26.	0.	0.000	1000.00	1.600s
Y-88	3592.14	898.04	33.	-10.	-0.006	70.08	1.608s
AC-228	3644.26	911.07	4.	45.	0.025	17.43	1.259
AG-110M	3749.96	937.49	20.	0.	0.000	1000.00	1.633s
PA-234	3784.07	946.02	30.	-11.	-0.006	113.55	1.638s
EU-152	3856.43	964.11	51.	-11.	-0.006	92.92	1.649s
AC-228	3875.88	968.97	45.	11.	0.006	87.55	1.652s
EU-154	3985.31	996.33	52.	-13.	-0.007	83.77	1.668s
PA-234M	4003.99	1001.00	69.	-5.	-0.003	159.59	1.671s
EU-154	4019.10	1004.77	78.	-10.	-0.006	123.26	1.673s
Co-56	4151.36	1037.84	15.	1.	0.001	896.13	1.693s
Cs-136	4192.29	1048.07	32.	-9.	-0.005	97.91	1.698s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	4201.45	1050.36	28.	10.	0.006	79.71	1.700s
Ga-68	4309.61	1077.40	5.	5.	0.003	108.01	1.716s
FE-59	4397.02	1099.25	15.	7.	0.004	127.38	1.728s
EU-152	4448.32	1112.07	74.	-10.	-0.006	120.45	1.736s
ZN-65	4462.20	1115.55	74.	-12.	-0.007	70.77	1.738s
BI-214	4479.88	1119.96	1.	39.	0.022	16.24	1.542
Ta-182	4485.22	1121.30	62.	0.	0.000	1000.00	1.741
CO-60	4692.97	1173.24	32.	-15.	-0.008	44.62	1.770s
Ta-182	4756.23	1189.05	30.	-15.	-0.008	83.53	1.779
Ta-182	4885.67	1221.41	5.	6.	0.003	93.06	1.797
Co-56	4953.16	1238.28	11.	8.	0.004	99.72	1.806s
NA-22	5098.16	1274.53	5.	6.	0.004	64.98	1.826s
EU-154	5098.20	1274.54	12.	3.	0.002	155.67	1.826s
FE-59	5166.43	1291.60	11.	-2.	-0.001	449.01	1.835s
TL-210	5252.05	1313.00	16.	-1.	-0.001	914.69	1.847s
CO-60	5330.06	1332.50	4.	7.	0.004	56.65	1.857s
AG-110M	5537.25	1384.30	16.	-7.	-0.004	135.27	1.884s
EU-152	5632.07	1408.00	5.	1.	0.000	796.87	1.896s
K-40	5843.26	1460.80	3.	118.	0.065	9.48	1.208s
La-140	6384.93	1596.21	11.	-3.	-0.002	243.10	1.990s
SB-124	6764.03	1690.98	6.	-4.	-0.002	301.91	2.034s
BI-214	7058.07	1764.49	8.	7.	0.004	67.49	2.067s
Co-56	7085.51	1771.35	18.	6.	0.004	99.43	2.070s
Y-88	7344.36	1836.06	0.	0.	0.000	1000.00	2.098s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	7.0678E-01					5.31E+01
			477.60	7.068E-01	?(P	1.438E+01	5.83E+02 1.05E+01 G
NA-22	C	5.0854E-01					9.50E+02
			1274.53	5.085E-01	?(	1.079E+00	6.50E+01 9.99E+01 G
K-40	N	9.9455E+01					4.66E+11
			1460.83	9.946E+01	(P	9.370E+00	9.48E+00 1.07E+01 G
Sc-46	F	1.9624E-02					8.38E+01
			889.28	1.962E-02	%(	1.549E+00	2.16E+03 1.00E+02 G
			1120.55	-9.598E-03	%	2.827E+00	8.33E+03 1.00E+02 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F	-3.6061E+00					2.77E+01	
			320.08	-3.606E+00	?(	2.392E+01	1.97E+02	9.94E+00 G
MN-54	C	-3.7213E-02					3.12E+02	
			834.85	-3.721E-02	%(	1.275E+00	1.38E+03	1.00E+02 G
FE-59	F	8.7338E-01					4.45E+01	
			1099.25	8.734E-01	?(	2.590E+00	1.27E+02	5.65E+01 G
			1291.60	-3.345E-01	- P	3.377E+00	4.49E+02	4.32E+01 G
Co-56	C	4.9363E-01					7.73E+01	
			846.77	1.994E-01	?(P	9.637E-01	1.92E+02	9.99E+01 G
			1238.28	9.470E-01	?(P	2.146E+00	9.97E+01	6.61E+01 G
			1037.84	4.548E-01	?(P	9.872E+00	8.96E+02	1.41E+01 G
			1771.35	4.466E+00	?	1.531E+01	9.94E+01	1.55E+01 A
CO-57	C	-1.0437E-02					2.72E+02	
			122.06	-1.044E-02	%(	8.282E-01	2.29E+03	8.56E+01 G
			136.47	-3.056E+00	+	1.537E+01	1.51E+02	1.07E+01 G
CO-58	C	-6.6137E-01					7.09E+01	
			810.78	-6.614E-01	?(	1.937E+00	8.70E+01	9.95E+01 G
CO-60	F	5.7626E-01					1.93E+03	
			1332.50	5.763E-01	?(P	1.008E+00	5.66E+01	1.00E+02 G
			1173.24	-1.130E+00	- P	2.174E+00	4.46E+01	9.99E+01 G
ZN-65	F	-1.7207E+00					2.44E+02	
			1115.55	-1.721E+00	?(P	6.051E+00	7.08E+01	5.06E+01 G
NB-94	I	1.5656E-01					7.41E+06	
			702.63	7.997E-02	?(P	1.006E+00	4.99E+02	9.79E+01 G
			871.10	2.316E-01	?(	1.167E+00	1.41E+02	9.99E+01 G
ZR-95	I	1.1638E+00					6.40E+01	
			756.73	1.164E+00	?(	1.206E+00	4.68E+01	5.45E+01 G
			724.20	0.000E+00	-	4.498E+00	1.00E+03	4.42E+01 G
NB-95	I	-4.4213E-01					6.40E+01	
			765.79	-4.421E-01	?(	2.011E+00	1.33E+02	9.98E+01 G
RU-103	I	1.1795E-01					3.93E+01	
			497.05	1.180E-01	?(P	7.808E-01	2.57E+02	9.09E+01 G
			610.30	-8.269E+00	+	4.697E+01	1.68E+02	5.75E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	9.3138E+00					3.74E+02	
			621.92	3.788E+00	?(	2.438E+01	1.89E+02	9.93E+00 G
			1050.36	4.449E+01	?(	1.193E+02	7.97E+01	1.56E+00 G
			511.86	6.199E-02	%	9.200E+00	4.26E+03	2.00E+01 GA
AG-108M	C	-2.3106E-01					1.53E+05	
			433.94	-2.311E-01	?(P	1.149E+00	2.04E+02	9.05E+01 G
			722.94	0.000E+00	+	2.183E+00	1.00E+03	9.08E+01 G
			614.28	-4.074E-01	+	2.925E+00	2.11E+02	8.98E+01 G
SB-124	F	-4.9854E-01					6.02E+01	
			602.73	-4.985E-01	(P	2.861E+00	8.07E+01	9.83E+01 G
			1690.98	-7.924E-01	+ P	2.964E+00	3.02E+02	4.78E+01 G
			722.79	-4.880E+00	+	1.686E+01	1.02E+02	1.08E+01 G
SB-125	I	1.2635E+00					1.01E+03	
			427.88	9.778E-01	?(	2.775E+00	1.12E+02	2.96E+01 G
			600.50	-2.901E+00	+ P	1.616E+01	7.55E+01	1.79E+01 G
			635.89	3.931E-01	?(	7.671E+00	5.20E+02	1.13E+01 G
			463.37	3.011E+00	(	9.524E+00	9.31E+01	1.05E+01 G
I-131	I	3.8059E-01					8.02E+00	
			364.48	1.206E-01	&(P	1.068E+00	3.43E+02	8.17E+01 G
			284.30	3.840E+00	&(P	1.048E+01	1.08E+02	6.14E+00 G
			636.97	-1.656E+00	+	1.515E+01	2.54E+02	7.17E+00 G
Gd-153	F	-9.0955E-01					2.42E+02	
			97.50	-9.095E-01	&(	5.595E+00	1.84E+02	3.00E+01 G
			103.20	0.000E+00	+	8.442E+00	1.00E+03	2.18E+01 G
Ga-68	C	1.2292E+01					4.71E-02	
			1077.40	1.229E+01	?(	3.228E+01	1.08E+02	3.30E+00 G
Tc-99m	I	-3.0469E-01					2.51E-01	
			140.51	-3.047E-01	(	1.956E+00	1.92E+02	8.93E+01 G
BA-133	F	-6.4215E-01					3.85E+03	
			356.00	-6.421E-01	&(	3.548E+00	1.64E+02	6.20E+01 G
			302.85	0.000E+00	+	1.210E+01	1.00E+03	1.83E+01 G
			383.84	9.658E-01	& P	1.498E+01	4.47E+02	8.94E+00 GA
			80.99	4.356E-01	?	5.160E+00	3.53E+02	3.41E+01 GA
CS-134	I	7.4775E-01					7.54E+02	
			795.87	3.435E-01	?(	1.038E+00	8.78E+01	8.55E+01 G
			604.71	4.522E-02	%	2.781E+00	1.79E+03	9.76E+01 G
			569.32	-3.167E+00	&	8.395E+00	7.91E+01	1.54E+01 G
			801.95	4.727E+00	?(	1.591E+01	9.83E+01	8.69E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			563.24	-4.387E+00	+ P	1.535E+01	1.49E+02	8.35E+00 G
CS-137	I	1.3538E-01					1.10E+04	
			661.66	1.354E-01	?(P	2.256E+00	4.78E+02	8.52E+01 G
CE-139	F	2.7523E-01					1.38E+02	
			165.85	2.752E-01	?(	9.433E-01	1.02E+02	7.99E+01 G
Ba-140	I	1.2614E+00					1.28E+01	
			537.26	5.818E-01	?(	3.508E+00	2.38E+02	2.44E+01 G
			162.66	3.926E+00	&(	1.135E+01	8.63E+01	6.22E+00 G
			304.85	0.000E+00	-	5.196E+01	1.00E+03	4.29E+00 G
La-140	I	2.8025E-01					1.28E+01	
			1596.21	-3.402E-01	?(	1.878E+00	2.43E+02	9.54E+01 G
			487.02	-1.456E-02	& P	3.427E+00	6.66E+03	4.55E+01 G
			328.76	1.453E+00	&(P	8.505E+00	1.73E+02	2.03E+01 G
			815.77	1.800E+00	?(	6.646E+00	1.08E+02	2.33E+01 G
CE-141	I	6.8504E-01					3.25E+01	
			145.44	6.850E-01	?(	3.541E+00	1.55E+02	4.82E+01 G
CE-144	I	-2.9102E+00					2.85E+02	
			133.54	-2.910E+00	&(	1.411E+01	1.45E+02	1.11E+01 G
PM-144	C	5.9743E-01					3.63E+02	
			696.54	5.974E-01	?(	6.189E-01	4.68E+01	9.90E+01 G
			618.06	0.000E+00	-	2.595E+00	1.00E+03	9.91E+01 G
EU-152	F	6.3137E-01					4.94E+03	
			121.78	-4.062E-01	?(	2.340E+00	1.69E+02	2.86E+01 G
			344.29	0.000E+00	+	7.258E+00	1.00E+03	2.65E+01 G
			1112.07	-5.454E+00	+	2.233E+01	1.20E+02	1.36E+01 G
			778.92	-1.085E+00	+	9.295E+00	3.49E+02	1.29E+01 G
			964.11	-4.947E+00	+	1.553E+01	9.29E+01	1.46E+01 G
			244.69	4.543E+00	?(	2.567E+01	1.68E+02	7.58E+00 G
			1408.00	2.770E-01	?	5.597E+00	7.97E+02	2.10E+01 GA
EU-154	I	4.4168E-01					3.14E+03	
			123.10	-4.827E-01	&(	1.989E+00	1.22E+02	4.08E+01 G
			1274.54	7.549E-01	?(	4.240E+00	1.56E+02	3.52E+01 G
			723.36	0.000E+00	-	9.812E+00	1.00E+03	2.02E+01 G
			873.23	2.616E+00	?(	8.299E+00	9.18E+01	1.23E+01 G
			1004.77	-3.806E+00	+	1.595E+01	1.23E+02	1.80E+01 G
			996.33	-7.929E+00	+	2.230E+01	8.38E+01	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	-6.6430E-02					1.81E+03	
			105.31	-1.562E+00	(	8.893E+00	1.71E+02	2.12E+01 G
			86.54	9.664E-01	?(	5.919E+00	1.83E+02	3.07E+01 G
Ta-182	F	7.7892E-01					1.14E+02	
			1121.30	0.000E+00	(	8.095E+00	1.00E+03	3.49E+01 G
			1221.41	1.786E+00	(	3.850E+00	9.31E+01	2.70E+01 G
			1189.05	-7.052E+00	+	1.314E+01	8.35E+01	1.62E+01 G
Hg-203	F	-3.2311E-01					4.66E+01	
			279.20	-3.231E-01	?(	1.175E+00	1.07E+02	8.15E+01 G
TL-208	N	3.6363E+00					6.98E+02	
			583.02	3.636E+00	@(P	5.752E-01	1.22E+01	8.45E+01 G
			277.28	9.641E+00	+ P	7.548E+00	3.50E+01	6.31E+00 G
			860.56	6.953E+00	+ P	7.294E+00	4.72E+01	1.24E+01 G
PM-146	C	9.3235E-01					2.02E+03	
			453.88	4.694E-01	?(P	1.150E+00	9.99E+01	6.50E+01 G
			747.16	1.817E+00	?(P	1.940E+00	4.77E+01	3.40E+01 G
			735.72	-1.429E+00	+ P	5.184E+00	1.28E+02	2.25E+01 G
Cd-113m		5.1745E+03					5.33E+03	
			263.70	5.175E+03	?(	1.541E+04	8.87E+01	6.00E-03 K
Cf-251	T	1.4483E+00					3.28E+05	
			176.60	1.448E+00	?(	4.209E+00	1.13E+02	1.70E+01 G
			227.00	4.789E+00	?	1.200E+01	1.01E+02	6.30E+00 GA
Cf-249	T	3.9052E-01					1.28E+05	
			387.95	0.000E+00	?(	2.079E+00	1.00E+03	6.60E+01 G
			333.44	2.052E+00	&(	1.158E+01	1.67E+02	1.55E+01 G
Sn-126		3.8415E+00					3.65E+07	
			87.57	0.000E+00	-	5.146E+00	1.00E+03	3.75E+01 GA
			64.28	3.842E+00	&(	1.561E+01	1.21E+02	9.70E+00 G
			86.94	-1.730E+00	-	2.156E+01	3.72E+02	9.04E+00 GA
PB-210	N	-1.5595E+01					8.14E+03	
			46.54	-1.560E+01	?(P	5.395E+01	4.25E+01	4.25E+00 G
PB-212	N	9.9184E+00					6.98E+02	
			238.63	9.918E+00	(P	1.431E+00	7.96E+00	4.33E+01 G
			300.03	9.338E+00	? P	6.300E+01	2.00E+02	3.28E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	N	1.3407E+01					5.84E+05	
			351.93	1.341E+01	@(P	2.084E+00	9.94E+00	3.76E+01 G
			295.09	1.026E+01	- P	3.076E+00	1.37E+01	1.93E+01 G
			242.00	5.098E+00	-	2.696E+01	1.58E+02	7.43E+00 GA
BI-207	C	-1.1772E-02					1.18E+04	
			1063.66	-1.177E-02	%(P	6.780E-01	6.73E+03	7.45E+01 G
			569.70	-2.695E-01	& P	1.389E+00	2.13E+02	9.77E+01 G
BI-212	N	5.0476E+00					6.98E+02	
			727.17	5.048E+00	&(	2.488E+01	1.43E+02	7.55E+00 G
			785.42	5.294E+01	? P	3.053E+01	2.86E+01	1.28E+00 GA
U-235	N	1.0454E+00					2.57E+11	
			143.79	-8.104E-01	(P	1.594E+01	3.38E+02	1.10E+01 G
			205.33	5.105E+00	&(P	1.485E+01	1.12E+02	5.01E+00 G
			163.38	2.973E-01	% P	1.520E+01	1.47E+03	5.08E+00 G
			185.72	-8.323E-01	+ P	1.961E+00	6.85E+01	5.40E+01 GA
BI-214	N	9.5757E+00					5.84E+05	
			609.31	9.576E+00	(P	1.493E+00	1.11E+01	4.61E+01 G
			1120.29	1.866E+01	+ P	3.497E+00	1.62E+01	1.51E+01 G
			1764.49	4.961E+00	-	1.106E+01	6.75E+01	1.54E+01 G
BI-210M	T	2.3489E-02					1.10E+09	
			265.83	2.349E-02	%(P	1.938E+00	2.35E+03	5.00E+01 G
			304.90	0.000E+00	-	7.962E+00	1.00E+03	2.80E+01 G
AC-228	N	1.0637E+01					2.10E+03	
			911.07	9.392E+00	(	2.410E+00	1.74E+01	2.90E+01 G
			968.97	4.164E+00	-	1.229E+01	8.75E+01	1.75E+01 G
			338.32	1.364E+01	@(	3.615E+00	1.58E+01	1.20E+01 G
			93.35	5.712E+00	-	3.314E+01	1.74E+02	5.56E+00 XA
TH-227	N	2.4603E+00					7.95E+03	
			256.24	-6.114E-01	?(	1.223E+01	7.86E+02	7.00E+00 G
			235.97	-3.008E+00	+	1.744E+01	1.73E+02	1.23E+01 G
			50.14	5.148E+00	@(	2.344E+01	1.35E+02	8.00E+00 G
TH-229	N	-7.3053E+00					2.68E+06	
			193.51	-7.305E+00	?(	1.852E+01	9.87E+01	4.40E+00 G
			210.85	-1.846E+00	+	2.976E+01	6.42E+02	2.99E+00 G
TH-234	N	1.1462E+01					1.63E+12	
			92.59	8.524E+00	(P	1.652E+01	5.93E+01	5.58E+00 G
			63.29	1.577E+01	(P	2.406E+01	5.45E+01	3.81E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-231	N	8.1565E+00					1.20E+07	
			302.65	3.983E+00	?(	7.647E+01	5.67E+02	2.88E+00 G
			300.07	1.304E+01	?(	8.562E+01	1.95E+02	2.46E+00 G
PA-233	C	7.6063E-01					7.82E+08	
			312.01	0.000E+00	?(	6.307E+00	1.00E+03	3.60E+01 G
			300.18	5.177E+00	?(	3.464E+01	1.99E+02	6.20E+00 G
PA-234	N	9.4889E-02					1.63E+12	
			131.29	-1.779E+00	&(	8.283E+00	1.39E+02	1.80E+01 G
			946.02	-5.092E+00	+	1.307E+01	1.14E+02	1.34E+01 G
			569.47	4.208E+00	&(	1.656E+01	1.15E+02	8.20E+00 G
			883.24	0.000E+00	-	1.614E+01	1.00E+03	9.60E+00 G
			880.53	4.540E+00	?	2.358E+01	1.47E+02	6.00E+00 GA
PA-234M	N	2.8671E+01					1.63E+12	
			1001.00	-3.765E+01	?(P	3.215E+02	1.60E+02	8.37E-01 G
			766.41	2.175E+02	?(P	6.539E+02	8.93E+01	2.94E-01 G
AM-241	T	5.2204E-01					1.58E+05	
			59.54	5.220E-01	(P	4.472E+00	2.54E+02	3.59E+01 G
Np-237	F	2.2654E+00					2.14E+06	
			86.49	2.265E+00	?(	1.368E+01	1.81E+02	1.31E+01 G
Ir-192	F	1.1481E-01					7.40E+01	
			316.49	0.000E+00	?(	2.638E+00	1.00E+03	8.70E+01 G
			468.06	3.079E-01	?(	1.453E+00	1.34E+02	5.18E+01 G
			308.44	0.000E+00	-	7.086E+00	1.00E+03	3.18E+01 G
Cs-136	F	-5.8962E-01					1.30E+01	
			818.50	-5.896E-01	&(	2.021E+00	1.01E+02	1.00E+02 G
			1048.07	-7.332E-01	+	2.448E+00	9.79E+01	8.00E+01 G
			340.57	3.632E-01	+	4.008E+00	3.24E+02	4.69E+01 G
Np-239	T	-4.2237E-02					2.36E+00	
			103.70	9.604E-01	?	7.587E+00	2.36E+02	2.40E+01 X
			106.13	-4.224E-02	%(	8.061E+00	5.68E+03	2.27E+01 G
			99.50	1.398E+00		1.223E+01	2.61E+02	1.50E+01 X
Nd-147		1.4034E+00					1.11E+01	
			531.00	1.403E+00	?(	3.659E+00	1.00E+02	1.30E+01 G
			91.10	0.000E+00	-	6.709E+00	1.00E+03	2.83E+01 G
TL-210	N	2.0877E-01					5.84E+05	
			799.60	5.547E-02	?(	1.535E+00	7.66E+02	9.90E+01 G
			296.00	4.008E-01	?(	2.617E+00	1.94E+02	7.90E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                         1313.00-3.912E-01 +   8.351E+00 9.15E+02 2.10E+01 GA

Kr-85    I  -7.0943E+01                                      3.92E+03
                         513.98-7.094E+01 ?(  4.588E+02 1.89E+02 4.30E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	295.	-24.	-0.013	42.52	-1.560E+01	P
TH-227	50.14	251.	17.	0.009	135.50	5.148E+00	
AM-241	59.54	299.	10.	0.005	253.77	5.220E-01	P
Sn-126	64.28	318.	21.	0.012	121.41	3.842E+00	
BA-133	80.99	643.	10.	0.006	352.78	4.356E-01	
Np-237	86.49	720.	21.	0.012	180.67	2.265E+00	
EU-155	86.54	741.	21.	0.012	183.27	9.664E-01	
Sn-126	86.94	858.	-11.	-0.006	372.06	-1.730E+00	
Gd-153	97.50	687.	-20.	-0.011	183.99	-9.095E-01	
EU-155	105.31	894.	-25.	-0.014	170.67	-1.562E+00	
EU-152	121.78	103.	-9.	-0.005	168.79	-4.062E-01	

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	123.10	153.	-15.	-0.008	122.22	-4.827E-01	
PA-234	131.29	520.	-23.	-0.013	139.34	-1.779E+00	
HF-181	133.02	543.	-23.	-0.013	142.20	-7.440E-01	
CE-144	133.54	567.	-23.	-0.013	145.12	-2.910E+00	
HF-181	136.30	590.	-23.	-0.013	147.74	-5.574E+00	
CO-57	136.47	614.	-23.	-0.013	150.57	-3.056E+00	
Tc-99m	140.51	637.	-19.	-0.010	191.82	-3.047E-01	
U-235	143.79	662.	-6.	-0.003	337.61	-8.104E-01	P
CE-141	145.44	623.	23.	0.013	154.73	6.850E-01	
Ba-140	162.66	85.	16.	0.009	86.30	3.926E+00	
CE-139	165.85	100.	14.	0.008	101.76	2.752E-01	
Cf-251	176.60	81.	15.	0.009	112.52	1.448E+00	
U-235	185.72	170.	-27.	-0.015	68.51	-8.323E-01	P
TH-229	193.51	92.	-19.	-0.010	98.71	-7.305E+00	
U-235	205.33	69.	14.	0.008	111.69	5.105E+00	P
TH-229	210.85	96.	-3.	-0.002	642.05	-1.846E+00	
Cf-251	227.00	60.	15.	0.009	101.14	4.789E+00	
TH-227	235.97	500.	-18.	-0.010	173.06	-3.008E+00	
EU-152	244.69	386.	17.	0.009	168.29	4.543E+00	
TH-227	256.24	64.	-2.	-0.001	786.34	-6.114E-01	
Cd-113m	263.70	72.	14.	0.008	88.66	5.175E+03	
Hg-203	279.20	70.	-12.	-0.006	107.38	-3.231E-01	
I-131	284.30	29.	10.	0.006	107.57	3.840E+00	P
TL-210	296.00	322.	13.	0.007	193.89	4.008E-01	
PA-231	300.07	327.	13.	0.007	194.97	1.304E+01	
PA-233	300.18	340.	13.	0.007	198.78	5.177E+00	
PA-231	302.65	353.	5.	0.003	567.02	3.983E+00	
CR-51	320.08	378.	-14.	-0.008	197.28	-3.606E+00	
La-140	328.76	186.	11.	0.006	172.97	1.453E+00	P
Cf-249	333.44	198.	12.	0.007	166.95	2.052E+00	
Cs-136	340.57	210.	6.	0.004	324.41	3.632E-01	
HF-181	345.83	245.	-14.	-0.008	164.98	-2.449E+00	
BA-133	356.00	270.	-14.	-0.008	164.09	-6.421E-01	
I-131	364.48	37.	3.	0.002	342.69	1.206E-01	P
BA-133	383.84	84.	3.	0.002	446.61	9.658E-01	P
SB-125	427.88	24.	9.	0.005	111.67	9.778E-01	
AG-108M	433.94	39.	-6.	-0.004	204.30	-2.311E-01	P
PM-146	453.88	17.	9.	0.005	99.89	4.694E-01	P
SB-125	463.37	32.	9.	0.005	93.07	3.011E+00	
Ir-192	468.06	17.	5.	0.003	133.77	3.079E-01	
BE-7	477.60	75.	2.	0.001	582.97	7.068E-01	P
RU-103	497.05	13.	3.	0.002	256.53	1.180E-01	P
Kr-85	513.98	116.	-8.	-0.005	189.47	-7.094E+01	
Nd-147	531.00	4.	5.	0.003	100.35	1.403E+00	
Ba-140	537.26	17.	4.	0.002	237.58	5.818E-01	
CS-134	563.24	39.	-9.	-0.005	148.85	-4.387E+00	P
CS-134	569.32	39.	-12.	-0.007	79.06	-3.167E+00	
PA-234	569.47	44.	8.	0.005	114.97	4.208E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	569.70	43.	-6.	-0.004	212.51	-2.695E-01	P
SB-125	600.50	197.	-12.	-0.007	75.53	-2.901E+00	P
SB-124	602.73	185.	-12.	-0.006	80.75	-4.985E-01	P
RU-103	610.30	167.	-11.	-0.006	167.69	-8.269E+00	
AG-108M	614.28	155.	-8.	-0.005	210.95	-4.074E-01	
RH-106	621.92	128.	9.	0.005	188.91	3.788E+00	
SB-125	635.89	13.	1.	0.001	519.62	3.931E-01	
I-131	636.97	22.	-3.	-0.001	254.34	-1.656E+00	
AG-110M	657.76	62.	-16.	-0.009	73.80	-7.728E-01	
CS-137	661.66	70.	3.	0.001	478.17	1.354E-01	P
PM-144	696.54	5.	12.	0.007	46.81	5.974E-01	
NB-94	702.63	14.	2.	0.001	499.35	7.997E-02	P
SB-124	722.79	54.	-11.	-0.006	101.84	-4.880E+00	
BI-212	727.17	57.	8.	0.004	143.48	5.048E+00	
PM-146	735.72	19.	-6.	-0.004	127.95	-1.429E+00	P
PM-146	747.16	5.	12.	0.007	47.70	1.817E+00	P
ZR-95	756.73	5.	12.	0.007	46.81	1.164E+00	
AG-110M	763.94	35.	-7.	-0.004	125.36	-1.627E+00	
NB-95	765.79	60.	-8.	-0.005	132.84	-4.421E-01	
PA-234M	766.41	54.	12.	0.007	89.28	2.175E+02	P
EU-152	778.92	19.	-3.	-0.001	349.11	-1.085E+00	
BI-212	785.42	0.	13.	0.007	28.55	5.294E+01	P
CS-134	795.87	9.	5.	0.003	87.79	3.435E-01	
TL-210	799.60	30.	1.	0.001	765.65	5.547E-02	
CS-134	801.95	24.	8.	0.004	98.25	4.727E+00	
CO-58	810.78	49.	-12.	-0.007	86.98	-6.614E-01	
La-140	815.77	30.	8.	0.004	107.57	1.800E+00	
Cs-136	818.50	54.	-11.	-0.006	101.09	-5.896E-01	
Co-56	846.77	9.	4.	0.002	192.04	1.994E-01	P
NB-94	871.10	14.	4.	0.002	141.42	2.316E-01	
EU-154	873.23	10.	6.	0.003	91.84	2.616E+00	
PA-234	880.53	21.	5.	0.003	147.43	4.540E+00	
Y-88	898.04	33.	-10.	-0.006	70.08	-6.516E-01	P
PA-234	946.02	30.	-11.	-0.006	113.55	-5.092E+00	
EU-152	964.11	51.	-11.	-0.006	92.92	-4.947E+00	
EU-154	996.33	52.	-13.	-0.007	83.77	-7.929E+00	
PA-234M	1001.00	69.	-5.	-0.003	159.59	-3.765E+01	P
EU-154	1004.77	78.	-10.	-0.006	123.26	-3.806E+00	
Co-56	1037.84	15.	1.	0.001	896.13	4.548E-01	P
Cs-136	1048.07	32.	-9.	-0.005	97.91	-7.332E-01	
RH-106	1050.36	28.	10.	0.006	79.71	4.449E+01	
Ga-68	1077.40	5.	5.	0.003	108.01	1.229E+01	
FE-59	1099.25	15.	7.	0.004	127.38	8.734E-01	
EU-152	1112.07	74.	-10.	-0.006	120.45	-5.454E+00	
ZN-65	1115.55	74.	-12.	-0.007	70.77	-1.721E+00	P
CO-60	1173.24	32.	-15.	-0.008	44.62	-1.130E+00	P
Ta-182	1189.05	30.	-15.	-0.008	83.53	-7.052E+00	
Ta-182	1221.41	5.	6.	0.003	93.06	1.786E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	1238.28	11.	8.	0.004	99.72	9.470E-01	P
NA-22	1274.53	5.	6.	0.004	64.98	5.085E-01	
EU-154	1274.54	12.	3.	0.002	155.67	7.549E-01	
FE-59	1291.60	11.	-2.	-0.001	449.01	-3.345E-01	P
TL-210	1313.00	16.	-1.	-0.001	914.69	-3.912E-01	
CO-60	1332.50	4.	7.	0.004	56.65	5.763E-01	P
AG-110M	1384.30	16.	-7.	-0.004	135.27	-2.478E+00	
EU-152	1408.00	5.	1.	0.000	796.87	2.770E-01	
La-140	1596.21	11.	-3.	-0.002	243.10	-3.402E-01	
SB-124	1690.98	6.	-4.	-0.002	301.91	-7.924E-01	P
Co-56	1771.35	18.	6.	0.004	99.43	4.466E+00	

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	7.0678E-01	7.0678E-01	5.830E+02%	1.44E+01
NA-22	#A	5.0854E-01	5.0854E-01	6.498E+01%	1.08E+00
K-40		9.9455E+01	9.9455E+01	9.476E+00%	9.37E+00
Sc-46	#A	1.9624E-02	1.9624E-02	2.156E+03%	1.55E+00
CR-51	#A	-3.6060E+00	-3.6061E+00	1.973E+02%	2.39E+01
MN-54	#A	-3.7213E-02	-3.7213E-02	1.380E+03%	1.28E+00
FE-59	#A	8.7337E-01	8.7338E-01	1.274E+02%	2.59E+00
Co-56	#A	4.9363E-01	4.9363E-01	9.972E+01%	9.64E-01
CO-57	#A	-1.0437E-02	-1.0437E-02	2.288E+03%	8.28E-01
CO-58	#A	-6.6136E-01	-6.6137E-01	8.698E+01%	1.94E+00
CO-60	#A	5.7626E-01	5.7626E-01	5.665E+01%	1.01E+00
ZN-65	#A	-1.7207E+00	-1.7207E+00	7.077E+01%	6.05E+00
NB-94	#A	1.5656E-01	1.5656E-01	1.414E+02%	1.01E+00
ZR-95	#A	1.1638E+00	1.1638E+00	4.681E+01%	1.21E+00
NB-95	#A	-4.4213E-01	-4.4213E-01	1.328E+02%	2.01E+00
RU-103	#A	1.1795E-01	1.1795E-01	2.565E+02%	7.81E-01
RH-106	#A	9.3138E+00	9.3138E+00	7.971E+01%	2.44E+01
AG-108M	#A	-2.3106E-01	-2.3106E-01	2.043E+02%	1.15E+00
AG-110M	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.13E+00
SN-113	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.16E+00
SB-124	#A	-4.9854E-01	-4.9854E-01	8.075E+01%	2.86E+00
SB-125	#A	1.2635E+00	1.2635E+00	9.307E+01%	2.77E+00
I-131	#A	3.8058E-01	3.8059E-01	1.076E+02%	1.07E+00
Gd-153	#A	-9.0955E-01	-9.0955E-01	1.840E+02%	5.60E+00
Ga-68	#A	1.2233E+01	1.2292E+01	1.080E+02%	3.23E+01
Tc-99m	#A	-3.0442E-01	-3.0469E-01	1.918E+02%	1.96E+00
BA-133	#A	-6.4215E-01	-6.4215E-01	1.641E+02%	3.55E+00
CS-134	#A	7.4775E-01	7.4775E-01	6.588E+01%	1.04E+00
CS-137	#A	1.3538E-01	1.3538E-01	4.782E+02%	2.26E+00

CE-139 #A	2.7523E-01	2.7523E-01	1.018E+02%		9.43E-01
Ba-140 #A	1.2614E+00	1.2614E+00	8.630E+01%		3.51E+00
La-140 #A	2.8024E-01	2.8025E-01	1.057E+02%		1.88E+00
CE-141 #A	6.8504E-01	6.8504E-01	1.547E+02%		3.54E+00
CE-144 #A	-2.9102E+00	-2.9102E+00	1.451E+02%		1.41E+01
PM-144 #A	5.9743E-01	5.9743E-01	4.681E+01%		6.19E-01
EU-152 #A	6.3137E-01	6.3137E-01	1.192E+02%		2.34E+00
EU-154 #A	4.4168E-01	4.4168E-01	7.273E+01%		1.99E+00
EU-155 #A	-6.6430E-02	-6.6430E-02	1.252E+02%		8.89E+00
HF-181 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.92E+00
Ta-182 #A	7.7892E-01	7.7892E-01	9.306E+01%		8.10E+00
Hg-203 #A	-3.2311E-01	-3.2311E-01	1.074E+02%		1.18E+00
TL-208	3.6363E+00	3.6363E+00	1.222E+01%		5.75E-01
PM-146 #A	9.3235E-01	9.3235E-01	4.770E+01%		1.15E+00
Y-88 #A	0.0000E+00	0.0000E+00	1.000E+03%		8.18E-01
Cd-113m#A	5.1745E+03	5.1745E+03	8.866E+01%		1.54E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		5.08E+01
Cf-251 #A	1.4483E+00	1.4483E+00	1.125E+02%		4.21E+00
Cf-249 #A	3.9052E-01	3.9052E-01	1.669E+02%		2.08E+00
Sn-126 #A	3.8415E+00	3.8415E+00	1.214E+02%		1.56E+01
PB-210 #A	-1.5595E+01	-1.5595E+01	4.252E+01%		5.39E+01
PB-212	9.9184E+00	9.9184E+00	7.960E+00%		1.43E+00
PB-214	1.3407E+01	1.3407E+01	9.939E+00%		2.08E+00
BI-207 #A	-1.1772E-02	-1.1772E-02	6.727E+03%		6.78E-01
BI-212 #A	5.0476E+00	5.0476E+00	1.435E+02%		2.49E+01
U-235 #A	1.0454E+00	1.0454E+00	1.117E+02%		1.59E+01
BI-214	9.5757E+00	9.5757E+00	1.114E+01%		1.49E+00
BI-210M#A	2.3489E-02	2.3489E-02	2.355E+03%		1.94E+00
AC-228	1.0637E+01	1.0637E+01	1.175E+01%		2.41E+00
TH-227 #A	2.4603E+00	2.4603E+00	1.355E+02%		1.22E+01
TH-229 #A	-7.3053E+00	-7.3053E+00	9.871E+01%		1.85E+01
TH-234 A	1.1462E+01	1.1462E+01	4.025E+01%		1.65E+01
PA-231 #A	8.1565E+00	8.1565E+00	1.950E+02%		7.65E+01
PA-233 #A	7.6063E-01	7.6063E-01	1.988E+02%		6.31E+00
PA-234 #A	9.4889E-02	9.4889E-02	9.032E+01%		8.28E+00
PA-234M#A	2.8671E+01	2.8671E+01	8.928E+01%		3.22E+02
AM-241 #A	5.2204E-01	5.2204E-01	2.538E+02%		4.47E+00
Np-237 #A	2.2654E+00	2.2654E+00	1.807E+02%		1.37E+01
Ir-192 #A	1.1481E-01	1.1481E-01	1.338E+02%		2.64E+00
Cs-136 #A	-5.8961E-01	-5.8962E-01	1.011E+02%		2.02E+00
Np-239 A	-4.2233E-02	-4.2237E-02	5.680E+03%		8.06E+00
Nd-147 #A	1.4034E+00	1.4034E+00	1.004E+02%		3.66E+00
TL-210 #A	2.0877E-01	2.0877E-01	1.939E+02%		1.54E+00
Kr-85 #A	-7.0943E+01	-7.0943E+01	1.895E+02%		4.59E+02

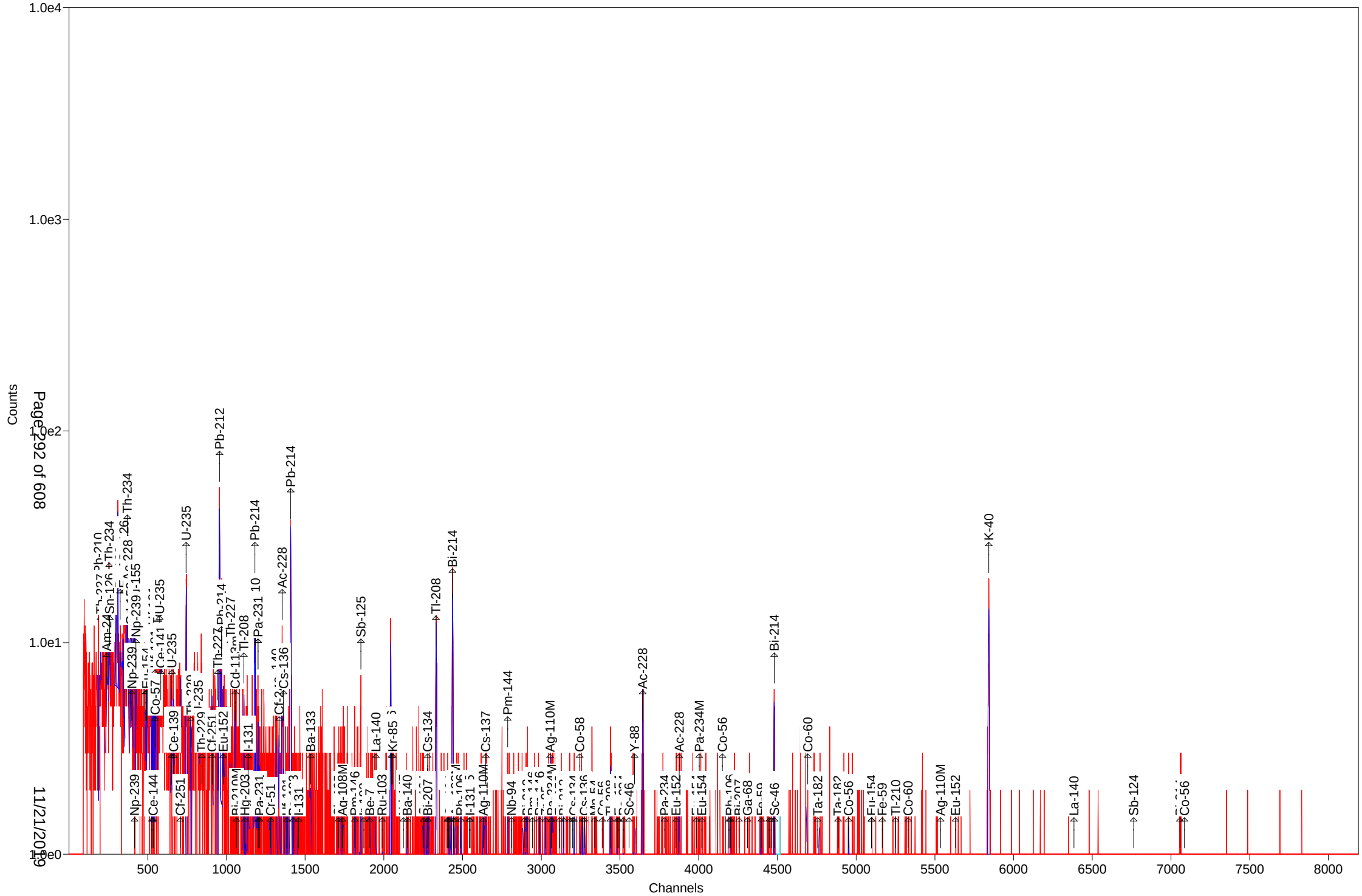
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.5 to 2000.0 keV) 1.581E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 1.5809148E+02 Bq/Sample

445369_Gamma_180-96595-A-3-B. 8_Gamma_20191808.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20192837

Sample Description: 445369_Gamma_180-96595-A-4-B
Detector: Detector # 5
Batch ID: 445369
Work Order Number: Gamma
Lot Number: 180-96595-A-4-B

Decay to Time: 10/31/2019 02:59 Live Time: 1800 sec
Acquisition Time: 10/31/2019 02:59:51 Real Time: 1807 sec
Analysis Time: 10/31/2019 03:30 Dead Time: 0.37 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 5_2019-10-06_1911.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	-2.634E+00	179.1	4.718E+00	4.720E+00	1.627E+01
NA-22	-6.797E-01	89.2	6.064E-01	6.073E-01	2.073E+00
K-40	1.388E+02	8.6	1.190E+01	1.386E+01	7.519E+00
Sc-46	7.361E-01	71.7	5.278E-01	5.291E-01	2.382E+00
CR-51	-1.257E+00	414.7	5.211E+00	5.212E+00	1.185E+01
MN-54	-5.122E-01	111.1	5.690E-01	5.696E-01	1.722E+00
FE-59	5.613E-01	30.5	1.711E-01	1.734E-01	3.572E+00
Co-56	5.051E-01	75.7	3.825E-01	3.834E-01	8.867E-01
CO-57	-5.290E-02	84.4	4.466E-02	4.475E-02	1.139E+00
CO-58	2.447E-01	177.4	4.341E-01	4.343E-01	1.548E+00
CO-60	4.591E-01	51.6	2.367E-01	2.378E-01	7.427E-01
ZN-65	0.000E+00	1.#INF	4.849E-01	4.849E-01	5.764E+00
NB-94	-5.011E-01	107.7	5.397E-01	5.403E-01	1.329E+00
ZR-95	5.003E-01	112.3	5.617E-01	5.623E-01	1.511E+00
NB-95	-7.095E-01	112.8	8.006E-01	8.015E-01	2.716E+00
RU-103	2.391E-01	121.4	2.902E-01	2.905E-01	7.734E-01
RH-106	-3.301E+00	164.3	5.424E+00	5.427E+00	1.346E+01
AG-108M	-4.046E-01	92.3	3.735E-01	3.741E-01	1.405E+00
AG-110M	6.793E-01	37.8	2.568E-01	2.591E-01	3.589E+00
SN-113	4.612E-01	144.8	6.678E-01	6.683E-01	2.288E+00
SB-124	2.467E-01	406.2	1.002E+00	1.002E+00	3.027E+00
SB-125	8.776E-01	85.1	7.469E-01	7.483E-01	3.830E+00
I-131	5.681E-01	92.8	5.272E-01	5.280E-01	9.532E-01
Gd-153	6.212E-01	134.4	8.347E-01	8.356E-01	2.827E+00
Ga-68	1.197E+01	180.9	2.165E+01	2.166E+01	5.220E+01
Tc-99m	-8.774E-02	383.3	3.363E-01	3.364E-01	1.151E+00
BA-133	-5.401E-01	186.4	1.007E+00	1.007E+00	3.416E+00
CS-134	1.226E+00	85.5	1.048E+00	1.050E+00	2.005E+00
CS-137	-1.040E+00	49.7	5.173E-01	5.202E-01	2.317E+00
CE-139	2.796E-01	109.2	3.053E-01	3.065E-01	1.032E+00
Ba-140	-2.314E+00	96.7	2.238E+00	2.241E+00	5.607E+00
La-140	-3.783E-02	101.2	3.831E-02	3.836E-02	2.262E+00
CE-141	4.367E-01	124.2	5.425E-01	5.429E-01	1.835E+00

CE-144	2.224E+00	129.6	2.882E+00	2.885E+00	9.702E+00
PM-144	1.872E-02	2360.0	4.417E-01	4.417E-01	1.177E+00
EU-152	5.267E-01	106.7	5.618E-01	5.625E-01	3.241E+00
EU-154	1.765E+00	92.3	1.628E+00	1.631E+00	2.372E+00
EU-155	-8.236E-01	197.8	1.629E+00	1.630E+00	5.504E+00
HF-181	7.717E-01	82.2	6.344E-01	6.357E-01	1.877E+00
Ta-182	-8.871E-01	65.6	5.815E-01	5.832E-01	9.434E+00
Hg-203	-4.435E-01	96.1	4.262E-01	4.269E-01	1.436E+00
TL-208	3.164E+00	16.1	5.078E-01	5.337E-01	8.370E-01
PM-146	3.700E-02	71.7	2.654E-02	2.661E-02	1.945E+00
Y-88	6.046E-01	29.3	1.770E-01	1.804E-01	9.809E-01
Cd-113m	-3.903E+03	130.1	5.076E+03	5.082E+03	1.734E+04
Cd-109	0.000E+00	1.#INF	2.541E+00	2.541E+00	4.379E+01
Cf-251	2.746E+00	49.3	1.353E+00	1.375E+00	3.535E+00
Cf-249	0.000E+00	1.#INF	1.718E-01	1.718E-01	2.412E+00
Sn-126	-1.108E+00	324.8	3.599E+00	3.599E+00	1.231E+01
PB-210	2.569E+01	45.4	1.167E+01	1.177E+01	2.856E+01
PB-212	1.099E+01	8.2	8.977E-01	1.145E+00	1.615E+00
PB-214	1.076E+01	9.7	1.038E+00	1.179E+00	1.023E+00
BI-207	1.842E-01	313.4	5.773E-01	5.774E-01	1.509E+00
BI-212	9.708E+00	95.0	9.226E+00	9.240E+00	3.115E+01
U-235	-5.657E-01	487.4	2.757E+00	2.757E+00	9.437E+00
BI-214	8.131E+00	12.4	1.007E+00	1.092E+00	1.263E+00
BI-210M	1.048E-01	600.0	6.287E-01	6.287E-01	2.199E+00
AC-228	1.494E+01	11.9	1.783E+00	1.939E+00	1.860E+00
TH-227	1.912E+00	155.6	2.974E+00	2.976E+00	1.266E+01
TH-229	-4.877E+00	156.7	7.644E+00	7.654E+00	1.955E+01
TH-234	9.926E+00	45.6	4.526E+00	4.559E+00	1.597E+01
PA-231	4.678E+00	238.6	1.116E+01	1.116E+01	7.212E+01
PA-233	-1.048E+00	134.3	1.408E+00	1.409E+00	6.075E+00
PA-234	4.722E-01	80.0	3.779E-01	3.787E-01	6.318E+00
PA-234M	4.722E+01	98.4	4.648E+01	4.654E+01	3.006E+02
AM-241	-2.217E-01	480.5	1.065E+00	1.065E+00	3.146E+00
Np-237	-1.153E+00	332.1	3.829E+00	3.830E+00	1.289E+01
Ir-192	3.244E-01	103.5	3.358E-01	3.364E-01	1.188E+00
Cs-136	2.907E-01	72.7	2.112E-01	2.119E-01	1.687E+00
Np-239	9.531E-01	147.6	1.407E+00	1.408E+00	4.742E+00
Nd-147	5.016E+00	38.7	1.941E+00	1.962E+00	4.310E+00
TL-210	-2.360E-01	273.3	6.450E-01	6.451E-01	2.265E+00
Kr-85	-1.388E+02	127.0	1.762E+02	1.764E+02	5.955E+02
Total	3.225E+02				

Analyst: Justin Banner

Sample description
445369_Gamma_180-96595-A-4-B

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20192837.An1

Acquisition information
Start time: 10/31/2019 2:59:51 AM
Live time: 1800
Real time: 1807
Dead time: 0.37 %
Detector ID: 5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_Soil_TunaCan.Clb
5_Soil_TunaCan_90099_032612

Energy Calibration
Created: 2/28/2012 7:35:48 PM
Zero offset: 0.158 keV
Gain: 0.250 keV/channel
Quadratic: 3.911E-08 keV/channel^2

Efficiency Calibration
Created: 3/27/2012 5:20:37 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.466115E-01 + (-7.830454E-01*Log(E)) + (-4.117504E-03*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.43 %
Log(Eff): -2.462251E+01 + (9.075211E+00*Log(E)) + (-9.664422E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.62keV)
Stop channel: 8000 (2000.81keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 2:59:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-10-06_1911.PBC 10/6/2019 7:11:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1948

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.34	35.	45.43	1.71	1.788E-02	46.54	4.250	PBC<MDA	PB210
49.55	9.	155.56	0.79	2.012E-02	50.14	8.000	PBC<MDA	TH227
59.54	-4.	480.53	0.80	2.533E-02	59.54	35.900	PBC<MDA	AM241
63.08	31.	41.17	0.42	2.703E-02	63.29	3.810	PBC<MDA	TH234
74.61	104.	16.01	0.81	3.146E-02				
77.13	201.	8.78	0.82	3.220E-02				
80.99	14.	135.96	0.82	3.320E-02	80.99	34.060	PBC<MDA	BA133
91.10	9.	318.76	0.83	3.508E-02	91.10	28.300	PBC<MDA	Nd147
92.52	37.	47.79	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.28	17.	152.43	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
97.07	12.	134.37	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
99.50	12.	115.55	0.84	3.592E-02	99.50	15.000	PBC<MDA	Np239
106.13	14.	147.58	0.84	3.620E-02	106.13	22.700	PBC<MDA	Np239
133.54	15.	129.58	0.87	3.487E-02	133.54	11.090	PBC<MDA	CE144
136.30	14.	130.01	0.88	3.458E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.101E+00	CO57
136.47	13.	126.26	0.88	3.457E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.946E+00	CO57
143.79	-4.	487.37	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235
145.44	13.	124.23	0.88	3.351E-02	145.44	48.200	PBC<MDA	CE141
162.66	3.	525.72	0.90	3.113E-02	162.66	6.220	PBC<MDA	Ba140
165.85	13.	109.19	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
176.60	25.	49.26	0.92	2.975E-02	176.60	17.000	PBC<MDA	Cf251
185.72	29.	58.39	0.93	2.854E-02	185.72	54.000	PBC<MDA	U235
235.92	12.	223.62	0.98	2.341E-02	235.97	12.300	PBC<MDA	TH227
238.53	196.	9.35	0.96	2.320E-02	238.63	43.300	1.084E+01	PB212
241.94	44.	26.19	0.98	2.293E-02	242.00	7.430	1.422E+01	PB214
265.83	2.	600.00	1.00	2.121E-02	265.83	50.000	PBC<MDA	BI210M
277.34	14.	43.83	1.05	2.048E-02	277.28	6.310	PBC<MDA	TL208
295.08	54.	19.11	0.82	1.945E-02	295.09	19.300	7.992E+00	PB214
					296.00	79.000	1.958E+00	TL210
299.81	11.	175.98	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.344E+01	PA231
					300.18	6.200	5.333E+00	PA233
300.07	9.	238.58	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.015E+01	PA231
					300.18	6.200	4.030E+00	PA233
316.49	10.	103.51	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
328.76	11.	101.24	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.02	37.	24.92	0.76	1.736E-02	338.32	12.010	9.858E+00	AC228
340.57	6.	231.88	1.08	1.727E-02	340.57	46.900	PBC<MDA	Cs136
344.29	9.	165.34	1.08	1.711E-02	344.29	26.500	PBC<MDA	EU152
351.86	122.	9.65	1.42	1.680E-02	351.93	37.600	1.076E+01	PB214
364.48	7.	116.93	1.10	1.632E-02	364.48	81.700	PBC<MDA	I131
383.84	4.	312.25	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
391.69	8.	144.80	1.12	1.537E-02	391.69	64.000	PBC<MDA	SN113
463.37	9.	90.34	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
468.06	4.	278.24	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
482.00	10.	100.67	1.21	1.293E-02	482.00	80.500	PBC<MDA	HF181
497.05	5.	121.40	1.22	1.260E-02	497.05	90.900	PBC<MDA	RU103
511.86	58.	23.00	2.48	1.230E-02	511.86	20.000	1.310E+01	RH106
531.00	14.	38.69	1.25	1.193E-02	531.00	13.000	5.016E+00	Nd147
563.24	4.	204.21	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
583.17	53.	16.05	0.99	1.103E-02	583.02	84.500	3.164E+00	TL208
600.50	8.	206.97	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
602.73	2.	797.06	1.32	1.073E-02	602.73	98.260	PBC<MDA	SB124
609.03	72.	12.38	1.02	1.063E-02	609.31	46.090	8.131E+00	BI214
636.97	5.	144.11	1.34	1.025E-02	636.97	7.170	PBC<MDA	I131
657.76	8.	85.50	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
722.79	3.	406.20	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.770E-01	AG108M
					723.36	20.220	7.955E-01	EU154
727.17	12.	95.04	1.42	9.170E-03	727.17	7.550	PBC<MDA	BI212
735.72	7.	111.97	1.43	9.081E-03	735.72	22.500	PBC<MDA	PM146
747.16	1.	742.74	1.44	8.965E-03	747.16	34.000	PBC<MDA	PM146
756.73	4.	112.28	1.45	8.869E-03	756.73	54.460	PBC<MDA	ZR95
766.41	12.	98.43	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	4.	116.84	1.46	8.657E-03	778.92	12.940	PBC<MDA	EU152
785.42	6.	146.34	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
795.87	9.	87.02	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
801.95	7.	128.40	1.48	8.448E-03	801.95	8.690	PBC<MDA	CS134
810.78	4.	177.45	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58
846.77	5.	99.21	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
860.18	20.	31.62	1.53	7.963E-03	860.56	12.420	1.142E+01	TL208
871.10	3.	154.92	1.54	7.882E-03	871.10	99.890	PBC<MDA	NB94
873.23	5.	92.26	1.54	7.866E-03	873.23	12.270	PBC<MDA	EU154
889.28	9.	110.05	1.55	7.747E-03	889.28	99.984	PBC<MDA	Sc46
898.04	7.	37.80	1.56	7.684E-03	898.04	93.700	PBC<MDA	Y88
910.75	53.	13.80	1.31	7.591E-03	911.07	29.000	1.334E+01	AC228
937.49	5.	146.39	1.59	7.411E-03	937.49	34.360	PBC<MDA	AG110M
946.02	5.	95.02	1.60	7.355E-03	946.02	13.400	PBC<MDA	PA234
964.11	2.	560.18	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
968.67	40.	19.48	1.61	7.209E-03	968.97	17.460	1.758E+01	AC228
996.33	6.	148.27	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1001.00	-3.	284.40	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	8.	97.51	1.64	6.992E-03	1004.77	18.010	PBC<MDA	EU154
1048.07	6.	72.66	1.67	6.749E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	2.	313.36	1.68	6.666E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	4.	180.85	1.69	6.594E-03	1077.40	3.300	PBC<MDA	Ga68
1120.08	8.	119.85	1.72	6.381E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	10.	91.94	1.72	6.380E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	8.386E-01	Sc46
					1121.30	34.900	2.404E+00	Ta182
1189.05	6.	89.49	1.77	6.069E-03	1189.05	16.200	PBC<MDA	Ta182
1238.28	5.	114.48	1.80	5.866E-03	1238.28	66.070	PBC<MDA	Co56
1291.60	11.	30.48	1.84	5.661E-03	1291.60	43.200	2.485E+00	FE59
1332.50	5.	51.55	1.87	5.514E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	7.	37.80	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	3.	177.69	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1460.33	136.	8.57	1.90	5.103E-03	1460.83	10.670	1.388E+02	K40
1763.76	2.	243.92	2.11	4.351E-03	1764.49	15.400	PBC<MDA	BI214
1836.06	5.	44.72	2.15	4.208E-03	1836.06	99.200	PBC<MDA	Y88

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
298.08	74.63	88.	104.	3.320E+03	16.01	0.812	-	sD
308.15	77.15	55.	201.	6.235E+03	8.78	0.815	-	sD

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

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This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	184.90	46.34	61.	35.	0.020	45.43	1.709s
TH-227	200.11	50.14	66.	9.	0.005	155.56	0.787
AM-241	237.72	59.54	110.	-4.	-0.002	480.53	0.797s
TH-234	251.89	63.08	62.	17.	0.010	77.66	0.424s
Sn-126	256.71	64.28	147.	-5.	-0.003	324.76	0.802s
BA-133	323.61	80.99	110.	14.	0.008	135.96	0.819s
Np-237	345.63	86.49	476.	-9.	-0.005	332.09	0.825s
EU-155	345.84	86.54	467.	0.	0.000	1000.00	0.825s
Sn-126	347.43	86.94	467.	0.	0.000	1000.00	0.825s
Sn-126	349.95	87.57	467.	0.	0.000	1000.00	0.826s
Cd-109	351.83	88.04	467.	0.	0.000	1000.00	0.826s
Nd-147	364.08	91.10	407.	9.	0.005	318.76	0.829s
TH-234	370.05	92.59	134.	37.	0.020	47.79	0.831D
AC-228	373.09	93.35	332.	17.	0.010	152.43	0.832s
Gd-153	389.70	97.50	124.	12.	0.007	134.37	0.836s
Np-239	397.71	99.50	96.	12.	0.007	115.55	0.838s
Gd-153	412.52	103.20	163.	-15.	-0.009	120.61	0.842
Np-239	414.52	103.70	179.	0.	0.000	1000.00	0.842s
EU-155	420.98	105.31	247.	-11.	-0.006	197.83	0.844s
Np-239	424.25	106.13	209.	14.	0.008	147.58	0.845s
EU-152	486.90	121.78	150.	-17.	-0.009	106.65	0.861s
CO-57	488.03	122.06	167.	-17.	-0.009	112.10	0.861s
PA-234	524.99	131.29	220.	-17.	-0.009	128.81	0.871s
HF-181	531.91	133.02	237.	-17.	-0.009	133.14	0.872s
CE-144	533.97	133.54	194.	15.	0.009	129.58	0.873
HF-181	545.02	136.30	158.	14.	0.008	130.01	0.876
CO-57	545.72	136.47	127.	13.	0.007	126.26	0.876
Tc-99m	561.88	140.51	158.	-5.	-0.003	383.33	0.880s
U-235	574.99	143.79	166.	-4.	-0.002	487.37	0.883s
CE-141	581.61	145.44	118.	13.	0.007	124.23	0.885s
Ba-140	650.54	162.66	114.	3.	0.002	525.72	0.902s
CE-139	663.32	165.85	88.	13.	0.007	109.19	0.905
Cf-251	706.34	176.60	40.	25.	0.014	49.26	0.916s
U-235	742.85	185.72	81.	29.	0.016	58.39	0.925s
TH-229	774.03	193.51	74.	-11.	-0.006	156.75	0.933s
U-235	821.35	205.33	55.	-7.	-0.004	256.30	0.945s
TH-229	843.44	210.85	74.	-5.	-0.003	322.24	0.950s
Cf-251	908.08	227.00	60.	-8.	-0.004	175.89	0.966s
TH-227	943.98	235.97	368.	12.	0.007	223.62	0.975s
PB-212	954.64	238.63	32.	199.	0.110	8.17	0.978D
PB-214	968.10	242.00	43.	44.	0.024	26.19	0.981D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	978.89	244.69	429.	-15.	-0.008	203.32	0.984s
Cd-113m	1054.97	263.70	64.	-9.	-0.005	130.05	1.002s
BI-210M	1063.50	265.83	71.	2.	0.001	600.00	1.005s
TL-208	1109.56	277.34	8.	14.	0.008	43.83	1.049
Hg-203	1117.00	279.20	74.	-13.	-0.007	96.09	1.017s
I-131	1137.41	284.30	45.	-5.	-0.003	369.06	1.022s
PB-214	1180.55	295.08	15.	54.	0.030	19.11	0.824
TL-210	1184.24	296.00	229.	-11.	-0.006	190.54	1.034s
PB-212	1200.37	300.03	196.	11.	0.006	175.98	1.038
PA-231	1200.53	300.07	207.	9.	0.005	238.58	1.038s
PA-233	1200.97	300.18	216.	0.	0.000	1000.00	1.038s
PA-231	1210.86	302.65	216.	0.	0.000	1000.00	1.040s
BA-133	1211.66	302.85	216.	0.	0.000	1000.00	1.040s
Ba-140	1219.66	304.85	216.	0.	0.000	1000.00	1.042s
BI-210M	1219.85	304.90	216.	0.	0.000	1000.00	1.042s
Ir-192	1234.03	308.44	216.	0.	0.000	1000.00	1.046s
PA-233	1248.32	312.01	228.	-13.	-0.007	134.33	1.049s
Ir-192	1266.25	316.49	46.	10.	0.005	103.51	1.053s
CR-51	1280.63	320.08	59.	-4.	-0.002	414.73	1.057s
La-140	1315.35	328.76	33.	11.	0.006	101.24	1.065s
Cf-249	1334.08	333.44	40.	-5.	-0.003	226.94	1.070s
AC-228	1352.40	338.02	12.	37.	0.021	24.92	0.758s
Cs-136	1362.62	340.57	105.	6.	0.004	231.88	1.077
EU-152	1377.49	344.29	98.	9.	0.005	165.34	1.080
HF-181	1383.66	345.83	120.	-9.	-0.005	181.71	1.082s
PB-214	1407.81	351.86	4.	122.	0.068	9.65	1.416s
BA-133	1424.36	356.00	170.	-10.	-0.006	186.45	1.091
I-131	1458.32	364.48	19.	7.	0.004	116.93	1.099s
BA-133	1535.78	383.84	76.	4.	0.002	312.25	1.117s
Cf-249	1552.22	387.95	80.	0.	0.000	1000.00	1.121s
SN-113	1567.19	391.69	66.	8.	0.005	144.80	1.125s
SB-125	1711.99	427.88	32.	-7.	-0.004	119.14	1.158
AG-108M	1736.25	433.94	40.	-9.	-0.005	92.32	1.164s
PM-146	1816.05	453.88	37.	-10.	-0.005	89.68	1.182s
SB-125	1854.01	463.37	29.	9.	0.005	90.34	1.191s
Ir-192	1872.79	468.06	52.	4.	0.002	278.24	1.195s
BE-7	1910.94	477.59	64.	-6.	-0.004	179.08	1.204s
HF-181	1928.56	482.00	48.	10.	0.006	100.67	1.208s
La-140	1948.65	487.02	36.	-13.	-0.007	64.96	1.212s
RU-103	1988.80	497.05	8.	5.	0.003	121.40	1.221s
RH-106	2048.06	511.86	60.	58.	0.032	23.00	2.485s
Kr-85	2056.53	513.98	133.	-13.	-0.007	126.97	1.237s
Nd-147	2124.62	531.00	4.	14.	0.008	38.69	1.252s
Ba-140	2149.67	537.26	32.	-12.	-0.007	96.70	1.258s
CS-134	2253.60	563.24	16.	4.	0.002	204.21	1.280s
CS-134	2277.94	569.32	32.	-9.	-0.005	94.93	1.286s
BI-207	2279.47	569.70	43.	0.	0.000	1000.00	1.286s
TL-208	2333.33	583.17	6.	53.	0.029	16.05	0.986s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	2402.69	600.50	130.	8.	0.004	206.97	1.313
SB-124	2411.61	602.73	138.	2.	0.001	797.06	1.315s
CS-134	2419.53	604.71	140.	0.	0.000	1000.00	1.317
BI-214	2436.81	609.03	3.	72.	0.040	12.38	1.018
RU-103	2441.89	610.30	140.	0.	0.000	1000.00	1.322s
AG-108M	2457.82	614.28	140.	0.	0.000	1000.00	1.325s
RH-106	2488.37	621.92	23.	-6.	-0.003	164.33	1.332s
SB-125	2544.26	635.89	21.	-5.	-0.003	163.54	1.344s
I-131	2548.61	636.97	21.	5.	0.003	144.11	1.345s
AG-110M	2631.76	657.76	20.	8.	0.005	85.50	1.362s
CS-137	2647.36	661.66	49.	-16.	-0.009	49.72	1.366s
NB-94	2811.25	702.63	17.	-8.	-0.005	107.70	1.400s
SB-124	2891.88	722.79	57.	3.	0.001	406.20	1.417s
AG-108M	2892.48	722.94	60.	0.	0.000	1000.00	1.417s
EU-154	2894.17	723.36	60.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	88.	-20.	-0.011	70.93	1.418s
BI-212	2909.41	727.17	60.	12.	0.007	95.04	1.421
PM-146	2943.61	735.72	13.	7.	0.004	111.97	1.428s
PM-146	2989.37	747.16	13.	1.	0.001	742.74	1.437s
ZR-95	3027.65	756.73	5.	4.	0.002	112.28	1.445s
AG-110M	3056.50	763.94	64.	-17.	-0.010	69.02	1.451s
NB-95	3063.89	765.79	74.	-11.	-0.006	112.85	1.453s
PA-234M	3066.38	766.41	64.	12.	0.007	98.43	1.453s
EU-152	3116.41	778.92	5.	4.	0.002	116.84	1.463s
BI-212	3142.41	785.42	14.	6.	0.003	146.34	1.468
CS-134	3184.20	795.87	26.	9.	0.005	87.02	1.477s
TL-210	3199.12	799.60	46.	-4.	-0.002	273.33	1.480s
CS-134	3208.53	801.95	41.	7.	0.004	128.40	1.482s
CO-58	3243.82	810.78	19.	4.	0.002	177.45	1.489s
La-140	3263.80	815.77	23.	0.	0.000	1000.00	1.493s
MN-54	3340.10	834.85	24.	-8.	-0.004	111.09	1.508s
Co-56	3387.78	846.77	5.	5.	0.003	99.21	1.518s
TL-208	3442.95	860.56	5.	20.	0.011	31.62	1.529
NB-94	3485.08	871.10	12.	3.	0.002	154.92	1.537s
EU-154	3493.61	873.23	10.	5.	0.003	92.26	1.539s
PA-234	3522.80	880.53	41.	-11.	-0.006	90.01	1.544s
AG-110M	3539.41	884.68	53.	0.	0.000	1000.00	1.547s
Sc-46	3557.79	889.28	43.	9.	0.005	110.05	1.551s
Y-88	3592.83	898.04	0.	7.	0.004	37.80	1.558s
AC-228	3643.64	910.75	0.	53.	0.029	13.80	1.313
AG-110M	3750.60	937.49	9.	5.	0.003	146.39	1.589s
PA-234	3784.70	946.02	5.	5.	0.003	95.02	1.595s
EU-152	3857.05	964.11	19.	2.	0.001	560.18	1.609s
AC-228	3876.48	968.97	10.	40.	0.022	19.48	1.612s
EU-154	3985.88	996.33	30.	6.	0.003	148.27	1.633s
PA-234M	4004.55	1001.00	39.	-3.	-0.002	284.40	1.636s
EU-154	4019.65	1004.77	27.	8.	0.004	97.51	1.639s
Co-56	4151.87	1037.84	15.	-7.	-0.004	113.37	1.664s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cs-136	4192.77	1048.07	6.	6.	0.003	72.66	1.671s
RH-106	4201.93	1050.36	19.	-1.	0.000	999.62	1.673s
BI-207	4255.11	1063.66	5.	2.	0.001	313.36	1.682s
Ga-68	4310.04	1077.40	10.	4.	0.002	180.85	1.692s
FE-59	4397.41	1099.25	20.	-6.	-0.003	168.87	1.708s
EU-152	4448.68	1112.07	52.	-8.	-0.004	132.29	1.717s
ZN-65	4462.56	1115.55	44.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	42.	8.	0.004	119.85	1.723s
Sc-46	4482.57	1120.55	34.	10.	0.005	91.94	1.723s
Ta-182	4485.56	1121.30	57.	-12.	-0.006	95.83	1.724s
CO-60	4693.21	1173.24	20.	-7.	-0.004	145.45	1.760s
Ta-182	4756.42	1189.05	5.	6.	0.003	89.49	1.771s
Ta-182	4885.79	1221.41	16.	-2.	-0.001	460.07	1.793s
Co-56	4953.23	1238.28	6.	5.	0.003	114.48	1.804s
NA-22	5098.13	1274.53	16.	-7.	-0.004	89.21	1.828s
EU-154	5098.17	1274.54	23.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	0.	11.	0.006	30.48	1.840s
TL-210	5251.91	1313.00	11.	-3.	-0.001	285.04	1.854s
CO-60	5329.85	1332.50	0.	5.	0.003	51.55	1.866s
AG-110M	5536.88	1384.30	0.	7.	0.004	37.80	1.899s
EU-152	5631.62	1408.00	6.	3.	0.002	177.69	1.914s
K-40	5840.76	1460.33	0.	136.	0.076	8.57	1.901
La-140	6383.73	1596.21	11.	-3.	-0.002	243.10	2.024s
SB-124	6762.39	1690.98	6.	-2.	-0.001	343.80	2.076s
BI-214	7056.06	1764.49	12.	2.	0.001	243.92	2.114s
Co-56	7083.46	1771.35	15.	-1.	0.000	821.58	2.117s
Y-88	7341.96	1836.06	0.	5.	0.003	44.72	2.149s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	-2.6344E+00				5.31E+01	
			477.60	-2.634E+00	?(	1.627E+01 1.79E+02 1.05E+01	G
NA-22	C	-6.7971E-01				9.50E+02	
			1274.53	-6.797E-01	?(	2.073E+00 8.92E+01 9.99E+01	G
K-40	N	1.3876E+02				4.66E+11	
			1460.83	1.388E+02	(	7.519E+00 8.57E+00 1.07E+01	G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Sc-46    F   7.3609E-01                                     8.38E+01
                          889.28 6.336E-01 ?(  2.382E+00 1.10E+02 1.00E+02 G
                         1120.55 8.386E-01 ?(  2.615E+00 9.19E+01 1.00E+02 G

CR-51    F  -1.2566E+00                                     2.77E+01
                          320.08-1.257E+00  (P 1.185E+01 4.15E+02 9.94E+00 G

MN-54    C  -5.1220E-01                                     3.12E+02
                          834.85-5.122E-01 ?(P 1.722E+00 1.11E+02 1.00E+02 G

FE-59    F   5.6130E-01                                     4.45E+01
                         1099.25-9.099E-01 ?(  3.572E+00 1.69E+02 5.65E+01 G
                         1291.60 2.485E+00 &(P 1.674E+00 3.05E+01 4.32E+01 G

Co-56    C   5.0506E-01                                     7.73E+01
                          846.77 3.571E-01 ?(P 8.867E-01 9.92E+01 9.99E+01 G
                         1238.28 7.288E-01 ?(P 2.013E+00 1.14E+02 6.61E+01 G
                         1037.84-4.180E+00 + P 1.208E+01 1.13E+02 1.41E+01 G
                         1771.35-5.516E-01 +   1.701E+01 8.22E+02 1.55E+01  A

CO-57    C  -5.2901E-02                                     2.72E+02
                          122.06-3.022E-01 ?(  1.139E+00 1.12E+02 8.56E+01 G
                          136.47 1.946E+00 ?(  8.304E+00 1.26E+02 1.07E+01 G

CO-58    C   2.4466E-01                                     7.09E+01
                          810.78 2.447E-01 ?(  1.548E+00 1.77E+02 9.95E+01 G

CO-60    F   4.5909E-01                                     1.93E+03
                         1332.50 4.591E-01 ?(P 7.427E-01 5.16E+01 1.00E+02 G
                         1173.24-6.342E-01 -   2.134E+00 1.45E+02 9.99E+01 G

NB-94    I  -5.0106E-01                                     7.41E+06
                          702.63-5.011E-01 ?(  1.329E+00 1.08E+02 9.79E+01 G
                          871.10 2.352E-01 &   1.314E+00 1.55E+02 9.99E+01 G

ZR-95    I   5.0027E-01                                     6.40E+01
                          756.73 5.003E-01 ?(P 1.511E+00 1.12E+02 5.45E+01 G
                          724.20-2.697E+00 +   6.348E+00 7.09E+01 4.42E+01 G

NB-95    I  -7.0946E-01                                     6.40E+01
                          765.79-7.095E-01 &(  2.716E+00 1.13E+02 9.98E+01 G

RU-103   I   2.3907E-01                                     3.93E+01
                          497.05 2.391E-01 ?(P 7.734E-01 1.21E+02 9.09E+01 G
                          610.30 0.000E+00 -   5.264E+01 1.00E+03 5.75E+00 GA
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	-3.3009E+00					3.74E+02	
			621.92	-3.301E+00	?(	1.346E+01	1.64E+02	9.93E+00 G
			1050.36	-4.344E+00	+ P	1.212E+02	1.00E+03	1.56E+00 G
			511.86	1.310E+01	?	8.765E+00	2.30E+01	2.00E+01 GA
AG-108M	C	-4.0455E-01					1.53E+05	
			433.94	-4.046E-01	&(P	1.405E+00	9.23E+01	9.05E+01 G
			722.94	0.000E+00	+	2.575E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	+	3.387E+00	1.00E+03	8.98E+01 G
AG-110M	F	6.7934E-01					2.50E+02	
			884.68	0.000E+00	?(	3.589E+00	1.00E+03	7.27E+01 G
			657.76	4.829E-01	?(	1.401E+00	8.55E+01	9.46E+01 G
			937.49	1.018E+00	?(	3.697E+00	1.46E+02	3.44E+01 G
			1384.30	2.998E+00	?(	3.157E+00	3.78E+01	2.43E+01 G
			763.94	-4.952E+00	+	1.133E+01	6.90E+01	2.23E+01 G
SN-113	F	4.6122E-01					1.15E+02	
			391.69	4.612E-01	?(	2.288E+00	1.45E+02	6.40E+01 G
SB-124	F	2.4666E-01					6.02E+01	
			602.73	1.102E-01	?(	3.027E+00	7.97E+02	9.83E+01 G
			1690.98	-4.295E-01	+	3.557E+00	3.44E+02	4.78E+01 G
			722.79	1.487E+00	?(	2.119E+01	4.06E+02	1.08E+01 G
SB-125	I	8.7763E-01					1.01E+03	
			427.88	-9.420E-01	?(P	3.830E+00	1.19E+02	2.96E+01 G
			600.50	2.286E+00	?(	1.614E+01	2.07E+02	1.79E+01 G
			635.89	-2.608E+00	+ P	1.163E+01	1.64E+02	1.13E+01 G
			463.37	3.620E+00	@(P	1.109E+01	9.03E+01	1.05E+01 G
I-131	I	5.6811E-01					8.02E+00	
			364.48	3.032E-01	&(P	9.532E-01	1.17E+02	8.17E+01 G
			284.30	-2.065E+00	+ P	1.526E+01	3.69E+02	6.14E+00 G
			636.97	3.587E+00	?(P	1.817E+01	1.44E+02	7.17E+00 G
Gd-153	F	6.2120E-01					2.42E+02	
			97.50	6.212E-01	?(	2.827E+00	1.34E+02	3.00E+01 G
			103.20	-1.082E+00	+	4.394E+00	1.21E+02	2.18E+01 G
Ga-68	C	1.1968E+01					4.71E-02	
			1077.40	1.197E+01	?(	5.220E+01	1.81E+02	3.30E+00 G
Tc-99m	I	-8.7740E-02					2.51E-01	
			140.51	-8.774E-02	?(	1.151E+00	3.83E+02	8.93E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BA-133	F	-5.4013E-01					3.85E+03	
			356.00	-5.401E-01	?(	3.416E+00	1.86E+02	6.20E+01 G
			302.85	0.000E+00	&	1.134E+01	1.00E+03	1.83E+01 G
			383.84	1.590E+00	?	1.723E+01	3.12E+02	8.94E+00 GA
			80.99	6.878E-01		2.534E+00	1.36E+02	3.41E+01 GA
CS-134	I	1.2257E+00					7.54E+02	
			795.87	6.794E-01	&(	2.005E+00	8.70E+01	8.55E+01 G
			604.71	0.000E+00	-	3.077E+00	1.00E+03	9.76E+01 G
			569.32	-2.889E+00	+	9.332E+00	9.49E+01	1.54E+01 G
			801.95	5.549E+00	?(	2.454E+01	1.28E+02	8.69E+00 G
			563.24	2.322E+00	&(P	1.252E+01	2.04E+02	8.35E+00 G
CS-137	I	-1.0405E+00					1.10E+04	
			661.66	-1.040E+00	?(P	2.317E+00	4.97E+01	8.52E+01 G
CE-139	F	2.7962E-01					1.38E+02	
			165.85	2.796E-01	&(	1.032E+00	1.09E+02	7.99E+01 G
Ba-140	I	-2.3143E+00					1.28E+01	
			537.26	-2.314E+00	?(	5.607E+00	9.67E+01	2.44E+01 G
			162.66	8.302E-01	+ P	1.506E+01	5.26E+02	6.22E+00 G
			304.85	0.000E+00	+	4.871E+01	1.00E+03	4.29E+00 G
La-140	I	-3.7835E-02					1.28E+01	
			1596.21	-4.099E-01	?(	2.262E+00	2.43E+02	9.54E+01 G
			487.02	-1.210E+00	+ P	2.923E+00	6.50E+01	4.55E+01 G
			328.76	1.711E+00	&(	4.538E+00	1.01E+02	2.03E+01 G
			815.77	0.000E+00	+	7.181E+00	1.00E+03	2.33E+01 G
CE-141	I	4.3669E-01					3.25E+01	
			145.44	4.367E-01	?(	1.835E+00	1.24E+02	4.82E+01 G
CE-144	I	2.2243E+00					2.85E+02	
			133.54	2.224E+00	?(	9.702E+00	1.30E+02	1.11E+01 G
PM-144	C	1.8716E-02					3.63E+02	
			696.54	1.872E-02	%(P	1.177E+00	2.36E+03	9.90E+01 G
			618.06	8.004E-02	%	3.050E+00	1.10E+03	9.91E+01 G
EU-152	F	5.2674E-01					4.94E+03	
			121.78	-9.046E-01	?(	3.241E+00	1.07E+02	2.86E+01 G
			344.29	1.062E+00	?(	5.994E+00	1.65E+02	2.65E+01 G
			1112.07	-5.073E+00	+	2.303E+01	1.32E+02	1.36E+01 G
			778.92	2.198E+00	?(P	6.675E+00	1.17E+02	1.29E+01 G
			964.11	8.758E-01	&(	1.210E+01	5.60E+02	1.46E+01 G
			244.69	-4.685E+00	+	3.200E+01	2.03E+02	7.58E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	1.594E+00	? P	7.014E+00	1.78E+02	2.10E+01 GA
EU-154	I	1.7649E+00					3.14E+03	
			123.10	-2.545E-02	%(P	2.372E+00	2.70E+03	4.08E+01 G
			1274.54	0.000E+00	+	6.910E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	1.158E+01	1.00E+03	2.02E+01 G
			873.23	3.079E+00	?(	9.827E+00	9.23E+01	1.23E+01 G
			1004.77	3.554E+00	?(	1.184E+01	9.75E+01	1.80E+01 G
			996.33	4.093E+00	?(	2.117E+01	1.48E+02	1.06E+01 G
EU-155	I	-8.2358E-01					1.81E+03	
			105.31	-8.236E-01	?(	5.504E+00	1.98E+02	2.12E+01 G
			86.54	0.000E+00	&	5.446E+00	1.00E+03	3.07E+01 G
HF-181	F	7.7167E-01					4.24E+01	
			482.00	5.492E-01	?(	1.877E+00	1.01E+02	8.05E+01 G
			133.02	-6.107E-01	&	2.733E+00	1.33E+02	4.33E+01 G
			345.83	-1.874E+00	+	1.161E+01	1.82E+02	1.51E+01 G
			136.30	3.833E+00	?(	1.681E+01	1.30E+02	5.85E+00 G
Ta-182	F	-8.8705E-01					1.14E+02	
			1121.30	-2.913E+00	?(	9.434E+00	9.58E+01	3.49E+01 G
			1221.41	-6.935E-01	+	7.403E+00	4.60E+02	2.70E+01 G
			1189.05	3.477E+00	?(	7.419E+00	8.95E+01	1.62E+01 G
Hg-203	F	-4.4353E-01					4.66E+01	
			279.20	-4.435E-01	?(	1.436E+00	9.61E+01	8.15E+01 G
TL-208	N	3.1637E+00					6.98E+02	
			583.02	3.164E+00	(P	8.370E-01	1.61E+01	8.45E+01 G
			277.28	5.875E+00	+	6.948E+00	4.38E+01	6.31E+00 G
			860.56	1.142E+01	+	7.177E+00	3.16E+01	1.24E+01 G
PM-146	C	3.7001E-02					2.02E+03	
			453.88	-6.081E-01	?(P	1.945E+00	8.97E+01	6.50E+01 G
			747.16	1.823E-01	+	3.556E+00	7.43E+02	3.40E+01 G
			735.72	1.901E+00	?(P	5.307E+00	1.12E+02	2.25E+01 G
Y-88	F	6.0461E-01					1.07E+02	
			1836.06	6.655E-01	?(	9.809E-01	4.47E+01	9.92E+01 G
			898.04	5.402E-01	?(	5.687E-01	3.78E+01	9.37E+01 G
Cd-113m		-3.9031E+03					5.33E+03	
			263.70	-3.903E+03	?(	1.734E+04	1.30E+02	6.00E-03 K
Cf-251	T	2.7464E+00					3.28E+05	
			176.60	2.746E+00	*(	3.535E+00	4.93E+01	1.70E+01 G
			227.00	-2.918E+00	-	1.416E+01	1.76E+02	6.30E+00 GA

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		-1.1081E+00					3.65E+07	
			87.57	0.000E+00	+	4.436E+00	1.00E+03	3.75E+01 GA
			64.28	-1.108E+00	&(	1.231E+01	3.25E+02	9.70E+00 G
			86.94	0.000E+00	+	1.846E+01	1.00E+03	9.04E+00 GA
PB-210	N	2.5690E+01					8.14E+03	
			46.54	2.569E+01	*(P	2.856E+01	4.54E+01	4.25E+00 G
PB-212	N	1.0992E+01					6.98E+02	
			238.63	1.099E+01	(	1.615E+00	8.17E+00	4.33E+01 G
			300.03	1.008E+01	?	5.999E+01	1.76E+02	3.28E+00 GA
PB-214	N	1.0758E+01					5.84E+05	
			351.93	1.076E+01	*(	1.023E+00	9.65E+00	3.76E+01 G
			295.09	7.992E+00	-	3.072E+00	1.91E+01	1.93E+01 G
			242.00	1.422E+01	+	1.090E+01	2.62E+01	7.43E+00 GA
BI-207	C	1.8424E-01					1.18E+04	
			1063.66	1.842E-01	?(P	1.509E+00	3.13E+02	7.45E+01 G
			569.70	0.000E+00	-	1.675E+00	1.00E+03	9.77E+01 G
BI-212	N	9.7076E+00					6.98E+02	
			727.17	9.708E+00	(	3.115E+01	9.50E+01	7.55E+00 G
			785.42	2.874E+01	P	1.027E+02	1.46E+02	1.28E+00 GA
U-235	N	-5.6568E-01					2.57E+11	
			143.79	-5.657E-01	?(P	9.437E+00	4.87E+02	1.10E+01 G
			205.33	-2.765E+00	+ P	1.568E+01	2.56E+02	5.01E+00 G
			163.38	-6.717E-02	& P	1.874E+01	8.00E+03	5.08E+00 G
			185.72	1.029E+00	P	1.614E+00	5.84E+01	5.40E+01 GA
BI-214	N	8.1312E+00					5.84E+05	
			609.31	8.131E+00	(P	1.263E+00	1.24E+01	4.61E+01 G
			1120.29	4.639E+00	- P	1.904E+01	1.20E+02	1.51E+01 G
			1764.49	1.734E+00	- P	1.558E+01	2.44E+02	1.54E+01 G
BI-210M	T	1.0478E-01					1.10E+09	
			265.83	1.048E-01	?(	2.199E+00	6.00E+02	5.00E+01 G
			304.90	0.000E+00	-	7.463E+00	1.00E+03	2.80E+01 G
AC-228	N	1.4937E+01					2.10E+03	
			911.07	1.334E+01	(P	1.860E+00	1.38E+01	2.90E+01 G
			968.97	1.758E+01	?(P	7.753E+00	1.95E+01	1.75E+01 G
			338.32	9.858E+00	-	5.023E+00	2.49E+01	1.20E+01 G
			93.35	4.836E+00	-	2.475E+01	1.52E+02	5.56E+00 XA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	1.9117E+00					7.95E+03	
			256.24	-2.420E-01	&(	1.266E+01	1.94E+03	7.00E+00 G
			235.97	2.360E+00	?(	1.777E+01	2.24E+02	1.23E+01 G
			50.14	3.107E+00	&(	1.400E+01	1.56E+02	8.00E+00 G
TH-229	N	-4.8766E+00					2.68E+06	
			193.51	-4.877E+00	(P	1.955E+01	1.57E+02	4.40E+00 G
			210.85	-3.782E+00	+ P	3.099E+01	3.22E+02	2.99E+00 G
TH-234	N	9.9256E+00					1.63E+12	
			92.59	1.033E+01	(P	1.597E+01	4.78E+01	5.58E+00 G
			63.29	9.334E+00	@(P	2.113E+01	7.77E+01	3.81E+00 G
PA-231	N	4.6779E+00					1.20E+07	
			302.65	0.000E+00	&(	7.212E+01	1.00E+03	2.88E+00 G
			300.07	1.015E+01	?(	8.220E+01	2.39E+02	2.46E+00 G
PA-233	C	-1.0479E+00					7.82E+08	
			312.01	-1.048E+00	?(P	6.075E+00	1.34E+02	3.60E+01 G
			300.18	0.000E+00	+	3.327E+01	1.00E+03	6.20E+00 G
PA-234	N	4.7218E-01					1.63E+12	
			131.29	-1.459E+00	?(	6.318E+00	1.29E+02	1.80E+01 G
			946.02	3.066E+00	?(P	7.265E+00	9.50E+01	1.34E+01 G
			569.47	-2.007E-01	%	1.989E+01	2.77E+03	8.20E+00 G
			883.24	-4.431E-01	%	2.699E+01	1.72E+03	9.60E+00 G
			880.53	-1.273E+01	+	3.872E+01	9.00E+01	6.00E+00 GA
PA-234M	N	4.7219E+01					1.63E+12	
			1001.00	-2.717E+01	?(P	3.006E+02	2.84E+02	8.37E-01 G
			766.41	2.590E+02	&(P	8.612E+02	9.84E+01	2.94E-01 G
AM-241	T	-2.2169E-01					1.58E+05	
			59.54	-2.217E-01	?(P	3.146E+00	4.81E+02	3.59E+01 G
Np-237	F	-1.1531E+00					2.14E+06	
			86.49	-1.153E+00	&(	1.289E+01	3.32E+02	1.31E+01 G
Ir-192	F	3.2442E-01					7.40E+01	
			316.49	3.372E-01	?(	1.188E+00	1.04E+02	8.70E+01 G
			468.06	3.030E-01	?(	2.949E+00	2.78E+02	5.18E+01 G
			308.44	0.000E+00	-	6.645E+00	1.00E+03	3.18E+01 G
Cs-136	F	2.9069E-01					1.30E+01	
			818.50	-2.230E-02	&(	1.687E+00	2.06E+03	1.00E+02 G
			1048.07	5.976E-01	?(	1.453E+00	7.27E+01	8.00E+01 G
			340.57	4.345E-01	?(	3.457E+00	2.32E+02	4.69E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Np-239   T   9.5308E-01                                      2.36E+00
                          103.70 0.000E+00 -   4.165E+00 1.00E+03 2.40E+01 X
                          106.13 9.531E-01 ?(  4.742E+00 1.48E+02 2.27E+01 G
                           99.50 1.276E+00 ?   4.988E+00 1.16E+02 1.50E+01 X

Nd-147       5.0163E+00                                      1.11E+01
                          531.00 5.016E+00 &(  4.310E+00 3.87E+01 1.30E+01 G
                           91.10 5.037E-01 -   5.413E+00 3.19E+02 2.83E+01 G

TL-210   N  -2.3597E-01                                      5.84E+05
                          799.60-2.360E-01 ?(  2.265E+00 2.73E+02 9.90E+01 G
                          296.00-4.122E-01 +   2.655E+00 1.91E+02 7.90E+01 G
                         1313.00-1.264E+00 +   8.495E+00 2.85E+02 2.10E+01 GA

Kr-85    I  -1.3880E+02                                      3.92E+03
                          513.98-1.388E+02 ?(  5.955E+02 1.27E+02 4.30E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
AM-241	59.54	110.	-4.	-0.002	480.53	-2.217E-01	P
Sn-126	64.28	147.	-5.	-0.003	324.76	-1.108E+00	
BA-133	80.99	110.	14.	0.008	135.96	6.878E-01	
Np-237	86.49	476.	-9.	-0.005	332.09	-1.153E+00	
Np-239	99.50	96.	12.	0.007	115.55	1.276E+00	
EU-155	105.31	247.	-11.	-0.006	197.83	-8.236E-01	
Np-239	106.13	209.	14.	0.008	147.58	9.531E-01	
EU-152	121.78	150.	-17.	-0.009	106.65	-9.046E-01	
CO-57	122.06	167.	-17.	-0.009	112.10	-3.022E-01	
PA-234	131.29	220.	-17.	-0.009	128.81	-1.459E+00	
HF-181	133.02	237.	-17.	-0.009	133.14	-6.107E-01	
CE-144	133.54	194.	15.	0.009	129.58	2.224E+00	
HF-181	136.30	158.	14.	0.008	130.01	3.833E+00	
CO-57	136.47	127.	13.	0.007	126.26	1.946E+00	
Tc-99m	140.51	158.	-5.	-0.003	383.33	-8.774E-02	
U-235	143.79	166.	-4.	-0.002	487.37	-5.657E-01	P
CE-141	145.44	118.	13.	0.007	124.23	4.367E-01	
Ba-140	162.66	114.	3.	0.002	525.72	8.302E-01	P
CE-139	165.85	88.	13.	0.007	109.19	2.796E-01	
Cf-251	176.60	40.	25.	0.014	49.26	2.746E+00	
U-235	185.72	81.	29.	0.016	58.39	1.029E+00	P
TH-229	193.51	74.	-11.	-0.006	156.75	-4.877E+00	P
U-235	205.33	55.	-7.	-0.004	256.30	-2.765E+00	P
TH-229	210.85	74.	-5.	-0.003	322.24	-3.782E+00	P
Cf-251	227.00	60.	-8.	-0.004	175.89	-2.918E+00	
EU-152	244.69	429.	-15.	-0.008	203.32	-4.685E+00	
Cd-113m	263.70	64.	-9.	-0.005	130.05	-3.903E+03	
BI-210M	265.83	71.	2.	0.001	600.00	1.048E-01	
Hg-203	279.20	74.	-13.	-0.007	96.09	-4.435E-01	
I-131	284.30	45.	-5.	-0.003	369.06	-2.065E+00	P
TL-210	296.00	229.	-11.	-0.006	190.54	-4.122E-01	
PA-231	300.07	207.	9.	0.005	238.58	1.015E+01	
PA-233	312.01	228.	-13.	-0.007	134.33	-1.048E+00	P
Ir-192	316.49	46.	10.	0.005	103.51	3.372E-01	
CR-51	320.08	59.	-4.	-0.002	414.73	-1.257E+00	P
La-140	328.76	33.	11.	0.006	101.24	1.711E+00	
Cf-249	333.44	40.	-5.	-0.003	226.94	-1.087E+00	
Cs-136	340.57	105.	6.	0.004	231.88	4.345E-01	
EU-152	344.29	98.	9.	0.005	165.34	1.062E+00	
HF-181	345.83	120.	-9.	-0.005	181.71	-1.874E+00	
BA-133	356.00	170.	-10.	-0.006	186.45	-5.401E-01	
I-131	364.48	19.	7.	0.004	116.93	3.032E-01	P
BA-133	383.84	76.	4.	0.002	312.25	1.590E+00	
SN-113	391.69	66.	8.	0.005	144.80	4.612E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	427.88	32.	-7.	-0.004	119.14	-9.420E-01	P
AG-108M	433.94	40.	-9.	-0.005	92.32	-4.046E-01	P
PM-146	453.88	37.	-10.	-0.005	89.68	-6.081E-01	P
SB-125	463.37	29.	9.	0.005	90.34	3.620E+00	P
Ir-192	468.06	52.	4.	0.002	278.24	3.030E-01	
BE-7	477.59	64.	-6.	-0.004	179.08	-2.634E+00	
HF-181	482.00	48.	10.	0.006	100.67	5.492E-01	
La-140	487.02	36.	-13.	-0.007	64.96	-1.210E+00	P
RU-103	497.05	8.	5.	0.003	121.40	2.391E-01	P
RH-106	511.86	60.	58.	0.032	23.00	1.310E+01	
Kr-85	513.98	133.	-13.	-0.007	126.97	-1.388E+02	
Ba-140	537.26	32.	-12.	-0.007	96.70	-2.314E+00	
CS-134	563.24	16.	4.	0.002	204.21	2.322E+00	P
CS-134	569.32	32.	-9.	-0.005	94.93	-2.889E+00	
SB-125	600.50	130.	8.	0.004	206.97	2.286E+00	
SB-124	602.73	138.	2.	0.001	797.06	1.102E-01	
RH-106	621.92	23.	-6.	-0.003	164.33	-3.301E+00	
SB-125	635.89	21.	-5.	-0.003	163.54	-2.608E+00	P
I-131	636.97	21.	5.	0.003	144.11	3.587E+00	P
AG-110M	657.76	20.	8.	0.005	85.50	4.829E-01	
CS-137	661.66	49.	-16.	-0.009	49.72	-1.040E+00	P
NB-94	702.63	17.	-8.	-0.005	107.70	-5.011E-01	
SB-124	722.79	57.	3.	0.001	406.20	1.487E+00	
ZR-95	724.20	88.	-20.	-0.011	70.93	-2.697E+00	
PM-146	735.72	13.	7.	0.004	111.97	1.901E+00	P
PM-146	747.16	13.	1.	0.001	742.74	1.823E-01	
ZR-95	756.73	5.	4.	0.002	112.28	5.003E-01	P
AG-110M	763.94	64.	-17.	-0.010	69.02	-4.952E+00	
NB-95	765.79	74.	-11.	-0.006	112.85	-7.095E-01	
PA-234M	766.41	64.	12.	0.007	98.43	2.590E+02	P
EU-152	778.92	5.	4.	0.002	116.84	2.198E+00	P
CS-134	795.87	26.	9.	0.005	87.02	6.794E-01	
TL-210	799.60	46.	-4.	-0.002	273.33	-2.360E-01	
CS-134	801.95	41.	7.	0.004	128.40	5.549E+00	
CO-58	810.78	19.	4.	0.002	177.45	2.447E-01	
MN-54	834.85	24.	-8.	-0.004	111.09	-5.122E-01	P
Co-56	846.77	5.	5.	0.003	99.21	3.571E-01	P
NB-94	871.10	12.	3.	0.002	154.92	2.352E-01	
EU-154	873.23	10.	5.	0.003	92.26	3.079E+00	
PA-234	880.53	41.	-11.	-0.006	90.01	-1.273E+01	
Sc-46	889.28	43.	9.	0.005	110.05	6.336E-01	
Y-88	898.04	0.	7.	0.004	37.80	5.402E-01	
AG-110M	937.49	9.	5.	0.003	146.39	1.018E+00	
PA-234	946.02	5.	5.	0.003	95.02	3.066E+00	P
EU-152	964.11	19.	2.	0.001	560.18	8.758E-01	
EU-154	996.33	30.	6.	0.003	148.27	4.093E+00	
PA-234M	1001.00	39.	-3.	-0.002	284.40	-2.717E+01	P
EU-154	1004.77	27.	8.	0.004	97.51	3.554E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Co-56	1037.84	15.	-7.	-0.004	113.37	-4.180E+00		P
Cs-136	1048.07	6.	6.	0.003	72.66	5.976E-01		
RH-106	1050.36	19.	-1.	0.000	999.62	-4.344E+00		P
BI-207	1063.66	5.	2.	0.001	313.36	1.842E-01		P
Ga-68	1077.40	10.	4.	0.002	180.85	1.197E+01		
FE-59	1099.25	20.	-6.	-0.003	168.87	-9.099E-01		
EU-152	1112.07	52.	-8.	-0.004	132.29	-5.073E+00		
Sc-46	1120.55	34.	10.	0.005	91.94	8.386E-01		
Ta-182	1121.30	57.	-12.	-0.006	95.83	-2.913E+00		
CO-60	1173.24	20.	-7.	-0.004	145.45	-6.342E-01		
Ta-182	1189.05	5.	6.	0.003	89.49	3.477E+00		
Ta-182	1221.41	16.	-2.	-0.001	460.07	-6.935E-01		
Co-56	1238.28	6.	5.	0.003	114.48	7.288E-01		P
NA-22	1274.53	16.	-7.	-0.004	89.21	-6.797E-01		
FE-59	1291.60	0.	11.	0.006	30.48	2.485E+00		P
TL-210	1313.00	11.	-3.	-0.001	285.04	-1.264E+00		
CO-60	1332.50	0.	5.	0.003	51.55	4.591E-01		P
AG-110M	1384.30	0.	7.	0.004	37.80	2.998E+00		
EU-152	1408.00	6.	3.	0.002	177.69	1.594E+00		P
La-140	1596.21	11.	-3.	-0.002	243.10	-4.099E-01		
SB-124	1690.98	6.	-2.	-0.001	343.80	-4.295E-01		
Co-56	1771.35	15.	-1.	0.000	821.58	-5.516E-01		
Y-88	1836.06	0.	5.	0.003	44.72	6.655E-01		

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma MDA Bq/Sample
BE-7	#A	-2.6344E+00	-2.6344E+00	1.791E+02%	1.63E+01
NA-22	#A	-6.7971E-01	-6.7971E-01	8.921E+01%	2.07E+00
K-40		1.3876E+02	1.3876E+02	8.575E+00%	7.52E+00
Sc-46	#A	7.3609E-01	7.3609E-01	7.170E+01%	2.38E+00
CR-51	#A	-1.2565E+00	-1.2566E+00	4.147E+02%	1.18E+01
MN-54	#A	-5.1220E-01	-5.1220E-01	1.111E+02%	1.72E+00
FE-59	#A	5.6130E-01	5.6130E-01	3.048E+01%	3.57E+00
Co-56	#A	5.0505E-01	5.0506E-01	7.574E+01%	8.87E-01
CO-57	#A	-5.2901E-02	-5.2901E-02	8.442E+01%	1.14E+00
CO-58	#A	2.4466E-01	2.4466E-01	1.774E+02%	1.55E+00
CO-60	#A	4.5909E-01	4.5909E-01	5.155E+01%	7.43E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.76E+00
NB-94	#A	-5.0106E-01	-5.0106E-01	1.077E+02%	1.33E+00
ZR-95	#A	5.0027E-01	5.0027E-01	1.123E+02%	1.51E+00
NB-95	#A	-7.0946E-01	-7.0946E-01	1.128E+02%	2.72E+00
RU-103	#A	2.3906E-01	2.3907E-01	1.214E+02%	7.73E-01
RH-106	#A	-3.3009E+00	-3.3009E+00	1.643E+02%	1.35E+01

AG-108M#A	-4.0455E-01	-4.0455E-01	9.232E+01%	1.40E+00
AG-110M#A	6.7933E-01	6.7934E-01	3.780E+01%	3.59E+00
SN-113 #A	4.6122E-01	4.6122E-01	1.448E+02%	2.29E+00
SB-124 #A	2.4666E-01	2.4666E-01	4.062E+02%	3.03E+00
SB-125 #A	8.7763E-01	8.7763E-01	8.511E+01%	3.83E+00
I-131 #A	5.6808E-01	5.6811E-01	9.279E+01%	9.53E-01
Gd-153 #A	6.2120E-01	6.2120E-01	1.344E+02%	2.83E+00
Ga-68 #A	1.1865E+01	1.1968E+01	1.809E+02%	5.22E+01
Tc-99m #A	-8.7597E-02	-8.7740E-02	3.833E+02%	1.15E+00
BA-133 #A	-5.4013E-01	-5.4013E-01	1.864E+02%	3.42E+00
CS-134 #A	1.2257E+00	1.2257E+00	8.548E+01%	2.00E+00
CS-137 #A	-1.0405E+00	-1.0405E+00	4.972E+01%	2.32E+00
CE-139 #A	2.7962E-01	2.7962E-01	1.092E+02%	1.03E+00
Ba-140 #A	-2.3142E+00	-2.3143E+00	9.670E+01%	5.61E+00
La-140 #A	-3.7833E-02	-3.7835E-02	1.012E+02%	2.26E+00
CE-141 #A	4.3668E-01	4.3669E-01	1.242E+02%	1.83E+00
CE-144 #A	2.2243E+00	2.2243E+00	1.296E+02%	9.70E+00
PM-144 #A	1.8716E-02	1.8716E-02	2.360E+03%	1.18E+00
EU-152 #A	5.2674E-01	5.2674E-01	1.067E+02%	3.24E+00
EU-154 #A	1.7649E+00	1.7649E+00	9.226E+01%	2.37E+00
EU-155 #A	-8.2358E-01	-8.2358E-01	1.978E+02%	5.50E+00
HF-181 #A	7.7166E-01	7.7167E-01	8.221E+01%	1.88E+00
Ta-182 #A	-8.8705E-01	-8.8705E-01	6.556E+01%	9.43E+00
Hg-203 #A	-4.4353E-01	-4.4353E-01	9.609E+01%	1.44E+00
TL-208	3.1637E+00	3.1637E+00	1.605E+01%	8.37E-01
PM-146 #A	3.7001E-02	3.7001E-02	7.173E+01%	1.94E+00
Y-88 #A	6.0461E-01	6.0461E-01	2.928E+01%	9.81E-01
Cd-113m#A	-3.9031E+03	-3.9031E+03	1.301E+02%	1.73E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%	4.38E+01
Cf-251 #A	2.7464E+00	2.7464E+00	4.926E+01%	3.54E+00
Cf-249 #A	0.0000E+00	0.0000E+00	1.000E+03%	2.41E+00
Sn-126 #A	-1.1081E+00	-1.1081E+00	3.248E+02%	1.23E+01
PB-210 #A	2.5690E+01	2.5690E+01	4.543E+01%	2.86E+01
PB-212	1.0992E+01	1.0992E+01	8.167E+00%	1.62E+00
PB-214	1.0758E+01	1.0758E+01	9.653E+00%	1.02E+00
BI-207 #A	1.8424E-01	1.8424E-01	3.134E+02%	1.51E+00
BI-212 A	9.7076E+00	9.7076E+00	9.504E+01%	3.12E+01
U-235 #A	-5.6568E-01	-5.6568E-01	4.874E+02%	9.44E+00
BI-214	8.1312E+00	8.1312E+00	1.238E+01%	1.26E+00
BI-210M#A	1.0478E-01	1.0478E-01	6.000E+02%	2.20E+00
AC-228	1.4937E+01	1.4937E+01	1.194E+01%	1.86E+00
TH-227 #A	1.9117E+00	1.9117E+00	1.556E+02%	1.27E+01
TH-229 #A	-4.8766E+00	-4.8766E+00	1.567E+02%	1.95E+01
TH-234 A	9.9256E+00	9.9256E+00	4.560E+01%	1.60E+01
PA-231 #A	4.6779E+00	4.6779E+00	2.386E+02%	7.21E+01
PA-233 #A	-1.0479E+00	-1.0479E+00	1.343E+02%	6.08E+00
PA-234 #A	4.7218E-01	4.7218E-01	8.003E+01%	6.32E+00
PA-234M#A	4.7219E+01	4.7219E+01	9.843E+01%	3.01E+02
AM-241 #A	-2.2169E-01	-2.2169E-01	4.805E+02%	3.15E+00

Np-237	#A	-1.1531E+00	-1.1531E+00	3.321E+02%	1.29E+01
Ir-192	#A	3.2442E-01	3.2442E-01	1.035E+02%	1.19E+00
Cs-136	#A	2.9068E-01	2.9069E-01	7.266E+01%	1.69E+00
Np-239	#A	9.5292E-01	9.5308E-01	1.476E+02%	4.74E+00
Nd-147	#	5.0162E+00	5.0163E+00	3.869E+01%	4.31E+00
TL-210	#A	-2.3597E-01	-2.3597E-01	2.733E+02%	2.26E+00
Kr-85	#A	-1.3880E+02	-1.3880E+02	1.270E+02%	5.95E+02

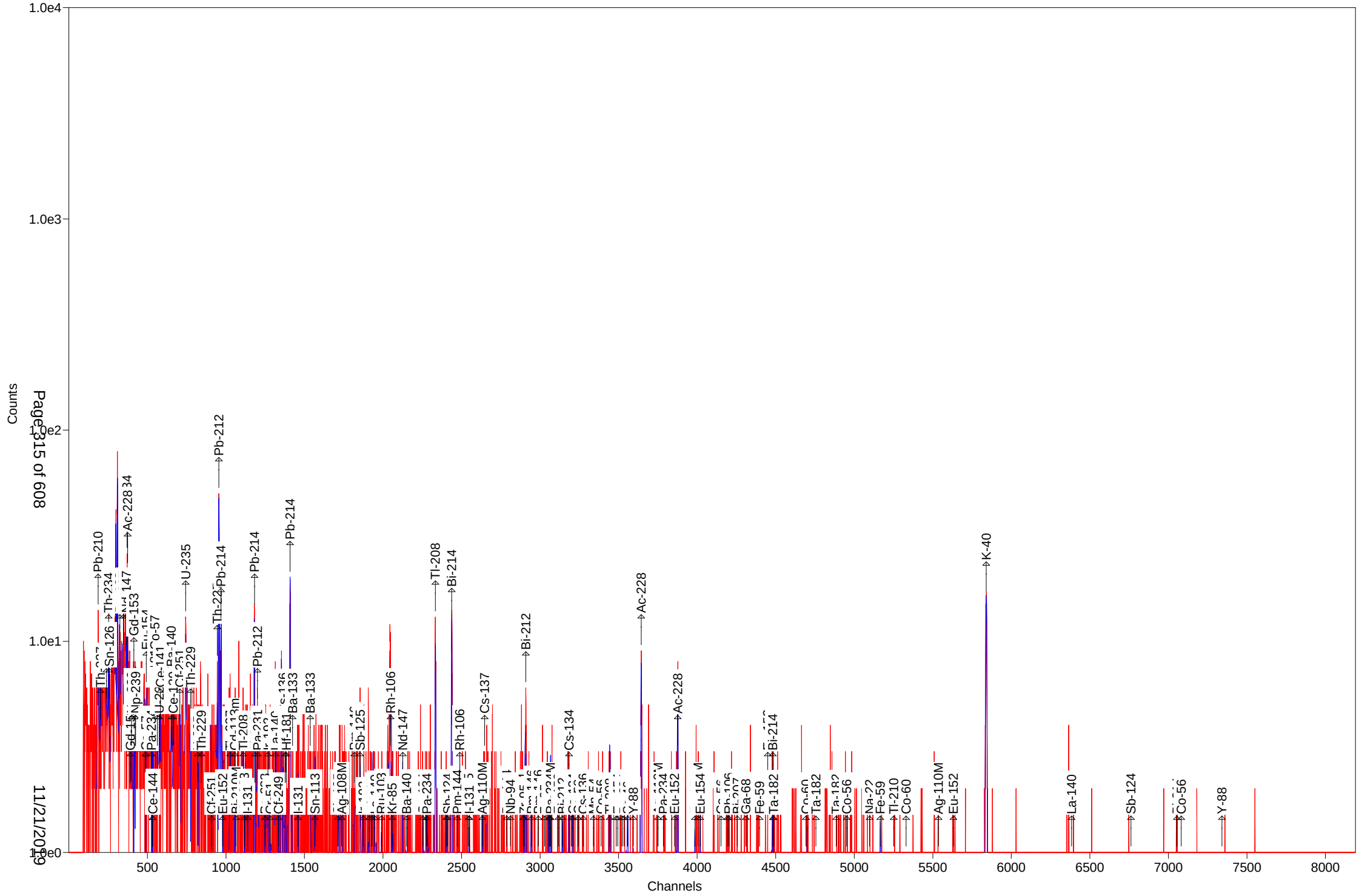
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 2000.8 keV) 2.224E+02 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 2.2235410E+02 Bq/Sample

(Page 22 of 22)

445369_Gamma_180-96595-A-4-B. 5_Gamma_20192837.spc.



Sample Description: 445369_Gamma_180-96595-A-5-C
Detector: Detector # 8
Batch ID: 445369
Work Order Number: Gamma
Lot Number: 180-96595-A-5-C

Decay to Time: 10/31/2019 03:00 Live Time: 1800 sec
Acquisition Time: 10/31/2019 03:01:14 Real Time: 1844 sec
Analysis Time: 10/31/2019 03:32 Dead Time: 2.36 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 8_Soil_TunaCan.Clb
Efficiency Cal Desc: 8_Soil_TunaCan_90099_032712
Efficiency Cal Date: 3/28/2012 10:35
Energy Cal Date: 2/28/2012 10:34
Library: Client_Long_Rev15.lib
Bkgd Correction File: 8_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	1.264E+00	308.8	3.902E+00	3.903E+00	1.358E+01
NA-22	-3.471E-01	158.2	5.492E-01	5.495E-01	1.941E+00
K-40	1.214E+02	8.5	1.036E+01	1.208E+01	9.370E+00
Sc-46	4.640E-01	99.8	4.631E-01	4.637E-01	1.585E+00
CR-51	-3.920E+00	184.3	7.224E+00	7.227E+00	2.427E+01
MN-54	-2.791E-01	228.9	6.389E-01	6.391E-01	1.528E+00
FE-59	-2.495E-01	431.6	1.077E+00	1.077E+00	2.590E+00
Co-56	8.955E-01	47.5	4.254E-01	4.279E-01	7.305E-01
CO-57	3.139E-01	91.0	2.856E-01	2.860E-01	9.546E-01
CO-58	4.015E-01	93.2	3.740E-01	3.746E-01	1.280E+00
CO-60	-7.552E-01	72.0	5.438E-01	5.451E-01	1.963E+00
ZN-65	-1.617E-02	4838.9	7.823E-01	7.823E-01	4.598E+00
NB-94	-7.095E-01	83.4	5.918E-01	5.930E-01	1.631E+00
ZR-95	9.437E-02	800.0	7.549E-01	7.549E-01	1.901E+00
NB-95	6.068E-01	80.9	4.907E-01	4.917E-01	1.648E+00
RU-103	-4.813E-01	110.9	5.339E-01	5.344E-01	1.272E+00
RH-106	-2.927E-01	82.2	2.405E-01	2.409E-01	3.107E+01
AG-108M	5.693E-02	335.4	1.909E-01	1.910E-01	1.149E+00
AG-110M	4.089E-01	44.7	1.829E-01	1.841E-01	2.535E+00
SN-113	-6.540E-01	104.5	6.835E-01	6.843E-01	2.304E+00
SB-124	8.417E-01	80.7	6.794E-01	6.808E-01	2.830E+00
SB-125	8.151E-01	78.3	6.384E-01	6.397E-01	2.775E+00
I-131	1.022E+00	28.0	2.865E-01	2.913E-01	5.643E-01
Gd-153	-1.301E+00	169.8	2.209E+00	2.210E+00	7.356E+00
Ga-68	1.487E+01	122.9	1.826E+01	1.828E+01	4.323E+01
Tc-99m	-4.026E-01	136.5	5.495E-01	5.500E-01	1.835E+00
BA-133	-7.499E-01	137.0	1.027E+00	1.028E+00	3.452E+00
CS-134	8.610E-01	71.9	6.192E-01	6.208E-01	1.673E+00
CS-137	-1.202E+00	53.6	6.446E-01	6.476E-01	2.428E+00
CE-139	8.303E-02	427.8	3.552E-01	3.553E-01	1.215E+00
Ba-140	2.047E+00	78.2	1.602E+00	1.605E+00	4.200E+00
La-140	-6.448E-02	187.2	1.207E-01	1.208E-01	1.878E+00
CE-141	7.033E-01	150.1	1.055E+00	1.056E+00	3.526E+00

CE-144	4.966E-01	787.7	3.912E+00	3.912E+00	1.320E+01
PM-144	-6.782E-01	101.8	6.902E-01	6.911E-01	1.594E+00
EU-152	1.889E-01	82.9	1.565E-01	1.568E-01	3.200E+00
EU-154	6.131E-01	84.1	5.158E-01	5.168E-01	1.723E+00
EU-155	0.000E+00	1.#INF	9.620E-01	9.620E-01	1.043E+01
HF-181	-6.773E-01	97.4	6.601E-01	6.610E-01	2.218E+00
Ta-182	1.911E+00	68.2	1.303E+00	1.307E+00	5.193E+00
Hg-203	-5.324E-01	84.1	4.477E-01	4.488E-01	1.495E+00
TL-208	4.469E+00	12.2	5.439E-01	5.913E-01	8.457E-01
PM-146	-8.930E-01	69.7	6.220E-01	6.237E-01	2.026E+00
Y-88	4.732E-01	26.6	1.257E-01	1.286E-01	8.180E-01
Cd-113m	-7.469E+03	72.7	5.428E+03	5.450E+03	1.803E+04
Cd-109	0.000E+00	1.#INF	1.747E+01	1.747E+01	5.818E+01
Cf-251	3.054E+00	54.9	1.676E+00	1.697E+00	4.209E+00
Cf-249	0.000E+00	1.#INF	9.006E-02	9.006E-02	1.927E+00
Sn-126	4.545E+00	108.9	4.950E+00	4.956E+00	1.261E+01
PB-210	-1.926E+00	500.7	9.646E+00	9.647E+00	4.251E+01
PB-212	1.353E+01	6.6	8.992E-01	1.255E+00	1.498E+00
PB-214	1.148E+01	7.8	8.953E-01	1.076E+00	1.707E+00
BI-207	5.344E-01	94.8	5.067E-01	5.074E-01	1.220E+00
BI-212	4.685E+00	141.1	6.613E+00	6.617E+00	2.279E+01
U-235	-3.472E+00	40.3	1.401E+00	1.412E+00	1.526E+01
BI-214	1.124E+01	9.5	1.064E+00	1.214E+00	1.156E+00
BI-210M	2.545E-01	269.8	6.867E-01	6.868E-01	2.387E+00
AC-228	1.421E+01	9.9	1.412E+00	1.587E+00	2.647E+00
TH-227	0.000E+00	1.#INF	2.521E+00	2.521E+00	1.325E+01
TH-229	5.624E+00	89.0	5.008E+00	5.028E+00	1.817E+01
TH-234	5.503E+00	84.4	4.645E+00	4.655E+00	1.538E+01
PA-231	6.266E+00	195.1	1.222E+01	1.223E+01	7.820E+01
PA-233	0.000E+00	1.#INF	1.963E-01	1.963E-01	6.409E+00
PA-234	-1.685E+00	146.5	2.468E+00	2.470E+00	8.253E+00
PA-234M	2.002E+01	88.3	1.768E+01	1.770E+01	2.905E+02
AM-241	-3.682E-01	415.1	1.529E+00	1.529E+00	5.200E+00
Np-237	0.000E+00	1.#INF	5.268E+00	5.268E+00	1.755E+01
Ir-192	6.645E-02	432.8	2.876E-01	2.876E-01	2.681E+00
Cs-136	2.530E-01	116.3	2.943E-01	2.947E-01	1.209E+00
Np-239	-5.067E-01	573.9	2.908E+00	2.908E+00	9.724E+00
Nd-147	-4.210E+00	93.1	3.920E+00	3.928E+00	9.380E+00
TL-210	0.000E+00	1.#INF	2.035E-01	2.035E-01	9.203E-01
Kr-85	9.585E+01	120.5	1.155E+02	1.156E+02	3.919E+02
Total	3.524E+02				

Analyst: Justin Banner

Sample description
445369_Gamma_180-96595-A-5-C

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20191809.An1

Acquisition information
Start time: 10/31/2019 3:01:14 AM
Live time: 1800
Real time: 1844
Dead time: 2.36 %
Detector ID: 8

Detector system
Ge 8 SN/174

Calibration
Filename: 8_Soil_TunaCan.Clb
8_Soil_TunaCan_90099_032712

Energy Calibration
Created: 2/28/2012 10:34:41 AM
Zero offset: 0.052 keV
Gain: 0.250 keV/channel
Quadratic: 5.282E-10 keV/channel^2

Efficiency Calibration
Created: 3/28/2012 10:35:20 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.39 %
Log(Eff): -1.098764E-01 + (-4.958544E-01*Log(E)) + (-2.572270E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.71 %
Log(Eff): -2.525301E+01 + (9.398253E+00*Log(E)) + (-1.000034E+00*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.55keV)
Stop channel: 8000 (1999.97keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 3:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-10-06_1931.PBC 10/6/2019 7:31:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 27 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1774

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
59.54	-7.	415.14	1.02	2.881E-02	59.54	35.900	PBC<MDA	AM241
63.32	80.	34.93	0.90	3.095E-02	63.29	3.810	PBC<MDA	TH234
64.91	25.	108.90	1.03	3.146E-02	64.28	9.700	PBC<MDA	Sn126
74.81	129.	14.88	1.03	3.617E-02				
77.18	184.	10.90	1.04	3.701E-02				
87.13	113.	15.80	1.13	3.973E-02	86.49	13.100	1.210E+01	Np237
					86.54	30.700	5.163E+00	EU155
					86.94	9.040	1.750E+01	Sn126
					87.57	37.500	4.204E+00	Sn126
					88.04	3.790	4.149E+01	Cd109
92.60	23.	84.41	1.05	4.072E-02	92.59	5.584	PBC<MDA	TH234
122.06	20.	90.99	1.07	4.146E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	3.139E-01	CO57
123.10	19.	84.12	1.07	4.138E-02	123.10	40.790	PBC<MDA	EU154
134.04	4.	787.67	1.08	4.035E-02	133.54	11.090	PBC<MDA	CE144
145.44	24.	150.07	1.09	3.874E-02	145.44	48.200	PBC<MDA	CE141
162.66	18.	100.00	1.10	3.593E-02	162.66	6.220	PBC<MDA	Ba140
165.85	4.	427.81	1.10	3.629E-02	165.85	79.900	PBC<MDA	CE139
176.60	32.	54.86	1.11	3.460E-02	176.60	17.000	PBC<MDA	Cf251
185.78	72.	29.15	1.75	3.329E-02	185.72	54.000	2.217E+00	U235
193.51	3.	587.84	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
207.50	10.	80.28	0.50	3.058E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
210.85	20.	89.04	1.14	3.020E-02	210.85	2.990	PBC<MDA	TH229
238.50	283.	8.40	1.01	2.745E-02	238.63	43.300	1.324E+01	PB212
241.96	61.	20.47	1.16	2.714E-02	242.00	7.430	1.685E+01	PB214
265.54	6.	269.81	1.18	2.523E-02	265.83	50.000	PBC<MDA	BI210M
284.30	5.	244.44	1.19	2.393E-02	284.30	6.140	PBC<MDA	I131
295.20	97.	12.31	1.20	2.324E-02	295.09	19.300	1.199E+01	PB214
300.07	14.	195.09	1.20	2.293E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.360E+01	PA231
					300.18	6.200	5.399E+00	PA233
300.14	14.	190.04	1.20	2.294E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
305.00	3.	959.96	1.21	2.265E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	2.478E-01	BI210M
328.76	5.	471.22	1.23	2.133E-02	328.76	20.300	PBC<MDA	La140
338.34	57.	18.64	1.25	2.085E-02	338.32	12.010	1.257E+01	AC228
344.29	14.	134.17	1.24	2.057E-02	344.29	26.500	PBC<MDA	EU152
351.96	153.	9.58	1.00	2.021E-02	351.93	37.600	1.121E+01	PB214
364.48	27.	28.04	1.25	1.965E-02	364.48	81.700	9.512E-01	I131
383.84	6.	190.20	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
468.06	3.	432.83	1.33	1.606E-02	468.06	51.750	PBC<MDA	Ir192
477.60	4.	308.79	1.33	1.580E-02	477.60	10.520	PBC<MDA	BE7
487.02	6.	240.83	1.34	1.555E-02	487.02	45.500	PBC<MDA	La140
511.86	26.	45.78	2.61	1.494E-02	511.86	20.000	PBC<MDA	RH106
513.98	11.	120.47	1.36	1.489E-02	513.98	0.430	PBC<MDA	Kr85
537.26	9.	120.36	1.37	1.436E-02	537.26	24.390	PBC<MDA	Ba140
563.24	10.	110.07	1.39	1.381E-02	563.24	8.350	PBC<MDA	CS134
569.32	11.	71.91	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	PBC<MDA	PA234
					569.70	97.740	PBC<MDA	BI207
569.47	-3.	346.32	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	PBC<MDA	PA234
					569.70	97.740	PBC<MDA	BI207
583.03	91.	12.17	1.37	1.342E-02	583.02	84.500	4.469E+00	TL208
602.73	8.	239.03	1.42	1.306E-02	602.73	98.260	PBC<MDA	SB124
604.71	8.	241.68	1.42	1.303E-02	604.71	97.620	PBC<MDA	CS134
609.20	121.	9.47	1.59	1.294E-02	609.31	46.090	1.124E+01	BI214
635.89	8.	78.32	1.44	1.250E-02	635.89	11.310	PBC<MDA	SB125
722.79	12.	80.72	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	6.339E-01	AG108M
					723.36	20.220	2.849E+00	EU154
722.94	3.	335.41	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.647E-01	AG108M
					723.36	20.220	7.405E-01	EU154
727.17	7.	141.14	1.50	1.118E-02	727.17	7.550	PBC<MDA	BI212
735.72	2.	585.63	1.51	1.107E-02	735.72	22.500	PBC<MDA	PM146
756.73	1.	800.00	1.52	1.081E-02	756.73	54.460	PBC<MDA	ZR95
765.79	12.	80.86	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					766.41	0.294	PBC<MDA	PA234M
766.41	9.	94.06	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
795.87	9.	84.87	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134
801.95	3.	270.27	1.55	1.030E-02	801.95	8.690	PBC<MDA	CS134
810.78	7.	93.15	1.55	1.020E-02	810.78	99.460	PBC<MDA	CO58
818.50	5.	116.34	1.56	1.012E-02	818.50	100.000	PBC<MDA	Cs136
846.77	12.	47.50	1.58	9.836E-03	846.77	99.935	PBC<MDA	Co56
871.10	15.	25.82	1.59	9.604E-03	871.10	99.890	8.686E-01	NB94
880.53	6.	139.44	1.60	9.517E-03	880.53	6.000	PBC<MDA	PA234
889.28	8.	99.81	1.60	9.438E-03	889.28	99.984	PBC<MDA	Sc46
898.04	15.	26.57	1.61	9.360E-03	898.04	93.700	9.742E-01	Y88
911.15	74.	13.14	1.62	9.247E-03	911.07	29.000	1.540E+01	AC228
937.49	8.	93.53	1.63	9.026E-03	937.49	34.360	PBC<MDA	AG110M
968.54	37.	19.20	1.52	8.776E-03	968.97	17.460	1.335E+01	AC228
1001.00	-3.	149.45	1.67	8.537E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	5.	147.48	1.69	8.278E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	2.	225.42	1.70	8.209E-03	1048.07	80.000	PBC<MDA	Cs136
1050.36	6.	82.16	1.70	8.193E-03	1050.36	1.560	PBC<MDA	RH106
1063.66	6.	94.81	1.71	8.106E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	6.	122.85	1.72	8.017E-03	1077.40	3.300	PBC<MDA	Ga68
1120.40	8.	105.80	1.74	7.754E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1121.41	7.	103.27	1.74	7.748E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.462E+00	Ta182
1173.24	4.	142.99	1.77	7.453E-03	1173.24	99.900	PBC<MDA	CO60
1187.74	6.	89.07	1.78	7.367E-03	1189.05	16.200	PBC<MDA	Ta182
1384.30	5.	44.72	1.88	6.460E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	1.	796.87	1.90	6.366E-03	1408.00	21.005	PBC<MDA	EU152
1460.66	144.	8.53	1.38	6.165E-03	1460.83	10.670	1.214E+02	K40
1764.22	4.	152.49	2.07	5.226E-03	1764.49	15.400	PBC<MDA	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
299.03	74.80	119.	129.	3.560E+03	14.88	1.034	- sD
308.54	77.17	110.	184.	4.977E+03	10.90	1.036	- D
829.83	207.50	23.	10.	3.161E+02	80.28	0.499	- c

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev15.lib

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********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.96	46.54	180.	-3.	-0.002	500.73	1.012s
TH-227	200.36	50.14	242.	-13.	-0.007	169.29	1.015s
AM-241	237.95	59.54	408.	-7.	-0.004	415.14	1.022s
Sn-126	256.93	64.28	204.	25.	0.014	108.90	1.026
BA-133	323.77	80.99	880.	-31.	-0.017	136.21	1.039s
Np-237	345.77	86.49	1196.	0.	0.000	182.82	1.043A
EU-155	345.98	86.54	1268.	-29.	-0.016	175.92	1.043s
Sn-126	350.09	87.57	1078.	64.	0.035	27.35	1.044D
Cd-109	351.97	88.04	1117.	0.	0.000	165.04	1.044A
Nd-147	364.21	91.10	1107.	-29.	-0.016	163.93	1.047s
TH-234	370.17	92.59	167.	23.	0.013	84.41	1.048D
AC-228	373.21	93.35	1172.	-29.	-0.016	168.32	1.049s
Gd-153	389.81	97.50	1200.	-29.	-0.016	169.83	1.052
Np-239	397.81	99.50	1230.	-7.	-0.004	663.45	1.053
Gd-153	412.62	103.20	1237.	0.	0.000	1000.00	1.056s
Np-239	414.62	103.70	1237.	0.	0.000	1000.00	1.057s
EU-155	421.07	105.31	1237.	0.	0.000	1000.00	1.058s
Np-239	424.34	106.13	1233.	-9.	-0.005	573.92	1.058s
EU-152	486.94	121.78	198.	-21.	-0.012	97.24	1.071
CO-57	488.06	122.06	156.	20.	0.011	90.99	1.071
EU-154	492.22	123.10	113.	19.	0.010	84.12	1.072s
PA-234	525.00	131.29	516.	-22.	-0.012	146.47	1.078s
HF-181	531.92	133.02	494.	-16.	-0.009	198.55	1.079s
CE-144	533.98	133.54	494.	4.	0.002	787.67	1.080s
CO-57	545.72	136.47	522.	-25.	-0.014	132.55	1.082s
Tc-99m	561.86	140.51	558.	-25.	-0.014	136.49	1.085s
U-235	574.97	143.79	606.	-27.	-0.015	40.35	1.087s
CE-141	581.59	145.44	618.	24.	0.013	150.07	1.089s
Ba-140	650.47	162.66	153.	18.	0.010	100.00	1.102s
U-235	653.35	163.38	172.	-1.	-0.001	885.62	1.102
CE-139	663.24	165.85	170.	4.	0.002	427.81	1.104s
Cf-251	706.23	176.60	81.	32.	0.018	54.86	1.112s
U-235	742.94	185.78	90.	72.	0.040	29.15	1.755s
TH-229	773.87	193.51	88.	3.	0.002	587.84	1.125
TH-229	843.24	210.85	145.	20.	0.011	89.04	1.138s
Cf-251	907.84	227.00	88.	-7.	-0.004	265.09	1.151s
TH-227	943.73	235.97	543.	-4.	-0.002	825.98	1.157s
PB-212	954.37	238.63	40.	289.	0.161	6.65	1.159D
PB-214	967.84	242.00	48.	61.	0.034	20.47	1.162D
EU-152	978.62	244.69	540.	-8.	-0.004	420.99	1.164s
TH-227	1024.81	256.24	76.	0.	0.000	1000.00	1.172
Cd-113m	1054.65	263.70	100.	-20.	-0.011	72.68	1.178s
BI-210M	1063.18	265.83	122.	6.	0.003	269.81	1.179s
TL-208	1108.99	277.28	77.	-6.	-0.003	173.21	1.188s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Hg-203	1116.66	279.20	118.	-19.	-0.011	84.10	1.189s
I-131	1137.05	284.30	41.	5.	0.003	244.44	1.193s
PB-214	1180.22	295.09	22.	97.	0.054	12.31	1.201D
TL-210	1183.86	296.00	389.	-14.	-0.008	194.58	1.202s
PB-212	1199.98	300.03	342.	14.	0.008	190.04	1.205
PA-231	1200.14	300.07	356.	14.	0.008	195.09	1.205
PA-233	1200.58	300.18	370.	0.	0.000	1000.00	1.205
PA-231	1210.46	302.65	370.	0.	0.000	1000.00	1.207s
BA-133	1211.27	302.85	370.	0.	0.000	1000.00	1.207s
Ba-140	1219.26	304.85	370.	0.	0.000	1000.00	1.208s
BI-210M	1219.45	304.90	367.	3.	0.002	959.96	1.208s
Ir-192	1233.62	308.44	370.	0.	0.000	1000.00	1.211s
PA-233	1247.91	312.01	370.	0.	0.000	1000.00	1.214s
Ir-192	1265.82	316.49	370.	0.	0.000	1000.00	1.217s
CR-51	1280.20	320.08	389.	-15.	-0.008	184.27	1.219s
La-140	1314.91	328.76	233.	5.	0.003	471.22	1.226s
Cf-249	1333.63	333.44	238.	0.	0.000	1000.00	1.229s
AC-228	1353.24	338.34	17.	57.	0.031	18.64	1.251
EU-152	1377.01	344.29	176.	14.	0.008	134.17	1.237s
HF-181	1383.19	345.83	74.	-15.	-0.008	85.74	1.238s
PB-214	1407.71	351.96	20.	153.	0.085	9.58	0.998
BA-133	1423.87	356.00	256.	-17.	-0.009	136.98	1.245s
I-131	1457.81	364.48	9.	27.	0.015	28.04	1.252s
BA-133	1535.24	383.84	68.	6.	0.003	190.20	1.266s
Cf-249	1551.68	387.95	74.	0.	0.000	1000.00	1.269s
SN-113	1566.64	391.69	100.	-14.	-0.008	104.50	1.271s
SB-125	1711.39	427.88	24.	0.	0.000	1000.00	1.297s
AG-108M	1735.64	433.94	39.	-1.	-0.001	837.95	1.301s
PM-146	1815.41	453.88	61.	-17.	-0.010	69.65	1.315s
Ir-192	1872.14	468.06	31.	3.	0.001	432.83	1.325s
BE-7	1910.28	477.60	66.	4.	0.002	308.79	1.332s
HF-181	1927.89	482.00	105.	-15.	-0.009	97.45	1.335s
La-140	1947.98	487.02	86.	6.	0.003	240.83	1.339s
RU-103	1988.12	497.05	39.	-12.	-0.007	110.92	1.346s
RH-106	2047.36	511.86	56.	26.	0.014	45.78	2.606s
Kr-85	2055.83	513.98	83.	11.	0.006	120.47	1.357s
Nd-147	2123.91	531.00	39.	-14.	-0.008	93.11	1.369s
Ba-140	2148.95	537.26	26.	9.	0.005	120.36	1.373s
CS-134	2252.86	563.24	26.	10.	0.005	110.07	1.391s
CS-134	2277.20	569.32	25.	11.	0.006	71.91	1.395s
PA-234	2277.80	569.47	39.	-3.	-0.001	346.32	1.395s
TL-208	2332.04	583.03	10.	91.	0.051	12.17	1.375s
SB-124	2410.85	602.73	181.	8.	0.004	239.03	1.418s
CS-134	2418.76	604.71	189.	8.	0.005	241.68	1.419s
BI-214	2436.73	609.20	4.	121.	0.067	9.47	1.590
AG-108M	2457.05	614.28	197.	0.	0.000	1000.00	1.426s
PM-144	2472.18	618.06	197.	0.	0.000	1000.00	1.428s
RH-106	2487.60	621.92	213.	-10.	-0.006	209.69	1.431s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	2543.49	635.89	14.	8.	0.004	78.32	1.440s
I-131	2547.83	636.97	33.	-8.	-0.005	103.92	1.441s
AG-110M	2630.98	657.76	45.	0.	0.000	1000.00	1.455s
CS-137	2646.58	661.66	82.	-22.	-0.012	53.63	1.457
PM-144	2786.11	696.54	42.	-14.	-0.008	101.77	1.480s
NB-94	2810.46	702.63	42.	-14.	-0.008	83.42	1.484s
SB-124	2891.09	722.79	38.	12.	0.006	80.72	1.497s
AG-108M	2891.70	722.94	50.	3.	0.002	335.41	1.498s
EU-154	2893.39	723.36	53.	0.	0.000	1000.00	1.498s
ZR-95	2896.74	724.20	54.	-14.	-0.008	80.28	1.498s
BI-212	2908.63	727.17	47.	7.	0.004	141.14	1.500
PM-146	2942.83	735.72	19.	2.	0.001	585.63	1.506s
ZR-95	3026.87	756.73	14.	1.	0.001	800.00	1.519s
AG-110M	3055.73	763.94	33.	-4.	-0.002	226.54	1.524s
NB-95	3063.11	765.79	39.	12.	0.006	80.86	1.525s
PA-234M	3065.60	766.41	28.	9.	0.005	94.06	1.526s
EU-152	3115.64	778.92	28.	-7.	-0.004	164.75	1.534s
CS-134	3183.44	795.87	26.	9.	0.005	84.87	1.544s
TL-210	3198.36	799.60	9.	0.	0.000	1000.00	1.547s
CS-134	3207.77	801.95	36.	3.	0.002	270.27	1.548s
CO-58	3243.06	810.78	20.	7.	0.004	93.15	1.554s
La-140	3263.04	815.77	27.	0.	0.000	1000.00	1.557s
Cs-136	3273.97	818.50	17.	5.	0.003	116.34	1.559s
MN-54	3339.36	834.85	28.	-5.	-0.003	228.91	1.569s
Co-56	3387.05	846.77	5.	12.	0.007	47.50	1.577s
TL-208	3442.23	860.56	29.	-8.	-0.004	48.22	1.585s
NB-94	3484.36	871.10	0.	15.	0.008	25.82	1.592s
EU-154	3492.89	873.23	15.	0.	0.000	1000.00	1.593
PA-234	3522.10	880.53	32.	6.	0.003	139.44	1.598s
PA-234	3532.94	883.24	38.	0.	0.000	1000.00	1.599s
AG-110M	3538.71	884.68	38.	0.	0.000	1000.00	1.600s
Sc-46	3557.10	889.28	27.	8.	0.004	99.81	1.603s
Y-88	3592.14	898.04	1.	15.	0.009	26.57	1.608s
AC-228	3644.26	911.07	5.	74.	0.041	13.14	1.616
AG-110M	3749.96	937.49	10.	8.	0.004	93.53	1.633s
PA-234	3784.07	946.02	20.	-2.	-0.001	496.66	1.638s
EU-152	3856.43	964.11	66.	-9.	-0.005	129.77	1.649s
AC-228	3874.15	968.54	3.	37.	0.020	19.20	1.520
EU-154	3985.31	996.33	42.	-10.	-0.006	96.95	1.668s
PA-234M	4003.99	1001.00	55.	-3.	-0.002	149.45	1.671s
Co-56	4151.36	1037.84	10.	5.	0.003	147.48	1.693s
Cs-136	4192.29	1048.07	13.	2.	0.001	225.42	1.698s
RH-106	4201.45	1050.36	9.	6.	0.003	82.16	1.700s
BI-207	4254.65	1063.66	5.	6.	0.003	94.81	1.708s
Ga-68	4309.61	1077.40	10.	6.	0.003	122.85	1.716s
FE-59	4397.02	1099.25	15.	-2.	-0.001	431.57	1.728s
EU-152	4448.32	1112.07	45.	-4.	-0.002	241.94	1.736s
BI-214	4481.17	1120.29	31.	8.	0.004	105.80	1.740

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Sc-46	4482.22	1120.55	37.	-9.	-0.005	98.14	1.740
Ta-182	4485.22	1121.30	23.	7.	0.004	103.27	1.741s
CO-60	4692.97	1173.24	7.	4.	0.002	142.99	1.770s
Ta-182	4756.23	1189.05	5.	6.	0.003	89.07	1.779s
Ta-182	4885.67	1221.41	21.	-4.	-0.002	246.99	1.797
Co-56	4953.16	1238.28	22.	-1.	0.000	886.09	1.806s
NA-22	5098.16	1274.53	21.	-4.	-0.002	158.21	1.826s
EU-154	5098.20	1274.54	26.	0.	0.000	1000.00	1.826s
FE-59	5166.43	1291.60	16.	-5.	-0.003	113.81	1.835s
TL-210	5252.05	1313.00	5.	-1.	-0.001	403.11	1.847s
CO-60	5330.06	1332.50	20.	-9.	-0.005	72.00	1.857s
AG-110M	5537.25	1384.30	0.	5.	0.003	44.72	1.884s
EU-152	5632.07	1408.00	5.	1.	0.000	796.87	1.896s
K-40	5842.70	1460.66	3.	144.	0.080	8.53	1.375s
La-140	6384.93	1596.21	11.	-4.	-0.002	188.42	1.990s
BI-214	7058.07	1764.49	20.	4.	0.002	152.49	2.067s
Co-56	7085.51	1771.35	25.	-1.	-0.001	714.14	2.070s
Y-88	7344.36	1836.06	0.	0.	0.000	1000.00	2.098s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	1.2637E+00				5.31E+01	
			477.60	1.264E+00	?(P	1.358E+01	3.09E+02 1.05E+01 G
NA-22	C	-3.4712E-01				9.50E+02	
			1274.53	-3.471E-01	?(	1.941E+00	1.58E+02 9.99E+01 G
K-40	N	1.2141E+02				4.66E+11	
			1460.83	1.214E+02	(P	9.370E+00	8.53E+00 1.07E+01 G
Sc-46	F	4.6400E-01				8.38E+01	
			889.28	4.640E-01	&(	1.585E+00	9.98E+01 1.00E+02 G
			1120.55	-6.694E-01	+	2.235E+00	9.81E+01 1.00E+02 G
CR-51	F	-3.9203E+00				2.77E+01	
			320.08	-3.920E+00	?(	2.427E+01	1.84E+02 9.94E+00 G
MN-54	C	-2.7910E-01				3.12E+02	
			834.85	-2.791E-01	?(	1.528E+00	2.29E+02 1.00E+02 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
FE-59	F	-2.4954E-01					4.45E+01	
			1099.25	-2.495E-01	?(	2.590E+00	4.32E+02	5.65E+01 G
			1291.60	-9.593E-01	+ P	4.015E+00	1.14E+02	4.32E+01 G
Co-56	C	8.9550E-01					7.73E+01	
			846.77	6.892E-01	?(P	7.305E-01	4.75E+01	9.99E+01 G
			1238.28	-7.730E-02	- P	2.883E+00	8.86E+02	6.61E+01 G
			1037.84	2.355E+00	(P	8.301E+00	1.47E+02	1.41E+01 G
			1771.35	-6.892E-01	-	1.792E+01	7.14E+02	1.55E+01 A
CO-57	C	3.1385E-01					2.72E+02	
			122.06	3.139E-01	&(	9.546E-01	9.10E+01	8.56E+01 G
			136.47	-3.208E+00	&	1.420E+01	1.33E+02	1.07E+01 G
CO-58	C	4.0149E-01					7.09E+01	
			810.78	4.015E-01	?(	1.280E+00	9.32E+01	9.95E+01 G
CO-60	F	-7.5517E-01					1.93E+03	
			1332.50	-7.552E-01	?(P	1.963E+00	7.20E+01	1.00E+02 G
			1173.24	2.988E-01	+ P	1.132E+00	1.43E+02	9.99E+01 G
ZN-65	F	-1.6167E-02					2.44E+02	
			1115.55	-1.617E-02	%(P	4.598E+00	4.84E+03	5.06E+01 G
NB-94	I	-7.0949E-01					7.41E+06	
			702.63	-7.095E-01	?(P	1.631E+00	8.34E+01	9.79E+01 G
			871.10	8.686E-01	+	4.268E-01	2.58E+01	9.99E+01 G
ZR-95	I	9.4365E-02					6.40E+01	
			756.73	9.437E-02	&(	1.901E+00	8.00E+02	5.45E+01 G
			724.20	-1.547E+00	&	4.158E+00	8.03E+01	4.42E+01 G
NB-95	I	6.0685E-01					6.40E+01	
			765.79	6.068E-01	?(	1.648E+00	8.09E+01	9.98E+01 G
RU-103	I	-4.8133E-01					3.93E+01	
			497.05	-4.813E-01	?(P	1.272E+00	1.11E+02	9.09E+01 G
			610.30	1.141E-05	%	5.091E+01	1.30E+08	5.75E+00 GA
RH-106	I	-2.9266E-01					3.74E+02	
			621.92	-4.374E+00	?(	3.107E+01	2.10E+02	9.93E+00 G
			1050.36	2.569E+01	?(	7.198E+01	8.22E+01	1.56E+00 G
			511.86	4.766E+00	?	6.990E+00	4.58E+01	2.00E+01 GA
AG-108M	C	5.6927E-02					1.53E+05	
			433.94	-5.132E-02	?(P	1.149E+00	8.38E+02	9.05E+01 G
			722.94	1.647E-01	?(	1.941E+00	3.35E+02	9.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	0.000E+00	-	3.276E+00	1.00E+03	8.98E+01 G
AG-110M	F	4.0892E-01					2.50E+02	
			884.68	0.000E+00	&(	2.535E+00	1.00E+03	7.27E+01 G
			657.76	0.000E+00	?(	1.641E+00	1.00E+03	9.46E+01 G
			937.49	1.438E+00	&(	3.125E+00	9.35E+01	3.44E+01 G
			1384.30	1.770E+00	?(	2.609E+00	4.47E+01	2.43E+01 G
			763.94	-8.525E-01	+	6.822E+00	2.27E+02	2.23E+01 G
SN-113	F	-6.5403E-01					1.15E+02	
			391.69	-6.540E-01	?(	2.304E+00	1.04E+02	6.40E+01 G
SB-124	F	8.4166E-01					6.02E+01	
			602.73	3.483E-01	&(P	2.830E+00	2.39E+02	9.83E+01 G
			1690.98	-1.495E-01	% P	2.964E+00	1.76E+03	4.78E+01 G
			722.79	5.326E+00	?(	1.444E+01	8.07E+01	1.08E+01 G
SB-125	I	8.1512E-01					1.01E+03	
			427.88	0.000E+00	(	2.775E+00	1.00E+03	2.96E+01 G
			600.50	2.680E-01	% P	1.633E+01	1.78E+03	1.79E+01 G
			635.89	2.948E+00	?(	7.796E+00	7.83E+01	1.13E+01 G
			463.37	3.276E-01	%	1.521E+01	1.33E+03	1.05E+01 G
I-131	I	1.0216E+00					8.02E+00	
			364.48	9.512E-01	?(P	5.643E-01	2.80E+01	8.17E+01 G
			284.30	1.959E+00	?(P	1.228E+01	2.44E+02	6.14E+00 G
			636.97	-5.175E+00	-	1.839E+01	1.04E+02	7.17E+00 G
Gd-153	F	-1.3005E+00					2.42E+02	
			97.50	-1.301E+00	?(	7.356E+00	1.70E+02	3.00E+01 G
			103.20	0.000E+00	+	1.017E+01	1.00E+03	2.18E+01 G
Ga-68	C	1.4867E+01					4.71E-02	
			1077.40	1.487E+01	?(	4.323E+01	1.23E+02	3.30E+00 G
Tc-99m	I	-4.0261E-01					2.51E-01	
			140.51	-4.026E-01	&(	1.835E+00	1.36E+02	8.93E+01 G
BA-133	F	-7.4986E-01					3.85E+03	
			356.00	-7.499E-01	(	3.452E+00	1.37E+02	6.20E+01 G
			302.85	0.000E+00	&	1.229E+01	1.00E+03	1.83E+01 G
			383.84	2.065E+00	? P	1.353E+01	1.90E+02	8.94E+00 GA
			80.99	-1.327E+00	+	6.019E+00	1.36E+02	3.41E+01 GA
CS-134	I	8.6103E-01					7.54E+02	
			795.87	5.829E-01	&(	1.673E+00	8.49E+01	8.55E+01 G
			604.71	3.551E-01	?(	2.917E+00	2.42E+02	9.76E+01 G
			569.32	2.862E+00	?(	6.864E+00	7.19E+01	1.54E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	1.987E+00	?(	1.899E+01	2.70E+02	8.69E+00 G
			563.24	4.766E+00	?(P	1.278E+01	1.10E+02	8.35E+00 G
CS-137	I	-1.2019E+00					1.10E+04	
			661.66	-1.202E+00	?(P	2.428E+00	5.36E+01	8.52E+01 G
CE-139	F	8.3026E-02					1.38E+02	
			165.85	8.303E-02	?(	1.215E+00	4.28E+02	7.99E+01 G
Ba-140	I	2.0472E+00					1.28E+01	
			537.26	1.428E+00	?(	4.200E+00	1.20E+02	2.44E+01 G
			162.66	4.475E+00	?(	1.500E+01	1.00E+02	6.22E+00 G
			304.85	0.000E+00	-	5.280E+01	1.00E+03	4.29E+00 G
La-140	I	-6.4475E-02					1.28E+01	
			1596.21	-4.423E-01	?(	1.878E+00	1.88E+02	9.54E+01 G
			487.02	4.351E-01	&(P	3.610E+00	2.41E+02	4.55E+01 G
			328.76	5.912E-01	&(P	9.480E+00	4.71E+02	2.03E+01 G
			815.77	0.000E+00	+	6.330E+00	1.00E+03	2.33E+01 G
CE-141	I	7.0332E-01					3.25E+01	
			145.44	7.033E-01	&(	3.526E+00	1.50E+02	4.82E+01 G
CE-144	I	4.9661E-01					2.85E+02	
			133.54	4.966E-01	?(	1.320E+01	7.88E+02	1.11E+01 G
PM-144	C	-6.7816E-01					3.63E+02	
			696.54	-6.782E-01	&(	1.594E+00	1.02E+02	9.90E+01 G
			618.06	0.000E+00	+	2.985E+00	1.00E+03	9.91E+01 G
EU-152	F	1.8887E-01					4.94E+03	
			121.78	-9.842E-01	?(	3.200E+00	9.72E+01	2.86E+01 G
			344.29	1.454E+00	?(	6.578E+00	1.34E+02	2.65E+01 G
			1112.07	-2.091E+00	+	1.773E+01	2.42E+02	1.36E+01 G
			778.92	-2.848E+00	+	1.114E+01	1.65E+02	1.29E+01 G
			964.11	-3.956E+00	+	1.753E+01	1.30E+02	1.46E+01 G
			244.69	-2.133E+00	+	3.023E+01	4.21E+02	7.58E+00 G
			1408.00	2.770E-01	?	5.597E+00	7.97E+02	2.10E+01 GA
EU-154	I	6.1311E-01					3.14E+03	
			123.10	6.131E-01	&(	1.723E+00	8.41E+01	4.08E+01 G
			1274.54	0.000E+00	-	5.988E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	8.967E+00	1.00E+03	2.02E+01 G
			873.23	0.000E+00	&	9.806E+00	1.00E+03	1.23E+01 G
			1004.77	-2.417E-01	%	1.324E+01	1.54E+03	1.80E+01 G
			996.33	-6.115E+00	+	2.012E+01	9.70E+01	1.06E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HF-181	F -6.7732E-01					4.24E+01	
		482.00	-6.773E-01	?(	2.218E+00	9.74E+01	8.05E+01 G
		133.02	-5.067E-01	&	3.374E+00	1.99E+02	4.33E+01 G
		345.83	-2.682E+00	+	7.712E+00	8.57E+01	1.51E+01 G
		136.30	2.264E-07	&	2.514E+01	3.28E+09	5.85E+00 G
Ta-182	F 1.9114E+00					1.14E+02	
		1121.30	1.462E+00	?(	5.193E+00	1.03E+02	3.49E+01 G
		1221.41	-1.239E+00	-	6.926E+00	2.47E+02	2.70E+01 G
		1189.05	2.879E+00	&(	6.112E+00	8.91E+01	1.62E+01 G
Hg-203	F -5.3243E-01					4.66E+01	
		279.20	-5.324E-01	?(	1.495E+00	8.41E+01	8.15E+01 G
TL-208	N 4.4689E+00					6.98E+02	
		583.02	4.469E+00	(P	8.457E-01	1.22E+01	8.45E+01 G
		277.28	-2.084E+00	- P	1.571E+01	1.73E+02	6.31E+00 G
		860.56	-3.496E+00	- P	1.273E+01	4.82E+01	1.24E+01 G
PM-146	C -8.9302E-01					2.02E+03	
		453.88	-8.930E-01	(P	2.026E+00	6.97E+01	6.50E+01 G
		747.16	-1.268E-01	% P	3.431E+00	1.10E+03	3.40E+01 G
		735.72	3.557E-01	& P	5.184E+00	5.86E+02	2.25E+01 G
Y-88	F 4.7323E-01					1.07E+02	
		1836.06	0.000E+00	?(	8.180E-01	1.00E+03	9.92E+01 G
		898.04	9.742E-01	?(P	4.668E-01	2.66E+01	9.37E+01 G
Cd-113m	-7.4688E+03					5.33E+03	
		263.70	-7.469E+03	&(	1.803E+04	7.27E+01	6.00E-03 K
Cf-251	T 3.0540E+00					3.28E+05	
		176.60	3.054E+00	&(	4.209E+00	5.49E+01	1.70E+01 G
		227.00	-2.164E+00	-	1.435E+01	2.65E+02	6.30E+00 GA
Sn-126	4.5454E+00					3.65E+07	
		87.57	2.373E+00	}	5.792E+00	2.73E+01	3.75E+01 GA
		64.28	4.545E+00	&(	1.261E+01	1.09E+02	9.70E+00 G
		86.94	0.000E+00	}	2.484E+01	1.91E+03	9.04E+00 GA
PB-210	N -1.9264E+00					8.14E+03	
		46.54	-1.926E+00	(P	4.251E+01	5.01E+02	4.25E+00 G
PB-212	N 1.3531E+01					6.98E+02	
		238.63	1.353E+01	(P	1.498E+00	6.65E+00	4.33E+01 G
		300.03	1.027E+01	- P	6.567E+01	1.90E+02	3.28E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	N	1.1477E+01					5.84E+05	
			351.93	1.121E+01	(P	1.707E+00	9.58E+00	3.76E+01 G
			295.09	1.199E+01	(P	3.056E+00	1.23E+01	1.93E+01 G
			242.00	1.685E+01 +		9.623E+00	2.05E+01	7.43E+00 GA
BI-207	C	5.3441E-01					1.18E+04	
			1063.66	5.344E-01	?(P	1.220E+00	9.48E+01	7.45E+01 G
			569.70	2.822E-02 %	P	1.213E+00	1.19E+03	9.77E+01 G
BI-212	N	4.6853E+00					6.98E+02	
			727.17	4.685E+00	(	2.279E+01	1.41E+02	7.55E+00 G
			785.42	4.753E-01 %	P	9.511E+01	8.02E+03	1.28E+00 GA
U-235	N	-3.4720E+00					2.57E+11	
			143.79	-3.472E+00	?(P	1.526E+01	4.03E+01	1.10E+01 G
			205.33	-7.344E-02 %	P	2.452E+01	9.74E+03	5.01E+00 G
			163.38	-3.765E-01 +	P	1.951E+01	8.86E+02	5.08E+00 G
			185.72	2.217E+00 +	P	1.452E+00	2.92E+01	5.40E+01 GA
BI-214	N	1.1236E+01					5.84E+05	
			609.31	1.124E+01	(P	1.156E+00	9.47E+00	4.61E+01 G
			1120.29	3.740E+00 -	P	1.356E+01	1.06E+02	1.51E+01 G
			1764.49	2.992E+00 -		1.614E+01	1.52E+02	1.54E+01 G
BI-210M	T	2.5449E-01					1.10E+09	
			265.83	2.582E-01	?(P	2.387E+00	2.70E+02	5.00E+01 G
			304.90	2.478E-01	?(	8.061E+00	9.60E+02	2.80E+01 G
AC-228	N	1.4208E+01					2.10E+03	
			911.07	1.540E+01	?(	2.647E+00	1.31E+01	2.90E+01 G
			968.97	1.335E+01	(	3.989E+00	1.92E+01	1.75E+01 G
			338.32	1.257E+01	(	4.905E+00	1.86E+01	1.20E+01 G
			93.35	-7.080E+00 -		3.969E+01	1.68E+02	5.56E+00 XA
TH-229	N	5.6245E+00					2.68E+06	
			193.51	1.174E+00	?(	1.817E+01	5.88E+02	4.40E+00 G
			210.85	1.217E+01	?(	3.623E+01	8.90E+01	2.99E+00 G
TH-234	N	5.5027E+00					1.63E+12	
			92.59	5.503E+00	(P	1.538E+01	8.44E+01	5.58E+00 G
			63.29	-5.245E-01 %	P	4.255E+01	2.39E+03	3.81E+00 G
PA-231	N	6.2662E+00					1.20E+07	
			302.65	0.000E+00	&(	7.820E+01	1.00E+03	2.88E+00 G
			300.07	1.360E+01	?(	8.927E+01	1.95E+02	2.46E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234   N  -1.6851E+00                                     1.63E+12
                         131.29-1.685E+00 ?(  8.253E+00 1.46E+02 1.80E+01 G
                         946.02-9.258E-01 +   1.090E+01 4.97E+02 1.34E+01 G
                         569.47-1.238E+00 + P 1.566E+01 3.46E+02 8.20E+00 G
                         883.24 0.000E+00 +   1.916E+01 1.00E+03 9.60E+00 G
                         880.53 5.837E+00 ?   2.828E+01 1.39E+02 6.00E+00 GA

PA-234M  N   2.0019E+01                                     1.63E+12
                        1001.00-2.572E+01 &(P 2.905E+02 1.49E+02 8.37E-01 G
                         766.41 1.502E+02 ?(P 4.810E+02 9.41E+01 2.94E-01 G

AM-241   T  -3.6822E-01                                     1.58E+05
                          59.54-3.682E-01  (P 5.200E+00 4.15E+02 3.59E+01 G

Ir-192   F   6.6446E-02                                     7.40E+01
                         316.49 0.000E+00 &(  2.681E+00 1.00E+03 8.70E+01 G
                         468.06 1.782E-01 &(  1.924E+00 4.33E+02 5.18E+01 G
                         308.44 0.000E+00 -   7.201E+00 1.00E+03 3.18E+01 G

Cs-136   F   2.5300E-01                                     1.30E+01
                         818.50 2.975E-01 ?(  1.209E+00 1.16E+02 1.00E+02 G
                        1048.07 1.974E-01 ?(  1.632E+00 2.25E+02 8.00E+01 G
                         340.57-2.178E-07 %   4.260E+00 5.72E+08 4.69E+01 G

Np-239   T  -5.0669E-01                                     2.36E+00
                         103.70 0.000E+00 +   9.233E+00 1.00E+03 2.40E+01 X
                         106.13-5.067E-01  (  9.724E+00 5.74E+02 2.27E+01 G
                          99.50-6.680E-01 +   1.482E+01 6.63E+02 1.50E+01 X

Nd-147      -4.2104E+00                                     1.11E+01
                         531.00-4.210E+00 ?(  9.380E+00 9.31E+01 1.30E+01 G
                          91.10-1.401E+00 +   7.650E+00 1.64E+02 2.83E+01 G

Kr-85    I   9.5845E+01                                     3.92E+03
                         513.98 9.585E+01 ?(  3.919E+02 1.20E+02 4.30E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
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- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	180.	-3.	-0.002	500.73	-1.926E+00	P
TH-227	50.14	242.	-13.	-0.007	169.29	-4.034E+00	
AM-241	59.54	408.	-7.	-0.004	415.14	-3.682E-01	P
BA-133	80.99	880.	-31.	-0.017	136.21	-1.327E+00	
EU-155	86.54	1268.	-29.	-0.016	175.92	-1.315E+00	
Nd-147	91.10	1107.	-29.	-0.016	163.93	-1.401E+00	
Gd-153	97.50	1200.	-29.	-0.016	169.83	-1.301E+00	
Np-239	99.50	1230.	-7.	-0.004	663.45	-6.680E-01	
Np-239	106.13	1233.	-9.	-0.005	573.92	-5.067E-01	
EU-152	121.78	198.	-21.	-0.012	97.24	-9.842E-01	
CO-57	122.06	156.	20.	0.011	90.99	3.139E-01	
EU-154	123.10	113.	19.	0.010	84.12	6.131E-01	
PA-234	131.29	516.	-22.	-0.012	146.47	-1.685E+00	
HF-181	133.02	494.	-16.	-0.009	198.55	-5.067E-01	
CO-57	136.47	522.	-25.	-0.014	132.55	-3.208E+00	
Tc-99m	140.51	558.	-25.	-0.014	136.49	-4.026E-01	
CE-141	145.44	618.	24.	0.013	150.07	7.033E-01	
Ba-140	162.66	153.	18.	0.010	100.00	4.475E+00	
CE-139	165.85	170.	4.	0.002	427.81	8.303E-02	
Cf-251	176.60	81.	32.	0.018	54.86	3.054E+00	
TH-229	193.51	88.	3.	0.002	587.84	1.174E+00	
TH-229	210.85	145.	20.	0.011	89.04	1.217E+01	
Cf-251	227.00	88.	-7.	-0.004	265.09	-2.164E+00	
TH-227	235.97	543.	-4.	-0.002	825.98	-6.522E-01	
EU-152	244.69	540.	-8.	-0.004	420.99	-2.133E+00	
Cd-113m	263.70	100.	-20.	-0.011	72.68	-7.469E+03	
Hg-203	279.20	118.	-19.	-0.011	84.10	-5.324E-01	
TL-210	296.00	389.	-14.	-0.008	194.58	-4.391E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-231	300.07	356.	14.	0.008	195.09	1.360E+01	
CR-51	320.08	389.	-15.	-0.008	184.27	-3.920E+00	
La-140	328.76	233.	5.	0.003	471.22	5.912E-01	P
EU-152	344.29	176.	14.	0.008	134.17	1.454E+00	
HF-181	345.83	74.	-15.	-0.008	85.74	-2.682E+00	
BA-133	356.00	256.	-17.	-0.009	136.98	-7.499E-01	
BA-133	383.84	68.	6.	0.003	190.20	2.065E+00	P
SN-113	391.69	100.	-14.	-0.008	104.50	-6.540E-01	
AG-108M	433.94	39.	-1.	-0.001	837.95	-5.132E-02	P
PM-146	453.88	61.	-17.	-0.010	69.65	-8.930E-01	P
Ir-192	468.06	31.	3.	0.001	432.83	1.782E-01	
BE-7	477.60	66.	4.	0.002	308.79	1.264E+00	P
HF-181	482.00	105.	-15.	-0.009	97.45	-6.773E-01	
La-140	487.02	86.	6.	0.003	240.83	4.351E-01	P
RU-103	497.05	39.	-12.	-0.007	110.92	-4.813E-01	P
RH-106	511.86	56.	26.	0.014	45.78	4.766E+00	
Kr-85	513.98	83.	11.	0.006	120.47	9.585E+01	
Nd-147	531.00	39.	-14.	-0.008	93.11	-4.210E+00	
Ba-140	537.26	26.	9.	0.005	120.36	1.428E+00	
CS-134	563.24	26.	10.	0.005	110.07	4.766E+00	P
CS-134	569.32	25.	11.	0.006	71.91	2.862E+00	
PA-234	569.47	39.	-3.	-0.001	346.32	-1.238E+00	P
SB-124	602.73	181.	8.	0.004	239.03	3.483E-01	P
CS-134	604.71	189.	8.	0.005	241.68	3.551E-01	
RH-106	621.92	213.	-10.	-0.006	209.69	-4.374E+00	
SB-125	635.89	14.	8.	0.004	78.32	2.948E+00	
CS-137	661.66	82.	-22.	-0.012	53.63	-1.202E+00	P
PM-144	696.54	42.	-14.	-0.008	101.77	-6.782E-01	
NB-94	702.63	42.	-14.	-0.008	83.42	-7.095E-01	P
SB-124	722.79	38.	12.	0.006	80.72	5.326E+00	
AG-108M	722.94	50.	3.	0.002	335.41	1.647E-01	
ZR-95	724.20	54.	-14.	-0.008	80.28	-1.547E+00	
PM-146	735.72	19.	2.	0.001	585.63	3.557E-01	P
ZR-95	756.73	14.	1.	0.001	800.00	9.437E-02	
AG-110M	763.94	33.	-4.	-0.002	226.54	-8.525E-01	
NB-95	765.79	39.	12.	0.006	80.86	6.068E-01	
PA-234M	766.41	28.	9.	0.005	94.06	1.502E+02	P
EU-152	778.92	28.	-7.	-0.004	164.75	-2.848E+00	
CS-134	795.87	26.	9.	0.005	84.87	5.829E-01	
CS-134	801.95	36.	3.	0.002	270.27	1.987E+00	
CO-58	810.78	20.	7.	0.004	93.15	4.015E-01	
Cs-136	818.50	17.	5.	0.003	116.34	2.975E-01	
MN-54	834.85	28.	-5.	-0.003	228.91	-2.791E-01	
NB-94	871.10	0.	15.	0.008	25.82	8.686E-01	
PA-234	880.53	32.	6.	0.003	139.44	5.837E+00	
Sc-46	889.28	27.	8.	0.004	99.81	4.640E-01	
Y-88	898.04	1.	15.	0.009	26.57	9.742E-01	P
AG-110M	937.49	10.	8.	0.004	93.53	1.438E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
PA-234	946.02	20.	-2.	-0.001	496.66	-9.258E-01		
EU-152	964.11	66.	-9.	-0.005	129.77	-3.956E+00		
EU-154	996.33	42.	-10.	-0.006	96.95	-6.115E+00		
PA-234M	1001.00	55.	-3.	-0.002	149.45	-2.572E+01		P
Cs-136	1048.07	13.	2.	0.001	225.42	1.974E-01		
RH-106	1050.36	9.	6.	0.003	82.16	2.569E+01		
BI-207	1063.66	5.	6.	0.003	94.81	5.344E-01		P
Ga-68	1077.40	10.	6.	0.003	122.85	1.487E+01		
FE-59	1099.25	15.	-2.	-0.001	431.57	-2.495E-01		
EU-152	1112.07	45.	-4.	-0.002	241.94	-2.091E+00		
Sc-46	1120.55	37.	-9.	-0.005	98.14	-6.694E-01		
CO-60	1173.24	7.	4.	0.002	142.99	2.988E-01		P
NA-22	1274.53	21.	-4.	-0.002	158.21	-3.471E-01		
FE-59	1291.60	16.	-5.	-0.003	113.81	-9.593E-01		P
TL-210	1313.00	5.	-1.	-0.001	403.11	-5.215E-01		
CO-60	1332.50	20.	-9.	-0.005	72.00	-7.552E-01		P
AG-110M	1384.30	0.	5.	0.003	44.72	1.770E+00		
EU-152	1408.00	5.	1.	0.000	796.87	2.770E-01		
La-140	1596.21	11.	-4.	-0.002	188.42	-4.423E-01		

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	1.2637E+00	1.2637E+00	3.088E+02%	1.36E+01
NA-22	#A	-3.4712E-01	-3.4712E-01	1.582E+02%	1.94E+00
K-40		1.2141E+02	1.2141E+02	8.534E+00%	9.37E+00
Sc-46	#A	4.6400E-01	4.6400E-01	9.981E+01%	1.59E+00
CR-51	#A	-3.9202E+00	-3.9203E+00	1.843E+02%	2.43E+01
MN-54	#A	-2.7910E-01	-2.7910E-01	2.289E+02%	1.53E+00
FE-59	#A	-2.4954E-01	-2.4954E-01	4.316E+02%	2.59E+00
Co-56	#	8.9549E-01	8.9550E-01	4.750E+01%	7.31E-01
CO-57	#A	3.1385E-01	3.1385E-01	9.099E+01%	9.55E-01
CO-58	#A	4.0148E-01	4.0149E-01	9.315E+01%	1.28E+00
CO-60	#A	-7.5517E-01	-7.5517E-01	7.200E+01%	1.96E+00
ZN-65	#A	-1.6167E-02	-1.6167E-02	4.839E+03%	4.60E+00
NB-94	#A	-7.0949E-01	-7.0949E-01	8.342E+01%	1.63E+00
ZR-95	#A	9.4365E-02	9.4365E-02	8.000E+02%	1.90E+00
NB-95	#A	6.0684E-01	6.0685E-01	8.086E+01%	1.65E+00
RU-103	#A	-4.8132E-01	-4.8133E-01	1.109E+02%	1.27E+00
RH-106	#A	-2.9266E-01	-2.9266E-01	8.216E+01%	3.11E+01
AG-108M	#A	5.6927E-02	5.6927E-02	3.354E+02%	1.15E+00
AG-110M	#A	4.0892E-01	4.0892E-01	4.472E+01%	2.53E+00
SN-113	#A	-6.5403E-01	-6.5403E-01	1.045E+02%	2.30E+00
SB-124	#A	8.4165E-01	8.4166E-01	8.072E+01%	2.83E+00

SB-125	#A	8.1512E-01	8.1512E-01	7.832E+01%	2.77E+00
I-131	#	1.0215E+00	1.0216E+00	2.804E+01%	5.64E-01
Gd-153	#A	-1.3005E+00	-1.3005E+00	1.698E+02%	7.36E+00
Ga-68	#A	1.4681E+01	1.4867E+01	1.229E+02%	4.32E+01
Tc-99m	#A	-4.0166E-01	-4.0261E-01	1.365E+02%	1.84E+00
BA-133	#A	-7.4986E-01	-7.4986E-01	1.370E+02%	3.45E+00
CS-134	#A	8.6103E-01	8.6103E-01	7.191E+01%	1.67E+00
CS-137	#A	-1.2019E+00	-1.2019E+00	5.363E+01%	2.43E+00
CE-139	#A	8.3025E-02	8.3026E-02	4.278E+02%	1.21E+00
Ba-140	#A	2.0471E+00	2.0472E+00	7.824E+01%	4.20E+00
La-140	#A	-6.4472E-02	-6.4475E-02	1.872E+02%	1.88E+00
CE-141	#A	7.0331E-01	7.0332E-01	1.501E+02%	3.53E+00
CE-144	#A	4.9661E-01	4.9661E-01	7.877E+02%	1.32E+01
PM-144	#A	-6.7816E-01	-6.7816E-01	1.018E+02%	1.59E+00
EU-152	#A	1.8887E-01	1.8887E-01	8.285E+01%	3.20E+00
EU-154	#A	6.1311E-01	6.1311E-01	8.412E+01%	1.72E+00
EU-155	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.04E+01
HF-181	#A	-6.7732E-01	-6.7732E-01	9.745E+01%	2.22E+00
Ta-182	#A	1.9114E+00	1.9114E+00	6.819E+01%	5.19E+00
Hg-203	#A	-5.3243E-01	-5.3243E-01	8.410E+01%	1.50E+00
TL-208	#	4.4689E+00	4.4689E+00	1.217E+01%	8.46E-01
PM-146	#A	-8.9302E-01	-8.9302E-01	6.965E+01%	2.03E+00
Y-88	#A	4.7322E-01	4.7323E-01	2.657E+01%	8.18E-01
Cd-113m	#A	-7.4688E+03	-7.4688E+03	7.268E+01%	1.80E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.82E+01
Cf-251	#A	3.0540E+00	3.0540E+00	5.486E+01%	4.21E+00
Cf-249	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.93E+00
Sn-126	#A	4.5454E+00	4.5454E+00	1.089E+02%	1.26E+01
PB-210	#A	-1.9264E+00	-1.9264E+00	5.007E+02%	4.25E+01
PB-212		1.3531E+01	1.3531E+01	6.645E+00%	1.50E+00
PB-214		1.1477E+01	1.1477E+01	7.801E+00%	1.71E+00
BI-207	#A	5.3441E-01	5.3441E-01	9.481E+01%	1.22E+00
BI-212	A	4.6853E+00	4.6853E+00	1.411E+02%	2.28E+01
U-235	A	-3.4720E+00	-3.4720E+00	4.035E+01%	1.53E+01
BI-214		1.1236E+01	1.1236E+01	9.472E+00%	1.16E+00
BI-210M	#A	2.5449E-01	2.5449E-01	2.698E+02%	2.39E+00
AC-228		1.4208E+01	1.4208E+01	9.937E+00%	2.65E+00
TH-227	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.32E+01
TH-229	#A	5.6245E+00	5.6245E+00	8.904E+01%	1.82E+01
TH-234	A	5.5027E+00	5.5027E+00	8.441E+01%	1.54E+01
PA-231	#A	6.2662E+00	6.2662E+00	1.951E+02%	7.82E+01
PA-233	#A	0.0000E+00	0.0000E+00	7.071E+02%	6.41E+00
PA-234	#A	-1.6851E+00	-1.6851E+00	1.465E+02%	8.25E+00
PA-234M	#A	2.0019E+01	2.0019E+01	8.829E+01%	2.91E+02
AM-241	#A	-3.6822E-01	-3.6822E-01	4.151E+02%	5.20E+00
Np-237	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.76E+01
Ir-192	#A	6.6446E-02	6.6446E-02	4.328E+02%	2.68E+00
Cs-136	#A	2.5299E-01	2.5300E-01	1.163E+02%	1.21E+00
Np-239	#A	-5.0656E-01	-5.0669E-01	5.739E+02%	9.72E+00

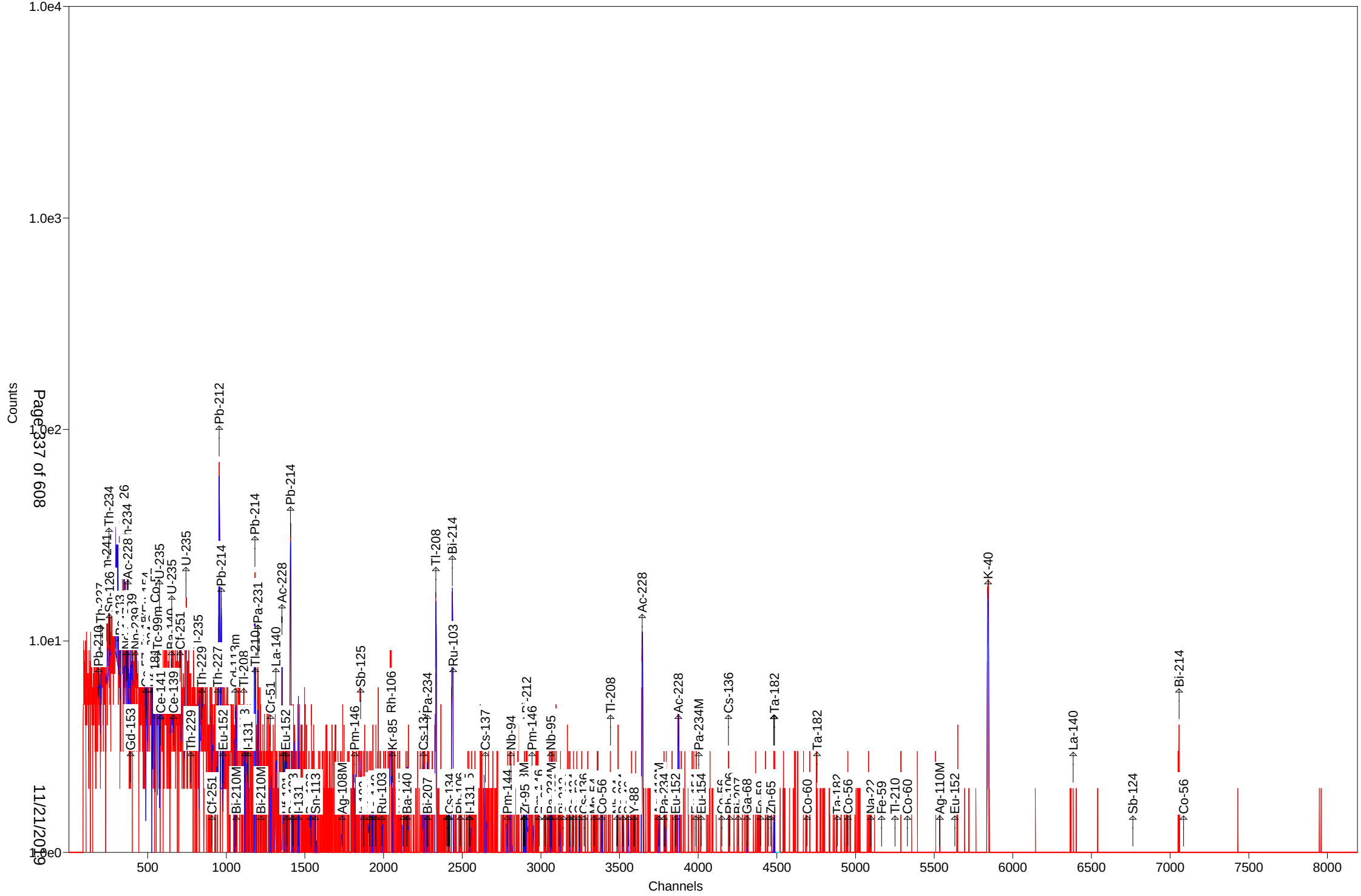
Nd-147	#A	-4.2102E+00	-4.2104E+00	9.311E+01%	9.38E+00
TL-210	#A	0.0000E+00	0.0000E+00	1.000E+03%	9.20E-01
Kr-85	#A	9.5845E+01	9.5845E+01	1.205E+02%	3.92E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.5 to 2000.0 keV) 1.763E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 1.7633411E+02 Bq/Sample

445369_Gamma_180-96595-A-5-C. 8_Gamma_20191809.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20192838

Sample Description: 445369_Gamma_180-96595-A-5-D DU
Detector: Detector # 5
Batch ID: 445369
Work Order Number: Gamma
Lot Number: 180-96595-A-5-D DU

Decay to Time: 10/31/2019 03:55 Live Time: 1800 sec
Acquisition Time: 10/31/2019 03:55:27 Real Time: 1807 sec
Analysis Time: 10/31/2019 04:25 Dead Time: 0.38 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 5_Soil_TunaCan.Clb
Efficiency Cal Desc: 5_Soil_TunaCan_90099_032612
Efficiency Cal Date: 3/27/2012 17:20
Energy Cal Date: 2/28/2012 19:35
Library: Client_Long_Rev15.lib
Bkgd Correction File: 5_2019-10-06_1911.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	3.310E+00	109.4	3.621E+00	3.625E+00	1.240E+01
NA-22	6.168E-01	64.9	4.006E-01	4.018E-01	1.308E+00
K-40	1.296E+02	8.9	1.150E+01	1.327E+01	7.519E+00
Sc-46	3.688E-01	90.2	3.328E-01	3.333E-01	1.269E+00
CR-51	2.242E+00	105.5	2.366E+00	2.369E+00	8.123E+00
MN-54	5.309E-01	108.2	5.744E-01	5.750E-01	1.379E+00
FE-59	9.730E-02	155.2	1.510E-01	1.511E-01	3.148E+00
Co-56	2.812E-01	128.8	3.623E-01	3.626E-01	1.740E+00
CO-57	-2.202E-02	90.0	1.981E-02	1.985E-02	1.279E+00
CO-58	3.781E-01	117.5	4.443E-01	4.447E-01	1.548E+00
CO-60	2.077E-01	174.8	3.631E-01	3.633E-01	1.402E+00
ZN-65	0.000E+00	1.#INF	2.425E-01	2.425E-01	5.390E+00
NB-94	-2.004E-02	2555.4	5.122E-01	5.122E-01	1.329E+00
ZR-95	7.575E-02	938.5	7.110E-01	7.110E-01	1.950E+00
NB-95	4.227E-02	1002.5	4.237E-01	4.237E-01	1.558E+00
RU-103	5.785E-01	43.9	2.542E-01	2.560E-01	5.873E-01
RH-106	3.505E+00	258.5	9.061E+00	9.063E+00	3.096E+01
AG-108M	-1.435E-01	341.2	4.898E-01	4.898E-01	1.270E+00
AG-110M	6.103E-02	456.9	2.789E-01	2.789E-01	2.815E+00
SN-113	5.411E-01	105.7	5.721E-01	5.727E-01	1.948E+00
SB-124	4.233E-01	82.5	3.494E-01	3.501E-01	3.410E+00
SB-125	1.231E+00	98.8	1.216E+00	1.218E+00	3.830E+00
I-131	1.287E-01	104.8	1.348E-01	1.350E-01	1.235E+00
Gd-153	-6.385E-01	122.2	7.799E-01	7.809E-01	2.640E+00
Ga-68	-5.960E+00	496.7	2.960E+01	2.960E+01	7.018E+01
Tc-99m	-3.354E-01	125.9	4.223E-01	4.227E-01	1.418E+00
BA-133	-9.863E-02	999.1	9.854E-01	9.855E-01	3.384E+00
CS-134	6.865E-01	81.0	5.561E-01	5.572E-01	1.858E+00
CS-137	2.409E-02	2327.3	5.606E-01	5.606E-01	2.005E+00
CE-139	-3.181E-01	134.7	4.286E-01	4.297E-01	1.445E+00
Ba-140	-1.929E-01	881.3	1.700E+00	1.700E+00	4.542E+00
La-140	4.162E-01	51.5	2.142E-01	2.153E-01	1.697E+00
CE-141	2.901E-01	266.9	7.743E-01	7.744E-01	2.623E+00

CE-144	-2.724E+00	136.2	3.709E+00	3.712E+00	1.244E+01
PM-144	2.155E-01	267.6	5.767E-01	5.768E-01	1.460E+00
EU-152	9.681E-01	84.7	8.201E-01	8.217E-01	3.662E+00
EU-154	1.400E+00	91.9	1.286E+00	1.288E+00	2.595E+00
EU-155	-1.165E-01	147.3	1.716E-01	1.717E-01	6.056E+00
HF-181	5.204E-02	120.7	6.282E-02	6.288E-02	1.906E+00
Ta-182	1.275E+00	164.8	2.102E+00	2.103E+00	7.349E+00
Hg-203	3.136E-01	117.6	3.687E-01	3.691E-01	1.258E+00
TL-208	6.185E+00	10.5	6.507E-01	7.255E-01	8.177E-01
PM-146	2.058E-02	3190.8	6.567E-01	6.567E-01	1.739E+00
Y-88	1.869E-01	304.1	5.683E-01	5.684E-01	1.880E+00
Cd-113m	-8.674E+02	570.1	4.945E+03	4.945E+03	1.734E+04
Cd-109	7.890E+00	158.1	1.247E+01	1.248E+01	4.179E+01
Cf-251	1.486E+00	105.5	1.567E+00	1.573E+00	4.263E+00
Cf-249	4.737E-01	95.0	4.501E-01	4.508E-01	1.533E+00
Sn-126	-3.288E+00	135.7	4.463E+00	4.467E+00	1.502E+01
PB-210	2.606E+01	48.6	1.266E+01	1.275E+01	3.252E+01
PB-212	1.258E+01	7.3	9.202E-01	1.228E+00	1.430E+00
PB-214	1.076E+01	9.4	1.014E+00	1.158E+00	2.355E+00
BI-207	-9.345E-01	68.7	6.416E-01	6.433E-01	2.655E+00
BI-212	3.061E-06	254158031.0	7.780E+00	7.780E+00	2.781E+01
U-235	2.856E+00	34.7	9.919E-01	1.003E+00	1.182E+01
BI-214	1.081E+01	11.9	1.287E+00	1.405E+00	1.945E+00
BI-210M	1.310E-01	508.3	6.658E-01	6.658E-01	2.319E+00
AC-228	1.370E+01	12.6	1.726E+00	1.862E+00	1.860E+00
TH-227	3.955E+00	96.4	3.812E+00	3.820E+00	1.266E+01
TH-229	1.586E-01	4409.4	6.994E+00	6.994E+00	1.955E+01
TH-234	1.214E+01	33.1	4.022E+00	4.079E+00	1.440E+01
PA-231	5.874E+00	207.5	1.219E+01	1.219E+01	8.002E+01
PA-233	1.386E+00	162.3	2.250E+00	2.251E+00	6.373E+00
PA-234	7.486E-01	95.0	7.113E-01	7.124E-01	7.170E+00
PA-234M	-2.717E+01	194.4	5.282E+01	5.284E+01	2.499E+02
AM-241	-1.550E+00	69.5	1.077E+00	1.080E+00	3.906E+00
Np-237	0.000E+00	1.#INF	4.243E+00	4.243E+00	1.420E+01
Ir-192	2.592E-01	136.9	3.549E-01	3.552E-01	1.379E+00
Cs-136	2.018E-01	158.8	3.205E-01	3.207E-01	1.750E+00
Np-239	2.490E-01	671.1	1.671E+00	1.671E+00	5.673E+00
Nd-147	2.702E+00	97.0	2.622E+00	2.626E+00	6.755E+00
TL-210	3.434E-01	137.0	4.705E-01	4.709E-01	1.883E+00
Kr-85	0.000E+00	1.#INF	5.774E+01	5.774E+01	5.271E+02
Total	2.710E+02				

Analyst: Justin Banner

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Sample description
445369_Gamma_180-96595-A-5-D DU

Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20192838.An1

Acquisition information
Start time: 10/31/2019 3:55:27 AM
Live time: 1800
Real time: 1807
Dead time: 0.38 %
Detector ID: 5

Detector system
Ge 5 SN/157

Calibration
Filename: 5_Soil_TunaCan.Clb
5_Soil_TunaCan_90099_032612

Energy Calibration
Created: 2/28/2012 7:35:48 PM
Zero offset: 0.158 keV
Gain: 0.250 keV/channel
Quadratic: 3.911E-08 keV/channel^2

Efficiency Calibration
Created: 3/27/2012 5:20:37 PM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.87 %
Log(Eff): 6.466115E-01 + (-7.830454E-01*Log(E)) +
(-4.117504E-03*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.43 %
Log(Eff): -2.462251E+01 + (9.075211E+00*Log(E)) +
(-9.664422E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.62keV)
Stop channel: 8000 (2000.81keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 3:55:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-10-06_1911.PBC 10/6/2019 7:11:20 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 23 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1322

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.69	36.	48.57	0.58	1.798E-02	46.54	4.250	PBC<MDA	PB210
50.14	10.	160.16	0.79	2.012E-02	50.14	8.000	PBC<MDA	TH227
63.31	29.	48.41	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
74.76	117.	15.34	0.81	3.150E-02				
77.04	224.	9.23	0.81	3.217E-02				
86.54	12.	252.27	0.82	3.436E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.208E-01	EU155
					86.94	9.040	2.104E+00	Sn126
86.92	19.	77.41	0.83	3.443E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	3.321E+00	Sn126
87.55	19.	80.62	0.83	3.454E-02	87.57	37.500	PBC<MDA	Sn126
88.06	19.	158.05	0.83	3.462E-02	88.04	3.790	PBC<MDA	Cd109
91.10	5.	590.42	0.83	3.508E-02	91.10	28.300	PBC<MDA	Nd147
92.38	35.	45.24	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.14	18.	161.62	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
99.50	6.	275.55	0.84	3.592E-02	99.50	15.000	PBC<MDA	Np239
106.13	4.	671.08	0.84	3.620E-02	106.13	22.700	PBC<MDA	Np239
136.47	17.	141.53	0.88	3.457E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	2.553E+00	CO57
145.44	8.	266.87	0.88	3.351E-02	145.44	48.200	PBC<MDA	CE141
176.60	14.	105.50	0.92	2.975E-02	176.60	17.000	PBC<MDA	Cf251
185.72	40.	42.97	0.93	2.854E-02	185.72	54.000	PBC<MDA	U235

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
205.33	38.	34.73	0.94	2.626E-02	205.33	5.010	1.623E+01	U235
238.59	224.	8.10	1.01	2.320E-02	238.63	43.300	1.239E+01	PB212
241.93	52.	24.02	0.98	2.293E-02	242.00	7.430	1.696E+01	PB214
244.69	12.	233.67	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
256.24	12.	107.29	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
265.83	2.	508.33	1.00	2.121E-02	265.83	50.000	PBC<MDA	BI210M
277.59	21.	46.18	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
279.20	9.	117.56	1.02	2.036E-02	279.20	81.460	PBC<MDA	Hg203
284.30	9.	112.37	1.02	2.006E-02	284.30	6.140	PBC<MDA	I131
295.11	89.	12.82	1.08	1.945E-02	295.09	19.300	1.317E+01	PB214
					296.00	79.000	3.226E+00	TL210
299.96	11.	203.08	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.275E+01	PA231
					300.18	6.200	5.059E+00	PA233
300.07	11.	207.53	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.275E+01	PA231
					300.18	6.200	5.061E+00	PA233
300.18	10.	228.02	1.04	1.917E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.184E+01	PA231
					300.18	6.200	4.700E+00	PA233
312.01	10.	231.00	1.05	1.857E-02	312.01	36.000	PBC<MDA	PA233
316.49	1.	965.32	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
321.51	7.	105.53	1.06	1.818E-02	320.08	9.940	PBC<MDA	CR51
328.76	22.	51.46	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
338.31	55.	21.09	1.14	1.736E-02	338.32	12.010	1.457E+01	AC228
340.57	10.	158.83	1.08	1.727E-02	340.57	46.900	PBC<MDA	Cs136
344.29	10.	164.56	1.08	1.711E-02	344.29	26.500	PBC<MDA	EU152
345.83	10.	174.01	1.08	1.705E-02	345.83	15.070	PBC<MDA	HF181
352.02	108.	13.81	1.21	1.680E-02	351.93	37.600	9.527E+00	PB214
387.95	9.	95.02	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
391.69	10.	105.73	1.12	1.537E-02	391.69	64.000	PBC<MDA	SN113
427.88	3.	396.20	1.16	1.428E-02	427.88	29.600	PBC<MDA	SB125
463.37	9.	98.82	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
468.06	8.	136.90	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
477.60	8.	109.41	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
497.05	12.	43.95	1.22	1.260E-02	497.05	90.900	PBC<MDA	RU103
511.86	42.	30.91	2.48	1.230E-02	511.86	20.000	9.374E+00	RH106
531.00	8.	97.04	1.25	1.193E-02	531.00	13.000	PBC<MDA	Nd147
583.21	105.	10.52	1.38	1.103E-02	583.02	84.500	6.283E+00	TL208
600.50	4.	431.52	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
609.22	95.	11.90	1.30	1.063E-02	609.31	46.090	1.081E+01	BI214
621.92	7.	258.53	1.33	1.045E-02	621.92	9.930	PBC<MDA	RH106
657.76	2.	456.90	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
696.54	4.	267.62	1.40	9.507E-03	696.54	99.000	PBC<MDA	PM144
722.79	11.	82.54	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	7.311E-01	AG108M
					723.36	20.220	3.286E+00	EU154
756.73	1.	938.54	1.45	8.869E-03	756.73	54.460	PBC<MDA	ZR95

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
795.87	9.	81.00	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
799.60	5.	175.54	1.48	8.469E-03	799.60	98.960	PBC<MDA	TL210
801.95	1.	900.00	1.48	8.448E-03	801.95	8.690	PBC<MDA	CS134
810.78	6.	117.50	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58
834.85	8.	108.20	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54
860.85	10.	41.55	2.23	7.963E-03	860.56	12.420	5.523E+00	TL208
873.23	9.	91.87	1.54	7.866E-03	873.23	12.270	PBC<MDA	EU154
880.53	8.	92.13	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
883.24	3.	280.82	1.55	7.791E-03	883.24	9.600	PBC<MDA	PA234
898.04	1.	692.82	1.56	7.684E-03	898.04	93.700	PBC<MDA	Y88
911.02	53.	13.80	1.32	7.591E-03	911.07	29.000	1.334E+01	AC228
946.02	5.	95.02	1.60	7.355E-03	946.02	13.400	PBC<MDA	PA234
964.11	6.	147.77	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
968.91	23.	21.31	0.78	7.209E-03	968.97	17.460	1.030E+01	AC228
996.33	3.	246.86	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1001.00	-3.	194.45	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1120.32	6.	132.34	1.72	6.381E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	8.	90.24	1.72	6.380E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	7.375E-01	Sc46
					1121.30	34.900	2.114E+00	Ta182
1121.34	5.	164.83	1.72	6.376E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.275E+00	Ta182
1173.24	1.	702.38	1.76	6.138E-03	1173.24	99.900	PBC<MDA	CO60
1238.28	7.	128.83	1.80	5.866E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	6.	64.94	1.83	5.725E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.752E+00	EU154
1291.60	4.	155.18	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1332.50	3.	174.81	1.87	5.514E-03	1332.50	99.980	PBC<MDA	CO60
1460.86	127.	8.87	2.11	5.103E-03	1460.83	10.670	1.296E+02	K40
1764.52	20.	24.69	2.11	4.351E-03	1764.49	15.400	1.652E+01	BI214
1836.06	2.	304.14	2.15	4.208E-03	1836.06	99.200	PBC<MDA	Y88

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.67	74.76	104.	117.	3.728E+03	15.34	0.813	- sD
307.79	77.04	102.	224.	6.968E+03	9.23	0.815	- D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev15.lib

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********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	186.29	46.69	80.	36.	0.020	48.57	0.579
TH-227	200.11	50.14	87.	10.	0.006	160.16	0.787s
AM-241	237.72	59.54	173.	-25.	-0.014	69.48	0.797
TH-234	252.74	63.29	81.	29.	0.016	48.41	0.801D
Sn-126	256.71	64.28	223.	-16.	-0.009	135.74	0.802s
BA-133	323.61	80.99	187.	-21.	-0.012	116.04	0.819
Np-237	345.63	86.49	581.	0.	0.000	169.38	0.825A
EU-155	345.84	86.54	436.	12.	0.007	252.27	0.825s
Sn-126	347.43	86.94	419.	19.	0.010	77.41	0.825D
Sn-126	349.95	87.57	406.	19.	0.010	80.62	0.826D
Cd-109	351.83	88.04	424.	19.	0.010	158.05	0.826A
Nd-147	364.08	91.10	443.	5.	0.003	590.42	0.829s
TH-234	370.05	92.59	108.	35.	0.020	45.24	0.831D
AC-228	373.09	93.35	407.	18.	0.010	161.62	0.832s
Gd-153	389.70	97.50	107.	-12.	-0.007	122.16	0.836
Np-239	397.71	99.50	134.	6.	0.003	275.55	0.838s
Gd-153	412.52	103.20	165.	-11.	-0.006	167.87	0.842s
Np-239	414.52	103.70	176.	0.	0.000	1000.00	0.842s
EU-155	420.98	105.31	302.	-16.	-0.009	152.21	0.844s
Np-239	424.25	106.13	304.	4.	0.002	671.08	0.845s
EU-152	486.90	121.78	193.	-19.	-0.011	106.32	0.861
CO-57	488.03	122.06	212.	-19.	-0.011	111.14	0.861
PA-234	524.99	131.29	286.	-19.	-0.011	128.52	0.871s
HF-181	531.91	133.02	305.	-19.	-0.011	132.30	0.872
CE-144	533.97	133.54	324.	-19.	-0.011	136.16	0.873s
HF-181	545.02	136.30	343.	-11.	-0.006	236.35	0.876s
CO-57	545.72	136.47	280.	17.	0.009	141.53	0.876s
Tc-99m	561.88	140.51	244.	-18.	-0.010	125.91	0.880s
U-235	574.99	143.79	265.	-22.	-0.012	92.95	0.883s
CE-141	581.61	145.44	249.	8.	0.005	266.87	0.885s
Ba-140	650.54	162.66	168.	-14.	-0.008	142.96	0.902s
CE-139	663.32	165.85	179.	-14.	-0.008	134.74	0.905s
Cf-251	706.34	176.60	60.	14.	0.008	105.50	0.916s
U-235	742.85	185.72	81.	40.	0.022	42.97	0.925s
U-235	821.35	205.33	45.	38.	0.021	34.73	0.945s
TH-229	843.44	210.85	71.	-7.	-0.004	194.85	0.950
Cf-251	908.08	227.00	47.	-5.	-0.003	264.58	0.966s
TH-227	943.98	235.97	482.	-16.	-0.009	201.39	0.975s
PB-212	954.64	238.63	25.	227.	0.126	7.32	0.978D
PB-214	968.10	242.00	52.	52.	0.029	24.02	0.981D
EU-152	978.89	244.69	378.	12.	0.007	233.67	0.984s
TH-227	1025.11	256.24	48.	12.	0.007	107.29	0.995s
Cd-113m	1054.97	263.70	64.	-2.	-0.001	570.09	1.002s
BI-210M	1063.50	265.83	80.	2.	0.001	508.33	1.005s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1109.33	277.28	36.	21.	0.012	46.18	1.016s
Hg-203	1117.00	279.20	56.	9.	0.005	117.56	1.017s
I-131	1137.41	284.30	30.	9.	0.005	112.37	1.022s
PB-214	1180.70	295.11	13.	89.	0.049	12.82	1.078
TL-210	1184.24	296.00	252.	11.	0.006	210.41	1.034s
PB-212	1200.37	300.03	236.	11.	0.006	203.08	1.038s
PA-231	1200.53	300.07	247.	11.	0.006	207.53	1.038s
PA-233	1200.97	300.18	258.	10.	0.006	228.02	1.038s
PA-231	1210.86	302.65	268.	0.	0.000	1000.00	1.040s
BA-133	1211.66	302.85	268.	0.	0.000	1000.00	1.040s
Ba-140	1219.66	304.85	268.	0.	0.000	1000.00	1.042s
BI-210M	1219.85	304.90	268.	0.	0.000	1000.00	1.042s
Ir-192	1234.03	308.44	268.	0.	0.000	1000.00	1.046s
PA-233	1248.32	312.01	252.	10.	0.005	231.00	1.049
Ir-192	1266.25	316.49	63.	1.	0.001	965.32	1.053s
CR-51	1280.63	320.08	26.	7.	0.004	105.53	1.057s
La-140	1315.35	328.76	29.	22.	0.012	51.46	1.065
Cf-249	1334.08	333.44	29.	-1.	-0.001	764.85	1.070
AC-228	1353.57	338.31	21.	55.	0.030	21.09	1.141s
Cs-136	1362.62	340.57	119.	10.	0.006	158.83	1.077
EU-152	1377.49	344.29	129.	10.	0.006	164.56	1.080s
HF-181	1383.66	345.83	136.	10.	0.005	174.01	1.082s
PB-214	1408.46	352.02	27.	108.	0.060	13.81	1.214
BA-133	1424.36	356.00	167.	-2.	-0.001	999.09	1.091s
I-131	1458.32	364.48	33.	-4.	-0.002	176.82	1.099s
Cf-249	1552.22	387.95	30.	9.	0.005	95.02	1.121s
SN-113	1567.19	391.69	47.	10.	0.005	105.73	1.125s
SB-125	1711.99	427.88	32.	3.	0.002	396.20	1.158s
AG-108M	1736.25	433.94	32.	-3.	-0.002	341.22	1.164s
SB-125	1854.01	463.37	36.	9.	0.005	98.82	1.191
Ir-192	1872.79	468.06	52.	8.	0.004	136.90	1.195s
BE-7	1910.94	477.59	36.	8.	0.005	109.41	1.204s
HF-181	1928.56	482.00	50.	-6.	-0.003	167.35	1.208s
La-140	1948.65	487.02	20.	-2.	-0.001	438.36	1.212s
RU-103	1988.80	497.05	4.	12.	0.007	43.95	1.221s
RH-106	2048.06	511.86	62.	42.	0.023	30.91	2.485s
Kr-85	2056.53	513.98	103.	0.	0.000	1000.00	1.237
Nd-147	2124.62	531.00	12.	8.	0.004	97.04	1.252s
Ba-140	2149.67	537.26	20.	-1.	-0.001	881.29	1.258s
CS-134	2253.60	563.24	24.	-6.	-0.003	87.31	1.280s
CS-134	2277.94	569.32	32.	-7.	-0.004	120.37	1.286s
BI-207	2279.47	569.70	41.	0.	0.000	1000.00	1.286s
TL-208	2333.53	583.21	6.	105.	0.059	10.52	1.377
SB-125	2402.69	600.50	173.	4.	0.002	431.52	1.313s
SB-124	2411.61	602.73	177.	0.	0.000	1000.00	1.315
CS-134	2419.53	604.71	177.	0.	0.000	1000.00	1.317s
BI-214	2437.58	609.22	10.	95.	0.053	11.90	1.296
RU-103	2441.89	610.30	177.	0.	0.000	1000.00	1.322s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-108M	2457.82	614.28	177.	0.	0.000	1000.00	1.325s
PM-144	2472.94	618.06	177.	0.	0.000	1000.00	1.328s
RH-106	2488.37	621.92	140.	7.	0.004	258.53	1.332s
SB-125	2544.26	635.89	29.	-7.	-0.004	159.91	1.344s
I-131	2548.61	636.97	43.	-5.	-0.003	216.76	1.345s
AG-110M	2631.76	657.76	34.	2.	0.001	456.90	1.362s
PM-144	2786.90	696.54	22.	4.	0.002	267.62	1.395
SB-124	2891.88	722.79	36.	11.	0.006	82.54	1.417s
EU-154	2894.17	723.36	47.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	47.	0.	0.000	1000.00	1.418s
PM-146	2943.61	735.72	22.	-8.	-0.004	127.39	1.428s
PM-146	2989.37	747.16	26.	-2.	-0.001	525.20	1.437s
ZR-95	3027.65	756.73	9.	1.	0.000	938.54	1.445s
PA-234M	3066.38	766.41	35.	-10.	-0.006	60.44	1.453s
EU-152	3116.41	778.92	29.	-13.	-0.007	48.57	1.463s
CS-134	3184.20	795.87	22.	9.	0.005	81.00	1.477s
TL-210	3199.12	799.60	30.	5.	0.003	175.54	1.480s
CS-134	3208.53	801.95	40.	1.	0.001	900.00	1.482s
CO-58	3243.82	810.78	19.	6.	0.003	117.50	1.489s
La-140	3263.80	815.77	25.	0.	0.000	1000.00	1.493s
MN-54	3340.10	834.85	14.	8.	0.004	108.20	1.508
Co-56	3387.78	846.77	23.	-3.	-0.002	247.23	1.518
TL-208	3444.09	860.85	2.	10.	0.005	41.55	2.231s
NB-94	3485.08	871.10	35.	-13.	-0.007	69.65	1.537s
EU-154	3493.61	873.23	32.	9.	0.005	91.87	1.539s
PA-234	3522.80	880.53	21.	8.	0.004	92.13	1.544s
PA-234	3533.64	883.24	28.	3.	0.002	280.82	1.547
AG-110M	3539.41	884.68	31.	0.	0.000	1000.00	1.547s
Sc-46	3557.79	889.28	10.	0.	0.000	1000.00	1.551s
Y-88	3592.83	898.04	19.	1.	0.001	692.82	1.558
AC-228	3644.74	911.02	0.	53.	0.029	13.80	1.323
AG-110M	3750.60	937.49	14.	-1.	-0.001	800.00	1.589s
PA-234	3784.70	946.02	5.	5.	0.003	95.02	1.595s
EU-152	3857.05	964.11	31.	6.	0.003	147.77	1.609s
AC-228	3876.25	968.91	1.	23.	0.013	21.31	0.775s
EU-154	3985.88	996.33	20.	3.	0.001	246.86	1.633s
PA-234M	4004.55	1001.00	26.	-3.	-0.002	194.45	1.636s
EU-154	4019.65	1004.77	24.	0.	0.000	1000.00	1.639s
Co-56	4151.87	1037.84	25.	-7.	-0.004	77.89	1.664s
Cs-136	4192.77	1048.07	18.	-1.	-0.001	608.28	1.671s
RH-106	4201.93	1050.36	34.	-11.	-0.006	53.77	1.673s
BI-207	4255.11	1063.66	20.	-8.	-0.005	68.65	1.682s
Ga-68	4310.04	1077.40	20.	-2.	-0.001	496.66	1.692s
FE-59	4397.41	1099.25	15.	-3.	-0.002	289.64	1.708s
EU-152	4448.68	1112.07	44.	-6.	-0.004	152.93	1.717s
ZN-65	4462.56	1115.55	38.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	30.	6.	0.003	132.34	1.723s
Sc-46	4482.57	1120.55	25.	8.	0.005	90.24	1.723s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ta-182	4485.56	1121.30	33.	5.	0.003	164.83	1.724s
CO-60	4693.21	1173.24	10.	1.	0.001	702.38	1.760s
Ta-182	4756.42	1189.05	20.	-6.	-0.003	168.87	1.771s
Ta-182	4885.79	1221.41	21.	-4.	-0.002	246.99	1.793s
Co-56	4953.23	1238.28	17.	7.	0.004	128.83	1.804s
NA-22	5098.13	1274.53	5.	6.	0.004	64.94	1.828s
FE-59	5166.35	1291.60	5.	4.	0.002	155.18	1.840s
TL-210	5251.91	1313.00	16.	-2.	-0.001	460.07	1.854s
CO-60	5329.85	1332.50	6.	3.	0.002	174.81	1.866s
AG-110M	5536.88	1384.30	16.	-4.	-0.002	232.74	1.899s
EU-152	5631.62	1408.00	11.	-3.	-0.002	181.26	1.914s
K-40	5842.87	1460.86	0.	127.	0.071	8.87	2.113
La-140	6383.73	1596.21	6.	-2.	-0.001	343.80	2.024s
SB-124	6762.39	1690.98	0.	0.	0.000	1000.00	2.076s
BI-214	7056.06	1764.49	2.	20.	0.011	24.69	2.114s
Co-56	7083.46	1771.35	22.	0.	0.000	1000.00	2.117s
Y-88	7341.96	1836.06	6.	2.	0.001	304.14	2.149s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	3.3099E+00					5.31E+01
			477.60	3.310E+00	?(	1.240E+01	1.09E+02 1.05E+01 G
NA-22	C	6.1681E-01					9.50E+02
			1274.53	6.168E-01	?(	1.308E+00	6.49E+01 9.99E+01 G
K-40	N	1.2957E+02					4.66E+11
			1460.83	1.296E+02	(	7.519E+00	8.87E+00 1.07E+01 G
Sc-46	F	3.6877E-01					8.38E+01
			889.28	0.000E+00	?(	1.269E+00	1.00E+03 1.00E+02 G
			1120.55	7.375E-01	?(	2.264E+00	9.02E+01 1.00E+02 G
CR-51	F	2.2422E+00					2.77E+01
			320.08	2.242E+00	&(P	8.123E+00	1.06E+02 9.94E+00 G
MN-54	C	5.3086E-01					3.12E+02
			834.85	5.309E-01	?(P	1.379E+00	1.08E+02 1.00E+02 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
FE-59	F	9.7298E-02					4.45E+01	
			1099.25	-4.550E-01	?(	3.148E+00	2.90E+02	5.65E+01 G
			1291.60	8.196E-01	?(P	3.074E+00	1.55E+02	4.32E+01 G
Co-56	C	2.8123E-01					7.73E+01	
			846.77	-2.358E-01	?(P	1.740E+00	2.47E+02	9.99E+01 G
			1238.28	1.063E+00	?(P	3.109E+00	1.29E+02	6.61E+01 G
			1037.84	-4.180E+00	+ P	1.509E+01	7.79E+01	1.41E+01 G
			1771.35	0.000E+00	-	2.033E+01	1.00E+03	1.55E+01 A
CO-57	C	-2.2019E-02					2.72E+02	
			122.06	-3.433E-01	(	1.279E+00	1.11E+02	8.56E+01 G
			136.47	2.553E+00	?(	1.214E+01	1.42E+02	1.07E+01 G
CO-58	C	3.7811E-01					7.09E+01	
			810.78	3.781E-01	?(	1.548E+00	1.17E+02	9.95E+01 G
CO-60	F	2.0772E-01					1.93E+03	
			1332.50	3.247E-01	?(P	1.402E+00	1.75E+02	1.00E+02 G
			1173.24	9.060E-02	?(	1.581E+00	7.02E+02	9.99E+01 G
NB-94	I	-2.0043E-02					7.41E+06	
			702.63	-2.004E-02	%(	1.329E+00	2.56E+03	9.79E+01 G
			871.10	-9.234E-01	+	2.136E+00	6.97E+01	9.99E+01 G
ZR-95	I	7.5754E-02					6.40E+01	
			756.73	7.575E-02	?(P	1.950E+00	9.39E+02	5.45E+01 G
			724.20	0.000E+00	-	4.739E+00	1.00E+03	4.42E+01 G
NB-95	I	4.2265E-02					6.40E+01	
			765.79	4.227E-02	&(	1.558E+00	1.00E+03	9.98E+01 G
RU-103	I	5.7852E-01					3.93E+01	
			497.05	5.785E-01	?(P	5.873E-01	4.39E+01	9.09E+01 G
			610.30	0.000E+00	-	5.888E+01	1.00E+03	5.75E+00 GA
RH-106	I	3.5048E+00					3.74E+02	
			621.92	3.505E+00	?(	3.096E+01	2.59E+02	9.93E+00 G
			1050.36	-5.558E+01	+ P	1.569E+02	5.38E+01	1.56E+00 G
			511.86	9.374E+00	?	8.866E+00	3.09E+01	2.00E+01 GA
AG-108M	C	-1.4353E-01					1.53E+05	
			433.94	-1.435E-01	(P	1.270E+00	3.41E+02	9.05E+01 G
			722.94	9.953E-03	%	2.297E+00	6.46E+03	9.08E+01 G
			614.28	0.000E+00	+	3.789E+00	1.00E+03	8.98E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-110M	F	6.1034E-02					2.50E+02	
			884.68	0.000E+00	?(	2.815E+00	1.00E+03	7.27E+01 G
			657.76	1.079E-01	?(	1.763E+00	4.57E+02	9.46E+01 G
			937.49	-2.182E-01	+	4.395E+00	8.00E+02	3.44E+01 G
			1384.30	-1.713E+00	+	9.144E+00	2.33E+02	2.43E+01 G
			763.94	-9.446E-02	&	6.574E+00	1.87E+03	2.23E+01 G
SN-113	F	5.4108E-01					1.15E+02	
			391.69	5.411E-01	?(	1.948E+00	1.06E+02	6.40E+01 G
SB-124	F	4.2333E-01					6.02E+01	
			602.73	0.000E+00	&(	3.410E+00	1.00E+03	9.83E+01 G
			1690.98	0.000E+00	?(	1.899E+00	1.00E+03	4.78E+01 G
			722.79	6.143E+00	?(	1.707E+01	8.25E+01	1.08E+01 G
SB-125	I	1.2306E+00					1.01E+03	
			427.88	3.723E-01	?(P	3.830E+00	3.96E+02	2.96E+01 G
			600.50	1.252E+00	?(	1.848E+01	4.32E+02	1.79E+01 G
			635.89	-3.406E+00	+ P	1.334E+01	1.60E+02	1.13E+01 G
			463.37	3.620E+00	?(P	1.218E+01	9.88E+01	1.05E+01 G
I-131	I	1.2869E-01					8.02E+00	
			364.48	-1.830E-01	?(P	1.235E+00	1.77E+02	8.17E+01 G
			284.30	4.276E+00	?(P	1.272E+01	1.12E+02	6.14E+00 G
			636.97	-3.976E+00	+ P	2.523E+01	2.17E+02	7.17E+00 G
Gd-153	F	-6.3846E-01					2.42E+02	
			97.50	-6.385E-01	?(	2.640E+00	1.22E+02	3.00E+01 G
			103.20	-7.762E-01	+	4.415E+00	1.68E+02	2.18E+01 G
Ga-68	C	-5.9597E+00					4.71E-02	
			1077.40	-5.960E+00	?(	7.018E+01	4.97E+02	3.30E+00 G
Tc-99m	I	-3.3536E-01					2.51E-01	
			140.51	-3.354E-01	?(	1.418E+00	1.26E+02	8.93E+01 G
BA-133	F	-9.8634E-02					3.85E+03	
			356.00	-9.863E-02	&(	3.384E+00	9.99E+02	6.20E+01 G
			302.85	0.000E+00	+	1.258E+01	1.00E+03	1.83E+01 G
			383.84	3.154E-01	%	1.385E+01	1.23E+03	8.94E+00 GA
			80.99	-1.048E+00	+	3.261E+00	1.16E+02	3.41E+01 GA
CS-134	I	6.8653E-01					7.54E+02	
			795.87	6.794E-01	?(	1.858E+00	8.10E+01	8.55E+01 G
			604.71	0.000E+00	-	3.442E+00	1.00E+03	9.76E+01 G
			569.32	-2.247E+00	+	9.332E+00	1.20E+02	1.54E+01 G
			801.95	7.567E-01	?(	2.435E+01	9.00E+02	8.69E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			563.24	-3.538E+00	+ P	1.498E+01	8.73E+01	8.35E+00 G
CS-137	I	2.4088E-02					1.10E+04	
			661.66	2.409E-02	%(P	2.005E+00	2.33E+03	8.52E+01 G
CE-139	F	-3.1810E-01					1.38E+02	
			165.85	-3.181E-01	?(	1.445E+00	1.35E+02	7.99E+01 G
Ba-140	I	-1.9286E-01					1.28E+01	
			537.26	-1.929E-01	?(	4.542E+00	8.81E+02	2.44E+01 G
			162.66	-4.048E+00	& P	1.811E+01	1.43E+02	6.22E+00 G
			304.85	0.000E+00	+	5.404E+01	1.00E+03	4.29E+00 G
La-140	I	4.1615E-01					1.28E+01	
			1596.21	-2.050E-01	?(	1.697E+00	3.44E+02	9.54E+01 G
			487.02	-1.961E-01	& P	2.246E+00	4.38E+02	4.55E+01 G
			328.76	3.335E+00	?(	4.302E+00	5.15E+01	2.03E+01 G
			815.77	0.000E+00	-	7.453E+00	1.00E+03	2.33E+01 G
CE-141	I	2.9013E-01					3.25E+01	
			145.44	2.901E-01	?(	2.623E+00	2.67E+02	4.82E+01 G
CE-144	I	-2.7243E+00					2.85E+02	
			133.54	-2.724E+00	?(	1.244E+01	1.36E+02	1.11E+01 G
PM-144	C	2.1548E-01					3.63E+02	
			696.54	2.155E-01	?(P	1.460E+00	2.68E+02	9.90E+01 G
			618.06	0.000E+00	-	3.453E+00	1.00E+03	9.91E+01 G
EU-152	F	9.6810E-01					4.94E+03	
			121.78	-1.028E+00	(	3.662E+00	1.06E+02	2.86E+01 G
			344.29	1.217E+00	&(	6.810E+00	1.65E+02	2.65E+01 G
			1112.07	-4.045E+00	+	2.141E+01	1.53E+02	1.36E+01 G
			778.92	-6.503E+00	+ P	1.371E+01	4.86E+01	1.29E+01 G
			964.11	2.938E+00	?(	1.513E+01	1.48E+02	1.46E+01 G
			244.69	3.825E+00	?(	3.010E+01	2.34E+02	7.58E+00 G
			1408.00	-1.588E+00	+ P	9.184E+00	1.81E+02	2.10E+01 GA
EU-154	I	1.3997E+00					3.14E+03	
			123.10	6.473E-02	&(P	2.595E+00	1.17E+03	4.08E+01 G
			1274.54	8.671E-02	%	5.140E+00	1.55E+03	3.52E+01 G
			723.36	0.000E+00	-	1.034E+01	1.00E+03	2.02E+01 G
			873.23	5.332E+00	?(	1.663E+01	9.19E+01	1.23E+01 G
			1004.77	0.000E+00	-	1.127E+01	1.00E+03	1.80E+01 G
			996.33	1.985E+00	?(	1.766E+01	2.47E+02	1.06E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

EU-155   I  -1.1646E-01                                     1.81E+03
                         105.31-1.184E+00  (  6.056E+00 1.52E+02 2.12E+01 G
                          86.54 6.208E-01 ?(  5.269E+00 2.52E+02 3.07E+01 G

HF-181   F   5.2041E-02                                     4.24E+01
                         482.00-3.291E-01 ?(  1.906E+00 1.67E+02 8.05E+01 G
                         133.02-6.963E-01 +   3.089E+00 1.32E+02 4.33E+01 G
                         345.83 2.088E+00 ?(  1.235E+01 1.74E+02 1.51E+01 G
                         136.30-3.067E+00 +   2.444E+01 2.36E+02 5.85E+00 G

Ta-182   F   1.2753E+00                                     1.14E+02
                        1121.30 1.275E+00 ?(  7.349E+00 1.65E+02 3.49E+01 G
                        1221.41-1.503E+00 +   8.403E+00 2.47E+02 2.70E+01 G
                        1189.05-3.390E+00 +   1.331E+01 1.69E+02 1.62E+01 G

Hg-203   F   3.1362E-01                                     4.66E+01
                         279.20 3.136E-01 &(  1.258E+00 1.18E+02 8.15E+01 G

TL-208   N   6.1854E+00                                     6.98E+02
                         583.02 6.283E+00  (P 8.177E-01 1.05E+01 8.45E+01 G
                         277.28 8.990E+00 +   1.321E+01 4.62E+01 6.31E+00 G
                         860.56 5.523E+00  (  5.375E+00 4.16E+01 1.24E+01 G

PM-146   C   2.0580E-02                                     2.02E+03
                         453.88 2.058E-02 %(P 1.739E+00 3.19E+03 6.50E+01 G
                         747.16-3.645E-01 +   4.825E+00 5.25E+02 3.40E+01 G
                         735.72-2.087E+00 + P 6.636E+00 1.27E+02 2.25E+01 G

Y-88     F   1.8687E-01                                     1.07E+02
                        1836.06 2.662E-01 ?(  1.880E+00 3.04E+02 9.92E+01 G
                         898.04 1.029E-01 ?(  1.763E+00 6.93E+02 9.37E+01 G

Cd-113m     -8.6736E+02                                     5.33E+03
                         263.70-8.674E+02 ?(  1.734E+04 5.70E+02 6.00E-03   K

Cd-109   F   7.8895E+00                                     4.53E+02
                                                          Derived Ave Activity
                          88.04 7.890E+00 }(  4.179E+01 1.58E+02 3.79E+00 G

Cf-251   T   1.4856E+00                                     3.28E+05
                         176.60 1.486E+00 @(  4.263E+00 1.05E+02 1.70E+01 G
                         227.00-1.702E+00 +   1.260E+01 2.65E+02 6.30E+00 GA

Cf-249   T   4.7368E-01                                     1.28E+05
                         387.95 4.737E-01 *(  1.533E+00 9.50E+01 6.60E+01 G
                         333.44-2.718E-01 -   5.697E+00 7.65E+02 1.55E+01 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		-3.2879E+00					3.65E+07	
			87.57	7.987E-01	}	4.142E+00	8.06E+01	3.75E+01 GA
			64.28	-3.288E+00	?(	1.502E+01	1.36E+02	9.70E+00 G
			86.94	3.321E+00	}	1.750E+01	7.74E+01	9.04E+00 GA
PB-210	N	2.6055E+01					8.14E+03	
			46.54	2.606E+01	(P	3.252E+01	4.86E+01	4.25E+00 G
PB-212	N	1.2576E+01					6.98E+02	
			238.63	1.258E+01	(	1.430E+00	7.32E+00	4.33E+01 G
			300.03	9.560E+00	-	6.564E+01	2.03E+02	3.28E+00 GA
PB-214	N	1.0763E+01					5.84E+05	
			351.93	9.527E+00	(	2.355E+00	1.38E+01	3.76E+01 G
			295.09	1.317E+01	(	2.888E+00	1.28E+01	1.93E+01 G
			242.00	1.696E+01	+	1.184E+01	2.40E+01	7.43E+00 GA
BI-207	C	-9.3452E-01					1.18E+04	
			1063.66	-9.345E-01	?(P	2.655E+00	6.87E+01	7.45E+01 G
			569.70	0.000E+00	+	1.639E+00	1.00E+03	9.77E+01 G
BI-212	N	3.0609E-06					6.98E+02	
			727.17	3.061E-06	%(	2.781E+01	2.54E+08	7.55E+00 G
			785.42	3.495E+00	% P	1.027E+02	1.16E+03	1.28E+00 GA
U-235	N	2.8559E+00					2.57E+11	
			143.79	-3.259E+00	&(P	1.182E+01	9.29E+01	1.10E+01 G
			205.33	1.623E+01	(P	1.428E+01	3.47E+01	5.01E+00 G
			163.38	-6.717E-02	% P	2.313E+01	1.06E+04	5.08E+00 G
			185.72	1.426E+00	P	1.614E+00	4.30E+01	5.40E+01 GA
BI-214	N	1.0814E+01					5.84E+05	
			609.31	1.081E+01	(P	1.945E+00	1.19E+01	4.61E+01 G
			1120.29	3.542E+00	- P	1.624E+01	1.32E+02	1.51E+01 G
			1764.49	1.652E+01	+ P	7.812E+00	2.47E+01	1.54E+01 G
BI-210M	T	1.3098E-01					1.10E+09	
			265.83	1.310E-01	?(	2.319E+00	5.08E+02	5.00E+01 G
			304.90	0.000E+00	-	8.281E+00	1.00E+03	2.80E+01 G
AC-228	N	1.3701E+01					2.10E+03	
			911.07	1.334E+01	(P	1.860E+00	1.38E+01	2.90E+01 G
			968.97	1.030E+01	- P	3.253E+00	2.13E+01	1.75E+01 G
			338.32	1.457E+01	(	6.457E+00	2.11E+01	1.20E+01 G
			93.35	5.039E+00	-	2.731E+01	1.62E+02	5.56E+00 XA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	3.9552E+00					7.95E+03	
			256.24	4.530E+00	?(	1.266E+01	1.07E+02	7.00E+00 G
			235.97	-3.000E+00	-	2.027E+01	2.01E+02	1.23E+01 G
			50.14	3.452E+00	*(	1.594E+01	1.60E+02	8.00E+00 G
TH-229	N	1.5861E-01					2.68E+06	
			193.51	1.586E-01	%(P	1.955E+01	4.41E+03	4.40E+00 G
			210.85	-4.987E+00	+ P	3.033E+01	1.95E+02	2.99E+00 G
TH-234	N	1.2141E+01					1.63E+12	
			92.59	9.902E+00	(P	1.440E+01	4.52E+01	5.58E+00 G
			63.29	1.542E+01	(P	2.405E+01	4.84E+01	3.81E+00 G
PA-231	N	5.8738E+00					1.20E+07	
			302.65	0.000E+00	?(	8.002E+01	1.00E+03	2.88E+00 G
			300.07	1.275E+01	?(	8.944E+01	2.08E+02	2.46E+00 G
PA-233	C	1.3863E+00					7.82E+08	
			312.01	8.156E-01	?(P	6.373E+00	2.31E+02	3.60E+01 G
			300.18	4.700E+00	?(	3.624E+01	2.28E+02	6.20E+00 G
PA-234	N	7.4857E-01					1.63E+12	
			131.29	-1.664E+00	&(	7.170E+00	1.29E+02	1.80E+01 G
			946.02	3.066E+00	?(P	7.265E+00	9.50E+01	1.34E+01 G
			569.47	-2.007E-01	%	1.945E+01	2.70E+03	8.20E+00 G
			883.24	2.036E+00	?(	2.041E+01	2.81E+02	9.60E+00 G
			880.53	8.999E+00	&	2.832E+01	9.21E+01	6.00E+00 GA
PA-234M	N	-2.7166E+01					1.63E+12	
			1001.00	-2.717E+01	?(P	2.499E+02	1.94E+02	8.37E-01 G
			766.41	-2.228E+02	& P	6.549E+02	6.04E+01	2.94E-01 G
AM-241	T	-1.5502E+00					1.58E+05	
			59.54	-1.550E+00	(P	3.906E+00	6.95E+01	3.59E+01 G
Ir-192	F	2.5924E-01					7.40E+01	
			316.49	4.058E-02	?(	1.379E+00	9.65E+02	8.70E+01 G
			468.06	6.270E-01	(	2.949E+00	1.37E+02	5.18E+01 G
			308.44	0.000E+00	-	7.373E+00	1.00E+03	3.18E+01 G
Cs-136	F	2.0181E-01					1.30E+01	
			818.50	-2.230E-02	&(	1.750E+00	2.14E+03	1.00E+02 G
			1048.07	-1.029E-01	+	2.313E+00	6.08E+02	8.00E+01 G
			340.57	6.797E-01	?(	3.671E+00	1.59E+02	4.69E+01 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Np-239   T   2.4903E-01                                      2.36E+00
                          103.70 0.000E+00 -   4.134E+00 1.00E+03 2.40E+01 X
                          106.13 2.490E-01 ?(  5.673E+00 6.71E+02 2.27E+01 G
                           99.50 6.187E-01 &   5.835E+00 2.76E+02 1.50E+01 X

Nd-147       2.7018E+00                                      1.11E+01
                          531.00 2.702E+00 ?(  6.755E+00 9.70E+01 1.30E+01 G
                           91.10 2.829E-01 -   5.640E+00 5.90E+02 2.83E+01 G

TL-210   N   3.4339E-01                                      5.84E+05
                          799.60 3.054E-01 ?(  1.883E+00 1.76E+02 9.90E+01 G
                          296.00 3.910E-01 ?(  2.781E+00 2.10E+02 7.90E+01 G
                         1313.00-9.477E-01 +   1.012E+01 4.60E+02 2.10E+01 GA
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-227	50.14	87.	10.	0.006	160.16	3.452E+00	
AM-241	59.54	173.	-25.	-0.014	69.48	-1.550E+00	P
BA-133	80.99	187.	-21.	-0.012	116.04	-1.048E+00	
EU-155	86.54	436.	12.	0.007	252.27	6.208E-01	
Nd-147	91.10	443.	5.	0.003	590.42	2.829E-01	
Gd-153	97.50	107.	-12.	-0.007	122.16	-6.385E-01	
Np-239	99.50	134.	6.	0.003	275.55	6.187E-01	
Gd-153	103.20	165.	-11.	-0.006	167.87	-7.762E-01	
EU-155	105.31	302.	-16.	-0.009	152.21	-1.184E+00	
Np-239	106.13	304.	4.	0.002	671.08	2.490E-01	
EU-152	121.78	193.	-19.	-0.011	106.32	-1.028E+00	
CO-57	122.06	212.	-19.	-0.011	111.14	-3.433E-01	
PA-234	131.29	286.	-19.	-0.011	128.52	-1.664E+00	
HF-181	133.02	305.	-19.	-0.011	132.30	-6.963E-01	
CE-144	133.54	324.	-19.	-0.011	136.16	-2.724E+00	
HF-181	136.30	343.	-11.	-0.006	236.35	-3.067E+00	
CO-57	136.47	280.	17.	0.009	141.53	2.553E+00	
Tc-99m	140.51	244.	-18.	-0.010	125.91	-3.354E-01	
U-235	143.79	265.	-22.	-0.012	92.95	-3.259E+00	P
CE-141	145.44	249.	8.	0.005	266.87	2.901E-01	
Ba-140	162.66	168.	-14.	-0.008	142.96	-4.048E+00	P
CE-139	165.85	179.	-14.	-0.008	134.74	-3.181E-01	
Cf-251	176.60	60.	14.	0.008	105.50	1.486E+00	
U-235	185.72	81.	40.	0.022	42.97	1.426E+00	P
U-235	205.33	45.	38.	0.021	34.73	1.623E+01	P
TH-229	210.85	71.	-7.	-0.004	194.85	-4.987E+00	P
Cf-251	227.00	47.	-5.	-0.003	264.58	-1.702E+00	
TH-227	235.97	482.	-16.	-0.009	201.39	-3.000E+00	
EU-152	244.69	378.	12.	0.007	233.67	3.825E+00	
TH-227	256.24	48.	12.	0.007	107.29	4.530E+00	
Cd-113m	263.70	64.	-2.	-0.001	570.09	-8.674E+02	
BI-210M	265.83	80.	2.	0.001	508.33	1.310E-01	
Hg-203	279.20	56.	9.	0.005	117.56	3.136E-01	
I-131	284.30	30.	9.	0.005	112.37	4.276E+00	P
TL-210	296.00	252.	11.	0.006	210.41	3.910E-01	
PA-231	300.07	247.	11.	0.006	207.53	1.275E+01	
PA-233	300.18	258.	10.	0.006	228.02	4.700E+00	
PA-233	312.01	252.	10.	0.005	231.00	8.156E-01	P
Ir-192	316.49	63.	1.	0.001	965.32	4.058E-02	
La-140	328.76	29.	22.	0.012	51.46	3.335E+00	
Cf-249	333.44	29.	-1.	-0.001	764.85	-2.718E-01	
Cs-136	340.57	119.	10.	0.006	158.83	6.797E-01	
EU-152	344.29	129.	10.	0.006	164.56	1.217E+00	
HF-181	345.83	136.	10.	0.005	174.01	2.088E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	356.00	167.	-2.	-0.001	999.09	-9.863E-02	
I-131	364.48	33.	-4.	-0.002	176.82	-1.830E-01	P
Cf-249	387.95	30.	9.	0.005	95.02	4.737E-01	
SN-113	391.69	47.	10.	0.005	105.73	5.411E-01	
SB-125	427.88	32.	3.	0.002	396.20	3.723E-01	P
AG-108M	433.94	32.	-3.	-0.002	341.22	-1.435E-01	P
SB-125	463.37	36.	9.	0.005	98.82	3.620E+00	P
Ir-192	468.06	52.	8.	0.004	136.90	6.270E-01	
BE-7	477.59	36.	8.	0.005	109.41	3.310E+00	
HF-181	482.00	50.	-6.	-0.003	167.35	-3.291E-01	
La-140	487.02	20.	-2.	-0.001	438.36	-1.961E-01	P
RU-103	497.05	4.	12.	0.007	43.95	5.785E-01	P
RH-106	511.86	62.	42.	0.023	30.91	9.374E+00	
Nd-147	531.00	12.	8.	0.004	97.04	2.702E+00	
Ba-140	537.26	20.	-1.	-0.001	881.29	-1.929E-01	
CS-134	563.24	24.	-6.	-0.003	87.31	-3.538E+00	P
CS-134	569.32	32.	-7.	-0.004	120.37	-2.247E+00	
SB-125	600.50	173.	4.	0.002	431.52	1.252E+00	
RH-106	621.92	140.	7.	0.004	258.53	3.505E+00	
SB-125	635.89	29.	-7.	-0.004	159.91	-3.406E+00	P
I-131	636.97	43.	-5.	-0.003	216.76	-3.976E+00	P
AG-110M	657.76	34.	2.	0.001	456.90	1.079E-01	
PM-144	696.54	22.	4.	0.002	267.62	2.155E-01	P
SB-124	722.79	36.	11.	0.006	82.54	6.143E+00	
PM-146	735.72	22.	-8.	-0.004	127.39	-2.087E+00	P
PM-146	747.16	26.	-2.	-0.001	525.20	-3.645E-01	
ZR-95	756.73	9.	1.	0.000	938.54	7.575E-02	P
PA-234M	766.41	35.	-10.	-0.006	60.44	-2.228E+02	P
EU-152	778.92	29.	-13.	-0.007	48.57	-6.503E+00	P
CS-134	795.87	22.	9.	0.005	81.00	6.794E-01	
TL-210	799.60	30.	5.	0.003	175.54	3.054E-01	
CS-134	801.95	40.	1.	0.001	900.00	7.567E-01	
CO-58	810.78	19.	6.	0.003	117.50	3.781E-01	
MN-54	834.85	14.	8.	0.004	108.20	5.309E-01	P
Co-56	846.77	23.	-3.	-0.002	247.23	-2.358E-01	P
NB-94	871.10	35.	-13.	-0.007	69.65	-9.234E-01	
EU-154	873.23	32.	9.	0.005	91.87	5.332E+00	
PA-234	880.53	21.	8.	0.004	92.13	8.999E+00	
PA-234	883.24	28.	3.	0.002	280.82	2.036E+00	
Y-88	898.04	19.	1.	0.001	692.82	1.029E-01	
AG-110M	937.49	14.	-1.	-0.001	800.00	-2.182E-01	
PA-234	946.02	5.	5.	0.003	95.02	3.066E+00	P
EU-152	964.11	31.	6.	0.003	147.77	2.938E+00	
EU-154	996.33	20.	3.	0.001	246.86	1.985E+00	
PA-234M	1001.00	26.	-3.	-0.002	194.45	-2.717E+01	P
Co-56	1037.84	25.	-7.	-0.004	77.89	-4.180E+00	P
Cs-136	1048.07	18.	-1.	-0.001	608.28	-1.029E-01	
RH-106	1050.36	34.	-11.	-0.006	53.77	-5.558E+01	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-207	1063.66	20.	-8.	-0.005	68.65	-9.345E-01	P
Ga-68	1077.40	20.	-2.	-0.001	496.66	-5.960E+00	
FE-59	1099.25	15.	-3.	-0.002	289.64	-4.550E-01	
EU-152	1112.07	44.	-6.	-0.004	152.93	-4.045E+00	
Sc-46	1120.55	25.	8.	0.005	90.24	7.375E-01	
CO-60	1173.24	10.	1.	0.001	702.38	9.060E-02	
Co-56	1238.28	17.	7.	0.004	128.83	1.063E+00	P
NA-22	1274.53	5.	6.	0.004	64.94	6.168E-01	
FE-59	1291.60	5.	4.	0.002	155.18	8.196E-01	P
TL-210	1313.00	16.	-2.	-0.001	460.07	-9.477E-01	
CO-60	1332.50	6.	3.	0.002	174.81	3.247E-01	P
AG-110M	1384.30	16.	-4.	-0.002	232.74	-1.713E+00	
EU-152	1408.00	11.	-3.	-0.002	181.26	-1.588E+00	P
La-140	1596.21	6.	-2.	-0.001	343.80	-2.050E-01	
Y-88	1836.06	6.	2.	0.001	304.14	2.662E-01	

P - Peakbackground subtraction

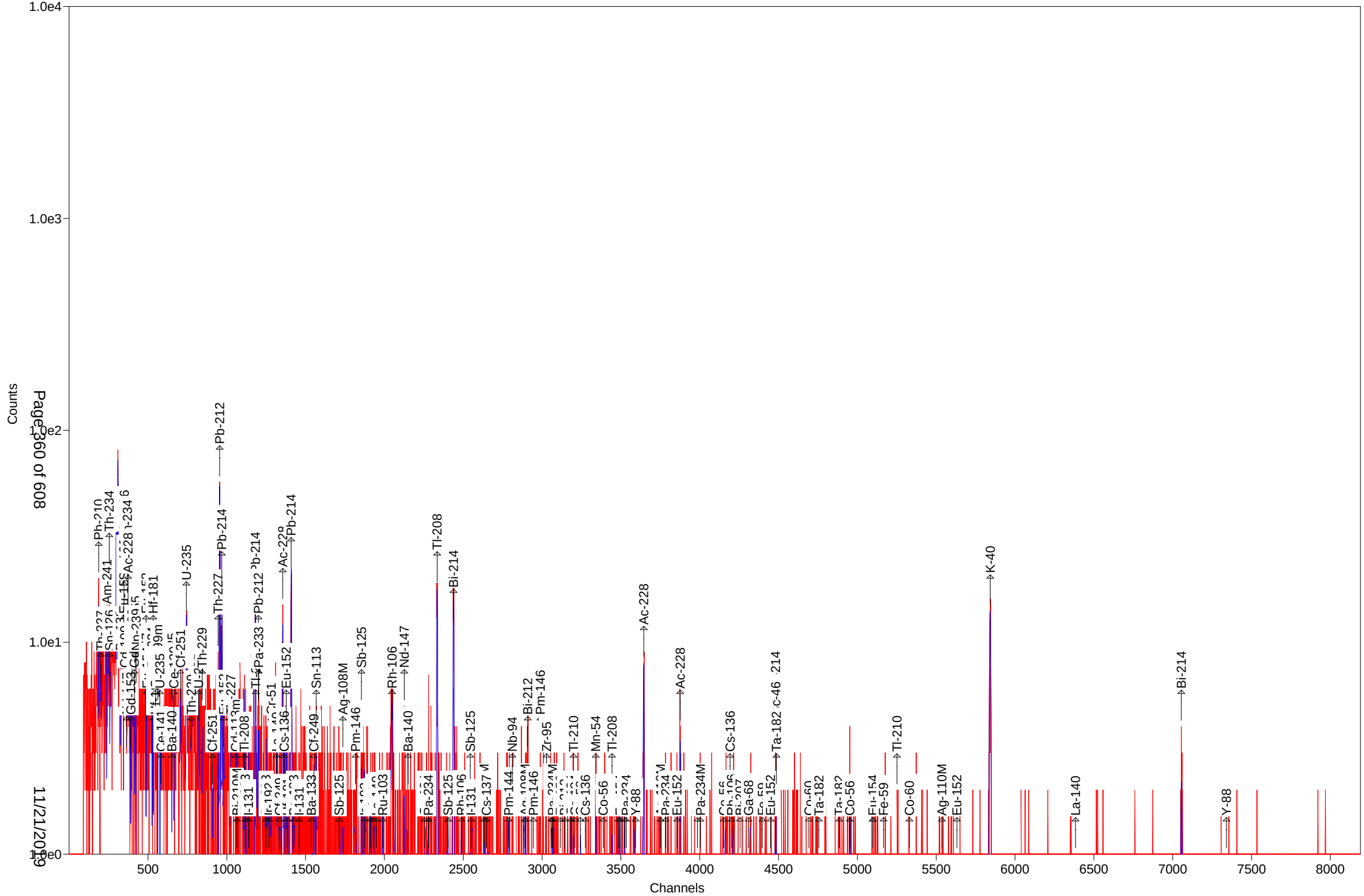
***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	3.3099E+00	3.3099E+00	1.094E+02%	1.24E+01
NA-22	#A	6.1681E-01	6.1681E-01	6.494E+01%	1.31E+00
K-40		1.2957E+02	1.2957E+02	8.874E+00%	7.52E+00
Sc-46	#A	3.6877E-01	3.6877E-01	9.024E+01%	1.27E+00
CR-51	A	2.2422E+00	2.2422E+00	1.055E+02%	8.12E+00
MN-54	#A	5.3086E-01	5.3086E-01	1.082E+02%	1.38E+00
FE-59	#A	9.7298E-02	9.7298E-02	1.552E+02%	3.15E+00
Co-56	#A	2.8123E-01	2.8123E-01	1.288E+02%	1.74E+00
CO-57	#A	-2.2019E-02	-2.2019E-02	8.998E+01%	1.28E+00
CO-58	#A	3.7811E-01	3.7811E-01	1.175E+02%	1.55E+00
CO-60	#A	2.0772E-01	2.0772E-01	1.748E+02%	1.40E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.39E+00
NB-94	#A	-2.0043E-02	-2.0043E-02	2.555E+03%	1.33E+00
ZR-95	#A	7.5754E-02	7.5754E-02	9.385E+02%	1.95E+00
NB-95	#A	4.2265E-02	4.2265E-02	1.002E+03%	1.56E+00
RU-103	#A	5.7852E-01	5.7852E-01	4.395E+01%	5.87E-01
RH-106	#A	3.5048E+00	3.5048E+00	2.585E+02%	3.10E+01
AG-108M	#A	-1.4353E-01	-1.4353E-01	3.412E+02%	1.27E+00
AG-110M	#A	6.1034E-02	6.1034E-02	4.569E+02%	2.82E+00
SN-113	#A	5.4108E-01	5.4108E-01	1.057E+02%	1.95E+00
SB-124	#A	4.2333E-01	4.2333E-01	8.254E+01%	3.41E+00
SB-125	#A	1.2306E+00	1.2306E+00	9.882E+01%	3.83E+00
I-131	#A	1.2868E-01	1.2869E-01	1.048E+02%	1.24E+00
Gd-153	#A	-6.3846E-01	-6.3846E-01	1.222E+02%	2.64E+00
Ga-68	#A	-5.9324E+00	-5.9597E+00	4.967E+02%	7.02E+01

Tc-99m	#A	-3.3507E-01	-3.3536E-01	1.259E+02%	1.42E+00
BA-133	#A	-9.8634E-02	-9.8634E-02	9.991E+02%	3.38E+00
CS-134	#A	6.8652E-01	6.8653E-01	8.100E+01%	1.86E+00
CS-137	#A	2.4088E-02	2.4088E-02	2.327E+03%	2.01E+00
CE-139	#A	-3.1810E-01	-3.1810E-01	1.347E+02%	1.45E+00
Ba-140	#A	-1.9285E-01	-1.9286E-01	8.813E+02%	4.54E+00
La-140	#A	4.1614E-01	4.1615E-01	5.146E+01%	1.70E+00
CE-141	#A	2.9013E-01	2.9013E-01	2.669E+02%	2.62E+00
CE-144	#A	-2.7243E+00	-2.7243E+00	1.362E+02%	1.24E+01
PM-144	#A	2.1548E-01	2.1548E-01	2.676E+02%	1.46E+00
EU-152	#A	9.6810E-01	9.6810E-01	8.471E+01%	3.66E+00
EU-154	#A	1.3997E+00	1.3997E+00	9.187E+01%	2.60E+00
EU-155	#A	-1.1646E-01	-1.1646E-01	1.473E+02%	6.06E+00
HF-181	#A	5.2041E-02	5.2041E-02	1.207E+02%	1.91E+00
Ta-182	#A	1.2753E+00	1.2753E+00	1.648E+02%	7.35E+00
Hg-203	#A	3.1362E-01	3.1362E-01	1.176E+02%	1.26E+00
TL-208		6.1853E+00	6.1854E+00	1.052E+01%	8.18E-01
PM-146	#A	2.0580E-02	2.0580E-02	3.191E+03%	1.74E+00
Y-88	#A	1.8687E-01	1.8687E-01	3.041E+02%	1.88E+00
Cd-113m	#A	-8.6736E+02	-8.6736E+02	5.701E+02%	1.73E+04
Cd-109	#A	7.8895E+00	7.8895E+00	1.581E+02%	4.18E+01
Cf-251	#A	1.4856E+00	1.4856E+00	1.055E+02%	4.26E+00
Cf-249	#A	4.7368E-01	4.7368E-01	9.502E+01%	1.53E+00
Sn-126	#A	-3.2879E+00	-3.2879E+00	1.357E+02%	1.50E+01
PB-210	A	2.6055E+01	2.6055E+01	4.857E+01%	3.25E+01
PB-212		1.2576E+01	1.2576E+01	7.317E+00%	1.43E+00
PB-214		1.0763E+01	1.0763E+01	9.422E+00%	2.35E+00
BI-207	#A	-9.3452E-01	-9.3452E-01	6.865E+01%	2.66E+00
BI-212	#A	3.0609E-06	3.0609E-06	2.542E+08%	2.78E+01
U-235	#A	2.8559E+00	2.8559E+00	3.473E+01%	1.18E+01
BI-214		1.0814E+01	1.0814E+01	1.190E+01%	1.94E+00
BI-210M	#A	1.3098E-01	1.3098E-01	5.083E+02%	2.32E+00
AC-228		1.3701E+01	1.3701E+01	1.260E+01%	1.86E+00
TH-227	#A	3.9552E+00	3.9552E+00	9.639E+01%	1.27E+01
TH-229	#A	1.5861E-01	1.5861E-01	4.409E+03%	1.95E+01
TH-234	#A	1.2141E+01	1.2141E+01	3.313E+01%	1.44E+01
PA-231	#A	5.8738E+00	5.8738E+00	2.075E+02%	8.00E+01
PA-233	#A	1.3863E+00	1.3863E+00	1.623E+02%	6.37E+00
PA-234	#A	7.4857E-01	7.4857E-01	9.502E+01%	7.17E+00
PA-234M	#A	-2.7166E+01	-2.7166E+01	1.944E+02%	2.50E+02
AM-241	#A	-1.5502E+00	-1.5502E+00	6.948E+01%	3.91E+00
Np-237	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.42E+01
Ir-192	#A	2.5924E-01	2.5924E-01	1.369E+02%	1.38E+00
Cs-136	#A	2.0181E-01	2.0181E-01	1.588E+02%	1.75E+00
Np-239	#A	2.4901E-01	2.4903E-01	6.711E+02%	5.67E+00
Nd-147	#A	2.7018E+00	2.7018E+00	9.704E+01%	6.76E+00
TL-210	#A	3.4339E-01	3.4339E-01	1.370E+02%	1.88E+00
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.27E+02

```
  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded
-----------------------------   S U M M A R Y   ----------------------------
Total Activity (   37.6 to  2000.8 keV)     2.218E+02  Bq/Sample
Total Decayed Activity (   37.6 to  2000.8 keV) 2.2181123E+02  Bq/Sample
```

445369_Gamma_180-96595-A-5-D DU. 5_Gamma_20192838.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193116

Sample Description: 445369_Gamma_180-96595-A-6-B
Detector: Detector # 9
Batch ID: 445369
Work Order Number: Gamma
Lot Number: 180-96595-A-6-B

Decay to Time: 10/31/2019 02:47 Live Time: 1800 sec
Acquisition Time: 10/31/2019 02:47:26 Real Time: 1804 sec
Analysis Time: 10/31/2019 03:17 Dead Time: 0.21 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 9_Soil_TunaCan.Clb
Efficiency Cal Desc: 9_Soil_TunaCan_90099_050312
Efficiency Cal Date: 6/14/2012 10:19
Energy Cal Date: 3/1/2012 13:57
Library: Client_Long_Rev15.lib
Bkgd Correction File: 9_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	3.142E+00	101.3	3.183E+00	3.187E+00	1.073E+01
NA-22	0.000E+00	1.#INF	5.108E-02	5.108E-02	1.120E+00
K-40	1.745E+02	5.6	9.842E+00	1.329E+01	7.638E+00
Sc-46	2.108E-01	123.8	2.609E-01	2.611E-01	1.320E+00
CR-51	-3.564E+00	90.8	3.237E+00	3.242E+00	1.082E+01
MN-54	-1.606E-02	2389.0	3.837E-01	3.837E-01	9.601E-01
FE-59	8.771E-02	137.5	1.206E-01	1.207E-01	2.335E+00
Co-56	3.372E-01	93.5	3.153E-01	3.158E-01	7.790E-01
CO-57	-3.154E-01	76.2	2.402E-01	2.407E-01	7.976E-01
CO-58	-7.801E-02	462.7	3.609E-01	3.609E-01	1.274E+00
CO-60	8.247E-03	219.1	1.806E-02	1.807E-02	1.160E+00
ZN-65	1.037E+00	90.0	9.337E-01	9.352E-01	3.152E+00
NB-94	-4.772E-01	86.4	4.121E-01	4.128E-01	1.383E+00
ZR-95	5.666E-01	104.3	5.911E-01	5.919E-01	1.622E+00
NB-95	-2.138E-01	240.8	5.147E-01	5.148E-01	1.765E+00
RU-103	-4.829E-01	89.9	4.343E-01	4.350E-01	1.030E+00
RH-106	-5.188E+00	85.9	4.458E+00	4.466E+00	2.378E+01
AG-108M	-2.075E-01	164.9	3.422E-01	3.424E-01	8.313E-01
AG-110M	2.862E-02	551.1	1.577E-01	1.577E-01	1.796E+00
SN-113	-5.803E-01	99.7	5.787E-01	5.795E-01	1.941E+00
SB-124	2.657E-01	93.2	2.477E-01	2.481E-01	1.083E+00
SB-125	1.015E+00	94.7	9.609E-01	9.623E-01	2.272E+00
I-131	1.462E-01	220.3	3.220E-01	3.221E-01	8.192E-01
Gd-153	-1.060E+00	168.5	1.787E+00	1.788E+00	5.949E+00
Ga-68	-1.211E+01	157.3	1.904E+01	1.905E+01	4.228E+01
Tc-99m	0.000E+00	1.#INF	6.660E-02	6.660E-02	1.454E+00
BA-133	-5.461E-01	135.7	7.410E-01	7.415E-01	2.489E+00
CS-134	4.754E-01	79.3	3.772E-01	3.780E-01	1.266E+00
CS-137	2.738E-01	84.3	2.309E-01	2.313E-01	7.832E-01
CE-139	-2.383E-02	1258.2	2.998E-01	2.998E-01	1.026E+00
Ba-140	8.531E-01	96.3	8.218E-01	8.229E-01	3.079E+00
La-140	-1.004E+00	118.2	1.186E+00	1.187E+00	1.659E+00
CE-141	-6.533E-01	141.7	9.258E-01	9.264E-01	3.086E+00

CE-144	2.157E+00	151.7	3.274E+00	3.275E+00	1.094E+01
PM-144	3.533E-01	76.8	2.715E-01	2.721E-01	9.099E-01
EU-152	1.334E+00	79.9	1.065E+00	1.068E+00	2.522E+00
EU-154	7.351E-01	88.0	6.470E-01	6.482E-01	1.687E+00
EU-155	-1.235E+00	99.6	1.230E+00	1.232E+00	8.676E+00
HF-181	2.361E-01	145.5	3.434E-01	3.437E-01	1.510E+00
Ta-182	1.694E+00	85.2	1.444E+00	1.446E+00	5.396E+00
Hg-203	4.064E-02	696.4	2.830E-01	2.830E-01	9.828E-01
TL-208	3.981E+00	10.4	4.159E-01	4.643E-01	5.908E-01
PM-146	2.674E-02	377.5	1.009E-01	1.009E-01	1.197E+00
Y-88	4.621E-02	945.4	4.369E-01	4.369E-01	1.001E+00
Cd-113m	1.371E+03	234.5	3.216E+03	3.217E+03	1.113E+04
Cd-109	0.000E+00	1.#INF	1.423E+01	1.423E+01	4.739E+01
Cf-251	5.987E-01	241.8	1.448E+00	1.449E+00	3.764E+00
Cf-249	3.984E-01	125.6	5.003E-01	5.007E-01	1.692E+00
Sn-126	3.410E+00	116.0	3.957E+00	3.961E+00	1.322E+01
PB-210	9.311E+00	94.1	8.763E+00	8.780E+00	2.935E+01
PB-212	1.134E+01	6.5	7.319E-01	1.036E+00	1.347E+00
PB-214	8.479E+00	8.1	6.879E-01	8.170E-01	1.577E+00
BI-207	-2.408E-01	281.1	6.770E-01	6.771E-01	1.460E+00
BI-212	-8.419E+00	80.9	6.809E+00	6.823E+00	2.271E+01
U-235	0.000E+00	1.#INF	1.224E+00	1.224E+00	1.162E+01
BI-214	7.874E+00	12.0	9.414E-01	1.026E+00	1.637E+00
BI-210M	4.546E-01	97.1	4.414E-01	4.422E-01	1.485E+00
AC-228	1.326E+01	11.5	1.523E+00	1.666E+00	1.886E+00
TH-227	8.923E-01	492.0	4.391E+00	4.391E+00	1.100E+01
TH-229	-7.365E+00	101.1	7.442E+00	7.465E+00	1.816E+01
TH-234	-5.937E+00	49.1	2.916E+00	2.935E+00	3.211E+01
PA-231	3.100E+00	314.6	9.750E+00	9.752E+00	6.189E+01
PA-233	-2.196E-02	2946.2	6.470E-01	6.470E-01	5.058E+00
PA-234	1.847E+00	84.5	1.561E+00	1.563E+00	6.436E+00
PA-234M	4.293E+01	84.7	3.634E+01	3.641E+01	1.437E+02
AM-241	6.345E-01	181.7	1.153E+00	1.153E+00	3.875E+00
Np-237	0.000E+00	1.#INF	4.433E+00	4.433E+00	1.476E+01
Ir-192	4.208E-01	89.1	3.751E-01	3.759E-01	1.777E+00
Cs-136	1.995E-01	33.3	6.653E-02	6.751E-02	1.423E+00
Np-239	1.295E+00	177.5	2.299E+00	2.300E+00	7.656E+00
Nd-147	1.070E+00	183.3	1.961E+00	1.962E+00	4.895E+00
TL-210	4.111E-01	84.7	3.481E-01	3.489E-01	1.172E+00
Kr-85	5.037E+01	188.6	9.502E+01	9.507E+01	3.239E+02
Total	1.723E+03				

Analyst: Justin Banner

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Sample description
445369_Gamma_180-96595-A-6-B

Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193116.An1

Acquisition information
Start time: 10/31/2019 2:47:26 AM
Live time: 1800
Real time: 1804
Dead time: 0.21 %
Detector ID: 9

Detector system
Ge9 S/N100228730

Calibration
Filename: 9_Soil_TunaCan.Clb
9_Soil_TunaCan_90099_050312

Energy Calibration
Created: 3/1/2012 1:57:17 PM
Zero offset: 0.074 keV
Gain: 0.250 keV/channel
Quadratic: -2.269E-08 keV/channel^2

Efficiency Calibration
Created: 6/14/2012 10:19:51 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.30 %
Log(Eff): -8.079856E-01 + (-2.367265E-01*Log(E)) + (-3.950640E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.42 %
Log(Eff): -2.387916E+01 + (8.875647E+00*Log(E)) + (-9.401100E-01*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 100 (25.08keV)
Stop channel: 8000 (1999.34keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 2:47:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-10-06_1923.PBC 10/6/2019 7:23:18 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 23 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0854

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.54	18.	94.12	1.00	2.577E-02	46.54	4.250	PBC<MDA	PB210
60.17	15.	181.72	1.01	3.659E-02	59.54	35.900	PBC<MDA	AM241
64.28	24.	116.02	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
74.82	152.	13.94	1.03	4.574E-02				
77.19	239.	9.00	1.03	4.680E-02				
87.60	32.	57.11	1.04	5.038E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	9.367E+00	Cd109
93.08	101.	24.72	1.95	5.171E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	1.948E+01	AC228
106.13	28.	177.49	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
123.54	22.	88.02	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
131.24	23.	142.65	1.08	5.216E-02	131.29	18.000	PBC<MDA	PA234
133.02	23.	145.47	1.08	5.195E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	2.206E+00	CE144
133.54	22.	151.74	1.08	5.189E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	2.157E+00	CE144
162.66	19.	96.33	1.11	4.690E-02	162.66	6.220	PBC<MDA	Ba140
176.60	8.	241.84	1.12	4.549E-02	176.60	17.000	PBC<MDA	Cf251
185.72	43.	50.23	1.13	4.403E-02	185.72	54.000	PBC<MDA	U235
210.85	15.	147.62	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
238.50	316.	8.00	1.21	3.733E-02	238.63	43.300	1.086E+01	PB212
241.93	58.	23.61	1.18	3.697E-02	242.00	7.430	1.174E+01	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
256.24	4.	492.02	1.20	3.558E-02	256.24	7.000	PBC<MDA	TH227
263.70	5.	234.53	1.20	3.489E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	14.	97.08	1.20	3.470E-02	265.83	50.000	PBC<MDA	BI210M
277.63	3.	420.32	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
279.20	2.	696.42	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
295.01	96.	16.62	1.27	3.232E-02	295.09	19.300	8.586E+00	PB214
					296.00	79.000	2.102E+00	TL210
300.03	17.	177.40	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.176E+01	PA231
					300.18	6.200	4.665E+00	PA233
300.07	10.	314.57	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	6.728E+00	PA231
					300.18	6.200	2.670E+00	PA233
316.49	17.	151.72	1.25	3.080E-02	316.49	87.040	PBC<MDA	Ir192
337.68	102.	13.13	1.26	2.944E-02	338.32	12.010	1.613E+01	AC228
344.29	21.	138.92	1.28	2.905E-02	344.29	26.500	PBC<MDA	EU152
351.89	164.	10.76	0.92	2.861E-02	351.93	37.600	8.495E+00	PB214
364.48	6.	220.27	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
387.95	13.	125.55	1.31	2.671E-02	387.95	66.000	PBC<MDA	Cf249
427.88	13.	94.67	1.35	2.491E-02	427.88	29.600	PBC<MDA	SB125
468.06	12.	93.62	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
477.60	14.	101.29	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
482.00	2.	730.48	1.40	2.286E-02	482.00	80.500	PBC<MDA	HF181
487.02	8.	174.18	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
511.86	33.	43.83	2.67	2.188E-02	511.86	20.000	PBC<MDA	RH106
513.98	9.	188.64	1.42	2.182E-02	513.98	0.430	PBC<MDA	Kr85
531.00	5.	183.34	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
537.26	1.	905.05	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
568.91	6.	84.54	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.674E-01	PA234
583.24	120.	10.45	1.27	1.988E-02	583.02	84.500	3.981E+00	TL208
600.50	5.	287.97	1.50	1.946E-02	600.50	17.860	PBC<MDA	SB125
609.16	126.	11.96	1.20	1.925E-02	609.31	46.090	7.874E+00	BI214
					610.30	5.750	6.319E+01	RU103
635.89	5.	170.88	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
657.76	2.	551.10	1.54	1.818E-02	657.76	94.640	PBC<MDA	AG110M
661.66	8.	84.33	1.55	1.810E-02	661.66	85.210	PBC<MDA	CS137
696.54	11.	76.84	1.58	1.741E-02	696.54	99.000	PBC<MDA	PM144
722.79	13.	93.24	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	4.636E-01	AG108M
723.66	2.	495.58	1.60	1.692E-02	722.94	90.840	PBC<MDA	AG108M
					723.36	20.220	4.059E-01	EU154
					724.20	44.150	1.861E-01	ZR95
724.20	7.	174.50	1.60	1.691E-02	723.36	20.220	PBC<MDA	EU154
					724.20	44.150	4.962E-01	ZR95
735.72	2.	428.21	1.61	1.671E-02	735.72	22.500	PBC<MDA	PM146
756.73	10.	114.38	1.62	1.635E-02	756.73	54.460	PBC<MDA	ZR95
766.41	15.	84.66	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					766.41	0.294	1.752E+02	PA234M
785.42	11.	93.59	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
795.88	12.	79.35	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
799.60	11.	84.67	1.66	1.568E-02	799.60	98.960	PBC<MDA	TL210
846.77	10.	93.52	1.70	1.501E-02	846.77	99.935	PBC<MDA	Co56
860.46	7.	176.13	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
871.10	7.	78.42	1.71	1.468E-02	871.10	99.890	PBC<MDA	NB94
882.89	7.	148.71	1.72	1.453E-02	883.24	9.600	PBC<MDA	PA234
911.07	98.	11.48	1.73	1.418E-02	911.07	29.000	1.326E+01	AC228
945.59	6.	147.67	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
969.06	14.	75.44	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.32	5.	166.13	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1048.07	16.	33.35	1.85	1.271E-02	1048.07	80.000	8.923E-01	Cs136
1112.07	11.	79.85	1.89	1.213E-02	1112.07	13.644	PBC<MDA	EU152
1115.55	11.	90.05	1.90	1.210E-02	1115.55	50.600	PBC<MDA	ZN65
1120.25	8.	140.02	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	10.	123.76	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	4.472E-01	Sc46
					1121.30	34.900	1.282E+00	Ta182
1121.30	9.	128.02	1.90	1.205E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.235E+00	Ta182
1173.24	4.	291.05	1.94	1.163E-02	1173.24	99.900	PBC<MDA	CO60
1189.05	9.	112.49	1.95	1.150E-02	1189.05	16.200	PBC<MDA	Ta182
1238.28	4.	425.79	1.98	1.114E-02	1238.28	66.070	PBC<MDA	Co56
1291.60	4.	137.50	2.02	1.077E-02	1291.60	43.200	PBC<MDA	FE59
1313.00	5.	175.40	2.03	1.063E-02	1313.00	21.000	PBC<MDA	TL210
1408.00	7.	85.00	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.88	327.	5.64	2.19	9.749E-03	1460.83	10.670	1.745E+02	K40
1690.98	1.	945.38	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124
1764.50	28.	21.94	2.31	8.350E-03	1764.49	15.400	1.193E+01	BI214
1836.06	1.	945.38	2.35	8.079E-03	1836.06	99.200	PBC<MDA	Y88

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.89	74.81	148.	152.	3.321E+03	13.93	1.025	- sD
308.38	77.19	112.	239.	5.111E+03	9.00	1.027	- D

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev15.lib

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********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.80	46.54	140.	18.	0.010	94.12	0.998s
TH-227	200.20	50.14	234.	-21.	-0.012	105.97	1.001s
AM-241	237.77	59.54	364.	15.	0.008	181.72	1.010s
TH-234	252.77	63.29	379.	-27.	-0.015	103.48	1.014
Sn-126	256.74	64.28	367.	24.	0.013	116.02	1.015
BA-133	323.56	80.99	1003.	-30.	-0.017	148.41	1.031s
Np-237	345.55	86.49	1356.	0.	0.000	177.58	1.036A
EU-155	345.76	86.54	1299.	-30.	-0.017	172.56	1.036s
Sn-126	349.87	87.57	1174.	32.	0.018	57.11	1.037D
Cd-109	351.75	88.04	1188.	0.	0.000	164.87	1.038A
Nd-147	363.99	91.10	1203.	-30.	-0.017	165.50	1.041s
TH-234	369.94	92.59	1234.	-31.	-0.017	49.12	1.042s
AC-228	371.92	93.08	120.	101.	0.056	24.72	1.952s
Gd-153	389.58	97.50	1263.	-30.	-0.017	168.51	1.047s
Np-239	397.58	99.50	1293.	-30.	-0.017	170.16	1.049
Gd-153	412.37	103.20	1323.	-30.	-0.017	171.57	1.052s
Np-239	414.37	103.70	1353.	-30.	-0.017	173.41	1.053s
EU-155	420.82	105.31	1384.	-25.	-0.014	99.55	1.054s
Np-239	424.09	106.13	1235.	28.	0.016	177.49	1.055s
CO-57	487.80	122.06	180.	-26.	-0.014	76.15	1.070
EU-154	491.95	123.10	182.	22.	0.012	88.02	1.071s
PA-234	524.72	131.29	518.	23.	0.013	142.65	1.079s
HF-181	531.64	133.02	541.	23.	0.013	145.47	1.081s
CE-144	533.69	133.54	564.	22.	0.012	151.74	1.081s
HF-181	544.74	136.30	586.	0.	0.000	1000.00	1.084s
CO-57	545.43	136.47	586.	0.	0.000	1000.00	1.084s
Tc-99m	561.57	140.51	586.	0.	0.000	1000.00	1.088s
U-235	574.67	143.79	586.	0.	0.000	1000.00	1.091s
CE-141	581.29	145.44	796.	-28.	-0.016	141.71	1.092s
Ba-140	650.15	162.66	162.	19.	0.011	96.33	1.108s
U-235	653.03	163.38	183.	-23.	-0.013	86.37	1.109s
Cf-251	705.90	176.60	114.	8.	0.005	241.84	1.122s
U-235	742.37	185.72	121.	43.	0.024	50.23	1.130s
TH-229	773.52	193.51	160.	-25.	-0.014	101.05	1.137s
U-235	820.80	205.33	113.	-4.	-0.002	636.88	1.148s
TH-229	842.87	210.85	124.	15.	0.008	147.62	1.153s
Cf-251	907.45	227.00	108.	-4.	-0.002	511.13	1.168s
TH-227	943.33	235.97	681.	-22.	-0.012	171.90	1.176s
PB-212	953.97	238.63	61.	330.	0.183	6.46	1.179D
PB-214	967.43	242.00	65.	58.	0.032	23.61	1.182D
EU-152	978.21	244.69	705.	-24.	-0.013	88.06	1.185s
TH-227	1024.39	256.24	100.	4.	0.002	492.02	1.195s
Cd-113m	1054.23	263.70	71.	5.	0.003	234.53	1.202s
BI-210M	1062.75	265.83	88.	14.	0.008	97.08	1.204s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	1108.55	277.28	78.	3.	0.002	420.32	1.215s
Hg-203	1116.22	279.20	96.	2.	0.001	696.42	1.216
I-131	1136.61	284.30	76.	-13.	-0.007	134.19	1.221s
PB-214	1179.77	295.09	34.	99.	0.055	13.15	1.231D
PB-212	1199.52	300.03	427.	17.	0.009	177.40	1.235
PA-231	1199.68	300.07	443.	10.	0.005	314.57	1.235
PA-231	1210.00	302.65	453.	0.	0.000	1000.00	1.237s
Ba-140	1218.80	304.85	453.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	453.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	453.	0.	0.000	1000.00	1.243s
Ir-192	1265.35	316.49	318.	17.	0.009	151.72	1.250s
CR-51	1279.73	320.08	147.	-19.	-0.011	90.82	1.253
La-140	1314.43	328.76	514.	-22.	-0.012	145.03	1.261
Cf-249	1333.15	333.44	492.	-22.	-0.012	141.43	1.265s
AC-228	1352.66	338.32	456.	-23.	-0.013	135.89	1.270s
Cs-136	1361.66	340.57	479.	-20.	-0.011	153.44	1.272s
EU-152	1376.53	344.29	407.	21.	0.012	138.92	1.275s
HF-181	1382.70	345.83	485.	-23.	-0.013	136.73	1.276s
PB-214	1407.11	351.93	36.	161.	0.089	9.50	1.282D
BA-133	1423.37	356.00	267.	-17.	-0.010	135.69	1.285s
I-131	1457.31	364.48	44.	6.	0.003	220.27	1.293s
BA-133	1534.73	383.84	148.	-18.	-0.010	100.23	1.310s
Cf-249	1551.17	387.95	120.	13.	0.007	125.55	1.314s
SN-113	1566.12	391.69	148.	-18.	-0.010	99.72	1.317s
SB-125	1710.86	427.88	35.	13.	0.007	94.67	1.349s
AG-108M	1735.10	433.94	43.	-8.	-0.005	164.92	1.354s
PM-146	1814.87	453.88	43.	-2.	-0.001	621.81	1.372s
SB-125	1852.82	463.37	96.	-10.	-0.006	142.13	1.380s
Ir-192	1871.59	468.06	55.	12.	0.007	93.62	1.384s
BE-7	1909.73	477.60	89.	14.	0.008	101.29	1.392s
HF-181	1927.34	482.00	103.	2.	0.001	730.48	1.396s
La-140	1947.43	487.02	89.	8.	0.004	174.18	1.400
RU-103	1987.56	497.05	56.	-18.	-0.010	89.93	1.409s
RH-106	2046.81	511.86	91.	33.	0.019	43.83	2.672s
Kr-85	2055.27	513.98	124.	9.	0.005	188.64	1.424s
Nd-147	2123.35	531.00	22.	5.	0.003	183.34	1.438s
Ba-140	2148.39	537.26	31.	1.	0.001	905.05	1.444s
CS-134	2252.30	563.24	66.	-20.	-0.011	23.00	1.466s
CS-134	2276.64	569.32	73.	0.	0.000	678.23	1.471D
PA-234	2277.24	569.47	92.	6.	0.003	84.54	1.471A
BI-207	2278.16	569.70	101.	0.	0.000	1000.00	1.471s
TL-208	2332.33	583.24	11.	120.	0.067	10.45	1.266
SB-125	2401.36	600.50	114.	5.	0.003	287.97	1.497s
SB-124	2410.29	602.73	55.	-2.	-0.001	640.20	1.499s
BI-214	2435.99	609.16	25.	126.	0.070	11.96	1.202
RU-103	2440.56	610.30	270.	4.	0.002	636.30	1.505s
AG-108M	2456.49	614.28	274.	0.	0.000	1000.00	1.508s
PM-144	2471.62	618.06	274.	0.	0.000	1000.00	1.512s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	2487.04	621.92	279.	-18.	-0.010	85.93	1.515s
SB-125	2542.94	635.89	34.	5.	0.003	170.88	1.526s
I-131	2547.28	636.97	48.	-10.	-0.006	148.36	1.527s
AG-110M	2630.43	657.76	36.	2.	0.001	551.10	1.544s
CS-137	2646.03	661.66	17.	8.	0.004	84.33	1.548
PM-144	2785.58	696.54	30.	11.	0.006	76.84	1.576s
NB-94	2809.93	702.63	72.	-15.	-0.008	86.36	1.581
SB-124	2890.57	722.79	65.	13.	0.007	93.24	1.598s
AG-108M	2891.17	722.94	78.	0.	0.000	1000.00	1.598s
EU-154	2892.86	723.36	76.	2.	0.001	495.58	1.598s
ZR-95	2896.22	724.20	64.	7.	0.004	174.50	1.599s
BI-212	2908.11	727.17	112.	-19.	-0.011	80.88	1.601s
PM-146	2942.31	735.72	24.	2.	0.001	428.21	1.608s
PM-146	2988.08	747.16	28.	0.	0.000	1000.00	1.617
ZR-95	3026.36	756.73	25.	10.	0.006	114.38	1.625s
AG-110M	3055.23	763.94	65.	-20.	-0.011	60.00	1.631s
NB-95	3062.61	765.79	109.	-6.	-0.003	240.75	1.632s
PA-234M	3065.10	766.41	73.	15.	0.008	84.66	1.633s
EU-152	3115.14	778.92	40.	-11.	-0.006	129.95	1.643s
BI-212	3141.15	785.42	49.	11.	0.006	93.59	1.648s
CS-134	3182.96	795.87	36.	12.	0.006	79.35	1.656s
TL-210	3197.88	799.60	42.	11.	0.006	84.67	1.659s
CS-134	3207.29	801.95	59.	0.	0.000	1000.00	1.661
CO-58	3242.59	810.78	49.	-2.	-0.001	462.69	1.668s
La-140	3262.58	815.77	51.	0.	0.000	1000.00	1.672
Cs-136	3273.50	818.50	62.	-10.	-0.005	117.79	1.674s
Co-56	3386.61	846.77	15.	10.	0.005	93.52	1.696
TL-208	3441.80	860.56	30.	7.	0.004	176.13	1.707s
NB-94	3483.94	871.10	10.	7.	0.004	78.42	1.715
EU-154	3492.47	873.23	26.	-4.	-0.002	202.26	1.717s
PA-234	3521.68	880.53	56.	-10.	-0.005	112.59	1.722
PA-234	3532.53	883.24	52.	7.	0.004	148.71	1.724s
AG-110M	3538.30	884.68	45.	0.	0.000	1000.00	1.725
Y-88	3591.74	898.04	21.	-2.	-0.001	520.69	1.736s
AC-228	3643.89	911.07	6.	98.	0.055	11.48	1.730
AG-110M	3749.60	937.49	35.	-15.	-0.008	90.47	1.766s
PA-234	3783.72	946.02	15.	6.	0.003	147.67	1.772s
EU-152	3856.11	964.11	97.	-5.	-0.003	291.50	1.786s
AC-228	3875.56	968.97	48.	14.	0.008	75.44	1.790
EU-154	3985.03	996.33	32.	5.	0.003	166.13	1.810s
Co-56	4151.13	1037.84	38.	-9.	-0.005	131.81	1.841s
Cs-136	4192.07	1048.07	7.	16.	0.009	33.35	1.848s
BI-207	4254.46	1063.66	22.	-4.	-0.002	281.11	1.860s
Ga-68	4309.44	1077.40	27.	-8.	-0.004	157.30	1.870s
FE-59	4396.88	1099.25	32.	-3.	-0.002	432.48	1.886s
EU-152	4448.20	1112.07	36.	11.	0.006	79.85	1.895s
ZN-65	4462.09	1115.55	47.	11.	0.006	90.05	1.897s
BI-214	4481.06	1120.29	60.	8.	0.005	140.02	1.901s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Sc-46	4482.12	1120.55	67.	10.	0.005	123.76	1.901s
Ta-182	4485.12	1121.30	67.	9.	0.005	128.02	1.901
CO-60	4692.96	1173.24	21.	4.	0.002	291.05	1.938s
Ta-182	4756.25	1189.05	17.	9.	0.005	112.49	1.949
Ta-182	4885.75	1221.41	45.	-3.	-0.002	476.86	1.972
Co-56	4953.27	1238.28	52.	4.	0.002	425.79	1.984s
NA-22	5098.35	1274.53	17.	0.	0.000	1000.00	2.008s
EU-154	5098.39	1274.54	17.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	6.	4.	0.002	137.50	2.020s
TL-210	5252.32	1313.00	11.	5.	0.003	175.40	2.034s
CO-60	5330.37	1332.50	17.	-3.	-0.002	327.45	2.047s
AG-110M	5537.69	1384.30	17.	-6.	-0.003	166.25	2.082s
EU-152	5632.56	1408.00	6.	7.	0.004	85.00	2.097s
K-40	5844.21	1460.88	6.	327.	0.182	5.64	2.186
La-140	6385.95	1596.21	25.	-16.	-0.009	118.15	2.215s
SB-124	6765.35	1690.98	6.	1.	0.000	945.38	2.272s
BI-214	7059.65	1764.49	4.	28.	0.015	21.94	2.314
Co-56	7087.11	1771.35	32.	0.	0.000	1000.00	2.318s
Y-88	7346.20	1836.06	6.	1.	0.000	945.38	2.354s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	3.1419E+00				5.31E+01	
			477.60	3.142E+00	?(	1.073E+01 1.01E+02 1.05E+01	G
K-40	N	1.7455E+02				4.66E+11	
			1460.83	1.745E+02	(P	7.638E+00 5.64E+00 1.07E+01	G
Sc-46	F	2.1079E-01				8.38E+01	
			889.28	-2.564E-02	%(	1.320E+00 1.44E+03 1.00E+02	G
			1120.55	4.472E-01	?(	1.886E+00 1.24E+02 1.00E+02	G
CR-51	F	-3.5638E+00				2.77E+01	
			320.08	-3.564E+00	?(	1.082E+01 9.08E+01 9.94E+00	G
MN-54	C	-1.6063E-02				3.12E+02	
			834.85	-1.606E-02	%(P	9.601E-01 2.39E+03 1.00E+02	G
FE-59	F	8.7708E-02				4.45E+01	
			1099.25	-2.409E-01	?(	2.335E+00 4.32E+02 5.65E+01	G
			1291.60	5.175E-01	?(	1.648E+00 1.37E+02 4.32E+01	G

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Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Co-56	C 3.3719E-01				7.73E+01		
		846.77	3.617E-01	?(P	7.790E-01	9.35E+01	9.99E+01 G
		1238.28	3.002E-01	&(P	2.742E+00	4.26E+02	6.61E+01 G
		1037.84	-2.639E+00	+ P	9.601E+00	1.32E+02	1.41E+01 G
		1771.35	0.000E+00	-	1.253E+01	1.00E+03	1.55E+01 A
CO-57	C -3.1538E-01				2.72E+02		
		122.06	-3.154E-01	?(	7.976E-01	7.62E+01	8.56E+01 G
		136.47	0.000E+00	+	1.167E+01	1.00E+03	1.07E+01 G
CO-58	C -7.8005E-02				7.09E+01		
		810.78	-7.801E-02	?(	1.274E+00	4.63E+02	9.95E+01 G
CO-60	F 8.2469E-03				1.93E+03		
		1332.50	-1.587E-01	?(	1.160E+00	3.27E+02	1.00E+02 G
		1173.24	1.754E-01	?(	1.159E+00	2.91E+02	9.99E+01 G
ZN-65	F 1.0369E+00				2.44E+02		
		1115.55	1.037E+00	?(	3.152E+00	9.00E+01	5.06E+01 G
NB-94	I -4.7720E-01				7.41E+06		
		702.63	-4.772E-01	?(	1.383E+00	8.64E+01	9.79E+01 G
		871.10	2.525E-01	+	6.701E-01	7.84E+01	9.99E+01 G
ZR-95	I 5.6664E-01				6.40E+01		
		756.73	6.238E-01	?(	1.622E+00	1.14E+02	5.45E+01 G
		724.20	4.962E-01	?(	2.983E+00	1.74E+02	4.42E+01 G
NB-95	I -2.1377E-01				6.40E+01		
		765.79	-2.138E-01	?(	1.765E+00	2.41E+02	9.98E+01 G
RU-103	I -4.8293E-01				3.93E+01		
		497.05	-4.829E-01	?(	1.030E+00	8.99E+01	9.09E+01 G
		610.30	1.843E+00	?	3.987E+01	6.36E+02	5.75E+00 GA
RH-106	I -5.1881E+00				3.74E+02		
		621.92	-5.188E+00	?(P	2.378E+01	8.59E+01	9.93E+00 G
		1050.36	-4.677E-01	%	7.055E+01	4.09E+03	1.56E+00 G
		511.86	4.251E+00	+	5.987E+00	4.38E+01	2.00E+01 GA
AG-108M	C -2.0750E-01				1.53E+05		
		433.94	-2.075E-01	?(	8.313E-01	1.65E+02	9.05E+01 G
		722.94	0.000E+00	+	1.585E+00	1.00E+03	9.08E+01 G
		614.28	0.000E+00	&	2.581E+00	1.00E+03	8.98E+01 G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-110M	F 2.8619E-02					2.50E+02	
		884.68	0.000E+00	?(	1.796E+00	1.00E+03	7.27E+01 G
		657.76	5.060E-02	?(P	9.958E-01	5.51E+02	9.46E+01 G
		937.49	-1.749E+00	+	3.530E+00	9.05E+01	3.44E+01 G
		1384.30	-1.348E+00	+	4.924E+00	1.66E+02	2.43E+01 G
		763.94	-3.140E+00	+	6.186E+00	6.00E+01	2.23E+01 G
SN-113	F -5.8034E-01					1.15E+02	
		391.69	-5.803E-01	&(	1.941E+00	9.97E+01	6.40E+01 G
SB-124	F 2.6569E-01					6.02E+01	
		602.73	-4.794E-02	?(	1.083E+00	6.40E+02	9.83E+01 G
		1690.98	8.961E-02	?(	1.941E+00	9.45E+02	4.78E+01 G
		722.79	3.895E+00	?(	1.224E+01	9.32E+01	1.08E+01 G
SB-125	I 1.0150E+00					1.01E+03	
		427.88	9.996E-01	*(	2.272E+00	9.47E+01	2.96E+01 G
		600.50	8.492E-01	?(	8.399E+00	2.88E+02	1.79E+01 G
		635.89	1.317E+00	(	7.873E+00	1.71E+02	1.13E+01 G
		463.37	-2.256E+00	+	1.091E+01	1.42E+02	1.05E+01 G
I-131	I 1.4619E-01					8.02E+00	
		364.48	1.462E-01	?(	8.192E-01	2.20E+02	8.17E+01 G
		284.30	-3.548E+00	+	1.183E+01	1.34E+02	6.14E+00 G
		636.97	-4.250E+00	+ P	1.459E+01	1.48E+02	7.17E+00 G
Gd-153	F -1.0604E+00					2.42E+02	
		97.50	-1.060E+00	&(	5.949E+00	1.69E+02	3.00E+01 G
		103.20	-1.449E+00	+	8.276E+00	1.72E+02	2.18E+01 G
Ga-68	C -1.2106E+01					4.71E-02	
		1077.40	-1.211E+01	?(	4.228E+01	1.57E+02	3.30E+00 G
BA-133	F -5.4608E-01					3.85E+03	
		356.00	-5.461E-01	?(	2.489E+00	1.36E+02	6.20E+01 G
		302.85	1.959E-01	%	9.706E+00	1.47E+03	1.83E+01 G
		383.84	-4.074E+00	+	1.370E+01	1.00E+02	8.94E+00 GA
		80.99	-1.027E+00	&	5.075E+00	1.48E+02	3.41E+01 GA
CS-134	I 4.7539E-01					7.54E+02	
		795.87	4.754E-01	?(	1.266E+00	7.93E+01	8.55E+01 G
		604.71	3.430E-02	%	2.343E+00	2.00E+03	9.76E+01 G
		569.32	0.000E+00	}	7.589E+00	6.78E+02	1.54E+01 G
		801.95	0.000E+00	-	1.573E+01	1.00E+03	8.69E+00 G
		563.24	-6.384E+00	+ P	1.322E+01	2.30E+01	8.35E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-137	I	2.7379E-01					1.10E+04	
			661.66	2.738E-01	&(P	7.832E-01	8.43E+01	8.52E+01 G
CE-139	F	-2.3829E-02					1.38E+02	
			165.85	-2.383E-02	%(	1.026E+00	1.26E+03	7.99E+01 G
Ba-140	I	8.5310E-01					1.28E+01	
			537.26	1.351E-01	?(P	3.079E+00	9.05E+02	2.44E+01 G
			162.66	3.668E+00	&(	1.183E+01	9.63E+01	6.22E+00 G
			304.85	0.000E+00	-	4.175E+01	1.00E+03	4.29E+00 G
La-140	I	-1.0036E+00					1.28E+01	
			1596.21	-1.004E+00	?(P	1.659E+00	1.18E+02	9.54E+01 G
			487.02	4.215E-01	&	2.514E+00	1.74E+02	4.55E+01 G
			328.76	-2.039E+00	&	9.889E+00	1.45E+02	2.03E+01 G
			815.77	0.000E+00	+	5.579E+00	1.00E+03	2.33E+01 G
CE-141	I	-6.5332E-01					3.25E+01	
			145.44	-6.533E-01	@(	3.086E+00	1.42E+02	4.82E+01 G
CE-144	I	2.1573E+00					2.85E+02	
			133.54	2.157E+00	&(	1.094E+01	1.52E+02	1.11E+01 G
PM-144	C	3.5329E-01					3.63E+02	
			696.54	3.533E-01	?(	9.099E-01	7.68E+01	9.90E+01 G
			618.06	0.000E+00	-	2.350E+00	1.00E+03	9.91E+01 G
EU-152	F	1.3341E+00					4.94E+03	
			121.78	-1.221E-02	&(	2.522E+00	6.02E+03	2.86E+01 G
			344.29	1.501E+00	?(	6.978E+00	1.39E+02	2.65E+01 G
			1112.07	3.831E+00	?(	1.027E+01	7.99E+01	1.36E+01 G
			778.92	-2.952E+00	&	8.637E+00	1.30E+02	1.29E+01 G
			964.11	-1.355E+00	+	1.361E+01	2.91E+02	1.46E+01 G
			244.69	-4.833E+00	+ P	2.525E+01	8.81E+01	7.58E+00 G
			1408.00	1.921E+00	?	3.635E+00	8.50E+01	2.10E+01 GA
EU-154	I	7.3511E-01					3.14E+03	
			123.10	5.745E-01	?(	1.687E+00	8.80E+01	4.08E+01 G
			1274.54	0.000E+00	-	3.180E+00	1.00E+03	3.52E+01 G
			723.36	4.059E-01	?(	7.014E+00	4.96E+02	2.02E+01 G
			873.23	-1.133E+00	+	8.132E+00	2.02E+02	1.23E+01 G
			1004.77	3.913E-02	%	5.748E+00	6.38E+03	1.80E+01 G
			996.33	1.981E+00	?(	1.152E+01	1.66E+02	1.06E+01 G
EU-155	I	-1.2355E+00					1.81E+03	
			105.31	-1.235E+00	?(P	8.676E+00	9.96E+01	2.12E+01 G
			86.54	-1.073E+00	&	6.164E+00	1.73E+02	3.07E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HF-181	F	2.3609E-01					4.24E+01	
			482.00	5.960E-02	?(	1.510E+00	7.30E+02	8.05E+01 G
			133.02	5.642E-01	?(	2.743E+00	1.45E+02	4.33E+01 G
			345.83	-2.935E+00	+	1.342E+01	1.37E+02	1.51E+01 G
			136.30	0.000E+00	&	2.129E+01	1.00E+03	5.85E+00 G
Ta-182	F	1.6942E+00					1.14E+02	
			1121.30	1.235E+00	(	5.396E+00	1.28E+02	3.49E+01 G
			1221.41	-6.091E-01	-	6.228E+00	4.77E+02	2.70E+01 G
			1189.05	2.683E+00	(	6.535E+00	1.12E+02	1.62E+01 G
Hg-203	F	4.0639E-02					4.66E+01	
			279.20	4.064E-02	?(	9.828E-01	6.96E+02	8.15E+01 G
TL-208	N	3.9809E+00					6.98E+02	
			583.02	3.981E+00	(P	5.908E-01	1.04E+01	8.45E+01 G
			277.28	7.833E-01	-	1.145E+01	4.20E+02	6.31E+00 G
			860.56	2.113E+00	-	8.521E+00	1.76E+02	1.24E+01 G
PM-146	C	2.6735E-02					2.02E+03	
			453.88	-8.817E-02	?(P	1.197E+00	6.22E+02	6.50E+01 G
			747.16	0.000E+00	+	2.708E+00	1.00E+03	3.40E+01 G
			735.72	3.587E-01	?(P	3.744E+00	4.28E+02	2.25E+01 G
Y-88	F	4.6211E-02					1.07E+02	
			1836.06	4.621E-02	?(	1.001E+00	9.45E+02	9.92E+01 G
			898.04	-7.332E-02	& P	9.902E-01	5.21E+02	9.37E+01 G
Cd-113m		1.3711E+03					5.33E+03	
			263.70	1.371E+03	?(	1.113E+04	2.35E+02	6.00E-03 K
Cf-251	T	5.9870E-01					3.28E+05	
			176.60	5.987E-01	*(	3.764E+00	2.42E+02	1.70E+01 G
			227.00	-9.142E-01	+	1.169E+01	5.11E+02	6.30E+00 GA
Cf-249	T	3.9844E-01					1.28E+05	
			387.95	3.984E-01	?(	1.692E+00	1.26E+02	6.60E+01 G
			333.44	-2.705E+00	+	1.279E+01	1.41E+02	1.55E+01 G
Sn-126		3.4103E+00					3.65E+07	
			87.57	9.490E-01	}	4.774E+00	5.71E+01	3.75E+01 GA
			64.28	3.410E+00	(	1.322E+01	1.16E+02	9.70E+00 G
			86.94	0.000E+00	}	2.023E+01	1.86E+03	9.04E+00 GA
PB-210	N	9.3105E+00					8.14E+03	
			46.54	9.311E+00	(	2.935E+01	9.41E+01	4.25E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PB-212   N   1.1338E+01                                      6.98E+02
                         238.63 1.134E+01  (P 1.347E+00 6.46E+00 4.33E+01 G
                         300.03 8.816E+00 -   5.247E+01 1.77E+02 3.28E+00 GA

PB-214   N   8.4794E+00                                      5.84E+05
                         351.93 8.317E+00  (P 1.577E+00 9.50E+00 3.76E+01 G
                         295.09 8.796E+00  (P 2.670E+00 1.32E+01 1.93E+01 G
                         242.00 1.174E+01 +   8.143E+00 2.36E+01 7.43E+00 GA

BI-207   C  -2.4081E-01                                      1.18E+04
                        1063.66-2.408E-01 ?(P 1.460E+00 2.81E+02 7.45E+01 G
                         569.70 0.000E+00 &   1.392E+00 1.00E+03 9.77E+01 G

BI-212   N  -8.4192E+00                                      6.98E+02
                         727.17-8.419E+00 @(  2.271E+01 8.09E+01 7.55E+00 G
                         785.42 3.039E+01 ? P 9.615E+01 9.36E+01 1.28E+00 GA

BI-214   N   7.8735E+00                                      5.84E+05
                         609.31 7.874E+00  (P 1.637E+00 1.20E+01 4.61E+01 G
                        1120.29 2.476E+00 - P 1.185E+01 1.40E+02 1.51E+01 G
                        1764.49 1.193E+01 + P 5.390E+00 2.19E+01 1.54E+01 G

BI-210M  T   4.5465E-01                                      1.10E+09
                         265.83 4.546E-01 ?(P 1.485E+00 9.71E+01 5.00E+01 G
                         304.90 0.000E+00 -   6.398E+00 1.00E+03 2.80E+01 G

AC-228   N   1.3261E+01                                      2.10E+03
                         911.07 1.326E+01  (P 1.886E+00 1.15E+01 2.90E+01 G
                         968.97 3.276E+00 -   8.250E+00 7.54E+01 1.75E+01 G
                         338.32-3.541E+00 &   1.609E+01 1.36E+02 1.20E+01 G
                          93.35 1.948E+01 + P 1.039E+01 2.47E+01 5.56E+00 XA

TH-227   N   8.9235E-01                                      7.95E+03
                         256.24 8.923E-01 ?(  1.100E+01 4.92E+02 7.00E+00 G
                         235.97-2.599E+00 +   1.493E+01 1.72E+02 1.23E+01 G
                          50.14-5.000E+00 &   1.773E+01 1.06E+02 8.00E+00 G

TH-229   N  -7.3646E+00                                      2.68E+06
                         193.51-7.365E+00 ?(  1.816E+01 1.01E+02 4.40E+00 G
                         210.85 6.879E+00 +   2.504E+01 1.48E+02 2.99E+00 G

TH-234   N  -5.9370E+00                                      1.63E+12
                          92.59-5.937E+00  (P 3.211E+01 4.91E+01 5.58E+00 G
                          63.29-1.007E+01 +   3.474E+01 1.03E+02 3.81E+00 G
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-231	N	3.0996E+00					1.20E+07	
			302.65	0.000E+00	?(	6.189E+01	1.00E+03	2.88E+00 G
			300.07	6.728E+00	?(	7.129E+01	3.15E+02	2.46E+00 G
PA-233	C	-2.1962E-02					7.82E+08	
			312.01	-2.196E-02	&(P	5.058E+00	2.95E+03	3.60E+01 G
			300.18	4.281E-06	%	2.859E+01	1.97E+08	6.20E+00 G
PA-234	N	1.8467E+00					1.63E+12	
			131.29	1.350E+00	?(	6.436E+00	1.43E+02	1.80E+01 G
			946.02	1.806E+00	?(	6.249E+00	1.48E+02	1.34E+01 G
			569.47	1.847E+00	}	1.590E+01	8.45E+01	8.20E+00 G
			883.24	2.835E+00	?(	1.452E+01	1.49E+02	9.60E+00 G
			880.53	-6.222E+00	+	2.386E+01	1.13E+02	6.00E+00 GA
PA-234M	N	4.2928E+01					1.63E+12	
			1001.00	-3.548E+00	&(P	1.437E+02	1.60E+03	8.37E-01 G
			766.41	1.752E+02	?(	4.972E+02	8.47E+01	2.94E-01 G
AM-241	T	6.3446E-01					1.58E+05	
			59.54	6.345E-01	&(	3.875E+00	1.82E+02	3.59E+01 G
Ir-192	F	4.2078E-01					7.40E+01	
			316.49	3.488E-01	&(	1.777E+00	1.52E+02	8.70E+01 G
			468.06	5.419E-01	?(	1.713E+00	9.36E+01	5.18E+01 G
			308.44	0.000E+00	&	5.687E+00	1.00E+03	3.18E+01 G
Cs-136	F	1.9952E-01					1.30E+01	
			818.50	-3.547E-01	?(	1.423E+00	1.18E+02	1.00E+02 G
			1048.07	8.923E-01	?(	8.053E-01	3.33E+01	8.00E+01 G
			340.57	-8.251E-01	+	4.238E+00	1.53E+02	4.69E+01 G
Np-239	T	1.2951E+00					2.36E+00	
			103.70	-1.316E+00	+	7.596E+00	1.73E+02	2.40E+01 X
			106.13	1.295E+00	&(	7.656E+00	1.77E+02	2.27E+01 G
			99.50	-2.114E+00	&	1.198E+01	1.70E+02	1.50E+01 X
Nd-147		1.0699E+00					1.11E+01	
			531.00	1.070E+00	(	4.895E+00	1.83E+02	1.30E+01 G
			91.10	-1.143E+00	+	6.297E+00	1.65E+02	2.83E+01 G
TL-210	N	4.1110E-01					5.84E+05	
			799.60	4.111E-01	?(	1.172E+00	8.47E+01	9.90E+01 G
			296.00	3.870E-02	%	2.218E+00	1.69E+03	7.90E+01 G
			1313.00	1.162E+00	?	4.580E+00	1.75E+02	2.10E+01 GA

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	I 5.0375E+01					3.92E+03	
		513.98	5.037E+01	?(	3.239E+02	1.89E+02	4.30E-01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
PB-210	46.54	140.	18.	0.010	94.12	9.311E+00	
TH-227	50.14	234.	-21.	-0.012	105.97	-5.000E+00	
TH-234	63.29	379.	-27.	-0.015	103.48	-1.007E+01	
BA-133	80.99	1003.	-30.	-0.017	148.41	-1.027E+00	
EU-155	86.54	1299.	-30.	-0.017	172.56	-1.073E+00	
Nd-147	91.10	1203.	-30.	-0.017	165.50	-1.143E+00	
TH-234	92.59	1234.	-31.	-0.017	49.12	-5.937E+00	P
Gd-153	97.50	1263.	-30.	-0.017	168.51	-1.060E+00	
Np-239	99.50	1293.	-30.	-0.017	170.16	-2.114E+00	
Gd-153	103.20	1323.	-30.	-0.017	171.57	-1.449E+00	
Np-239	103.70	1353.	-30.	-0.017	173.41	-1.316E+00	
EU-155	105.31	1384.	-25.	-0.014	99.55	-1.235E+00	P

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Np-239	106.13	1235.	28.	0.016	177.49	1.295E+00	
CO-57	122.06	180.	-26.	-0.014	76.15	-3.154E-01	
HF-181	133.02	541.	23.	0.013	145.47	5.642E-01	
CE-144	133.54	564.	22.	0.012	151.74	2.157E+00	
CE-141	145.44	796.	-28.	-0.016	141.71	-6.533E-01	
Ba-140	162.66	162.	19.	0.011	96.33	3.668E+00	
U-235	163.38	183.	-23.	-0.013	86.37	-5.334E+00	
Cf-251	176.60	114.	8.	0.005	241.84	5.987E-01	
U-235	185.72	121.	43.	0.024	50.23	1.005E+00	
TH-229	193.51	160.	-25.	-0.014	101.05	-7.365E+00	
U-235	205.33	113.	-4.	-0.002	636.88	-1.056E+00	P
TH-229	210.85	124.	15.	0.008	147.62	6.879E+00	
Cf-251	227.00	108.	-4.	-0.002	511.13	-9.142E-01	
TH-227	235.97	681.	-22.	-0.012	171.90	-2.599E+00	
EU-152	244.69	705.	-24.	-0.013	88.06	-4.833E+00	P
TH-227	256.24	100.	4.	0.002	492.02	8.923E-01	
Cd-113m	263.70	71.	5.	0.003	234.53	1.371E+03	
BI-210M	265.83	88.	14.	0.008	97.08	4.546E-01	P
Hg-203	279.20	96.	2.	0.001	696.42	4.064E-02	
I-131	284.30	76.	-13.	-0.007	134.19	-3.548E+00	
PA-231	300.07	443.	10.	0.005	314.57	6.728E+00	
Ir-192	316.49	318.	17.	0.009	151.72	3.488E-01	
CR-51	320.08	147.	-19.	-0.011	90.82	-3.564E+00	
La-140	328.76	514.	-22.	-0.012	145.03	-2.039E+00	
Cf-249	333.44	492.	-22.	-0.012	141.43	-2.705E+00	
Cs-136	340.57	479.	-20.	-0.011	153.44	-8.251E-01	
EU-152	344.29	407.	21.	0.012	138.92	1.501E+00	
HF-181	345.83	485.	-23.	-0.013	136.73	-2.935E+00	
BA-133	356.00	267.	-17.	-0.010	135.69	-5.461E-01	
I-131	364.48	44.	6.	0.003	220.27	1.462E-01	
BA-133	383.84	148.	-18.	-0.010	100.23	-4.074E+00	
Cf-249	387.95	120.	13.	0.007	125.55	3.984E-01	
SN-113	391.69	148.	-18.	-0.010	99.72	-5.803E-01	
SB-125	427.88	35.	13.	0.007	94.67	9.996E-01	
AG-108M	433.94	43.	-8.	-0.005	164.92	-2.075E-01	
PM-146	453.88	43.	-2.	-0.001	621.81	-8.817E-02	P
SB-125	463.37	96.	-10.	-0.006	142.13	-2.256E+00	
Ir-192	468.06	55.	12.	0.007	93.62	5.419E-01	
BE-7	477.60	89.	14.	0.008	101.29	3.142E+00	
HF-181	482.00	103.	2.	0.001	730.48	5.960E-02	
La-140	487.02	89.	8.	0.004	174.18	4.215E-01	
RU-103	497.05	56.	-18.	-0.010	89.93	-4.829E-01	
RH-106	511.86	91.	33.	0.019	43.83	4.251E+00	
Kr-85	513.98	124.	9.	0.005	188.64	5.037E+01	
Nd-147	531.00	22.	5.	0.003	183.34	1.070E+00	
Ba-140	537.26	31.	1.	0.001	905.05	1.351E-01	P
SB-125	600.50	114.	5.	0.003	287.97	8.492E-01	
SB-124	602.73	55.	-2.	-0.001	640.20	-4.794E-02	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
RU-103	610.30	270.	4.	0.002	636.30	1.843E+00		
RH-106	621.92	279.	-18.	-0.010	85.93	-5.188E+00		P
SB-125	635.89	34.	5.	0.003	170.88	1.317E+00		
I-131	636.97	48.	-10.	-0.006	148.36	-4.250E+00		P
AG-110M	657.76	36.	2.	0.001	551.10	5.060E-02		P
CS-137	661.66	17.	8.	0.004	84.33	2.738E-01		P
PM-144	696.54	30.	11.	0.006	76.84	3.533E-01		
NB-94	702.63	72.	-15.	-0.008	86.36	-4.772E-01		
SB-124	722.79	65.	13.	0.007	93.24	3.895E+00		
ZR-95	724.20	64.	7.	0.004	174.50	4.962E-01		
BI-212	727.17	112.	-19.	-0.011	80.88	-8.419E+00		
PM-146	735.72	24.	2.	0.001	428.21	3.587E-01		P
ZR-95	756.73	25.	10.	0.006	114.38	6.238E-01		
AG-110M	763.94	65.	-20.	-0.011	60.00	-3.140E+00		
NB-95	765.79	109.	-6.	-0.003	240.75	-2.138E-01		
PA-234M	766.41	73.	15.	0.008	84.66	1.752E+02		
EU-152	778.92	40.	-11.	-0.006	129.95	-2.952E+00		
BI-212	785.42	49.	11.	0.006	93.59	3.039E+01		P
TL-210	799.60	42.	11.	0.006	84.67	4.111E-01		
CO-58	810.78	49.	-2.	-0.001	462.69	-7.801E-02		
Cs-136	818.50	62.	-10.	-0.005	117.79	-3.547E-01		
Co-56	846.77	15.	10.	0.005	93.52	3.617E-01		P
NB-94	871.10	10.	7.	0.004	78.42	2.525E-01		
Y-88	898.04	21.	-2.	-0.001	520.69	-7.332E-02		P
AG-110M	937.49	35.	-15.	-0.008	90.47	-1.749E+00		
EU-152	964.11	97.	-5.	-0.003	291.50	-1.355E+00		
Co-56	1037.84	38.	-9.	-0.005	131.81	-2.639E+00		P
Cs-136	1048.07	7.	16.	0.009	33.35	8.923E-01		
BI-207	1063.66	22.	-4.	-0.002	281.11	-2.408E-01		P
Ga-68	1077.40	27.	-8.	-0.004	157.30	-1.211E+01		
FE-59	1099.25	32.	-3.	-0.002	432.48	-2.409E-01		
EU-152	1112.07	36.	11.	0.006	79.85	3.831E+00		
ZN-65	1115.55	47.	11.	0.006	90.05	1.037E+00		
Sc-46	1120.55	67.	10.	0.005	123.76	4.472E-01		
CO-60	1173.24	21.	4.	0.002	291.05	1.754E-01		
Co-56	1238.28	52.	4.	0.002	425.79	3.002E-01		P
FE-59	1291.60	6.	4.	0.002	137.50	5.175E-01		
TL-210	1313.00	11.	5.	0.003	175.40	1.162E+00		
CO-60	1332.50	17.	-3.	-0.002	327.45	-1.587E-01		
AG-110M	1384.30	17.	-6.	-0.003	166.25	-1.348E+00		
EU-152	1408.00	6.	7.	0.004	85.00	1.921E+00		
La-140	1596.21	25.	-16.	-0.009	118.15	-1.004E+00		P
SB-124	1690.98	6.	1.	0.000	945.38	8.961E-02		
Y-88	1836.06	6.	1.	0.000	945.38	4.621E-02		

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	3.1419E+00	3.1419E+00	1.013E+02%	1.07E+01
NA-22	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.12E+00
K-40		1.7455E+02	1.7455E+02	5.639E+00%	7.64E+00
Sc-46	#A	2.1079E-01	2.1079E-01	1.238E+02%	1.32E+00
CR-51	#A	-3.5638E+00	-3.5638E+00	9.082E+01%	1.08E+01
MN-54	#A	-1.6063E-02	-1.6063E-02	2.389E+03%	9.60E-01
FE-59	#A	8.7707E-02	8.7708E-02	1.375E+02%	2.33E+00
Co-56	#A	3.3719E-01	3.3719E-01	9.352E+01%	7.79E-01
CO-57	#A	-3.1538E-01	-3.1538E-01	7.615E+01%	7.98E-01
CO-58	#A	-7.8005E-02	-7.8005E-02	4.627E+02%	1.27E+00
CO-60	#A	8.2469E-03	8.2469E-03	2.191E+02%	1.16E+00
ZN-65	#A	1.0369E+00	1.0369E+00	9.005E+01%	3.15E+00
NB-94	#A	-4.7720E-01	-4.7720E-01	8.636E+01%	1.38E+00
ZR-95	#A	5.6664E-01	5.6664E-01	1.043E+02%	1.62E+00
NB-95	#A	-2.1377E-01	-2.1377E-01	2.408E+02%	1.77E+00
RU-103	#A	-4.8293E-01	-4.8293E-01	8.993E+01%	1.03E+00
RH-106	#A	-5.1881E+00	-5.1881E+00	8.593E+01%	2.38E+01
AG-108M	#A	-2.0750E-01	-2.0750E-01	1.649E+02%	8.31E-01
AG-110M	#A	2.8619E-02	2.8619E-02	5.511E+02%	1.80E+00
SN-113	#A	-5.8034E-01	-5.8034E-01	9.972E+01%	1.94E+00
SB-124	#A	2.6569E-01	2.6569E-01	9.324E+01%	1.08E+00
SB-125	#A	1.0150E+00	1.0150E+00	9.467E+01%	2.27E+00
I-131	#A	1.4619E-01	1.4619E-01	2.203E+02%	8.19E-01
Gd-153	#A	-1.0604E+00	-1.0604E+00	1.685E+02%	5.95E+00
Ga-68	#A	-1.2052E+01	-1.2106E+01	1.573E+02%	4.23E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.45E+00
BA-133	#A	-5.4608E-01	-5.4608E-01	1.357E+02%	2.49E+00
CS-134	#A	4.7539E-01	4.7539E-01	7.935E+01%	1.27E+00
CS-137	#A	2.7379E-01	2.7379E-01	8.433E+01%	7.83E-01
CE-139	#A	-2.3829E-02	-2.3829E-02	1.258E+03%	1.03E+00
Ba-140	#A	8.5309E-01	8.5310E-01	9.633E+01%	3.08E+00
La-140	#A	-1.0036E+00	-1.0036E+00	1.182E+02%	1.66E+00
CE-141	#A	-6.5332E-01	-6.5332E-01	1.417E+02%	3.09E+00
CE-144	#A	2.1573E+00	2.1573E+00	1.517E+02%	1.09E+01
PM-144	#A	3.5329E-01	3.5329E-01	7.684E+01%	9.10E-01
EU-152	#A	1.3341E+00	1.3341E+00	7.985E+01%	2.52E+00
EU-154	#A	7.3511E-01	7.3511E-01	8.802E+01%	1.69E+00
EU-155	#A	-1.2355E+00	-1.2355E+00	9.955E+01%	8.68E+00
HF-181	#A	2.3609E-01	2.3609E-01	1.455E+02%	1.51E+00
Ta-182	A	1.6942E+00	1.6942E+00	8.521E+01%	5.40E+00
Hg-203	#A	4.0639E-02	4.0639E-02	6.964E+02%	9.83E-01
TL-208		3.9809E+00	3.9809E+00	1.045E+01%	5.91E-01
PM-146	#A	2.6735E-02	2.6735E-02	3.775E+02%	1.20E+00

Y-88 #A	4.6211E-02	4.6211E-02	9.454E+02%		1.00E+00
Cd-113m#A	1.3711E+03	1.3711E+03	2.345E+02%		1.11E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		4.74E+01
Cf-251 #A	5.9870E-01	5.9870E-01	2.418E+02%		3.76E+00
Cf-249 #A	3.9844E-01	3.9844E-01	1.256E+02%		1.69E+00
Sn-126 A	3.4103E+00	3.4103E+00	1.160E+02%		1.32E+01
PB-210 #A	9.3105E+00	9.3105E+00	9.412E+01%		2.93E+01
PB-212	1.1338E+01	1.1338E+01	6.456E+00%		1.35E+00
PB-214	8.4794E+00	8.4794E+00	8.113E+00%		1.58E+00
BI-207 #A	-2.4081E-01	-2.4081E-01	2.811E+02%		1.46E+00
BI-212 #A	-8.4192E+00	-8.4192E+00	8.088E+01%		2.27E+01
U-235 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.16E+01
BI-214	7.8735E+00	7.8735E+00	1.196E+01%		1.64E+00
BI-210M#A	4.5465E-01	4.5465E-01	9.708E+01%		1.48E+00
AC-228	1.3261E+01	1.3261E+01	1.148E+01%		1.89E+00
TH-227 #A	8.9235E-01	8.9235E-01	4.920E+02%		1.10E+01
TH-229 #A	-7.3646E+00	-7.3646E+00	1.011E+02%		1.82E+01
TH-234 #A	-5.9370E+00	-5.9370E+00	4.912E+01%		3.21E+01
PA-231 #A	3.0996E+00	3.0996E+00	3.146E+02%		6.19E+01
PA-233 #A	-2.1962E-02	-2.1962E-02	2.946E+03%		5.06E+00
PA-234 #A	1.8467E+00	1.8467E+00	8.450E+01%		6.44E+00
PA-234M#A	4.2928E+01	4.2928E+01	8.466E+01%		1.44E+02
AM-241 #A	6.3446E-01	6.3446E-01	1.817E+02%		3.88E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.48E+01
Ir-192 #A	4.2078E-01	4.2078E-01	8.914E+01%		1.78E+00
Cs-136 #A	1.9952E-01	1.9952E-01	3.335E+01%		1.42E+00
Np-239 #A	1.2950E+00	1.2951E+00	1.775E+02%		7.66E+00
Nd-147 #A	1.0698E+00	1.0699E+00	1.833E+02%		4.89E+00
TL-210 #A	4.1110E-01	4.1110E-01	8.467E+01%		1.17E+00
Kr-85 #A	5.0375E+01	5.0375E+01	1.886E+02%		3.24E+02

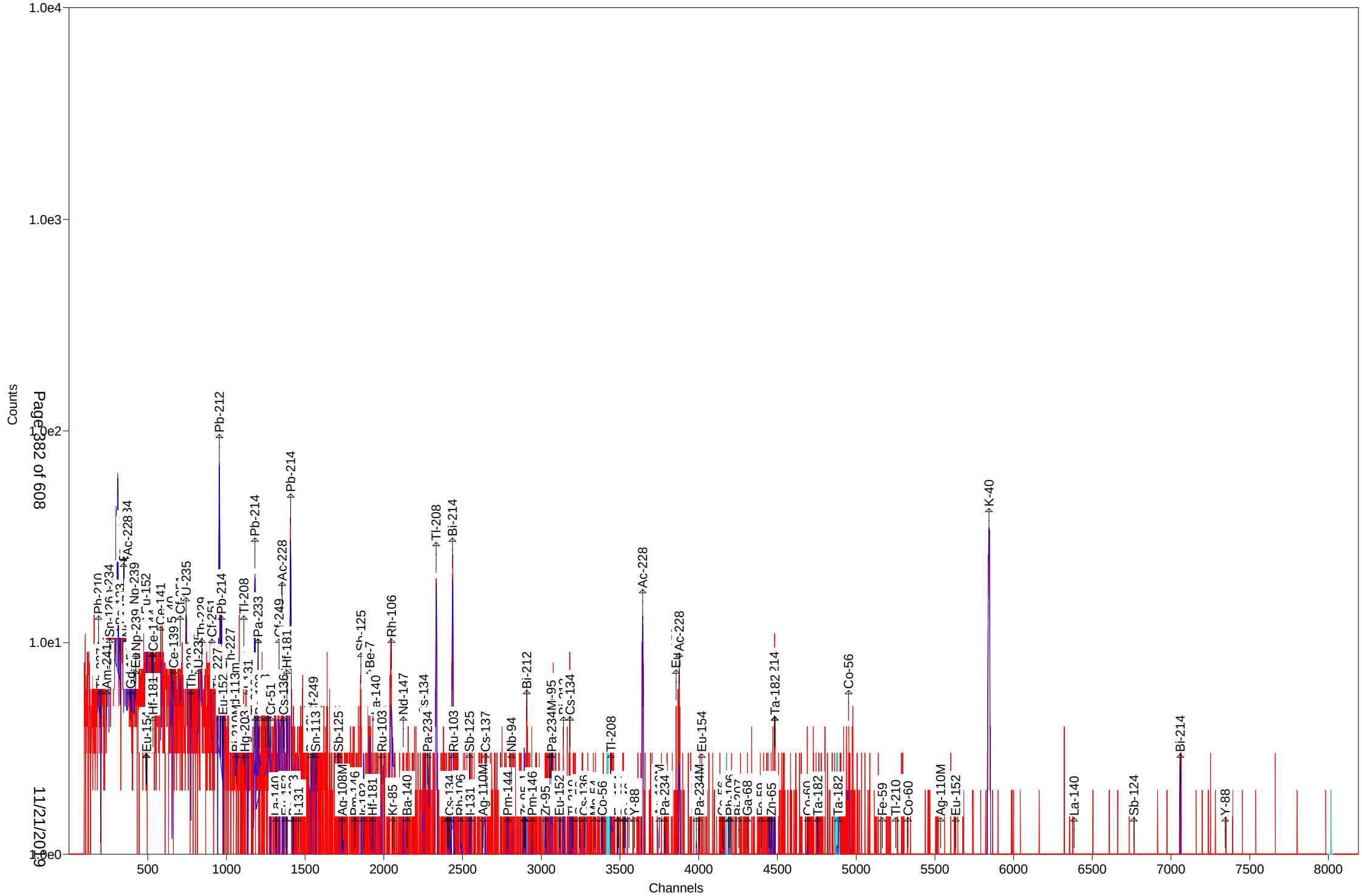
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.3 keV) 2.195E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 2.1948184E+02 Bq/Sample

(Page 21 of 21)

445369_Gamma_180-96595-A-6-B. 9_Gamma_20193116.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20192917

Sample Description: 445369_Gamma_180-96595-A-7-B
Detector: Detector #12
Batch ID: 445369
Work Order Number: Gamma
Lot Number: 180-96595-A-7-B

Decay to Time: 10/31/2019 02:49 Live Time: 1800 sec
Acquisition Time: 10/31/2019 02:50:02 Real Time: 1801 sec
Analysis Time: 10/31/2019 03:20 Dead Time: 0.07 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: Client_Long_Rev15.lib
Bkgd Correction File: 12_2019-10-06_1923.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	9.730E-01	363.6	3.538E+00	3.538E+00	1.239E+01
NA-22	2.341E-01	154.9	3.627E-01	3.629E-01	1.308E+00
K-40	1.076E+02	8.2	8.876E+00	1.041E+01	5.395E+00
Sc-46	-4.405E-01	129.0	5.683E-01	5.687E-01	1.948E+00
CR-51	-3.429E+00	221.7	7.603E+00	7.605E+00	2.555E+01
MN-54	-3.942E-01	162.2	6.394E-01	6.397E-01	1.509E+00
FE-59	-1.601E+00	85.7	1.371E+00	1.374E+00	2.976E+00
Co-56	1.033E+00	46.0	4.754E-01	4.783E-01	1.079E+00
CO-57	0.000E+00	1.#INF	2.120E-01	2.120E-01	1.029E+00
CO-58	-6.866E-01	83.2	5.715E-01	5.726E-01	1.917E+00
CO-60	1.787E-03	87.8	1.569E-03	1.571E-03	1.593E+00
ZN-65	0.000E+00	1.#INF	3.549E-01	3.549E-01	5.267E+00
NB-94	2.867E-01	92.8	2.661E-01	2.665E-01	9.338E-01
ZR-95	1.172E-01	692.8	8.122E-01	8.122E-01	2.008E+00
NB-95	0.000E+00	1.#INF	2.651E-01	2.651E-01	1.484E+00
RU-103	-3.868E-01	121.7	4.706E-01	4.710E-01	1.186E+00
RH-106	5.451E+00	143.8	7.841E+00	7.846E+00	2.649E+01
AG-108M	8.416E-01	34.9	2.934E-01	2.964E-01	6.611E-01
AG-110M	5.403E-01	37.8	2.042E-01	2.060E-01	2.082E+00
SN-113	5.720E-01	112.0	6.405E-01	6.411E-01	2.166E+00
SB-124	-9.097E-02	81.2	7.385E-02	7.400E-02	3.422E+00
SB-125	7.884E-01	64.0	5.050E-01	5.065E-01	3.253E+00
I-131	3.399E-02	1112.1	3.780E-01	3.780E-01	9.881E-01
Gd-153	-1.173E-01	1033.0	1.212E+00	1.212E+00	4.122E+00
Ga-68	-2.201E+00	914.7	2.013E+01	2.013E+01	4.699E+01
Tc-99m	-3.729E-01	165.5	6.172E-01	6.175E-01	2.064E+00
BA-133	-2.010E-01	134.6	2.705E-01	2.707E-01	3.243E+00
CS-134	1.051E+00	81.8	8.592E-01	8.609E-01	1.524E+00
CS-137	5.157E-01	84.3	4.349E-01	4.357E-01	1.468E+00
CE-139	3.086E-01	106.3	3.281E-01	3.284E-01	1.104E+00
Ba-140	1.551E+00	157.1	2.436E+00	2.438E+00	4.045E+00
La-140	4.772E-02	58.9	2.810E-02	2.821E-02	1.979E+00
CE-141	-6.683E-02	1702.9	1.138E+00	1.138E+00	3.834E+00

CE-144	-2.855E+00	157.8	4.505E+00	4.508E+00	1.507E+01
PM-144	-3.037E-01	185.9	5.646E-01	5.648E-01	1.337E+00
EU-152	8.350E-01	103.8	8.670E-01	8.680E-01	2.914E+00
EU-154	1.164E+00	65.1	7.584E-01	7.608E-01	2.033E+00
EU-155	-1.391E+00	102.0	1.419E+00	1.421E+00	4.752E+00
HF-181	0.000E+00	1.#INF	8.536E-02	8.536E-02	1.669E+00
Ta-182	1.573E+00	134.1	2.109E+00	2.111E+00	7.217E+00
Hg-203	3.152E-01	93.2	2.938E-01	2.943E-01	9.930E-01
TL-208	4.857E+00	12.3	5.953E-01	6.445E-01	9.243E-01
PM-146	3.754E-01	146.4	5.496E-01	5.499E-01	1.290E+00
Y-88	2.474E-01	91.4	2.262E-01	2.266E-01	1.407E+00
Cd-113m	-4.169E+03	114.2	4.761E+03	4.767E+03	1.614E+04
Cd-109	5.210E+00	234.1	1.220E+01	1.220E+01	4.101E+01
Cf-251	4.948E-01	331.4	1.639E+00	1.640E+00	4.314E+00
Cf-249	2.520E-01	126.9	3.197E-01	3.200E-01	2.277E+00
Sn-126	2.990E+00	158.0	4.723E+00	4.726E+00	1.588E+01
PB-210	2.702E+01	47.6	1.286E+01	1.297E+01	3.445E+01
PB-212	1.101E+01	8.0	8.851E-01	1.055E+00	1.824E+00
PB-214	9.558E+00	10.9	1.042E+00	1.149E+00	2.291E+00
BI-207	1.322E-01	92.3	1.220E-01	1.222E-01	1.757E+00
BI-212	-8.593E+00	86.0	7.393E+00	7.406E+00	2.482E+01
U-235	-3.709E+00	80.0	2.966E+00	2.972E+00	1.677E+01
BI-214	1.061E+01	11.5	1.217E+00	1.331E+00	1.917E+00
BI-210M	5.674E-01	93.9	5.330E-01	5.338E-01	2.122E+00
AC-228	9.814E+00	16.7	1.641E+00	1.715E+00	3.495E+00
TH-227	4.145E+00	87.6	3.630E+00	3.636E+00	9.831E+00
TH-229	6.249E+00	106.1	6.634E+00	6.642E+00	1.713E+01
TH-234	-1.399E+01	40.6	5.680E+00	5.732E+00	3.029E+01
PA-231	1.039E+01	159.2	1.654E+01	1.655E+01	7.457E+01
PA-233	6.547E-01	225.4	1.476E+00	1.476E+00	6.432E+00
PA-234	1.495E+00	121.2	1.813E+00	1.814E+00	6.085E+00
PA-234M	9.112E+01	59.4	5.414E+01	5.434E+01	1.947E+02
AM-241	-1.167E+00	137.3	1.601E+00	1.603E+00	5.359E+00
Np-237	0.000E+00	1.#INF	3.707E+00	3.707E+00	1.254E+01
Ir-192	2.619E-01	100.6	2.634E-01	2.639E-01	2.689E+00
Cs-136	5.412E-01	63.2	3.421E-01	3.435E-01	2.160E+00
Np-239	-1.299E+00	111.4	1.447E+00	1.449E+00	4.847E+00
Nd-147	9.688E-02	261.3	2.532E-01	2.532E-01	6.284E+00
TL-210	-4.705E-01	107.0	5.036E-01	5.043E-01	1.716E+00
Kr-85	5.590E+01	213.9	1.196E+02	1.196E+02	4.102E+02
Total	3.798E+02				

Analyst: Justin Banner

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Sample description
445369_Gamma_180-96595-A-7-B

Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20192917.An1

Acquisition information

Start time:	10/31/2019 2:50:02 AM
Live time:	1800
Real time:	1801
Dead time:	0.07 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration

Filename:	12_Soil_TunaCan.Clb

12_TunaCan_108513

Energy Calibration

Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files

Main analysis library:	Client_Long_Rev15.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

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Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 2:49:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-10-06_1923.PBC 10/6/2019 7:23:34 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1435

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.99	70.	23.90	0.61	1.855E-02	46.54	4.250	PBC<MDA	PB210
50.14	14.	143.01	0.85	2.193E-02	50.14	8.000	PBC<MDA	TH227
63.08	62.	30.31	1.43	2.970E-02	63.29	3.810	PBC<MDA	TH234
64.28	16.	157.96	0.87	3.015E-02	64.28	9.700	PBC<MDA	Sn126
74.63	88.	20.35	0.88	3.328E-02				
77.19	177.	10.57	0.88	3.387E-02				
87.51	52.	27.67	0.89	3.575E-02	87.57	37.500	PBC<MDA	Sn126
87.98	13.	234.07	0.89	3.582E-02	88.04	3.790	PBC<MDA	Cd109
91.10	8.	369.12	0.90	3.621E-02	91.10	28.300	PBC<MDA	Nd147
92.93	93.	21.92	1.17	3.645E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	2.549E+01	AC228
99.50	8.	293.89	0.91	3.697E-02	99.50	15.000	PBC<MDA	Np239
121.78	16.	103.83	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.788E-01	CO57
131.29	18.	121.21	0.94	3.683E-02	131.29	18.000	PBC<MDA	PA234
162.66	12.	157.12	0.97	3.435E-02	162.66	6.220	PBC<MDA	Ba140
165.85	15.	106.31	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
176.60	5.	331.36	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	50.	34.90	0.99	3.215E-02	185.72	54.000	1.599E+00	U235
193.51	16.	106.15	1.00	3.140E-02	193.51	4.400	PBC<MDA	TH229
209.36	48.	27.82	0.42	2.993E-02				
238.56	232.	9.10	1.22	2.743E-02	238.63	43.300	1.086E+01	PB212
241.95	46.	26.08	1.05	2.716E-02	242.00	7.430	1.274E+01	PB214
256.24	12.	101.10	1.06	2.608E-02	256.24	7.000	PBC<MDA	TH227
265.83	15.	93.94	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M
276.80	5.	256.90	1.08	2.462E-02	277.28	6.310	PBC<MDA	TL208
279.20	11.	93.21	1.09	2.449E-02	279.20	81.460	PBC<MDA	Hg203

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
295.00	90.	18.46	0.76	2.351E-02	295.09	19.300	1.101E+01	PB214
					296.00	79.000	2.697E+00	TL210
299.82	21.	61.17	0.88	2.321E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	2.044E+01	PA231
					300.18	6.200	8.111E+00	PA233
300.07	12.	221.57	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.123E+01	PA231
					300.18	6.200	4.455E+00	PA233
300.18	12.	225.40	1.11	2.320E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	1.123E+01	PA231
					300.18	6.200	4.456E+00	PA233
302.65	12.	228.71	1.11	2.306E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.521E+00	BA133
302.85	12.	232.41	1.11	2.304E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.521E+00	BA133
304.85	12.	235.73	1.11	2.293E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	1.002E+00	BI210M
304.90	4.	628.68	1.11	2.293E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	3.799E-01	BI210M
328.76	19.	58.88	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
333.44	8.	126.86	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
338.08	36.	27.71	1.50	2.118E-02	338.32	12.010	7.752E+00	AC228
351.98	128.	13.04	1.01	2.055E-02	351.93	37.600	9.215E+00	PB214
383.88	7.	198.86	1.19	1.923E-02	383.84	8.940	PBC<MDA	BA133
391.69	12.	111.97	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
433.94	24.	34.86	1.24	1.751E-02	433.94	90.480	8.416E-01	AG108M
463.37	11.	92.21	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
468.06	11.	100.58	1.27	1.653E-02	468.06	51.750	PBC<MDA	Ir192
477.60	3.	363.62	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
511.86	77.	14.78	2.56	1.546E-02	511.86	20.000	1.390E+01	RH106
513.98	7.	213.89	1.31	1.541E-02	513.98	0.430	PBC<MDA	Kr85
537.26	2.	525.20	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
563.24	5.	99.01	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.32	3.	298.43	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.265E+00	PA234
					569.70	97.740	1.062E-01	BI207
569.70	9.	92.30	1.37	1.427E-02	569.32	15.380	2.277E+00	CS134
					569.47	8.200	4.271E+00	PA234
					569.70	97.740	3.584E-01	BI207
583.14	104.	12.26	1.94	1.403E-02	583.02	84.500	4.857E+00	TL208
609.23	115.	11.47	0.99	1.359E-02	609.31	46.090	1.017E+01	BI214
					610.30	5.750	8.159E+01	RU103
621.92	13.	143.84	1.42	1.338E-02	621.92	9.930	PBC<MDA	RH106
635.89	7.	74.83	1.43	1.317E-02	635.89	11.310	PBC<MDA	SB125
661.66	10.	84.33	1.45	1.279E-02	661.66	85.210	PBC<MDA	CS137
702.63	9.	94.37	1.49	1.224E-02	702.63	97.900	PBC<MDA	NB94
722.79	11.	81.19	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	5.780E-01	AG108M

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					723.36	20.220	2.598E+00	EU154
735.72	5.	146.39	1.52	1.184E-02	735.72	22.500	PBC<MDA	PM146
747.16	5.	164.92	1.53	1.171E-02	747.16	34.000	PBC<MDA	PM146
756.73	1.	692.82	1.54	1.160E-02	756.73	54.460	PBC<MDA	ZR95
766.41	11.	72.62	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.774E+02	PA234M
795.87	10.	81.78	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
801.95	10.	83.07	1.58	1.113E-02	801.95	8.690	PBC<MDA	CS134
818.50	12.	101.38	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
846.77	7.	127.38	1.63	1.070E-02	846.77	99.935	PBC<MDA	Co56
857.60	16.	50.13	1.64	1.057E-02	860.56	12.420	PBC<MDA	TL208
871.10	3.	159.86	1.65	1.048E-02	871.10	99.890	PBC<MDA	NB94
873.23	4.	107.73	1.65	1.046E-02	873.23	12.270	PBC<MDA	EU154
880.53	30.	18.26	1.66	1.040E-02	880.53	6.000	2.671E+01	PA234
898.04	8.	91.43	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
911.52	56.	18.74	1.21	1.015E-02	911.07	29.000	1.067E+01	AC228
968.94	60.	17.49	1.22	9.703E-03	968.97	17.460	1.951E+01	AC228
996.33	9.	81.09	1.76	9.508E-03	996.33	10.600	PBC<MDA	EU154
1001.00	9.	94.06	1.76	9.476E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	6.	127.87	1.77	9.450E-03	1004.77	18.010	PBC<MDA	EU154
1048.07	6.	75.56	1.81	9.162E-03	1048.07	80.000	PBC<MDA	Cs136
1120.17	28.	29.27	1.87	8.722E-03	1120.29	15.100	1.197E+01	BI214
					1120.55	99.987	1.808E+00	Sc46
1121.19	9.	134.13	1.87	8.716E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.573E+00	Ta182
1173.24	7.	87.76	1.92	8.426E-03	1173.24	99.900	PBC<MDA	CO60
1188.58	1.	796.87	1.93	8.342E-03	1189.05	16.200	PBC<MDA	Ta182
1238.28	20.	46.04	1.97	8.090E-03	1238.28	66.070	2.044E+00	Co56
1274.53	3.	154.92	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	6.650E-01	EU154
1274.54	5.	95.92	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	9.974E-01	EU154
1384.30	7.	37.80	2.10	7.423E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	1.	600.00	2.12	7.324E-03	1408.00	21.005	PBC<MDA	EU152
1460.73	147.	8.25	1.09	7.112E-03	1460.83	10.670	1.076E+02	K40
1764.41	26.	19.61	2.40	6.075E-03	1764.49	15.400	1.544E+01	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
251.92	63.08	94.	44.	1.478E+03	34.71	0.868	- sD
298.08	74.64	121.	82.	2.466E+03	21.93	0.880	- sD
308.29	77.20	100.	164.	4.835E+03	11.66	0.883	- D
836.68	209.36	34.	48.	1.604E+03	27.82	0.422	- s

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s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev15.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	187.58	46.99	93.	37.	0.021	47.58	0.614s
TH-227	200.18	50.14	200.	14.	0.008	143.01	0.855s
AM-241	237.74	59.54	414.	-21.	-0.012	137.25	0.865s
Sn-126	256.71	64.28	301.	16.	0.009	157.96	0.869s
BA-133	323.50	80.99	702.	-23.	-0.013	165.32	0.887
Np-237	345.49	86.49	484.	0.	0.000	1000.00	0.892A
Sn-126	349.81	87.57	423.	52.	0.029	27.67	0.893D
Cd-109	351.68	88.04	438.	13.	0.007	234.07	0.894A
Nd-147	363.92	91.10	457.	8.	0.005	369.12	0.897s
TH-234	369.87	92.59	537.	-51.	-0.028	40.59	0.898s
AC-228	371.24	92.93	88.	93.	0.052	21.92	1.172s
Np-239	397.50	99.50	239.	8.	0.004	293.89	0.905s
Np-239	414.29	103.70	192.	-18.	-0.010	110.61	0.909s
EU-155	420.73	105.31	194.	-20.	-0.011	102.04	0.911s
Np-239	424.00	106.13	233.	-20.	-0.011	111.36	0.912s
EU-152	486.56	121.78	130.	16.	0.009	103.83	0.928s
CO-57	487.69	122.06	146.	0.	0.000	1000.00	0.928s
EU-154	491.84	123.10	128.	-6.	-0.004	249.73	0.929s
PA-234	524.60	131.29	225.	18.	0.010	121.21	0.938
HF-181	531.51	133.02	483.	-19.	-0.011	164.82	0.939s
CE-144	533.57	133.54	534.	-21.	-0.012	157.83	0.940s
HF-181	544.61	136.30	555.	-21.	-0.012	160.36	0.943s
CO-57	545.30	136.47	576.	-21.	-0.012	163.30	0.943s
Tc-99m	561.44	140.51	597.	-21.	-0.012	165.49	0.947s
U-235	574.53	143.79	623.	-26.	-0.015	79.97	0.950s
Ba-140	649.99	162.66	158.	12.	0.006	157.12	0.969s
U-235	652.87	163.38	169.	0.	0.000	1000.00	0.970s
CE-139	662.76	165.85	122.	15.	0.008	106.31	0.973s
Cf-251	705.72	176.60	77.	5.	0.003	331.36	0.983s
U-235	742.18	185.72	79.	50.	0.028	34.90	0.992s
TH-229	773.32	193.51	73.	16.	0.009	106.15	1.000s
U-235	820.59	205.33	219.	-18.	-0.010	121.32	1.012s
TH-229	842.65	210.85	199.	-2.	-0.001	961.97	1.018s
Cf-251	907.22	227.00	81.	-6.	-0.003	299.48	1.034s
TH-227	943.09	235.97	576.	-20.	-0.011	175.45	1.043s
PB-212	953.73	238.63	61.	235.	0.131	8.04	1.045D

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PB-214	967.18	242.00	50.	46.	0.026	26.08	1.049D
TH-227	1024.13	256.24	40.	12.	0.007	101.10	1.063s
Cd-113m	1053.96	263.70	80.	-12.	-0.006	114.21	1.070s
BI-210M	1062.48	265.83	96.	15.	0.009	93.94	1.072s
TL-208	1108.27	277.28	80.	5.	0.003	256.90	1.084s
Hg-203	1115.93	279.20	50.	11.	0.006	93.21	1.086
I-131	1136.32	284.30	44.	-5.	-0.003	252.19	1.091s
PB-214	1179.10	295.00	43.	90.	0.050	18.46	0.760s
TL-210	1183.11	296.00	309.	11.	0.006	218.42	1.102s
PB-212	1198.37	299.82	36.	21.	0.012	61.17	0.875
PA-231	1199.38	300.07	321.	12.	0.006	221.57	1.106
PA-233	1199.82	300.18	332.	12.	0.006	225.40	1.107
PA-231	1209.70	302.65	344.	12.	0.006	228.71	1.109s
BA-133	1210.50	302.85	355.	12.	0.006	232.41	1.109
Ba-140	1218.49	304.85	367.	12.	0.006	235.73	1.111s
BI-210M	1218.68	304.90	379.	4.	0.002	628.68	1.111s
Ir-192	1232.85	308.44	383.	0.	0.000	1000.00	1.115s
PA-233	1247.13	312.01	383.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	383.	0.	0.000	1000.00	1.123s
CR-51	1279.41	320.08	445.	-14.	-0.008	221.72	1.126s
La-140	1314.10	328.76	50.	19.	0.010	58.88	1.135s
Cf-249	1332.81	333.44	47.	8.	0.004	126.86	1.139s
AC-228	1351.36	338.08	18.	36.	0.020	27.71	1.499s
Cs-136	1361.32	340.57	237.	-19.	-0.010	118.83	1.146s
EU-152	1376.18	344.29	218.	-19.	-0.010	113.88	1.150
HF-181	1382.35	345.83	191.	-18.	-0.010	109.09	1.151s
PB-214	1406.76	351.93	39.	123.	0.068	11.60	1.158D
BA-133	1423.02	356.00	233.	-16.	-0.009	135.90	1.162s
BA-133	1534.35	383.84	103.	7.	0.004	198.86	1.189s
Cf-249	1550.79	387.95	110.	0.	0.000	1000.00	1.193s
SN-113	1565.74	391.69	91.	12.	0.007	111.97	1.196
SB-125	1710.45	427.88	36.	-8.	-0.004	151.04	1.232s
AG-108M	1734.69	433.94	12.	24.	0.013	34.86	1.238
PM-146	1814.45	453.88	24.	0.	0.000	1000.00	1.257s
SB-125	1852.39	463.37	44.	11.	0.006	92.21	1.266s
Ir-192	1871.16	468.06	54.	11.	0.006	100.58	1.271s
BE-7	1909.29	477.60	58.	3.	0.002	363.62	1.280s
HF-181	1926.90	482.00	61.	0.	0.000	1000.00	1.284s
La-140	1946.98	487.02	106.	-14.	-0.008	106.31	1.289
RU-103	1987.11	497.05	36.	-10.	-0.006	121.66	1.298s
RH-106	2046.35	511.86	27.	77.	0.043	14.78	2.563s
Kr-85	2054.81	513.98	98.	7.	0.004	213.89	1.315s
Nd-147	2122.88	531.00	17.	-2.	-0.001	370.05	1.331s
Ba-140	2147.92	537.26	26.	2.	0.001	525.20	1.337s
CS-134	2251.82	563.24	4.	5.	0.003	99.01	1.362s
CS-134	2276.15	569.32	30.	3.	0.001	298.43	1.367s
PA-234	2276.75	569.47	39.	-5.	-0.003	194.04	1.368s
BI-207	2277.68	569.70	30.	9.	0.005	92.30	1.368s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TL-208	2331.42	583.14	13.	104.	0.058	12.26	1.938s
SB-125	2400.87	600.50	311.	-15.	-0.009	164.45	1.397s
SB-124	2409.79	602.73	296.	-15.	-0.009	160.20	1.399s
CS-134	2417.71	604.71	281.	-15.	-0.009	155.88	1.401s
BI-214	2435.79	609.23	16.	115.	0.064	11.47	0.991s
RU-103	2440.06	610.30	265.	-15.	-0.009	151.11	1.406s
AG-108M	2455.99	614.28	250.	-16.	-0.009	146.37	1.410s
PM-144	2471.12	618.06	234.	-7.	-0.004	302.01	1.414s
RH-106	2486.54	621.92	169.	13.	0.007	143.84	1.417s
SB-125	2542.43	635.89	10.	7.	0.004	74.83	1.430s
I-131	2546.77	636.97	28.	-8.	-0.004	103.17	1.432s
AG-110M	2629.92	657.76	28.	-3.	-0.002	232.38	1.451s
CS-137	2645.51	661.66	31.	10.	0.006	84.33	1.455s
PM-144	2785.05	696.54	33.	-7.	-0.004	185.94	1.487s
NB-94	2809.41	702.63	14.	9.	0.005	94.37	1.493s
SB-124	2890.04	722.79	37.	11.	0.006	81.19	1.512s
AG-108M	2890.65	722.94	48.	0.	0.000	1000.00	1.512s
EU-154	2892.34	723.36	48.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	48.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	65.	-14.	-0.008	86.03	1.516s
PM-146	2941.78	735.72	9.	5.	0.003	146.39	1.524s
PM-146	2987.55	747.16	14.	5.	0.003	164.92	1.535s
ZR-95	3025.83	756.73	19.	1.	0.001	692.82	1.543s
AG-110M	3054.69	763.94	35.	0.	0.000	1000.00	1.550s
NB-95	3062.08	765.79	36.	0.	0.000	1000.00	1.552s
PA-234M	3064.57	766.41	25.	11.	0.006	72.62	1.552s
EU-152	3114.61	778.92	37.	-15.	-0.009	88.30	1.564s
BI-212	3140.62	785.42	42.	-16.	-0.009	87.51	1.570s
CS-134	3182.43	795.87	26.	10.	0.005	81.78	1.579s
TL-210	3197.35	799.60	45.	-9.	-0.005	107.03	1.583s
CS-134	3206.76	801.95	27.	10.	0.005	83.07	1.585s
CO-58	3242.06	810.78	57.	-14.	-0.008	83.24	1.593s
La-140	3262.05	815.77	71.	-11.	-0.006	116.36	1.598s
Cs-136	3272.97	818.50	73.	12.	0.007	101.38	1.600s
MN-54	3338.38	834.85	33.	-8.	-0.004	162.22	1.615s
Co-56	3386.08	846.77	15.	7.	0.004	127.38	1.626s
TL-208	3441.27	860.56	10.	16.	0.009	50.13	1.638s
NB-94	3483.41	871.10	10.	3.	0.002	159.86	1.648s
EU-154	3491.95	873.23	10.	4.	0.002	107.73	1.650s
PA-234	3521.16	880.53	0.	30.	0.017	18.26	1.657s
PA-234	3532.00	883.24	30.	0.	0.000	1000.00	1.659s
AG-110M	3537.78	884.68	30.	0.	0.000	1000.00	1.660s
Sc-46	3556.17	889.28	52.	-8.	-0.005	129.00	1.664s
Y-88	3591.22	898.04	10.	8.	0.005	91.43	1.672s
AC-228	3645.17	911.52	12.	56.	0.031	18.74	1.214s
AG-110M	3749.09	937.49	40.	-17.	-0.009	86.28	1.708s
PA-234	3783.21	946.02	15.	-3.	-0.002	289.64	1.716s
EU-152	3855.60	964.11	87.	-10.	-0.006	130.16	1.732s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AC-228	3874.92	968.94	6.	60.	0.033	17.49	1.219s
EU-154	3984.54	996.33	20.	9.	0.005	81.09	1.761s
PA-234M	4003.22	1001.00	29.	9.	0.005	94.06	1.765s
EU-154	4018.33	1004.77	28.	6.	0.003	127.87	1.768s
Co-56	4150.66	1037.84	21.	-9.	-0.005	117.15	1.798s
Cs-136	4191.60	1048.07	6.	6.	0.003	75.56	1.807s
BI-207	4253.99	1063.66	16.	-2.	-0.001	460.07	1.820s
Ga-68	4308.98	1077.40	16.	-1.	-0.001	914.69	1.833s
FE-59	4396.44	1099.25	27.	-14.	-0.008	85.66	1.852s
EU-152	4447.76	1112.07	83.	-12.	-0.007	111.31	1.863s
ZN-65	4461.66	1115.55	71.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	20.	28.	0.016	29.27	1.870D
Sc-46	4481.68	1120.55	71.	0.	0.000	1000.00	1.870
Ta-182	4484.69	1121.30	62.	9.	0.005	134.13	1.871s
CO-60	4692.57	1173.24	5.	7.	0.004	87.76	1.916s
Ta-182	4755.86	1189.05	5.	1.	0.000	796.87	1.930s
Co-56	4952.92	1238.28	11.	20.	0.011	46.04	1.972s
NA-22	5098.03	1274.53	12.	3.	0.002	154.92	2.003s
EU-154	5098.08	1274.54	9.	5.	0.003	95.92	2.003s
FE-59	5166.35	1291.60	11.	-1.	-0.001	598.44	2.017s
CO-60	5330.11	1332.50	17.	-6.	-0.003	166.25	2.052s
AG-110M	5537.48	1384.30	0.	7.	0.004	37.80	2.096s
EU-152	5632.39	1408.00	6.	1.	0.001	600.00	2.115s
K-40	5843.51	1460.73	0.	147.	0.082	8.25	1.088s
La-140	6386.02	1596.21	18.	-5.	-0.003	209.76	2.269s
SB-124	6765.58	1690.98	6.	-2.	-0.001	275.72	2.345s
BI-214	7060.00	1764.49	0.	26.	0.014	19.61	2.403
Co-56	7087.48	1771.35	26.	0.	0.000	1000.00	2.408s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	9.7300E-01				5.31E+01	
			477.60	9.730E-01	?(	1.239E+01 3.64E+02 1.05E+01	G
NA-22	C	2.3414E-01				9.50E+02	
			1274.53	2.341E-01	&(	1.308E+00 1.55E+02 9.99E+01	G
K-40	N	1.0762E+02				4.66E+11	
			1460.83	1.076E+02	@(	5.395E+00 8.25E+00 1.07E+01	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sc-46	F	-4.4051E-01					8.38E+01	
			889.28	-4.405E-01	?(	1.948E+00	1.29E+02	1.00E+02 G
			1120.55	0.000E+00	+	2.674E+00	1.00E+03	1.00E+02 G
CR-51	F	-3.4291E+00					2.77E+01	
			320.08	-3.429E+00	*(	2.555E+01	2.22E+02	9.94E+00 G
MN-54	C	-3.9416E-01					3.12E+02	
			834.85	-3.942E-01	?(	1.509E+00	1.62E+02	1.00E+02 G
FE-59	F	-1.6009E+00					4.45E+01	
			1099.25	-1.601E+00	?(	2.976E+00	8.57E+01	5.65E+01 G
			1291.60	-2.189E-01	+	3.020E+00	5.98E+02	4.32E+01 G
Co-56	C	1.0325E+00					7.73E+01	
			846.77	3.638E-01	?(	1.079E+00	1.27E+02	9.99E+01 G
			1238.28	2.044E+00	?(	1.912E+00	4.60E+01	6.61E+01 G
			1037.84	-3.977E+00	+	1.032E+01	1.17E+02	1.41E+01 G
			1771.35	0.000E+00	-	1.569E+01	1.00E+03	1.55E+01 A
CO-58	C	-6.8659E-01					7.09E+01	
			810.78	-6.866E-01	?(	1.917E+00	8.32E+01	9.95E+01 G
CO-60	F	1.7874E-03					1.93E+03	
			1332.50	-4.360E-01	?(	1.593E+00	1.66E+02	1.00E+02 G
			1173.24	4.399E-01	?(	8.891E-01	8.78E+01	9.99E+01 G
NB-94	I	2.8667E-01					7.41E+06	
			702.63	4.167E-01	?(	9.338E-01	9.44E+01	9.79E+01 G
			871.10	1.592E-01	?(	9.257E-01	1.60E+02	9.99E+01 G
ZR-95	I	1.1723E-01					6.40E+01	
			756.73	1.172E-01	?(	2.008E+00	6.93E+02	5.45E+01 G
			724.20	0.000E+00	-	3.677E+00	1.00E+03	4.42E+01 G
RU-103	I	-3.8681E-01					3.93E+01	
			497.05	-3.868E-01	?(	1.186E+00	1.22E+02	9.09E+01 G
			610.30	-1.101E+01	+	5.597E+01	1.51E+02	5.75E+00 GA
RH-106	I	5.4513E+00					3.74E+02	
			621.92	5.451E+00	?(	2.649E+01	1.44E+02	9.93E+00 G
			1050.36	1.947E+00	%	7.469E+01	1.01E+03	1.56E+00 G
			511.86	1.390E+01	?	4.812E+00	1.48E+01	2.00E+01 GA
AG-108M	C	8.4162E-01					1.53E+05	
			433.94	8.416E-01	(	6.611E-01	3.49E+01	9.05E+01 G
			722.94	0.000E+00	-	1.785E+00	1.00E+03	9.08E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	-7.099E-01	-	3.496E+00	1.46E+02	8.98E+01 G
AG-110M	F	5.4030E-01					2.50E+02	
			884.68	0.000E+00	?(	2.082E+00	1.00E+03	7.27E+01 G
			657.76	-1.523E-01	+	1.257E+00	2.32E+02	9.46E+01 G
			937.49	-2.733E+00	+	5.236E+00	8.63E+01	3.44E+01 G
			1384.30	2.157E+00	?(	2.271E+00	3.78E+01	2.43E+01 G
			763.94	0.000E+00	&	6.552E+00	1.00E+03	2.23E+01 G
SN-113	F	5.7198E-01					1.15E+02	
			391.69	5.720E-01	&(	2.166E+00	1.12E+02	6.40E+01 G
SB-124	F	-9.0966E-02					6.02E+01	
			602.73	-6.352E-01	?(	3.422E+00	1.60E+02	9.83E+01 G
			1690.98	-4.304E-01	+	2.663E+00	2.76E+02	4.78E+01 G
			722.79	4.856E+00	?(	1.325E+01	8.12E+01	1.08E+01 G
SB-125	I	7.8844E-01					1.01E+03	
			427.88	-8.484E-01	?(	3.253E+00	1.51E+02	2.96E+01 G
			600.50	-3.480E+00	+	1.924E+01	1.64E+02	1.79E+01 G
			635.89	2.624E+00	?(	6.600E+00	7.48E+01	1.13E+01 G
			463.37	3.433E+00	?(	1.071E+01	9.22E+01	1.05E+01 G
I-131	I	3.3989E-02					8.02E+00	
			364.48	3.399E-02	&(	9.881E-01	1.11E+03	8.17E+01 G
			284.30	-1.872E+00	&	1.259E+01	2.52E+02	6.14E+00 G
			636.97	-4.537E+00	&	1.605E+01	1.03E+02	7.17E+00 G
Gd-153	F	-1.1733E-01					2.42E+02	
			97.50	-1.173E-01	&(	4.122E+00	1.03E+03	3.00E+01 G
			103.20	3.269E-08	%	5.155E+00	4.61E+09	2.18E+01 G
Ga-68	C	-2.2008E+00					4.71E-02	
			1077.40	-2.201E+00	?(	4.699E+01	9.15E+02	3.30E+00 G
Tc-99m	I	-3.7294E-01					2.51E-01	
			140.51	-3.729E-01	?(	2.064E+00	1.65E+02	8.93E+01 G
BA-133	F	-2.0095E-01					3.85E+03	
			356.00	-7.097E-01	?(	3.243E+00	1.36E+02	6.20E+01 G
			302.85	1.521E+00	(	1.191E+01	2.32E+02	1.83E+01 G
			383.84	2.370E+00	?	1.613E+01	1.99E+02	8.94E+00 GA
			80.99	-1.075E+00	&	5.937E+00	1.65E+02	3.41E+01 GA
CS-134	I	1.0506E+00					7.54E+02	
			795.87	5.522E-01	&(	1.524E+00	8.18E+01	8.55E+01 G
			604.71	-6.418E-01	-	3.365E+00	1.56E+02	9.76E+01 G
			569.32	6.745E-01	&(	7.177E+00	2.98E+02	1.54E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	5.485E+00	?(	1.538E+01	8.31E+01	8.69E+00 G
			563.24	2.233E+00	?(	5.736E+00	9.90E+01	8.35E+00 G
CS-137	I	5.1573E-01						1.10E+04
			661.66	5.157E-01	?(	1.468E+00	8.43E+01	8.52E+01 G
CE-139	F	3.0858E-01						1.38E+02
			165.85	3.086E-01	?(	1.104E+00	1.06E+02	7.99E+01 G
Ba-140	I	1.5507E+00						1.28E+01
			537.26	3.056E-01	?(	4.045E+00	5.25E+02	2.44E+01 G
			162.66	2.990E+00	&(	1.591E+01	1.57E+02	6.22E+00 G
			304.85	6.542E+00	?(	5.195E+01	2.36E+02	4.29E+00 G
La-140	I	4.7724E-02						1.28E+01
			1596.21	-4.401E-01	?(	1.979E+00	2.10E+02	9.54E+01 G
			487.02	-1.078E+00	+	3.863E+00	1.06E+02	4.55E+01 G
			328.76	2.340E+00	&(	4.515E+00	5.89E+01	2.03E+01 G
			815.77	-2.301E+00	+	9.099E+00	1.16E+02	2.33E+01 G
CE-141	I	-6.6828E-02						3.25E+01
			145.44	-6.683E-02	%(	3.834E+00	1.70E+03	4.82E+01 G
CE-144	I	-2.8545E+00						2.85E+02
			133.54	-2.855E+00	?(	1.507E+01	1.58E+02	1.11E+01 G
PM-144	C	-3.0366E-01						3.63E+02
			696.54	-3.037E-01	?(	1.337E+00	1.86E+02	9.90E+01 G
			618.06	-3.012E-01	+	3.087E+00	3.02E+02	9.91E+01 G
EU-152	F	8.3497E-01						4.94E+03
			121.78	8.350E-01	&(	2.914E+00	1.04E+02	2.86E+01 G
			344.29	-1.880E+00	+	7.181E+00	1.14E+02	2.65E+01 G
			1112.07	-5.564E+00	+	2.097E+01	1.11E+02	1.36E+01 G
			778.92	-5.794E+00	+	1.178E+01	8.83E+01	1.29E+01 G
			964.11	-4.075E+00	+	1.804E+01	1.30E+02	1.46E+01 G
			244.69	-4.395E-01	%	2.852E+01	1.92E+03	7.58E+00 G
			1408.00	3.611E-01	?	5.101E+00	6.00E+02	2.10E+01 GA
EU-154	I	1.1642E+00						3.14E+03
			123.10	-2.379E-01	*(	2.033E+00	2.50E+02	4.08E+01 G
			1274.54	9.974E-01	&(	3.329E+00	9.59E+01	3.52E+01 G
			723.36	0.000E+00	&	8.021E+00	1.00E+03	2.02E+01 G
			873.23	1.947E+00	?(	7.388E+00	1.08E+02	1.23E+01 G
			1004.77	2.007E+00	?(	8.911E+00	1.28E+02	1.80E+01 G
			996.33	4.774E+00	?(	1.308E+01	8.11E+01	1.06E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	-1.3906E+00					1.81E+03	
			105.31	-1.391E+00	*(	4.752E+00	1.02E+02	2.12E+01 G
			86.54	8.472E-02	%	5.237E+00	1.83E+03	3.07E+01 G
Ta-182	F	1.5726E+00					1.14E+02	
			1121.30	1.573E+00	?(	7.217E+00	1.34E+02	3.49E+01 G
			1221.41	8.390E-02	%	6.266E+00	3.35E+03	2.70E+01 G
			1189.05	2.741E-01	-	5.538E+00	7.97E+02	1.62E+01 G
Hg-203	F	3.1522E-01					4.66E+01	
			279.20	3.152E-01	&(	9.930E-01	9.32E+01	8.15E+01 G
TL-208	N	4.8573E+00					6.98E+02	
			583.02	4.857E+00	(	9.243E-01	1.23E+01	8.45E+01 G
			277.28	1.788E+00	-	1.588E+01	2.57E+02	6.31E+00 G
			860.56	6.768E+00	&	7.380E+00	5.01E+01	1.24E+01 G
PM-146	C	3.7544E-01					2.02E+03	
			453.88	0.000E+00	?(	1.290E+00	1.00E+03	6.50E+01 G
			747.16	6.977E-01	?(	2.811E+00	1.65E+02	3.40E+01 G
			735.72	9.731E-01	?(	3.534E+00	1.46E+02	2.25E+01 G
Y-88	F	2.4741E-01					1.07E+02	
			1836.06	3.182E-02	%(	1.407E+00	1.98E+03	9.92E+01 G
			898.04	4.757E-01	&(	1.009E+00	9.14E+01	9.37E+01 G
Cd-113m		-4.1688E+03					5.33E+03	
			263.70	-4.169E+03	&(	1.614E+04	1.14E+02	6.00E-03 K
Cd-109	F	5.2104E+00					4.53E+02	
							Derived Ave Activity	
			88.04	5.210E+00	}(	4.101E+01	2.34E+02	3.79E+00 G
Cf-251	T	4.9476E-01					3.28E+05	
			176.60	4.948E-01	&(	4.314E+00	3.31E+02	1.70E+01 G
			227.00	-1.760E+00	+	1.384E+01	2.99E+02	6.30E+00 GA
Cf-249	T	2.5202E-01					1.28E+05	
			387.95	0.000E+00	?(	2.277E+00	1.00E+03	6.60E+01 G
			333.44	1.324E+00	&(	5.768E+00	1.27E+02	1.55E+01 G
Sn-126		2.9901E+00					3.65E+07	
			87.57	2.141E+00	}	4.084E+00	2.77E+01	3.75E+01 GA
			64.28	2.990E+00	?(	1.588E+01	1.58E+02	9.70E+00 G
			86.94	0.000E+00	}	1.766E+01	1.59E+03	9.04E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-210	N	2.7021E+01					8.14E+03	
			46.54	2.702E+01	(P	3.445E+01	4.76E+01	4.25E+00 G
PB-212	N	1.1010E+01					6.98E+02	
			238.63	1.101E+01	(P	1.824E+00	8.04E+00	4.33E+01 G
			300.03	1.533E+01	+	2.238E+01	6.12E+01	3.28E+00 GA
PB-214	N	9.5577E+00					5.84E+05	
			351.93	8.811E+00	(P	2.291E+00	1.16E+01	3.76E+01 G
			295.09	1.101E+01	(P	4.079E+00	1.85E+01	1.93E+01 G
			242.00	1.274E+01	+	9.791E+00	2.61E+01	7.43E+00 GA
BI-207	C	1.3220E-01					1.18E+04	
			1063.66	-1.646E-01	?(	1.757E+00	4.60E+02	7.45E+01 G
			569.70	3.584E-01	?(	1.124E+00	9.23E+01	9.77E+01 G
BI-212	N	-8.5932E+00					6.98E+02	
			727.17	-8.593E+00	?(	2.482E+01	8.60E+01	7.55E+00 G
			785.42	-6.293E+01	+	1.265E+02	8.75E+01	1.28E+00 GA
U-235	N	-3.7091E+00					2.57E+11	
			143.79	-3.709E+00	@(P	1.677E+01	8.00E+01	1.10E+01 G
			205.33	-6.437E+00	+	2.622E+01	1.21E+02	5.01E+00 G
			163.38	0.000E+00	&	2.019E+01	1.00E+03	5.08E+00 G
			185.72	1.599E+00	+ P	1.413E+00	3.49E+01	5.40E+01 GA
BI-214	N	1.0611E+01					5.84E+05	
			609.31	1.017E+01	(P	1.917E+00	1.15E+01	4.61E+01 G
			1120.29	1.197E+01	(	1.000E+01	2.93E+01	1.51E+01 G
			1764.49	1.544E+01	+	4.376E+00	1.96E+01	1.54E+01 G
BI-210M	T	5.6736E-01					1.10E+09	
			265.83	6.723E-01	&(	2.122E+00	9.39E+01	5.00E+01 G
			304.90	3.799E-01	&(	8.081E+00	6.29E+02	2.80E+01 G
AC-228	N	9.8136E+00					2.10E+03	
			911.07	1.067E+01	(	3.495E+00	1.87E+01	2.90E+01 G
			968.97	1.951E+01	+	4.785E+00	1.75E+01	1.75E+01 G
			338.32	7.752E+00	(	4.849E+00	2.77E+01	1.20E+01 G
			93.35	2.549E+01	+	1.272E+01	2.19E+01	5.56E+00 XA
TH-227	N	4.1450E+00					7.95E+03	
			256.24	3.728E+00	&(	9.831E+00	1.01E+02	7.00E+00 G
			235.97	-3.188E+00	-	1.872E+01	1.75E+02	1.23E+01 G
			50.14	4.510E+00	&(	2.174E+01	1.43E+02	8.00E+00 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	6.2493E+00					2.68E+06	
			193.51	6.249E+00	?(	1.713E+01	1.06E+02	4.40E+00 G
			210.85	-1.297E+00	-	4.269E+01	9.62E+02	2.99E+00 G
TH-234	N	-1.3994E+01					1.63E+12	
			92.59	-1.399E+01	*(P	3.029E+01	4.06E+01	5.58E+00 G
			63.29	-8.365E-01	% P	4.030E+01	1.41E+03	3.81E+00 G
PA-231	N	1.0389E+01					1.20E+07	
			302.65	9.674E+00	?(	7.457E+01	2.29E+02	2.88E+00 G
			300.07	1.123E+01	(	8.387E+01	2.22E+02	2.46E+00 G
PA-233	C	6.5470E-01					7.82E+08	
			312.01	0.000E+00	?(	6.432E+00	1.00E+03	3.60E+01 G
			300.18	4.456E+00	(	3.386E+01	2.25E+02	6.20E+00 G
PA-234	N	1.4954E+00					1.63E+12	
			131.29	1.495E+00	?(	6.085E+00	1.21E+02	1.80E+01 G
			946.02	-1.260E+00	+	8.716E+00	2.90E+02	1.34E+01 G
			569.47	-2.214E+00	+	1.504E+01	1.94E+02	8.20E+00 G
			883.24	0.000E+00	-	1.575E+01	1.00E+03	9.60E+00 G
			880.53	2.671E+01	?	6.562E+00	1.83E+01	6.00E+00 GA
PA-234M	N	9.1124E+01					1.63E+12	
			1001.00	6.081E+01	?(	1.947E+02	9.41E+01	8.37E-01 G
			766.41	1.774E+02	?(	4.301E+02	7.26E+01	2.94E-01 G
AM-241	T	-1.1668E+00					1.58E+05	
			59.54	-1.167E+00	?(	5.359E+00	1.37E+02	3.59E+01 G
Ir-192	F	2.6192E-01					7.40E+01	
			316.49	0.000E+00	@(	2.689E+00	1.00E+03	8.70E+01 G
			468.06	7.024E-01	?(	2.395E+00	1.01E+02	5.18E+01 G
			308.44	0.000E+00	-	7.230E+00	1.00E+03	3.18E+01 G
Cs-136	F	5.4117E-01					1.30E+01	
			818.50	6.305E-01	?(	2.160E+00	1.01E+02	1.00E+02 G
			1048.07	4.295E-01	?(	1.094E+00	7.56E+01	8.00E+01 G
			340.57	-1.050E+00	+	4.186E+00	1.19E+02	4.69E+01 G
Np-239	T	-1.2992E+00					2.36E+00	
			103.70	-1.130E+00	+	4.193E+00	1.11E+02	2.40E+01 X
			106.13	-1.299E+00	?(	4.847E+00	1.11E+02	2.27E+01 G
			99.50	7.515E-01	+	7.493E+00	2.94E+02	1.50E+01 X

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Nd-147       9.6880E-02                                      1.11E+01
                          531.00-6.631E-01 ?(  6.284E+00 3.70E+02 1.30E+01 G
                           91.10 4.460E-01 ?(  5.547E+00 3.69E+02 2.83E+01 G

TL-210   N  -4.7051E-01                                      5.84E+05
                          799.60-4.705E-01 ?(  1.716E+00 1.07E+02 9.90E+01 G
                          296.00 3.447E-01 +   2.540E+00 2.18E+02 7.90E+01 G
                         1313.00 1.140E-01 %   4.721E+00 1.68E+03 2.10E+01 GA

Kr-85    I   5.5898E+01                                      3.92E+03
                          513.98 5.590E+01 ?(  4.102E+02 2.14E+02 4.30E-01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-227	50.14	200.	14.	0.008	143.01	4.510E+00	
AM-241	59.54	414.	-21.	-0.012	137.25	-1.167E+00	
Nd-147	91.10	457.	8.	0.005	369.12	4.460E-01	
TH-234	92.59	537.	-51.	-0.028	40.59	-1.399E+01	P
Np-239	99.50	239.	8.	0.004	293.89	7.515E-01	
Np-239	103.70	192.	-18.	-0.010	110.61	-1.130E+00	
EU-155	105.31	194.	-20.	-0.011	102.04	-1.391E+00	
Np-239	106.13	233.	-20.	-0.011	111.36	-1.299E+00	
EU-152	121.78	130.	16.	0.009	103.83	8.350E-01	
EU-154	123.10	128.	-6.	-0.004	249.73	-2.379E-01	
PA-234	131.29	225.	18.	0.010	121.21	1.495E+00	
HF-181	133.02	483.	-19.	-0.011	164.82	-6.649E-01	
CE-144	133.54	534.	-21.	-0.012	157.83	-2.855E+00	
HF-181	136.30	555.	-21.	-0.012	160.36	-5.453E+00	
CO-57	136.47	576.	-21.	-0.012	163.30	-2.988E+00	
Tc-99m	140.51	597.	-21.	-0.012	165.49	-3.729E-01	
U-235	143.79	623.	-26.	-0.015	79.97	-3.709E+00	P
Ba-140	162.66	158.	12.	0.006	157.12	2.990E+00	
CE-139	165.85	122.	15.	0.008	106.31	3.086E-01	
Cf-251	176.60	77.	5.	0.003	331.36	4.948E-01	
U-235	185.72	79.	50.	0.028	34.90	1.599E+00	P
TH-229	193.51	73.	16.	0.009	106.15	6.249E+00	
U-235	205.33	219.	-18.	-0.010	121.32	-6.437E+00	
TH-229	210.85	199.	-2.	-0.001	961.97	-1.297E+00	
Cf-251	227.00	81.	-6.	-0.003	299.48	-1.760E+00	
TH-227	235.97	576.	-20.	-0.011	175.45	-3.188E+00	
TH-227	256.24	40.	12.	0.007	101.10	3.728E+00	
Cd-113m	263.70	80.	-12.	-0.006	114.21	-4.169E+03	
BI-210M	265.83	96.	15.	0.009	93.94	6.723E-01	
Hg-203	279.20	50.	11.	0.006	93.21	3.152E-01	
I-131	284.30	44.	-5.	-0.003	252.19	-1.872E+00	
TL-210	296.00	309.	11.	0.006	218.42	3.447E-01	
PA-231	300.07	321.	12.	0.006	221.57	1.123E+01	
PA-233	300.18	332.	12.	0.006	225.40	4.456E+00	
PA-231	302.65	344.	12.	0.006	228.71	9.674E+00	
Ba-140	304.85	367.	12.	0.006	235.73	6.542E+00	
BI-210M	304.90	379.	4.	0.002	628.68	3.799E-01	
CR-51	320.08	445.	-14.	-0.008	221.72	-3.429E+00	
La-140	328.76	50.	19.	0.010	58.88	2.340E+00	
Cf-249	333.44	47.	8.	0.004	126.86	1.324E+00	
Cs-136	340.57	237.	-19.	-0.010	118.83	-1.050E+00	
EU-152	344.29	218.	-19.	-0.010	113.88	-1.880E+00	
HF-181	345.83	191.	-18.	-0.010	109.09	-3.246E+00	
SN-113	391.69	91.	12.	0.007	111.97	5.720E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-125	427.88	36.	-8.	-0.004	151.04	-8.484E-01	
SB-125	463.37	44.	11.	0.006	92.21	3.433E+00	
Ir-192	468.06	54.	11.	0.006	100.58	7.024E-01	
BE-7	477.60	58.	3.	0.002	363.62	9.730E-01	
La-140	487.02	106.	-14.	-0.008	106.31	-1.078E+00	
RU-103	497.05	36.	-10.	-0.006	121.66	-3.868E-01	
RH-106	511.86	27.	77.	0.043	14.78	1.390E+01	
Kr-85	513.98	98.	7.	0.004	213.89	5.590E+01	
Nd-147	531.00	17.	-2.	-0.001	370.05	-6.631E-01	
Ba-140	537.26	26.	2.	0.001	525.20	3.056E-01	
CS-134	563.24	4.	5.	0.003	99.01	2.233E+00	
CS-134	569.32	30.	3.	0.001	298.43	6.745E-01	
PA-234	569.47	39.	-5.	-0.003	194.04	-2.214E+00	
BI-207	569.70	30.	9.	0.005	92.30	3.584E-01	
SB-125	600.50	311.	-15.	-0.009	164.45	-3.480E+00	
SB-124	602.73	296.	-15.	-0.009	160.20	-6.352E-01	
CS-134	604.71	281.	-15.	-0.009	155.88	-6.418E-01	
RU-103	610.30	265.	-15.	-0.009	151.11	-1.101E+01	
PM-144	618.06	234.	-7.	-0.004	302.01	-3.012E-01	
RH-106	621.92	169.	13.	0.007	143.84	5.451E+00	
SB-125	635.89	10.	7.	0.004	74.83	2.624E+00	
I-131	636.97	28.	-8.	-0.004	103.17	-4.537E+00	
AG-110M	657.76	28.	-3.	-0.002	232.38	-1.523E-01	
CS-137	661.66	31.	10.	0.006	84.33	5.157E-01	
PM-144	696.54	33.	-7.	-0.004	185.94	-3.037E-01	
NB-94	702.63	14.	9.	0.005	94.37	4.167E-01	
SB-124	722.79	37.	11.	0.006	81.19	4.856E+00	
BI-212	727.17	65.	-14.	-0.008	86.03	-8.593E+00	
PM-146	735.72	9.	5.	0.003	146.39	9.731E-01	
PM-146	747.16	14.	5.	0.003	164.92	6.977E-01	
ZR-95	756.73	19.	1.	0.001	692.82	1.172E-01	
PA-234M	766.41	25.	11.	0.006	72.62	1.774E+02	
EU-152	778.92	37.	-15.	-0.009	88.30	-5.794E+00	
BI-212	785.42	42.	-16.	-0.009	87.51	-6.293E+01	
CS-134	795.87	26.	10.	0.005	81.78	5.522E-01	
TL-210	799.60	45.	-9.	-0.005	107.03	-4.705E-01	
CS-134	801.95	27.	10.	0.005	83.07	5.485E+00	
CO-58	810.78	57.	-14.	-0.008	83.24	-6.866E-01	
La-140	815.77	71.	-11.	-0.006	116.36	-2.301E+00	
Cs-136	818.50	73.	12.	0.007	101.38	6.305E-01	
MN-54	834.85	33.	-8.	-0.004	162.22	-3.942E-01	
Co-56	846.77	15.	7.	0.004	127.38	3.638E-01	
NB-94	871.10	10.	3.	0.002	159.86	1.592E-01	
EU-154	873.23	10.	4.	0.002	107.73	1.947E+00	
PA-234	880.53	0.	30.	0.017	18.26	2.671E+01	
Sc-46	889.28	52.	-8.	-0.005	129.00	-4.405E-01	
Y-88	898.04	10.	8.	0.005	91.43	4.757E-01	
AG-110M	937.49	40.	-17.	-0.009	86.28	-2.733E+00	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-234	946.02	15.	-3.	-0.002	289.64	-1.260E+00	
EU-152	964.11	87.	-10.	-0.006	130.16	-4.075E+00	
EU-154	996.33	20.	9.	0.005	81.09	4.774E+00	
PA-234M	1001.00	29.	9.	0.005	94.06	6.081E+01	
EU-154	1004.77	28.	6.	0.003	127.87	2.007E+00	
Co-56	1037.84	21.	-9.	-0.005	117.15	-3.977E+00	
Cs-136	1048.07	6.	6.	0.003	75.56	4.295E-01	
BI-207	1063.66	16.	-2.	-0.001	460.07	-1.646E-01	
Ga-68	1077.40	16.	-1.	-0.001	914.69	-2.201E+00	
FE-59	1099.25	27.	-14.	-0.008	85.66	-1.601E+00	
EU-152	1112.07	83.	-12.	-0.007	111.31	-5.564E+00	
CO-60	1173.24	5.	7.	0.004	87.76	4.399E-01	
Co-56	1238.28	11.	20.	0.011	46.04	2.044E+00	
NA-22	1274.53	12.	3.	0.002	154.92	2.341E-01	
EU-154	1274.54	9.	5.	0.003	95.92	9.974E-01	
FE-59	1291.60	11.	-1.	-0.001	598.44	-2.189E-01	
CO-60	1332.50	17.	-6.	-0.003	166.25	-4.360E-01	
AG-110M	1384.30	0.	7.	0.004	37.80	2.157E+00	
EU-152	1408.00	6.	1.	0.001	600.00	3.611E-01	
La-140	1596.21	18.	-5.	-0.003	209.76	-4.401E-01	
SB-124	1690.98	6.	-2.	-0.001	275.72	-4.304E-01	

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	9.7299E-01	9.7300E-01	3.636E+02%	1.24E+01
NA-22	#A	2.3414E-01	2.3414E-01	1.549E+02%	1.31E+00
K-40	#	1.0762E+02	1.0762E+02	8.248E+00%	5.40E+00
Sc-46	#A	-4.4051E-01	-4.4051E-01	1.290E+02%	1.95E+00
CR-51	#A	-3.4290E+00	-3.4291E+00	2.217E+02%	2.55E+01
MN-54	#A	-3.9416E-01	-3.9416E-01	1.622E+02%	1.51E+00
FE-59	#A	-1.6009E+00	-1.6009E+00	8.566E+01%	2.98E+00
Co-56	#A	1.0325E+00	1.0325E+00	4.604E+01%	1.08E+00
CO-57	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.03E+00
CO-58	#A	-6.8659E-01	-6.8659E-01	8.324E+01%	1.92E+00
CO-60	#A	1.7874E-03	1.7874E-03	8.776E+01%	1.59E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.27E+00
NB-94	#A	2.8667E-01	2.8667E-01	9.282E+01%	9.34E-01
ZR-95	#A	1.1723E-01	1.1723E-01	6.928E+02%	2.01E+00
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.48E+00
RU-103	#A	-3.8680E-01	-3.8681E-01	1.217E+02%	1.19E+00
RH-106	#A	5.4513E+00	5.4513E+00	1.438E+02%	2.65E+01
AG-108M	#	8.4162E-01	8.4162E-01	3.486E+01%	6.61E-01
AG-110M	#A	5.4030E-01	5.4030E-01	3.780E+01%	2.08E+00

SN-113 #A	5.7198E-01	5.7198E-01	1.120E+02%		2.17E+00
SB-124 #A	-9.0966E-02	-9.0966E-02	8.119E+01%		3.42E+00
SB-125 #A	7.8844E-01	7.8844E-01	6.404E+01%		3.25E+00
I-131 #A	3.3987E-02	3.3989E-02	1.112E+03%		9.88E-01
Gd-153 #A	-1.1733E-01	-1.1733E-01	1.033E+03%		4.12E+00
Ga-68 #A	-2.1776E+00	-2.2008E+00	9.147E+02%		4.70E+01
Tc-99m #A	-3.7220E-01	-3.7294E-01	1.655E+02%		2.06E+00
BA-133 A	-2.0095E-01	-2.0095E-01	1.346E+02%		3.24E+00
CS-134 #A	1.0506E+00	1.0506E+00	8.178E+01%		1.52E+00
CS-137 #A	5.1573E-01	5.1573E-01	8.433E+01%		1.47E+00
CE-139 #A	3.0858E-01	3.0858E-01	1.063E+02%		1.10E+00
Ba-140 #A	1.5506E+00	1.5507E+00	1.571E+02%		4.04E+00
La-140 #A	4.7722E-02	4.7724E-02	5.888E+01%		1.98E+00
CE-141 #A	-6.6827E-02	-6.6828E-02	1.703E+03%		3.83E+00
CE-144 #A	-2.8545E+00	-2.8545E+00	1.578E+02%		1.51E+01
PM-144 #A	-3.0366E-01	-3.0366E-01	1.859E+02%		1.34E+00
EU-152 #A	8.3497E-01	8.3497E-01	1.038E+02%		2.91E+00
EU-154 #A	1.1642E+00	1.1642E+00	6.515E+01%		2.03E+00
EU-155 #A	-1.3906E+00	-1.3906E+00	1.020E+02%		4.75E+00
HF-181 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.67E+00
Ta-182 #A	1.5726E+00	1.5726E+00	1.341E+02%		7.22E+00
Hg-203 #A	3.1522E-01	3.1522E-01	9.321E+01%		9.93E-01
TL-208	4.8573E+00	4.8573E+00	1.226E+01%		9.24E-01
PM-146 #A	3.7544E-01	3.7544E-01	1.464E+02%		1.29E+00
Y-88 #A	2.4741E-01	2.4741E-01	9.143E+01%		1.41E+00
Cd-113m#A	-4.1688E+03	-4.1688E+03	1.142E+02%		1.61E+04
Cd-109 #A	5.2104E+00	5.2104E+00	2.341E+02%		4.10E+01
Cf-251 #A	4.9476E-01	4.9476E-01	3.314E+02%		4.31E+00
Cf-249 #A	2.5202E-01	2.5202E-01	1.269E+02%		2.28E+00
Sn-126 #A	2.9901E+00	2.9901E+00	1.580E+02%		1.59E+01
PB-210 A	2.7021E+01	2.7021E+01	4.758E+01%		3.45E+01
PB-212	1.1010E+01	1.1010E+01	8.039E+00%		1.82E+00
PB-214	9.5577E+00	9.5577E+00	1.090E+01%		2.29E+00
BI-207 #A	1.3220E-01	1.3220E-01	9.230E+01%		1.76E+00
BI-212 #A	-8.5932E+00	-8.5932E+00	8.603E+01%		2.48E+01
U-235 #A	-3.7091E+00	-3.7091E+00	7.997E+01%		1.68E+01
BI-214	1.0611E+01	1.0611E+01	1.147E+01%		1.92E+00
BI-210M#A	5.6736E-01	5.6736E-01	9.394E+01%		2.12E+00
AC-228	9.8136E+00	9.8136E+00	1.672E+01%		3.50E+00
TH-227 #A	4.1450E+00	4.1450E+00	8.757E+01%		9.83E+00
TH-229 #A	6.2493E+00	6.2493E+00	1.061E+02%		1.71E+01
TH-234 #A	-1.3994E+01	-1.3994E+01	4.059E+01%		3.03E+01
PA-231 #A	1.0389E+01	1.0389E+01	1.592E+02%		7.46E+01
PA-233 #A	6.5470E-01	6.5470E-01	2.254E+02%		6.43E+00
PA-234 #A	1.4954E+00	1.4954E+00	1.212E+02%		6.08E+00
PA-234M#A	9.1124E+01	9.1124E+01	5.942E+01%		1.95E+02
AM-241 #A	-1.1668E+00	-1.1668E+00	1.373E+02%		5.36E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.25E+01
Ir-192 #A	2.6192E-01	2.6192E-01	1.006E+02%		2.69E+00

Cs-136	#A	5.4115E-01	5.4117E-01	6.322E+01%	2.16E+00
Np-239	#A	-1.2989E+00	-1.2992E+00	1.114E+02%	4.85E+00
Nd-147	#A	9.6876E-02	9.6880E-02	2.613E+02%	6.28E+00
TL-210	#A	-4.7051E-01	-4.7051E-01	1.070E+02%	1.72E+00
Kr-85	#A	5.5898E+01	5.5898E+01	2.139E+02%	4.10E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.1 keV) 1.805E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 1.8048639E+02 Bq/Sample

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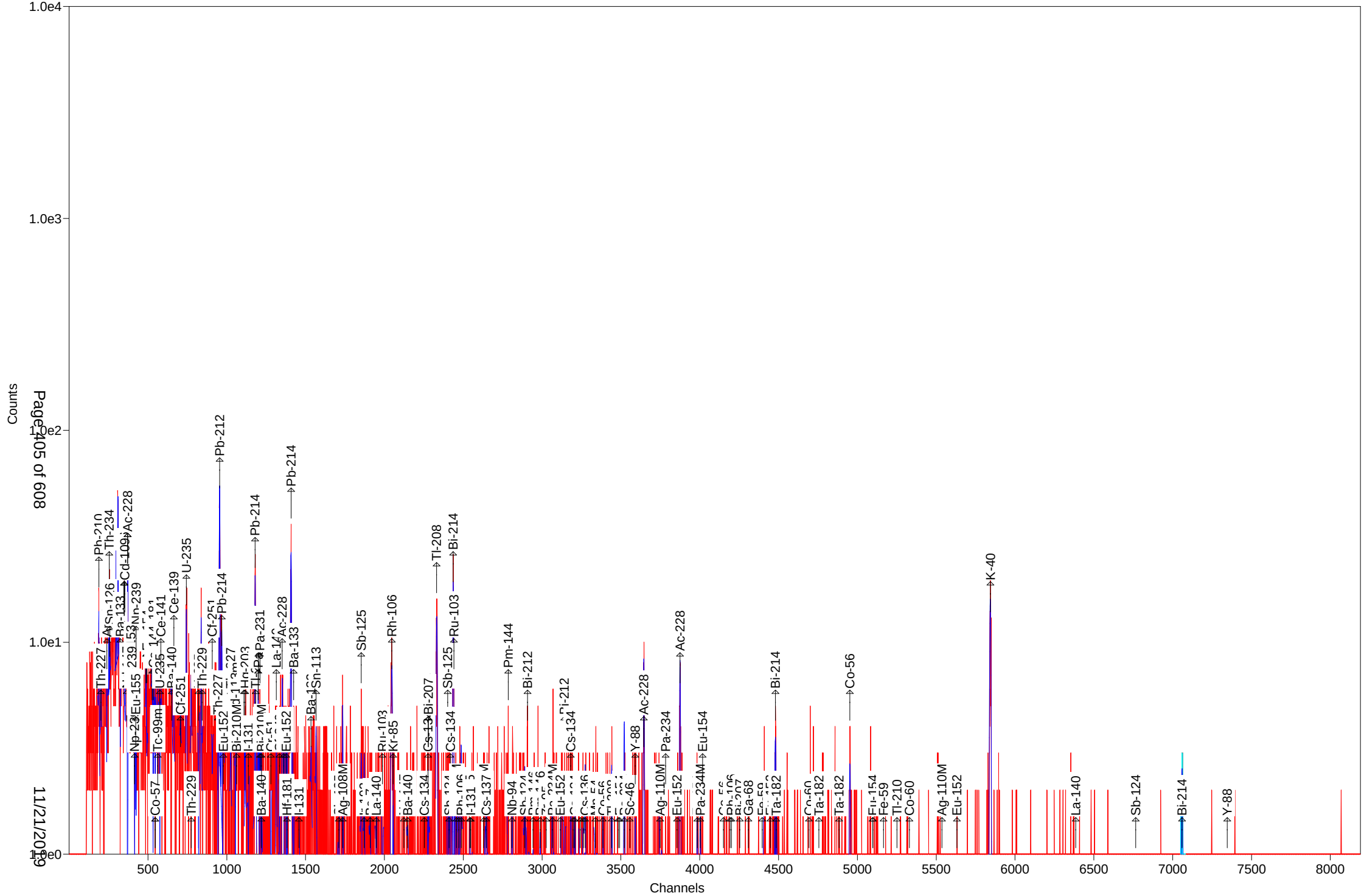
445369_Gamma_180-96595-A-7-B. 12_Gamma_20192917.spc.



Test America St. Louis Spectrum ID: 8_Gamma_20191810

Sample Description: 445369_Gamma_180-96595-A-8-B
Detector: Detector # 8
Batch ID: 445369
Work Order Number: Gamma
Lot Number: 180-96595-A-8-B

Decay to Time: 10/31/2019 03:53 Live Time: 1800 sec
Acquisition Time: 10/31/2019 03:54:02 Real Time: 1844 sec
Analysis Time: 10/31/2019 04:25 Dead Time: 2.36 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 8_Soil_TunaCan.Clb
Efficiency Cal Desc: 8_Soil_TunaCan_90099_032712
Efficiency Cal Date: 3/28/2012 10:35
Energy Cal Date: 2/28/2012 10:34
Library: Client_Long_Rev15.lib
Bkgd Correction File: 8_2019-10-06_1931.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
BE-7	3.387E+00	102.2	3.463E+00	3.467E+00	1.176E+01
NA-22	1.041E+00	27.7	2.888E-01	2.935E-01	5.904E-01
K-40	2.160E+02	6.3	1.368E+01	1.759E+01	9.370E+00
Sc-46	3.281E-01	139.2	4.566E-01	4.569E-01	1.593E+00
CR-51	-4.068E+00	181.8	7.397E+00	7.401E+00	2.484E+01
MN-54	4.306E-01	91.4	3.936E-01	3.942E-01	9.460E-01
FE-59	1.842E+00	26.2	4.821E-01	4.908E-01	1.638E+00
Co-56	8.294E-02	453.7	3.763E-01	3.763E-01	1.295E+00
CO-57	2.914E-01	92.9	2.707E-01	2.711E-01	9.061E-01
CO-58	2.958E-01	92.7	2.741E-01	2.745E-01	9.484E-01
CO-60	-7.552E-01	45.4	3.426E-01	3.446E-01	1.963E+00
ZN-65	-1.898E+00	50.9	9.667E-01	9.714E-01	6.243E+00
NB-94	-2.161E-01	238.9	5.162E-01	5.163E-01	1.359E+00
ZR-95	-1.258E-01	773.4	9.731E-01	9.731E-01	2.380E+00
NB-95	0.000E+00	1.#INF	1.471E-01	1.471E-01	1.629E+00
RU-103	-8.181E-02	571.2	4.673E-01	4.673E-01	1.272E+00
RH-106	4.890E+00	148.8	7.278E+00	7.282E+00	2.468E+01
AG-108M	4.738E-01	65.0	3.079E-01	3.089E-01	8.848E-01
AG-110M	9.947E-01	50.1	4.985E-01	5.011E-01	1.977E+00
SN-113	1.088E-01	640.5	6.967E-01	6.968E-01	2.411E+00
SB-124	4.529E-01	81.3	3.684E-01	3.692E-01	2.835E+00
SB-125	1.445E+00	88.6	1.281E+00	1.283E+00	2.559E+00
I-131	5.288E-01	101.0	5.340E-01	5.347E-01	8.242E-01
Gd-153	-1.351E+00	165.3	2.234E+00	2.235E+00	7.437E+00
Ga-68	-2.473E+00	988.3	2.444E+01	2.444E+01	5.824E+01
Tc-99m	0.000E+00	1.#INF	1.150E-01	1.151E-01	1.589E+00
BA-133	-6.421E-01	152.1	9.769E-01	9.775E-01	3.291E+00
CS-134	5.778E-01	123.0	7.109E-01	7.115E-01	2.111E+00
CS-137	3.153E-01	178.1	5.616E-01	5.618E-01	1.940E+00
CE-139	3.379E-01	100.0	3.378E-01	3.394E-01	1.133E+00
Ba-140	8.463E-01	183.3	1.552E+00	1.552E+00	3.872E+00
La-140	3.859E-01	105.4	4.067E-01	4.073E-01	1.409E+00
CE-141	-7.555E-01	138.4	1.046E+00	1.047E+00	3.491E+00

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CE-144	0.000E+00	1.#INF	1.684E+00	1.684E+00	1.212E+01
PM-144	3.725E-01	112.5	4.192E-01	4.196E-01	1.107E+00
EU-152	1.486E+00	93.3	1.387E+00	1.389E+00	3.254E+00
EU-154	5.009E-01	119.9	6.004E-01	6.010E-01	2.022E+00
EU-155	1.857E+00	169.9	3.155E+00	3.156E+00	1.050E+01
HF-181	7.708E-01	96.1	7.405E-01	7.415E-01	1.690E+00
Ta-182	2.780E+00	99.1	2.755E+00	2.759E+00	9.288E+00
Hg-203	-4.500E-01	104.9	4.718E-01	4.725E-01	1.586E+00
TL-208	3.881E+00	13.3	5.168E-01	5.546E-01	8.457E-01
PM-146	-8.272E-01	63.2	5.229E-01	5.247E-01	1.886E+00
Y-88	0.000E+00	1.#INF	1.570E-01	1.570E-01	8.180E-01
Cd-113m	-5.107E+03	96.4	4.921E+03	4.932E+03	1.657E+04
Cd-109	-1.100E+01	165.4	1.819E+01	1.820E+01	6.055E+01
Cf-251	-1.921E+00	97.4	1.871E+00	1.879E+00	4.795E+00
Cf-249	5.958E-01	106.1	6.322E-01	6.330E-01	2.134E+00
Sn-126	1.456E+00	343.2	4.999E+00	4.999E+00	1.688E+01
PB-210	3.240E+01	35.0	1.133E+01	1.149E+01	2.650E+01
PB-212	1.397E+01	6.4	8.971E-01	1.274E+00	1.397E+00
PB-214	1.144E+01	8.2	9.421E-01	1.114E+00	2.037E+00
BI-207	-1.300E+00	48.3	6.276E-01	6.310E-01	2.790E+00
BI-212	4.857E+00	98.9	4.802E+00	4.808E+00	1.647E+01
U-235	-4.251E+00	58.4	2.481E+00	2.491E+00	1.559E+01
BI-214	4.633E+00	21.3	9.878E-01	1.017E+00	4.526E+00
BI-210M	5.295E-01	97.3	5.151E-01	5.161E-01	1.739E+00
AC-228	1.916E+01	8.5	1.619E+00	1.892E+00	1.527E+00
TH-227	-1.834E+00	256.0	4.696E+00	4.698E+00	1.186E+01
TH-229	2.746E+00	217.7	5.979E+00	5.983E+00	1.852E+01
TH-234	1.091E+01	40.5	4.418E+00	4.460E+00	1.481E+01
PA-231	0.000E+00	1.#INF	5.220E+00	5.220E+00	7.789E+01
PA-233	0.000E+00	1.#INF	3.926E-01	3.926E-01	6.383E+00
PA-234	2.117E+00	84.5	1.788E+00	1.791E+00	7.300E+00
PA-234M	-7.652E+01	68.8	5.263E+01	5.278E+01	3.215E+02
AM-241	-3.624E-01	431.0	1.562E+00	1.562E+00	5.310E+00
Np-237	-2.802E+00	175.4	4.913E+00	4.915E+00	1.638E+01
Ir-192	0.000E+00	1.#INF	7.111E-02	7.111E-02	2.670E+00
Cs-136	2.256E-01	100.0	2.256E-01	2.260E-01	9.900E-01
Np-239	-1.800E+00	168.4	3.032E+00	3.034E+00	1.009E+01
Nd-147	-3.931E+00	104.4	4.106E+00	4.112E+00	9.844E+00
TL-210	5.167E-01	93.3	4.819E-01	4.828E-01	1.636E+00
Kr-85	0.000E+00	1.#INF	4.252E+01	4.252E+01	4.300E+02
Total	3.523E+02				

Analyst: Justin Banner

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Sample description
445369_Gamma_180-96595-A-8-B

Spectrum Filename: C:\User\SPC\Det8\8_Gamma_20191810.An1

Acquisition information
Start time: 10/31/2019 3:54:02 AM
Live time: 1800
Real time: 1844
Dead time: 2.36 %
Detector ID: 8

Detector system
Ge 8 SN/174

Calibration
Filename: 8_Soil_TunaCan.Clb
8_Soil_TunaCan_90099_032712

Energy Calibration
Created: 2/28/2012 10:34:41 AM
Zero offset: 0.052 keV
Gain: 0.250 keV/channel
Quadratic: 5.282E-10 keV/channel^2

Efficiency Calibration
Created: 3/28/2012 10:35:20 AM
Knee Energy: 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.39 %
Log(Eff): -1.098764E-01 + (-4.958544E-01*Log(E)) + (-2.572270E-02*Log(E)^2)
Below the Knee: Quadratic Uncertainty = 1.71 %
Log(Eff): -2.525301E+01 + (9.398253E+00*Log(E)) + (-1.000034E+00*Log(E)^2)

Library Files
Main analysis library: Client_Long_Rev15.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.55keV)
Stop channel: 8000 (1999.97keV)
Peak rejection level: 1000.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method: Reg. Guide 4.16 Method

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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3
Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/31/2019 3:53:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2019-10-06_1931.PBC 10/6/2019 7:31:35 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1364

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
46.94	50.	34.97	2.17	2.005E-02	46.54	4.250	3.240E+01	PB210
59.54	-7.	431.04	1.02	2.881E-02	59.54	35.900	PBC<MDA	AM241
63.35	30.	61.53	0.80	3.097E-02	63.29	3.810	PBC<MDA	TH234
					64.28	9.700	5.483E+00	Sn126
74.78	153.	12.80	1.03	3.615E-02				
77.09	213.	9.93	1.04	3.697E-02				
92.86	119.	15.56	1.06	4.076E-02	92.59	5.584	1.744E+01	TH234
					93.35	5.561	2.920E+01	AC228
105.31	30.	169.89	1.06	4.185E-02	105.31	21.200	PBC<MDA	EU155
122.06	19.	92.89	1.07	4.146E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.914E-01	CO57
123.10	15.	119.86	1.07	4.138E-02	123.10	40.790	PBC<MDA	EU154
125.60	13.	53.85	0.46	4.117E-02				
131.29	14.	206.52	1.08	4.061E-02	131.29	18.000	PBC<MDA	PA234
163.38	18.	106.81	1.10	3.580E-02	163.38	5.080	PBC<MDA	U235
165.85	18.	99.99	1.10	3.629E-02	165.85	79.900	PBC<MDA	CE139
185.54	48.	38.66	0.43	3.332E-02	185.72	54.000	PBC<MDA	U235
193.79	8.	217.72	1.13	3.226E-02	193.51	4.400	PBC<MDA	TH229
211.04	3.	544.78	1.14	3.020E-02	210.85	2.990	PBC<MDA	TH229
227.00	6.	294.71	1.15	2.853E-02	227.00	6.300	PBC<MDA	Cf251
238.65	281.	7.39	0.85	2.744E-02	238.63	43.300	1.315E+01	PB212
242.03	50.	23.82	1.16	2.714E-02	242.00	7.430	1.386E+01	PB214

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
244.69	10.	309.38	1.16	2.691E-02	244.69	7.580	PBC<MDA	EU152
265.83	12.	97.29	1.18	2.523E-02	265.83	50.000	PBC<MDA	BI210M
277.08	43.	26.70	1.69	2.440E-02	277.28	6.310	1.541E+01	TL208
295.25	111.	14.71	1.03	2.323E-02	295.09	19.300	1.379E+01	PB214
					296.00	79.000	3.376E+00	TL210
300.15	31.	28.12	1.20	2.294E-02	300.03	3.280	2.304E+01	PB212
					300.07	2.460	3.073E+01	PA231
					300.18	6.200	PBC<MDA	PA233
328.76	6.	384.61	1.23	2.133E-02	328.76	20.300	PBC<MDA	La140
338.16	65.	17.29	1.13	2.085E-02	338.32	12.010	1.449E+01	AC228
345.83	14.	158.30	1.24	2.049E-02	345.83	15.070	PBC<MDA	HF181
351.89	150.	10.97	1.08	2.021E-02	351.93	37.600	1.096E+01	PB214
364.48	8.	109.53	1.25	1.965E-02	364.48	81.700	PBC<MDA	I131
383.84	12.	104.55	1.27	1.885E-02	383.84	8.940	PBC<MDA	BA133
387.95	13.	106.11	1.27	1.869E-02	387.95	66.000	PBC<MDA	Cf249
391.69	2.	640.54	1.27	1.855E-02	391.69	64.000	PBC<MDA	SN113
427.88	6.	151.54	1.30	1.728E-02	427.88	29.600	PBC<MDA	SB125
433.94	10.	103.72	1.30	1.708E-02	433.94	90.480	PBC<MDA	AG108M
463.37	11.	91.99	1.32	1.620E-02	463.37	10.470	PBC<MDA	SB125
477.60	10.	102.24	1.33	1.580E-02	477.60	10.520	PBC<MDA	BE7
482.00	10.	108.90	1.34	1.569E-02	482.00	80.500	PBC<MDA	HF181
487.02	9.	128.05	1.34	1.555E-02	487.02	45.500	PBC<MDA	La140
511.86	65.	17.95	2.61	1.494E-02	511.86	20.000	1.212E+01	RH106
537.26	5.	183.34	1.37	1.436E-02	537.26	24.390	PBC<MDA	Ba140
563.24	5.	217.79	1.39	1.381E-02	563.24	8.350	PBC<MDA	CS134
569.32	3.	247.21	1.40	1.369E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.485E+00	PA234
					569.70	97.740	PBC<MDA	BI207
583.27	79.	13.32	1.74	1.342E-02	583.02	84.500	3.881E+00	TL208
609.23	94.	13.29	0.88	1.295E-02	609.31	46.090	8.784E+00	BI214
					610.30	5.750	7.051E+01	RU103
614.28	11.	133.82	1.43	1.286E-02	614.28	89.850	PBC<MDA	AG108M
618.06	11.	138.70	1.43	1.279E-02	618.06	99.100	PBC<MDA	PM144
622.02	11.	148.82	1.43	1.273E-02	621.92	9.930	PBC<MDA	RH106
636.97	5.	169.65	1.44	1.248E-02	636.97	7.170	PBC<MDA	I131
661.66	6.	178.12	1.46	1.209E-02	661.66	85.210	PBC<MDA	CS137
696.54	5.	177.22	1.48	1.158E-02	696.54	99.000	PBC<MDA	PM144
722.79	10.	81.35	1.50	1.123E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	5.670E-01	AG108M
					723.36	20.220	2.548E+00	EU154
722.94	10.	96.72	1.50	1.123E-02	722.79	10.810	4.539E+00	SB124
					722.94	90.840	5.402E-01	AG108M
					723.36	20.220	2.428E+00	EU154
727.17	7.	98.86	1.50	1.118E-02	727.17	7.550	PBC<MDA	BI212
766.41	9.	92.32	1.53	1.070E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	8.	93.34	1.53	1.055E-02	778.92	12.940	PBC<MDA	EU152
795.87	6.	166.35	1.54	1.036E-02	795.87	85.530	PBC<MDA	CS134

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
799.60	10.	93.26	1.55	1.032E-02	799.60	98.960	PBC<MDA	TL210
810.78	5.	92.68	1.55	1.020E-02	810.78	99.460	PBC<MDA	CO58
815.77	5.	105.39	1.56	1.015E-02	815.77	23.280	PBC<MDA	La140
834.85	8.	91.40	1.57	9.955E-03	834.85	99.980	PBC<MDA	MN54
859.90	35.	17.10	2.60	9.703E-03	860.56	12.420	1.633E+01	TL208
880.53	6.	91.67	1.60	9.517E-03	880.53	6.000	PBC<MDA	PA234
883.24	6.	111.20	1.60	9.493E-03	883.24	9.600	PBC<MDA	PA234
884.68	6.	126.28	1.60	9.480E-03	884.68	72.680	PBC<MDA	AG110M
889.28	6.	139.17	1.60	9.438E-03	889.28	99.984	PBC<MDA	Sc46
910.75	86.	10.78	1.42	9.247E-03	911.07	29.000	1.782E+01	AC228
937.49	12.	50.12	1.63	9.026E-03	937.49	34.360	PBC<MDA	AG110M
946.02	6.	95.97	1.64	8.957E-03	946.02	13.400	PBC<MDA	PA234
964.11	6.	205.75	1.65	8.814E-03	964.11	14.605	PBC<MDA	EU152
968.88	59.	13.02	1.29	8.776E-03	968.97	17.460	2.139E+01	AC228
1048.07	6.	100.00	1.70	8.209E-03	1048.07	80.000	PBC<MDA	Cs136
1099.25	17.	37.74	1.73	7.881E-03	1099.25	56.500	2.121E+00	FE59
1120.45	13.	106.18	1.74	7.754E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	PBC<MDA	Ta182
1121.30	14.	99.10	1.74	7.748E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	9.700E-01	Sc46
					1121.30	34.900	2.780E+00	Ta182
1238.28	2.	453.70	1.81	7.114E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	13.	27.74	1.83	6.939E-03	1274.53	99.940	1.041E+00	NA22
					1274.54	35.190	2.958E+00	EU154
1291.60	8.	36.26	1.84	6.860E-03	1291.60	43.200	1.478E+00	FE59
1313.00	3.	206.16	1.85	6.763E-03	1313.00	21.000	PBC<MDA	TL210
1408.00	8.	35.36	1.90	6.366E-03	1408.00	21.005	3.324E+00	EU152
1460.74	256.	6.33	1.60	6.165E-03	1460.83	10.670	2.160E+02	K40
1764.25	22.	21.32	2.07	5.226E-03	1764.49	15.400	1.519E+01	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
298.92	74.74	116.	153.	4.239E+03	12.80	1.034	- D
308.17	77.05	117.	213.	5.764E+03	9.93	1.036	- sD
502.23	125.60	18.	13.	3.157E+02	53.85	0.463	- s
742.00	185.54	59.	75.	2.261E+03	22.62	0.426	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: Client_Long_Rev15.lib

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********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	187.58	46.94	66.	50.	0.028	34.97	2.166s
TH-227	200.36	50.14	273.	-21.	-0.012	110.97	1.015s
AM-241	237.95	59.54	426.	-7.	-0.004	431.04	1.022s
TH-234	253.20	63.35	108.	30.	0.017	61.53	0.803
Sn-126	256.93	64.28	373.	8.	0.004	343.24	1.026s
BA-133	323.77	80.99	964.	-32.	-0.018	138.79	1.039
Np-237	345.77	86.49	1039.	-26.	-0.015	175.35	1.043s
EU-155	345.98	86.54	1013.	-26.	-0.015	173.16	1.043s
Sn-126	347.57	86.94	986.	-12.	-0.007	356.63	1.044s
Cd-109	351.97	88.04	1211.	-30.	-0.017	165.38	1.044s
Nd-147	364.21	91.10	1181.	-30.	-0.017	162.99	1.047s
TH-234	370.17	92.59	154.	35.	0.020	52.69	1.048D
AC-228	373.21	93.35	1197.	-30.	-0.017	163.81	1.049
Gd-153	389.81	97.50	1227.	-30.	-0.017	165.31	1.052
Np-239	397.81	99.50	1258.	-30.	-0.017	167.06	1.053s
Gd-153	412.62	103.20	1288.	-30.	-0.017	168.57	1.056s
Np-239	414.62	103.70	1318.	-30.	-0.017	170.45	1.057s
EU-155	421.07	105.31	1254.	30.	0.016	169.89	1.058s
Np-239	424.34	106.13	1329.	-31.	-0.017	168.45	1.058s
CO-57	488.06	122.06	140.	19.	0.010	92.89	1.071s
EU-154	492.22	123.10	159.	15.	0.008	119.86	1.072s
PA-234	525.00	131.29	401.	14.	0.008	206.52	1.078s
HF-181	531.92	133.02	415.	0.	0.000	1000.00	1.079s
CE-144	533.98	133.54	415.	0.	0.000	1000.00	1.080s
HF-181	545.02	136.30	415.	0.	0.000	1000.00	1.082s
CO-57	545.72	136.47	415.	0.	0.000	1000.00	1.082s
Tc-99m	561.86	140.51	415.	0.	0.000	1000.00	1.085s
U-235	574.97	143.79	633.	-33.	-0.018	58.36	1.087
CE-141	581.59	145.44	605.	-25.	-0.014	138.43	1.089s
Ba-140	650.47	162.66	293.	-25.	-0.014	97.37	1.102
U-235	653.35	163.38	167.	18.	0.010	106.81	1.102
CE-139	663.24	165.85	147.	18.	0.010	99.99	1.104s
Cf-251	706.23	176.60	106.	-20.	-0.011	97.43	1.112s
U-235	742.71	185.72	219.	-40.	-0.022	53.31	1.119s
TH-229	773.87	193.51	92.	8.	0.005	217.72	1.125s
U-235	821.17	205.33	98.	-10.	-0.005	219.13	1.134s
TH-229	843.24	210.85	80.	3.	0.002	544.78	1.138s
Cf-251	907.84	227.00	80.	6.	0.003	294.71	1.151s
TH-227	943.73	235.97	562.	-18.	-0.010	187.85	1.157s
PB-212	954.37	238.63	34.	299.	0.166	6.42	1.159D
PB-214	967.84	242.00	47.	50.	0.028	23.82	1.162D
EU-152	978.62	244.69	515.	10.	0.006	309.38	1.164s
TH-227	1024.81	256.24	60.	-6.	-0.003	256.04	1.172s
Cd-113m	1054.65	263.70	84.	-14.	-0.008	96.36	1.178s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1063.18	265.83	62.	12.	0.007	97.29	1.179s
TL-208	1108.17	277.08	20.	43.	0.024	26.70	1.687s
Hg-203	1116.66	279.20	133.	-16.	-0.009	104.86	1.189s
I-131	1137.05	284.30	61.	-6.	-0.003	197.51	1.193s
PB-214	1180.22	295.09	25.	100.	0.056	12.28	1.201D
TL-210	1183.86	296.00	394.	-14.	-0.008	195.81	1.202s
PB-212	1199.98	300.03	23.	31.	0.017	28.12	1.205D
PA-231	1200.14	300.07	380.	-13.	-0.007	216.20	1.205s
PA-233	1200.58	300.18	367.	0.	0.000	1000.00	1.205s
PA-231	1210.46	302.65	367.	0.	0.000	1000.00	1.207s
BA-133	1211.27	302.85	367.	0.	0.000	1000.00	1.207s
Ba-140	1219.26	304.85	367.	0.	0.000	1000.00	1.208
BI-210M	1219.45	304.90	367.	0.	0.000	1000.00	1.208
Ir-192	1233.62	308.44	367.	0.	0.000	1000.00	1.211s
PA-233	1247.91	312.01	367.	0.	0.000	1000.00	1.214
Ir-192	1265.82	316.49	367.	0.	0.000	1000.00	1.217s
CR-51	1280.20	320.08	408.	-16.	-0.009	181.83	1.219s
La-140	1314.91	328.76	258.	6.	0.003	384.61	1.226s
Cf-249	1333.63	333.44	264.	0.	0.000	1000.00	1.229s
AC-228	1352.51	338.16	19.	65.	0.036	17.29	1.133
Cs-136	1362.15	340.57	264.	0.	0.000	1000.00	1.234s
EU-152	1377.01	344.29	264.	0.	0.000	1000.00	1.237s
HF-181	1383.19	345.83	225.	14.	0.008	158.30	1.238s
PB-214	1407.44	351.89	29.	150.	0.083	10.97	1.081
BA-133	1423.87	356.00	232.	-14.	-0.008	152.13	1.245s
I-131	1457.81	364.48	21.	8.	0.005	109.53	1.252s
BA-133	1535.24	383.84	77.	12.	0.007	104.55	1.266s
Cf-249	1551.68	387.95	92.	13.	0.007	106.11	1.269s
SN-113	1566.64	391.69	110.	2.	0.001	640.54	1.271s
SB-125	1711.39	427.88	20.	6.	0.003	151.54	1.297s
AG-108M	1735.64	433.94	22.	10.	0.005	103.72	1.301
PM-146	1815.41	453.88	52.	-16.	-0.009	63.22	1.315s
SB-125	1853.36	463.37	48.	11.	0.006	91.99	1.322s
Ir-192	1872.14	468.06	79.	-7.	-0.004	189.66	1.325s
BE-7	1910.28	477.60	49.	10.	0.006	102.24	1.332s
HF-181	1927.89	482.00	59.	10.	0.006	108.90	1.335s
La-140	1947.98	487.02	64.	9.	0.005	128.05	1.339s
RU-103	1988.12	497.05	39.	-2.	-0.001	571.25	1.346s
RH-106	2047.36	511.86	36.	65.	0.036	17.95	2.606
Kr-85	2055.83	513.98	101.	0.	0.000	1000.00	1.357
Nd-147	2123.91	531.00	43.	-13.	-0.007	104.43	1.369s
Ba-140	2148.95	537.26	22.	5.	0.003	183.34	1.373s
CS-134	2252.86	563.24	26.	5.	0.003	217.79	1.391s
CS-134	2277.20	569.32	26.	3.	0.002	247.21	1.395s
PA-234	2277.80	569.47	34.	-4.	-0.002	190.52	1.395s
BI-207	2278.73	569.70	37.	-3.	-0.002	388.24	1.396s
TL-208	2332.99	583.27	10.	79.	0.044	13.32	1.738s
SB-125	2401.92	600.50	188.	-7.	-0.004	144.93	1.416s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2418.76	604.71	181.	0.	0.000	1000.00	1.419s
BI-214	2437.17	609.31	97.	7.	0.004	211.52	1.422s
RU-103	2441.12	610.30	93.	11.	0.006	127.15	1.423s
AG-108M	2457.05	614.28	104.	11.	0.006	133.82	1.426s
PM-144	2472.18	618.06	113.	11.	0.006	138.70	1.428s
RH-106	2487.60	621.92	131.	11.	0.006	148.82	1.431s
SB-125	2543.49	635.89	36.	-10.	-0.006	90.55	1.440s
I-131	2547.83	636.97	36.	5.	0.003	169.65	1.441s
AG-110M	2630.98	657.76	70.	-10.	-0.006	117.22	1.455s
CS-137	2646.58	661.66	51.	6.	0.003	178.12	1.457s
PM-144	2786.11	696.54	19.	5.	0.003	177.22	1.480s
NB-94	2810.46	702.63	28.	-4.	-0.002	238.89	1.484s
SB-124	2891.09	722.79	31.	10.	0.006	81.35	1.497s
AG-108M	2891.70	722.94	41.	10.	0.006	96.72	1.498s
EU-154	2893.39	723.36	51.	0.	0.000	1000.00	1.498s
ZR-95	2896.74	724.20	58.	-13.	-0.007	89.15	1.498s
BI-212	2908.63	727.17	23.	7.	0.004	98.86	1.500s
PM-146	2942.83	735.72	38.	-15.	-0.008	69.94	1.506s
PM-146	2988.59	747.16	28.	-7.	-0.004	147.15	1.513s
ZR-95	3026.87	756.73	23.	-1.	-0.001	773.39	1.519s
AG-110M	3055.73	763.94	31.	-7.	-0.004	121.12	1.524s
NB-95	3063.11	765.79	38.	0.	0.000	1000.00	1.525s
PA-234M	3065.60	766.41	27.	9.	0.005	92.32	1.526s
EU-152	3115.64	778.92	9.	8.	0.004	93.34	1.534s
BI-212	3141.64	785.42	28.	-8.	-0.005	96.02	1.538s
CS-134	3183.44	795.87	44.	6.	0.003	166.35	1.544s
TL-210	3198.36	799.60	34.	10.	0.005	93.26	1.547s
CO-58	3243.06	810.78	10.	5.	0.003	92.68	1.554s
La-140	3263.04	815.77	14.	5.	0.003	105.39	1.557s
Cs-136	3273.97	818.50	11.	0.	0.000	1000.00	1.559s
MN-54	3339.36	834.85	9.	8.	0.004	91.40	1.569s
Co-56	3387.05	846.77	19.	-1.	0.000	982.90	1.577s
TL-208	3439.58	859.90	1.	35.	0.020	17.10	2.604s
NB-94	3484.36	871.10	37.	-5.	-0.003	177.76	1.592s
EU-154	3492.89	873.23	42.	0.	0.000	1000.00	1.593s
PA-234	3522.10	880.53	11.	6.	0.003	91.67	1.598s
PA-234	3532.94	883.24	16.	6.	0.003	111.20	1.599s
AG-110M	3538.71	884.68	22.	6.	0.003	126.28	1.600s
Sc-46	3557.10	889.28	27.	6.	0.003	139.17	1.603s
Y-88	3592.14	898.04	19.	-2.	-0.001	269.85	1.608
AC-228	3642.96	910.75	0.	86.	0.048	10.78	1.417
AG-110M	3749.96	937.49	5.	12.	0.007	50.12	1.633s
PA-234	3784.07	946.02	5.	6.	0.003	95.97	1.638s
EU-152	3856.43	964.11	67.	6.	0.003	205.75	1.649s
AC-228	3875.51	968.88	0.	59.	0.033	13.02	1.287
EU-154	3985.31	996.33	52.	-13.	-0.007	83.77	1.668
PA-234M	4003.99	1001.00	69.	-10.	-0.005	68.78	1.671s
EU-154	4019.10	1004.77	84.	-10.	-0.006	126.88	1.673s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	4151.36	1037.84	25.	-8.	-0.004	84.40	1.693s
Cs-136	4192.29	1048.07	15.	6.	0.003	100.00	1.698s
RH-106	4201.45	1050.36	32.	-4.	-0.002	206.16	1.700s
BI-207	4254.65	1063.66	35.	-14.	-0.008	48.29	1.708s
Ga-68	4309.61	1077.40	20.	-1.	-0.001	988.26	1.716s
FE-59	4397.02	1099.25	5.	17.	0.009	37.74	1.728s
EU-152	4448.32	1112.07	93.	-13.	-0.007	104.60	1.736s
ZN-65	4462.20	1115.55	79.	-13.	-0.007	50.93	1.738
BI-214	4481.17	1120.29	87.	13.	0.007	106.18	1.740s
Sc-46	4482.22	1120.55	107.	-14.	-0.008	107.47	1.740s
Ta-182	4485.22	1121.30	83.	14.	0.008	99.10	1.741s
CO-60	4692.97	1173.24	37.	-13.	-0.007	105.16	1.770s
Ta-182	4756.23	1189.05	25.	-8.	-0.004	141.88	1.779s
Ta-182	4885.67	1221.41	32.	-6.	-0.003	218.16	1.797s
Co-56	4953.16	1238.28	22.	2.	0.001	453.70	1.806s
NA-22	5098.16	1274.53	0.	13.	0.007	27.74	1.826s
EU-154	5098.20	1274.54	13.	0.	0.000	1000.00	1.826s
FE-59	5166.43	1291.60	0.	8.	0.004	36.26	1.835s
TL-210	5252.05	1313.00	5.	3.	0.001	206.16	1.847s
CO-60	5330.06	1332.50	20.	-9.	-0.005	45.36	1.857s
AG-110M	5537.25	1384.30	16.	-10.	-0.006	96.26	1.884s
EU-152	5632.07	1408.00	0.	8.	0.004	35.36	1.896s
K-40	5843.03	1460.74	3.	256.	0.142	6.33	1.597
La-140	6384.93	1596.21	6.	-1.	0.000	846.32	1.990s
BI-214	7058.07	1764.49	0.	22.	0.012	21.32	2.067s
Co-56	7085.51	1771.35	32.	-7.	-0.004	117.79	2.070s
Y-88	7344.36	1836.06	0.	0.	0.000	1000.00	2.098s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	3.3872E+00				5.31E+01	
			477.60	3.387E+00	&(P	1.176E+01 1.02E+02 1.05E+01 G	
NA-22	C	1.0414E+00				9.50E+02	
			1274.53	1.041E+00	?(	5.904E-01 2.77E+01 9.99E+01 G	
K-40	N	2.1600E+02				4.66E+11	
			1460.83	2.160E+02	(P	9.370E+00 6.33E+00 1.07E+01 G	

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Sc-46    F   3.2810E-01                                     8.38E+01
                          889.28 3.281E-01 ?(  1.593E+00 1.39E+02 1.00E+02 G
                         1120.55-1.005E+00 +   3.643E+00 1.07E+02 1.00E+02 G

CR-51    F  -4.0682E+00                                     2.77E+01
                          320.08-4.068E+00  (  2.484E+01 1.82E+02 9.94E+00 G

MN-54    C   4.3063E-01                                     3.12E+02
                          834.85 4.306E-01 ?(  9.460E-01 9.14E+01 1.00E+02 G

FE-59    F   1.8423E+00                                     4.45E+01
                         1099.25 2.121E+00 ?(  1.638E+00 3.77E+01 5.65E+01 G
                         1291.60 1.478E+00  (P 1.382E+00 3.63E+01 4.32E+01 G

Co-56    C   8.2940E-02                                     7.73E+01
                          846.77-4.554E-02 ?(P 1.295E+00 9.83E+02 9.99E+01 G
                         1238.28 2.773E-01 ?(P 2.883E+00 4.54E+02 6.61E+01 G
                         1037.84-3.820E+00 + P 1.236E+01 8.44E+01 1.41E+01 G
                         1771.35-4.960E+00 +   2.013E+01 1.18E+02 1.55E+01  A

CO-57    C   2.9140E-01                                     2.72E+02
                          122.06 2.914E-01  (  9.061E-01 9.29E+01 8.56E+01 G
                          136.47 0.000E+00 &   1.270E+01 1.00E+03 1.07E+01 G

CO-58    C   2.9577E-01                                     7.09E+01
                          810.78 2.958E-01 ?(  9.484E-01 9.27E+01 9.95E+01 G

CO-60    F  -7.5517E-01                                     1.93E+03
                         1332.50-7.552E-01 ?(P 1.963E+00 4.54E+01 1.00E+02 G
                         1173.24-9.812E-01 & P 2.322E+00 1.05E+02 9.99E+01 G

ZN-65    F  -1.8984E+00                                     2.44E+02
                         1115.55-1.898E+00 &(P 6.243E+00 5.09E+01 5.06E+01 G

NB-94    I  -2.1608E-01                                     7.41E+06
                          702.63-2.161E-01 ?(P 1.359E+00 2.39E+02 9.79E+01 G
                          871.10-2.895E-01 +   1.798E+00 1.78E+02 9.99E+01 G

ZR-95    I  -1.2582E-01                                     6.40E+01
                          756.73-1.258E-01 ?(  2.380E+00 7.73E+02 5.45E+01 G
                          724.20-1.432E+00 +   4.298E+00 8.92E+01 4.42E+01 G

RU-103   I  -8.1808E-02                                     3.93E+01
                          497.05-8.181E-02 ?(P 1.272E+00 5.71E+02 9.09E+01 G
                          610.30 8.269E+00 ?   3.569E+01 1.27E+02 5.75E+00 GA
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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	4.8901E+00					3.74E+02	
			621.92	4.890E+00	?(	2.468E+01	1.49E+02	9.93E+00 G
			1050.36	-1.739E+01	+	1.264E+02	2.06E+02	1.56E+00 G
			511.86	1.212E+01		5.692E+00	1.80E+01	2.00E+01 GA
AG-108M	C	4.7380E-01					1.53E+05	
			433.94	3.483E-01	?(P	8.848E-01	1.04E+02	9.05E+01 G
			722.94	5.402E-01	&(	1.774E+00	9.67E+01	9.08E+01 G
			614.28	5.330E-01	?(	2.421E+00	1.34E+02	8.98E+01 G
AG-110M	F	9.9467E-01					2.50E+02	
			884.68	4.486E-01	?(	1.977E+00	1.26E+02	7.27E+01 G
			657.76	-5.073E-01	+	2.021E+00	1.17E+02	9.46E+01 G
			937.49	2.150E+00	?(	2.352E+00	5.01E+01	3.44E+01 G
			1384.30	-3.540E+00	+	7.559E+00	9.63E+01	2.43E+01 G
			763.94	-1.589E+00	+	6.646E+00	1.21E+02	2.23E+01 G
SN-113	F	1.0877E-01					1.15E+02	
			391.69	1.088E-01	&(	2.411E+00	6.41E+02	6.40E+01 G
SB-124	F	4.5292E-01					6.02E+01	
			602.73	-2.134E-02	%(P	2.835E+00	2.18E+03	9.83E+01 G
			1690.98	-6.637E-03	% P	1.579E+00	5.23E+04	4.78E+01 G
			722.79	4.764E+00	?(	1.305E+01	8.13E+01	1.08E+01 G
SB-125	I	1.4452E+00					1.01E+03	
			427.88	6.518E-01	&(	2.559E+00	1.52E+02	2.96E+01 G
			600.50	-1.750E+00	+ P	1.583E+01	1.45E+02	1.79E+01 G
			635.89	-3.931E+00	&	1.206E+01	9.06E+01	1.13E+01 G
			463.37	3.688E+00	&(	1.146E+01	9.20E+01	1.05E+01 G
I-131	I	5.2885E-01					8.02E+00	
			364.48	2.937E-01	?(P	8.242E-01	1.10E+02	8.17E+01 G
			284.30	-2.201E+00	+ P	1.477E+01	1.98E+02	6.14E+00 G
			636.97	3.209E+00	&(	1.901E+01	1.70E+02	7.17E+00 G
Gd-153	F	-1.3512E+00					2.42E+02	
			97.50	-1.351E+00	?(	7.437E+00	1.65E+02	3.00E+01 G
			103.20	-1.848E+00	+	1.037E+01	1.69E+02	2.18E+01 G
Ga-68	C	-2.4728E+00					4.71E-02	
			1077.40	-2.473E+00	?(	5.824E+01	9.88E+02	3.30E+00 G
BA-133	F	-6.4215E-01					3.85E+03	
			356.00	-6.421E-01	?(	3.291E+00	1.52E+02	6.20E+01 G
			302.85	0.000E+00	+	1.225E+01	1.00E+03	1.83E+01 G
			383.84	4.079E+00	? P	1.441E+01	1.05E+02	8.94E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			80.99	-1.362E+00	+	6.294E+00	1.39E+02	3.41E+01 GA
CS-134	I	5.7783E-01					7.54E+02	
			795.87	3.656E-01	&(	2.111E+00	1.66E+02	8.55E+01 G
			604.71	0.000E+00	-	2.858E+00	1.00E+03	9.76E+01 G
			569.32	7.916E-01	?(	6.985E+00	2.47E+02	1.54E+01 G
			801.95	-4.139E-01	%	2.228E+01	1.51E+03	8.69E+00 G
			563.24	2.358E+00	?(P	1.278E+01	2.18E+02	8.35E+00 G
CS-137	I	3.1529E-01					1.10E+04	
			661.66	3.153E-01	&(P	1.940E+00	1.78E+02	8.52E+01 G
CE-139	F	3.3786E-01					1.38E+02	
			165.85	3.379E-01	&(	1.133E+00	1.00E+02	7.99E+01 G
Ba-140	I	8.4627E-01					1.28E+01	
			537.26	8.463E-01	?(	3.872E+00	1.83E+02	2.44E+01 G
			162.66	-6.317E+00	+	2.051E+01	9.74E+01	6.22E+00 G
			304.85	0.000E+00	-	5.259E+01	1.00E+03	4.29E+00 G
La-140	I	3.8593E-01					1.28E+01	
			1596.21	-6.804E-02	?(	1.409E+00	8.46E+02	9.54E+01 G
			487.02	7.161E-01	?(P	3.130E+00	1.28E+02	4.55E+01 G
			328.76	7.622E-01	&(P	9.951E+00	3.85E+02	2.03E+01 G
			815.77	1.273E+00	&(	4.673E+00	1.05E+02	2.33E+01 G
CE-141	I	-7.5549E-01					3.25E+01	
			145.44	-7.555E-01	?(	3.491E+00	1.38E+02	4.82E+01 G
PM-144	C	3.7252E-01					3.63E+02	
			696.54	2.583E-01	?(	1.107E+00	1.77E+02	9.90E+01 G
			618.06	4.866E-01	?(	2.290E+00	1.39E+02	9.91E+01 G
EU-152	F	1.4860E+00					4.94E+03	
			121.78	-9.373E-02	&(	3.254E+00	1.01E+03	2.86E+01 G
			344.29	0.000E+00	+	7.995E+00	1.00E+03	2.65E+01 G
			1112.07	-7.041E+00	+	2.484E+01	1.05E+02	1.36E+01 G
			778.92	3.068E+00	?(	6.895E+00	9.33E+01	1.29E+01 G
			964.11	2.474E+00	?(	1.759E+01	2.06E+02	1.46E+01 G
			244.69	2.838E+00	?(	2.953E+01	3.09E+02	7.58E+00 G
			1408.00	3.324E+00	?	3.062E+00	3.54E+01	2.10E+01 GA
EU-154	I	5.0095E-01					3.14E+03	
			123.10	5.009E-01	&(	2.022E+00	1.20E+02	4.08E+01 G
			1274.54	0.000E+00	-	4.439E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	8.809E+00	1.00E+03	2.02E+01 G
			873.23	0.000E+00	-	1.555E+01	1.00E+03	1.23E+01 G
			1004.77	-3.806E+00	+	1.642E+01	1.27E+02	1.80E+01 G

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			996.33	-7.929E+00	+	2.230E+01	8.38E+01	1.06E+01 G
EU-155	I	1.8568E+00					1.81E+03	
			105.31	1.857E+00	*(	1.050E+01	1.70E+02	2.12E+01 G
			86.54	-1.195E+00	+	6.899E+00	1.73E+02	3.07E+01 G
HF-181	F	7.7077E-01					4.24E+01	
			482.00	4.567E-01	?(	1.690E+00	1.09E+02	8.05E+01 G
			133.02	0.000E+00	-	3.100E+00	1.00E+03	4.33E+01 G
			345.83	2.449E+00	?(	1.307E+01	1.58E+02	1.51E+01 G
			136.30	0.000E+00	-	2.318E+01	1.00E+03	5.85E+00 G
Ta-182	F	2.7805E+00					1.14E+02	
			1121.30	2.780E+00	?(	9.288E+00	9.91E+01	3.49E+01 G
			1221.41	-1.715E+00	-	8.309E+00	2.18E+02	2.70E+01 G
			1189.05	-3.724E+00	+	1.211E+01	1.42E+02	1.62E+01 G
Hg-203	F	-4.4999E-01					4.66E+01	
			279.20	-4.500E-01	?(	1.586E+00	1.05E+02	8.15E+01 G
TL-208	N	3.8812E+00					6.98E+02	
			583.02	3.881E+00	(P	8.457E-01	1.33E+01	8.45E+01 G
			277.28	1.541E+01	+ P	8.548E+00	2.67E+01	6.31E+00 G
			860.56	1.633E+01	+ P	3.397E+00	1.71E+01	1.24E+01 G
PM-146	C	-8.2715E-01					2.02E+03	
			453.88	-8.272E-01	?(P	1.886E+00	6.32E+01	6.50E+01 G
			747.16	-1.074E+00	+ P	4.105E+00	1.47E+02	3.40E+01 G
			735.72	-3.362E+00	+ P	7.019E+00	6.99E+01	2.25E+01 G
Cd-113m		-5.1065E+03					5.33E+03	
			263.70	-5.107E+03	?(	1.657E+04	9.64E+01	6.00E-03 K
Cd-109	F	-1.0996E+01					4.53E+02	
			88.04	-1.100E+01	?(	6.055E+01	1.65E+02	3.79E+00 G
Cf-251	T	-1.9206E+00					3.28E+05	
			176.60	-1.921E+00	?(	4.795E+00	9.74E+01	1.70E+01 G
			227.00	1.855E+00	+	1.372E+01	2.95E+02	6.30E+00 GA
Cf-249	T	5.9579E-01					1.28E+05	
			387.95	5.958E-01	?(	2.134E+00	1.06E+02	6.60E+01 G
			333.44	0.000E+00	-	1.332E+01	1.00E+03	1.55E+01 G
Sn-126		1.4563E+00					3.65E+07	
			87.57	1.419E-07	&	5.511E+00	1.16E+09	3.75E+01 GA
			64.28	1.456E+00	?(	1.688E+01	3.43E+02	9.70E+00 G
			86.94	-1.935E+00	+	2.308E+01	3.57E+02	9.04E+00 GA

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-210	N	3.2403E+01					8.14E+03	
			46.54	3.240E+01	*(P	2.650E+01	3.50E+01	4.25E+00 G
PB-212	N	1.3973E+01					6.98E+02	
			238.63	1.397E+01	(P	1.397E+00	6.42E+00	4.33E+01 G
			300.03	2.304E+01	+ P	1.843E+01	2.81E+01	3.28E+00 GA
PB-214	N	1.1442E+01					5.84E+05	
			351.93	1.096E+01	(P	2.037E+00	1.10E+01	3.76E+01 G
			295.09	1.239E+01	(P	3.223E+00	1.23E+01	1.93E+01 G
			242.00	1.386E+01		9.517E+00	2.38E+01	7.43E+00 GA
BI-207	C	-1.2997E+00					1.18E+04	
			1063.66	-1.300E+00	?(P	2.790E+00	4.83E+01	7.45E+01 G
			569.70	-1.172E-01	+ P	1.287E+00	3.88E+02	9.77E+01 G
BI-212	N	4.8568E+00					6.98E+02	
			727.17	4.857E+00	?(	1.647E+01	9.89E+01	7.55E+00 G
			785.42	-3.404E+01	+ P	1.138E+02	9.60E+01	1.28E+00 GA
U-235	N	-4.2514E+00					2.57E+11	
			143.79	-4.251E+00	(P	1.559E+01	5.84E+01	1.10E+01 G
			205.33	-3.551E+00	+ P	1.756E+01	2.19E+02	5.01E+00 G
			163.38	5.358E+00	+ P	1.920E+01	1.07E+02	5.08E+00 G
			185.72	-1.244E+00	+ P	2.216E+00	5.33E+01	5.40E+01 GA
BI-214	N	4.6330E+00					5.84E+05	
			609.31	6.258E-01	?(P	4.526E+00	2.12E+02	4.61E+01 G
			1120.29	6.100E+00	?(P	2.187E+01	1.06E+02	1.51E+01 G
			1764.49	1.519E+01	?(	5.088E+00	2.13E+01	1.54E+01 G
BI-210M	T	5.2949E-01					1.10E+09	
			265.83	5.295E-01	?(P	1.739E+00	9.73E+01	5.00E+01 G
			304.90	0.000E+00	-	8.059E+00	1.00E+03	2.80E+01 G
AC-228	N	1.9160E+01					2.10E+03	
			911.07	1.782E+01	(	1.527E+00	1.08E+01	2.90E+01 G
			968.97	2.139E+01	(	2.672E+00	1.30E+01	1.75E+01 G
			338.32	1.449E+01	-	5.067E+00	1.73E+01	1.20E+01 G
			93.35	-7.356E+00	-	4.012E+01	1.64E+02	5.56E+00 XA
TH-227	N	-1.8342E+00					7.95E+03	
			256.24	-1.834E+00	?(	1.186E+01	2.56E+02	7.00E+00 G
			235.97	-2.936E+00	+	1.847E+01	1.88E+02	1.23E+01 G
			50.14	-6.575E+00	&	2.441E+01	1.11E+02	8.00E+00 G

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-229   N   2.7461E+00                                      2.68E+06
                          193.51 3.261E+00 ?(  1.852E+01 2.18E+02 4.40E+00 G
                          210.85 1.988E+00 ?(  2.731E+01 5.45E+02 2.99E+00 G

TH-234   N   1.0907E+01                                      1.63E+12
                           92.59 8.663E+00  (P 1.481E+01 5.27E+01 5.58E+00 G
                           63.29 1.420E+01  (P 2.409E+01 6.15E+01 3.81E+00 G

PA-234   N   2.1167E+00                                      1.63E+12
                          131.29 1.051E+00 ?(  7.300E+00 2.07E+02 1.80E+01 G
                          946.02 2.636E+00 ?(  6.078E+00 9.60E+01 1.34E+01 G
                          569.47-2.228E+00 +   1.489E+01 1.91E+02 8.20E+00 G
                          883.24 3.390E+00 ?(  1.313E+01 1.11E+02 9.60E+00 G
                          880.53 5.515E+00 ?   1.744E+01 9.17E+01 6.00E+00 GA

PA-234M  N  -7.6524E+01                                      1.63E+12
                         1001.00-7.652E+01 ?(P 3.215E+02 6.88E+01 8.37E-01 G
                          766.41 1.502E+02 + P 4.718E+02 9.23E+01 2.94E-01 G

AM-241   T  -3.6241E-01                                      1.58E+05
                           59.54-3.624E-01 &(P 5.310E+00 4.31E+02 3.59E+01 G

Np-237   F  -2.8016E+00                                      2.14E+06
                           86.49-2.802E+00 &(  1.638E+01 1.75E+02 1.31E+01 G

Cs-136   F   2.2560E-01                                      1.30E+01
                          818.50 0.000E+00 ?(  9.900E-01 1.00E+03 1.00E+02 G
                         1048.07 5.076E-01 ?(  1.756E+00 1.00E+02 8.00E+01 G
                          340.57 0.000E+00 -   4.479E+00 1.00E+03 4.69E+01 G

Np-239   T  -1.7999E+00                                      2.36E+00
                          103.70-1.679E+00 +   9.525E+00 1.70E+02 2.40E+01 X
                          106.13-1.800E+00 &(  1.009E+01 1.68E+02 2.27E+01 G
                           99.50-2.695E+00 +   1.499E+01 1.67E+02 1.50E+01 X

Nd-147      -3.9314E+00                                      1.11E+01
                          531.00-3.931E+00 ?(  9.844E+00 1.04E+02 1.30E+01 G
                           91.10-1.455E+00 +   7.899E+00 1.63E+02 2.83E+01 G

TL-210   N   5.1667E-01                                      5.84E+05
                          799.60 5.167E-01 ?(  1.636E+00 9.33E+01 9.90E+01 G
                          296.00-4.391E-01 -   2.889E+00 1.96E+02 7.90E+01 G
                         1313.00 1.043E+00 ?   5.270E+00 2.06E+02 2.10E+01 GA
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
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! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity	
TH-227	50.14	273.	-21.	-0.012	110.97	-6.575E+00	
AM-241	59.54	426.	-7.	-0.004	431.04	-3.624E-01	P
Sn-126	64.28	373.	8.	0.004	343.24	1.456E+00	
BA-133	80.99	964.	-32.	-0.018	138.79	-1.362E+00	
Np-237	86.49	1039.	-26.	-0.015	175.35	-2.802E+00	
EU-155	86.54	1013.	-26.	-0.015	173.16	-1.195E+00	
Sn-126	86.94	986.	-12.	-0.007	356.63	-1.935E+00	
Cd-109	88.04	1211.	-30.	-0.017	165.38	-1.100E+01	
Nd-147	91.10	1181.	-30.	-0.017	162.99	-1.455E+00	
Gd-153	97.50	1227.	-30.	-0.017	165.31	-1.351E+00	
Np-239	99.50	1258.	-30.	-0.017	167.06	-2.695E+00	
Gd-153	103.20	1288.	-30.	-0.017	168.57	-1.848E+00	
Np-239	103.70	1318.	-30.	-0.017	170.45	-1.679E+00	
EU-155	105.31	1254.	30.	0.016	169.89	1.857E+00	
Np-239	106.13	1329.	-31.	-0.017	168.45	-1.800E+00	
CO-57	122.06	140.	19.	0.010	92.89	2.914E-01	
EU-154	123.10	159.	15.	0.008	119.86	5.009E-01	
PA-234	131.29	401.	14.	0.008	206.52	1.051E+00	
U-235	143.79	633.	-33.	-0.018	58.36	-4.251E+00	P
CE-141	145.44	605.	-25.	-0.014	138.43	-7.555E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ba-140	162.66	293.	-25.	-0.014	97.37	-6.317E+00	
U-235	163.38	167.	18.	0.010	106.81	5.358E+00	P
CE-139	165.85	147.	18.	0.010	99.99	3.379E-01	
Cf-251	176.60	106.	-20.	-0.011	97.43	-1.921E+00	
U-235	185.72	219.	-40.	-0.022	53.31	-1.244E+00	P
U-235	205.33	98.	-10.	-0.005	219.13	-3.551E+00	P
Cf-251	227.00	80.	6.	0.003	294.71	1.855E+00	
TH-227	235.97	562.	-18.	-0.010	187.85	-2.936E+00	
EU-152	244.69	515.	10.	0.006	309.38	2.838E+00	
TH-227	256.24	60.	-6.	-0.003	256.04	-1.834E+00	
Cd-113m	263.70	84.	-14.	-0.008	96.36	-5.107E+03	
BI-210M	265.83	62.	12.	0.007	97.29	5.295E-01	P
Hg-203	279.20	133.	-16.	-0.009	104.86	-4.500E-01	
I-131	284.30	61.	-6.	-0.003	197.51	-2.201E+00	P
TL-210	296.00	394.	-14.	-0.008	195.81	-4.391E-01	
PA-231	300.07	380.	-13.	-0.007	216.20	-1.266E+01	
CR-51	320.08	408.	-16.	-0.009	181.83	-4.068E+00	
La-140	328.76	258.	6.	0.003	384.61	7.622E-01	P
HF-181	345.83	225.	14.	0.008	158.30	2.449E+00	
BA-133	356.00	232.	-14.	-0.008	152.13	-6.421E-01	
I-131	364.48	21.	8.	0.005	109.53	2.937E-01	P
BA-133	383.84	77.	12.	0.007	104.55	4.079E+00	P
Cf-249	387.95	92.	13.	0.007	106.11	5.958E-01	
SN-113	391.69	110.	2.	0.001	640.54	1.088E-01	
SB-125	427.88	20.	6.	0.003	151.54	6.518E-01	
AG-108M	433.94	22.	10.	0.005	103.72	3.483E-01	P
PM-146	453.88	52.	-16.	-0.009	63.22	-8.272E-01	P
SB-125	463.37	48.	11.	0.006	91.99	3.688E+00	
Ir-192	468.06	79.	-7.	-0.004	189.66	-4.516E-01	
BE-7	477.60	49.	10.	0.006	102.24	3.387E+00	P
HF-181	482.00	59.	10.	0.006	108.90	4.567E-01	
La-140	487.02	64.	9.	0.005	128.05	7.161E-01	P
RU-103	497.05	39.	-2.	-0.001	571.25	-8.181E-02	P
Nd-147	531.00	43.	-13.	-0.007	104.43	-3.931E+00	
Ba-140	537.26	22.	5.	0.003	183.34	8.463E-01	
CS-134	563.24	26.	5.	0.003	217.79	2.358E+00	P
CS-134	569.32	26.	3.	0.002	247.21	7.916E-01	
PA-234	569.47	34.	-4.	-0.002	190.52	-2.228E+00	
BI-207	569.70	37.	-3.	-0.002	388.24	-1.172E-01	P
SB-125	600.50	188.	-7.	-0.004	144.93	-1.750E+00	P
RU-103	610.30	93.	11.	0.006	127.15	8.269E+00	
AG-108M	614.28	104.	11.	0.006	133.82	5.330E-01	
PM-144	618.06	113.	11.	0.006	138.70	4.866E-01	
SB-125	635.89	36.	-10.	-0.006	90.55	-3.931E+00	
I-131	636.97	36.	5.	0.003	169.65	3.209E+00	
AG-110M	657.76	70.	-10.	-0.006	117.22	-5.073E-01	
CS-137	661.66	51.	6.	0.003	178.12	3.153E-01	P
PM-144	696.54	19.	5.	0.003	177.22	2.583E-01	

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
NB-94	702.63	28.	-4.	-0.002	238.89	-2.161E-01	P
SB-124	722.79	31.	10.	0.006	81.35	4.764E+00	
AG-108M	722.94	41.	10.	0.006	96.72	5.402E-01	
ZR-95	724.20	58.	-13.	-0.007	89.15	-1.432E+00	
BI-212	727.17	23.	7.	0.004	98.86	4.857E+00	
PM-146	735.72	38.	-15.	-0.008	69.94	-3.362E+00	P
PM-146	747.16	28.	-7.	-0.004	147.15	-1.074E+00	P
ZR-95	756.73	23.	-1.	-0.001	773.39	-1.258E-01	
AG-110M	763.94	31.	-7.	-0.004	121.12	-1.589E+00	
PA-234M	766.41	27.	9.	0.005	92.32	1.502E+02	P
EU-152	778.92	9.	8.	0.004	93.34	3.068E+00	
BI-212	785.42	28.	-8.	-0.005	96.02	-3.404E+01	P
CS-134	795.87	44.	6.	0.003	166.35	3.656E-01	
TL-210	799.60	34.	10.	0.005	93.26	5.167E-01	
CO-58	810.78	10.	5.	0.003	92.68	2.958E-01	
La-140	815.77	14.	5.	0.003	105.39	1.273E+00	
MN-54	834.85	9.	8.	0.004	91.40	4.306E-01	
Co-56	846.77	19.	-1.	0.000	982.90	-4.554E-02	P
NB-94	871.10	37.	-5.	-0.003	177.76	-2.895E-01	
PA-234	880.53	11.	6.	0.003	91.67	5.515E+00	
PA-234	883.24	16.	6.	0.003	111.20	3.390E+00	
AG-110M	884.68	22.	6.	0.003	126.28	4.486E-01	
Sc-46	889.28	27.	6.	0.003	139.17	3.281E-01	
Y-88	898.04	19.	-2.	-0.001	269.85	-1.448E-01	P
AG-110M	937.49	5.	12.	0.007	50.12	2.150E+00	
PA-234	946.02	5.	6.	0.003	95.97	2.636E+00	
EU-152	964.11	67.	6.	0.003	205.75	2.474E+00	
EU-154	996.33	52.	-13.	-0.007	83.77	-7.929E+00	
PA-234M	1001.00	69.	-10.	-0.005	68.78	-7.652E+01	P
EU-154	1004.77	84.	-10.	-0.006	126.88	-3.806E+00	
Co-56	1037.84	25.	-8.	-0.004	84.40	-3.820E+00	P
Cs-136	1048.07	15.	6.	0.003	100.00	5.076E-01	
BI-207	1063.66	35.	-14.	-0.008	48.29	-1.300E+00	P
Ga-68	1077.40	20.	-1.	-0.001	988.26	-2.473E+00	
EU-152	1112.07	93.	-13.	-0.007	104.60	-7.041E+00	
ZN-65	1115.55	79.	-13.	-0.007	50.93	-1.898E+00	P
Sc-46	1120.55	107.	-14.	-0.008	107.47	-1.005E+00	
Ta-182	1121.30	83.	14.	0.008	99.10	2.780E+00	
CO-60	1173.24	37.	-13.	-0.007	105.16	-9.812E-01	P
Ta-182	1189.05	25.	-8.	-0.004	141.88	-3.724E+00	
Ta-182	1221.41	32.	-6.	-0.003	218.16	-1.715E+00	
Co-56	1238.28	22.	2.	0.001	453.70	2.773E-01	P
TL-210	1313.00	5.	3.	0.001	206.16	1.043E+00	
CO-60	1332.50	20.	-9.	-0.005	45.36	-7.552E-01	P
AG-110M	1384.30	16.	-10.	-0.006	96.26	-3.540E+00	
EU-152	1408.00	0.	8.	0.004	35.36	3.324E+00	
La-140	1596.21	6.	-1.	0.000	846.32	-6.804E-02	
Co-56	1771.35	32.	-7.	-0.004	117.79	-4.960E+00	

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	3.3872E+00	3.3872E+00	1.022E+02%	1.18E+01
NA-22	#	1.0414E+00	1.0414E+00	2.774E+01%	5.90E-01
K-40		2.1600E+02	2.1600E+02	6.335E+00%	9.37E+00
Sc-46	#A	3.2810E-01	3.2810E-01	1.392E+02%	1.59E+00
CR-51	#A	-4.0682E+00	-4.0682E+00	1.818E+02%	2.48E+01
MN-54	#A	4.3063E-01	4.3063E-01	9.140E+01%	9.46E-01
FE-59	#	1.8423E+00	1.8423E+00	2.617E+01%	1.64E+00
Co-56	#A	8.2940E-02	8.2940E-02	4.537E+02%	1.30E+00
CO-57	#A	2.9140E-01	2.9140E-01	9.289E+01%	9.06E-01
CO-58	#A	2.9577E-01	2.9577E-01	9.268E+01%	9.48E-01
CO-60	#A	-7.5517E-01	-7.5517E-01	4.536E+01%	1.96E+00
ZN-65	#A	-1.8984E+00	-1.8984E+00	5.093E+01%	6.24E+00
NB-94	#A	-2.1608E-01	-2.1608E-01	2.389E+02%	1.36E+00
ZR-95	#A	-1.2582E-01	-1.2582E-01	7.734E+02%	2.38E+00
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.63E+00
RU-103	#A	-8.1807E-02	-8.1808E-02	5.712E+02%	1.27E+00
RH-106	A	4.8901E+00	4.8901E+00	1.488E+02%	2.47E+01
AG-108M	#A	4.7380E-01	4.7380E-01	6.500E+01%	8.85E-01
AG-110M	#A	9.9466E-01	9.9467E-01	5.012E+01%	1.98E+00
SN-113	#A	1.0877E-01	1.0877E-01	6.405E+02%	2.41E+00
SB-124	#A	4.5292E-01	4.5292E-01	8.135E+01%	2.84E+00
SB-125	#A	1.4452E+00	1.4452E+00	8.864E+01%	2.56E+00
I-131	#A	5.2881E-01	5.2885E-01	1.010E+02%	8.24E-01
Gd-153	#A	-1.3512E+00	-1.3512E+00	1.653E+02%	7.44E+00
Ga-68	#A	-2.4468E+00	-2.4728E+00	9.883E+02%	5.82E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.59E+00
BA-133	#A	-6.4215E-01	-6.4215E-01	1.521E+02%	3.29E+00
CS-134	#A	5.7783E-01	5.7783E-01	1.230E+02%	2.11E+00
CS-137	#A	3.1529E-01	3.1529E-01	1.781E+02%	1.94E+00
CE-139	#A	3.3785E-01	3.3786E-01	9.999E+01%	1.13E+00
Ba-140	#A	8.4624E-01	8.4627E-01	1.833E+02%	3.87E+00
La-140	#A	3.8591E-01	3.8593E-01	1.054E+02%	1.41E+00
CE-141	#A	-7.5547E-01	-7.5549E-01	1.384E+02%	3.49E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.21E+01
PM-144	#A	3.7252E-01	3.7252E-01	1.125E+02%	1.11E+00
EU-152	#A	1.4860E+00	1.4860E+00	9.334E+01%	3.25E+00
EU-154	#A	5.0095E-01	5.0095E-01	1.199E+02%	2.02E+00
EU-155	#A	1.8568E+00	1.8568E+00	1.699E+02%	1.05E+01
HF-181	#A	7.7076E-01	7.7077E-01	9.607E+01%	1.69E+00
Ta-182	#A	2.7805E+00	2.7805E+00	9.910E+01%	9.29E+00
Hg-203	#A	-4.4998E-01	-4.4999E-01	1.049E+02%	1.59E+00

TL-208	3.8812E+00	3.8812E+00	1.332E+01%	8.46E-01
PM-146 #A	-8.2715E-01	-8.2715E-01	6.322E+01%	1.89E+00
Y-88 #A	0.0000E+00	0.0000E+00	1.000E+03%	8.18E-01
Cd-113m#A	-5.1065E+03	-5.1065E+03	9.636E+01%	1.66E+04
Cd-109 #A	-1.0996E+01	-1.0996E+01	1.654E+02%	6.06E+01
Cf-251 #A	-1.9206E+00	-1.9206E+00	9.743E+01%	4.79E+00
Cf-249 #A	5.9579E-01	5.9579E-01	1.061E+02%	2.13E+00
Sn-126 #A	1.4563E+00	1.4563E+00	3.432E+02%	1.69E+01
PB-210 #	3.2403E+01	3.2403E+01	3.497E+01%	2.65E+01
PB-212	1.3973E+01	1.3973E+01	6.421E+00%	1.40E+00
PB-214	1.1442E+01	1.1442E+01	8.233E+00%	2.04E+00
BI-207 #A	-1.2997E+00	-1.2997E+00	4.829E+01%	2.79E+00
BI-212 #A	4.8568E+00	4.8568E+00	9.886E+01%	1.65E+01
U-235 #A	-4.2514E+00	-4.2514E+00	5.836E+01%	1.56E+01
BI-214 #C	4.6330E+00	4.6330E+00	2.132E+01%	4.53E+00
BI-210M#A	5.2949E-01	5.2949E-01	9.729E+01%	1.74E+00
AC-228	1.9160E+01	1.9160E+01	8.452E+00%	1.53E+00
TH-227 #A	-1.8342E+00	-1.8342E+00	2.560E+02%	1.19E+01
TH-229 #A	2.7461E+00	2.7461E+00	2.177E+02%	1.85E+01
TH-234 A	1.0907E+01	1.0907E+01	4.050E+01%	1.48E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%	7.79E+01
PA-233 #A	0.0000E+00	0.0000E+00	7.071E+02%	6.38E+00
PA-234 #A	2.1167E+00	2.1167E+00	8.448E+01%	7.30E+00
PA-234M#A	-7.6524E+01	-7.6524E+01	6.878E+01%	3.22E+02
AM-241 #A	-3.6241E-01	-3.6241E-01	4.310E+02%	5.31E+00
Np-237 #A	-2.8016E+00	-2.8016E+00	1.754E+02%	1.64E+01
Ir-192 #A	0.0000E+00	0.0000E+00	7.071E+02%	2.67E+00
Cs-136 #A	2.2559E-01	2.2560E-01	1.000E+02%	9.90E-01
Np-239 #A	-1.7995E+00	-1.7999E+00	1.684E+02%	1.01E+01
Nd-147 #A	-3.9313E+00	-3.9314E+00	1.044E+02%	9.84E+00
TL-210 #A	5.1667E-01	5.1667E-01	9.326E+01%	1.64E+00
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%	4.30E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.5 to 2000.0 keV) 3.078E+02 Bq/Sample
Total Decayed Activity (37.5 to 2000.0 keV) 3.0776837E+02 Bq/Sample

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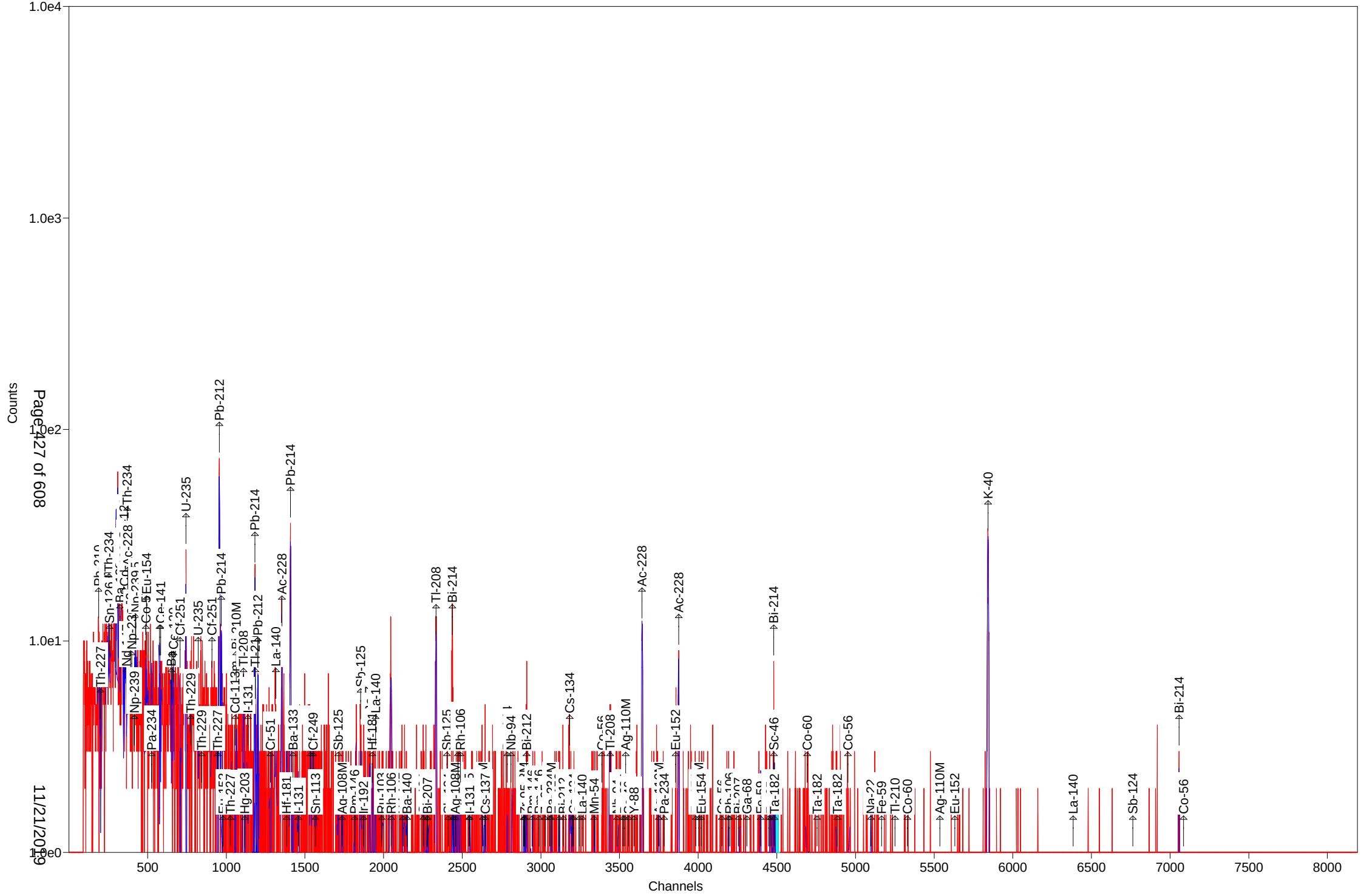
445369_Gamma_180-96595-A-8-B. 8_Gamma_20191810.spc.



Daily Checks

Test America
St. Louis
Quality Control Check

Spectrum: 5_20191030001_QCAsLeft
Description: Quality control Check (QC Source 'A') Post Stabilization
Acquired: 10/30/2019 12:54:18 AM
Detector: Detector # 5
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.59	59.79	60.04	PASS
FWHM	0.74	0.00	0.00	0.79	1.84	1.94	PASS
ActivityDiff	636.60	-5.00	-4.00	1.66	4.00	5.00	PASS
QA-662							
FWHM	1.36	0.00	0.00	1.40	3.06	3.16	PASS
ActivityDiff	596.80	-5.00	-4.00	-1.47	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.60	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.44	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.95	4.10	4.20	PASS
ActivityDiff	1164.20	-5.00	-4.00	-0.04	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 5_20191030002_BG
Description: Background Contamination Check
Acquired: 10/30/2019 1:41:00 AM
Detector: Detector # 5
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.45	1.30	1.35	1.41	1.55	1.60	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 5_20191031001_QCAsLeft
Description: Quality control Check (QC Source 'A') Post Stabilization
Acquired: 10/31/2019 1:07:54 AM
Detector: Detector # 5
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.80	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.58	59.79	60.04	PASS
FWHM	0.74	0.00	0.00	0.78	1.84	1.94	PASS
ActivityDiff	636.60	-5.00	-4.00	4.04	4.00	5.00	High OOT
QA-662							
FWHM	1.36	0.00	0.00	1.37	3.06	3.16	PASS
ActivityDiff	596.80	-5.00	-4.00	1.31	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.60	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.44	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.90	4.10	4.20	PASS
ActivityDiff	1164.20	-5.00	-4.00	-0.03	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 5_20191031002_BG
Description: Background Contamination Check
Acquired: 10/31/2019 1:27:13 AM
Detector: Detector # 5
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.45	1.30	1.35	1.51	1.55	1.60	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 8_20191030001_QCAsLeft
Description: Quality control Check (QC Source 'D') Post Stabilization
Acquired: 10/30/2019 12:46:22 AM
Detector: Detector # 8
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.80	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.52	59.79	60.04	PASS
FWHM	1.10	0.00	0.00	0.91	2.20	2.30	PASS
ActivityDiff	650.60	-5.00	-4.00	0.00	4.00	5.00	PASS
QA-662							
FWHM	1.53	0.00	0.00	1.44	3.23	3.33	PASS
ActivityDiff	609.90	-5.00	-4.00	2.47	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.90	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.48	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.79	4.10	4.20	PASS
ActivityDiff	1189.70	-5.00	-4.00	0.38	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 8_20191030002_BG
Description: Background Contamination Check
Acquired: 10/30/2019 1:09:53 AM
Detector: Detector # 8
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.56	1.39	1.45	1.59	1.68	1.74	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 8_20191031001_QCAsLeft
Description: Quality control Check (QC Source 'D') Post Stabilization
Acquired: 10/31/2019 1:09:11 AM
Detector: Detector # 8
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.80	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.51	59.79	60.04	PASS
FWHM	1.10	0.00	0.00	0.92	2.20	2.30	PASS
ActivityDiff	650.60	-5.00	-4.00	0.07	4.00	5.00	PASS
QA-662							
FWHM	1.53	0.00	0.00	1.42	3.23	3.33	PASS
ActivityDiff	609.90	-5.00	-4.00	1.76	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.80	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.45	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.85	4.10	4.20	PASS
ActivityDiff	1189.70	-5.00	-4.00	0.98	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 8_20191031002_BG
Description: Background Contamination Check
Acquired: 10/31/2019 1:28:15 AM
Detector: Detector # 8
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.56	1.39	1.45	1.58	1.68	1.74	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 9_20191031001_QCAsLeft
Description: Quality control Check (QC Source 'E') Post Stabilization
Acquired: 10/31/2019 1:08:40 AM
Detector: Detector # 9
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.58	59.79	60.04	PASS
FWHM	1.08	0.00	0.00	0.94	2.18	2.28	PASS
ActivityDiff	649.44	-5.00	-4.00	2.05	4.00	5.00	PASS
QA-662							
FWHM	1.62	0.00	0.00	1.50	3.32	3.42	PASS
ActivityDiff	607.56	-5.00	-4.00	1.26	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.80	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.61	1333.01	1333.26	PASS
FWHM	2.12	0.00	0.00	1.91	4.32	4.42	PASS
ActivityDiff	1191.31	-5.00	-4.00	3.10	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 9_20191031002_BG
Description: Background Contamination Check
Acquired: 10/31/2019 1:28:02 AM
Detector: Detector # 9
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.89	1.53	1.65	1.76	2.14	2.26	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 12_20191031001_QCAsLeft
Description: Quality control Check (QC Source 'H') Post Stabilization
Acquired: 10/31/2019 1:29:38 AM
Detector: Detector #12
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	238.00	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.60	59.79	60.04	PASS
FWHM	0.90	0.00	0.00	0.84	2.00	2.10	PASS
ActivityDiff	691.00	-5.00	-4.00	-0.58	4.00	5.00	PASS
QA-662							
FWHM	1.48	0.00	0.00	1.43	3.18	3.28	PASS
ActivityDiff	659.00	-5.00	-4.00	-0.86	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.70	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.65	1333.01	1333.26	PASS
FWHM	2.00	0.00	0.00	2.05	4.20	4.30	PASS
ActivityDiff	1274.00	-5.00	-4.00	0.36	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 12_20191031002_BG
Description: Background Contamination Check
Acquired: 10/31/2019 1:49:57 AM
Detector: Detector #12
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.00	1.89	1.93	1.95	2.07	2.10	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 14_20191031001_BG
Description: Background Contamination Check
Acquired: 10/31/2019 12:48:17 AM
Detector: Detector #14
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.80	1.66	1.71	1.70	1.90	1.94	Low OOT

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 14_20191031002_QCAsLeft
Description: Quality control Check (QC Source 'E') Post Stabilization
Acquired: 10/31/2019 1:48:39 AM
Detector: Detector #14
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.80	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.61	59.79	60.04	PASS
FWHM	0.76	0.00	0.00	0.90	1.86	1.96	PASS
ActivityDiff	671.90	-5.00	-4.00	-1.40	4.00	5.00	PASS
QA-662							
FWHM	1.35	0.00	0.00	1.44	3.05	3.15	PASS
ActivityDiff	628.85	-5.00	-4.00	-0.99	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.20	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.57	1333.01	1333.26	PASS
FWHM	1.91	0.00	0.00	1.92	4.11	4.21	PASS
ActivityDiff	1224.59	-5.00	-4.00	-1.54	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 16_20191031001_BG
Description: Background Contamination Check
Acquired: 10/31/2019 12:41:05 AM
Detector: Detector #16
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.68	2.51	2.56	2.62	2.80	2.86	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 16_20191031002_QCAsLeft
Description: Quality control Check (QC Source 'G') Post Stabilization
Acquired: 10/31/2019 1:47:17 AM
Detector: Detector #16
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.80	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.55	59.79	60.04	PASS
FWHM	0.96	0.00	0.00	1.01	2.06	2.16	PASS
ActivityDiff	602.10	-5.00	-4.00	2.71	4.00	5.00	PASS
QA-662							
FWHM	1.53	0.00	0.00	1.71	3.23	3.33	PASS
ActivityDiff	571.13	-5.00	-4.00	1.54	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.60	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.76	1333.01	1333.26	PASS
FWHM	2.09	0.00	0.00	2.64	4.29	4.39	PASS
ActivityDiff	1139.05	-5.00	-4.00	2.98	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 17_20191031001_BG
Description: Background Contamination Check
Acquired: 10/31/2019 12:49:27 AM
Detector: Detector #17
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.32	2.18	2.23	2.32	2.42	2.46	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 17_20191031002_QCAsLeft
Description: Quality control Check (QC Source 'H') Post Stabilization
Acquired: 10/31/2019 2:12:13 AM
Detector: Detector #17
Quality Control Evaluation Criteria:
1) Notify Supervisor if 'AS FOUND' parameters exceed Tolerance or Control Limits.
2) Place out of service if 'AS LEFT' parameters exceed Tolerance or Control Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-60							
Channel	238.00	236.00	237.00	237.90	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.62	59.79	60.04	PASS
FWHM	0.77	0.00	0.00	1.42	1.87	1.97	PASS
ActivityDiff	691.00	-5.00	-4.00	1.99	4.00	5.00	PASS
QA-662							
FWHM	1.37	0.00	0.00	1.84	3.07	3.17	PASS
ActivityDiff	659.00	-5.00	-4.00	2.51	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.60	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.51	1333.01	1333.26	PASS
FWHM	1.88	0.00	0.00	2.23	4.08	4.18	PASS
ActivityDiff	1274.00	-5.00	-4.00	0.05	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Initial Calibrations

Gamma Verification per Geometry

Detector: Ge5

Geometry: Tunacan

Reference date 1/1/2012

Calibration Standard: 90099

Standard volume g / vial 1550

Standard volume transferred in g / geometry 317.8

lab ID# of cal standard Rad12-0007

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	γ abundance	Bq/sample	Count Results	%recovery
Pb-210	3094	634	0.0425	14926	14353	96.2
Am-241	2037	418	0.3590	1163	1230.2	105.7
Cd-109	2881	591	0.0361	16363	16101	98.4
Co-57	1511	310	0.8560	362	347.72	96.1
Ce-139	2139	439	0.7990	549	538.4	98.1
Hg-203	4651	954	0.8146	1171	1208.4	103.2
Sn-113	3015	618	0.6400	966	972.07	100.6
Cs-137	1938	397	0.8510	467	462.35	99.0
Y-88	7264	1489	0.9370	1589	1559.3	98.1
Co-60	3580	734	0.9997	734	722.51	98.4
Co-60	3581	734	0.9999	734	739.67	100.7
Y-88	7690	1577	0.9920	1589	1613.8	101.5

Reviewed By: Jody Watson

Date: 3/27/2012

Calibration Data from file: 5_Soil_TunaCan.Clb
Energy Calibration Date: 3/27/2012 Time: 5:20:02 PM
Efficiency Calibration Date: 3/27/2012 Time: 5:20:37 PM

Calibration Description:
5_Soil_TunaCan_90099_032612

Energy Calibration Fit
Energy = 0.1351 +0.249831*Channel +2.72022e-008*Channel**2
FWHM (ch) = 2.8138 +0.001050*Channel -2.57606e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
186.01	46.54	46.61	-0.15%	0.74	0.75	-1.17%
237.86	59.54	59.56	-0.04%	0.74	0.77	-4.07%
351.46	88.03	87.95	0.10%	0.80	0.79	1.28%
487.52	122.06	121.94	0.10%	0.85	0.83	2.66%
663.26	165.85	165.85	0.00%	0.88	0.87	0.98%
1116.90	279.17	279.20	-0.01%	0.97	0.99	-2.35%
1567.36	391.69	391.78	-0.02%	1.12	1.10	1.78%
2647.45	661.66	661.74	-0.01%	1.38	1.35	1.91%
3592.51	898.02	898.01	0.00%	1.55	1.56	-1.11%
4692.96	1173.24	1173.18	0.00%	1.77	1.79	-1.18%
5329.72	1332.50	1332.44	0.00%	1.93	1.92	0.31%
7342.77	1836.01	1836.05	-0.00%	2.29	2.29	0.24%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 0.8682 %
Ln(Eff) = 0.6466 -0.783045*Ln(Eng) -0.0041175*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 1.4296 %
Ln(Eff) = -24.6225 +9.075211*Ln(Eng) -0.966442*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	1.7205E-002	1.7882E-002	-3.93%
59.54	2.6619E-002	2.5335E-002	4.82%
88.03	3.4045E-002	3.4617E-002	-1.68%
122.06	3.4394E-002	3.5819E-002	-4.15%
165.85	========== Knee ==========		
165.85	3.0704E-002	3.1331E-002	-2.04%
279.17	2.1030E-002	2.0365E-002	3.17%
391.69	1.5475E-002	1.5370E-002	0.68%
661.66	9.8486E-003	9.9244E-003	-0.77%
898.02	7.5404E-003	7.6837E-003	-1.90%
1173.24	6.0360E-003	6.1381E-003	-1.69%
1332.50	5.5560E-003	5.5144E-003	0.75%
1836.01	4.2722E-003	4.2078E-003	1.51%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.54	4.25	8.15E+003	14918.00	634.00	4.10%	1/1/2012 11:00:00 AM
Am-241	59.54	35.70	1.58E+005	1170.90	418.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	16371.00	591.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	362.15	310.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	549.44	439.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	1170.60	954.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	965.63	618.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	465.91	397.00	4.00%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	1589.10	1489.00	3.90%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	734.73	734.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	734.15	734.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	1589.70	1577.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  3/27/2012 5:22:03 PM
TestAmerica                      Spectrum name: 5_TunaCan_20120810.An1

Sample description
     5_TunaCan_90099_032612


Spectrum Filename: C:\User\SPC\Det5\5_TunaCan_20120810.An1

Acquisition information
       Start time:                 3/26/2012 3:05:42 PM
       Live time:               3600
       Real time:               3652
       Dead time:                  1.44 %
       Detector ID:                   5

Detector system
     Ge 5 SN/157


Calibration
       Filename:                   5_Soil_TunaCan.Clb
     5_Soil_TunaCan_90099_032612


       Energy Calibration
            Created:               3/27/2012 5:20:02 PM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:             2.720E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/27/2012 5:20:37 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   0.87 %
            Log(Eff):              6.466115E-01 + (-7.830454E-01*Log(E) ) +
                                   ( -4.117504E-03*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.43 %
            Log(Eff):             -2.462251E+01 + ( 9.075211E+00*Log(E) ) +
                                   ( -9.664422E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.61keV )
       Stop channel:            8000 (  2000.53keV )
       Peak rejection level:      10.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method
```

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	average of three points.
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2012 11:00:00 AM
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0527

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq	Nuc
46.61	38986.	0.74	0.74	1.793E-02	46.54	4.250	1.435E+04	Pb210
59.56	40041.	0.74	0.74	2.535E-02	59.54	35.700	1.230E+03	AM241
70.85	1493.	9.22	0.78	3.019E-02				
72.87	2354.	5.96	0.78	3.089E-02				
87.95	63754.	0.53	0.80	3.460E-02	88.03	3.610	1.610E+04	CD109
121.94	30888.	0.76	0.85	3.583E-02	122.06	85.600	3.477E+02	CO57
136.41	3768.	3.80	0.89	3.457E-02				
165.85	31597.	0.74	0.88	3.066E-02	165.85	79.900	5.384E+02	Ce139
279.20	20358.	0.87	0.97	2.036E-02	279.17	81.500	1.208E+03	Hg203
391.78	20611.	0.93	1.12	1.537E-02	391.69	64.000	9.721E+02	SN113
661.74	14000.	1.10	1.38	9.923E-03	661.66	85.210	4.623E+02	CS137
898.01	23228.	0.82	1.55	7.684E-03	898.02	93.700	1.559E+03	Y898
1173.18	15468.	0.93	1.77	6.138E-03	1173.24	99.900	7.225E+02	Co1173
1332.44	14238.	0.98	1.93	5.515E-03	1332.50	99.982	7.397E+02	Co1332
1836.04	13938.	0.87	2.30	4.208E-03	1836.01	99.200	1.614E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
291.16	72.88	8722.	2253.	7.295E+04	7.09	0.801	-
545.44	136.41	5274.	3768.	1.090E+05	3.80	0.888	-

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	186.01	46.61	12895.	38986.	10.829	0.74	0.743
AM-241	237.86	59.56	13293.	40041.	11.122	0.74	0.735
CD-109	351.46	87.95	12894.	63754.	17.710	0.53	0.805
CO-57	487.52	121.94	6935.	30888.	8.580	0.76	0.852
Ce-139	663.26	165.85	5616.	31597.	8.777	0.74	0.883
Hg-203	1116.90	279.20	2848.	20358.	5.655	0.87	0.966
SN-113	1567.36	391.78	3046.	20611.	5.725	0.93	1.119
CS-137	2647.45	661.74	1982.	14000.	3.889	1.10	1.380
Y-898	3592.51	898.01	1944.	23228.	6.452	0.82	1.547
Co-1173	4692.96	1173.18	847.	15468.	4.297	0.93	1.774
Co-1332	5329.75	1332.44	693.	14238.	3.955	0.98	1.927
Y-1836	7342.72	1836.04	102.	13938.	3.872	0.87	2.295

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq			COMMENTS
Pb-210	N	1.4353E+04						8.15E+03	
			46.54	1.435E+04	(	1.958E+02	7.44E-01	4.25E+00	G
AM-241		1.2302E+03						1.58E+05	
			59.54	1.230E+03	(	1.659E+01	7.44E-01	3.57E+01	G
CD-109		1.6101E+04						4.63E+02	
			88.03	1.610E+04	(	1.343E+02	5.28E-01	3.61E+00	G
CO-57		3.4772E+02						2.72E+02	
			122.06	3.477E+02	(	4.399E+00	7.60E-01	8.56E+01	G

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ce-139	5.3840E+02					1.38E+02	
		165.85	5.384E+02	(	5.997E+00	7.36E-01	7.99E+01 G
Hg-203	1.2084E+03					4.66E+01	
		279.17	1.208E+03	(	1.492E+01	8.69E-01	8.15E+01 G
SN-113	9.7207E+02					1.15E+02	
		391.69	9.721E+02	(	1.226E+01	9.31E-01	6.40E+01 G
CS-137	4.6235E+02					1.10E+04	
		661.66	4.623E+02	(	6.941E+00	1.10E+00	8.52E+01 G
Y-898	1.5593E+03					1.07E+02	
		898.02	1.559E+03	(	1.397E+01	8.19E-01	9.37E+01 G
Co-1173	7.2251E+02					1.93E+03	
		1173.24	7.225E+02	(	6.463E+00	9.30E-01	9.99E+01 G
Co-1332	7.3967E+02					1.93E+03	
		1332.50	7.397E+02	(	6.515E+00	9.82E-01	1.00E+02 G
Y-1836	1.6138E+03					1.07E+02	
		1836.01	1.614E+03	(	5.776E+00	8.71E-01	9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape

ORTEC g v - i (1087) Env32 G53W4.25 3/27/2012 5:22:03 PM
TestAmerica Spectrum name: 5_TunaCan_20120810.An1

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq	Time Corrected Activity Bq	Uncertainty 1 Sigma Counting	MDA
Pb-210	1.4250E+04	1.4353E+04	7.439E-01%	1.96E+02
AM-241	1.2297E+03	1.2302E+03	7.442E-01%	1.66E+01
CD-109	1.4172E+04	1.6101E+04	5.277E-01%	1.34E+02
CO-57	2.7983E+02	3.4772E+02	7.604E-01%	4.40E+00
Ce-139	3.5061E+02	5.3840E+02	7.359E-01%	6.00E+00
Hg-203	3.4071E+02	1.2084E+03	8.687E-01%	1.49E+01
SN-113	5.8200E+02	9.7207E+02	9.315E-01%	1.23E+01
CS-137	4.5987E+02	4.6235E+02	1.097E+00%	6.94E+00
Y-898	8.9620E+02	1.5593E+03	8.189E-01%	1.40E+01
Co-1173	7.0069E+02	7.2251E+02	9.300E-01%	6.46E+00
Co-1332	7.1733E+02	7.3967E+02	9.821E-01%	6.52E+00
Y-1836	9.2756E+02	1.6138E+03	8.711E-01%	5.78E+00

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 2000.5 keV) 3.491E+04 Bq
Total Decayed Activity (37.6 to 2000.5 keV) 3.9848164E+04 Bq

Analyzed by: _____
Admin

Reviewed by: _____
Supervisor

Laboratory: TestAmerica

Gamma Verification per Geometry

Detector:	Ge8
Geometry:	Tunacan
Reference date	1/1/2012
Calibration Standard:	90099
Standard volume g / vial	1550
Standard volume transferred in g / geometry	317.8
lab ID# of cal standard	6699

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	γ abundance	Bq/sample	Count Results	%recovery
Pb-210	3094	634	0.0425	14926	14960	100.2
Am-241	2037	418	0.3590	1163	1240.5	106.6
Cd-109	2881	591	0.0361	16363	16066	98.2
Co-57	1511	310	0.8560	362	345.12	95.4
Ce-139	2139	439	0.7990	549	536.34	97.7
Hg-203	4651	954	0.8146	1171	1218.2	104.1
Sn-113	3015	618	0.6400	966	967.15	100.1
Cs-137	1938	397	0.8510	467	465.86	99.8
Y-88	7264	1489	0.9370	1589	1552.1	97.6
Co-60	3580	734	0.9997	734	724.48	98.7
Co-60	3581	734	0.9999	734	729.98	99.4
Y-88	7690	1577	0.9920	1589	1627.2	102.4

Reviewed By: Jody Watson

Date: 3/28/2012

Calibration Data from file: 8_Soil_TunaCan.Clb
Energy Calibration Date: 3/28/2012 Time: 10:35:07 AM
Efficiency Calibration Date: 3/28/2012 Time: 10:35:20 AM

Calibration Description:
8_Soil_TunaCan_90099_032712

Energy Calibration Fit
Energy = 0.0505 +0.250025*Channel +8.06699e-010*Channel**2
FWHM (ch) = 3.6351 +0.000832*Channel -2.49195e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
185.74	46.54	46.49	0.11%	0.94	0.95	-0.61%
237.86	59.54	59.52	0.03%	0.95	0.96	-1.36%
351.89	88.03	88.03	-0.00%	0.97	0.98	-1.63%
488.04	122.06	122.07	-0.01%	1.01	1.01	0.12%
663.26	165.85	165.88	-0.02%	1.07	1.04	2.17%
1116.59	279.17	279.23	-0.02%	1.15	1.13	1.73%
1566.40	391.69	391.69	-0.00%	1.22	1.22	0.24%
2645.92	661.66	661.60	0.01%	1.39	1.42	-1.95%
3591.62	898.02	898.05	-0.00%	1.61	1.58	2.16%
4692.17	1173.24	1173.23	0.00%	1.74	1.75	-0.61%
5329.14	1332.50	1332.49	0.00%	1.82	1.84	-1.05%
7342.97	1836.01	1836.02	-0.00%	2.11	2.10	0.42%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.3942 %
Ln(Eff) = -0.1099 -0.495854*Ln(Eng) -0.0257227*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 1.7131 %
Ln(Eff) = -25.2530 +9.398253*Ln(Eng) -1.00003*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	1.9170E-002	2.0055E-002	-4.62%
59.54	3.0526E-002	2.8813E-002	5.61%
88.03	3.9175E-002	3.9918E-002	-1.90%
122.06	3.9509E-002	4.1457E-002	-4.93%
165.85	========== Knee ==========		
165.85	3.5429E-002	3.6291E-002	-2.43%
279.17	2.5270E-002	2.4275E-002	3.94%
391.69	1.8582E-002	1.8550E-002	0.17%
661.66	1.2089E-002	1.2090E-002	-0.01%
898.02	9.1435E-003	9.3604E-003	-2.37%
1173.24	7.3487E-003	7.4527E-003	-1.42%
1332.50	6.6398E-003	6.6776E-003	-0.57%
1836.01	5.1654E-003	5.0457E-003	2.32%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.54	4.25	8.15E+003	14918.00	634.00	4.10%	1/1/2012 11:00:00 AM
Am-241	59.54	35.70	1.58E+005	1170.90	418.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	16371.00	591.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	362.15	310.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	549.44	439.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	1170.60	954.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	965.63	618.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	465.91	397.00	4.00%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	1589.10	1489.00	3.90%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	734.73	734.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	734.15	734.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	1589.70	1577.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  3/28/2012 10:36:01 AM
TestAmerica                      Spectrum name: 8_TunaCan_20120676.An1

Sample description
     8_TunaCan_90099_032712


Spectrum Filename: C:\User\SPC\Det8\8_TunaCan_20120676.An1

Acquisition information
       Start time:                 3/27/2012 10:58:29 AM
       Live time:               3600
       Real time:               3655
       Dead time:                  1.49 %
       Detector ID:                   8

Detector system
     Ge 8 SN/174


Calibration
       Filename:                   8_Soil_TunaCan.Clb
     8_Soil_TunaCan_90099_032712


       Energy Calibration
            Created:               3/28/2012 10:35:07 AM
            Zero offset:           0.050 keV
            Gain:                  0.250 keV/channel
            Quadratic:             8.067E-10 keV/channel^2

       Efficiency Calibration
            Created:               3/28/2012 10:35:20 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.39 %
            Log(Eff):             -1.098764E-01 + (-4.958544E-01*Log(E) ) +
                                   ( -2.572270E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.71 %
            Log(Eff):             -2.525301E+01 + ( 9.398253E+00*Log(E) ) +
                                   ( -1.000034E+00*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.55keV )
       Stop channel:            8000 (  2000.30keV )
       Peak rejection level:      10.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method
```

ORTEC g v - i (1087) Env32 G53W4.25 3/28/2012 10:36:01 AM
TestAmerica Spectrum name: 8_TunaCan_20120676.An1

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	average of three points.
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2012 11:00:00 AM
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0205

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq	Nuc
46.54	43426.	0.60	0.95	2.002E-02	46.54	4.250	1.426E+04	Pb210
59.52	45918.	0.77	0.95	2.880E-02	59.54	35.700	1.240E+03	AM241
72.86	2434.	6.68	0.97	3.542E-02				
88.03	73269.	0.53	0.97	3.992E-02	88.03	3.610	1.607E+04	CD109
122.07	35407.	0.77	1.01	4.146E-02	122.06	85.600	3.451E+02	CO57
136.51	4312.	4.44	1.06	3.999E-02				
165.88	36308.	0.76	1.07	3.629E-02	165.85	79.900	5.363E+02	Ce139
279.23	24162.	0.88	1.15	2.427E-02	279.17	81.500	1.218E+03	Hg203
391.69	24625.	0.77	1.22	1.855E-02	391.69	64.000	9.671E+02	SN113
661.60	17184.	1.10	1.39	1.209E-02	661.66	85.210	4.659E+02	CS137
898.05	28015.	0.71	1.61	9.360E-03	898.02	93.700	1.552E+03	Y898
1173.23	18826.	0.79	1.74	7.453E-03	1173.24	99.900	7.245E+02	Co1173
1332.49	17010.	0.84	1.82	6.678E-03	1332.50	99.982	7.300E+02	Co1332
1836.02	16762.	0.79	2.11	5.046E-03	1836.01	99.200	1.627E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
291.19	72.85	12003.	2434.	6.872E+04	6.68	0.969	-	D
545.78	136.51	8432.	4312.	1.078E+05	4.44	1.059	-	

ORTEC g v - i (1087) Env32 G53W4.25 3/28/2012 10:36:01 AM
TestAmerica Spectrum name: 8_TunaCan_20120676.An1

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.74	46.49	17505.	45568.	12.658	0.76	0.942
AM-241	237.86	59.52	18397.	45918.	12.755	0.77	0.945
CD-109	351.89	88.03	17370.	73269.	20.353	0.53	0.966
CO-57	488.04	122.07	9639.	35407.	9.835	0.77	1.010
Ce-139	663.26	165.88	8356.	36308.	10.085	0.76	1.067
Hg-203	1116.59	279.23	4382.	24162.	6.712	0.88	1.153
SN-113	1566.40	391.69	2677.	24625.	6.840	0.77	1.223
CS-137	2645.92	661.60	3145.	17184.	4.773	1.10	1.389
Y-898	3591.62	898.05	1881.	28015.	7.782	0.71	1.611
Co-1173	4692.17	1173.23	650.	18826.	5.229	0.79	1.738
Co-1332	5329.14	1332.49	576.	17010.	4.725	0.84	1.822
Y-1836	7342.97	1836.02	111.	16762.	4.656	0.79	2.110

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq			COMMENTS
Pb-210	N	1.4960E+04					8.15E+03		
			46.54	1.496E+04	(	2.033E+02	7.55E-01	4.25E+00	G
AM-241		1.2405E+03					1.58E+05		
			59.54	1.240E+03	(	1.715E+01	7.72E-01	3.57E+01	G
CD-109		1.6066E+04					4.63E+02		
			88.03	1.607E+04	(	1.353E+02	5.26E-01	3.61E+00	G
CO-57		3.4512E+02					2.72E+02		
			122.06	3.451E+02	(	4.486E+00	7.68E-01	8.56E+01	G

ORTEC g v - i (1087) Env32 G53W4.25 3/28/2012 10:36:01 AM
TestAmerica Spectrum name: 8_TunaCan_20120676.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ce-139	5.3634E+02					1.38E+02	
		165.85	5.363E+02	(	6.333E+00	7.56E-01	7.99E+01 G
Hg-203	1.2182E+03					4.66E+01	
		279.17	1.218E+03	(	1.569E+01	8.81E-01	8.15E+01 G
SN-113	9.6715E+02					1.15E+02	
		391.69	9.671E+02	(	9.575E+00	7.73E-01	6.40E+01 G
CS-137	4.6586E+02					1.10E+04	
		661.66	4.659E+02	(	7.158E+00	1.10E+00	8.52E+01 G
Y-898	1.5521E+03					1.07E+02	
		898.02	1.552E+03	(	1.135E+01	7.10E-01	9.37E+01 G
Co-1173	7.2448E+02					1.93E+03	
		1173.24	7.245E+02	(	4.676E+00	7.93E-01	9.99E+01 G
Co-1332	7.2998E+02					1.93E+03	
		1332.50	7.300E+02	(	4.916E+00	8.45E-01	1.00E+02 G
Y-1836	1.6272E+03					1.07E+02	
		1836.01	1.627E+03	(	5.029E+00	7.91E-01	9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape

ORTEC g v - i (1087) Env32 G53W4.25 3/28/2012 10:36:01 AM
TestAmerica Spectrum name: 8_TunaCan_20120676.An1

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq	Time Corrected Activity Bq	Uncertainty 1 Sigma Counting	MDA
Pb-210	1.4851E+04	1.4960E+04	7.555E-01%	2.03E+02
AM-241	1.2400E+03	1.2405E+03	7.719E-01%	1.71E+01
CD-109	1.4124E+04	1.6066E+04	5.260E-01%	1.35E+02
CO-57	2.7715E+02	3.4512E+02	7.681E-01%	4.49E+00
Ce-139	3.4782E+02	5.3634E+02	7.558E-01%	6.33E+00
Hg-203	3.3925E+02	1.2182E+03	8.812E-01%	1.57E+01
SN-113	5.7617E+02	9.6715E+02	7.729E-01%	9.58E+00
CS-137	4.6334E+02	4.6586E+02	1.105E+00%	7.16E+00
Y-898	8.8728E+02	1.5521E+03	7.104E-01%	1.13E+01
Co-1173	7.0239E+02	7.2448E+02	7.931E-01%	4.68E+00
Co-1332	7.0772E+02	7.2998E+02	8.450E-01%	4.92E+00
Y-1836	9.3024E+02	1.6272E+03	7.905E-01%	5.03E+00

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (82.3 to 2000.3 keV) 3.545E+04 Bq
Total Decayed Activity (82.3 to 2000.3 keV) 4.0432598E+04 Bq

Analyzed by: _____
Admin

Reviewed by: _____
Supervisor

Laboratory: TestAmerica

Gamma Verification per Geometry

Detector:	Ge9
Geometry:	Tunacan
Reference date	1/1/2012
Calibration Standard:	90099
Standard volume g / vial	1550
Standard volume transferred in g / geometry	317.8
lab ID# of cal standard	6699

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	γ abundance	Bq/sample	Count Results	%recovery
Pb-210	3094	634	0.0425	14926	14240	95.4
Am-241	2037	418	0.3590	1163	1244.5	107.0
Cd-109	2881	591	0.0361	16363	15902	97.2
Co-57	1511	310	0.8560	362	347.48	96.0
Ce-139	2139	439	0.7990	549	535.87	97.6
Hg-203	4651	954	0.8146	1171	1216.7	103.9
Sn-113	3015	618	0.6400	966	970.65	100.5
Cs-137	1938	397	0.8510	467	466.58	99.9
Y-88	7264	1489	0.9370	1589	1552.5	97.7
Co-60	3580	734	0.9997	734	727.12	99.0
Co-60	3581	734	0.9999	734	719.75	98.0
Y-88	7690	1577	0.9920	1589	1638.8	103.1

Reviewed By: Jody Watson

Date: 6/14/2012

Calibration Data from file: 9_Soil_TunaCan.Clb
Energy Calibration Date: 6/14/2012 Time: 10:19:40 AM
Efficiency Calibration Date: 6/14/2012 Time: 10:19:51 AM

Calibration Description:
9_Soil_TunaCan_90099_050312

Energy Calibration Fit
Energy = 0.0875 +0.250109*Channel -2.0385e-008*Channel**2
FWHM (ch) = 4.1690 +0.000934*Channel -2.36522e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
185.85	46.54	46.57	-0.06%	1.07	1.09	-1.37%
237.85	59.54	59.58	-0.06%	1.08	1.10	-1.96%
351.79	88.03	88.07	-0.05%	1.12	1.12	-0.18%
487.79	122.06	122.08	-0.02%	1.14	1.16	-1.17%
662.64	165.85	165.81	0.02%	1.23	1.19	2.51%
1115.53	279.17	279.07	0.04%	1.30	1.30	0.44%
1565.74	391.69	391.64	0.01%	1.43	1.39	2.81%
2645.81	661.66	661.69	-0.00%	1.60	1.62	-0.83%
3591.21	898.02	898.02	0.00%	1.80	1.80	-0.02%
4692.44	1173.24	1173.26	-0.00%	2.01	2.01	0.18%
5329.80	1332.50	1332.54	-0.00%	2.09	2.12	-1.38%
7344.77	1836.01	1835.98	0.00%	2.45	2.44	0.55%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.3038 %
Ln(Eff) = -0.8080 -0.236727*Ln(Eng) -0.0395064*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 1.4241 %
Ln(Eff) = -23.8792 +8.875647*Ln(Eng) -0.94011*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	2.4596E-002	2.5767E-002	-4.76%
59.54	3.8891E-002	3.6589E-002	5.92%
88.03	4.9059E-002	5.0504E-002	-2.95%
122.06	5.0886E-002	5.3031E-002	-4.22%
165.85	========== Knee ==========		
165.85	4.6197E-002	4.7361E-002	-2.52%
279.17	3.4900E-002	3.3566E-002	3.82%
391.69	2.6668E-002	2.6526E-002	0.53%
661.66	1.8125E-002	1.8099E-002	0.14%
898.02	1.4012E-002	1.4341E-002	-2.34%
1173.24	1.1507E-002	1.1627E-002	-1.05%
1332.50	1.0296E-002	1.0501E-002	-2.00%
1836.01	8.3305E-003	8.0796E-003	3.01%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.54	4.25	8.15E+003	14918.00	634.00	4.10%	1/1/2012 11:00:00 AM
Am-241	59.54	35.70	1.58E+005	1170.90	418.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	16371.00	591.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	362.15	310.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	549.44	439.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	1170.60	954.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	965.63	618.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	465.91	397.00	4.00%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	1589.10	1489.00	3.90%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	734.73	734.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	734.15	734.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	1589.70	1577.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  6/14/2012 10:20:07 AM
TestAmerica, Inc                Spectrum name: 9_TunaCan_20120147.An1

Sample description
     9_TunaCan_90099_050312


Spectrum Filename: C:\User\SPC\Det9\9_TunaCan_20120147.An1

Acquisition information
       Start time:                 5/3/2012 1:37:42 PM
       Live time:               3600
       Real time:               3661
       Dead time:                  1.65 %
       Detector ID:                    9

Detector system
     Ge 9 SN/100113


Calibration
       Filename:                   9_Soil_TunaCan.Clb
     9_Soil_TunaCan_90099_050312


       Energy Calibration
            Created:               6/14/2012 10:19:40 AM
            Zero offset:           0.088 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -2.039E-08 keV/channel^2

       Efficiency Calibration
            Created:               6/14/2012 10:19:51 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.30 %
            Log(Eff):             -8.079856E-01 + (-2.367265E-01*Log(E) ) +
                                   ( -3.950640E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.42 %
            Log(Eff):             -2.387916E+01 + ( 8.875647E+00*Log(E) ) +
                                   ( -9.401100E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.60keV )
       Stop channel:            8000 (  1999.66keV )
       Peak rejection level:      10.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method
```

ORTEC g v - i (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	average of three points.
Half lives decay limit:	12.000
Activity range factor:	2.000
Min. step backg. energy	0.000
Multiplet shift channel	2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2012 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0265

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq	Nuc
46.57	55553.	0.67	1.07	2.579E-02	46.54	4.250	1.424E+04	Pb210
59.56	58492.	0.66	1.08	3.660E-02	59.54	35.700	1.245E+03	AM241
88.07	86792.	0.48	1.12	5.052E-02	88.03	3.610	1.590E+04	CD109
122.08	41484.	0.73	1.14	5.303E-02	122.06	85.600	3.475E+02	CO57
136.48	5266.	4.55	1.22	5.150E-02				
165.81	39272.	0.74	1.23	4.626E-02	165.85	79.900	5.359E+02	Ce139
279.06	19221.	1.24	1.30	3.358E-02	279.17	81.500	1.217E+03	Hg203
391.64	28263.	0.86	1.43	2.653E-02	391.69	64.000	9.707E+02	SN113
661.69	25703.	0.90	1.61	1.810E-02	661.66	85.210	4.666E+02	CS137
898.02	33728.	0.69	1.80	1.434E-02	898.02	93.700	1.552E+03	Y898
1173.24	29087.	0.72	2.01	1.163E-02	1173.24	99.900	7.271E+02	Co1173
1332.54	26026.	0.70	2.09	1.050E-02	1332.50	99.982	7.198E+02	Co1332
1835.94	21237.	0.73	2.46	8.080E-03	1836.01	99.200	1.639E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
545.34	136.48	10776.	5266.	1.023E+05	4.55	1.225	-

ORTEC g v - i (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.85	46.57	18837.	55553.	15.431	0.67	1.071
AM-241	237.79	59.56	19448.	58492.	16.248	0.66	1.078
CD-109	351.79	88.07	19261.	86792.	24.109	0.48	1.122
CO-57	487.79	122.08	11232.	41484.	11.523	0.73	1.142
Ce-139	662.64	165.81	9084.	39272.	10.909	0.74	1.225
Hg-203	1115.51	279.06	6250.	19221.	5.339	1.24	1.302
SN-113	1565.73	391.64	4864.	28263.	7.851	0.86	1.434
CS-137	2645.81	661.69	4037.	25703.	7.140	0.90	1.605
Y-898	3591.21	898.02	2958.	33728.	9.369	0.69	1.803
Co-1173	4692.36	1173.24	1710.	29087.	8.080	0.72	2.014
Co-1332	5329.80	1332.54	1048.	26026.	7.229	0.70	2.088
Y-1836	7344.62	1835.94	304.	21237.	5.899	0.73	2.457

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq	Peak Energy keV	Peak Activity Bq	Code	MDA Value Bq			COMMENTS
Pb-210	N	1.4240E+04					8.15E+03		
			46.54	1.424E+04	(	1.646E+02	6.67E-01	4.25E+00	G
AM-241		1.2445E+03					1.58E+05		
			59.54	1.245E+03	(	1.388E+01	6.60E-01	3.57E+01	G
CD-109		1.5902E+04					4.63E+02		
			88.03	1.590E+04	(	1.190E+02	4.84E-01	3.61E+00	G
CO-57		3.4748E+02					2.72E+02		
			122.06	3.475E+02	(	4.159E+00	7.31E-01	8.56E+01	G

ORTEC g v - i (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ce-139	5.3587E+02					1.38E+02	
		165.85	5.359E+02	(	6.097E+00	7.41E-01	7.99E+01 G
Hg-203	1.2167E+03					4.66E+01	
		279.17	1.217E+03	(	2.349E+01	1.24E+00	8.15E+01 G
SN-113	9.7065E+02					1.15E+02	
		391.69	9.707E+02	(	1.125E+01	8.60E-01	6.40E+01 G
CS-137	4.6658E+02					1.10E+04	
		661.66	4.666E+02	(	5.424E+00	8.98E-01	8.52E+01 G
Y-898	1.5525E+03					1.07E+02	
		898.02	1.552E+03	(	1.179E+01	6.92E-01	9.37E+01 G
Co-1173	7.2712E+02					1.93E+03	
		1173.24	7.271E+02	(	4.884E+00	7.20E-01	9.99E+01 G
Co-1332	7.1975E+02					1.93E+03	
		1332.50	7.198E+02	(	4.248E+00	6.98E-01	1.00E+02 G
Y-1836	1.6388E+03					1.07E+02	
		1836.01	1.639E+03	(	6.479E+00	7.29E-01	9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape

ORTEC g v - i (1087) Env32 G53W4.25 6/14/2012 10:20:07 AM
TestAmerica, Inc Spectrum name: 9_TunaCan_20120147.An1

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq	Time Corrected Activity Bq	Uncertainty 1 Sigma Counting	MDA
Pb-210	1.4091E+04	1.4240E+04	6.667E-01%	1.65E+02
AM-241	1.2439E+03	1.2445E+03	6.605E-01%	1.39E+01
CD-109	1.3223E+04	1.5902E+04	4.843E-01%	1.19E+02
CO-57	2.5385E+02	3.4748E+02	7.313E-01%	4.16E+00
Ce-139	2.8828E+02	5.3587E+02	7.410E-01%	6.10E+00
Hg-203	1.9517E+02	1.2167E+03	1.239E+00%	2.35E+01
SN-113	4.6244E+02	9.7065E+02	8.599E-01%	1.13E+01
CS-137	4.6297E+02	4.6658E+02	8.981E-01%	5.42E+00
Y-898	6.9723E+02	1.5525E+03	6.917E-01%	1.18E+01
Co-1173	6.9559E+02	7.2712E+02	7.204E-01%	4.88E+00
Co-1332	6.8854E+02	7.1975E+02	6.982E-01%	4.25E+00
Y-1836	7.3602E+02	1.6388E+03	7.291E-01%	6.48E+00

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 1999.7 keV) 3.304E+04 Bq
Total Decayed Activity (37.6 to 1999.7 keV) 3.9561668E+04 Bq

Analyzed by: _____
admin

Reviewed by: _____
Supervisor

Laboratory: TestAmerica, Inc

Gamma Verification per Geometry

Detector: **Ge12**
Geometry: **Tuna Can**
Reference date: **1/1/2018**
Calibration Standard: **108513**
Standard volume g / vial: **1550**
Standard volume transferred in g / geometry: **342.2**
lab ID# of cal standard: **#1402359 / Tuna Can_2018_00001**

Isotope	Certified Activity - Bq	Geometry Activity - Bq	Count Results	%recovery
Pb-210	72410	15986	16000	100.1
Am-241	5770	1274	1261	99.0
Cd-109	79700	17596	18250	103.7
Co-57	1809	399	393.1	98.4
Ce-139	2723	601	585.9	97.5
Hg-203	5868	1296	1312	101.3
Sn-113	4658	1028	1059	103.0
Cs-137	2283	504	509.8	101.1
Y-88	7810	1724	1705	98.9
Co-60	3574	789	776.5	98.4
Co-60	3574	789	765.4	97.0
Y-88	7810	1724	1769	102.6

Reviewed By: Jody Watson

Date: 4/23/2018

Calibration Data from file: 12_Soil_TunaCan.Clb
Energy Calibration Date: 4/20/2018 Time: 11:53:01 AM
Efficiency Calibration Date: 4/20/2018 Time: 11:53:09 AM

Calibration Description:
12_TunaCan_108513

Energy Calibration Fit
Energy = 0.0591 +0.250183*Channel -3.73476e-008*Channel**2
FWHM (ch) = 3.2115 +0.001032*Channel -1.75096e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
185.95	46.54	46.58	-0.09%	0.84	0.85	-1.23%
237.82	59.54	59.56	-0.03%	0.86	0.86	-0.65%
351.66	88.03	88.03	-0.01%	0.89	0.89	-0.96%
487.75	122.06	122.08	-0.01%	0.92	0.93	-0.62%
662.97	165.85	165.91	-0.03%	0.97	0.97	0.22%
1115.42	279.17	279.07	0.04%	1.11	1.09	2.13%
1565.35	391.69	391.59	0.02%	1.20	1.20	0.60%
2645.53	661.66	661.66	-0.00%	1.49	1.45	2.30%
3591.22	898.02	898.04	-0.00%	1.66	1.67	-0.91%
4692.62	1173.24	1173.25	-0.00%	1.85	1.92	-3.60%
5330.40	1332.50	1332.57	-0.01%	2.09	2.05	1.92%
7346.34	1836.01	1835.97	0.00%	2.46	2.46	0.18%

Efficiency Calibration Fit
Polynomial Uncertainty = 1.0201 %
Coefficients:
-0.363508 -4.707999 0.462125 -0.051256 0.002384 -0.000043

Efficiency Table

Energy	Efficiency	Fit	Delta
46.54	1.8052E-002	1.7999E-002	0.29%
59.54	2.7878E-002	2.8172E-002	-1.06%
88.03	3.7143E-002	3.5814E-002	3.58%
122.06	3.6658E-002	3.7240E-002	-1.59%
165.85	3.3189E-002	3.4052E-002	-2.60%
279.17	2.4853E-002	2.4494E-002	1.45%
391.69	1.9499E-002	1.8934E-002	2.90%
661.66	1.2936E-002	1.2789E-002	1.13%
898.02	1.0139E-002	1.0253E-002	-1.13%
1173.24	8.2922E-003	8.4265E-003	-1.62%
1332.50	7.4182E-003	7.6470E-003	-3.08%
1836.01	6.0193E-003	5.8663E-003	2.54%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Pb-210	46.50	4.25	8.11E+003	15986.00	679.41	4.20%	1/1/2018 11:00:00 AM
Am-241	59.50	35.70	1.58E+005	1273.90	454.78	3.60%	1/1/2018 11:00:00 AM
Cd-109	88.00	3.61	4.61E+002	17596.00	635.22	4.10%	1/1/2018 11:00:00 AM
Co-57	122.10	85.60	2.72E+002	399.38	341.87	3.40%	1/1/2018 11:00:00 AM
Ce-139	165.90	79.90	1.38E+002	601.20	480.36	3.60%	1/1/2018 11:00:00 AM
Hg-203	279.20	81.50	4.66E+001	1295.50	1055.83	3.50%	1/1/2018 11:00:00 AM
Sn-113	391.70	64.00	1.15E+002	1028.40	658.18	3.90%	1/1/2018 11:00:00 AM
Cs-137	661.70	85.21	1.10E+004	504.03	429.48	4.10%	1/1/2018 11:00:00 AM
Y-88	898.00	93.70	1.07E+002	1724.30	1615.67	3.70%	1/1/2018 11:00:00 AM
Co-60	1173.20	99.90	1.93E+003	789.05	788.26	3.90%	1/1/2018 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	789.05	788.89	3.90%	1/1/2018 11:00:00 AM
Y-88	1836.10	99.20	1.07E+002	1724.30	1710.51	3.70%	1/1/2018 11:00:00 AM

Test America St. Louis Spectrum ID: 12_TunaCan_20180005

Sample Description: 12_TunaCan_108513
Detector: Detector #12
Batch ID: 12
Work Order Number: TunaCan
Lot Number: 108513

Decay to Time: 1/1/2018 11:00 Live Time: 3600 sec
Acquisition Time: 4/18/2018 13:54:19 Real Time: 3652 sec
Analysis Time: 4/20/2018 11:55 Dead Time: 1.41 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: DET_EnergyStandardMix & Pb.lib
Bkgd Correction File: 12_2017-05-07_0806.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
Pb-210	1.600E+04	0.6	9.485E+01	1.031E+03	1.853E+02
AM-241	1.261E+03	0.7	9.223E+00	8.039E+01	1.659E+01
CD-109	1.825E+04	0.4	7.598E+01	1.135E+03	1.134E+02
CO-57	3.931E+02	0.8	3.042E+00	2.279E+01	5.110E+00
Ce-139	5.859E+02	0.7	4.357E+00	3.335E+01	6.791E+00
Hg-203	1.312E+03	1.1	1.414E+01	7.659E+01	2.206E+01
SN-113	1.059E+03	0.9	9.013E+00	6.310E+01	1.205E+01
CS-137	5.098E+02	0.9	4.734E+00	2.665E+01	6.233E+00
Y-898	1.705E+03	0.8	1.331E+01	8.765E+01	1.505E+01
Co-1173	7.765E+02	0.9	6.740E+00	3.922E+01	6.891E+00
Co-1332	7.654E+02	0.8	6.419E+00	3.866E+01	6.071E+00
Y-1836	1.769E+03	0.8	1.413E+01	1.018E+02	8.211E+00
Total	4.438E+04				

Analyst: Jody Watson

(Page 1 of 8)

Sample description
12_TunaCan_108513

Spectrum Filename: C:\User\SPC\Det12\12_TunaCan_20180005.An1

Acquisition information

Start time:	4/18/2018 1:54:19 PM
Live time:	3600
Real time:	3652
Dead time:	1.41 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration
Filename: 12_Soil_TunaCan.Clb
12_TunaCan_108513

Energy Calibration

Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files

Main analysis library:	DET_EnergyStandardMix & Pb.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2018 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2017-05-07_0806.PBC 5/7/2017 8:06:54 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0332

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
27.87	601.	9.86	0.70	3.939E-03				
33.44	3191.	3.58	0.84	8.062E-03				
36.78	534.	21.42	0.84	1.059E-02				
38.00	764.	15.14	0.84	1.151E-02				
46.62	43669.	0.59	0.85	1.805E-02	46.54	4.250	1.600E+04	Pb210
49.75	200.	71.91	0.85	2.153E-02				
59.56	45621.	0.73	0.86	2.818E-02	59.54	35.700	1.261E+03	AM241
70.78	903.	16.81	0.88	3.227E-02				
72.97	1715.	8.94	0.88	3.286E-02				
74.88	161.	95.77	0.88	3.334E-02				
77.23	29.	497.10	0.88	3.389E-02				
82.47	1429.	10.54	0.89	3.493E-02				
84.79	2014.	7.84	0.89	3.532E-02				
88.06	72330.	0.42	0.89	3.581E-02	88.03	3.610	1.825E+04	CD109
90.37	144.	87.05	0.90	3.612E-02				
122.08	34326.	0.77	0.92	3.724E-02	122.06	85.600	3.931E+02	CO57
136.51	4200.	4.35	0.96	3.651E-02				
165.91	33460.	0.74	0.97	3.405E-02	165.85	79.900	5.859E+02	Ce139
206.00	117.	63.94	0.45	3.024E-02				
238.46	443.	25.54	0.90	2.744E-02				
255.00	1168.	12.03	0.88	2.617E-02				
279.07	19187.	1.08	1.11	2.450E-02	279.17	81.500	1.312E+03	Hg203
286.67	107.	74.95	0.64	2.401E-02				
351.85	322.	30.50	1.33	2.056E-02				
391.59	24235.	0.85	1.20	1.894E-02	391.69	64.000	1.059E+03	SN113
500.18	113.	56.68	0.53	1.573E-02				
583.01	248.	32.33	0.89	1.403E-02				

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
601.08	176.	44.64	0.64	1.372E-02				
643.04	164.	48.09	0.69	1.306E-02				
661.66	19866.	0.93	1.49	1.279E-02	661.66	85.210	5.098E+02	CS137
695.58	154.	52.24	0.30	1.233E-02				
712.59	169.	39.74	0.69	1.212E-02				
814.18	641.	15.80	1.86	1.101E-02				
890.80	44.	76.23	0.45	1.031E-02				
898.03	29383.	0.78	1.66	1.025E-02	898.02	93.700	1.705E+03	Y898
924.59	170.	51.69	2.08	1.004E-02				
1059.91	148.	40.90	0.51	9.087E-03				
1173.24	22640.	0.87	1.85	8.426E-03	1173.24	99.900	7.765E+02	Co1173
1217.40	45.	61.22	0.33	8.195E-03				
1271.51	36.	60.60	1.04	7.928E-03				
1301.67	34.	60.56	0.43	7.787E-03				
1332.57	20270.	0.84	2.09	7.647E-03	1332.50	99.982	7.654E+02	Co1332
1491.52	180.	28.09	0.33	6.994E-03				
1835.92	18468.	0.80	2.47	5.867E-03	1836.01	99.200	1.769E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
111.16	27.87	1248.	601.	1.526E+05	9.86	0.703	-	s
133.41	33.32	4927.	3191.	3.959E+05	3.58	0.838	-	sD
146.77	36.66	6263.	534.	5.040E+04	21.42	0.841	-	sD
151.64	37.88	6317.	764.	6.642E+04	15.14	0.842	-	sD
198.79	49.71	10292.	213.	9.912E+03	67.59	0.855	-	sc
282.69	70.80	11078.	903.	2.799E+04	16.81	0.876	-	D
291.44	72.99	10900.	1715.	5.219E+04	8.94	0.878	-	D
299.07	74.90	11841.	161.	4.837E+03	95.77	0.880	-	c
308.48	77.26	10683.	29.	8.685E+02	497.10	0.883	-	c
329.43	82.44	10620.	1431.	4.097E+04	10.52	0.888	-	D
338.70	84.76	11438.	2016.	5.707E+04	7.83	0.890	-	sD
361.04	90.35	7839.	145.	4.014E+03	86.78	0.896	-	sc
545.45	136.51	7622.	4200.	1.150E+05	4.35	0.964	-	
823.26	206.00	2348.	117.	3.869E+03	63.94	0.454	-	s
953.03	238.46	3718.	443.	1.615E+04	25.54	0.897	-	s
1019.19	255.00	4459.	1168.	4.464E+04	12.03	0.878	-	
1145.82	286.67	2108.	107.	4.456E+03	74.95	0.636	-	s
1406.43	351.85	2440.	322.	1.569E+04	30.50	1.334	-	
1999.63	500.18	1252.	113.	7.164E+03	56.68	0.530	-	s
2330.90	583.01	1545.	248.	1.767E+04	32.33	0.894	-	s
2403.19	601.08	1564.	176.	1.283E+04	44.64	0.638	-	s
2571.03	643.04	1587.	164.	1.258E+04	48.09	0.694	-	s
2781.20	695.58	1652.	154.	1.250E+04	52.24	0.304	-	s
2849.27	712.59	1184.	169.	1.395E+04	39.74	0.695	-	s

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
3255.67	814.18	1648.	641.	5.823E+04	15.80	1.859	-	s
3562.26	890.80	503.	44.	4.283E+03	76.23	0.452	-	sc
3697.47	924.59	1556.	170.	1.690E+04	51.69	2.082	-	s
4239.01	1059.91	879.	148.	1.629E+04	40.90	0.508	-	s
4869.35	1217.40	238.	45.	5.491E+03	61.22	0.330	-	s
5085.97	1271.51	165.	36.	4.541E+03	60.60	1.043	-	s
5206.71	1301.67	156.	34.	4.366E+03	60.56	0.434	-	s
5966.81	1491.52	462.	180.	2.581E+04	28.09	0.329	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Pb.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.79	46.54	11653.	43669.	12.130	0.59	0.851D
AM-241	237.82	59.56	16449.	45621.	12.672	0.73	0.859
CD-109	351.65	88.03	9195.	72330.	20.092	0.42	0.894D
CO-57	487.75	122.08	9060.	34326.	9.535	0.77	0.923
Ce-139	662.97	165.91	6830.	33460.	9.295	0.74	0.975
Hg-203	1115.42	279.07	4712.	19187.	5.330	1.08	1.109
SN-113	1565.35	391.59	3432.	24235.	6.732	0.85	1.204
CS-137	2645.53	661.66	2656.	19866.	5.518	0.93	1.489
Y-898	3591.19	898.03	3033.	29383.	8.162	0.78	1.658
Co-1173	4692.59	1173.24	1810.	22640.	6.289	0.87	1.852
Co-1332	5330.41	1332.57	1150.	20270.	5.631	0.84	2.092
Y-1836	7346.14	1835.92	317.	18468.	5.130	0.80	2.475

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Peak Code	Peak MDA Value Bq/Sample	COMMENTS
Pb-210	N	1.6003E+04				8.15E+03	
			46.54	1.600E+04	(P	1.853E+02 5.93E-01 4.25E+00 G	

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	1.2606E+03					1.58E+05	
		59.54	1.261E+03	(	1.659E+01	7.32E-01	3.57E+01 G
CD-109	1.8246E+04					4.63E+02	
		88.03	1.825E+04	(	1.134E+02	4.16E-01	3.61E+00 G
CO-57	3.9307E+02					2.72E+02	
		122.06	3.931E+02	(	5.110E+00	7.74E-01	8.56E+01 G
Ce-139	5.8589E+02					1.38E+02	
		165.85	5.859E+02	(	6.791E+00	7.44E-01	7.99E+01 G
Hg-203	1.3123E+03					4.66E+01	
		279.17	1.312E+03	(	2.206E+01	1.08E+00	8.15E+01 G
SN-113	1.0590E+03					1.15E+02	
		391.69	1.059E+03	(	1.205E+01	8.51E-01	6.40E+01 G
CS-137	5.0981E+02					1.10E+04	
		661.66	5.098E+02	(	6.233E+00	9.29E-01	8.52E+01 G
Y-898	1.7049E+03					1.07E+02	
		898.02	1.705E+03	(	1.505E+01	7.81E-01	9.37E+01 G
Co-1173	7.7646E+02					1.93E+03	
		1173.24	7.765E+02	(	6.891E+00	8.68E-01	9.99E+01 G
Co-1332	7.6541E+02					1.93E+03	
		1332.50	7.654E+02	(	6.071E+00	8.39E-01	1.00E+02 G
Y-1836	1.7690E+03					1.07E+02	
		1836.01	1.769E+03	(	8.211E+00	7.99E-01	9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the

library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
Pb-210	1.5857E+04	1.6003E+04	5.927E-01%	1.85E+02
AM-241	1.2600E+03	1.2606E+03	7.317E-01%	1.66E+01
CD-109	1.5540E+04	1.8246E+04	4.164E-01%	1.13E+02
CO-57	2.9911E+02	3.9307E+02	7.739E-01%	5.11E+00
Ce-139	3.4161E+02	5.8589E+02	7.437E-01%	6.79E+00
Hg-203	2.6699E+02	1.3123E+03	1.078E+00%	2.21E+01
SN-113	5.5555E+02	1.0590E+03	8.510E-01%	1.20E+01
CS-137	5.0637E+02	5.0981E+02	9.286E-01%	6.23E+00
Y-898	8.4955E+02	1.7049E+03	7.808E-01%	1.50E+01
Co-1173	7.4709E+02	7.7646E+02	8.681E-01%	6.89E+00
Co-1332	7.3646E+02	7.6541E+02	8.386E-01%	6.07E+00
Y-1836	8.8152E+02	1.7690E+03	7.985E-01%	8.21E+00

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.1 keV) 3.784E+04 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 4.4384840E+04 Bq/Sample

Gamma Verification per Geometry

Detector: Ge14

Geometry: 1L Marn

Reference date 1/1/2012

Calibration Standard: 90062

Standard volume g / vial 1

Standard volume transferred in g / geometry 1

lab ID# of cal standard 6707

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1821	1821	0.359	**5072.4**	5099.7	100.5
Cd-109	2602	2602	0.0361	**72077.6**	70211	97.4
Co-57	1364	1364	0.856	**1593.5**	1591.3	99.9
Ce-139	1932	1932	0.799	**2418.0**	2382.7	98.5
Hg-203	4200	4200	0.8146	**5155.9**	5295.7	102.7
Sn-113	2722	2722	0.64	**4253.1**	4241.5	99.7
Cs-137	1750	1750	0.851	**2056.4**	2032.3	98.8
Mn-54	3114	3114	0.9998	**3114.6**	3210.8	103.1
Y-88	6559	6559	0.937	**7000.0**	6624.4	94.6
Zn-65	3134	3134	0.506	**6193.7**	6501.5	105.0
Co-60	3233	3233	0.99974	**3233.8**	3130	96.8
Co-60	3233	3233	0.99986	**3233.5**	3161.8	97.8
Y-88	6944	6944	0.992	**7000.0**	7104.9	101.5

Reviewed By: Rachael Schneider

Date: 3/15/2012

Calibration Data from file: 14_Liquid_Marinelli 1L.Clb
Energy Calibration Date: 3/14/2012 Time: 4:58:19 PM
Efficiency Calibration Date: 3/14/2012 Time: 4:58:47 PM

Calibration Description:
14_1LMarinelli_90062_030612

Energy Calibration Fit
Energy = 0.1952 +0.250028*Channel -1.58918e-008*Channel**2
FWHM (ch) = 2.9497 +0.000953*Channel -2.15433e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
237.80	59.54	59.65	-0.19%	0.77	0.79	-3.71%
351.28	88.03	88.02	0.01%	0.82	0.82	-0.46%
487.13	122.06	121.99	0.06%	0.84	0.85	-1.44%
662.38	165.85	165.80	0.03%	0.93	0.89	3.74%
1115.87	279.17	279.18	-0.00%	1.01	1.00	0.86%
1565.85	391.69	391.66	0.01%	1.12	1.10	1.65%
2646.08	661.66	661.68	-0.00%	1.33	1.33	-0.08%
3338.98	834.85	834.86	-0.00%	1.46	1.47	-0.99%
3591.90	898.02	898.06	-0.00%	1.53	1.52	0.21%
4462.13	1115.55	1115.54	0.00%	1.68	1.69	-0.54%
4693.00	1173.24	1173.23	0.00%	1.73	1.74	-0.64%
5330.38	1332.50	1332.49	0.00%	1.87	1.85	0.68%
7345.88	1836.01	1836.01	-0.00%	2.20	2.20	0.11%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 1.6436 %
Ln(Eff) = -1.4280 -0.041364*Ln(Eng) -0.0595801*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 0.0669 %
Ln(Eff) = -13.8330 +4.786779*Ln(Eng) -0.529374*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
59.54	4.4501E-002	4.4511E-002	-0.02%
88.03	4.9213E-002	4.9141E-002	0.15%
122.06	4.7083E-002	4.7143E-002	-0.13%
165.85	========== Knee ==========		
165.85	4.0337E-002	4.0931E-002	-1.47%
279.17	2.9507E-002	2.8704E-002	2.72%
391.69	2.2339E-002	2.2397E-002	-0.26%
661.66	1.4693E-002	1.4848E-002	-1.05%
834.85	1.2525E-002	1.2245E-002	2.23%
898.02	1.0895E-002	1.1511E-002	-5.65%
1115.55	1.0017E-002	9.5425E-003	4.74%
1173.24	8.8285E-003	9.1281E-003	-3.39%
1332.50	7.9683E-003	8.1493E-003	-2.27%
1836.01	6.1643E-003	6.0723E-003	1.49%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Am-241	59.54	35.70	1.58E+005	5100.80	1821.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	72078.00	2602.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	1593.50	1364.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	2418.00	1932.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	5153.40	4200.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	4253.10	2722.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	2053.70	1750.00	4.00%	1/1/2012 11:00:00 AM
Mn-54	834.85	99.98	3.12E+002	3114.60	3114.00	3.30%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	7000.00	6559.00	3.90%	1/1/2012 11:00:00 AM
Zn-65	1115.55	50.60	2.44E+002	6193.70	3134.00	3.50%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	3236.20	3233.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	3233.60	3233.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	7000.00	6944.00	4.00%	1/1/2012 11:00:00 AM

14_Marn1L_20120214

```
     ORTEC g v - i (1087) Env32  G53W4.25  3/14/2012 5:01:08 PM    Page  1
TestAmerica, Inc.               Spectrum name: 14_Marn1L_20120214.An1

Sample description
     14_Marn1L_90062_030612


Spectrum Filename: C:\User\Cal\Spectra\Det14\14_Marn1L_20120214.An1

Acquisition information
       Start time:                 3/6/2012 11:06:57 PM
       Live time:               3600
       Real time:               4175
       Dead time:                 13.77 %
       Detector ID:                   14

Detector system
     Ge14 SN/11080670


Calibration
       Filename:                   14_Liquid_Marinelli 1L.Clb
     14_1LMarinelli_90062_030612


       Energy Calibration
            Created:               3/14/2012 4:58:19 PM
            Zero offset:           0.195 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -1.589E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/14/2012 4:58:47 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.64 %
            Log(Eff):             -1.428037E+00 + (-4.136370E-02*Log(E) ) +
                                   ( -5.958012E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.07 %
            Log(Eff):             -1.383299E+01 + ( 4.786779E+00*Log(E) ) +
                                   ( -5.293738E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.70keV )
       Stop channel:            8000 (  1999.40keV )
       Peak rejection level:      10.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

     ORTEC g v - i (1087) Env32  G53W4.25  3/14/2012 5:01:08 PM    Page  2
TestAmerica, Inc.               Spectrum name: 14_Marn1L_20120214.An1
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```
       Random error:                4.0000000E+00
       Systematic error:            4.0000000E+00
       Fraction Limit:              0.000%
       Background width:            average of three points.

       Half lives decay limit:     12.000
       Activity range factor:       2.000
       Min. step backg. energy      0.000
       Multiplet shift channel      2.000

Corrections                          Status          Comments
       Decay correct to date:         YES       1/1/2012 11:00:00 AM
       Decay during acquisition:      NO
       Decay during collection:       NO
       True coincidence correction:   NO
       Peaked background correction:  NO
       Absorption (Internal):         NO
       Geometry correction:           NO
       Random summing:                NO


total peaks alloc.   13 cutoff: 5.00E+01%
       Energy Calibration
            Normalized diff:       0.0292
```

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq	Nuc
38.07	21654.	2.26	0.75	3.259E-02				
49.67	9700.	5.85	1.48	4.025E-02				
59.65	291645.	0.29	0.77	4.455E-02	59.54	35.700	5.100E+03	AM241
70.89	11685.	3.35	0.80	4.746E-02				
72.96	19771.	1.98	0.81	4.782E-02				
82.52	8416.	4.51	0.82	4.888E-02				
85.00	10172.	3.72	0.82	4.903E-02				
88.04	416870.	0.17	0.82	4.914E-02	88.03	3.610	7.201E+04	CD109
121.99	195618.	0.35	0.84	4.715E-02	122.06	85.600	1.591E+03	CO57
136.40	24070.	1.86	0.86	4.530E-02				
165.80	201696.	0.34	0.93	4.092E-02	165.85	79.900	2.383E+03	Ce139
199.08	5460.	6.64	0.97	3.628E-02				
255.08	6879.	4.87	1.03	3.060E-02				
279.18	168439.	0.32	1.01	2.870E-02	279.17	81.500	5.296E+03	Hg203
391.66	147525.	0.33	1.12	2.240E-02	391.69	64.000	4.242E+03	SN113
511.09	8266.	3.88	2.16	1.825E-02				
661.68	92186.	0.51	1.33	1.485E-02	661.66	85.210	2.032E+03	CS137
813.92	2750.	5.30	1.46	1.251E-02				
834.87	121393.	0.31	1.47	1.224E-02	834.85	99.980	3.185E+03	Mn54
898.06	168004.	0.33	1.53	1.151E-02	898.02	93.700	6.624E+03	Y898
1115.54	93846.	0.44	1.68	9.543E-03	1115.55	50.600	6.502E+03	Zn65
1173.23	100357.	0.37	1.73	9.128E-03	1173.24	99.900	3.130E+03	Co1173
1324.84	3723.	5.11	3.11	8.192E-03				
1332.49	90580.	0.40	1.87	8.149E-03	1332.50	99.982	3.162E+03	Co1332
1836.01	100634.	0.33	2.20	6.072E-03	1836.01	99.200	7.105E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
151.47	38.07	68514.	21654.	6.644E+05	2.26	0.749	- s
197.90	49.67	98774.	9700.	2.410E+05	5.85	1.481	- s

282.79	70.90	72030.	10225.	2.154E+05	4.40	0.796	-	D

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TestAmerica, Inc. Spectrum name: 14_Marn1L_20120214.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
291.07	72.97	66878.	18325.	3.832E+05	2.42	0.793	-	D
329.18	82.50	76800.	5506.	1.126E+05	8.82	1.048	-	sD
339.19	84.98	66692.	10172.	4.523E+04	3.72	0.818	-	lD
544.79	136.40	50098.	24070.	5.313E+05	1.86	0.859	-	
795.47	199.08	36038.	5460.	1.505E+05	6.64	0.972	-	s
1019.50	255.08	28728.	6879.	2.248E+05	4.87	1.025	-	
2043.63	511.09	21035.	8266.	4.528E+05	3.88	2.156	-	s
3255.08	813.89	12208.	3401.	2.718E+05	7.58	1.641	-	s
5299.75	1324.84	4748.	3723.	4.544E+05	5.11	3.107	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Mn, Zn.L

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
AM-241	237.80	59.65	116745.	291645.	81.013	0.29	0.765
CD-109	351.28	88.02	93268.	406468.	112.908	0.22	0.817
CO-57	487.13	121.99	67906.	195618.	54.338	0.35	0.840
Ce-139	662.38	165.80	56766.	201696.	56.027	0.34	0.928
Hg-203	1115.87	279.18	28497.	168439.	46.789	0.32	1.005
SN-113	1565.85	391.66	20811.	147525.	40.979	0.33	1.116
CS-137	2646.08	661.68	22769.	92186.	25.607	0.51	1.329
Mn-54	3338.98	834.86	14954.	122362.	33.989	0.37	1.458
Y-898	3591.89	898.06	20498.	168004.	46.668	0.33	1.527
Zn-65	4462.13	1115.54	10931.	93846.	26.068	0.44	1.683
Co-1173	4693.00	1173.23	6251.	100357.	27.877	0.37	1.725
Co-1332	5330.38	1332.49	5298.	90580.	25.161	0.40	1.866
Y-1836	7345.86	1836.01	1482.	100634.	27.954	0.33	2.198

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq	Peak Energy keV	Activity Bq	Code	MDA Value Bq	COMMENTS
AM-241		5.0997E+03				1.58E+05	
			59.54	5.100E+03	(	2.789E+01 2.95E-01 3.57E+01	G

ORTEC g v - i (1087) Env32 G53W4.25 3/14/2012 5:01:08 PM Page 4
TestAmerica, Inc. Spectrum name: 14_Marn1L_20120214.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments

```
CD-109       7.0211E+04                                        4.63E+02
                           88.03 7.021E+04  (  2.463E+02 2.15E-01 3.61E+00 G

CO-57        1.5913E+03                                        2.72E+02
                          122.06 1.591E+03  (  9.901E+00 3.54E-01 8.56E+01 G

Ce-139       2.3827E+03                                        1.38E+02
                          165.85 2.383E+03  (  1.315E+01 3.35E-01 7.99E+01 G

Hg-203       5.2957E+03                                        4.66E+01
                          279.17 5.296E+03  (  2.482E+01 3.18E-01 8.15E+01 G

SN-113       4.2415E+03                                        1.15E+02
                          391.69 4.242E+03  (  1.941E+01 3.33E-01 6.40E+01 G

CS-137       2.0323E+03                                        1.10E+04
                          661.66 2.032E+03  (  1.556E+01 5.10E-01 8.52E+01 G

Mn-54        3.2108E+03                                        3.12E+02
                          834.85 3.211E+03  (  1.502E+01 3.74E-01 1.00E+02 G

Y-898        6.6244E+03                                        1.07E+02
                          898.02 6.624E+03  (  2.641E+01 3.30E-01 9.37E+01 G

Zn-65    F   6.5015E+03                                        2.44E+02
                         1115.55 6.502E+03  (  3.394E+01 4.44E-01 5.06E+01 G

Co-1173      3.1300E+03                                        1.93E+03
                         1173.24 3.130E+03  (  1.158E+01 3.73E-01 9.99E+01 G

Co-1332      3.1618E+03                                        1.93E+03
                         1332.50 3.162E+03  (  1.193E+01 3.99E-01 1.00E+02 G

Y-1836       7.1049E+03                                        1.07E+02
                         1836.01 7.105E+03  (  1.286E+01 3.32E-01 9.92E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
```



```
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
                                       Page 4
```

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq	Time Corrected Activity Bq	Uncertainty Counting 1 Sigma	MDA
AM-241	5.0982E+03	5.0997E+03	2.948E-01%	2.79E+01
CD-109	6.3647E+04	7.0211E+04	2.150E-01%	2.46E+02
CO-57	1.3465E+03	1.5913E+03	3.536E-01%	9.90E+00
Ce-139	1.7132E+03	2.3827E+03	3.352E-01%	1.31E+01
Hg-203	2.0000E+03	5.2957E+03	3.181E-01%	2.48E+01
SN-113	2.8588E+03	4.2415E+03	3.329E-01%	1.94E+01
CS-137	2.0240E+03	2.0323E+03	5.102E-01%	1.56E+01
Mn-54	2.7764E+03	3.2108E+03	3.741E-01%	1.50E+01
Y-898	4.3268E+03	6.6244E+03	3.304E-01%	2.64E+01
Zn-65	5.3988E+03	6.5015E+03	4.445E-01%	3.39E+01
Co-1173	3.0570E+03	3.1300E+03	3.728E-01%	1.16E+01
Co-1332	3.0881E+03	3.1618E+03	3.985E-01%	1.19E+01
Y-1836	4.6406E+03	7.1049E+03	3.322E-01%	1.29E+01

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

ORTEC g v - i (1087) Env32 G53W4.25 3/14/2012 5:01:08 PM Page 6
TestAmerica, Inc. Spectrum name: 14_Marn1L_20120214.An1

---------- S U M M A R Y ----------

Total Activity (37.7 to 1999.4 keV) 1.020E+05 Bq
Total Decayed Activity (37.7 to 1999.4 keV) 1.2058714E+05 Bq

Gamma Verification per Geometry

Detector: Ge16

Geometry: 1L Marn

Reference date 1/1/2012

Calibration Standard: 90062

Standard volume g / vial 1

Standard volume transferred in g / geometry 1

lab ID# of cal standard 6707

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1821	1821	0.359	**5072.4**	5015.2	98.9
Cd-109	2602	2602	0.0361	**72077.6**	69098	95.9
Co-57	1364	1364	0.856	**1593.5**	1601.3	100.5
Ce-139	1932	1932	0.799	**2418.0**	2391.1	98.9
Hg-203	4200	4200	0.8146	**5155.9**	5262.6	102.1
Sn-113	2722	2722	0.64	**4253.1**	4232.8	99.5
Cs-137	1750	1750	0.851	**2056.4**	2036.7	99.0
Mn-54	3114	3114	0.9998	**3114.6**	3232.6	103.8
Y-88	6559	6559	0.937	**7000.0**	6514.5	93.1
Zn-65	3134	3134	0.506	**6193.7**	6635.9	107.1
Co-60	3233	3233	0.99974	**3233.8**	3077.5	95.2
Co-60	3233	3233	0.99986	**3233.5**	3114.5	96.3
Y-88	6944	6944	0.992	**7000.0**	7137.4	102.0

Reviewed By: Rachael Schneider

Date: 4/3/2012

Calibration Data from file: 16_Liquid_Marinelli 1L.Clb
Energy Calibration Date: 4/2/2012 Time: 6:09:11 PM
Efficiency Calibration Date: 4/2/2012 Time: 6:09:24 PM

Calibration Description:
16_1Lmarn_90062_032712

Energy Calibration Fit
Energy = -0.0068 +0.250063*Channel -1.97784e-008*Channel**2
FWHM (ch) = 3.8412 +0.000871*Channel -1.25435e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
238.12	59.54	59.54	0.01%	1.01	1.01	-0.57%
352.22	88.03	88.07	-0.04%	1.03	1.04	-0.82%
488.32	122.06	122.10	-0.03%	1.08	1.07	1.06%
663.48	165.85	165.90	-0.03%	1.12	1.10	1.25%
1116.17	279.17	279.08	0.03%	1.19	1.20	-0.51%
1566.25	391.69	391.60	0.02%	1.29	1.29	-0.31%
2646.59	661.66	661.67	-0.00%	1.52	1.51	0.19%
3339.48	834.85	834.85	-0.00%	1.65	1.65	0.11%
3592.25	898.02	898.03	-0.00%	1.69	1.70	-0.64%
4462.73	1115.55	1115.56	-0.00%	1.86	1.87	-0.63%
4693.62	1173.24	1173.26	-0.00%	1.90	1.91	-0.62%
5331.05	1332.50	1332.53	-0.00%	2.07	2.03	1.76%
7346.38	1836.01	1835.98	0.00%	2.38	2.39	-0.34%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.4245 %
Ln(Eff) = -2.3147 +0.284801*Ln(Eng) -0.0811499*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 0.2610 %
Ln(Eff) = -12.6035 +4.382261*Ln(Eng) -0.488912*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
59.54	5.7326E-002	5.7274E-002	0.09%
88.03	6.1456E-002	6.1813E-002	-0.58%
122.06	5.9034E-002	5.8742E-002	0.49%
165.85	========== Knee ==========		
165.85	5.0286E-002	5.0846E-002	-1.11%
279.17	3.8262E-002	3.7455E-002	2.11%
391.69	2.9847E-002	2.9986E-002	-0.47%
661.66	2.0315E-002	2.0485E-002	-0.84%
834.85	1.7702E-002	1.7055E-002	3.66%
898.02	1.4961E-002	1.6073E-002	-7.43%
1115.55	1.4365E-002	1.3406E-002	6.67%
1173.24	1.2209E-002	1.2839E-002	-5.16%
1332.50	1.1066E-002	1.1489E-002	-3.82%
1836.01	8.7552E-003	8.5852E-003	1.94%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Am-241	59.54	35.70	1.58E+005	5100.80	1821.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	72078.00	2602.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	1593.50	1364.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	2418.00	1932.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	5153.40	4200.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	4253.10	2722.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	2053.70	1750.00	4.00%	1/1/2012 11:00:00 AM
Mn-54	834.85	99.98	3.12E+002	3114.60	3114.00	3.30%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	7000.00	6559.00	3.90%	1/1/2012 11:00:00 AM
Zn-65	1115.55	50.60	2.44E+002	6193.70	3134.00	3.50%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	3236.20	3233.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	3233.60	3233.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	7000.00	6944.00	4.00%	1/1/2012 11:00:00 AM

16_Marn1L_20120257

```
     ORTEC g v - i (1087) Env32  G53W4.25  4/2/2012 6:09:53 PM     Page  1
TestAmerica, Inc.               Spectrum name: 16_Marn1L_20120257.An1

Sample description
     16_Marn1L_90062_032712


Spectrum Filename: C:\User\SPC\Det16\16_Marn1L_20120257.An1

Acquisition information
       Start time:                 3/27/2012 3:43:12 PM
       Live time:               3600
       Real time:               4253
       Dead time:                 15.35 %
       Detector ID:                   16

Detector system
     Ge16 SN/11012217


Calibration
       Filename:                   16_Liquid_Marinelli 1L.Clb
     16_1Lmarn_90062_032712


       Energy Calibration
            Created:               4/2/2012 6:09:11 PM
            Zero offset:          -0.007 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -1.978E-08 keV/channel^2

       Efficiency Calibration
            Created:               4/2/2012 6:09:24 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   2.42 %
            Log(Eff):             -2.314705E+00 + ( 2.848008E-01*Log(E) ) +
                                   ( -8.114986E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.26 %
            Log(Eff):             -1.260350E+01 + ( 4.382261E+00*Log(E) ) +
                                   ( -4.889120E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.50keV )
       Stop channel:            8000 (  1999.23keV )
       Peak rejection level:      10.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

     ORTEC g v - i (1087) Env32  G53W4.25  4/2/2012 6:09:53 PM     Page  2
TestAmerica, Inc.               Spectrum name: 16_Marn1L_20120257.An1
                                      Page 1
```

```
       Random error:                4.0000000E+00
       Systematic error:            4.0000000E+00
       Fraction Limit:              0.000%
       Background width:            average of three points.

       Half lives decay limit:     12.000
       Activity range factor:       2.000
       Min. step backg. energy      0.000
       Multiplet shift channel      2.000

Corrections                          Status          Comments
       Decay correct to date:         YES       1/1/2012 11:00:00 AM
       Decay during acquisition:      NO
       Decay during collection:       NO
       True coincidence correction:   NO
       Peaked background correction:  NO
       Absorption (Internal):         NO
       Geometry correction:           NO
       Random summing:                NO


total peaks alloc.   13 cutoff: 5.00E+01%
       Energy Calibration
            Normalized diff:       0.0239
```

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq	Nuc
37.83	30994.	1.94	1.11	4.347E-02				
49.52	16296.	4.51	1.90	5.246E-02				
56.55	9875.	5.10	1.01	5.605E-02				
59.58	372591.	0.20	1.01	5.727E-02	59.54	35.700	5.064E+03	AM241
70.84	10335.	4.30	1.02	6.035E-02				
72.96	17658.	2.60	1.02	6.071E-02				
82.50	10170.	4.38	1.03	6.167E-02				
84.88	12549.	3.45	1.03	6.176E-02				
88.08	502632.	0.16	1.04	6.181E-02	88.03	3.610	7.120E+04	CD109
122.10	232662.	0.34	1.08	5.874E-02	122.06	85.600	1.601E+03	CO57
136.54	29103.	1.83	1.06	5.635E-02				
165.90	226558.	0.31	1.12	5.084E-02	165.85	79.900	2.391E+03	Ce139
199.13	7237.	5.62	1.32	4.590E-02				
255.07	7532.	5.00	1.12	3.962E-02				
279.08	160585.	0.38	1.19	3.746E-02	279.17	81.500	5.263E+03	Hg203
391.60	174011.	0.36	1.29	2.999E-02	391.69	64.000	4.233E+03	SN113
511.03	14656.	2.70	2.70	2.485E-02				
661.67	127292.	0.48	1.52	2.049E-02	661.66	85.210	2.037E+03	CS137
834.85	163887.	0.33	1.65	1.706E-02	834.85	99.980	3.233E+03	Mn54
898.03	201661.	0.29	1.69	1.607E-02	898.02	93.700	6.515E+03	Y898
1115.56	126897.	0.38	1.86	1.341E-02	1115.55	50.600	6.636E+03	Zn65
1173.26	137755.	0.35	1.90	1.284E-02	1173.24	99.900	3.077E+03	Co1173
1324.86	3898.	4.83	2.78	1.155E-02				
1332.53	124857.	0.33	2.07	1.149E-02	1332.50	99.982	3.114E+03	Co1332
1835.98	124938.	0.31	2.38	8.585E-03	1836.01	99.200	7.137E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
151.30	37.83	85759.	30994.	7.130E+05	1.94	1.111	- s
198.06	49.52	136436.	16296.	3.106E+05	4.51	1.898	- s

226.17	56.51	121941.	9875.-	9.845E+03	5.10	1.010	-	D

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
283.31	70.84	93409.	10335.	1.712E+05	4.30	1.022	-	D
291.81	72.96	96786.	17658.	2.908E+05	2.60	1.024	-	D
329.95	82.48	94240.	10170.	8.117E+04	4.38	1.032	-	lD
339.46	84.86	87407.	12549.	3.048E+04	3.45	1.034	-	lD
546.08	136.54	63267.	29103.	5.165E+05	1.83	1.064	-	
796.39	199.13	43208.	7237.	1.577E+05	5.62	1.316	-	
1020.15	255.07	35111.	7532.	1.901E+05	5.00	1.125	-	
2043.98	511.03	26576.	14656.	5.897E+05	2.70	2.704	-	s
5300.35	1324.86	5255.	3898.	3.376E+05	4.83	2.783	-	sM

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_EnergyStandardMix & Mn, Zn.L

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
AM-241	238.12	59.54	164069.	369020.	102.506	0.29	1.006
CD-109	352.22	88.07	125895.	487826.	135.507	0.21	1.028
CO-57	488.32	122.10	84352.	232662.	64.628	0.34	1.078
Ce-139	663.48	165.90	60532.	226558.	62.933	0.31	1.118
Hg-203	1116.16	279.08	41732.	160585.	44.607	0.38	1.194
SN-113	1566.24	391.60	35115.	174011.	48.336	0.36	1.290
CS-137	2646.59	661.67	34986.	127292.	35.359	0.48	1.518
Mn-54	3339.48	834.85	20555.	163887.	45.524	0.33	1.654
Y-898	3592.25	898.03	23155.	201661.	56.017	0.29	1.691
Zn-65	4462.73	1115.56	13927.	126897.	35.249	0.38	1.858
Co-1173	4693.62	1173.26	10843.	137755.	38.265	0.35	1.901
Co-1332	5331.05	1332.53	6246.	124857.	34.682	0.33	2.068
Y-1836	7346.37	1835.98	2517.	124938.	34.705	0.31	2.381

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq	Peak Energy keV	Peak Activity Bq	Peak Code	Peak MDA Value Bq	COMMENTS
AM-241		5.0152E+03					1.58E+05
			59.54	5.015E+03	(	2.569E+01	2.89E-01 3.57E+01 G

```
CD-109       6.9098E+04                                        4.63E+02
                           88.03 6.910E+04  (  2.346E+02 2.10E-01 3.61E+00 G

CO-57        1.6013E+03                                        2.72E+02
                          122.06 1.601E+03  (  9.333E+00 3.40E-01 8.56E+01 G

Ce-139       2.3911E+03                                        1.38E+02
                          165.85 2.391E+03  (  1.213E+01 3.12E-01 7.99E+01 G

Hg-203       5.2626E+03                                        4.66E+01
                          279.17 5.263E+03  (  3.129E+01 3.78E-01 8.15E+01 G

SN-113       4.2328E+03                                        1.15E+02
                          391.69 4.233E+03  (  2.131E+01 3.56E-01 6.40E+01 G

CS-137       2.0367E+03                                        1.10E+04
                          661.66 2.037E+03  (  1.399E+01 4.79E-01 8.52E+01 G

Mn-54        3.2326E+03                                        3.12E+02
                          834.85 3.233E+03  (  1.323E+01 3.31E-01 1.00E+02 G

Y-898        6.5145E+03                                        1.07E+02
                          898.02 6.515E+03  (  2.299E+01 2.94E-01 9.37E+01 G

Zn-65    F   6.6359E+03                                        2.44E+02
                         1115.55 6.636E+03  (  2.890E+01 3.77E-01 5.06E+01 G

Co-1173      3.0775E+03                                        1.93E+03
                         1173.24 3.077E+03  (  1.090E+01 3.45E-01 9.99E+01 G

Co-1332      3.1145E+03                                        1.93E+03
                         1332.50 3.114E+03  (  9.254E+00 3.29E-01 1.00E+02 G

Y-1836       7.1374E+03                                        1.07E+02
                         1836.01 7.137E+03  (  1.351E+01 3.08E-01 9.92E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
```



```
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
                                       Page 4
```

I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq	Time Corrected Activity Bq	Uncertainty Counting 1 Sigma	MDA
AM-241	5.0133E+03	5.0152E+03	2.887E-01%	2.57E+01
CD-109	6.0726E+04	6.9098E+04	2.105E-01%	2.35E+02
CO-57	1.2853E+03	1.6013E+03	3.401E-01%	9.33E+00
Ce-139	1.5491E+03	2.3911E+03	3.118E-01%	1.21E+01
Hg-203	1.4613E+03	5.2626E+03	3.784E-01%	3.13E+01
SN-113	2.5187E+03	4.2328E+03	3.564E-01%	2.13E+01
CS-137	2.0256E+03	2.0367E+03	4.793E-01%	1.40E+01
Mn-54	2.6697E+03	3.2326E+03	3.309E-01%	1.32E+01
Y-898	3.7194E+03	6.5145E+03	2.943E-01%	2.30E+01
Zn-65	5.1962E+03	6.6359E+03	3.771E-01%	2.89E+01
Co-1173	2.9835E+03	3.0775E+03	3.453E-01%	1.09E+01
Co-1332	3.0193E+03	3.1145E+03	3.288E-01%	9.25E+00

ORTEC g v - i (1087) Env32 G53W4.25 4/2/2012 6:09:53 PM Page 6
TestAmerica, Inc. Spectrum name: 16_Marn1L_20120257.An1

Y-1836	4.0750E+03	7.1374E+03	3.084E-01%	1.35E+01

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (78.0 to 1999.2 keV) 9.624E+04 Bq
Total Decayed Activity (78.0 to 1999.2 keV) 1.1935008E+05 Bq

Gamma Verification per Geometry

Detector: Ge17

Geometry: 1L Marn

Reference date 1/1/2012

Calibration Standard: 90062

Standard volume g / vial 1

Standard volume transferred in g / geometry 1

lab ID# of cal standard 6707

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1821	1821	0.359	**5072.4**	5112.5	100.8
Cd-109	2602	2602	0.0361	**72077.6**	71031	98.5
Co-57	1364	1364	0.856	**1593.5**	1613.4	101.3
Ce-139	1932	1932	0.799	**2418.0**	2392	98.9
Hg-203	4200	4200	0.8146	**5155.9**	5257.5	102.0
Sn-113	2722	2722	0.64	**4253.1**	4231.2	99.5
Cs-137	1750	1750	0.851	**2056.4**	2042.9	99.3
Mn-54	3114	3114	0.9998	**3114.6**	3228.2	103.6
Y-88	6559	6559	0.937	**7000.0**	6547.6	93.5
Zn-65	3134	3134	0.506	**6193.7**	6547.5	105.7
Co-60	3233	3233	0.99974	**3233.8**	3100.4	95.9
Co-60	3233	3233	0.99986	**3233.5**	3131	96.8
Y-88	6944	6944	0.992	**7000.0**	7133.8	101.9

Reviewed By: Elizabeth M. Hoerchler

Date: 3/8/2012

Calibration Data from file: 17_Liquid_Marinelli 1L.Clb
Energy Calibration Date: 3/7/2012 Time: 11:47:12 AM
Efficiency Calibration Date: 3/7/2012 Time: 11:47:27 AM

Calibration Description:
17_1L marn_90062_030512

Energy Calibration Fit
Energy = 0.1347 +0.250093*Channel -2.1148e-008*Channel**2
FWHM (ch) = 2.9716 +0.000920*Channel -1.82029e-008*Channel**2

Energy/FWHM Table

Channel	Energy(keV)	Fit(keV)	Delta	FWHM(keV)	Fit(keV)	Delta
237.91	59.54	59.63	-0.16%	0.80	0.80	0.12%
351.76	88.03	88.11	-0.09%	0.81	0.82	-1.28%
487.42	122.06	122.03	0.02%	0.86	0.85	0.15%
662.29	165.85	165.76	0.05%	0.91	0.89	1.82%
1115.54	279.17	279.10	0.03%	1.00	0.99	0.87%
1565.73	391.69	391.66	0.01%	1.10	1.09	0.88%
2645.69	661.66	661.66	0.00%	1.28	1.32	-2.99%
3338.60	834.85	834.86	-0.00%	1.38	1.46	-5.41%
3591.45	898.02	898.06	-0.00%	1.55	1.51	2.83%
4461.68	1115.55	1115.55	-0.00%	1.71	1.68	1.99%
4692.56	1173.24	1173.25	-0.00%	1.74	1.72	1.25%
5329.94	1332.50	1332.52	-0.00%	1.84	1.84	-0.14%
7345.24	1836.01	1835.99	0.00%	2.17	2.19	-0.50%

Efficiency Calibration Fit
Knee Energy = 165.85 keV
Above the Knee: Quadratic Uncertainty = 2.0885 %
Ln(Eff) = -2.0941 +0.178816*Ln(Eng) -0.0728314*(Ln(Eng))**2
Below the Knee: Quadratic Uncertainty = 0.6563 %
Ln(Eff) = -12.0102 +4.016685*Ln(Eng) -0.443977*(Ln(Eng))**2

Efficiency Table

Energy	Efficiency	Fit	Delta
59.54	4.9398E-002	4.9285E-002	0.23%
88.03	5.2818E-002	5.3594E-002	-1.47%
122.06	5.2447E-002	5.1796E-002	1.24%
165.85	========== Knee ==========		
165.85	4.5346E-002	4.5833E-002	-1.07%
279.17	3.4160E-002	3.3471E-002	2.02%
391.69	2.6577E-002	2.6711E-002	-0.50%
661.66	1.8130E-002	1.8226E-002	-0.53%
834.85	1.5743E-002	1.5188E-002	3.53%
898.02	1.3397E-002	1.4321E-002	-6.89%
1115.55	1.2652E-002	1.1968E-002	5.41%
1173.24	1.0986E-002	1.1467E-002	-4.38%
1332.50	9.9524E-003	1.0279E-002	-3.28%
1836.01	7.8699E-003	7.7211E-003	1.89%

Calibration Certificate Table

Isotope	Energy	Pct	Halflife	Activity	GPS	Error	Date & Time
Am-241	59.54	35.70	1.58E+005	5100.80	1821.00	3.50%	1/1/2012 11:00:00 AM
Cd-109	88.03	3.61	4.63E+002	72078.00	2602.00	4.70%	1/1/2012 11:00:00 AM
Co-57	122.06	85.60	2.72E+002	1593.50	1364.00	4.10%	1/1/2012 11:00:00 AM
Ce-139	165.85	79.90	1.38E+002	2418.00	1932.00	3.90%	1/1/2012 11:00:00 AM
Hg-203	279.17	81.50	4.66E+001	5153.40	4200.00	3.80%	1/1/2012 11:00:00 AM
Sn-113	391.69	64.00	1.15E+002	4253.10	2722.00	3.90%	1/1/2012 11:00:00 AM
Cs-137	661.66	85.21	1.10E+004	2053.70	1750.00	4.00%	1/1/2012 11:00:00 AM
Mn-54	834.85	99.98	3.12E+002	3114.60	3114.00	3.30%	1/1/2012 11:00:00 AM
Y-88	898.02	93.70	1.07E+002	7000.00	6559.00	3.90%	1/1/2012 11:00:00 AM
Zn-65	1115.55	50.60	2.44E+002	6193.70	3134.00	3.50%	1/1/2012 11:00:00 AM
Co-60	1173.24	99.90	1.93E+003	3236.20	3233.00	4.00%	1/1/2012 11:00:00 AM
Co-60	1332.50	99.98	1.93E+003	3233.60	3233.00	4.00%	1/1/2012 11:00:00 AM
Y-88	1836.01	99.20	1.07E+002	7000.00	6944.00	4.00%	1/1/2012 11:00:00 AM

```
     ORTEC g v - i (1087) Env32  G53W4.25  3/7/2012 11:48:20 AM    Page  1
TestAmerica, Inc.                Spectrum name: 17_1LMarn_20120191.An1

Sample description
     17_1LMarn_90062_030512


Spectrum Filename: C:\User\SPC\Det17\17_1LMarn_20120191.An1

Acquisition information
       Start time:                 3/5/2012 2:23:43 PM
       Live time:               3600
       Real time:               4296
       Dead time:                 16.19 %
       Detector ID:                   17

Detector system
     Ge17 SN/11080671


Calibration
       Filename:                   17_Liquid_Marinelli 1L.Clb
     17_1L marn_90062_030512


       Energy Calibration
            Created:               3/7/2012 11:47:12 AM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -2.115E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/7/2012 11:47:27 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   2.09 %
            Log(Eff):             -2.094103E+00 + ( 1.788156E-01*Log(E) ) +
                                   ( -7.283143E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.66 %
            Log(Eff):             -1.201018E+01 + ( 4.016685E+00*Log(E) ) +
                                   ( -4.439774E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.65keV )
       Stop channel:            8000 (  1999.53keV )
       Peak rejection level:      10.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

     ORTEC g v - i (1087) Env32  G53W4.25  3/7/2012 11:48:20 AM    Page  2
TestAmerica, Inc.                Spectrum name: 17_1LMarn_20120191.An1
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```
       Random error:                4.0000000E+00
       Systematic error:            4.0000000E+00
       Fraction Limit:              0.000%
       Background width:            average of three points.

       Half lives decay limit:     12.000
       Activity range factor:       2.000
       Min. step backg. energy      0.000
       Multiplet shift channel      2.000

Corrections                          Status          Comments
       Decay correct to date:         YES       1/1/2012 11:00:00 AM
       Decay during acquisition:      NO
       Decay during collection:       NO
       True coincidence correction:   NO
       Peaked background correction:  NO
       Absorption (Internal):         NO
       Geometry correction:           NO
       Random summing:                NO


total peaks alloc.   13 cutoff: 5.00E+01%
       Energy Calibration
            Normalized diff:       0.0383
```

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq	Nuc
38.01	28332.	1.83	0.82	3.787E-02				
49.65	10470.	5.54	1.42	4.526E-02				
59.63	323741.	0.27	0.80	4.932E-02	59.54	35.700	5.112E+03	AM241
70.90	13184.	3.06	0.81	5.203E-02				
73.01	22392.	1.88	0.81	5.237E-02				
82.52	6082.	6.51	0.82	5.335E-02				
88.11	449400.	0.21	0.83	5.360E-02	88.03	3.610	7.103E+04	CD109
122.03	218662.	0.35	0.90	5.180E-02	122.06	85.600	1.613E+03	CO57
136.42	26924.	1.83	0.87	5.010E-02				
165.76	228303.	0.31	0.93	4.603E-02	165.85	79.900	2.392E+03	Ce139
198.99	6240.	5.78	1.08	4.125E-02				
255.05	7674.	4.40	1.06	3.545E-02				
279.10	198991.	0.30	1.05	3.348E-02	279.17	81.500	5.258E+03	Hg203
391.66	176956.	0.32	1.13	2.671E-02	391.69	64.000	4.231E+03	SN113
510.97	13673.	2.59	2.45	2.212E-02				
661.66	113755.	0.46	1.36	1.823E-02	661.66	85.210	2.043E+03	CS137
813.91	2992.	9.03	1.66	1.550E-02				
834.86	153063.	0.34	1.50	1.519E-02	834.85	99.980	3.228E+03	Mn54
898.06	208430.	0.28	1.55	1.432E-02	898.02	93.700	6.548E+03	Y898
1115.55	118990.	0.39	1.71	1.197E-02	1115.55	50.600	6.548E+03	Zn65
1173.24	124948.	0.35	1.74	1.147E-02	1173.24	99.900	3.100E+03	Co1173
1324.83	3875.	5.01	2.78	1.033E-02				
1332.52	113188.	0.35	1.84	1.028E-02	1332.50	99.982	3.131E+03	Co1332
1835.98	129623.	0.30	2.18	7.721E-03	1836.01	99.200	7.134E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
151.45	38.01	68392.	28332.	7.482E+05	1.83	0.816	- s
197.99	49.65	103012.	10470.	2.313E+05	5.54	1.416	- s
282.92	70.89	76458.	11270.	2.166E+05	4.12	0.818	- D

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TestAmerica, Inc. Spectrum name: 17_1LMarn_20120191.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
291.38	73.00	78615.	19753.	3.772E+05	2.49	0.799	-	D
329.30	82.49	80588.	7080.	1.327E+05	7.05	1.043	-	s
544.96	136.42	58536.	26924.	5.374E+05	1.83	0.869	-	
795.19	198.99	37191.	6240.	1.513E+05	5.78	1.080	-	
1019.36	255.05	30402.	7674.	2.165E+05	4.40	1.059	-	
2042.93	510.97	23019.	13673.	6.182E+05	2.59	2.451	-	s
3254.77	813.91	13996.	2992.	1.930E+05	9.03	1.661	-	
5299.18	1324.83	5645.	3875.	3.751E+05	5.01	2.776	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Mn, Zn.L

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
AM-241	237.91	59.63	117664.	323741.	89.928	0.27	0.802
CD-109	351.76	88.11	113683.	449400.	124.833	0.21	0.828
CO-57	487.42	122.03	82520.	218662.	60.739	0.35	0.901
Ce-139	662.29	165.76	62517.	228303.	63.417	0.31	0.935
Hg-203	1115.56	279.10	34927.	198991.	55.275	0.30	1.051
SN-113	1565.73	391.66	28892.	176956.	49.155	0.32	1.130
CS-137	2645.69	661.66	26757.	113755.	31.599	0.46	1.357
Mn-54	3338.59	834.86	18685.	153063.	42.518	0.34	1.501
Y-898	3591.45	898.06	21083.	208430.	57.897	0.28	1.554
Zn-65	4461.67	1115.55	13488.	118990.	33.053	0.39	1.713
Co-1173	4692.55	1173.24	9210.	124948.	34.708	0.35	1.744
Co-1332	5329.94	1332.52	6347.	113188.	31.441	0.35	1.836
Y-1836	7345.22	1835.98	2492.	129623.	36.006	0.30	2.176

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq	Peak Energy keV	Activity Bq	Code	MDA Value Bq	COMMENTS
AM-241		5.1125E+03				1.58E+05	
			59.54	5.112E+03	(	2.529E+01 2.68E-01 3.57E+01	G

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TestAmerica, Inc. Spectrum name: 17_1LMarn_20120191.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak MDA	Comments
CD-109	7.1031E+04				4.63E+02	

```
                                88.03 7.103E+04  (  2.488E+02 2.14E-01 3.61E+00 G

CO-57        1.6134E+03                                       2.72E+02
                               122.06 1.613E+03  (  9.897E+00 3.51E-01 8.56E+01 G

Ce-139       2.3920E+03                                       1.38E+02
                               165.85 2.392E+03  (  1.224E+01 3.13E-01 7.99E+01 G

Hg-203       5.2575E+03                                       4.66E+01
                               279.17 5.258E+03  (  2.308E+01 2.97E-01 8.15E+01 G

SN-113       4.2312E+03                                       1.15E+02
                               391.69 4.231E+03  (  1.900E+01 3.23E-01 6.40E+01 G

CS-137       2.0429E+03                                       1.10E+04
                               661.66 2.043E+03  (  1.374E+01 4.57E-01 8.52E+01 G

Mn-54        3.2282E+03                                       3.12E+02
                               834.85 3.228E+03  (  1.349E+01 3.36E-01 1.00E+02 G

Y-898        6.5476E+03                                       1.07E+02
                               898.02 6.548E+03  (  2.134E+01 2.81E-01 9.37E+01 G

Zn-65    F   6.5475E+03                                       2.44E+02
                              1115.55 6.548E+03  (  2.993E+01 3.94E-01 5.06E+01 G

Co-1173      3.1004E+03                                       1.93E+03
                              1173.24 3.100E+03  (  1.116E+01 3.53E-01 9.99E+01 G

Co-1332      3.1310E+03                                       1.93E+03
                              1332.50 3.131E+03  (  1.034E+01 3.50E-01 1.00E+02 G

Y-1836       7.1338E+03                                       1.07E+02
                              1836.01 7.134E+03  (  1.295E+01 3.02E-01 9.92E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
```



```
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
                                       Page 4
```

17_1LMarn_20120191

P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq	Time Corrected Activity Bq	Uncertainty 1 Sigma Counting	MDA
AM-241	5.1110E+03	5.1125E+03	2.684E-01%	2.53E+01
CD-109	6.4522E+04	7.1031E+04	2.138E-01%	2.49E+02
CO-57	1.3699E+03	1.6134E+03	3.513E-01%	9.90E+00
Ce-139	1.7317E+03	2.3920E+03	3.127E-01%	1.22E+01
Hg-203	2.0263E+03	5.2575E+03	2.974E-01%	2.31E+01
SN-113	2.8753E+03	4.2312E+03	3.228E-01%	1.90E+01
CS-137	2.0346E+03	2.0429E+03	4.566E-01%	1.37E+01
Mn-54	2.7999E+03	3.2282E+03	3.364E-01%	1.35E+01
Y-898	4.3147E+03	6.5476E+03	2.806E-01%	2.13E+01
Zn-65	5.4581E+03	6.5475E+03	3.943E-01%	2.99E+01
Co-1173	3.0297E+03	3.1004E+03	3.525E-01%	1.12E+01
Co-1332	3.0595E+03	3.1310E+03	3.496E-01%	1.03E+01
Y-1836	4.7010E+03	7.1338E+03	3.016E-01%	1.30E+01

< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

ORTEC g v - i (1087) Env32 G53W4.25 3/7/2012 11:48:20 AM Page 6
TestAmerica, Inc. Spectrum name: 17_1LMarn_20120191.An1

---------- S U M M A R Y ----------

Total Activity (37.6 to 1999.5 keV) 1.030E+05 Bq
Total Decayed Activity (37.6 to 1999.5 keV) 1.2136901E+05 Bq

Initial Calibration Verifications

2nd Source Verification

Detector:	Ge5
Geometry:	Tunacan
Reference date	1/1/2010
Source:	81427-334
Standard volume g / vial	1550
Standard volume transferred in g / geometry	318.5
lab ID# of cal standard	6665

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	418	0.359	1164	1160.9	99.7
Cs-137	1926	396	0.851	465	442.36	95.1
Co-60	3611	742	0.99974	742	700.21	94.3
Co-60	3612	742	0.999856	742	701.86	94.6

Reviewed By: Jody Watson

Date: 3/27/2012

```
     ORTEC g v - i (3263) Env32  G53W4.25  3/28/2012 7:35:49 AM    Page  1
TestAmerica                     Spectrum name: 5_TunaCan2nd_20120813.An1

Sample description
     5_TunaCan2nd_Rad10_032712


Spectrum Filename: C:\User\SPC\Det5\5_TunaCan2nd_20120813.An1

Acquisition information
       Start time:                 3/27/2012 10:12:05 AM
       Live time:               7200
       Real time:               7250
       Dead time:                  0.69 %
       Detector ID:                    5

Detector system
     Ge 5 SN/157


Calibration
       Filename:                   5_Soil_TunaCan.Clb
     5_Soil_TunaCan_90099_032612


       Energy Calibration
            Created:               3/27/2012 5:20:02 PM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:             2.720E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/27/2012 5:20:37 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   0.87 %
            Log(Eff):              6.466115E-01 + (-7.830454E-01*Log(E) ) +
                                   ( -4.117504E-03*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.43 %
            Log(Eff):             -2.462251E+01 + ( 9.075211E+00*Log(E) ) +
                                   ( -9.664422E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.61keV )
       Stop channel:            8000 (  2000.53keV )
       Peak rejection level:    1000.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

     ORTEC g v - i (3263) Env32  G53W4.25  3/28/2012 7:35:49 AM    Page  2
TestAmerica                     Spectrum name: 5_TunaCan2nd_20120813.An1
                                      Page 1
```

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2010 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2012-02-26_0305.PBC 2/26/2012 3:05:30 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 33.1557

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
36.81	1005.	12.08	0.62	1.151E-02				
46.61	72616.	0.49	0.73	1.792E-02	46.54	4.250	1.421E+04	Pb210
49.73	1326.	15.18	0.68	1.987E-02				
59.57	75329.	0.49	0.74	2.535E-02	59.54	35.700	1.161E+03	AM241
87.94	40851.	0.68	0.80	3.460E-02	88.03	3.610	1.542E+04	CD109
96.44	148.	47.31	0.80	3.568E-02				
99.01	160.	48.52	0.81	3.589E-02				
105.59	109.	69.79	0.52	3.619E-02				
121.94	9225.	1.66	0.84	3.583E-02	122.06	85.600	3.348E+02	CO57
129.89	126.	62.97	0.30	3.522E-02				
136.43	1263.	7.42	0.90	3.457E-02				
165.86	1574.	6.14	0.84	3.133E-02	165.85	79.900	5.319E+02	Ce139
238.72	327.	27.04	0.86	2.319E-02				
247.25	57.	84.47	0.31	2.252E-02				
259.02	93.	60.17	0.97	2.167E-02				
260.46	98.	58.62	0.97	2.157E-02				
322.65	45.	91.14	0.46	1.806E-02				
351.63	256.	27.79	1.06	1.681E-02				
391.95	494.	16.33	1.15	1.536E-02	391.69	64.000	9.501E+02	SN113
407.02	43.	90.43	0.56	1.489E-02				
412.80	202.	35.90	0.77	1.471E-02				
420.83	123.	52.91	0.72	1.448E-02				
510.72	188.	44.32	0.50	1.232E-02				
542.81	148.	28.69	0.36	1.171E-02				
583.30	161.	33.50	0.69	1.103E-02				
661.70	25605.	0.71	1.39	9.924E-03	661.66	85.210	4.424E+02	CS137
762.61	129.	36.06	0.79	8.812E-03				
796.90	151.	38.71	0.30	8.493E-03				
886.67	129.	46.77	0.30	7.766E-03				
897.77	428.	19.21	1.38	7.686E-03	898.02	93.700	1.665E+03	Y898
932.49	230.	35.52	0.82	7.445E-03				

1008.65	104.	56.29	0.28	6.970E-03				
1173.15	23044.	0.73	1.79	6.138E-03	1173.24	99.900	7.002E+02	Co1173
1332.39	20769.	0.71	1.87	5.515E-03	1332.50	99.982	7.019E+02	Co1332
1836.05	245.	7.47	1.56	4.208E-03	1836.01	99.200	1.642E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
146.78	36.81	4847.	1005.	8.731E+04	12.08	0.625	-
198.52	49.73	12365.	1326.	6.673E+04	15.18	0.681	- s
385.40	96.42	1874.	90.	2.532E+03	71.31	0.588	- sc
395.68	98.99	2103.	121.	3.381E+03	58.44	0.394	- s

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TestAmerica Spectrum name: 5_TunaCan2nd_20120813.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
422.09	105.59	2271.	109.	3.012E+03	69.79	0.518	- sc
519.32	129.89	2194.	126.	3.592E+03	62.97	0.298	- s
545.51	136.43	2377.	1263.	3.654E+04	7.42	0.900	- s
954.90	238.72	2247.	327.	1.410E+04	27.04	0.863	- sM
989.00	247.25	1031.	57.	2.516E+03	84.47	0.312	- sc
1036.13	259.01	1532.	93.	4.309E+03	60.17	0.968	- D
1041.90	260.46	1588.	98.	4.525E+03	58.62	0.970	- D
1290.76	322.65	744.	45.	2.473E+03	91.14	0.455	- c
1406.70	351.63	1442.	256.	1.523E+04	27.79	1.058	- s
1628.36	407.02	667.	43.	2.866E+03	90.43	0.562	- sc
1651.47	412.80	1438.	202.	1.370E+04	35.90	0.775	- s
1683.60	420.83	1291.	123.	8.472E+03	52.91	0.720	- s
2043.25	510.72	1553.	188.	1.523E+04	44.32	0.503	- s
2171.67	542.81	587.	148.	1.267E+04	28.69	0.362	- s
2333.63	583.30	785.	161.	1.460E+04	33.50	0.694	- s
3050.97	762.61	614.	129.	1.468E+04	36.06	0.794	- s
3188.11	796.90	856.	151.	1.782E+04	38.71	0.295	- s
3547.15	886.67	963.	129.	1.665E+04	46.77	0.296	- s
3730.41	932.49	1438.	230.	3.096E+04	35.52	0.818	- s
4035.01	1008.65	864.	104.	1.490E+04	56.29	0.275	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	186.01	46.61	16470.	72552.	10.077	0.49	0.733
AM-241	237.88	59.57	15419.	75329.	10.462	0.49	0.735
CD-109	351.46	87.94	8772.	40851.	5.674	0.68	0.804
CO-57	487.54	121.94	3880.	9225.	1.281	1.66	0.838
Ce-139	663.30	165.86	2329.	1574.	0.219	6.14	0.840
SN-113	1568.04	391.95	1640.	494.	0.069	16.33	1.153
CS-137	2647.28	661.70	1362.	25582.	3.553	0.71	1.394
Y-898	3591.55	897.77	1410.	428.	0.060	19.21	1.376

Co-1173	4692.83	1173.15	788.	23044.	3.201	0.73	1.786
Co-1332	5329.55	1332.39	98.	20769.	2.885	0.71	1.870
Y-1836	7342.76	1836.05	15.	245.	0.034	7.47	1.556s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

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TestAmerica Spectrum name: 5_TunaCan2nd_20120813.An1

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
Pb-210	N	1.4212E+04				8.15E+03	
			46.54	1.421E+04	(P	1.177E+02 4.91E-01 4.25E+00	G
AM-241		1.1609E+03				1.58E+05	
			59.54	1.161E+03	(	8.959E+00 4.87E-01 3.57E+01	G
CD-109		1.5419E+04				4.63E+02	
			88.03	1.542E+04	(	1.658E+02 6.81E-01 3.61E+00	G
CO-57		3.3478E+02				2.72E+02	
			122.06	3.348E+02	(	1.063E+01 1.66E+00 8.56E+01	G
Ce-139		5.3191E+02				1.38E+02	
			165.85	5.319E+02	(	7.689E+01 6.14E+00 7.99E+01	G
Hg-203		-6.5193E-03				4.66E+01	
			279.17	-6.519E-03	%(	1.788E+00 8.22E+03 8.15E+01	G
SN-113		9.5011E+02				1.15E+02	
			391.69	9.501E+02	(	3.682E+02 1.63E+01 6.40E+01	G
CS-137		4.4236E+02				1.10E+04	
			661.66	4.424E+02	(P	3.020E+00 7.12E-01 8.52E+01	G
Y-898		1.6655E+03				1.07E+02	
			898.02	1.665E+03	(	6.908E+02 1.92E+01 9.37E+01	G
Co-1173		7.0021E+02				1.93E+03	
			1173.24	7.002E+02	(	4.056E+00 7.32E-01 9.99E+01	G
Co-1332		7.0186E+02				1.93E+03	
			1332.50	7.019E+02	(	1.651E+00 7.07E-01 1.00E+02	G
Y-1836		1.6424E+03				1.07E+02	
			1836.01	1.642E+03	(	1.392E+02 7.47E+00 9.92E+01	G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.

@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
Pb-210	1.3259E+04	1.4212E+04	4.918E-01%	1.18E+02
AM-241	1.1568E+03	1.1609E+03	4.867E-01%	8.96E+00
CD-109	4.5403E+03	1.5419E+04	6.810E-01%	1.66E+02
CO-57	4.1787E+01	3.3478E+02	1.660E+00%	1.06E+01
Ce-139	8.7347E+00	5.3191E+02	6.138E+00%	7.69E+01
Hg-203 #A	-6.5193E-03	>12 Halflives	8.2197E+03%	1.7882E+00
SN-113	6.9747E+00	9.5011E+02	1.633E+01%	3.68E+02
CS-137	4.2015E+02	4.4236E+02	7.122E-01%	3.02E+00
Y-898	8.2662E+00	1.6655E+03	1.921E+01%	6.91E+02
Co-1173	5.2196E+02	7.0021E+02	7.316E-01%	4.06E+00
Co-1332	5.2320E+02	7.0186E+02	7.069E-01%	1.65E+00
Y-1836	8.1520E+00	1.6424E+03	7.471E+00%	1.39E+02

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.

```
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded
-----------------------------   S U M M A R Y   ----------------------------
Total Activity (  279.0 to  2000.5 keV)     2.050E+04  Bq/Sample
Total Decayed Activity (  279.0 to  2000.5 keV) 3.7761527E+04  Bq/Sample
```

2nd Source Verification

Detector:	Ge8
Geometry:	Tunacan
Reference date	1/1/2010
Source:	81427-334
Standard volume g / vial	1550
Standard volume transferred in g / geometry	318.5
lab ID# of cal standard	6665

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	418	0.359	1164	1175.4	101.0
Cs-137	1926	396	0.851	465	446.61	96.0
Co-60	3611	742	0.99974	742	697.22	93.9
Co-60	3612	742	0.999856	742	691.92	93.2

Reviewed By: Jody Watson

Date: 3/29/2012

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TestAmerica                     Spectrum name: 8_TunaCan2nd_20120697.An1

Sample description
     8_TunaCan_81427-334_2ndsource_032912


Spectrum Filename: C:\User\SPC\Det8\8_TunaCan2nd_20120697.An1

Acquisition information
       Start time:                 3/29/2012 1:58:04 AM
       Live time:               3600
       Real time:               3622
       Dead time:                  0.61 %
       Detector ID:                    8

Detector system
     Ge 8 SN/174


Calibration
       Filename:                   8_Soil_TunaCan.Clb
     8_Soil_TunaCan_90099_032712


       Energy Calibration
            Created:               3/28/2012 10:35:07 AM
            Zero offset:           0.050 keV
            Gain:                  0.250 keV/channel
            Quadratic:             8.067E-10 keV/channel^2

       Efficiency Calibration
            Created:               3/28/2012 10:35:20 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.39 %
            Log(Eff):             -1.098764E-01 + (-4.958544E-01*Log(E) ) +
                                   ( -2.572270E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.71 %
            Log(Eff):             -2.525301E+01 + ( 9.398253E+00*Log(E) ) +
                                   ( -1.000034E+00*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.55keV )
       Stop channel:            8000 (  2000.30keV )
       Peak rejection level:    1000.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

     ORTEC g v - i (3263) Env32  G53W4.25  3/29/2012 7:45:38 AM    Page  2
TestAmerica                     Spectrum name: 8_TunaCan2nd_20120697.An1
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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2010 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	8_2012-03-02_0402.PBC 3/2/2012 4:02:11 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 27.9595

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
36.61	594.	17.47	1.15	1.254E-02				
46.53	38495.	0.62	0.95	2.001E-02	46.54	4.250	1.345E+04	Pb210
49.81	542.	25.92	1.04	2.243E-02				
59.48	43371.	0.71	0.98	2.878E-02	59.54	35.700	1.175E+03	AM241
84.86	327.	26.82	0.98	3.922E-02				
88.03	22911.	0.76	0.98	3.992E-02	88.03	3.610	1.504E+04	CD109
122.06	5318.	2.55	1.03	4.146E-02	122.06	85.600	3.349E+02	CO57
136.54	691.	14.03	0.89	3.998E-02				
165.93	1033.	8.62	1.19	3.628E-02	165.85	79.900	6.077E+02	Ce139
177.05	71.	70.08	0.69	3.453E-02				
185.74	128.	40.98	0.85	3.329E-02				
227.93	52.	65.04	0.45	2.844E-02				
270.79	87.	50.41	0.41	2.486E-02				
278.94	44.	131.33	1.13	2.428E-02	279.17	81.500	HL>Cutoff	Hg203
302.52	63.	54.81	0.69	2.279E-02				
370.09	35.	84.23	0.41	1.941E-02				
391.61	316.	17.91	0.81	1.855E-02	391.69	64.000	1.016E+03	SN113
409.22	93.	50.95	0.41	1.791E-02				
428.24	88.	46.51	0.39	1.726E-02				
564.57	72.	45.26	0.57	1.378E-02				
591.73	73.	42.60	0.61	1.326E-02				
661.62	15734.	0.88	1.38	1.209E-02	661.66	85.210	4.466E+02	CS137
720.39	41.	72.89	0.46	1.126E-02				
831.73	36.	50.61	0.44	9.986E-03				
897.91	396.	17.93	1.52	9.360E-03	898.02	93.700	2.554E+03	Y898
1092.31	69.	44.41	0.50	7.924E-03				
1173.30	13922.	0.92	1.73	7.452E-03	1173.24	99.900	6.972E+02	Co1173
1332.56	12390.	0.92	1.75	6.677E-03	1332.50	99.982	6.919E+02	Co1332
1836.18	152.	9.00	1.63	5.046E-03	1836.01	99.200	1.724E+03	Y1836

8_TunaCan2nd_20120697

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
146.23	36.61	3218.	594.	4.742E+04	17.47	1.147	- s
199.01	49.81	6400.	542.	2.416E+04	25.92	1.039	- sM
339.16	84.85	3491.	236.	6.026E+03	42.58	0.697	- sM

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TestAmerica Spectrum name: 8_TunaCan2nd_20120697.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
545.91	136.54	2178.	691.	1.728E+04	14.03	0.888	-
707.94	177.05	893.	71.	2.046E+03	70.08	0.693	- sM
742.68	185.74	978.	128.	3.835E+03	40.98	0.847	- sM
911.43	227.93	546.	52.	1.829E+03	65.04	0.445	- sc
1082.86	270.79	683.	87.	3.486E+03	50.41	0.413	- sM
1209.76	302.52	484.	63.	2.765E+03	54.81	0.692	- s
1480.00	370.09	385.	35.	1.803E+03	84.23	0.412	- sc
1636.49	409.22	685.	93.	5.212E+03	50.95	0.407	- s
1712.56	428.24	565.	88.	5.117E+03	46.51	0.393	- s
2257.86	564.57	330.	72.	5.224E+03	45.26	0.565	- s
2366.45	591.73	298.	73.	5.505E+03	42.60	0.613	- s
2881.06	720.39	284.	41.	3.640E+03	72.89	0.464	- s
3326.37	831.73	148.	36.	3.605E+03	50.61	0.439	- s
4368.55	1092.31	290.	69.	8.708E+03	44.41	0.495	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.71	46.48	12173.	40702.	11.306	0.74	0.992
AM-241	237.70	59.48	10649.	43371.	12.047	0.71	0.984
CD-109	351.85	88.02	4506.	23196.	6.443	0.88	1.056
CO-57	487.99	122.06	2908.	5318.	1.477	2.55	1.026
Ce-139	663.47	165.93	1722.	1033.	0.287	8.62	1.189s
Hg-203	1115.46	278.94	1642.	44.	0.012	131.33	1.133
SN-113	1566.07	391.61	822.	316.	0.088	17.91	0.806s
CS-137	2646.01	661.62	665.	15731.	4.370	0.88	1.379
Y-898	3591.03	897.91	871.	396.	0.110	17.93	1.524
Co-1173	4692.46	1173.30	374.	13922.	3.867	0.92	1.726
Co-1332	5329.42	1332.56	82.	12390.	3.442	0.92	1.753
Y-1836	7343.62	1836.18	6.	152.	0.042	9.00	1.626s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

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TestAmerica Spectrum name: 8_TunaCan2nd_20120697.An1
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 *****   S U M M A R Y   O F   L I B R A R Y   P E A K   U S A G E   *****
- Nuclide -  Average     ------------- Peak --------------
Name   Code  Activity     Energy   Activity Code MDA Value
             Bq/Sample     keV     Bq/Sample     Bq/Sample      COMMENTS
 ____________________________________________________________________________

Pb-210   N   1.4221E+04                                      8.15E+03
                            46.54 1.422E+04  (  1.806E+02 7.43E-01 4.25E+00 G

AM-241       1.1754E+03                                      1.58E+05
                            59.54 1.175E+03  (  1.311E+01 7.10E-01 3.57E+01 G

CD-109       1.5223E+04                                      4.63E+02
                            88.03 1.522E+04  (  2.071E+02 8.83E-01 3.61E+00 G

CO-57        3.3494E+02                                      2.72E+02
                           122.06 3.349E+02  (  1.600E+01 2.55E+00 8.56E+01 G

Ce-139       6.0766E+02                                      1.38E+02
                           165.85 6.077E+02 *(  1.153E+02 8.62E+00 7.99E+01 G

Hg-203       6.1671E-01                                      4.66E+01
                           279.17 6.167E-01  (  2.689E+00 1.31E+02 8.15E+01 G

SN-113       1.0157E+03                                      1.15E+02
                           391.69 1.016E+03  (  4.390E+02 1.79E+01 6.40E+01 G

CS-137       4.4661E+02                                      1.10E+04
                           661.66 4.466E+02  (P 3.489E+00 8.85E-01 8.52E+01 G

Y-898        2.5543E+03                                      1.07E+02
                           898.02 2.554E+03  (  9.046E+02 1.79E+01 9.37E+01 G

Co-1173      6.9722E+02                                      1.93E+03
                          1173.24 6.972E+02  (  4.649E+00 9.19E-01 9.99E+01 G

Co-1332      6.9192E+02                                      1.93E+03
                          1332.50 6.919E+02  (  2.515E+00 9.18E-01 1.00E+02 G

Y-1836       1.7236E+03                                      1.07E+02
                          1836.01 1.724E+03  (  1.542E+02 9.00E+00 9.92E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
```



```
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
```

P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting	1 Sigma	MDA Bq/Sample
Pb-210	1.3265E+04	1.4221E+04	7.429E-01%		1.81E+02
AM-241	1.1712E+03	1.1754E+03	7.101E-01%		1.31E+01
CD-109	4.4713E+03	1.5223E+04	8.832E-01%		2.07E+02
CO-57	4.1631E+01	3.3494E+02	2.551E+00%		1.60E+01
Ce-139 #	9.8959E+00	6.0766E+02	8.616E+00%		1.15E+02
Hg-203 A	6.1671E-01	>12 Halflives	1.3133E+02%	2.6892E+00	
SN-113	7.3819E+00	1.0157E+03	1.791E+01%		4.39E+02
CS-137	4.2415E+02	4.4661E+02	8.848E-01%		3.49E+00
Y-898	1.2542E+01	2.5543E+03	1.793E+01%		9.05E+02
Co-1173	5.1942E+02	6.9722E+02	9.185E-01%		4.65E+00
Co-1332	5.1548E+02	6.9192E+02	9.176E-01%		2.52E+00
Y-1836	8.4633E+00	1.7236E+03	8.997E+00%		1.54E+02

ORTEC g v - i (3263) Env32 G53W4.25 3/29/2012 7:45:38 AM Page 6
TestAmerica Spectrum name: 8_TunaCan2nd_20120697.An1

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 2000.3 keV) 2.045E+04 Bq/Sample
Total Decayed Activity (37.6 to 2000.3 keV) 3.8690848E+04 Bq/Sample

2nd Source Verification

Detector:	Ge9
Geometry:	Tunacan
Reference date	1/1/2010
Source:	81427-334
Standard volume g / vial	1550
Standard volume transferred in g / geometry	318.5
lab ID# of cal standard	6665

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	418	0.359	1164	1169.4	100.4
Cs-137	1926	396	0.851	465	444.52	95.6
Co-60	3611	742	0.99974	742	687.72	92.7
Co-60	3612	742	0.999856	742	692.56	93.3

Reviewed By: Jody Watson

Date: 6/14/2012

```
     ORTEC g v - i (3263) Env32  G53W4.25  6/14/2012 1:20:45 PM    Page  1
TestAmerica, Inc                Spectrum name: 9_TunaCan_20120371.An1

Sample description
     9_TunaCan_90099_061412


Spectrum Filename: C:\User\SPC\Det9\9_TunaCan_20120371.An1

Acquisition information
       Start time:                 6/14/2012 10:54:15 AM
       Live time:               3600
       Real time:               3629
       Dead time:                  0.81 %
       Detector ID:                    9

Detector system
     Ge 9 SN/100113


Calibration
       Filename:                   9_Soil_TunaCan.Clb
     9_Soil_TunaCan_90099_050312


       Energy Calibration
            Created:               6/14/2012 10:19:40 AM
            Zero offset:           0.088 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -2.039E-08 keV/channel^2

       Efficiency Calibration
            Created:               6/14/2012 10:19:51 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.30 %
            Log(Eff):             -8.079856E-01 + (-2.367265E-01*Log(E) ) +
                                   ( -3.950640E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   1.42 %
            Log(Eff):             -2.387916E+01 + ( 8.875647E+00*Log(E) ) +
                                   ( -9.401100E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Pb.Lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.60keV )
       Stop channel:            8000 (  1999.66keV )
       Peak rejection level:    1000.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

     ORTEC g v - i (3263) Env32  G53W4.25  6/14/2012 1:20:45 PM    Page  2
TestAmerica, Inc                Spectrum name: 9_TunaCan_20120371.An1
                                      Page 1
```

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2010 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2012-05-27_0502.PBC 5/27/2012 5:02:59 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0390

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
36.54	860.	12.66	1.34	1.634E-02				
46.62	48876.	0.54	1.09	2.580E-02	46.54	4.250	1.338E+04	Pb210
50.03	116.	122.12	1.09	2.886E-02				
59.57	54776.	0.62	1.11	3.661E-02	59.54	35.700	1.169E+03	AM241
63.90	47.	193.18	0.35	3.962E-02				
88.09	26880.	0.87	1.14	5.052E-02	88.03	3.610	1.566E+04	CD109
122.10	5522.	2.86	1.15	5.303E-02	122.06	85.600	3.312E+02	CO57
136.38	729.	11.64	1.25	5.151E-02				
165.67	814.	10.74	1.30	4.629E-02	165.85	79.900	5.417E+02	Ce139
295.46	252.	33.13	0.56	3.229E-02				
316.16	66.	75.82	0.25	3.082E-02				
356.41	45.	97.50	1.36	2.835E-02				
358.68	42.	110.02	1.37	2.822E-02				
379.76	37.	75.05	0.46	2.711E-02				
391.75	310.	24.80	1.08	2.652E-02	391.69	64.000	1.113E+03	SN113
454.98	83.	53.05	0.37	2.383E-02				
568.66	103.	37.41	0.47	2.026E-02				
626.42	84.	49.00	0.45	1.885E-02				
661.66	23324.	0.76	1.61	1.810E-02	661.66	85.210	4.445E+02	CS137
821.54	239.	27.43	0.39	1.536E-02				
876.16	66.	52.19	0.61	1.462E-02				
898.25	346.	23.61	1.52	1.434E-02	898.02	93.700	2.406E+03	Y898
937.90	34.	79.64	0.44	1.387E-02				
1071.41	38.	61.01	0.57	1.249E-02				
1085.31	68.	35.74	1.00	1.237E-02				
1098.64	14.	140.33	0.47	1.225E-02				
1173.23	20836.	0.81	2.05	1.163E-02	1173.24	99.900	6.877E+02	Co1173
1332.49	18966.	0.75	2.11	1.050E-02	1332.50	99.982	6.926E+02	Co1332
1835.90	150.	10.23	1.72	8.080E-03	1836.01	99.200	1.745E+03	Y1836

9_TunaCan_20120371

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
145.76	36.54	3297.	860.	5.262E+04	12.66	1.336	- s
199.48	49.98	8660.	956.	3.313E+04	18.50	0.958	- sM
255.13	63.90	2893.	47.	1.186E+03	193.18	0.347	- sc
544.97	136.38	1941.	729.	1.415E+04	11.64	1.247	-

ORTEC g v - i (3263) Env32 G53W4.25 6/14/2012 1:20:45 PM Page 3

TestAmerica, Inc Spectrum name: 9_TunaCan_20120371.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
1181.07	295.46	1550.	252.	7.804E+03	33.13	0.562	- s
1263.87	316.16	856.	66.	2.136E+03	75.82	0.245	- sc
1424.84	356.47	930.	45.	1.579E+03	97.50	1.363	- sc
1433.89	358.73	1025.	42.	1.473E+03	110.02	1.365	- sc
1518.22	379.76	367.	37.	1.365E+03	75.05	0.460	- sc
1819.03	454.98	702.	83.	3.496E+03	53.05	0.375	- s
2273.73	568.66	433.	103.	5.068E+03	37.41	0.468	- s
2504.73	626.42	460.	84.	4.455E+03	49.00	0.451	- s
3285.25	821.54	812.	239.	1.556E+04	27.43	0.391	- s
3503.76	876.16	400.	66.	4.538E+03	52.19	0.608	- s
3750.76	937.90	332.	34.	2.488E+03	79.64	0.436	- sc
4284.91	1071.41	226.	38.	3.015E+03	61.01	0.571	- s
4340.51	1085.31	224.	68.	5.498E+03	35.74	1.000	- s
4393.86	1098.64	186.	14.	1.143E+03	140.33	0.472	- sc

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_EnergyStandardMix & Pb.Lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.86	46.57	13300.	51041.	14.178	0.65	1.116
AM-241	237.82	59.57	11784.	54776.	15.216	0.62	1.111
CD-109	351.87	88.09	5995.	26880.	7.467	0.87	1.137
CO-57	487.85	122.10	3767.	5522.	1.534	2.86	1.155
Ce-139	662.09	165.67	1864.	814.	0.226	10.74	1.299
Hg-203	1120.44	280.29	2362.	-52.	-0.014	133.84	1.296s
SN-113	1565.85	391.67	1962.	266.	0.074	24.38	1.393
CS-137	2645.72	661.66	1258.	23324.	6.479	0.76	1.614
Y-898	3592.12	898.25	1148.	346.	0.096	23.61	1.524s
Co-1173	4692.30	1173.23	840.	20836.	5.788	0.81	2.049
Co-1332	5329.58	1332.49	131.	18966.	5.268	0.75	2.109
Y-1836	7344.43	1835.90	14.	150.	0.042	10.23	1.719s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

ORTEC g v - i (3263) Env32 G53W4.25 6/14/2012 1:20:45 PM Page 4

Page 3

```
 *****   S U M M A R Y   O F   L I B R A R Y   P E A K   U S A G E   *****
- Nuclide -  Average     ------------- Peak --------------
Name   Code  Activity     Energy   Activity Code MDA Value
             Bq/Sample     keV     Bq/Sample     Bq/Sample      COMMENTS
 ____________________________________________________________________________

Pb-210   N   1.3971E+04                                     8.15E+03
                            46.54 1.397E+04  (  1.478E+02 6.46E-01 4.25E+00 G

AM-241       1.1694E+03                                     1.58E+05
                            59.54 1.169E+03  (  1.086E+01 6.16E-01 3.57E+01 G

CD-109       1.5657E+04                                     4.63E+02
                            88.03 1.566E+04  (  2.117E+02 8.71E-01 3.61E+00 G

CO-57        3.3118E+02                                     2.72E+02
                           122.06 3.312E+02  (  1.731E+01 2.86E+00 8.56E+01 G

Ce-139       5.4173E+02                                     1.38E+02
                           165.85 5.417E+02  (  1.357E+02 1.07E+01 7.99E+01 G

Hg-203      -5.2429E-01                                     4.66E+01
                           279.17-5.243E-01 ?(  2.327E+00 1.34E+02 8.15E+01 G

SN-113       9.5260E+02                                     1.15E+02
                           391.69 9.526E+02 ?(  7.503E+02 2.44E+01 6.40E+01 G

CS-137       4.4452E+02                                     1.10E+04
                           661.66 4.445E+02  (  3.202E+00 7.63E-01 8.52E+01 G

Y-898        2.4057E+03                                     1.07E+02
                           898.02 2.406E+03 @(  1.118E+03 2.36E+01 9.37E+01 G

Co-1173      6.8772E+02                                     1.93E+03
                          1173.24 6.877E+02  (  4.547E+00 8.09E-01 9.99E+01 G

Co-1332      6.9256E+02                                     1.93E+03
                          1332.50 6.926E+02  (  2.044E+00 7.49E-01 1.00E+02 G

Y-1836       1.7452E+03                                     1.07E+02
                          1836.01 1.745E+03  (  2.388E+02 1.02E+01 9.92E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
```



```
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
```

```
      library energy centroid for positive identification.
  P - Peakbackground subtraction
  } - Peak is too close to another for the activity
      to be found directly.

  Nuclide Codes:                        Peak Codes:
  T - Thermal Neutron Activation        G - Gamma Ray
  F - Fast Neutron Activation           X - X-Ray
  I - Fission Product                   P - Positron Decay
  N - Naturally Occurring Isotope       S - Single-Escape
  P - Photon Reaction                   D - Double-Escape
  C - Charged Particle Reaction         K - Key Line
  M - No MDA Calculation                A - Not in Average
  R - Coincidence Corrected             C - Coincidence Peak
  H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


*************** D I S C A R D E D  I S O T O P E  P E A K S ***************
Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
          Energy   Counts     Counts     Cts/Sec  1 Sigma %
_____________________________________________________________________________
Hg-203     280.29      2362.       -52.    -0.014   133.84   0.000E+00
  P - Peakbackground subtraction

*****   S U M M A R Y   O F   N U C L I D E S   I N   S A M P L E   *****
        Time of Count  Time Corrected  Uncertainty  1 Sigma
Nuclide     Activity       Activity       Counting                    MDA
               Bq/Sample     Bq/Sample                                 Bq/Sample

_____________________________________________________________________________
Pb-210       1.2947E+04    1.3971E+04    6.459E-01%                 1.48E+02
AM-241       1.1648E+03    1.1694E+03    6.156E-01%                 1.09E+01
CD-109       4.0954E+03    1.5657E+04    8.713E-01%                 2.12E+02
CO-57        3.3792E+01    3.3118E+02    2.862E+00%                 1.73E+01
Ce-139       5.9752E+00    5.4173E+02    1.074E+01%                 1.36E+02
Hg-203 #A   -5.2429E-01 >12 Halflives   1.3384E+02%   2.3272E+00
SN-113 #     4.3447E+00    9.5260E+02    2.438E+01%                 7.50E+02
CS-137       4.2011E+02    4.4452E+02    7.635E-01%                 3.20E+00
Y-898  #     7.1422E+00    2.4057E+03    2.361E+01%                 1.12E+03
Co-1173      4.9827E+02    6.8772E+02    8.087E-01%                 4.55E+00
Co-1332      5.0178E+02    6.9256E+02    7.487E-01%                 2.04E+00
Y-1836       5.1813E+00    1.7452E+03    1.023E+01%                 2.39E+02
```



```
  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded
----------------------------   S U M M A R Y   ---------------------------
Total Activity (  379.7 to  1999.7 keV)     1.968E+04  Bq/Sample
Total Decayed Activity (  379.7 to  1999.7 keV) 3.8598309E+04  Bq/Sample
```

2nd Source Verification

Detector: **Ge12**
Geometry: **Tunacan**
Reference date: **10/1/2006**
Calibration Standard: **74139-334**
Standard volume g / vial: **1550**
Standard volume transferred in g / geometry: **341.9**
lab ID# of cal standard: **1282974**

Isotope	Certified Activity gammas/sec	Geometry Activity	γ abundance	Bq/sample	Count Results	%recovery
Am-241	2034	449	0.359	1250	1288	103.1
Cs-137	1926	425	0.851	499	509.9	102.1
Co-60	3612	797	0.999856	797	833.8	104.6

Reviewed By: Jody Watson

Date: 4/24/2018

Test America St. Louis Spectrum ID: 12_TunaCan_20180012

Sample Description: 12_TunaCan_ICV
Detector: Detector #12
Batch ID: 12
Work Order Number: TunaCan
Lot Number: ICV

Decay to Time: 10/1/2006 11:00 Live Time: 5000 sec
Acquisition Time: 4/24/2018 09:26:18 Real Time: 5018 sec
Analysis Time: 4/24/2018 10:50 Dead Time: 0.36 %
Analysis Quantity: 1.000E+00 Sample

Efficiency Cal File: 12_Soil_TunaCan.Clb
Efficiency Cal Desc: 12_TunaCan_108513
Efficiency Cal Date: 4/20/2018 11:53
Energy Cal Date: 4/20/2018 11:13
Library: DET_EnergyStandardMix & Pb.lib
Bkgd Correction File: 12_2017-05-07_0806.PBC

Nuclide	Activity Bq/Sample	1-Sigma Counting Uncert %	1-Sigma Counting Uncert Bq/Sample	1-Sigma Total Uncert Bq/Sample	Minimum Detectable Activity Bq/Sample
Pb-210	1.634E+04	0.6	9.464E+01	1.053E+03	1.764E+02
AM-241	1.288E+03	0.4	5.772E+00	8.177E+01	8.914E+00
CD-109	2.726E+04	25.0	6.823E+03	7.030E+03	1.764E+04
CO-57	1.000E+100	153.6	5.398E-01	5.402E-01	1.425E+00
Ce-139	1.000E+100	106.9	5.267E-01	5.274E-01	1.390E+00
Hg-203	1.000E+100	297.5	6.855E-01	6.856E-01	1.730E+00
SN-113	1.000E+100	692.4	1.143E+00	1.143E+00	2.762E+00
CS-137	5.099E+02	0.8	3.904E+00	2.652E+01	3.285E+00
Y-898	1.000E+100	140.9	1.086E+00	1.086E+00	2.342E+00
Co-1173	8.106E+02	1.3	1.069E+01	4.173E+01	9.187E+00
Co-1332	8.338E+02	1.3	1.078E+01	4.290E+01	6.803E+00
Y-1836	1.000E+100	127.2	4.662E-01	4.667E-01	9.202E-01
Total	6.000E+100				

Analyst: Jody Watson

(Page 1 of 7)

Sample description
12_TunaCan_ICV

Spectrum Filename: C:\User\SPC\Det12\12_TunaCan_20180012.An1

Acquisition information

Start time:	4/24/2018 9:26:18 AM
Live time:	5000
Real time:	5018
Dead time:	0.36 %
Detector ID:	12

Detector system
Ge12 S/N10034336

Calibration

Filename:	12_Soil_TunaCan.Clb

12_TunaCan_108513

Energy Calibration

Created:	4/20/2018 11:13:27 AM
Zero offset:	0.059 keV
Gain:	0.250 keV/channel
Quadratic:	-3.735E-08 keV/channel^2

Efficiency Calibration

Created:	4/20/2018 11:53:09 AM
Type:	Polynomial
Uncertainty:	1.020 %
Coefficients:	-0.363508 -4.707999 0.462125
	-0.051256 0.002384 -0.000043

Library Files

Main analysis library:	DET_EnergyStandardMix & Pb.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	100 (25.08keV)
Stop channel:	8000 (1999.13keV)
Peak rejection level:	1000.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3
Half lives decay limit:	12.000

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	10/1/2006 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2017-05-07_0806.PBC 5/7/2017 8:06:54 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 7 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 25.3541

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
28.13	58.	46.71	0.75	4.137E-03				
32.13	394.	18.65	0.81	7.163E-03				
36.69	330.	25.31	0.84	1.059E-02				
46.66	43625.	0.58	0.85	1.811E-02	46.54	4.250	1.634E+04	Pb210
49.83	321.	44.33	0.85	2.160E-02				
59.65	63562.	0.45	0.86	2.820E-02	59.54	35.700	1.288E+03	AM241
70.53	127.	49.58	1.39	3.219E-02				
74.86	220.	28.10	0.88	3.333E-02				
77.21	369.	16.72	0.88	3.387E-02				
87.68	350.	23.71	0.81	3.578E-02	88.03	3.610	3.034E+04	CD109
93.18	213.	27.98	1.16	3.644E-02				
165.85	67.	106.94	0.97	3.405E-02	165.85	79.900	HL>Cutoff	Ce139
238.54	388.	19.10	0.88	2.744E-02				
279.17	23.	297.48	1.09	2.449E-02	279.17	81.500	HL>Cutoff	Hg203
307.48	44.	92.73	0.49	2.278E-02				
312.92	63.	62.15	0.30	2.248E-02				
320.20	50.	55.24	0.61	2.209E-02				
355.42	79.	51.62	0.51	2.040E-02				
384.05	22.	98.42	0.50	1.922E-02				
428.92	42.	63.02	0.59	1.766E-02				
454.01	126.	41.89	2.09	1.692E-02				
493.21	76.	56.00	0.64	1.589E-02				
583.05	231.	19.93	1.19	1.403E-02				
609.57	255.	15.76	1.66	1.358E-02				
661.72	21282.	0.77	1.42	1.279E-02	661.66	85.210	5.099E+02	CS137
898.02	37.	140.94	1.67	1.025E-02	898.02	93.700	HL>Cutoff	Y898
1173.31	7459.	1.32	1.92	8.426E-03	1173.24	99.900	8.106E+02	Co1173

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1332.58	6951.	1.30	1.98	7.647E-03	1332.50	99.982	8.318E+02	Co1332

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
112.21	28.13	314.	58.	1.406E+04	46.71	0.750	-	s
128.21	32.13	1577.	394.	5.496E+04	18.65	0.810	-	
146.44	36.67	3332.	330.	3.120E+04	25.31	0.841	-	sD
199.29	49.79	9113.	333.	1.539E+04	40.96	0.855	-	sD
281.70	70.53	1447.	127.	3.956E+03	49.58	1.387	-	s
299.02	74.84	1784.	220.	6.587E+03	28.10	0.880	-	D
308.40	77.19	1706.	369.	1.088E+04	16.72	0.883	-	sD
372.24	93.18	1248.	213.	5.837E+03	27.98	1.163	-	sM
953.35	238.54	1339.	388.	1.414E+04	19.10	0.882	-	s
1229.01	307.48	572.	44.	1.931E+03	92.73	0.491	-	sc
1250.75	312.92	513.	63.	2.788E+03	62.15	0.295	-	s
1279.88	320.20	329.	50.	2.263E+03	55.24	0.611	-	s
1420.71	355.42	528.	79.	3.873E+03	51.62	0.511	-	s
1535.20	384.00	232.	22.	1.118E+03	98.42	0.497	-	sc
1714.62	428.92	312.	42.	2.406E+03	63.02	0.590	-	s
1814.96	454.01	760.	126.	7.448E+03	41.89	2.094	-	s
1971.76	493.21	502.	76.	4.813E+03	56.00	0.640	-	s
2331.07	583.05	403.	231.	1.644E+04	19.93	1.194	-	
2437.14	609.57	326.	255.	1.877E+04	15.76	1.660	-	

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_EnergyStandardMix & Pb.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
Pb-210	185.79	46.54	10103.	43625.	8.725	0.58	0.851D
AM-241	237.76	59.54	8808.	63562.	12.712	0.45	0.865D
CD-109	350.62	87.77	1861.	315.	0.063	25.03	0.760s
CO-57	487.68	122.06	2320.	-56.	-0.011	153.64	0.928
Ce-139	662.74	165.85	1600.	67.	0.013	106.94	0.973s
Hg-203	1115.81	279.17	1331.	23.	0.005	297.48	1.086s
SN-113	1565.74	391.69	1248.	-10.	-0.002	692.39	1.196s

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-137	2645.75	661.72	832.	21282.	4.256	0.77	1.422
Y-898	3591.15	898.02	555.	37.	0.007	140.94	1.672s
Co-1173	4692.85	1173.31	308.	7459.	1.492	1.32	1.921
Co-1332	5330.42	1332.58	135.	6968.	1.394	1.29	1.978
Y-1836	7346.49	1836.01	27.	-11.	-0.002	127.17	2.459s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
Pb-210	N	1.6338E+04				8.15E+03	
			46.54	1.634E+04	(P	1.764E+02 5.79E-01 4.25E+00	G
AM-241		1.2876E+03				1.58E+05	
			59.54	1.288E+03	(	8.914E+00 4.48E-01 3.57E+01	G
CD-109		2.7262E+04				4.63E+02	
			88.03	2.726E+04	*(	1.764E+04 2.50E+01 3.61E+00	G
CO-57		-3.5134E-01				2.72E+02	
			122.06	-3.513E-01	(	1.425E+00 1.54E+02 8.56E+01	G
Ce-139		4.9250E-01				1.38E+02	
			165.85	4.925E-01	?(	1.390E+00 1.07E+02 7.99E+01	G
Hg-203		2.3043E-01				4.66E+01	
			279.17	2.304E-01	&(	1.730E+00 2.97E+02 8.15E+01	G
SN-113		-1.6505E-01				1.15E+02	
			391.69	-1.650E-01	&(	2.762E+00 6.92E+02 6.40E+01	G
CS-137		5.0987E+02				1.10E+04	
			661.66	5.099E+02	(	3.285E+00 7.66E-01 8.52E+01	G
Y-898		7.7025E-01				1.07E+02	
			898.02	7.703E-01	&(	2.342E+00 1.41E+02 9.37E+01	G
Co-1173		8.1058E+02				1.93E+03	
			1173.24	8.106E+02	(	9.187E+00 1.32E+00 9.99E+01	G
Co-1332		8.3376E+02				1.93E+03	
			1332.50	8.338E+02	(	6.803E+00 1.29E+00 1.00E+02	G

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-1836	-3.6659E-01					1.07E+02	
		1836.01	-3.666E-01	?(	9.202E-01	1.27E+02	9.92E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:
T - Thermal Neutron Activation
F - Fast Neutron Activation
I - Fission Product
N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

Peak Codes:
G - Gamma Ray
X - X-Ray
P - Positron Decay
S - Single-Escape
D - Double-Escape
K - Key Line
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity
CO-57	122.06	2320.	-56.	-0.011	153.64	0.000E+00
Ce-139	165.85	1600.	67.	0.013	106.94	0.000E+00
Hg-203	279.17	1331.	23.	0.005	297.48	0.000E+00
SN-113	391.69	1248.	-10.	-0.002	692.39	0.000E+00
Y-898	898.02	555.	37.	0.007	140.94	0.000E+00
Y-1836	1836.01	27.	-11.	-0.002	127.17	0.000E+00

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
Pb-210	1.1406E+04	1.6338E+04	5.793E-01%	1.76E+02
AM-241	1.2640E+03	1.2876E+03	4.483E-01%	8.91E+00
CD-109 #	4.8702E+01	2.7262E+04	2.503E+01%	1.76E+04
CO-57 #A	-3.5134E-01	>12 Halflives	1.536E+02%	1.43E+00
Ce-139 #A	4.9250E-01	>12 Halflives	1.069E+02%	1.39E+00
Hg-203 #A	2.3043E-01	>12 Halflives	2.975E+02%	1.73E+00
SN-113 #A	-1.6505E-01	>12 Halflives	6.924E+02%	2.76E+00
CS-137	3.9058E+02	5.0987E+02	7.657E-01%	3.29E+00
Y-898 #A	7.7025E-01	>12 Halflives	1.409E+02%	2.34E+00
Co-1173	1.7721E+02	8.1058E+02	1.318E+00%	9.19E+00
Co-1332	1.8227E+02	8.3376E+02	1.293E+00%	6.80E+00
Y-1836 #A	-3.6659E-01	>12 Halflives	1.272E+02%	9.20E-01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (25.1 to 1999.1 keV) 1.347E+04 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 4.7041629E+04 Bq/Sample

(Page 7 of 7)

Second Source Verification

Detector:	Ge14
Geometry:	1L Marn
Reference date	1/1/2011
Calibration Standard:	83924-334
Standard volume g / vial	1
Standard volume transferred in g / geometry	1
lab ID# of cal standard	6707

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1830	1830	0.359	**5097.5**	4967.3	97.4
Cs-137	1705	1705	0.851	**2003.5**	1968.3	98.2
Co-60	3293	3293	0.99974	**3293.9**	3103.7	94.2
Co-60	3294	3294	0.99986	**3294.5**	3166.5	96.1

Reviewed By: Megan McAfee

Date: 4/24/2012

14_Marn1L2nd_20120346

```
     ORTEC g v - i (3263) Env32  G53W4.25  4/17/2012 11:26:44 AM   Page  1
TestAmerica, Inc.               Spectrum name: 14_Marn1L2nd_20120346.An1

Sample description
     14_Marn1L_83924-334_2nd_041212


Spectrum Filename: C:\User\SPC\Det14\14_Marn1L2nd_20120346.An1

Acquisition information
       Start time:                 4/12/2012 3:08:24 AM
       Live time:               3600
       Real time:               3857
       Dead time:                  6.67 %
       Detector ID:                   14

Detector system
     Ge14 SN/11080670


Calibration
       Filename:                   14_Liquid_Marinelli 1L.Clb
     14_1LMarinelli_90062_030612


       Energy Calibration
            Created:               3/14/2012 4:58:19 PM
            Zero offset:           0.195 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -1.589E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/14/2012 4:58:47 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   1.64 %
            Log(Eff):             -1.428037E+00 + (-4.136370E-02*Log(E) ) +
                                   ( -5.958012E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.07 %
            Log(Eff):             -1.383299E+01 + ( 4.786779E+00*Log(E) ) +
                                   ( -5.293738E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.70keV )
       Stop channel:            8000 (  1999.40keV )
       Peak rejection level:    1000.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

     ORTEC g v - i (3263) Env32  G53W4.25  4/17/2012 11:26:44 AM   Page  2
TestAmerica, Inc.               Spectrum name: 14_Marn1L2nd_20120346.An1
                                      Page 1
```

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2011 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	14_2012-04-01_0328.PBC 4/1/2012 3:28:19 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0572

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
36.52	2151.	9.38	0.77	3.130E-02				
37.98	2880.	7.52	0.77	3.250E-02				
48.78	4817.	6.60	0.78	3.976E-02				
49.91	7782.	4.43	0.78	4.037E-02				
59.64	291261.	0.25	0.75	4.455E-02	59.54	35.700	5.102E+03	AM241
78.34	604.	39.20	0.40	4.853E-02				
88.01	222992.	0.28	0.79	4.914E-02	88.03	3.610	7.026E+04	CD109
105.28	316.	47.04	0.70	4.871E-02				
111.69	119.	98.40	0.44	4.821E-02				
121.97	70281.	0.55	0.82	4.715E-02	122.06	85.600	1.590E+03	CO57
130.99	336.	49.79	0.58	4.603E-02				
136.39	8488.	2.60	0.85	4.530E-02				
165.77	26682.	1.10	0.89	4.093E-02	165.85	79.900	2.377E+03	Ce139
199.09	806.	25.82	0.99	3.627E-02				
236.18	363.	55.45	0.54	3.228E-02				
279.22	628.	29.93	0.98	2.870E-02	279.17	81.500	7.674E+03	Hg203
310.46	356.	48.90	0.73	2.659E-02				
328.88	369.	43.27	0.36	2.550E-02				
365.21	256.	52.80	0.53	2.360E-02				
391.64	13213.	2.00	1.13	2.240E-02	391.69	64.000	4.256E+03	SN113
426.40	227.	77.87	0.36	2.100E-02				
444.14	192.	60.53	0.26	2.036E-02				
469.82	353.	38.19	0.74	1.949E-02				
511.03	2129.	5.83	1.20	1.826E-02				
515.49	168.	62.96	1.21	1.813E-02				
519.01	165.	54.74	1.21	1.804E-02				
524.70	177.	48.12	1.21	1.788E-02				
528.12	183.	52.86	1.22	1.779E-02				
564.55	182.	57.58	0.49	1.687E-02				
598.46	136.	67.06	0.56	1.610E-02				
661.62	86475.	0.39	1.32	1.485E-02	661.66	85.210	1.955E+03	CS137

706.30	187.	52.42	0.35	1.407E-02				
726.37	83.	63.44	0.32	1.375E-02				
834.79	47232.	0.58	1.44	1.225E-02	834.85	99.980	3.019E+03	Mn54
876.24	196.	47.00	0.56	1.175E-02				
897.97	12441.	1.84	1.49	1.151E-02	898.02	93.700	6.661E+03	Y898
934.37	235.	46.78	0.26	1.113E-02				
957.07	131.	78.82	0.51	1.090E-02				
1066.08	224.	58.92	0.49	9.929E-03				
1108.85	81.	73.40	0.58	9.593E-03				
1115.47	30186.	0.90	1.72	9.543E-03	1115.55	50.600	6.527E+03	Zn65
1173.16	88330.	0.39	1.70	9.129E-03	1173.24	99.900	3.183E+03	Co1173
1239.13	132.	41.44	0.54	8.696E-03				
1290.41	49.	53.90	0.32	8.387E-03				
1332.41	79724.	0.37	1.85	8.150E-03	1332.50	99.982	3.215E+03	Co1332
1606.25	86.	38.76	0.59	6.875E-03				
1625.37	39.	42.90	0.68	6.801E-03				
1835.92	7412.	1.27	2.30	6.073E-03	1836.01	99.200	7.106E+03	Y1836
1939.28	15.	54.93	0.67	5.768E-03				

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
145.29	36.49	19301.	2151.	6.872E+04	9.38	0.772	-	D
151.14	37.96	22005.	2880.	8.860E+04	7.52	0.773	-	D

ORTEC g v - i (3263) Env32 G53W4.25 4/17/2012 11:26:44 AM Page 3
TestAmerica, Inc. Spectrum name: 14_Marn1L2nd_20120346.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
194.30	48.77	48065.	4817.	1.212E+05	6.60	0.784	-	D
198.83	49.90	55460.	7782.	1.928E+05	4.43	0.785	-	D
312.55	78.34	22222.	604.	1.246E+04	39.20	0.403	-	s
420.32	105.28	9313.	316.	6.480E+03	47.04	0.697	-	
445.93	111.69	6796.	119.	2.468E+03	98.40	0.445	-	c
523.13	130.99	9770.	336.	7.303E+03	49.79	0.585	-	s
544.75	136.39	12105.	8488.	1.874E+05	2.60	0.855	-	
795.54	199.09	12158.	806.	2.223E+04	25.82	0.993	-	
943.91	236.18	11470.	363.	1.124E+04	55.45	0.542	-	s
1241.00	310.46	8168.	356.	1.339E+04	48.90	0.726	-	s
1314.69	328.88	7180.	369.	1.447E+04	43.27	0.361	-	s
1460.01	365.21	5703.	256.	1.086E+04	52.80	0.530	-	s
1704.83	426.40	7755.	227.	1.081E+04	77.87	0.358	-	s
1775.77	444.14	4682.	192.	9.416E+03	60.53	0.257	-	s
1878.51	469.82	5629.	353.	1.811E+04	38.19	0.745	-	s
2043.01	510.94	7840.	2882.	1.578E+05	6.78	2.130	-	s
2060.86	515.40	2340.	90.	4.945E+03	80.11	0.346	-	sc
2074.92	518.92	2312.	91.	5.026E+03	78.77	0.401	-	sc
2097.65	524.60	2580.	123.	6.878E+03	63.72	0.716	-	s
2111.32	528.01	2916.	159.	8.936E+03	54.28	0.408	-	s
2257.47	564.55	3600.	182.	1.079E+04	57.58	0.487	-	s
2393.16	598.46	3053.	136.	8.424E+03	67.06	0.561	-	s
2824.62	706.30	2986.	187.	1.331E+04	52.42	0.347	-	s
2904.92	726.37	1345.	83.	6.035E+03	63.44	0.319	-	sc
3504.56	876.24	2926.	196.	1.668E+04	47.00	0.558	-	s
3737.15	934.37	3753.	235.	2.115E+04	46.78	0.260	-	s
3828.01	957.07	3510.	131.	1.202E+04	78.82	0.514	-	sc
4264.20	1066.08	3804.	224.	2.251E+04	58.92	0.495	-	s
4435.38	1108.85	1480.	81.	8.444E+03	73.40	0.578	-	sc
4956.75	1239.13	660.	132.	1.518E+04	41.44	0.537	-	s
5161.96	1290.41	247.	49.	5.882E+03	53.90	0.322	-	s

6426.11	1606.25	277.	86.	1.246E+04	38.76	0.587	-	s
6502.66	1625.37	101.	39.	5.686E+03	42.90	0.682	-	s
7759.31	1939.28	26.	15.	2.658E+03	54.93	0.670	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Mn, Zn.L

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
AM-241	237.77	59.64	59483.	291261.	80.906	0.25	0.748
CD-109	351.21	88.01	38124.	222992.	61.942	0.28	0.788
CO-57	487.07	121.97	19554.	70281.	19.522	0.55	0.818
Ce-139	662.25	165.77	14453.	26682.	7.412	1.10	0.888
Hg-203	1116.04	279.22	9453.	628.	0.174	29.93	0.982s
SN-113	1565.75	391.64	10900.	13213.	3.670	2.00	1.126
CS-137	2645.83	661.62	6160.	86475.	24.021	0.39	1.322
Mn-54	3338.72	834.79	5919.	47232.	13.120	0.58	1.440
Y-898	3591.53	897.97	7492.	12441.	3.456	1.84	1.488
Zn-65	4461.87	1115.47	6228.	30186.	8.385	0.90	1.722
Co-1173	4692.72	1173.16	3873.	88330.	24.536	0.39	1.704
Co-1332	5330.07	1332.41	974.	79724.	22.146	0.37	1.851
Y-1836	7345.51	1835.92	184.	7412.	2.059	1.27	2.304

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
AM-241		5.1019E+03				1.58E+05	
			59.54	5.102E+03	(	1.996E+01 2.45E-01 3.57E+01	G
CD-109		7.0262E+04				4.63E+02	
			88.03	7.026E+04	(	2.875E+02 2.77E-01 3.61E+00	G
CO-57		1.5904E+03				2.72E+02	
			122.06	1.590E+03	(	1.481E+01 5.54E-01 8.56E+01	G
Ce-139		2.3767E+03				1.38E+02	
			165.85	2.377E+03	(	5.014E+01 1.10E+00 7.99E+01	G
Hg-203		7.6741E+03				4.66E+01	
			279.17	7.674E+03	*(	5.573E+03 2.99E+01 8.15E+01	G
SN-113		4.2555E+03				1.15E+02	

```
                                391.69 4.256E+03  (  1.576E+02 2.00E+00 6.40E+01 G

CS-137       1.9553E+03                                          1.10E+04
                                661.66 1.955E+03  (  8.331E+00 3.93E-01 8.52E+01 G
```



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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Mn-54        3.0193E+03                                          3.12E+02
                                834.85 3.019E+03  (  2.309E+01 5.83E-01 1.00E+02 G

Y-898        6.6610E+03                                          1.07E+02
                                898.02 6.661E+03  (  2.174E+02 1.84E+00 9.37E+01 G

Zn-65    F   6.5273E+03                                          2.44E+02
                               1115.55 6.527E+03  (  8.011E+01 9.00E-01 5.06E+01 G

Co-1173      3.1829E+03                                          1.93E+03
                               1173.24 3.183E+03  (  1.055E+01 3.89E-01 9.99E+01 G

Co-1332      3.2153E+03                                          1.93E+03
                               1332.50 3.215E+03  (  5.975E+00 3.69E-01 1.00E+02 G

Y-1836       7.1063E+03                                          1.07E+02
                               1836.01 7.106E+03  (  6.328E+01 1.27E+00 9.92E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide	Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
AM-241	5.0915E+03	5.1019E+03	2.450E-01%	2.00E+01
CD-109	3.4917E+04	7.0262E+04	2.771E-01%	2.88E+02
CO-57	4.8377E+02	1.5904E+03	5.543E-01%	1.48E+01
Ce-139	2.2663E+02	2.3767E+03	1.105E+00%	5.01E+01
Hg-203 #	7.4529E+00	7.6741E+03	2.993E+01%	5.57E+03
SN-113	2.5605E+02	4.2555E+03	1.996E+00%	1.58E+02
CS-137	1.8986E+03	1.9553E+03	3.925E-01%	8.33E+00
Mn-54	1.0717E+03	3.0193E+03	5.831E-01%	2.31E+01
Y-898	3.2040E+02	6.6610E+03	1.840E+00%	2.17E+02
Zn-65	1.7366E+03	6.5273E+03	8.998E-01%	8.01E+01
Co-1173	2.6906E+03	3.1829E+03	3.889E-01%	1.05E+01
Co-1332	2.7180E+03	3.2153E+03	3.687E-01%	5.98E+00
Y-1836	3.4182E+02	7.1063E+03	1.270E+00%	6.33E+01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (59.5 to 1999.4 keV) 5.176E+04 Bq/Sample
Total Decayed Activity (59.5 to 1999.4 keV) 1.2292753E+05 Bq/Sample

Second Source Verification

Detector: Ge16

Geometry: 1L Marn

Reference date 1/1/2011

Calibration Standard: 83924-334

Standard volume g / vial 1

Standard volume transferred in g / geometry 1

lab ID# of cal standard 1L Marn_00002

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1830	1830	0.359	**5097.5**	5095.2	100.0
Cs-137	1705	1705	0.851	**2003.5**	2003.6	100.0
Co-60	3293	3293	0.99974	**3293.9**	3267.4	99.2
Co-60	3294	3294	0.99986	**3294.5**	3265.3	99.1

Reviewed By: Jody Watson

Date: _____

16_1Lmarn2nd_20120385

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     ORTEC g v - i (3263) Env32  G53W4.25  4/24/2012 10:47:24 AM   Page  1
TestAmerica, Inc.               Spectrum name: 16_1Lmarn2nd_20120385.An1

Sample description
     16_1Lmarn2nd_Rad11_042412


Spectrum Filename: C:\User\SPC\Det16\16_1Lmarn2nd_20120385.An1

Acquisition information
       Start time:                 4/24/2012 8:11:06 AM
       Live time:               3600
       Real time:               3890
       Dead time:                  7.46 %
       Detector ID:                   16

Detector system
     Ge16 SN/11012217


Calibration
       Filename:                   16_Liquid_Marinelli 1L.Clb
     16_1Lmarn_90062_032712


       Energy Calibration
            Created:               4/2/2012 6:09:11 PM
            Zero offset:          -0.007 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -1.978E-08 keV/channel^2

       Efficiency Calibration
            Created:               4/2/2012 6:09:24 PM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   2.42 %
            Log(Eff):             -2.314705E+00 + ( 2.848008E-01*Log(E) ) +
                                   ( -8.114986E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.26 %
            Log(Eff):             -1.260350E+01 + ( 4.382261E+00*Log(E) ) +
                                   ( -4.889120E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.50keV )
       Stop channel:            8000 (  1999.23keV )
       Peak rejection level:    1000.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method


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TestAmerica, Inc.               Spectrum name: 16_1Lmarn2nd_20120385.An1
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Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2011 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	16_2012-04-01_0336.PBC 4/1/2012 3:36:15 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0381

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
36.24	2633.	9.05	0.99	4.192E-02				
37.73	3600.	7.28	0.99	4.339E-02				
43.01	1744.	21.30	1.21	4.796E-02				
49.63	17367.	3.62	1.81	5.253E-02				
59.52	364868.	0.24	0.99	5.727E-02	59.54	35.700	4.967E+03	AM241
77.86	1704.	22.69	0.64	6.133E-02				
88.04	270447.	0.27	1.00	6.181E-02	88.03	3.610	6.899E+04	CD109
101.18	167.	75.80	0.36	6.126E-02				
122.08	84451.	0.56	1.05	5.874E-02	122.06	85.600	1.582E+03	CO57
136.49	10430.	2.77	1.05	5.636E-02				
165.86	30802.	1.11	1.08	5.084E-02	165.85	79.900	2.349E+03	Ce139
199.00	1287.	18.47	1.49	4.592E-02				
220.46	244.	83.67	0.48	4.326E-02				
244.11	344.	44.21	0.74	4.070E-02				
278.61	580.	31.95	0.72	3.750E-02				
279.17	24.	799.67	1.20	3.745E-02	279.17	81.500	PBC<MDA	Hg203
294.17	181.	85.14	0.40	3.623E-02				
391.55	16351.	1.89	1.29	2.999E-02	391.69	64.000	4.234E+03	SN113
511.07	3625.	7.09	2.38	2.485E-02				
525.22	222.	43.75	0.56	2.436E-02				
661.61	120063.	0.30	1.51	2.049E-02	661.66	85.210	1.969E+03	CS137
666.12	109.	104.95	1.52	2.038E-02				
701.63	181.	58.10	0.60	1.958E-02				
730.08	88.	91.86	0.38	1.898E-02				
789.34	114.	59.03	0.66	1.784E-02				
834.78	63972.	0.55	1.65	1.706E-02	834.85	99.980	3.017E+03	Mn54
897.97	15428.	1.54	1.68	1.607E-02	898.02	93.700	6.404E+03	Y898
924.86	512.	35.84	0.38	1.569E-02				
935.31	113.	59.08	0.52	1.554E-02				
949.83	207.	52.10	0.44	1.535E-02				
971.39	360.	55.06	0.41	1.506E-02				

1002.30	88.	72.53	0.57	1.468E-02				
1030.28	135.	51.42	0.52	1.434E-02				
1087.52	232.	68.18	0.32	1.370E-02				
1115.47	41218.	0.80	1.85	1.341E-02	1115.55	50.600	6.568E+03	Zn65
1129.46	314.	46.37	0.69	1.327E-02				
1173.16	120613.	0.34	1.91	1.284E-02	1173.24	99.900	3.104E+03	Co1173
1234.16	56.	63.47	0.30	1.229E-02				
1274.33	249.	24.48	1.10	1.195E-02				
1332.42	110205.	0.32	2.04	1.149E-02	1332.50	99.982	3.166E+03	Co1332
1429.54	129.	51.29	0.35	1.079E-02				
1767.54	116.	44.61	0.50	8.895E-03				
1835.87	9468.	1.18	2.26	8.586E-03	1836.01	99.200	6.951E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
144.94	36.24	27063.	2633.	6.282E+04	9.05	0.992	-	D
150.93	37.74	32518.	3600.	8.298E+04	7.28	0.993	-	D

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TestAmerica, Inc. Spectrum name: 16_1Lmarn2nd_20120385.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
172.01	43.01	42984.	1744.	3.635E+04	21.30	1.213	-	s
198.51	49.63	98747.	17367.	3.306E+05	3.62	1.807	-	s
311.38	77.86	42218.	1704.	2.778E+04	22.69	0.645	-	s
404.67	101.18	7929.	167.	2.726E+03	75.80	0.363	-	sc
545.88	136.49	18327.	10430.	1.851E+05	2.77	1.054	-	
795.88	199.00	15056.	1287.	2.803E+04	18.47	1.487	-	s
881.71	220.46	13032.	244.	5.629E+03	83.67	0.481	-	sc
976.30	244.11	8528.	344.	8.445E+03	44.21	0.740	-	s
1176.53	294.17	7856.	181.	4.995E+03	85.14	0.404	-	sc
2044.14	511.07	12100.	3625.	1.459E+05	7.09	2.382	-	s
2100.73	525.22	3668.	222.	9.092E+03	43.75	0.563	-	s
2664.36	666.11	4888.	226.	1.106E+04	58.38	0.353	-	sM
2806.46	701.63	3626.	181.	9.246E+03	58.10	0.599	-	s
2920.30	730.08	2608.	88.	4.664E+03	91.86	0.378	-	sc
3157.38	789.34	2031.	114.	6.381E+03	59.03	0.661	-	s
3699.64	924.86	7354.	512.	3.260E+04	35.84	0.380	-	s
3741.42	935.31	2172.	113.	7.269E+03	59.08	0.524	-	s
3799.55	949.83	4039.	207.	1.350E+04	52.10	0.442	-	s
3885.79	971.39	7512.	360.	2.386E+04	55.06	0.413	-	s
4009.51	1002.30	1847.	88.	6.007E+03	72.53	0.566	-	sc
4121.46	1030.28	1997.	135.	9.390E+03	51.42	0.518	-	s
4350.52	1087.52	5328.	232.	1.696E+04	68.18	0.319	-	s
4518.33	1129.46	4033.	314.	2.365E+04	46.37	0.690	-	s
4937.37	1234.16	483.	56.	4.557E+03	63.47	0.298	-	s
5098.12	1274.33	833.	249.	2.085E+04	24.48	1.102	-	s
5719.34	1429.54	687.	129.	1.194E+04	51.29	0.347	-	s
7072.37	1767.54	366.	116.	1.304E+04	44.61	0.496	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_EnergyStandardMix & Mn, Zn.L

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
AM-241	238.06	59.52	90566.	364868.	101.352	0.24	0.985
CD-109	352.11	88.04	53425.	270447.	75.124	0.27	1.004
CO-57	488.24	122.08	28256.	84451.	23.459	0.56	1.045
Ce-139	663.35	165.86	18928.	30802.	8.556	1.11	1.077
Hg-203	1116.52	279.17	18155.	24.	0.007	799.67	1.200s
SN-113	1566.04	391.55	14418.	16351.	4.542	1.89	1.286
CS-137	2646.33	661.60	11242.	120008.	33.336	0.37	1.500

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TestAmerica, Inc. Spectrum name: 16_1Lmarn2nd_20120385.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Mn-54	3339.17	834.78	9796.	63972.	17.770	0.55	1.647
Y-898	3592.03	897.97	8456.	15428.	4.285	1.54	1.683
Zn-65	4462.34	1115.47	8938.	41218.	11.450	0.80	1.851
Co-1173	4693.23	1173.16	5375.	120613.	33.504	0.34	1.908
Co-1332	5330.61	1332.42	1667.	110205.	30.613	0.32	2.035
Y-1836	7345.92	1835.87	410.	9468.	2.630	1.18	2.257

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample	COMMENTS
AM-241		4.9673E+03				1.58E+05	
			59.54	4.967E+03	(	1.913E+01 2.41E-01 3.57E+01	G
CD-109		6.8995E+04				4.63E+02	
			88.03	6.899E+04	(	2.755E+02 2.69E-01 3.61E+00	G
CO-57		1.5822E+03				2.72E+02	
			122.06	1.582E+03	(	1.473E+01 5.63E-01 8.56E+01	G
Ce-139		2.3487E+03				1.38E+02	
			165.85	2.349E+03	(	4.909E+01 1.11E+00 7.99E+01	G
Hg-203		2.6780E+02				4.66E+01	
			279.17	2.678E+02	?(	7.085E+03 8.00E+02 8.15E+01	G
SN-113		4.2336E+03				1.15E+02	
			391.69	4.234E+03	(	1.456E+02 1.89E+00 6.40E+01	G
CS-137		1.9683E+03				1.10E+04	
			661.66	1.968E+03	(	8.148E+00 3.66E-01 8.52E+01	G
Mn-54		3.0166E+03				3.12E+02	
			834.85	3.017E+03	(	2.188E+01 5.51E-01 1.00E+02	G
Y-898		6.4044E+03				1.07E+02	
			898.02	6.404E+03	(	1.790E+02 1.54E+00 9.37E+01	G

```
Zn-65    F   6.5677E+03                                        2.44E+02
                         1115.55 6.568E+03  (  7.063E+01 7.98E-01 5.06E+01 G
```

```
     ORTEC g v - i (3263) Env32  G53W4.25  4/24/2012 10:47:24 AM   Page  5
 TestAmerica, Inc.              Spectrum name: 16_1Lmarn2nd_20120385.An1

 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Co-1173      3.1037E+03                                        1.93E+03
                         1173.24 3.104E+03  (  8.862E+00 3.37E-01 9.99E+01 G

Co-1332      3.1665E+03                                        1.93E+03
                         1332.50 3.166E+03  (  5.544E+00 3.18E-01 1.00E+02 G

Y-1836       6.9509E+03                                        1.07E+02
                         1836.01 6.951E+03  (  7.122E+01 1.18E+00 9.92E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


 *************** D I S C A R D E D  I S O T O P E  P E A K S ***************
 Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
           Energy   Counts     Counts     Cts/Sec  1 Sigma %
 ____________________________________________________________________________
   P - Peakbackground subtraction
```

```
     ORTEC g v - i (3263) Env32  G53W4.25  4/24/2012 10:47:24 AM   Page  6
 TestAmerica, Inc.              Spectrum name: 16_1Lmarn2nd_20120385.An1


 *****   S U M M A R Y   O F   N U C L I D E S   I N   S A M P L E   *****
         Time of Count  Time Corrected  Uncertainty  1 Sigma
```

16_1Lmarn2nd_20120385

Nuclide	Activity Bq/Sample	Activity Bq/Sample	Counting	MDA Bq/Sample
AM-241	4.9569E+03	4.9673E+03	2.409E-01%	1.91E+01
CD-109	3.3666E+04	6.8995E+04	2.688E-01%	2.75E+02
CO-57	4.6653E+02	1.5822E+03	5.626E-01%	1.47E+01
Ce-139	2.1061E+02	2.3487E+03	1.106E+00%	4.91E+01
Hg-203 #A	2.1691E-01	2.6780E+02	7.997E+02%	7.08E+03
SN-113	2.3667E+02	4.2336E+03	1.891E+00%	1.46E+02
CS-137	1.9097E+03	1.9683E+03	3.662E-01%	8.15E+00
Mn-54	1.0421E+03	3.0166E+03	5.513E-01%	2.19E+01
Y-898	2.8454E+02	6.4044E+03	1.538E+00%	1.79E+02
Zn-65	1.6878E+03	6.5677E+03	7.982E-01%	7.06E+01
Co-1173	2.6122E+03	3.1037E+03	3.372E-01%	8.86E+00
Co-1332	2.6650E+03	3.1665E+03	3.182E-01%	5.54E+00
Y-1836	3.0883E+02	6.9509E+03	1.183E+00%	7.12E+01

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (43.0 to 1999.2 keV) 5.005E+04 Bq/Sample
Total Decayed Activity (43.0 to 1999.2 keV) 1.1330478E+05 Bq/Sample

Second Source Verification

Detector:	Ge17
Geometry:	1L Marn
Reference date	1/1/2011
Calibration Standard:	83924-334
Standard volume g / vial	1
Standard volume transferred in g / geometry	1
lab ID# of cal standard	6675

Isotope	Certified Activity gammas/sec	Geometry Activity gammas/sec	Abundance	Activity Bq/L	Count Results	%recovery
Am-241	1830	1830	0.359	**5097.5**	5027.9	98.6
Cs-137	1705	1705	0.851	**2003.5**	1932.9	96.5
Co-60	3293	3293	0.99974	**3293.9**	3091.2	93.8
Co-60	3294	3294	0.99986	**3294.5**	3117.6	94.6

Reviewed By: Rachael Schneider

Date: 3/13/2012

17_1Lmarn2nd_20120209

```
     ORTEC g v - i (3263) Env32  G53W4.25  3/12/2012 2:00:02 PM    Page  1
TestAmerica, Inc.               Spectrum name: 17_1Lmarn2nd_20120209.An1

Sample description
     17_Marn1L_83924-334_2ndsource_030712


Spectrum Filename: C:\User\SPC\Det17\17_1Lmarn2nd_20120209.An1

Acquisition information
       Start time:                 3/7/2012 11:01:01 PM
       Live time:               3600
       Real time:               3890
       Dead time:                  7.45 %
       Detector ID:                   17

Detector system
     Ge17 SN/11080671


Calibration
       Filename:                   17_Liquid_Marinelli 1L.Clb
     17_1L marn_90062_030512


       Energy Calibration
            Created:               3/7/2012 11:47:12 AM
            Zero offset:           0.135 keV
            Gain:                  0.250 keV/channel
            Quadratic:            -2.115E-08 keV/channel^2

       Efficiency Calibration
            Created:               3/7/2012 11:47:27 AM
            Knee Energy:         165.85 keV
            Above the Knee:        Quadratic        Uncertainty =   2.09 %
            Log(Eff):             -2.094103E+00 + ( 1.788156E-01*Log(E) ) +
                                   ( -7.283143E-02*Log(E)^2 )
            Below the Knee:        Quadratic        Uncertainty =   0.66 %
            Log(Eff):             -1.201018E+01 + ( 4.016685E+00*Log(E) ) +
                                   ( -4.439774E-01*Log(E)^2 )

Library Files
       Main analysis library:      DET_EnergyStandardMix & Mn, Zn.L
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G53W4.25
       Start channel:            150 (    37.65keV )
       Stop channel:            8000 (  1999.53keV )
       Peak rejection level:    1000.000%
       Peak search sensitivity:    3
       Sample Size:                1.0000E+00
       Activity scaling factor:    1.0000E+00/(  1.0000E+00*  1.0000E+00) =
                                   1.0000E+00
       Detection limit method:     Reg. Guide 4.16 Method

     ORTEC g v - i (3263) Env32  G53W4.25  3/12/2012 2:00:02 PM    Page  2
TestAmerica, Inc.               Spectrum name: 17_1Lmarn2nd_20120209.An1
                                      Page 1
```

Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: average of three points.

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	1/1/2011 11:00:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	17_2012-02-26_0520.PBC 2/26/2012 5:20:29 AM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 13 cutoff: 5.00E+01%
Energy Calibration
Normalized diff: 0.0396

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. Bq/Sampl	Nuc
36.45	2365.	8.54	0.78	3.661E-02				
37.91	3372.	6.46	0.78	3.779E-02				
42.41	470.	48.38	0.49	4.106E-02				
49.72	9114.	3.85	0.79	4.524E-02				
51.72	3571.	9.79	0.79	4.620E-02				
59.59	317872.	0.25	0.78	4.930E-02	59.54	35.700	5.028E+03	AM241
75.26	183.	110.61	0.81	5.266E-02				
78.24	841.	28.10	0.81	5.300E-02				
88.07	259579.	0.25	0.82	5.359E-02	88.03	3.610	7.114E+04	CD109
122.01	83297.	0.52	0.87	5.180E-02	122.06	85.600	1.568E+03	CO57
136.38	9862.	2.54	0.87	5.011E-02				
165.72	35094.	0.98	0.92	4.604E-02	165.85	79.900	2.338E+03	Ce139
170.83	203.	73.00	0.47	4.507E-02				
183.81	150.	108.32	0.46	4.321E-02				
198.94	1448.	14.51	1.05	4.125E-02				
254.89	675.	21.65	0.76	3.546E-02				
279.09	1160.	18.10	0.89	3.348E-02	279.17	81.500	7.210E+03	Hg203
391.64	18754.	1.41	1.13	2.671E-02	391.69	64.000	4.098E+03	SN113
421.79	353.	37.95	0.39	2.537E-02				
510.92	3542.	6.09	1.97	2.212E-02				
661.63	105165.	0.37	1.35	1.823E-02	661.66	85.210	1.933E+03	CS137
673.47	274.	46.60	0.48	1.798E-02				
703.46	162.	53.59	0.73	1.738E-02				
739.87	151.	60.97	0.72	1.671E-02				
834.84	62790.	0.58	1.48	1.519E-02	834.85	99.980	2.993E+03	Mn54
880.57	163.	47.88	0.73	1.455E-02				
898.06	18825.	1.30	1.53	1.432E-02	898.02	93.700	6.445E+03	Y898
1115.54	41217.	0.72	1.70	1.197E-02	1115.55	50.600	6.432E+03	Zn65
1165.48	173.	44.94	0.62	1.153E-02				
1173.22	109141.	0.34	1.73	1.147E-02	1173.24	99.900	3.091E+03	Co1173
1208.90	97.	39.52	0.75	1.118E-02				

1264.54	37.	74.18	0.33	1.075E-02				
1282.13	132.	41.80	0.39	1.063E-02				
1332.49	98744.	0.33	1.80	1.028E-02	1332.50	99.982	3.118E+03	Co1332
1353.89	62.	62.45	0.43	1.014E-02				
1364.68	83.	52.15	0.46	1.007E-02				
1731.88	50.	45.85	0.33	8.143E-03				
1835.98	11538.	1.07	2.13	7.721E-03	1836.01	99.200	6.921E+03	Y1836

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
145.21	36.44	19211.	2365.	6.462E+04	8.54	0.776	- D
151.07	37.91	22047.	3372.	8.924E+04	6.46	0.778	- D

ORTEC g v - i (3263) Env32 G53W4.25 3/12/2012 2:00:02 PM Page 3
TestAmerica, Inc. Spectrum name: 17_1Lmarn2nd_20120209.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
169.05	42.41	21991.	470.	1.146E+04	48.38	0.492	- s
197.80	49.60	73487.	10257.	2.267E+05	4.81	1.585	- s
205.80	51.60	54339.	232.	5.021E+03	159.00	0.308	- sc
300.00	75.16	25922.	68.	1.282E+03	377.33	0.000	- sc
311.92	78.14	27362.	920.	1.736E+04	29.53	0.710	-
544.81	136.38	15138.	9862.	1.968E+05	2.54	0.865	-
682.56	170.83	8160.	203.	4.504E+03	73.00	0.467	- c
734.46	183.81	9286.	150.	3.475E+03	108.32	0.457	- c
794.99	198.94	12803.	1448.	3.510E+04	14.51	1.048	- s
1018.72	254.89	7762.	675.	1.904E+04	21.65	0.759	-
1686.21	421.79	5864.	353.	1.391E+04	37.95	0.386	- s
2042.75	510.92	9566.	3542.	1.602E+05	6.09	1.970	- s
2692.97	673.47	4580.	274.	1.524E+04	46.60	0.480	- s
2812.91	703.46	2777.	162.	9.338E+03	53.59	0.726	- s
2958.58	739.87	2952.	151.	9.054E+03	60.97	0.723	- s
3521.48	880.57	2551.	163.	1.123E+04	47.88	0.732	- s
4661.47	1165.48	1769.	173.	1.503E+04	44.94	0.617	- s
4835.24	1208.90	549.	97.	8.678E+03	39.52	0.747	- s
5057.91	1264.54	301.	37.	3.409E+03	74.18	0.331	- sc
5128.29	1282.13	694.	132.	1.237E+04	41.80	0.392	- s
5415.49	1353.89	392.	62.	6.116E+03	62.45	0.430	- s
5458.66	1364.68	417.	83.	8.278E+03	52.15	0.460	- s
6928.47	1731.88	145.	50.	6.181E+03	45.85	0.334	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_EnergyStandardMix & Mn, Zn.L

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
AM-241	237.76	59.59	73101.	317872.	88.298	0.25	0.778
CD-109	351.63	88.07	39287.	259579.	72.105	0.25	0.824
CO-57	487.32	122.01	24057.	83297.	23.138	0.52	0.871
Ce-139	662.14	165.72	18515.	35094.	9.748	0.98	0.916
Hg-203	1115.50	279.09	11200.	1160.	0.322	18.10	0.891s

SN-113	1565.63	391.64	11029.	18754.	5.209	1.41	1.132
CS-137	2645.58	661.63	8458.	105165.	29.212	0.37	1.349
Mn-54	3338.50	834.84	10383.	62790.	17.442	0.58	1.482
Y-898	3591.45	898.06	8260.	18825.	5.229	1.30	1.526
Zn-65	4461.62	1115.54	7078.	41217.	11.449	0.72	1.701
Co-1173	4692.44	1173.22	4383.	109141.	30.317	0.34	1.729
Co-1332	5329.83	1332.49	1452.	98744.	27.429	0.33	1.799

ORTEC g v - i (3263) Env32 G53W4.25 3/12/2012 2:00:02 PM Page 4
TestAmerica, Inc. Spectrum name: 17_1Lmarn2nd_20120209.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Y-1836	7345.18	1835.98	416.	11538.	3.205	1.07	2.125

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity Bq/Sample	Peak Energy keV	Peak Activity Bq/Sample	Code	MDA Value Bq/Sample		COMMENTS
AM-241		5.0279E+03				1.58E+05		
			59.54	5.028E+03	(	1.997E+01	2.46E-01	3.57E+01 G
CD-109		7.1144E+04				4.63E+02		
			88.03	7.114E+04	(	2.539E+02	2.47E-01	3.61E+00 G
CO-57		1.5684E+03				2.72E+02		
			122.06	1.568E+03	(	1.366E+01	5.20E-01	8.56E+01 G
Ce-139		2.3385E+03				1.38E+02		
			165.85	2.338E+03	(	4.243E+01	9.81E-01	7.99E+01 G
Hg-203		7.2096E+03				4.66E+01		
			279.17	7.210E+03	*(	3.082E+03	1.81E+01	8.15E+01 G
SN-113		4.0978E+03				1.15E+02		
			391.69	4.098E+03	(	1.075E+02	1.41E+00	6.40E+01 G
CS-137		1.9329E+03				1.10E+04		
			661.66	1.933E+03	(	7.927E+00	3.67E-01	8.52E+01 G
Mn-54		2.9929E+03				3.12E+02		
			834.85	2.993E+03	(	2.276E+01	5.82E-01	1.00E+02 G
Y-898		6.4454E+03				1.07E+02		
			898.02	6.445E+03	(	1.459E+02	1.30E+00	9.37E+01 G
Zn-65	F	6.4315E+03				2.44E+02		
			1115.55	6.432E+03	(	6.160E+01	7.21E-01	5.06E+01 G
Co-1173		3.0912E+03				1.93E+03		
			1173.24	3.091E+03	(	8.814E+00	3.44E-01	9.99E+01 G
Co-1332		3.1176E+03				1.93E+03		
			1332.50	3.118E+03	(	5.693E+00	3.34E-01	1.00E+02 G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Y-1836       6.9209E+03                                        1.07E+02
                         1836.01 6.921E+03  (  5.864E+01 1.07E+00 9.92E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


 *************** D I S C A R D E D  I S O T O P E  P E A K S ***************
 Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
           Energy   Counts     Counts     Cts/Sec  1 Sigma %
 ____________________________________________________________________________
   P - Peakbackground subtraction

 *****   S U M M A R Y   O F   N U C L I D E S   I N   S A M P L E   *****
          Time of Count  Time Corrected  Uncertainty  1 Sigma
 Nuclide     Activity       Activity       Counting                   MDA
                Bq/Sample     Bq/Sample                                 Bq/Sample

 ____________________________________________________________________________
 AM-241       5.0184E+03    5.0279E+03    2.458E-01%                2.00E+01
 CD-109       3.7269E+04    7.1144E+04    2.467E-01%                2.54E+02
 CO-57        5.2187E+02    1.5684E+03    5.199E-01%                1.37E+01
 Ce-139       2.6620E+02    2.3385E+03    9.805E-01%                4.24E+01
```



```
 Hg-203 #     1.1810E+01    7.2096E+03    1.810E+01%                3.08E+03
 SN-113       3.0473E+02    4.0978E+03    1.413E+00%                1.08E+02
```

CS-137	1.8810E+03	1.9329E+03	3.669E-01%	7.93E+00
Mn-54	1.1486E+03	2.9929E+03	5.824E-01%	2.28E+01
Y-898	3.8969E+02	6.4454E+03	1.303E+00%	1.46E+02
Zn-65	1.8907E+03	6.4315E+03	7.214E-01%	6.16E+01
Co-1173	2.6464E+03	3.0912E+03	3.444E-01%	8.81E+00
Co-1332	2.6690E+03	3.1176E+03	3.338E-01%	5.69E+00
Y-1836	4.1844E+02	6.9209E+03	1.071E+00%	5.86E+01

```
  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded
----------------------------   S U M M A R Y   ----------------------------
Total Activity (   42.4 to  1999.5 keV)     5.444E+04  Bq/Sample
Total Decayed Activity (   42.4 to  1999.5 keV) 1.2231852E+05  Bq/Sample
```

Monthly Backgrounds

Test America
St. Louis
Background Check

Spectrum: 5_20191005013_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:05:47 PM
Detector: Detector # 5
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.45	1.30	1.35	1.42	1.55	1.60	PASS

Analyst: Shiloh Smith Reviewer: Kellene Robbs

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Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det5\5_20191005013_BGLong.An1

Acquisition information

Start time:	10/5/2019 11:05:47 PM
Live time:	72000
Real time:	72284
Dead time:	0.39 %
Detector ID:	5

Detector system
Ge 5 SN/157

Calibration

Filename:	5_QC.Clb

Ge5_QC

Energy Calibration

Created:	2/28/2012 7:35:48 PM
Zero offset:	0.158 keV
Gain:	0.250 keV/channel
Quadratic:	3.911E-08 keV/channel^2

Efficiency Calibration

Created:	1/6/2011 8:03:22 AM
Knee Energy:	0.00 keV
Above the Knee:	Interpolative Uncertainty = 0.00 %
Below the Knee:	Interpolative Uncertainty = 0.00 %

Library Files

Main analysis library:	DET_Long Background PBC.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	150 (37.62keV)
Stop channel:	8000 (2000.81keV)
Peak rejection level:	30.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3

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Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0904

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. DPS	Nuc
46.60	514.	11.19	0.73	5.683E-02	46.54	4.250	2.962E+00	PB210
59.59	185.	21.55	0.49	7.427E-02	59.54	35.900	9.655E-02	AM241
63.39	559.	8.65	0.76	7.937E-02	63.29	3.810	2.571E+00	TH234
75.01	171.	20.26	0.81	9.492E-02				
77.19	132.	25.70	0.82	9.784E-02				
92.62	860.	6.44	1.01	1.129E-01	92.59	5.584	1.895E+00	TH234
					93.35	5.561	1.902E+00	AC228
143.76	150.	29.17	1.94	1.085E-01	143.79	10.960	1.758E-01	U235
					145.44	48.200	4.018E-02	CE141
185.83	361.	15.74	0.84	9.605E-02	185.72	54.000	9.660E-02	U235
					185.99	3.280	1.591E+00	Ra226
511.23	1808.	4.78	2.31	3.834E-02	511.86	20.000	3.278E+00	RH106
609.58	131.	24.27	1.36	3.199E-02	609.31	46.090	1.234E-01	BI214
					610.30	5.750	9.910E-01	RU103
661.86	259.	16.82	1.48	2.860E-02	661.66	85.210	1.474E-01	CS137
1000.07	115.	20.25	0.86	1.860E-02	1001.00	0.837	1.024E+01	PA234M
1119.28	93.	23.39	2.54	1.646E-02	1120.29	15.100	5.196E-01	BI214
					1120.55	99.987	7.849E-02	Sc46
					1121.30	34.900	2.250E-01	Ta182
1766.37	83.	16.88	2.72	1.105E-02	1764.49	15.400	6.773E-01	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
299.69	74.98	513.	171.	1.800E+03	20.26	0.813	- D
308.38	77.15	509.	132.	1.349E+03	25.70	0.815	- sD
2045.51	511.23	574.	1808.	4.715E+04	4.78	2.310	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_Long Background PBC.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.93	46.60	763.	514.	0.007	11.19	0.731s
AM-241	237.94	59.59	497.	185.	0.003	21.55	0.493s
TH-234	253.16	63.39	561.	559.	0.008	8.65	0.757s
TH-234	370.18	92.62	632.	860.	0.012	6.44	1.010s
U-235	574.91	143.76	508.	150.	0.002	29.17	1.943s
U-235	742.85	185.72	653.	325.	0.005	10.46	0.925D
BI-214	2439.01	609.58	240.	131.	0.002	24.27	1.365
CS-137	2648.15	661.86	280.	259.	0.004	16.82	1.479s
PA-234M	4000.83	1000.07	88.	115.	0.002	20.25	0.856s
BI-214	4477.48	1119.28	76.	93.	0.001	23.39	2.540s
BI-214	7063.57	1766.37	17.	83.	0.001	16.88	2.718s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Peak Code	Peak MDA Value DPS	COMMENTS
CS-137	I	1.4740E-01				1.10E+04	
			661.66	1.474E-01	@(	4.601E-02 1.68E+01	8.52E+01 G
PB-210	N	2.9616E+00				8.14E+03	
			46.54	2.962E+00	@(	7.566E-01 1.12E+01	4.25E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	N	1.2339E-01					5.84E+05	
			609.31	1.234E-01	?(	7.055E-02	2.43E+01	4.61E+01 G
			1120.29	5.196E-01	&	2.421E-01	2.34E+01	1.51E+01 G
			1764.49	6.773E-01	&	1.789E-01	1.69E+01	1.54E+01 G
TH-234	N	2.5711E+00					1.63E+12	
			63.29	2.571E+00	*(	5.204E-01	8.65E+00	3.81E+00 G
			92.59	1.895E+00	-	2.641E-01	6.44E+00	5.58E+00 G
PA-234M	N	1.0244E+01					1.63E+12	
			1001.00	1.024E+01	&(	4.145E+00	2.03E+01	8.37E-01 G
			766.41	0.000E+00	&	7.633E+00	9.02E+01	2.94E-01 G
U-235	N	1.7576E-01					2.57E+11	
			185.72	8.700E-02	}	3.260E-02	1.05E+01	5.40E+01 GA
			143.79	1.758E-01	*(	1.258E-01	2.92E+01	1.10E+01 G
			205.33	0.000E+00	%	2.028E-01	4.09E+01	5.01E+00 G
			163.38	0.000E+00	%	1.862E-01	2.56E+02	5.08E+00 G
AM-241	T	9.6547E-02					1.58E+05	
			59.54	9.655E-02	(	5.557E-02	2.16E+01	3.59E+01 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
% - Peak fails sensitivity test.
$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
\+ - Peak activity higher than counting uncertainty range.
\- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
P - Peakbackground subtraction
} - Peak is too close to another for the activity to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line

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M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
A - Not in Average
C - Coincidence Peak

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity DPS	Uncertainty 1 Sigma Counting	MDA
BE-7	<	2.6197E-01		
NA-22	<	1.4477E-02		
K-40	<	3.9311E-01		
Sc-46	<	1.5768E-02		
CR-51	<	1.2518E-01		
MN-54	<	2.4995E-02		
FE-59	<	5.3942E-02		
Co-56	<	2.6088E-02		
CO-57	<	8.9763E-03		
CO-58	<	2.3428E-02		
CO-60	<	3.1976E-02		
ZN-65	<	4.7530E-02		
NB-94	<	2.6190E-02		
ZR-95	<	3.8214E-02		
NB-95	<	2.7442E-02		
RU-103	<	1.6317E-02		
RH-106	<	2.0243E-01		
AG-108M	<	1.5486E-02		
AG-110M	<	2.4611E-02		
SN-113	<	2.4116E-02		
SB-124	<	1.3372E-02		
SB-125	<	5.0767E-02		
I-131	<	1.6940E-02		
BA-133	<	3.1711E-02		
CS-134	<	2.8969E-02		
CS-137	#	1.4740E-01	1.6825E+01%	4.601E-02
CE-139	<	1.1582E-02		
Ba-140	<	7.5442E-02		
La-140	<	3.1494E-02		
CE-141	<	1.2784E-02		
CE-144	<	1.1868E-01		
PM-144	<	2.4582E-02		
EU-152	<	9.3326E-02		
EU-154	<	3.3727E-01		

EU-155	<	3.8788E-02		
HF-181	<	3.1793E-02		
Ta-182	<	1.3060E-01		
Hg-203	<	1.6978E-02		
TL-208	<	2.5751E-02		
pm-146	<	6.4296E-02		
y-88	<	2.8781E-02		
PB-210	#	2.9616E+00	1.1187E+01%	7.566E-01
PB-212	<	2.4971E-02		
PB-214	<	5.8114E-02		
BI-207	<	3.0300E-02		
BI-212	<	3.9139E-01		
BI-214	#	1.2339E-01	2.4272E+01%	7.055E-02
BI-210M	<	2.2460E-02		
RA-224	<	2.7434E-01		
AC-228	<	9.3257E-02		
TH-227	<	8.8975E-02		
TH-229	<	2.3361E-01		
TH-234	#	2.5711E+00	8.6485E+00%	5.204E-01
PA-231	<	6.9884E-01		
PA-233	<	3.4113E-02		
PA-234	<	6.2991E-02		
PA-234M		1.0244E+01	2.0254E+01%	4.145E+00
U-235	#	1.7576E-01	2.9166E+01%	1.258E-01
AM-241		9.6547E-02	2.1554E+01%	5.557E-02
Np-237	<	9.9956E-02		

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 2000.8 keV) 1.632E+01 DPS

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Test America
St. Louis
Background Check

Spectrum: 8_20191005015_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:01:15 PM
Detector: Detector # 8
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.56	1.39	1.45	1.59	1.68	1.74	PASS

Analyst: Shiloh Smith Reviewer: Kellene Robbs

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Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det8\8_20191005015_BGLong.An1

Acquisition information

Start time:	10/5/2019 11:01:15 PM
Live time:	72000
Real time:	73778
Dead time:	2.41 %
Detector ID:	8

Detector system
Ge 8 SN/174

Calibration

Filename:	8_QC.Clb

Ge8_QC

Energy Calibration

Created:	2/28/2012 10:34:41 AM
Zero offset:	0.052 keV
Gain:	0.250 keV/channel
Quadratic:	5.282E-10 keV/channel^2

Efficiency Calibration

Created:	1/6/2011 8:07:20 AM
Knee Energy:	0.00 keV
Above the Knee:	Interpolative Uncertainty = 0.00 %
Below the Knee:	Interpolative Uncertainty = 0.00 %

Library Files

Main analysis library:	DET_Long Background PBC.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	150 (37.55keV)
Stop channel:	8000 (1999.97keV)
Peak rejection level:	30.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3

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Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 22 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1174

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. DPS	Nuc
59.49	390.	10.42	1.02	8.681E-02	59.54	35.900	1.736E-01	AM241
63.30	1022.	4.86	1.03	9.243E-02	63.29	3.810	4.030E+00	TH234
92.62	1918.	4.55	1.19	1.295E-01	92.59	5.584	3.683E+00	TH234
					93.35	5.561	3.696E+00	AC228
143.90	249.	19.12	0.71	1.247E-01	143.79	10.960	2.532E-01	U235
185.73	1049.	5.73	0.98	1.108E-01	185.72	54.000	2.436E-01	U235
					185.99	3.280	4.014E+00	Ra226
238.67	256.	17.87	1.02	9.638E-02	238.63	43.300	8.519E-02	PB212
351.73	185.	20.14	0.89	6.563E-02	351.93	37.600	1.042E-01	PB214
510.87	1442.	6.16	2.30	4.531E-02	511.86	20.000	2.213E+00	RH106
569.30	106.	27.20	1.85	4.064E-02	569.70	97.740	3.712E-02	BI207
					569.32	15.380	2.357E-01	CS134
					569.47	8.200	4.423E-01	PA234
583.12	150.	20.13	0.97	3.958E-02	583.02	84.500	6.243E-02	TL208
609.64	174.	26.28	1.25	3.750E-02	609.31	46.090	1.394E-01	BI214
					610.30	5.750	1.120E+00	RU103
661.56	219.	14.62	1.72	3.334E-02	661.66	85.210	1.072E-01	CS137
1000.75	132.	22.79	0.59	2.158E-02	1001.00	0.837	1.018E+01	PA234M
1173.27	86.	26.16	1.34	1.834E-02	1173.24	99.900	6.520E-02	CO60
1332.94	163.	13.76	1.64	1.637E-02	1332.50	99.980	1.383E-01	CO60
1460.46	130.	16.40	0.96	1.543E-02	1460.83	10.670	1.093E+00	K40

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
2043.40	510.87	702.	1442.	3.182E+04	6.16	2.300	-

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_Long Background PBC.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
AM-241	237.95	59.54	683.	390.	0.005	10.75	1.022D
TH-234	252.96	63.29	721.	1022.	0.014	4.86	1.025D
TH-234	370.28	92.62	1217.	1918.	0.027	4.55	1.191
U-235	575.44	143.90	607.	249.	0.003	19.12	0.714s
U-235	742.71	185.72	669.	1091.	0.015	19.25	0.984A
PB-212	954.54	238.67	525.	256.	0.004	17.87	1.017
PB-214	1406.80	351.73	328.	185.	0.003	20.14	0.892s
BI-207	2277.11	569.30	190.	106.	0.001	27.20	1.847s
TL-208	2332.39	583.12	177.	150.	0.002	20.13	0.972s
BI-214	2438.47	609.64	346.	174.	0.002	26.28	1.255
CS-137	2646.17	661.56	187.	219.	0.003	14.62	1.720s
PA-234M	4003.02	1000.75	123.	132.	0.002	22.79	0.589s
CO-60	4693.10	1173.27	84.	86.	0.001	26.16	1.344s
CO-60	5331.80	1332.94	51.	163.	0.002	13.76	1.641s
K-40	5841.90	1460.46	50.	130.	0.002	16.40	0.956s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Name	Nuclide Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Peak Code	MDA Value DPS	COMMENTS
K-40	N	1.0927E+00				4.66E+11	
			1460.83	1.093E+00	(	2.995E-01 1.64E+01 1.07E+01 G	

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-60	F	1.3830E-01					1.93E+03	
			1332.50	1.383E-01	*(	3.053E-02	1.38E+01	1.00E+02 G
			1173.24	6.520E-02	-	3.444E-02	2.62E+01	9.99E+01 G
CS-137	I	1.0722E-01					1.10E+04	
			661.66	1.072E-01	(	3.245E-02	1.46E+01	8.52E+01 G
TL-208	N	6.2425E-02					6.98E+02	
			583.02	6.243E-02	(	2.685E-02	2.01E+01	8.45E+01 G
			277.28	0.000E+00	&	1.524E-01	1.52E+02	6.31E+00 G
			860.56	0.000E+00	%	1.786E-01	5.46E+01	1.24E+01 G
PB-212	N	8.5193E-02					6.98E+02	
			238.63	8.519E-02	(	3.643E-02	1.79E+01	4.33E+01 G
			300.03	0.000E+00	%	3.260E-01	7.39E+01	3.28E+00 GA
PB-214	N	1.0421E-01					5.84E+05	
			351.93	1.042E-01	(	4.906E-02	2.01E+01	3.76E+01 G
			295.09	0.000E+00	%	5.597E-02	3.52E+01	1.93E+01 G
			242.00	0.000E+00		2.079E-01	0.00E+00	7.43E+00 GA
BI-207	C	3.7122E-02					1.18E+04	
			569.70	3.712E-02	(	2.340E-02	2.72E+01	9.77E+01 G
			1063.66	0.000E+00	%	3.668E-02	2.52E+02	7.45E+01 G
BI-214	N	1.3944E-01					5.84E+05	
			609.31	1.394E-01	(	7.189E-02	2.63E+01	4.61E+01 G
			1120.29	0.000E+00	%	1.689E-01	4.56E+01	1.51E+01 G
			1764.49	0.000E+00	%	2.461E-01	1.00E+03	1.54E+01 G
TH-234	N	3.8238E+00					1.63E+12	
			63.29	4.030E+00	(	5.040E-01	4.86E+00	3.81E+00 G
			92.59	3.683E+00	(	3.175E-01	4.55E+00	5.58E+00 G
PA-234M	N	1.0177E+01					1.63E+12	
			1001.00	1.018E+01	(	4.178E+00	2.28E+01	8.37E-01 G
			766.41	0.000E+00	%	6.635E+00	4.79E+01	2.94E-01 G
U-235	N	2.5324E-01					2.57E+11	
			185.72	2.532E-01	}	2.861E-02	1.93E+01	5.40E+01 GA
			143.79	2.532E-01	@(	1.193E-01	1.91E+01	1.10E+01 G
			205.33	0.000E+00	%	1.764E-01	3.95E+01	5.01E+00 G
			163.38	0.000E+00	%	1.736E-01	4.46E+01	5.08E+00 G
AM-241	T	1.7356E-01					1.58E+05	
			59.54	1.736E-01	?(	5.543E-02	1.07E+01	3.59E+01 G

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```
  ( - This peak used in the nuclide activity average.

  * - Peak is too wide, but only one peak in library.
  ! - Peak is part of a multiplet and this area went
      negative during deconvolution.
  ? - Peak is too narrow.
  @ - Peak is too wide at FW25M, but ok at FWHM.
  % - Peak fails sensitivity test.
  $ - Peak identified, but first peak of this nuclide
      failed one or more qualification tests.
  + - Peak activity higher than counting uncertainty range.
  - - Peak activity lower than counting uncertainty range.
  = - Peak outside analysis energy range.
  & - Calculated peak centroid is not close enough to the
      library energy centroid for positive identification.
  P - Peakbackground subtraction
  } - Peak is too close to another for the activity
      to be found directly.

  Nuclide Codes:                      Peak Codes:
  T - Thermal Neutron Activation      G - Gamma Ray
  F - Fast Neutron Activation         X - X-Ray
  I - Fission Product                 P - Positron Decay
  N - Naturally Occurring Isotope     S - Single-Escape
  P - Photon Reaction                 D - Double-Escape
  C - Charged Particle Reaction       K - Key Line
  M - No MDA Calculation              A - Not in Average
  R - Coincidence Corrected           C - Coincidence Peak
  H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


*************** D I S C A R D E D  I S O T O P E  P E A K S ***************
Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
          Energy   Counts     Counts     Cts/Sec  1 Sigma %
_____________________________________________________________________________
  P - Peakbackground subtraction

*****   S U M M A R Y   O F   N U C L I D E S   I N   S A M P L E   *****
        Time of Count   Uncertainty  1 Sigma
Nuclide    Activity        Counting                    MDA
              DPS
_____________________________________________________________________________
BE-7    <    1.4039E-01
NA-22   <    3.7350E-02
K-40         1.0927E+00   1.6404E+01%               2.995E-01
Sc-46   <    2.4897E-02
CR-51   <    1.0919E-01
MN-54   <    2.2331E-02
FE-59   <    4.9463E-02
Co-56   <    2.0949E-02
CO-57   <    1.1850E-02
CO-58   <    2.4885E-02
```

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CO-60		1.3830E-01	1.3759E+01%	3.053E-02
ZN-65	<	5.3551E-02		
NB-94	<	1.9827E-02		
ZR-95	<	3.7020E-02		
NB-95	<	2.9132E-02		
RU-103	<	1.6788E-02		
RH-106	<	2.9891E-01		
AG-108M	<	1.5456E-02		
AG-110M	<	1.7406E-02		
SN-113	<	2.4161E-02		
SB-124	<	2.0000E-02		
SB-125	<	5.3128E-02		
I-131	<	1.6374E-02		
BA-133	<	3.8327E-02		
CS-134	<	2.3580E-02		
CS-137	#	1.0722E-01	1.4620E+01%	3.245E-02
CE-139	<	1.0864E-02		
Ba-140	<	6.7534E-02		
La-140	<	2.9746E-02		
CE-141	<	1.3152E-02		
CE-144	<	8.7434E-02		
PM-144	<	2.2774E-02		
EU-152	<	6.5862E-02		
EU-154	<	2.6403E-01		
EU-155	<	3.8599E-02		
HF-181	<	2.0632E-02		
Ta-182	<	9.8678E-02		
Hg-203	<	1.4473E-02		
TL-208		6.2425E-02	2.0131E+01%	2.685E-02
pm-146	<	5.4441E-02		
y-88	<	2.1008E-02		
PB-210	<	4.0673E-01		
PB-212		8.5193E-02	1.7873E+01%	3.643E-02
PB-214		1.0421E-01	2.0136E+01%	4.906E-02
BI-207		3.7122E-02	2.7199E+01%	2.340E-02
BI-212	<	3.8241E-01		
BI-214		1.3944E-01	2.6282E+01%	7.189E-02
BI-210M	<	1.8907E-02		
RA-224	<	3.7417E-01		
AC-228	<	1.0308E-01		
TH-227	<	1.2174E-01		
TH-229	<	2.0905E-01		
TH-234		3.8238E+00	3.3261E+00%	5.040E-01
PA-231	<	3.7421E-01		
PA-233	<	3.0256E-02		
PA-234	<	5.4607E-02		
PA-234M		1.0177E+01	2.2786E+01%	4.178E+00
U-235		2.5324E-01	1.9115E+01%	1.193E-01
AM-241	#	1.7356E-01	1.0749E+01%	5.543E-02

Np-237 < 1.0271E-01

```
  # - All peaks for activity calculation had bad shape.
  * - Activity omitted from total
  & - Activity omitted from total and all peaks had bad shape.
  < - MDA value printed.
  A - Activity printed, but activity < MDA.
  B - Activity < MDA and failed test.
  C - Area < Critical level.
  F - Failed fraction or key line test.
  H - Halflife limit exceeded
-----------------------------   S U M M A R Y   -----------------------------
Total Activity (   37.5 to  2000.0 keV)     1.619E+01  DPS
```

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Test America
St. Louis
Background Check

Spectrum: 9_20191005003_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:20:47 PM
Detector: Detector # 9
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.89	1.53	1.65	1.79	2.14	2.26	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

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Test America
St. Louis
Background Check

Spectrum: 12_20191005015_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:22:44 PM
Detector: Detector #12
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.00	1.89	1.93	1.97	2.07	2.10	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

(Page 1 of 1)

Test America
St. Louis
Background Check

Spectrum: 14_20191005009_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:21:47 PM
Detector: Detector #14
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	1.80	1.66	1.71	1.79	1.90	1.94	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

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Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det14\14_20191005009_BGLong.An1

Acquisition information
Start time: 10/5/2019 11:21:47 PM
Live time: 72000
Real time: 72029
Dead time: 0.04 %
Detector ID: 14

Detector system
Ge14 SN/11080670

Calibration
Filename: 14_QC.Clb
14_QC_79670-334_SOURCE E_042211

Energy Calibration
Created: 2/28/2012 10:48:23 AM
Zero offset: 0.130 keV
Gain: 0.250 keV/channel
Quadratic: -2.050E-08 keV/channel^2

Efficiency Calibration
Created: 5/1/2011 8:43:09 AM
Knee Energy: 0.00 keV
Above the Knee: Interpolative Uncertainty = 0.00 %
Below the Knee: Interpolative Uncertainty = 0.00 %

Library Files
Main analysis library: DET_Long Background PBC.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.64keV)
Stop channel: 8000 (1999.51keV)
Peak rejection level: 30.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method
Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3

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Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 19 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.3366

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. DPS	Nuc
46.62	770.	7.92	0.88	6.133E-02	46.54	4.250	4.108E+00	PB210
63.32	567.	9.15	0.82	8.541E-02	63.29	3.810	2.422E+00	TH234
75.08	237.	17.99	0.78	1.023E-01				
77.15	197.	20.52	0.78	1.053E-01				
84.69	253.	22.70	0.91	1.158E-01				
92.68	949.	7.49	1.14	1.215E-01	92.59	5.584	1.943E+00	TH234
					93.35	5.561	1.950E+00	AC228
185.43	578.	10.79	1.02	1.072E-01	185.72	54.000	1.387E-01	U235
238.29	304.	13.45	0.92	9.398E-02	238.63	43.300	1.039E-01	PB212
294.99	250.	20.43	1.17	7.975E-02	295.09	19.300	2.258E-01	PB214
351.67	344.	11.49	0.86	6.553E-02	351.93	37.600	1.939E-01	PB214
510.61	1922.	4.43	2.74	4.543E-02	511.86	20.000	2.945E+00	RH106
582.99	182.	17.57	1.25	3.931E-02	583.02	84.500	7.611E-02	TL208
608.91	296.	16.50	1.51	3.708E-02	609.31	46.090	2.404E-01	BI214
					610.30	5.750	1.931E+00	RU103
1119.71	94.	23.11	1.98	1.998E-02	1120.29	15.100	4.328E-01	BI214
					1120.55	99.987	6.538E-02	Sc46
					1121.30	34.900	1.875E-01	Ta182
1460.66	155.	17.52	2.30	1.557E-02	1460.83	10.670	1.298E+00	K40
1765.00	142.	15.88	0.58	1.327E-02	1764.49	15.400	9.651E-01	BI214

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********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
299.70	75.04	789.	237.	2.314E+03	17.99	0.778	- D
308.00	77.12	715.	197.	1.866E+03	20.52	0.780	- D
338.13	84.41	962.	253.	2.184E+03	22.70	0.913	- s
2041.56	510.61	580.	1922.	4.231E+04	4.43	2.742	- s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

This section based on library: DET_Long Background PBC.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.90	46.62	842.	770.	0.011	7.92	0.879s
TH-234	252.67	63.32	750.	567.	0.008	9.15	0.823s
TH-234	370.10	92.68	1120.	949.	0.013	7.49	1.140s
U-235	740.99	185.43	864.	578.	0.008	10.79	1.016s
PB-212	952.37	238.29	456.	304.	0.004	13.45	0.923
PB-214	1179.15	294.99	567.	250.	0.003	20.43	1.168s
PB-214	1405.85	351.67	317.	344.	0.005	11.49	0.855s
TL-208	2331.09	582.99	210.	182.	0.003	17.57	1.251s
BI-214	2434.77	608.91	404.	296.	0.004	16.50	1.514
BI-214	4478.40	1119.71	84.	94.	0.001	23.11	1.979
K-40	5842.89	1460.66	72.	155.	0.002	17.52	2.296s
BI-214	7061.12	1765.00	44.	142.	0.002	15.88	0.583s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Peak Code	Peak MDA Value DPS	COMMENTS
K-40	N	1.2983E+00				4.66E+11	
			1460.83	1.298E+00	*(	3.524E-01 1.75E+01 1.07E+01	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	N	7.6107E-02					6.98E+02	
			583.02	7.611E-02	@(	2.937E-02	1.76E+01	8.45E+01 G
			277.28	0.000E+00	&	1.739E-01	1.00E+03	6.31E+00 G
			860.56	0.000E+00	&	1.727E-01	1.11E+02	1.24E+01 G
PB-210	N	4.1083E+00					8.14E+03	
			46.54	4.108E+00	(	7.366E-01	7.92E+00	4.25E+00 G
PB-212	N	1.0385E-01					6.98E+02	
			238.63	1.039E-01	(	3.492E-02	1.35E+01	4.33E+01 G
			300.03	0.000E+00	%	3.472E-01	1.42E+02	3.28E+00 GA
PB-214	N	2.0473E-01					5.84E+05	
			351.93	1.939E-01	*(	4.837E-02	1.15E+01	3.76E+01 G
			295.09	2.258E-01	*(	1.026E-01	2.04E+01	1.93E+01 G
			242.00	0.000E+00		2.136E-01	0.00E+00	7.43E+00 GA
BI-214	N	2.4040E-01					5.84E+05	
			609.31	2.404E-01	(	7.833E-02	1.65E+01	4.61E+01 G
			1120.29	4.328E-01	+	2.091E-01	2.31E+01	1.51E+01 G
			1764.49	9.651E-01	+	2.285E-01	1.59E+01	1.54E+01 G
TH-234	N	2.4220E+00					1.63E+12	
			63.29	2.422E+00	(	5.565E-01	9.15E+00	3.81E+00 G
			92.59	1.943E+00	-	3.249E-01	7.49E+00	5.58E+00 G
U-235	N	1.3868E-01					2.57E+11	
			185.72	1.387E-01	*	3.353E-02	1.08E+01	5.40E+01 GA
			143.79	0.000E+00	%	9.240E-02	3.51E+01	1.10E+01 G
			205.33	0.000E+00	%	2.127E-01	1.00E+03	5.01E+00 G
			163.38	0.000E+00	&	2.008E-01	6.60E+01	5.08E+00 G

(- This peak used in the nuclide activity average.

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.
@ - Peak is too wide at FW25M, but ok at FWHM.
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$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
+ - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
= - Peak outside analysis energy range.
& - Calculated peak centroid is not close enough to the library energy centroid for positive identification.

P - Peakbackground subtraction
} - Peak is too close to another for the activity
to be found directly.

Nuclide Codes:	Peak Codes:
T - Thermal Neutron Activation	G - Gamma Ray
F - Fast Neutron Activation	X - X-Ray
I - Fission Product	P - Positron Decay
N - Naturally Occurring Isotope	S - Single-Escape
P - Photon Reaction	D - Double-Escape
C - Charged Particle Reaction	K - Key Line
M - No MDA Calculation	A - Not in Average
R - Coincidence Corrected	C - Coincidence Peak
H - Halflife limit exceeded	

- -

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity DPS	Uncertainty Counting 1 Sigma	MDA
BE-7	<	2.3812E-01		
NA-22	<	3.9741E-02		
K-40	#	1.2983E+00	1.7520E+01%	3.524E-01
Sc-46	<	3.4989E-02		
CR-51	<	1.1931E-01		
MN-54	<	2.0674E-02		
FE-59	<	4.1976E-02		
Co-56	<	2.1967E-02		
CO-57	<	1.5954E-02		
CO-58	<	1.4451E-02		
CO-60	<	2.8517E-02		
ZN-65	<	8.2435E-02		
NB-94	<	2.2678E-02		
ZR-95	<	3.9446E-02		
NB-95	<	3.8306E-02		
RU-103	<	1.4201E-02		
RH-106	<	1.9419E-01		
AG-108M	<	1.4406E-02		
AG-110M	<	3.1054E-02		
SN-113	<	1.9735E-02		
SB-124	<	2.7210E-02		
SB-125	<	4.5161E-02		
I-131	<	1.6091E-02		
BA-133	<	3.3514E-02		

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CS-134	<	1.9502E-02		
CS-137	<	2.4652E-02		
CE-139	<	1.6522E-02		
Ba-140	<	5.5906E-02		
La-140	<	2.7610E-02		
CE-141	<	2.1011E-02		
CE-144	<	9.4954E-02		
PM-144	<	2.3107E-02		
EU-152	<	5.7197E-02		
EU-154	<	1.8386E-01		
EU-155	<	3.7052E-02		
HF-181	<	2.3457E-02		
Ta-182	<	9.0584E-02		
Hg-203	<	2.4089E-02		
TL-208	#	7.6107E-02	1.7565E+01%	2.937E-02
pm-146	<	5.6706E-02		
y-88	<	2.4123E-02		
PB-210	#	4.1083E+00	7.9243E+00%	7.366E-01
PB-212		1.0385E-01	1.3451E+01%	3.492E-02
PB-214	#	2.0473E-01	1.1493E+01%	4.837E-02
BI-207	<	3.1504E-02		
BI-212	<	4.9338E-01		
BI-214		2.4040E-01	1.6505E+01%	7.833E-02
BI-210M	<	2.1536E-02		
RA-224	<	4.1307E-01		
AC-228	<	1.1150E-01		
TH-227	<	1.1214E-01		
TH-229	<	2.2733E-01		
TH-234	#	2.4220E+00	9.1475E+00%	5.565E-01
PA-231	<	4.7334E-01		
PA-233	<	3.0638E-02		
PA-234	<	7.1750E-02		
PA-234M	<	2.7232E+00		
Ra-226	<	6.4906E-01		
U-235	#	1.3868E-01	1.0794E+01%	3.353E-02
AM-241	<	3.3398E-02		
Np-237	<	6.1511E-02		

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

TestAmerica Inc Spectrum name: 14_20191005009_BGLong.An1

---------- S U M M A R Y ----------
Total Activity (37.6 to 1999.5 keV) 8.592E+00 DPS

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Test America
St. Louis
Background Check

Spectrum: 16_20191005009_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:24:33 PM
Detector: Detector #16
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.68	2.51	2.56	2.66	2.80	2.86	PASS

Analyst: Shiloh Smith Reviewer:

(Page 1 of 8)

Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det16\16_20191005009_BGLong.An1

Acquisition information
Start time: 10/5/2019 11:24:33 PM
Live time: 72000
Real time: 72092
Dead time: 0.13 %
Detector ID: 16

Detector system
Ge16 SN/11012217

Calibration
Filename: 16_QC.Clb
16_QC-G_081311

Energy Calibration
Created: 2/28/2012 9:35:31 AM
Zero offset: 0.050 keV
Gain: 0.250 keV/channel
Quadratic: -2.285E-08 keV/channel^2

Efficiency Calibration
Created: 8/14/2011 1:15:14 PM
Knee Energy: 0.00 keV
Above the Knee: Interpolative Uncertainty = 0.00 %
Below the Knee: Interpolative Uncertainty = 0.00 %

Library Files
Main analysis library: DET_Long Background PBC.lib
Library Match Width: 0.500
Peak stripping: Library based

Analysis parameters
Analysis engine: Env32 G800W064
Start channel: 150 (37.57keV)
Stop channel: 8000 (1999.64keV)
Peak rejection level: 30.000%
Peak search sensitivity: 3
Sample Size: 1.0000E+00 +/- 0.000E+00%
Activity scaling factor: 1.0000E+00/(1.0000E+00* 1.0000E+00) =
1.0000E+00
Detection limit method: Reg. Guide 4.16 Method
Random error: 4.0000000E+00
Systematic error: 4.0000000E+00
Fraction Limit: 0.000%
Background width: 3

Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 27 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1936

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. DPS	Nuc
46.46	1624.	5.49	1.00	7.061E-02	46.54	4.250	7.505E+00	PB210
59.49	229.	21.27	0.97	8.946E-02	59.54	35.900	9.885E-02	AM241
63.25	956.	6.22	0.97	9.489E-02	63.29	3.810	3.670E+00	TH234
72.70	198.	27.40	0.98	1.086E-01				
74.89	488.	11.76	0.99	1.117E-01				
77.19	355.	15.76	0.99	1.151E-01				
84.34	454.	16.94	1.33	1.255E-01				
89.49	153.	29.32	1.00	1.309E-01				
92.60	1365.	4.74	1.00	1.312E-01	92.59	5.584	2.587E+00	TH234
					93.35	5.561	2.596E+00	AC228
143.98	195.	29.45	1.03	1.260E-01	143.79	10.960	1.959E-01	U235
185.72	690.	10.67	0.88	1.130E-01	185.72	54.000	1.569E-01	U235
					185.99	3.280	2.585E+00	Ra226
198.44	218.	26.69	1.69	1.096E-01				
238.55	536.	10.31	1.19	9.904E-02	238.63	43.300	1.736E-01	PB212
241.95	154.	27.55	1.14	9.813E-02	242.00	7.430	2.931E-01	PB214
					240.99	4.100	5.296E-01	RA224
295.46	240.	24.87	1.28	8.399E-02	295.09	19.300	2.054E-01	PB214
351.73	546.	10.55	1.36	6.911E-02	351.93	37.600	2.920E-01	PB214
511.22	2537.	4.61	2.58	4.932E-02	511.86	20.000	3.576E+00	RH106
583.47	209.	20.74	2.44	4.377E-02	583.02	84.500	7.860E-02	TL208
609.45	496.	13.35	1.61	4.173E-02	609.31	46.090	3.581E-01	BI214
					610.30	5.750	2.875E+00	RU103
911.49	224.	20.08	4.03	2.646E-02	911.16	29.000	4.055E-01	AC228
1001.06	123.	27.06	2.50	2.469E-02	1001.00	0.837	8.255E+00	PA234M
1275.26	92.	29.30	0.50	1.985E-02	1274.53	99.940	6.419E-02	NA22
					1274.54	35.190	1.823E-01	EU154

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1461.37	316.	10.72	2.62	1.797E-02	1460.83	10.670	2.287E+00	K40
1765.38	204.	16.29	2.70	1.550E-02	1764.49	15.400	1.187E+00	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
290.45	72.68	1378.	198.	1.827E+03	27.40	0.984	- sD
299.20	74.87	1403.	488.	4.366E+03	11.76	0.986	- D
308.40	77.17	1385.	355.	3.083E+03	15.76	0.988	- D
337.00	84.34	1560.	454.	3.619E+03	16.94	1.334	- sM
357.57	89.52	925.	153.	6.899E+02	29.32	0.999	- sD
793.19	198.44	947.	218.	1.985E+03	26.69	1.691	- s
2043.98	511.22	1192.	2537.	5.145E+04	4.61	2.584	- M

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.
M - Peak is close to a library peak.

This section based on library: DET_Long Background PBC.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.54	46.46	1517.	1624.	0.023	5.49	1.000s
AM-241	237.83	59.54	1069.	229.	0.003	21.29	0.971D
TH-234	252.82	63.29	1288.	956.	0.013	6.22	0.975D
TH-234	369.98	92.59	1791.	1173.	0.016	5.88	1.002D
AC-228	373.02	93.35	2571.	302.	0.004	24.44	1.003D
U-235	575.46	143.98	1034.	195.	0.003	29.45	1.032
U-235	742.34	185.72	1232.	661.	0.009	7.93	0.881D
PB-212	953.91	238.63	837.	546.	0.008	8.62	1.136D
PB-214	967.37	242.00	821.	154.	0.002	27.55	1.139D
PB-214	1181.16	295.46	831.	240.	0.003	24.87	1.275
PB-214	1406.16	351.73	665.	546.	0.008	10.55	1.358
TL-208	2332.96	583.47	387.	209.	0.003	20.74	2.438s
BI-214	2436.87	609.45	667.	496.	0.007	13.35	1.615s
AC-228	3645.05	911.49	300.	224.	0.003	20.08	4.029s
PA-234M	4003.41	1001.06	203.	123.	0.002	27.06	2.496s
NA-22	5100.55	1275.26	130.	92.	0.001	29.30	0.501s
K-40	5845.32	1461.37	134.	316.	0.004	10.72	2.616
BI-214	7062.16	1765.38	90.	204.	0.003	16.29	2.697

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

- Nuclide - Name	Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Code	MDA Value DPS		COMMENTS
NA-22	C	6.4192E-02					9.50E+02	
			1274.53	6.419E-02	(	3.915E-02	2.93E+01	9.99E+01 G
K-40	N	2.2869E+00					4.66E+11	
			1460.83	2.287E+00	(	4.109E-01	1.07E+01	1.07E+01 G
TL-208	N	7.8604E-02					6.98E+02	
			583.02	7.860E-02	*(	3.543E-02	2.07E+01	8.45E+01 G
			277.28	0.000E+00	%	1.912E-01	1.58E+02	6.31E+00 G
			860.56	0.000E+00	%	2.258E-01	1.39E+02	1.24E+01 G
PB-210	N	7.5051E+00					8.14E+03	
			46.54	7.505E+00	@(	8.512E-01	5.49E+00	4.25E+00 G
PB-212	N	1.7702E-01					6.98E+02	
			238.63	1.770E-01	(	4.454E-02	8.62E+00	4.33E+01 G
			300.03	0.000E+00	%	3.920E-01	8.12E+01	3.28E+00 GA
PB-214	N	2.9204E-01					5.84E+05	
			351.93	2.920E-01	(	6.573E-02	1.05E+01	3.76E+01 G
			295.09	2.054E-01	-	1.173E-01	2.49E+01	1.93E+01 G
			242.00	2.931E-01		2.595E-01	2.75E+01	7.43E+00 GA
BI-214	N	3.5807E-01					5.84E+05	
			609.31	3.581E-01	*(	8.884E-02	1.34E+01	4.61E+01 G
			1120.29	0.000E+00	%	2.340E-01	1.95E+02	1.51E+01 G
			1764.49	1.187E+00	+	2.730E-01	1.63E+01	1.54E+01 G
AC-228	N	4.0551E-01					2.10E+03	
			911.16	4.055E-01	*(	1.510E-01	2.01E+01	2.90E+01 G
			968.97	0.000E+00	&	1.824E-01	3.27E+02	1.75E+01 G
			338.32	0.000E+00	%	1.231E-01	5.24E+01	1.20E+01 G
			93.35	5.744E-01	?	4.547E-01	2.44E+01	5.56E+00 XA
TH-234	N	3.6702E+00					1.63E+12	
			63.29	3.670E+00	(	6.524E-01	6.22E+00	3.81E+00 G
			92.59	2.224E+00	-	3.790E-01	5.88E+00	5.58E+00 G

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```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PA-234M  N   8.2554E+00                                      1.63E+12
                         1001.00 8.255E+00 ?(  4.646E+00 2.71E+01 8.37E-01 G
                          766.41 0.000E+00 &   7.523E+00 3.91E+01 2.94E-01 G

U-235    N   1.9594E-01                                      2.57E+11
                          185.72 1.504E-01 }   3.785E-02 7.93E+00 5.40E+01 GA
                          143.79 1.959E-01 ?(  1.533E-01 2.94E+01 1.10E+01 G
                          205.33 0.000E+00 &   2.335E-01 2.01E+02 5.01E+00 G
                          163.38 0.000E+00 %   2.262E-01 4.42E+01 5.08E+00 G

AM-241   T   9.8744E-02                                      1.58E+05
                           59.54 9.874E-02  (  6.702E-02 2.13E+01 3.59E+01 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

********** D I S C A R D E D I S O T O P E P E A K S **********

Nuclide	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	Activity

P - Peakbackground subtraction

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity DPS	Uncertainty 1 Sigma Counting	MDA
BE-7	<	2.1689E-01		
NA-22		6.4192E-02	2.9305E+01%	3.915E-02
K-40		2.2869E+00	1.0715E+01%	4.109E-01
Sc-46	<	1.4891E-02		
CR-51	<	1.3754E-01		
MN-54	<	2.3517E-02		
FE-59	<	5.1856E-02		
Co-56	<	3.0529E-02		
CO-57	<	1.3564E-02		
CO-58	<	4.4418E-02		
CO-60	<	2.9645E-02		
ZN-65	<	4.0258E-02		
NB-94	<	2.4166E-02		
ZR-95	<	4.0839E-02		
NB-95	<	3.9370E-02		
RU-103	<	2.0595E-02		
RH-106	<	2.0466E-01		
AG-108M	<	1.8319E-02		
AG-110M	<	2.0324E-02		
SN-113	<	2.8105E-02		
SB-124	<	3.8094E-02		
SB-125	<	6.0362E-02		
I-131	<	1.7091E-02		
BA-133	<	3.9002E-02		
CS-134	<	3.8483E-02		
CS-137	<	4.1467E-02		
CE-139	<	1.3823E-02		
Ba-140	<	7.3660E-02		
La-140	<	3.1666E-02		
CE-141	<	3.9955E-02		
CE-144	<	7.5274E-02		
PM-144	<	2.5734E-02		
EU-152	<	5.1888E-02		
EU-154	<	2.1444E-01		
EU-155	<	5.2621E-02		
HF-181	<	3.2241E-02		

Ta-182	<	1.3669E-01		
Hg-203	<	1.4940E-02		
TL-208	#	7.8604E-02	2.0740E+01%	3.543E-02
pm-146	<	6.3635E-02		
y-88	<	3.0872E-02		
PB-210	#	7.5051E+00	5.4878E+00%	8.512E-01
PB-212		1.7702E-01	8.6211E+00%	4.454E-02
PB-214		2.9204E-01	1.0548E+01%	6.573E-02
BI-207	<	2.6102E-02		
BI-212	<	4.4426E-01		
BI-214		3.5807E-01	1.3353E+01%	8.884E-02
BI-210M	<	2.2997E-02		
RA-224	<	5.2496E-01		
AC-228	#	4.0551E-01	2.0084E+01%	1.510E-01
TH-227	<	1.2782E-01		
TH-229	<	2.6244E-01		
TH-234		3.6702E+00	6.2163E+00%	6.524E-01
PA-231	<	3.2564E-01		
PA-233	<	3.6839E-02		
PA-234	<	1.0538E-01		
PA-234M	#	8.2554E+00	2.7060E+01%	4.646E+00
U-235		1.9594E-01	2.9446E+01%	1.533E-01
AM-241		9.8744E-02	2.1290E+01%	6.702E-02
Np-237	<	1.5411E-01		

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 1999.6 keV) 2.339E+01 DPS

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Test America
St. Louis
Background Check

Spectrum: 17_20191005003_BGLong
Description: Background Long PBC Count
Acquired: 10/5/2019 11:26:45 PM
Detector: Detector #17
Background Evaluation Criteria:
1) Place instrument out of service if Countrate exceeds Control Limits.
2) Investigate high countrate and take corrective action as necessary if Countrate exceeds Tolerance Limits.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
Bkgd Countrate	2.32	2.18	2.23	2.35	2.42	2.46	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

(Page 1 of 7)

Sample description
Background Long PBC Count

Spectrum Filename: C:\User\SPC\Det17\17_20191005003_BGLong.An1

Acquisition information

Start time:	10/5/2019 11:26:45 PM
Live time:	72000
Real time:	72241
Dead time:	0.33 %
Detector ID:	17

Detector system
Ge17 SN/11080671

Calibration

Filename:	17_QC.Clb

17_QC_83725-334_SOURCE H_042211

Energy Calibration

Created:	2/29/2012 10:33:23 AM
Zero offset:	0.108 keV
Gain:	0.250 keV/channel
Quadratic:	-2.584E-08 keV/channel^2

Efficiency Calibration

Created:	5/1/2011 11:17:56 AM		
Knee Energy:	0.00 keV		
Above the Knee:	Interpolative	Uncertainty =	0.00 %
Below the Knee:	Interpolative	Uncertainty =	0.00 %

Library Files

Main analysis library:	DET_Long Background PBC.lib
Library Match Width:	0.500
Peak stripping:	Library based

Analysis parameters

Analysis engine:	Env32 G800W064
Start channel:	150 (37.63keV)
Stop channel:	8000 (1999.54keV)
Peak rejection level:	30.000%
Peak search sensitivity:	3
Sample Size:	1.0000E+00 +/- 0.000E+00%
Activity scaling factor:	1.0000E+00/(1.0000E+00* 1.0000E+00) = 1.0000E+00
Detection limit method:	Reg. Guide 4.16 Method
Random error:	4.0000000E+00
Systematic error:	4.0000000E+00
Fraction Limit:	0.000%
Background width:	3

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Half lives decay limit: 12.000
Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	NO	
Decay during acquisition:	NO	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	NO	
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 14 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 1.0000

***** S U M M A R Y O F P E A K S I N R A N G E *****

Peak Energy	Area	Uncert	FWHM	Corrctn Factor	Nuclide Energy	Brnch. Ratio	Act. DPS	Nuc
46.57	1014.	7.78	1.36	5.944E-02	46.54	4.250	5.578E+00	PB210
63.28	896.	8.77	1.24	8.035E-02	63.29	3.810	4.064E+00	TH234
75.09	232.	25.63	1.31	9.514E-02				
92.68	1491.	5.96	1.47	1.119E-01	92.59	5.584	3.315E+00	TH234
					93.35	5.561	3.326E+00	AC228
185.64	988.	7.72	1.60	9.858E-02	185.72	54.000	2.578E-01	U235
					185.99	3.280	4.247E+00	Ra226
238.71	402.	15.59	1.08	8.652E-02	238.63	43.300	1.491E-01	PB212
295.05	201.	25.97	1.27	7.373E-02	295.09	19.300	1.965E-01	PB214
351.94	392.	12.89	1.89	6.080E-02	351.93	37.600	2.381E-01	PB214
609.20	426.	11.57	1.96	3.710E-02	609.31	46.090	3.460E-01	BI214
					610.30	5.750	2.779E+00	RU103
1001.67	86.	29.63	1.65	2.198E-02	1001.00	0.837	6.493E+00	PA234M
1460.67	279.	10.86	2.03	1.608E-02	1460.83	10.670	2.255E+00	K40
1764.60	111.	21.32	2.26	1.381E-02	1764.49	15.400	7.228E-01	BI214

********** U N I D E N T I F I E D P E A K S U M M A R Y **********

Peak Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide	
299.78	75.09	1172.	232.	2.444E+03	25.63	1.305	-	s

s - Peak fails shape tests.
D - Peak area deconvoluted.
L - Peak written from unknown list.
C - Area < Critical level.

(Page 3 of 7)

This section based on library: DET_Long Background PBC.lib

********** I D E N T I F I E D P E A K S U M M A R Y **********

Nuclide	Peak Channel	Centroid Energy	Background Counts	Net Area Counts	Intensity Cts/Sec	Uncert 1 Sigma %	FWHM keV
PB-210	185.74	46.57	1490.	1014.	0.014	7.78	1.356s
TH-234	252.55	63.28	1510.	896.	0.012	8.77	1.245s
TH-234	370.10	92.68	1669.	1491.	0.021	5.96	1.470s
Ra-226	741.77	185.64	1159.	988.	0.014	7.72	1.597s
PB-212	953.98	238.71	921.	402.	0.006	15.59	1.079s
PB-214	1179.27	295.05	691.	201.	0.003	25.97	1.270s
PB-214	1406.78	351.94	540.	392.	0.005	12.89	1.892s
BI-214	2435.65	609.20	429.	426.	0.006	11.57	1.961s
PA-234M	4005.72	1001.67	130.	86.	0.001	29.63	1.645
K-40	5842.61	1460.67	103.	279.	0.004	10.86	2.027s
BI-214	7059.30	1764.60	72.	111.	0.002	21.32	2.258s

s - Peak fails shape tests.
D - Peak area deconvoluted.
A Derived peak area.

***** S U M M A R Y O F L I B R A R Y P E A K U S A G E *****

Nuclide Name	Nuclide Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Peak Code	MDA Value DPS		COMMENTS
K-40	N	2.2551E+00					4.66E+11	
			1460.83	2.255E+00	(	4.053E-01	1.09E+01	1.07E+01 G
PB-210	N	5.5782E+00					8.14E+03	
			46.54	5.578E+00	*(	1.004E+00	7.78E+00	4.25E+00 G
PB-212	N	1.4906E-01					6.98E+02	
			238.63	1.491E-01	*(	5.342E-02	1.56E+01	4.33E+01 G
			300.03	0.000E+00	%	4.034E-01	6.94E+01	3.28E+00 GA
PB-214	N	2.2403E-01					5.84E+05	
			351.93	2.381E-01	*(	6.743E-02	1.29E+01	3.76E+01 G
			295.09	1.965E-01	*(	1.222E-01	2.60E+01	1.93E+01 G
			242.00	0.000E+00		2.653E-01	0.00E+00	7.43E+00 GA
BI-214	N	3.4603E-01					5.84E+05	
			609.31	3.460E-01	*(	8.060E-02	1.16E+01	4.61E+01 G
			1120.29	0.000E+00	%	2.100E-01	4.57E+01	1.51E+01 G
			1764.49	7.228E-01	+	2.766E-01	2.13E+01	1.54E+01 G

```
 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

TH-234   N   4.0643E+00                                      1.63E+12
                           63.29 4.064E+00 *(  8.337E-01 8.77E+00 3.81E+00 G
                           92.59 3.315E+00 -   4.292E-01 5.96E+00 5.58E+00 G

PA-234M  N   6.4933E+00                                      1.63E+12
                         1001.00 6.493E+00 ?(  4.216E+00 2.96E+01 8.37E-01 G
                          766.41 0.000E+00 &   8.283E+00 5.26E+02 2.94E-01 G

Ra-226       4.2473E+00                                      5.84E+05
                          185.99 4.247E+00 *(  6.936E-01 7.72E+00 3.28E+00 G
   ( - This peak used in the nuclide activity average.

   * - Peak is too wide, but only one peak in library.
   ! - Peak is part of a multiplet and this area went
       negative during deconvolution.
   ? - Peak is too narrow.
   @ - Peak is too wide at FW25M, but ok at FWHM.
   % - Peak fails sensitivity test.
   $ - Peak identified, but first peak of this nuclide
       failed one or more qualification tests.
   + - Peak activity higher than counting uncertainty range.
   - - Peak activity lower than counting uncertainty range.
   = - Peak outside analysis energy range.
   & - Calculated peak centroid is not close enough to the
       library energy centroid for positive identification.
   P - Peakbackground subtraction
   } - Peak is too close to another for the activity
       to be found directly.

   Nuclide Codes:                      Peak Codes:
   T - Thermal Neutron Activation      G - Gamma Ray
   F - Fast Neutron Activation         X - X-Ray
   I - Fission Product                 P - Positron Decay
   N - Naturally Occurring Isotope     S - Single-Escape
   P - Photon Reaction                 D - Double-Escape
   C - Charged Particle Reaction       K - Key Line
   M - No MDA Calculation              A - Not in Average
   R - Coincidence Corrected           C - Coincidence Peak
   H - Halflife limit exceeded

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


 *************** D I S C A R D E D  I S O T O P E  P E A K S ***************
 Nuclide Centroid  Background  Net Area   Intensity   Uncert   Activity
           Energy   Counts     Counts     Cts/Sec  1 Sigma %
 ____________________________________________________________________________
   P - Peakbackground subtraction
```

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***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

Nuclide		Time of Count Activity DPS	Uncertainty 1 Sigma Counting	MDA
BE-7	<	1.5887E-01		
NA-22	<	2.6604E-02		
K-40	#	2.2551E+00	1.0860E+01%	4.053E-01
Sc-46	<	2.5089E-02		
CR-51	<	1.4397E-01		
MN-54	<	2.4520E-02		
FE-59	<	5.2745E-02		
Co-56	<	2.5610E-02		
CO-57	<	1.8044E-02		
CO-58	<	3.1148E-02		
CO-60	<	2.9723E-02		
ZN-65	<	8.6728E-02		
NB-94	<	2.7810E-02		
ZR-95	<	3.9850E-02		
NB-95	<	3.7378E-02		
RU-103	<	1.7454E-02		
RH-106	<	1.9027E-01		
AG-108M	<	1.6643E-02		
AG-110M	<	3.1711E-02		
SN-113	<	2.4993E-02		
SB-124	<	2.0399E-02		
SB-125	<	5.0452E-02		
I-131	<	1.9471E-02		
BA-133	<	3.7469E-02		
CS-134	<	3.7135E-02		
CS-137	<	2.5510E-02		
CE-139	<	2.0151E-02		
Ba-140	<	6.7188E-02		
La-140	<	3.1209E-02		
CE-141	<	2.9984E-02		
CE-144	<	1.2474E-01		
PM-144	<	2.6150E-02		
EU-152	<	6.9118E-02		
EU-154	<	2.4820E-01		
EU-155	<	4.2510E-02		
HF-181	<	1.9482E-02		
Ta-182	<	1.5356E-01		
Hg-203	<	2.2563E-02		
TL-208	<	2.5691E-02		
pm-146	<	6.4932E-02		
y-88	<	2.9928E-02		
PB-210	#	5.5782E+00	7.7834E+00%	1.004E+00
PB-212	#	1.4906E-01	1.5592E+01%	5.342E-02

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PB-214 #	2.2403E-01	1.2887E+01%		6.743E-02
BI-207 <	3.7562E-02			
BI-212 <	4.4566E-01			
BI-214 #	3.4603E-01	1.1567E+01%		8.060E-02
BI-210M <	2.5365E-02			
RA-224 <	4.6101E-01			
AC-228 <	1.3932E-01			
TH-227 <	1.3511E-01			
TH-229 <	2.8768E-01			
TH-234 #	4.0643E+00	8.7745E+00%		8.337E-01
PA-231 <	8.3686E-01			
PA-233 <	3.7885E-02			
PA-234 <	8.9437E-02			
PA-234M#	6.4933E+00	2.9630E+01%		4.216E+00
Ra-226 #	4.2473E+00	7.7197E+00%		6.936E-01
U-235 <	1.1547E-01			
AM-241 <	8.1863E-02			
Np-237 <	1.3923E-01			

- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line test.
H - Halflife limit exceeded

---------- S U M M A R Y ----------

Total Activity (37.6 to 1999.5 keV) 2.336E+01 DPS

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Run Logs

Gamma Spectroscopy Run Log

Detector: GV5

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/26/12 15:05		IC 160-12297/1		12297			JLW
03/27/12 10:12		ICV 160-12297/2		12297			JLW
10/05/19 23:05		ICB 160-445738/1		445738			JLW
10/30/19 00:33		CCV 160-448217/1		448217			
10/30/19 00:54		CCV 160-448217/2		448217			KLS
10/30/19 01:41		CCB 160-448217/3		448217			KLS
10/30/19 02:42	60	ZZZZZ		448217			
10/30/19 04:29	60	ZZZZZ		448217			
10/30/19 06:45	30	ZZZZZ		448217			
10/30/19 07:24	30	ZZZZZ		448217			
10/30/19 08:05	200	ZZZZZ		448217			
10/30/19 12:49	30	ZZZZZ		448217			
10/30/19 13:42		ZZZZZ		448217			
10/30/19 14:37	30	ZZZZZ		448217			
10/30/19 16:10	60	ZZZZZ		448217			
10/30/19 17:33	30	ZZZZZ		448217			
10/30/19 18:12	60	ZZZZZ		448217			
10/30/19 19:18	30	ZZZZZ		448217			
10/30/19 20:22	30	ZZZZZ		448217			
10/30/19 21:15	30	ZZZZZ		448217			
10/30/19 21:49	30	ZZZZZ		448217			
10/30/19 22:38	30	MB 160-445369/1-A		448217	445369	901.1	KLS
10/31/19 00:46		CCV 160-448408/1		448408			
10/31/19 01:07		CCV 160-448408/2		448408			KLS
10/31/19 01:27		CCB 160-448408/3		448408			KLS
10/31/19 02:25	30	180-96595-2	BRF-BS-BG13-5.0/6.6-20 191001 ~ BRF BG13	448408	445369	901.1	KLS
10/31/19 02:59	30	180-96595-4	BRF-BS-BG05-3.5/5.0-20 191001 ~ BRF BG05	448408	445369	901.1	KLS
10/31/19 03:55	30	180-96595-5 DU	BRF-BS-BG05-6.5/8.5-20 191001 ~ BRF BG05 DU	448408	445369	901.1	KLS
10/31/19 05:10	30	ZZZZZ		448408			
10/31/19 06:36	360	ZZZZZ		448408			
10/31/19 12:53	30	ZZZZZ		448408			
10/31/19 16:46	30	ZZZZZ		448408			
10/31/19 18:01	30	ZZZZZ		448408			
10/31/19 18:56	30	ZZZZZ		448408			
10/31/19 19:34	30	ZZZZZ		448408			
10/31/19 20:59	30	ZZZZZ		448408			
10/31/19 21:33	30	ZZZZZ		448408			
10/31/19 22:31	30	ZZZZZ		448408			

Detector: GV8

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/12 10:58		IC 160-12311/1		12311			JLW
03/29/12 01:58		ICV 160-12311/2		12311			JLW
10/05/19 23:01		ICB 160-445728/1		445728			JLW
10/30/19 00:25		CCV 160-448218/1		448218			
10/30/19 00:46		CCV 160-448218/2		448218			KLS
10/30/19 01:09		CCB 160-448218/3		448218			KLS
10/30/19 02:44	60	ZZZZZ		448218			
10/30/19 04:30	60	ZZZZZ		448218			

Gamma Spectroscopy Run Log

Detector: GV8 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
10/30/19 05:52	360	ZZZZZ		448218			
10/30/19 12:48	30	ZZZZZ		448218			
10/30/19 13:43	30	ZZZZZ		448218			
10/30/19 14:39	30	ZZZZZ		448218			
10/30/19 16:11	60	ZZZZZ		448218			
10/30/19 17:39	30	ZZZZZ		448218			
10/30/19 18:13	60	ZZZZZ		448218			
10/30/19 19:16	60	ZZZZZ		448218			
10/30/19 20:21	30	ZZZZZ		448218			
10/30/19 21:16	30	ZZZZZ		448218			
10/30/19 21:50	30	ZZZZZ		448218			
10/30/19 22:38	30	LCS 160-445369/2-A		448218	445369	901.1	KLS
10/31/19 00:47		CCV 160-448409/1		448409			
10/31/19 01:09		CCV 160-448409/2		448409			KLS
10/31/19 01:28		CCB 160-448409/3		448409			KLS
10/31/19 02:24	30	180-96595-3	BRF-BS-BG13-0.0/0.5-20 191001 ~ BRF BG13	448409	445369	901.1	KLS
10/31/19 03:01	30	180-96595-5	BRF-BS-BG05-6.5/8.5-20 191001 ~ BRF BG05	448409	445369	901.1	KLS
10/31/19 03:54	30	180-96595-8	BRF-BS-BG05-0.0/0.5-20 191001 ~ BRF BG05	448409	445369	901.1	KLS
10/31/19 05:11	30	ZZZZZ		448409			
10/31/19 06:42		ZZZZZ		448409			
10/31/19 07:18		ZZZZZ		448409			
10/31/19 07:56		ZZZZZ		448409			
10/31/19 08:29		ZZZZZ		448409			
10/31/19 09:15		ZZZZZ		448409			
10/31/19 10:23		ZZZZZ		448409			
10/31/19 11:37		ZZZZZ		448409			
10/31/19 12:21		ZZZZZ		448409			
10/31/19 12:54		ZZZZZ		448409			
10/31/19 16:45		ZZZZZ		448409			
10/31/19 18:00		ZZZZZ		448409			
10/31/19 18:55		ZZZZZ		448409			
10/31/19 19:33		ZZZZZ		448409			
10/31/19 21:00	30	ZZZZZ		448409			
10/31/19 21:37	30	ZZZZZ		448409			
10/31/19 22:30	30	ZZZZZ		448409			

Detector: GV9

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/03/12 13:37		IC 160-12326/1		12326			JLW
06/14/12 10:54		ICV 160-12326/2		12326			JLW
10/05/19 23:20		ICB 160-445724/1		445724			JLW
10/31/19 00:47		CCV 160-448447/1		448447			
10/31/19 01:08		CCV 160-448447/2		448447			KLS
10/31/19 01:28		CCB 160-448447/3		448447			KLS
10/31/19 02:12	30	180-96595-1	BRF-BS-BG13-1.5/3.5-20 191001 ~ BRF BG13	448447	445369	901.1	KLS
10/31/19 02:47	30	180-96595-6	BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05	448447	445369	901.1	KLS
10/31/19 03:52	30	ZZZZZ		448447			

Gamma Spectroscopy Run Log

Detector: GV9 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
10/31/19 05:08	30	ZZZZZ		448447			
10/31/19 06:00	30	ZZZZZ		448447			
10/31/19 06:35	360	ZZZZZ		448447			
10/31/19 12:42	360	ZZZZZ		448447			
10/31/19 18:54	30	ZZZZZ		448447			
10/31/19 19:31	30	ZZZZZ		448447			
10/31/19 20:57	30	ZZZZZ		448447			
10/31/19 21:36	30	ZZZZZ		448447			
10/31/19 22:28	30	ZZZZZ		448447			

Detector: GV12

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
04/18/18 13:54		IC 160-364854/1		364854			JLW
04/24/18 09:26		ICV 160-364854/2		364854			JLW
10/05/19 23:22		ICB 160-445725/1		445725			JLW
10/31/19 01:08		CCV 160-448446/1		448446			
10/31/19 01:29		CCV 160-448446/2		448446			KLS
10/31/19 01:49		CCB 160-448446/3		448446			KLS
10/31/19 02:50	30	180-96595-7	BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05	448446	445369	901.1	KLS
10/31/19 03:55	30	ZZZZZ		448446			
10/31/19 05:21	30	ZZZZZ		448446			
10/31/19 06:02	30	ZZZZZ		448446			
10/31/19 06:37	360	ZZZZZ		448446			
10/31/19 12:52	30	ZZZZZ		448446			
10/31/19 16:45	30	ZZZZZ		448446			
10/31/19 18:00	30	ZZZZZ		448446			
10/31/19 18:56	30	ZZZZZ		448446			
10/31/19 19:33	30	ZZZZZ		448446			
10/31/19 21:01	30	ZZZZZ		448446			
10/31/19 21:39	30	ZZZZZ		448446			
10/31/19 22:31	30	ZZZZZ		448446			

Detector: GV14

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/06/12 23:06		IC 160-12355/1		12355			JLW
04/12/12 03:08		ICV 160-12355/2		12355			JLW
10/05/19 23:21		ICB 160-445731/1		445731			JLW
10/31/19 00:48		CCB 160-448405/1		448405			KLS
10/31/19 01:27		CCV 160-448405/2		448405			
10/31/19 01:48		CCV 160-448405/3		448405			KLS
10/31/19 02:21	120	MB 160-445202/1-A		448405	445202	901.1	KLS
10/31/19 05:04	120	LCS 160-445202/2-A		448405	445202	901.1	KLS
10/31/19 07:45	120	ZZZZZ		448405			
10/31/19 10:28	120	ZZZZZ		448405			
10/31/19 12:48	120	ZZZZZ		448405			
10/31/19 17:54	360	ZZZZZ		448405			

Gamma Spectroscopy Run Log

Detector: GV16

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/27/12 15:43		IC 160-11759/1		11759			JLW
04/24/12 08:11		ICV 160-11759/2		11759			JLW
10/05/19 23:24		ICB 160-446459/1		446459			JLW
10/31/19 00:41		CCB 160-448406/1		448406			KLS
10/31/19 01:26		CCV 160-448406/2		448406			
10/31/19 01:47		CCV 160-448406/3		448406			KLS
10/31/19 02:19	120	ZZZZZ		448406			
10/31/19 05:05	120	ZZZZZ		448406			
10/31/19 07:40	120	180-96595-9	BRF-BS-FB02-20191001 ~ BRF BG05	448406	445202	901.1	KLS
10/31/19 10:44	360	ZZZZZ		448406			
10/31/19 17:56	200	ZZZZZ		448406			

Detector: GV17

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
03/05/12 14:23		IC 160-11760/1		11760			JLW
03/07/12 23:01		ICV 160-11760/2		11760			JLW
10/05/19 09:03		ZZZZZ		445733			
10/05/19 23:26		ICB 160-445733/1		445733			JLW
10/31/19 00:49		CCB 160-448407/1		448407			KLS
10/31/19 01:51		CCV 160-448407/2		448407			
10/31/19 02:12		CCV 160-448407/3		448407			KLS
10/31/19 02:57	60	ZZZZZ		448407			
10/31/19 05:07	120	180-96597-A-1-B DU		448407	445202	901.1	KLS
10/31/19 12:50	360	ZZZZZ		448407			
10/31/19 20:53	120	ZZZZZ		448407			

Radiological
Pre-Preparation Data

Subcontract Data

Shipping and Receiving Documents

TVA Environmental Investigations

Tennessee Valley Authority

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

COOLER No.:	1 of 2
COC No:	BRF_BS_20191001_1B
1 of 1 Pages	
Task Desc:	BRF_BS

Rev 1 BJ 10/22/19

11/21/2019

Required Ship to Lab:

Lab Name:	TestAmerica Pittsburgh
Lab Address:	301 Alpha Drive Pittsburgh, PA 15238

Lab Manager Contact Information

Lab PM:	Gail Lage
Phone/Fax:	615-301-5741/615-726-3404
Lab Email:	Gail.Lage@testamericainc.com

Required Project Information:

Site ID #:	Bull Run Fossil Plant		
Project #:	175568274		
Site Address	1265 Edgemoor Road		
City	Clinton	State, Zip:	TN, 37716
Site PM Name:	Roy Quinn		
Phone/Fax:	423-751-3753		
Site PM Email:	jrquinn@tva.gov		

Required Sampler Information

Sampler:	Kevin Nguyen		
Sampling Company:	Stantec		
Address	601 Grassmere Park Suite 22		
City/State	Nashville	Phone:	615-88
Sampling Team Number:	1		
Send EDD/Hard Copy to:	tva_deliverables@envsid.com		

180-96595 Chain of Custody

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours

☐ 3 Business Days

☒ 5 Business Days

☐ 10 Business Days

BJ 10/22/19

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit: Start Depth	Sample Depth: Select Unit: End Depth	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analysis: BACKGROUNDSOIL_RAD	Analysis: BACKGROUNDSOIL_BLANKS_RAD	Preserve: None	Preserve: HNO3
1	BRF-BS-BG13-1.5/3.5-20191001	BRF BG13	1.5	3.5	BS	G	N	10/1/2019	0840	2	NA	☐	X			
2	BRF-BS-BG13-5.0/6.6-20191001	BRF BG13	5.0	6.6	BS	G	N	10/1/2019	0900	2	NA	☐	X			
3	BRF-BS-BG13-0.0/0.5-20191001	BRF BG13	0.0	0.5	BS	G	N	10/1/2019	0915	2	NA	☐	X			
4	BRF-BS-BG05-3.5/5.0-20191001	BRF BG05	3.5	5.0	BS	G	N	10/1/2019	1300	2	NA	☐	X			
5	BRF-BS-BG05-6.5/8.5-20191001	BRF BG05	6.5	8.5	BS	G	N	10/1/2019	1335	3	NA	☑	X			
6	BRF-BS-BG05-11.5/13.5-20191001	BRF BG05	11.5	13.5	BS	G	N	10/1/2019	1400	2	NA	☐	X			
7	BRF-BS-BG05-15.0/17.0-20191001	BRF BG05	15.0	17.0	BS	G	N	10/1/2019	1435	2	NA	☐	X			
8	BRF-BS-BG05-0.0/0.5-20191001	BRF BG05	0.0	0.5	BS	G	N	10/1/2019	1500	2	NA	☐	X			
9	BRF-BS-FB02-20191001	BRF BG05	--	--	AQ	G	FB	10/1/2019	1512	3	NA	☐			X	

KN 10/1/19

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

KN 10/1/19

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Kevin Nguyen / Stantec	10/1/19	1715	[illegible]	10/2/19	9:24
KN	10/1/19				

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Courier	Kevin Nguyen

Form TVA 30067A

TVA Environmental Investigations

Tennessee Valley Authority

COOLER No.:	2	of	2
COC No:	BRF_BS_20191001_1B		
1 of 1 Pages			
Task Desc:	BRF_BS		

Rev 1 BB 10/22/19

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

Required Ship to Lab:

Lab Name:	TestAmerica Pittsburgh
Lab Address:	301 Alpha Drive Pittsburgh, PA 15238

Lab Manager Contact Information

Lab PM:	Gail Lage
Phone/Fax:	615-301-5741/615-726-3404
Lab Email:	Gail.Lage@testamericainc.com

Required Project Information:

Site ID #:	Bull Run Fossil Plant		
Project #:	175568274		
Site Address	1265 Edgemoor Road		
City	Clinton	State, Zip:	TN, 37716
Site PM Name:	Roy Quinn		
Phone/Fax:	423-751-3753		
Site PM Email:	jrquinn@tva.gov		

Required Sampler Information

Sampler:	Kevin Nguyen		
Sampling Company:	Stantec		
Address	601 Grassmere Park Suite 22		
City/State	Nashville	Phone:	615-885-114
Sampling Team Number:	1		
Send EDD/Hard Copy to:	tva_deliverables@envstd.com		

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours

☐ 3 Business Days

☐ ~~5 Business Days~~

☒ 10 Business Days

BB 10/22/19

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit Start Depth	Sample Depth: Select Unit End Depth	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Filtered N	Preserve None	Preserve HNO3	Analysis BACKGROUNDSOIL_RAD	Analysis BACKGROUNDSOIL_BLANKS_RAD
1	BRF-BS-BG13-1.5/3.5-20191001	BRF BG13	1.5	3.5	BS	G	N	10/1/2019	0840	2	NA	☐				X	
2	BRF-BS-BG13-5.0/6.6-20191001	BRF BG13	5.0	6.6	BS	G	N	10/1/2019	0900	2	NA	☐				X	
3	BRF-BS-BG13-0.0/0.5-20191001	BRF BG13	0.0	0.5	BS	G	N	10/1/2019	0915	2	NA	☐				X	
4	BRF-BS-BG05-3.5/5.0-20191001	BRF BG05	3.5	5.0	BS	G	N	10/1/2019	1300	2	NA	☐				X	
5	BRF-BS-BG05-6.5/8.5-20191001	BRF BG05	6.5	8.5	BS	G	N	10/1/2019	1335	3	NA	☑				X	
6	BRF-BS-BG05-11.5/13.5-20191001	BRF BG05	11.5	13.5	BS	G	N	10/1/2019	1400	2	NA	☐				X	
7	BRF-BS-BG05-15.0/17.0-20191001	BRF BG05	15.0	17.0	BS	G	N	10/1/2019	1435	2	NA	☐				X	
8	BRF-BS-BG05-0.0/0.5-20191001	BRF BG05	0.0	0.5	BS	G	N	10/1/2019	1500	2	NA	☐				X	
9	BRF-BS-FB02-20191001	BRF BG05	--	--	AQ	G	FB	10/1/2019	1512	3	NA	☐			X		

KN 10/1/19

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

KN 10/1/19

RELINQISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Kevin Nguyen / Stantec	10/1/19	1715	[illegible]	10/2/19	9:00
KN 10/1/19					

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Courier	Kevin Nguyen

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Form TVA 30067A

11/21/2019

TVA Environmental Investigations

Tennessee Valley Authority

COOLER No.:	1	of	2
COC No:	BRF_BS_20191001_1B		
1 of 1 Pages			
Task Desc:	BRF_BS		

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

180-96595 Chain of Custody

Required Ship to Lab:		Required Project Information:		Required Sampler Information	
Lab Name:	TestAmerica Pittsburgh	Site ID #:	Bull Run Fossil Plant	Sampler:	Kevin Nguyen
Lab Address:	301 Alpha Drive	Project #:	175568274	Sampling Company:	Stantec
	Pittsburgh, PA 15238	Site Address	1265 Edgemoor Road	Address	601 Grassmere Park Suite 22
		City	Clinton State, Zip: TN, 37716	City/State	Nashville Phone: 615-88
Lab Manager Contact Information		Site PM Name:	Roy Quinn		
Lab PM:	Gail Lage	Phone/Fax:	423-751-3753	Sampling Team Number:	1
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	jrquinn@tva.gov	Send EDD/Hard Copy to:	tva_deliverables@envstd.com
Lab Email:	Gail.Lage@testamericainc.com				

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☑ **5 Business Days**
☐ 10 Business Days

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Start Depth (Depth Unit)	Sample Depth: End Depth (Select Unit)	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Preserve: None	Preserve: HNO3	Analysis: BACKGROUNDSOIL_RAD	Analysis: BACKGROUNDSOIL_BLANKS_RAD
1	BRF-BS-BG13-1.5/3.5-20191001	BRF BG13	1.5	3.5	BS	G	N	10/1/2019	0840	2	NA	☐			X	
2	BRF-BS-BG13-5.0/6.6-20191001	BRF BG13	5.0	6.6	BS	G	N	10/1/2019	0900	2	NA	☐			X	
3	BRF-BS-BG13-0.0/0.5-20191001	BRF BG13	0.0	0.5	BS	G	N	10/1/2019	0915	2	NA	☐			X	
4	BRF-BS-BG05-3.5/5.0-20191001	BRF BG05	3.5	5.0	BS	G	N	10/1/2019	1300	2	NA	☐			X	
5	BRF-BS-BG05-6.5/8.5-20191001	BRF BG05	6.5	8.5	BS	G	N	10/1/2019	1335	3	NA	☑			X	
6	BRF-BS-BG05-11.5/13.5-20191001	BRF BG05	11.5	13.5	BS	G	N	10/1/2019	1400	2	NA	☐			X	
7	BRF-BS-BG05-15.0/17.0-20191001	BRF BG05	15.0	17.0	BS	G	N	10/1/2019	1435	2	NA	☐			X	
8	BRF-BS-BG05-0.0/0.5-20191001	BRF BG05	0.0	0.5	BS	G	N	10/1/2019	1500	2	NA	☐			X	
9	BRF-BS-FB02-20191001	BRF BG05	--	--	AQ	G	FB	10/1/2019	1512	3	NA	☐		X		

KN 10/1/19

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

KN 10/1/19

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Kevin Nguyen / Stantec	10/1/19	1715	[illegible]	10/2/19	9:24
KN	10/1/19				

Sample Receipt Conditions

☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Courier	Kevin Nguyen

Form TVA 30067A

TVA Environmental Investigations

Tennessee Valley Authority

COOLER No.:	2	of	2
COC No:	BRF_BS_20191001_1B		
1 of 1 Pages			
Task Desc:	BRF_BS		

Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

Required Ship to Lab:		Required Project Information:		Required Sampler Information	
Lab Name:	TestAmerica Pittsburgh	Site ID #:	Bull Run Fossil Plant	Sampler:	Kevin Nguyen
Lab Address:	301 Alpha Drive	Project #:	175568274	Sampling Company:	Stantec
	Pittsburgh, PA 15238	Site Address	1265 Edgemoor Road	Address	601 Grassmere Park Suite 22
		City	Clinton State, Zip: TN, 37716	City/State	Nashville Phone: 615-885-114
Lab Manager Contact Information		Site PM Name:	Roy Quinn		
Lab PM:	Gail Lage	Phone/Fax:	423-751-3753	Sampling Team Number:	1
Phone/Fax:	615-301-5741/615-726-3404	Site PM Email:	jrquinn@tva.gov	Send EDD/Hard Copy to:	tva_deliverables@envstd.com
Lab Email:	Gail.Lage@testamericainc.com				

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

- ☐ 24 Hours
- ☐ 3 Business Days
- ☑ **5 Business Days**
- ☐ 10 Business Days

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth: Depth Unit Start Depth	Sample Depth: Select Unit End Depth	MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Filtered N	Filtered N	Preserve None	Preserve HNO3	Analysis BACKGROUNDSOIL_RAD	Analysis BACKGROUNDSOIL_BLANKS_RAD
1	BRF-BS-BG13-1.5/3.5-20191001	BRF BG13	1.5	3.5	BS	G	N	10/1/2019	0840	2	NA	☐					X	
2	BRF-BS-BG13-5.0/6.6-20191001	BRF BG13	5.0	6.6	BS	G	N	10/1/2019	0900	2	NA	☐					X	
3	BRF-BS-BG13-0.0/0.5-20191001	BRF BG13	0.0	0.5	BS	G	N	10/1/2019	0915	2	NA	☐					X	
4	BRF-BS-BG05-3.5/5.0-20191001	BRF BG05	3.5	5.0	BS	G	N	10/1/2019	1300	2	NA	☐					X	
5	BRF-BS-BG05-6.5/8.5-20191001	BRF BG05	6.5	8.5	BS	G	N	10/1/2019	1335	3	NA	☑					X	
6	BRF-BS-BG05-11.5/13.5-20191001	BRF BG05	11.5	13.5	BS	G	N	10/1/2019	1400	2	NA	☐					X	
7	BRF-BS-BG05-15.0/17.0-20191001	BRF BG05	15.0	17.0	BS	G	N	10/1/2019	1435	2	NA	☐					X	
8	BRF-BS-BG05-0.0/0.5-20191001	BRF BG05	0.0	0.5	BS	G	N	10/1/2019	1500	2	NA	☐					X	
9	BRF-BS-FB02-20191001	BRF BG05	--	--	AQ	G	FB	10/1/2019	1512	3	NA	☐						X

KN 10/1/19

Additional Comments/Special Instructions:

Additional volume collected should be used for laboratory duplicate analysis.

KN 10/1/19

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Kevin Nguyen / Stantec	10/1/19	1715	[illegible]	10/2/19	900
KN 10/1/19					

SHIPPING METHOD:	SAMPLER NAME AND SIGNATURE
Courier	Kevin Nguyen

Sample Receipt Conditions

Temperature in °C	Sample on Ice?	Sample Intact?	Trip Blank?
☐ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	☐ Yes ☑ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Form TVA 30067A

180-96595 Waybill

eurofins | Environment Testing TestAmerica

Custody Seal

DATE

SIGNATURE

10-1-19

eurofins | Environment Testing TestAmerica

SHIP DATE: 01OCT
ACTWGT: 62.70 LB
CAD: 006995125/SS
DIMS: 23x13x13 IN

BILL THIRD PARTY

ING
AMERICA
RIDGE PARK
A 15238

REF:

DEPT:

Custody Seal

DATE

SIGNATURE

eurofins | Environment Testing TestAmerica

4 of 6

MPS# 0681 7764 3385 9261

Mstr# 8120 5914 9376

0215

WED - 02 OCT

STANDARD OVERNIGHT

AHS

15238

PA-US PIT

NA AGCA

Uncorrected temp 3.0 °C

Thermometer ID 10

Initials B

ORIGIN ID:GKTA (865) 621-1653
DAVE MYERS
TESTAMERICA KNOXVILLE LAB
5815 MIDDLEBROOK PIKE

KNOXVILLE, TN 37921
UNITED STATES US

SHIP DATE: 01OCT19
ACTWGT: 62.70 LB
CAD: 006995125/SSFE2C
DIMS: 23x13x13 IN

BILL THIRD PARTY

SAMPLE RECIEVING
EUROFINS TEST AMERICA
301 ALPHA DR RIDGE PARK

PITTSBURGH PA 15238
(412) 963-7058

REF:
INV:
PO:
DEPT:

Fedl
Exp

REL#
37653

6 of 6
MPS# 7764 3385 9283
0681
Mstr# 8120 5914 9376

0215

WED - 02 OCT 3
STANDARD OVERNI

15

PA-US

NA AGCA

Uncorrected temp 10 °C
Thermometer ID
CF 0 Initials B
PT-WI-SR-001 effective 11/8/18

eurofins | Environment Testing TestAmerica

Custody Seal
DATE 10-1-19
SIGNATURE

eurofins | Environment Testing TestAmerica

Custody Seal
DATE 10-1
SIGNATURE

eurofins | Environment Testing TestAmerica

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Rumble, Jennifer L	Carrier Tracking No(s):	COC No: 180-375193.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jennifer.rumble@testamericainc.com	State of Origin: Tennessee	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-96595-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 10/14/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: BRF_BS_20191001_1B	Project #: 18019624			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Dry_Grind Radium-226/228	901.1_Ra/Fill_Geo_21 Radium-226/228	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
BRF-BS-BG13-1.5/3.5-20191001 ~ BRF BG13 (180-96595-1)	10/1/19	08:40 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
BRF-BS-BG13-5.0/6.6-20191001 ~ BRF BG13 (180-96595-2)	10/1/19	09:00 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
BRF-BS-BG13-0.0/0.5-20191001 ~ BRF BG13 (180-96595-3)	10/1/19	09:15 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
BRF-BS-BG05-3.5/5.0-20191001 ~ BRF BG05 (180-96595-4)	10/1/19	13:00 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05 (180-96595-5)	10/1/19	13:35 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
BRF-BS-BG05-6.5/8.5-20191001 ~ BRF BG05 (180-96595-5DU)	10/1/19	13:35 Eastern	DU	Solid			X		1	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
BRF-BS-BG05-11.5/13.5-20191001 ~ BRF BG05 (180-96595-6)	10/1/19	14:00 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
BRF-BS-BG05-15.0/17.0-20191001 ~ BRF BG05 (180-96595-7)	10/1/19	14:35 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna
BRF-BS-BG05-0.0/0.5-20191001 ~ BRF BG05 (180-96595-8)	10/1/19	15:00 Eastern		Solid			X		2	TVA - Batch alone. Quarantine zone soil. Contact PM if insufficient volume for Tuna

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 10/3/19 1700	Company: MAA	Received by:	Date/Time: 10/4/19 09:20	Company: TASTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)

Client Contact: Shipping/Receiving
Company: TestAmerica Laboratories, Inc.
Address: 13715 Rider Trail North,
City: Earth City
State, Zip: MO, 63045
Phone: 314-298-8566(Tel) 314-298-8757(Fax)
Email:
Project Name: BRF_BS_20191001_1B
Site:

Sampler:
Phone:
Due Date Requested: 10/14/2019
TAT Requested (days):
PO #:
WO #:
Project #: 18019624
SSOW#:

Lab PM: Rumble, Jennifer L
E-Mail: jennifer.rumble@testamericainc.com
Carrier Tracking No(s):
State of Origin: Tennessee
Accreditations Required (See note):

COC No: 180-375193.2
Page: Page 2 of 2
Job #: 180-96595-1

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Dry_Grind Radium-226/228	901.1_Ra/Fill_Geo_21 Radium-226/228	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
BRF-BS-FB02-20191001 ~ BRF BG05 (180-96595-9)	10/1/19	15:12 Eastern		Water				X	3	TVA - Batch alone

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)

Other:

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. I

Possible Hazard Identification
Unconfirmed

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Date: Time: Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	10/3/19 1700	TAPIX	[signature]	10/4/19 05:20	TASTL

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 180-96595-1

Login Number: 96595
List Number: 1
Creator: Say, Thomas C

List Source: Eurofins TestAmerica, Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 180-96595-1

Login Number: 96595
List Number: 2
Creator: Harris, Lorin C

List Source: Eurofins TestAmerica, St. Louis
List Creation: 10/04/19 03:45 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 180-96595-1

Login Number: 96595
List Number: 3
Creator: Harris, Lorin C

List Source: Eurofins TestAmerica, St. Louis
List Creation: 10/04/19 03:50 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	