TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:13:29PM 11/16/2018

Calibration

Sample Name: ICV-7107;AV218-11162018
Description:
Detector: AV218

Analyst: 60040
Analysis Date: 11/16/2018 2:13:28PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82232-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

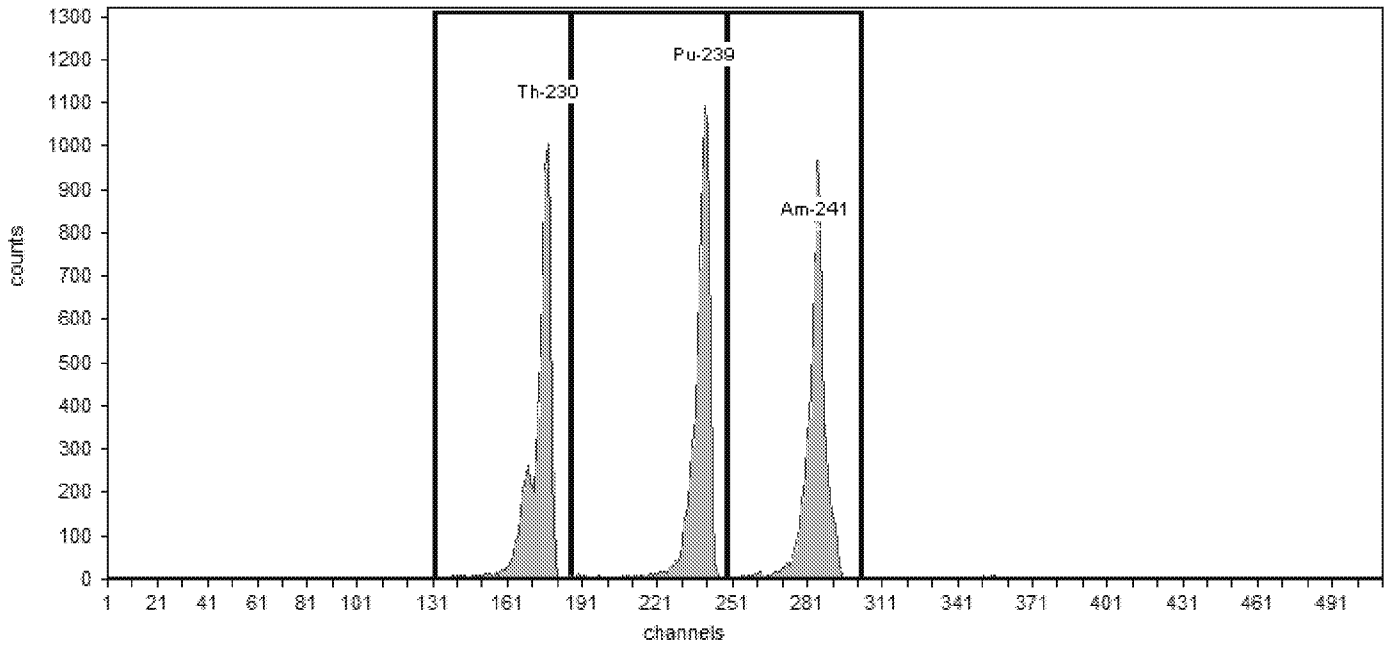
Detector: AV218 , SN: 50-117Z7
Acquisition Start Date: 11/16/2018 12:39:01PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-7107;AV218-1116201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.89% +/- 0.39% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	34.20	6,569.00	109.48
Pu-239	240	5,155.40	186	249	35.93	6,675.00	111.25
Am-241	284	5,485.70	249	303	34.86	6,458.00	107.63

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:13:41PM 11/16/2018

Calibration

Sample Name: ICV-9520;AV221-11162018
Description:
Detector: AV221

Analyst: 60040
Analysis Date: 11/16/2018 2:13:40PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82237-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

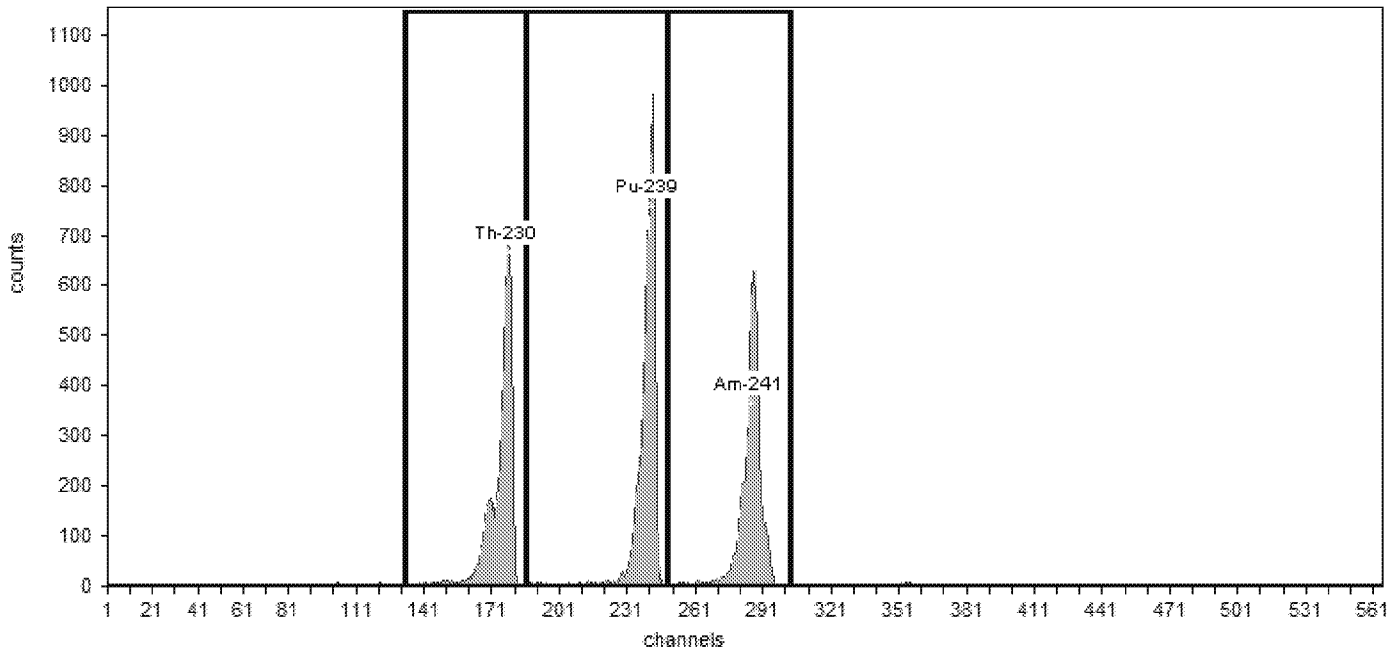
Detector: AV221 , SN: 50-117H5
Acquisition Start Date: 11/16/2018 12:43:03PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9520;AV221-1116201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.17% +/- 0.43% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	34.11	4,480.00	74.67
Pu-239	240	5,155.40	186	249	33.10	5,436.00	90.60
Am-241	284	5,485.70	249	303	35.05	4,323.00	72.05

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:21:05AM 11/20/2018

Calibration

Sample Name: ICV-9793;AV223-11192018
Description:
Detector: AV223

Analyst: 60040
Analysis Date: 11/20/2018 10:21:04AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82241-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

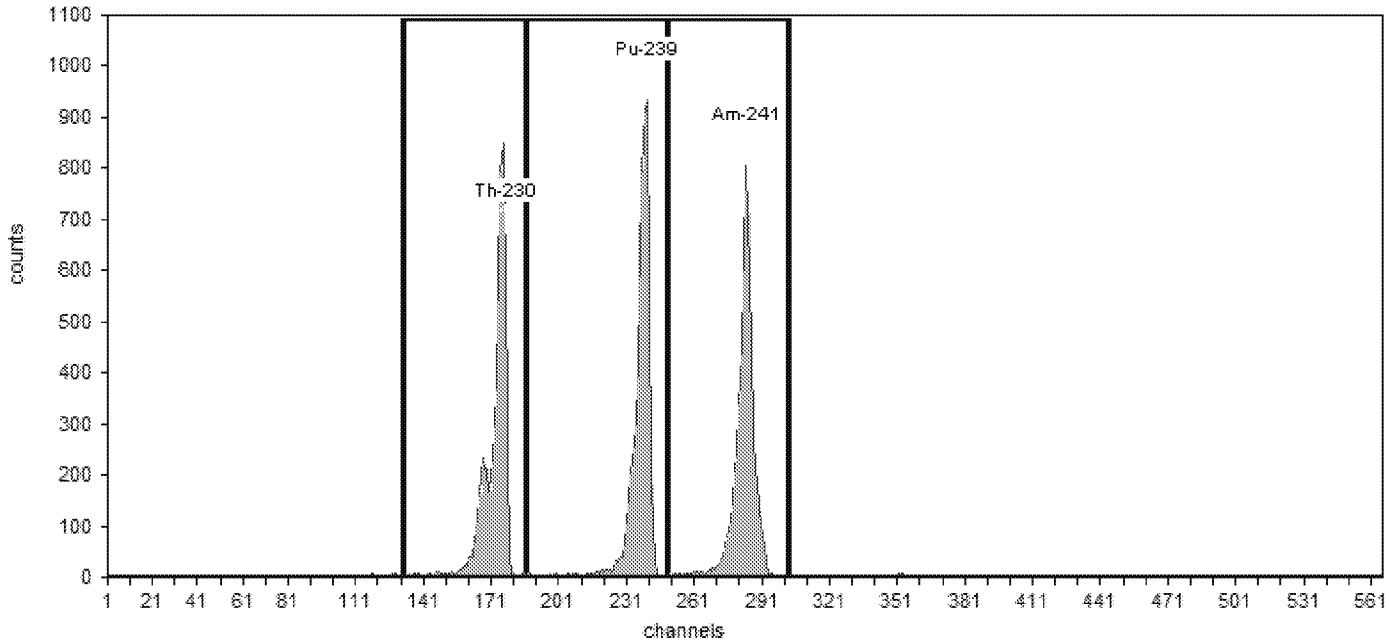
Detector: AV223 , SN: 49-037X6
Acquisition Start Date: 11/19/2018 8:45:38PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9793;AV223-1119201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.97% +/- 0.40% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	31.46	5,459.00	90.98
Pu-239	240	5,155.40	186	249	36.38	5,720.00	95.33
Am-241	284	5,485.70	249	303	34.59	5,349.00	89.15

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:12:14PM 11/20/2018

Calibration

Sample Name: ICV-9792;AV224-11162018
Description:
Detector: AV224

Analyst: 60040
Analysis Date: 11/16/2018 2:13:51PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82240-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

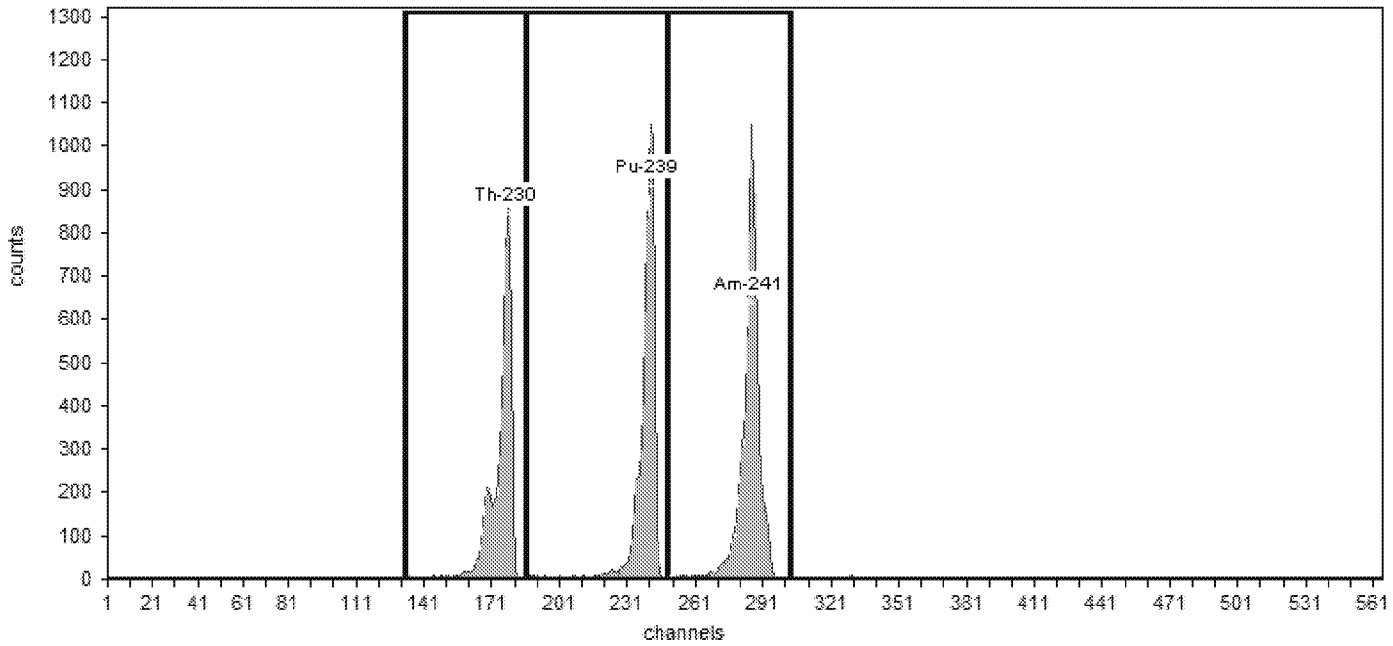
Detector: AV224 , SN: 50-119AA5
Acquisition Start Date: 11/16/2018 12:43:58PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9792;AV224-1116201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.85% +/- 0.38% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	30.95	5,170.00	86.17
Pu-239	240	5,155.40	186	249	33.32	5,965.00	99.42
Am-241	284	5,485.70	249	303	32.66	6,686.00	111.43

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:13:48PM 11/16/2018

Calibration

Sample Name: ICV-1368447;AV225-11162018
Description:
Detector: AV225

Analyst: 60040
Analysis Date: 11/16/2018 2:13:47PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108002_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 12/1/2017 12:00:00PM

Acquisition

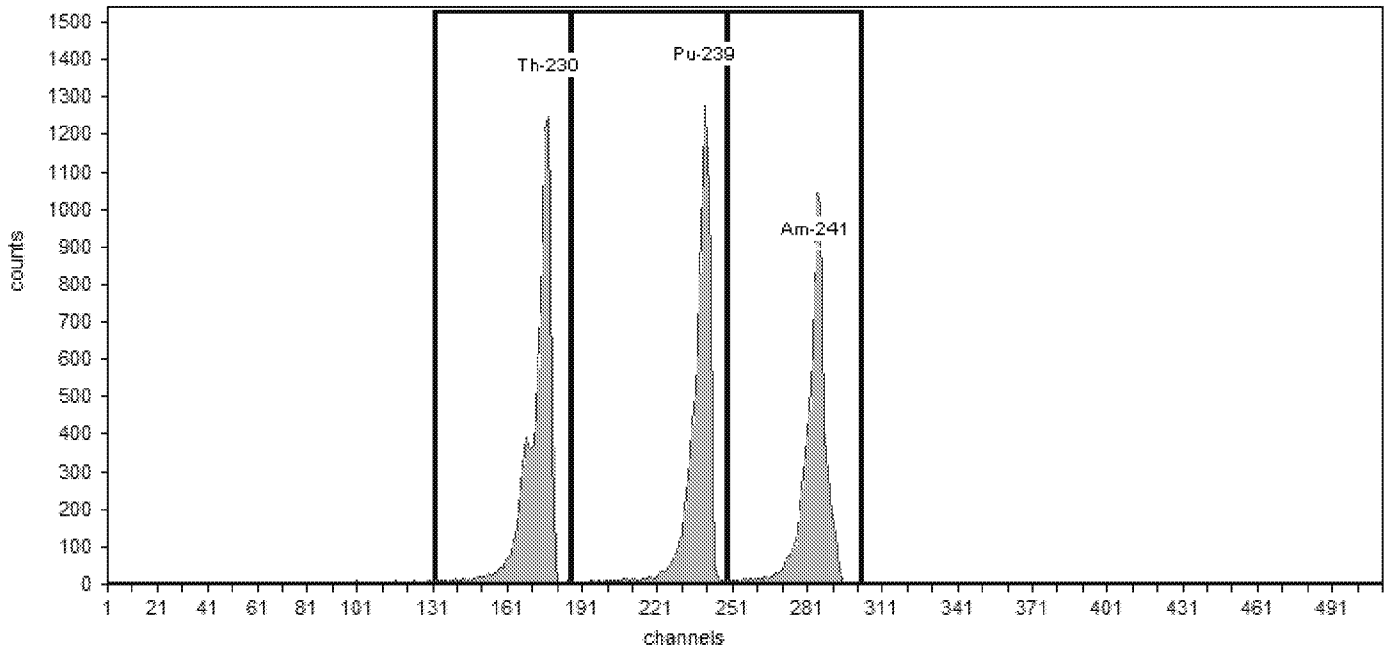
Detector: AV225 , SN: 50-117J7
Acquisition Start Date: 11/16/2018 12:44:11PM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: ICV-1368447;AV225-1116

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.06% +/- 0.35% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	39.14	9,544.00	159.07
Pu-239	240	5,155.40	186	249	39.16	8,710.00	145.17
Am-241	284	5,485.70	249	303	38.65	7,963.00	132.72

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:11:42PM 11/16/2018

Calibration

Sample Name: ICV-1370622;AV227-11162018
Description:
Detector: AV227

Analyst: 60040
Analysis Date: 11/16/2018 5:11:41PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108346_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/22/2018 12:00:00PM

Acquisition

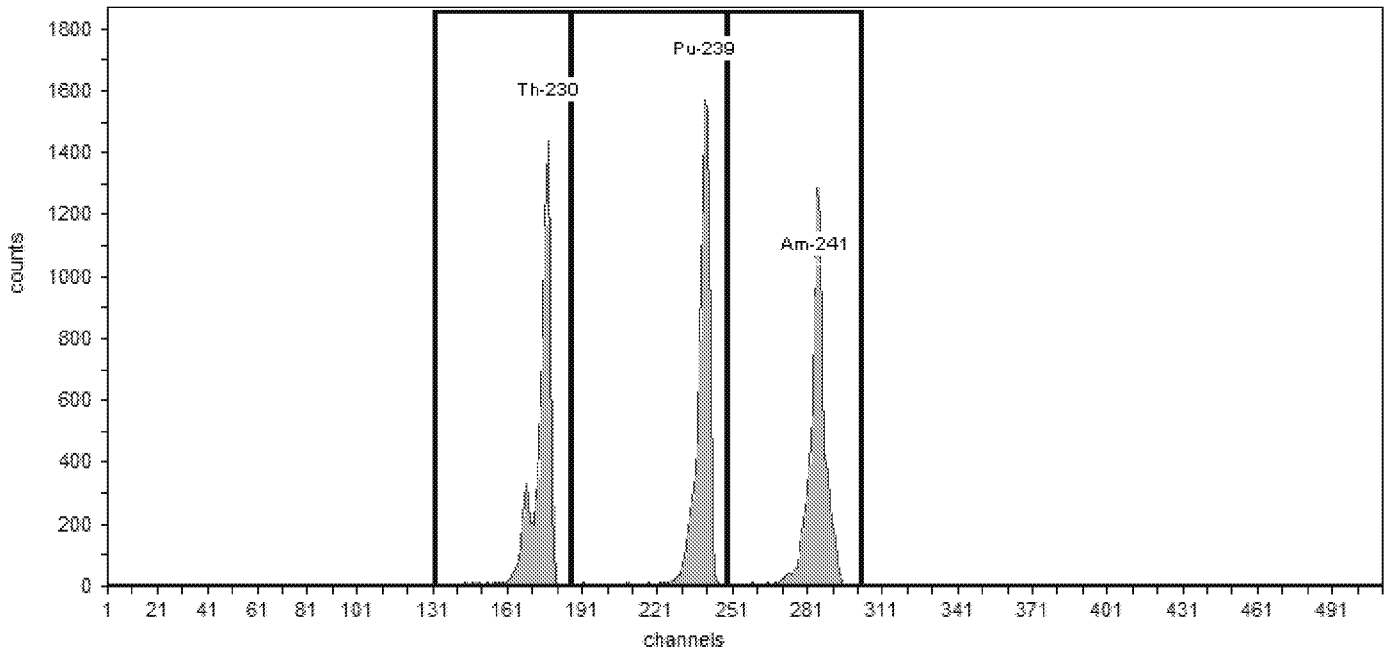
Detector: AV227 , SN: 50-120DD5
Acquisition Start Date: 11/16/2018 2:17:43PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-1370622;AV227-1116

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.31% +/- 0.36% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	27.69	7,435.00	123.92
Pu-239	240	5,155.40	186	249	29.79	7,891.00	131.52
Am-241	284	5,485.70	249	303	29.87	7,702.00	128.37

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:11:46PM 11/16/2018

Calibration

Sample Name: ICV-1370621;AV228-11162018
Description:
Detector: AV228

Analyst: 60040
Analysis Date: 11/16/2018 5:11:45PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108345_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/22/2018 12:00:00PM

Acquisition

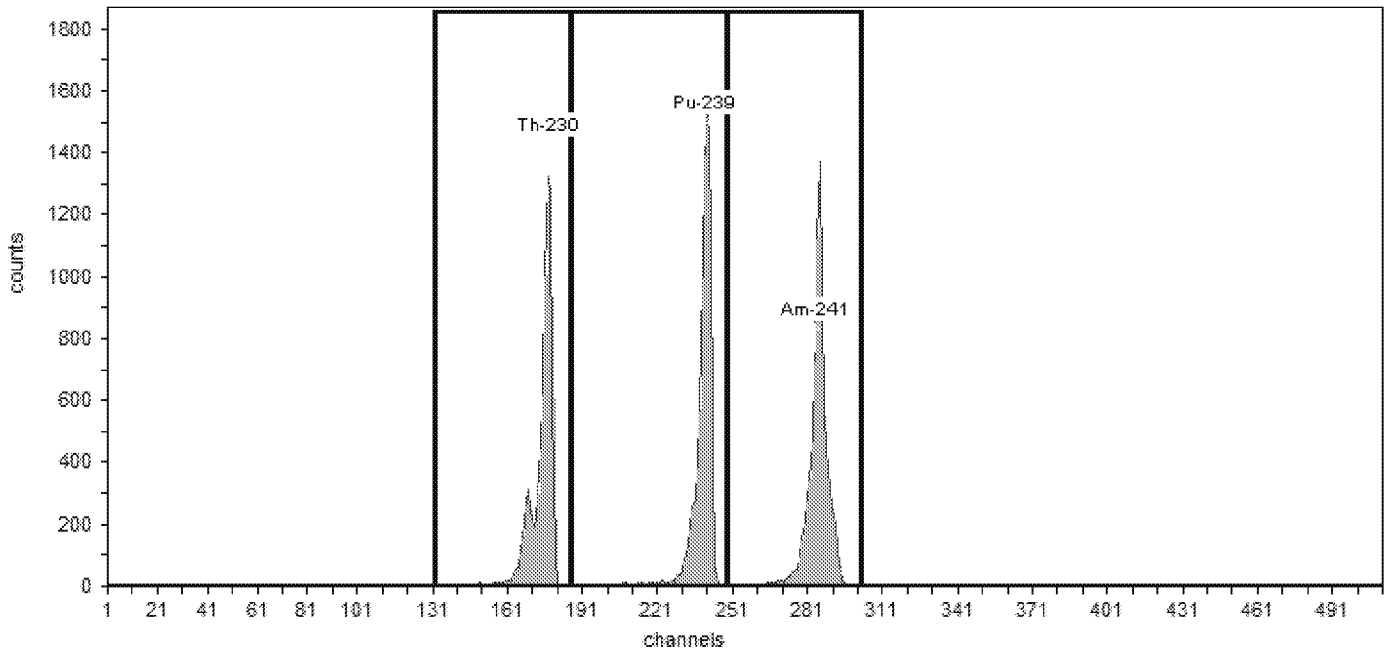
Detector: AV228 , SN: 51-005Q6
Acquisition Start Date: 11/16/2018 2:17:56PM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: ICV-1370621;AV228-1116

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.78% +/- 0.37% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	28.23	7,336.00	122.27
Pu-239	240	5,155.40	186	249	29.64	7,754.00	129.23
Am-241	284	5,485.70	249	303	28.48	7,838.00	130.63

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:12:20PM 11/20/2018

Calibration

Sample Name: ICV-1370620;AV229-11162018
Description:
Detector: AV229

Analyst: 60040
Analysis Date: 11/16/2018 5:11:48PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108348_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/23/2018 12:00:00PM

Acquisition

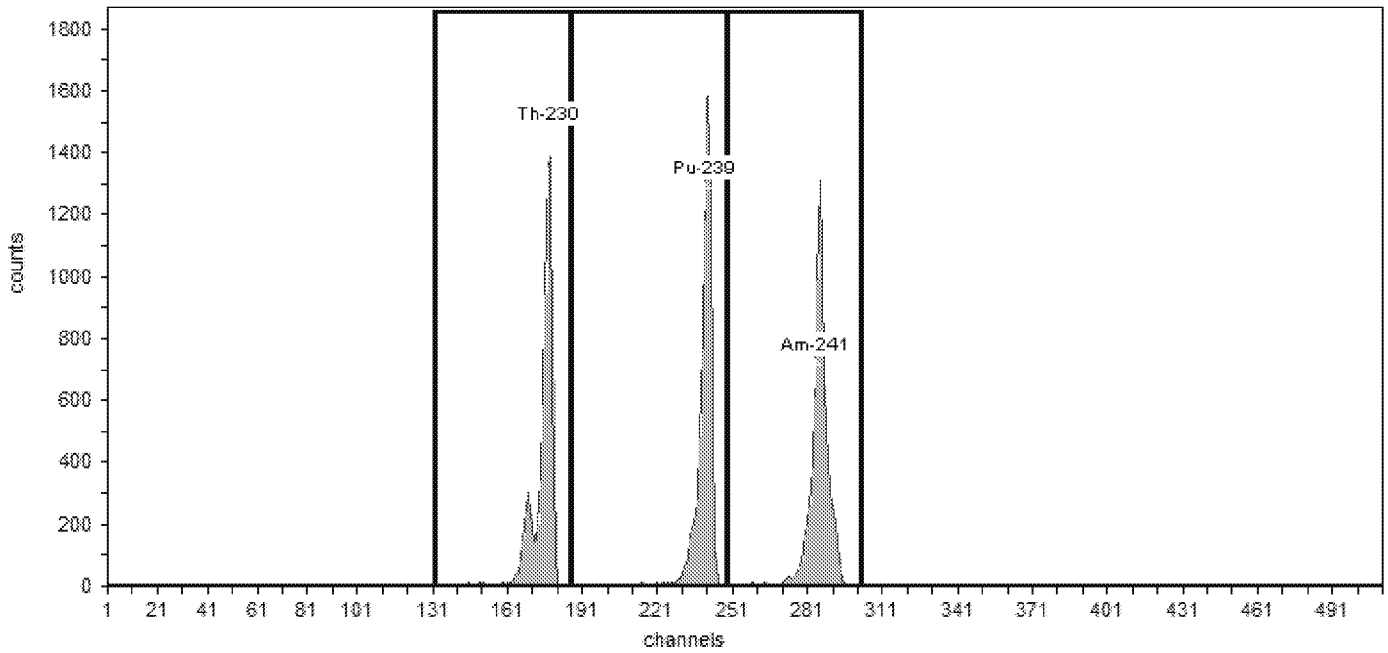
Detector: AV229 , SN: 51-005EE4
Acquisition Start Date: 11/16/2018 2:18:08PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-1370620;AV229-1116

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.58% +/- 0.38% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	~~1,753.95~~ *	6,998.00	116.63
Pu-239	240	5,155.40	186	249	26.90	7,043.00	117.38
Am-241	284	5,485.70	249	303	28.73	7,327.00	122.12

*FWHM<100
ALS 11/20/2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:11:52PM 11/16/2018

Calibration

Sample Name: ICV-1370619;AV230-11162018
Description:
Detector: AV230

Analyst: 60040
Analysis Date: 11/16/2018 5:11:51PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108347_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/23/2018 12:00:00PM

Acquisition

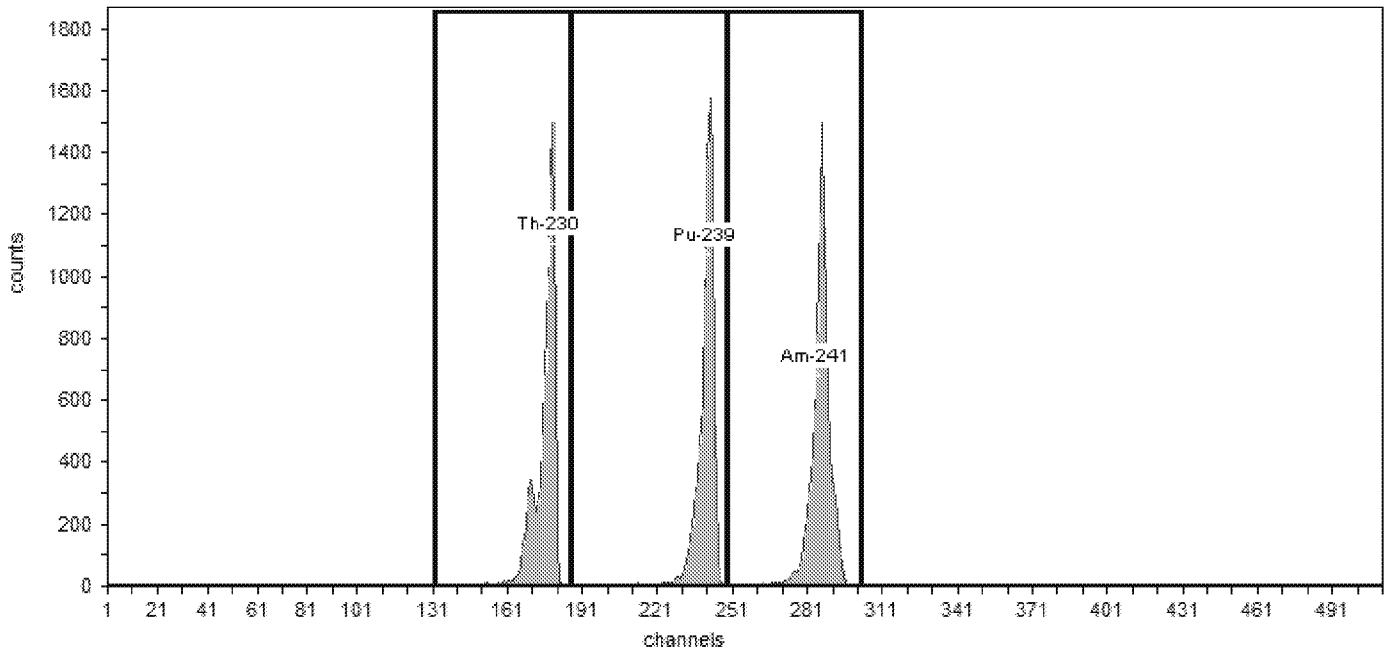
Detector: AV230 , SN: 49-045J5
Acquisition Start Date: 11/16/2018 2:18:24PM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: ICV-1370619;AV230-1116

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.34% +/- 0.36% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	28.82	8,203.00	136.72
Pu-239	240	5,155.40	186	249	30.80	8,192.00	136.53
Am-241	284	5,485.70	249	303	30.36	8,880.00	148.00

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:12:25PM 11/20/2018

Calibration

Sample Name: ICV-9795;AV232-11162018
Description:
Detector: AV232

Analyst: 60040
Analysis Date: 11/16/2018 5:11:58PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82243-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

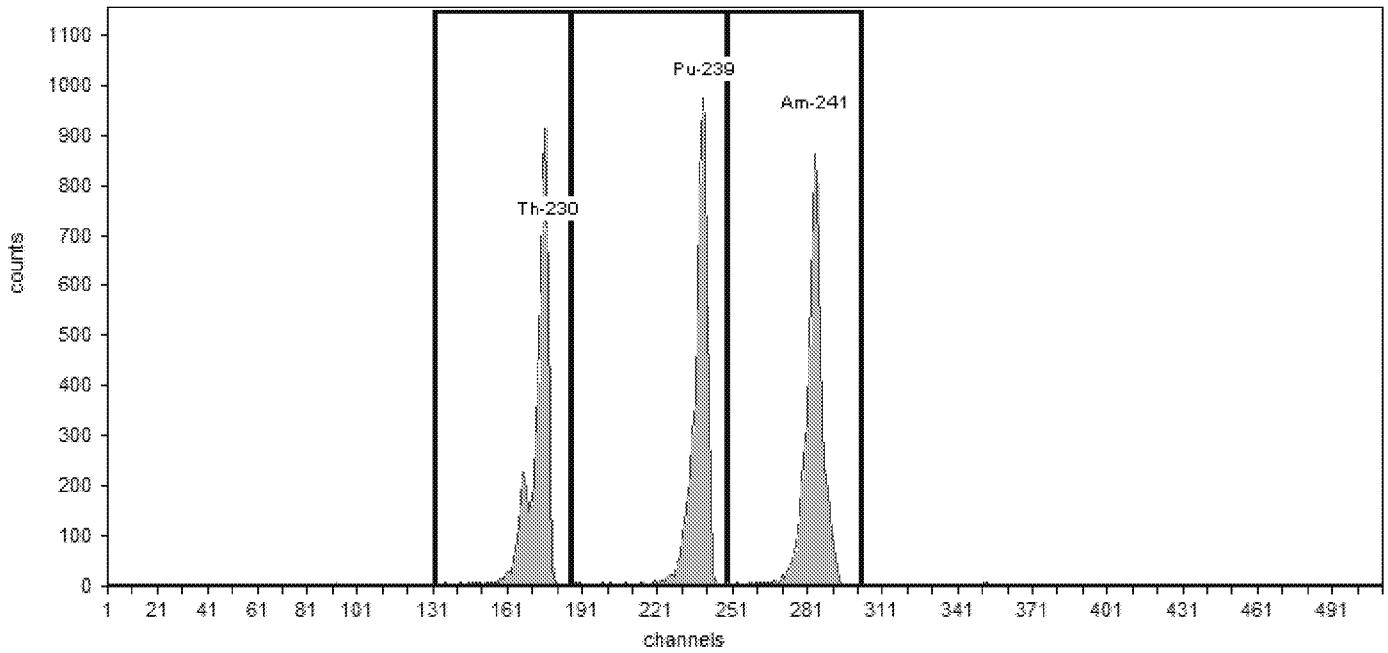
Detector: AV232 , SN: 46-033p2
Acquisition Start Date: 11/16/2018 2:18:58PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9795;AV232-1116201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.52% +/- 0.45% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	31.05	5,379.00	89.65
Pu-239	240	5,155.40	186	249	33.71	5,537.00	92.28
Am-241	284	5,485.70	249	303	34.48	5,752.00	95.87

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:12:03PM 11/16/2018

Calibration

Sample Name: ICV-7107;AV233-11162018
Description:
Detector: AV233

Analyst: 60040
Analysis Date: 11/16/2018 5:12:02PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82232-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

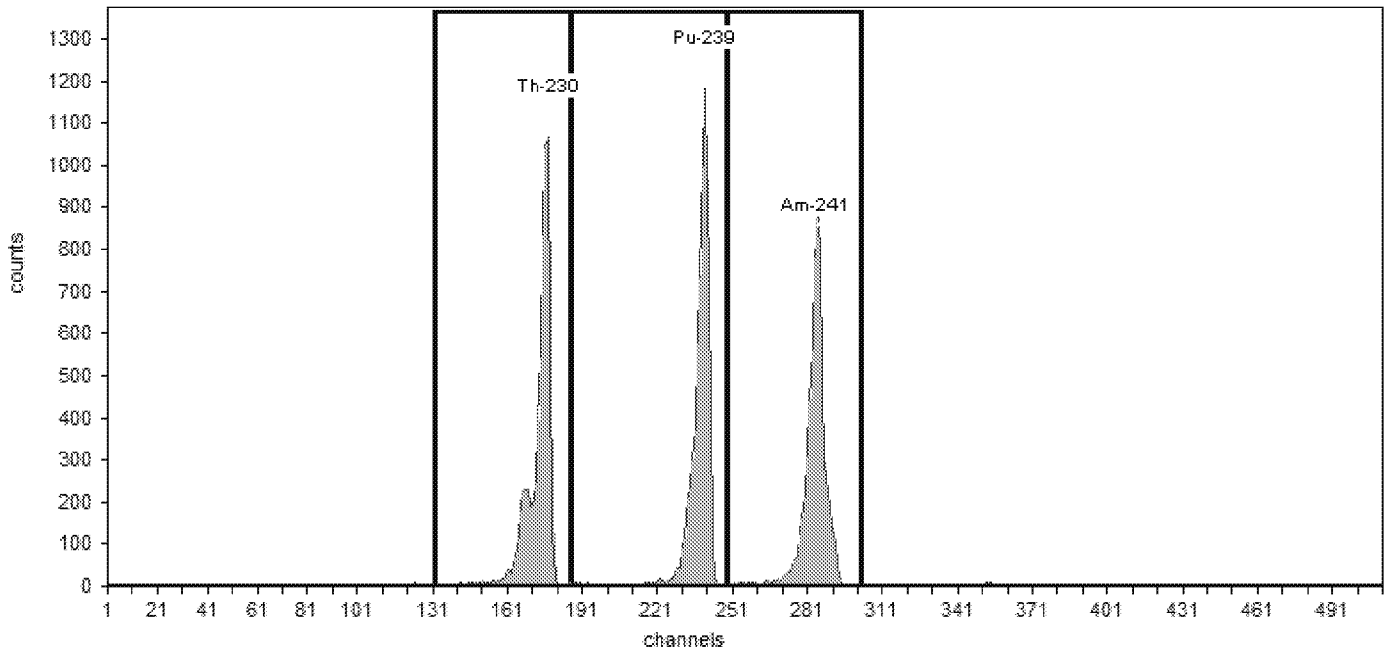
Detector: AV233 , SN: 51-005Q7
Acquisition Start Date: 11/16/2018 2:19:10PM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: ICV-7107;AV233-1116201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.21% +/- 0.39% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	30.90	6,505.00	108.42
Pu-239	240	5,155.40	186	249	34.31	6,533.00	108.88
Am-241	284	5,485.70	249	303	37.40	6,124.00	102.07

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:12:06PM 11/16/2018

Calibration

Sample Name: ICV-9817;AV234-11162018
Description:
Detector: AV234

Analyst: 60040
Analysis Date: 11/16/2018 5:12:05PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82244-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

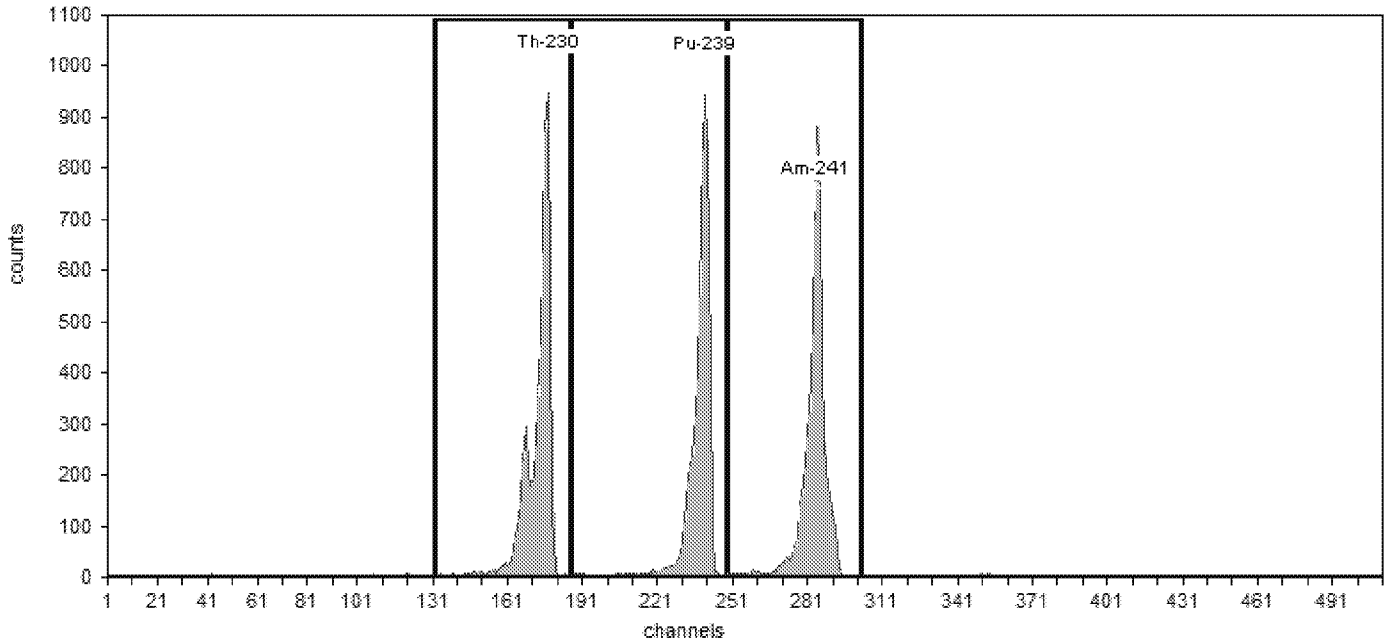
Detector: AV234 , SN: 51-005P2
Acquisition Start Date: 11/16/2018 2:19:23PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9817;AV234-1116201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.54% +/- 0.39% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	30.07	5,872.00	97.87
Pu-239	240	5,155.40	186	249	32.29	5,464.00	91.07
Am-241	284	5,485.70	249	303	31.28	5,611.00	93.52

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:47:44AM 11/18/2018

Calibration

Sample Name: ICV-1368446;AV241-11162018
Description:
Detector: AV241

Analyst: 60040
Analysis Date: 11/18/2018 1:47:43AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108001_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 12/6/2017 12:00:00PM

Acquisition

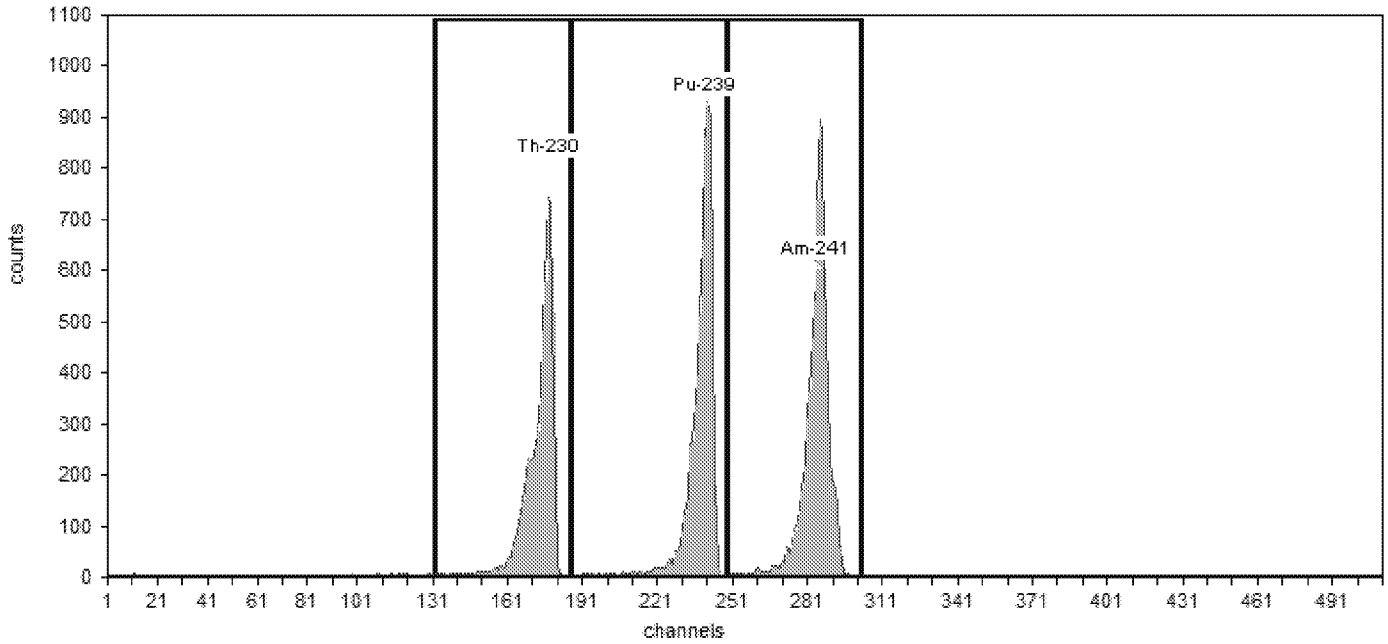
Detector: AV241 , SN: 52-059DD3
Acquisition Start Date: 11/16/2018 5:15:14PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-1368446;AV241-1116

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.13% +/- 0.39% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	39.41	5,791.00	96.52
Pu-239	240	5,155.40	186	249	41.69	6,631.00	110.52
Am-241	284	5,485.70	249	303	43.52	7,055.00	117.58

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
3:12:45PM 11/20/2018

Calibration

Sample Name: ICV-1370621;AV243-11162018
Description:
Detector: AV243

Analyst: 60040
Analysis Date: 11/18/2018 1:47:51AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108345_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/22/2018 12:00:00PM

Acquisition

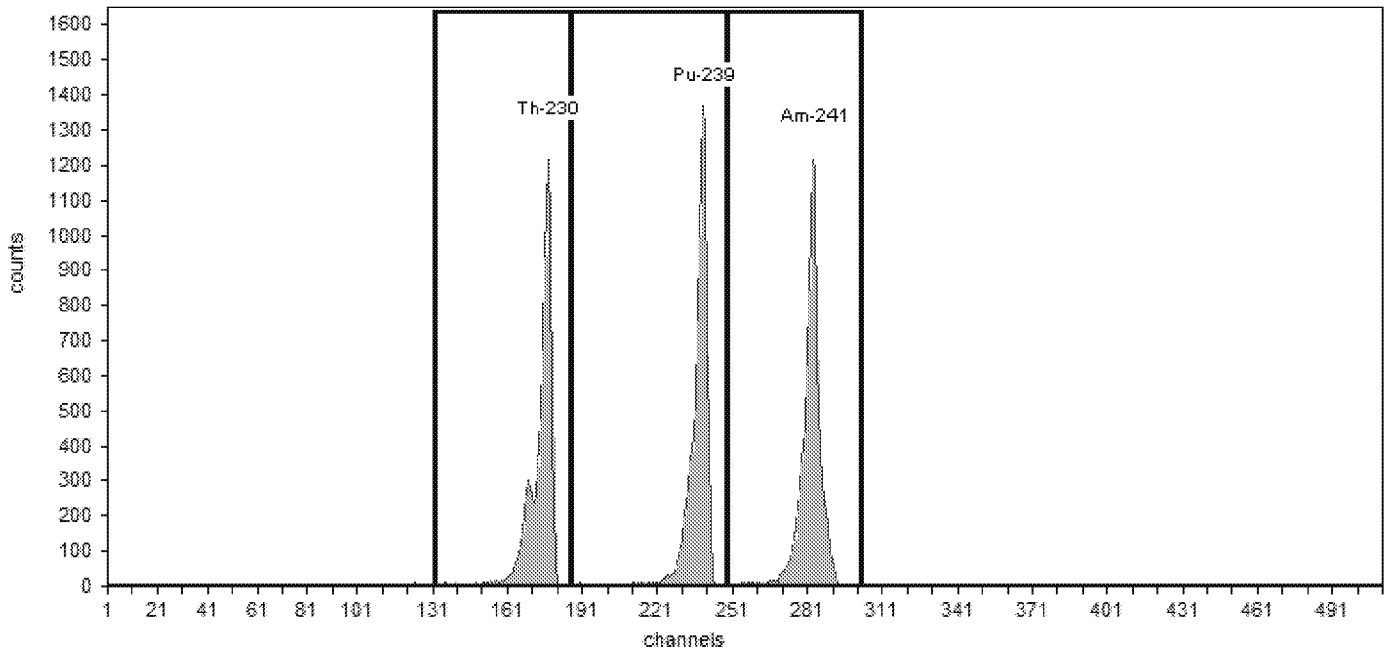
Detector: AV243 , SN: 51-005P6
Acquisition Start Date: 11/16/2018 5:15:43PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-1370621;AV243-1116

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.88% +/- 0.36% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	29.90	7,075.00	117.92
Pu-239	240	5,155.40	186	249	31.61	7,493.00	124.88
Am-241	284	5,485.70	249	303	31.71	7,611.00	126.85

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:48:13AM 11/18/2018

Calibration

Sample Name: ICV-9817;AV249-11162018
Description:
Detector: AV249

Analyst: 60040
Analysis Date: 11/18/2018 1:48:12AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82244-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

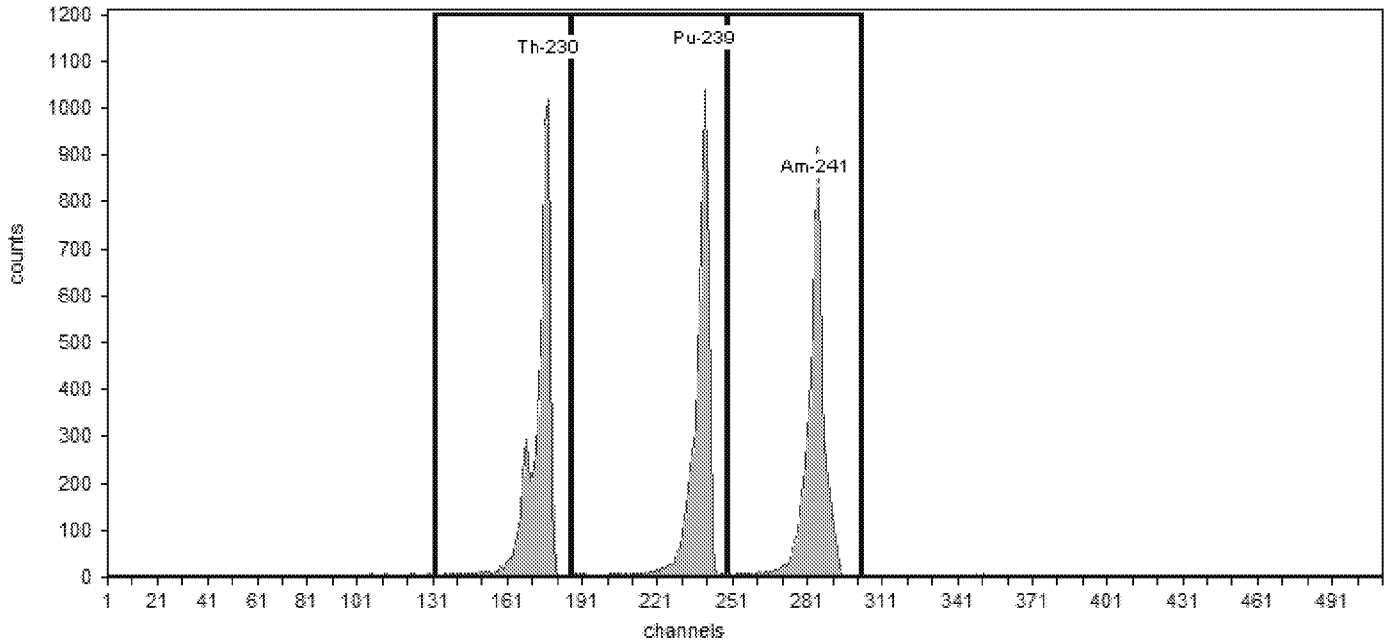
Detector: AV249 , SN: 51-005EE5
Acquisition Start Date: 11/16/2018 5:17:09PM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: ICV-9817;AV249-1116201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.70% +/- 0.40% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	29.20	6,165.00	102.75
Pu-239	240	5,155.40	186	249	30.87	5,792.00	96.53
Am-241	284	5,485.70	249	303	31.07	5,865.00	97.75

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:48:18AM 11/18/2018

Calibration

Sample Name: ICV-9885;AV250-11162018
Description:
Detector: AV250

Analyst: 60040
Analysis Date: 11/18/2018 1:48:17AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

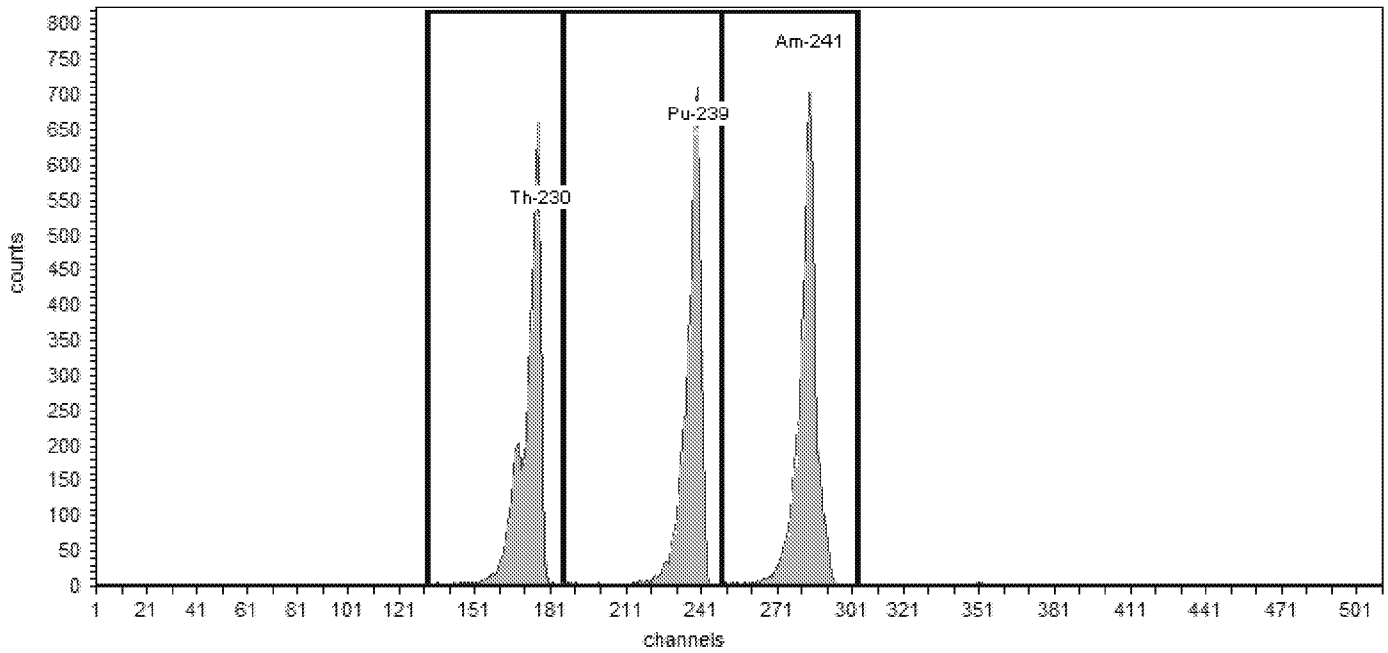
Detector: AV250 , SN: 47-052x7
Acquisition Start Date: 11/16/2018 5:17:25PM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: ICV-9885;AV250-1116201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.10% +/- 0.46% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	36.71	4,648.00	77.47
Pu-239	240	5,155.40	186	249	36.06	4,425.00	73.75
Am-241	284	5,485.70	249	303	36.93	4,937.00	82.28

Monthly Calibration Verifications

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:14:15PM 11/12/2019

Calibration

Sample Name: CCV-7107;AV1-20191112
Description:
Detector: AV1

Calibration Date: 11/12/2019 12:13:30PM
Analyst: 60040

Source Info

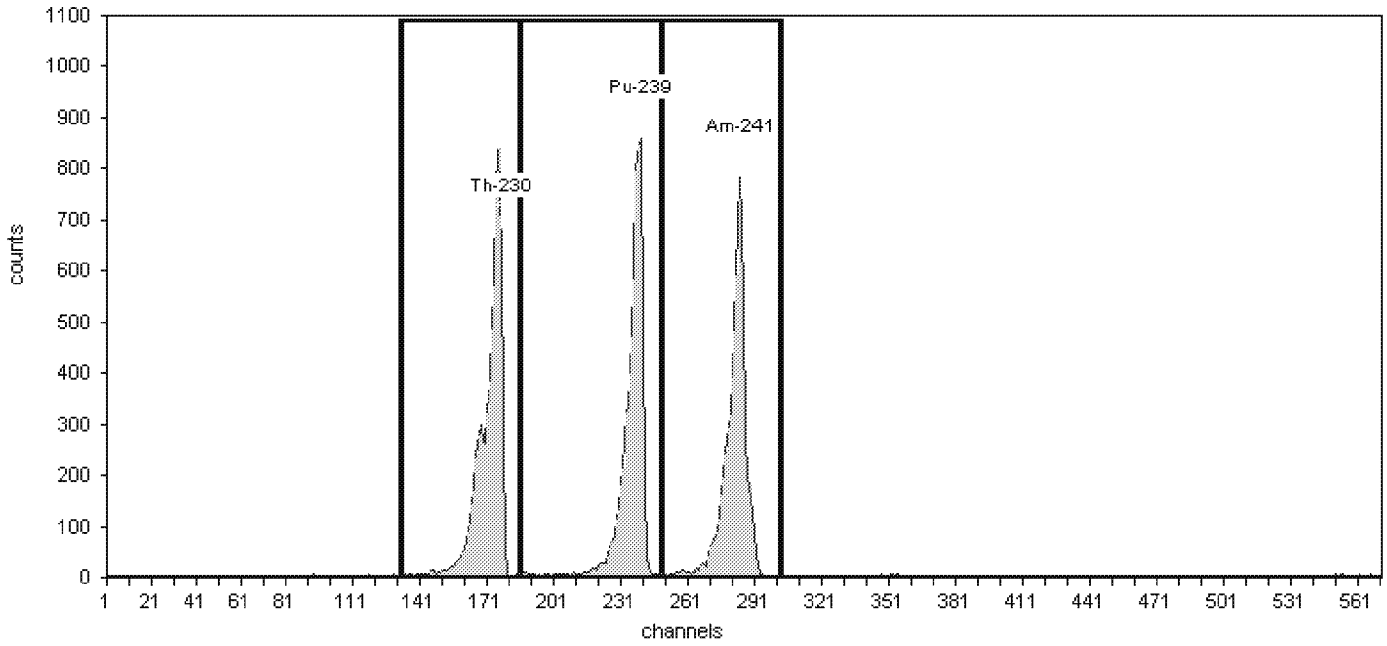
Certificate ID: 82232-334
Prepared by: Analytics

Certification Date: 6/3/2010 12:00:00PM
Description:

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 11/12/2019 7:44:34AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 24.38% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	6,574.00	109.57
Pu-239	240	5.16	186	249	0.00	6,453.00	107.55
Am-241	284	5.49	249	303	0.00	6,248.00	104.13

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:15:39PM 11/12/2019

Calibration

Sample Name: CCV-8877;AV3-20191112
Description:
Detector: AV3

Calibration Date: 11/12/2019 12:15:15PM
Analyst: 60040

Source Info

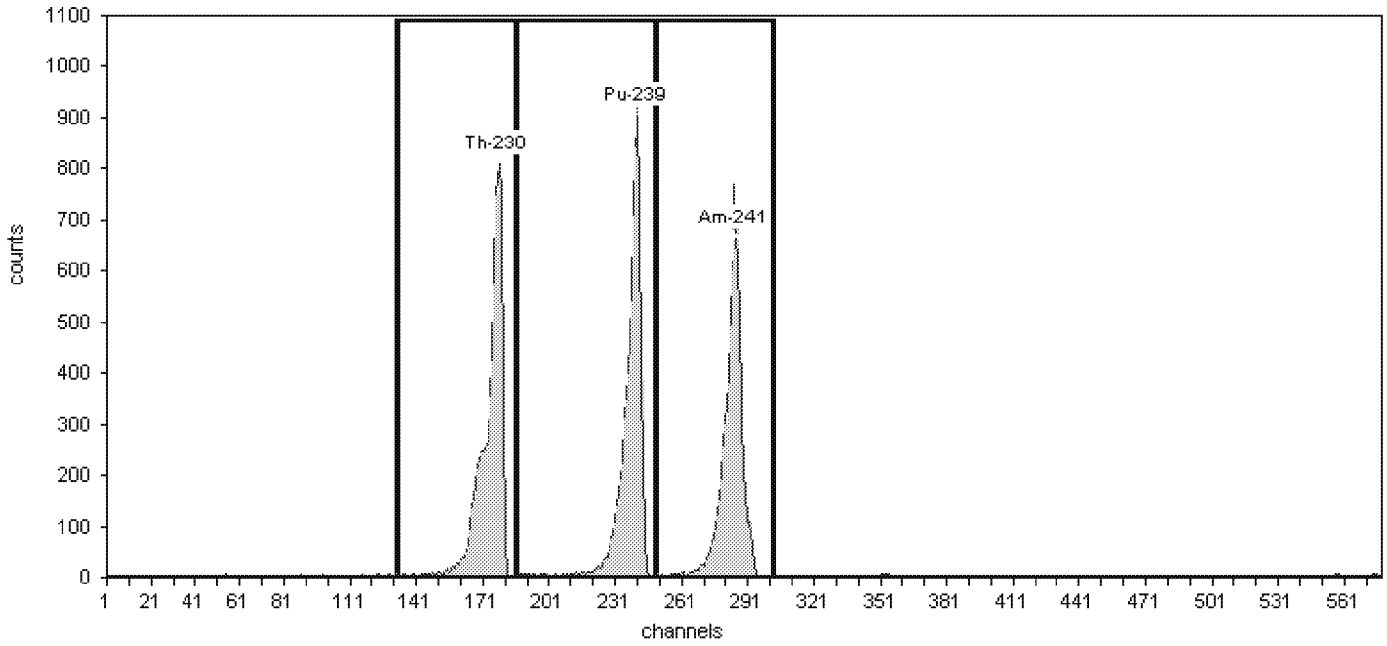
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV3 , SN: 49-202 FF7
Acquisition Start Date: 11/12/2019 7:45:37AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 24.92% +/- 0.41% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	6,242.00	104.03
Pu-239	240	5.16	186	249	0.00	6,388.00	106.47
Am-241	284	5.49	249	303	0.00	5,876.00	97.93

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:18:25PM 11/12/2019

Calibration

Sample Name: CCV-9795;AV8-20191112
Description:
Detector: AV8

Calibration Date: 11/12/2019 12:18:20PM
Analyst: 60040

Source Info

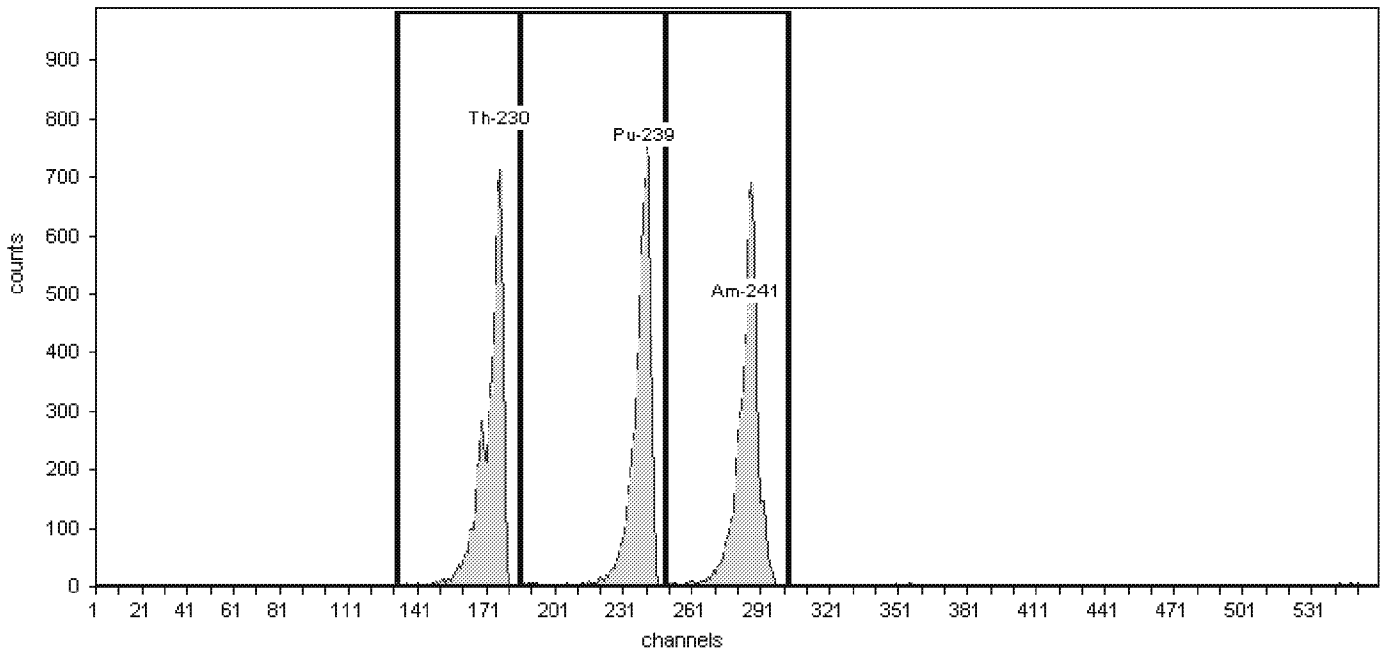
Certificate ID: 82243-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV8 , SN: 41-137Q6
Acquisition Start Date: 11/12/2019 7:48:09AM
Live Time: 60.00 min.
Real Time: 60.04 min.
Efficiency: 25.55% +/- 0.45% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	5,397.00	89.95
Pu-239	240	5.16	186	249	0.00	5,538.00	92.30
Am-241	284	5.49	249	303	0.00	5,747.00	95.78

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:20:09PM 11/12/2019

Calibration

Sample Name: CCV-1368446;AV11-20191112
Description:
Detector: AV11

Calibration Date: 11/12/2019 12:19:59PM
Analyst: 60040

Source Info

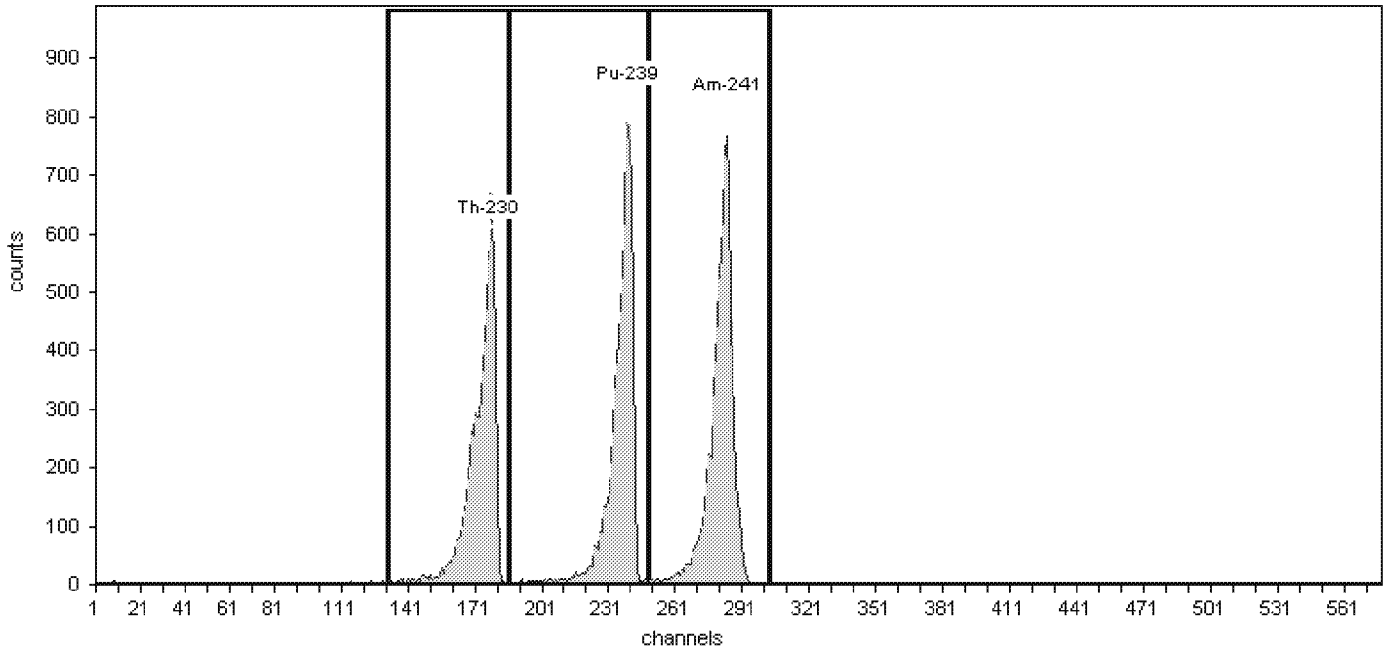
Certificate ID: 108001_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/6/2017 11:00:00AM
Description:

Acquisition

Detector: AV11 , SN: 49-155dd2
Acquisition Start Date: 11/12/2019 7:50:02AM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 27.78% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	6,073.00	101.22
Pu-239	240	5.16	186	249	0.00	6,732.00	112.20
Am-241	284	5.49	249	303	0.00	7,123.00	118.72

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THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:20:40PM 11/12/2019

Calibration

Sample Name: CCV-1368447;AV12-20191112
Description:
Detector: AV12

Calibration Date: 11/12/2019 12:20:36PM
Analyst: 60040

Source Info

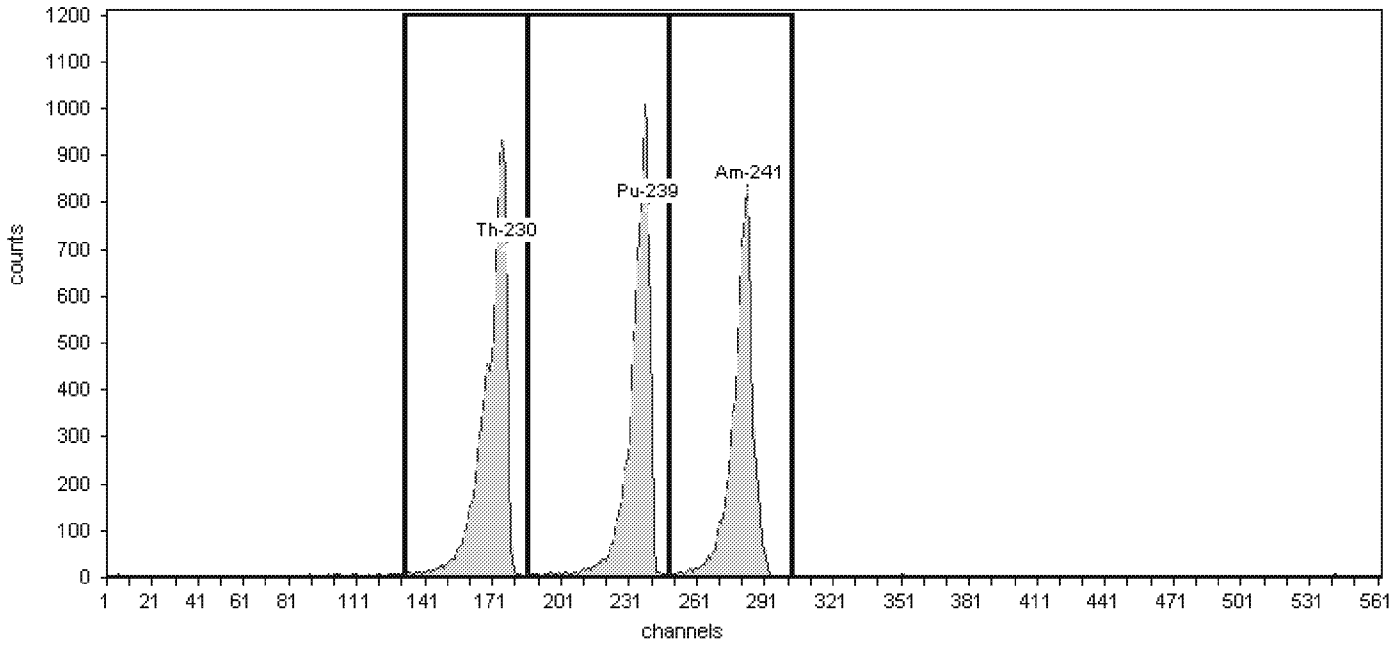
Certificate ID: 108002_00001
Prepared by: Eckert & Ziegler

Certification Date: 12/1/2017 11:00:00AM
Description:

Acquisition

Detector: AV12 , SN: 51-082B7
Acquisition Start Date: 11/12/2019 7:50:18AM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 28.08% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	9,556.00	159.27
Pu-239	240	5.16	186	249	0.00	8,740.00	145.67
Am-241	284	5.49	249	303	0.00	7,935.00	132.25

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:21:28PM 11/12/2019

Calibration

Sample Name: CCV-1370622;AV14-20191112
Description:
Detector: AV14

Calibration Date: 11/12/2019 12:21:15PM
Analyst: 60040

Source Info

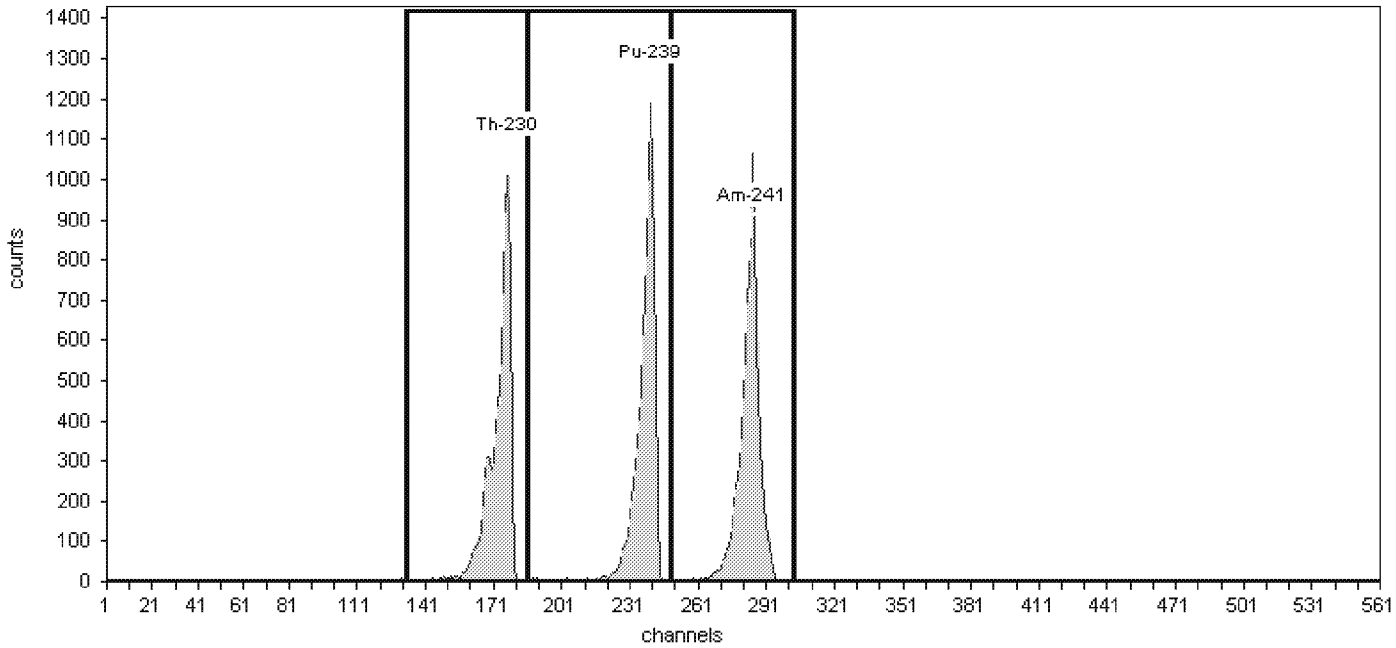
Certificate ID: 108346_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV14 , SN: 50-060W4
Acquisition Start Date: 11/12/2019 7:51:18AM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 27.08% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	7,297.00	121.62
Pu-239	240	5.16	186	249	0.00	7,677.00	127.95
Am-241	284	5.49	249	303	0.00	7,837.00	130.62

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:22:18PM 11/12/2019

Calibration

Sample Name: CCV-1370619;AV15-20191112
Description:
Detector: AV15

Calibration Date: 11/12/2019 12:22:14PM
Analyst: 60040

Source Info

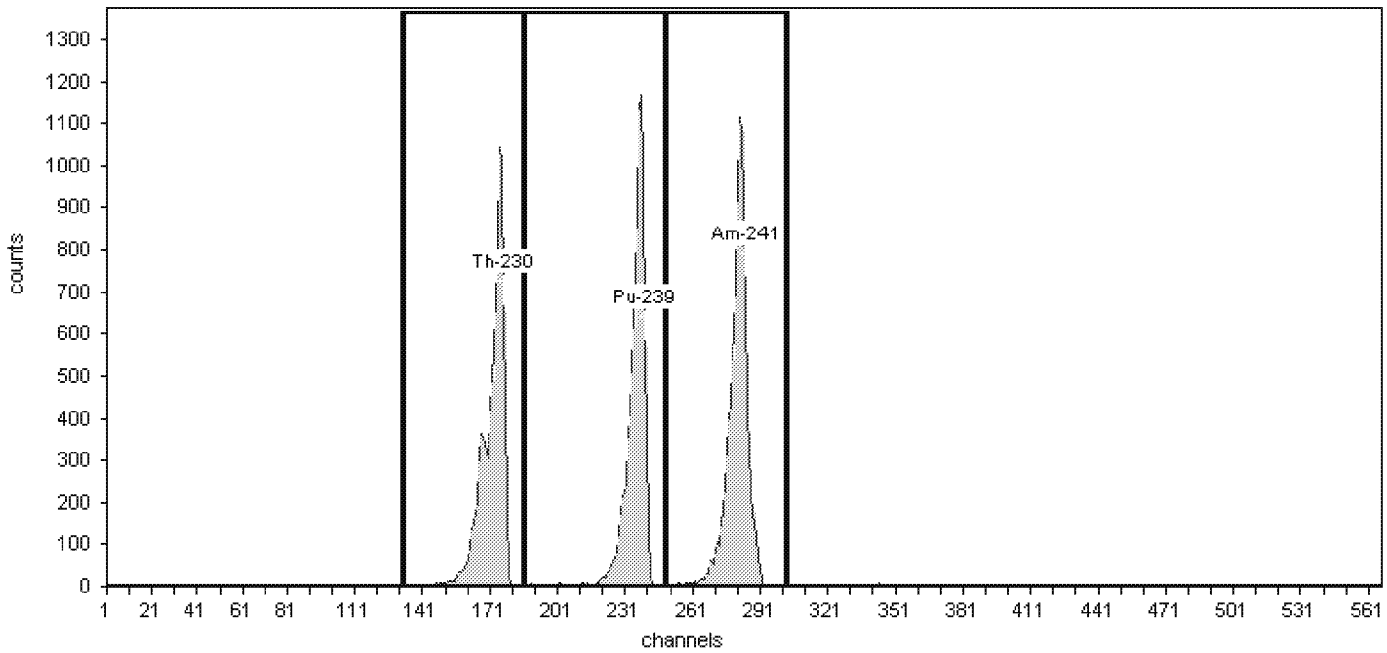
Certificate ID: 108347_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00AM
Description:

Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 11/12/2019 7:51:50AM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 26.92% +/- 0.35% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	7,754.00	129.23
Pu-239	240	5.16	186	249	0.00	7,834.00	130.57
Am-241	284	5.49	249	303	0.00	8,415.00	140.25

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:23:13PM 11/12/2019

Calibration

Sample Name: CCV-1370620;AV16-20191112
Description:
Detector: AV16

Calibration Date: 11/12/2019 12:23:09PM
Analyst: 60040

Source Info

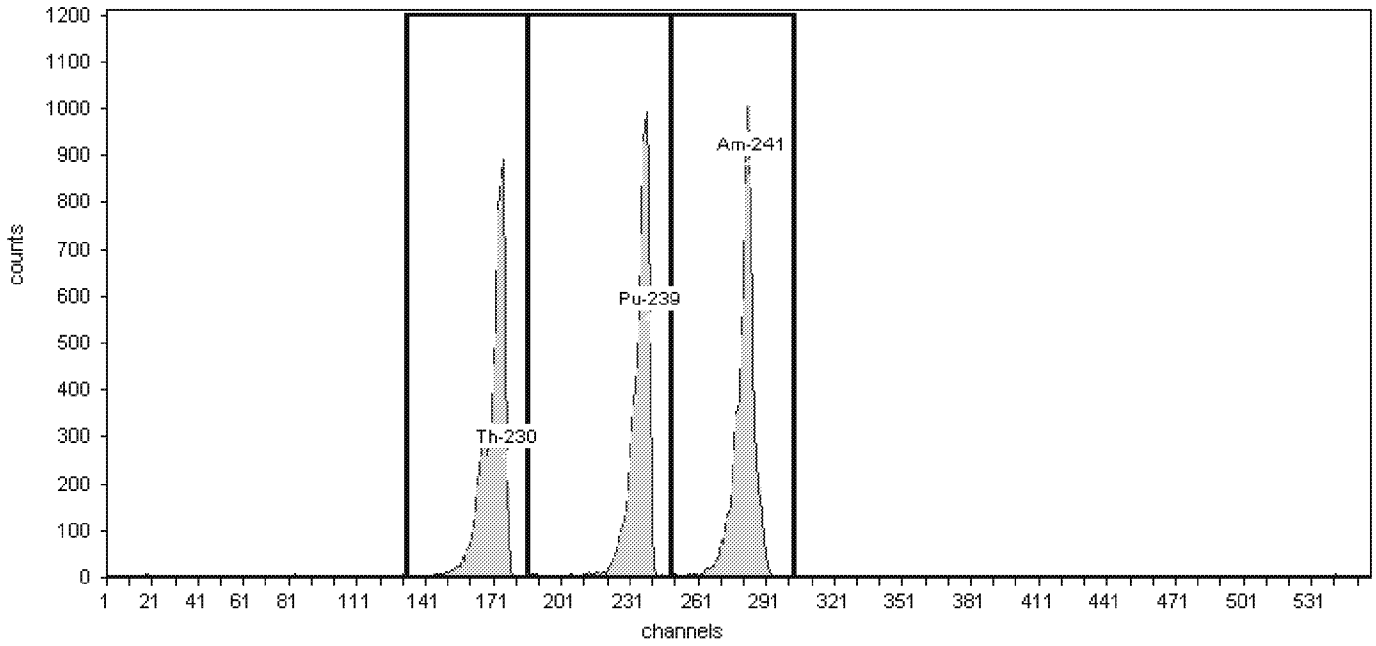
Certificate ID: 108348_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/23/2018 11:00:00PM
Description:

Acquisition

Detector: AV16 , SN: 51-082B6
Acquisition Start Date: 11/12/2019 7:52:23AM
Live Time: 60.00 min.
Real Time: 60.05 min.
Efficiency: 26.96% +/- 0.37% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	6,814.00	113.57
Pu-239	240	5.16	186	249	0.00	6,874.00	114.57
Am-241	284	5.49	249	303	0.00	7,185.00	119.75

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:25:24PM 11/12/2019

Calibration

Sample Name: CCV-8877;AV19-20191112
Description:
Detector: AV19

Calibration Date: 11/12/2019 12:25:19PM
Analyst: 60040

Source Info

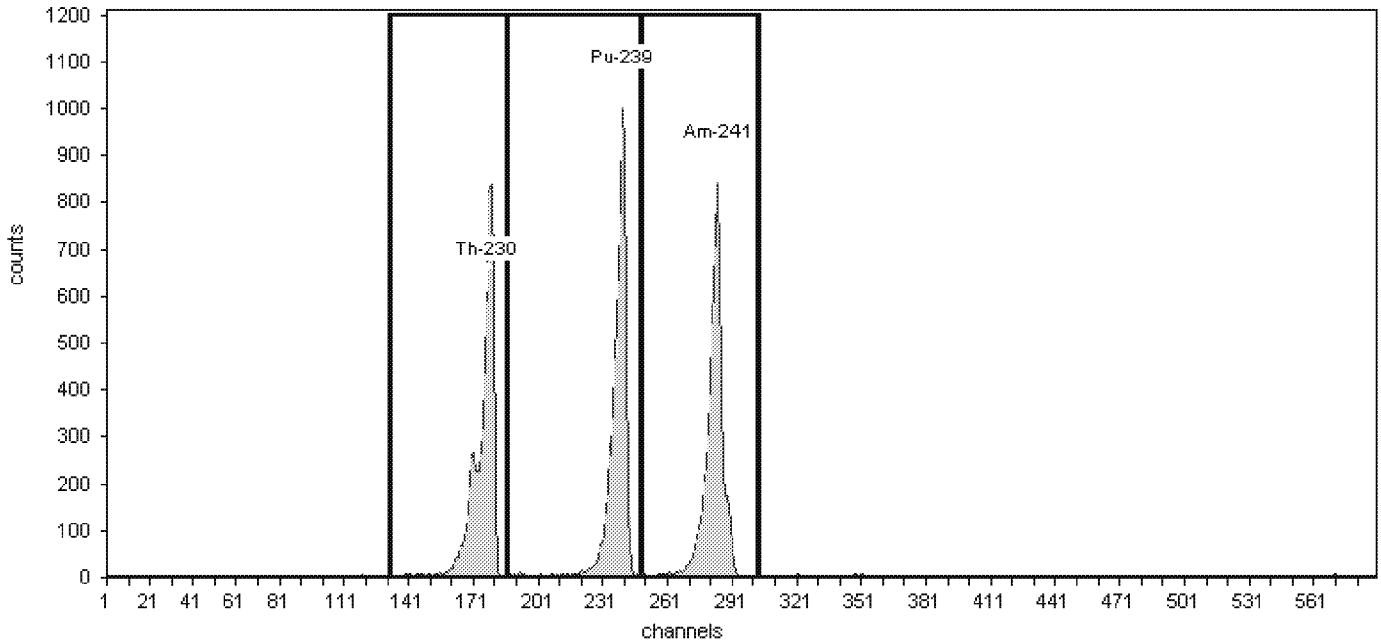
Certificate ID: 82236-334
Prepared by: Analytics

Certification Date: 6/2/2010 12:00:00PM
Description:

Acquisition

Detector: AV19 , SN: 50-025FF5
Acquisition Start Date: 11/12/2019 9:41:07AM
Live Time: 60.00 min.
Real Time: 60.34 min.
Efficiency: 23.57% +/- 0.40% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	5,783.00	96.38
Pu-239	240	5.16	186	249	0.00	6,057.00	100.95
Am-241	284	5.49	249	303	0.00	5,665.00	94.42

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:26:09PM 11/12/2019

Calibration

Sample Name: CCV-9520;AV20-20191112
Description:
Detector: AV20

Calibration Date: 11/12/2019 12:25:57PM
Analyst: 60040

Source Info

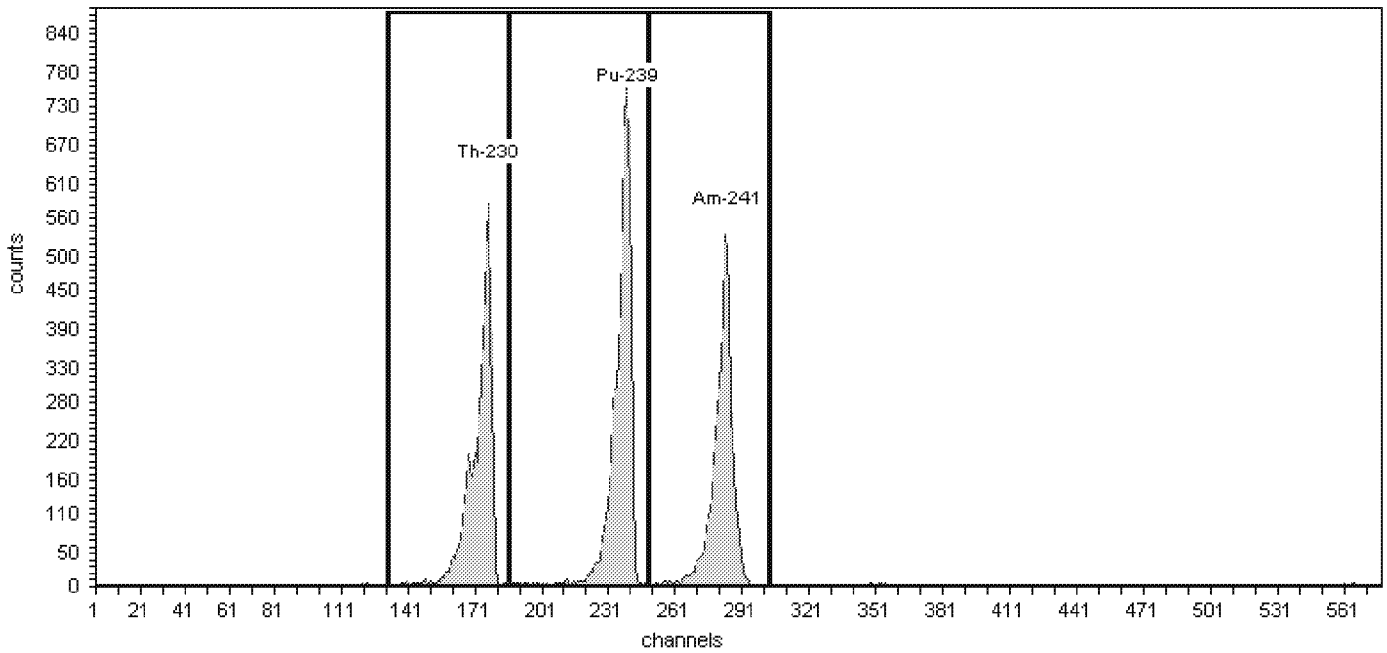
Certificate ID: 82237-334
Prepared by: Analytics

Certification Date: 6/1/2010 12:00:00PM
Description:

Acquisition

Detector: AV20 , SN: 48-121A7
Acquisition Start Date: 11/12/2019 9:42:02AM
Live Time: 60.00 min.
Real Time: 60.32 min.
Efficiency: 22.17% +/- 0.43% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	4,437.00	73.95
Pu-239	240	5.16	186	249	0.00	5,504.00	91.73
Am-241	284	5.49	249	303	0.00	4,303.00	71.72

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:28:40PM 11/12/2019

Calibration

Sample Name: CCV-9817;AV24-20191112
Description:
Detector: AV24

Calibration Date: 11/12/2019 12:28:27PM
Analyst: 60040

Source Info

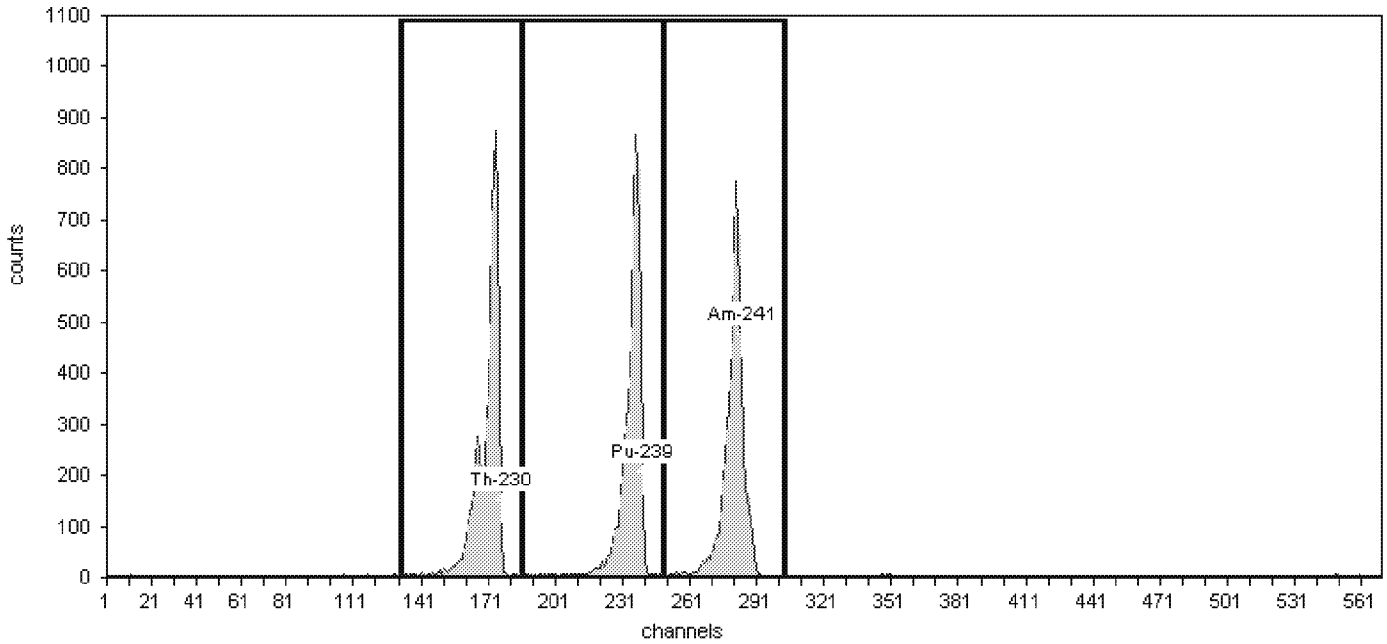
Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV24 , SN: 47-137Q4
Acquisition Start Date: 11/12/2019 9:44:15AM
Live Time: 60.00 min.
Real Time: 60.25 min.
Efficiency: 22.47% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	5,919.00	98.65
Pu-239	240	5.16	186	249	0.00	5,471.00	91.18
Am-241	284	5.49	249	303	0.00	5,490.00	91.50

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:28:40PM 11/12/2019

Calibration

Sample Name: CCV-9817;AV24-20191112
Description:
Detector: AV24

Calibration Date: 11/12/2019 12:28:27PM
Analyst: 60040

Source Info

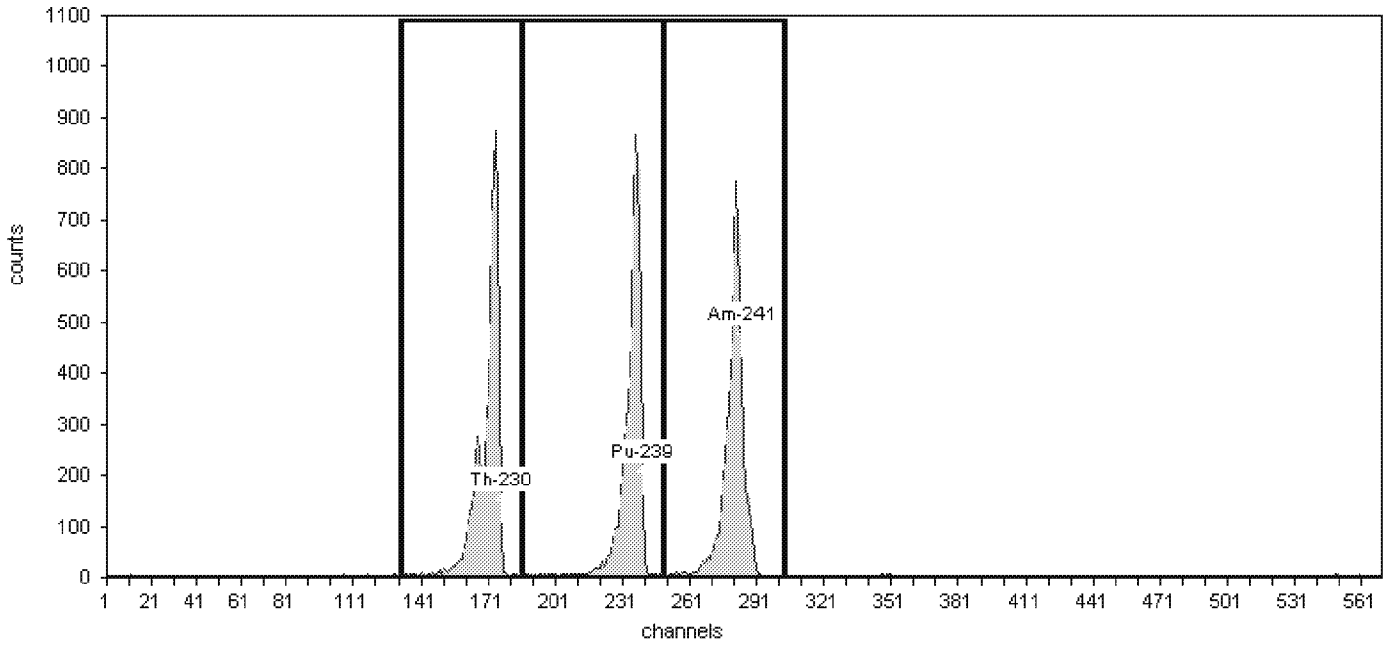
Certificate ID: 82244-334
Prepared by: Analytics

Certification Date: 6/9/2010 12:00:00PM
Description:

Acquisition

Detector: AV24 , SN: 47-137Q4
Acquisition Start Date: 11/12/2019 9:44:15AM
Live Time: 60.00 min.
Real Time: 60.25 min.
Efficiency: 22.47% +/- 0.39% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	5,919.00	98.65
Pu-239	240	5.16	186	249	0.00	5,471.00	91.18
Am-241	284	5.49	249	303	0.00	5,490.00	91.50

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:29:59PM 11/12/2019

Calibration

Sample Name: CCV-1370621;AV63-20191112
Description:
Detector: AV63

Calibration Date: 11/12/2019 12:29:47PM
Analyst: 60040

Source Info

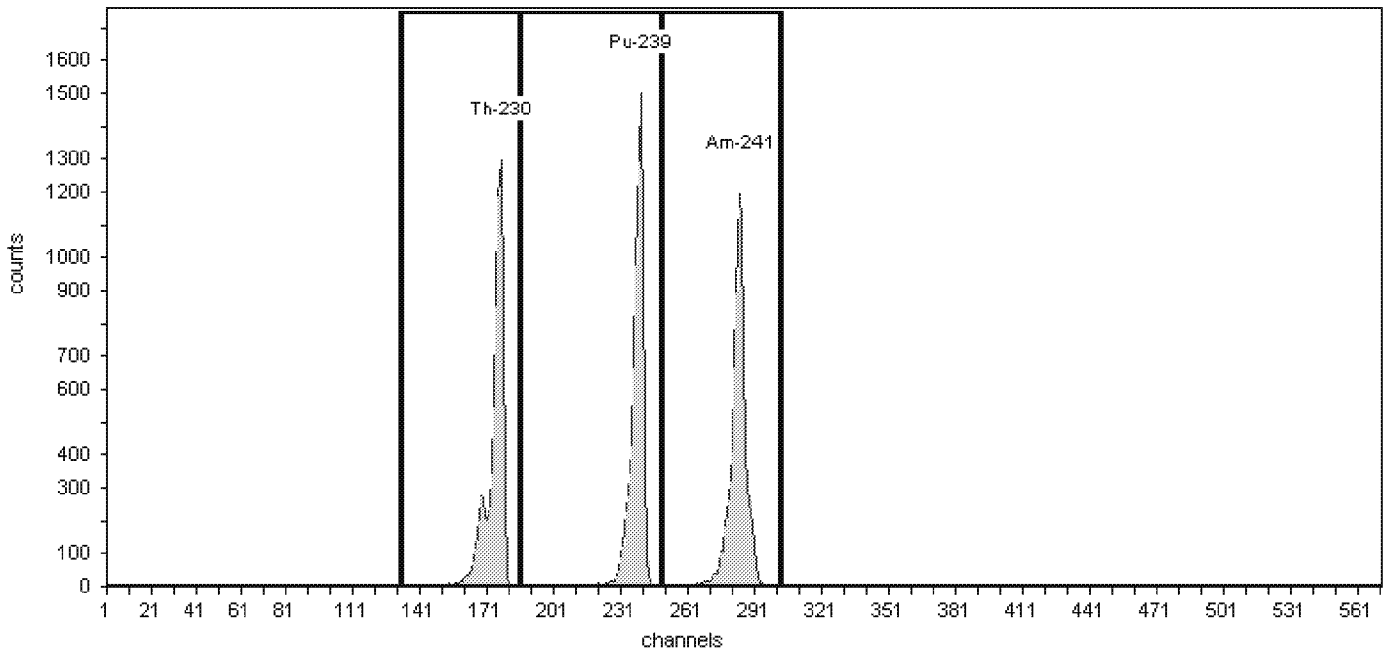
Certificate ID: 108345_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV63 , SN: 47-029ff2
Acquisition Start Date: 11/12/2019 7:53:03AM
Live Time: 60.00 min.
Real Time: 60.01 min.
Efficiency: 26.98% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	7,142.00	119.03
Pu-239	240	5.16	186	249	0.00	7,575.00	126.25
Am-241	284	5.49	249	303	0.00	7,540.00	125.67

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:12:25PM 11/12/2019

Calibration

Sample Name: CCV-1370621;AV63-20191112
Description:
Detector: AV63

Calibration Date: 11/12/2019 12:29:47PM
Analyst: 60040

Source Info

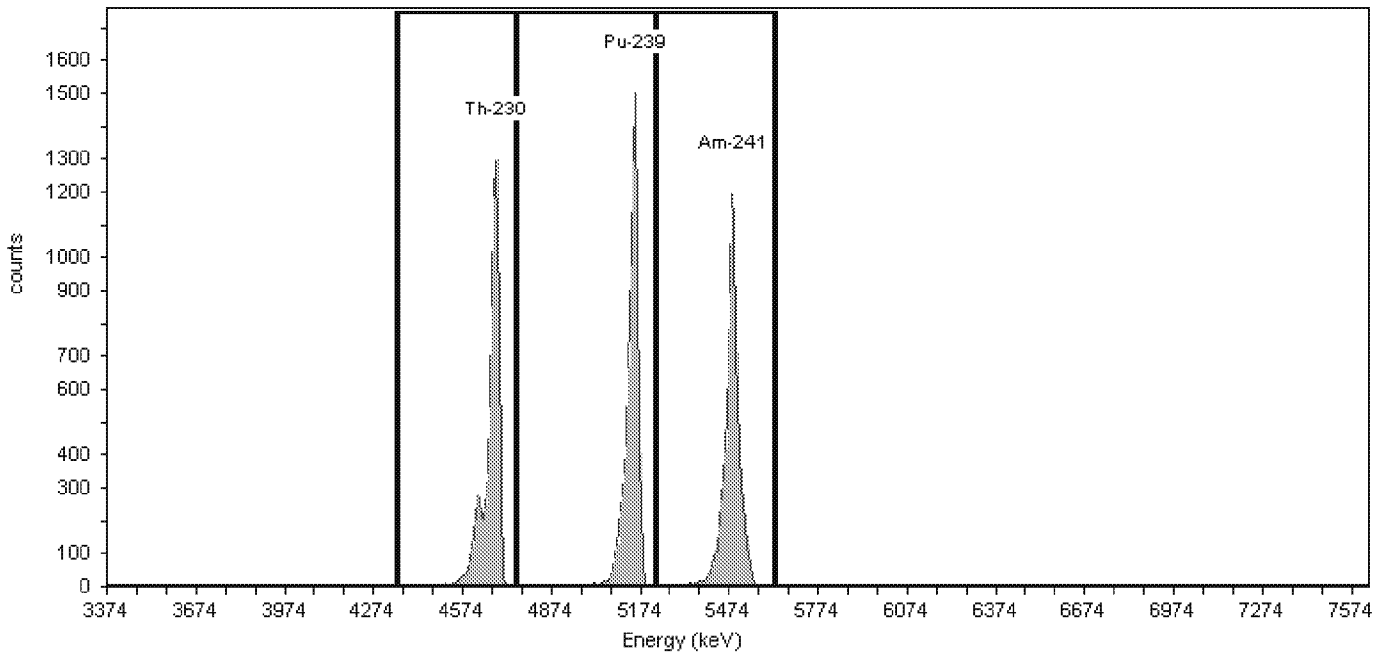
Certificate ID: 108345_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV63 , SN: 47-029ff2
Acquisition Start Date: 11/12/2019 7:53:03AM
Live Time: 60.00 min.
Real Time: 60.01 min.
Efficiency: 26.98% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	6,011.00	100.18
Pu-239	240	5.16	186	249	0.00	6,820.00	113.67
Am-241	284	5.49	249	303	0.00	7,120.00	118.67

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:14:35PM 11/12/2019

Calibration

Sample Name: CCV-1370621;AV63-20191112
Description:
Detector: AV63

Calibration Date: 11/12/2019 12:29:47PM
Analyst: 60040

Source Info

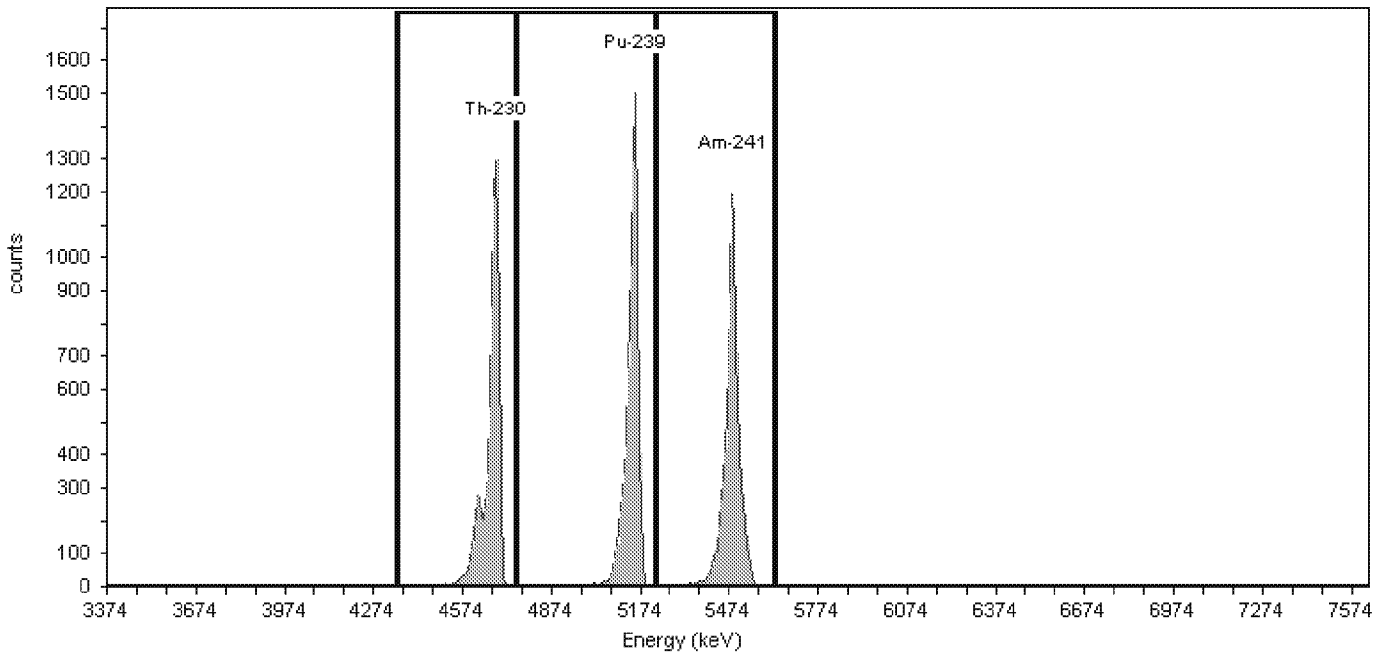
Certificate ID: 108345_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV63 , SN: 47-029ff2
Acquisition Start Date: 11/12/2019 7:53:03AM
Live Time: 60.00 min.
Real Time: 60.01 min.
Efficiency: 26.98% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	6,011.00	100.18
Pu-239	240	5.16	186	249	0.00	6,820.00	113.67
Am-241	284	5.49	249	303	0.00	7,120.00	118.67

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
2:17:50PM 12/4/2019

Calibration

Sample Name: CCV-1370622;AV80-20191108
Description:
Detector: AV80

Calibration Date: 11/8/2019 11:47:03AM
Analyst: 60040

Source Info

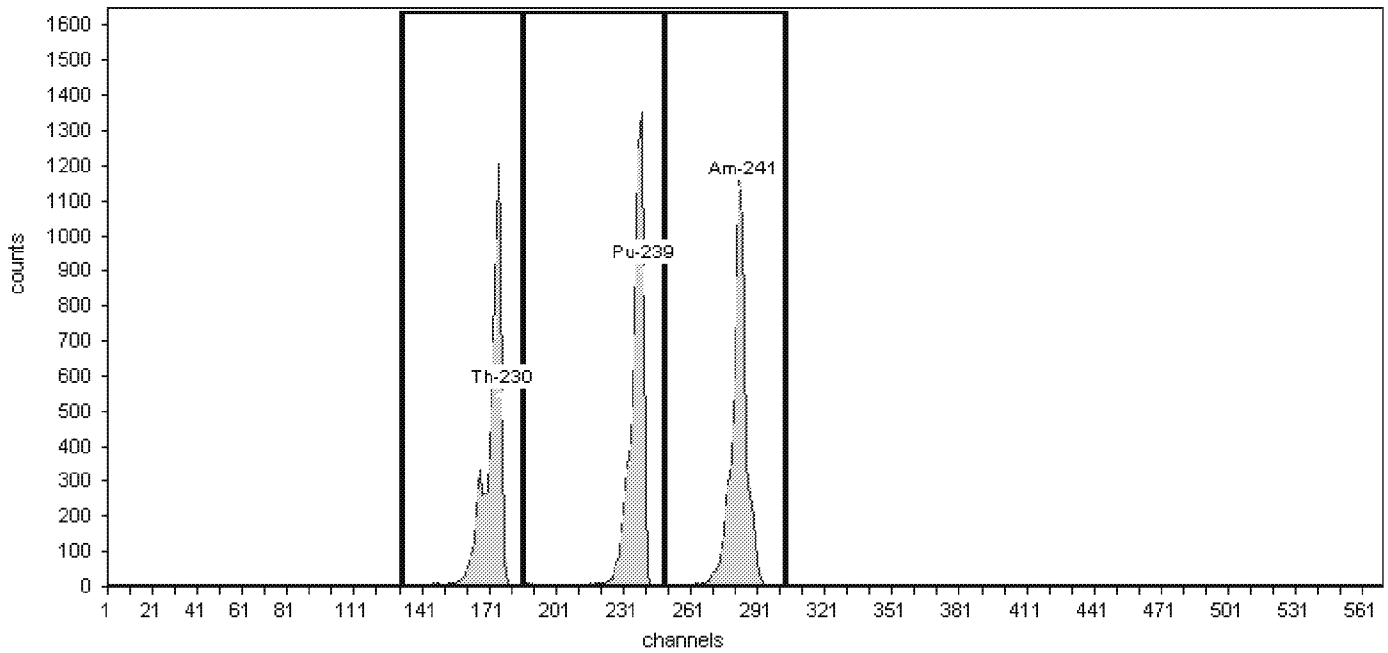
Certificate ID: 108346_00001
Prepared by: Eckert & Ziegler

Certification Date: 1/22/2018 11:00:00AM
Description:

Acquisition

Detector: AV80 , SN: 46-03305
Acquisition Start Date: 11/8/2019 10:38:49AM
Live Time: 60.00 min.
Real Time: 60.07 min.
Efficiency: 26.66% +/- 0.36% TPU(2 sigma)

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4.69	132	186	0.00	7,296.00	121.60
Pu-239	240	5.16	186	249	0.00	7,601.00	126.68
Am-241	284	5.49	249	303	0.00	7,560.00	126.00

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:15:57AM 11/7/2019

Calibration

Sample Name: CCV-1370619;AV214-20191107
Description:
Detector: AV214

Analyst: 60040
Analysis Date: 11/7/2019 9:15:55AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108347_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/23/2018 12:00:00PM

Acquisition

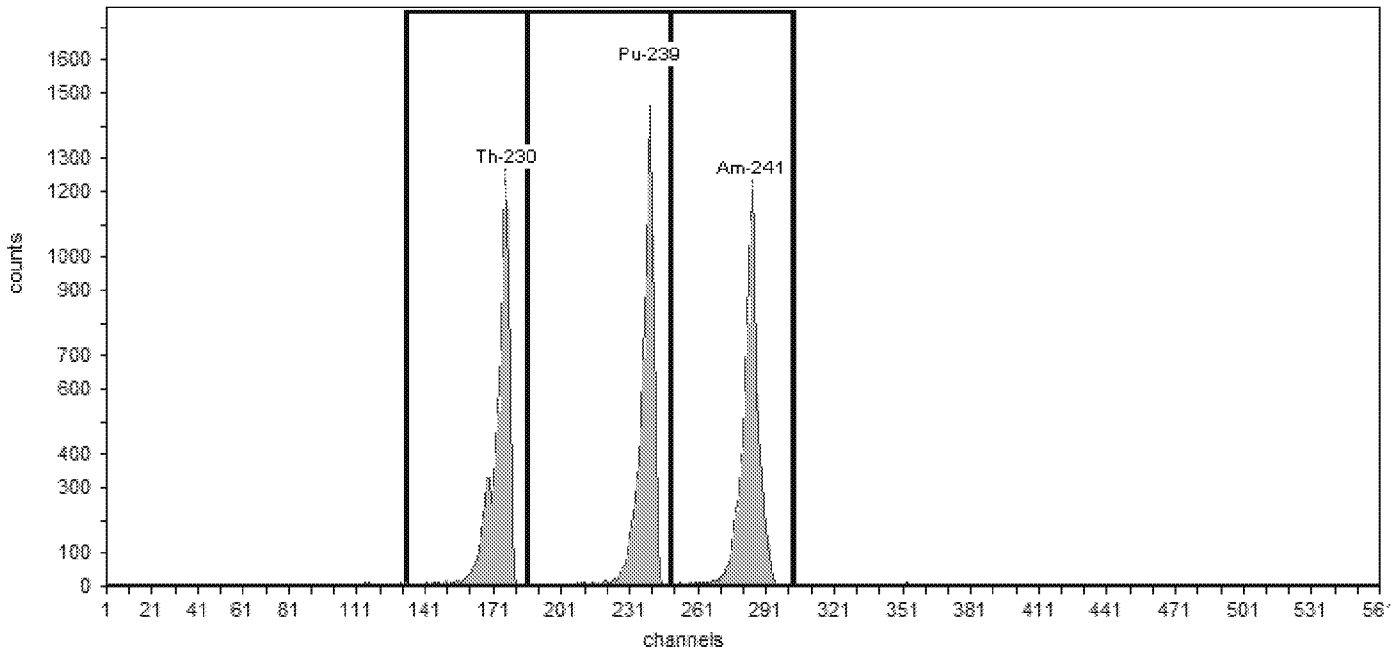
Detector: AV214 , SN: 5507304
Acquisition Start Date: 11/7/2019 8:14:30AM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: CCV-1370619;AV214-201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.06% +/- 0.35% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	32.70	8,203.00	136.72
Pu-239	240	5,155.40	186	249	33.15	8,226.00	137.10
Am-241	284	5,485.70	249	303	35.30	8,591.00	143.18

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:16:10AM 11/7/2019

Calibration

Sample Name: CCV-1370620;AV215-20191107
Description:
Detector: AV215

Analyst: 60040
Analysis Date: 11/7/2019 9:16:09AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108348_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/23/2018 12:00:00PM

Acquisition

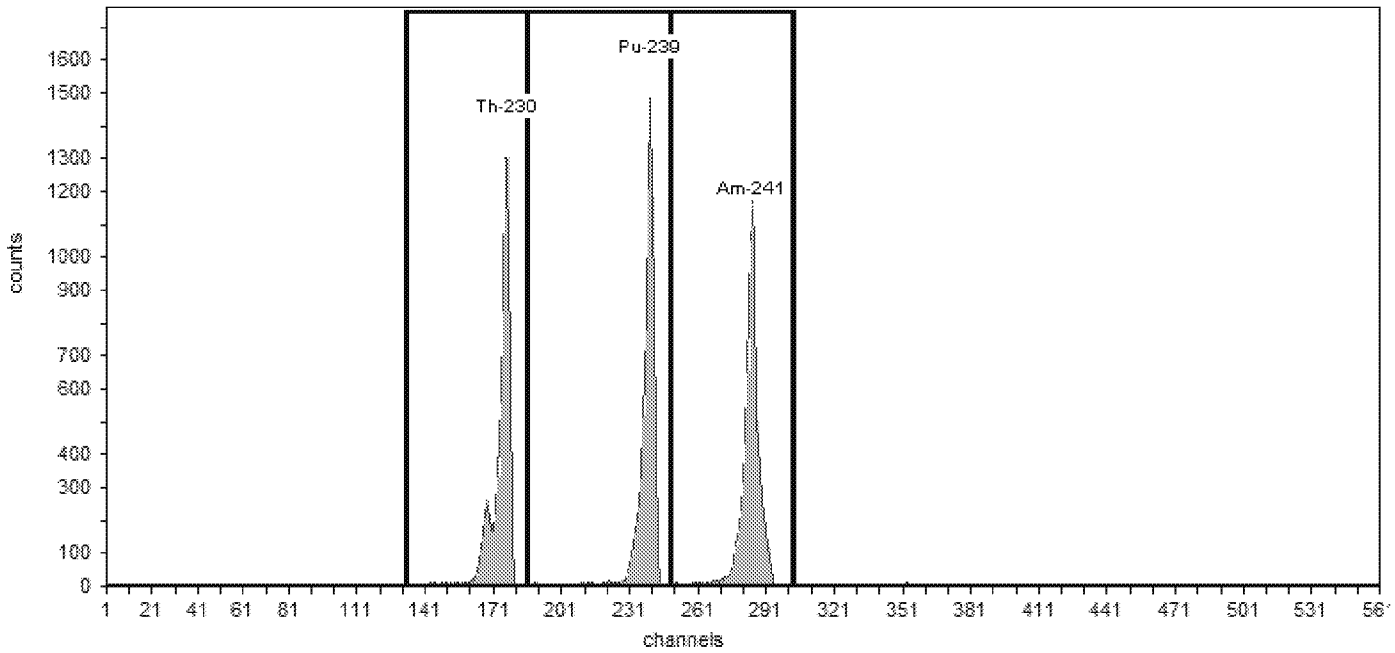
Detector: AV215 , SN: 50-119J4
Acquisition Start Date: 11/7/2019 8:14:54AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-1370620;AV215-201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.98% +/- 0.37% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	27.65	6,810.00	113.50
Pu-239	240	5,155.40	186	249	27.84	6,956.00	115.93
Am-241	284	5,485.70	249	303	28.71	7,125.00	118.75

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THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:16:20AM 11/7/2019

Calibration

Sample Name: CCV-7107;AV216-20191107
Description:
Detector: AV216

Analyst: 60040
Analysis Date: 11/7/2019 9:16:13AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82232-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

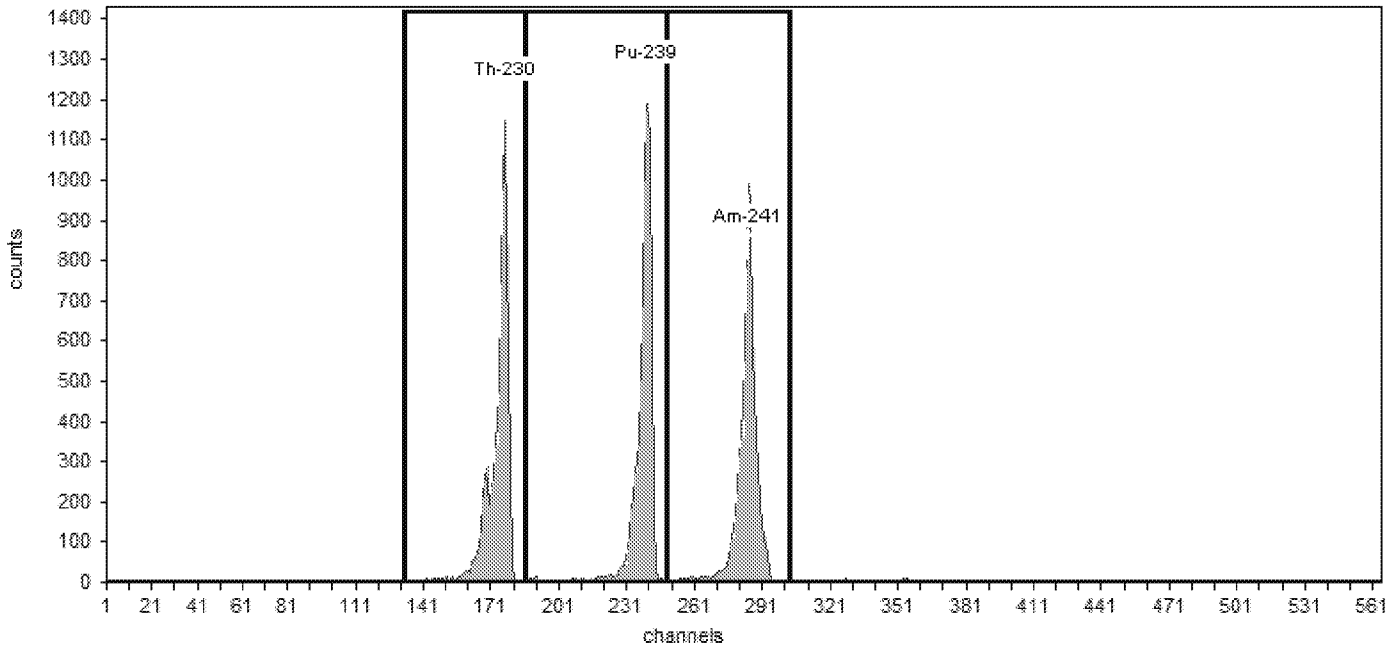
Detector: AV216 , SN: 50-117J5
Acquisition Start Date: 11/7/2019 8:16:00AM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: CCV-7107;AV216-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.44% +/- 0.40% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	30.52	6,789.00	113.15
Pu-239	240	5,155.40	186	249	33.75	6,763.00	112.72
Am-241	284	5,485.70	249	303	34.66	6,568.00	109.47

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:16:38AM 11/7/2019

Calibration

Sample Name: CCV-8874;AV217-20191107
Description:
Detector: AV217

Analyst: 60040
Analysis Date: 11/7/2019 9:16:37AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82233-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

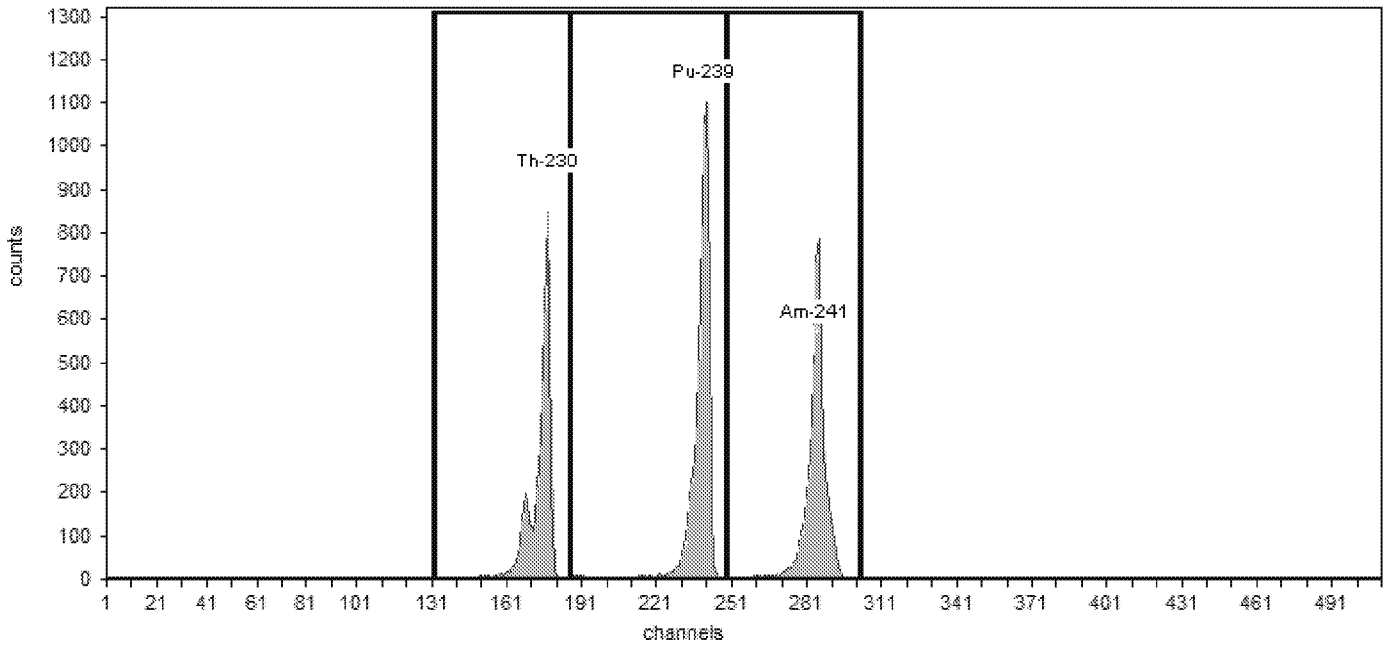
Detector: AV217 , SN: 50-117I2
Acquisition Start Date: 11/7/2019 8:16:32AM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: CCV-8874;AV217-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.03% +/- 0.49% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	27.74	4,461.00	74.35
Pu-239	240	5,155.40	186	249	30.60	5,808.00	96.80
Am-241	284	5,485.70	249	303	31.21	4,782.00	79.70

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:17:33AM 11/7/2019

Calibration

Sample Name: CCV-8877;AV218-20191107
Description:
Detector: AV218

Analyst: 60040
Analysis Date: 11/7/2019 9:17:25AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82236-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

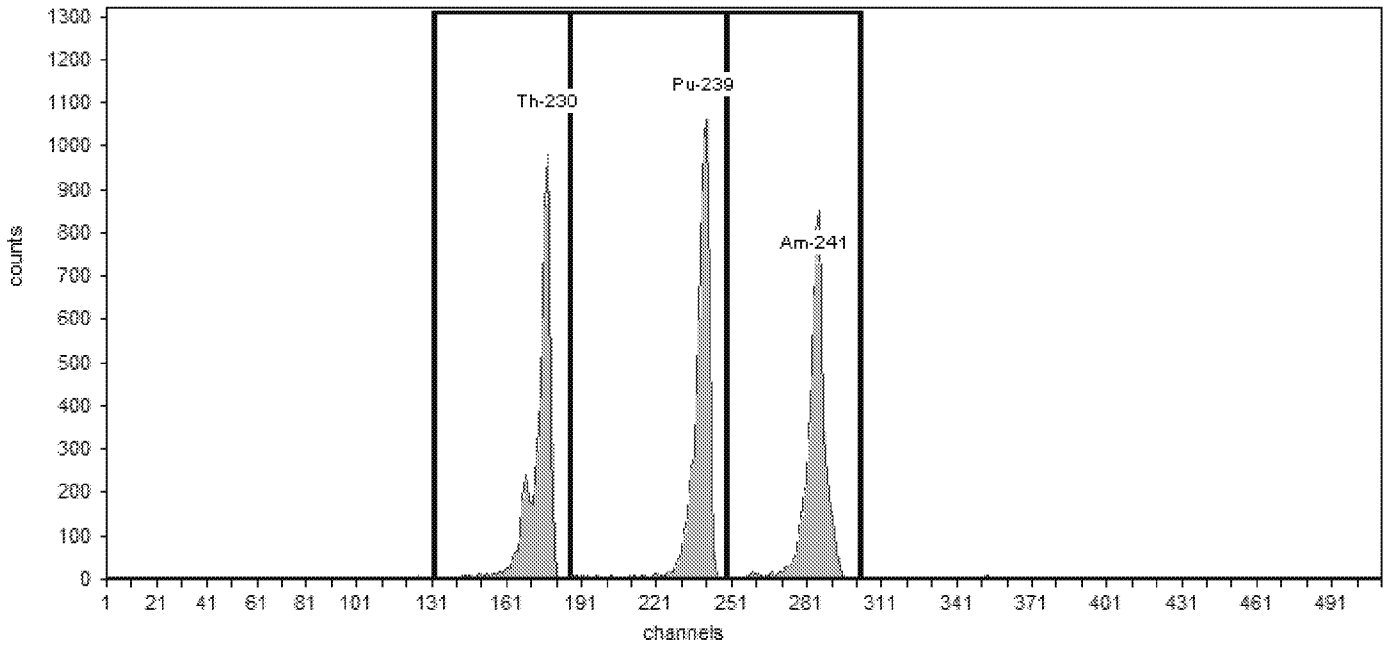
Detector: AV218 , SN: 50-117Z7
Acquisition Start Date: 11/7/2019 8:16:59AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8877;AV218-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.37% +/- 0.40% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	31.59	6,008.00	100.13
Pu-239	240	5,155.40	186	249	35.17	6,262.00	104.37
Am-241	284	5,485.70	249	303	37.24	5,828.00	97.13

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:19:09AM 11/7/2019

Calibration

Sample Name: CCV-9793;AV221-20191107
Description:
Detector: AV221

Analyst: 60040
Analysis Date: 11/7/2019 9:19:08AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82241-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

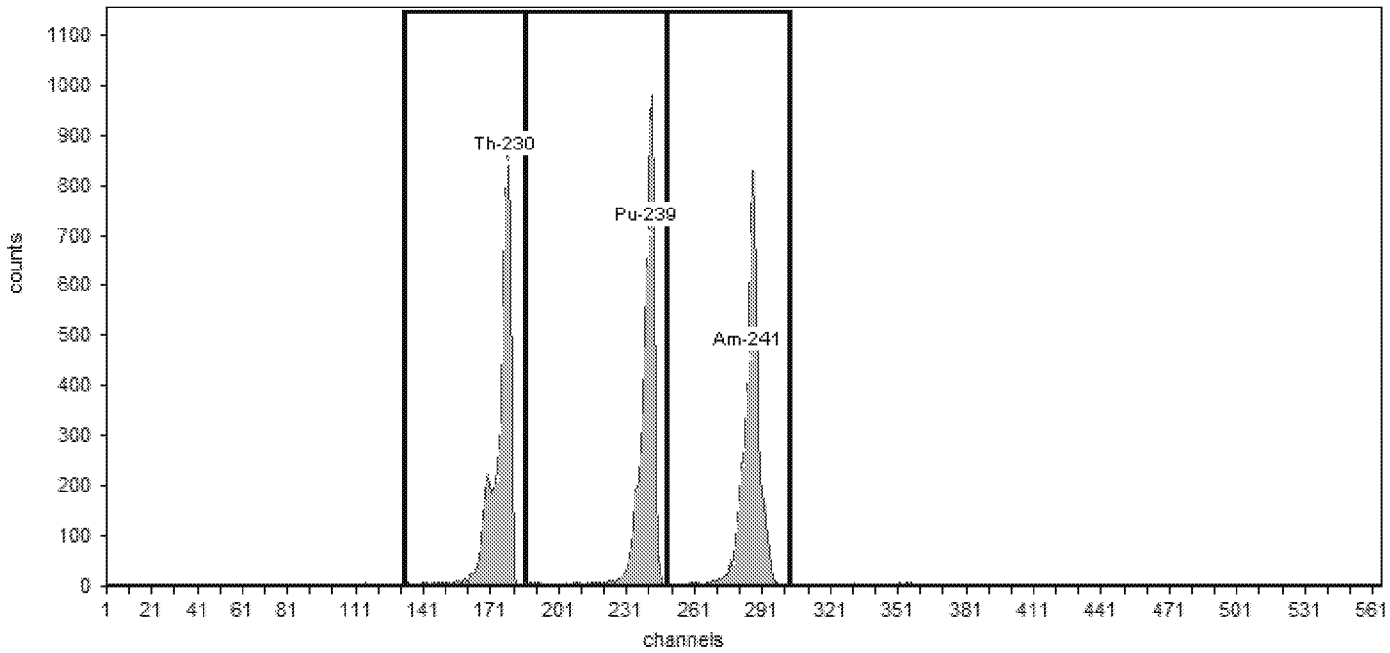
Detector: AV221 , SN: 50-117H5
Acquisition Start Date: 11/7/2019 8:18:53AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9793;AV221-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.50% +/- 0.39% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	30.55	5,443.00	90.72
Pu-239	240	5,155.40	186	249	32.81	5,469.00	91.15
Am-241	284	5,485.70	249	303	33.34	5,268.00	87.80

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:20:23AM 11/7/2019

Calibration

Sample Name: CCV-9817;AV223-20191107
Description:
Detector: AV223

Analyst: 60040
Analysis Date: 11/7/2019 9:20:21AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82244-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

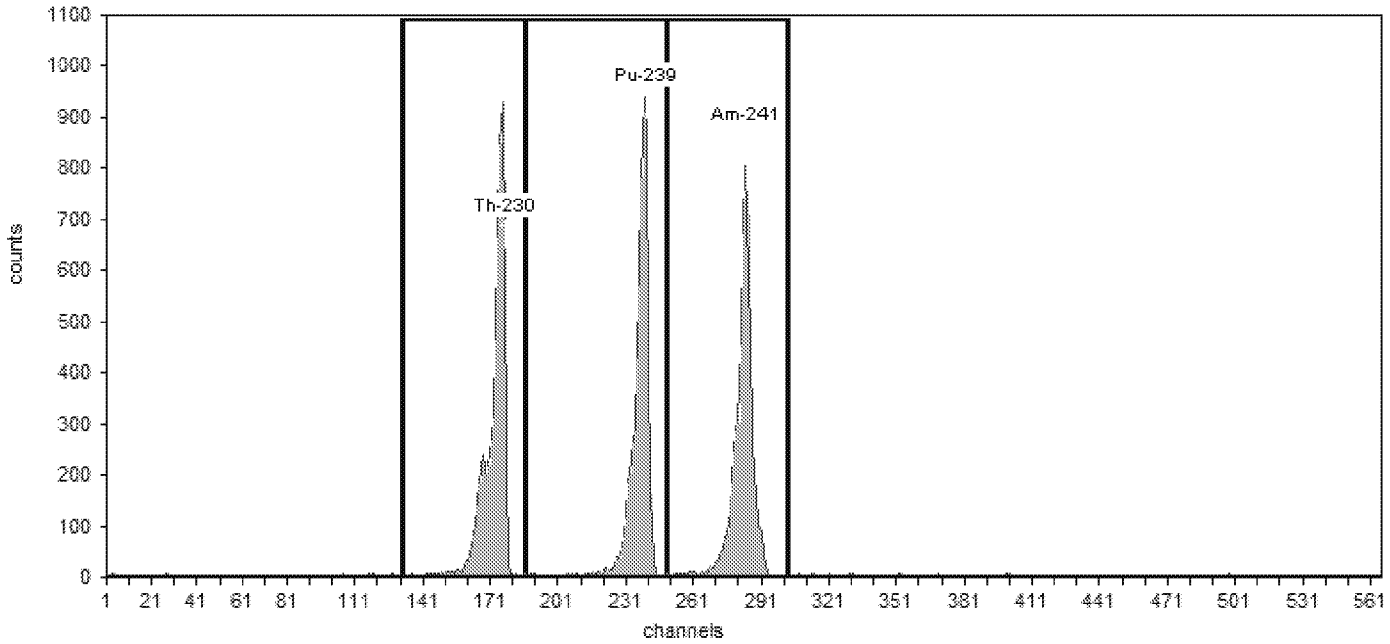
Detector: AV223 , SN: 49-037X6
Acquisition Start Date: 11/7/2019 8:20:06AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9817;AV223-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.81% +/- 0.39% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	32.81	5,953.00	99.22
Pu-239	240	5,155.40	186	249	34.66	5,637.00	93.95
Am-241	284	5,485.70	249	303	34.69	5,558.00	92.63

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
9:20:47AM 11/7/2019

Calibration

Sample Name: CCV-9885;AV224-20191107
Description:
Detector: AV224

Analyst: 60040
Analysis Date: 11/7/2019 9:20:46AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82246-334
Prepared by: Analytics
Description:

Certification Date: 6/9/2010 12:00:00PM

Acquisition

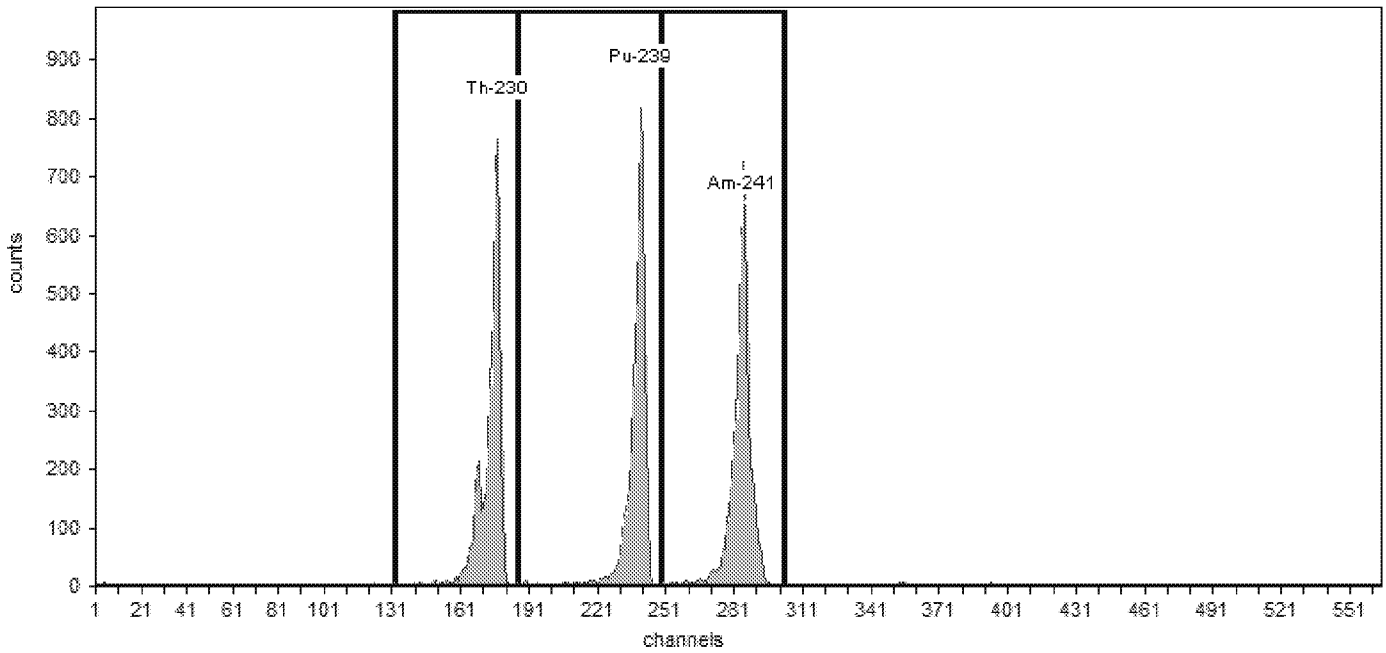
Detector: AV224 , SN: 50-119AA5
Acquisition Start Date: 11/7/2019 8:20:41AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9885;AV224-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.62% +/- 0.46% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	31.61	4,726.00	78.77
Pu-239	240	5,155.40	186	249	33.44	4,578.00	76.30
Am-241	284	5,485.70	249	303	35.02	5,017.00	83.62

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:40:19AM 11/7/2019

Calibration

Sample Name: CCV-1368446;AV225-20191107
Description:
Detector: AV225

Analyst: 60040
Analysis Date: 11/7/2019 10:40:01AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108001_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 12/6/2017 12:00:00PM

Acquisition

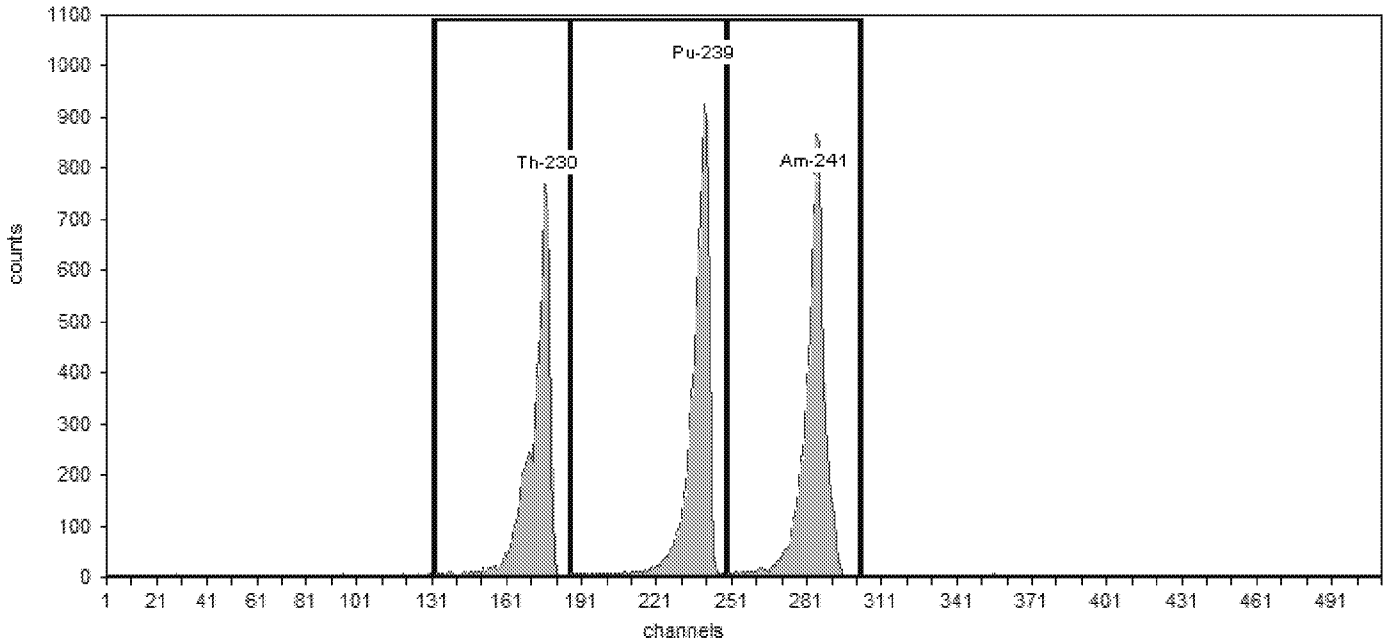
Detector: AV225 , SN: 50-117J7
Acquisition Start Date: 11/7/2019 9:34:41AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-1368446;AV225-201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.44% +/- 0.39% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	41.58	5,972.00	99.53
Pu-239	240	5,155.40	186	249	43.09	6,728.00	112.13
Am-241	284	5,485.70	249	303	41.84	6,992.00	116.53

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:40:53AM 11/7/2019

Calibration

Sample Name: CCV-1370621;AV227-20191107
Description:
Detector: AV227

Analyst: 60040
Analysis Date: 11/7/2019 10:40:51AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108345_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/22/2018 12:00:00PM

Acquisition

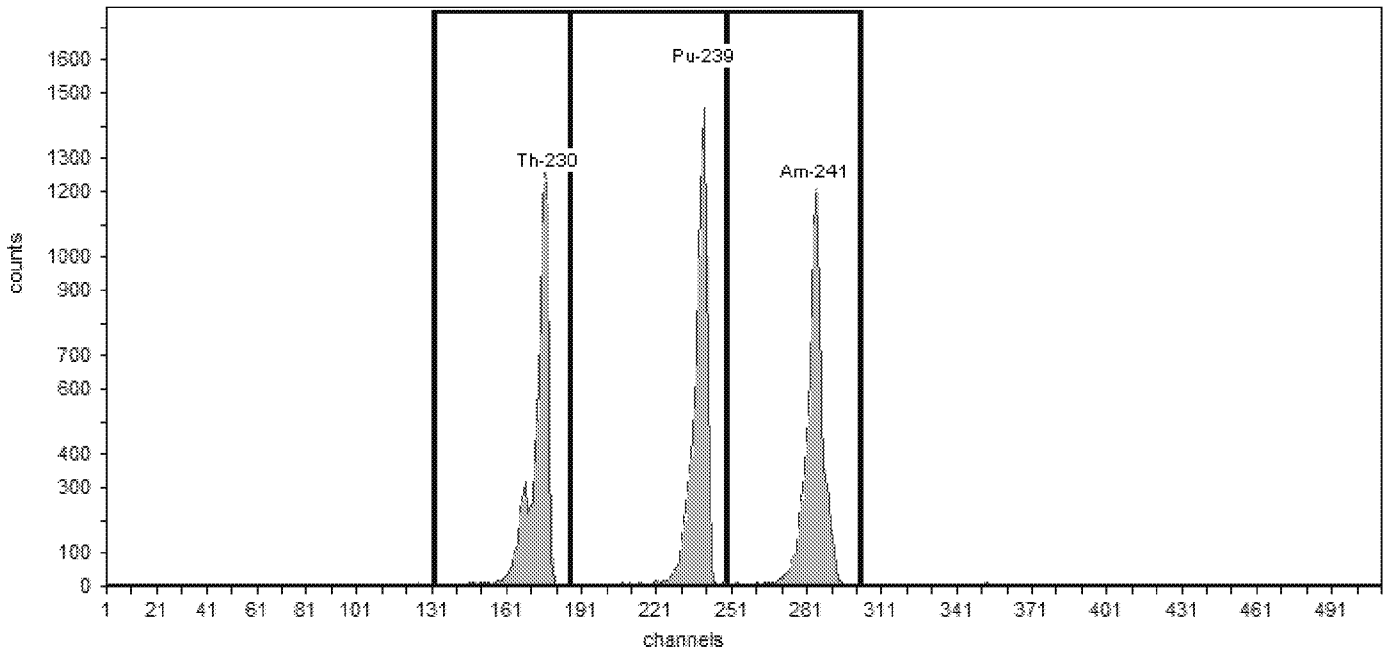
Detector: AV227 , SN: 50-120DD5
Acquisition Start Date: 11/7/2019 9:35:55AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-1370621;AV227-201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.77% +/- 0.37% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	31.50	7,685.00	128.08
Pu-239	240	5,155.40	186	249	31.56	8,025.00	133.75
Am-241	284	5,485.70	249	303	33.77	8,019.00	133.65

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:42:07AM 11/7/2019

Calibration

Sample Name: CCV-1370622;AV228-20191107
Description:
Detector: AV228

Analyst: 60040
Analysis Date: 11/7/2019 10:42:04AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108346_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/22/2018 12:00:00PM

Acquisition

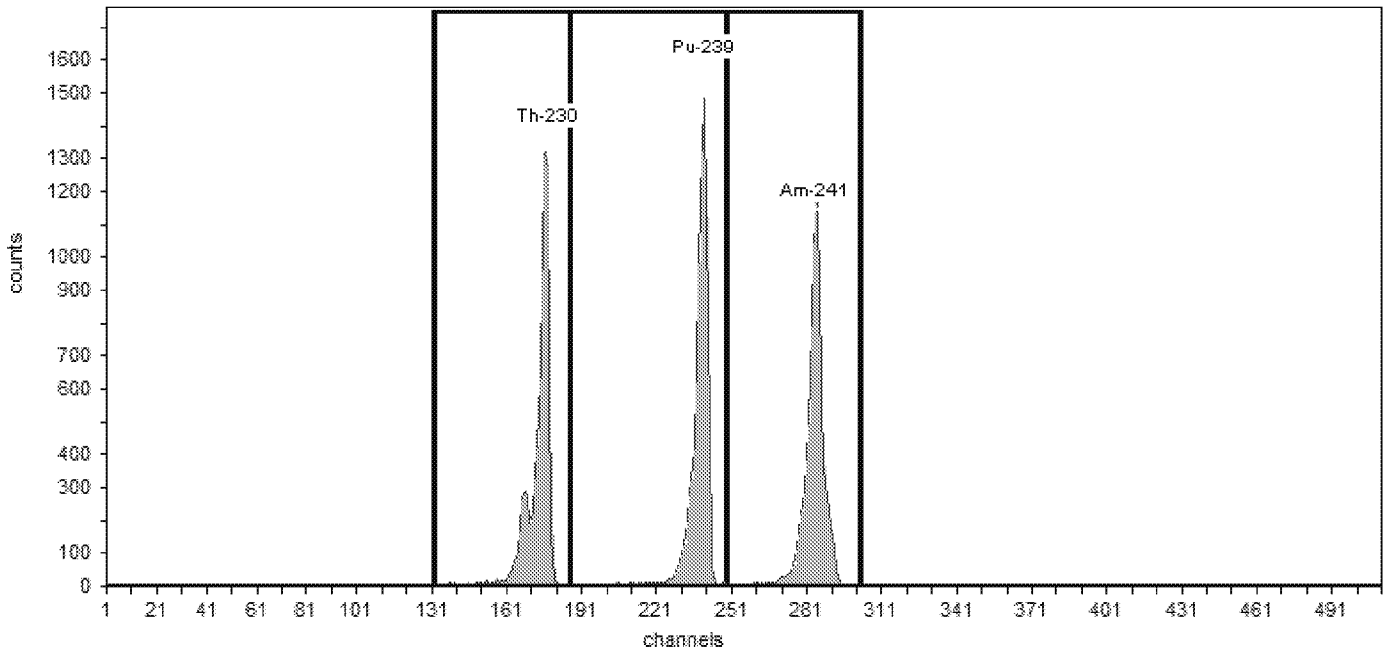
Detector: AV228 , SN: 51-005Q6
Acquisition Start Date: 11/7/2019 9:36:26AM

Live Time: 60.00 min.
Real Time: 60.02 min.

Efficiency Calibration Name: CCV-1370622;AV228-201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.33% +/- 0.36% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	29.23	7,523.00	125.38
Pu-239	240	5,155.40	186	249	31.71	7,784.00	129.73
Am-241	284	5,485.70	249	303	33.08	7,716.00	128.60

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:42:21AM 11/7/2019

Calibration

Sample Name: CCV-1370619;AV229-20191107
Description:
Detector: AV229

Analyst: 60040
Analysis Date: 11/7/2019 10:42:18AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108347_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/23/2018 12:00:00PM

Acquisition

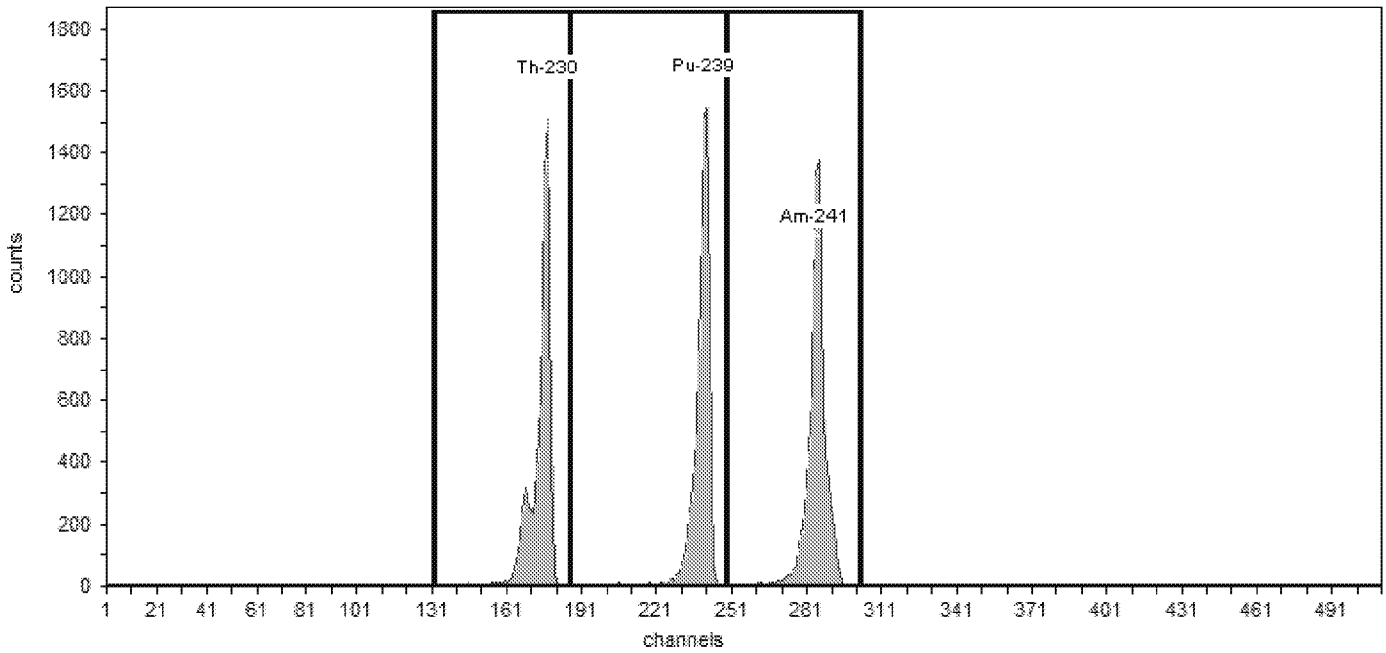
Detector: AV229 , SN: 51-005EE4
Acquisition Start Date: 11/7/2019 9:36:55AM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: CCV-1370619;AV229-201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.25% +/- 0.36% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	29.22	8,231.00	137.18
Pu-239	240	5,155.40	186	249	31.42	8,186.00	136.43
Am-241	284	5,485.70	249	303	33.33	8,768.00	146.13

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:42:37AM 11/7/2019

Calibration

Sample Name: CCV-1370620;AV230-20191107
Description:
Detector: AV230

Analyst: 60040
Analysis Date: 11/7/2019 10:42:34AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108348_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/23/2018 12:00:00PM

Acquisition

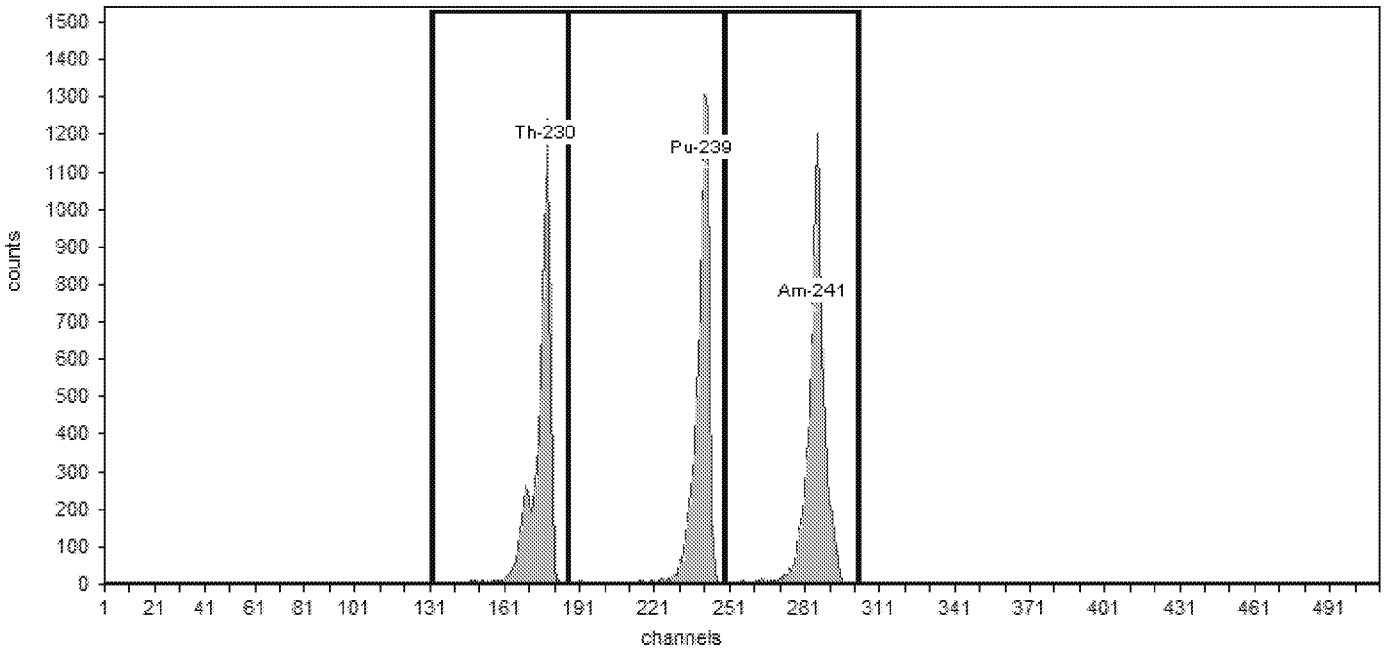
Detector: AV230 , SN: 49-045J5
Acquisition Start Date: 11/7/2019 9:37:20AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-1370620;AV230-201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.48% +/- 0.38% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	29.26	6,872.00	114.53
Pu-239	240	5,155.40	186	249	31.32	7,018.00	116.97
Am-241	284	5,485.70	249	303	32.28	7,384.00	123.07

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:43:10AM 11/7/2019

Calibration

Sample Name: CCV-8874;AV232-20191107
Description:
Detector: AV232

Analyst: 60040
Analysis Date: 11/7/2019 10:42:59AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82233-334
Prepared by: Analytics
Description:

Certification Date: 6/3/2010 12:00:00PM

Acquisition

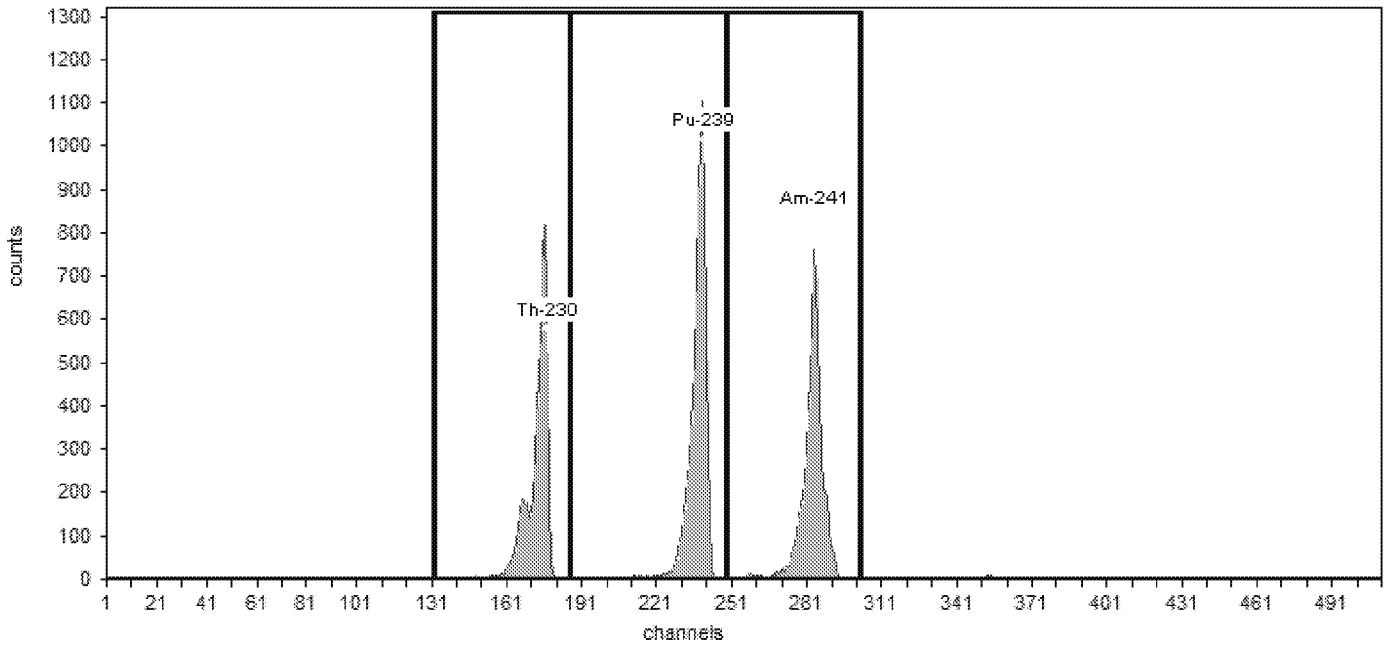
Detector: AV232 , SN: 46-033p2
Acquisition Start Date: 11/7/2019 9:38:35AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8874;AV232-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.47% +/- 0.51% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	31.21	4,818.00	80.30
Pu-239	240	5,155.40	186	249	33.59	6,103.00	101.72
Am-241	284	5,485.70	249	303	33.14	4,953.00	82.55

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:43:22AM 11/7/2019

Calibration

Sample Name: CCV-8877;AV233-20191107
Description:
Detector: AV233

Analyst: 60040
Analysis Date: 11/7/2019 10:43:19AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82236-334
Prepared by: Analytics
Description:

Certification Date: 6/2/2010 12:00:00PM

Acquisition

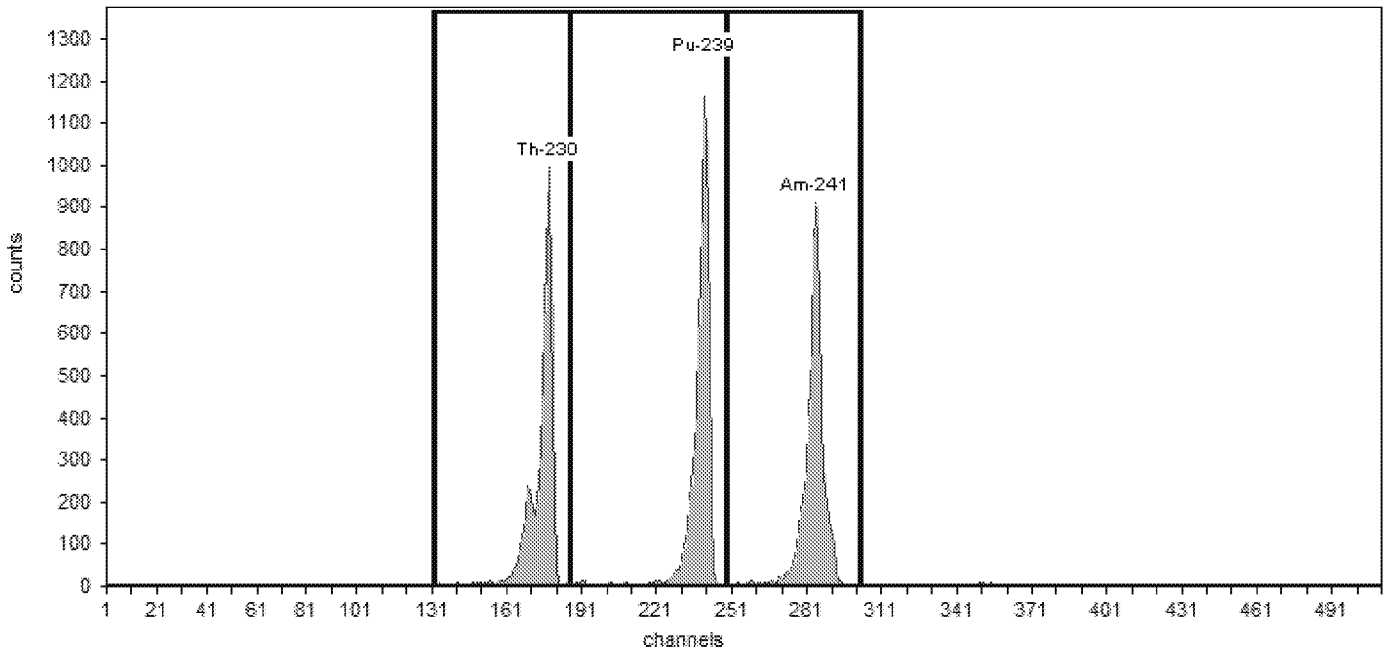
Detector: AV233 , SN: 51-005Q7
Acquisition Start Date: 11/7/2019 9:39:06AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-8877;AV233-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.08% +/- 0.40% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	30.86	5,838.00	97.30
Pu-239	240	5,155.40	186	249	31.52	6,213.00	103.55
Am-241	284	5,485.70	249	303	33.33	5,843.00	97.38

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
10:43:33AM 11/7/2019

Calibration

Sample Name: CCV-9520;AV234-20191107
Description:
Detector: AV234

Analyst: 60040
Analysis Date: 11/7/2019 10:43:31AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82237-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

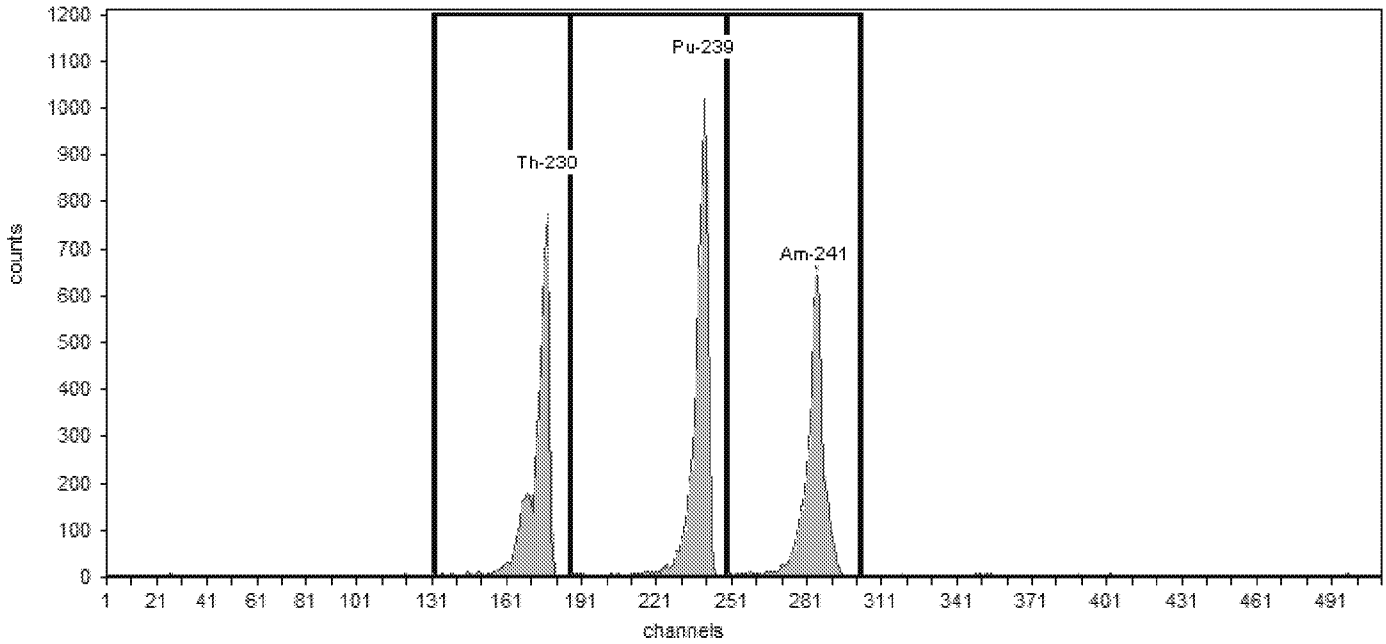
Detector: AV234 , SN: 51-005P2
Acquisition Start Date: 11/7/2019 9:39:48AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9520;AV234-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.36% +/- 0.44% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	33.45	4,763.00	79.38
Pu-239	240	5,155.40	186	249	32.51	5,620.00	93.67
Am-241	284	5,485.70	249	303	33.68	4,597.00	76.62

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:38:37PM 11/7/2019

Calibration

Sample Name: CCV-1368447;AV241-20191107
Description:
Detector: AV241

Analyst: 60040
Analysis Date: 11/7/2019 12:38:36PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108002_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 12/1/2017 12:00:00PM

Acquisition

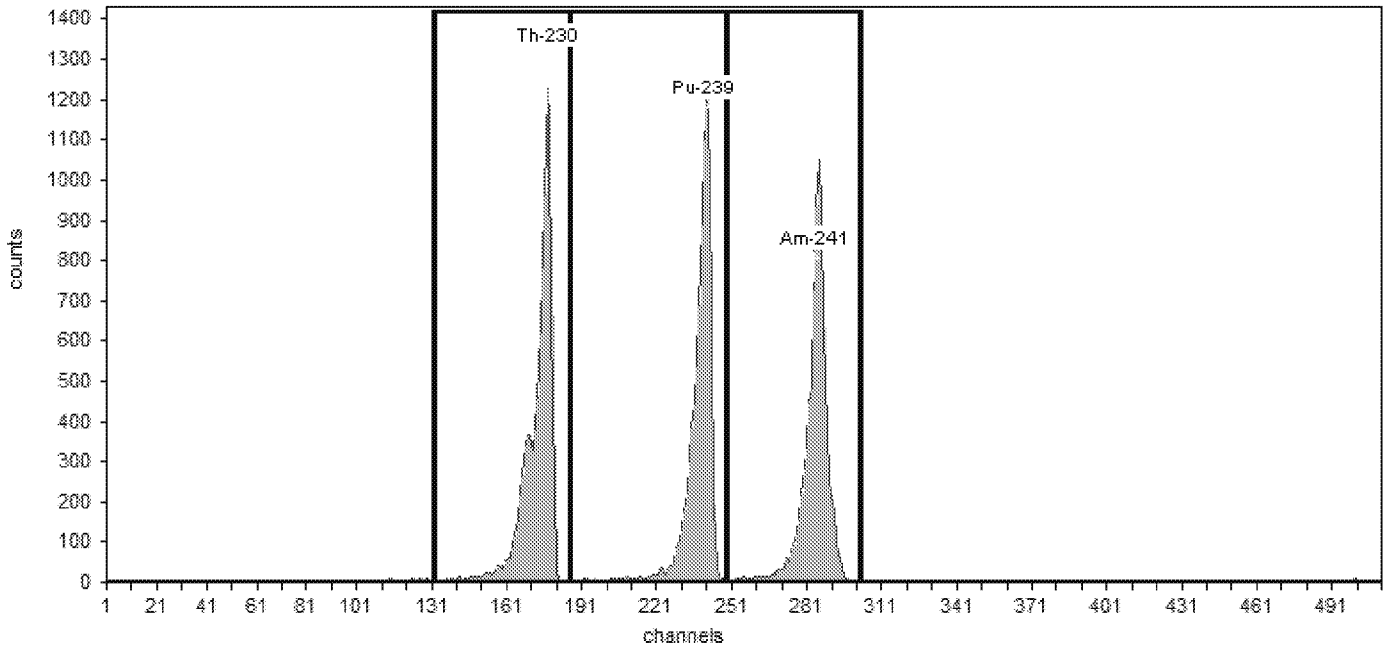
Detector: AV241 , SN: 52-059DD3
Acquisition Start Date: 11/7/2019 10:57:09AM

Live Time: 60.00 min.
Real Time: 60.01 min.

Efficiency Calibration Name: CCV-1368447;AV241-201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.55% +/- 0.34% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	38.12	9,172.00	152.87
Pu-239	240	5,155.40	186	249	40.73	8,525.00	142.08
Am-241	284	5,485.70	249	303	38.84	8,030.00	133.83

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:38:52PM 11/7/2019

Calibration

Sample Name: CCV-1370622;AV243-20191107
Description:
Detector: AV243

Analyst: 60040
Analysis Date: 11/7/2019 12:38:51PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 108346_00001
Prepared by: Eckert & Ziegler
Description:

Certification Date: 1/22/2018 12:00:00PM

Acquisition

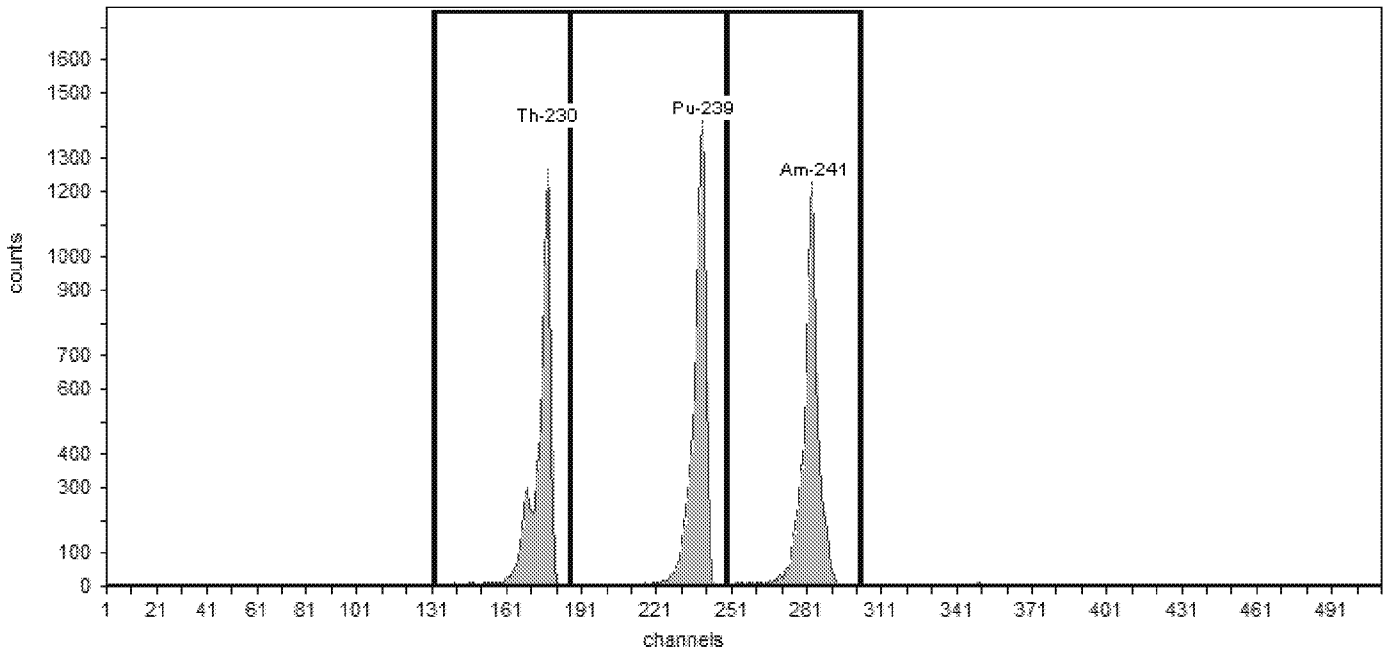
Detector: AV243 , SN: 51-005P6
Acquisition Start Date: 11/7/2019 10:58:04AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-1370622;AV243-201

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.60% +/- 0.36% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	28.61	7,196.00	119.93
Pu-239	240	5,155.40	186	249	30.73	7,619.00	126.98
Am-241	284	5,485.70	249	303	30.60	7,591.00	126.52

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:39:46PM 11/7/2019

Calibration

Sample Name: CCV-9520;AV249-20191107
Description:
Detector: AV249

Analyst: 60040
Analysis Date: 11/7/2019 12:39:44PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82237-334
Prepared by: Analytics
Description:

Certification Date: 6/1/2010 12:00:00PM

Acquisition

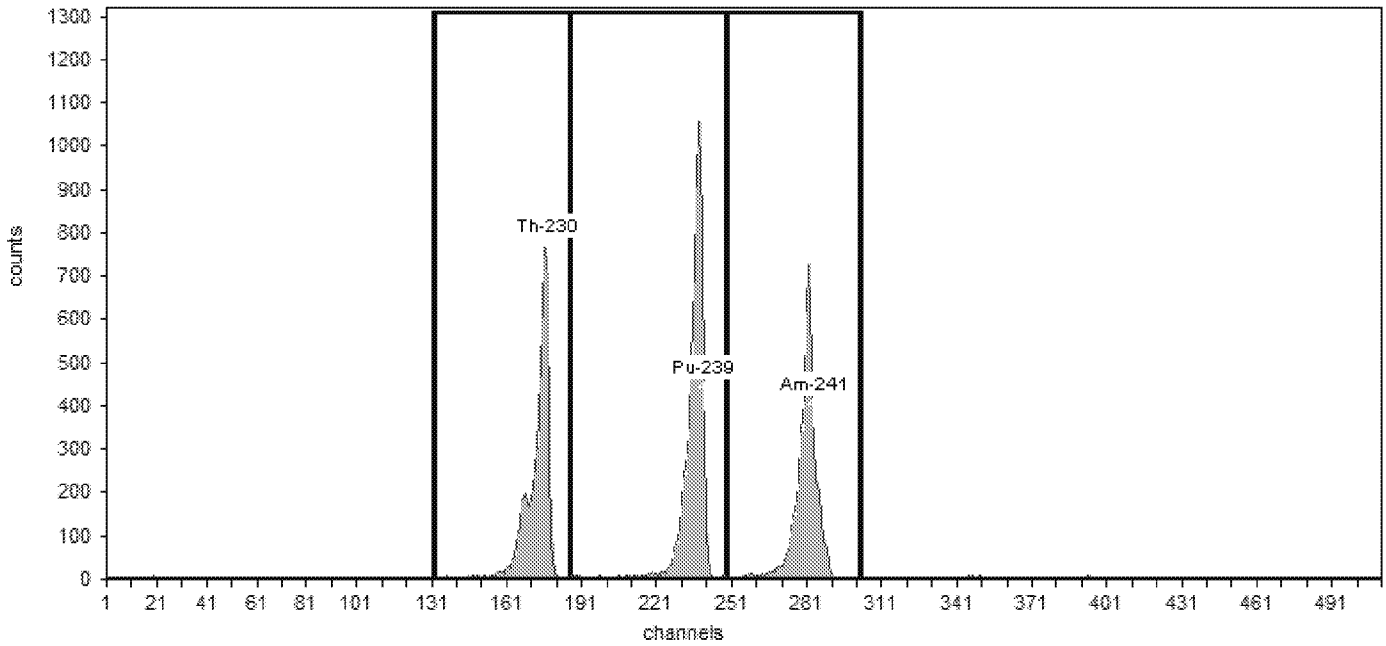
Detector: AV249 , SN: 51-005EE5
Acquisition Start Date: 11/7/2019 11:00:52AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9520;AV249-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.14% +/- 0.45% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	31.72	4,839.00	80.65
Pu-239	240	5,155.40	186	249	33.60	5,987.00	99.78
Am-241	284	5,485.70	249	303	33.38	4,682.00	78.03

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Calibration Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
12:39:54PM 11/7/2019

Calibration

Sample Name: CCV-9792;AV250-20191107
Description:
Detector: AV250

Analyst: 60040
Analysis Date: 11/7/2019 12:39:53PM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: 82240-334
Prepared by: Analytics
Description:

Certification Date: 6/8/2010 12:00:00PM

Acquisition

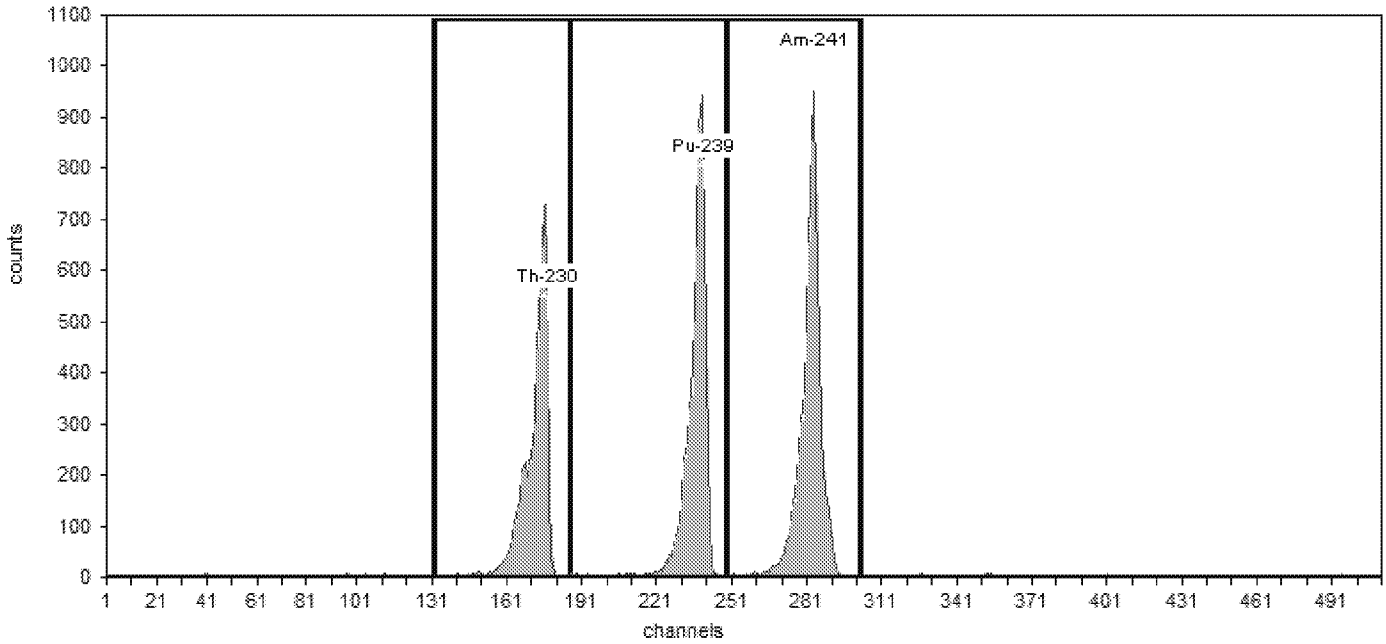
Detector: AV250 , SN: 47-052x7
Acquisition Start Date: 11/7/2019 11:01:22AM

Live Time: 60.00 min.
Real Time: 60.00 min.

Efficiency Calibration Name: CCV-9792;AV250-201911(

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.11% +/- 0.38% TPU(2 sigma)



General Analysis

Method: Manual (ROI)
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy keV	ROI Start Channel	ROI End Channel	Peak FWHM keV	Gross Counts	Net Count Rate (cpm)
Th-230	177	4,687.50	132	186	37.05	5,204.00	86.73
Pu-239	240	5,155.40	186	249	37.24	6,036.00	100.60
Am-241	284	5,485.70	249	303	37.05	6,767.00	112.78

Monthly Backgrounds

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:00:28PM 11/19/2019

Sample

Sample Name: ICB;AV1
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

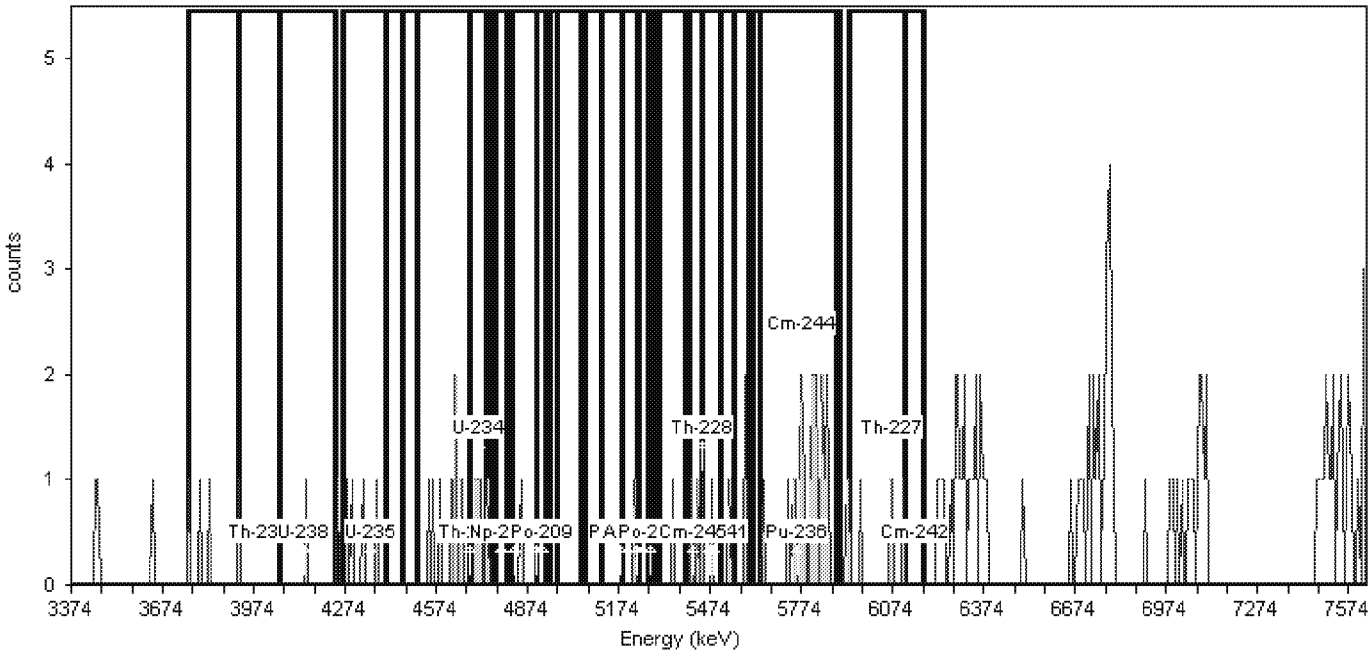
Analyst: 60040

Acquisition

Detector: AV1 , SN: 49-188 AA4
Acquisition Start Date: 11/13/2019 1:56:34PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-7107;AV1-05142018
Calibration Date: 5/14/2018 6:23:45PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.36% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 147.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	4.00	4.167E-003	2.329E-003
U-238	4.14	3.92	4.24	2.00	2.083E-003	1.804E-003
U-235	4.36	4.26	4.46	4.00	4.167E-003	2.329E-003
Th-230	4.68	4.40	4.75	12.00	1.250E-002	3.756E-003
U-234	4.71	4.51	4.82	12.00	1.250E-002	3.756E-003
Pu-242	4.90	4.68	4.95	5.00	5.208E-003	2.552E-003
Th-229	4.83	4.74	5.12	2.00	2.083E-003	1.804E-003
Np-237	4.78	4.77	4.81	0.00	0.000E+000	1.473E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	1.00	1.042E-003	1.473E-003
Am-243	5.23	5.05	5.31	1.00	1.042E-003	1.473E-003
U-232	5.25	5.06	5.40	2.00	2.083E-003	1.804E-003
Th-228	5.45	5.19	5.51	6.00	6.250E-003	2.756E-003
Po-210	5.28	5.23	5.29	0.00	0.000E+000	1.473E-003
Pu-238	5.47	5.27	5.55	6.00	6.250E-003	2.756E-003
Am-241	5.48	5.30	5.60	8.00	8.333E-003	3.125E-003
Cm-245	5.42	5.40	5.45	3.00	3.125E-003	2.083E-003
Pu-236	5.76	5.61	5.89	20.00	2.083E-002	4.774E-003
Cm-244	5.78	5.64	5.90	20.00	2.083E-002	4.774E-003
Th-227	6.07	5.93	6.18	5.00	5.208E-003	2.552E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
1:00:45PM 11/19/2019

Sample

Sample Name: ICB;AV3
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

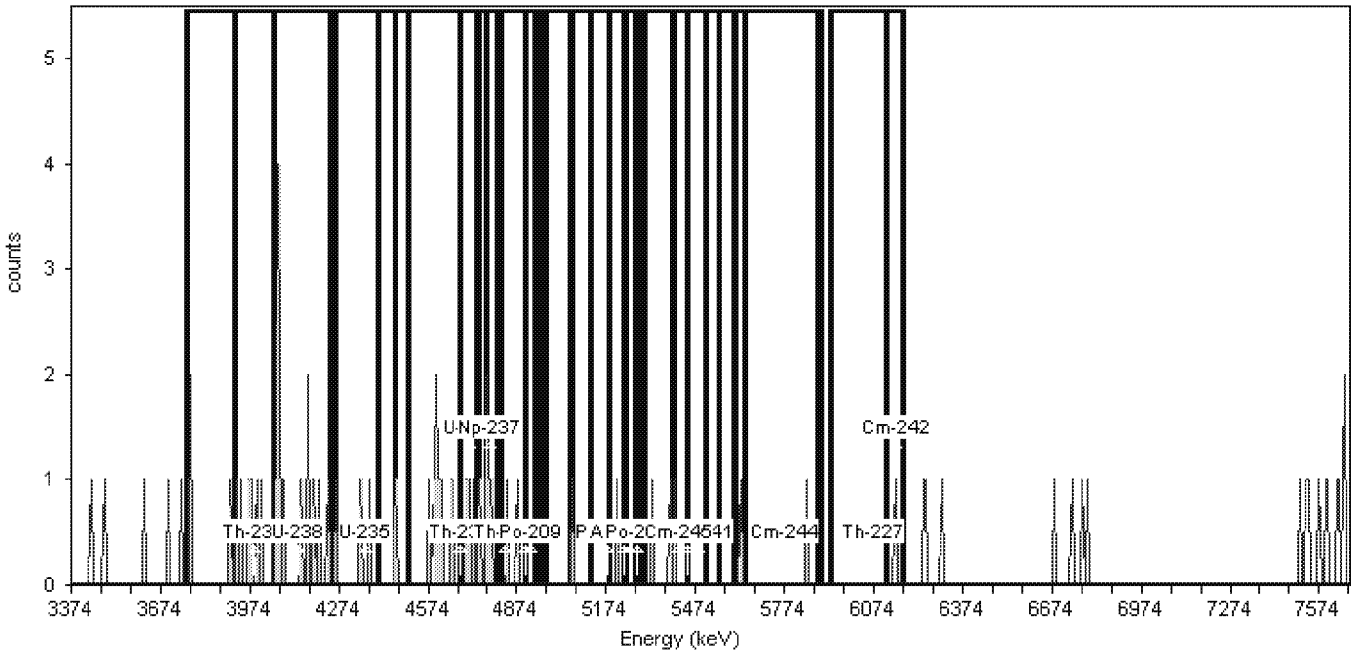
Analyst: 60040

Acquisition

Detector: AV3 , SN: 49-202 FF7
Acquisition Start Date: 11/13/2019 1:56:37PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-8877;AV3-05142018
Calibration Date: 5/14/2018 6:25:15PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 24.44% +/- 0.30% TPU(2 sigma)



General Analysis

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

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	10.00	1.042E-002	3.455E-003
U-238	4.14	3.92	4.24	19.00	1.979E-002	4.658E-003
U-235	4.36	4.26	4.46	4.00	4.167E-003	2.329E-003
Th-230	4.68	4.40	4.75	14.00	1.458E-002	4.034E-003
U-234	4.71	4.51	4.82	17.00	1.771E-002	4.419E-003
Pu-242	4.90	4.68	4.95	10.00	1.042E-002	3.455E-003
Th-229	4.83	4.74	5.12	8.00	8.333E-003	3.125E-003
Np-237	4.78	4.77	4.81	4.00	4.167E-003	2.329E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	2.00	2.083E-003	1.804E-003
Am-243	5.23	5.05	5.31	2.00	2.083E-003	1.804E-003
U-232	5.25	5.06	5.40	5.00	5.208E-003	2.552E-003
Th-228	5.45	5.19	5.51	4.00	4.167E-003	2.329E-003
Po-210	5.28	5.23	5.29	0.00	0.000E+000	1.473E-003
Pu-238	5.47	5.27	5.55	3.00	3.125E-003	2.083E-003
Am-241	5.48	5.30	5.60	3.00	3.125E-003	2.083E-003
Cm-245	5.42	5.40	5.45	1.00	1.042E-003	1.473E-003
Pu-236	5.76	5.61	5.89	2.00	2.083E-003	1.804E-003
Cm-244	5.78	5.64	5.90	1.00	1.042E-003	1.473E-003
Th-227	6.07	5.93	6.18	1.00	1.042E-003	1.473E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:05:01AM 11/14/2019

Sample

Sample Name: ICB;AV8
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

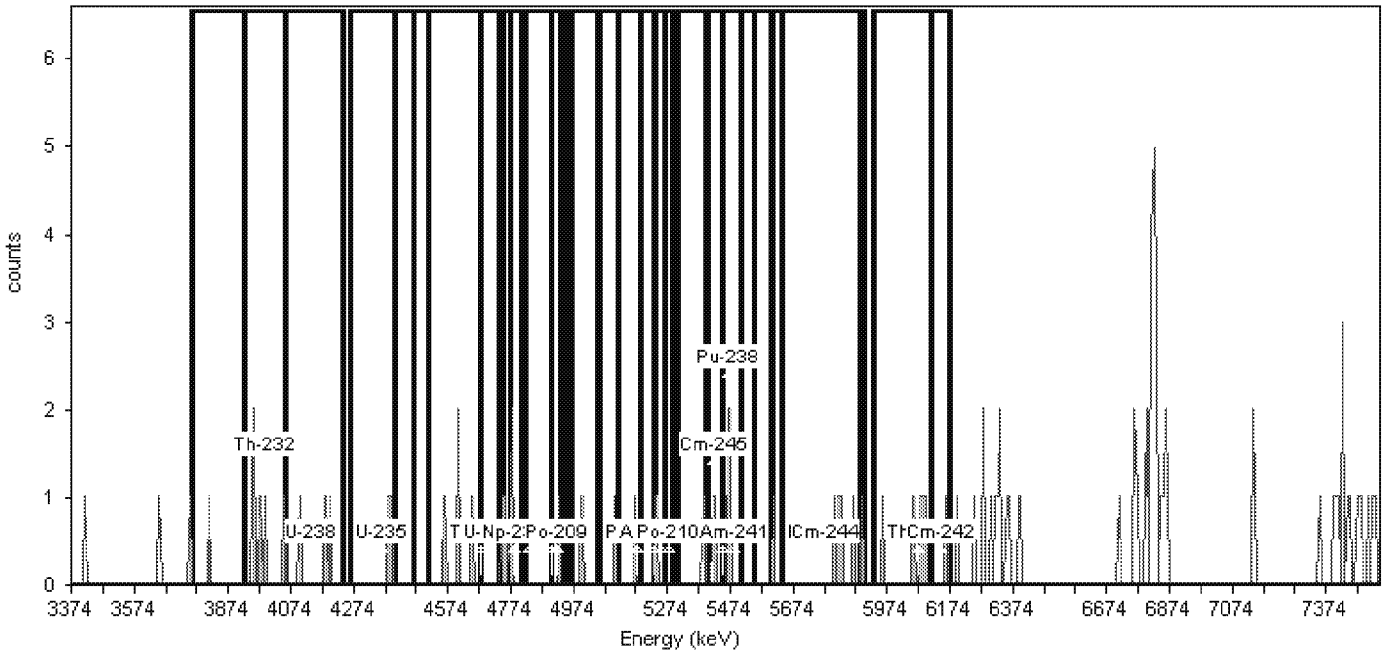
Analyst: 60040

Acquisition

Detector: AV8 , SN: 41-137Q6
Acquisition Start Date: 11/13/2019 1:54:28PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-9795;AV8-05142018
Calibration Date: 5/14/2018 6:26:27PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 25.96% +/- 0.34% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 98.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	6.00	6.250E-003	2.756E-003
U-238	4.14	3.92	4.24	8.00	8.333E-003	3.125E-003
U-235	4.36	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.68	4.40	4.75	5.00	5.208E-003	2.552E-003
U-234	4.71	4.51	4.82	9.00	9.375E-003	3.294E-003
Pu-242	4.90	4.68	4.95	6.00	6.250E-003	2.756E-003
Th-229	4.83	4.74	5.12	8.00	8.333E-003	3.125E-003
Np-237	4.78	4.77	4.81	3.00	3.125E-003	2.083E-003
Po-209	4.92	4.90	4.93	1.00	1.042E-003	1.473E-003
Pu-239	5.18	4.97	5.24	4.00	4.167E-003	2.329E-003
Am-243	5.23	5.05	5.31	3.00	3.125E-003	2.083E-003
U-232	5.25	5.06	5.40	4.00	4.167E-003	2.329E-003
Th-228	5.45	5.19	5.51	6.00	6.250E-003	2.756E-003
Po-210	5.28	5.23	5.29	1.00	1.042E-003	1.473E-003
Pu-238	5.47	5.27	5.55	5.00	5.208E-003	2.552E-003
Am-241	5.48	5.30	5.60	5.00	5.208E-003	2.552E-003
Cm-245	5.42	5.40	5.45	2.00	2.083E-003	1.804E-003
Pu-236	5.76	5.61	5.89	5.00	5.208E-003	2.552E-003
Cm-244	5.78	5.64	5.90	5.00	5.208E-003	2.552E-003
Th-227	6.07	5.93	6.18	6.00	6.250E-003	2.756E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:06:03AM 11/14/2019

Sample

Sample Name: ICB;AV11
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

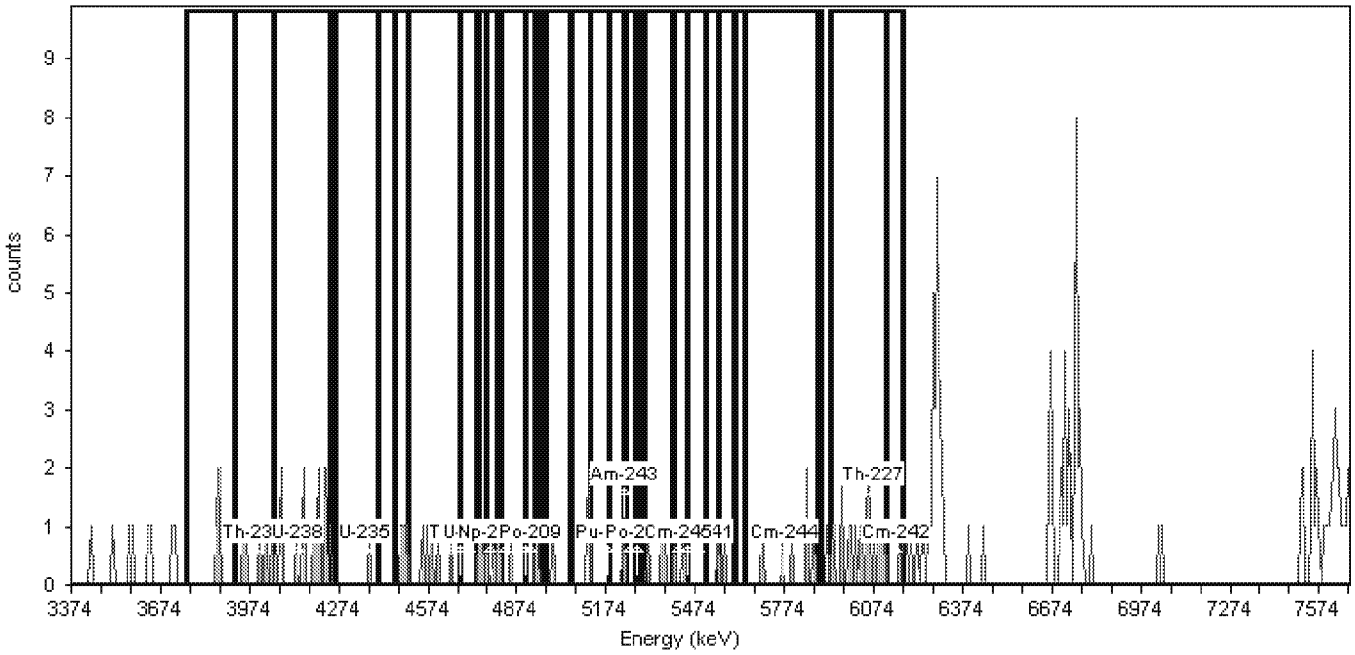
Analyst: 60040

Acquisition

Detector: AV11 , SN: 49-155dd2
Acquisition Start Date: 11/13/2019 1:54:32PM
Live Time: 960.00 min.
Real Time: 960.63 min.
Calibration Name: IC-1368446;AV11-05142018
Calibration Date: 5/14/2018 6:27:11PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.19% +/- 0.26% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 184.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	8.00	8.333E-003	3.125E-003
U-238	4.14	3.92	4.24	18.00	1.875E-002	4.541E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.68	4.40	4.75	10.00	1.042E-002	3.455E-003
U-234	4.71	4.51	4.82	11.00	1.146E-002	3.608E-003
Pu-242	4.90	4.68	4.95	8.00	8.333E-003	3.125E-003
Th-229	4.83	4.74	5.12	11.00	1.146E-002	3.608E-003
Np-237	4.78	4.77	4.81	3.00	3.125E-003	2.083E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	4.00	4.167E-003	2.329E-003
Am-243	5.23	5.05	5.31	3.00	3.125E-003	2.083E-003
U-232	5.25	5.06	5.40	8.00	8.333E-003	3.125E-003
Th-228	5.45	5.19	5.51	7.00	7.292E-003	2.946E-003
Po-210	5.28	5.23	5.29	1.00	1.042E-003	1.473E-003
Pu-238	5.47	5.27	5.55	7.00	7.292E-003	2.946E-003
Am-241	5.48	5.30	5.60	8.00	8.333E-003	3.125E-003
Cm-245	5.42	5.40	5.45	2.00	2.083E-003	1.804E-003
Pu-236	5.76	5.61	5.89	6.00	6.250E-003	2.756E-003
Cm-244	5.78	5.64	5.90	6.00	6.250E-003	2.756E-003
Th-227	6.07	5.93	6.18	18.00	1.875E-002	4.541E-003
Cm-242	6.15	6.12	6.18	2.00	2.083E-003	1.804E-003

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THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:06:20AM 11/14/2019

Sample

Sample Name: ICB;AV12
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

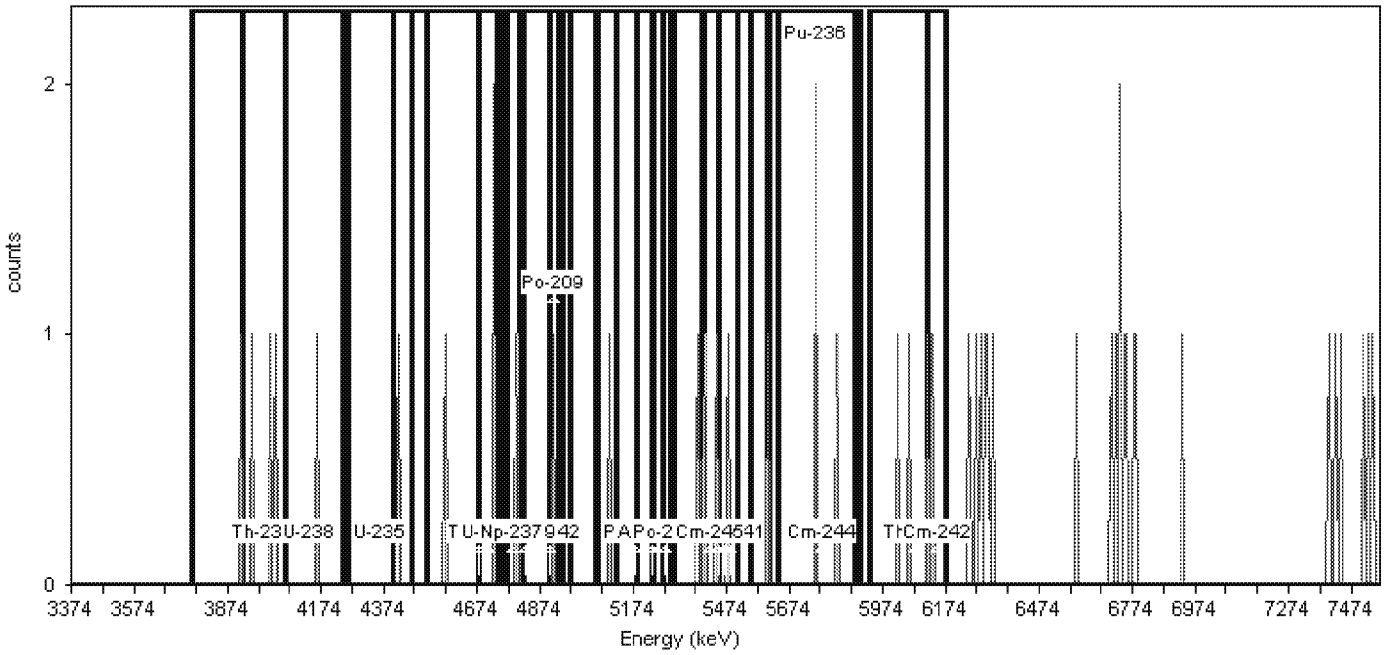
Analyst: 60040

Acquisition

Detector: AV12 , SN: 51-082B7
Acquisition Start Date: 11/13/2019 1:54:34PM
Live Time: 960.00 min.
Real Time: 960.63 min.
Calibration Name: IC-1368447; AV12-05142018
Calibration Date: 5/14/2018 6:27:24PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.78% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 46.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	4.00	4.167E-003	2.329E-003
U-238	4.14	3.92	4.24	4.00	4.167E-003	2.329E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.68	4.40	4.75	4.00	4.167E-003	2.329E-003
U-234	4.71	4.51	4.82	4.00	4.167E-003	2.329E-003
Pu-242	4.90	4.68	4.95	4.00	4.167E-003	2.329E-003
Th-229	4.83	4.74	5.12	3.00	3.125E-003	2.083E-003
Np-237	4.78	4.77	4.81	1.00	1.042E-003	1.473E-003
Po-209	4.92	4.90	4.93	1.00	1.042E-003	1.473E-003
Pu-239	5.18	4.97	5.24	1.00	1.042E-003	1.473E-003
Am-243	5.23	5.05	5.31	1.00	1.042E-003	1.473E-003
U-232	5.25	5.06	5.40	3.00	3.125E-003	2.083E-003
Th-228	5.45	5.19	5.51	4.00	4.167E-003	2.329E-003
Po-210	5.28	5.23	5.29	0.00	0.000E+000	1.473E-003
Pu-238	5.47	5.27	5.55	4.00	4.167E-003	2.329E-003
Am-241	5.48	5.30	5.60	5.00	5.208E-003	2.552E-003
Cm-245	5.42	5.40	5.45	2.00	2.083E-003	1.804E-003
Pu-236	5.76	5.61	5.89	3.00	3.125E-003	2.083E-003
Cm-244	5.78	5.64	5.90	3.00	3.125E-003	2.083E-003
Th-227	6.07	5.93	6.18	4.00	4.167E-003	2.329E-003
Cm-242	6.15	6.12	6.18	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:06:47AM 11/14/2019

Sample

Sample Name: ICB;AV14
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

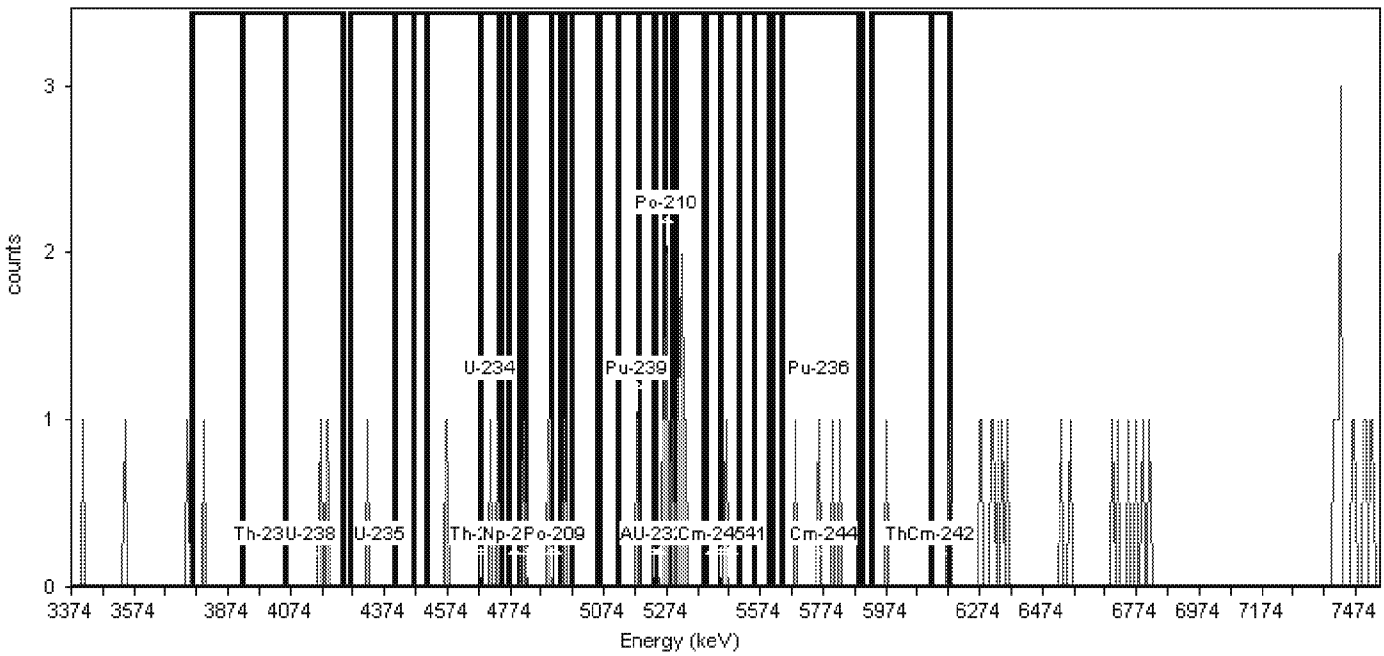
Analyst: 60040

Acquisition

Detector: AV14 , SN: 50-060W4
Acquisition Start Date: 11/13/2019 1:54:35PM
Live Time: 960.00 min.
Real Time: 960.63 min.
Calibration Name: IC-1370622;AV14-05142018
Calibration Date: 5/14/2018 6:27:53PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.40% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 58.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	2.00	2.083E-003	1.804E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.68	4.40	4.75	3.00	3.125E-003	2.083E-003
U-234	4.71	4.51	4.82	4.00	4.167E-003	2.329E-003
Pu-242	4.90	4.68	4.95	5.00	5.208E-003	2.552E-003
Th-229	4.83	4.74	5.12	3.00	3.125E-003	2.083E-003
Np-237	4.78	4.77	4.81	0.00	0.000E+000	1.473E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	1.00	1.042E-003	1.473E-003
Am-243	5.23	5.05	5.31	6.00	6.250E-003	2.756E-003
U-232	5.25	5.06	5.40	11.00	1.146E-002	3.608E-003
Th-228	5.45	5.19	5.51	11.00	1.146E-002	3.608E-003
Po-210	5.28	5.23	5.29	5.00	5.208E-003	2.552E-003
Pu-238	5.47	5.27	5.55	10.00	1.042E-002	3.455E-003
Am-241	5.48	5.30	5.60	6.00	6.250E-003	2.756E-003
Cm-245	5.42	5.40	5.45	0.00	0.000E+000	1.473E-003
Pu-236	5.76	5.61	5.89	4.00	4.167E-003	2.329E-003
Cm-244	5.78	5.64	5.90	4.00	4.167E-003	2.329E-003
Th-227	6.07	5.93	6.18	2.00	2.083E-003	1.804E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:07:08AM 11/14/2019

Sample

Sample Name: ICB;AV15
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

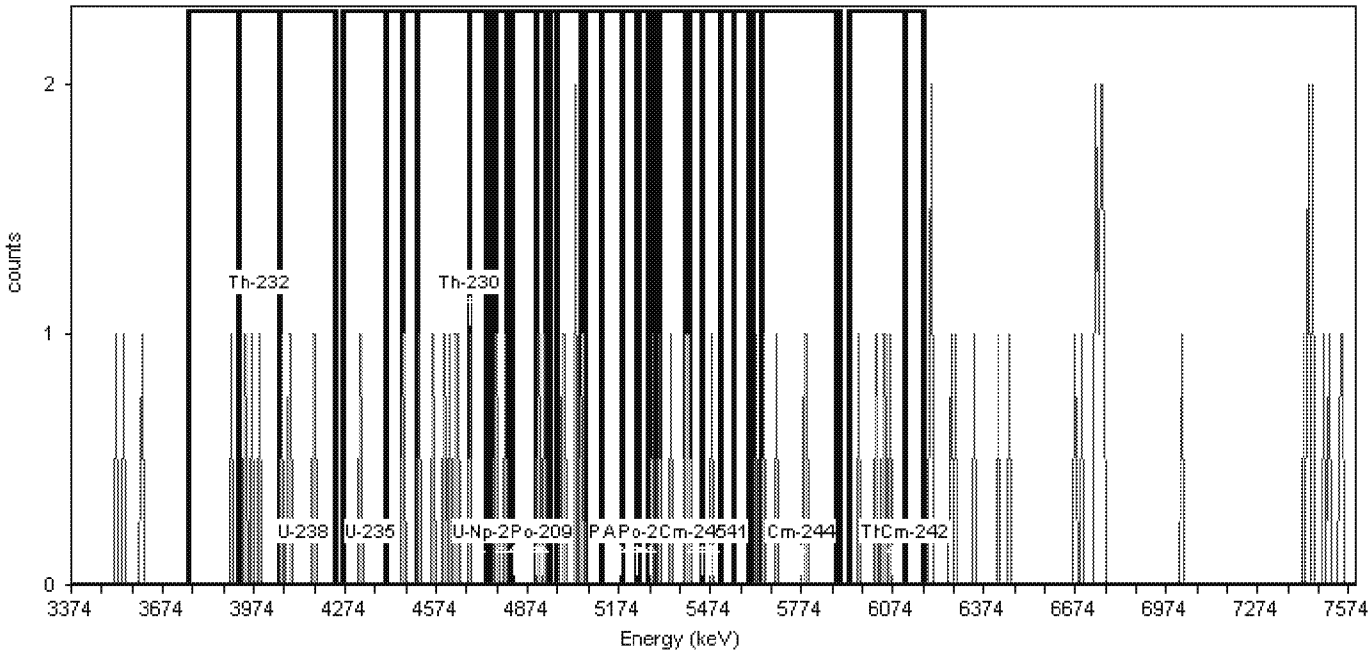
Analyst: 60040

Acquisition

Detector: AV15 , SN: 41-172C5
Acquisition Start Date: 11/13/2019 1:54:37PM
Live Time: 960.00 min.
Real Time: 960.63 min.
Calibration Name: IC-1370619;AV15-05142018
Calibration Date: 5/14/2018 6:28:04PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.26% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 73.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	4.00	4.167E-003	2.329E-003
U-238	4.14	3.92	4.24	8.00	8.333E-003	3.125E-003
U-235	4.36	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.68	4.40	4.75	8.00	8.333E-003	3.125E-003
U-234	4.71	4.51	4.82	9.00	9.375E-003	3.294E-003
Pu-242	4.90	4.68	4.95	5.00	5.208E-003	2.552E-003
Th-229	4.83	4.74	5.12	9.00	9.375E-003	3.294E-003
Np-237	4.78	4.77	4.81	2.00	2.083E-003	1.804E-003
Po-209	4.92	4.90	4.93	2.00	2.083E-003	1.804E-003
Pu-239	5.18	4.97	5.24	5.00	5.208E-003	2.552E-003
Am-243	5.23	5.05	5.31	3.00	3.125E-003	2.083E-003
U-232	5.25	5.06	5.40	5.00	5.208E-003	2.552E-003
Th-228	5.45	5.19	5.51	6.00	6.250E-003	2.756E-003
Po-210	5.28	5.23	5.29	1.00	1.042E-003	1.473E-003
Pu-238	5.47	5.27	5.55	6.00	6.250E-003	2.756E-003
Am-241	5.48	5.30	5.60	5.00	5.208E-003	2.552E-003
Cm-245	5.42	5.40	5.45	2.00	2.083E-003	1.804E-003
Pu-236	5.76	5.61	5.89	5.00	5.208E-003	2.552E-003
Cm-244	5.78	5.64	5.90	4.00	4.167E-003	2.329E-003
Th-227	6.07	5.93	6.18	5.00	5.208E-003	2.552E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:07:26AM 11/14/2019

Sample

Sample Name: ICB;AV16
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

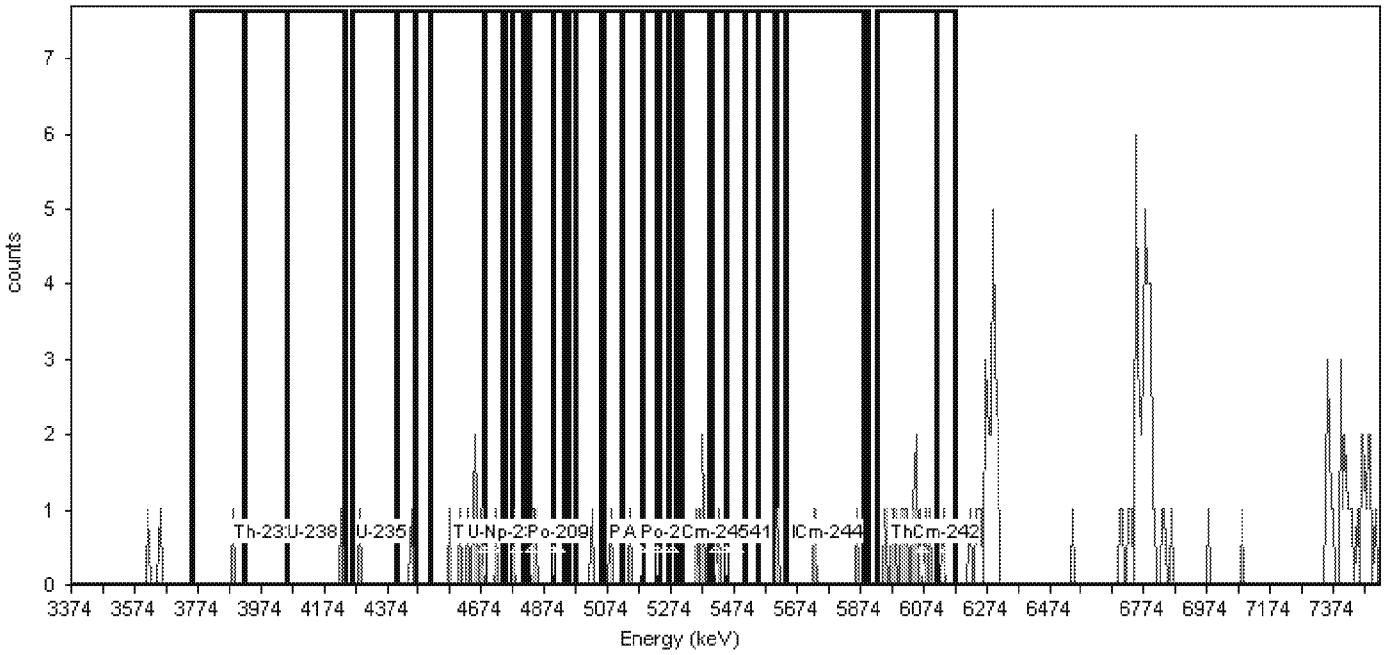
Analyst: 60040

Acquisition

Detector: AV16 , SN: 51-082B6
Acquisition Start Date: 11/13/2019 1:54:38PM
Live Time: 960.00 min.
Real Time: 960.63 min.
Calibration Name: IC-137620;AV16-05142018
Calibration Date: 5/14/2018 6:28:17PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.96% +/- 0.24% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 127.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	1.00	1.042E-003	1.473E-003
U-235	4.36	4.26	4.46	2.00	2.083E-003	1.804E-003
Th-230	4.68	4.40	4.75	9.00	9.375E-003	3.294E-003
U-234	4.71	4.51	4.82	9.00	9.375E-003	3.294E-003
Pu-242	4.90	4.68	4.95	4.00	4.167E-003	2.329E-003
Th-229	4.83	4.74	5.12	5.00	5.208E-003	2.552E-003
Np-237	4.78	4.77	4.81	1.00	1.042E-003	1.473E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	3.00	3.125E-003	2.083E-003
Am-243	5.23	5.05	5.31	2.00	2.083E-003	1.804E-003
U-232	5.25	5.06	5.40	6.00	6.250E-003	2.756E-003
Th-228	5.45	5.19	5.51	5.00	5.208E-003	2.552E-003
Po-210	5.28	5.23	5.29	0.00	0.000E+000	1.473E-003
Pu-238	5.47	5.27	5.55	5.00	5.208E-003	2.552E-003
Am-241	5.48	5.30	5.60	5.00	5.208E-003	2.552E-003
Cm-245	5.42	5.40	5.45	1.00	1.042E-003	1.473E-003
Pu-236	5.76	5.61	5.89	3.00	3.125E-003	2.083E-003
Cm-244	5.78	5.64	5.90	2.00	2.083E-003	1.804E-003
Th-227	6.07	5.93	6.18	13.00	1.354E-002	3.898E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:12:00AM 11/14/2019

Sample

Sample Name: ICB;AV19
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

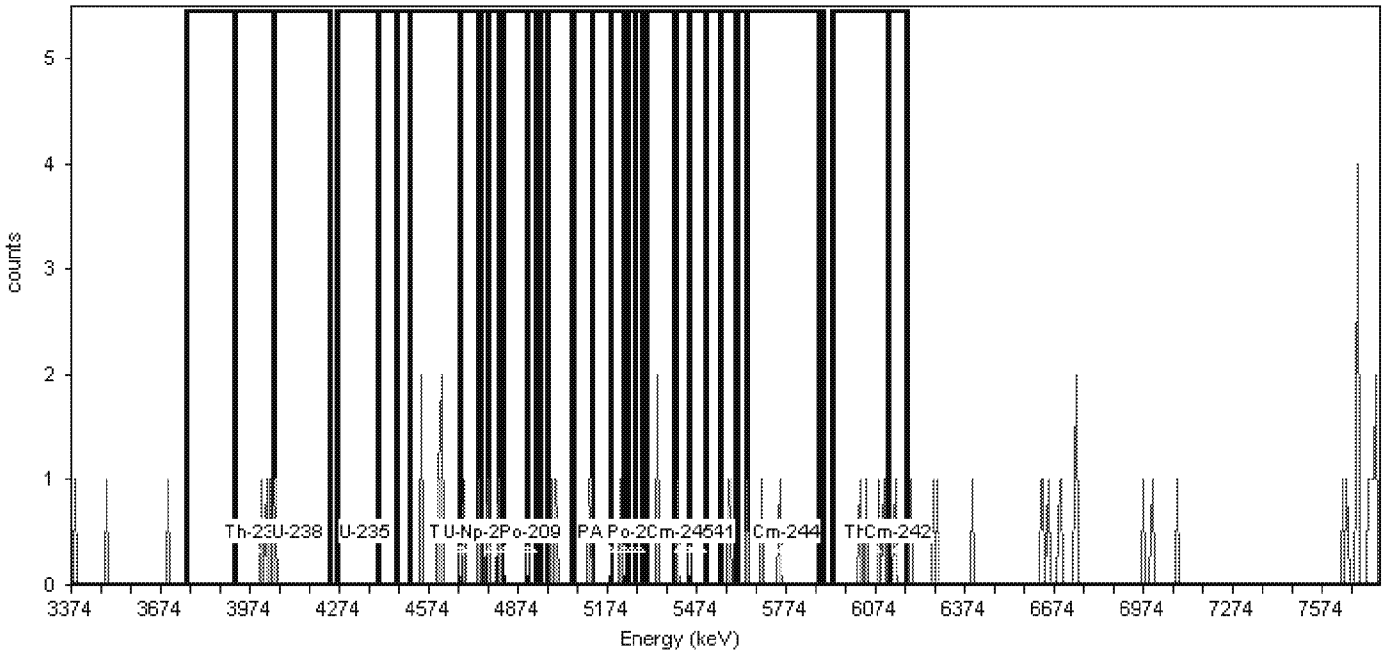
Analyst: 60040

Acquisition

Detector: AV19 , SN: 50-025FF5
Acquisition Start Date: 11/13/2019 1:54:42PM
Live Time: 960.00 min.
Real Time: 961.77 min.
Calibration Name: IC-8877;AV19-05142018
Calibration Date: 5/15/2018 12:27:55PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 23.60% +/- 0.29% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 59.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	4.00	4.167E-003	2.329E-003
U-238	4.14	3.92	4.24	4.00	4.167E-003	2.329E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.68	4.40	4.75	7.00	7.292E-003	2.946E-003
U-234	4.71	4.51	4.82	9.00	9.375E-003	3.294E-003
Pu-242	4.90	4.68	4.95	4.00	4.167E-003	2.329E-003
Th-229	4.83	4.74	5.12	6.00	6.250E-003	2.756E-003
Np-237	4.78	4.77	4.81	2.00	2.083E-003	1.804E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	4.00	4.167E-003	2.329E-003
Am-243	5.23	5.05	5.31	2.00	2.083E-003	1.804E-003
U-232	5.25	5.06	5.40	4.00	4.167E-003	2.329E-003
Th-228	5.45	5.19	5.51	4.00	4.167E-003	2.329E-003
Po-210	5.28	5.23	5.29	0.00	0.000E+000	1.473E-003
Pu-238	5.47	5.27	5.55	3.00	3.125E-003	2.083E-003
Am-241	5.48	5.30	5.60	4.00	4.167E-003	2.329E-003
Cm-245	5.42	5.40	5.45	1.00	1.042E-003	1.473E-003
Pu-236	5.76	5.61	5.89	3.00	3.125E-003	2.083E-003
Cm-244	5.78	5.64	5.90	3.00	3.125E-003	2.083E-003
Th-227	6.07	5.93	6.18	5.00	5.208E-003	2.552E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:12:09AM 11/14/2019

Sample

Sample Name: ICB;AV20
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

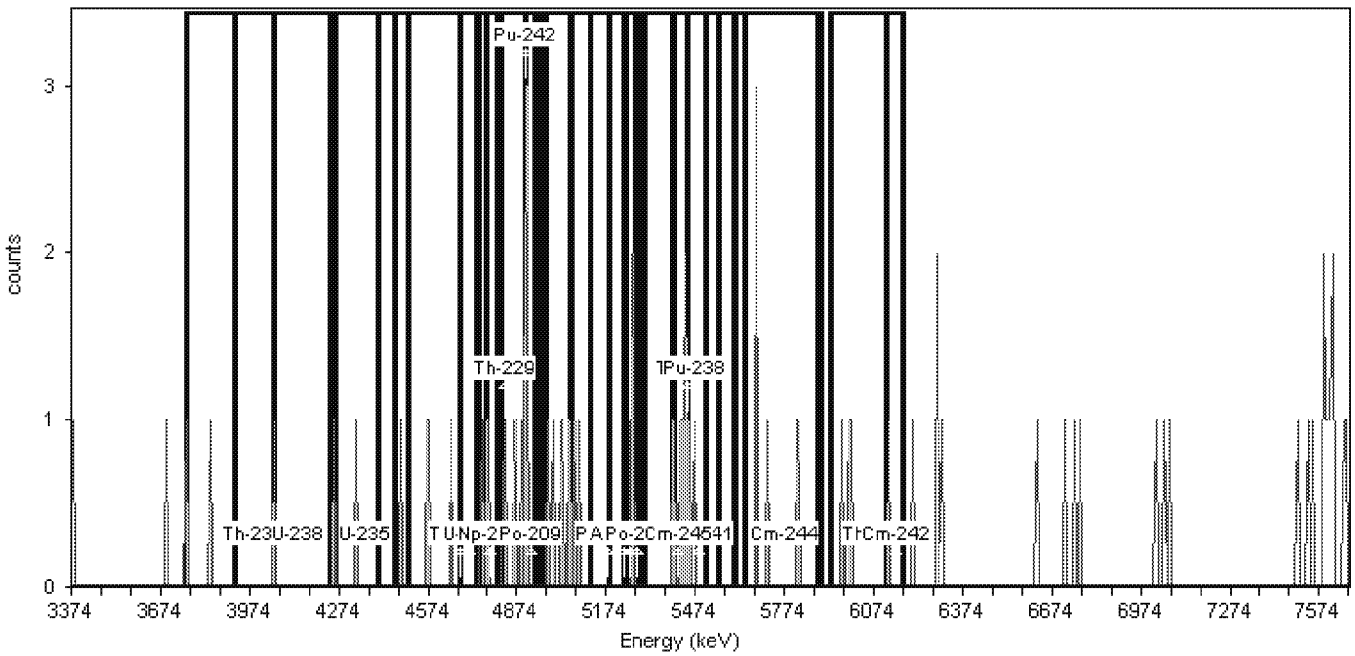
Analyst: 60040

Acquisition

Detector: AV20 , SN: 48-121A7
Acquisition Start Date: 11/13/2019 1:54:43PM
Live Time: 960.00 min.
Real Time: 961.77 min.
Calibration Name: IC-9520;AV20-05142018
Calibration Date: 5/15/2018 12:28:08PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.15% +/- 0.32% TPU(2 sigma)



General Analysis

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

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	3.00	3.125E-003	2.083E-003
U-238	4.14	3.92	4.24	1.00	1.042E-003	1.473E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.68	4.40	4.75	4.00	4.167E-003	2.329E-003
U-234	4.71	4.51	4.82	6.00	6.250E-003	2.756E-003
Pu-242	4.90	4.68	4.95	9.00	9.375E-003	3.294E-003
Th-229	4.83	4.74	5.12	16.00	1.667E-002	4.295E-003
Np-237	4.78	4.77	4.81	2.00	2.083E-003	1.804E-003
Po-209	4.92	4.90	4.93	3.00	3.125E-003	2.083E-003
Pu-239	5.18	4.97	5.24	7.00	7.292E-003	2.946E-003
Am-243	5.23	5.05	5.31	5.00	5.208E-003	2.552E-003
U-232	5.25	5.06	5.40	6.00	6.250E-003	2.756E-003
Th-228	5.45	5.19	5.51	11.00	1.146E-002	3.608E-003
Po-210	5.28	5.23	5.29	2.00	2.083E-003	1.804E-003
Pu-238	5.47	5.27	5.55	9.00	9.375E-003	3.294E-003
Am-241	5.48	5.30	5.60	9.00	9.375E-003	3.294E-003
Cm-245	5.42	5.40	5.45	7.00	7.292E-003	2.946E-003
Pu-236	5.76	5.61	5.89	5.00	5.208E-003	2.552E-003
Cm-244	5.78	5.64	5.90	5.00	5.208E-003	2.552E-003
Th-227	6.07	5.93	6.18	4.00	4.167E-003	2.329E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:11:42AM 11/14/2019

Sample

Sample Name: ICB;AV24
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

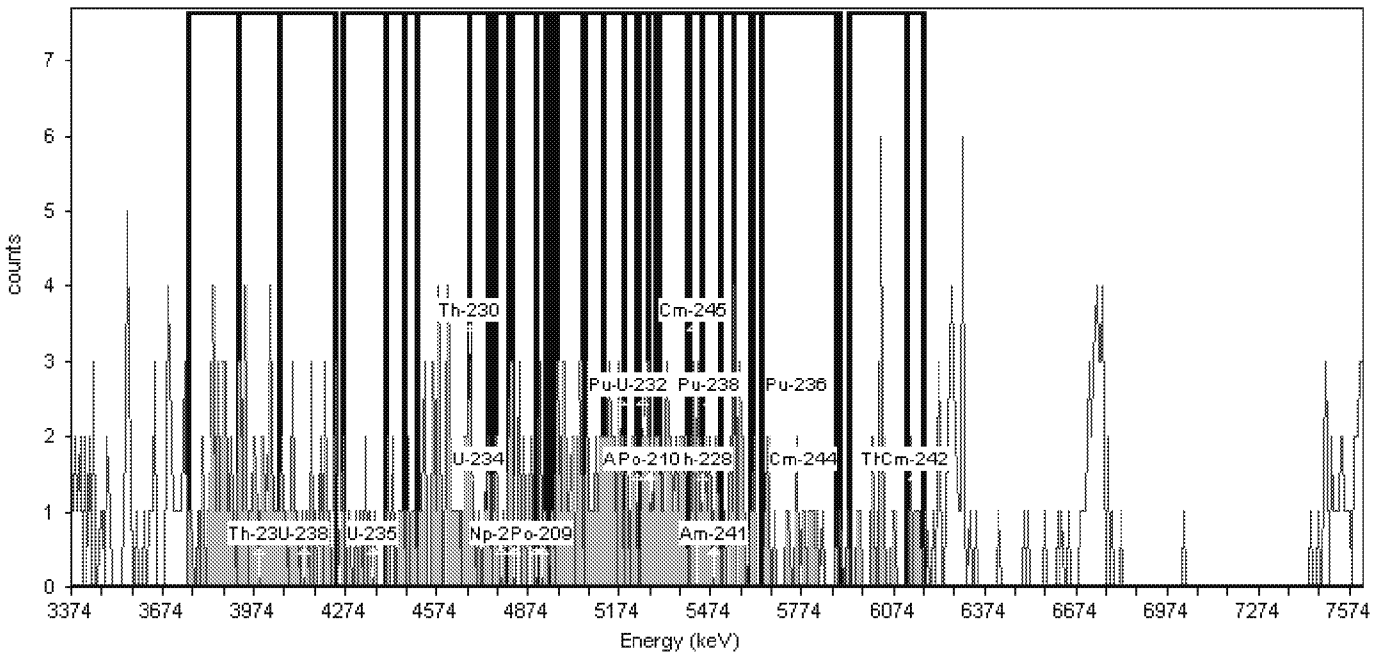
Analyst: 60040

Acquisition

Detector: AV24 , SN: 47-137Q4
Acquisition Start Date: 11/13/2019 1:54:50PM
Live Time: 960.00 min.
Real Time: 961.77 min.
Calibration Name: IC-9817;AV24-05142018
Calibration Date: 5/15/2018 12:28:57PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 22.21% +/- 0.28% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 502.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	61.00	6.354E-002	8.202E-003
U-238	4.14	3.92	4.24	59.00	6.146E-002	8.069E-003
U-235	4.36	4.26	4.46	16.00	1.667E-002	4.295E-003
Th-230	4.68	4.40	4.75	54.00	5.625E-002	7.725E-003
U-234	4.71	4.51	4.82	55.00	5.729E-002	7.795E-003
Pu-242	4.90	4.68	4.95	38.00	3.958E-002	6.505E-003
Th-229	4.83	4.74	5.12	65.00	6.771E-002	8.463E-003
Np-237	4.78	4.77	4.81	5.00	5.208E-003	2.552E-003
Po-209	4.92	4.90	4.93	5.00	5.208E-003	2.552E-003
Pu-239	5.18	4.97	5.24	58.00	6.042E-002	8.001E-003
Am-243	5.23	5.05	5.31	54.00	5.625E-002	7.725E-003
U-232	5.25	5.06	5.40	72.00	7.500E-002	8.900E-003
Th-228	5.45	5.19	5.51	61.00	6.354E-002	8.202E-003
Po-210	5.28	5.23	5.29	13.00	1.354E-002	3.898E-003
Pu-238	5.47	5.27	5.55	56.00	5.833E-002	7.864E-003
Am-241	5.48	5.30	5.60	57.00	5.937E-002	7.933E-003
Cm-245	5.42	5.40	5.45	9.00	9.375E-003	3.294E-003
Pu-236	5.76	5.61	5.89	20.00	2.083E-002	4.774E-003
Cm-244	5.78	5.64	5.90	18.00	1.875E-002	4.541E-003
Th-227	6.07	5.93	6.18	21.00	2.187E-002	4.886E-003
Cm-242	6.15	6.12	6.18	5.00	5.208E-003	2.552E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:10:33AM 11/14/2019

Sample

Sample Name: ICB;AV48
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

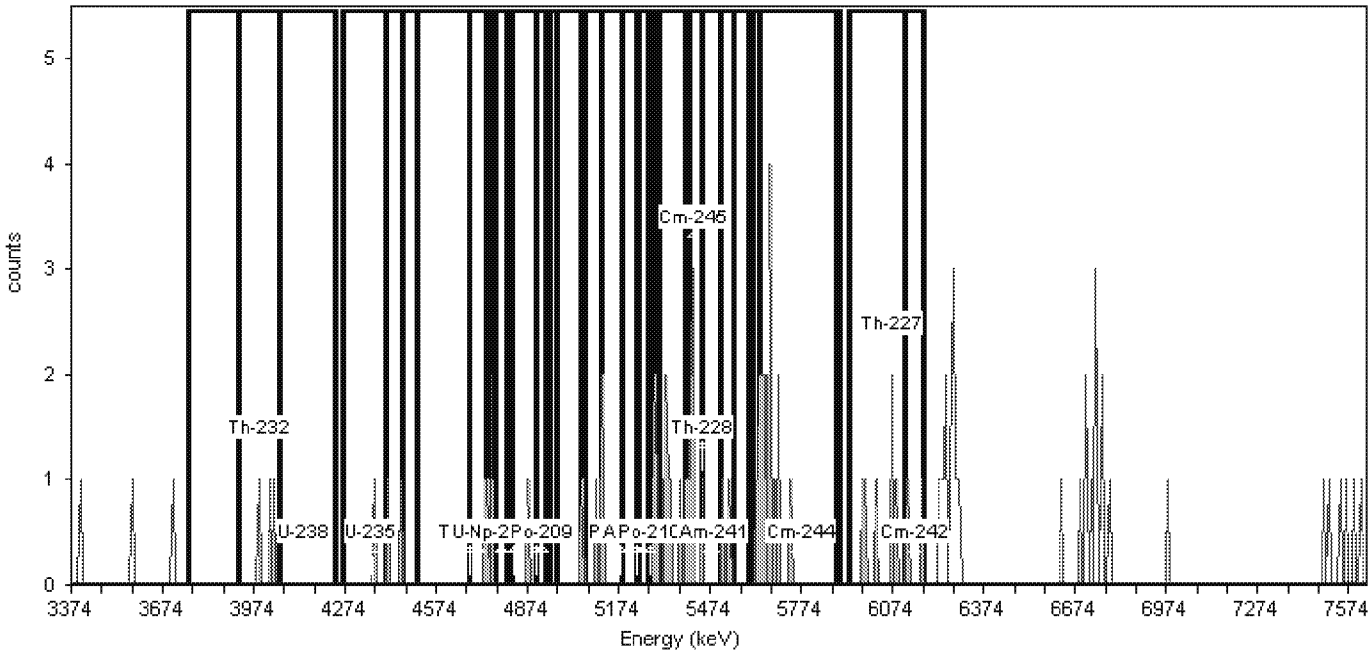
Analyst: 60040

Acquisition

Detector: AV48 , SN: 46-033P6
Acquisition Start Date: 11/13/2019 1:55:00PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-1370619;AV48-05142018
Calibration Date: 5/15/2018 12:27:25PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 27.06% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 92.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	3.00	3.125E-003	2.083E-003
U-238	4.14	3.92	4.24	3.00	3.125E-003	2.083E-003
U-235	4.36	4.26	4.46	3.00	3.125E-003	2.083E-003
Th-230	4.68	4.40	4.75	4.00	4.167E-003	2.329E-003
U-234	4.71	4.51	4.82	4.00	4.167E-003	2.329E-003
Pu-242	4.90	4.68	4.95	5.00	5.208E-003	2.552E-003
Th-229	4.83	4.74	5.12	8.00	8.333E-003	3.125E-003
Np-237	4.78	4.77	4.81	0.00	0.000E+000	1.473E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	4.00	4.167E-003	2.329E-003
Am-243	5.23	5.05	5.31	7.00	7.292E-003	2.946E-003
U-232	5.25	5.06	5.40	13.00	1.354E-002	3.898E-003
Th-228	5.45	5.19	5.51	16.00	1.667E-002	4.295E-003
Po-210	5.28	5.23	5.29	2.00	2.083E-003	1.804E-003
Pu-238	5.47	5.27	5.55	18.00	1.875E-002	4.541E-003
Am-241	5.48	5.30	5.60	16.00	1.667E-002	4.295E-003
Cm-245	5.42	5.40	5.45	8.00	8.333E-003	3.125E-003
Pu-236	5.76	5.61	5.89	16.00	1.667E-002	4.295E-003
Cm-244	5.78	5.64	5.90	14.00	1.458E-002	4.034E-003
Th-227	6.07	5.93	6.18	8.00	8.333E-003	3.125E-003
Cm-242	6.15	6.12	6.18	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:10:41AM 11/14/2019

Sample

Sample Name: ICB;AV49
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

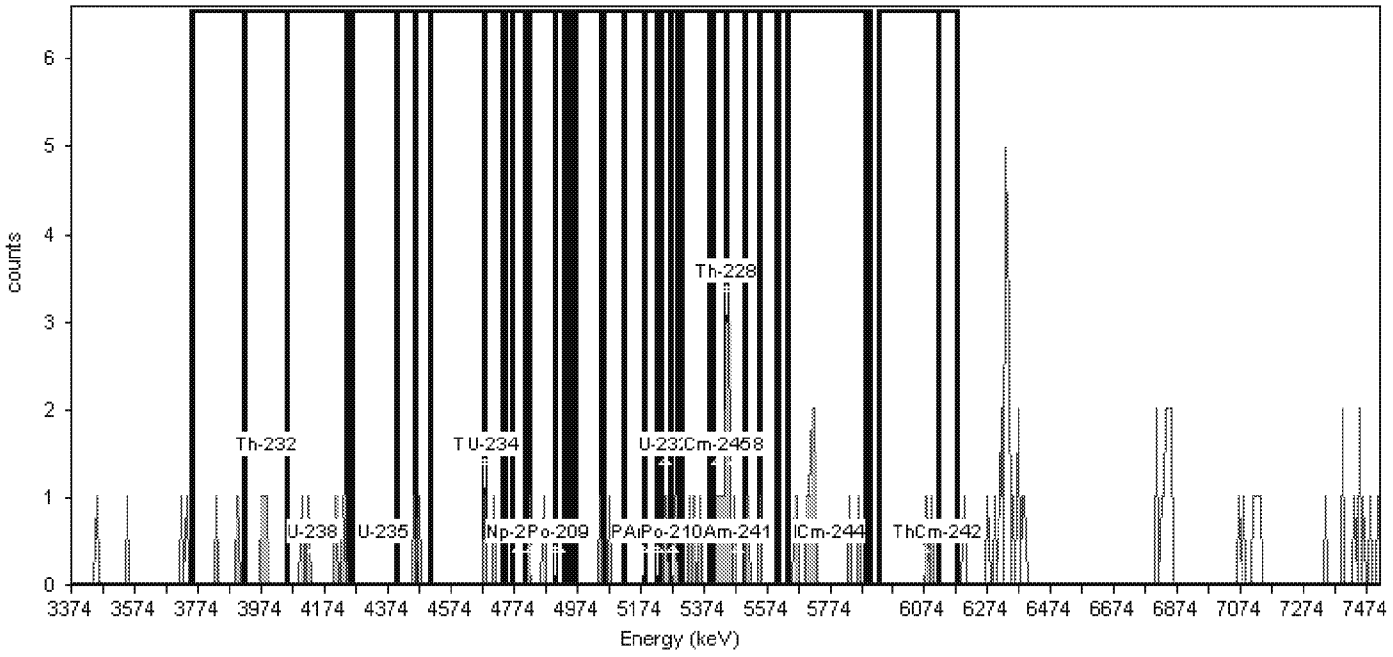
Analyst: 60040

Acquisition

Detector: AV49 , SN: 47-043hh4
Acquisition Start Date: 11/13/2019 1:55:02PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-1370620;AV49-05142018
Calibration Date: 5/15/2018 12:27:36PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.27% +/- 0.24% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 96.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	5.00	5.208E-003	2.552E-003
U-238	4.14	3.92	4.24	7.00	7.292E-003	2.946E-003
U-235	4.36	4.26	4.46	1.00	1.042E-003	1.473E-003
Th-230	4.68	4.40	4.75	4.00	4.167E-003	2.329E-003
U-234	4.71	4.51	4.82	3.00	3.125E-003	2.083E-003
Pu-242	4.90	4.68	4.95	4.00	4.167E-003	2.329E-003
Th-229	4.83	4.74	5.12	4.00	4.167E-003	2.329E-003
Np-237	4.78	4.77	4.81	0.00	0.000E+000	1.473E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	2.00	2.083E-003	1.804E-003
Am-243	5.23	5.05	5.31	3.00	3.125E-003	2.083E-003
U-232	5.25	5.06	5.40	6.00	6.250E-003	2.756E-003
Th-228	5.45	5.19	5.51	16.00	1.667E-002	4.295E-003
Po-210	5.28	5.23	5.29	2.00	2.083E-003	1.804E-003
Pu-238	5.47	5.27	5.55	17.00	1.771E-002	4.419E-003
Am-241	5.48	5.30	5.60	16.00	1.667E-002	4.295E-003
Cm-245	5.42	5.40	5.45	7.00	7.292E-003	2.946E-003
Pu-236	5.76	5.61	5.89	11.00	1.146E-002	3.608E-003
Cm-244	5.78	5.64	5.90	11.00	1.146E-002	3.608E-003
Th-227	6.07	5.93	6.18	2.00	2.083E-003	1.804E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
5:57:02AM 11/14/2019

Sample

Sample Name: ICB;AV63
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

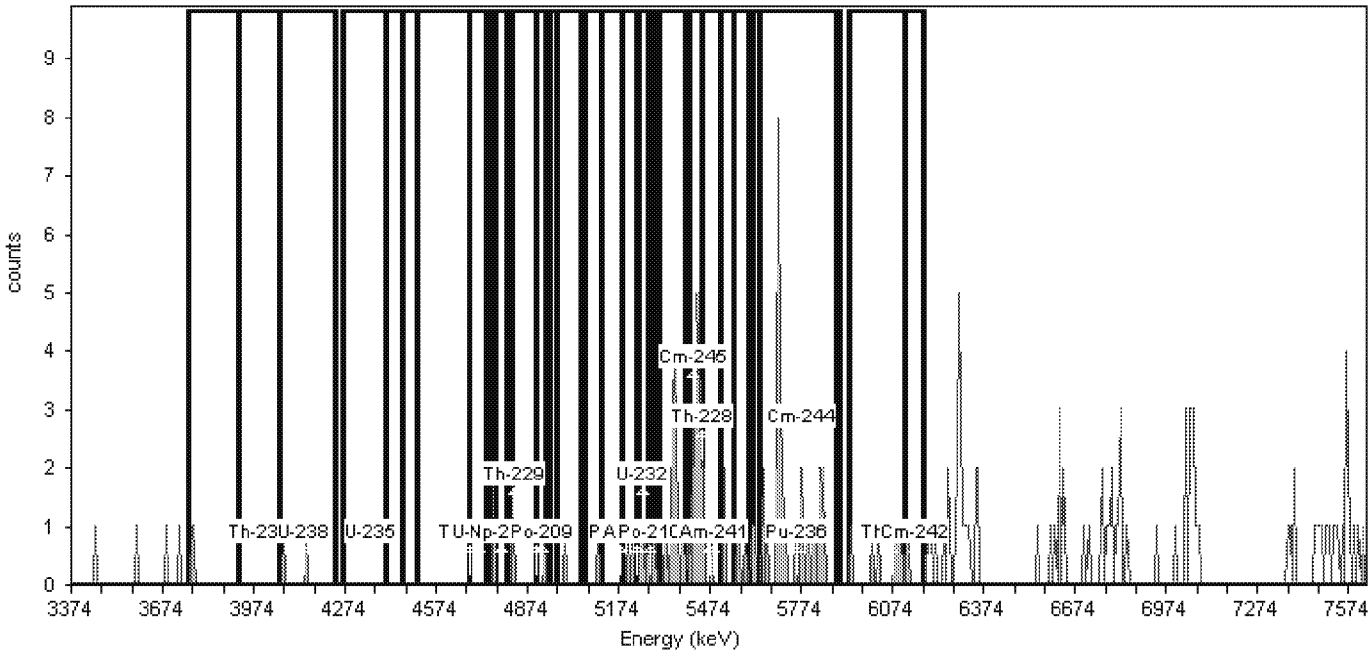
Analyst: 60040

Acquisition

Detector: AV63 , SN: 47-029ff2
Acquisition Start Date: 11/13/2019 1:55:10PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-1370621;AV63-05152018
Calibration Date: 5/15/2018 3:39:32PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.80% +/- 0.24% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 177.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3.99	3.75	4.05	1.00	1.042E-003	1.473E-003
U-238	4.14	3.92	4.24	2.00	2.083E-003	1.804E-003
U-235	4.36	4.26	4.46	0.00	0.000E+000	1.473E-003
Th-230	4.68	4.40	4.75	0.00	0.000E+000	1.473E-003
U-234	4.71	4.51	4.82	4.00	4.167E-003	2.329E-003
Pu-242	4.90	4.68	4.95	6.00	6.250E-003	2.756E-003
Th-229	4.83	4.74	5.12	8.00	8.333E-003	3.125E-003
Np-237	4.78	4.77	4.81	0.00	0.000E+000	1.473E-003
Po-209	4.92	4.90	4.93	1.00	1.042E-003	1.473E-003
Pu-239	5.18	4.97	5.24	4.00	4.167E-003	2.329E-003
Am-243	5.23	5.05	5.31	7.00	7.292E-003	2.946E-003
U-232	5.25	5.06	5.40	20.00	2.083E-002	4.774E-003
Th-228	5.45	5.19	5.51	36.00	3.750E-002	6.336E-003
Po-210	5.28	5.23	5.29	4.00	4.167E-003	2.329E-003
Pu-238	5.47	5.27	5.55	34.00	3.542E-002	6.163E-003
Am-241	5.48	5.30	5.60	34.00	3.542E-002	6.163E-003
Cm-245	5.42	5.40	5.45	15.00	1.563E-002	4.167E-003
Pu-236	5.76	5.61	5.89	32.00	3.333E-002	5.984E-003
Cm-244	5.78	5.64	5.90	30.00	3.125E-002	5.800E-003
Th-227	6.07	5.93	6.18	8.00	8.333E-003	3.125E-003
Cm-242	6.15	6.12	6.18	1.00	1.042E-003	1.473E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Background Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:01:13AM 11/14/2019

Sample

Sample Name: ICB;AV80
Comment:

Spectrum #2 Analysis #1

Batch

Batch Name: November2019
Description:

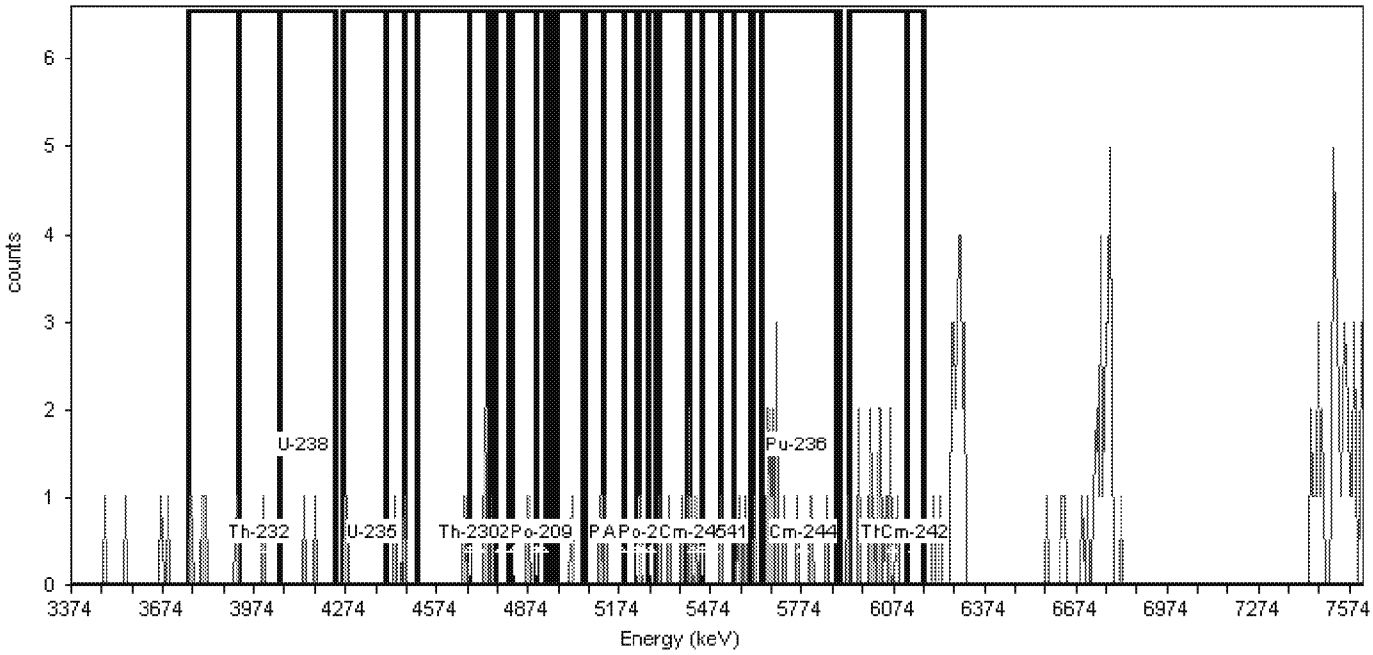
Analyst: 60040

Acquisition

Detector: AV80 , SN: 46-03305
Acquisition Start Date: 11/13/2019 1:54:40PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-1370622;AV80-05152018
Calibration Date: 5/15/2018 6:38:17PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 26.32% +/- 0.23% TPU(2 sigma)



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 151.00

Nuclide Summary (ROI)

RegionName	Peak Energy (MeV)	Start Energy (MeV)	End Energy (MeV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
U-234	4.71	4.51	4.82	4.00	4.167E-003	2.329E-003
Pu-242	4.90	4.68	4.95	4.00	4.167E-003	2.329E-003
Th-229	4.83	4.74	5.12	4.00	4.167E-003	2.329E-003
Np-237	4.78	4.77	4.81	0.00	0.000E+000	1.473E-003
Po-209	4.92	4.90	4.93	0.00	0.000E+000	1.473E-003
Pu-239	5.18	4.97	5.24	4.00	4.167E-003	2.329E-003
Am-243	5.23	5.05	5.31	5.00	5.208E-003	2.552E-003
U-232	5.25	5.06	5.40	9.00	9.375E-003	3.294E-003
Th-228	5.45	5.19	5.51	9.00	9.375E-003	3.294E-003
Po-210	5.28	5.23	5.29	2.00	2.083E-003	1.804E-003
Pu-238	5.47	5.27	5.55	7.00	7.292E-003	2.946E-003
Am-241	5.48	5.30	5.60	9.00	9.375E-003	3.294E-003
Cm-245	5.42	5.40	5.45	3.00	3.125E-003	2.083E-003
Pu-236	5.76	5.61	5.89	13.00	1.354E-002	3.898E-003
Cm-244	5.78	5.64	5.90	12.00	1.250E-002	3.756E-003
Th-227	6.07	5.93	6.18	14.00	1.458E-002	4.034E-003
Cm-242	6.15	6.12	6.18	0.00	0.000E+000	1.473E-003
Th-232	3.99	3.75	4.05	5.00	5.208E-003	2.552E-003
U-238	4.14	3.92	4.24	3.00	3.125E-003	2.083E-003
U-235	4.36	4.26	4.46	4.00	4.167E-003	2.329E-003
Th-230	4.68	4.40	4.75	5.00	5.208E-003	2.552E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:33:36AM 11/10/2019

Sample

Sample Name: ICB;AV214
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

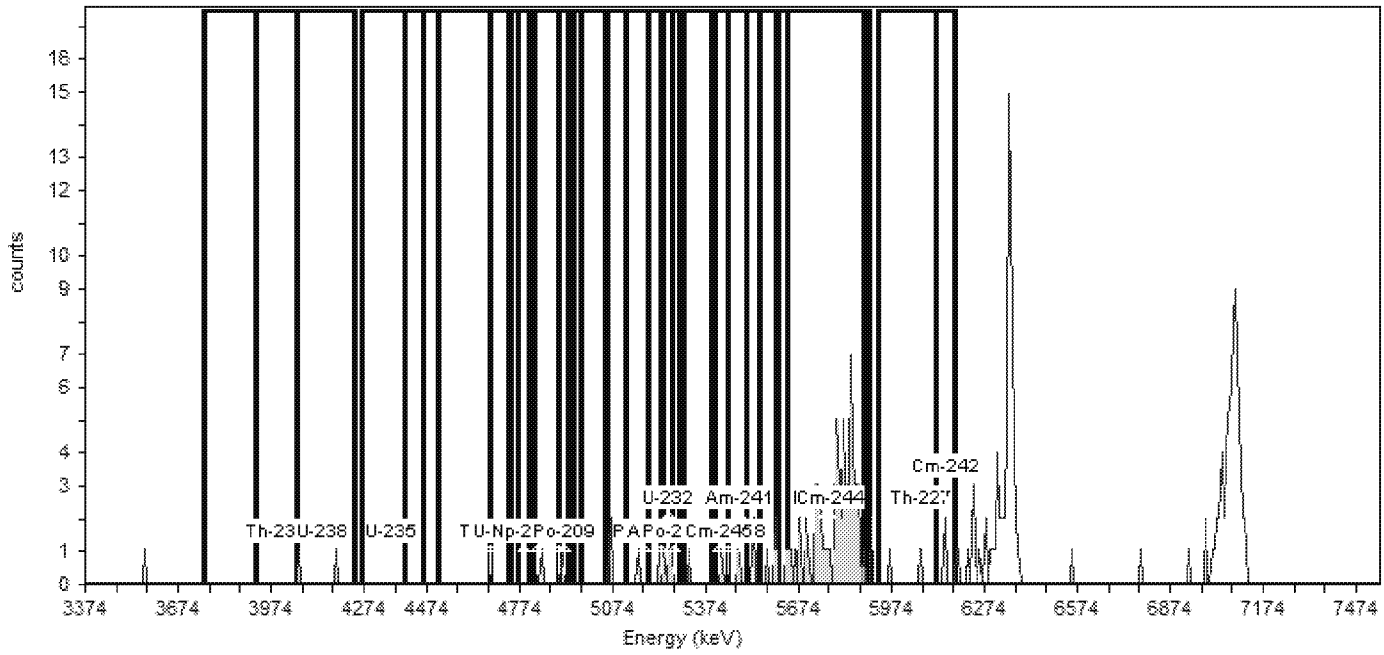
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV214 , SN: 5507304
Acquisition Start Date: 11/9/2019 2:31:23PM
Live Time: 960.00 min.
Real Time: 960.03 min.
Calibration Name: IC-1370619;AV214-07152019b
Calibration Date: 7/15/2019 2:06:28PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 217.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	0.00	0.000E+000	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	2.00	2.083E-003	1.804E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	0.00	0.000E+000	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	0.00	0.000E+000	1.473E-003
Pu-242	4,903.21	4,679.48	4,947.95	2.00	2.083E-003	1.804E-003
Th-229	4,828.63	4,739.14	5,119.48	4.00	4.167E-003	2.329E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	5.00	5.208E-003	2.552E-003
Am-243	5,231.34	5,052.36	5,305.92	8.00	8.333E-003	3.125E-003
U-232	5,253.71	5,059.82	5,402.86	9.00	9.375E-003	3.294E-003
Th-228	5,447.61	5,186.59	5,507.27	9.00	9.375E-003	3.294E-003
Po-210	5,276.09	5,231.34	5,291.00	4.00	4.167E-003	2.329E-003
Pu-238	5,469.98	5,268.63	5,552.01	7.00	7.292E-003	2.946E-003
Am-241	5,484.90	5,298.46	5,604.22	10.00	1.042E-002	3.455E-003
Cm-245	5,417.78	5,395.41	5,447.61	1.00	1.042E-003	1.473E-003
Pu-236	5,760.83	5,611.67	5,887.60	62.00	6.458E-002	8.268E-003
Cm-244	5,775.74	5,641.51	5,902.52	61.00	6.354E-002	8.202E-003
Th-227	6,074.04	5,932.35	6,178.45	5.00	5.208E-003	2.552E-003
Cm-242	6,148.62	6,118.79	6,178.45	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:31:25AM 11/10/2019

Sample

Sample Name: ICB;AV215
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

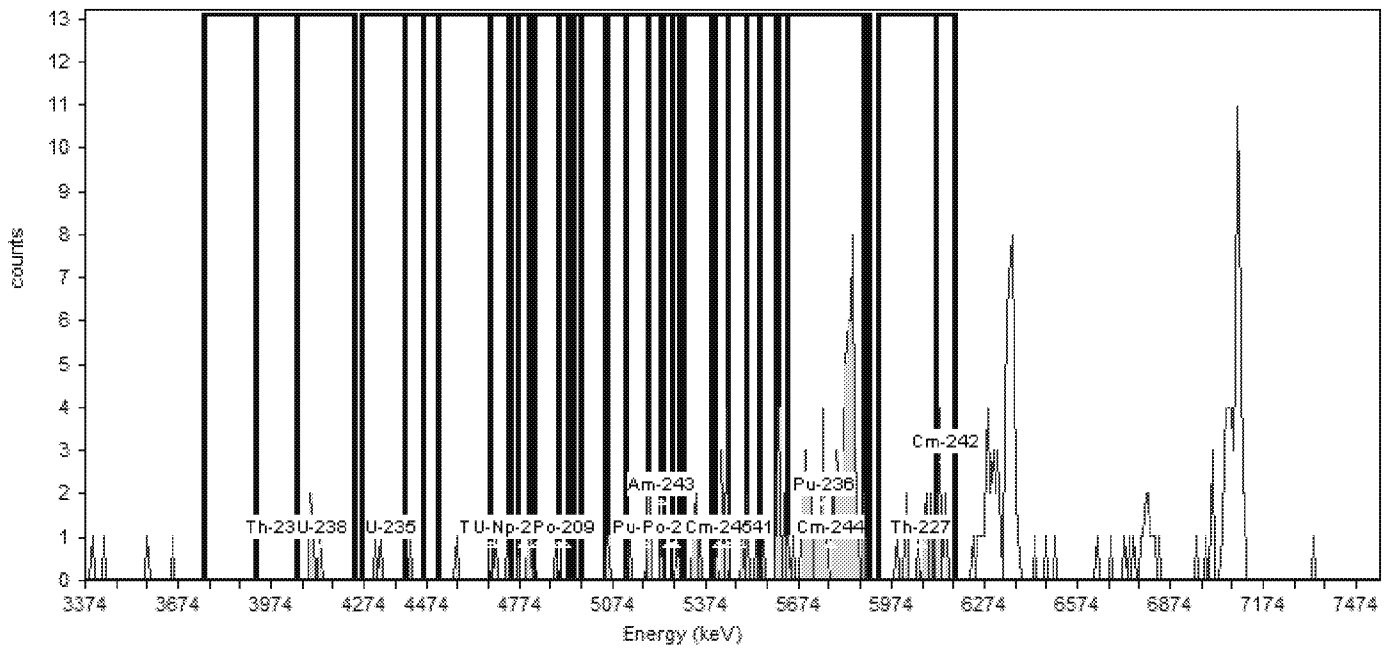
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV215 , SN: 50-119J4
Acquisition Start Date: 11/9/2019 2:31:24PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-1370620;AV215-11152018
Calibration Date: 11/15/2018 3:56:53PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 266.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	0.00	0.000E+000	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	4.00	4.167E-003	2.329E-003
U-235	4,358.81	4,261.86	4,463.21	3.00	3.125E-003	2.083E-003
Th-230	4,679.48	4,403.55	4,746.60	4.00	4.167E-003	2.329E-003
U-234	4,709.31	4,507.96	4,821.17	6.00	6.250E-003	2.756E-003
Pu-242	4,903.21	4,679.48	4,947.95	6.00	6.250E-003	2.756E-003
Th-229	4,828.63	4,739.14	5,119.48	5.00	5.208E-003	2.552E-003
Np-237	4,783.89	4,768.97	4,806.26	3.00	3.125E-003	2.083E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	7.00	7.292E-003	2.946E-003
Am-243	5,231.34	5,052.36	5,305.92	8.00	8.333E-003	3.125E-003
U-232	5,253.71	5,059.82	5,402.86	12.00	1.250E-002	3.756E-003
Th-228	5,447.61	5,186.59	5,507.27	21.00	2.188E-002	4.886E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-003
Pu-238	5,469.98	5,268.63	5,552.01	18.00	1.875E-002	4.541E-003
Am-241	5,484.90	5,298.46	5,604.22	19.00	1.979E-002	4.658E-003
Cm-245	5,417.78	5,395.41	5,447.61	8.00	8.333E-003	3.125E-003
Pu-236	5,760.83	5,611.67	5,887.60	73.00	7.604E-002	8.961E-003
Cm-244	5,775.74	5,641.51	5,902.52	67.00	6.979E-002	8.590E-003
Th-227	6,074.04	5,932.35	6,178.45	19.00	1.979E-002	4.658E-003
Cm-242	6,148.62	6,118.79	6,178.45	10.00	1.042E-002	3.455E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:33:54AM 11/10/2019

Sample

Sample Name: ICB;AV216
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

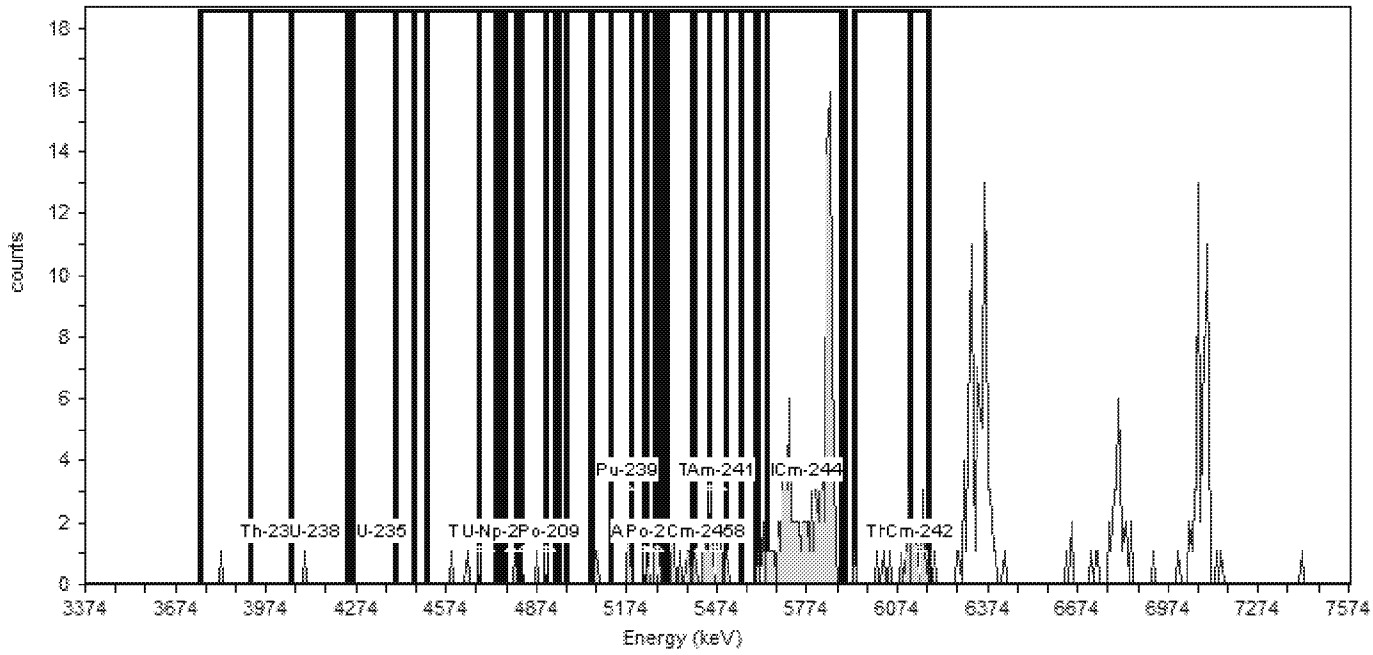
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV216 , SN: 50-117J5
Acquisition Start Date: 11/9/2019 2:31:24PM
Live Time: 960.00 min.
Real Time: 960.02 min.
Calibration Name: IC-7107;AV216-11152018
Calibration Date: 11/15/2018 3:56:57PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 327.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	1.00	1.042E-003	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	3.00	3.125E-003	2.083E-003
Pu-242	4,903.21	4,679.48	4,947.95	2.00	2.083E-003	1.804E-003
Th-229	4,828.63	4,739.14	5,119.48	3.00	3.125E-003	2.083E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	3.00	3.125E-003	2.083E-003
Am-243	5,231.34	5,052.36	5,305.92	7.00	7.292E-003	2.946E-003
U-232	5,253.71	5,059.82	5,402.86	13.00	1.354E-002	3.898E-003
Th-228	5,447.61	5,186.59	5,507.27	22.00	2.292E-002	4.996E-003
Po-210	5,276.09	5,231.34	5,291.00	4.00	4.167E-003	2.329E-003
Pu-238	5,469.98	5,268.63	5,552.01	21.00	2.188E-002	4.886E-003
Am-241	5,484.90	5,298.46	5,604.22	18.00	1.875E-002	4.541E-003
Cm-245	5,417.78	5,395.41	5,447.61	6.00	6.250E-003	2.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	104.00	1.083E-001	1.067E-002
Cm-244	5,775.74	5,641.51	5,902.52	101.00	1.052E-001	1.052E-002
Th-227	6,074.04	5,932.35	6,178.45	19.00	1.979E-002	4.658E-003
Cm-242	6,148.62	6,118.79	6,178.45	10.00	1.042E-002	3.455E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:00AM 11/10/2019

Sample

Sample Name: ICB;AV217
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

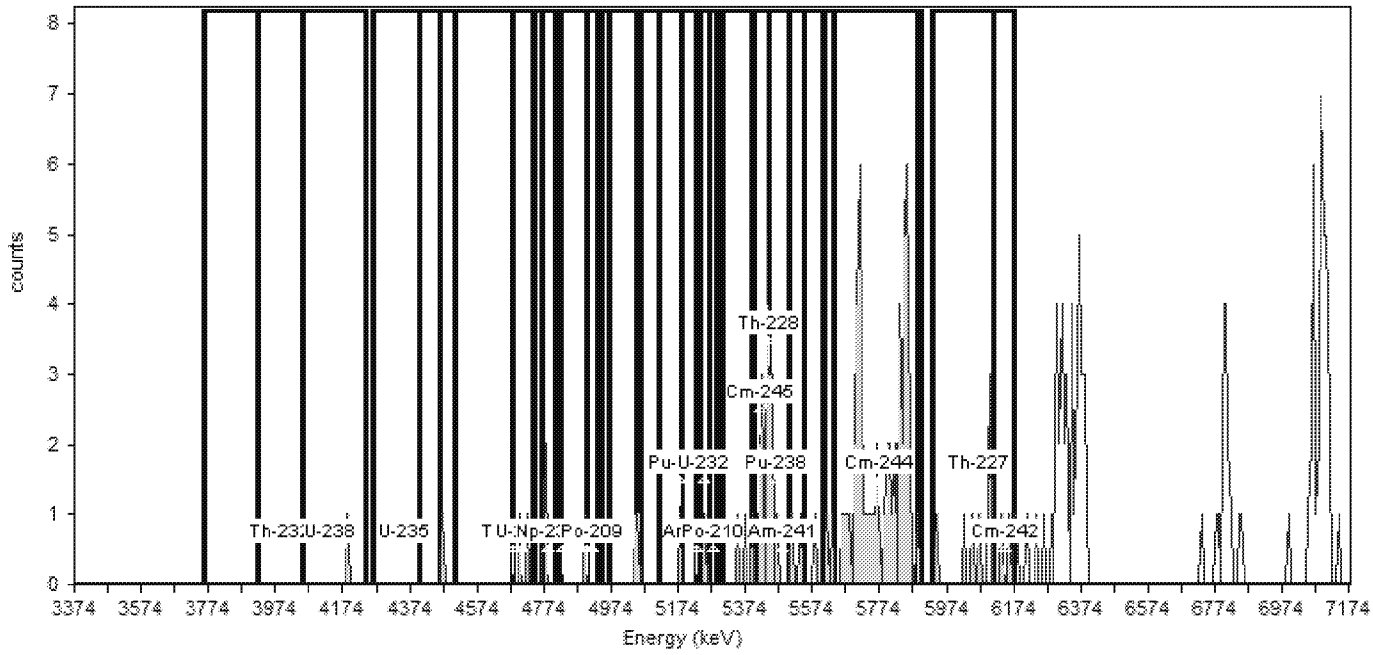
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV217 , SN: 50-117I2
Acquisition Start Date: 11/9/2019 2:31:24PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-8874;AV217-11152018
Calibration Date: 11/15/2018 6:57:58PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 192.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	0.00	0.000E+000	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	1.00	1.042E-003	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	3.00	3.125E-003	2.083E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	5.00	5.208E-003	2.552E-003
Th-229	4,828.63	4,739.14	5,119.48	5.00	5.208E-003	2.552E-003
Np-237	4,783.89	4,768.97	4,806.26	2.00	2.083E-003	1.804E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	3.00	3.125E-003	2.083E-003
Am-243	5,231.34	5,052.36	5,305.92	3.00	3.125E-003	2.083E-003
U-232	5,253.71	5,059.82	5,402.86	5.00	5.208E-003	2.552E-003
Th-228	5,447.61	5,186.59	5,507.27	21.00	2.188E-002	4.886E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	22.00	2.292E-002	4.996E-003
Am-241	5,484.90	5,298.46	5,604.22	23.00	2.396E-002	5.103E-003
Cm-245	5,417.78	5,395.41	5,447.61	14.00	1.458E-002	4.034E-003
Pu-236	5,760.83	5,611.67	5,887.60	57.00	5.937E-002	7.933E-003
Cm-244	5,775.74	5,641.51	5,902.52	55.00	5.729E-002	7.795E-003
Th-227	6,074.04	5,932.35	6,178.45	10.00	1.042E-002	3.455E-003
Cm-242	6,148.62	6,118.79	6,178.45	3.00	3.125E-003	2.083E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:02AM 11/10/2019

Sample

Sample Name: ICB;AV218
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

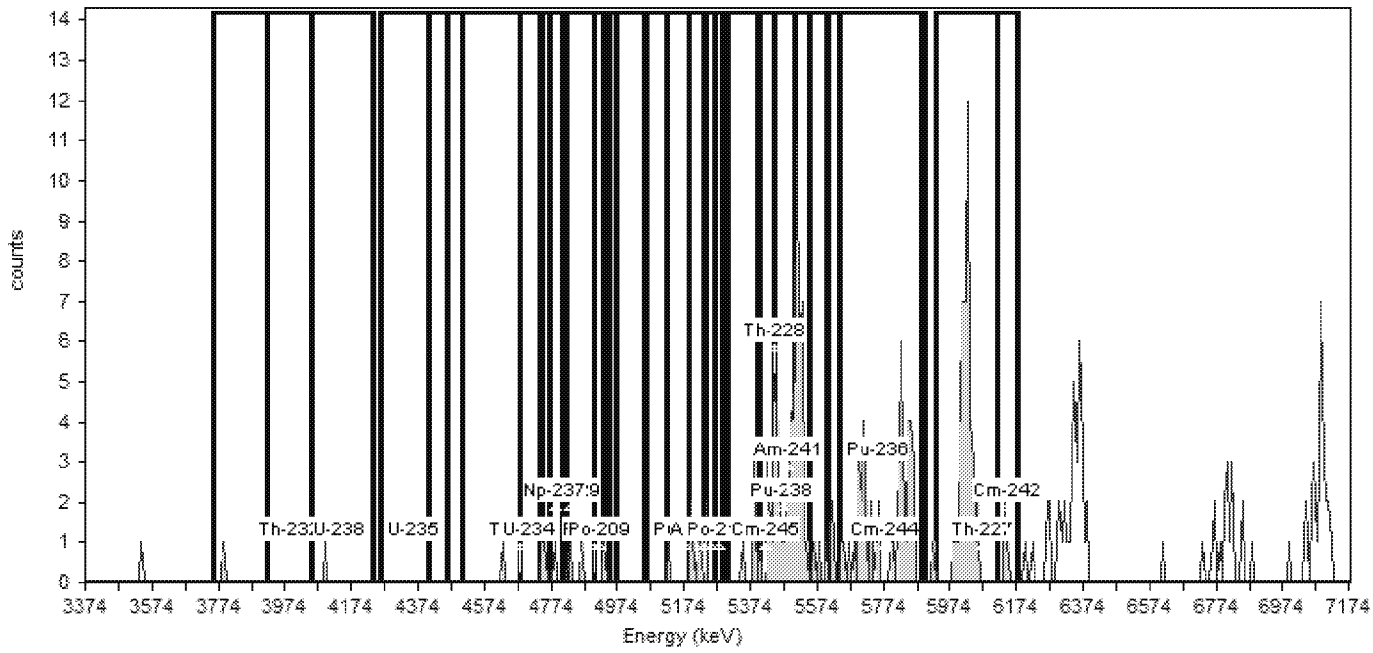
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV218 , SN: 50-117Z7
Acquisition Start Date: 11/9/2019 2:31:24PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8877;AV218-11152018
Calibration Date: 11/15/2018 3:57:00PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 265.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	1.00	1.042E-003	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	6.00	6.250E-003	2.756E-003
Th-229	4,828.63	4,739.14	5,119.48	6.00	6.250E-003	2.756E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	8.00	8.333E-003	3.125E-003
Am-243	5,231.34	5,052.36	5,305.92	8.00	8.333E-003	3.125E-003
U-232	5,253.71	5,059.82	5,402.86	13.00	1.354E-002	3.898E-003
Th-228	5,447.61	5,186.59	5,507.27	44.00	4.583E-002	6.988E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-003
Pu-238	5,469.98	5,268.63	5,552.01	63.00	6.563E-002	8.333E-003
Am-241	5,484.90	5,298.46	5,604.22	66.00	6.875E-002	8.526E-003
Cm-245	5,417.78	5,395.41	5,447.61	12.00	1.250E-002	3.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	49.00	5.104E-002	7.366E-003
Cm-244	5,775.74	5,641.51	5,902.52	46.00	4.792E-002	7.141E-003
Th-227	6,074.04	5,932.35	6,178.45	46.00	4.792E-002	7.141E-003
Cm-242	6,148.62	6,118.79	6,178.45	3.00	3.125E-003	2.083E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:21AM 11/10/2019

Sample

Sample Name: ICB;AV221
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

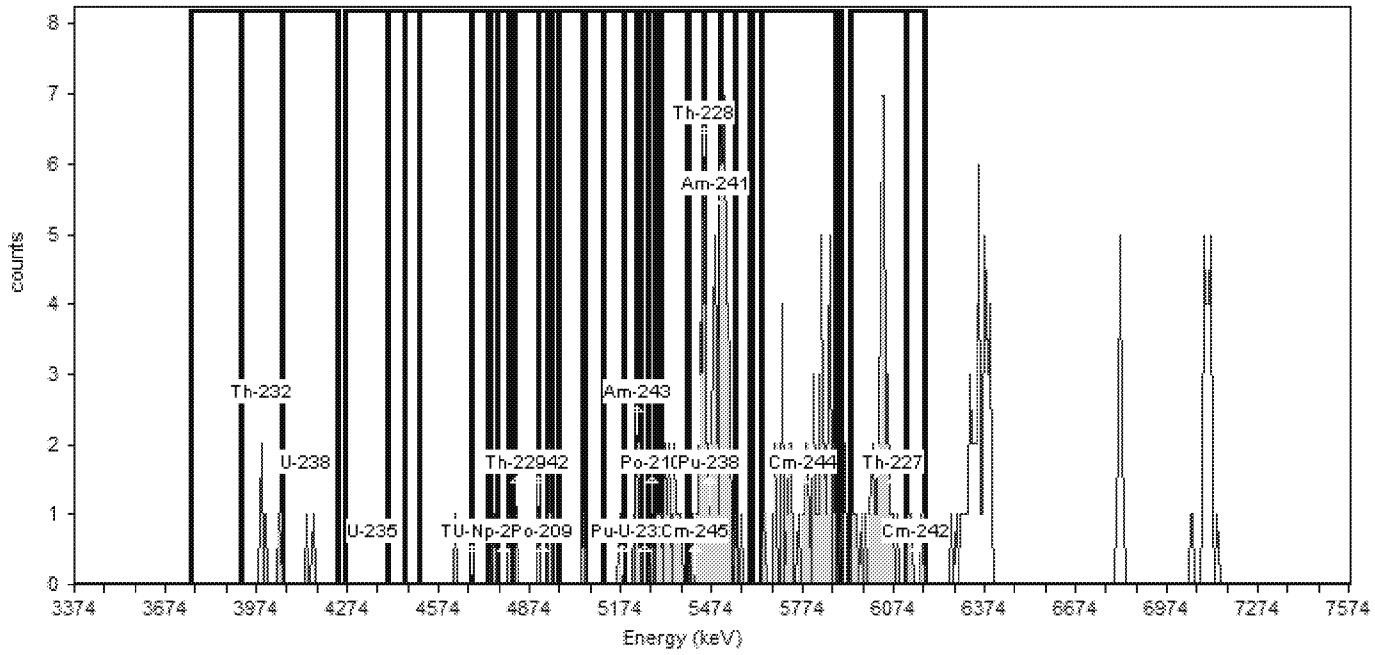
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV221 , SN: 50-117H5
Acquisition Start Date: 11/9/2019 2:31:25PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9793;AV221-11152018
Calibration Date: 11/15/2018 3:57:25PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 234.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	4.00	4.167E-003	2.329E-003
U-238	4,135.08	3,918.81	4,239.49	6.00	6.250E-003	2.756E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	1.00	1.042E-003	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	3.00	3.125E-003	2.083E-003
Pu-242	4,903.21	4,679.48	4,947.95	6.00	6.250E-003	2.756E-003
Th-229	4,828.63	4,739.14	5,119.48	7.00	7.292E-003	2.946E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	5.00	5.208E-003	2.552E-003
Am-243	5,231.34	5,052.36	5,305.92	8.00	8.333E-003	3.125E-003
U-232	5,253.71	5,059.82	5,402.86	17.00	1.771E-002	4.419E-003
Th-228	5,447.61	5,186.59	5,507.27	50.00	5.208E-002	7.439E-003
Po-210	5,276.09	5,231.34	5,291.00	3.00	3.125E-003	2.083E-003
Pu-238	5,469.98	5,268.63	5,552.01	66.00	6.875E-002	8.526E-003
Am-241	5,484.90	5,298.46	5,604.22	66.00	6.875E-002	8.526E-003
Cm-245	5,417.78	5,395.41	5,447.61	12.00	1.250E-002	3.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	40.00	4.167E-002	6.670E-003
Cm-244	5,775.74	5,641.51	5,902.52	41.00	4.271E-002	6.751E-003
Th-227	6,074.04	5,932.35	6,178.45	37.00	3.854E-002	6.421E-003
Cm-242	6,148.62	6,118.79	6,178.45	3.00	3.125E-003	2.083E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:13AM 11/10/2019

Sample

Sample Name: ICB;AV223
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

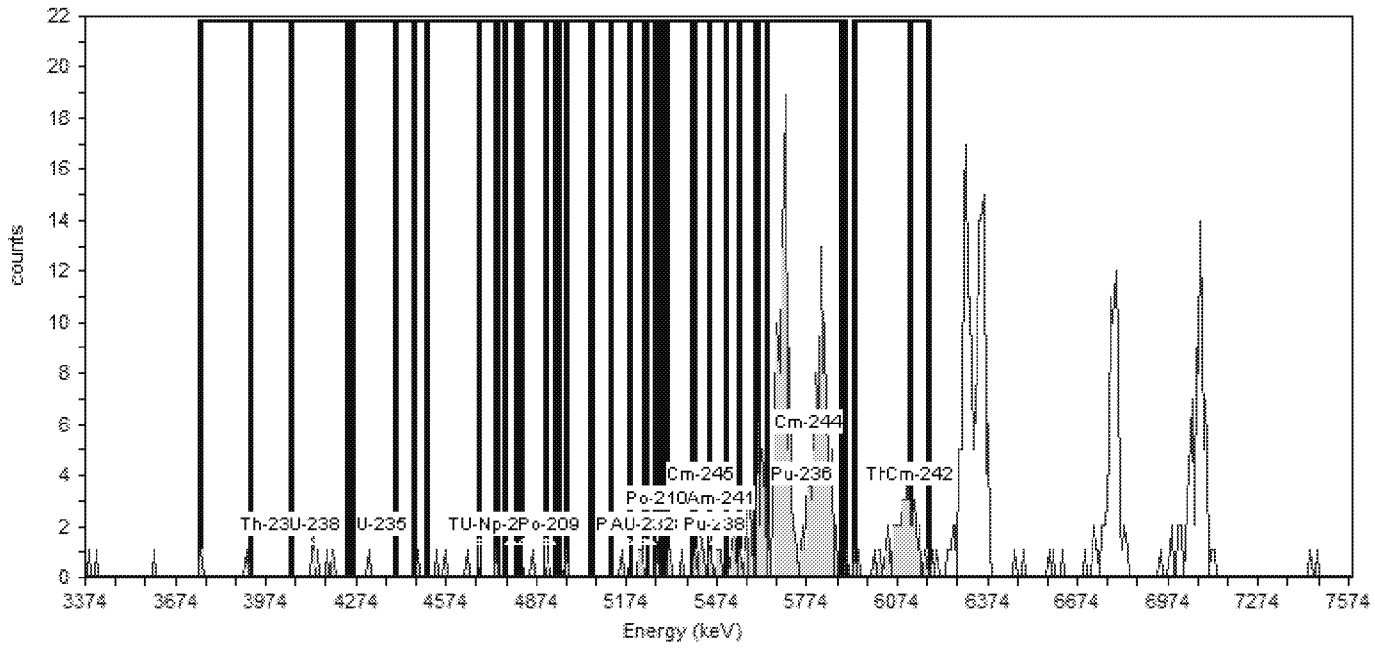
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV223 , SN: 49-037X6
Acquisition Start Date: 11/9/2019 2:31:25PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9817;AV223-11192018
Calibration Date: 11/19/2018 8:42:38PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 564.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	2.00	2.083E-003	1.804E-003
U-238	4,135.08	3,918.81	4,239.49	5.00	5.208E-003	2.552E-003
U-235	4,358.81	4,261.86	4,463.21	1.00	1.042E-003	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	5.00	5.208E-003	2.552E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	3.00	3.125E-003	2.083E-003
Th-229	4,828.63	4,739.14	5,119.48	4.00	4.167E-003	2.329E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	4.00	4.167E-003	2.329E-003
Am-243	5,231.34	5,052.36	5,305.92	4.00	4.167E-003	2.329E-003
U-232	5,253.71	5,059.82	5,402.86	8.00	8.333E-003	3.125E-003
Th-228	5,447.61	5,186.59	5,507.27	15.00	1.563E-002	4.167E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	18.00	1.875E-002	4.541E-003
Am-241	5,484.90	5,298.46	5,604.22	24.00	2.500E-002	5.208E-003
Cm-245	5,417.78	5,395.41	5,447.61	6.00	6.250E-003	2.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	185.00	1.927E-001	1.421E-002
Cm-244	5,775.74	5,641.51	5,902.52	169.00	1.760E-001	1.358E-002
Th-227	6,074.04	5,932.35	6,178.45	38.00	3.958E-002	6.505E-003
Cm-242	6,148.62	6,118.79	6,178.45	11.00	1.146E-002	3.608E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:17AM 11/10/2019

Sample

Sample Name: ICB;AV224
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

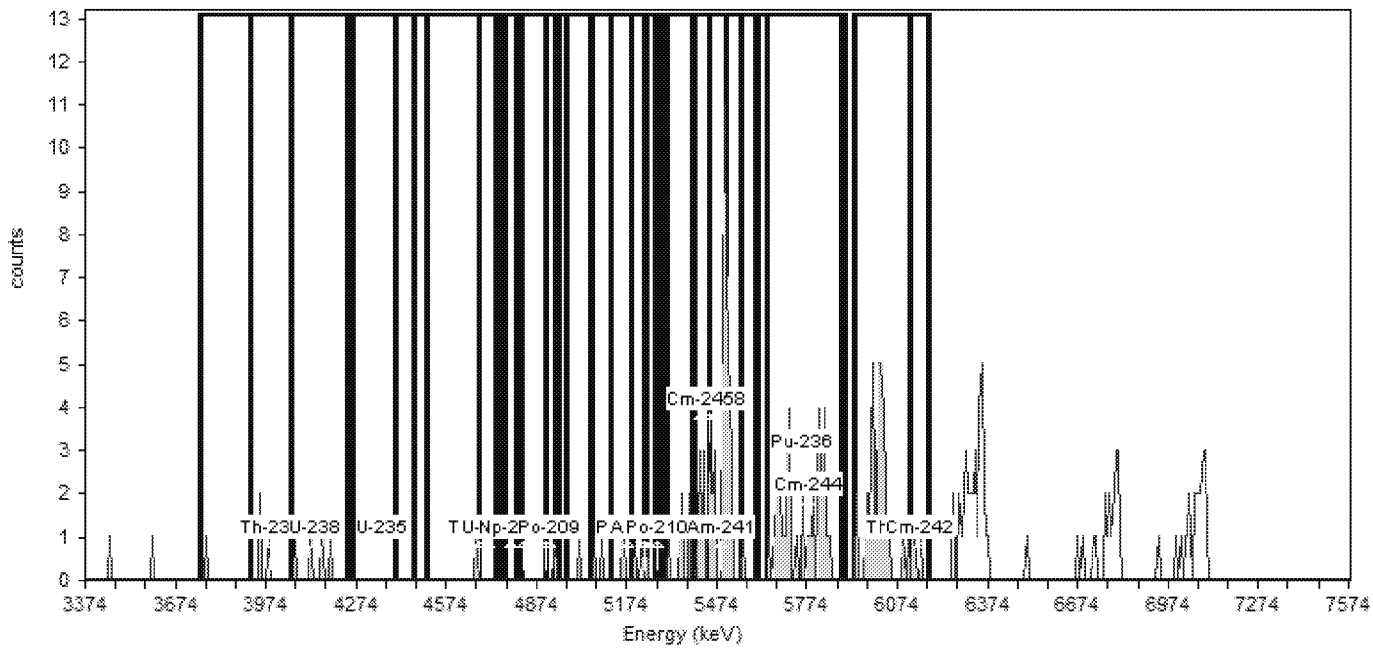
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV224 , SN: 50-119AA5
Acquisition Start Date: 11/9/2019 2:31:26PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-9885;AV224-11152018
Calibration Date: 11/15/2018 3:59:05PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

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

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	4.00	4.167E-003	2.329E-003
U-238	4,135.08	3,918.81	4,239.49	7.00	7.292E-003	2.946E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	1.00	1.042E-003	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	1.00	1.042E-003	1.473E-003
Pu-242	4,903.21	4,679.48	4,947.95	1.00	1.042E-003	1.473E-003
Th-229	4,828.63	4,739.14	5,119.48	4.00	4.167E-003	2.329E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	8.00	8.333E-003	3.125E-003
Am-243	5,231.34	5,052.36	5,305.92	7.00	7.292E-003	2.946E-003
U-232	5,253.71	5,059.82	5,402.86	13.00	1.354E-002	3.898E-003
Th-228	5,447.61	5,186.59	5,507.27	50.00	5.208E-002	7.439E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	54.00	5.625E-002	7.725E-003
Am-241	5,484.90	5,298.46	5,604.22	55.00	5.729E-002	7.795E-003
Cm-245	5,417.78	5,395.41	5,447.61	11.00	1.146E-002	3.608E-003
Pu-236	5,760.83	5,611.67	5,887.60	40.00	4.167E-002	6.670E-003
Cm-244	5,775.74	5,641.51	5,902.52	40.00	4.167E-002	6.670E-003
Th-227	6,074.04	5,932.35	6,178.45	37.00	3.854E-002	6.421E-003
Cm-242	6,148.62	6,118.79	6,178.45	3.00	3.125E-003	2.083E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:36AM 11/10/2019

Sample

Sample Name: ICB;AV225
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

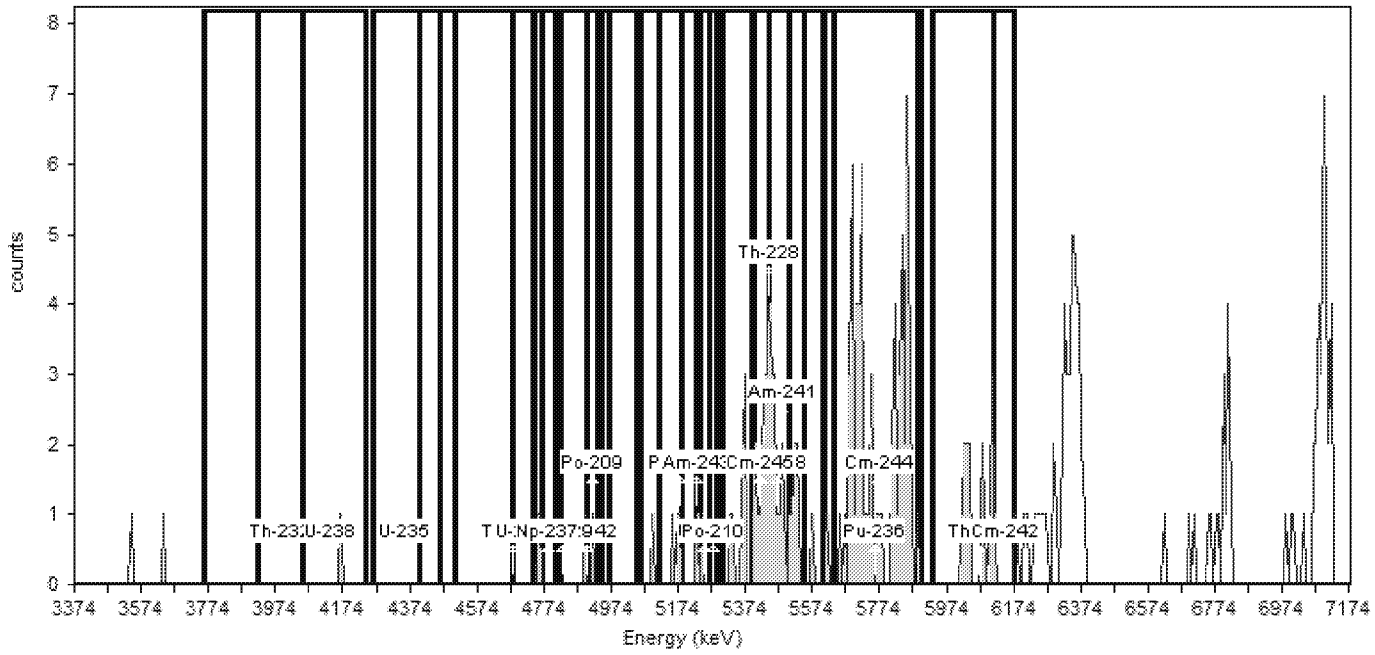
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV225 , SN: 50-117J7
Acquisition Start Date: 11/9/2019 2:31:27PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-1368446;AV225-11152018
Calibration Date: 11/15/2018 3:59:09PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 229.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	0.00	0.000E+000	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	1.00	1.042E-003	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	0.00	0.000E+000	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	2.00	2.083E-003	1.804E-003
Pu-242	4,903.21	4,679.48	4,947.95	4.00	4.167E-003	2.329E-003
Th-229	4,828.63	4,739.14	5,119.48	5.00	5.208E-003	2.552E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	5.00	5.208E-003	2.552E-003
Am-243	5,231.34	5,052.36	5,305.92	6.00	6.250E-003	2.756E-003
U-232	5,253.71	5,059.82	5,402.86	15.00	1.563E-002	4.167E-003
Th-228	5,447.61	5,186.59	5,507.27	37.00	3.854E-002	6.421E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-003
Pu-238	5,469.98	5,268.63	5,552.01	40.00	4.167E-002	6.670E-003
Am-241	5,484.90	5,298.46	5,604.22	41.00	4.271E-002	6.751E-003
Cm-245	5,417.78	5,395.41	5,447.61	16.00	1.667E-002	4.295E-003
Pu-236	5,760.83	5,611.67	5,887.60	65.00	6.771E-002	8.463E-003
Cm-244	5,775.74	5,641.51	5,902.52	64.00	6.667E-002	8.398E-003
Th-227	6,074.04	5,932.35	6,178.45	16.00	1.667E-002	4.295E-003
Cm-242	6,148.62	6,118.79	6,178.45	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:29AM 11/10/2019

Sample

Sample Name: ICB;AV227
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

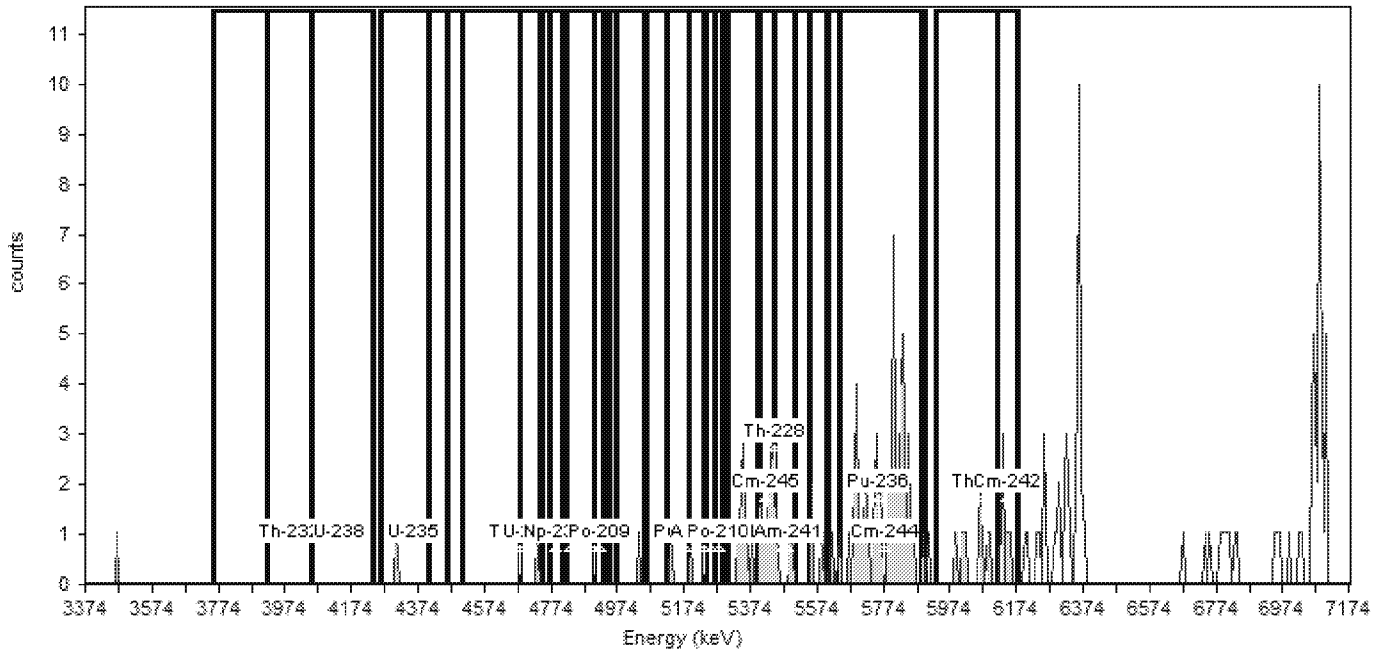
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV227 , SN: 50-120DD5
Acquisition Start Date: 11/9/2019 2:31:26PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-1370621;AV227-11152018
Calibration Date: 11/15/2018 6:58:05PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 182.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	0.00	0.000E+000	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	0.00	0.000E+000	1.473E-003
U-235	4,358.81	4,261.86	4,463.21	1.00	1.042E-003	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	1.00	1.042E-003	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	1.00	1.042E-003	1.473E-003
Pu-242	4,903.21	4,679.48	4,947.95	1.00	1.042E-003	1.473E-003
Th-229	4,828.63	4,739.14	5,119.48	1.00	1.042E-003	1.473E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	3.00	3.125E-003	2.083E-003
Am-243	5,231.34	5,052.36	5,305.92	2.00	2.083E-003	1.804E-003
U-232	5,253.71	5,059.82	5,402.86	12.00	1.250E-002	3.756E-003
Th-228	5,447.61	5,186.59	5,507.27	24.00	2.500E-002	5.208E-003
Po-210	5,276.09	5,231.34	5,291.00	0.00	0.000E+000	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	23.00	2.396E-002	5.103E-003
Am-241	5,484.90	5,298.46	5,604.22	26.00	2.708E-002	5.413E-003
Cm-245	5,417.78	5,395.41	5,447.61	12.00	1.250E-002	3.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	52.00	5.417E-002	7.583E-003
Cm-244	5,775.74	5,641.51	5,902.52	52.00	5.417E-002	7.583E-003
Th-227	6,074.04	5,932.35	6,178.45	13.00	1.354E-002	3.898E-003
Cm-242	6,148.62	6,118.79	6,178.45	5.00	5.208E-003	2.552E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:33:58AM 11/10/2019

Sample

Sample Name: ICB;AV228
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

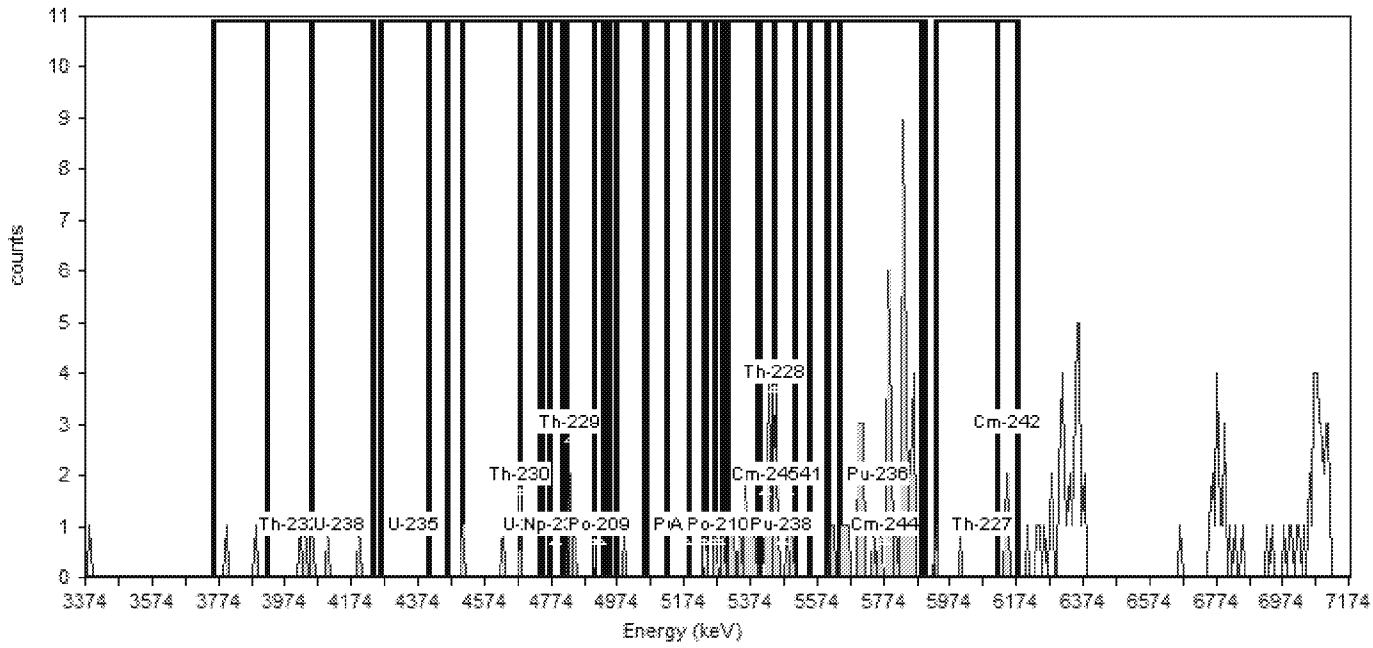
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV228 , SN: 51-005Q6
Acquisition Start Date: 11/9/2019 2:31:26PM
Live Time: 960.00 min.
Real Time: 960.27 min.
Calibration Name: IC-1370622;AV228-11152018
Calibration Date: 11/15/2018 6:58:08PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 181.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	5.00	5.208E-003	2.552E-003
U-238	4,135.08	3,918.81	4,239.49	5.00	5.208E-003	2.552E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	3.00	3.125E-003	2.083E-003
U-234	4,709.31	4,507.96	4,821.17	3.00	3.125E-003	2.083E-003
Pu-242	4,903.21	4,679.48	4,947.95	4.00	4.167E-003	2.329E-003
Th-229	4,828.63	4,739.14	5,119.48	4.00	4.167E-003	2.329E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	2.00	2.083E-003	1.804E-003
Am-243	5,231.34	5,052.36	5,305.92	3.00	3.125E-003	2.083E-003
U-232	5,253.71	5,059.82	5,402.86	12.00	1.250E-002	3.756E-003
Th-228	5,447.61	5,186.59	5,507.27	26.00	2.708E-002	5.413E-003
Po-210	5,276.09	5,231.34	5,291.00	3.00	3.125E-003	2.083E-003
Pu-238	5,469.98	5,268.63	5,552.01	25.00	2.604E-002	5.311E-003
Am-241	5,484.90	5,298.46	5,604.22	23.00	2.396E-002	5.103E-003
Cm-245	5,417.78	5,395.41	5,447.61	10.00	1.042E-002	3.455E-003
Pu-236	5,760.83	5,611.67	5,887.60	51.00	5.313E-002	7.512E-003
Cm-244	5,775.74	5,641.51	5,902.52	49.00	5.104E-002	7.366E-003
Th-227	6,074.04	5,932.35	6,178.45	5.00	5.208E-003	2.552E-003
Cm-242	6,148.62	6,118.79	6,178.45	3.00	3.125E-003	2.083E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:32AM 11/10/2019

Sample

Sample Name: ICB;AV229
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

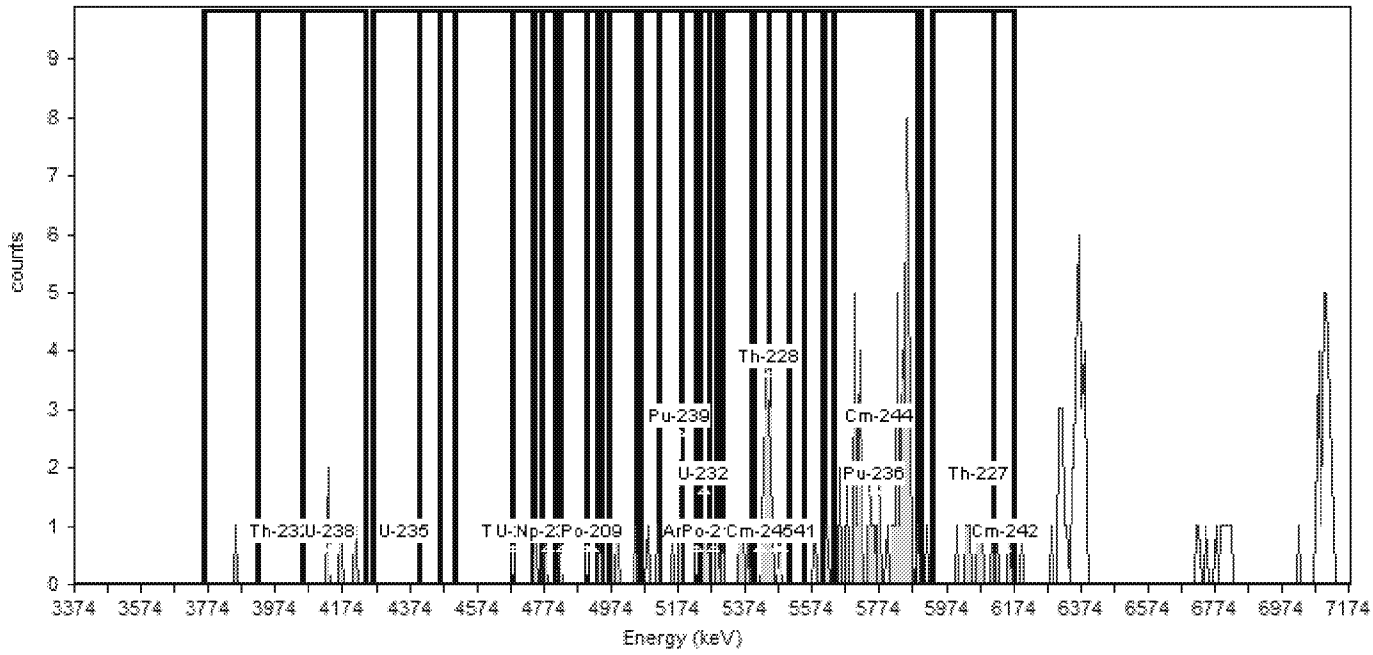
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV229 , SN: 51-005EE4
Acquisition Start Date: 11/9/2019 2:31:27PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-1370619;AV229-11152018
Calibration Date: 11/15/2018 6:58:12PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 164.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	4.00	4.167E-003	2.329E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	1.00	1.042E-003	1.473E-003
U-234	4,709.31	4,507.96	4,821.17	3.00	3.125E-003	2.083E-003
Pu-242	4,903.21	4,679.48	4,947.95	4.00	4.167E-003	2.329E-003
Th-229	4,828.63	4,739.14	5,119.48	8.00	8.333E-003	3.125E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	7.00	7.292E-003	2.946E-003
Am-243	5,231.34	5,052.36	5,305.92	9.00	9.375E-003	3.294E-003
U-232	5,253.71	5,059.82	5,402.86	12.00	1.250E-002	3.756E-003
Th-228	5,447.61	5,186.59	5,507.27	21.00	2.188E-002	4.886E-003
Po-210	5,276.09	5,231.34	5,291.00	3.00	3.125E-003	2.083E-003
Pu-238	5,469.98	5,268.63	5,552.01	19.00	1.979E-002	4.658E-003
Am-241	5,484.90	5,298.46	5,604.22	19.00	1.979E-002	4.658E-003
Cm-245	5,417.78	5,395.41	5,447.61	12.00	1.250E-002	3.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	50.00	5.208E-002	7.439E-003
Cm-244	5,775.74	5,641.51	5,902.52	49.00	5.104E-002	7.366E-003
Th-227	6,074.04	5,932.35	6,178.45	9.00	9.375E-003	3.294E-003
Cm-242	6,148.62	6,118.79	6,178.45	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:44AM 11/10/2019

Sample

Sample Name: ICB;AV230
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

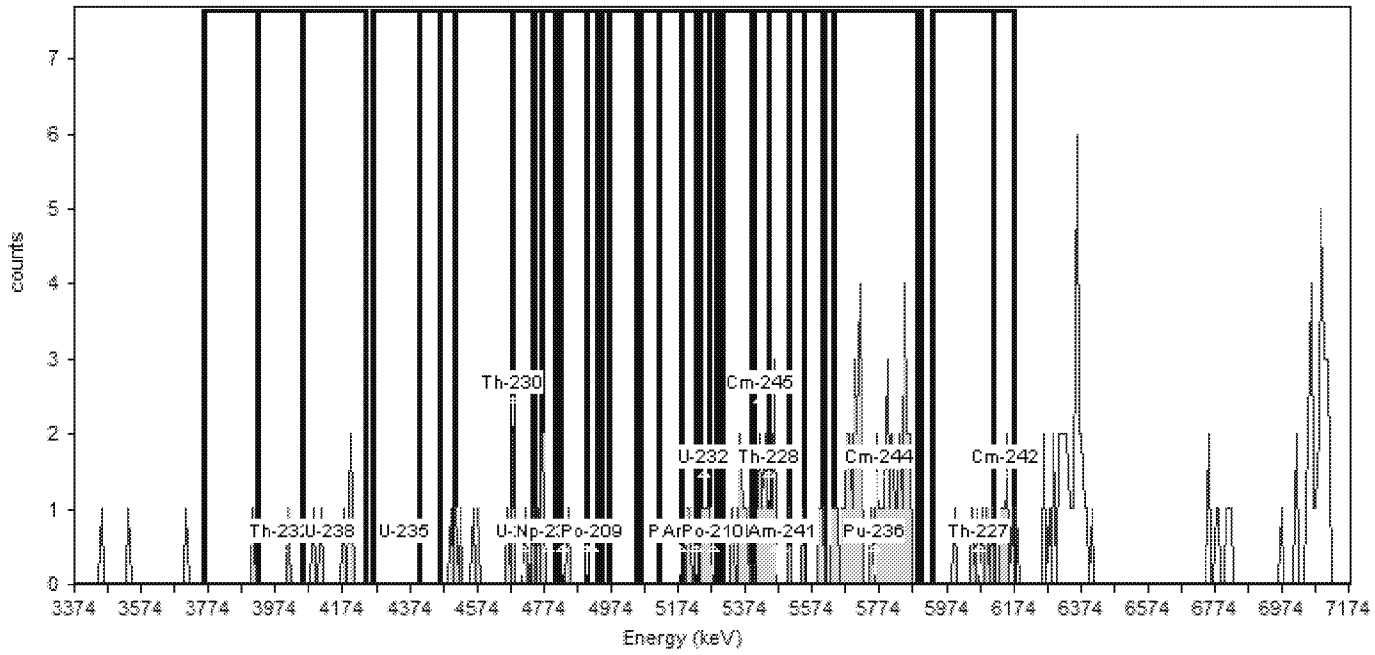
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV230 , SN: 49-045J5
Acquisition Start Date: 11/9/2019 2:31:24PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-1370620;AV230-11152018
Calibration Date: 11/15/2018 6:58:15PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 175.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	2.00	2.083E-003	1.804E-003
U-238	4,135.08	3,918.81	4,239.49	7.00	7.292E-003	2.946E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	10.00	1.042E-002	3.455E-003
U-234	4,709.31	4,507.96	4,821.17	12.00	1.250E-002	3.756E-003
Pu-242	4,903.21	4,679.48	4,947.95	8.00	8.333E-003	3.125E-003
Th-229	4,828.63	4,739.14	5,119.48	5.00	5.208E-003	2.552E-003
Np-237	4,783.89	4,768.97	4,806.26	2.00	2.083E-003	1.804E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	2.00	2.083E-003	1.804E-003
Am-243	5,231.34	5,052.36	5,305.92	6.00	6.250E-003	2.756E-003
U-232	5,253.71	5,059.82	5,402.86	12.00	1.250E-002	3.756E-003
Th-228	5,447.61	5,186.59	5,507.27	25.00	2.604E-002	5.311E-003
Po-210	5,276.09	5,231.34	5,291.00	4.00	4.167E-003	2.329E-003
Pu-238	5,469.98	5,268.63	5,552.01	21.00	2.188E-002	4.886E-003
Am-241	5,484.90	5,298.46	5,604.22	22.00	2.292E-002	4.996E-003
Cm-245	5,417.78	5,395.41	5,447.61	8.00	8.333E-003	3.125E-003
Pu-236	5,760.83	5,611.67	5,887.60	46.00	4.792E-002	7.141E-003
Cm-244	5,775.74	5,641.51	5,902.52	45.00	4.688E-002	7.065E-003
Th-227	6,074.04	5,932.35	6,178.45	11.00	1.146E-002	3.608E-003
Cm-242	6,148.62	6,118.79	6,178.45	5.00	5.208E-003	2.552E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:48AM 11/10/2019

Sample

Sample Name: ICB;AV232
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

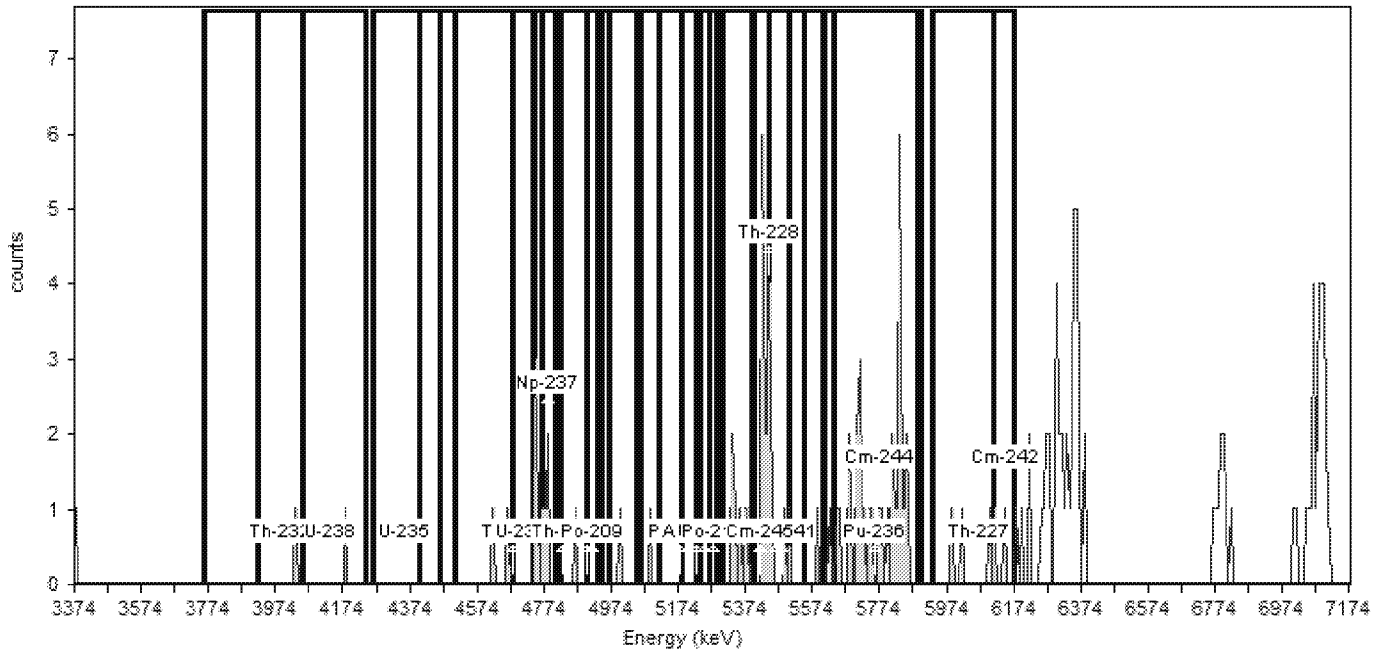
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV232 , SN: 46-033p2
Acquisition Start Date: 11/9/2019 2:31:24PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8874;AV232-11152018a
Calibration Date: 11/15/2018 10:59:14PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 148.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	2.00	2.083E-003	1.804E-003
U-235	4,358.81	4,261.86	4,463.21	0.00	0.000E+000	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	5.00	5.208E-003	2.552E-003
U-234	4,709.31	4,507.96	4,821.17	10.00	1.042E-002	3.455E-003
Pu-242	4,903.21	4,679.48	4,947.95	9.00	9.375E-003	3.294E-003
Th-229	4,828.63	4,739.14	5,119.48	11.00	1.146E-002	3.608E-003
Np-237	4,783.89	4,768.97	4,806.26	4.00	4.167E-003	2.329E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	2.00	2.083E-003	1.804E-003
Am-243	5,231.34	5,052.36	5,305.92	1.00	1.042E-003	1.473E-003
U-232	5,253.71	5,059.82	5,402.86	7.00	7.292E-003	2.946E-003
Th-228	5,447.61	5,186.59	5,507.27	23.00	2.396E-002	5.103E-003
Po-210	5,276.09	5,231.34	5,291.00	0.00	0.000E+000	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	23.00	2.396E-002	5.103E-003
Am-241	5,484.90	5,298.46	5,604.22	24.00	2.500E-002	5.208E-003
Cm-245	5,417.78	5,395.41	5,447.61	14.00	1.458E-002	4.034E-003
Pu-236	5,760.83	5,611.67	5,887.60	31.00	3.229E-002	5.893E-003
Cm-244	5,775.74	5,641.51	5,902.52	30.00	3.125E-002	5.800E-003
Th-227	6,074.04	5,932.35	6,178.45	5.00	5.208E-003	2.552E-003
Cm-242	6,148.62	6,118.79	6,178.45	2.00	2.083E-003	1.804E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:32:40AM 11/10/2019

Sample

Sample Name: ICB;AV233
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

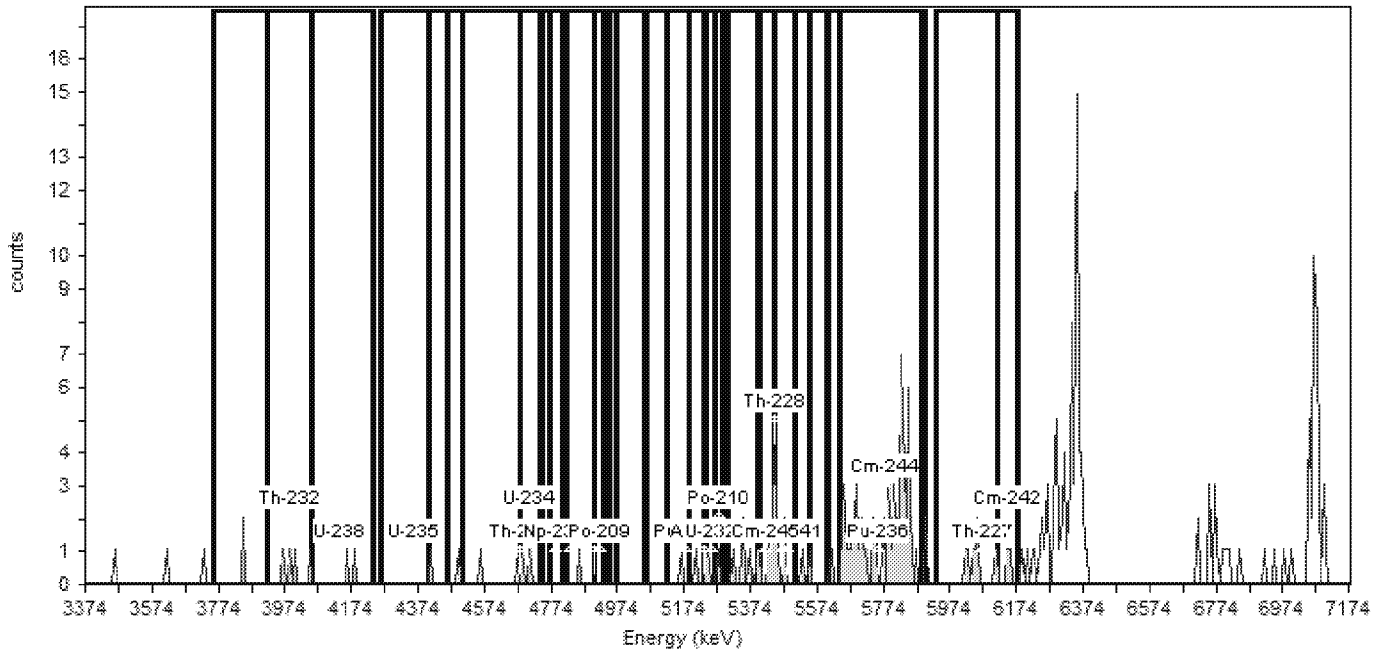
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV233 , SN: 51-005Q7
Acquisition Start Date: 11/9/2019 2:31:24PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-8877;AV233-11152018
Calibration Date: 11/15/2018 6:58:23PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 229.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	6.00	6.250E-003	2.756E-003
U-238	4,135.08	3,918.81	4,239.49	6.00	6.250E-003	2.756E-003
U-235	4,358.81	4,261.86	4,463.21	1.00	1.042E-003	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	6.00	6.250E-003	2.756E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	3.00	3.125E-003	2.083E-003
Th-229	4,828.63	4,739.14	5,119.48	1.00	1.042E-003	1.473E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	3.00	3.125E-003	2.083E-003
Am-243	5,231.34	5,052.36	5,305.92	5.00	5.208E-003	2.552E-003
U-232	5,253.71	5,059.82	5,402.86	11.00	1.146E-002	3.608E-003
Th-228	5,447.61	5,186.59	5,507.27	22.00	2.292E-002	4.996E-003
Po-210	5,276.09	5,231.34	5,291.00	3.00	3.125E-003	2.083E-003
Pu-238	5,469.98	5,268.63	5,552.01	21.00	2.188E-002	4.886E-003
Am-241	5,484.90	5,298.46	5,604.22	20.00	2.083E-002	4.774E-003
Cm-245	5,417.78	5,395.41	5,447.61	10.00	1.042E-002	3.455E-003
Pu-236	5,760.83	5,611.67	5,887.60	57.00	5.937E-002	7.933E-003
Cm-244	5,775.74	5,641.51	5,902.52	58.00	6.042E-002	8.001E-003
Th-227	6,074.04	5,932.35	6,178.45	10.00	1.042E-002	3.455E-003
Cm-242	6,148.62	6,118.79	6,178.45	3.00	3.125E-003	2.083E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:33:04AM 11/10/2019

Sample

Sample Name: ICB;AV234
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

Batch

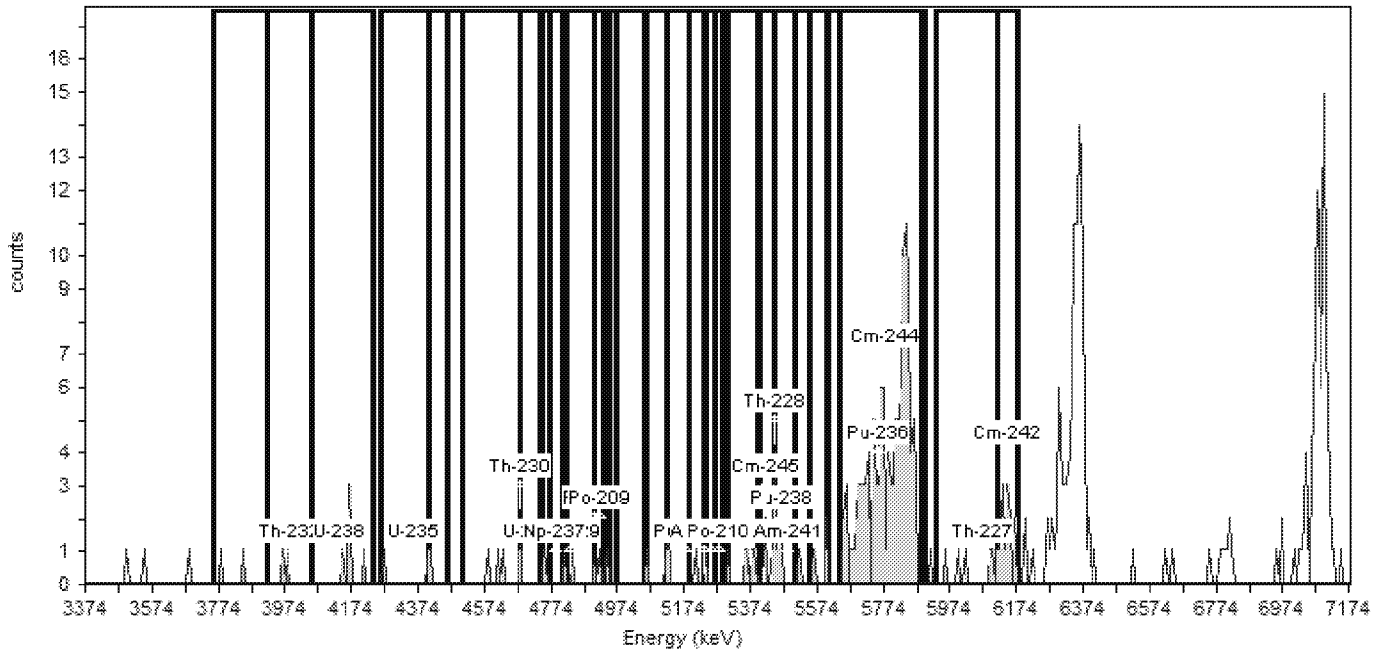
Batch Name: November2019c
Description:

Acquisition

Detector: AV234 , SN: 51-005P2
Acquisition Start Date: 11/9/2019 2:31:24PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9520;AV234-11152018
Calibration Date: 11/15/2018 6:58:26PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 374.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	4.00	4.167E-003	2.329E-003
U-238	4,135.08	3,918.81	4,239.49	7.00	7.292E-003	2.946E-003
U-235	4,358.81	4,261.86	4,463.21	3.00	3.125E-003	2.083E-003
Th-230	4,679.48	4,403.55	4,746.60	7.00	7.292E-003	2.946E-003
U-234	4,709.31	4,507.96	4,821.17	7.00	7.292E-003	2.946E-003
Pu-242	4,903.21	4,679.48	4,947.95	8.00	8.333E-003	3.125E-003
Th-229	4,828.63	4,739.14	5,119.48	8.00	8.333E-003	3.125E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	2.00	2.083E-003	1.804E-003
Pu-239	5,179.14	4,970.33	5,238.80	6.00	6.250E-003	2.756E-003
Am-243	5,231.34	5,052.36	5,305.92	7.00	7.292E-003	2.946E-003
U-232	5,253.71	5,059.82	5,402.86	11.00	1.146E-002	3.608E-003
Th-228	5,447.61	5,186.59	5,507.27	18.00	1.875E-002	4.541E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	17.00	1.771E-002	4.419E-003
Am-241	5,484.90	5,298.46	5,604.22	20.00	2.083E-002	4.774E-003
Cm-245	5,417.78	5,395.41	5,447.61	7.00	7.292E-003	2.946E-003
Pu-236	5,760.83	5,611.67	5,887.60	117.00	1.219E-001	1.132E-002
Cm-244	5,775.74	5,641.51	5,902.52	117.00	1.219E-001	1.132E-002
Th-227	6,074.04	5,932.35	6,178.45	18.00	1.875E-002	4.541E-003
Cm-242	6,148.62	6,118.79	6,178.45	13.00	1.354E-002	3.898E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:33:09AM 11/10/2019

Sample

Sample Name: ICB;AV241
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

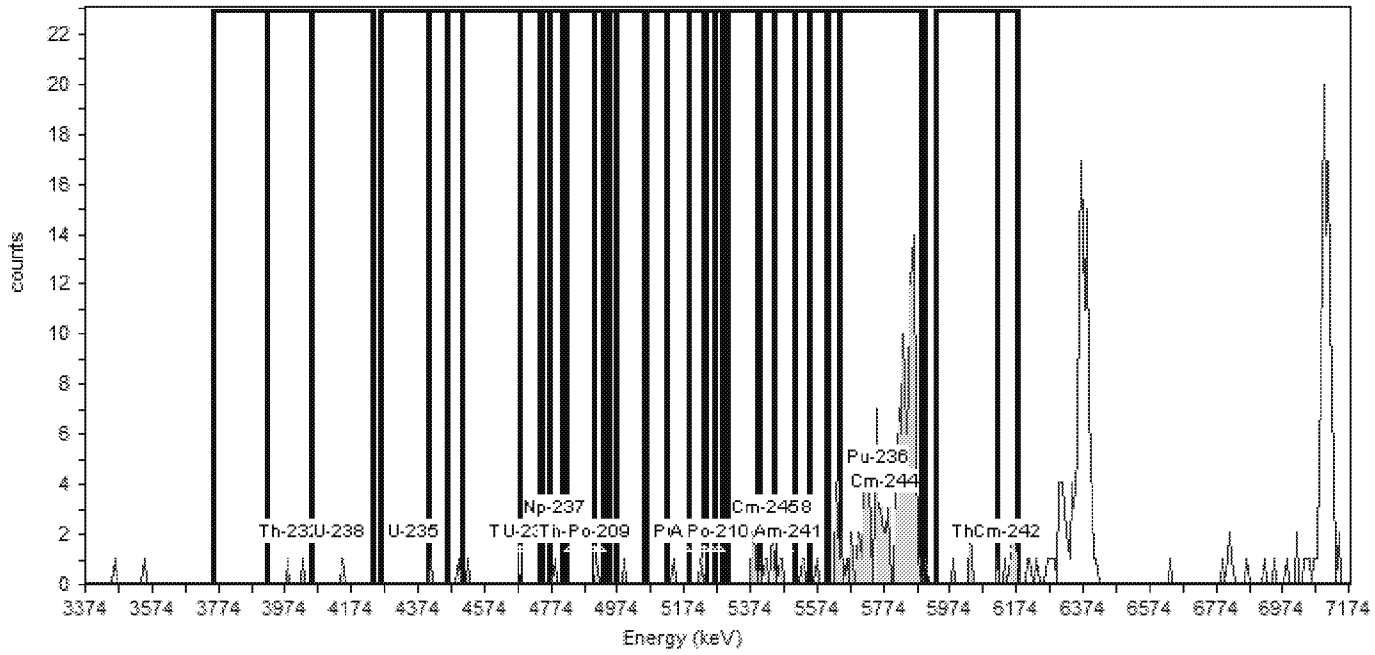
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV241 , SN: 52-059DD3
Acquisition Start Date: 11/9/2019 2:31:26PM
Live Time: 960.00 min.
Real Time: 960.01 min.
Calibration Name: IC-1368447;AV241-11152018
Calibration Date: 11/15/2018 10:58:36PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 356.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	2.00	2.083E-003	1.804E-003
U-238	4,135.08	3,918.81	4,239.49	3.00	3.125E-003	2.083E-003
U-235	4,358.81	4,261.86	4,463.21	1.00	1.042E-003	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	3.00	3.125E-003	2.083E-003
U-234	4,709.31	4,507.96	4,821.17	2.00	2.083E-003	1.804E-003
Pu-242	4,903.21	4,679.48	4,947.95	2.00	2.083E-003	1.804E-003
Th-229	4,828.63	4,739.14	5,119.48	3.00	3.125E-003	2.083E-003
Np-237	4,783.89	4,768.97	4,806.26	1.00	1.042E-003	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	3.00	3.125E-003	2.083E-003
Am-243	5,231.34	5,052.36	5,305.92	2.00	2.083E-003	1.804E-003
U-232	5,253.71	5,059.82	5,402.86	7.00	7.292E-003	2.946E-003
Th-228	5,447.61	5,186.59	5,507.27	13.00	1.354E-002	3.898E-003
Po-210	5,276.09	5,231.34	5,291.00	0.00	0.000E+000	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	14.00	1.458E-002	4.034E-003
Am-241	5,484.90	5,298.46	5,604.22	15.00	1.563E-002	4.167E-003
Cm-245	5,417.78	5,395.41	5,447.61	6.00	6.250E-003	2.756E-003
Pu-236	5,760.83	5,611.67	5,887.60	120.00	1.250E-001	1.146E-002
Cm-244	5,775.74	5,641.51	5,902.52	117.00	1.219E-001	1.132E-002
Th-227	6,074.04	5,932.35	6,178.45	11.00	1.146E-002	3.608E-003
Cm-242	6,148.62	6,118.79	6,178.45	8.00	8.333E-003	3.125E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:33:33AM 11/10/2019

Sample

Sample Name: ICB;AV243
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

Batch

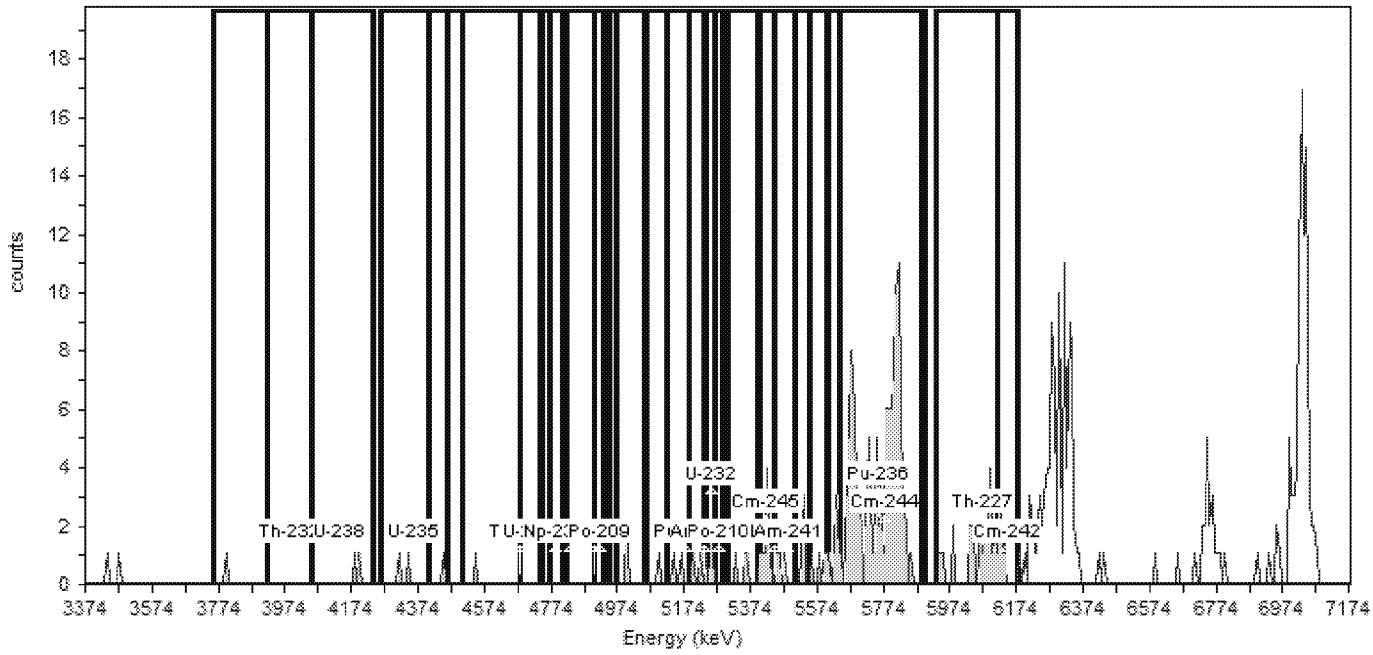
Batch Name: November2019c
Description:

Acquisition

Detector: AV243 , SN: 51-005P6
Acquisition Start Date: 11/9/2019 2:31:27PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-1370622;AV243-11152018
Calibration Date: 11/15/2018 10:58:43PM

Energy Calibration Equation:

Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 387.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	2.00	2.083E-003	1.804E-003
U-235	4,358.81	4,261.86	4,463.21	3.00	3.125E-003	2.083E-003
Th-230	4,679.48	4,403.55	4,746.60	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	1.00	1.042E-003	1.473E-003
Pu-242	4,903.21	4,679.48	4,947.95	0.00	0.000E+000	1.473E-003
Th-229	4,828.63	4,739.14	5,119.48	3.00	3.125E-003	2.083E-003
Np-237	4,783.89	4,768.97	4,806.26	0.00	0.000E+000	1.473E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	8.00	8.333E-003	3.125E-003
Am-243	5,231.34	5,052.36	5,305.92	9.00	9.375E-003	3.294E-003
U-232	5,253.71	5,059.82	5,402.86	13.00	1.354E-002	3.898E-003
Th-228	5,447.61	5,186.59	5,507.27	21.00	2.188E-002	4.886E-003
Po-210	5,276.09	5,231.34	5,291.00	4.00	4.167E-003	2.329E-003
Pu-238	5,469.98	5,268.63	5,552.01	20.00	2.083E-002	4.774E-003
Am-241	5,484.90	5,298.46	5,604.22	24.00	2.500E-002	5.208E-003
Cm-245	5,417.78	5,395.41	5,447.61	9.00	9.375E-003	3.294E-003
Pu-236	5,760.83	5,611.67	5,887.60	118.00	1.229E-001	1.136E-002
Cm-244	5,775.74	5,641.51	5,902.52	113.00	1.177E-001	1.112E-002
Th-227	6,074.04	5,932.35	6,178.45	29.00	3.021E-002	5.705E-003
Cm-242	6,148.62	6,118.79	6,178.45	7.00	7.292E-003	2.946E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:33:48AM 11/10/2019

Sample

Sample Name: ICB;AV249
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

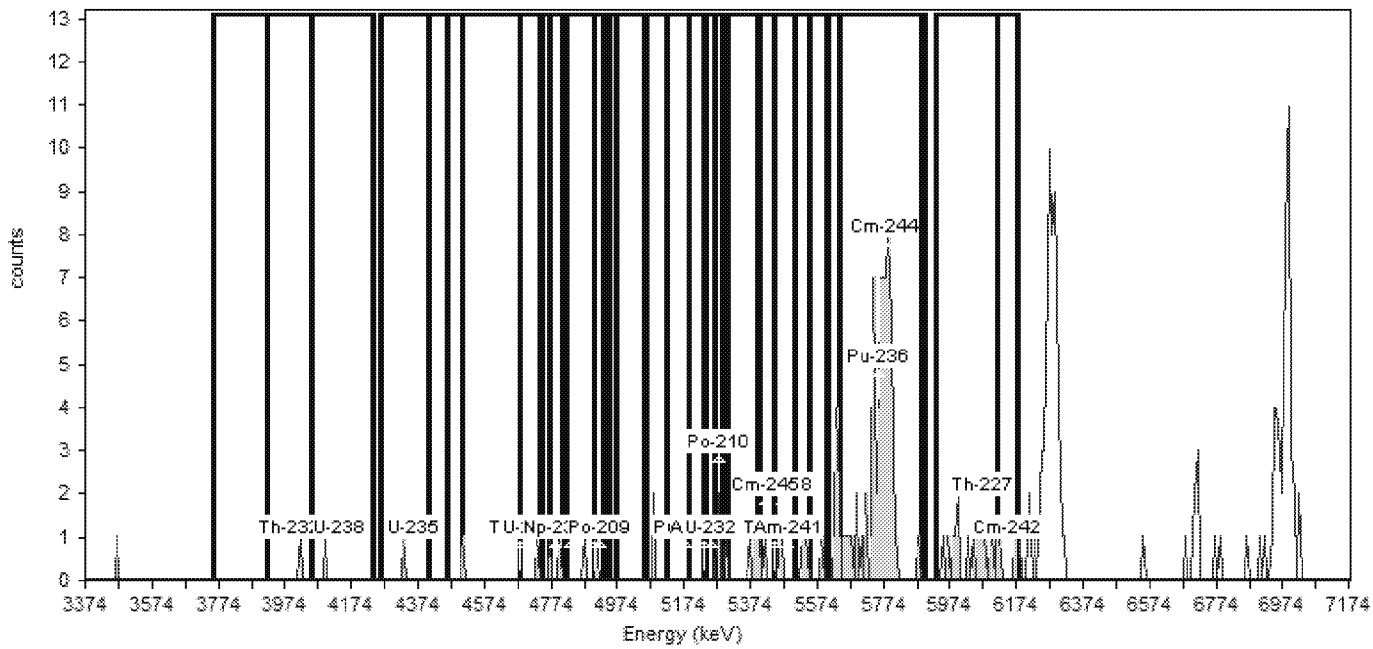
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV249 , SN: 51-005EE5
Acquisition Start Date: 11/9/2019 2:31:28PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9520;AV249-11152018
Calibration Date: 11/15/2018 10:59:03PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 234.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	1.00	1.042E-003	1.473E-003
U-238	4,135.08	3,918.81	4,239.49	2.00	2.083E-003	1.804E-003
U-235	4,358.81	4,261.86	4,463.21	1.00	1.042E-003	1.473E-003
Th-230	4,679.48	4,403.55	4,746.60	2.00	2.083E-003	1.804E-003
U-234	4,709.31	4,507.96	4,821.17	4.00	4.167E-003	2.329E-003
Pu-242	4,903.21	4,679.48	4,947.95	5.00	5.208E-003	2.552E-003
Th-229	4,828.63	4,739.14	5,119.48	6.00	6.250E-003	2.756E-003
Np-237	4,783.89	4,768.97	4,806.26	2.00	2.083E-003	1.804E-003
Po-209	4,918.12	4,903.21	4,933.04	1.00	1.042E-003	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	2.00	2.083E-003	1.804E-003
Am-243	5,231.34	5,052.36	5,305.92	5.00	5.208E-003	2.552E-003
U-232	5,253.71	5,059.82	5,402.86	9.00	9.375E-003	3.294E-003
Th-228	5,447.61	5,186.59	5,507.27	10.00	1.042E-002	3.455E-003
Po-210	5,276.09	5,231.34	5,291.00	2.00	2.083E-003	1.804E-003
Pu-238	5,469.98	5,268.63	5,552.01	13.00	1.354E-002	3.898E-003
Am-241	5,484.90	5,298.46	5,604.22	12.00	1.250E-002	3.756E-003
Cm-245	5,417.78	5,395.41	5,447.61	3.00	3.125E-003	2.083E-003
Pu-236	5,760.83	5,611.67	5,887.60	70.00	7.292E-002	8.777E-003
Cm-244	5,775.74	5,641.51	5,902.52	65.00	6.771E-002	8.463E-003
Th-227	6,074.04	5,932.35	6,178.45	18.00	1.875E-002	4.541E-003
Cm-242	6,148.62	6,118.79	6,178.45	4.00	4.167E-003	2.329E-003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Alpha-Spectroscopy Analysis Report

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
6:33:45AM 11/10/2019

Sample

Sample Name: ICB;AV250
Comment:

Spectrum #1 Analysis #1
Analyst: 60040

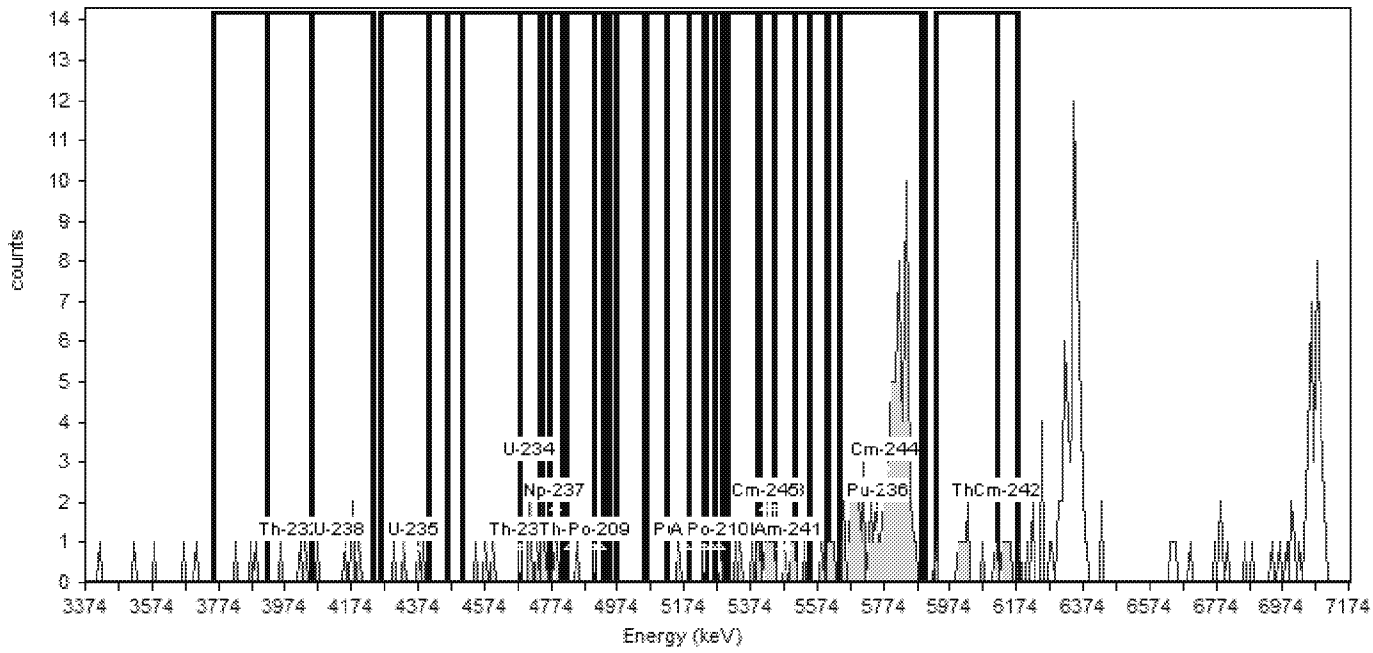
Batch

Batch Name: November2019c
Description:

Acquisition

Detector: AV250 , SN: 47-052x7
Acquisition Start Date: 11/9/2019 2:31:28PM
Live Time: 960.00 min.
Real Time: 960.00 min.
Calibration Name: IC-9792;AV250-11152018
Calibration Date: 11/15/2018 10:59:07PM

Energy Calibration Equation:
Gain = 7.4575 keV / Ch
Offset = 3,366.95 keV
Quadratic = 0.0000 keV / Ch^2



General Analysis

Analysis Method: Absolute ROI Analysis, Set Name = 11/05_BackgroundROI
Nuclide Library: Background ROI Library
Total Background Counts: 273.00

Nuclide Summary (ROI)

RegionName	Peak Energy (keV)	Start Energy (keV)	End Energy (keV)	GrossCounts	Count Rate (CPM)	CR Uncertainty (CPM)
Th-232	3,985.93	3,754.75	4,053.05	6.00	6.250E-003	2.756E-003
U-238	4,135.08	3,918.81	4,239.49	8.00	8.333E-003	3.125E-003
U-235	4,358.81	4,261.86	4,463.21	4.00	4.167E-003	2.329E-003
Th-230	4,679.48	4,403.55	4,746.60	8.00	8.333E-003	3.125E-003
U-234	4,709.31	4,507.96	4,821.17	11.00	1.146E-002	3.608E-003
Pu-242	4,903.21	4,679.48	4,947.95	9.00	9.375E-003	3.294E-003
Th-229	4,828.63	4,739.14	5,119.48	6.00	6.250E-003	2.756E-003
Np-237	4,783.89	4,768.97	4,806.26	2.00	2.083E-003	1.804E-003
Po-209	4,918.12	4,903.21	4,933.04	0.00	0.000E+000	1.473E-003
Pu-239	5,179.14	4,970.33	5,238.80	1.00	1.042E-003	1.473E-003
Am-243	5,231.34	5,052.36	5,305.92	2.00	2.083E-003	1.804E-003
U-232	5,253.71	5,059.82	5,402.86	7.00	7.292E-003	2.946E-003
Th-228	5,447.61	5,186.59	5,507.27	15.00	1.563E-002	4.167E-003
Po-210	5,276.09	5,231.34	5,291.00	1.00	1.042E-003	1.473E-003
Pu-238	5,469.98	5,268.63	5,552.01	16.00	1.667E-002	4.295E-003
Am-241	5,484.90	5,298.46	5,604.22	16.00	1.667E-002	4.295E-003
Cm-245	5,417.78	5,395.41	5,447.61	8.00	8.333E-003	3.125E-003
Pu-236	5,760.83	5,611.67	5,887.60	85.00	8.854E-002	9.660E-003
Cm-244	5,775.74	5,641.51	5,902.52	82.00	8.542E-002	9.490E-003
Th-227	6,074.04	5,932.35	6,178.45	14.00	1.458E-002	4.034E-003
Cm-242	6,148.62	6,118.79	6,178.45	5.00	5.208E-003	2.552E-003

Run Logs

Alpha Spectroscopy Run Log

Detector: AV1

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:44	140	IC 160-371830/1		371830			RTM
05/18/18 19:25	60	ICV 160-371933/1		371933			PS
11/12/19 07:44	60	CCV 160-450128/1		450128			TJR
11/12/19 12:57	1	PULSER 160-450128/2		450128			
11/12/19 14:22	240	ZZZZZ		450128			
11/12/19 23:49	240	ZZZZZ		450128			
11/13/19 07:50	1	PULSER 160-451156/1		451156			
11/13/19 09:03	240	ZZZZZ		451156			
11/13/19 13:56	960	ICB 160-451156/3		451156			KRR
11/14/19 07:08	1	PULSER 160-450540/1		450540			KRR
11/14/19 12:28	240	ZZZZZ		450540			
11/14/19 23:57	240	MB 160-449075/1-A		450540	449075	A-01-R	KRR

Detector: AV3

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:46	140	IC 160-371847/1		371847			PS
05/18/18 19:25	60	ICV 160-371942/1		371942			PS
11/12/19 07:45	60	CCV 160-450161/1		450161			TJR
11/12/19 12:57	1	PULSER 160-450161/2		450161			
11/12/19 14:22	240	ZZZZZ		450161			
11/12/19 23:49	240	ZZZZZ		450161			
11/13/19 07:50	1	PULSER 160-451157/1		451157			
11/13/19 09:03	240	ZZZZZ		451157			
11/13/19 13:56	960	ICB 160-451157/3		451157			KRR
11/14/19 07:07	1	PULSER 160-450571/1		450571			KRR
11/14/19 12:28	240	ZZZZZ		450571			
11/14/19 23:57	240	LCS 160-449075/2-A		450571	449075	A-01-R	KRR

Detector: AV8

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:47	140	IC 160-371857/1		371857			PS
05/18/18 19:27	60	ICV 160-371946/1		371946			PS
11/12/19 07:48	60	CCV 160-450166/1		450166			KRR
11/12/19 12:57	1	PULSER 160-450166/2		450166			
11/12/19 14:30	240	ZZZZZ		450166			
11/12/19 23:49	240	ZZZZZ		450166			
11/13/19 07:50	1	PULSER 160-450183/1		450183			
11/13/19 09:03	240	ZZZZZ		450183			
11/13/19 13:54	960	ICB 160-450183/3		450183			KRR
11/14/19 07:07	1	PULSER 160-450585/1		450585			KRR
11/14/19 12:28	240	ZZZZZ		450585			
11/14/19 23:56	240	160-36160-1	F-SU3-B01-S001	450585	449075	A-01-R	KRR

Detector: AV11

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:50	140	IC 160-371832/1		371832			PS
05/18/18 19:31	60	ICV 160-371934/1		371934			PS
11/12/19 07:50	60	CCV 160-450132/1		450132			KRR
11/12/19 12:57	1	PULSER 160-450132/2		450132			

Alpha Spectroscopy Run Log

Detector: AV11 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/12/19 14:29	240	ZZZZZ		450132			
11/13/19 07:50	1	PULSER 160-450169/1		450169			
11/13/19 09:03	240	ZZZZZ		450169			
11/13/19 13:54	960	ICB 160-450169/3		450169			KRR
11/14/19 07:07	1	PULSER 160-450544/1		450544			KRR
11/14/19 07:26	240	ZZZZZ		450544			
11/14/19 12:28	240	ZZZZZ		450544			
11/14/19 23:56	240	160-36160-2	F-SU3-B04-S001	450544	449075	A-01-R	KRR

Detector: AV12

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:52	140	IC 160-371833/1		371833			PS
05/18/18 19:32	60	ICV 160-371935/1		371935			PS
11/12/19 07:50	60	CCV 160-450139/1		450139			KRR
11/12/19 12:57	1	PULSER 160-450139/2		450139			
11/12/19 14:29	240	ZZZZZ		450139			
11/12/19 23:49	240	ZZZZZ		450139			
11/13/19 07:50	1	PULSER 160-450170/1		450170			
11/13/19 09:03	240	ZZZZZ		450170			
11/13/19 13:54	960	ICB 160-450170/3		450170			KRR
11/14/19 07:08	1	PULSER 160-450551/1		450551			KRR
11/14/19 07:26	240	ZZZZZ		450551			
11/14/19 12:28	240	ZZZZZ		450551			
11/14/19 23:56	240	160-36160-3	F-SU3-B05-S001	450551	449075	A-01-R	KRR

Detector: AV14

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:54	140	IC 160-371835/1		371835			PS
05/18/18 19:32	60	ICV 160-371938/1		371938			PS
11/12/19 07:51	60	CCV 160-450151/1		450151			KRR
11/12/19 12:58	1	PULSER 160-450151/2		450151			
11/12/19 14:29	240	ZZZZZ		450151			
11/13/19 07:50	1	PULSER 160-450171/1		450171			
11/13/19 09:03	240	ZZZZZ		450171			
11/13/19 13:54	960	ICB 160-450171/3		450171			KRR
11/14/19 07:08	1	PULSER 160-450563/1		450563			KRR
11/14/19 07:26	240	ZZZZZ		450563			
11/14/19 12:28	240	ZZZZZ		450563			
11/14/19 23:57	240	160-36160-4	F-SU3-B07-S001	450563	449075	A-01-R	KRR

Detector: AV15

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:57	140	IC 160-371836/1		371836			PS
05/18/18 19:34	60	ICV 160-371939/1		371939			PS
11/12/19 07:51	60	CCV 160-450152/1		450152			KRR
11/12/19 12:58	1	PULSER 160-450152/2		450152			
11/12/19 14:29	240	ZZZZZ		450152			
11/12/19 23:49	240	ZZZZZ		450152			
11/13/19 07:50	1	PULSER 160-450172/1		450172			

Alpha Spectroscopy Run Log

Detector: AV15 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/13/19 09:03	240	ZZZZZ		450172			
11/13/19 13:54	960	ICB 160-450172/3		450172			KRR
11/14/19 07:07	1	PULSER 160-450564/1		450564			KRR
11/14/19 07:26	240	ZZZZZ		450564			
11/14/19 12:28	240	ZZZZZ		450564			
11/14/19 23:57	240	160-36160-5	F-SU3-B09-S001	450564	449075	A-01-R	KRR

Detector: AV16

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 15:59	140	IC 160-371837/1		371837			RTM
05/18/18 19:35	60	ICV 160-371940/1		371940			PS
11/12/19 07:52	60	CCV 160-450153/1		450153			KRR
11/12/19 12:58	1	PULSER 160-450153/2		450153			
11/12/19 14:29	240	ZZZZZ		450153			
11/12/19 23:49	240	ZZZZZ		450153			
11/13/19 07:50	1	PULSER 160-450173/1		450173			
11/13/19 09:03	240	ZZZZZ		450173			
11/13/19 13:54	960	ICB 160-450173/3		450173			KRR
11/14/19 07:07	1	PULSER 160-450565/1		450565			KRR
11/14/19 12:33	240	ZZZZZ		450565			
11/14/19 23:57	240	160-36160-6	F-SU3-B11-S001	450565	449075	A-01-R	KRR

Detector: AV19

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:35	140	IC 160-371840/1		371840			PS
05/20/18 16:11	60	ICV 160-371952/1		371952			PS
11/12/19 09:41	60	CCV 160-450155/1		450155			KRR
11/12/19 12:58	1	PULSER 160-450155/2		450155			
11/12/19 14:29	240	ZZZZZ		450155			
11/12/19 23:49	240	ZZZZZ		450155			
11/13/19 07:50	1	PULSER 160-450174/1		450174			
11/13/19 09:27	240	ZZZZZ		450174			
11/13/19 13:54	960	ICB 160-450174/3		450174			TJR
11/14/19 07:07	1	PULSER 160-450566/1		450566			KRR
11/14/19 12:32	240	ZZZZZ		450566			
11/14/19 23:57	240	160-36160-7	F-SU3-B12-S001	450566	449075	A-01-R	KRR

Detector: AV20

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:36	140	IC 160-371842/1		371842			PS
05/20/18 16:11	60	ICV 160-371953/1		371953			PS
11/12/19 09:42	60	CCV 160-450156/1		450156			KRR
11/12/19 12:58	1	PULSER 160-450156/2		450156			
11/12/19 14:29	240	ZZZZZ		450156			
11/12/19 23:49	240	ZZZZZ		450156			
11/13/19 07:50	1	PULSER 160-450175/1		450175			
11/13/19 09:27	240	ZZZZZ		450175			
11/13/19 13:54	960	ICB 160-450175/3		450175			TJR
11/14/19 07:07	1	PULSER 160-450567/1		450567			KRR

Alpha Spectroscopy Run Log

Detector: AV20 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/19 12:32	240	ZZZZZ		450567			
11/14/19 23:57	240	160-36160-8	F-SU3-B14-S001	450567	449075	A-01-R	KRR

Detector: AV24

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:37	140.003 336588 542	IC 160-371846/1		371846			PS
05/20/18 16:12	60	ICV 160-371957/1		371957			PS
11/12/19 09:44	60	CCV 160-450160/1		450160			KRR
11/12/19 12:58	1	PULSER 160-450160/2		450160			
11/12/19 14:29	240	ZZZZZ		450160			
11/12/19 23:49	240	ZZZZZ		450160			
11/13/19 07:50	1	PULSER 160-450178/1		450178			
11/13/19 13:54	960	ICB 160-450178/2		450178			PS
11/14/19 07:08	1	PULSER 160-450570/1		450570			KRR
11/14/19 12:32	240	ZZZZZ		450570			
11/14/19 23:57	240	160-36160-11	F-SU3-B29-S001	450570	449075	A-01-R	KRR

Detector: AV48

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:40	140	IC 160-371854/1		371854			PS
05/20/18 16:15	60	ICV 160-371963/1		371963			PS
11/08/19 08:34	60	CCV 160-452958/1		452958			PS
11/13/19 10:55	1	PULSER 160-450303/1		450303			
11/13/19 13:55	960	ICB 160-450303/2		450303			PS
11/14/19 11:26	1	PULSER 160-450575/1		450575			KRR
11/14/19 23:57	240	160-36160-12	F-SU3-B30-S001	450575	449075	A-01-R	KRR

Detector: AV49

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/14/18 18:41	140	IC 160-375897/1		375897			PS
05/20/18 16:15	60	ICV 160-371964/1		371964			PS
11/08/19 08:35	60	CCV 160-452959/1		452959			PS
11/13/19 10:55	1	PULSER 160-450304/1		450304			
11/13/19 13:55	960	ICB 160-450304/2		450304			PS
11/14/19 11:26	1	PULSER 160-450576/1		450576			KRR
11/14/19 12:30	240	ZZZZZ		450576			
11/14/19 23:57	240	160-36160-13	F-SU4-B04-S001	450576	449075	A-01-R	KRR

Detector: AV63

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 12:40	140	IC 160-371870/1		371870			PS
05/21/18 10:36	60	ICV 160-371967/1		371967			PS
11/12/19 07:53	60	CCV 160-450164/1		450164			PS
11/13/19 10:55	1	PULSER 160-450305/1		450305			
11/13/19 13:55	960	ICB 160-450305/2		450305			PS

Alpha Spectroscopy Run Log

Detector: AV63 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/14/19 11:27	1	PULSER 160-450578/1		450578			KRR
11/14/19 12:30	240	ZZZZZ		450578			
11/14/19 23:57	240	160-36160-14	F-SU5-B05-S001	450578	449075	A-01-R	KRR

Detector: AV80

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
05/15/18 15:50	140	IC 160-371886/1		371886			PS
05/21/18 12:20	60	ICV 160-371974/1		371974			PS
11/08/19 10:38	60	CCV 160-449693/3		449693			KRR
11/08/19 13:26	1	PULSER 160-449693/1		449693			
11/08/19 14:39	240	ZZZZZ		449693			
11/13/19 11:01	1	PULSER 160-450308/1		450308			
11/13/19 13:54	960	ICB 160-450308/2		450308			PS
11/14/19 11:31	1	PULSER 160-450586/1		450586			KRR
11/14/19 12:32	240	ZZZZZ		450586			
11/14/19 23:57	240	160-36160-15	F-SU5-B10-S001	450586	449075	A-01-R	KRR

Detector: AV214

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
07/15/19 11:42	140	IC 160-435244/1		435244			PS
07/15/19 14:21	60	ICV 160-435244/2		435244			PS
11/07/19 07:12	1	PULSER 160-449371/1		449371			
11/07/19 08:14	60	CCV 160-449371/3		449371			TJR
11/07/19 13:38	960	ZZZZZ		449371			
11/09/19 14:31	960	ICB 160-449982/1		449982			PS
11/16/19 06:18	1	PULSER 160-450726/1		450726			KRR
11/16/19 07:02	240	ZZZZZ		450726			
11/16/19 13:38	960	160-36160-13	F-SU4-B04-S001	450726	448621	A-01-R	KRR

Detector: AV215

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 13:28	140	IC 160-401294/1		401294			PS
11/16/18 12:38	60	ICV 160-401832/1		401832			PS
11/07/19 07:12	1	PULSER 160-449372/1		449372			
11/07/19 08:14	60	CCV 160-449372/3		449372			TJR
11/07/19 13:38	960	ZZZZZ		449372			
11/09/19 14:31	960	ICB 160-449983/1		449983			PS
11/16/19 06:18	1	PULSER 160-450727/1		450727			KRR
11/16/19 07:02	240	ZZZZZ		450727			
11/16/19 13:38	960	160-36160-12	F-SU3-B30-S001	450727	448621	A-01-R	KRR

Detector: AV216

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 13:28	140	IC 160-401295/1		401295			PS
11/16/18 12:38	60	ICV 160-401833/1		401833			PS
11/07/19 07:12	1	PULSER 160-449373/1		449373			
11/07/19 08:16	60	CCV 160-449373/3		449373			TJR

Alpha Spectroscopy Run Log

Detector: AV216 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/07/19 13:38	960	ZZZZZ		449373			
11/09/19 14:31	960	ICB 160-449984/1		449984			PS
11/16/19 06:18	1	PULSER 160-450728/1		450728			KRR
11/16/19 07:02	240	ZZZZZ		450728			
11/16/19 13:38	960	160-36160-11	F-SU3-B29-S001	450728	448621	A-01-R	KRR

Detector: AV217

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 16:11	140	IC 160-401296/1		401296			PS
11/16/18 12:38	60	ICV 160-401834/1		401834			PS
11/07/19 07:12	1	PULSER 160-449374/1		449374			
11/07/19 08:16	60	CCV 160-449374/3		449374			TJR
11/07/19 13:42	960	ZZZZZ		449374			
11/09/19 14:31	960	ICB 160-449985/1		449985			PS
11/16/19 06:18	1	PULSER 160-450729/1		450729			KRR
11/16/19 07:02	240	ZZZZZ		450729			
11/16/19 13:38	960	160-36160-15	F-SU5-B10-S001	450729	448621	A-01-R	KRR

Detector: AV218

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 13:29	140	IC 160-401297/1		401297			PS
11/16/18 12:39	60	ICV 160-401835/1		401835			PS
11/07/19 07:12	1	PULSER 160-449375/1		449375			
11/07/19 08:16	60	CCV 160-449375/3		449375			TJR
11/07/19 13:42	960	ZZZZZ		449375			
11/09/19 14:31	960	ICB 160-449986/1		449986			PS
11/16/19 06:18	1	PULSER 160-450730/1		450730			KRR
11/16/19 07:02	240	ZZZZZ		450730			
11/16/19 13:38	960	160-36160-14	F-SU5-B05-S001	450730	448621	A-01-R	KRR

Detector: AV221

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 13:29	140	IC 160-401300/1		401300			PS
11/16/18 12:43	60	ICV 160-401838/1		401838			PS
11/07/19 07:12	1	PULSER 160-449378/1		449378			
11/07/19 08:18	60	CCV 160-449378/3		449378			TJR
11/07/19 13:42	960	ZZZZZ		449378			
11/09/19 14:31	960	ICB 160-449989/1		449989			PS
11/16/19 06:18	1	PULSER 160-450733/1		450733			KRR
11/16/19 07:02	240	ZZZZZ		450733			
11/16/19 13:38	960	160-36160-10	F-SU3-B23-S001	450733	448621	A-01-R	KRR

Detector: AV223

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/19/18 16:59	140	IC 160-401867/1		401867			PS
11/19/18 20:45	60	ICV 160-401868/1		401868			PS
11/07/19 07:12	1	PULSER 160-449380/1		449380			

Alpha Spectroscopy Run Log

Detector: AV223 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/07/19 08:20	60	CCV 160-449380/3		449380			KRR
11/07/19 13:47	240	ZZZZZ		449380			
11/09/19 14:31	960	ICB 160-449991/1		449991			PS
11/16/19 06:18	1	PULSER 160-450735/1		450735			KRR
11/16/19 07:02	240	ZZZZZ		450735			
11/16/19 13:38	960	160-36160-8	F-SU3-B14-S001	450735	448621	A-01-R	KRR

Detector: AV224

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 13:31	140	IC 160-401303/1		401303			PS
11/16/18 12:43	60	ICV 160-401840/1		401840			PS
11/07/19 07:12	1	PULSER 160-449381/1		449381			
11/07/19 08:20	60	CCV 160-449381/3		449381			TJR
11/07/19 13:42	960	ZZZZZ		449381			
11/09/19 14:31	960	ICB 160-449992/1		449992			PS
11/16/19 06:18	1	PULSER 160-450736/1		450736			KRR
11/16/19 07:02	240	ZZZZZ		450736			
11/16/19 13:38	960	160-36160-9	F-SU3-B15-S001	450736	448621	A-01-R	KRR

Detector: AV225

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 13:31	140	IC 160-401304/1		401304			PS
11/16/18 12:44	60	ICV 160-401841/1		401841			PS
11/07/19 07:12	1	PULSER 160-449382/1		449382			
11/07/19 09:34	60	CCV 160-449382/3		449382			TJR
11/07/19 13:40	960	ZZZZZ		449382			
11/09/19 14:31	960	ICB 160-449993/1		449993			PS
11/16/19 06:18	1	PULSER 160-450737/1		450737			KRR
11/16/19 07:02	240	ZZZZZ		450737			
11/16/19 13:38	960	160-36160-7	F-SU3-B12-S001	450737	448621	A-01-R	KRR

Detector: AV227

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 16:12	140	IC 160-401306/1		401306			PS
11/16/18 14:17	60	ICV 160-401843/1		401843			PS
11/07/19 07:12	1	PULSER 160-449384/1		449384			
11/07/19 09:35	60	CCV 160-449384/3		449384			TJR
11/07/19 13:40	960	ZZZZZ		449384			
11/09/19 14:31	960	ICB 160-449995/1		449995			PS
11/16/19 06:18	1	PULSER 160-450739/1		450739			KRR
11/16/19 07:02	240	ZZZZZ		450739			
11/16/19 13:38	960	160-36160-6	F-SU3-B11-S001	450739	448621	A-01-R	KRR

Detector: AV228

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 16:13	140	IC 160-401307/1		401307			PS
11/16/18 14:17	60	ICV 160-401844/1		401844			PS

Alpha Spectroscopy Run Log

Detector: AV228 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/07/19 07:12	1	PULSER 160-449385/1		449385			
11/07/19 09:36	60	CCV 160-449385/3		449385			TJR
11/07/19 13:40	960	ZZZZZ		449385			
11/09/19 14:31	960	ICB 160-449996/1		449996			PS
11/16/19 06:18	1	PULSER 160-450740/1		450740			KRR
11/16/19 07:02	240	ZZZZZ		450740			
11/16/19 13:38	960	160-36160-5	F-SU3-B09-S001	450740	448621	A-01-R	KRR

Detector: AV229

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 16:13	140	IC 160-401308/1		401308			PS
11/16/18 14:18	60	ICV 160-401845/1		401845			PS
11/07/19 07:12	1	PULSER 160-449386/1		449386			
11/07/19 09:36	60	CCV 160-449386/3		449386			TJR
11/07/19 13:40	960	ZZZZZ		449386			
11/09/19 14:31	960	ICB 160-449997/1		449997			PS
11/16/19 06:18	1	PULSER 160-450741/1		450741			KRR
11/16/19 07:02	240	ZZZZZ		450741			
11/16/19 13:38	960	160-36160-4	F-SU3-B07-S001	450741	448621	A-01-R	KRR

Detector: AV230

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 16:13	140	IC 160-401309/1		401309			PS
11/16/18 14:18	60	ICV 160-401846/1		401846			PS
11/07/19 07:12	1	PULSER 160-449387/1		449387			
11/07/19 09:37	60	CCV 160-449387/3		449387			TJR
11/07/19 13:43	960	ZZZZZ		449387			
11/09/19 14:31	960	ICB 160-449998/1		449998			PS
11/16/19 06:18	1	PULSER 160-450742/1		450742			KRR
11/16/19 07:02	240	ZZZZZ		450742			
11/16/19 13:38	960	160-36160-3	F-SU3-B05-S001	450742	448621	A-01-R	KRR

Detector: AV232

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 19:19	140	IC 160-401311/1		401311			PS
11/16/18 14:18	60	ICV 160-401848/1		401848			PS
11/07/19 07:12	1	PULSER 160-449389/1		449389			
11/07/19 09:38	60	CCV 160-449389/3		449389			TJR
11/07/19 13:43	960	ZZZZZ		449389			
11/09/19 14:31	960	ICB 160-450000/1		450000			PS
11/16/19 06:18	1	PULSER 160-450744/1		450744			KRR
11/16/19 07:02	240	ZZZZZ		450744			
11/16/19 13:38	960	160-36160-2	F-SU3-B04-S001	450744	448621	A-01-R	KRR

Detector: AV233

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 16:14	140	IC 160-401312/1		401312			PS

Alpha Spectroscopy Run Log

Detector: AV233 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/16/18 14:19	60	ICV 160-401849/1		401849			PS
11/07/19 07:12	1	PULSER 160-449390/1		449390			
11/07/19 09:39	60	CCV 160-449390/3		449390			TJR
11/07/19 13:43	960	ZZZZZ		449390			
11/09/19 14:31	960	ICB 160-450001/1		450001			PS
11/16/19 06:18	1	PULSER 160-450745/1		450745			KRR
11/16/19 07:02	240	ZZZZZ		450745			
11/16/19 13:38	960	160-36160-1 DU	F-SU3-B01-S001 DU	450745	448621	A-01-R	KRR

Detector: AV234

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 16:14	140	IC 160-401313/1		401313			PS
11/16/18 14:19	60	ICV 160-401850/1		401850			PS
11/07/19 07:12	1	PULSER 160-449391/1		449391			
11/07/19 09:39	60	CCV 160-449391/3		449391			TJR
11/07/19 13:43	960	ZZZZZ		449391			
11/09/19 14:31	960	ICB 160-450002/1		450002			PS
11/16/19 06:18	1	PULSER 160-450746/1		450746			KRR
11/16/19 07:02	240	ZZZZZ		450746			
11/16/19 13:38	960	160-36160-1	F-SU3-B01-S001	450746	448621	A-01-R	KRR

Detector: AV241

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 19:16	140	IC 160-401320/1		401320			PS
11/16/18 17:15	60	ICV 160-401857/1		401857			PS
11/07/19 07:12	1	PULSER 160-449398/1		449398			
11/07/19 10:57	60	CCV 160-449398/3		449398			TJR
11/07/19 13:35	960	ZZZZZ		449398			
11/09/19 14:31	960	ICB 160-450009/1		450009			PS
11/16/19 06:18	1	PULSER 160-450753/1		450753			KRR
11/16/19 07:02	240	ZZZZZ		450753			
11/16/19 13:38	960	LCS 160-448621/2-A		450753	448621	A-01-R	KRR

Detector: AV243

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 19:16	140	IC 160-401322/1		401322			PS
11/16/18 17:15	60	ICV 160-401859/1		401859			PS
11/07/19 07:12	1	PULSER 160-449400/1		449400			
11/07/19 10:58	60	CCV 160-449400/3		449400			TJR
11/07/19 13:35	960	ZZZZZ		449400			
11/09/19 14:31	960	ICB 160-450011/1		450011			PS
11/16/19 06:18	1	PULSER 160-450755/1		450755			KRR
11/16/19 07:02	240	ZZZZZ		450755			
11/16/19 13:38	960	MB 160-448621/1-A		450755	448621	A-01-R	KRR

Alpha Spectroscopy Run Log

Detector: AV244

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 19:17	140	IC 160-401323/1		401323			PS
11/16/18 17:16	60	ICV 160-401860/1		401860			PS
11/07/19 07:12	1	PULSER 160-449401/1		449401			
11/07/19 10:58	60	CCV 160-449401/3		449401			TJR
11/07/19 13:32	960	ZZZZZ		449401			
11/09/19 14:31	960	ICB 160-450012/1		450012			PS
11/19/19 10:05	1	PULSER 160-451278/1		451278			TJR
11/19/19 11:15	240	ZZZZZ		451278			

Detector: AV249

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 19:18	140	IC 160-401328/1		401328			PS
11/16/18 17:17	60	ICV 160-401865/1		401865			PS
11/07/19 07:12	1	PULSER 160-449406/1		449406			
11/07/19 11:00	60	CCV 160-449406/3		449406			KRR
11/07/19 13:46	240	ZZZZZ		449406			
11/09/19 14:31	960	ICB 160-450017/1		450017			PS
11/15/19 00:56	1	PULSER 160-450536/1		450536			KRR
11/15/19 03:32	180	ZZZZZ		450536			
11/15/19 09:56	240	160-36160-9	F-SU3-B15-S001	450536	449075	A-01-R	KRR

Detector: AV250

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/15/18 19:18	140	IC 160-401329/1		401329			PS
11/16/18 17:17	60	ICV 160-401866/1		401866			PS
11/07/19 07:12	1	PULSER 160-449407/1		449407			
11/07/19 11:01	60	CCV 160-449407/3		449407			KRR
11/07/19 13:46	240	ZZZZZ		449407			
11/09/19 14:31	960	ICB 160-450018/1		450018			PS
11/15/19 00:56	1	PULSER 160-450537/1		450537			KRR
11/15/19 03:32	180	ZZZZZ		450537			
11/15/19 09:56	240	160-36160-10	F-SU3-B23-S001	450537	449075	A-01-R	KRR

GAMMA SPECTROSCOPY

Method GA-01-R
Ra-226

Radium-226 & Other Gamma Emitters (GS) by Method GA-01-R

Prep Batch: 448571

Fill Geometry, 21-Day In-Growth

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: MB 160-448571/1-A | Analyzed: 11/23/19 19:15 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.05257	0.251	0.251	U	pCi/g		0.129	451809
Lead-214	-0.08903	0.208	0.209	U	pCi/g		0.110	451809
Potassium-40	0.3398	0.860	0.860	U	pCi/g		0.388	451809
Protactinium-231	0.0000	0.439	0.439	U	pCi/g		2.01	451809
Radium-226	0.08282	0.0676	0.0681	U	pCi/g	0.500	0.230	451809
Radium-228	0.05257	0.251	0.251	U	pCi/g		0.129	451809
Thallium-208	0.06107	0.0353	0.0358		pCi/g		0.0365	451809
Thorium-228	-0.08417	0.148	0.148	U	pCi/g		0.103	451809
Thorium-232	0.05257	0.251	0.251	U	pCi/g		0.129	451809
Thorium-234	-0.5769	0.805	0.807	U	pCi/g		0.688	451809
Uranium-235	0.03972	0.399	0.399	U	pCi/g		0.326	451809
Actinium-227	0.1063	0.269	0.269	U	pCi/g		0.333	451809
Uranium-238	-0.5769	0.805	0.807	U	pCi/g		0.688	451809
Bismuth-212	-0.3813	1.02	1.02	U	pCi/g		0.807	451809
Bismuth-214	0.08282	0.0676	0.0681	U	pCi/g		0.230	451809
Cesium-137	0.02393	0.0530	0.0531	U	pCi/g	0.0700	0.0400	451809
Lead-210	0.2319	1.37	1.37	U	pCi/g		1.03	451809
Lead-212	-0.08417	0.148	0.148	U	pCi/g		0.103	451809

Lab Id: LCS 160-448571/2-A | Analyzed: 11/23/19 19:47 | Ts: 30 | Sigma: 2
Client ID: | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Americium-241	95.97	1.45	10.1		pCi/g		0.508	451807
Cesium-137	27.03	0.574	2.87		pCi/g	0.0700	0.0699	451807
Cobalt-60	10.51	0.308	1.10		pCi/g	0.200	0.0347	451807

Lab Id: 160-36160-1 | Analyzed: 11/26/19 09:34 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B01-S001 | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.312	0.343	0.344		pCi/g		0.198	452002
Lead-214	0.412	0.155	0.161		pCi/g		0.0631	452002
Potassium-40	8.14	2.27	2.42		pCi/g		0.765	452002
Protactinium-231	1.02	3.22	3.22	U	pCi/g		2.59	452002
Radium-226	0.555	0.209	0.217		pCi/g	0.500	0.0814	452002
Radium-228	0.312	0.343	0.344		pCi/g		0.198	452002

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-1 | Analyzed: 11/26/19 09:34 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B01-S001 | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Thallium-208	0.149	0.0630	0.0649		pCi/g		0.0146	452002
Thorium-228	0.0323	0.172	0.172	U	pCi/g		0.139	452002
Thorium-232	0.312	0.343	0.344		pCi/g		0.198	452002
Thorium-234	0.885	0.810	0.816		pCi/g		0.515	452002
Uranium-235	-0.0630	0.444	0.444	U	pCi/g		0.372	452002
Actinium-227	-0.383	0.980	0.981	U	pCi/g		0.591	452002
Uranium-238	0.885	0.810	0.816		pCi/g		0.515	452002
Bismuth-212	0.0846	1.16	1.16	U	pCi/g		0.945	452002
Bismuth-214	0.555	0.209	0.217		pCi/g		0.0814	452002
Cesium-137	-0.0264	0.109	0.109	U	pCi/g	0.0700	0.0924	452002
Lead-210	-0.569	2.05	2.05	U	pCi/g		1.48	452002
Lead-212	0.0323	0.172	0.172	U	pCi/g		0.139	452002

Lab Id: 160-36160-1 DU | Analyzed: 11/23/19 20:22 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B01-S001 | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	DU Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.1436	0.199	0.200		pCi/g		0.142	451807
Lead-214	0.4454	0.121	0.129		pCi/g		0.0566	451807
Potassium-40	7.834	1.40	1.62		pCi/g		0.368	451807
Protactinium-231	0.3312	1.49	1.49	U	pCi/g		2.31	451807
Radium-226	0.2846	0.118	0.121		pCi/g	0.500	0.0529	451807
Radium-228	0.1436	0.199	0.200		pCi/g		0.142	451807
Thallium-208	0.09003	0.0996	0.100		pCi/g		0.0461	451807
Thorium-228	0.04697	0.122	0.122	U	pCi/g		0.0981	451807
Thorium-232	0.1436	0.199	0.200		pCi/g		0.142	451807
Thorium-234	0.2680	0.913	0.914	U	pCi/g		0.859	451807
Uranium-235	0.08004	0.237	0.237	U	pCi/g		0.345	451807
Actinium-227	-0.4258	0.827	0.829	U	pCi/g		0.478	451807
Uranium-238	0.2680	0.913	0.914	U	pCi/g		0.859	451807
Bismuth-212	-0.01095	0.738	0.738	U	pCi/g		0.609	451807
Bismuth-214	0.2846	0.118	0.121		pCi/g		0.0529	451807
Cesium-137	-0.05738	0.0647	0.0649	U	pCi/g	0.0700	0.0639	451807
Lead-210	-0.4456	1.75	1.75	U	pCi/g		1.42	451807
Lead-212	0.04697	0.122	0.122	U	pCi/g		0.0981	451807

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-2 | Analyzed: 11/23/19 20:23 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B04-S001 | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.427	0.207	0.211		pCi/g		0.159	451809
Lead-214	0.461	0.147	0.154		pCi/g		0.0662	451809
Potassium-40	9.79	1.64	1.91		pCi/g		0.160	451809
Protactinium-231	0.000	0.626	0.626	U	pCi/g		2.63	451809
Radium-226	0.623	0.175	0.186		pCi/g	0.500	0.0547	451809
Radium-228	0.427	0.207	0.211		pCi/g		0.159	451809
Thallium-208	0.0522	0.125	0.125	U	pCi/g		0.0638	451809
Thorium-228	0.360	0.110	0.116		pCi/g		0.0618	451809
Thorium-232	0.427	0.207	0.211		pCi/g		0.159	451809
Thorium-234	0.707	0.729	0.734		pCi/g		0.565	451809
Uranium-235	-0.0572	0.383	0.383	U	pCi/g		0.583	451809
Actinium-227	0.197	0.403	0.404	U	pCi/g		0.381	451809
Uranium-238	0.707	0.729	0.734		pCi/g		0.565	451809
Bismuth-212	-0.403	0.929	0.930	U	pCi/g		0.723	451809
Bismuth-214	0.623	0.175	0.186		pCi/g		0.0547	451809
Cesium-137	0.0241	0.0550	0.0551	U	pCi/g	0.0700	0.0418	451809
Lead-210	0.843	1.65	1.66	U	pCi/g		1.22	451809
Lead-212	0.360	0.110	0.116		pCi/g		0.0618	451809

Lab Id: 160-36160-3 | Analyzed: 11/23/19 21:08 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B05-S001 | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.101	0.244	0.244	U	pCi/g		0.156	451807
Lead-214	0.489	0.117	0.127		pCi/g		0.0698	451807
Potassium-40	7.87	1.31	1.54		pCi/g		0.325	451807
Protactinium-231	0.000	0.716	0.716	U	pCi/g		2.20	451807
Radium-226	0.413	0.146	0.153		pCi/g	0.500	0.0608	451807
Radium-228	0.101	0.244	0.244	U	pCi/g		0.156	451807
Thallium-208	0.193	0.0529	0.0565		pCi/g		0.0148	451807
Thorium-228	0.379	0.0906	0.103		pCi/g		0.0478	451807
Thorium-232	0.101	0.244	0.244	U	pCi/g		0.156	451807
Thorium-234	0.00459	0.0105	0.0105	U	pCi/g		1.19	451807
Uranium-235	-0.0323	0.0552	0.0553	U	pCi/g		0.397	451807
Actinium-227	0.114	0.213	0.214	U	pCi/g		0.388	451807
Uranium-238	0.00459	0.0105	0.0105	U	pCi/g		1.19	451807
Bismuth-212	0.275	0.627	0.628	U	pCi/g		0.486	451807

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-3 Analyzed: 11/23/19 21:08 Ts: 30 Sigma: 2
Client ID: F-SU3-B05-S001 Detector: GV9 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Bismuth-214	0.413	0.146	0.153		pCi/g		0.0608	451807
Cesium-137	-0.0264	0.0364	0.0365	U	pCi/g	0.0700	0.0488	451807
Lead-210	0.837	1.24	1.24	U	pCi/g		0.967	451807
Lead-212	0.379	0.0906	0.103		pCi/g		0.0478	451807

Lab Id: 160-36160-4 Analyzed: 11/23/19 21:09 Ts: 30 Sigma: 2
Client ID: F-SU3-B07-S001 Detector: GV12 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.513	0.229	0.235		pCi/g		0.0982	451809
Lead-214	0.495	0.170	0.177		pCi/g		0.0767	451809
Potassium-40	8.26	1.55	1.76		pCi/g		0.170	451809
Protactinium-231	-0.0000000398	3.42	3.42	U	pCi/g		2.82	451809
Radium-226	0.617	0.171	0.182		pCi/g	0.500	0.0430	451809
Radium-228	0.513	0.229	0.235		pCi/g		0.0982	451809
Thallium-208	0.215	0.0635	0.0671		pCi/g		0.0109	451809
Thorium-228	0.235	0.102	0.105		pCi/g		0.0629	451809
Thorium-232	0.513	0.229	0.235		pCi/g		0.0982	451809
Thorium-234	-0.532	0.761	0.763	U	pCi/g		0.652	451809
Uranium-235	0.233	0.421	0.421	U	pCi/g		0.278	451809
Actinium-227	0.234	0.452	0.453	U	pCi/g		0.384	451809
Uranium-238	-0.532	0.761	0.763	U	pCi/g		0.652	451809
Bismuth-212	0.390	0.945	0.946	U	pCi/g		0.736	451809
Bismuth-214	0.617	0.171	0.182		pCi/g		0.0430	451809
Cesium-137	0.0146	0.0783	0.0783	U	pCi/g	0.0700	0.0629	451809
Lead-210	1.91	2.22	2.23		pCi/g		1.44	451809
Lead-212	0.235	0.102	0.105		pCi/g		0.0629	451809

Lab Id: 160-36160-5 Analyzed: 11/23/19 21:14 Ts: 30 Sigma: 2
Client ID: F-SU3-B09-S001 Detector: GV5 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.469	0.191	0.197		pCi/g		0.0961	451822
Lead-214	0.470	0.128	0.137		pCi/g		0.0406	451822
Potassium-40	7.99	1.76	1.94		pCi/g		0.413	451822
Protactinium-231	-0.504	3.21	3.21	U	pCi/g		2.62	451822
Radium-226	0.111	0.236	0.236	U	pCi/g	0.500	0.224	451822

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-5 | Analyzed: 11/23/19 21:14 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B09-S001 | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Radium-228	0.469	0.191	0.197		pCi/g		0.0961	451822
Thallium-208	0.155	0.0571	0.0593		pCi/g		0.0121	451822
Thorium-228	0.338	0.101	0.110		pCi/g		0.0499	451822
Thorium-232	0.469	0.191	0.197		pCi/g		0.0961	451822
Thorium-234	-0.213	0.923	0.923	U	pCi/g		0.768	451822
Uranium-235	0.0686	0.363	0.363	U	pCi/g		0.294	451822
Actinium-227	0.0526	0.645	0.645	U	pCi/g		0.398	451822
Uranium-238	-0.213	0.923	0.923	U	pCi/g		0.768	451822
Bismuth-212	-0.430	1.09	1.09	U	pCi/g		0.848	451822
Bismuth-214	0.111	0.236	0.236	U	pCi/g		0.224	451822
Cesium-137	-0.0644	0.156	0.156	U	pCi/g	0.0700	0.0845	451822
Lead-210	0.802	1.17	1.17		pCi/g		0.775	451822
Lead-212	0.338	0.101	0.110		pCi/g		0.0499	451822

Lab Id: 160-36160-6 | Analyzed: 11/23/19 21:47 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B11-S001 | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.437	0.210	0.214		pCi/g		0.0874	451807
Lead-214	0.499	0.103	0.115		pCi/g		0.0556	451807
Potassium-40	8.43	1.38	1.63		pCi/g		0.335	451807
Protactinium-231	0.661	1.98	1.98	U	pCi/g		2.11	451807
Radium-226	0.551	0.144	0.155		pCi/g	0.500	0.0522	451807
Radium-228	0.437	0.210	0.214		pCi/g		0.0874	451807
Thallium-208	0.0977	0.0646	0.0654		pCi/g		0.0316	451807
Thorium-228	0.346	0.0855	0.0965		pCi/g		0.0431	451807
Thorium-232	0.437	0.210	0.214		pCi/g		0.0874	451807
Thorium-234	0.312	0.432	0.433	U	pCi/g		0.333	451807
Uranium-235	0.0717	0.199	0.200	U	pCi/g		0.369	451807
Actinium-227	-0.0285	0.141	0.141	U	pCi/g		0.374	451807
Uranium-238	0.312	0.432	0.433	U	pCi/g		0.333	451807
Bismuth-212	-0.346	0.697	0.698	U	pCi/g		0.628	451807
Bismuth-214	0.551	0.144	0.155		pCi/g		0.0522	451807
Cesium-137	0.0342	0.0673	0.0674	U	pCi/g	0.0700	0.0524	451807
Lead-210	0.655	1.46	1.46	U	pCi/g		1.16	451807
Lead-212	0.346	0.0855	0.0965		pCi/g		0.0431	451807

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-7 | Analyzed: 11/23/19 21:48 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B12-S001 | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.287	0.154	0.156		pCi/g		0.0478	451809
Lead-214	0.492	0.153	0.161		pCi/g		0.0657	451809
Potassium-40	9.63	1.75	2.00		pCi/g		0.185	451809
Protactinium-231	0.000	0.727	0.727	U	pCi/g		3.15	451809
Radium-226	0.598	0.175	0.185		pCi/g	0.500	0.0449	451809
Radium-228	0.287	0.154	0.156		pCi/g		0.0478	451809
Thallium-208	0.173	0.0594	0.0619		pCi/g		0.0119	451809
Thorium-228	0.304	0.109	0.114		pCi/g		0.0617	451809
Thorium-232	0.287	0.154	0.156		pCi/g		0.0478	451809
Thorium-234	1.24	1.02	1.03		pCi/g		0.624	451809
Uranium-235	0.136	0.675	0.675	U	pCi/g		0.551	451809
Actinium-227	0.540	0.544	0.547		pCi/g		0.295	451809
Uranium-238	1.24	1.02	1.03		pCi/g		0.624	451809
Bismuth-212	-0.469	1.18	1.18	U	pCi/g		0.923	451809
Bismuth-214	0.598	0.175	0.185		pCi/g		0.0449	451809
Cesium-137	0.0627	0.109	0.109	U	pCi/g	0.0700	0.0840	451809
Lead-210	2.53	2.11	2.13		pCi/g		1.37	451809
Lead-212	0.304	0.109	0.114		pCi/g		0.0617	451809

Lab Id: 160-36160-8 | Analyzed: 11/23/19 21:48 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B14-S001 | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.352	0.315	0.317		pCi/g		0.135	451822
Lead-214	0.0487	0.151	0.152	U	pCi/g		0.195	451822
Potassium-40	5.68	1.61	1.71		pCi/g		0.463	451822
Protactinium-231	0.000	0.927	0.927	U	pCi/g		2.84	451822
Radium-226	0.396	0.151	0.156		pCi/g	0.500	0.0550	451822
Radium-228	0.352	0.315	0.317		pCi/g		0.135	451822
Thallium-208	0.160	0.117	0.118		pCi/g		0.0472	451822
Thorium-228	0.0268	0.149	0.149	U	pCi/g		0.121	451822
Thorium-232	0.352	0.315	0.317		pCi/g		0.135	451822
Thorium-234	-0.301	1.17	1.17	U	pCi/g		0.975	451822
Uranium-235	-0.0583	0.343	0.343	U	pCi/g		0.338	451822
Actinium-227	0.147	0.328	0.328	U	pCi/g		0.570	451822
Uranium-238	-0.301	1.17	1.17	U	pCi/g		0.975	451822
Bismuth-212	0.000	0.384	0.384	U	pCi/g		0.448	451822

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-8 | Analyzed: 11/23/19 21:48 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B14-S001 | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Bismuth-214	0.396	0.151	0.156		pCi/g		0.0550	451822
Cesium-137	-0.00197	0.102	0.102	U	pCi/g	0.0700	0.0836	451822
Lead-210	1.51	1.74	1.74		pCi/g		1.08	451822
Lead-212	0.0268	0.149	0.149	U	pCi/g		0.121	451822

Lab Id: 160-36160-9 | Analyzed: 11/23/19 22:22 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B15-S001 | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.465	0.171	0.178		pCi/g		0.0555	451807
Lead-214	0.431	0.105	0.114		pCi/g		0.0541	451807
Potassium-40	7.48	1.31	1.52		pCi/g		0.336	451807
Protactinium-231	-0.836	2.71	2.72	U	pCi/g		2.21	451807
Radium-226	0.388	0.120	0.127		pCi/g	0.500	0.0504	451807
Radium-228	0.465	0.171	0.178		pCi/g		0.0555	451807
Thallium-208	0.125	0.0556	0.0571		pCi/g		0.0249	451807
Thorium-228	0.312	0.0796	0.0892		pCi/g		0.0386	451807
Thorium-232	0.465	0.171	0.178		pCi/g		0.0555	451807
Thorium-234	-0.363	1.09	1.09	U	pCi/g		0.884	451807
Uranium-235	-0.195	0.572	0.573	U	pCi/g		0.466	451807
Actinium-227	0.101	0.180	0.181	U	pCi/g		0.388	451807
Uranium-238	-0.363	1.09	1.09	U	pCi/g		0.884	451807
Bismuth-212	-0.0311	0.876	0.876	U	pCi/g		0.634	451807
Bismuth-214	0.388	0.120	0.127		pCi/g		0.0504	451807
Cesium-137	-0.0174	0.0492	0.0493	U	pCi/g	0.0700	0.0665	451807
Lead-210	-0.375	1.87	1.88	U	pCi/g		1.16	451807
Lead-212	0.312	0.0796	0.0892		pCi/g		0.0386	451807

Lab Id: 160-36160-10 | Analyzed: 11/23/19 22:22 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B23-S001 | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.186	0.331	0.331		pCi/g		0.175	451809
Lead-214	0.617	0.187	0.197		pCi/g		0.0834	451809
Potassium-40	10.6	1.79	2.09		pCi/g		0.176	451809
Protactinium-231	0.000	0.244	0.244	U	pCi/g		3.17	451809
Radium-226	0.503	0.162	0.170		pCi/g	0.500	0.0522	451809

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-10 | Analyzed: 11/23/19 22:22 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B23-S001 | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Radium-228	0.186	0.331	0.331		pCi/g		0.175	451809
Thallium-208	0.305	0.101	0.105		pCi/g		0.0337	451809
Thorium-228	0.0291	0.183	0.183	U	pCi/g		0.149	451809
Thorium-232	0.186	0.331	0.331		pCi/g		0.175	451809
Thorium-234	0.249	0.809	0.809	U	pCi/g		0.646	451809
Uranium-235	-0.283	0.427	0.428	U	pCi/g		0.597	451809
Actinium-227	-0.104	0.754	0.754	U	pCi/g		0.464	451809
Uranium-238	0.249	0.809	0.809	U	pCi/g		0.646	451809
Bismuth-212	0.473	0.938	0.939	U	pCi/g		0.718	451809
Bismuth-214	0.503	0.162	0.170		pCi/g		0.0522	451809
Cesium-137	-0.0341	0.0913	0.0913	U	pCi/g	0.0700	0.0719	451809
Lead-210	0.705	1.80	1.81	U	pCi/g		1.34	451809
Lead-212	0.0291	0.183	0.183	U	pCi/g		0.149	451809

Lab Id: 160-36160-11 | Analyzed: 11/23/19 22:23 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B29-S001 | Detector: GV5 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.118	0.443	0.443	U	pCi/g		0.242	451822
Lead-214	0.478	0.163	0.171		pCi/g		0.0758	451822
Potassium-40	6.96	1.85	1.98		pCi/g		0.506	451822
Protactinium-231	0.727	1.64	1.64	U	pCi/g		1.83	451822
Radium-226	0.223	0.166	0.168		pCi/g	0.500	0.171	451822
Radium-228	0.118	0.443	0.443	U	pCi/g		0.242	451822
Thallium-208	0.0585	0.110	0.111	U	pCi/g		0.0595	451822
Thorium-228	0.306	0.121	0.128		pCi/g		0.0569	451822
Thorium-232	0.118	0.443	0.443	U	pCi/g		0.242	451822
Thorium-234	-0.318	1.12	1.12	U	pCi/g		0.934	451822
Uranium-235	0.412	0.317	0.319		pCi/g		0.166	451822
Actinium-227	-0.426	0.994	0.996	U	pCi/g		0.598	451822
Uranium-238	-0.318	1.12	1.12	U	pCi/g		0.934	451822
Bismuth-212	-0.423	1.36	1.36	U	pCi/g		1.08	451822
Bismuth-214	0.223	0.166	0.168		pCi/g		0.171	451822
Cesium-137	-0.0526	0.131	0.131	U	pCi/g	0.0700	0.123	451822
Lead-210	-0.342	2.09	2.09	U	pCi/g		1.50	451822
Lead-212	0.306	0.121	0.128		pCi/g		0.0569	451822

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-12 | Analyzed: 11/23/19 22:55 | Ts: 30 | Sigma: 2
Client ID: F-SU3-B30-S001 | Detector: GV9 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.505	0.189	0.196		pCi/g		0.0610	451807
Lead-214	0.484	0.116	0.126		pCi/g		0.0569	451807
Potassium-40	9.24	1.79	2.02		pCi/g		0.588	451807
Protactinium-231	0.000	0.258	0.258	U	pCi/g		2.44	451807
Radium-226	0.459	0.148	0.155		pCi/g	0.500	0.0596	451807
Radium-228	0.505	0.189	0.196		pCi/g		0.0610	451807
Thallium-208	0.152	0.0576	0.0597		pCi/g		0.0225	451807
Thorium-228	0.335	0.0863	0.0966		pCi/g		0.0418	451807
Thorium-232	0.505	0.189	0.196		pCi/g		0.0610	451807
Thorium-234	0.378	1.38	1.38	U	pCi/g		1.12	451807
Uranium-235	0.208	0.416	0.417	U	pCi/g		0.347	451807
Actinium-227	-0.0710	0.620	0.620	U	pCi/g		0.366	451807
Uranium-238	0.378	1.38	1.38	U	pCi/g		1.12	451807
Bismuth-212	-0.320	0.909	0.909	U	pCi/g		0.704	451807
Bismuth-214	0.459	0.148	0.155		pCi/g		0.0596	451807
Cesium-137	0.0247	0.0793	0.0793	U	pCi/g	0.0700	0.0633	451807
Lead-210	-0.00897	1.38	1.38	U	pCi/g		1.14	451807
Lead-212	0.335	0.0863	0.0966		pCi/g		0.0418	451807

Lab Id: 160-36160-13 | Analyzed: 11/23/19 22:56 | Ts: 30 | Sigma: 2
Client ID: F-SU4-B04-S001 | Detector: GV12 | Decay Corrected: No | Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.477	0.317	0.320		pCi/g		0.135	451809
Lead-214	0.822	0.170	0.190		pCi/g		0.0803	451809
Potassium-40	4.91	1.45	1.53		pCi/g		0.406	451809
Protactinium-231	-1.04	3.95	3.95	U	pCi/g		3.22	451809
Radium-226	0.903	0.188	0.210		pCi/g	0.500	0.0367	451809
Radium-228	0.477	0.317	0.320		pCi/g		0.135	451809
Thallium-208	0.281	0.0932	0.0975		pCi/g		0.0306	451809
Thorium-228	0.370	0.112	0.119		pCi/g		0.0624	451809
Thorium-232	0.477	0.317	0.320		pCi/g		0.135	451809
Thorium-234	0.566	0.357	0.363	U	pCi/g		1.07	451809
Uranium-235	0.0790	0.164	0.165	U	pCi/g		0.529	451809
Actinium-227	-0.187	0.807	0.807	U	pCi/g		0.494	451809
Uranium-238	0.566	0.357	0.363	U	pCi/g		1.07	451809
Bismuth-212	-0.439	1.12	1.12	U	pCi/g		0.886	451809

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-13 Analyzed: 11/23/19 22:56 Ts: 30 Sigma: 2
Client ID: F-SU4-B04-S001 Detector: GV12 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Bismuth-214	0.903	0.188	0.210		pCi/g		0.0367	451809
Cesium-137	-0.0235	0.0877	0.0877	U	pCi/g	0.0700	0.0700	451809
Lead-210	2.17	1.92	1.94		pCi/g		1.25	451809
Lead-212	0.370	0.112	0.119		pCi/g		0.0624	451809

Lab Id: 160-36160-14 Analyzed: 11/23/19 22:56 Ts: 30 Sigma: 2
Client ID: F-SU5-B05-S001 Detector: GV5 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.250	0.131	0.133		pCi/g		0.244	451822
Lead-214	0.604	0.146	0.159		pCi/g		0.0845	451822
Potassium-40	5.31	1.70	1.79		pCi/g		0.613	451822
Protactinium-231	0.000	0.541	0.541	U	pCi/g		2.52	451822
Radium-226	0.745	0.205	0.219		pCi/g	0.500	0.0677	451822
Radium-228	0.250	0.131	0.133		pCi/g		0.244	451822
Thallium-208	0.154	0.0557	0.0579		pCi/g		0.0117	451822
Thorium-228	0.0332	0.156	0.156	U	pCi/g		0.126	451822
Thorium-232	0.250	0.131	0.133		pCi/g		0.244	451822
Thorium-234	-0.800	0.707	0.713	U	pCi/g		0.944	451822
Uranium-235	0.169	0.359	0.360	U	pCi/g		0.273	451822
Actinium-227	0.197	0.468	0.469	U	pCi/g		0.362	451822
Uranium-238	-0.800	0.707	0.713	U	pCi/g		0.944	451822
Bismuth-212	0.473	0.964	0.966	U	pCi/g		0.738	451822
Bismuth-214	0.745	0.205	0.219		pCi/g		0.0677	451822
Cesium-137	-0.0925	0.0534	0.0542	U	pCi/g	0.0700	0.101	451822
Lead-210	1.09	1.42	1.43		pCi/g		0.936	451822
Lead-212	0.0332	0.156	0.156	U	pCi/g		0.126	451822

Lab Id: 160-36160-15 Analyzed: 11/23/19 23:28 Ts: 30 Sigma: 2
Client ID: F-SU5-B10-S001 Detector: GV9 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Actinium 228	0.130	0.255	0.255	U	pCi/g		0.156	451807
Lead-214	0.541	0.117	0.130		pCi/g		0.0522	451807
Potassium-40	5.52	1.12	1.25		pCi/g		0.324	451807
Protactinium-231	0.000	0.714	0.714	U	pCi/g		2.15	451807
Radium-226	0.310	0.125	0.129		pCi/g	0.500	0.205	451807

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Lab Id: 160-36160-15 Analyzed: 11/23/19 23:28 Ts: 30 Sigma: 2
Client ID: F-SU5-B10-S001 Detector: GV9 Decay Corrected: No Ingrowth:

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Anly Batch
Radium-228	0.130	0.255	0.255	U	pCi/g		0.156	451807
Thallium-208	0.179	0.0707	0.0731		pCi/g		0.0293	451807
Thorium-228	0.417	0.0880	0.103		pCi/g		0.0405	451807
Thorium-232	0.130	0.255	0.255	U	pCi/g		0.156	451807
Thorium-234	0.0591	0.141	0.141	U	pCi/g		1.14	451807
Uranium-235	0.125	0.261	0.262	U	pCi/g		0.476	451807
Actinium-227	0.166	0.597	0.598	U	pCi/g		0.348	451807
Uranium-238	0.0591	0.141	0.141	U	pCi/g		1.14	451807
Bismuth-212	-0.0164	0.946	0.946	U	pCi/g		0.780	451807
Bismuth-214	0.310	0.125	0.129		pCi/g		0.205	451807
Cesium-137	-0.0539	0.114	0.114	U	pCi/g	0.0700	0.0641	451807
Lead-210	-0.785	1.74	1.74	U	pCi/g		1.39	451807
Lead-212	0.417	0.0880	0.103		pCi/g		0.0405	451807

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

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 160-448571/1-A	Actinium 228			0.05257	U	pCi/g							.4186
MB 160-448571/1-A	Lead-214			-0.08903	U	pCi/g							-.8537
MB 160-448571/1-A	Potassium-40			0.3398	U	pCi/g							.7899
MB 160-448571/1-A	Protactinium-231			0.0000	U	pCi/g							.
MB 160-448571/1-A	Radium-226			0.08282	U	pCi/g							2.4307
MB 160-448571/1-A	Radium-228			0.05257	U	pCi/g							.4186
MB 160-448571/1-A	Thallium-208			0.06107		pCi/g							3.4116
MB 160-448571/1-A	Thorium-228			-0.08417	U	pCi/g							-1.1361
MB 160-448571/1-A	Thorium-232			0.05257	U	pCi/g							.4186
MB 160-448571/1-A	Thorium-234			-0.5769	U	pCi/g							-1.4295
MB 160-448571/1-A	Uranium-235			0.03972	U	pCi/g							.1989
MB 160-448571/1-A	Actinium-227			0.1063	U	pCi/g							.7894
MB 160-448571/1-A	Uranium-238			-0.5769	U	pCi/g							-1.4295
MB 160-448571/1-A	Bismuth-212			-0.3813	U	pCi/g							-.7448
MB 160-448571/1-A	Bismuth-214			0.08282	U	pCi/g							2.4307
MB 160-448571/1-A	Cesium-137			0.02393	U	pCi/g							.9015
MB 160-448571/1-A	Lead-210			0.2319	U	pCi/g							.3384
MB 160-448571/1-A	Lead-212			-0.08417	U	pCi/g							-1.1361
Lab Control Sample ID:	**Analyte**	**Parent Result**	**Spike Added**	**LCS Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
LCS 160-448571/2-A	Americium-241		96.6	95.97		pCi/g	99	87 - 116					-.1175
LCS 160-448571/2-A	Cesium-137		27.4	27.03		pCi/g	99	87 - 120					-.2343
LCS 160-448571/2-A	Cobalt-60		10.9	10.51		pCi/g	97	87 - 115					-.6272
Duplicate ID:	**Analyte**	**Parent Result**	**Spike Added**	**DU Result**	**Qualifier**	**Unit**	**% Rec**	**% Rec Limits**	**RPD**	**RER**	**DER**	**RER Limit**	**Z Factor**
160-36160-1	Actinium 228	0.312		0.1436		pCi/g			74	0.31	0.84	1	1.2661
160-36160-1	Lead-214	0.412		0.4454		pCi/g			8	0.11	0.32	1	.5827
160-36160-1	Potassium-40	8.14		7.834		pCi/g			4	0.08	0.21	1	1.0744
160-36160-1	Protactinium-231	1.02		0.3312	U	pCi/g			102	0.15	0.39	1	.3807
160-36160-1	Radium-226	0.555		0.2846		pCi/g			64	0.80	2.18	1	2.5764
160-36160-1	Radium-228	0.312		0.1436		pCi/g			74	0.31	0.84	1	1.2661
160-36160-1	Thallium-208	0.149		0.09003		pCi/g			50	0.36	1.0	1	.9968
160-36160-1	Thorium-228	0.0323		0.04697	U	pCi/g			37	0.05	0.14	1	3.2454
160-36160-1	Thorium-232	0.312		0.1436		pCi/g			74	0.31	0.84	1	1.2661
160-36160-1	Thorium-234	0.885		0.2680	U	pCi/g			107	0.36	1.01	1	.6236
160-36160-1	Uranium-235	-0.0630		0.08004	U	pCi/g			1678	0.21	0.57	1	1.4469
160-36160-1	Actinium-227	-0.383		-0.4258	U	pCi/g			11	0.02	0.07	1	.0672
160-36160-1	Uranium-238	0.885		0.2680	U	pCi/g			107	0.36	1.01	1	.6236
160-36160-1	Bismuth-212	0.0846		-0.01095	U	pCi/g			259	0.05	0.14	1	.6338
160-36160-1	Bismuth-214	0.555		0.2846		pCi/g			64	0.80	2.18	1	2.5764

Gamma Spectroscopy Analysis Detail Report
Prep Batch: 448571

Duplicate ID:	Analyte	Parent Result	Spike Added	DU Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
160-36160-1	Cesium-137	-0.0264		-0.05738	U	pCi/g			74	0.18	0.49	1	.7052
160-36160-1	Lead-210	-0.569		-0.4456	U	pCi/g			24	0.03	0.09	1	.9111
160-36160-1	Lead-212	0.0323		0.04697	U	pCi/g			37	0.05	0.14	1	3.2454

Glossary:

Ts = Count Duration, Sample

GAMMA SPECTROSCOPY BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 160-36160-2

SDG No.:

Batch Number: 448571 Batch Start Date: 11/01/19 15:33 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 11/01/19 16:04

Lab Sample ID	Client Sample ID	Method Chain	Basis	TareWeight	GrossWeight	InitialAmount	IngDecDate1	IngDecDate3	Geometry
MB 160-448571/1		Fill_Geo-21, GA-01-R				291.18 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
LCS 160-448571/2		Fill_Geo-21, GA-01-R				341.9 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-1-A	F-SU3-B01-S001	Fill_Geo-21, GA-01-R	T	46.4 g	302.8 g	256.4 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-1-A DU	F-SU3-B01-S001	Fill_Geo-21, GA-01-R	T	46.4 g	302.8 g	256.4 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-2-A	F-SU3-B04-S001	Fill_Geo-21, GA-01-R	T	46.1 g	335.1 g	289 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-3-A	F-SU3-B05-S001	Fill_Geo-21, GA-01-R	T	46.8 g	336.7 g	289.9 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-4-A	F-SU3-B07-S001	Fill_Geo-21, GA-01-R	T	46.4 g	317.0 g	270.6 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-5-A	F-SU3-B09-S001	Fill_Geo-21, GA-01-R	T	46.8 g	357.5 g	310.7 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-6-A	F-SU3-B11-S001	Fill_Geo-21, GA-01-R	T	46.3 g	327.5 g	281.2 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-7-A	F-SU3-B12-S001	Fill_Geo-21, GA-01-R	T	46.4 g	295.1 g	248.7 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-8-A	F-SU3-B14-S001	Fill_Geo-21, GA-01-R	T	46.3 g	323.2 g	276.9 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-9-A	F-SU3-B15-S001	Fill_Geo-21, GA-01-R	T	46.6 g	326.8 g	280.2 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-10-A	F-SU3-B23-S001	Fill_Geo-21, GA-01-R	T	46.6 g	309.0 g	262.4 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-11-A	F-SU3-B29-S001	Fill_Geo-21, GA-01-R	T	46.5 g	300.0 g	253.5 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-12-A	F-SU3-B30-S001	Fill_Geo-21, GA-01-R	T	46.3 g	301.2 g	254.9 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-13-A	F-SU4-B04-S001	Fill_Geo-21, GA-01-R	T	46.4 g	324.4 g	278 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-14-A	F-SU5-B05-S001	Fill_Geo-21, GA-01-R	T	46.6 g	366.7 g	320.1 g	11/01/2019 16:04	11/22/2019 16:04	tuna can
160-36160-A-15-A	F-SU5-B10-S001	Fill_Geo-21, GA-01-R	T	46.2 g	336.9 g	290.7 g	11/01/2019 16:04	11/22/2019 16:04	tuna can

Lab Sample ID	Client Sample ID	Method Chain	Basis	Tuna Can LCS 00009					
MB 160-448571/1		Fill_Geo-21, GA-01-R							

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.: 160-36160-2

SDG No.:

Batch Number: 448571 Batch Start Date: 11/01/19 15:33 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 11/01/19 16:04

Lab Sample ID	Client Sample ID	Method Chain	Basis	Tuna Can LCS 00009					
LCS 160-448571/2		Fill_Geo-21, GA-01-R		# g					
160-36160-A-1-A	F-SU3-B01-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-1-A DU	F-SU3-B01-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-2-A	F-SU3-B04-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-3-A	F-SU3-B05-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-4-A	F-SU3-B07-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-5-A	F-SU3-B09-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-6-A	F-SU3-B11-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-7-A	F-SU3-B12-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-8-A	F-SU3-B14-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-9-A	F-SU3-B15-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-10-A	F-SU3-B23-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-11-A	F-SU3-B29-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-12-A	F-SU3-B30-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-13-A	F-SU4-B04-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-14-A	F-SU5-B05-S001	Fill_Geo-21, GA-01-R	T						
160-36160-A-15-A	F-SU5-B10-S001	Fill_Geo-21, GA-01-R	T						

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

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.: 160-36160-2

SDG No.:

Batch Number: 448571 Batch Start Date: 11/01/19 15:33 Batch Analyst: Slama, Kurt R

Batch Method: Fill_Geo-21 Batch End Date: 11/01/19 16:04

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: 12_Gamma_20193346

Sample Description: 448571_Gamma_MB 160-448571~1-A
Detector: Detector #12
Batch ID: 448571
Work Order Number: Gamma
Lot Number: MB 160-448571~1-A

Decay to Time: 11/23/2019 19:15 Live Time: 1800 sec
Acquisition Time: 11/23/2019 19:15:37 Real Time: 1801 sec
Analysis Time: 11/23/2019 19:45 Dead Time: 0.05 %
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_2019-11-10_1422.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	2.040E+00	109.7	2.238E+00	2.241E+00	7.750E+00
NA-22	4.215E-01	40.8	1.721E-01	1.733E-01	5.177E-01
K-40	3.660E+00	126.5	4.630E+00	4.634E+00	1.034E+01
Sc-46	-1.883E-01	277.7	5.231E-01	5.232E-01	1.837E+00
CR-51	-2.970E+00	168.9	5.016E+00	5.019E+00	1.697E+01
MN-54	3.085E-01	40.8	1.259E-01	1.269E-01	3.789E-01
FE-59	7.781E-01	37.8	2.941E-01	2.967E-01	8.193E-01
Co-56	5.196E-02	501.7	2.607E-01	2.607E-01	6.823E-01
CO-57	2.629E-01	110.3	2.898E-01	2.902E-01	5.806E-01
CO-58	-5.060E-02	624.5	3.160E-01	3.160E-01	1.165E+00
CO-60	1.999E-01	33.3	6.665E-02	6.739E-02	1.003E+00
ZN-65	0.000E+00	1.#INF	2.510E-01	2.510E-01	2.366E+00
NB-94	-4.790E-01	103.9	4.978E-01	4.984E-01	1.169E+00
ZR-95	-7.913E-01	94.3	7.460E-01	7.471E-01	1.771E+00
NB-95	2.420E-02	1462.9	3.540E-01	3.540E-01	1.292E+00
RU-103	3.868E-02	562.7	2.177E-01	2.177E-01	6.147E-01
RH-106	4.607E+00	112.7	5.190E+00	5.196E+00	1.761E+01
AG-108M	7.014E-02	346.4	2.430E-01	2.430E-01	6.611E-01
AG-110M	-2.214E-01	131.8	2.917E-01	2.919E-01	2.189E+00
SN-113	-4.670E-01	110.4	5.155E-01	5.160E-01	1.753E+00
SB-124	-4.920E-01	135.8	6.680E-01	6.685E-01	2.262E+00
SB-125	1.092E+00	25.8	2.819E-01	2.872E-01	2.264E+00
I-131	2.764E-01	102.5	2.833E-01	2.836E-01	7.256E-01
Gd-153	-5.235E-01	145.8	7.633E-01	7.639E-01	2.594E+00
Ga-68	1.534E+01	37.8	5.798E+00	5.861E+00	1.615E+01
Tc-99m	8.357E-02	348.7	2.914E-01	2.914E-01	9.997E-01
BA-133	2.509E-01	114.0	2.861E-01	2.864E-01	9.960E-01
CS-134	7.613E-01	83.2	6.336E-01	6.347E-01	1.273E+00
CS-137	2.579E-01	110.8	2.857E-01	2.860E-01	1.001E+00
CE-139	1.952E-01	117.5	2.294E-01	2.296E-01	7.821E-01
Ba-140	1.528E-01	742.7	1.135E+00	1.135E+00	2.981E+00
La-140	0.000E+00	1.#INF	8.802E-02	8.802E-02	6.487E-01
CE-141	2.377E-01	210.7	5.009E-01	5.011E-01	1.712E+00

CE-144	1.179E+00	172.9	2.040E+00	2.040E+00	6.959E+00
PM-144	-3.340E-01	144.5	4.828E-01	4.831E-01	1.149E+00
EU-152	1.661E+00	31.4	5.216E-01	5.286E-01	2.102E+00
EU-154	3.580E-01	64.1	2.294E-01	2.302E-01	1.395E+00
EU-155	0.000E+00	1.#INF	3.145E-01	3.145E-01	3.899E+00
HF-181	2.654E-01	129.6	3.439E-01	3.441E-01	1.103E+00
Ta-182	1.189E+00	101.5	1.207E+00	1.208E+00	4.162E+00
Hg-203	1.485E-01	128.1	1.902E-01	1.904E-01	6.654E-01
TL-208	6.579E-01	28.9	1.899E-01	1.929E-01	9.142E-01
PM-146	5.051E-02	562.7	2.842E-01	2.842E-01	8.026E-01
Y-88	-4.455E-01	148.5	6.614E-01	6.619E-01	1.407E+00
Cd-113m	2.296E+03	113.5	2.606E+03	2.609E+03	9.025E+03
Cd-109	0.000E+00	1.#INF	2.523E+00	2.523E+00	2.302E+01
Cf-251	-5.937E-01	210.8	1.252E+00	1.252E+00	3.327E+00
Cf-249	-4.091E-01	112.4	4.599E-01	4.603E-01	1.569E+00
Sn-126	-2.069E+00	134.0	2.773E+00	2.775E+00	9.415E+00
PB-210	2.498E+00	295.4	7.381E+00	7.383E+00	2.423E+01
PB-212	-9.069E-01	87.9	7.968E-01	7.982E-01	2.345E+00
PB-214	-9.592E-01	117.0	1.122E+00	1.123E+00	2.572E+00
BI-207	4.937E-01	40.8	2.015E-01	2.031E-01	6.064E-01
BI-212	-4.108E+00	134.2	5.511E+00	5.515E+00	1.906E+01
U-235	4.280E-01	502.7	2.152E+00	2.152E+00	7.411E+00
BI-214	8.923E-01	40.8	3.643E-01	3.671E-01	5.203E+00
BI-210M	-2.334E-01	154.6	3.608E-01	3.610E-01	1.260E+00
AC-228	5.664E-01	238.8	1.353E+00	1.353E+00	3.294E+00
TH-227	1.145E+00	126.6	1.450E+00	1.451E+00	8.009E+00
TH-229	1.340E-01	2848.7	3.818E+00	3.818E+00	1.058E+01
TH-234	-6.215E+00	69.7	4.334E+00	4.348E+00	1.556E+01
PA-231	0.000E+00	1.#INF	2.366E+00	2.366E+00	4.551E+01
PA-233	0.000E+00	1.#INF	4.843E-01	4.843E-01	3.726E+00
PA-234	9.365E-01	94.8	8.878E-01	8.891E-01	3.455E+00
PA-234M	4.967E+00	813.6	4.042E+01	4.042E+01	1.507E+02
AM-241	-5.716E-01	149.0	8.517E-01	8.524E-01	2.894E+00
Np-237	-8.142E-01	246.8	2.010E+00	2.010E+00	6.865E+00
Ir-192	-3.160E-01	170.8	5.399E-01	5.402E-01	1.829E+00
Cs-136	3.925E-01	37.8	1.483E-01	1.500E-01	1.120E+00
Np-239	5.504E-01	155.7	8.569E-01	8.575E-01	2.931E+00
Nd-147	2.842E-01	742.7	2.111E+00	2.111E+00	5.545E+00
TL-210	-5.542E-01	83.2	4.611E-01	4.622E-01	1.553E+00
Kr-85	-2.795E+00	3612.5	1.010E+02	1.010E+02	3.550E+02
Total	2.346E+03				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 7:45:45 PMPage  1
TestAmerica Inc                 Spectrum name: 12_Gamma_20193346.An1

Sample description
     448571_Gamma_MB 160-448571~1-A


Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193346.An1

Acquisition information
       Start time:                 11/23/2019 7:15:37 PM
       Live time:               1800
       Real time:               1801
       Dead time:                  0.05 %
       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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 2
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11/23/2019 7:15:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-11-10_1422.PBC 11/10/2019 2:22:07 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 4 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0924

***** 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
46.58	3.	295.45	0.73	1.805E-02	46.54	4.250	PBC<MDA	PB210
63.41	5.	199.46	1.06	2.978E-02	63.29	3.810	PBC<MDA	TH234
91.93	44.	23.53	0.75	3.630E-02	91.10	28.300	2.359E+00	Nd147
					92.59	5.584	PBC<MDA	TH234
106.13	8.	155.69	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
122.06	8.	119.55	0.93	3.724E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.416E-01	CO57
131.29	8.	156.70	0.94	3.683E-02	131.29	18.000	PBC<MDA	PA234
133.02	9.	166.18	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
133.54	9.	172.92	0.94	3.670E-02	133.54	11.090	PBC<MDA	CE144
136.30	9.	178.97	0.94	3.652E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.235E+00	CO57
136.47	9.	185.30	0.94	3.651E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.235E+00	CO57
140.51	5.	348.65	0.95	3.623E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	3.	502.72	0.95	3.599E-02	143.79	10.960	PBC<MDA	U235
145.44	7.	210.72	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
165.85	10.	117.55	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
227.00	1.	716.11	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
235.97	10.	126.58	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227
256.24	1.	716.11	1.06	2.608E-02	256.24	7.000	PBC<MDA	TH227
263.70	6.	113.49	1.07	2.554E-02	263.70	0.006	PBC<MDA	Cd113m
277.28	6.	106.37	1.08	2.462E-02	277.28	6.310	PBC<MDA	TL208
279.20	5.	128.09	1.09	2.449E-02	279.20	81.460	PBC<MDA	Hg203
295.09	3.	591.85	1.10	2.350E-02	295.09	19.300	PBC<MDA	PB214
296.00	9.	178.57	1.10	2.345E-02	296.00	79.000	PBC<MDA	TL210
300.03	2.	915.13	1.11	2.321E-02	300.03	3.280	PBC<MDA	PB212

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 3
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					300.07	2.460	1.662E+00	PA231
					300.18	6.200	6.597E-01	PA233
333.44	1.	779.42	1.14	2.142E-02	333.44	15.510	PBC<MDA	Cf249
356.00	6.	114.03	1.16	2.037E-02	356.00	62.050	PBC<MDA	BA133
364.48	8.	102.49	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
383.84	7.	111.06	1.19	1.923E-02	383.84	8.940	PBC<MDA	BA133
433.94	2.	346.41	1.24	1.751E-02	433.94	90.480	PBC<MDA	AG108M
453.88	1.	562.73	1.26	1.692E-02	453.88	65.000	PBC<MDA	PM146
463.37	15.	25.82	1.27	1.666E-02	463.37	10.470	4.778E+00	SB125
477.60	6.	109.70	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
482.00	2.	302.40	1.28	1.617E-02	482.00	80.500	PBC<MDA	HF181
497.05	1.	562.73	1.30	1.580E-02	497.05	90.900	PBC<MDA	RU103
511.86	65.	13.58	2.56	1.546E-02	511.86	20.000	1.174E+01	RH106
531.00	1.	742.74	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
537.26	1.	742.74	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
563.24	7.	97.72	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.47	3.	106.77	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.582E+00	PA234
					569.70	97.740	1.327E-01	BI207
621.92	11.	112.66	1.42	1.338E-02	621.92	9.930	PBC<MDA	RH106
657.76	6.	40.23	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
661.66	5.	110.81	1.45	1.279E-02	661.66	85.210	PBC<MDA	CS137
785.42	4.	116.15	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
795.87	8.	83.22	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
801.95	3.	287.80	1.58	1.113E-02	801.95	8.690	PBC<MDA	CS134
818.50	6.	113.99	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
834.85	6.	40.82	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
846.77	1.	501.66	1.63	1.070E-02	846.77	99.935	PBC<MDA	Co56
860.56	12.	28.87	1.64	1.057E-02	860.56	12.420	5.076E+00	TL208
871.10	2.	187.08	1.65	1.048E-02	871.10	99.890	PBC<MDA	NB94
880.53	4.	141.42	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
911.07	3.	238.82	1.68	1.015E-02	911.07	29.000	PBC<MDA	AC228
937.49	2.	255.77	1.71	9.939E-03	937.49	34.360	PBC<MDA	AG110M
964.11	7.	37.80	1.73	9.739E-03	964.11	14.605	PBC<MDA	EU152
996.33	6.	83.99	1.76	9.508E-03	996.33	10.600	PBC<MDA	EU154
1001.00	1.	813.61	1.76	9.476E-03	1001.00	0.837	PBC<MDA	PA234M
1048.07	7.	37.80	1.81	9.162E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	6.	40.82	1.82	9.063E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	7.	37.80	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	7.	37.80	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1112.07	11.	31.40	1.86	8.770E-03	1112.07	13.644	5.262E+00	EU152
1121.04	7.	101.51	1.87	8.716E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	4.147E-01	Sc46
					1121.30	34.900	1.189E+00	Ta182
1173.24	9.	33.33	1.92	8.426E-03	1173.24	99.900	5.940E-01	CO60
1189.08	1.	796.87	1.93	8.342E-03	1189.05	16.200	PBC<MDA	Ta182
1274.53	6.	40.82	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.197E+00	EU154

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 4
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1291.60	2.	248.05	2.02	7.834E-03	1291.60	43.200	PBC<MDA	FE59
1460.83	5.	126.49	2.16	7.112E-03	1460.83	10.670	PBC<MDA	K40
1764.49	6.	40.82	2.40	6.075E-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	185.94	46.58	44.	3.	0.002	295.45	0.734
TH-227	200.18	50.14	87.	-6.	-0.003	223.61	0.855s
AM-241	237.74	59.54	115.	-10.	-0.006	149.01	0.865s
TH-234	253.22	63.41	33.	5.	0.003	199.46	1.063s
Sn-126	256.71	64.28	101.	-11.	-0.006	134.03	0.869s
BA-133	323.50	80.99	40.	-7.	-0.004	165.16	0.887s
Np-237	345.49	86.49	139.	-7.	-0.004	246.84	0.892s
EU-155	345.70	86.54	132.	0.	0.000	1000.00	0.892s
Sn-126	347.29	86.94	132.	0.	0.000	1000.00	0.892s
Sn-126	349.81	87.57	132.	0.	0.000	1000.00	0.893
Cd-109	351.68	88.04	132.	0.	0.000	1000.00	0.894
Nd-147	363.92	91.10	132.	0.	0.000	1000.00	0.897s
TH-234	369.87	92.59	135.	-23.	-0.013	69.73	0.898s
Gd-153	389.50	97.50	110.	-10.	-0.006	145.81	0.903s
Np-239	397.50	99.50	120.	-8.	-0.004	207.65	0.905s
Gd-153	412.29	103.20	128.	0.	0.000	1000.00	0.909s
Np-239	414.29	103.70	128.	0.	0.000	1000.00	0.909s
EU-155	420.73	105.31	128.	0.	0.000	1000.00	0.911s
Np-239	424.00	106.13	81.	8.	0.005	155.69	0.912s
EU-152	486.56	121.78	65.	-12.	-0.006	102.36	0.928s
CO-57	487.69	122.06	43.	8.	0.005	119.55	0.928s
EU-154	491.84	123.10	58.	-12.	-0.006	96.79	0.929s
PA-234	524.60	131.29	68.	8.	0.004	156.70	0.938s
HF-181	531.51	133.02	99.	9.	0.005	166.18	0.939s
CE-144	533.57	133.54	107.	9.	0.005	172.92	0.940s
HF-181	544.61	136.30	116.	9.	0.005	178.97	0.943s
CO-57	545.30	136.47	125.	9.	0.005	185.30	0.943s
Tc-99m	561.44	140.51	133.	5.	0.003	348.65	0.947s
U-235	574.53	143.79	115.	3.	0.002	502.72	0.950s
CE-141	581.15	145.44	118.	7.	0.004	210.72	0.952s
Ba-140	649.99	162.66	63.	-11.	-0.006	110.03	0.969s
U-235	652.87	163.38	74.	-4.	-0.002	334.34	0.970s
CE-139	662.76	165.85	58.	10.	0.005	117.55	0.973
Cf-251	705.72	176.60	44.	-6.	-0.003	210.82	0.983s
U-235	742.18	185.72	60.	-21.	-0.012	78.51	0.992

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 5
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
U-235	820.59	205.33	55.	-14.	-0.008	105.39	1.012
TH-229	842.65	210.85	33.	-9.	-0.005	123.98	1.018s
Cf-251	907.22	227.00	26.	1.	0.001	716.11	1.034s
TH-227	943.09	235.97	69.	10.	0.005	126.58	1.043s
PB-212	953.73	238.63	104.	-19.	-0.011	87.87	1.046s
PB-214	967.18	242.00	87.	-2.	-0.001	606.09	1.049s
EU-152	977.96	244.69	89.	0.	0.000	1000.00	1.051s
TH-227	1024.13	256.24	26.	1.	0.001	716.11	1.063s
Cd-113m	1053.96	263.70	23.	6.	0.004	113.49	1.070s
BI-210M	1062.48	265.83	31.	-5.	-0.003	154.62	1.072s
TL-208	1108.27	277.28	15.	6.	0.003	106.37	1.084s
Hg-203	1115.93	279.20	21.	5.	0.003	128.09	1.086s
I-131	1136.32	284.30	22.	-1.	-0.001	883.18	1.091s
PB-214	1179.47	295.09	110.	3.	0.001	591.85	1.101s
TL-210	1183.11	296.00	113.	9.	0.005	178.57	1.102s
PB-212	1199.22	300.03	121.	2.	0.001	915.13	1.106s
PA-231	1199.38	300.07	123.	0.	0.000	1000.00	1.106s
PA-233	1199.82	300.18	123.	0.	0.000	1000.00	1.107s
PA-231	1209.70	302.65	123.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	123.	0.	0.000	1000.00	1.109
Ba-140	1218.49	304.85	123.	0.	0.000	1000.00	1.111s
BI-210M	1218.68	304.90	123.	0.	0.000	1000.00	1.111s
Ir-192	1232.85	308.44	123.	0.	0.000	1000.00	1.115
PA-233	1247.13	312.01	123.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	172.	-11.	-0.006	170.83	1.123s
CR-51	1279.41	320.08	191.	-12.	-0.007	168.92	1.126s
La-140	1314.10	328.76	45.	-4.	-0.002	224.93	1.135s
Cf-249	1332.81	333.44	53.	1.	0.001	779.42	1.139s
AC-228	1352.33	338.32	55.	-10.	-0.005	112.35	1.144s
Cs-136	1361.32	340.57	65.	-2.	-0.001	507.77	1.146
EU-152	1376.18	344.29	67.	0.	0.000	1000.00	1.150s
HF-181	1382.35	345.83	75.	-8.	-0.004	157.12	1.151s
PB-214	1406.76	351.93	50.	-13.	-0.007	117.02	1.158
BA-133	1423.02	356.00	18.	6.	0.003	114.03	1.162s
I-131	1456.95	364.48	16.	8.	0.005	102.49	1.170s
BA-133	1534.35	383.84	28.	7.	0.004	111.06	1.189s
Cf-249	1550.79	387.95	50.	-9.	-0.005	112.40	1.193s
SN-113	1565.74	391.69	58.	-10.	-0.006	110.38	1.196s
SB-125	1710.45	427.88	16.	-2.	-0.001	397.91	1.232s
AG-108M	1734.69	433.94	12.	2.	0.001	346.41	1.238s
PM-146	1814.45	453.88	8.	1.	0.001	562.73	1.257s
SB-125	1852.39	463.37	0.	15.	0.008	25.82	1.266s
Ir-192	1871.16	468.06	15.	0.	0.000	1000.00	1.271s
BE-7	1909.29	477.60	21.	6.	0.003	109.70	1.280s
HF-181	1926.90	482.00	25.	2.	0.001	302.40	1.284s
La-140	1946.98	487.02	40.	-8.	-0.004	120.27	1.289s
RU-103	1987.11	497.05	8.	1.	0.001	562.73	1.298s
RH-106	2046.35	511.86	7.	65.	0.036	13.58	2.563s

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 6
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Nd-147	2122.88	531.00	13.	1.	0.001	742.74	1.331s
Ba-140	2147.92	537.26	13.	1.	0.001	742.74	1.337s
CS-134	2251.82	563.24	9.	7.	0.004	97.72	1.362s
PA-234	2276.75	569.47	5.	3.	0.002	106.77	1.368s
TL-208	2330.96	583.02	13.	-2.	-0.001	374.72	1.381s
SB-125	2400.87	600.50	113.	-12.	-0.007	129.64	1.397s
SB-124	2409.79	602.73	125.	-12.	-0.007	135.76	1.399s
CS-134	2417.71	604.71	137.	-7.	-0.004	233.18	1.401s
AG-108M	2455.99	614.28	113.	-12.	-0.007	128.47	1.410s
PM-144	2471.12	618.06	125.	-12.	-0.007	134.47	1.414s
RH-106	2486.54	621.92	72.	11.	0.006	112.66	1.417s
SB-125	2542.43	635.89	13.	-6.	-0.003	94.28	1.430s
I-131	2546.77	636.97	32.	-10.	-0.005	87.19	1.432s
AG-110M	2629.92	657.76	0.	6.	0.003	40.23	1.451s
CS-137	2645.51	661.66	13.	5.	0.003	110.81	1.455s
PM-144	2785.05	696.54	23.	-7.	-0.004	144.53	1.487s
NB-94	2809.41	702.63	23.	-10.	-0.006	103.93	1.493s
SB-124	2890.04	722.79	22.	-6.	-0.003	117.85	1.512s
AG-108M	2890.65	722.94	28.	0.	0.000	1000.00	1.512s
EU-154	2892.34	723.36	28.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	28.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	37.	-7.	-0.004	134.16	1.516s
PM-146	2941.78	735.72	9.	-3.	-0.002	201.99	1.524s
PM-146	2987.55	747.16	9.	-1.	-0.001	493.71	1.535s
ZR-95	3025.83	756.73	14.	-9.	-0.005	94.28	1.543s
AG-110M	3054.69	763.94	18.	-8.	-0.005	77.59	1.550s
PA-234M	3064.57	766.41	27.	0.	0.000	1000.00	1.552s
EU-152	3114.61	778.92	9.	-2.	-0.001	285.36	1.564s
BI-212	3140.62	785.42	5.	4.	0.002	116.15	1.570s
CS-134	3182.43	795.87	17.	8.	0.004	83.22	1.579s
TL-210	3197.35	799.60	36.	-11.	-0.006	83.20	1.583s
CS-134	3206.76	801.95	30.	3.	0.002	287.80	1.585s
CO-58	3242.06	810.78	19.	-1.	-0.001	624.50	1.593s
La-140	3262.05	815.77	26.	-6.	-0.004	116.66	1.598s
Cs-136	3272.97	818.50	17.	6.	0.003	113.99	1.600s
MN-54	3338.38	834.85	0.	6.	0.003	40.82	1.615s
Co-56	3386.08	846.77	5.	1.	0.001	501.66	1.626s
TL-208	3441.27	860.56	0.	12.	0.007	28.87	1.638s
NB-94	3483.41	871.10	6.	2.	0.001	187.08	1.648s
EU-154	3491.95	873.23	8.	0.	0.000	836.66	1.650s
PA-234	3521.16	880.53	10.	4.	0.002	141.42	1.657s
PA-234	3532.00	883.24	30.	-10.	-0.006	84.31	1.659s
AG-110M	3537.78	884.68	33.	-7.	-0.004	131.75	1.660s
Sc-46	3556.17	889.28	46.	-4.	-0.002	277.75	1.664s
Y-88	3591.22	898.04	10.	-3.	-0.002	238.82	1.672s
AC-228	3643.36	911.07	10.	3.	0.002	238.82	1.684s
AG-110M	3749.09	937.49	5.	2.	0.001	255.77	1.708s
PA-234	3783.21	946.02	15.	-6.	-0.003	147.67	1.716s

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 7
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	3855.60	964.11	0.	7.	0.004	37.80	1.732s
AC-228	3875.05	968.97	11.	-4.	-0.002	439.04	1.736s
EU-154	3984.54	996.33	10.	6.	0.003	83.99	1.761s
PA-234M	4003.22	1001.00	16.	1.	0.000	813.61	1.765s
EU-154	4018.33	1004.77	28.	-9.	-0.005	92.25	1.768s
Co-56	4150.66	1037.84	0.	0.	0.000	1000.00	1.798s
Cs-136	4191.60	1048.07	0.	7.	0.004	37.80	1.807s
RH-106	4200.76	1050.36	7.	0.	0.000	1000.00	1.809s
BI-207	4253.99	1063.66	0.	6.	0.003	40.82	1.820s
Ga-68	4308.98	1077.40	0.	7.	0.004	37.80	1.833s
FE-59	4396.44	1099.25	0.	7.	0.004	37.80	1.852s
EU-152	4447.76	1112.07	1.	11.	0.006	31.40	1.863s
ZN-65	4461.66	1115.55	12.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	34.	-9.	-0.005	95.09	1.870s
Sc-46	4481.68	1120.55	25.	-9.	-0.005	83.34	1.870s
Ta-182	4484.69	1121.30	19.	7.	0.004	101.51	1.871s
CO-60	4692.57	1173.24	0.	9.	0.005	33.33	1.916s
Ta-182	4755.86	1189.05	5.	1.	0.000	796.87	1.930s
Ta-182	4885.39	1221.41	0.	0.	0.000	1000.00	1.957s
Co-56	4952.92	1238.28	6.	-2.	-0.001	343.80	1.972s
NA-22	5098.03	1274.53	0.	6.	0.003	40.82	2.003s
EU-154	5098.08	1274.54	6.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	6.	2.	0.001	248.05	2.017s
TL-210	5252.04	1313.00	11.	-6.	-0.004	130.84	2.036s
CO-60	5330.11	1332.50	6.	-3.	-0.001	218.12	2.052s
AG-110M	5537.48	1384.30	11.	-5.	-0.003	154.24	2.096s
EU-152	5632.39	1408.00	12.	-4.	-0.002	215.06	2.115s
K-40	5843.92	1460.83	6.	5.	0.003	126.49	2.159s
La-140	6386.02	1596.21	0.	0.	0.000	1000.00	2.269s
SB-124	6765.58	1690.98	6.	-4.	-0.002	152.01	2.345s
BI-214	7060.00	1764.49	0.	6.	0.003	40.82	2.403s
Co-56	7087.48	1771.35	6.	0.	0.000	1000.00	2.408s
Y-88	7346.69	1836.06	7.	-5.	-0.003	148.46	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	Peak Code	MDA Value Bq/Sample	COMMENTS
BE-7	C	2.0403E+00				5.31E+01	
			477.60	2.040E+00	&(	7.750E+00 1.10E+02 1.05E+01	G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 8
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NA-22	C	4.2145E-01					9.50E+02	
			1274.53	4.215E-01	?(	5.177E-01	4.08E+01	9.99E+01 G
K-40	N	3.6604E+00					4.66E+11	
			1460.83	3.660E+00	?(	1.034E+01	1.26E+02	1.07E+01 G
Sc-46	F	-1.8834E-01					8.38E+01	
			889.28	-1.883E-01	?(	1.837E+00	2.78E+02	1.00E+02 G
			1120.55	-5.862E-01	+	1.651E+00	8.33E+01	1.00E+02 G
CR-51	F	-2.9696E+00					2.77E+01	
			320.08	-2.970E+00	?(	1.697E+01	1.69E+02	9.94E+00 G
MN-54	C	3.0847E-01					3.12E+02	
			834.85	3.085E-01	?(	3.789E-01	4.08E+01	1.00E+02 G
FE-59	F	7.7813E-01					4.45E+01	
			1099.25	7.781E-01	?(	8.193E-01	3.78E+01	5.65E+01 G
			1291.60	3.831E-01	-	2.266E+00	2.48E+02	4.32E+01 G
Co-56	C	5.1965E-02					7.73E+01	
			846.77	5.196E-02	?(	6.823E-01	5.02E+02	9.99E+01 G
			1238.28	-1.732E-01	+	1.435E+00	3.44E+02	6.61E+01 G
			1037.84	0.000E+00	-	3.140E+00	1.00E+03	1.41E+01 G
			1771.35	0.000E+00	-	8.372E+00	1.00E+03	1.55E+01 A
CO-57	C	2.6286E-01					2.72E+02	
			122.06	1.416E-01	(	5.806E-01	1.20E+02	8.56E+01 G
			136.47	1.235E+00	?(	7.797E+00	1.85E+02	1.07E+01 G
CO-58	C	-5.0601E-02					7.09E+01	
			810.78	-5.060E-02	?(	1.165E+00	6.24E+02	9.95E+01 G
CO-60	F	1.9994E-01					1.93E+03	
			1332.50	-1.938E-01	?(	1.003E+00	2.18E+02	1.00E+02 G
			1173.24	5.940E-01	?(	4.864E-01	3.33E+01	9.99E+01 G
NB-94	I	-4.7897E-01					7.41E+06	
			702.63	-4.790E-01	?(	1.169E+00	1.04E+02	9.79E+01 G
			871.10	1.061E-01	+	7.495E-01	1.87E+02	9.99E+01 G
ZR-95	I	-7.9130E-01					6.40E+01	
			756.73	-7.913E-01	?(	1.771E+00	9.43E+01	5.45E+01 G
			724.20	0.000E+00	+	2.875E+00	1.00E+03	4.42E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 9
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-95	I	2.4199E-02					6.40E+01	
			765.79	2.420E-02	%(	1.292E+00	1.46E+03	9.98E+01 G
RU-103	I	3.8681E-02					3.93E+01	
			497.05	3.868E-02	?(	6.147E-01	5.63E+02	9.09E+01 G
			610.30	1.358E-06	%	4.175E+01	8.90E+08	5.75E+00 GA
RH-106	I	4.6072E+00					3.74E+02	
			621.92	4.607E+00	?(	1.761E+01	1.13E+02	9.93E+00 G
			1050.36	0.000E+00	-	5.855E+01	1.00E+03	1.56E+00 G
			511.86	1.174E+01	?	2.649E+00	1.36E+01	2.00E+01 GA
AG-108M	C	7.0135E-02					1.53E+05	
			433.94	7.014E-02	?(	6.611E-01	3.46E+02	9.05E+01 G
			722.94	0.000E+00	-	1.396E+00	1.00E+03	9.08E+01 G
			614.28	-5.499E-01	+	2.392E+00	1.28E+02	8.98E+01 G
AG-110M	F	-2.2138E-01					2.50E+02	
			884.68	-4.799E-01	?(	2.189E+00	1.32E+02	7.27E+01 G
			657.76	2.824E-01	+	3.368E-01	4.02E+01	9.46E+01 G
			937.49	3.254E-01	?(	2.136E+00	2.56E+02	3.44E+01 G
			1384.30	-1.643E+00	+	5.669E+00	1.54E+02	2.43E+01 G
			763.94	-1.839E+00	+	4.805E+00	7.76E+01	2.23E+01 G
SN-113	F	-4.6702E-01					1.15E+02	
			391.69	-4.670E-01	(	1.753E+00	1.10E+02	6.40E+01 G
SB-124	F	-4.9204E-01					6.02E+01	
			602.73	-4.920E-01	?(	2.262E+00	1.36E+02	9.83E+01 G
			1690.98	-7.993E-01	+	2.663E+00	1.52E+02	4.78E+01 G
			722.79	-2.571E+00	+	1.053E+01	1.18E+02	1.08E+01 G
SB-125	I	1.0917E+00					1.01E+03	
			427.88	-2.121E-01	?(	2.264E+00	3.98E+02	2.96E+01 G
			600.50	-2.696E+00	+	1.184E+01	1.30E+02	1.79E+01 G
			635.89	-2.239E+00	&	7.280E+00	9.43E+01	1.13E+01 G
			463.37	4.778E+00	?(	2.347E+00	2.58E+01	1.05E+01 G
I-131	I	2.7638E-01					8.02E+00	
			364.48	2.764E-01	&(	7.256E-01	1.02E+02	8.17E+01 G
			284.30	-3.745E-01	+	9.199E+00	8.83E+02	6.14E+00 G
			636.97	-5.795E+00	+	1.709E+01	8.72E+01	7.17E+00 G
Gd-153	F	-5.2347E-01					2.42E+02	
			97.50	-5.235E-01	?(	2.594E+00	1.46E+02	3.00E+01 G
			103.20	0.000E+00	+	3.800E+00	1.00E+03	2.18E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 10
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ga-68	C	1.5339E+01					4.71E-02	
			1077.40	1.534E+01	?(	1.615E+01	3.78E+01	3.30E+00 G
Tc-99m	I	8.3572E-02					2.51E-01	
			140.51	8.357E-02	&(	9.997E-01	3.49E+02	8.93E+01 G
BA-133	F	2.5090E-01					3.85E+03	
			356.00	2.509E-01	?(	9.960E-01	1.14E+02	6.20E+01 G
			302.85	0.000E+00	&	7.154E+00	1.00E+03	1.83E+01 G
			383.84	2.312E+00	?	8.844E+00	1.11E+02	8.94E+00 GA
			80.99	-3.294E-01	+	1.515E+00	1.65E+02	3.41E+01 GA
CS-134	I	7.6133E-01					7.54E+02	
			795.87	4.509E-01	?(	1.273E+00	8.32E+01	8.55E+01 G
			604.71	-2.994E-01	-	2.384E+00	2.33E+02	9.76E+01 G
			569.32	8.432E-02	%	4.156E+00	1.26E+03	1.54E+01 G
			801.95	1.575E+00	?(	1.616E+01	2.88E+02	8.69E+00 G
			563.24	3.095E+00	&(	7.594E+00	9.77E+01	8.35E+00 G
CS-137	I	2.5786E-01					1.10E+04	
			661.66	2.579E-01	?(	1.001E+00	1.11E+02	8.52E+01 G
CE-139	F	1.9516E-01					1.38E+02	
			165.85	1.952E-01	(	7.821E-01	1.18E+02	7.99E+01 G
Ba-140	I	1.5280E-01					1.28E+01	
			537.26	1.528E-01	?(	2.981E+00	7.43E+02	2.44E+01 G
			162.66	-2.769E+00	+	1.035E+01	1.10E+02	6.22E+00 G
			304.85	0.000E+00	-	3.072E+01	1.00E+03	4.29E+00 G
CE-141	I	2.3772E-01					3.25E+01	
			145.44	2.377E-01	*(	1.712E+00	2.11E+02	4.82E+01 G
CE-144	I	1.1795E+00					2.85E+02	
			133.54	1.179E+00	?(	6.959E+00	1.73E+02	1.11E+01 G
PM-144	C	-3.3402E-01					3.63E+02	
			696.54	-3.340E-01	?(	1.149E+00	1.45E+02	9.90E+01 G
			618.06	-5.021E-01	+	2.286E+00	1.34E+02	9.91E+01 G
EU-152	F	1.6609E+00					4.94E+03	
			121.78	-6.067E-01	(	2.102E+00	1.02E+02	2.86E+01 G
			344.29	0.000E+00	+	4.098E+00	1.00E+03	2.65E+01 G
			1112.07	5.262E+00	?(	3.422E+00	3.14E+01	1.36E+01 G
			778.92	-8.816E-01	-	6.403E+00	2.85E+02	1.29E+01 G
			964.11	2.734E+00	?(	2.879E+00	3.78E+01	1.46E+01 G
			244.69	0.000E+00	-	1.269E+01	1.00E+03	7.58E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 11
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1408.00	-1.445E+00	-	6.808E+00	2.15E+02	2.10E+01 GA
EU-154	I	3.5804E-01					3.14E+03	
			123.10	-4.262E-01	?(	1.395E+00	9.68E+01	4.08E+01 G
			1274.54	0.000E+00	+	2.818E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	6.273E+00	1.00E+03	2.02E+01 G
			873.23	-2.164E-01	+	7.052E+00	8.37E+02	1.23E+01 G
			1004.77	-2.839E+00	+	8.910E+00	9.22E+01	1.80E+01 G
			996.33	3.376E+00	?(	9.684E+00	8.40E+01	1.06E+01 G
HF-181	F	2.6539E-01					4.24E+01	
			482.00	1.014E-01	?(	1.103E+00	3.02E+02	8.05E+01 G
			133.02	3.017E-01	?(	1.712E+00	1.66E+02	4.33E+01 G
			345.83	-1.416E+00	+	7.622E+00	1.57E+02	1.51E+01 G
			136.30	2.253E+00	?(	1.375E+01	1.79E+02	5.85E+00 G
Ta-182	F	1.1886E+00					1.14E+02	
			1121.30	1.189E+00	?(	4.162E+00	1.02E+02	3.49E+01 G
			1221.41	0.000E+00	-	1.855E+00	1.00E+03	2.70E+01 G
			1189.05	2.741E-01	-	5.538E+00	7.97E+02	1.62E+01 G
Hg-203	F	1.4851E-01					4.66E+01	
			279.20	1.485E-01	?(	6.654E-01	1.28E+02	8.15E+01 G
TL-208	N	6.5793E-01					6.98E+02	
			583.02	-9.371E-02	?(	9.142E-01	3.75E+02	8.45E+01 G
			277.28	2.027E+00	?(	7.496E+00	1.06E+02	6.31E+00 G
			860.56	5.076E+00	?(	3.118E+00	2.89E+01	1.24E+01 G
PM-146	C	5.0509E-02					2.02E+03	
			453.88	5.051E-02	?(	8.026E-01	5.63E+02	6.50E+01 G
			747.16	-1.861E-01	+	2.365E+00	4.94E+02	3.40E+01 G
			735.72	-6.951E-01	+	3.534E+00	2.02E+02	2.25E+01 G
Y-88	F	-4.4552E-01					1.07E+02	
			1836.06	-4.455E-01	?(	1.407E+00	1.48E+02	9.92E+01 G
			898.04	-1.735E-01	+	1.009E+00	2.39E+02	9.37E+01 G
Cd-113m		2.2959E+03					5.33E+03	
			263.70	2.296E+03	?(	9.025E+03	1.13E+02	6.00E-03 K
Cf-251	T	-5.9372E-01					3.28E+05	
			176.60	-5.937E-01	*(	3.327E+00	2.11E+02	1.70E+01 G
			227.00	4.142E-01	?	8.176E+00	7.16E+02	6.30E+00 GA
Cf-249	T	-4.0913E-01					1.28E+05	
			387.95	-4.091E-01	&(	1.569E+00	1.12E+02	6.60E+01 G
			333.44	2.230E-01	+	6.144E+00	7.79E+02	1.55E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 12
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		-2.0688E+00					3.65E+07	
			87.57	0.000E+00	+	2.331E+00	1.00E+03	3.75E+01 GA
			64.28	-2.069E+00	?(	9.415E+00	1.34E+02	9.70E+00 G
			86.94	0.000E+00	+	9.694E+00	1.00E+03	9.04E+00 GA
PB-210	N	2.4984E+00					8.14E+03	
			46.54	2.498E+00	(P	2.423E+01	2.95E+02	4.25E+00 G
PB-212	N	-9.0687E-01					6.98E+02	
			238.63	-9.069E-01	*(P	2.345E+00	8.79E+01	4.33E+01 G
			300.03	1.246E+00	?	3.943E+01	9.15E+02	3.28E+00 GA
PB-214	N	-9.5916E-01					5.84E+05	
			351.93	-9.592E-01	&(P	2.572E+00	1.17E+02	3.76E+01 G
			295.09	3.104E-01	& P	6.324E+00	5.92E+02	1.93E+01 G
			242.00	-6.022E-01	+	1.270E+01	6.06E+02	7.43E+00 GA
BI-207	C	4.9368E-01					1.18E+04	
			1063.66	4.937E-01	?(	6.064E-01	4.08E+01	7.45E+01 G
			569.70	-6.637E-03	%	6.382E-01	2.44E+03	9.77E+01 G
BI-212	N	-4.1079E+00					6.98E+02	
			727.17	-4.108E+00	?(	1.906E+01	1.34E+02	7.55E+00 G
			785.42	1.665E+01	?	4.910E+01	1.16E+02	1.28E+00 GA
U-235	N	4.2798E-01					2.57E+11	
			143.79	4.280E-01	?(P	7.411E+00	5.03E+02	1.10E+01 G
			205.33	-4.986E+00	+	1.364E+01	1.05E+02	5.01E+00 G
			163.38	-1.175E+00	+	1.365E+01	3.34E+02	5.08E+00 G
			185.72	-6.694E-01	+ P	1.241E+00	7.85E+01	5.40E+01 GA
BI-214	N	8.9230E-01					5.84E+05	
			609.31	-1.693E-07	%(	5.203E+00	8.90E+08	4.61E+01 G
			1120.29	-3.881E+00	+	1.255E+01	9.51E+01	1.51E+01 G
			1764.49	3.563E+00	?(	4.376E+00	4.08E+01	1.54E+01 G
BI-210M	T	-2.3337E-01					1.10E+09	
			265.83	-2.334E-01	?(	1.260E+00	1.55E+02	5.00E+01 G
			304.90	0.000E+00	+	4.707E+00	1.00E+03	2.80E+01 G
AC-228	N	5.6640E-01					2.10E+03	
			911.07	5.664E-01	?(	3.294E+00	2.39E+02	2.90E+01 G
			968.97	-1.186E+00	+ P	5.868E+00	4.39E+02	1.75E+01 G
			338.32	-2.127E+00	+	8.139E+00	1.12E+02	1.20E+01 G
			93.35	4.062E-01	%	1.494E+01	1.06E+03	5.56E+00 XA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 13
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	1.1455E+00					7.95E+03	
			256.24	4.058E-01	&(	8.009E+00	7.16E+02	7.00E+00 G
			235.97	1.566E+00	?(	6.760E+00	1.27E+02	1.23E+01 G
			50.14	-1.900E+00	+	1.462E+01	2.24E+02	8.00E+00 G
TH-229	N	1.3402E-01					2.68E+06	
			193.51	1.340E-01	%(	1.058E+01	2.85E+03	4.40E+00 G
			210.85	-5.612E+00	+	1.838E+01	1.24E+02	2.99E+00 G
TH-234	N	-6.2154E+00					1.63E+12	
			92.59	-6.215E+00	&(P	1.556E+01	6.97E+01	5.58E+00 G
			63.29	2.255E+00	+ P	1.452E+01	1.99E+02	3.81E+00 G
PA-234	N	9.3645E-01					1.63E+12	
			131.29	6.425E-01	?(	3.455E+00	1.57E+02	1.80E+01 G
			946.02	-2.519E+00	+	8.716E+00	1.48E+02	1.34E+01 G
			569.47	1.582E+00	?(	6.063E+00	1.07E+02	8.20E+00 G
			883.24	-5.573E+00	+	1.586E+01	8.43E+01	9.60E+00 G
			880.53	3.116E+00	?	1.586E+01	1.41E+02	6.00E+00 GA
PA-234M	N	4.9675E+00					1.63E+12	
			1001.00	4.967E+00	?(	1.507E+02	8.14E+02	8.37E-01 G
			766.41	0.000E+00	-	4.425E+02	1.00E+03	2.94E-01 G
AM-241	T	-5.7161E-01					1.58E+05	
			59.54	-5.716E-01	?(	2.894E+00	1.49E+02	3.59E+01 G
Np-237	F	-8.1420E-01					2.14E+06	
			86.49	-8.142E-01	?(	6.865E+00	2.47E+02	1.31E+01 G
Ir-192	F	-3.1603E-01					7.40E+01	
			316.49	-3.160E-01	?(	1.829E+00	1.71E+02	8.70E+01 G
			468.06	0.000E+00	+	1.348E+00	1.00E+03	5.18E+01 G
			308.44	0.000E+00	&	4.188E+00	1.00E+03	3.18E+01 G
Cs-136	F	3.9246E-01					1.30E+01	
			818.50	2.820E-01	?(	1.120E+00	1.14E+02	1.00E+02 G
			1048.07	5.306E-01	?(	5.586E-01	3.78E+01	8.00E+01 G
			340.57	-1.271E-01	-	2.260E+00	5.08E+02	4.69E+01 G
Np-239	T	5.5036E-01					2.36E+00	
			103.70	0.000E+00	-	3.450E+00	1.00E+03	2.40E+01 X
			106.13	5.504E-01	&(	2.931E+00	1.56E+02	2.27E+01 G
			99.50	-7.605E-01	+	5.395E+00	2.08E+02	1.50E+01 X

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 7:45:45 PMPage 14
 TestAmerica Inc                Spectrum name: 12_Gamma_20193346.An1

 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Nd-147       2.8418E-01                                      1.11E+01
                          531.00 2.842E-01 ?(  5.545E+00 7.43E+02 1.30E+01 G
                           91.10 0.000E+00 &   3.050E+00 1.00E+03 2.83E+01 G

TL-210   N  -5.5419E-01                                      5.84E+05
                          799.60-5.542E-01 ?(  1.553E+00 8.32E+01 9.90E+01 G
                          296.00 2.569E-01 +   1.565E+00 1.79E+02 7.90E+01 G
                         1313.00-2.166E+00 +   6.293E+00 1.31E+02 2.10E+01 GA

Kr-85    I  -2.7949E+00                                      3.92E+03
                          513.98-2.795E+00 %(  3.550E+02 3.61E+03 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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 15
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

********** 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.	-6.	-0.003	223.61	-1.900E+00	
AM-241	59.54	115.	-10.	-0.006	149.01	-5.716E-01	
Sn-126	64.28	101.	-11.	-0.006	134.03	-2.069E+00	
BA-133	80.99	40.	-7.	-0.004	165.16	-3.294E-01	
Np-237	86.49	139.	-7.	-0.004	246.84	-8.142E-01	
Gd-153	97.50	110.	-10.	-0.006	145.81	-5.235E-01	
Np-239	99.50	120.	-8.	-0.004	207.65	-7.605E-01	
Np-239	106.13	81.	8.	0.005	155.69	5.504E-01	
EU-152	121.78	65.	-12.	-0.006	102.36	-6.067E-01	
CO-57	122.06	43.	8.	0.005	119.55	1.416E-01	
EU-154	123.10	58.	-12.	-0.006	96.79	-4.262E-01	
PA-234	131.29	68.	8.	0.004	156.70	6.425E-01	
HF-181	133.02	99.	9.	0.005	166.18	3.017E-01	
CE-144	133.54	107.	9.	0.005	172.92	1.179E+00	
HF-181	136.30	116.	9.	0.005	178.97	2.253E+00	
CO-57	136.47	125.	9.	0.005	185.30	1.235E+00	
Tc-99m	140.51	133.	5.	0.003	348.65	8.357E-02	
U-235	143.79	115.	3.	0.002	502.72	4.280E-01	P
CE-141	145.44	118.	7.	0.004	210.72	2.377E-01	
Ba-140	162.66	63.	-11.	-0.006	110.03	-2.769E+00	
U-235	163.38	74.	-4.	-0.002	334.34	-1.175E+00	
CE-139	165.85	58.	10.	0.005	117.55	1.952E-01	
Cf-251	176.60	44.	-6.	-0.003	210.82	-5.937E-01	
U-235	185.72	60.	-21.	-0.012	78.51	-6.694E-01	P
U-235	205.33	55.	-14.	-0.008	105.39	-4.986E+00	
TH-229	210.85	33.	-9.	-0.005	123.98	-5.612E+00	
Cf-251	227.00	26.	1.	0.001	716.11	4.142E-01	
TH-227	235.97	69.	10.	0.005	126.58	1.566E+00	
PB-212	238.63	104.	-19.	-0.011	87.87	-9.069E-01	P
PB-214	242.00	87.	-2.	-0.001	606.09	-6.022E-01	
TH-227	256.24	26.	1.	0.001	716.11	4.058E-01	
Cd-113m	263.70	23.	6.	0.004	113.49	2.296E+03	
BI-210M	265.83	31.	-5.	-0.003	154.62	-2.334E-01	
TL-208	277.28	15.	6.	0.003	106.37	2.027E+00	
Hg-203	279.20	21.	5.	0.003	128.09	1.485E-01	
I-131	284.30	22.	-1.	-0.001	883.18	-3.745E-01	
PB-214	295.09	110.	3.	0.001	591.85	3.104E-01	P
TL-210	296.00	113.	9.	0.005	178.57	2.569E-01	
PB-212	300.03	121.	2.	0.001	915.13	1.246E+00	
Ir-192	316.49	172.	-11.	-0.006	170.83	-3.160E-01	
CR-51	320.08	191.	-12.	-0.007	168.92	-2.970E+00	
La-140	328.76	45.	-4.	-0.002	224.93	-5.477E-01	
Cf-249	333.44	53.	1.	0.001	779.42	2.230E-01	
AC-228	338.32	55.	-10.	-0.005	112.35	-2.127E+00	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 16
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Cs-136	340.57	65.	-2.	-0.001	507.77	-1.271E-01		
HF-181	345.83	75.	-8.	-0.004	157.12	-1.416E+00		
PB-214	351.93	50.	-13.	-0.007	117.02	-9.592E-01		P
BA-133	356.00	18.	6.	0.003	114.03	2.509E-01		
I-131	364.48	16.	8.	0.005	102.49	2.764E-01		
BA-133	383.84	28.	7.	0.004	111.06	2.312E+00		
Cf-249	387.95	50.	-9.	-0.005	112.40	-4.091E-01		
SN-113	391.69	58.	-10.	-0.006	110.38	-4.670E-01		
SB-125	427.88	16.	-2.	-0.001	397.91	-2.121E-01		
AG-108M	433.94	12.	2.	0.001	346.41	7.014E-02		
PM-146	453.88	8.	1.	0.001	562.73	5.051E-02		
SB-125	463.37	0.	15.	0.008	25.82	4.778E+00		
BE-7	477.60	21.	6.	0.003	109.70	2.040E+00		
HF-181	482.00	25.	2.	0.001	302.40	1.014E-01		
La-140	487.02	40.	-8.	-0.004	120.27	-5.905E-01		
RU-103	497.05	8.	1.	0.001	562.73	3.868E-02		
RH-106	511.86	7.	65.	0.036	13.58	1.174E+01		
Nd-147	531.00	13.	1.	0.001	742.74	2.842E-01		
Ba-140	537.26	13.	1.	0.001	742.74	1.528E-01		
CS-134	563.24	9.	7.	0.004	97.72	3.095E+00		
PA-234	569.47	5.	3.	0.002	106.77	1.582E+00		
TL-208	583.02	13.	-2.	-0.001	374.72	-9.371E-02		
SB-125	600.50	113.	-12.	-0.007	129.64	-2.696E+00		
SB-124	602.73	125.	-12.	-0.007	135.76	-4.920E-01		
CS-134	604.71	137.	-7.	-0.004	233.18	-2.994E-01		
AG-108M	614.28	113.	-12.	-0.007	128.47	-5.499E-01		
PM-144	618.06	125.	-12.	-0.007	134.47	-5.021E-01		
RH-106	621.92	72.	11.	0.006	112.66	4.607E+00		
SB-125	635.89	13.	-6.	-0.003	94.28	-2.239E+00		
I-131	636.97	32.	-10.	-0.005	87.19	-5.795E+00		
AG-110M	657.76	0.	6.	0.003	40.23	2.824E-01		
CS-137	661.66	13.	5.	0.003	110.81	2.579E-01		
PM-144	696.54	23.	-7.	-0.004	144.53	-3.340E-01		
NB-94	702.63	23.	-10.	-0.006	103.93	-4.790E-01		
SB-124	722.79	22.	-6.	-0.003	117.85	-2.571E+00		
BI-212	727.17	37.	-7.	-0.004	134.16	-4.108E+00		
PM-146	735.72	9.	-3.	-0.002	201.99	-6.951E-01		
PM-146	747.16	9.	-1.	-0.001	493.71	-1.861E-01		
ZR-95	756.73	14.	-9.	-0.005	94.28	-7.913E-01		
AG-110M	763.94	18.	-8.	-0.005	77.59	-1.839E+00		
EU-152	778.92	9.	-2.	-0.001	285.36	-8.816E-01		
BI-212	785.42	5.	4.	0.002	116.15	1.665E+01		
CS-134	795.87	17.	8.	0.004	83.22	4.509E-01		
TL-210	799.60	36.	-11.	-0.006	83.20	-5.542E-01		
CS-134	801.95	30.	3.	0.002	287.80	1.575E+00		
CO-58	810.78	19.	-1.	-0.001	624.50	-5.060E-02		
La-140	815.77	26.	-6.	-0.004	116.66	-1.411E+00		
Cs-136	818.50	17.	6.	0.003	113.99	2.820E-01		

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 7:45:45 PMPage 17
TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
MN-54	834.85	0.	6.	0.003	40.82	3.085E-01		
Co-56	846.77	5.	1.	0.001	501.66	5.196E-02		
TL-208	860.56	0.	12.	0.007	28.87	5.076E+00		
NB-94	871.10	6.	2.	0.001	187.08	1.061E-01		
EU-154	873.23	8.	0.	0.000	836.66	-2.164E-01		
PA-234	880.53	10.	4.	0.002	141.42	3.116E+00		
PA-234	883.24	30.	-10.	-0.006	84.31	-5.573E+00		
AG-110M	884.68	33.	-7.	-0.004	131.75	-4.799E-01		
Sc-46	889.28	46.	-4.	-0.002	277.75	-1.883E-01		
Y-88	898.04	10.	-3.	-0.002	238.82	-1.735E-01		
AC-228	911.07	10.	3.	0.002	238.82	5.664E-01		
AG-110M	937.49	5.	2.	0.001	255.77	3.254E-01		
PA-234	946.02	15.	-6.	-0.003	147.67	-2.519E+00		
EU-152	964.11	0.	7.	0.004	37.80	2.734E+00		
AC-228	968.97	11.	-4.	-0.002	439.04	-1.186E+00		P
EU-154	996.33	10.	6.	0.003	83.99	3.376E+00		
PA-234M	1001.00	16.	1.	0.000	813.61	4.967E+00		
EU-154	1004.77	28.	-9.	-0.005	92.25	-2.839E+00		
Cs-136	1048.07	0.	7.	0.004	37.80	5.306E-01		
BI-207	1063.66	0.	6.	0.003	40.82	4.937E-01		
Ga-68	1077.40	0.	7.	0.004	37.80	1.534E+01		
FE-59	1099.25	0.	7.	0.004	37.80	7.781E-01		
EU-152	1112.07	1.	11.	0.006	31.40	5.262E+00		
BI-214	1120.29	34.	-9.	-0.005	95.09	-3.881E+00		
Sc-46	1120.55	25.	-9.	-0.005	83.34	-5.862E-01		
CO-60	1173.24	0.	9.	0.005	33.33	5.940E-01		
Co-56	1238.28	6.	-2.	-0.001	343.80	-1.732E-01		
NA-22	1274.53	0.	6.	0.003	40.82	4.215E-01		
FE-59	1291.60	6.	2.	0.001	248.05	3.831E-01		
TL-210	1313.00	11.	-6.	-0.004	130.84	-2.166E+00		
CO-60	1332.50	6.	-3.	-0.001	218.12	-1.938E-01		
AG-110M	1384.30	11.	-5.	-0.003	154.24	-1.643E+00		
EU-152	1408.00	12.	-4.	-0.002	215.06	-1.445E+00		
K-40	1460.83	6.	5.	0.003	126.49	3.660E+00		
SB-124	1690.98	6.	-4.	-0.002	152.01	-7.993E-01		
BI-214	1764.49	0.	6.	0.003	40.82	3.563E+00		
Y-88	1836.06	7.	-5.	-0.003	148.46	-4.455E-01		

P - Peakbackground subtraction

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TestAmerica Inc Spectrum name: 12_Gamma_20193346.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 *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	2.0403E+00	2.0403E+00	1.097E+02%	7.75E+00
NA-22	#A	4.2145E-01	4.2145E-01	4.082E+01%	5.18E-01
K-40	#A	3.6604E+00	3.6604E+00	1.265E+02%	1.03E+01
Sc-46	#A	-1.8834E-01	-1.8834E-01	2.777E+02%	1.84E+00
CR-51	#A	-2.9696E+00	-2.9696E+00	1.689E+02%	1.70E+01
MN-54	#A	3.0847E-01	3.0847E-01	4.082E+01%	3.79E-01
FE-59	#A	7.7813E-01	7.7813E-01	3.780E+01%	8.19E-01
Co-56	#A	5.1965E-02	5.1965E-02	5.017E+02%	6.82E-01
CO-57	#A	2.6286E-01	2.6286E-01	1.103E+02%	5.81E-01
CO-58	#A	-5.0601E-02	-5.0601E-02	6.245E+02%	1.16E+00
CO-60	#A	1.9994E-01	1.9994E-01	3.333E+01%	1.00E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.37E+00
NB-94	#A	-4.7897E-01	-4.7897E-01	1.039E+02%	1.17E+00
ZR-95	#A	-7.9129E-01	-7.9130E-01	9.428E+01%	1.77E+00
NB-95	#A	2.4199E-02	2.4199E-02	1.463E+03%	1.29E+00
RU-103	#A	3.8680E-02	3.8681E-02	5.627E+02%	6.15E-01
RH-106	#A	4.6072E+00	4.6072E+00	1.127E+02%	1.76E+01
AG-108M	#A	7.0135E-02	7.0135E-02	3.464E+02%	6.61E-01
AG-110M	#A	-2.2138E-01	-2.2138E-01	1.318E+02%	2.19E+00
SN-113	#A	-4.6702E-01	-4.6702E-01	1.104E+02%	1.75E+00
SB-124	#A	-4.9203E-01	-4.9204E-01	1.358E+02%	2.26E+00
SB-125	#A	1.0917E+00	1.0917E+00	2.582E+01%	2.26E+00
I-131	#A	2.7637E-01	2.7638E-01	1.025E+02%	7.26E-01
Gd-153	#A	-5.2347E-01	-5.2347E-01	1.458E+02%	2.59E+00
Ga-68	#A	1.5243E+01	1.5339E+01	3.780E+01%	1.62E+01
Tc-99m	#A	8.3473E-02	8.3572E-02	3.487E+02%	1.00E+00
BA-133	#A	2.5090E-01	2.5090E-01	1.140E+02%	9.96E-01
CS-134	#A	7.6133E-01	7.6133E-01	8.322E+01%	1.27E+00
CS-137	#A	2.5786E-01	2.5786E-01	1.108E+02%	1.00E+00
CE-139	#A	1.9516E-01	1.9516E-01	1.175E+02%	7.82E-01
Ba-140	#A	1.5279E-01	1.5280E-01	7.427E+02%	2.98E+00
La-140	#A	0.0000E+00	0.0000E+00	1.000E+03%	6.49E-01
CE-141	#A	2.3772E-01	2.3772E-01	2.107E+02%	1.71E+00
CE-144	#A	1.1795E+00	1.1795E+00	1.729E+02%	6.96E+00
PM-144	#A	-3.3402E-01	-3.3402E-01	1.445E+02%	1.15E+00
EU-152	#A	1.6609E+00	1.6609E+00	3.140E+01%	2.10E+00
EU-154	#A	3.5804E-01	3.5804E-01	6.408E+01%	1.39E+00
EU-155	#A	0.0000E+00	0.0000E+00	7.071E+02%	3.90E+00
HF-181	#A	2.6539E-01	2.6539E-01	1.296E+02%	1.10E+00
Ta-182	#A	1.1886E+00	1.1886E+00	1.015E+02%	4.16E+00
Hg-203	#A	1.4851E-01	1.4851E-01	1.281E+02%	6.65E-01
TL-208	#A	6.5793E-01	6.5793E-01	2.887E+01%	9.14E-01
PM-146	#A	5.0509E-02	5.0509E-02	5.627E+02%	8.03E-01

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TestAmerica Inc Spectrum name: 12_Gamma_20193346.An1

Y-88	#A	-4.4552E-01	-4.4552E-01	1.485E+02%	1.41E+00
Cd-113m	#A	2.2959E+03	2.2959E+03	1.135E+02%	9.02E+03
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.30E+01
Cf-251	#A	-5.9372E-01	-5.9372E-01	2.108E+02%	3.33E+00
Cf-249	#A	-4.0913E-01	-4.0913E-01	1.124E+02%	1.57E+00
Sn-126	#A	-2.0688E+00	-2.0688E+00	1.340E+02%	9.41E+00
PB-210	A	2.4984E+00	2.4984E+00	2.954E+02%	2.42E+01
PB-212	#A	-9.0687E-01	-9.0687E-01	8.787E+01%	2.35E+00
PB-214	#A	-9.5916E-01	-9.5916E-01	1.170E+02%	2.57E+00
BI-207	#A	4.9368E-01	4.9368E-01	4.082E+01%	6.06E-01
BI-212	#A	-4.1079E+00	-4.1079E+00	1.342E+02%	1.91E+01
U-235	#A	4.2798E-01	4.2798E-01	5.027E+02%	7.41E+00
BI-214	#A	8.9230E-01	8.9230E-01	4.082E+01%	5.20E+00
BI-210M	#A	-2.3337E-01	-2.3337E-01	1.546E+02%	1.26E+00
AC-228	#A	5.6640E-01	5.6640E-01	2.388E+02%	3.29E+00
TH-227	#A	1.1455E+00	1.1455E+00	1.266E+02%	8.01E+00
TH-229	#A	1.3402E-01	1.3402E-01	2.849E+03%	1.06E+01
TH-234	A	-6.2154E+00	-6.2154E+00	6.973E+01%	1.56E+01
PA-231	#A	0.0000E+00	0.0000E+00	7.071E+02%	4.55E+01
PA-233	#A	0.0000E+00	0.0000E+00	7.071E+02%	3.73E+00
PA-234	#A	9.3645E-01	9.3645E-01	9.481E+01%	3.46E+00
PA-234M	#A	4.9675E+00	4.9675E+00	8.136E+02%	1.51E+02
AM-241	#A	-5.7161E-01	-5.7161E-01	1.490E+02%	2.89E+00
Np-237	#A	-8.1420E-01	-8.1420E-01	2.468E+02%	6.87E+00
Ir-192	#A	-3.1603E-01	-3.1603E-01	1.708E+02%	1.83E+00
Cs-136	#A	3.9245E-01	3.9246E-01	3.780E+01%	1.12E+00
Np-239	#A	5.5030E-01	5.5036E-01	1.557E+02%	2.93E+00
Nd-147	#A	2.8417E-01	2.8418E-01	7.427E+02%	5.54E+00
TL-210	#A	-5.5419E-01	-5.5419E-01	8.320E+01%	1.55E+00
Kr-85	#A	-2.7949E+00	-2.7949E+00	3.612E+03%	3.55E+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) 0.000E+00 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 0.0000000E+00 Bq/Sample

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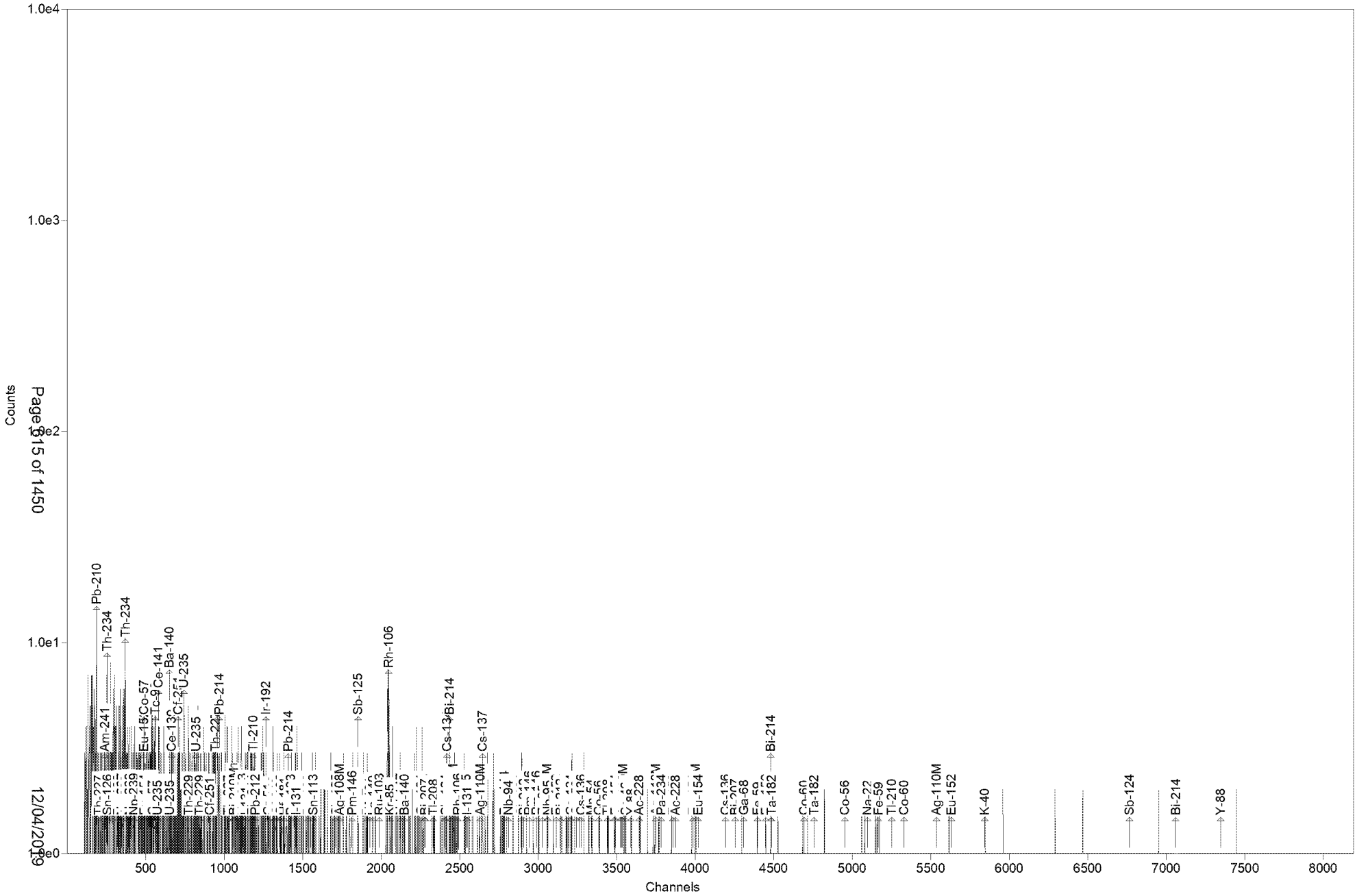
448571_Gamma_MB 160-448571~1-A. 12_Gamma_20193346.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193492

Sample Description: 448571_Gamma_LCS 160-448571~2-A
Detector: Detector # 9
Batch ID: 448571
Work Order Number: Gamma
Lot Number: LCS 160-448571~2-A

Decay to Time: 11/23/2019 19:47 Live Time: 1800 sec
Acquisition Time: 11/23/2019 19:47:44 Real Time: 1808 sec
Analysis Time: 11/23/2019 20:18 Dead Time: 0.42 %
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_2019-11-10_1422.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	-1.176E+01	98.6	1.159E+01	1.161E+01	3.844E+01
NA-22	-5.278E-01	97.3	5.133E-01	5.140E-01	1.741E+00
K-40	4.353E+00	94.5	4.112E+00	4.118E+00	1.071E+01
Sc-46	-1.406E+00	83.6	1.175E+00	1.178E+00	3.901E+00
CR-51	5.404E+00	256.9	1.388E+01	1.388E+01	4.612E+01
MN-54	-1.465E-01	749.2	1.098E+00	1.098E+00	2.421E+00
FE-59	-1.954E+00	127.4	2.490E+00	2.492E+00	5.257E+00
Co-56	-2.349E-01	137.1	3.220E-01	3.223E-01	2.662E+00
CO-57	-7.466E-01	83.5	6.235E-01	6.247E-01	2.063E+00
CO-58	-1.321E+00	78.9	1.041E+00	1.044E+00	3.453E+00
CO-60	1.330E+02	1.5	1.951E+00	6.956E+00	1.021E+00
ZN-65	-3.542E+00	74.5	2.638E+00	2.644E+00	8.735E+00
NB-94	1.067E+00	53.3	5.684E-01	5.711E-01	2.505E+00
ZR-95	-2.402E+00	59.7	1.435E+00	1.441E+00	4.579E+00
NB-95	-5.496E-01	127.8	7.023E-01	7.029E-01	2.363E+00
RU-103	3.063E-01	344.8	1.056E+00	1.056E+00	2.477E+00
RH-106	1.057E+01	120.5	1.274E+01	1.276E+01	3.989E+01
AG-108M	2.308E-01	219.0	5.055E-01	5.056E-01	3.871E+00
AG-110M	2.340E-01	131.1	3.068E-01	3.070E-01	5.082E+00
SN-113	-7.948E-01	200.3	1.592E+00	1.593E+00	5.309E+00
SB-124	0.000E+00	1.#INF	3.545E-01	3.545E-01	4.312E+00
SB-125	2.160E+00	85.4	1.845E+00	1.848E+00	1.114E+01
I-131	3.746E-01	141.7	5.310E-01	5.313E-01	2.533E+00
Gd-153	-2.395E+00	133.8	3.206E+00	3.209E+00	1.062E+01
Ga-68	-4.172E+01	127.6	5.322E+01	5.328E+01	1.121E+02
Tc-99m	0.000E+00	1.#INF	4.474E-01	4.474E-01	3.436E+00
BA-133	-9.782E-01	138.1	1.351E+00	1.352E+00	4.499E+00
CS-134	-2.792E-01	156.6	4.372E-01	4.375E-01	3.477E+00
CS-137	3.419E+02	1.1	3.630E+00	1.816E+01	1.865E+00
CE-139	7.755E-01	90.9	7.049E-01	7.088E-01	2.336E+00
Ba-140	4.543E+00	85.1	3.864E+00	3.871E+00	8.132E+00
La-140	-1.323E+00	37.5	4.967E-01	5.016E-01	2.118E+00
CE-141	-1.380E+00	131.8	1.819E+00	1.820E+00	6.027E+00

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CE-144	-5.243E+00	150.3	7.882E+00	7.887E+00	2.613E+01
PM-144	-1.066E+00	304.6	3.248E+00	3.248E+00	2.510E+00
EU-152	3.639E+00	88.8	3.232E+00	3.238E+00	6.119E+00
EU-154	7.312E-01	98.1	7.175E-01	7.185E-01	4.247E+00
EU-155	-6.185E-02	115.3	7.131E-02	7.139E-02	1.769E+01
HF-181	-1.551E+00	100.3	1.556E+00	1.558E+00	5.158E+00
Ta-182	-5.038E-07	796848779.4	4.015E+00	4.015E+00	1.359E+01
Hg-203	9.400E-01	81.1	7.628E-01	7.647E-01	2.527E+00
TL-208	5.979E-01	268.0	1.602E+00	1.603E+00	2.687E+00
PM-146	1.313E-01	1352.5	1.775E+00	1.775E+00	4.147E+00
Y-88	8.172E-01	89.2	7.291E-01	7.306E-01	1.001E+00
Cd-113m	2.521E+03	437.1	1.102E+04	1.102E+04	3.693E+04
Cd-109	-1.864E+01	162.2	3.024E+01	3.026E+01	1.001E+02
Cf-251	5.987E-01	602.8	3.609E+00	3.610E+00	9.170E+00
Cf-249	1.517E+00	92.1	1.396E+00	1.399E+00	4.630E+00
Sn-126	-1.756E+01	224.5	3.942E+01	3.943E+01	1.302E+02
PB-210	9.609E+03	0.9	8.372E+01	5.704E+02	1.536E+02
PB-212	6.723E+00	15.7	1.058E+00	1.144E+00	3.198E+00
PB-214	9.318E+00	18.1	1.689E+00	1.757E+00	4.025E+00
BI-207	3.958E-01	201.4	7.972E-01	7.975E-01	3.601E+00
BI-212	-1.451E+01	69.2	1.004E+01	1.007E+01	3.450E+01
U-235	0.000E+00	1.#INF	3.232E+00	3.232E+00	2.745E+01
BI-214	3.243E+00	28.2	9.136E-01	9.290E-01	8.885E+00
BI-210M	-1.158E+00	75.4	8.731E-01	8.758E-01	4.455E+00
AC-228	3.466E+00	124.7	4.323E+00	4.326E+00	9.452E+00
TH-227	2.008E+00	561.6	1.127E+01	1.128E+01	2.739E+01
TH-229	-1.149E+01	151.8	1.744E+01	1.746E+01	4.207E+01
TH-234	-1.281E+01	127.5	1.634E+01	1.635E+01	5.411E+01
PA-231	1.822E+00	2535.3	4.620E+01	4.620E+01	1.538E+02
PA-233	0.000E+00	1.#INF	1.219E+00	1.220E+00	1.257E+01
PA-234	5.611E+00	56.5	3.173E+00	3.186E+00	5.356E+00
PA-234M	-1.108E+02	123.1	1.365E+02	1.366E+02	4.565E+02
AM-241	1.214E+03	0.8	9.181E+00	6.367E+01	1.296E+01
Np-237	5.176E+00	165.5	8.567E+00	8.572E+00	2.838E+01
Ir-192	4.985E-01	84.1	4.194E-01	4.205E-01	5.194E+00
Cs-136	1.241E+00	53.8	6.676E-01	6.714E-01	3.655E+00
Np-239	9.838E-01	159.6	1.570E+00	1.572E+00	5.252E+00
Nd-147	7.506E+00	86.5	6.496E+00	6.510E+00	1.511E+01
TL-210	6.163E-01	156.0	9.616E-01	9.623E-01	2.970E+00
Kr-85	2.417E+02	83.1	2.010E+02	2.014E+02	6.664E+02
Total	1.415E+04				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 8:18:07 PMPage  1
TestAmerica Inc                 Spectrum name: 9_Gamma_20193492.An1

Sample description
     448571_Gamma_LCS 160-448571~2-A


Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193492.An1

Acquisition information
       Start time:                 11/23/2019 7:47:44 PM
       Live time:               1800
       Real time:               1808
       Dead time:                  0.42 %
       Detector ID:                    9

Detector system
     Ge9 S/N09363993


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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 2
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

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	11/23/2019 7:47:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-11-10_1422.PBC 11/10/2019 2:22:11 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 23 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1337

***** 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
31.98	197.	21.71	1.38	1.213E-02				
36.44	312.	19.19	0.96	1.625E-02				
46.54	18941.	0.87	1.00	2.574E-02	46.54	4.250	9.609E+03	PB210
49.54	136.	66.21	1.00	2.844E-02	50.14	8.000	3.250E+01	TH227
59.52	28702.	0.76	0.95	3.657E-02	59.54	35.900	1.214E+03	AM241
86.49	61.	165.52	1.04	5.008E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	2.208E+00	EU155
					86.94	9.040	7.482E+00	Sn126
86.54	61.	166.51	1.04	5.010E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	2.208E+00	EU155
					86.94	9.040	7.482E+00	Sn126
103.61	39.	272.99	1.05	5.307E-02	103.20	21.800	PBC<MDA	Gd153
					103.70	24.000	1.711E+00	Np239
106.04	21.	159.63	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
121.78	57.	88.82	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	6.947E-01	CO57
131.74	56.	56.54	1.27	5.216E-02	131.29	18.000	PBC<MDA	PA234
162.66	36.	145.68	1.11	4.690E-02	162.66	6.220	PBC<MDA	Ba140
165.85	53.	90.89	1.11	4.736E-02	165.85	79.900	PBC<MDA	CE139
176.60	8.	602.83	1.12	4.549E-02	176.60	17.000	PBC<MDA	Cf251
185.72	57.	92.17	1.13	4.403E-02	185.72	54.000	PBC<MDA	U235
227.00	7.	778.06	1.17	3.858E-02	227.00	6.300	PBC<MDA	Cf251

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 3
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
238.54	181.	19.15	1.10	3.733E-02	238.63	43.300	6.223E+00	PB212
241.93	31.	89.20	1.18	3.697E-02	242.00	7.430	PBC<MDA	PB214
244.69	54.	113.90	1.18	3.670E-02	244.69	7.580	PBC<MDA	EU152
256.24	9.	561.56	1.20	3.558E-02	256.24	7.000	PBC<MDA	TH227
263.70	10.	437.13	1.20	3.489E-02	263.70	0.006	PBC<MDA	Cd113m
279.20	46.	81.15	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
284.52	15.	296.47	1.22	3.315E-02	284.30	6.140	PBC<MDA	I131
294.54	91.	45.88	1.35	3.232E-02	295.09	19.300	PBC<MDA	PB214
296.00	48.	156.04	1.23	3.225E-02	296.00	79.000	PBC<MDA	TL210
300.03	37.	204.42	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	2.622E+01	PA231
					300.18	6.200	1.041E+01	PA233
320.08	30.	256.88	1.25	3.056E-02	320.08	9.940	PBC<MDA	CR51
351.83	193.	18.12	1.94	2.860E-02	351.93	37.600	9.949E+00	PB214
387.95	48.	92.07	1.31	2.671E-02	387.95	66.000	PBC<MDA	Cf249
430.88	41.	54.41	0.38	2.478E-02				
463.37	54.	85.40	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
468.06	52.	84.14	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
487.02	48.	99.75	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
497.05	11.	344.84	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	79.	42.27	2.67	2.188E-02	511.86	20.000	PBC<MDA	RH106
513.98	41.	83.14	1.42	2.182E-02	513.98	0.430	PBC<MDA	Kr85
531.00	37.	86.54	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
537.26	37.	87.85	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
569.70	8.	291.73	1.47	2.023E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.790E+00	PA234
					569.70	97.740	2.341E-01	BI207
583.29	10.	366.69	1.48	1.989E-02	583.02	84.500	PBC<MDA	TL208
609.08	26.	163.84	1.50	1.925E-02	609.31	46.090	PBC<MDA	BI214
610.30	35.	121.77	1.51	1.922E-02	610.30	5.750	PBC<MDA	RU103
614.28	20.	219.02	1.51	1.913E-02	614.28	89.850	PBC<MDA	AG108M
621.92	34.	120.52	1.51	1.896E-02	621.92	9.930	PBC<MDA	RH106
635.89	7.	441.84	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
636.97	14.	146.91	1.53	1.862E-02	636.97	7.170	PBC<MDA	I131
661.56	9492.	1.06	1.51	1.810E-02	661.66	85.210	3.419E+02	CS137
702.26	27.	84.30	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
724.20	12.	178.77	1.60	1.691E-02	724.20	44.150	PBC<MDA	ZR95
763.94	11.	166.39	1.63	1.624E-02	763.94	22.280	PBC<MDA	AG110M
778.92	11.	246.63	1.64	1.600E-02	778.92	12.940	PBC<MDA	EU152
799.60	8.	326.73	1.66	1.568E-02	799.60	98.960	PBC<MDA	TL210
801.95	8.	288.54	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
818.50	23.	131.80	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136
860.56	8.	390.93	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
868.73	33.	65.13	1.71	1.468E-02	871.10	99.890	PBC<MDA	NB94
873.23	22.	98.13	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
880.53	33.	81.92	1.72	1.456E-02	880.53	6.000	PBC<MDA	PA234
883.24	25.	111.67	1.72	1.453E-02	883.24	9.600	PBC<MDA	PA234
898.04	34.	89.22	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 4
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
911.07	26.	124.73	1.75	1.418E-02	911.07	29.000	PBC<MDA	AC228
1004.77	4.	747.50	1.82	1.314E-02	1004.77	18.010	PBC<MDA	EU154
1037.84	9.	319.84	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1048.07	32.	53.78	1.85	1.271E-02	1048.07	80.000	PBC<MDA	Cs136
1050.36	5.	397.00	1.85	1.269E-02	1050.36	1.560	PBC<MDA	RH106
1063.66	10.	277.75	1.86	1.257E-02	1063.66	74.500	PBC<MDA	BI207
1173.13	2855.	2.09	1.91	1.163E-02	1173.24	99.900	1.365E+02	CO60
1332.37	2446.	2.06	1.97	1.050E-02	1332.50	99.980	1.294E+02	CO60
1384.30	5.	198.49	2.08	1.018E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	2.	248.05	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.83	8.	94.47	2.13	9.749E-03	1460.83	10.670	PBC<MDA	K40
1764.74	19.	28.17	2.31	8.350E-03	1764.49	15.400	8.079E+00	BI214
1836.06	4.	178.26	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 Centroid Channel	Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
127.60	31.98	544.	197.	1.623E+04	21.71	1.377	- s
145.42	36.44	1031.	312.	1.918E+04	19.19	0.963	- s
197.67	49.51	3969.	129.	4.537E+03	69.60	1.001	- sc
1722.87	430.88	168.	41.	1.641E+03	54.41	0.378	- 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

********** 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	4146.	18941.	10.523	0.87	0.998D
TH-227	200.20	50.14	31070.	-148.	-0.082	169.04	1.001s
AM-241	237.70	59.52	4250.	28702.	15.946	0.76	0.948
TH-234	252.77	63.29	37702.	-122.	-0.068	225.10	1.014s
Sn-126	256.74	64.28	37580.	-122.	-0.068	224.52	1.015s
BA-133	323.56	80.99	1283.	-20.	-0.011	330.35	1.031s
Np-237	345.55	86.49	5088.	61.	0.034	165.52	1.036s
EU-155	345.76	86.54	5149.	61.	0.034	166.51	1.036s
Sn-126	347.35	86.94	5511.	-64.	-0.036	164.15	1.037
Sn-126	349.87	87.57	5447.	-64.	-0.036	163.08	1.037s
Cd-109	351.75	88.04	5395.	-64.	-0.036	162.23	1.038s

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 5
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Nd-147	363.99	91.10	5459.	-64.	-0.036	162.74	1.041s
TH-234	369.94	92.59	3551.	-66.	-0.037	127.52	1.042s
AC-228	372.98	93.35	3617.	-63.	-0.035	135.78	1.043s
Gd-153	389.58	97.50	4081.	-68.	-0.038	133.85	1.047s
Np-239	397.58	99.50	5660.	-11.	-0.006	982.99	1.049
Gd-153	412.37	103.20	5671.	0.	0.000	1000.00	1.052s
Np-239	414.37	103.70	5710.	39.	0.022	272.99	1.053s
EU-155	420.82	105.31	5843.	-68.	-0.038	159.53	1.054s
Np-239	424.09	106.13	572.	21.	0.012	159.63	1.055D
EU-152	486.67	121.78	1243.	57.	0.032	88.82	1.070s
CO-57	487.80	122.06	1267.	-61.	-0.034	83.51	1.070s
EU-154	491.95	123.10	1215.	-45.	-0.025	109.92	1.071s
PA-234	526.51	131.74	355.	56.	0.031	56.54	1.269
HF-181	531.64	133.02	3360.	-58.	-0.032	142.69	1.081s
CE-144	533.69	133.54	3306.	-54.	-0.030	150.35	1.081s
HF-181	544.74	136.30	3360.	0.	0.000	1000.00	1.084s
CO-57	545.43	136.47	3360.	0.	0.000	1000.00	1.084s
Tc-99m	561.57	140.51	3360.	0.	0.000	1000.00	1.088s
U-235	574.67	143.79	3360.	0.	0.000	1000.00	1.091s
CE-141	581.29	145.44	3098.	-60.	-0.033	131.78	1.092s
Ba-140	650.15	162.66	1320.	36.	0.020	145.68	1.108s
U-235	653.03	163.38	1355.	0.	0.000	1000.00	1.109s
CE-139	662.92	165.85	1126.	53.	0.029	90.89	1.111s
Cf-251	705.90	176.60	719.	8.	0.005	602.83	1.122s
U-235	742.37	185.72	777.	57.	0.032	92.17	1.130
TH-229	773.52	193.51	904.	-39.	-0.022	151.79	1.137s
U-235	820.80	205.33	872.	-59.	-0.033	98.97	1.148s
TH-229	842.87	210.85	864.	-59.	-0.033	98.54	1.153s
Cf-251	907.45	227.00	772.	7.	0.004	778.06	1.168s
TH-227	943.33	235.97	2263.	-57.	-0.032	117.95	1.176
PB-212	953.97	238.63	376.	196.	0.109	15.74	1.179D
PB-214	967.43	242.00	355.	31.	0.017	89.20	1.182D
EU-152	978.21	244.69	1832.	54.	0.030	113.90	1.185
TH-227	1024.39	256.24	664.	9.	0.005	561.56	1.195s
Cd-113m	1054.23	263.70	858.	10.	0.005	437.13	1.202
BI-210M	1062.75	265.83	857.	-36.	-0.020	75.37	1.204s
TL-208	1108.55	277.28	846.	-24.	-0.013	173.78	1.215
Hg-203	1116.22	279.20	681.	46.	0.026	81.15	1.216s
I-131	1136.61	284.30	512.	15.	0.008	296.47	1.221
PB-214	1177.58	294.54	382.	91.	0.050	45.88	1.348s
TL-210	1183.41	296.00	2809.	48.	0.027	156.04	1.231
PB-212	1199.52	300.03	2857.	37.	0.021	204.42	1.235
PA-231	1199.68	300.07	2894.	0.	0.000	1000.00	1.235
PA-233	1200.12	300.18	2894.	0.	0.000	1000.00	1.235s
BA-133	1210.81	302.85	2894.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	2894.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	2894.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	2894.	0.	0.000	1000.00	1.243s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-233	1247.44	312.01	2894.	0.	0.000	1000.00	1.246s
Ir-192	1265.35	316.49	2830.	-30.	-0.017	251.44	1.250s
CR-51	1279.73	320.08	2864.	30.	0.016	256.88	1.253s
La-140	1314.43	328.76	2058.	-50.	-0.028	129.16	1.261s
Cf-249	1333.15	333.44	2108.	-30.	-0.017	214.68	1.265s
AC-228	1352.66	338.32	2139.	0.	0.000	1000.00	1.270s
Cs-136	1361.66	340.57	2139.	0.	0.000	1000.00	1.272
EU-152	1376.53	344.29	2139.	0.	0.000	1000.00	1.275s
HF-181	1382.70	345.83	2157.	-51.	-0.029	128.64	1.276s
PB-214	1406.70	351.83	260.	193.	0.107	18.12	1.943s
BA-133	1423.37	356.00	901.	-31.	-0.017	138.11	1.285s
I-131	1457.31	364.48	472.	-16.	-0.009	267.02	1.293
BA-133	1534.73	383.84	1268.	-52.	-0.029	67.74	1.310
Cf-249	1551.17	387.95	957.	48.	0.027	92.07	1.314
SN-113	1566.12	391.69	1172.	-24.	-0.013	200.35	1.317s
SB-125	1710.86	427.88	971.	-17.	-0.009	265.50	1.349
AG-108M	1735.10	433.94	1074.	-7.	-0.004	476.00	1.354s
SB-125	1852.82	463.37	1049.	54.	0.030	85.40	1.380s
Ir-192	1871.59	468.06	925.	52.	0.029	84.14	1.384s
BE-7	1909.73	477.60	1251.	-51.	-0.028	98.62	1.392
HF-181	1927.34	482.00	1302.	-51.	-0.029	100.31	1.396s
La-140	1947.43	487.02	1132.	48.	0.027	99.75	1.400s
RU-103	1987.56	497.05	356.	11.	0.006	344.84	1.409s
RH-106	2046.81	511.86	523.	79.	0.044	42.27	2.672
Kr-85	2055.27	513.98	555.	41.	0.023	83.14	1.424s
Nd-147	2123.35	531.00	243.	37.	0.021	86.54	1.438s
Ba-140	2148.39	537.26	243.	37.	0.020	87.85	1.444s
CS-134	2276.64	569.32	261.	-30.	-0.017	77.53	1.471s
PA-234	2277.24	569.47	292.	0.	0.000	1000.00	1.471
BI-207	2278.16	569.70	291.	8.	0.005	291.73	1.471s
TL-208	2331.45	583.02	284.	10.	0.005	366.69	1.482s
SB-124	2410.29	602.73	972.	0.	0.000	1000.00	1.499s
CS-134	2418.21	604.71	972.	0.	0.000	1000.00	1.500s
BI-214	2436.61	609.31	892.	26.	0.014	163.84	1.505s
RU-103	2440.56	610.30	916.	35.	0.020	121.77	1.505s
AG-108M	2456.49	614.28	952.	20.	0.011	219.02	1.508s
PM-144	2471.62	618.06	972.	0.	0.000	1000.00	1.512s
RH-106	2487.04	621.92	808.	34.	0.019	120.52	1.515s
SB-125	2542.94	635.89	191.	7.	0.004	441.84	1.526s
I-131	2547.28	636.97	210.	14.	0.008	146.91	1.527
AG-110M	2630.43	657.76	9786.	-34.	-0.019	417.51	1.544s
CS-137	2645.62	661.56	111.	9492.	5.273	1.06	1.508
PM-144	2785.58	696.54	260.	-33.	-0.018	304.60	1.576s
NB-94	2809.93	702.63	250.	27.	0.015	84.30	1.581s
SB-124	2890.57	722.79	251.	-17.	-0.009	136.56	1.598s
AG-108M	2891.17	722.94	267.	0.	0.000	1000.00	1.598s
EU-154	2892.86	723.36	267.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	212.	12.	0.006	178.77	1.599s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-212	2908.11	727.17	268.	-33.	-0.018	69.18	1.601s
PM-146	2942.31	735.72	191.	-28.	-0.016	105.25	1.608s
PM-146	2988.08	747.16	149.	-10.	-0.006	252.79	1.617s
ZR-95	3026.36	756.73	230.	-39.	-0.021	59.74	1.625s
AG-110M	3055.23	763.94	162.	11.	0.006	166.39	1.631s
NB-95	3062.61	765.79	201.	-16.	-0.009	127.78	1.632s
PA-234M	3065.10	766.41	218.	-12.	-0.007	171.81	1.633s
EU-152	3115.14	778.92	150.	11.	0.006	246.63	1.643s
CS-134	3182.96	795.87	306.	-16.	-0.009	156.62	1.656s
TL-210	3197.88	799.60	296.	8.	0.004	326.73	1.659s
CS-134	3207.29	801.95	296.	8.	0.005	288.54	1.661s
CO-58	3242.59	810.78	400.	-37.	-0.020	78.85	1.668s
La-140	3262.58	815.77	437.	-31.	-0.017	96.04	1.672s
Cs-136	3273.50	818.50	448.	23.	0.013	131.80	1.674
MN-54	3338.91	834.85	185.	-4.	-0.002	749.24	1.687s
Co-56	3386.61	846.77	220.	-18.	-0.010	137.09	1.696s
TL-208	3441.80	860.56	211.	8.	0.005	390.93	1.707
NB-94	3483.94	871.10	210.	33.	0.018	65.13	1.715s
EU-154	3492.47	873.23	217.	22.	0.012	98.13	1.717s
PA-234	3521.68	880.53	345.	33.	0.018	81.92	1.722
PA-234	3532.53	883.24	374.	25.	0.014	111.67	1.724s
AG-110M	3538.30	884.68	405.	-10.	-0.005	296.05	1.725s
Sc-46	3556.69	889.28	449.	-37.	-0.020	83.57	1.729s
Y-88	3591.74	898.04	186.	34.	0.019	89.22	1.736s
AC-228	3643.88	911.07	208.	26.	0.014	124.73	1.746s
AG-110M	3749.60	937.49	245.	-18.	-0.010	192.62	1.766s
PA-234	3783.72	946.02	260.	-10.	-0.006	355.90	1.772
EU-152	3856.11	964.11	470.	-33.	-0.018	95.47	1.786s
AC-228	3875.56	968.97	503.	0.	0.000	1000.00	1.790s
EU-154	3985.03	996.33	384.	-5.	-0.003	556.06	1.810s
PA-234M	4003.71	1001.00	356.	-22.	-0.012	123.15	1.814s
EU-154	4018.82	1004.77	445.	4.	0.002	747.50	1.816s
Co-56	4151.13	1037.84	171.	9.	0.005	319.84	1.841s
Cs-136	4192.07	1048.07	133.	32.	0.018	53.78	1.848
RH-106	4201.23	1050.36	210.	5.	0.003	397.00	1.850s
BI-207	4254.46	1063.66	155.	10.	0.006	277.75	1.860s
Ga-68	4309.44	1077.40	213.	-26.	-0.015	127.57	1.870s
FE-59	4396.88	1099.25	181.	-24.	-0.014	127.41	1.886s
EU-152	4448.20	1112.07	441.	-39.	-0.022	77.82	1.895s
ZN-65	4462.09	1115.55	403.	-39.	-0.022	74.48	1.897s
CO-60	4692.53	1173.13	86.	2855.	1.586	2.09	1.907
Ta-182	4885.75	1221.41	62.	-10.	-0.006	181.87	1.972s
NA-22	5098.35	1274.53	45.	-10.	-0.006	97.26	2.008s
EU-154	5098.39	1274.54	56.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	51.	-21.	-0.012	282.59	2.020s
TL-210	5252.32	1313.00	28.	-4.	-0.002	292.05	2.034s
CO-60	5329.85	1332.37	13.	2446.	1.359	2.06	1.975
AG-110M	5537.69	1384.30	17.	5.	0.003	198.49	2.082s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	5632.56	1408.00	6.	2.	0.001	248.05	2.097s
K-40	5844.03	1460.83	14.	8.	0.005	94.47	2.131
La-140	6385.95	1596.21	42.	-21.	-0.011	37.55	2.215s
SB-124	6765.35	1690.98	32.	-16.	-0.009	92.71	2.272s
BI-214	7059.65	1764.49	4.	19.	0.010	28.17	2.314s
Co-56	7087.11	1771.35	34.	-3.	-0.002	296.34	2.318s
Y-88	7346.20	1836.06	6.	4.	0.002	178.26	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	-1.1756E+01				5.31E+01	
			477.60	-1.176E+01	?(	3.844E+01 9.86E+01 1.05E+01	G
NA-22	C	-5.2779E-01				9.50E+02	
			1274.53	-5.278E-01	?(	1.741E+00 9.73E+01 9.99E+01	G
K-40	N	4.3529E+00				4.66E+11	
			1460.83	4.353E+00	(P	1.071E+01 9.45E+01 1.07E+01	G
Sc-46	F	-1.4064E+00				8.38E+01	
			889.28	-1.406E+00	&(	3.901E+00 8.36E+01 1.00E+02	G
			1120.55	0.000E+00	} P	4.828E+00 1.53E+03 1.00E+02	G
CR-51	F	5.4036E+00				2.77E+01	
			320.08	5.404E+00	&(P	4.612E+01 2.57E+02 9.94E+00	G
MN-54	C	-1.4651E-01				3.12E+02	
			834.85	-1.465E-01	?(	2.421E+00 7.49E+02 1.00E+02	G
FE-59	F	-1.9543E+00				4.45E+01	
			1099.25	-1.954E+00	?(	5.257E+00 1.27E+02 5.65E+01	G
			1291.60	-2.521E+00	+ P	4.299E+00 2.83E+02 4.32E+01	G
Co-56	C	-2.3490E-01				7.73E+01	
			846.77	-6.731E-01	&(P	2.662E+00 1.37E+02 9.99E+01	G
			1238.28	-3.461E-02	% P	2.270E+00 1.30E+04 6.61E+01	G
			1037.84	2.865E+00	?(	1.952E+01 3.20E+02 1.41E+01	G
			1771.35	-1.222E+00	+	1.286E+01 2.96E+02 1.55E+01	A

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TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	C	-7.4660E-01					2.72E+02	
			122.06	-7.466E-01	&(	2.063E+00	8.35E+01	8.56E+01 G
			136.47	0.000E+00	+	2.756E+01	1.00E+03	1.07E+01 G
CO-58	C	-1.3206E+00					7.09E+01	
			810.78	-1.321E+00	&(	3.453E+00	7.89E+01	9.95E+01 G
CO-60	F	1.3299E+02					1.93E+03	
			1332.50	1.294E+02	(	1.021E+00	2.06E+00	1.00E+02 G
			1173.24	1.365E+02	(P	2.200E+00	2.09E+00	9.99E+01 G
ZN-65	F	-3.5419E+00					2.44E+02	
			1115.55	-3.542E+00	?(	8.735E+00	7.45E+01	5.06E+01 G
NB-94	I	1.0671E+00					7.41E+06	
			702.63	8.934E-01	?(P	2.505E+00	8.43E+01	9.79E+01 G
			871.10	1.237E+00	&(	2.661E+00	6.51E+01	9.99E+01 G
ZR-95	I	-2.4024E+00					6.40E+01	
			756.73	-2.402E+00	?(P	4.579E+00	5.97E+01	5.45E+01 G
			724.20	8.683E-01	+	5.247E+00	1.79E+02	4.42E+01 G
NB-95	I	-5.4964E-01					6.40E+01	
			765.79	-5.496E-01	?(	2.363E+00	1.28E+02	9.98E+01 G
RU-103	I	3.0630E-01					3.93E+01	
			497.05	3.063E-01	?(P	2.477E+00	3.45E+02	9.09E+01 G
			610.30	1.784E+01	?	7.226E+01	1.22E+02	5.75E+00 GA
RH-106	I	1.0574E+01					3.74E+02	
			621.92	9.946E+00	&(P	3.989E+01	1.21E+02	9.93E+00 G
			1050.36	1.457E+01	?(	1.970E+02	3.97E+02	1.56E+00 G
			511.86	1.007E+01	?	1.387E+01	4.23E+01	2.00E+01 GA
AG-108M	C	2.3081E-01					1.53E+05	
			433.94	-1.827E-01	?(P	3.871E+00	4.76E+02	9.05E+01 G
			722.94	0.000E+00	+	2.850E+00	1.00E+03	9.08E+01 G
			614.28	6.473E-01	?(	4.734E+00	2.19E+02	8.98E+01 G
AG-110M	F	2.3396E-01					2.50E+02	
			884.68	-5.093E-01	?(	5.082E+00	2.96E+02	7.27E+01 G
			657.76	-1.083E+00	+	1.497E+01	4.18E+02	9.46E+01 G
			937.49	-2.098E+00	+	8.819E+00	1.93E+02	3.44E+01 G
			1384.30	1.123E+00	?(	4.924E+00	1.98E+02	2.43E+01 G
			763.94	1.689E+00	&(	9.525E+00	1.66E+02	2.23E+01 G

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Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	F -7.9480E-01					1.15E+02	
		391.69	-7.948E-01	?(	5.309E+00	2.00E+02	6.40E+01 G
SB-125	I 2.1599E+00					1.01E+03	
		427.88	-1.256E+00	?(	1.114E+01	2.65E+02	2.96E+01 G
		600.50	-1.066E-01	&	2.367E+01	6.62E+03	1.79E+01 G
		635.89	1.756E+00	(	1.770E+01	4.42E+02	1.13E+01 G
		463.37	1.225E+01	&(P	3.465E+01	8.54E+01	1.05E+01 G
I-131	I 3.7465E-01					8.02E+00	
		364.48	-3.899E-01	&(	2.533E+00	2.67E+02	8.17E+01 G
		284.30	4.094E+00	?(	2.952E+01	2.96E+02	6.14E+00 G
		636.97	5.901E+00	(P	2.922E+01	1.47E+02	7.17E+00 G
Gd-153	F -2.3953E+00					2.42E+02	
		97.50	-2.395E+00	?(	1.062E+01	1.34E+02	3.00E+01 G
		103.20	0.000E+00	+	1.699E+01	1.00E+03	2.18E+01 G
Ga-68	C -4.1721E+01					4.71E-02	
		1077.40	-4.172E+01	?(	1.121E+02	1.28E+02	3.30E+00 G
BA-133	F -9.7821E-01					3.85E+03	
		356.00	-9.782E-01	?(	4.499E+00	1.38E+02	6.20E+01 G
		302.85	0.000E+00	+	2.419E+01	1.00E+03	1.83E+01 G
		383.84	-1.190E+01	+ P	3.895E+01	6.77E+01	8.94E+00 GA
		80.99	-6.866E-01	&	5.729E+00	3.30E+02	3.41E+01 GA
CS-134	I -2.7916E-01					7.54E+02	
		795.87	-6.604E-01	&(	3.477E+00	1.57E+02	8.55E+01 G
		604.71	0.000E+00	+	4.351E+00	1.00E+03	9.76E+01 G
		569.32	-5.414E+00	+	1.393E+01	7.75E+01	1.54E+01 G
		801.95	3.473E+00	&(	3.390E+01	2.89E+02	8.69E+00 G
		563.24	-1.087E-01	&	2.478E+01	1.00E+04	8.35E+00 G
CS-137	I 3.4194E+02					1.10E+04	
		661.66	3.419E+02	(P	1.865E+00	1.06E+00	8.52E+01 G
CE-139	F 7.7555E-01					1.38E+02	
		165.85	7.755E-01	&(	2.336E+00	9.09E+01	7.99E+01 G
Ba-140	I 4.5427E+00					1.28E+01	
		537.26	3.977E+00	?(P	8.132E+00	8.78E+01	2.44E+01 G
		162.66	6.761E+00	&(	3.275E+01	1.46E+02	6.22E+00 G
		304.85	0.000E+00	-	1.038E+02	1.00E+03	4.29E+00 G

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TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
La-140	I	-1.3227E+00					1.28E+01	
			1596.21	-1.323E+00	?(P	2.118E+00	3.75E+01	9.54E+01 G
			487.02	2.594E+00	+	8.582E+00	9.97E+01	4.55E+01 G
			328.76	-4.560E+00	+	1.954E+01	1.29E+02	2.03E+01 G
			815.77	-4.840E+00	+	1.547E+01	9.60E+01	2.33E+01 G
CE-141	I	-1.3804E+00					3.25E+01	
			145.44	-1.380E+00	?(	6.027E+00	1.32E+02	4.82E+01 G
CE-144	I	-5.2427E+00					2.85E+02	
			133.54	-5.243E+00	?(	2.613E+01	1.50E+02	1.11E+01 G
PM-144	C	-1.0662E+00					3.63E+02	
			696.54	-1.066E+00	*(P	2.510E+00	3.05E+02	9.90E+01 G
			618.06	0.000E+00	+	4.356E+00	1.00E+03	9.91E+01 G
EU-152	F	3.6390E+00					4.94E+03	
			121.78	2.080E+00	&(	6.119E+00	8.88E+01	2.86E+01 G
			344.29	0.000E+00	-	1.575E+01	1.00E+03	2.65E+01 G
			1112.07	-1.309E+01	&	3.375E+01	7.78E+01	1.36E+01 G
			778.92	2.952E+00	&(	1.604E+01	2.47E+02	1.29E+01 G
			964.11	-9.156E+00	+	2.908E+01	9.55E+01	1.46E+01 G
			244.69	1.069E+01	(	4.037E+01	1.14E+02	7.58E+00 G
			1408.00	6.144E-01	-	3.635E+00	2.48E+02	2.10E+01 GA
EU-154	I	7.3117E-01					3.14E+03	
			123.10	-1.164E+00	?(	4.247E+00	1.10E+02	4.08E+01 G
			1274.54	0.000E+00	+	5.437E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	1.281E+01	1.00E+03	2.02E+01 G
			873.23	6.726E+00	&(P	2.206E+01	9.81E+01	1.23E+01 G
			1004.77	9.390E-01	?(	2.371E+01	7.47E+02	1.80E+01 G
			996.33	-1.981E+00	+	3.726E+01	5.56E+02	1.06E+01 G
EU-155	I	-6.1845E-02					1.81E+03	
			105.31	-3.349E+00	(	1.769E+01	1.60E+02	2.12E+01 G
			86.54	2.208E+00	?(	1.218E+01	1.67E+02	3.07E+01 G
HF-181	F	-1.5507E+00					4.24E+01	
			482.00	-1.551E+00	(	5.158E+00	1.00E+02	8.05E+01 G
			133.02	-1.425E+00	+	6.738E+00	1.43E+02	4.33E+01 G
			345.83	-6.540E+00	+	2.790E+01	1.29E+02	1.51E+01 G
			136.30	0.000E+00	+	5.029E+01	1.00E+03	5.85E+00 G
Ta-182	F	-5.0383E-07					1.14E+02	
			1121.30	-5.038E-07	%(	1.359E+01	7.97E+08	3.49E+01 G
			1221.41	-1.888E+00	+	7.218E+00	1.82E+02	2.70E+01 G
			1189.05	4.968E-01	%	1.178E+01	1.11E+03	1.62E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 12
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Hg-203	F	9.3999E-01					4.66E+01	
			279.20	9.400E-01	(P	2.527E+00	8.11E+01	8.15E+01 G
TL-208	N	5.9789E-01					6.98E+02	
			583.02	3.225E-01	?(P	2.687E+00	3.67E+02	8.45E+01 G
			277.28	-6.223E+00	+	3.609E+01	1.74E+02	6.31E+00 G
			860.56	2.472E+00	(P	2.124E+01	3.91E+02	1.24E+01 G
PM-146	C	1.3126E-01					2.02E+03	
			453.88	1.313E-01	&(	4.147E+00	1.35E+03	6.50E+01 G
			747.16	-1.023E+00	+	5.903E+00	2.53E+02	3.40E+01 G
			735.72	-4.187E+00	+	9.927E+00	1.05E+02	2.25E+01 G
Y-88	F	8.1722E-01					1.07E+02	
			1836.06	2.542E-01	?(	1.001E+00	1.78E+02	9.92E+01 G
			898.04	1.413E+00	?(P	2.738E+00	8.92E+01	9.37E+01 G
Cd-113m		2.5210E+03					5.33E+03	
			263.70	2.521E+03	&(	3.693E+04	4.37E+02	6.00E-03 K
Cd-109	F	-1.8638E+01					4.53E+02	
			88.04	-1.864E+01	&(	1.001E+02	1.62E+02	3.79E+00 G
Cf-251	T	5.9870E-01					3.28E+05	
			176.60	5.987E-01	?(	9.170E+00	6.03E+02	1.70E+01 G
			227.00	1.600E+00	?	3.021E+01	7.78E+02	6.30E+00 GA
Cf-249	T	1.5167E+00					1.28E+05	
			387.95	1.517E+00	&(	4.630E+00	9.21E+01	6.60E+01 G
			333.44	-3.661E+00	&	2.613E+01	2.15E+02	1.55E+01 G
Sn-126		-1.7556E+01					3.65E+07	
			87.57	-1.888E+00	&	1.019E+01	1.63E+02	3.75E+01 GA
			64.28	-1.756E+01	&(	1.302E+02	2.25E+02	9.70E+00 G
			86.94	-7.851E+00	+	4.267E+01	1.64E+02	9.04E+00 GA
PB-210	N	9.6092E+03					8.14E+03	
			46.54	9.609E+03	(	1.536E+02	8.71E-01	4.25E+00 G
PB-212	N	6.7225E+00					6.98E+02	
			238.63	6.723E+00	(	3.198E+00	1.57E+01	4.33E+01 G
			300.03	1.967E+01	+	1.335E+02	2.04E+02	3.28E+00 GA
PB-214	N	9.3177E+00					5.84E+05	
			351.93	9.949E+00	@(P	4.025E+00	1.81E+01	3.76E+01 G
			295.09	8.088E+00	*(P	8.356E+00	4.59E+01	1.93E+01 G
			242.00	6.175E+00	- P	1.832E+01	8.92E+01	7.43E+00 GA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 13
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-207	C	3.9584E-01					1.18E+04	
			1063.66	6.080E-01	(P	3.601E+00	2.78E+02	7.45E+01 G
			569.70	2.341E-01	(	2.311E+00	2.92E+02	9.77E+01 G
BI-212	N	-1.4510E+01					6.98E+02	
			727.17	-1.451E+01	&(P	3.450E+01	6.92E+01	7.55E+00 G
			785.42	8.524E-01	% P	2.313E+02	7.97E+03	1.28E+00 GA
BI-214	N	3.2427E+00					5.84E+05	
			609.31	1.627E+00	?(P	8.885E+00	1.64E+02	4.61E+01 G
			1120.29	2.212E-01	} P	3.157E+01	1.56E+03	1.51E+01 G
			1764.49	8.079E+00	?(P	5.346E+00	2.82E+01	1.54E+01 G
BI-210M	T	-1.1584E+00					1.10E+09	
			265.83	-1.158E+00	?(P	4.455E+00	7.54E+01	5.00E+01 G
			304.90	0.000E+00	+	1.591E+01	1.00E+03	2.80E+01 G
AC-228	N	3.4655E+00					2.10E+03	
			911.07	3.466E+00	?(P	9.452E+00	1.25E+02	2.90E+01 G
			968.97	0.000E+00	-	2.523E+01	1.00E+03	1.75E+01 G
			338.32	0.000E+00	-	3.433E+01	1.00E+03	1.20E+01 G
			93.35	-1.215E+01	+	5.467E+01	1.36E+02	5.56E+00 XA
TH-227	N	2.0078E+00					7.95E+03	
			256.24	2.008E+00	?(	2.739E+01	5.62E+02	7.00E+00 G
			235.97	-6.895E+00	&	2.695E+01	1.18E+02	1.23E+01 G
			50.14	-3.536E+01	&	1.974E+02	1.69E+02	8.00E+00 G
TH-229	N	-1.1488E+01					2.68E+06	
			193.51	-1.149E+01	?(	4.207E+01	1.52E+02	4.40E+00 G
			210.85	-2.702E+01	&	6.406E+01	9.85E+01	2.99E+00 G
TH-234	N	-1.2811E+01					1.63E+12	
			92.59	-1.281E+01	(	5.411E+01	1.28E+02	5.58E+00 G
			63.29	-4.540E+01	+	3.375E+02	2.25E+02	3.81E+00 G
PA-231	N	1.8221E+00					1.20E+07	
			302.65	1.822E+00	%(	1.538E+02	2.54E+03	2.88E+00 G
			300.07	0.000E+00	-	1.791E+02	1.00E+03	2.46E+00 G
PA-234	N	5.6111E+00					1.63E+12	
			131.29	3.314E+00	(	5.356E+00	5.65E+01	1.80E+01 G
			946.02	-3.010E+00	-	2.343E+01	3.56E+02	1.34E+01 G
			569.47	0.000E+00	-	2.755E+01	1.00E+03	8.20E+00 G
			883.24	9.919E+00	&(	3.699E+01	1.12E+02	9.60E+00 G
			880.53	2.086E+01		5.674E+01	8.19E+01	6.00E+00 GA

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TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234M	N	-1.1080E+02					1.63E+12	
			1001.00	-1.108E+02	&(	4.565E+02	1.23E+02	8.37E-01 G
			766.41	-1.439E+02	&	8.350E+02	1.72E+02	2.94E-01 G
AM-241	T	1.2140E+03					1.58E+05	
			59.54	1.214E+03	(	1.296E+01	7.56E-01	3.59E+01 G
Np-237	F	5.1760E+00					2.14E+06	
			86.49	5.176E+00	?(	2.838E+01	1.66E+02	1.31E+01 G
Ir-192	F	4.9849E-01					7.40E+01	
			316.49	-6.218E-01	(	5.194E+00	2.51E+02	8.70E+01 G
			468.06	2.383E+00	&(	6.640E+00	8.41E+01	5.18E+01 G
			308.44	0.000E+00	&	1.414E+01	1.00E+03	3.18E+01 G
Cs-136	F	1.2413E+00					1.30E+01	
			818.50	8.296E-01	&(	3.655E+00	1.32E+02	1.00E+02 G
			1048.07	1.756E+00	?(	3.088E+00	5.38E+01	8.00E+01 G
			340.57	0.000E+00	-	8.832E+00	1.00E+03	4.69E+01 G
Np-239	T	9.8381E-01					2.36E+00	
			103.70	1.711E+00	?	1.548E+01	2.73E+02	2.40E+01 X
			106.13	9.838E-01	(	5.252E+00	1.60E+02	2.27E+01 G
			99.50	-7.617E-01	+	2.485E+01	9.83E+02	1.50E+01 X
Nd-147		7.5061E+00					1.11E+01	
			531.00	7.506E+00	&(	1.511E+01	8.65E+01	1.30E+01 G
			91.10	-2.467E+00	-	1.329E+01	1.63E+02	2.83E+01 G
TL-210	N	6.1626E-01					5.84E+05	
			799.60	2.685E-01	?(	2.970E+00	3.27E+02	9.90E+01 G
			296.00	1.052E+00	&(	5.445E+00	1.56E+02	7.90E+01 G
			1313.00	-1.079E+00	&	6.850E+00	2.92E+02	2.10E+01 GA
Kr-85	I	2.4170E+02					3.92E+03	
			513.98	2.417E+02	(	6.664E+02	8.31E+01	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.

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 15
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

+ - 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	31070.	-148.	-0.082	169.04	-3.536E+01
TH-234	63.29	37702.	-122.	-0.068	225.10	-4.540E+01
Sn-126	64.28	37580.	-122.	-0.068	224.52	-1.756E+01
BA-133	80.99	1283.	-20.	-0.011	330.35	-6.866E-01
Np-237	86.49	5088.	61.	0.034	165.52	5.176E+00
EU-155	86.54	5149.	61.	0.034	166.51	2.208E+00
Sn-126	86.94	5511.	-64.	-0.036	164.15	-7.851E+00
Sn-126	87.57	5447.	-64.	-0.036	163.08	-1.888E+00
Cd-109	88.04	5395.	-64.	-0.036	162.23	-1.864E+01
Nd-147	91.10	5459.	-64.	-0.036	162.74	-2.467E+00
TH-234	92.59	3551.	-66.	-0.037	127.52	-1.281E+01
AC-228	93.35	3617.	-63.	-0.035	135.78	-1.215E+01
Gd-153	97.50	4081.	-68.	-0.038	133.85	-2.395E+00
EU-155	105.31	5843.	-68.	-0.038	159.53	-3.349E+00
EU-152	121.78	1243.	57.	0.032	88.82	2.080E+00
CO-57	122.06	1267.	-61.	-0.034	83.51	-7.466E-01
EU-154	123.10	1215.	-45.	-0.025	109.92	-1.164E+00
HF-181	133.02	3360.	-58.	-0.032	142.69	-1.425E+00
CE-144	133.54	3306.	-54.	-0.030	150.35	-5.243E+00
CE-141	145.44	3098.	-60.	-0.033	131.78	-1.380E+00
Ba-140	162.66	1320.	36.	0.020	145.68	6.761E+00
CE-139	165.85	1126.	53.	0.029	90.89	7.755E-01
Cf-251	176.60	719.	8.	0.005	602.83	5.987E-01
U-235	185.72	777.	57.	0.032	92.17	1.336E+00
TH-229	193.51	904.	-39.	-0.022	151.79	-1.149E+01
U-235	205.33	872.	-59.	-0.033	98.97	-1.585E+01
TH-229	210.85	864.	-59.	-0.033	98.54	-2.702E+01

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 16
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Cf-251	227.00	772.	7.	0.004	778.06	1.600E+00		
TH-227	235.97	2263.	-57.	-0.032	117.95	-6.895E+00		
EU-152	244.69	1832.	54.	0.030	113.90	1.069E+01		
TH-227	256.24	664.	9.	0.005	561.56	2.008E+00		
Cd-113m	263.70	858.	10.	0.005	437.13	2.521E+03		
BI-210M	265.83	857.	-36.	-0.020	75.37	-1.158E+00		P
Hg-203	279.20	681.	46.	0.026	81.15	9.400E-01		P
TL-210	296.00	2809.	48.	0.027	156.04	1.052E+00		
Ir-192	316.49	2830.	-30.	-0.017	251.44	-6.218E-01		
CR-51	320.08	2864.	30.	0.016	256.88	5.404E+00		P
La-140	328.76	2058.	-50.	-0.028	129.16	-4.560E+00		
Cf-249	333.44	2108.	-30.	-0.017	214.68	-3.661E+00		
HF-181	345.83	2157.	-51.	-0.029	128.64	-6.540E+00		
BA-133	356.00	901.	-31.	-0.017	138.11	-9.782E-01		
BA-133	383.84	1268.	-52.	-0.029	67.74	-1.190E+01		P
Cf-249	387.95	957.	48.	0.027	92.07	1.517E+00		
SN-113	391.69	1172.	-24.	-0.013	200.35	-7.948E-01		
SB-125	427.88	971.	-17.	-0.009	265.50	-1.256E+00		
AG-108M	433.94	1074.	-7.	-0.004	476.00	-1.827E-01		P
SB-125	463.37	1049.	54.	0.030	85.40	1.225E+01		P
Ir-192	468.06	925.	52.	0.029	84.14	2.383E+00		
BE-7	477.60	1251.	-51.	-0.028	98.62	-1.176E+01		
HF-181	482.00	1302.	-51.	-0.029	100.31	-1.551E+00		
La-140	487.02	1132.	48.	0.027	99.75	2.594E+00		
RU-103	497.05	356.	11.	0.006	344.84	3.063E-01		P
RH-106	511.86	523.	79.	0.044	42.27	1.007E+01		
Kr-85	513.98	555.	41.	0.023	83.14	2.417E+02		
Nd-147	531.00	243.	37.	0.021	86.54	7.506E+00		
Ba-140	537.26	243.	37.	0.020	87.85	3.977E+00		P
CS-134	569.32	261.	-30.	-0.017	77.53	-5.414E+00		
BI-207	569.70	291.	8.	0.005	291.73	2.341E-01		
RU-103	610.30	916.	35.	0.020	121.77	1.784E+01		
AG-108M	614.28	952.	20.	0.011	219.02	6.473E-01		
RH-106	621.92	808.	34.	0.019	120.52	9.946E+00		P
SB-125	635.89	191.	7.	0.004	441.84	1.756E+00		
AG-110M	657.76	9786.	-34.	-0.019	417.51	-1.083E+00		
PM-144	696.54	260.	-33.	-0.018	304.60	-1.066E+00		P
SB-124	722.79	251.	-17.	-0.009	136.56	-5.058E+00		
ZR-95	724.20	212.	12.	0.006	178.77	8.683E-01		
BI-212	727.17	268.	-33.	-0.018	69.18	-1.451E+01		P
PM-146	735.72	191.	-28.	-0.016	105.25	-4.187E+00		
PM-146	747.16	149.	-10.	-0.006	252.79	-1.023E+00		
ZR-95	756.73	230.	-39.	-0.021	59.74	-2.402E+00		P
AG-110M	763.94	162.	11.	0.006	166.39	1.689E+00		
NB-95	765.79	201.	-16.	-0.009	127.78	-5.496E-01		
PA-234M	766.41	218.	-12.	-0.007	171.81	-1.439E+02		
EU-152	778.92	150.	11.	0.006	246.63	2.952E+00		
CS-134	795.87	306.	-16.	-0.009	156.62	-6.604E-01		

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 17
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
TL-210	799.60	296.	8.	0.004	326.73	2.685E-01		
CS-134	801.95	296.	8.	0.005	288.54	3.473E+00		
CO-58	810.78	400.	-37.	-0.020	78.85	-1.321E+00		
La-140	815.77	437.	-31.	-0.017	96.04	-4.840E+00		
Cs-136	818.50	448.	23.	0.013	131.80	8.296E-01		
MN-54	834.85	185.	-4.	-0.002	749.24	-1.465E-01		
Co-56	846.77	220.	-18.	-0.010	137.09	-6.731E-01		P
EU-154	873.23	217.	22.	0.012	98.13	6.726E+00		P
AG-110M	884.68	405.	-10.	-0.005	296.05	-5.093E-01		
Y-88	898.04	186.	34.	0.019	89.22	1.413E+00		P
AC-228	911.07	208.	26.	0.014	124.73	3.466E+00		P
AG-110M	937.49	245.	-18.	-0.010	192.62	-2.098E+00		
EU-152	964.11	470.	-33.	-0.018	95.47	-9.156E+00		
EU-154	996.33	384.	-5.	-0.003	556.06	-1.981E+00		
PA-234M	1001.00	356.	-22.	-0.012	123.15	-1.108E+02		
EU-154	1004.77	445.	4.	0.002	747.50	9.390E-01		
Co-56	1037.84	171.	9.	0.005	319.84	2.865E+00		
Cs-136	1048.07	133.	32.	0.018	53.78	1.756E+00		
RH-106	1050.36	210.	5.	0.003	397.00	1.457E+01		
BI-207	1063.66	155.	10.	0.006	277.75	6.080E-01		P
Ga-68	1077.40	213.	-26.	-0.015	127.57	-4.172E+01		
FE-59	1099.25	181.	-24.	-0.014	127.41	-1.954E+00		
EU-152	1112.07	441.	-39.	-0.022	77.82	-1.309E+01		
ZN-65	1115.55	403.	-39.	-0.022	74.48	-3.542E+00		
Ta-182	1221.41	62.	-10.	-0.006	181.87	-1.888E+00		
NA-22	1274.53	45.	-10.	-0.006	97.26	-5.278E-01		
FE-59	1291.60	51.	-21.	-0.012	282.59	-2.521E+00		P
TL-210	1313.00	28.	-4.	-0.002	292.05	-1.079E+00		
AG-110M	1384.30	17.	5.	0.003	198.49	1.123E+00		
EU-152	1408.00	6.	2.	0.001	248.05	6.144E-01		
La-140	1596.21	42.	-21.	-0.011	37.55	-1.323E+00		P
SB-124	1690.98	32.	-16.	-0.009	92.71	-2.106E+00		
Co-56	1771.35	34.	-3.	-0.002	296.34	-1.222E+00		
Y-88	1836.06	6.	4.	0.002	178.26	2.542E-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	-1.1756E+01	-1.1756E+01	9.862E+01%	3.84E+01
NA-22	#A	-5.2779E-01	-5.2779E-01	9.726E+01%	1.74E+00
K-40	A	4.3529E+00	4.3529E+00	9.447E+01%	1.07E+01
Sc-46	#A	-1.4064E+00	-1.4064E+00	8.357E+01%	3.90E+00
CR-51	#A	5.4036E+00	5.4036E+00	2.569E+02%	4.61E+01
MN-54	#A	-1.4651E-01	-1.4651E-01	7.492E+02%	2.42E+00

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:18:07 PMPage 18
TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

FE-59	#A	-1.9542E+00	-1.9543E+00	1.274E+02%	5.26E+00
Co-56	#A	-2.3490E-01	-2.3490E-01	1.371E+02%	2.66E+00
CO-57	#A	-7.4660E-01	-7.4660E-01	8.351E+01%	2.06E+00
CO-58	#A	-1.3206E+00	-1.3206E+00	7.885E+01%	3.45E+00
CO-60		1.3299E+02	1.3299E+02	1.467E+00%	1.02E+00
ZN-65	#A	-3.5418E+00	-3.5419E+00	7.448E+01%	8.73E+00
NB-94	#A	1.0671E+00	1.0671E+00	5.327E+01%	2.51E+00
ZR-95	#A	-2.4024E+00	-2.4024E+00	5.974E+01%	4.58E+00
NB-95	#A	-5.4964E-01	-5.4964E-01	1.278E+02%	2.36E+00
RU-103	#A	3.0630E-01	3.0630E-01	3.448E+02%	2.48E+00
RH-106	#A	1.0574E+01	1.0574E+01	1.205E+02%	3.99E+01
AG-108M	#A	2.3081E-01	2.3081E-01	2.190E+02%	3.87E+00
AG-110M	#A	2.3396E-01	2.3396E-01	1.311E+02%	5.08E+00
SN-113	#A	-7.9480E-01	-7.9480E-01	2.003E+02%	5.31E+00
SB-124	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.31E+00
SB-125	#A	2.1599E+00	2.1599E+00	8.540E+01%	1.11E+01
I-131	A	3.7463E-01	3.7465E-01	1.417E+02%	2.53E+00
Gd-153	#A	-2.3953E+00	-2.3953E+00	1.338E+02%	1.06E+01
Ga-68	#A	-4.1410E+01	-4.1721E+01	1.276E+02%	1.12E+02
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.44E+00
BA-133	#A	-9.7821E-01	-9.7821E-01	1.381E+02%	4.50E+00
CS-134	#A	-2.7916E-01	-2.7916E-01	1.566E+02%	3.48E+00
CS-137		3.4194E+02	3.4194E+02	1.062E+00%	1.87E+00
CE-139	#A	7.7554E-01	7.7555E-01	9.089E+01%	2.34E+00
Ba-140	#A	4.5426E+00	4.5427E+00	8.506E+01%	8.13E+00
La-140	#A	-1.3227E+00	-1.3227E+00	3.755E+01%	2.12E+00
CE-141	#A	-1.3804E+00	-1.3804E+00	1.318E+02%	6.03E+00
CE-144	#A	-5.2427E+00	-5.2427E+00	1.503E+02%	2.61E+01
PM-144	#A	-1.0662E+00	-1.0662E+00	3.046E+02%	2.51E+00
EU-152	#A	3.6390E+00	3.6390E+00	8.882E+01%	6.12E+00
EU-154	#A	7.3117E-01	7.3117E-01	9.813E+01%	4.25E+00
EU-155	#A	-6.1845E-02	-6.1845E-02	1.153E+02%	1.77E+01
HF-181	#A	-1.5506E+00	-1.5507E+00	1.003E+02%	5.16E+00
Ta-182	#A	-5.0383E-07	-5.0383E-07	7.968E+08%	1.36E+01
Hg-203	#A	9.3999E-01	9.3999E-01	8.115E+01%	2.53E+00
TL-208	A	5.9789E-01	5.9789E-01	2.680E+02%	2.69E+00
PM-146	#A	1.3126E-01	1.3126E-01	1.352E+03%	4.15E+00
Y-88	#A	8.1722E-01	8.1722E-01	8.922E+01%	1.00E+00
Cd-113m	#A	2.5210E+03	2.5210E+03	4.371E+02%	3.69E+04
Cd-109	#A	-1.8638E+01	-1.8638E+01	1.622E+02%	1.00E+02
Cf-251	#A	5.9870E-01	5.9870E-01	6.028E+02%	9.17E+00
Cf-249	#A	1.5167E+00	1.5167E+00	9.207E+01%	4.63E+00
Sn-126	#A	-1.7556E+01	-1.7556E+01	2.245E+02%	1.30E+02
PB-210		9.6092E+03	9.6092E+03	8.713E-01%	1.54E+02
PB-212		6.7225E+00	6.7225E+00	1.574E+01%	3.20E+00
PB-214		9.3177E+00	9.3177E+00	1.812E+01%	4.02E+00
BI-207	#A	3.9584E-01	3.9584E-01	2.014E+02%	3.60E+00
BI-212	#A	-1.4510E+01	-1.4510E+01	6.918E+01%	3.45E+01
U-235	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.74E+01

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TestAmerica Inc Spectrum name: 9_Gamma_20193492.An1

BI-214 #A	3.2427E+00	3.2427E+00	2.817E+01%	8.88E+00
BI-210M#A	-1.1584E+00	-1.1584E+00	7.537E+01%	4.46E+00
AC-228 #A	3.4655E+00	3.4655E+00	1.247E+02%	9.45E+00
TH-227 #A	2.0078E+00	2.0078E+00	5.616E+02%	2.74E+01
TH-229 #A	-1.1488E+01	-1.1488E+01	1.518E+02%	4.21E+01
TH-234 #A	-1.2811E+01	-1.2811E+01	1.275E+02%	5.41E+01
PA-231 #A	1.8221E+00	1.8221E+00	2.535E+03%	1.54E+02
PA-233 #A	0.0000E+00	0.0000E+00	7.071E+02%	1.26E+01
PA-234	5.6111E+00	5.6111E+00	5.654E+01%	5.36E+00
PA-234M#A	-1.1080E+02	-1.1080E+02	1.231E+02%	4.56E+02
AM-241	1.2140E+03	1.2140E+03	7.563E-01%	1.30E+01
Np-237 #A	5.1760E+00	5.1760E+00	1.655E+02%	2.84E+01
Ir-192 #A	4.9849E-01	4.9849E-01	8.414E+01%	5.19E+00
Cs-136 #A	1.2413E+00	1.2413E+00	5.378E+01%	3.66E+00
Np-239 #A	9.8366E-01	9.8381E-01	1.596E+02%	5.25E+00
Nd-147 #A	7.5059E+00	7.5061E+00	8.654E+01%	1.51E+01
TL-210 #A	6.1626E-01	6.1626E-01	1.560E+02%	2.97E+00
Kr-85 #A	2.4170E+02	2.4170E+02	8.314E+01%	6.66E+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) 1.132E+04 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 1.1319825E+04 Bq/Sample

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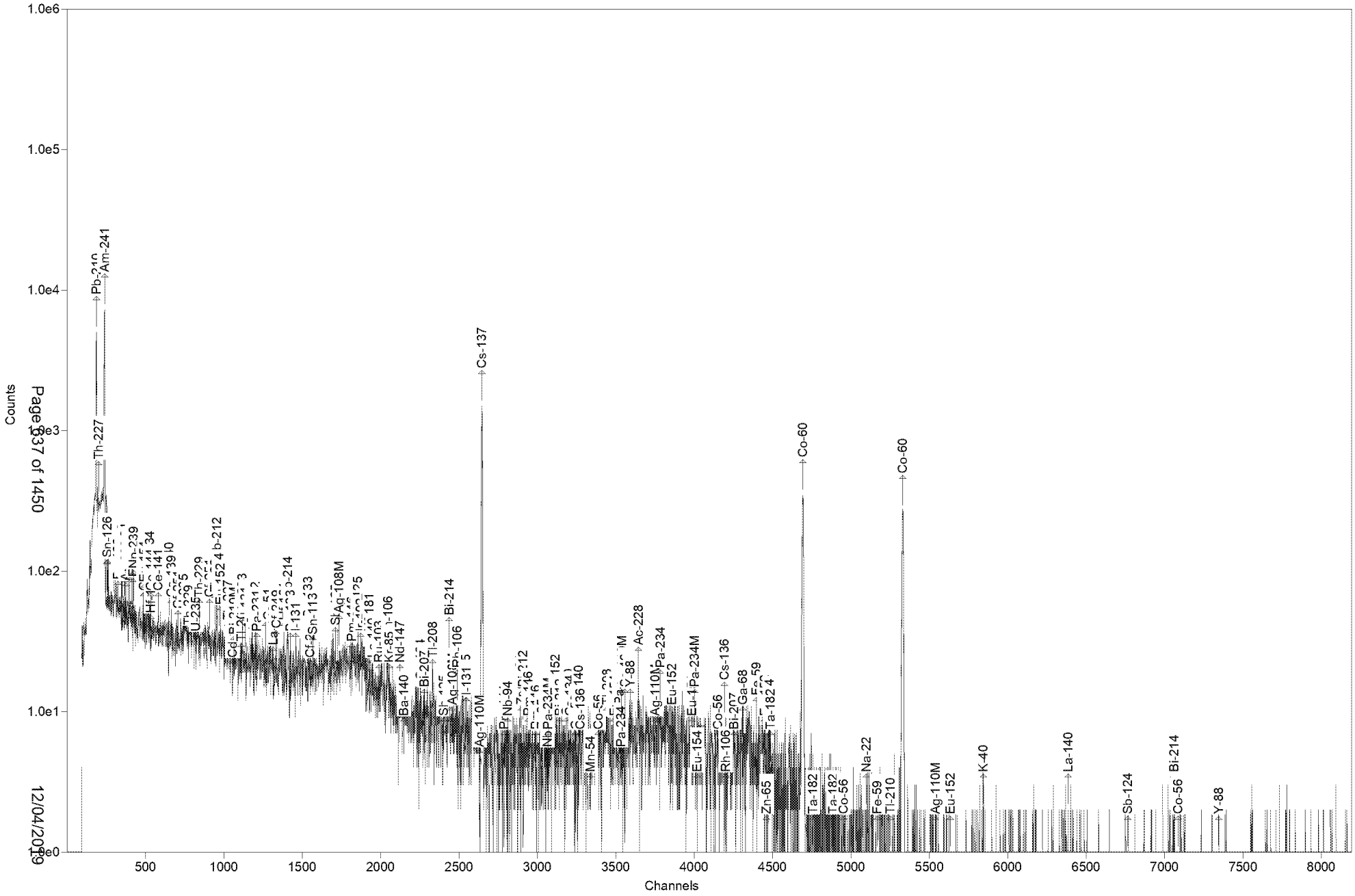
448571_Gamma_LCS 160-448571~2-A. 9_Gamma_20193492.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20193075

Sample Description: 448571_Gamma_160-36160-A-1-D
Detector: Detector # 5
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-1-D

Decay to Time: 11/26/2019 09:34 Live Time: 1800 sec
Acquisition Time: 11/26/2019 09:34:14 Real Time: 1805 sec
Analysis Time: 11/26/2019 10:04 Dead Time: 0.29 %
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_2019-11-10_1418.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	2.629E+00	110.2	2.898E+00	2.901E+00	1.001E+01
NA-22	5.826E-01	40.8	2.378E-01	2.396E-01	7.156E-01
K-40	7.721E+01	14.0	1.078E+01	1.148E+01	1.728E+01
Sc-46	3.867E-01	123.6	4.779E-01	4.783E-01	1.670E+00
CR-51	-3.930E+00	125.1	4.915E+00	4.920E+00	1.290E+01
MN-54	-1.587E-01	285.4	4.529E-01	4.530E-01	1.153E+00
FE-59	1.341E+00	34.4	4.609E-01	4.658E-01	1.118E+00
Co-56	2.296E-01	148.0	3.397E-01	3.399E-01	8.799E-01
CO-57	1.214E-01	125.7	1.526E-01	1.527E-01	5.276E-01
CO-58	-5.982E-01	91.3	5.460E-01	5.469E-01	1.855E+00
CO-60	7.501E-01	27.0	2.023E-01	2.058E-01	7.427E-01
ZN-65	0.000E+00	1.#INF	2.425E-01	2.425E-01	3.114E+00
NB-94	3.325E-01	28.0	9.304E-02	9.463E-02	1.329E+00
ZR-95	1.055E+00	50.2	5.301E-01	5.329E-01	1.427E+00
NB-95	4.528E-01	99.0	4.482E-01	4.488E-01	1.539E+00
RU-103	-2.993E-01	117.3	3.512E-01	3.516E-01	1.040E+00
RH-106	1.963E+00	127.1	2.495E+00	2.497E+00	6.643E+00
AG-108M	-1.396E-01	229.0	3.198E-01	3.199E-01	1.029E+00
AG-110M	5.100E-01	44.7	2.281E-01	2.296E-01	3.162E+00
SN-113	-1.130E-01	524.4	5.923E-01	5.924E-01	2.087E+00
SB-124	0.000E+00	1.#INF	1.291E-01	1.291E-01	2.498E+00
SB-125	-7.998E-02	108.3	8.664E-02	8.674E-02	3.597E+00
I-131	1.746E-01	177.8	3.104E-01	3.105E-01	8.723E-01
Gd-153	3.153E-02	98.3	3.099E-02	3.105E-02	2.467E+00
Ga-68	2.378E+01	35.4	8.409E+00	8.514E+00	2.191E+01
Tc-99m	-7.825E-02	331.3	2.592E-01	2.592E-01	8.956E-01
BA-133	-3.428E-02	118.5	4.063E-02	4.067E-02	2.430E+00
CS-134	3.669E-01	88.0	3.228E-01	3.234E-01	2.012E+00
CS-137	-2.505E-01	207.0	5.184E-01	5.186E-01	1.932E+00
CE-139	1.977E-01	115.7	2.288E-01	2.295E-01	7.816E-01
Ba-140	-1.198E+00	117.3	1.406E+00	1.408E+00	4.141E+00
La-140	-4.604E-01	282.4	1.300E+00	1.300E+00	1.707E+00
CE-141	2.802E-01	128.6	3.605E-01	3.608E-01	1.236E+00

CE-144	-9.855E-01	227.0	2.237E+00	2.237E+00	7.655E+00
PM-144	2.558E-01	146.8	3.754E-01	3.756E-01	9.698E-01
EU-152	1.495E+00	44.7	6.686E-01	6.732E-01	1.390E+00
EU-154	9.989E-01	78.1	7.804E-01	7.822E-01	1.673E+00
EU-155	1.560E-01	208.3	3.250E-01	3.251E-01	4.246E+00
HF-181	2.109E-01	161.5	3.405E-01	3.407E-01	1.621E+00
Ta-182	-1.495E+00	142.0	2.123E+00	2.124E+00	7.376E+00
Hg-203	1.675E-01	161.2	2.700E-01	2.702E-01	9.456E-01
TL-208	1.418E+00	21.1	2.991E-01	3.080E-01	4.392E-01
PM-146	3.788E-01	122.1	4.624E-01	4.628E-01	1.226E+00
Y-88	-1.660E-02	8644.8	1.435E+00	1.435E+00	9.809E-01
Cd-113m	1.446E+02	2504.0	3.620E+03	3.620E+03	1.307E+04
Cd-109	4.715E+00	178.1	8.396E+00	8.400E+00	2.842E+01
Cf-251	-8.056E-01	164.0	1.321E+00	1.323E+00	3.668E+00
Cf-249	-4.200E-01	137.6	5.780E-01	5.784E-01	1.986E+00
Sn-126	-2.147E+00	153.3	3.292E+00	3.294E+00	1.118E+01
PB-210	-5.401E+00	179.7	9.705E+00	9.710E+00	3.015E+01
PB-212	3.064E-01	265.9	8.149E-01	8.151E-01	2.794E+00
PB-214	3.910E+00	18.8	7.369E-01	7.644E-01	1.435E+00
BI-207	7.468E-01	40.8	3.045E-01	3.068E-01	8.245E-01
BI-212	8.024E-01	685.6	5.501E+00	5.501E+00	2.011E+01
U-235	-5.976E-01	352.5	2.107E+00	2.107E+00	7.459E+00
BI-214	5.266E+00	18.8	9.910E-01	1.028E+00	1.852E+00
BI-210M	-7.323E-01	106.2	7.779E-01	7.791E-01	2.017E+00
AC-228	2.957E+00	55.0	1.626E+00	1.633E+00	4.439E+00
TH-227	-3.630E+00	128.1	4.649E+00	4.654E+00	1.220E+01
TH-229	-5.569E+00	100.0	5.567E+00	5.584E+00	1.582E+01
TH-234	8.398E+00	45.8	3.843E+00	3.871E+00	1.053E+01
PA-231	9.696E+00	157.4	1.526E+01	1.527E+01	5.195E+01
PA-233	-1.006E+00	101.2	1.018E+00	1.020E+00	3.442E+00
PA-234	1.007E+00	166.0	1.671E+00	1.672E+00	4.240E+00
PA-234M	-1.283E+02	57.7	7.400E+01	7.428E+01	3.794E+02
AM-241	-3.833E-01	220.1	8.438E-01	8.441E-01	2.586E+00
Np-237	1.584E+00	165.6	2.623E+00	2.625E+00	8.855E+00
Ir-192	2.121E-01	107.4	2.277E-01	2.281E-01	1.188E+00
Cs-136	3.813E-01	88.2	3.361E-01	3.368E-01	1.879E+00
Np-239	-7.948E-01	152.9	1.215E+00	1.216E+00	4.114E+00
Nd-147	-2.150E+00	165.0	3.547E+00	3.549E+00	9.151E+00
TL-210	1.421E-01	177.4	2.520E-01	2.521E-01	1.755E+00
Kr-85	1.282E+02	108.2	1.388E+02	1.390E+02	4.696E+02
Total	4.304E+02				

Analyst: Caleb Quinn

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     ORTEC g v - i (3263) Env32  G800W064  11/26/2019 10:04:39 AMPage  1
TestAmerica Inc                 Spectrum name: 5_Gamma_20193075.An1

Sample description
     448571_Gamma_160-36160-A-1-D


Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20193075.An1

Acquisition information
       Start time:                 11/26/2019 9:34:14 AM
       Live time:               1800
       Real time:               1805
       Dead time:                  0.29 %
       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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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 2
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

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	11/26/2019 9:34:00 AM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-11-10_1418.PBC 11/10/2019 2:18:51 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0789

***** 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
46.39	-7.	179.70	0.78	1.788E-02	46.54	4.250	PBC<MDA	PB210
63.22	16.	78.63	0.91	2.712E-02	63.29	3.810	PBC<MDA	TH234
77.07	57.	25.97	0.93	3.218E-02				
86.49	13.	165.57	0.82	3.435E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.759E-01	EU155
86.54	9.	246.26	0.82	3.436E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	4.652E-01	EU155
					86.94	9.040	1.577E+00	Sn126
88.04	11.	178.07	0.83	3.462E-02	88.04	3.790	PBC<MDA	Cd109
91.10	11.	182.37	0.83	3.508E-02	91.10	28.300	PBC<MDA	Nd147
92.77	29.	46.83	0.79	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.35	10.	191.86	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
99.50	11.	115.78	0.84	3.592E-02	99.50	15.000	PBC<MDA	Np239
103.20	10.	120.75	0.84	3.612E-02	103.20	21.800	PBC<MDA	Gd153
103.70	3.	447.85	0.84	3.614E-02	103.70	24.000	PBC<MDA	Np239
121.78	8.	94.39	0.86	3.584E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.440E-01	CO57
122.06	7.	125.71	0.86	3.582E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.214E-01	CO57
131.29	4.	380.19	0.87	3.509E-02	131.29	18.000	PBC<MDA	PA234
145.44	8.	128.64	0.88	3.351E-02	145.44	48.200	PBC<MDA	CE141
165.85	9.	115.69	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 3
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.72	20.	59.84	0.93	2.854E-02	185.72	54.000	PBC<MDA	U235
238.43	61.	20.01	0.85	2.321E-02	238.63	43.300	3.116E+00	PB212
241.86	24.	32.74	0.98	2.293E-02	242.00	7.430	7.735E+00	PB214
244.69	12.	142.98	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
275.20	5.	151.00	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
279.20	5.	161.25	1.02	2.036E-02	279.20	81.460	PBC<MDA	Hg203
284.30	5.	177.78	1.02	2.006E-02	284.30	6.140	PBC<MDA	I131
295.12	10.	158.44	1.03	1.945E-02	295.09	19.300	PBC<MDA	PB214
296.00	9.	177.38	1.03	1.940E-02	296.00	79.000	PBC<MDA	TL210
302.65	10.	157.36	1.04	1.904E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	1.524E+00	BA133
302.85	9.	178.75	1.04	1.903E-02	302.65	2.880	8.874E+00	PA231
					302.85	18.330	1.395E+00	BA133
308.44	3.	272.84	1.05	1.875E-02	308.44	31.750	PBC<MDA	Ir192
338.34	22.	24.83	0.69	1.736E-02	338.32	12.010	PBC<MDA	AC228
340.57	6.	166.14	1.08	1.727E-02	340.57	46.900	PBC<MDA	Cs136
345.83	7.	161.48	1.08	1.705E-02	345.83	15.070	PBC<MDA	HF181
351.82	44.	18.84	0.81	1.680E-02	351.93	37.600	3.910E+00	PB214
383.84	7.	118.60	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
453.88	6.	122.06	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
468.06	8.	107.36	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
477.60	6.	110.25	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
511.86	26.	46.60	2.48	1.230E-02	511.86	20.000	PBC<MDA	RH106
513.98	12.	108.23	1.24	1.226E-02	513.98	0.430	PBC<MDA	Kr85
569.47	4.	165.99	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.509E+00	PA234
					569.70	97.740	2.106E-01	BI207
582.91	23.	21.09	1.00	1.103E-02	583.02	84.500	1.363E+00	TL208
600.50	4.	309.32	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
609.21	46.	18.82	1.19	1.063E-02	609.31	46.090	5.266E+00	BI214
621.92	4.	127.11	1.33	1.045E-02	621.92	9.930	PBC<MDA	RH106
635.89	2.	214.35	1.34	1.026E-02	635.89	11.310	PBC<MDA	SB125
657.76	8.	85.50	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
661.66	-4.	206.95	1.37	9.924E-03	661.66	85.210	PBC<MDA	CS137
696.54	4.	146.76	1.40	9.507E-03	696.54	99.000	PBC<MDA	PM144
724.20	6.	119.71	1.42	9.202E-03	724.20	44.150	PBC<MDA	ZR95
727.17	1.	685.57	1.42	9.170E-03	727.17	7.550	PBC<MDA	BI212
756.73	11.	50.24	1.45	8.869E-03	756.73	54.460	PBC<MDA	ZR95
765.79	7.	99.00	1.45	8.781E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
766.41	4.	142.56	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	5.	44.72	1.46	8.657E-03	778.92	12.940	PBC<MDA	EU152
801.95	5.	87.99	1.48	8.448E-03	801.95	8.690	PBC<MDA	CS134
818.50	7.	111.09	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
846.77	3.	147.99	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
860.00	8.	93.64	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
871.10	13.	27.98	1.54	7.882E-03	871.10	99.890	9.137E-01	NB94

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 4
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
889.28	5.	123.57	1.55	7.747E-03	889.28	99.984	PBC<MDA	Sc46
911.07	14.	54.99	1.57	7.591E-03	911.07	29.000	PBC<MDA	AC228
964.11	1.	754.98	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
1004.77	10.	113.16	1.64	6.992E-03	1004.77	18.010	PBC<MDA	EU154
1048.07	2.	173.21	1.67	6.749E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	7.	40.78	1.68	6.666E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	8.	35.36	1.69	6.594E-03	1077.40	3.300	2.378E+01	Ga68
1099.25	9.	34.37	1.71	6.484E-03	1099.25	56.500	1.341E+00	FE59
1120.43	22.	21.81	1.72	6.381E-03	1120.29	15.100	1.251E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1173.24	11.	30.15	1.76	6.138E-03	1173.24	99.900	9.966E-01	CO60
1221.41	1.	563.47	1.79	5.934E-03	1221.41	27.000	PBC<MDA	Ta182
1274.53	6.	40.82	1.83	5.725E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.655E+00	EU154
1313.00	6.	40.82	1.85	5.583E-03	1313.00	21.000	PBC<MDA	TL210
1332.50	5.	44.72	1.87	5.514E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	5.	44.72	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	1.	796.87	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1460.29	84.	10.91	0.71	5.105E-03	1460.83	10.670	8.163E+01	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	
307.90	77.07	53.	57.	1.781E+03	25.97	0.930	-	s
1353.68	338.34	2.	22.	1.258E+03	24.53	0.692	-	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

********** 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	68.	-7.	-0.004	179.70	0.783s
TH-227	200.11	50.14	63.	-13.	-0.007	110.15	0.787s
AM-241	237.72	59.54	72.	-6.	-0.003	220.14	0.797
TH-234	252.48	63.22	53.	16.	0.009	78.63	0.909s
Sn-126	256.71	64.28	120.	-10.	-0.006	153.32	0.802s
BA-133	323.61	80.99	73.	-2.	-0.001	656.37	0.819s
Np-237	345.63	86.49	219.	13.	0.007	165.57	0.825s

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 5
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-155	345.84	86.54	232.	9.	0.005	246.26	0.825s
Sn-126	347.43	86.94	241.	0.	0.000	1000.00	0.825s
Sn-126	349.95	87.57	241.	0.	0.000	1000.00	0.826s
Cd-109	351.83	88.04	191.	11.	0.006	178.07	0.826s
Nd-147	364.08	91.10	202.	11.	0.006	182.37	0.829s
TH-234	370.76	92.77	55.	29.	0.016	46.83	0.794s
AC-228	373.09	93.35	195.	10.	0.006	191.86	0.832s
Gd-153	389.70	97.50	93.	-9.	-0.005	155.16	0.836s
Np-239	397.71	99.50	74.	11.	0.006	115.78	0.838s
Gd-153	412.52	103.20	70.	10.	0.006	120.75	0.842
Np-239	414.52	103.70	80.	3.	0.002	447.85	0.842s
EU-155	420.98	105.31	144.	-4.	-0.002	336.06	0.844s
Np-239	424.25	106.13	156.	-12.	-0.007	152.89	0.845s
EU-152	486.90	121.78	24.	8.	0.004	94.39	0.861s
CO-57	488.03	122.06	32.	7.	0.004	125.71	0.861s
EU-154	492.18	123.10	78.	-13.	-0.007	107.75	0.862s
PA-234	524.99	131.29	95.	4.	0.002	380.19	0.871s
HF-181	531.91	133.02	113.	-12.	-0.007	127.12	0.872s
CE-144	533.97	133.54	118.	-7.	-0.004	226.98	0.873
HF-181	545.02	136.30	125.	0.	0.000	1000.00	0.876
CO-57	545.72	136.47	125.	0.	0.000	1000.00	0.876s
Tc-99m	561.88	140.51	93.	-4.	-0.002	331.25	0.880s
U-235	574.99	143.79	101.	-4.	-0.002	352.48	0.883s
CE-141	581.61	145.44	51.	8.	0.005	128.64	0.885s
Ba-140	650.54	162.66	66.	-6.	-0.003	195.79	0.902s
CE-139	663.32	165.85	49.	9.	0.005	115.69	0.905
Cf-251	706.34	176.60	43.	-7.	-0.004	163.95	0.916s
U-235	742.85	185.72	44.	20.	0.011	59.84	0.925s
TH-229	774.03	193.51	47.	-12.	-0.007	99.96	0.933s
U-235	821.35	205.33	37.	-11.	-0.006	111.26	0.945
TH-229	843.44	210.85	51.	-10.	-0.005	127.90	0.950s
Cf-251	908.08	227.00	30.	-4.	-0.002	248.75	0.966s
TH-227	943.98	235.97	180.	-10.	-0.006	189.12	0.975s
PB-212	954.64	238.63	105.	6.	0.003	265.93	0.978
PB-214	968.10	242.00	18.	24.	0.013	32.74	0.981D
EU-152	978.89	244.69	138.	12.	0.007	142.98	0.984s
TH-227	1025.11	256.24	44.	-10.	-0.006	128.06	0.995s
BI-210M	1063.50	265.83	59.	-14.	-0.008	106.23	1.005s
TL-208	1109.33	277.28	26.	5.	0.003	151.00	1.016s
Hg-203	1117.00	279.20	30.	5.	0.003	161.25	1.017
I-131	1137.41	284.30	18.	5.	0.003	177.78	1.022s
PB-214	1180.60	295.09	109.	10.	0.005	158.44	1.033
TL-210	1184.24	296.00	118.	9.	0.005	177.38	1.034s
PA-231	1210.86	302.65	109.	10.	0.005	157.36	1.040s
BA-133	1211.66	302.85	118.	9.	0.005	178.75	1.040s
Ir-192	1234.03	308.44	32.	3.	0.002	272.84	1.046s
PA-233	1248.32	312.01	69.	-12.	-0.007	101.23	1.049
Ir-192	1266.25	316.49	46.	-2.	-0.001	386.78	1.053s

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 6
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CR-51	1280.63	320.08	71.	-13.	-0.007	125.08	1.057s
La-140	1315.35	328.76	26.	-3.	-0.001	360.66	1.065s
Cf-249	1334.08	333.44	22.	-4.	-0.002	225.00	1.070s
AC-228	1353.61	338.32	48.	6.	0.004	160.76	1.074s
Cs-136	1362.62	340.57	55.	6.	0.004	166.14	1.077s
EU-152	1377.49	344.29	83.	-9.	-0.005	143.70	1.080s
HF-181	1383.66	345.83	52.	7.	0.004	161.48	1.082s
PB-214	1407.66	351.82	9.	44.	0.025	18.84	0.814s
BA-133	1424.36	356.00	83.	-8.	-0.005	155.68	1.091s
BA-133	1535.78	383.84	28.	7.	0.004	118.60	1.117s
Cf-249	1552.22	387.95	53.	-8.	-0.004	137.62	1.121s
SN-113	1567.19	391.69	54.	-2.	-0.001	524.40	1.125s
SB-125	1711.99	427.88	28.	-10.	-0.006	108.32	1.158s
AG-108M	1736.25	433.94	20.	-3.	-0.002	229.04	1.164s
PM-146	1816.05	453.88	13.	6.	0.003	122.06	1.182s
SB-125	1854.01	463.37	43.	-7.	-0.004	100.96	1.191
Ir-192	1872.79	468.06	36.	8.	0.005	107.36	1.195s
BE-7	1910.94	477.59	22.	6.	0.004	110.25	1.204s
La-140	1948.65	487.02	20.	-5.	-0.003	135.52	1.212s
RU-103	1988.80	497.05	16.	-6.	-0.003	117.33	1.221s
RH-106	2048.06	511.86	60.	26.	0.014	46.60	2.485s
Kr-85	2056.53	513.98	81.	12.	0.007	108.23	1.237s
Nd-147	2124.62	531.00	24.	-6.	-0.003	164.99	1.252s
Ba-140	2149.67	537.26	16.	-6.	-0.003	117.35	1.258s
CS-134	2253.60	563.24	20.	-10.	-0.006	93.48	1.280s
CS-134	2277.94	569.32	24.	-1.	-0.001	700.00	1.286
PA-234	2278.54	569.47	22.	4.	0.002	165.99	1.286
TL-208	2332.30	582.91	0.	23.	0.013	21.09	1.000
SB-125	2402.69	600.50	88.	4.	0.002	309.32	1.313s
SB-124	2411.61	602.73	92.	0.	0.000	1000.00	1.315s
CS-134	2419.53	604.71	92.	0.	0.000	1000.00	1.317s
BI-214	2437.53	609.21	9.	46.	0.026	18.82	1.189
RU-103	2441.89	610.30	92.	0.	0.000	1000.00	1.322s
AG-108M	2457.82	614.28	92.	0.	0.000	1000.00	1.325s
RH-106	2488.37	621.92	4.	4.	0.002	127.11	1.332s
SB-125	2544.26	635.89	10.	2.	0.001	214.35	1.344
I-131	2548.61	636.97	33.	-11.	-0.006	77.18	1.345s
AG-110M	2631.76	657.76	20.	8.	0.005	85.50	1.362s
CS-137	2647.36	661.66	33.	-4.	-0.002	206.95	1.366s
PM-144	2786.90	696.54	9.	4.	0.002	146.76	1.395s
NB-94	2811.25	702.63	17.	-4.	-0.002	201.91	1.400s
SB-124	2891.88	722.79	29.	-5.	-0.003	168.73	1.417s
AG-108M	2892.48	722.94	33.	0.	0.000	1000.00	1.417s
EU-154	2894.17	723.36	33.	0.	0.000	1000.00	1.418
ZR-95	2897.53	724.20	24.	6.	0.003	119.71	1.418
BI-212	2909.41	727.17	23.	1.	0.001	685.57	1.421s
PM-146	2943.61	735.72	13.	-2.	-0.001	352.60	1.428s
ZR-95	3027.65	756.73	4.	11.	0.006	50.24	1.445s

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 7
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	3056.50	763.94	21.	-10.	-0.006	71.99	1.451s
NB-95	3063.89	765.79	21.	7.	0.004	99.00	1.453s
PA-234M	3066.38	766.41	15.	4.	0.002	142.56	1.453s
EU-152	3116.41	778.92	0.	5.	0.003	44.72	1.463s
BI-212	3142.41	785.42	14.	0.	0.000	1000.00	1.468s
TL-210	3199.12	799.60	26.	0.	0.000	1000.00	1.480s
CS-134	3208.53	801.95	7.	5.	0.003	87.99	1.482s
CO-58	3243.82	810.78	29.	-9.	-0.005	91.27	1.489s
La-140	3263.80	815.77	38.	-1.	-0.001	848.40	1.493s
Cs-136	3274.72	818.50	30.	7.	0.004	111.09	1.495s
MN-54	3340.10	834.85	9.	-2.	-0.001	285.36	1.508s
Co-56	3387.78	846.77	5.	3.	0.002	147.99	1.518s
TL-208	3442.95	860.56	9.	8.	0.004	93.64	1.529s
NB-94	3485.08	871.10	0.	13.	0.007	27.98	1.537s
EU-154	3493.61	873.23	20.	-6.	-0.003	67.31	1.539s
PA-234	3522.80	880.53	31.	-9.	-0.005	93.62	1.544s
PA-234	3533.64	883.24	40.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	40.	0.	0.000	1000.00	1.547s
Sc-46	3557.79	889.28	20.	5.	0.003	123.57	1.551s
Y-88	3592.83	898.04	9.	-2.	-0.001	285.36	1.558s
AC-228	3644.94	911.07	10.	14.	0.008	54.99	1.568s
AG-110M	3750.60	937.49	0.	0.	0.000	1000.00	1.589s
EU-152	3857.05	964.11	12.	1.	0.000	754.98	1.609s
AC-228	3876.48	968.97	17.	-1.	-0.001	710.23	1.612s
EU-154	3985.88	996.33	51.	-13.	-0.007	84.27	1.633s
PA-234M	4004.55	1001.00	64.	-14.	-0.008	57.70	1.636s
EU-154	4019.65	1004.77	57.	10.	0.005	113.16	1.639s
Co-56	4151.87	1037.84	15.	-3.	-0.002	289.64	1.664s
Cs-136	4192.77	1048.07	5.	2.	0.001	173.21	1.671s
RH-106	4201.93	1050.36	15.	-1.	-0.001	556.78	1.673s
BI-207	4255.11	1063.66	0.	7.	0.004	40.78	1.682s
Ga-68	4310.04	1077.40	0.	8.	0.004	35.36	1.692s
FE-59	4397.41	1099.25	0.	9.	0.005	34.37	1.708s
EU-152	4448.68	1112.07	11.	0.	0.000	1000.00	1.717s
ZN-65	4462.56	1115.55	11.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	0.	22.	0.012	21.81	1.723s
Sc-46	4482.57	1120.55	22.	0.	0.000	1000.00	1.723s
Ta-182	4485.56	1121.30	33.	-6.	-0.003	141.98	1.724s
CO-60	4693.21	1173.24	0.	11.	0.006	30.15	1.760s
Ta-182	4756.42	1189.05	15.	-8.	-0.004	112.15	1.771s
Ta-182	4885.79	1221.41	11.	1.	0.001	563.47	1.793s
Co-56	4953.23	1238.28	16.	-5.	-0.003	88.68	1.804s
NA-22	5098.13	1274.53	0.	6.	0.003	40.82	1.828s
EU-154	5098.17	1274.54	6.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	11.	-4.	-0.002	123.08	1.840s
TL-210	5251.91	1313.00	0.	6.	0.003	40.82	1.854s
CO-60	5329.85	1332.50	0.	5.	0.003	44.72	1.866s
AG-110M	5536.88	1384.30	0.	5.	0.003	44.72	1.899s

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 8
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	5631.62	1408.00	5.	1.	0.000	796.87	1.914s
K-40	5842.75	1460.83	9.	76.	0.042	13.95	1.946s
La-140	6383.73	1596.21	6.	-4.	-0.002	282.38	2.024s
SB-124	6762.39	1690.98	6.	-5.	-0.003	128.27	2.076s
BI-214	7056.06	1764.49	12.	-5.	-0.003	225.08	2.114s
Co-56	7083.46	1771.35	13.	-1.	0.000	784.22	2.117s

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	MDA Value Bq/Sample		COMMENTS
BE-7	C	2.6286E+00				5.31E+01		
			477.60	2.629E+00	?(P	1.001E+01	1.10E+02	1.05E+01 G
NA-22	C	5.8261E-01				9.50E+02		
			1274.53	5.826E-01	?(	7.156E-01	4.08E+01	9.99E+01 G
K-40	N	7.7214E+01				4.66E+11		
			1460.83	7.721E+01	?(P	1.728E+01	1.40E+01	1.07E+01 G
Sc-46	F	3.8674E-01				8.38E+01		
			889.28	3.867E-01	?(	1.670E+00	1.24E+02	1.00E+02 G
			1120.55	0.000E+00	-	2.140E+00	1.00E+03	1.00E+02 G
CR-51	F	-3.9296E+00				2.77E+01		
			320.08	-3.930E+00	?(P	1.290E+01	1.25E+02	9.94E+00 G
MN-54	C	-1.5873E-01				3.12E+02		
			834.85	-1.587E-01	?(	1.153E+00	2.85E+02	1.00E+02 G
FE-59	F	1.3412E+00				4.45E+01		
			1099.25	1.341E+00	?(P	1.118E+00	3.44E+01	5.65E+01 G
			1291.60	-9.097E-01	- P	4.127E+00	1.23E+02	4.32E+01 G
Co-56	C	2.2957E-01				7.73E+01		
			846.77	2.296E-01	?(	8.799E-01	1.48E+02	9.99E+01 G
			1238.28	-7.836E-01	+ P	3.099E+00	8.87E+01	6.61E+01 G
			1037.84	-1.733E+00	+	1.199E+01	2.90E+02	1.41E+01 G
			1771.35	-5.516E-01	+	1.632E+01	7.84E+02	1.55E+01 A
CO-57	C	1.2139E-01				2.72E+02		
			122.06	1.214E-01	?(	5.276E-01	1.26E+02	8.56E+01 G
			136.47	0.000E+00	-	8.238E+00	1.00E+03	1.07E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 9
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-58	C	-5.9825E-01					7.09E+01	
			810.78	-5.982E-01	?(	1.855E+00	9.13E+01	9.95E+01 G
CO-60	F	7.5012E-01					1.93E+03	
			1332.50	5.038E-01	?(	7.427E-01	4.47E+01	1.00E+02 G
			1173.24	9.966E-01	*(	6.677E-01	3.02E+01	9.99E+01 G
NB-94	I	3.3246E-01					7.41E+06	
			702.63	-2.606E-01	?(	1.329E+00	2.02E+02	9.79E+01 G
			871.10	9.137E-01	?(P	5.200E-01	2.80E+01	9.99E+01 G
ZR-95	I	1.0551E+00					6.40E+01	
			756.73	1.227E+00	&(	1.427E+00	5.02E+01	5.45E+01 G
			724.20	8.433E-01	?(	3.503E+00	1.20E+02	4.42E+01 G
NB-95	I	4.5276E-01					6.40E+01	
			765.79	4.528E-01	?(	1.539E+00	9.90E+01	9.98E+01 G
RU-103	I	-2.9934E-01					3.93E+01	
			497.05	-2.993E-01	?(P	1.040E+00	1.17E+02	9.09E+01 G
			610.30	0.000E+00	+	4.314E+01	1.00E+03	5.75E+00 GA
RH-106	I	1.9627E+00					3.74E+02	
			621.92	1.963E+00	?(	6.643E+00	1.27E+02	9.93E+00 G
			1050.36	-5.287E+00	+	1.097E+02	5.57E+02	1.56E+00 G
			511.86	5.855E+00	?	8.765E+00	4.66E+01	2.00E+01 GA
AG-108M	C	-1.3965E-01					1.53E+05	
			433.94	-1.396E-01	&(P	1.029E+00	2.29E+02	9.05E+01 G
			722.94	0.000E+00	&	1.965E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	+	2.776E+00	1.00E+03	8.98E+01 G
AG-110M	F	5.1000E-01					2.50E+02	
			884.68	0.000E+00	?(	3.162E+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	0.000E+00	-	1.608E+00	1.00E+03	3.44E+01 G
			1384.30	2.142E+00	?(	3.157E+00	4.47E+01	2.43E+01 G
			763.94	-2.859E+00	+	6.867E+00	7.20E+01	2.23E+01 G
SN-113	F	-1.1295E-01					1.15E+02	
			391.69	-1.130E-01	?(	2.087E+00	5.24E+02	6.40E+01 G
SB-125	I	-7.9984E-02					1.01E+03	
			427.88	-1.314E+00	?(	3.597E+00	1.08E+02	2.96E+01 G
			600.50	1.252E+00	?(	1.339E+01	3.09E+02	1.79E+01 G
			635.89	1.046E+00	?(P	8.287E+00	2.14E+02	1.13E+01 G
			463.37	-2.917E+00	+ P	1.326E+01	1.01E+02	1.05E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 10
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
I-131	I	1.7457E-01					8.02E+00	
			364.48	2.949E-02	&(P	8.723E-01	1.03E+03	8.17E+01 G
			284.30	2.105E+00	&(	1.022E+01	1.78E+02	6.14E+00 G
			636.97	-8.662E+00	+	2.240E+01	7.72E+01	7.17E+00 G
Gd-153	F	3.1527E-02					2.42E+02	
			97.50	-4.659E-01	?(	2.467E+00	1.55E+02	3.00E+01 G
			103.20	7.161E-01	?(	2.942E+00	1.21E+02	2.18E+01 G
Ga-68	C	2.3783E+01					4.71E-02	
			1077.40	2.378E+01	?(	2.191E+01	3.54E+01	3.30E+00 G
Tc-99m	I	-7.8245E-02					2.51E-01	
			140.51	-7.825E-02	?(	8.956E-01	3.31E+02	8.93E+01 G
BA-133	F	-3.4278E-02					3.85E+03	
			356.00	-4.565E-01	?(	2.430E+00	1.56E+02	6.20E+01 G
			302.85	1.395E+00	?(	8.500E+00	1.79E+02	1.83E+01 G
			383.84	2.676E+00	&	1.097E+01	1.19E+02	8.94E+00 GA
			80.99	-1.146E-01	&	2.094E+00	6.56E+02	3.41E+01 GA
CS-134	I	3.6687E-01					7.54E+02	
			795.87	2.184E-02	%(P	2.012E+00	2.52E+03	8.55E+01 G
			604.71	0.000E+00	-	2.521E+00	1.00E+03	9.76E+01 G
			569.32	-3.210E-01	&	8.198E+00	7.00E+02	1.54E+01 G
			801.95	3.763E+00	?(P	1.139E+01	8.80E+01	8.69E+00 G
			563.24	-5.834E+00	+	1.380E+01	9.35E+01	8.35E+00 G
CS-137	I	-2.5050E-01					1.10E+04	
			661.66	-2.505E-01	(P	1.932E+00	2.07E+02	8.52E+01 G
CE-139	F	1.9772E-01					1.38E+02	
			165.85	1.977E-01	?(	7.816E-01	1.16E+02	7.99E+01 G
Ba-140	I	-1.1983E+00					1.28E+01	
			537.26	-1.198E+00	?(P	4.141E+00	1.17E+02	2.44E+01 G
			162.66	-1.722E+00	&	1.164E+01	1.96E+02	6.22E+00 G
			304.85	-1.305E-06	%	3.778E+01	8.36E+08	4.29E+00 G
La-140	I	-4.6038E-01					1.28E+01	
			1596.21	-4.604E-01	?(P	1.707E+00	2.82E+02	9.54E+01 G
			487.02	-5.064E-01	+ P	2.259E+00	1.36E+02	4.55E+01 G
			328.76	-4.105E-01	+	4.051E+00	3.61E+02	2.03E+01 G
			815.77	-2.963E-01	+	9.004E+00	8.48E+02	2.33E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 11
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	I	2.8021E-01					3.25E+01	
			145.44	2.802E-01	?(	1.236E+00	1.29E+02	4.82E+01 G
CE-144	I	-9.8552E-01					2.85E+02	
			133.54	-9.855E-01	(	7.655E+00	2.27E+02	1.11E+01 G
PM-144	C	2.5579E-01					3.63E+02	
			696.54	2.558E-01	?(	9.698E-01	1.47E+02	9.90E+01 G
			618.06	-8.346E-03	% P	2.532E+00	5.61E+03	9.91E+01 G
EU-152	F	1.4949E+00					4.94E+03	
			121.78	4.311E-01	&(	1.390E+00	9.44E+01	2.86E+01 G
			344.29	-1.127E+00	+	5.527E+00	1.44E+02	2.65E+01 G
			1112.07	0.000E+00	-	1.152E+01	1.00E+03	1.36E+01 G
			778.92	2.480E+00	?(	3.655E+00	4.47E+01	1.29E+01 G
			964.11	3.503E-01	-	1.002E+01	7.55E+02	1.46E+01 G
			244.69	3.825E+00	?(	1.852E+01	1.43E+02	7.58E+00 G
			1408.00	3.350E-01	-	6.769E+00	7.97E+02	2.10E+01 GA
EU-154	I	9.9894E-01					3.14E+03	
			123.10	-4.821E-01	?(P	1.673E+00	1.08E+02	4.08E+01 G
			1274.54	0.000E+00	+	3.895E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	8.834E+00	1.00E+03	2.02E+01 G
			873.23	-3.217E+00	+ P	1.343E+01	6.73E+01	1.23E+01 G
			1004.77	4.353E+00	?(	1.677E+01	1.13E+02	1.80E+01 G
			996.33	-9.445E+00	+	2.674E+01	8.43E+01	1.06E+01 G
EU-155	I	1.5599E-01					1.81E+03	
			105.31	-2.918E-01	?(P	4.246E+00	3.36E+02	2.12E+01 G
			86.54	4.652E-01	(	3.882E+00	2.46E+02	3.07E+01 G
HF-181	F	2.1088E-01					4.24E+01	
			482.00	-1.340E-02	%(	1.621E+00	3.35E+03	8.05E+01 G
			133.02	-4.460E-01	+	1.919E+00	1.27E+02	4.33E+01 G
			345.83	1.409E+00	&(	7.859E+00	1.61E+02	1.51E+01 G
			136.30	0.000E+00	-	1.503E+01	1.00E+03	5.85E+00 G
Ta-182	F	-1.4954E+00					1.14E+02	
			1121.30	-1.495E+00	?(	7.376E+00	1.42E+02	3.49E+01 G
			1221.41	4.624E-01	+	6.217E+00	5.63E+02	2.70E+01 G
			1189.05	-4.520E+00	+	1.173E+01	1.12E+02	1.62E+01 G
Hg-203	F	1.6746E-01					4.66E+01	
			279.20	1.675E-01	?(	9.456E-01	1.61E+02	8.15E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 12
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TL-208	N	1.4178E+00					6.98E+02	
			583.02	1.363E+00	(P	4.392E-01	2.11E+01	8.45E+01 G
			277.28	2.150E+00	&(	1.138E+01	1.51E+02	6.31E+00 G
			860.56	4.221E+00	+	9.519E+00	9.36E+01	1.24E+01 G
PM-146	C	3.7881E-01					2.02E+03	
			453.88	3.788E-01	?(P	1.226E+00	1.22E+02	6.50E+01 G
			747.16	1.303E-01	% P	3.590E+00	1.04E+03	3.40E+01 G
			735.72	-6.117E-01	+ P	5.349E+00	3.53E+02	2.25E+01 G
Y-88	F	-1.6601E-02					1.07E+02	
			1836.06	-1.660E-02	%(P	9.809E-01	8.64E+03	9.92E+01 G
			898.04	-1.801E-01	+	1.308E+00	2.85E+02	9.37E+01 G
Cd-113m		1.4456E+02					5.33E+03	
			263.70	1.446E+02	%(	1.307E+04	2.50E+03	6.00E-03 K
Cd-109	F	4.7149E+00					4.53E+02	
			88.04	4.715E+00	?(	2.842E+01	1.78E+02	3.79E+00 G
Cf-251	T	-8.0561E-01					3.28E+05	
			176.60	-8.056E-01	?(	3.668E+00	1.64E+02	1.70E+01 G
			227.00	-1.459E+00	+	1.030E+01	2.49E+02	6.30E+00 GA
Cf-249	T	-4.2002E-01					1.28E+05	
			387.95	-4.200E-01	&(	1.986E+00	1.38E+02	6.60E+01 G
			333.44	-8.154E-01	+	5.008E+00	2.25E+02	1.55E+01 G
Sn-126		-2.1469E+00					3.65E+07	
			87.57	0.000E+00	+	3.219E+00	1.00E+03	3.75E+01 GA
			64.28	-2.147E+00	?(	1.118E+01	1.53E+02	9.70E+00 G
			86.94	0.000E+00	+	1.340E+01	1.00E+03	9.04E+00 GA
PB-210	N	-5.4005E+00					8.14E+03	
			46.54	-5.401E+00	?(P	3.015E+01	1.80E+02	4.25E+00 G
PB-212	N	3.0643E-01					6.98E+02	
			238.63	3.064E-01	?(P	2.794E+00	2.66E+02	4.33E+01 G
			300.03	1.081E+00	& P	4.854E+01	1.30E+03	3.28E+00 GA
PB-214	N	3.9104E+00					5.84E+05	
			351.93	3.910E+00	@(P	1.435E+00	1.88E+01	3.76E+01 G
			295.09	1.407E+00	-	7.591E+00	1.58E+02	1.93E+01 G
			242.00	7.735E+00	+	7.383E+00	3.27E+01	7.43E+00 GA

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 13
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-207	C	7.4678E-01					1.18E+04	
			1063.66	7.468E-01	?(P	8.245E-01	4.08E+01	7.45E+01 G
			569.70	1.205E-08	&	1.291E+00	2.91E+09	9.77E+01 G
BI-212	N	8.0240E-01					6.98E+02	
			727.17	8.024E-01	?(	2.011E+01	6.86E+02	7.55E+00 G
			785.42	0.000E+00	-	1.017E+02	1.00E+03	1.28E+00 GA
U-235	N	-5.9763E-01					2.57E+11	
			143.79	-5.976E-01	&(P	7.459E+00	3.52E+02	1.10E+01 G
			205.33	-4.631E+00	& P	1.311E+01	1.11E+02	5.01E+00 G
			163.38	-4.947E-01	% P	1.503E+01	1.01E+03	5.08E+00 G
			185.72	7.315E-01	* P	1.208E+00	5.98E+01	5.40E+01 GA
BI-214	N	5.2659E+00					5.84E+05	
			609.31	5.266E+00	(P	1.852E+00	1.88E+01	4.61E+01 G
			1120.29	1.251E+01	+ P	4.249E+00	2.18E+01	1.51E+01 G
			1764.49	-3.966E+00	- P	1.551E+01	2.25E+02	1.54E+01 G
BI-210M	T	-7.3231E-01					1.10E+09	
			265.83	-7.323E-01	?(	2.017E+00	1.06E+02	5.00E+01 G
			304.90	-1.999E-07	%	5.789E+00	8.36E+08	2.80E+01 G
AC-228	N	2.9570E+00					2.10E+03	
			911.07	3.483E+00	?(P	4.439E+00	5.50E+01	2.90E+01 G
			968.97	-4.787E-01	- P	9.698E+00	7.10E+02	1.75E+01 G
			338.32	1.686E+00	?(P	9.367E+00	1.61E+02	1.20E+01 G
			93.35	2.948E+00	?	1.916E+01	1.92E+02	5.56E+00 XA
TH-227	N	-3.6299E+00					7.95E+03	
			256.24	-3.630E+00	&(	1.220E+01	1.28E+02	7.00E+00 G
			235.97	-1.964E+00	+	1.259E+01	1.89E+02	1.23E+01 G
			50.14	-4.332E+00	+	1.370E+01	1.10E+02	8.00E+00 G
TH-229	N	-5.5687E+00					2.68E+06	
			193.51	-5.569E+00	(P	1.582E+01	1.00E+02	4.40E+00 G
			210.85	-6.937E+00	+ P	2.593E+01	1.28E+02	2.99E+00 G
TH-234	N	8.3981E+00					1.63E+12	
			92.59	8.109E+00	@(P	1.053E+01	4.68E+01	5.58E+00 G
			63.29	8.821E+00	(P	1.963E+01	7.86E+01	3.81E+00 G
PA-231	N	9.6959E+00					1.20E+07	
			302.65	9.696E+00	?(	5.195E+01	1.57E+02	2.88E+00 G
			300.07	-1.279E-01	& P	6.505E+01	1.47E+04	2.46E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 14
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-233	C	-1.0058E+00					7.82E+08	
			312.01	-1.006E+00	?(	3.442E+00	1.01E+02	3.60E+01 G
			300.18	-5.077E-02	& P	2.582E+01	1.47E+04	6.20E+00 G
PA-234	N	1.0069E+00					1.63E+12	
			131.29	3.225E-01	?(	4.240E+00	3.80E+02	1.80E+01 G
			946.02	1.879E-01	%	7.202E+00	1.39E+03	1.34E+01 G
			569.47	2.509E+00	&(	1.474E+01	1.66E+02	8.20E+00 G
			883.24	0.000E+00	-	2.390E+01	1.00E+03	9.60E+00 G
			880.53	-1.067E+01	+	3.397E+01	9.36E+01	6.00E+00 GA
PA-234M	N	-1.2825E+02					1.63E+12	
			1001.00	-1.283E+02	?(P	3.794E+02	5.77E+01	8.37E-01 G
			766.41	8.784E+01	+ P	4.446E+02	1.43E+02	2.94E-01 G
AM-241	T	-3.8332E-01					1.58E+05	
			59.54	-3.833E-01	(P	2.586E+00	2.20E+02	3.59E+01 G
Np-237	F	1.5844E+00					2.14E+06	
			86.49	1.584E+00	&(	8.855E+00	1.66E+02	1.31E+01 G
Ir-192	F	2.1211E-01					7.40E+01	
			316.49	-8.696E-02	?(	1.188E+00	3.87E+02	8.70E+01 G
			468.06	6.735E-01	(	2.474E+00	1.07E+02	5.18E+01 G
			308.44	2.800E-01	(	2.713E+00	2.73E+02	3.18E+01 G
Cs-136	F	3.8126E-01					1.30E+01	
			818.50	4.918E-01	?(	1.879E+00	1.11E+02	1.00E+02 G
			1048.07	2.058E-01	?(	1.351E+00	1.73E+02	8.00E+01 G
			340.57	4.449E-01	&(	2.553E+00	1.66E+02	4.69E+01 G
Np-239	T	-7.9483E-01					2.36E+00	
			103.70	1.827E-01	+	2.846E+00	4.48E+02	2.40E+01 X
			106.13	-7.948E-01	?(	4.114E+00	1.53E+02	2.27E+01 G
			99.50	1.125E+00	*	4.422E+00	1.16E+02	1.50E+01 X
Nd-147		-2.1498E+00					1.11E+01	
			531.00	-2.150E+00	?(	9.151E+00	1.65E+02	1.30E+01 G
			91.10	6.255E-01	+	3.859E+00	1.82E+02	2.83E+01 G
TL-210	N	1.4205E-01					5.84E+05	
			799.60	0.000E+00	?(	1.755E+00	1.00E+03	9.90E+01 G
			296.00	3.200E-01	?(	1.935E+00	1.77E+02	7.90E+01 G
			1313.00	2.843E+00	?	3.492E+00	4.08E+01	2.10E+01 GA

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 15
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Kr-85	I 1.2823E+02					3.92E+03	
		513.98	1.282E+02	?(	4.696E+02	1.08E+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:
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	
PB-210	46.54	68.	-7.	-0.004	179.70	-5.401E+00	P
TH-227	50.14	63.	-13.	-0.007	110.15	-4.332E+00	
AM-241	59.54	72.	-6.	-0.003	220.14	-3.833E-01	P
Sn-126	64.28	120.	-10.	-0.006	153.32	-2.147E+00	
BA-133	80.99	73.	-2.	-0.001	656.37	-1.146E-01	
Np-237	86.49	219.	13.	0.007	165.57	1.584E+00	
EU-155	86.54	232.	9.	0.005	246.26	4.652E-01	
Cd-109	88.04	191.	11.	0.006	178.07	4.715E+00	
Nd-147	91.10	202.	11.	0.006	182.37	6.255E-01	
AC-228	93.35	195.	10.	0.006	191.86	2.948E+00	
Gd-153	97.50	93.	-9.	-0.005	155.16	-4.659E-01	
Np-239	99.50	74.	11.	0.006	115.78	1.125E+00	

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 16
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Gd-153	103.20	70.	10.	0.006	120.75	7.161E-01		
Np-239	103.70	80.	3.	0.002	447.85	1.827E-01		
EU-155	105.31	144.	-4.	-0.002	336.06	-2.918E-01		P
Np-239	106.13	156.	-12.	-0.007	152.89	-7.948E-01		
CO-57	122.06	32.	7.	0.004	125.71	1.214E-01		
EU-154	123.10	78.	-13.	-0.007	107.75	-4.821E-01		P
PA-234	131.29	95.	4.	0.002	380.19	3.225E-01		
HF-181	133.02	113.	-12.	-0.007	127.12	-4.460E-01		
CE-144	133.54	118.	-7.	-0.004	226.98	-9.855E-01		
Tc-99m	140.51	93.	-4.	-0.002	331.25	-7.825E-02		
U-235	143.79	101.	-4.	-0.002	352.48	-5.976E-01		P
CE-141	145.44	51.	8.	0.005	128.64	2.802E-01		
Ba-140	162.66	66.	-6.	-0.003	195.79	-1.722E+00		
CE-139	165.85	49.	9.	0.005	115.69	1.977E-01		
Cf-251	176.60	43.	-7.	-0.004	163.95	-8.056E-01		
U-235	185.72	44.	20.	0.011	59.84	7.315E-01		P
TH-229	193.51	47.	-12.	-0.007	99.96	-5.569E+00		P
U-235	205.33	37.	-11.	-0.006	111.26	-4.631E+00		P
TH-229	210.85	51.	-10.	-0.005	127.90	-6.937E+00		P
Cf-251	227.00	30.	-4.	-0.002	248.75	-1.459E+00		
TH-227	235.97	180.	-10.	-0.006	189.12	-1.964E+00		
TH-227	256.24	44.	-10.	-0.006	128.06	-3.630E+00		
BI-210M	265.83	59.	-14.	-0.008	106.23	-7.323E-01		
Hg-203	279.20	30.	5.	0.003	161.25	1.675E-01		
I-131	284.30	18.	5.	0.003	177.78	2.105E+00		
TL-210	296.00	118.	9.	0.005	177.38	3.200E-01		
PA-231	302.65	109.	10.	0.005	157.36	9.696E+00		
BA-133	302.85	118.	9.	0.005	178.75	1.395E+00		
Ir-192	308.44	32.	3.	0.002	272.84	2.800E-01		
PA-233	312.01	69.	-12.	-0.007	101.23	-1.006E+00		
Ir-192	316.49	46.	-2.	-0.001	386.78	-8.696E-02		
CR-51	320.08	71.	-13.	-0.007	125.08	-3.930E+00		P
La-140	328.76	26.	-3.	-0.001	360.66	-4.105E-01		
Cf-249	333.44	22.	-4.	-0.002	225.00	-8.154E-01		
AC-228	338.32	48.	6.	0.004	160.76	1.686E+00		P
Cs-136	340.57	55.	6.	0.004	166.14	4.449E-01		
HF-181	345.83	52.	7.	0.004	161.48	1.409E+00		
BA-133	356.00	83.	-8.	-0.005	155.68	-4.565E-01		
BA-133	383.84	28.	7.	0.004	118.60	2.676E+00		
Cf-249	387.95	53.	-8.	-0.004	137.62	-4.200E-01		
SN-113	391.69	54.	-2.	-0.001	524.40	-1.130E-01		
SB-125	427.88	28.	-10.	-0.006	108.32	-1.314E+00		
AG-108M	433.94	20.	-3.	-0.002	229.04	-1.396E-01		P
PM-146	453.88	13.	6.	0.003	122.06	3.788E-01		P
SB-125	463.37	43.	-7.	-0.004	100.96	-2.917E+00		P
Ir-192	468.06	36.	8.	0.005	107.36	6.735E-01		
BE-7	477.59	22.	6.	0.004	110.25	2.629E+00		P
La-140	487.02	20.	-5.	-0.003	135.52	-5.064E-01		P

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 17
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RU-103	497.05	16.	-6.	-0.003	117.33	-2.993E-01	P
RH-106	511.86	60.	26.	0.014	46.60	5.855E+00	
Kr-85	513.98	81.	12.	0.007	108.23	1.282E+02	
Nd-147	531.00	24.	-6.	-0.003	164.99	-2.150E+00	
Ba-140	537.26	16.	-6.	-0.003	117.35	-1.198E+00	P
CS-134	563.24	20.	-10.	-0.006	93.48	-5.834E+00	
CS-134	569.32	24.	-1.	-0.001	700.00	-3.210E-01	
PA-234	569.47	22.	4.	0.002	165.99	2.509E+00	
SB-125	600.50	88.	4.	0.002	309.32	1.252E+00	
RH-106	621.92	4.	4.	0.002	127.11	1.963E+00	
SB-125	635.89	10.	2.	0.001	214.35	1.046E+00	P
I-131	636.97	33.	-11.	-0.006	77.18	-8.662E+00	
AG-110M	657.76	20.	8.	0.005	85.50	4.829E-01	
CS-137	661.66	33.	-4.	-0.002	206.95	-2.505E-01	P
PM-144	696.54	9.	4.	0.002	146.76	2.558E-01	
NB-94	702.63	17.	-4.	-0.002	201.91	-2.606E-01	
SB-124	722.79	29.	-5.	-0.003	168.73	-2.602E+00	
ZR-95	724.20	24.	6.	0.003	119.71	8.433E-01	
BI-212	727.17	23.	1.	0.001	685.57	8.024E-01	
PM-146	735.72	13.	-2.	-0.001	352.60	-6.117E-01	P
ZR-95	756.73	4.	11.	0.006	50.24	1.227E+00	
AG-110M	763.94	21.	-10.	-0.006	71.99	-2.859E+00	
NB-95	765.79	21.	7.	0.004	99.00	4.528E-01	
PA-234M	766.41	15.	4.	0.002	142.56	8.784E+01	P
CS-134	801.95	7.	5.	0.003	87.99	3.763E+00	P
CO-58	810.78	29.	-9.	-0.005	91.27	-5.982E-01	
La-140	815.77	38.	-1.	-0.001	848.40	-2.963E-01	
Cs-136	818.50	30.	7.	0.004	111.09	4.918E-01	
MN-54	834.85	9.	-2.	-0.001	285.36	-1.587E-01	
Co-56	846.77	5.	3.	0.002	147.99	2.296E-01	
NB-94	871.10	0.	13.	0.007	27.98	9.137E-01	P
EU-154	873.23	20.	-6.	-0.003	67.31	-3.217E+00	P
PA-234	880.53	31.	-9.	-0.005	93.62	-1.067E+01	
Sc-46	889.28	20.	5.	0.003	123.57	3.867E-01	
Y-88	898.04	9.	-2.	-0.001	285.36	-1.801E-01	
AC-228	911.07	10.	14.	0.008	54.99	3.483E+00	P
AC-228	968.97	17.	-1.	-0.001	710.23	-4.787E-01	P
EU-154	996.33	51.	-13.	-0.007	84.27	-9.445E+00	
PA-234M	1001.00	64.	-14.	-0.008	57.70	-1.283E+02	P
EU-154	1004.77	57.	10.	0.005	113.16	4.353E+00	
Co-56	1037.84	15.	-3.	-0.002	289.64	-1.733E+00	
Cs-136	1048.07	5.	2.	0.001	173.21	2.058E-01	
RH-106	1050.36	15.	-1.	-0.001	556.78	-5.287E+00	
BI-207	1063.66	0.	7.	0.004	40.78	7.468E-01	P
Ta-182	1121.30	33.	-6.	-0.003	141.98	-1.495E+00	
Ta-182	1189.05	15.	-8.	-0.004	112.15	-4.520E+00	
Ta-182	1221.41	11.	1.	0.001	563.47	4.624E-01	
Co-56	1238.28	16.	-5.	-0.003	88.68	-7.836E-01	P

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ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 18
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
NA-22	1274.53	0.	6.	0.003	40.82	5.826E-01		
TL-210	1313.00	0.	6.	0.003	40.82	2.843E+00		
AG-110M	1384.30	0.	5.	0.003	44.72	2.142E+00		
La-140	1596.21	6.	-4.	-0.002	282.38	-4.604E-01		P
SB-124	1690.98	6.	-5.	-0.003	128.27	-1.203E+00		
Co-56	1771.35	13.	-1.	0.000	784.22	-5.516E-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	2.6286E+00	2.6286E+00	1.102E+02%	1.00E+01
NA-22	#A	5.8261E-01	5.8261E-01	4.082E+01%	7.16E-01
K-40	#	7.7214E+01	7.7214E+01	1.395E+01%	1.73E+01
Sc-46	#A	3.8674E-01	3.8674E-01	1.236E+02%	1.67E+00
CR-51	#A	-3.9296E+00	-3.9296E+00	1.251E+02%	1.29E+01
MN-54	#A	-1.5873E-01	-1.5873E-01	2.854E+02%	1.15E+00
FE-59	#	1.3412E+00	1.3412E+00	3.437E+01%	1.12E+00
Co-56	#A	2.2957E-01	2.2957E-01	1.480E+02%	8.80E-01
CO-57	#A	1.2139E-01	1.2139E-01	1.257E+02%	5.28E-01
CO-58	#A	-5.9825E-01	-5.9825E-01	9.127E+01%	1.86E+00
CO-60	#	7.5012E-01	7.5012E-01	2.697E+01%	7.43E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.11E+00
NB-94	#A	3.3246E-01	3.3246E-01	2.798E+01%	1.33E+00
ZR-95	#A	1.0551E+00	1.0551E+00	5.024E+01%	1.43E+00
NB-95	#A	4.5276E-01	4.5276E-01	9.900E+01%	1.54E+00
RU-103	#A	-2.9934E-01	-2.9934E-01	1.173E+02%	1.04E+00
RH-106	#A	1.9627E+00	1.9627E+00	1.271E+02%	6.64E+00
AG-108M	#A	-1.3965E-01	-1.3965E-01	2.290E+02%	1.03E+00
AG-110M	#A	5.1000E-01	5.1000E-01	4.472E+01%	3.16E+00
SN-113	#A	-1.1295E-01	-1.1295E-01	5.244E+02%	2.09E+00
SB-124	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.50E+00
SB-125	#A	-7.9984E-02	-7.9984E-02	1.083E+02%	3.60E+00
I-131	#A	1.7457E-01	1.7457E-01	1.778E+02%	8.72E-01
Gd-153	#A	3.1527E-02	3.1527E-02	9.830E+01%	2.47E+00
Ga-68	#	2.3727E+01	2.3783E+01	3.536E+01%	2.19E+01
Tc-99m	#A	-7.8210E-02	-7.8245E-02	3.313E+02%	8.96E-01
BA-133	#A	-3.4278E-02	-3.4278E-02	1.185E+02%	2.43E+00
CS-134	#A	3.6687E-01	3.6687E-01	8.799E+01%	2.01E+00
CS-137	#A	-2.5050E-01	-2.5050E-01	2.070E+02%	1.93E+00
CE-139	#A	1.9772E-01	1.9772E-01	1.157E+02%	7.82E-01
Ba-140	#A	-1.1982E+00	-1.1983E+00	1.173E+02%	4.14E+00
La-140	#A	-4.6038E-01	-4.6038E-01	2.824E+02%	1.71E+00
CE-141	#A	2.8021E-01	2.8021E-01	1.286E+02%	1.24E+00
CE-144	#A	-9.8552E-01	-9.8552E-01	2.270E+02%	7.66E+00

ORTEC g v - i (3263) Env32 G800W064 11/26/2019 10:04:39 AMPage 19
TestAmerica Inc Spectrum name: 5_Gamma_20193075.An1

PM-144 #A	2.5579E-01	2.5579E-01	1.468E+02%		9.70E-01
EU-152 #C	1.4949E+00	1.4949E+00	4.472E+01%		1.39E+00
EU-154 #A	9.9894E-01	9.9894E-01	7.813E+01%		1.67E+00
EU-155 #A	1.5599E-01	1.5599E-01	2.083E+02%		4.25E+00
HF-181 #A	2.1088E-01	2.1088E-01	1.615E+02%		1.62E+00
Ta-182 #A	-1.4954E+00	-1.4954E+00	1.420E+02%		7.38E+00
Hg-203 #A	1.6746E-01	1.6746E-01	1.612E+02%		9.46E-01
TL-208	1.4178E+00	1.4178E+00	2.109E+01%		4.39E-01
PM-146 #A	3.7881E-01	3.7881E-01	1.221E+02%		1.23E+00
Y-88 #A	-1.6601E-02	-1.6601E-02	8.645E+03%		9.81E-01
Cd-113m#B	1.4456E+02	1.4456E+02	2.504E+03%		1.31E+04
Cd-109 #A	4.7149E+00	4.7149E+00	1.781E+02%		2.84E+01
Cf-251 #A	-8.0561E-01	-8.0561E-01	1.640E+02%		3.67E+00
Cf-249 #A	-4.2002E-01	-4.2002E-01	1.376E+02%		1.99E+00
Sn-126 #A	-2.1469E+00	-2.1469E+00	1.533E+02%		1.12E+01
PB-210 #A	-5.4005E+00	-5.4005E+00	1.797E+02%		3.02E+01
PB-212 #A	3.0643E-01	3.0643E-01	2.659E+02%		2.79E+00
PB-214	3.9104E+00	3.9104E+00	1.884E+01%		1.44E+00
BI-207 #A	7.4678E-01	7.4678E-01	4.078E+01%		8.25E-01
BI-212 #A	8.0240E-01	8.0240E-01	6.856E+02%		2.01E+01
U-235 #A	-5.9763E-01	-5.9763E-01	3.525E+02%		7.46E+00
BI-214	5.2659E+00	5.2659E+00	1.882E+01%		1.85E+00
BI-210M#A	-7.3231E-01	-7.3231E-01	1.062E+02%		2.02E+00
AC-228 #A	2.9570E+00	2.9570E+00	5.499E+01%		4.44E+00
TH-227 #A	-3.6299E+00	-3.6299E+00	1.281E+02%		1.22E+01
TH-229 #A	-5.5687E+00	-5.5687E+00	9.996E+01%		1.58E+01
TH-234 #A	8.3981E+00	8.3981E+00	4.576E+01%		1.05E+01
PA-231 #A	9.6959E+00	9.6959E+00	1.574E+02%		5.19E+01
PA-233 #A	-1.0058E+00	-1.0058E+00	1.012E+02%		3.44E+00
PA-234 #A	1.0069E+00	1.0069E+00	1.660E+02%		4.24E+00
PA-234M#A	-1.2825E+02	-1.2825E+02	5.770E+01%		3.79E+02
AM-241 #A	-3.8332E-01	-3.8332E-01	2.201E+02%		2.59E+00
Np-237 #A	1.5844E+00	1.5844E+00	1.656E+02%		8.86E+00
Ir-192 #A	2.1211E-01	2.1211E-01	1.074E+02%		1.19E+00
Cs-136 #A	3.8125E-01	3.8126E-01	8.816E+01%		1.88E+00
Np-239 #A	-7.9479E-01	-7.9483E-01	1.529E+02%		4.11E+00
Nd-147 #A	-2.1498E+00	-2.1498E+00	1.650E+02%		9.15E+00
TL-210 #A	1.4205E-01	1.4205E-01	1.774E+02%		1.75E+00
Kr-85 #A	1.2823E+02	1.2823E+02	1.082E+02%		4.70E+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

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```
     ORTEC g v - i (3263) Env32  G800W064  11/26/2019 10:04:39 AMPage 20
TestAmerica Inc                 Spectrum name: 5_Gamma_20193075.An1

-----------------------------   S U M M A R Y   ----------------------------
Total Activity (   37.6 to  2000.8 keV)     9.621E+01  Bq/Sample
Total Decayed Activity (   37.6 to  2000.8 keV) 9.6205788E+01  Bq/Sample
```

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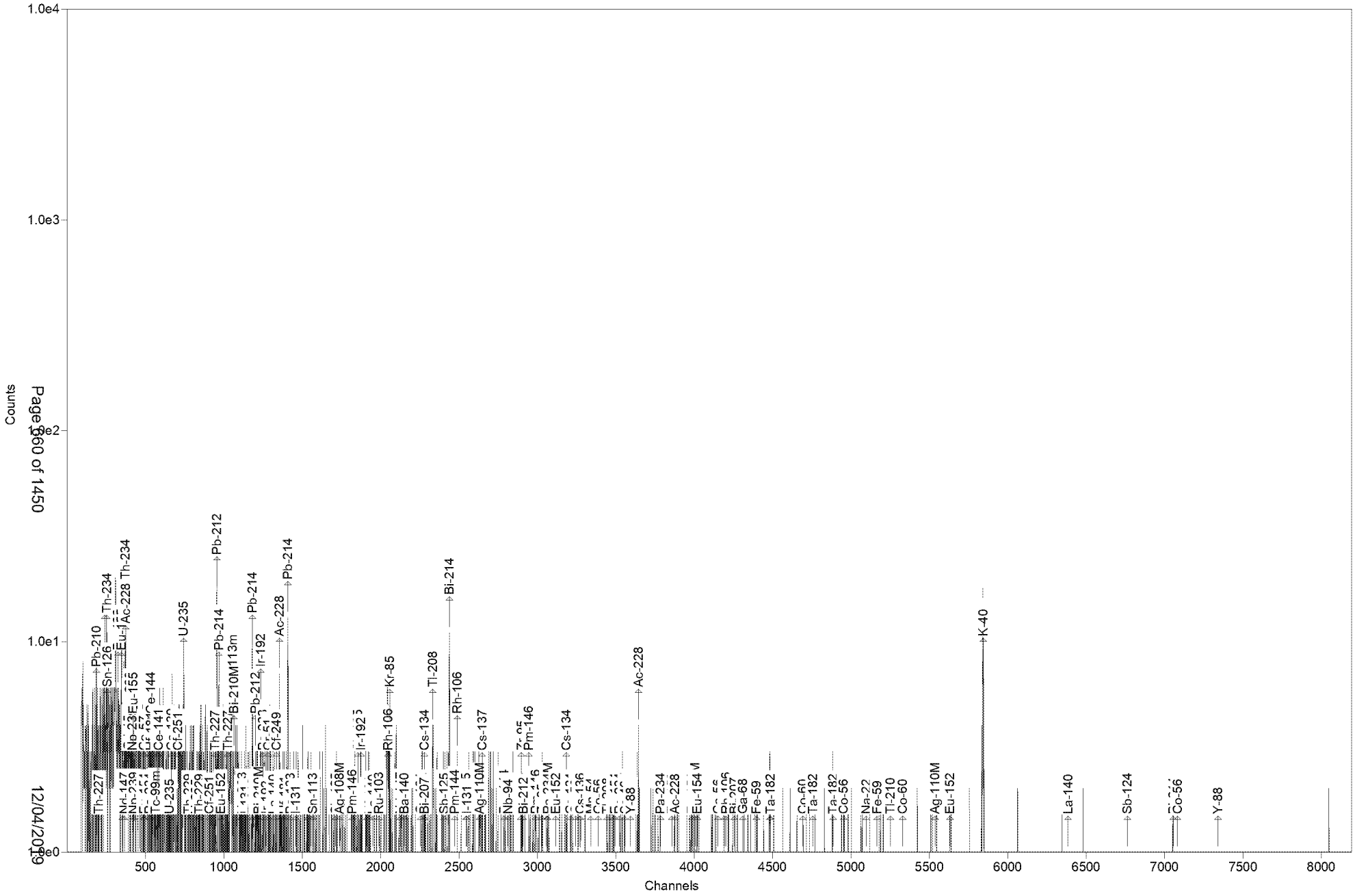
448571_Gamma_160-36160-A-1-D. 5_Gamma_20193075.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193493

Sample Description: 448571_Gamma_160-36160-A-1-E DU
Detector: Detector # 9
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-1-E DU

Decay to Time: 11/23/2019 20:22 Live Time: 1800 sec
Acquisition Time: 11/23/2019 20:22:34 Real Time: 1802 sec
Analysis Time: 11/23/2019 20:52 Dead Time: 0.09 %
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_2019-11-10_1422.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	-2.295E+00	120.0	2.754E+00	2.756E+00	9.375E+00
NA-22	3.065E-01	40.8	1.251E-01	1.260E-01	3.764E-01
K-40	7.432E+01	9.0	6.656E+00	7.665E+00	8.421E+00
Sc-46	3.260E-02	63.3	2.064E-02	2.071E-02	1.500E+00
CR-51	-2.604E+00	80.7	2.100E+00	2.105E+00	1.518E+01
MN-54	2.148E-01	93.4	2.007E-01	2.010E-01	4.809E-01
FE-59	1.071E-01	563.5	6.034E-01	6.034E-01	1.440E+00
Co-56	-2.656E-01	113.3	3.009E-01	3.012E-01	1.049E+00
CO-57	8.135E-02	144.4	1.175E-01	1.176E-01	6.810E-01
CO-58	1.440E-01	165.8	2.388E-01	2.389E-01	8.479E-01
CO-60	-1.764E-02	2374.9	4.189E-01	4.189E-01	9.735E-01
ZN-65	-9.883E-01	102.5	1.013E+00	1.014E+00	3.435E+00
NB-94	9.205E-02	160.6	1.479E-01	1.479E-01	1.276E+00
ZR-95	-5.111E-01	98.4	5.029E-01	5.036E-01	1.475E+00
NB-95	3.899E-01	84.5	3.295E-01	3.302E-01	1.110E+00
RU-103	6.026E-02	394.2	2.376E-01	2.376E-01	6.115E-01
RH-106	-7.442E-03	32978.3	2.454E+00	2.454E+00	1.654E+01
AG-108M	1.670E-01	94.3	1.575E-01	1.577E-01	4.157E-01
AG-110M	4.856E-01	44.7	2.172E-01	2.186E-01	1.311E+00
SN-113	2.782E-01	126.4	3.517E-01	3.520E-01	1.204E+00
SB-124	1.643E-01	79.7	1.309E-01	1.312E-01	1.633E+00
SB-125	1.238E+00	35.3	4.374E-01	4.420E-01	1.238E+00
I-131	1.218E-01	226.0	2.753E-01	2.754E-01	7.083E-01
Gd-153	4.639E-01	205.1	9.515E-01	9.519E-01	3.203E+00
Ga-68	3.689E+00	324.8	1.198E+01	1.198E+01	2.834E+01
Tc-99m	1.371E-01	178.8	2.451E-01	2.453E-01	8.302E-01
BA-133	-2.367E-01	221.7	5.247E-01	5.249E-01	1.791E+00
CS-134	3.362E-01	81.6	2.742E-01	2.748E-01	9.279E-01
CS-137	-5.443E-01	56.4	3.068E-01	3.081E-01	1.311E+00
CE-139	-8.075E-02	263.8	2.130E-01	2.131E-01	7.324E-01
Ba-140	9.307E-01	74.4	6.928E-01	6.945E-01	1.417E+00
La-140	1.114E-01	114.2	1.272E-01	1.273E-01	9.194E-01
CE-141	-2.300E-02	1957.0	4.501E-01	4.501E-01	1.544E+00

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CE-144	1.257E+00	134.6	1.692E+00	1.693E+00	5.716E+00
PM-144	-2.641E-01	104.5	2.759E-01	2.762E-01	1.086E+00
EU-152	6.409E-01	61.9	3.968E-01	3.982E-01	1.906E+00
EU-154	8.247E-01	76.6	6.317E-01	6.331E-01	1.210E+00
EU-155	3.927E-01	114.6	4.501E-01	4.506E-01	4.545E+00
HF-181	-2.234E-01	86.0	1.922E-01	1.926E-01	1.416E+00
Ta-182	1.519E+00	82.6	1.255E+00	1.257E+00	4.004E+00
Hg-203	2.569E-01	96.7	2.483E-01	2.487E-01	8.371E-01
TL-208	8.541E-01	55.3	4.723E-01	4.743E-01	9.644E-01
PM-146	5.966E-02	515.8	3.077E-01	3.077E-01	7.915E-01
Y-88	-2.311E-01	195.3	4.513E-01	4.515E-01	1.001E+00
Cd-113m	-3.671E+03	93.0	3.414E+03	3.422E+03	1.149E+04
Cd-109	3.917E+00	184.0	7.209E+00	7.212E+00	2.428E+01
Cf-251	-9.819E-01	125.9	1.236E+00	1.239E+00	3.202E+00
Cf-249	2.670E-01	111.0	2.965E-01	2.968E-01	1.270E+00
Sn-126	-2.682E+00	110.7	2.970E+00	2.973E+00	9.959E+00
PB-210	-4.228E+00	196.8	8.321E+00	8.324E+00	2.836E+01
PB-212	4.456E-01	129.8	5.785E-01	5.792E-01	1.955E+00
PB-214	4.226E+00	13.6	5.736E-01	6.142E-01	1.214E+00
BI-207	8.256E-01	27.1	2.236E-01	2.274E-01	4.374E-01
BI-212	-1.039E-01	3372.0	3.503E+00	3.503E+00	1.273E+01
U-235	7.593E-01	148.1	1.125E+00	1.125E+00	6.819E+00
BI-214	2.700E+00	20.6	5.574E-01	5.748E-01	1.174E+00
BI-210M	3.802E-01	99.7	3.790E-01	3.797E-01	1.281E+00
AC-228	1.362E+00	69.5	9.462E-01	9.488E-01	3.062E+00
TH-227	-4.040E+00	97.1	3.924E+00	3.932E+00	9.667E+00
TH-229	-1.178E+00	440.6	5.192E+00	5.193E+00	1.308E+01
TH-234	2.543E+00	170.4	4.332E+00	4.334E+00	1.683E+01
PA-231	3.142E+00	224.8	7.062E+00	7.065E+00	4.549E+01
PA-233	0.000E+00	1.#INF	1.215E-01	1.215E-01	3.717E+00
PA-234	1.517E+00	31.6	4.798E-01	4.861E-01	4.414E+00
PA-234M	0.000E+00	1.#INF	7.123E+00	7.123E+00	1.310E+02
AM-241	-8.270E-01	113.8	9.409E-01	9.419E-01	3.153E+00
Np-237	1.556E+00	109.8	1.708E+00	1.711E+00	5.730E+00
Ir-192	1.114E-01	143.9	1.603E-01	1.605E-01	1.552E+00
Cs-136	9.071E-02	206.0	1.868E-01	1.869E-01	9.212E-01
Np-239	-7.727E-01	186.2	1.439E+00	1.439E+00	4.824E+00
Nd-147	1.448E-01	160.6	2.325E-01	2.327E-01	4.436E+00
TL-210	1.466E-01	182.4	2.673E-01	2.675E-01	9.501E-01
Kr-85	0.000E+00	1.#INF	8.375E+00	8.375E+00	2.836E+02
Total	1.138E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 8:52:50 PMPage  1
TestAmerica Inc                 Spectrum name: 9_Gamma_20193493.An1

Sample description
     448571_Gamma_160-36160-A-1-E DU


Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193493.An1

Acquisition information
       Start time:                11/23/2019 8:22:34 PM
       Live time:              1800
       Real time:              1802
       Dead time:                 0.09 %
       Detector ID:                   9

Detector system
     Ge9 S/N09363993


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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 2
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

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	11/23/2019 8:22:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-11-10_1422.PBC 11/10/2019 2:22:11 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1036

***** 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
50.14	9.	178.64	1.00	2.900E-02	50.14	8.000	PBC<MDA	TH227
63.29	7.	282.06	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
80.99	10.	154.28	1.03	4.830E-02	80.99	34.060	PBC<MDA	BA133
86.49	18.	109.76	1.04	5.008E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.639E-01	EU155
					86.94	9.040	2.250E+00	Sn126
86.54	18.	114.61	1.04	5.010E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.639E-01	EU155
					86.94	9.040	2.250E+00	Sn126
86.94	13.	176.02	1.04	5.021E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	4.869E-01	EU155
					86.94	9.040	1.650E+00	Sn126
87.57	13.	180.06	1.04	5.038E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	3.915E+00	Cd109
88.04	13.	184.05	1.04	5.051E-02	87.57	37.500	PBC<MDA	Sn126
					88.04	3.790	3.917E+00	Cd109
91.10	14.	187.52	1.04	5.124E-02	91.10	28.300	PBC<MDA	Nd147
92.59	14.	191.16	1.04	5.156E-02	92.59	5.584	PBC<MDA	TH234
93.35	14.	194.84	1.04	5.171E-02	93.35	5.561	PBC<MDA	AC228
97.50	13.	205.12	1.05	5.240E-02	97.50	30.000	PBC<MDA	Gd153
123.10	14.	96.95	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
133.54	13.	134.62	1.08	5.189E-02	133.02	43.300	PBC<MDA	HF181

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 3
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					133.54	11.090	1.257E+00	CE144
136.30	13.	139.04	1.08	5.152E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.318E+00	CO57
136.47	13.	144.44	1.08	5.150E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.318E+00	CO57
140.51	11.	178.80	1.09	5.091E-02	140.51	89.300	PBC<MDA	Tc99m
162.66	14.	97.23	1.11	4.690E-02	162.66	6.220	PBC<MDA	Ba140
185.72	15.	94.75	1.13	4.403E-02	185.72	54.000	PBC<MDA	U235
205.33	9.	148.10	1.15	4.123E-02	205.33	5.010	PBC<MDA	U235
227.00	22.	54.67	1.17	3.858E-02	227.00	6.300	PBC<MDA	Cf251
238.46	13.	129.84	1.18	3.732E-02	238.63	43.300	PBC<MDA	PB212
241.82	31.	29.99	1.18	3.697E-02	242.00	7.430	6.173E+00	PB214
244.69	12.	134.43	1.18	3.670E-02	244.69	7.580	PBC<MDA	EU152
265.83	12.	99.68	1.20	3.470E-02	265.83	50.000	PBC<MDA	BI210M
279.20	13.	96.66	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
295.10	52.	22.10	1.30	3.232E-02	295.09	19.300	4.600E+00	PB214
296.00	11.	182.40	1.23	3.225E-02	296.00	79.000	PBC<MDA	TL210
300.03	11.	186.60	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.030E+00	PA231
					300.18	6.200	3.187E+00	PA233
300.07	10.	224.77	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	6.821E+00	PA231
					300.18	6.200	2.707E+00	PA233
333.44	12.	111.05	1.27	2.970E-02	333.44	15.510	PBC<MDA	Cf249
338.32	12.	118.13	1.27	2.940E-02	338.32	12.010	PBC<MDA	AC228
340.57	7.	205.95	1.27	2.927E-02	340.57	46.900	PBC<MDA	Cs136
351.68	78.	15.76	1.33	2.862E-02	351.93	37.600	4.034E+00	PB214
364.48	5.	225.98	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
391.69	8.	126.44	1.32	2.653E-02	391.69	64.000	PBC<MDA	SN113
427.88	7.	98.57	1.35	2.491E-02	427.88	29.600	PBC<MDA	SB125
433.94	2.	313.24	1.35	2.466E-02	433.94	90.480	PBC<MDA	AG108M
453.88	2.	515.75	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
468.06	6.	143.91	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
487.02	12.	114.17	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
497.05	2.	394.24	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	45.	26.57	2.67	2.188E-02	511.86	20.000	5.712E+00	RH106
537.26	4.	112.76	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
569.70	9.	104.01	1.47	2.023E-02	569.32	15.380	1.517E+00	CS134
					569.47	8.200	2.846E+00	PA234
					569.70	97.740	2.388E-01	BI207
583.02	23.	55.30	1.48	1.989E-02	583.02	84.500	PBC<MDA	TL208
600.50	5.	300.39	1.50	1.946E-02	600.50	17.860	PBC<MDA	SB125
609.22	40.	20.64	1.17	1.925E-02	609.31	46.090	2.515E+00	BI214
635.89	14.	35.35	1.53	1.864E-02	635.89	11.310	3.776E+00	SB125
702.63	2.	635.22	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
722.79	8.	79.68	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.838E-01	AG108M
					723.36	20.220	1.276E+00	EU154

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
722.94	8.	94.31	1.60	1.693E-02	722.79	10.810	2.384E+00	SB124
					722.94	90.840	2.838E-01	AG108M
					723.36	20.220	1.276E+00	EU154
765.79	11.	84.51	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.324E+02	PA234M
795.87	8.	81.58	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
799.60	2.	396.47	1.66	1.568E-02	799.60	98.960	PBC<MDA	TL210
810.78	4.	165.83	1.67	1.551E-02	810.78	99.460	PBC<MDA	CO58
834.85	6.	93.43	1.69	1.517E-02	834.85	99.980	PBC<MDA	MN54
860.56	5.	108.81	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
871.10	3.	160.62	1.71	1.468E-02	871.10	99.890	PBC<MDA	NB94
873.23	-1.	641.39	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
880.53	6.	87.27	1.72	1.456E-02	880.53	6.000	PBC<MDA	PA234
883.24	6.	104.55	1.72	1.453E-02	883.24	9.600	PBC<MDA	PA234
884.68	5.	133.10	1.73	1.451E-02	884.68	72.680	PBC<MDA	AG110M
911.07	7.	139.84	1.75	1.418E-02	911.07	29.000	PBC<MDA	AC228
937.49	4.	218.66	1.77	1.387E-02	937.49	34.360	PBC<MDA	AG110M
946.02	10.	31.62	1.77	1.377E-02	946.02	13.400	3.010E+00	PA234
964.11	8.	90.14	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
968.97	8.	99.62	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.33	4.	185.64	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1004.77	6.	94.52	1.82	1.314E-02	1004.77	18.010	PBC<MDA	EU154
1063.66	14.	27.09	1.86	1.257E-02	1063.66	74.500	8.256E-01	BI207
1077.40	2.	324.82	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1099.25	1.	563.47	1.89	1.224E-02	1099.25	56.500	PBC<MDA	FE59
1120.32	11.	112.81	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	11.	82.53	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	5.276E-01	Sc46
					1121.30	34.900	1.512E+00	Ta182
1121.33	11.	82.61	1.90	1.205E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.440E+00	Ta182
1189.05	6.	145.52	1.95	1.150E-02	1189.05	16.200	PBC<MDA	Ta182
1274.53	6.	40.82	2.01	1.088E-02	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	8.704E-01	EU154
1313.00	3.	176.21	2.03	1.063E-02	1313.00	21.000	PBC<MDA	TL210
1384.30	5.	44.72	2.08	1.018E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	4.	137.50	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.86	139.	8.96	1.45	9.749E-03	1460.83	10.670	7.432E+01	K40

No unknown peaks passed sensitivity test.

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	130.	-8.	-0.005	196.81	0.998
TH-227	200.20	50.14	134.	9.	0.005	178.64	1.001
AM-241	237.77	59.54	238.	-20.	-0.011	113.77	1.010s
TH-234	252.77	63.29	168.	7.	0.004	282.06	1.014s
Sn-126	256.74	64.28	204.	-19.	-0.010	110.74	1.015s
BA-133	323.56	80.99	70.	10.	0.006	154.28	1.031s
Np-237	345.55	86.49	194.	18.	0.010	109.76	1.036s
EU-155	345.76	86.54	213.	18.	0.010	114.61	1.036
Sn-126	347.35	86.94	275.	13.	0.007	176.02	1.037s
Sn-126	349.87	87.57	288.	13.	0.007	180.06	1.037s
Cd-109	351.75	88.04	302.	13.	0.007	184.05	1.038s
Nd-147	363.99	91.10	315.	14.	0.008	187.52	1.041s
TH-234	369.94	92.59	329.	14.	0.008	191.16	1.042
AC-228	372.98	93.35	342.	14.	0.008	194.84	1.043
Gd-153	389.58	97.50	356.	13.	0.007	205.12	1.047s
Np-239	397.58	99.50	369.	0.	0.000	1000.00	1.049s
Gd-153	412.37	103.20	369.	0.	0.000	1000.00	1.052s
Np-239	414.37	103.70	369.	0.	0.000	1000.00	1.053s
EU-155	420.82	105.31	369.	0.	0.000	1000.00	1.054
Np-239	424.09	106.13	481.	-17.	-0.009	186.20	1.055s
EU-152	486.67	121.78	112.	-17.	-0.009	91.11	1.070s
CO-57	487.80	122.06	129.	-6.	-0.003	272.69	1.070s
EU-154	491.95	123.10	90.	14.	0.008	96.95	1.071
HF-181	531.64	133.02	239.	0.	0.000	1000.00	1.081s
CE-144	533.69	133.54	147.	13.	0.007	134.62	1.081s
HF-181	544.74	136.30	158.	13.	0.007	139.04	1.084s
CO-57	545.43	136.47	171.	13.	0.007	144.44	1.084s
Tc-99m	561.57	140.51	184.	11.	0.006	178.80	1.088s
U-235	574.67	143.79	195.	0.	0.000	1000.00	1.091
Ba-140	650.15	162.66	91.	14.	0.008	97.23	1.108s
CE-139	662.92	165.85	102.	-6.	-0.003	263.79	1.111s
Cf-251	705.90	176.60	81.	-14.	-0.008	125.89	1.122s
U-235	742.37	185.72	55.	15.	0.008	94.75	1.130s
TH-229	773.52	193.51	80.	-4.	-0.002	440.64	1.137
U-235	820.80	205.33	44.	9.	0.005	148.10	1.148s
TH-229	842.87	210.85	60.	-12.	-0.007	129.64	1.153
Cf-251	907.45	227.00	32.	22.	0.012	54.67	1.168s
PB-212	953.97	238.63	135.	13.	0.007	129.84	1.179
PB-214	967.43	242.00	26.	31.	0.017	29.99	1.182D
EU-152	978.21	244.69	117.	12.	0.006	134.43	1.185s
TH-227	1024.39	256.24	76.	-18.	-0.010	97.15	1.195s
Cd-113m	1054.23	263.70	76.	-14.	-0.008	93.00	1.202s
BI-210M	1062.75	265.83	64.	12.	0.007	99.68	1.204s
TL-208	1108.55	277.28	60.	-10.	-0.006	114.02	1.215s

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TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Hg-203	1116.22	279.20	68.	13.	0.007	96.66	1.216s
I-131	1136.61	284.30	32.	0.	0.000	1000.00	1.221s
PB-214	1179.80	295.10	21.	52.	0.029	22.10	1.304s
TL-210	1183.41	296.00	208.	11.	0.006	182.40	1.231s
PB-212	1199.52	300.03	219.	11.	0.006	186.60	1.235
PA-231	1199.68	300.07	230.	10.	0.005	224.77	1.235s
PA-233	1200.12	300.18	240.	0.	0.000	1000.00	1.235s
PA-231	1210.00	302.65	240.	0.	0.000	1000.00	1.237s
BA-133	1210.81	302.85	240.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	240.	0.	0.000	1000.00	1.240
BI-210M	1218.99	304.90	240.	0.	0.000	1000.00	1.240
Ir-192	1233.16	308.44	240.	0.	0.000	1000.00	1.243s
PA-233	1247.44	312.01	240.	0.	0.000	1000.00	1.246s
Ir-192	1265.35	316.49	240.	0.	0.000	1000.00	1.250s
CR-51	1279.73	320.08	297.	-14.	-0.008	80.67	1.253
Cf-249	1333.15	333.44	78.	12.	0.006	111.05	1.265s
AC-228	1352.66	338.32	89.	12.	0.006	118.13	1.270s
Cs-136	1361.66	340.57	101.	7.	0.004	205.95	1.272s
PB-214	1406.11	351.68	20.	78.	0.043	15.76	1.328
BA-133	1423.37	356.00	134.	-8.	-0.004	221.71	1.285s
I-131	1457.31	364.48	32.	5.	0.003	225.98	1.293
BA-133	1534.73	383.84	59.	-6.	-0.003	198.58	1.310s
Cf-249	1551.17	387.95	65.	0.	0.000	1000.00	1.314
SN-113	1566.12	391.69	54.	8.	0.005	126.44	1.317s
SB-125	1710.86	427.88	9.	7.	0.004	98.57	1.349s
AG-108M	1735.10	433.94	9.	2.	0.001	313.24	1.354s
PM-146	1814.87	453.88	17.	2.	0.001	515.75	1.372s
SB-125	1852.82	463.37	49.	-4.	-0.002	177.24	1.380s
Ir-192	1871.59	468.06	40.	6.	0.004	143.91	1.384s
BE-7	1909.73	477.60	67.	-10.	-0.006	120.00	1.392s
HF-181	1927.34	482.00	90.	-14.	-0.008	101.39	1.396s
La-140	1947.43	487.02	87.	12.	0.007	114.17	1.400s
RU-103	1987.56	497.05	18.	2.	0.001	394.24	1.409s
RH-106	2046.81	511.86	49.	45.	0.025	26.57	2.672s
Kr-85	2055.27	513.98	94.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	17.	-3.	-0.002	260.77	1.438s
Ba-140	2148.39	537.26	5.	4.	0.002	112.76	1.444s
CS-134	2252.30	563.24	37.	-9.	-0.005	142.68	1.466s
CS-134	2276.64	569.32	33.	-11.	-0.006	81.73	1.471s
PA-234	2277.24	569.47	43.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	35.	9.	0.005	104.01	1.471s
TL-208	2331.45	583.02	32.	23.	0.013	55.30	1.482s
SB-125	2401.36	600.50	126.	5.	0.003	300.39	1.497s
SB-124	2410.29	602.73	131.	0.	0.000	1000.00	1.499s
CS-134	2418.21	604.71	131.	0.	0.000	1000.00	1.500s
BI-214	2436.26	609.22	12.	40.	0.022	20.64	1.174
RU-103	2440.56	610.30	131.	0.	0.000	1000.00	1.505s
AG-108M	2456.49	614.28	131.	0.	0.000	1000.00	1.508s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-144	2471.62	618.06	131.	0.	0.000	1000.00	1.512s
SB-125	2542.94	635.89	6.	14.	0.008	35.35	1.526s
I-131	2547.28	636.97	20.	-1.	-0.001	728.05	1.527s
AG-110M	2630.43	657.76	24.	0.	0.000	1000.00	1.544
CS-137	2646.03	661.66	52.	-15.	-0.008	56.36	1.548s
PM-144	2785.58	696.54	44.	-8.	-0.005	104.46	1.576s
NB-94	2809.93	702.63	60.	2.	0.001	635.22	1.581s
SB-124	2890.57	722.79	16.	8.	0.004	79.68	1.598s
AG-108M	2891.17	722.94	24.	8.	0.004	94.31	1.598s
ZR-95	2896.22	724.20	38.	-7.	-0.004	124.98	1.599s
PM-146	2942.31	735.72	23.	-6.	-0.004	166.60	1.608s
PM-146	2988.08	747.16	14.	-1.	-0.001	800.00	1.617
ZR-95	3026.36	756.73	20.	-8.	-0.005	98.39	1.625s
AG-110M	3055.23	763.94	42.	-15.	-0.008	66.33	1.631s
NB-95	3062.61	765.79	40.	11.	0.006	84.51	1.632s
PA-234M	3065.10	766.41	44.	-6.	-0.004	152.41	1.633s
EU-152	3115.14	778.92	15.	-3.	-0.002	289.64	1.643s
BI-212	3141.15	785.42	40.	-9.	-0.005	86.37	1.648s
CS-134	3182.96	795.87	18.	8.	0.005	81.58	1.656s
TL-210	3197.88	799.60	26.	2.	0.001	396.47	1.659s
CS-134	3207.29	801.95	28.	0.	0.000	1000.00	1.661s
CO-58	3242.59	810.78	20.	4.	0.002	165.83	1.668s
La-140	3262.58	815.77	24.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	24.	0.	0.000	1000.00	1.674
MN-54	3338.91	834.85	5.	6.	0.003	93.43	1.687s
Co-56	3386.61	846.77	30.	-7.	-0.004	113.27	1.696s
TL-208	3441.80	860.56	6.	5.	0.003	108.81	1.707s
NB-94	3483.94	871.10	13.	3.	0.002	160.62	1.715s
EU-154	3492.47	873.23	17.	-1.	0.000	641.39	1.717s
PA-234	3521.68	880.53	11.	6.	0.003	87.27	1.722s
PA-234	3532.53	883.24	17.	6.	0.003	104.55	1.724s
AG-110M	3538.30	884.68	23.	5.	0.003	133.10	1.725s
Sc-46	3556.69	889.28	61.	-12.	-0.007	96.03	1.729s
Y-88	3591.74	898.04	21.	-4.	-0.002	155.27	1.736s
AC-228	3643.88	911.07	18.	7.	0.004	139.84	1.746s
AG-110M	3749.60	937.49	15.	4.	0.002	218.66	1.766s
PA-234	3783.72	946.02	0.	10.	0.006	31.62	1.772s
EU-152	3856.11	964.11	22.	8.	0.004	90.14	1.786s
AC-228	3875.56	968.97	25.	8.	0.004	99.62	1.790s
EU-154	3985.03	996.33	21.	4.	0.002	185.64	1.810s
PA-234M	4003.71	1001.00	25.	0.	0.000	1000.00	1.814s
EU-154	4018.82	1004.77	15.	6.	0.004	94.52	1.816s
Co-56	4151.13	1037.84	16.	-5.	-0.003	187.26	1.841s
Cs-136	4192.07	1048.07	27.	-8.	-0.004	101.87	1.848s
RH-106	4201.23	1050.36	42.	-6.	-0.004	146.09	1.850s
BI-207	4254.46	1063.66	0.	14.	0.008	27.09	1.860s
Ga-68	4309.44	1077.40	11.	2.	0.001	324.82	1.870
FE-59	4396.88	1099.25	11.	1.	0.001	563.47	1.886s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	4448.20	1112.07	70.	-13.	-0.007	93.95	1.895s
ZN-65	4462.09	1115.55	57.	-11.	-0.006	102.51	1.897s
BI-214	4481.06	1120.29	67.	11.	0.006	112.81	1.901
Sc-46	4482.12	1120.55	39.	11.	0.006	82.53	1.901
Ta-182	4485.12	1121.30	35.	11.	0.006	82.61	1.901s
CO-60	4692.96	1173.24	16.	-3.	-0.002	363.22	1.938s
Ta-182	4756.25	1189.05	11.	6.	0.003	145.52	1.949
Ta-182	4885.75	1221.41	23.	-7.	-0.004	171.90	1.972s
NA-22	5098.35	1274.53	0.	6.	0.003	40.82	2.008s
EU-154	5098.39	1274.54	6.	0.	0.000	1000.00	2.008s
TL-210	5252.32	1313.00	6.	3.	0.002	176.21	2.034s
AG-110M	5537.69	1384.30	0.	5.	0.003	44.72	2.082s
EU-152	5632.56	1408.00	6.	4.	0.002	137.50	2.097s
K-40	5844.14	1460.86	8.	139.	0.077	8.96	1.453s
La-140	6385.95	1596.21	6.	-2.	-0.001	566.25	2.215s
SB-124	6765.35	1690.98	0.	0.	0.000	1000.00	2.272s
BI-214	7059.65	1764.49	25.	-7.	-0.004	68.11	2.314s
Co-56	7087.11	1771.35	35.	-11.	-0.006	83.16	2.318s
Y-88	7346.20	1836.06	6.	-3.	-0.002	195.32	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	-2.2947E+00					5.31E+01	
			477.60	-2.295E+00	?(	9.375E+00	1.20E+02	1.05E+01 G
NA-22	C	3.0646E-01					9.50E+02	
			1274.53	3.065E-01	?(	3.764E-01	4.08E+01	9.99E+01 G
K-40	N	7.4319E+01					4.66E+11	
			1460.83	7.432E+01	(P	8.421E+00	8.96E+00	1.07E+01 G
Sc-46	F	3.2600E-02					8.38E+01	
			889.28	-4.624E-01	?(	1.500E+00	9.60E+01	1.00E+02 G
			1120.55	5.276E-01	?(	1.465E+00	8.25E+01	1.00E+02 G
CR-51	F	-2.6039E+00					2.77E+01	
			320.08	-2.604E+00	&(P	1.518E+01	8.07E+01	9.94E+00 G
MN-54	C	2.1484E-01					3.12E+02	
			834.85	2.148E-01	&(	4.809E-01	9.34E+01	1.00E+02 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 9
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
FE-59	F	1.0708E-01					4.45E+01	
			1099.25	1.071E-01	&(	1.440E+00	5.63E+02	5.65E+01 G
			1291.60	7.593E-02	% P	2.200E+00	1.25E+03	4.32E+01 G
Co-56	C	-2.6563E-01					7.73E+01	
			846.77	-2.656E-01	?(P	1.049E+00	1.13E+02	9.99E+01 G
			1238.28	4.089E-02	& P	1.675E+00	1.80E+03	6.61E+01 G
			1037.84	-1.535E+00	+	6.553E+00	1.87E+02	1.41E+01 G
			1771.35	-4.671E+00	+	1.308E+01	8.32E+01	1.55E+01 A
CO-57	C	8.1354E-02					2.72E+02	
			122.06	-7.293E-02	?(	6.810E-01	2.73E+02	8.56E+01 G
			136.47	1.318E+00	?(	6.430E+00	1.44E+02	1.07E+01 G
CO-58	C	1.4401E-01					7.09E+01	
			810.78	1.440E-01	?(	8.479E-01	1.66E+02	9.95E+01 G
CO-60	F	-1.7638E-02					1.93E+03	
			1332.50	-1.764E-02	%(	9.735E-01	2.37E+03	1.00E+02 G
			1173.24	-1.594E-01	+ P	1.030E+00	3.63E+02	9.99E+01 G
ZN-65	F	-9.8827E-01					2.44E+02	
			1115.55	-9.883E-01	?(	3.435E+00	1.03E+02	5.06E+01 G
NB-94	I	9.2054E-02					7.41E+06	
			702.63	5.714E-02	?(P	1.276E+00	6.35E+02	9.79E+01 G
			871.10	1.263E-01	?(	7.309E-01	1.61E+02	9.99E+01 G
ZR-95	I	-5.1113E-01					6.40E+01	
			756.73	-5.111E-01	?(P	1.475E+00	9.84E+01	5.45E+01 G
			724.20	-5.458E-01	+	2.349E+00	1.25E+02	4.42E+01 G
NB-95	I	3.8995E-01					6.40E+01	
			765.79	3.899E-01	?(	1.110E+00	8.45E+01	9.98E+01 G
RU-103	I	6.0264E-02					3.93E+01	
			497.05	6.026E-02	?(P	6.115E-01	3.94E+02	9.09E+01 G
			610.30	0.000E+00	-	2.817E+01	1.00E+03	5.75E+00 GA
RH-106	I	-7.4424E-03					3.74E+02	
			621.92	-7.442E-03	%(P	1.654E+01	3.30E+04	9.93E+00 G
			1050.36	-1.824E+01	+	9.219E+01	1.46E+02	1.56E+00 G
			511.86	5.712E+00	?	4.485E+00	2.66E+01	2.00E+01 GA
AG-108M	C	1.6696E-01					1.53E+05	
			433.94	4.965E-02	?(P	4.157E-01	3.13E+02	9.05E+01 G
			722.94	2.838E-01	&(	9.143E-01	9.43E+01	9.08E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 10
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			614.28	0.000E+00	&	1.811E+00	1.00E+03	8.98E+01 G
AG-110M	F	4.8562E-01					2.50E+02	
			884.68	2.817E-01	?(	1.311E+00	1.33E+02	7.27E+01 G
			657.76	0.000E+00	-	8.247E-01	1.00E+03	9.46E+01 G
			937.49	4.663E-01	?(	2.420E+00	2.19E+02	3.44E+01 G
			1384.30	1.123E+00	?(	1.655E+00	4.47E+01	2.43E+01 G
			763.94	-2.304E+00	&	5.054E+00	6.63E+01	2.23E+01 G
SN-113	F	2.7816E-01					1.15E+02	
			391.69	2.782E-01	(	1.204E+00	1.26E+02	6.40E+01 G
SB-124	F	1.6433E-01					6.02E+01	
			602.73	0.000E+00	&(	1.633E+00	1.00E+03	9.83E+01 G
			1690.98	0.000E+00	?(	9.906E-01	1.00E+03	4.78E+01 G
			722.79	2.384E+00	&(	6.421E+00	7.97E+01	1.08E+01 G
SB-125	I	1.2375E+00					1.01E+03	
			427.88	4.998E-01	?(	1.238E+00	9.86E+01	2.96E+01 G
			600.50	8.527E-01	?(	8.785E+00	3.00E+02	1.79E+01 G
			635.89	3.776E+00	?(	3.636E+00	3.53E+01	1.13E+01 G
			463.37	-8.115E-01	- P	7.939E+00	1.77E+02	1.05E+01 G
I-131	I	1.2183E-01					8.02E+00	
			364.48	1.218E-01	?(	7.083E-01	2.26E+02	8.17E+01 G
			284.30	0.000E+00	-	7.935E+00	1.00E+03	6.14E+00 G
			636.97	-4.798E-01	& P	9.833E+00	7.28E+02	7.17E+00 G
Gd-153	F	4.6387E-01					2.42E+02	
			97.50	4.639E-01	?(	3.203E+00	2.05E+02	3.00E+01 G
			103.20	0.000E+00	-	4.432E+00	1.00E+03	2.18E+01 G
Ga-68	C	3.6887E+00					4.71E-02	
			1077.40	3.689E+00	?(	2.834E+01	3.25E+02	3.30E+00 G
Tc-99m	I	1.3710E-01					2.51E-01	
			140.51	1.371E-01	?(	8.302E-01	1.79E+02	8.93E+01 G
BA-133	F	-2.3666E-01					3.85E+03	
			356.00	-2.367E-01	?(	1.791E+00	2.22E+02	6.20E+01 G
			302.85	0.000E+00	+	7.151E+00	1.00E+03	1.83E+01 G
			383.84	-1.436E+00	+ P	8.907E+00	1.99E+02	8.94E+00 GA
			80.99	3.490E-01	?	1.405E+00	1.54E+02	3.41E+01 GA
CS-134	I	3.3615E-01					7.54E+02	
			795.87	3.362E-01	?(	9.279E-01	8.16E+01	8.55E+01 G
			604.71	0.000E+00	-	1.648E+00	1.00E+03	9.76E+01 G
			569.32	-1.904E+00	+	5.237E+00	8.17E+01	1.54E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 11
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	0.000E+00	-	1.118E+01	1.00E+03	8.69E+00 G
			563.24	-3.044E+00	+	1.017E+01	1.43E+02	8.35E+00 G
CS-137	I	-5.4433E-01					1.10E+04	
			661.66	-5.443E-01	&(P	1.311E+00	5.64E+01	8.52E+01 G
CE-139	F	-8.0747E-02					1.38E+02	
			165.85	-8.075E-02	&(	7.324E-01	2.64E+02	7.99E+01 G
Ba-140	I	9.3071E-01					1.28E+01	
			537.26	4.680E-01	?(P	1.417E+00	1.13E+02	2.44E+01 G
			162.66	2.745E+00	?(	8.982E+00	9.72E+01	6.22E+00 G
			304.85	0.000E+00	-	3.069E+01	1.00E+03	4.29E+00 G
La-140	I	1.1139E-01					1.28E+01	
			1596.21	-1.416E-01	?(P	9.194E-01	5.66E+02	9.54E+01 G
			487.02	6.418E-01	&(	2.481E+00	1.14E+02	4.55E+01 G
			328.76	6.083E-02	%	5.598E+00	2.67E+03	2.03E+01 G
			815.77	0.000E+00	-	3.947E+00	1.00E+03	2.33E+01 G
CE-141	I	-2.2999E-02					3.25E+01	
			145.44	-2.300E-02	&(	1.544E+00	1.96E+03	4.82E+01 G
CE-144	I	1.2566E+00					2.85E+02	
			133.54	1.257E+00	?(	5.716E+00	1.35E+02	1.11E+01 G
PM-144	C	-2.6413E-01					3.63E+02	
			696.54	-2.641E-01	?(P	1.086E+00	1.04E+02	9.90E+01 G
			618.06	0.000E+00	+	1.650E+00	1.00E+03	9.91E+01 G
EU-152	F	6.4087E-01					4.94E+03	
			121.78	-6.244E-01	?(	1.906E+00	9.11E+01	2.86E+01 G
			344.29	-2.406E-02	%	3.729E+00	4.46E+03	2.65E+01 G
			1112.07	-4.424E+00	+	1.400E+01	9.39E+01	1.36E+01 G
			778.92	-8.051E-01	+	5.571E+00	2.90E+02	1.29E+01 G
			964.11	2.242E+00	?(	6.886E+00	9.01E+01	1.46E+01 G
			244.69	2.326E+00	?(	1.060E+01	1.34E+02	7.58E+00 G
			1408.00	1.141E+00	?	3.635E+00	1.37E+02	2.10E+01 GA
EU-154	I	8.2472E-01					3.14E+03	
			123.10	3.708E-01	?(	1.210E+00	9.70E+01	4.08E+01 G
			1274.54	0.000E+00	-	2.049E+00	1.00E+03	3.52E+01 G
			723.36	1.007E-01	%	4.678E+00	1.28E+03	2.02E+01 G
			873.23	-2.774E-01	- P	6.756E+00	6.41E+02	1.23E+01 G
			1004.77	1.483E+00	?(	4.826E+00	9.45E+01	1.80E+01 G
			996.33	1.453E+00	?(	9.602E+00	1.86E+02	1.06E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 12
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	3.9274E-01					1.81E+03	
			105.31	0.000E+00	(	4.545E+00	1.00E+03	2.12E+01 G
			86.54	6.639E-01	(	2.553E+00	1.15E+02	3.07E+01 G
HF-181	F	-2.2343E-01					4.24E+01	
			482.00	-4.144E-01	?(	1.416E+00	1.01E+02	8.05E+01 G
			133.02	0.000E+00	+	1.846E+00	1.00E+03	4.33E+01 G
			345.83	4.244E-02	%	3.921E+00	3.54E+03	1.51E+01 G
			136.30	2.405E+00	?(	1.130E+01	1.39E+02	5.85E+00 G
Ta-182	F	1.5188E+00					1.14E+02	
			1121.30	1.440E+00	?(	4.004E+00	8.26E+01	3.49E+01 G
			1221.41	-1.218E+00	&	4.549E+00	1.72E+02	2.70E+01 G
			1189.05	1.689E+00	(	5.484E+00	1.46E+02	1.62E+01 G
Hg-203	F	2.5688E-01					4.66E+01	
			279.20	2.569E-01	&(P	8.371E-01	9.67E+01	8.15E+01 G
TL-208	N	8.5406E-01					6.98E+02	
			583.02	7.522E-01	(P	9.644E-01	5.53E+01	8.45E+01 G
			277.28	-2.611E+00	-	1.013E+01	1.14E+02	6.31E+00 G
			860.56	1.547E+00	?(P	4.208E+00	1.09E+02	1.24E+01 G
PM-146	C	5.9662E-02					2.02E+03	
			453.88	5.966E-02	?(	7.915E-01	5.16E+02	6.50E+01 G
			747.16	-9.895E-02	+	1.994E+00	8.00E+02	3.40E+01 G
			735.72	-9.360E-01	&	3.727E+00	1.67E+02	2.25E+01 G
Y-88	F	-2.3105E-01					1.07E+02	
			1836.06	-2.311E-01	?(	1.001E+00	1.95E+02	9.92E+01 G
			898.04	-1.578E-01	+ P	9.911E-01	1.55E+02	9.37E+01 G
Cd-113m		-3.6709E+03					5.33E+03	
			263.70	-3.671E+03	?(	1.149E+04	9.30E+01	6.00E-03 K
Cd-109	F	3.9169E+00					4.53E+02	
			88.04	3.917E+00	?(	2.428E+01	1.84E+02	3.79E+00 G
Cf-251	T	-9.8187E-01					3.28E+05	
			176.60	-9.819E-01	&(	3.202E+00	1.26E+02	1.70E+01 G
			227.00	5.028E+00	?	6.644E+00	5.47E+01	6.30E+00 GA
Cf-249	T	2.6703E-01					1.28E+05	
			387.95	0.000E+00	?(	1.270E+00	1.00E+03	6.60E+01 G
			333.44	1.403E+00	?(	5.280E+00	1.11E+02	1.55E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 13
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		-2.6818E+00					3.65E+07	
			87.57	3.967E-01	+	2.406E+00	1.80E+02	3.75E+01 GA
			64.28	-2.682E+00	&(	9.959E+00	1.11E+02	9.70E+00 G
			86.94	1.650E+00	+	9.786E+00	1.76E+02	9.04E+00 GA
PB-210	N	-4.2277E+00					8.14E+03	
			46.54	-4.228E+00	?(	2.836E+01	1.97E+02	4.25E+00 G
PB-212	N	4.4555E-01					6.98E+02	
			238.63	4.456E-01	?(	1.955E+00	1.30E+02	4.33E+01 G
			300.03	6.022E+00		3.799E+01	1.87E+02	3.28E+00 GA
PB-214	N	4.2259E+00					5.84E+05	
			351.93	4.034E+00	(P	1.214E+00	1.58E+01	3.76E+01 G
			295.09	4.600E+00	@(P	2.160E+00	2.21E+01	1.93E+01 G
			242.00	6.173E+00	P	5.398E+00	3.00E+01	7.43E+00 GA
BI-207	C	8.2559E-01					1.18E+04	
			1063.66	8.256E-01	?(P	4.374E-01	2.71E+01	7.45E+01 G
			569.70	2.388E-01	-	8.489E-01	1.04E+02	9.77E+01 G
BI-212	N	-1.0387E-01					6.98E+02	
			727.17	-1.039E-01	%(P	1.273E+01	3.37E+03	7.55E+00 G
			785.42	-2.554E+01	+ P	8.823E+01	8.64E+01	1.28E+00 GA
U-235	N	7.5933E-01					2.57E+11	
			143.79	0.000E+00	?(	6.819E+00	1.00E+03	1.10E+01 G
			205.33	2.420E+00	?(	9.042E+00	1.48E+02	5.01E+00 G
			163.38	1.370E-01	%	1.182E+01	2.48E+03	5.08E+00 G
			185.72	3.554E-01		8.709E-01	9.48E+01	5.40E+01 GA
BI-214	N	2.6999E+00					5.84E+05	
			609.31	2.515E+00	(P	1.174E+00	2.06E+01	4.61E+01 G
			1120.29	3.263E+00	?(P	1.246E+01	1.13E+02	1.51E+01 G
			1764.49	-3.010E+00	- P	1.123E+01	6.81E+01	1.54E+01 G
BI-210M	T	3.8025E-01					1.10E+09	
			265.83	3.802E-01	?(P	1.281E+00	9.97E+01	5.00E+01 G
			304.90	0.000E+00	&	4.703E+00	1.00E+03	2.80E+01 G
AC-228	N	1.3621E+00					2.10E+03	
			911.07	8.989E-01	?(P	3.062E+00	1.40E+02	2.90E+01 G
			968.97	1.805E+00	&(	6.159E+00	9.96E+01	1.75E+01 G
			338.32	1.837E+00	?(	7.355E+00	1.18E+02	1.20E+01 G
			93.35	2.620E+00		1.718E+01	1.95E+02	5.56E+00 XA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 14
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	-4.0395E+00					7.95E+03	
			256.24	-4.040E+00	?(	9.667E+00	9.71E+01	7.00E+00 G
			235.97	2.441E-03	%	8.476E+00	1.01E+05	1.23E+01 G
			50.14	2.235E+00	&	1.358E+01	1.79E+02	8.00E+00 G
TH-229	N	-1.1782E+00					2.68E+06	
			193.51	-1.178E+00	(	1.308E+01	4.41E+02	4.40E+00 G
			210.85	-5.503E+00	+	1.780E+01	1.30E+02	2.99E+00 G
TH-234	N	2.5428E+00					1.63E+12	
			92.59	2.615E+00	&(	1.683E+01	1.91E+02	5.58E+00 G
			63.29	2.437E+00	?(	2.344E+01	2.82E+02	3.81E+00 G
PA-231	N	3.1421E+00					1.20E+07	
			302.65	0.000E+00	?(	4.549E+01	1.00E+03	2.88E+00 G
			300.07	6.821E+00	(	5.191E+01	2.25E+02	2.46E+00 G
PA-234	N	1.5173E+00					1.63E+12	
			131.29	-5.917E-02	%(	4.414E+00	2.18E+03	1.80E+01 G
			946.02	3.010E+00	?(	2.219E+00	3.16E+01	1.34E+01 G
			569.47	0.000E+00	-	1.118E+01	1.00E+03	8.20E+00 G
			883.24	2.389E+00	?(	8.656E+00	1.05E+02	9.60E+00 G
			880.53	3.809E+00	?	1.140E+01	8.73E+01	6.00E+00 GA
AM-241	T	-8.2704E-01					1.58E+05	
			59.54	-8.270E-01	&(	3.153E+00	1.14E+02	3.59E+01 G
Np-237	F	1.5564E+00					2.14E+06	
			86.49	1.556E+00	?(	5.730E+00	1.10E+02	1.31E+01 G
Ir-192	F	1.1142E-01					7.40E+01	
			316.49	0.000E+00	?(	1.552E+00	1.00E+03	8.70E+01 G
			468.06	2.988E-01	?(	1.488E+00	1.44E+02	5.18E+01 G
			308.44	0.000E+00	-	4.181E+00	1.00E+03	3.18E+01 G
Cs-136	F	9.0706E-02					1.30E+01	
			818.50	0.000E+00	?(	9.212E-01	1.00E+03	1.00E+02 G
			1048.07	-4.188E-01	+	1.463E+00	1.02E+02	8.00E+01 G
			340.57	2.841E-01	?(	2.005E+00	2.06E+02	4.69E+01 G
Np-239	T	-7.7268E-01					2.36E+00	
			103.70	0.000E+00	&	4.023E+00	1.00E+03	2.40E+01 X
			106.13	-7.727E-01	?(	4.824E+00	1.86E+02	2.27E+01 G
			99.50	0.000E+00	+	6.487E+00	1.00E+03	1.50E+01 X

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 8:52:50 PMPage 15
 TestAmerica Inc                 Spectrum name: 9_Gamma_20193493.An1

 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Nd-147       1.4478E-01                                      1.11E+01
                          531.00-6.687E-01 ?(  4.436E+00 2.61E+02 1.30E+01 G
                           91.10 5.185E-01 ?(  3.273E+00 1.88E+02 2.83E+01 G

TL-210   N   1.4658E-01                                      5.84E+05
                          799.60 6.645E-02 ?(  9.501E-01 3.96E+02 9.90E+01 G
                          296.00 2.469E-01 ?(  1.523E+00 1.82E+02 7.90E+01 G
                         1313.00 8.298E-01 ?   3.436E+00 1.76E+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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


 *************** 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 %
 ____________________________________________________________________________
 PB-210      46.54       130.        -8.    -0.005   196.81  -4.228E+00
 TH-227      50.14       134.         9.     0.005   178.64   2.235E+00
 AM-241      59.54       238.       -20.    -0.011   113.77  -8.270E-01
 TH-234      63.29       168.         7.     0.004   282.06   2.437E+00
 Sn-126      64.28       204.       -19.    -0.010   110.74  -2.682E+00
 BA-133      80.99        70.        10.     0.006   154.28   3.490E-01

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 16
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Np-237	86.49	194.	18.	0.010	109.76	1.556E+00		
Sn-126	86.94	275.	13.	0.007	176.02	1.650E+00		
Sn-126	87.57	288.	13.	0.007	180.06	3.967E-01		
Cd-109	88.04	302.	13.	0.007	184.05	3.917E+00		
Nd-147	91.10	315.	14.	0.008	187.52	5.185E-01		
TH-234	92.59	329.	14.	0.008	191.16	2.615E+00		
AC-228	93.35	342.	14.	0.008	194.84	2.620E+00		
Gd-153	97.50	356.	13.	0.007	205.12	4.639E-01		
Np-239	106.13	481.	-17.	-0.009	186.20	-7.727E-01		
EU-152	121.78	112.	-17.	-0.009	91.11	-6.244E-01		
CO-57	122.06	129.	-6.	-0.003	272.69	-7.293E-02		
EU-154	123.10	90.	14.	0.008	96.95	3.708E-01		
CE-144	133.54	147.	13.	0.007	134.62	1.257E+00		
HF-181	136.30	158.	13.	0.007	139.04	2.405E+00		
CO-57	136.47	171.	13.	0.007	144.44	1.318E+00		
Tc-99m	140.51	184.	11.	0.006	178.80	1.371E-01		
Ba-140	162.66	91.	14.	0.008	97.23	2.745E+00		
CE-139	165.85	102.	-6.	-0.003	263.79	-8.075E-02		
Cf-251	176.60	81.	-14.	-0.008	125.89	-9.819E-01		
U-235	185.72	55.	15.	0.008	94.75	3.554E-01		
TH-229	193.51	80.	-4.	-0.002	440.64	-1.178E+00		
U-235	205.33	44.	9.	0.005	148.10	2.420E+00		
TH-229	210.85	60.	-12.	-0.007	129.64	-5.503E+00		
Cf-251	227.00	32.	22.	0.012	54.67	5.028E+00		
EU-152	244.69	117.	12.	0.006	134.43	2.326E+00		
TH-227	256.24	76.	-18.	-0.010	97.15	-4.040E+00		
Cd-113m	263.70	76.	-14.	-0.008	93.00	-3.671E+03		
BI-210M	265.83	64.	12.	0.007	99.68	3.802E-01		P
TL-208	277.28	60.	-10.	-0.006	114.02	-2.611E+00		
Hg-203	279.20	68.	13.	0.007	96.66	2.569E-01		P
TL-210	296.00	208.	11.	0.006	182.40	2.469E-01		
PA-231	300.07	230.	10.	0.005	224.77	6.821E+00		
CR-51	320.08	297.	-14.	-0.008	80.67	-2.604E+00		P
Cf-249	333.44	78.	12.	0.006	111.05	1.403E+00		
AC-228	338.32	89.	12.	0.006	118.13	1.837E+00		
Cs-136	340.57	101.	7.	0.004	205.95	2.841E-01		
BA-133	356.00	134.	-8.	-0.004	221.71	-2.367E-01		
I-131	364.48	32.	5.	0.003	225.98	1.218E-01		
BA-133	383.84	59.	-6.	-0.003	198.58	-1.436E+00		P
SN-113	391.69	54.	8.	0.005	126.44	2.782E-01		
SB-125	427.88	9.	7.	0.004	98.57	4.998E-01		
AG-108M	433.94	9.	2.	0.001	313.24	4.965E-02		P
PM-146	453.88	17.	2.	0.001	515.75	5.966E-02		
SB-125	463.37	49.	-4.	-0.002	177.24	-8.115E-01		P
Ir-192	468.06	40.	6.	0.004	143.91	2.988E-01		
BE-7	477.60	67.	-10.	-0.006	120.00	-2.295E+00		
HF-181	482.00	90.	-14.	-0.008	101.39	-4.144E-01		
La-140	487.02	87.	12.	0.007	114.17	6.418E-01		

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 17
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RU-103	497.05	18.	2.	0.001	394.24	6.026E-02	P
RH-106	511.86	49.	45.	0.025	26.57	5.712E+00	
Nd-147	531.00	17.	-3.	-0.002	260.77	-6.687E-01	
Ba-140	537.26	5.	4.	0.002	112.76	4.680E-01	P
CS-134	563.24	37.	-9.	-0.005	142.68	-3.044E+00	
CS-134	569.32	33.	-11.	-0.006	81.73	-1.904E+00	
TL-208	583.02	32.	23.	0.013	55.30	7.522E-01	P
SB-125	600.50	126.	5.	0.003	300.39	8.527E-01	
SB-125	635.89	6.	14.	0.008	35.35	3.776E+00	
I-131	636.97	20.	-1.	-0.001	728.05	-4.798E-01	P
CS-137	661.66	52.	-15.	-0.008	56.36	-5.443E-01	P
PM-144	696.54	44.	-8.	-0.005	104.46	-2.641E-01	P
NB-94	702.63	60.	2.	0.001	635.22	5.714E-02	P
SB-124	722.79	16.	8.	0.004	79.68	2.384E+00	
AG-108M	722.94	24.	8.	0.004	94.31	2.838E-01	
ZR-95	724.20	38.	-7.	-0.004	124.98	-5.458E-01	
PM-146	735.72	23.	-6.	-0.004	166.60	-9.360E-01	
PM-146	747.16	14.	-1.	-0.001	800.00	-9.895E-02	
ZR-95	756.73	20.	-8.	-0.005	98.39	-5.111E-01	P
AG-110M	763.94	42.	-15.	-0.008	66.33	-2.304E+00	
NB-95	765.79	40.	11.	0.006	84.51	3.899E-01	
PA-234M	766.41	44.	-6.	-0.004	152.41	-7.408E+01	
EU-152	778.92	15.	-3.	-0.002	289.64	-8.051E-01	
BI-212	785.42	40.	-9.	-0.005	86.37	-2.554E+01	P
CS-134	795.87	18.	8.	0.005	81.58	3.362E-01	
TL-210	799.60	26.	2.	0.001	396.47	6.645E-02	
CO-58	810.78	20.	4.	0.002	165.83	1.440E-01	
MN-54	834.85	5.	6.	0.003	93.43	2.148E-01	
Co-56	846.77	30.	-7.	-0.004	113.27	-2.656E-01	P
TL-208	860.56	6.	5.	0.003	108.81	1.547E+00	P
NB-94	871.10	13.	3.	0.002	160.62	1.263E-01	
EU-154	873.23	17.	-1.	0.000	641.39	-2.774E-01	P
PA-234	880.53	11.	6.	0.003	87.27	3.809E+00	
PA-234	883.24	17.	6.	0.003	104.55	2.389E+00	
AG-110M	884.68	23.	5.	0.003	133.10	2.817E-01	
Sc-46	889.28	61.	-12.	-0.007	96.03	-4.624E-01	
Y-88	898.04	21.	-4.	-0.002	155.27	-1.578E-01	P
AC-228	911.07	18.	7.	0.004	139.84	8.989E-01	P
AG-110M	937.49	15.	4.	0.002	218.66	4.663E-01	
PA-234	946.02	0.	10.	0.006	31.62	3.010E+00	
EU-152	964.11	22.	8.	0.004	90.14	2.242E+00	
AC-228	968.97	25.	8.	0.004	99.62	1.805E+00	
EU-154	996.33	21.	4.	0.002	185.64	1.453E+00	
EU-154	1004.77	15.	6.	0.004	94.52	1.483E+00	
Co-56	1037.84	16.	-5.	-0.003	187.26	-1.535E+00	
Cs-136	1048.07	27.	-8.	-0.004	101.87	-4.188E-01	
RH-106	1050.36	42.	-6.	-0.004	146.09	-1.824E+01	
Ga-68	1077.40	11.	2.	0.001	324.82	3.689E+00	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 18
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
FE-59	1099.25	11.	1.	0.001	563.47	1.071E-01		
EU-152	1112.07	70.	-13.	-0.007	93.95	-4.424E+00		
ZN-65	1115.55	57.	-11.	-0.006	102.51	-9.883E-01		
Sc-46	1120.55	39.	11.	0.006	82.53	5.276E-01		
CO-60	1173.24	16.	-3.	-0.002	363.22	-1.594E-01		P
NA-22	1274.53	0.	6.	0.003	40.82	3.065E-01		
TL-210	1313.00	6.	3.	0.002	176.21	8.298E-01		
AG-110M	1384.30	0.	5.	0.003	44.72	1.123E+00		
EU-152	1408.00	6.	4.	0.002	137.50	1.141E+00		
La-140	1596.21	6.	-2.	-0.001	566.25	-1.416E-01		P
Co-56	1771.35	35.	-11.	-0.006	83.16	-4.671E+00		
Y-88	1836.06	6.	-3.	-0.002	195.32	-2.311E-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	-2.2947E+00	-2.2947E+00	1.200E+02%	9.37E+00
NA-22	#A	3.0646E-01	3.0646E-01	4.082E+01%	3.76E-01
K-40		7.4319E+01	7.4319E+01	8.955E+00%	8.42E+00
Sc-46	#A	3.2600E-02	3.2600E-02	6.331E+01%	1.50E+00
CR-51	#A	-2.6038E+00	-2.6039E+00	8.067E+01%	1.52E+01
MN-54	#A	2.1484E-01	2.1484E-01	9.343E+01%	4.81E-01
FE-59	#A	1.0708E-01	1.0708E-01	5.635E+02%	1.44E+00
Co-56	#A	-2.6563E-01	-2.6563E-01	1.133E+02%	1.05E+00
CO-57	#A	8.1354E-02	8.1354E-02	1.444E+02%	6.81E-01
CO-58	#A	1.4401E-01	1.4401E-01	1.658E+02%	8.48E-01
CO-60	#A	-1.7638E-02	-1.7638E-02	2.375E+03%	9.74E-01
ZN-65	#A	-9.8827E-01	-9.8827E-01	1.025E+02%	3.43E+00
NB-94	#A	9.2054E-02	9.2054E-02	1.606E+02%	1.28E+00
ZR-95	#A	-5.1112E-01	-5.1113E-01	9.839E+01%	1.48E+00
NB-95	#A	3.8995E-01	3.8995E-01	8.451E+01%	1.11E+00
RU-103	#A	6.0263E-02	6.0264E-02	3.942E+02%	6.11E-01
RH-106	#A	-7.4423E-03	-7.4424E-03	3.298E+04%	1.65E+01
AG-108M	#A	1.6696E-01	1.6696E-01	9.431E+01%	4.16E-01
AG-110M	#A	4.8562E-01	4.8562E-01	4.472E+01%	1.31E+00
SN-113	#A	2.7816E-01	2.7816E-01	1.264E+02%	1.20E+00
SB-124	#A	1.6433E-01	1.6433E-01	7.968E+01%	1.63E+00
SB-125	#A	1.2375E+00	1.2375E+00	3.535E+01%	1.24E+00
I-131	#A	1.2183E-01	1.2183E-01	2.260E+02%	7.08E-01
Gd-153	#A	4.6387E-01	4.6387E-01	2.051E+02%	3.20E+00
Ga-68	#A	3.6674E+00	3.6887E+00	3.248E+02%	2.83E+01
Tc-99m	#A	1.3695E-01	1.3710E-01	1.788E+02%	8.30E-01
BA-133	#A	-2.3666E-01	-2.3666E-01	2.217E+02%	1.79E+00
CS-134	#A	3.3615E-01	3.3615E-01	8.158E+01%	9.28E-01

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:52:50 PMPage 19
TestAmerica Inc Spectrum name: 9_Gamma_20193493.An1

CS-137 #A	-5.4433E-01	-5.4433E-01	5.636E+01%	1.31E+00
CE-139 #A	-8.0747E-02	-8.0747E-02	2.638E+02%	7.32E-01
Ba-140 #A	9.3069E-01	9.3071E-01	7.444E+01%	1.42E+00
La-140 #A	1.1139E-01	1.1139E-01	1.142E+02%	9.19E-01
CE-141 #A	-2.2999E-02	-2.2999E-02	1.957E+03%	1.54E+00
CE-144 #A	1.2566E+00	1.2566E+00	1.346E+02%	5.72E+00
PM-144 #A	-2.6413E-01	-2.6413E-01	1.045E+02%	1.09E+00
EU-152 #A	6.4087E-01	6.4087E-01	6.191E+01%	1.91E+00
EU-154 #A	8.2472E-01	8.2472E-01	7.659E+01%	1.21E+00
EU-155 A	3.9274E-01	3.9274E-01	1.146E+02%	4.54E+00
HF-181 #A	-2.2342E-01	-2.2343E-01	8.604E+01%	1.42E+00
Ta-182 A	1.5188E+00	1.5188E+00	8.261E+01%	4.00E+00
Hg-203 #A	2.5688E-01	2.5688E-01	9.666E+01%	8.37E-01
TL-208 #A	8.5406E-01	8.5406E-01	5.530E+01%	9.64E-01
PM-146 #A	5.9662E-02	5.9662E-02	5.158E+02%	7.92E-01
Y-88 #A	-2.3105E-01	-2.3105E-01	1.953E+02%	1.00E+00
Cd-113m#A	-3.6709E+03	-3.6709E+03	9.300E+01%	1.15E+04
Cd-109 #A	3.9169E+00	3.9169E+00	1.840E+02%	2.43E+01
Cf-251 #A	-9.8187E-01	-9.8187E-01	1.259E+02%	3.20E+00
Cf-249 #A	2.6703E-01	2.6703E-01	1.110E+02%	1.27E+00
Sn-126 #A	-2.6818E+00	-2.6818E+00	1.107E+02%	9.96E+00
PB-210 #A	-4.2277E+00	-4.2277E+00	1.968E+02%	2.84E+01
PB-212 A	4.4555E-01	4.4555E-01	1.298E+02%	1.96E+00
PB-214	4.2259E+00	4.2259E+00	1.357E+01%	1.21E+00
BI-207 #	8.2559E-01	8.2559E-01	2.709E+01%	4.37E-01
BI-212 #A	-1.0387E-01	-1.0387E-01	3.372E+03%	1.27E+01
U-235 #A	7.5933E-01	7.5933E-01	1.481E+02%	6.82E+00
BI-214	2.6999E+00	2.6999E+00	2.064E+01%	1.17E+00
BI-210M#A	3.8025E-01	3.8025E-01	9.968E+01%	1.28E+00
AC-228 #A	1.3621E+00	1.3621E+00	6.947E+01%	3.06E+00
TH-227 #A	-4.0395E+00	-4.0395E+00	9.715E+01%	9.67E+00
TH-229 #A	-1.1782E+00	-1.1782E+00	4.406E+02%	1.31E+01
TH-234 #A	2.5428E+00	2.5428E+00	1.704E+02%	1.68E+01
PA-231 #A	3.1421E+00	3.1421E+00	2.248E+02%	4.55E+01
PA-233 #A	0.0000E+00	0.0000E+00	7.071E+02%	3.72E+00
PA-234 #A	1.5173E+00	1.5173E+00	3.162E+01%	4.41E+00
PA-234M#A	0.0000E+00	0.0000E+00	1.000E+03%	1.31E+02
AM-241 #A	-8.2704E-01	-8.2704E-01	1.138E+02%	3.15E+00
Np-237 #A	1.5564E+00	1.5564E+00	1.098E+02%	5.73E+00
Ir-192 #A	1.1142E-01	1.1142E-01	1.439E+02%	1.55E+00
Cs-136 #A	9.0704E-02	9.0706E-02	2.060E+02%	9.21E-01
Np-239 #A	-7.7259E-01	-7.7268E-01	1.862E+02%	4.82E+00
Nd-147 #A	1.4478E-01	1.4478E-01	1.606E+02%	4.44E+00
TL-210 #A	1.4658E-01	1.4658E-01	1.824E+02%	9.50E-01
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%	2.84E+02

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```
     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 8:52:50 PMPage 20
TestAmerica Inc                 Spectrum name: 9_Gamma_20193493.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 (   25.1 to  1999.3 keV)     8.124E+01  Bq/Sample
Total Decayed Activity (   25.1 to  1999.3 keV) 8.1244797E+01  Bq/Sample
```

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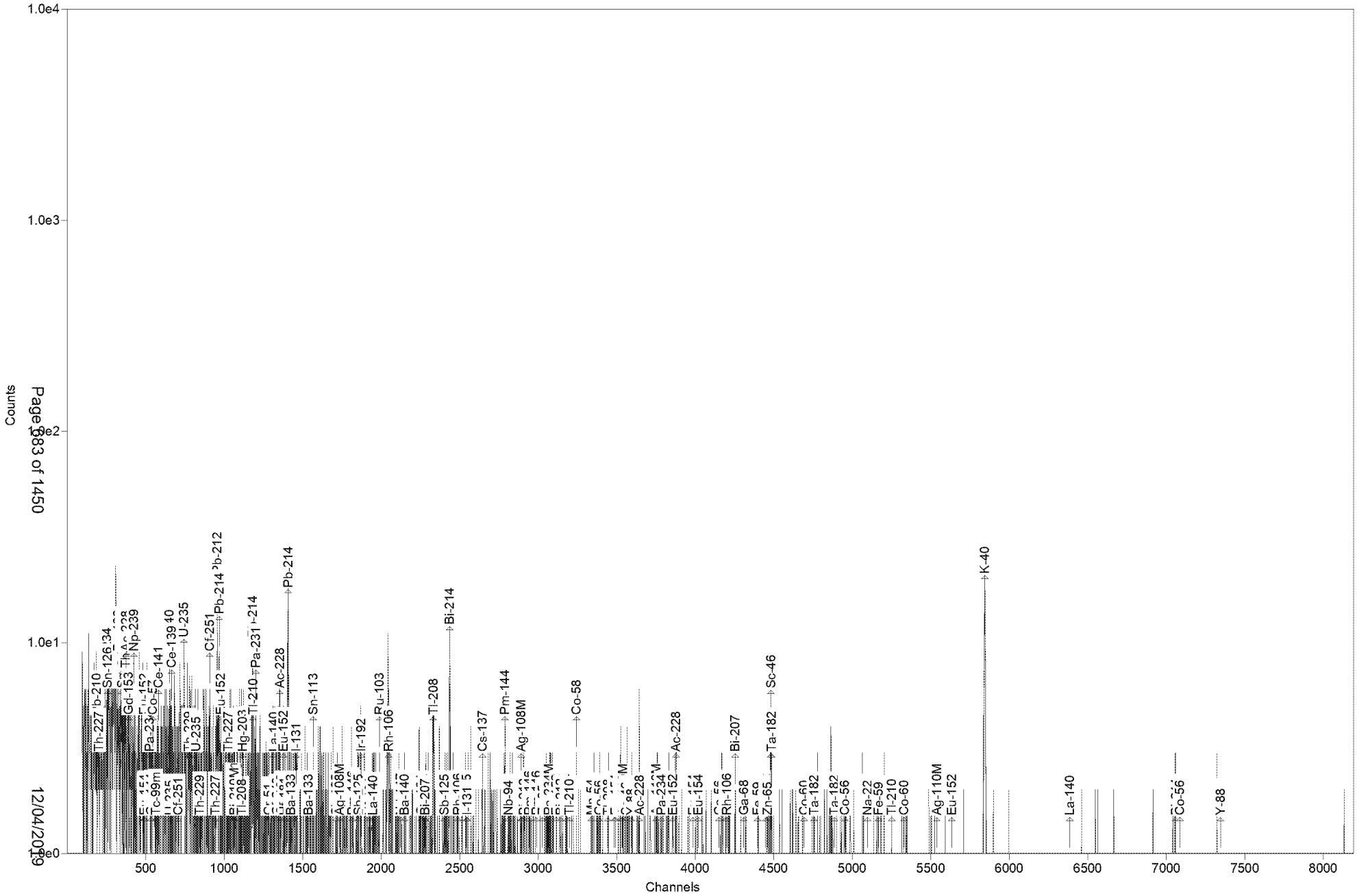
448571_Gamma_160-36160-A-1-E DU. 9_Gamma_20193493.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193348

Sample Description: 448571_Gamma_160-36160-A-2-C
Detector: Detector #12
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-2-C

Decay to Time: 11/23/2019 20:23 Live Time: 1800 sec
Acquisition Time: 11/23/2019 20:23:13 Real Time: 1801 sec
Analysis Time: 11/23/2019 20:53 Dead Time: 0.06 %
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_2019-11-10_1422.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	1.730E+00	195.5	3.381E+00	3.382E+00	1.174E+01
NA-22	4.215E-01	40.8	1.721E-01	1.733E-01	5.177E-01
K-40	1.047E+02	8.4	8.754E+00	1.023E+01	5.395E+00
Sc-46	-4.405E-01	130.2	5.733E-01	5.738E-01	1.966E+00
CR-51	-3.283E+00	182.9	6.005E+00	6.007E+00	2.024E+01
MN-54	4.113E-01	35.4	1.454E-01	1.469E-01	3.789E-01
FE-59	4.446E-01	232.7	1.035E+00	1.035E+00	2.373E+00
Co-56	-1.559E-01	332.8	5.188E-01	5.188E-01	1.224E+00
CO-57	-2.070E-01	136.3	2.822E-01	2.824E-01	9.557E-01
CO-58	2.803E-01	89.4	2.507E-01	2.511E-01	8.639E-01
CO-60	0.000E+00	1.#INF	7.266E-02	7.267E-02	5.355E-01
ZN-65	-1.821E+00	80.2	1.461E+00	1.464E+00	4.889E+00
NB-94	4.248E-01	30.2	1.281E-01	1.299E-01	7.855E-01
ZR-95	4.982E-01	121.8	6.070E-01	6.076E-01	1.490E+00
NB-95	5.889E-01	88.7	5.224E-01	5.233E-01	1.760E+00
RU-103	7.736E-02	484.8	3.750E-01	3.750E-01	9.879E-01
RH-106	7.065E+00	95.8	6.768E+00	6.778E+00	2.168E+01
AG-108M	2.743E-01	77.8	2.135E-01	2.140E-01	8.258E-01
AG-110M	4.345E-01	37.8	1.642E-01	1.657E-01	2.113E+00
SN-113	4.263E-01	125.2	5.336E-01	5.341E-01	1.821E+00
SB-124	1.927E-01	37.8	7.283E-02	7.349E-02	2.909E+00
SB-125	8.108E-01	93.3	7.567E-01	7.578E-01	3.083E+00
I-131	-2.934E-02	109.2	3.203E-02	3.206E-02	1.042E+00
Gd-153	-1.509E-01	652.3	9.841E-01	9.841E-01	3.366E+00
Ga-68	1.391E+01	91.4	1.271E+01	1.274E+01	2.940E+01
Tc-99m	-1.763E-01	265.6	4.684E-01	4.685E-01	1.580E+00
BA-133	-5.018E-01	149.3	7.490E-01	7.494E-01	2.538E+00
CS-134	1.595E-01	97.7	1.559E-01	1.561E-01	1.735E+00
CS-137	2.579E-01	114.1	2.943E-01	2.946E-01	1.031E+00
CE-139	3.063E-02	934.5	2.862E-01	2.862E-01	9.949E-01
Ba-140	6.983E-01	190.7	1.331E+00	1.332E+00	2.981E+00
La-140	-1.204E+00	79.6	9.589E-01	9.610E-01	1.979E+00
CE-141	4.634E-01	171.3	7.938E-01	7.941E-01	2.672E+00

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CE-144	-2.138E+00	158.2	3.382E+00	3.384E+00	1.137E+01
PM-144	3.189E-01	105.0	3.348E-01	3.352E-01	9.176E-01
EU-152	3.490E-02	101.4	3.538E-02	3.543E-02	2.692E+00
EU-154	6.286E-01	110.9	6.968E-01	6.975E-01	1.891E+00
EU-155	2.947E-01	203.7	6.004E-01	6.006E-01	4.744E+00
HF-181	-2.011E-01	91.4	1.839E-01	1.841E-01	1.774E+00
Ta-182	1.670E+00	90.6	1.513E+00	1.515E+00	6.298E+00
Hg-203	3.063E-01	102.4	3.138E-01	3.142E-01	1.064E+00
TL-208	5.578E-01	119.7	6.679E-01	6.685E-01	1.491E+00
PM-146	8.426E-01	28.9	2.432E-01	2.469E-01	1.078E+00
Y-88	8.427E-02	238.8	2.013E-01	2.013E-01	7.036E-01
Cd-113m	-5.721E+03	93.9	5.374E+03	5.384E+03	1.804E+04
Cd-109	4.019E+00	216.6	8.704E+00	8.707E+00	2.948E+01
Cf-251	-1.484E+00	112.4	1.669E+00	1.671E+00	4.314E+00
Cf-249	3.169E-01	121.1	3.839E-01	3.842E-01	1.323E+00
Sn-126	-9.992E-01	390.4	3.901E+00	3.902E+00	1.329E+01
PB-210	9.016E+00	98.1	8.846E+00	8.864E+00	2.800E+01
PB-212	3.848E+00	15.3	5.870E-01	6.204E-01	1.448E+00
PB-214	4.931E+00	15.9	7.855E-01	8.243E-01	1.610E+00
BI-207	-5.485E-02	1120.3	6.145E-01	6.145E-01	1.475E+00
BI-212	-4.313E+00	115.2	4.968E+00	4.973E+00	1.713E+01
U-235	-6.120E-01	334.9	2.050E+00	2.050E+00	1.284E+01
BI-214	6.661E+00	14.0	9.357E-01	9.953E-01	1.410E+00
BI-210M	3.420E-02	1820.0	6.224E-01	6.224E-01	2.166E+00
AC-228	4.564E+00	24.2	1.105E+00	1.129E+00	3.919E+00
TH-227	2.108E+00	102.2	2.155E+00	2.158E+00	8.971E+00
TH-229	3.472E+00	125.7	4.365E+00	4.368E+00	1.451E+01
TH-234	7.564E+00	51.6	3.900E+00	3.922E+00	1.283E+01
PA-231	0.000E+00	1.#INF	3.347E+00	3.347E+00	5.850E+01
PA-233	0.000E+00	1.#INF	4.222E-01	4.222E-01	4.789E+00
PA-234	3.193E+00	25.8	8.225E-01	8.386E-01	5.010E+00
PA-234M	2.706E+01	139.2	3.765E+01	3.768E+01	2.007E+02
AM-241	7.193E-01	133.8	9.627E-01	9.636E-01	3.253E+00
Np-237	1.168E+00	198.7	2.320E+00	2.321E+00	7.869E+00
Ir-192	0.000E+00	1.#INF	1.515E-01	1.515E-01	2.002E+00
Cs-136	4.486E-02	541.8	2.431E-01	2.431E-01	9.239E-01
Np-239	6.240E-01	140.1	8.745E-01	8.753E-01	2.981E+00
Nd-147	8.208E-01	134.4	1.103E+00	1.104E+00	5.545E+00
TL-210	2.861E-01	96.8	2.770E-01	2.775E-01	1.333E+00
Kr-85	-5.590E+00	2100.0	1.174E+02	1.174E+02	4.089E+02
Total	2.195E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 8:53:22 PMPage  1
TestAmerica Inc                 Spectrum name: 12_Gamma_20193348.An1

Sample description
     448571_Gamma_160-36160-A-2-C


Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193348.An1

Acquisition information
       Start time:                 11/23/2019 8:23:13 PM
       Live time:               1800
       Real time:               1801
       Dead time:                  0.06 %
       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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:53:22 PMPage 2
TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11/23/2019 8:23:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-11-10_1422.PBC 11/10/2019 2:22:07 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1939

***** 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
46.77	45.	23.57	0.92	1.829E-02	46.54	4.250	PBC<MDA	PB210
50.14	5.	336.81	0.85	2.193E-02	50.14	8.000	PBC<MDA	TH227
59.54	13.	133.84	0.86	2.817E-02	59.54	35.900	PBC<MDA	AM241
63.00	23.	66.98	0.89	2.978E-02	63.29	3.810	PBC<MDA	TH234
74.82	55.	21.07	0.88	3.332E-02				
77.10	68.	20.24	0.88	3.385E-02				
80.99	7.	201.54	0.89	3.466E-02	80.99	34.060	PBC<MDA	BA133
87.28	38.	41.66	0.55	3.571E-02	86.49	13.100	4.587E+00	Np237
					86.54	30.700	1.957E+00	EU155
					86.94	9.040	6.635E+00	Sn126
					87.57	37.500	1.595E+00	Sn126
88.37	10.	216.59	0.89	3.582E-02	88.04	3.790	PBC<MDA	Cd109
91.10	12.	189.41	0.90	3.621E-02	91.10	28.300	PBC<MDA	Nd147
92.68	18.	78.40	0.90	3.637E-02	92.59	5.584	PBC<MDA	TH234
93.44	12.	190.31	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
106.13	10.	140.15	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
123.10	12.	130.65	0.93	3.721E-02	123.10	40.790	PBC<MDA	EU154
133.02	13.	167.17	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
143.79	-4.	334.87	0.95	3.599E-02	143.79	10.960	PBC<MDA	U235
145.44	14.	171.29	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
162.66	4.	380.79	0.97	3.435E-02	162.66	6.220	PBC<MDA	Ba140
165.85	2.	934.52	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
185.72	15.	88.49	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
193.51	5.	290.93	1.00	3.140E-02	193.51	4.400	PBC<MDA	TH229
202.57	18.	28.05	0.48	3.055E-02				
210.85	9.	125.71	1.02	2.980E-02	210.85	2.990	PBC<MDA	TH229
235.97	10.	190.60	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:53:22 PMPage 3
TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
238.48	85.	16.12	0.89	2.744E-02	238.63	43.300	3.953E+00	PB212
241.89	15.	60.35	1.05	2.716E-02	242.00	7.430	PBC<MDA	PB214
244.69	12.	180.17	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152
256.24	11.	102.25	1.06	2.608E-02	256.24	7.000	PBC<MDA	TH227
279.20	11.	102.45	1.09	2.449E-02	279.20	81.460	PBC<MDA	Hg203
284.30	7.	134.42	1.09	2.416E-02	284.30	6.140	PBC<MDA	I131
295.00	37.	29.34	0.89	2.350E-02	295.09	19.300	4.570E+00	PB214
296.00	5.	434.60	1.10	2.345E-02	296.00	79.000	PBC<MDA	TL210
338.16	40.	24.20	1.89	2.118E-02	338.32	12.010	8.844E+00	AC228
340.57	2.	541.85	1.15	2.108E-02	340.57	46.900	PBC<MDA	Cs136
345.83	8.	150.36	1.15	2.083E-02	345.83	15.070	PBC<MDA	HF181
351.80	71.	15.93	1.21	2.055E-02	351.93	37.600	5.116E+00	PB214
383.84	9.	109.63	1.19	1.923E-02	383.84	8.940	PBC<MDA	BA133
387.95	7.	121.13	1.19	1.907E-02	387.95	66.000	PBC<MDA	Cf249
391.69	9.	125.17	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
433.94	8.	115.02	1.24	1.751E-02	433.94	90.480	PBC<MDA	AG108M
453.88	9.	95.81	1.26	1.692E-02	453.88	65.000	PBC<MDA	PM146
463.37	9.	93.33	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
477.60	5.	195.46	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
487.02	1.	797.48	1.29	1.604E-02	487.02	45.500	PBC<MDA	La140
497.05	2.	484.77	1.30	1.580E-02	497.05	90.900	PBC<MDA	RU103
511.86	42.	29.23	2.56	1.546E-02	511.86	20.000	7.488E+00	RH106
531.00	4.	190.67	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
537.26	4.	190.67	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
563.24	7.	97.72	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.32	2.	361.66	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	7.909E-01	PA234
					569.70	97.740	6.637E-02	BI207
569.47	4.	152.48	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.819E+00	PA234
					569.70	97.740	1.527E-01	BI207
583.02	11.	119.74	1.38	1.403E-02	583.02	84.500	PBC<MDA	TL208
609.23	77.	14.05	1.12	1.358E-02	609.31	46.090	6.833E+00	BI214
618.06	10.	129.97	1.41	1.344E-02	618.06	99.100	PBC<MDA	PM144
621.92	11.	138.64	1.42	1.338E-02	621.92	9.930	PBC<MDA	RH106
657.76	7.	85.41	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
661.66	5.	114.13	1.45	1.279E-02	661.66	85.210	PBC<MDA	CS137
696.54	5.	164.92	1.49	1.232E-02	696.54	99.000	PBC<MDA	PM144
702.63	6.	121.84	1.49	1.224E-02	702.63	97.900	PBC<MDA	NB94
722.79	5.	84.91	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.681E-01	AG108M
					723.36	20.220	1.205E+00	EU154
722.94	5.	104.94	1.51	1.199E-02	722.79	10.810	2.253E+00	SB124
					722.94	90.840	2.681E-01	AG108M
					723.36	20.220	1.205E+00	EU154
723.36	3.	197.68	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.608E-01	AG108M
					723.36	20.220	7.227E-01	EU154

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TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
735.72	12.	28.87	1.52	1.184E-02	735.72	22.500	2.502E+00	PM146
747.16	4.	184.30	1.53	1.171E-02	747.16	34.000	PBC<MDA	PM146
756.73	6.	121.84	1.54	1.160E-02	756.73	54.460	PBC<MDA	ZR95
765.79	12.	88.70	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	2.000E+02	PA234M
766.41	6.	139.15	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.041E+02	PA234M
785.42	2.	396.48	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
799.60	8.	96.82	1.58	1.115E-02	799.60	98.960	PBC<MDA	TL210
810.78	6.	89.43	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58
815.77	6.	107.45	1.60	1.099E-02	815.77	23.280	PBC<MDA	La140
834.85	8.	35.36	1.61	1.081E-02	834.85	99.980	4.113E-01	MN54
860.56	2.	354.73	1.64	1.057E-02	860.56	12.420	PBC<MDA	TL208
871.10	11.	30.15	1.65	1.048E-02	871.10	99.890	5.837E-01	NB94
880.53	7.	37.65	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
883.24	24.	25.76	1.66	1.038E-02	883.24	9.600	1.335E+01	PA234
898.04	3.	238.82	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
911.40	19.	50.35	1.68	1.015E-02	911.07	29.000	PBC<MDA	AC228
946.02	6.	92.00	1.72	9.873E-03	946.02	13.400	PBC<MDA	PA234
969.16	10.	110.97	1.74	9.703E-03	968.97	17.460	PBC<MDA	AC228
1004.77	3.	233.33	1.77	9.450E-03	1004.77	18.010	PBC<MDA	EU154
1050.36	6.	132.23	1.81	9.147E-03	1050.36	1.560	PBC<MDA	RH106
1077.40	6.	91.39	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1099.25	4.	232.74	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1119.82	15.	92.89	1.87	8.722E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	9.268E-01	Sc46
1120.55	2.	483.82	1.87	8.721E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	1.566E-01	Sc46
					1121.30	34.900	4.488E-01	Ta182
1121.30	11.	90.59	1.87	8.716E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	2.059E+00	Ta182
1189.05	2.	324.82	1.93	8.342E-03	1189.05	16.200	PBC<MDA	Ta182
1221.41	6.	96.69	1.96	8.175E-03	1221.41	27.000	PBC<MDA	Ta182
1274.53	6.	40.82	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.197E+00	EU154
1384.30	7.	37.80	2.10	7.423E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	2.	304.14	2.12	7.324E-03	1408.00	21.005	PBC<MDA	EU152
1460.85	143.	8.36	1.43	7.112E-03	1460.83	10.670	1.047E+02	K40
1690.98	7.	37.80	2.35	6.302E-03	1690.98	47.790	PBC<MDA	SB124
1766.05	22.	21.32	2.40	6.075E-03	1764.49	15.400	1.306E+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
298.82	74.82	39.	55.	1.655E+03	21.07	0.880	- sD

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TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
307.94	77.10	60.	68.	2.009E+03	20.24	0.882	- sD
348.79	87.28	48.	36.	1.002E+03	32.12	0.893	- sD
809.54	202.57	3.	18.	5.891E+02	28.05	0.482	- 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

********** 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	186.71	46.77	60.	12.	0.007	98.12	0.919
TH-227	200.18	50.14	159.	5.	0.003	336.81	0.855s
AM-241	237.74	59.54	147.	13.	0.007	133.84	0.865s
TH-234	251.57	63.00	74.	23.	0.013	66.98	0.893
Sn-126	256.71	64.28	208.	-5.	-0.003	390.44	0.869
BA-133	323.50	80.99	67.	7.	0.004	201.54	0.887s
Np-237	345.49	86.49	185.	10.	0.005	198.71	0.892
EU-155	345.70	86.54	194.	10.	0.005	203.72	0.892s
Sn-126	347.29	86.94	204.	10.	0.005	208.61	0.892
Sn-126	349.81	87.57	214.	10.	0.005	213.26	0.893
Cd-109	351.68	88.04	221.	10.	0.005	216.59	0.894s
Nd-147	363.92	91.10	272.	12.	0.007	189.41	0.897s
TH-234	369.87	92.59	90.	18.	0.010	78.40	0.898D
AC-228	372.91	93.35	276.	12.	0.007	190.31	0.899s
Gd-153	389.50	97.50	190.	-3.	-0.002	652.35	0.903s
Np-239	397.50	99.50	193.	0.	0.000	1000.00	0.905s
Gd-153	412.29	103.20	193.	0.	0.000	1000.00	0.909s
Np-239	414.29	103.70	193.	0.	0.000	1000.00	0.909s
EU-155	420.73	105.31	193.	0.	0.000	1000.00	0.911s
Np-239	424.00	106.13	84.	10.	0.005	140.15	0.912s
EU-152	486.56	121.78	110.	-15.	-0.008	101.39	0.928s
CO-57	487.69	122.06	125.	-12.	-0.007	136.33	0.928s
EU-154	491.84	123.10	110.	12.	0.006	130.65	0.929s
PA-234	524.60	131.29	150.	-13.	-0.007	136.09	0.938s
HF-181	531.51	133.02	232.	13.	0.007	167.17	0.939s
CE-144	533.57	133.54	299.	-16.	-0.009	158.18	0.940s
HF-181	544.61	136.30	315.	-16.	-0.009	161.66	0.943s
CO-57	545.30	136.47	330.	-16.	-0.009	165.55	0.943s
Tc-99m	561.44	140.51	346.	-10.	-0.006	265.60	0.947s
U-235	574.53	143.79	360.	-4.	-0.002	334.87	0.950s
CE-141	581.15	145.44	298.	14.	0.008	171.29	0.952s
Ba-140	649.99	162.66	114.	4.	0.002	380.79	0.969s

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TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
U-235	652.87	163.38	118.	0.	0.000	1000.00	0.970s
CE-139	662.76	165.85	98.	2.	0.001	934.52	0.973s
Cf-251	705.72	176.60	77.	-15.	-0.008	112.45	0.983s
U-235	742.18	185.72	53.	15.	0.008	88.49	0.992s
TH-229	773.32	193.51	51.	5.	0.003	290.93	1.000s
TH-229	842.65	210.85	37.	9.	0.005	125.71	1.018s
Cf-251	907.22	227.00	40.	-3.	-0.002	360.62	1.034s
TH-227	943.09	235.97	186.	10.	0.006	190.60	1.043s
PB-212	953.73	238.63	37.	82.	0.046	15.26	1.045D
PB-214	967.18	242.00	33.	15.	0.008	60.35	1.049D
EU-152	977.96	244.69	211.	12.	0.006	180.17	1.051s
TH-227	1024.13	256.24	33.	11.	0.006	102.25	1.063
Cd-113m	1053.96	263.70	102.	-16.	-0.009	93.94	1.070s
TL-208	1108.27	277.28	64.	-8.	-0.004	145.77	1.084s
Hg-203	1115.93	279.20	58.	11.	0.006	102.45	1.086s
I-131	1136.32	284.30	26.	7.	0.004	134.42	1.091s
PB-214	1179.10	295.00	25.	37.	0.021	29.34	0.892
TL-210	1183.11	296.00	203.	5.	0.003	434.60	1.102s
PB-212	1199.22	300.03	208.	0.	0.000	1000.00	1.106
PA-231	1199.38	300.07	208.	0.	0.000	1000.00	1.106s
PA-233	1199.82	300.18	208.	0.	0.000	1000.00	1.107s
PA-231	1209.70	302.65	208.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	208.	0.	0.000	1000.00	1.109s
Ba-140	1218.49	304.85	208.	0.	0.000	1000.00	1.111s
BI-210M	1218.68	304.90	208.	0.	0.000	1000.00	1.111s
Ir-192	1232.85	308.44	208.	0.	0.000	1000.00	1.115
PA-233	1247.13	312.01	208.	0.	0.000	1000.00	1.118s
Ir-192	1265.04	316.49	208.	0.	0.000	1000.00	1.123s
CR-51	1279.41	320.08	275.	-13.	-0.007	182.91	1.126s
La-140	1314.10	328.76	86.	-14.	-0.008	99.74	1.135s
Cf-249	1332.81	333.44	84.	-3.	-0.002	391.25	1.139s
AC-228	1351.67	338.16	12.	40.	0.023	24.20	1.887s
Cs-136	1361.32	340.57	90.	2.	0.001	541.85	1.146s
EU-152	1376.18	344.29	138.	-13.	-0.007	128.45	1.150
HF-181	1382.35	345.83	68.	8.	0.004	150.36	1.151s
PB-214	1406.24	351.80	18.	71.	0.040	15.93	1.212
BA-133	1423.02	356.00	140.	-11.	-0.006	149.25	1.162s
I-131	1456.95	364.48	36.	-7.	-0.004	172.02	1.170s
BA-133	1534.35	383.84	47.	9.	0.005	109.63	1.189s
Cf-249	1550.79	387.95	34.	7.	0.004	121.13	1.193s
SN-113	1565.74	391.69	63.	9.	0.005	125.17	1.196s
AG-108M	1734.69	433.94	20.	8.	0.004	115.02	1.238s
PM-146	1814.45	453.88	16.	9.	0.005	95.81	1.257s
SB-125	1852.39	463.37	29.	9.	0.005	93.33	1.266s
Ir-192	1871.16	468.06	45.	-5.	-0.003	209.12	1.271s
BE-7	1909.29	477.60	52.	5.	0.003	195.46	1.280s
HF-181	1926.90	482.00	70.	-12.	-0.007	104.00	1.284s
La-140	1946.98	487.02	68.	1.	0.001	797.48	1.289s

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TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RU-103	1987.11	497.05	24.	2.	0.001	484.77	1.298s
RH-106	2046.35	511.86	53.	42.	0.023	29.23	2.563
Nd-147	2122.88	531.00	13.	4.	0.002	190.67	1.331s
Ba-140	2147.92	537.26	13.	4.	0.002	190.67	1.337s
CS-134	2251.82	563.24	9.	7.	0.004	97.72	1.362s
CS-134	2276.15	569.32	17.	2.	0.001	361.66	1.367s
PA-234	2276.75	569.47	15.	4.	0.002	152.48	1.368s
BI-207	2277.68	569.70	24.	-4.	-0.002	173.90	1.368s
TL-208	2330.96	583.02	39.	11.	0.006	119.74	1.381s
SB-125	2400.87	600.50	225.	-14.	-0.008	156.75	1.397s
SB-124	2409.79	602.73	211.	-14.	-0.008	151.81	1.399s
CS-134	2417.71	604.71	198.	-14.	-0.008	146.74	1.401s
BI-214	2435.78	609.23	8.	77.	0.043	14.05	1.120
RU-103	2440.06	610.30	184.	-14.	-0.008	141.20	1.406s
AG-108M	2455.99	614.28	170.	-14.	-0.008	135.62	1.410s
PM-144	2471.12	618.06	77.	10.	0.005	129.97	1.414
RH-106	2486.54	621.92	111.	11.	0.006	138.64	1.417s
SB-125	2542.43	635.89	21.	-1.	0.000	972.11	1.430s
I-131	2546.77	636.97	32.	-9.	-0.005	91.33	1.432s
AG-110M	2629.92	657.76	15.	7.	0.004	85.41	1.451s
CS-137	2645.51	661.66	14.	5.	0.003	114.13	1.455
PM-144	2785.05	696.54	14.	5.	0.003	164.92	1.487s
NB-94	2809.41	702.63	9.	6.	0.003	121.84	1.493s
SB-124	2890.04	722.79	7.	5.	0.003	84.91	1.512s
AG-108M	2890.65	722.94	13.	5.	0.003	104.94	1.512s
EU-154	2892.34	723.36	18.	3.	0.002	197.68	1.512s
BI-212	2907.58	727.17	29.	-7.	-0.004	115.18	1.516s
PM-146	2941.78	735.72	0.	12.	0.007	28.87	1.524s
PM-146	2987.55	747.16	9.	4.	0.002	184.30	1.535s
ZR-95	3025.83	756.73	9.	6.	0.003	121.84	1.543s
AG-110M	3054.69	763.94	52.	-16.	-0.009	68.08	1.550s
NB-95	3062.08	765.79	52.	12.	0.007	88.70	1.552s
PA-234M	3064.57	766.41	36.	6.	0.004	139.15	1.552s
EU-152	3114.61	778.92	19.	-2.	-0.001	555.34	1.564s
BI-212	3140.62	785.42	9.	2.	0.001	396.48	1.570s
CS-134	3182.43	795.87	34.	-3.	-0.002	280.87	1.579s
TL-210	3197.35	799.60	26.	8.	0.004	96.82	1.583s
CS-134	3206.76	801.95	49.	-12.	-0.007	85.36	1.585s
CO-58	3242.06	810.78	10.	6.	0.003	89.43	1.593s
La-140	3262.05	815.77	15.	6.	0.003	107.45	1.598s
Cs-136	3272.97	818.50	11.	0.	0.000	1000.00	1.600s
MN-54	3338.38	834.85	0.	8.	0.004	35.36	1.615s
Co-56	3386.08	846.77	20.	-3.	-0.002	332.78	1.626s
TL-208	3441.27	860.56	10.	2.	0.001	354.73	1.638s
NB-94	3483.41	871.10	0.	11.	0.006	30.15	1.648s
EU-154	3491.95	873.23	24.	-8.	-0.005	92.31	1.650s
PA-234	3521.16	880.53	0.	7.	0.004	37.65	1.657s
PA-234	3532.00	883.24	7.	24.	0.013	25.76	1.659s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	3537.78	884.68	31.	0.	0.000	1000.00	1.660s
Sc-46	3556.17	889.28	53.	-8.	-0.005	130.15	1.664s
Y-88	3591.22	898.04	10.	3.	0.002	238.82	1.672s
AC-228	3643.36	911.07	15.	19.	0.011	50.35	1.684s
AG-110M	3749.09	937.49	25.	-13.	-0.007	88.99	1.708s
PA-234	3783.21	946.02	5.	6.	0.003	92.00	1.716s
EU-152	3855.60	964.11	52.	-10.	-0.006	102.35	1.732
AC-228	3875.05	968.97	55.	10.	0.005	110.97	1.736
PA-234M	4003.22	1001.00	31.	0.	0.000	1000.00	1.765s
EU-154	4018.33	1004.77	23.	3.	0.002	233.33	1.768s
Co-56	4150.66	1037.84	11.	-2.	-0.001	452.11	1.798s
Cs-136	4191.60	1048.07	25.	-6.	-0.004	119.21	1.807s
RH-106	4200.76	1050.36	27.	6.	0.003	132.23	1.809s
Ga-68	4308.98	1077.40	5.	6.	0.004	91.39	1.833s
FE-59	4396.44	1099.25	16.	4.	0.002	232.74	1.852s
EU-152	4447.76	1112.07	75.	-14.	-0.008	88.51	1.863s
ZN-65	4461.66	1115.55	61.	-15.	-0.008	80.21	1.866s
BI-214	4480.63	1120.29	84.	15.	0.008	92.89	1.870s
Sc-46	4481.68	1120.55	69.	2.	0.001	483.82	1.870s
Ta-182	4484.69	1121.30	46.	11.	0.006	90.59	1.871s
Ta-182	4755.86	1189.05	11.	2.	0.001	324.82	1.930s
Ta-182	4885.39	1221.41	6.	6.	0.004	96.69	1.957s
Co-56	4952.92	1238.28	34.	-17.	-0.009	84.95	1.972s
NA-22	5098.03	1274.53	0.	6.	0.003	40.82	2.003s
EU-154	5098.08	1274.54	6.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	6.	-1.	0.000	846.32	2.017s
TL-210	5252.04	1313.00	11.	-4.	-0.002	188.42	2.036s
CO-60	5330.11	1332.50	0.	0.	0.000	1000.00	2.052s
AG-110M	5537.48	1384.30	0.	7.	0.004	37.80	2.096s
EU-152	5632.39	1408.00	6.	2.	0.001	304.14	2.115s
K-40	5843.98	1460.85	0.	143.	0.079	8.36	1.429s
La-140	6386.02	1596.21	18.	-14.	-0.008	79.63	2.269s
SB-124	6765.58	1690.98	0.	7.	0.004	37.80	2.345s
BI-214	7060.00	1764.49	0.	22.	0.012	21.32	2.403s
Co-56	7087.48	1771.35	22.	0.	0.000	1000.00	2.408s
Y-88	7346.69	1836.06	0.	0.	0.000	1000.00	2.459s

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

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TestAmerica Inc Spectrum name: 12_Gamma_20193348.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
BE-7	C	1.7298E+00					5.31E+01		
			477.60	1.730E+00	?(	1.174E+01	1.95E+02	1.05E+01	G
NA-22	C	4.2145E-01					9.50E+02		
			1274.53	4.215E-01	?(	5.177E-01	4.08E+01	9.99E+01	G
K-40	N	1.0469E+02					4.66E+11		
			1460.83	1.047E+02	(	5.395E+00	8.36E+00	1.07E+01	G
Sc-46	F	-4.4051E-01					8.38E+01		
			889.28	-4.405E-01	?(	1.966E+00	1.30E+02	1.00E+02	G
			1120.55	1.566E-01	+	2.647E+00	4.84E+02	1.00E+02	G
CR-51	F	-3.2830E+00					2.77E+01		
			320.08	-3.283E+00	?(	2.024E+01	1.83E+02	9.94E+00	G
MN-54	C	4.1130E-01					3.12E+02		
			834.85	4.113E-01	?(	3.789E-01	3.54E+01	1.00E+02	G
FE-59	F	4.4465E-01					4.45E+01		
			1099.25	4.446E-01	&(	2.373E+00	2.33E+02	5.65E+01	G
			1291.60	-1.094E-01	-	2.266E+00	8.46E+02	4.32E+01	G
Co-56	C	-1.5589E-01					7.73E+01		
			846.77	-1.559E-01	?(	1.224E+00	3.33E+02	9.99E+01	G
			1238.28	-1.747E+00	+	3.106E+00	8.49E+01	6.61E+01	G
			1037.84	-7.101E-01	+	7.639E+00	4.52E+02	1.41E+01	G
			1771.35	0.000E+00	+	1.456E+01	1.00E+03	1.55E+01	A
CO-57	C	-2.0697E-01					2.72E+02		
			122.06	-2.070E-01	?(	9.557E-01	1.36E+02	8.56E+01	G
			136.47	-2.238E+00	&	1.245E+01	1.66E+02	1.07E+01	G
CO-58	C	2.8030E-01					7.09E+01		
			810.78	2.803E-01	?(	8.639E-01	8.94E+01	9.95E+01	G
ZN-65	F	-1.8212E+00					2.44E+02		
			1115.55	-1.821E+00	?(	4.889E+00	8.02E+01	5.06E+01	G
NB-94	I	4.2479E-01					7.41E+06		
			702.63	2.627E-01	&(	7.855E-01	1.22E+02	9.79E+01	G
			871.10	5.837E-01	?(	3.911E-01	3.02E+01	9.99E+01	G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:53:22 PMPage 10
TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
ZR-95	I	4.9822E-01					6.40E+01	
			756.73	4.982E-01	?(	1.490E+00	1.22E+02	5.45E+01 G
			724.20	-1.002E-07	%	2.528E+00	6.80E+08	4.42E+01 G
NB-95	I	5.8893E-01					6.40E+01	
			765.79	5.889E-01	?(	1.760E+00	8.87E+01	9.98E+01 G
RU-103	I	7.7361E-02					3.93E+01	
			497.05	7.736E-02	?(	9.879E-01	4.85E+02	9.09E+01 G
			610.30	-9.848E+00	+	4.691E+01	1.41E+02	5.75E+00 GA
RH-106	I	7.0650E+00					3.74E+02	
			621.92	4.607E+00	?(	2.168E+01	1.39E+02	9.93E+00 G
			1050.36	2.271E+01	&(	1.045E+02	1.32E+02	1.56E+00 G
			511.86	7.488E+00	?	6.603E+00	2.92E+01	2.00E+01 GA
AG-108M	C	2.7431E-01					1.53E+05	
			433.94	2.805E-01	?(	8.258E-01	1.15E+02	9.05E+01 G
			722.94	2.681E-01	?(	9.814E-01	1.05E+02	9.08E+01 G
			614.28	-6.350E-01	+	2.905E+00	1.36E+02	8.98E+01 G
AG-110M	F	4.3449E-01					2.50E+02	
			884.68	0.000E+00	?(	2.113E+00	1.00E+03	7.27E+01 G
			657.76	3.261E-01	?(	9.487E-01	8.54E+01	9.46E+01 G
			937.49	-2.115E+00	+	4.231E+00	8.90E+01	3.44E+01 G
			1384.30	2.157E+00	?(	2.271E+00	3.78E+01	2.43E+01 G
			763.94	-3.499E+00	+	7.893E+00	6.81E+01	2.23E+01 G
SN-113	F	4.2633E-01					1.15E+02	
			391.69	4.263E-01	?(	1.821E+00	1.25E+02	6.40E+01 G
SB-124	F	1.9270E-01					6.02E+01	
			602.73	-5.682E-01	?(	2.909E+00	1.52E+02	9.83E+01 G
			1690.98	1.291E+00	?(	1.359E+00	3.78E+01	4.78E+01 G
			722.79	2.252E+00	?(	6.568E+00	8.49E+01	1.08E+01 G
SB-125	I	8.1079E-01					1.01E+03	
			427.88	1.061E-01	%(	3.083E+00	1.11E+03	2.96E+01 G
			600.50	-3.113E+00	+	1.645E+01	1.57E+02	1.79E+01 G
			635.89	-2.487E-01	+	8.915E+00	9.72E+02	1.13E+01 G
			463.37	2.803E+00	&(	8.902E+00	9.33E+01	1.05E+01 G
I-131	I	-2.9339E-02					8.02E+00	
			364.48	-2.379E-01	?(	1.042E+00	1.72E+02	8.17E+01 G
			284.30	2.746E+00	?(	9.855E+00	1.34E+02	6.14E+00 G
			636.97	-5.500E+00	+	1.705E+01	9.13E+01	7.17E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:53:22 PMPage 11
TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Gd-153	F	-1.5086E-01					2.42E+02	
			97.50	-1.509E-01	&(	3.366E+00	6.52E+02	3.00E+01 G
			103.20	0.000E+00	+	4.624E+00	1.00E+03	2.18E+01 G
Ga-68	C	1.3911E+01					4.71E-02	
			1077.40	1.391E+01	?(	2.940E+01	9.14E+01	3.30E+00 G
Tc-99m	I	-1.7634E-01					2.51E-01	
			140.51	-1.763E-01	&(	1.580E+00	2.66E+02	8.93E+01 G
BA-133	F	-5.0181E-01					3.85E+03	
			356.00	-5.018E-01	?(	2.538E+00	1.49E+02	6.20E+01 G
			302.85	0.000E+00	+	9.196E+00	1.00E+03	1.83E+01 G
			383.84	2.985E+00	&	1.116E+01	1.10E+02	8.94E+00 GA
			80.99	3.451E-01	?	1.918E+00	2.02E+02	3.41E+01 GA
CS-134	I	1.5949E-01					7.54E+02	
			795.87	-1.742E-01	?(	1.735E+00	2.81E+02	8.55E+01 G
			604.71	-5.740E-01	+	2.841E+00	1.47E+02	9.76E+01 G
			569.32	4.216E-01	?(	5.593E+00	3.62E+02	1.54E+01 G
			801.95	-7.081E+00	+	2.033E+01	8.54E+01	8.69E+00 G
			563.24	3.095E+00	&(	7.594E+00	9.77E+01	8.35E+00 G
CS-137	I	2.5786E-01					1.10E+04	
			661.66	2.579E-01	&(	1.031E+00	1.14E+02	8.52E+01 G
CE-139	F	3.0629E-02					1.38E+02	
			165.85	3.063E-02	(	9.949E-01	9.35E+02	7.99E+01 G
Ba-140	I	6.9832E-01					1.28E+01	
			537.26	6.112E-01	?(	2.981E+00	1.91E+02	2.44E+01 G
			162.66	1.040E+00	&(	1.364E+01	3.81E+02	6.22E+00 G
			304.85	0.000E+00	&	3.949E+01	1.00E+03	4.29E+00 G
La-140	I	-1.2042E+00					1.28E+01	
			1596.21	-1.204E+00	?(	1.979E+00	7.96E+01	9.54E+01 G
			487.02	1.123E-01	+	3.141E+00	7.97E+02	4.55E+01 G
			328.76	-1.727E+00	&	5.805E+00	9.97E+01	2.03E+01 G
			815.77	1.206E+00	+	4.513E+00	1.07E+02	2.33E+01 G
CE-141	I	4.6341E-01					3.25E+01	
			145.44	4.634E-01	&(	2.672E+00	1.71E+02	4.82E+01 G
CE-144	I	-2.1380E+00					2.85E+02	
			133.54	-2.138E+00	?(	1.137E+01	1.58E+02	1.11E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:53:22 PMPage 12
TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-144	C 3.1889E-01					3.63E+02	
		696.54	2.277E-01	?(	9.176E-01	1.65E+02	9.90E+01 G
		618.06	4.099E-01	?(	1.815E+00	1.30E+02	9.91E+01 G
EU-152	F 3.4899E-02					4.94E+03	
		121.78	-7.893E-01	?(	2.692E+00	1.01E+02	2.86E+01 G
		344.29	-1.330E+00	&	5.769E+00	1.28E+02	2.65E+01 G
		1112.07	-6.728E+00	+	2.000E+01	8.85E+01	1.36E+01 G
		778.92	-6.297E-01	+	8.631E+00	5.55E+02	1.29E+01 G
		964.11	-4.101E+00	+	1.425E+01	1.02E+02	1.46E+01 G
		244.69	3.142E+00	(	1.914E+01	1.80E+02	7.58E+00 G
		1408.00	7.223E-01	?	5.101E+00	3.04E+02	2.10E+01 GA
EU-154	I 6.2858E-01					3.14E+03	
		123.10	4.271E-01	?(	1.891E+00	1.31E+02	4.08E+01 G
		1274.54	0.000E+00	-	2.818E+00	1.00E+03	3.52E+01 G
		723.36	7.227E-01	?(	5.133E+00	1.98E+02	2.02E+01 G
		873.23	-3.512E+00	+	1.105E+01	9.23E+01	1.23E+01 G
		1004.77	9.793E-01	?(	8.180E+00	2.33E+02	1.80E+01 G
		996.33	-2.756E-01	%	1.568E+01	1.57E+03	1.06E+01 G
EU-155	I 2.9474E-01					1.81E+03	
		105.31	0.000E+00	?(	4.744E+00	1.00E+03	2.12E+01 G
		86.54	4.983E-01	?(	3.441E+00	2.04E+02	3.07E+01 G
HF-181	F -2.0115E-01					4.24E+01	
		482.00	-5.040E-01	?(	1.774E+00	1.04E+02	8.05E+01 G
		133.02	4.561E-01	+	2.572E+00	1.67E+02	4.33E+01 G
		345.83	1.417E+00	?(	7.301E+00	1.50E+02	1.51E+01 G
		136.30	-4.084E+00	&	2.220E+01	1.62E+02	5.85E+00 G
Ta-182	F 1.6700E+00					1.14E+02	
		1121.30	2.059E+00	&(	6.298E+00	9.06E+01	3.49E+01 G
		1221.41	1.594E+00	?(	3.474E+00	9.67E+01	2.70E+01 G
		1189.05	9.592E-01	?(	7.371E+00	3.25E+02	1.62E+01 G
Hg-203	F 3.0631E-01					4.66E+01	
		279.20	3.063E-01	@(	1.064E+00	1.02E+02	8.15E+01 G
TL-208	N 5.5778E-01					6.98E+02	
		583.02	5.154E-01	(	1.491E+00	1.20E+02	8.45E+01 G
		277.28	-2.861E+00	+	1.430E+01	1.46E+02	6.31E+00 G
		860.56	8.461E-01	?(	7.380E+00	3.55E+02	1.24E+01 G
PM-146	C 8.4263E-01					2.02E+03	
		453.88	4.413E-01	&(	1.078E+00	9.58E+01	6.50E+01 G
		747.16	5.116E-01	?(	2.365E+00	1.84E+02	3.40E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:53:22 PMPage 13
TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			735.72	2.502E+00	?(	1.537E+00	2.89E+01	2.25E+01 G
Y-88	F	8.4268E-02					1.07E+02	
			1836.06	0.000E+00	?(	7.036E-01	1.00E+03	9.92E+01 G
			898.04	1.735E-01	?(	1.009E+00	2.39E+02	9.37E+01 G
Cd-113m		-5.7209E+03					5.33E+03	
			263.70	-5.721E+03	&(	1.804E+04	9.39E+01	6.00E-03 K
Cd-109	F	4.0187E+00					4.53E+02	
			88.04	4.019E+00	?(	2.948E+01	2.17E+02	3.79E+00 G
Cf-251	T	-1.4843E+00					3.28E+05	
			176.60	-1.484E+00	?(	4.314E+00	1.12E+02	1.70E+01 G
			227.00	-1.036E+00	+	1.004E+01	3.61E+02	6.30E+00 GA
Cf-249	T	3.1691E-01					1.28E+05	
			387.95	3.169E-01	?(	1.323E+00	1.21E+02	6.60E+01 G
			333.44	-5.584E-01	+	7.581E+00	3.91E+02	1.55E+01 G
Sn-126		-9.9915E-01					3.65E+07	
			87.57	4.067E-01		2.938E+00	2.13E+02	3.75E+01 GA
			64.28	-9.992E-01	(	1.329E+01	3.90E+02	9.70E+00 G
			86.94	1.690E+00		1.195E+01	2.09E+02	9.04E+00 GA
PB-210	N	9.0159E+00					8.14E+03	
			46.54	9.016E+00	(P	2.800E+01	9.81E+01	4.25E+00 G
PB-212	N	3.8479E+00					6.98E+02	
			238.63	3.848E+00	(P	1.448E+00	1.53E+01	4.33E+01 G
			300.03	0.000E+00	-	5.103E+01	1.00E+03	3.28E+00 GA
PB-214	N	4.9306E+00					5.84E+05	
			351.93	5.116E+00	(P	1.610E+00	1.59E+01	3.76E+01 G
			295.09	4.570E+00	(P	3.168E+00	2.93E+01	1.93E+01 G
			242.00	4.107E+00		8.124E+00	6.03E+01	7.43E+00 GA
BI-207	C	-5.4853E-02					1.18E+04	
			1063.66	-5.485E-02	%(	1.475E+00	1.12E+03	7.45E+01 G
			569.70	-1.659E-01	+	1.020E+00	1.74E+02	9.77E+01 G
BI-212	N	-4.3133E+00					6.98E+02	
			727.17	-4.313E+00	?(	1.713E+01	1.15E+02	7.55E+00 G
			785.42	6.405E+00		6.512E+01	3.96E+02	1.28E+00 GA
U-235	N	-6.1204E-01					2.57E+11	
			143.79	-6.120E-01	?(P	1.284E+01	3.35E+02	1.10E+01 G
			205.33	6.100E-02	%	1.575E+01	7.34E+03	5.01E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:53:22 PMPage 14
TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			163.38	0.000E+00	+	1.701E+01	1.00E+03	5.08E+00 G
			185.72	4.818E-01	* P	1.168E+00	8.85E+01	5.40E+01 GA
BI-214	N	6.6608E+00					5.84E+05	
			609.31	6.833E+00	(	1.410E+00	1.40E+01	4.61E+01 G
			1120.29	6.136E+00	?(	1.916E+01	9.29E+01	1.51E+01 G
			1764.49	1.306E+01	&	4.376E+00	2.13E+01	1.54E+01 G
BI-210M	T	3.4200E-02					1.10E+09	
			265.83	3.420E-02	%(	2.166E+00	1.82E+03	5.00E+01 G
			304.90	0.000E+00	&	6.051E+00	1.00E+03	2.80E+01 G
AC-228	N	4.5640E+00					2.10E+03	
			911.07	3.587E+00	?(	3.919E+00	5.03E+01	2.90E+01 G
			968.97	3.242E+00	?(P	1.222E+01	1.11E+02	1.75E+01 G
			338.32	8.844E+00	*(	4.043E+00	2.42E+01	1.20E+01 G
			93.35	3.424E+00	?	2.198E+01	1.90E+02	5.56E+00 XA
TH-227	N	2.1077E+00					7.95E+03	
			256.24	3.348E+00	?(	8.971E+00	1.02E+02	7.00E+00 G
			235.97	1.675E+00	?(	1.082E+01	1.91E+02	1.23E+01 G
			50.14	1.689E+00	?(	1.944E+01	3.37E+02	8.00E+00 G
TH-229	N	3.4720E+00					2.68E+06	
			193.51	1.876E+00	?(	1.451E+01	2.91E+02	4.40E+00 G
			210.85	5.820E+00	?(	1.929E+01	1.26E+02	2.99E+00 G
TH-234	N	7.5637E+00					1.63E+12	
			92.59	4.949E+00	(P	1.283E+01	7.84E+01	5.58E+00 G
			63.29	1.140E+01	(P	2.092E+01	6.70E+01	3.81E+00 G
PA-234	N	3.1925E+00					1.63E+12	
			131.29	-1.089E+00	&(	5.010E+00	1.36E+02	1.80E+01 G
			946.02	2.506E+00	?(	5.513E+00	9.20E+01	1.34E+01 G
			569.47	1.819E+00	?(	9.898E+00	1.52E+02	8.20E+00 G
			883.24	1.335E+01	?(	8.414E+00	2.58E+01	9.60E+00 G
			880.53	6.282E+00	?	6.562E+00	3.76E+01	6.00E+00 GA
PA-234M	N	2.7060E+01					1.63E+12	
			1001.00	0.000E+00	?(	2.007E+02	1.00E+03	8.37E-01 G
			766.41	1.041E+02	?(	5.020E+02	1.39E+02	2.94E-01 G
AM-241	T	7.1926E-01					1.58E+05	
			59.54	7.193E-01	?(	3.253E+00	1.34E+02	3.59E+01 G
Np-237	F	1.1676E+00					2.14E+06	
			86.49	1.168E+00	(	7.869E+00	1.99E+02	1.31E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 8:53:22 PMPage 15
TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cs-136	F 4.4862E-02					1.30E+01	
		818.50	0.000E+00	?(	9.239E-01	1.00E+03	1.00E+02 G
		1048.07	-4.800E-01	+	1.983E+00	1.19E+02	8.00E+01 G
		340.57	1.405E-01	?(	2.644E+00	5.42E+02	4.69E+01 G
Np-239	T 6.2400E-01					2.36E+00	
		103.70	0.000E+00	-	4.198E+00	1.00E+03	2.40E+01 X
		106.13	6.240E-01	&(	2.981E+00	1.40E+02	2.27E+01 G
		99.50	0.000E+00	&	6.757E+00	1.00E+03	1.50E+01 X
Nd-147	8.2082E-01					1.11E+01	
		531.00	1.137E+00	?(	5.545E+00	1.91E+02	1.30E+01 G
		91.10	6.757E-01	?(	4.317E+00	1.89E+02	2.83E+01 G
TL-210	N 2.8613E-01					5.84E+05	
		799.60	4.028E-01	?(	1.333E+00	9.68E+01	9.90E+01 G
		296.00	1.400E-01	?(	2.074E+00	4.35E+02	7.90E+01 G
		1313.00	-1.482E+00	+	6.293E+00	1.88E+02	2.10E+01 GA
Kr-85	I -5.5898E+00					3.92E+03	
		513.98	-5.590E+00	%(	4.089E+02	2.10E+03	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

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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	
TH-227	50.14	159.	5.	0.003	336.81	1.689E+00	
AM-241	59.54	147.	13.	0.007	133.84	7.193E-01	
BA-133	80.99	67.	7.	0.004	201.54	3.451E-01	
EU-155	86.54	194.	10.	0.005	203.72	4.983E-01	
Nd-147	91.10	272.	12.	0.007	189.41	6.757E-01	
Gd-153	97.50	190.	-3.	-0.002	652.35	-1.509E-01	
Np-239	106.13	84.	10.	0.005	140.15	6.240E-01	
EU-152	121.78	110.	-15.	-0.008	101.39	-7.893E-01	
CO-57	122.06	125.	-12.	-0.007	136.33	-2.070E-01	
EU-154	123.10	110.	12.	0.006	130.65	4.271E-01	
PA-234	131.29	150.	-13.	-0.007	136.09	-1.089E+00	
HF-181	133.02	232.	13.	0.007	167.17	4.561E-01	
CE-144	133.54	299.	-16.	-0.009	158.18	-2.138E+00	
HF-181	136.30	315.	-16.	-0.009	161.66	-4.084E+00	
CO-57	136.47	330.	-16.	-0.009	165.55	-2.238E+00	
Tc-99m	140.51	346.	-10.	-0.006	265.60	-1.763E-01	
U-235	143.79	360.	-4.	-0.002	334.87	-6.120E-01	P
CE-141	145.44	298.	14.	0.008	171.29	4.634E-01	
Ba-140	162.66	114.	4.	0.002	380.79	1.040E+00	
CE-139	165.85	98.	2.	0.001	934.52	3.063E-02	
Cf-251	176.60	77.	-15.	-0.008	112.45	-1.484E+00	
U-235	185.72	53.	15.	0.008	88.49	4.818E-01	P
TH-229	193.51	51.	5.	0.003	290.93	1.876E+00	
TH-229	210.85	37.	9.	0.005	125.71	5.820E+00	
Cf-251	227.00	40.	-3.	-0.002	360.62	-1.036E+00	
TH-227	235.97	186.	10.	0.006	190.60	1.675E+00	
EU-152	244.69	211.	12.	0.006	180.17	3.142E+00	
TH-227	256.24	33.	11.	0.006	102.25	3.348E+00	
Cd-113m	263.70	102.	-16.	-0.009	93.94	-5.721E+03	
TL-208	277.28	64.	-8.	-0.004	145.77	-2.861E+00	
Hg-203	279.20	58.	11.	0.006	102.45	3.063E-01	
I-131	284.30	26.	7.	0.004	134.42	2.746E+00	
TL-210	296.00	203.	5.	0.003	434.60	1.400E-01	
CR-51	320.08	275.	-13.	-0.007	182.91	-3.283E+00	
La-140	328.76	86.	-14.	-0.008	99.74	-1.727E+00	
Cf-249	333.44	84.	-3.	-0.002	391.25	-5.584E-01	
Cs-136	340.57	90.	2.	0.001	541.85	1.405E-01	
EU-152	344.29	138.	-13.	-0.007	128.45	-1.330E+00	
HF-181	345.83	68.	8.	0.004	150.36	1.417E+00	
BA-133	356.00	140.	-11.	-0.006	149.25	-5.018E-01	
I-131	364.48	36.	-7.	-0.004	172.02	-2.379E-01	
BA-133	383.84	47.	9.	0.005	109.63	2.985E+00	

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TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-249	387.95	34.	7.	0.004	121.13	3.169E-01	
SN-113	391.69	63.	9.	0.005	125.17	4.263E-01	
AG-108M	433.94	20.	8.	0.004	115.02	2.805E-01	
PM-146	453.88	16.	9.	0.005	95.81	4.413E-01	
SB-125	463.37	29.	9.	0.005	93.33	2.803E+00	
Ir-192	468.06	45.	-5.	-0.003	209.12	-3.009E-01	
BE-7	477.60	52.	5.	0.003	195.46	1.730E+00	
HF-181	482.00	70.	-12.	-0.007	104.00	-5.040E-01	
La-140	487.02	68.	1.	0.001	797.48	1.123E-01	
RU-103	497.05	24.	2.	0.001	484.77	7.736E-02	
RH-106	511.86	53.	42.	0.023	29.23	7.488E+00	
Nd-147	531.00	13.	4.	0.002	190.67	1.137E+00	
Ba-140	537.26	13.	4.	0.002	190.67	6.112E-01	
CS-134	563.24	9.	7.	0.004	97.72	3.095E+00	
CS-134	569.32	17.	2.	0.001	361.66	4.216E-01	
PA-234	569.47	15.	4.	0.002	152.48	1.819E+00	
BI-207	569.70	24.	-4.	-0.002	173.90	-1.659E-01	
TL-208	583.02	39.	11.	0.006	119.74	5.154E-01	
SB-125	600.50	225.	-14.	-0.008	156.75	-3.113E+00	
SB-124	602.73	211.	-14.	-0.008	151.81	-5.682E-01	
CS-134	604.71	198.	-14.	-0.008	146.74	-5.740E-01	
RU-103	610.30	184.	-14.	-0.008	141.20	-9.848E+00	
AG-108M	614.28	170.	-14.	-0.008	135.62	-6.350E-01	
PM-144	618.06	77.	10.	0.005	129.97	4.099E-01	
RH-106	621.92	111.	11.	0.006	138.64	4.607E+00	
SB-125	635.89	21.	-1.	0.000	972.11	-2.487E-01	
I-131	636.97	32.	-9.	-0.005	91.33	-5.500E+00	
AG-110M	657.76	15.	7.	0.004	85.41	3.261E-01	
CS-137	661.66	14.	5.	0.003	114.13	2.579E-01	
PM-144	696.54	14.	5.	0.003	164.92	2.277E-01	
NB-94	702.63	9.	6.	0.003	121.84	2.627E-01	
SB-124	722.79	7.	5.	0.003	84.91	2.252E+00	
AG-108M	722.94	13.	5.	0.003	104.94	2.681E-01	
EU-154	723.36	18.	3.	0.002	197.68	7.227E-01	
BI-212	727.17	29.	-7.	-0.004	115.18	-4.313E+00	
PM-146	735.72	0.	12.	0.007	28.87	2.502E+00	
PM-146	747.16	9.	4.	0.002	184.30	5.116E-01	
ZR-95	756.73	9.	6.	0.003	121.84	4.982E-01	
AG-110M	763.94	52.	-16.	-0.009	68.08	-3.499E+00	
NB-95	765.79	52.	12.	0.007	88.70	5.889E-01	
PA-234M	766.41	36.	6.	0.004	139.15	1.041E+02	
EU-152	778.92	19.	-2.	-0.001	555.34	-6.297E-01	
BI-212	785.42	9.	2.	0.001	396.48	6.405E+00	
CS-134	795.87	34.	-3.	-0.002	280.87	-1.742E-01	
TL-210	799.60	26.	8.	0.004	96.82	4.028E-01	
CS-134	801.95	49.	-12.	-0.007	85.36	-7.081E+00	
CO-58	810.78	10.	6.	0.003	89.43	2.803E-01	
La-140	815.77	15.	6.	0.003	107.45	1.206E+00	

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TestAmerica Inc Spectrum name: 12_Gamma_20193348.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	846.77	20.	-3.	-0.002	332.78	-1.559E-01	
TL-208	860.56	10.	2.	0.001	354.73	8.461E-01	
NB-94	871.10	0.	11.	0.006	30.15	5.837E-01	
EU-154	873.23	24.	-8.	-0.005	92.31	-3.512E+00	
PA-234	880.53	0.	7.	0.004	37.65	6.282E+00	
PA-234	883.24	7.	24.	0.013	25.76	1.335E+01	
Sc-46	889.28	53.	-8.	-0.005	130.15	-4.405E-01	
Y-88	898.04	10.	3.	0.002	238.82	1.735E-01	
AG-110M	937.49	25.	-13.	-0.007	88.99	-2.115E+00	
PA-234	946.02	5.	6.	0.003	92.00	2.506E+00	
EU-152	964.11	52.	-10.	-0.006	102.35	-4.101E+00	
EU-154	1004.77	23.	3.	0.002	233.33	9.793E-01	
Co-56	1037.84	11.	-2.	-0.001	452.11	-7.101E-01	
Cs-136	1048.07	25.	-6.	-0.004	119.21	-4.800E-01	
RH-106	1050.36	27.	6.	0.003	132.23	2.271E+01	
Ga-68	1077.40	5.	6.	0.004	91.39	1.391E+01	
FE-59	1099.25	16.	4.	0.002	232.74	4.446E-01	
EU-152	1112.07	75.	-14.	-0.008	88.51	-6.728E+00	
ZN-65	1115.55	61.	-15.	-0.008	80.21	-1.821E+00	
Sc-46	1120.55	69.	2.	0.001	483.82	1.566E-01	
Ta-182	1121.30	46.	11.	0.006	90.59	2.059E+00	
Ta-182	1189.05	11.	2.	0.001	324.82	9.592E-01	
Ta-182	1221.41	6.	6.	0.004	96.69	1.594E+00	
Co-56	1238.28	34.	-17.	-0.009	84.95	-1.747E+00	
NA-22	1274.53	0.	6.	0.003	40.82	4.215E-01	
FE-59	1291.60	6.	-1.	0.000	846.32	-1.094E-01	
TL-210	1313.00	11.	-4.	-0.002	188.42	-1.482E+00	
AG-110M	1384.30	0.	7.	0.004	37.80	2.157E+00	
EU-152	1408.00	6.	2.	0.001	304.14	7.223E-01	
La-140	1596.21	18.	-14.	-0.008	79.63	-1.204E+00	
SB-124	1690.98	0.	7.	0.004	37.80	1.291E+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	1.7298E+00	1.7298E+00	1.955E+02%	1.17E+01
NA-22	#A	4.2145E-01	4.2145E-01	4.082E+01%	5.18E-01
K-40		1.0469E+02	1.0469E+02	8.362E+00%	5.40E+00
Sc-46	#A	-4.4051E-01	-4.4051E-01	1.302E+02%	1.97E+00
CR-51	#A	-3.2830E+00	-3.2830E+00	1.829E+02%	2.02E+01
MN-54	#	4.1130E-01	4.1130E-01	3.536E+01%	3.79E-01
FE-59	#A	4.4464E-01	4.4465E-01	2.327E+02%	2.37E+00
Co-56	#A	-1.5589E-01	-1.5589E-01	3.328E+02%	1.22E+00
CO-57	#A	-2.0697E-01	-2.0697E-01	1.363E+02%	9.56E-01

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CO-58	#A	2.8030E-01	2.8030E-01	8.943E+01%	8.64E-01
CO-60	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.36E-01
ZN-65	#A	-1.8212E+00	-1.8212E+00	8.021E+01%	4.89E+00
NB-94	#A	4.2479E-01	4.2479E-01	3.015E+01%	7.86E-01
ZR-95	#A	4.9822E-01	4.9822E-01	1.218E+02%	1.49E+00
NB-95	#A	5.8893E-01	5.8893E-01	8.870E+01%	1.76E+00
RU-103	#A	7.7361E-02	7.7361E-02	4.848E+02%	9.88E-01
RH-106	#A	7.0650E+00	7.0650E+00	9.580E+01%	2.17E+01
AG-108M	#A	2.7431E-01	2.7431E-01	7.785E+01%	8.26E-01
AG-110M	#A	4.3449E-01	4.3449E-01	3.780E+01%	2.11E+00
SN-113	#A	4.2633E-01	4.2633E-01	1.252E+02%	1.82E+00
SB-124	#A	1.9270E-01	1.9270E-01	3.780E+01%	2.91E+00
SB-125	#A	8.1079E-01	8.1079E-01	9.333E+01%	3.08E+00
I-131	#A	-2.9339E-02	-2.9339E-02	1.092E+02%	1.04E+00
Gd-153	#A	-1.5086E-01	-1.5086E-01	6.523E+02%	3.37E+00
Ga-68	#A	1.3880E+01	1.3911E+01	9.139E+01%	2.94E+01
Tc-99m	#A	-1.7627E-01	-1.7634E-01	2.656E+02%	1.58E+00
BA-133	#A	-5.0181E-01	-5.0181E-01	1.493E+02%	2.54E+00
CS-134	#A	1.5949E-01	1.5949E-01	9.772E+01%	1.73E+00
CS-137	#A	2.5786E-01	2.5786E-01	1.141E+02%	1.03E+00
CE-139	#A	3.0629E-02	3.0629E-02	9.345E+02%	9.95E-01
Ba-140	#A	6.9832E-01	6.9832E-01	1.907E+02%	2.98E+00
La-140	#A	-1.2042E+00	-1.2042E+00	7.963E+01%	1.98E+00
CE-141	#A	4.6340E-01	4.6341E-01	1.713E+02%	2.67E+00
CE-144	#A	-2.1380E+00	-2.1380E+00	1.582E+02%	1.14E+01
PM-144	#A	3.1889E-01	3.1889E-01	1.050E+02%	9.18E-01
EU-152	#A	3.4899E-02	3.4899E-02	1.014E+02%	2.69E+00
EU-154	#A	6.2858E-01	6.2858E-01	1.109E+02%	1.89E+00
EU-155	#A	2.9474E-01	2.9474E-01	2.037E+02%	4.74E+00
HF-181	#A	-2.0114E-01	-2.0115E-01	9.141E+01%	1.77E+00
Ta-182	#A	1.6700E+00	1.6700E+00	9.059E+01%	6.30E+00
Hg-203	#A	3.0631E-01	3.0631E-01	1.024E+02%	1.06E+00
TL-208	#A	5.5778E-01	5.5778E-01	1.197E+02%	1.49E+00
PM-146	#A	8.4263E-01	8.4263E-01	2.887E+01%	1.08E+00
Y-88	#A	8.4268E-02	8.4268E-02	2.388E+02%	7.04E-01
Cd-113m	#A	-5.7209E+03	-5.7209E+03	9.394E+01%	1.80E+04
Cd-109	#A	4.0187E+00	4.0187E+00	2.166E+02%	2.95E+01
Cf-251	#A	-1.4843E+00	-1.4843E+00	1.124E+02%	4.31E+00
Cf-249	#A	3.1691E-01	3.1691E-01	1.211E+02%	1.32E+00
Sn-126	A	-9.9915E-01	-9.9915E-01	3.904E+02%	1.33E+01
PB-210	A	9.0159E+00	9.0159E+00	9.812E+01%	2.80E+01
PB-212		3.8479E+00	3.8479E+00	1.526E+01%	1.45E+00
PB-214		4.9306E+00	4.9306E+00	1.593E+01%	1.61E+00
BI-207	#A	-5.4853E-02	-5.4853E-02	1.120E+03%	1.48E+00
BI-212	#A	-4.3133E+00	-4.3133E+00	1.152E+02%	1.71E+01
U-235	#A	-6.1204E-01	-6.1204E-01	3.349E+02%	1.28E+01
BI-214		6.6608E+00	6.6608E+00	1.405E+01%	1.41E+00
BI-210M	#A	3.4200E-02	3.4200E-02	1.820E+03%	2.17E+00
AC-228	#	4.5640E+00	4.5640E+00	2.420E+01%	3.92E+00

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TH-227	#A	2.1077E+00	2.1077E+00	1.022E+02%	8.97E+00
TH-229	#A	3.4720E+00	3.4720E+00	1.257E+02%	1.45E+01
TH-234	A	7.5637E+00	7.5637E+00	5.156E+01%	1.28E+01
PA-231	#A	0.0000E+00	0.0000E+00	7.071E+02%	5.85E+01
PA-233	#A	0.0000E+00	0.0000E+00	7.071E+02%	4.79E+00
PA-234	#A	3.1925E+00	3.1925E+00	2.576E+01%	5.01E+00
PA-234M	#A	2.7060E+01	2.7060E+01	1.392E+02%	2.01E+02
AM-241	#A	7.1926E-01	7.1926E-01	1.338E+02%	3.25E+00
Np-237	A	1.1676E+00	1.1676E+00	1.987E+02%	7.87E+00
Ir-192	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.00E+00
Cs-136	#A	4.4861E-02	4.4862E-02	5.418E+02%	9.24E-01
Np-239	#A	6.2398E-01	6.2400E-01	1.401E+02%	2.98E+00
Nd-147	#A	8.2082E-01	8.2082E-01	1.344E+02%	5.54E+00
TL-210	#A	2.8613E-01	2.8613E-01	9.682E+01%	1.33E+00
Kr-85	#A	-5.5898E+00	-5.5898E+00	2.100E+03%	4.09E+02

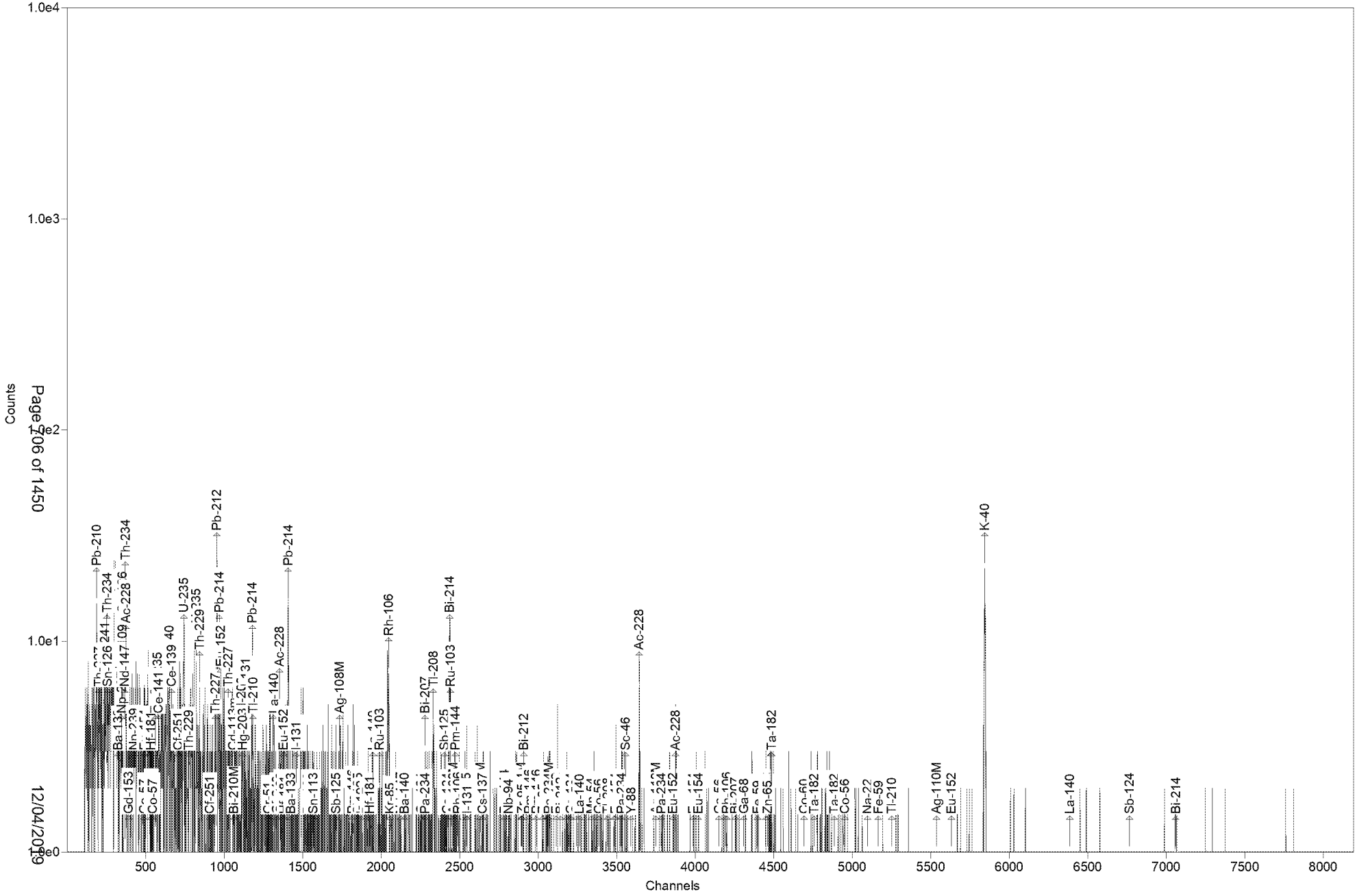
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line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

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

Total Activity (25.1 to 1999.1 keV) 1.247E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 1.2469064E+02 Bq/Sample

(Page 22 of 22)

448571_Gamma_160-36160-A-2-C. 12_Gamma_20193348.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193494

Sample Description: 448571_Gamma_160-36160-A-3-C
Detector: Detector # 9
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-3-C

Decay to Time: 11/23/2019 21:08 Live Time: 1800 sec
Acquisition Time: 11/23/2019 21:08:57 Real Time: 1802 sec
Analysis Time: 11/23/2019 21:39 Dead Time: 0.09 %
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_2019-11-10_1422.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	-2.677E+00	108.8	2.912E+00	2.915E+00	9.862E+00
NA-22	1.362E-01	188.7	2.571E-01	2.572E-01	9.397E-01
K-40	8.447E+01	8.3	7.051E+00	8.270E+00	8.421E+00
Sc-46	-3.653E-01	123.3	4.504E-01	4.508E-01	1.536E+00
CR-51	-2.187E+00	91.2	1.994E+00	1.997E+00	1.504E+01
MN-54	-4.395E-01	104.4	4.589E-01	4.595E-01	1.034E+00
FE-59	2.189E-02	438.4	9.596E-02	9.596E-02	1.715E+00
Co-56	5.609E-01	30.2	1.691E-01	1.716E-01	4.929E-01
CO-57	2.283E-01	132.9	3.034E-01	3.037E-01	6.176E-01
CO-58	9.001E-01	20.0	1.800E-01	1.859E-01	2.653E-01
CO-60	-8.819E-02	343.8	3.032E-01	3.032E-01	7.304E-01
ZN-65	0.000E+00	1.#INF	9.073E-02	9.073E-02	3.255E+00
NB-94	1.927E-01	88.9	1.713E-01	1.716E-01	1.208E+00
ZR-95	-6.983E-01	69.2	4.832E-01	4.845E-01	1.766E+00
NB-95	1.832E-01	182.4	3.342E-01	3.344E-01	1.163E+00
RU-103	-1.584E-01	176.9	2.803E-01	2.804E-01	7.810E-01
RH-106	-2.042E-01	1669.7	3.410E+00	3.410E+00	8.901E+00
AG-108M	-4.897E-03	681.4	3.337E-02	3.337E-02	7.101E-01
AG-110M	3.629E-01	28.9	1.048E-01	1.064E-01	1.919E+00
SN-113	-2.400E-01	168.8	4.050E-01	4.052E-01	9.909E-01
SB-124	-9.748E-02	78.2	7.623E-02	7.640E-02	2.061E+00
SB-125	1.009E+00	67.1	6.771E-01	6.791E-01	1.666E+00
I-131	5.800E-01	57.4	3.328E-01	3.341E-01	6.223E-01
Gd-153	3.547E-01	169.3	6.004E-01	6.008E-01	4.863E+00
Ga-68	4.761E+00	308.5	1.469E+01	1.469E+01	3.388E+01
Tc-99m	-2.284E-01	147.3	3.365E-01	3.367E-01	1.129E+00
BA-133	-4.676E-01	131.2	6.134E-01	6.138E-01	2.067E+00
CS-134	5.080E-01	80.3	4.080E-01	4.088E-01	9.429E-01
CS-137	-2.836E-01	68.8	1.950E-01	1.956E-01	1.144E+00
CE-139	1.189E-02	1811.2	2.154E-01	2.154E-01	7.481E-01
Ba-140	-1.452E-01	767.9	1.115E+00	1.115E+00	2.668E+00
La-140	2.884E-01	111.0	3.202E-01	3.206E-01	9.194E-01
CE-141	-4.452E-01	142.3	6.333E-01	6.337E-01	2.122E+00

CE-144	1.308E+00	153.4	2.006E+00	2.007E+00	6.767E+00
PM-144	-3.286E-01	53.8	1.767E-01	1.776E-01	1.063E+00
EU-152	5.230E-01	72.9	3.812E-01	3.821E-01	1.906E+00
EU-154	3.411E-01	122.7	4.185E-01	4.189E-01	1.256E+00
EU-155	-9.207E-01	121.3	1.117E+00	1.118E+00	3.747E+00
HF-181	2.246E-01	148.5	3.337E-01	3.339E-01	1.389E+00
Ta-182	4.403E-02	3044.6	1.340E+00	1.340E+00	4.768E+00
Hg-203	-2.177E-01	220.1	4.790E-01	4.792E-01	8.226E-01
TL-208	2.073E+00	13.7	2.835E-01	3.032E-01	4.070E-01
PM-146	-2.076E-01	94.9	1.970E-01	1.973E-01	1.139E+00
Y-88	-3.697E-01	124.9	4.618E-01	4.623E-01	1.001E+00
Cd-113m	-3.981E+02	688.0	2.739E+03	2.739E+03	9.679E+03
Cd-109	-6.014E+00	197.2	1.186E+01	1.186E+01	3.962E+01
Cf-251	-9.579E-01	131.7	1.262E+00	1.265E+00	3.269E+00
Cf-249	-1.051E-02	3604.2	3.787E-01	3.787E-01	1.332E+00
Sn-126	2.090E+00	121.3	2.535E+00	2.537E+00	8.545E+00
PB-210	8.979E+00	74.0	6.648E+00	6.669E+00	2.212E+01
PB-212	4.061E+00	12.0	4.861E-01	5.525E-01	1.118E+00
PB-214	5.248E+00	11.9	6.252E-01	6.821E-01	1.638E+00
BI-207	3.786E-01	91.7	3.472E-01	3.477E-01	8.048E-01
BI-212	2.952E+00	114.0	3.364E+00	3.367E+00	1.160E+01
U-235	-3.467E-01	85.4	2.960E-01	2.965E-01	8.781E+00
BI-214	4.425E+00	17.7	7.853E-01	8.183E-01	1.475E+00
BI-210M	-5.049E-01	149.1	7.526E-01	7.532E-01	1.368E+00
AC-228	1.087E+00	120.5	1.310E+00	1.311E+00	3.718E+00
TH-227	1.221E+00	93.7	1.145E+00	1.147E+00	8.921E+00
TH-229	-1.300E-02	149.0	1.937E-02	1.940E-02	1.178E+01
TH-234	4.927E-02	114.2	5.628E-02	5.635E-02	2.615E+01
PA-231	0.000E+00	1.#INF	3.841E+00	3.841E+00	4.892E+01
PA-233	0.000E+00	1.#INF	3.365E-01	3.366E-01	3.997E+00
PA-234	1.615E+00	87.6	1.415E+00	1.417E+00	3.880E+00
PA-234M	0.000E+00	1.#INF	5.036E+00	5.037E+00	1.356E+02
AM-241	6.807E-01	114.3	7.777E-01	7.785E-01	2.616E+00
Np-237	-1.752E+00	207.0	3.628E+00	3.629E+00	1.212E+01
Ir-192	2.383E-01	163.6	3.897E-01	3.899E-01	1.319E+00
Cs-136	-2.099E-01	149.6	3.141E-01	3.143E-01	1.092E+00
Np-239	-8.261E-01	120.7	9.967E-01	9.980E-01	3.346E+00
Nd-147	1.538E+00	116.6	1.793E+00	1.795E+00	4.436E+00
TL-210	2.921E-01	90.8	2.653E-01	2.658E-01	9.035E-01
Kr-85	0.000E+00	1.#INF	5.922E+00	5.922E+00	2.961E+02
Total	1.339E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 9:39:13 PMPage  1
TestAmerica Inc                 Spectrum name: 9_Gamma_20193494.An1

Sample description
     448571_Gamma_160-36160-A-3-C


Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193494.An1

Acquisition information
       Start time:                 11/23/2019 9:08:57 PM
       Live time:               1800
       Real time:               1802
       Dead time:                  0.09 %
       Detector ID:                    9

Detector system
     Ge9 S/N09363993


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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 2
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

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	11/23/2019 9:08:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-11-10_1422.PBC 11/10/2019 2:22:11 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1278

***** 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.	74.03	1.00	2.577E-02	46.54	4.250	PBC<MDA	PB210
50.14	13.	113.82	1.00	2.900E-02	50.14	8.000	PBC<MDA	TH227
59.54	16.	114.25	1.01	3.659E-02	59.54	35.900	PBC<MDA	AM241
63.29	16.	119.15	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
64.28	15.	121.31	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
76.76	96.	22.82	0.76	4.661E-02				
84.51	18.	41.82	0.66	4.949E-02				
99.20	17.	166.43	1.05	5.266E-02	99.50	15.000	PBC<MDA	Np239
103.20	18.	169.29	1.05	5.303E-02	103.20	21.800	PBC<MDA	Gd153
					103.70	24.000	7.651E-01	Np239
103.40	18.	171.01	1.05	5.307E-02	103.20	21.800	PBC<MDA	Gd153
					103.70	24.000	7.654E-01	Np239
122.06	7.	210.44	1.07	5.303E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	8.567E-02	CO57
131.29	14.	143.70	1.08	5.216E-02	131.29	18.000	PBC<MDA	PA234
133.02	14.	148.54	1.08	5.195E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	1.307E+00	CE144
133.54	14.	153.36	1.08	5.189E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	1.308E+00	CE144
136.30	14.	157.73	1.08	5.152E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.372E+00	CO57
136.47	14.	162.33	1.08	5.150E-02	136.30	5.850	PBC<MDA	HF181

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 3
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					136.47	10.680	1.372E+00	CO57
163.38	12.	93.12	1.11	4.676E-02	163.38	5.080	PBC<MDA	U235
185.72	15.	94.75	1.13	4.403E-02	185.72	54.000	PBC<MDA	U235
210.85	7.	193.14	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
235.97	15.	162.95	1.18	3.760E-02	235.97	12.300	PBC<MDA	TH227
238.52	118.	11.97	1.18	3.732E-02	238.63	43.300	4.061E+00	PB212
241.88	14.	172.54	1.18	3.697E-02	242.00	7.430	PBC<MDA	PB214
244.69	11.	226.25	1.18	3.670E-02	244.69	7.580	PBC<MDA	EU152
276.70	2.	423.54	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
284.30	11.	96.97	1.22	3.315E-02	284.30	6.140	PBC<MDA	I131
294.92	67.	16.11	1.23	3.232E-02	295.09	19.300	5.987E+00	PB214
316.49	11.	163.56	1.25	3.080E-02	316.49	87.040	PBC<MDA	Ir192
328.76	13.	133.90	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
351.73	94.	17.55	0.85	2.861E-02	351.93	37.600	4.869E+00	PB214
364.48	11.	92.26	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
427.79	9.	96.30	1.35	2.491E-02	427.88	29.600	PBC<MDA	SB125
463.37	6.	159.15	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
487.02	12.	111.04	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
511.86	68.	17.28	2.67	2.188E-02	511.86	20.000	8.632E+00	RH106
531.00	8.	116.58	1.44	2.130E-02	531.00	13.000	PBC<MDA	Nd147
569.32	5.	148.32	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.674E+00	PA234
					569.70	97.740	1.405E-01	BI207
583.12	62.	13.67	0.97	1.989E-02	583.02	84.500	2.042E+00	TL208
609.16	65.	17.75	1.73	1.925E-02	609.31	46.090	4.071E+00	BI214
618.06	6.	131.23	1.51	1.904E-02	618.06	99.100	PBC<MDA	PM144
635.89	5.	76.86	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
636.97	5.	108.19	1.53	1.862E-02	636.97	7.170	PBC<MDA	I131
657.76	1.	554.53	1.54	1.818E-02	657.76	94.640	PBC<MDA	AG110M
702.63	4.	239.81	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
722.79	10.	78.20	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.476E-01	AG108M
					723.36	20.220	1.562E+00	EU154
722.94	1.	933.33	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.171E-02	AG108M
					723.36	20.220	1.425E-01	EU154
727.17	7.	113.95	1.60	1.686E-02	727.17	7.550	PBC<MDA	BI212
735.72	4.	216.89	1.61	1.671E-02	735.72	22.500	PBC<MDA	PM146
747.16	1.	692.82	1.62	1.651E-02	747.16	34.000	PBC<MDA	PM146
765.79	5.	182.43	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	6.223E+01	PA234M
778.92	2.	354.73	1.64	1.600E-02	778.92	12.940	PBC<MDA	EU152
785.42	6.	93.57	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
795.87	5.	137.89	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
799.60	8.	90.81	1.66	1.568E-02	799.60	98.960	PBC<MDA	TL210
801.95	7.	130.54	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
810.78	25.	20.00	1.67	1.551E-02	810.78	99.460	9.001E-01	CO58
846.77	6.	96.27	1.70	1.501E-02	846.77	99.935	PBC<MDA	Co56

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 4
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
860.15	8.	100.18	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
871.10	6.	88.85	1.71	1.468E-02	871.10	99.890	PBC<MDA	NB94
873.23	4.	126.93	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
911.07	8.	152.32	1.75	1.418E-02	911.07	29.000	PBC<MDA	AC228
946.02	9.	100.31	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
964.11	6.	72.87	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
968.97	5.	186.77	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.33	6.	122.69	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1037.84	11.	30.15	1.84	1.281E-02	1037.84	14.130	3.376E+00	Co56
1063.66	6.	91.71	1.86	1.257E-02	1063.66	74.500	PBC<MDA	BI207
1077.40	3.	308.52	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1120.55	-3.	432.16	1.90	1.206E-02	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	PBC<MDA	Ta182
1238.28	6.	96.51	1.98	1.114E-02	1238.28	66.070	PBC<MDA	Co56
1274.53	3.	188.75	2.01	1.088E-02	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	3.868E-01	EU154
1291.60	1.	438.38	2.02	1.077E-02	1291.60	43.200	PBC<MDA	FE59
1313.00	12.	28.87	2.03	1.063E-02	1313.00	21.000	2.987E+00	TL210
1384.30	12.	28.87	2.08	1.018E-02	1384.30	24.290	2.695E+00	AG110M
1408.00	4.	137.50	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.63	158.	8.35	1.55	9.749E-03	1460.83	10.670	8.447E+01	K40
1764.83	13.	36.73	2.31	8.350E-03	1764.49	15.400	5.487E+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	
306.63	76.76	96.	96.	2.060E+03	22.82	0.758	-	s
337.62	84.51	19.	18.	3.704E+02	41.82	0.665	-	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

********** 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	77.	18.	0.010	74.03	0.998
TH-227	200.20	50.14	96.	13.	0.007	113.82	1.001s
AM-241	237.77	59.54	161.	16.	0.009	114.25	1.010s
TH-234	252.77	63.29	177.	16.	0.009	119.15	1.014s

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TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Sn-126	256.74	64.28	148.	15.	0.008	121.31	1.015
BA-133	323.56	80.99	928.	-21.	-0.011	210.42	1.031s
Np-237	345.55	86.49	907.	-21.	-0.011	207.04	1.036s
EU-155	345.76	86.54	887.	-21.	-0.011	204.70	1.036s
Sn-126	347.35	86.94	866.	-21.	-0.011	202.27	1.037s
Sn-126	349.87	87.57	845.	-21.	-0.012	199.73	1.037s
Cd-109	351.75	88.04	825.	-21.	-0.012	197.21	1.038s
Nd-147	363.99	91.10	804.	-21.	-0.012	194.22	1.041s
TH-234	369.94	92.59	812.	-21.	-0.012	194.92	1.042s
AC-228	372.98	93.35	833.	-5.	-0.003	783.24	1.043s
Np-239	397.58	99.50	414.	17.	0.010	166.43	1.049s
Gd-153	412.37	103.20	432.	18.	0.010	169.29	1.052s
Np-239	414.37	103.70	441.	18.	0.010	171.01	1.053s
EU-155	420.82	105.31	248.	-19.	-0.010	121.32	1.054s
Np-239	424.09	106.13	226.	-18.	-0.010	120.66	1.055
EU-152	486.67	121.78	112.	-15.	-0.008	103.06	1.070s
CO-57	487.80	122.06	105.	7.	0.004	210.44	1.070s
EU-154	491.95	123.10	98.	0.	0.000	1000.00	1.071s
PA-234	524.72	131.29	182.	14.	0.008	143.70	1.079s
HF-181	531.64	133.02	196.	14.	0.008	148.54	1.081s
CE-144	533.69	133.54	209.	14.	0.008	153.36	1.081s
HF-181	544.74	136.30	223.	14.	0.008	157.73	1.084
CO-57	545.43	136.47	236.	14.	0.008	162.33	1.084
Tc-99m	561.57	140.51	348.	-18.	-0.010	147.32	1.088s
U-235	574.67	143.79	329.	-18.	-0.010	143.12	1.091s
CE-141	581.29	145.44	369.	-19.	-0.011	142.27	1.092s
Ba-140	650.15	162.66	130.	-10.	-0.006	164.32	1.108s
U-235	653.03	163.38	58.	12.	0.007	93.12	1.109s
Cf-251	705.90	176.60	84.	-13.	-0.007	131.73	1.122s
U-235	742.37	185.72	55.	15.	0.008	94.75	1.130s
TH-229	773.52	193.51	64.	-7.	-0.004	226.93	1.137s
U-235	820.80	205.33	64.	-14.	-0.008	115.03	1.148s
TH-229	842.87	210.85	40.	7.	0.004	193.14	1.153s
Cf-251	907.45	227.00	104.	-21.	-0.012	98.91	1.168s
TH-227	943.33	235.97	281.	15.	0.008	162.95	1.176s
PB-212	953.97	238.63	41.	118.	0.066	11.97	1.179D
PB-214	967.43	242.00	268.	14.	0.008	172.54	1.182
EU-152	978.21	244.69	285.	11.	0.006	226.25	1.185
TH-227	1024.39	256.24	64.	-8.	-0.004	198.96	1.195s
Cd-113m	1054.23	263.70	52.	-2.	-0.001	687.99	1.202s
BI-210M	1062.75	265.83	74.	-16.	-0.009	149.06	1.204s
TL-208	1108.55	277.28	48.	2.	0.001	423.54	1.215
Hg-203	1116.22	279.20	66.	-11.	-0.006	220.09	1.216s
I-131	1136.61	284.30	28.	11.	0.006	96.97	1.221s
PB-214	1179.77	295.09	24.	67.	0.037	16.11	1.230D
TL-210	1183.41	296.00	332.	-15.	-0.008	175.74	1.231s
PB-212	1199.52	300.03	306.	-15.	-0.008	168.31	1.235
PA-231	1199.68	300.07	291.	-12.	-0.007	202.44	1.235

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TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PA-233	1200.12	300.18	279.	0.	0.000	1000.00	1.235
PA-231	1210.00	302.65	279.	0.	0.000	1000.00	1.237s
BA-133	1210.81	302.85	279.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	279.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	279.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	279.	0.	0.000	1000.00	1.243s
PA-233	1247.44	312.01	279.	0.	0.000	1000.00	1.246s
Ir-192	1265.35	316.49	171.	11.	0.006	163.56	1.250s
CR-51	1279.73	320.08	291.	-12.	-0.007	91.18	1.253
La-140	1314.43	328.76	145.	13.	0.007	133.90	1.261s
Cf-249	1333.15	333.44	158.	0.	0.000	1000.00	1.265s
AC-228	1352.66	338.32	158.	0.	0.000	1000.00	1.270
Cs-136	1361.66	340.57	158.	0.	0.000	1000.00	1.272
EU-152	1376.53	344.29	158.	0.	0.000	1000.00	1.275s
HF-181	1382.70	345.83	214.	-16.	-0.009	131.86	1.276s
PB-214	1406.28	351.73	39.	94.	0.052	17.55	0.849s
BA-133	1423.37	356.00	182.	-15.	-0.008	131.16	1.285s
I-131	1457.31	364.48	24.	11.	0.006	92.26	1.293s
BA-133	1534.73	383.84	69.	-8.	-0.004	205.91	1.310s
SN-113	1566.12	391.69	35.	-7.	-0.004	168.76	1.317s
SB-125	1710.86	427.88	17.	9.	0.005	96.30	1.349s
AG-108M	1735.10	433.94	31.	-2.	-0.001	993.04	1.354s
PM-146	1814.87	453.88	39.	-14.	-0.008	94.90	1.372
SB-125	1852.82	463.37	49.	6.	0.004	159.15	1.380
Ir-192	1871.59	468.06	67.	-14.	-0.008	89.26	1.384s
BE-7	1909.73	477.60	75.	-12.	-0.006	108.76	1.392s
HF-181	1927.34	482.00	86.	0.	0.000	1000.00	1.396s
La-140	1947.43	487.02	85.	12.	0.007	111.04	1.400s
RU-103	1987.56	497.05	31.	-6.	-0.003	176.89	1.409s
RH-106	2046.81	511.86	35.	68.	0.038	17.28	2.672s
Kr-85	2055.27	513.98	103.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	17.	8.	0.004	116.58	1.438s
Ba-140	2148.39	537.26	22.	-1.	-0.001	767.93	1.444s
CS-134	2276.64	569.32	25.	5.	0.003	148.32	1.471s
PA-234	2277.24	569.47	33.	-4.	-0.002	209.17	1.471s
BI-207	2278.16	569.70	30.	0.	0.000	1000.00	1.471s
TL-208	2331.83	583.12	4.	62.	0.034	13.67	0.975s
SB-125	2401.36	600.50	228.	-15.	-0.008	147.33	1.497s
SB-124	2410.29	602.73	213.	-15.	-0.008	142.47	1.499s
CS-134	2418.21	604.71	198.	-15.	-0.008	137.48	1.500s
BI-214	2436.02	609.16	20.	65.	0.036	17.75	1.735
RU-103	2440.56	610.30	184.	-10.	-0.005	201.84	1.505s
PM-144	2471.62	618.06	28.	6.	0.003	131.23	1.512s
SB-125	2542.94	635.89	6.	5.	0.003	76.86	1.526
I-131	2547.28	636.97	11.	5.	0.003	108.19	1.527s
AG-110M	2630.43	657.76	27.	1.	0.001	554.53	1.544s
CS-137	2646.03	661.66	39.	-8.	-0.004	68.77	1.548
PM-144	2785.58	696.54	42.	-10.	-0.006	53.79	1.576s

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TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
NB-94	2809.93	702.63	54.	4.	0.002	239.81	1.581s
SB-124	2890.57	722.79	24.	10.	0.005	78.20	1.598s
AG-108M	2891.17	722.94	33.	1.	0.000	933.33	1.598s
EU-154	2892.86	723.36	34.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	34.	0.	0.000	1000.00	1.599s
BI-212	2908.11	727.17	26.	7.	0.004	113.95	1.601s
PM-146	2942.31	735.72	19.	4.	0.002	216.89	1.608s
PM-146	2988.08	747.16	19.	1.	0.001	692.82	1.617s
ZR-95	3026.36	756.73	30.	-11.	-0.006	69.20	1.625s
AG-110M	3055.23	763.94	36.	-13.	-0.007	70.92	1.631
NB-95	3062.61	765.79	45.	5.	0.003	182.43	1.632s
EU-152	3115.14	778.92	10.	2.	0.001	354.73	1.643s
BI-212	3141.15	785.42	11.	6.	0.003	93.57	1.648s
CS-134	3182.96	795.87	19.	5.	0.003	137.89	1.656s
TL-210	3197.88	799.60	23.	8.	0.005	90.81	1.659s
CS-134	3207.29	801.95	40.	7.	0.004	130.54	1.661s
CO-58	3242.59	810.78	0.	25.	0.014	20.00	1.668s
La-140	3262.58	815.77	25.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	35.	-6.	-0.003	149.60	1.674s
MN-54	3338.91	834.85	30.	-12.	-0.007	104.42	1.687s
Co-56	3386.61	846.77	5.	6.	0.003	96.27	1.696s
TL-208	3441.80	860.56	11.	8.	0.004	100.18	1.707s
NB-94	3483.94	871.10	13.	6.	0.004	88.85	1.715s
EU-154	3492.47	873.23	14.	4.	0.002	126.93	1.717s
PA-234	3521.68	880.53	43.	-10.	-0.005	100.83	1.722s
PA-234	3532.53	883.24	52.	0.	0.000	1000.00	1.724s
AG-110M	3538.30	884.68	52.	0.	0.000	1000.00	1.725s
Sc-46	3556.69	889.28	64.	-10.	-0.005	123.28	1.729s
Y-88	3591.74	898.04	26.	-14.	-0.008	41.98	1.736
AC-228	3643.88	911.07	28.	8.	0.004	152.32	1.746s
AG-110M	3749.60	937.49	15.	-5.	-0.003	176.07	1.766s
PA-234	3783.72	946.02	15.	9.	0.005	100.31	1.772s
EU-152	3856.11	964.11	8.	6.	0.004	72.87	1.786s
AC-228	3875.56	968.97	41.	5.	0.003	186.77	1.790s
EU-154	3985.03	996.33	21.	6.	0.003	122.69	1.810s
PA-234M	4003.71	1001.00	27.	0.	0.000	1000.00	1.814s
Co-56	4151.13	1037.84	0.	11.	0.006	30.15	1.841
Cs-136	4192.07	1048.07	13.	-6.	-0.004	90.70	1.848s
RH-106	4201.23	1050.36	34.	-12.	-0.007	74.22	1.850s
BI-207	4254.46	1063.66	5.	6.	0.004	91.71	1.860s
Ga-68	4309.44	1077.40	16.	3.	0.002	308.52	1.870s
FE-59	4396.88	1099.25	16.	-1.	-0.001	914.69	1.886s
EU-152	4448.20	1112.07	48.	-8.	-0.004	129.87	1.895s
ZN-65	4462.09	1115.55	51.	0.	0.000	1000.00	1.897s
Sc-46	4482.12	1120.55	53.	-3.	-0.001	432.16	1.901s
Ta-182	4756.25	1189.05	11.	-1.	-0.001	598.44	1.949s
Ta-182	4885.75	1221.41	17.	0.	0.000	1000.00	1.972s
Co-56	4953.27	1238.28	6.	6.	0.004	96.51	1.984s

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TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
NA-22	5098.35	1274.53	11.	3.	0.001	188.75	2.008s
EU-154	5098.39	1274.54	14.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	6.	1.	0.001	438.38	2.020s
TL-210	5252.32	1313.00	0.	12.	0.007	28.87	2.034s
CO-60	5330.37	1332.50	6.	-2.	-0.001	343.80	2.047s
AG-110M	5537.69	1384.30	0.	12.	0.007	28.87	2.082s
EU-152	5632.56	1408.00	6.	4.	0.002	137.50	2.097s
K-40	5843.20	1460.63	8.	158.	0.088	8.35	1.546s
SB-124	6765.35	1690.98	0.	0.	0.000	1000.00	2.272s
BI-214	7059.65	1764.49	4.	13.	0.007	36.73	2.314s
Co-56	7087.11	1771.35	17.	0.	0.000	1000.00	2.318s
Y-88	7346.20	1836.06	6.	-5.	-0.003	124.92	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	Peak Code	Peak MDA Value Bq/Sample	COMMENTS
BE-7	C	-2.6771E+00				5.31E+01	
			477.60	-2.677E+00	?(	9.862E+00 1.09E+02 1.05E+01	G
NA-22	C	1.3620E-01				9.50E+02	
			1274.53	1.362E-01	?(	9.397E-01 1.89E+02 9.99E+01	G
K-40	N	8.4467E+01				4.66E+11	
			1460.83	8.447E+01	(P	8.421E+00 8.35E+00 1.07E+01	G
Sc-46	F	-3.6531E-01				8.38E+01	
			889.28	-3.653E-01	?(	1.536E+00 1.23E+02 1.00E+02	G
			1120.55	-1.163E-01	& P	1.691E+00 4.32E+02 1.00E+02	G
CR-51	F	-2.1866E+00				2.77E+01	
			320.08	-2.187E+00	(P	1.504E+01 9.12E+01 9.94E+00	G
MN-54	C	-4.3954E-01				3.12E+02	
			834.85	-4.395E-01	?(	1.034E+00 1.04E+02 1.00E+02	G
FE-59	F	2.1889E-02				4.45E+01	
			1099.25	-8.031E-02	?(	1.715E+00 9.15E+02 5.65E+01	G
			1291.60	1.556E-01	?(P	1.652E+00 4.38E+02 4.32E+01	G
Co-56	C	5.6091E-01				7.73E+01	
			846.77	2.122E-01	&(P	4.929E-01 9.63E+01 9.99E+01	G
			1238.28	4.863E-01	?(P	1.075E+00 9.65E+01 6.61E+01	G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 9
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1037.84	3.376E+00	?(	2.262E+00	3.02E+01	1.41E+01 G
			1771.35	0.000E+00	-	9.453E+00	1.00E+03	1.55E+01 A
CO-57	C	2.2833E-01					2.72E+02	
			122.06	8.567E-02	?(	6.176E-01	2.10E+02	8.56E+01 G
			136.47	1.372E+00	?(	7.508E+00	1.62E+02	1.07E+01 G
CO-58	C	9.0006E-01					7.09E+01	
			810.78	9.001E-01	?(	2.653E-01	2.00E+01	9.95E+01 G
CO-60	F	-8.8190E-02					1.93E+03	
			1332.50	-8.819E-02	?(	7.304E-01	3.44E+02	1.00E+02 G
			1173.24	3.194E-02	% P	1.030E+00	1.37E+03	9.99E+01 G
NB-94	I	1.9274E-01					7.41E+06	
			702.63	1.446E-01	?(P	1.208E+00	2.40E+02	9.79E+01 G
			871.10	2.399E-01	?(	7.309E-01	8.89E+01	9.99E+01 G
ZR-95	I	-6.9826E-01					6.40E+01	
			756.73	-6.983E-01	?(P	1.766E+00	6.92E+01	5.45E+01 G
			724.20	0.000E+00	+	2.224E+00	1.00E+03	4.42E+01 G
NB-95	I	1.8322E-01					6.40E+01	
			765.79	1.832E-01	?(	1.163E+00	1.82E+02	9.98E+01 G
RU-103	I	-1.5844E-01					3.93E+01	
			497.05	-1.584E-01	?(P	7.810E-01	1.77E+02	9.09E+01 G
			610.30	-4.834E+00	+	3.310E+01	2.02E+02	5.75E+00 GA
RH-106	I	-2.0420E-01					3.74E+02	
			621.92	-2.042E-01	&(P	8.901E+00	1.67E+03	9.93E+00 G
			1050.36	-3.368E+01	+	8.348E+01	7.42E+01	1.56E+00 G
			511.86	8.632E+00	?	3.843E+00	1.73E+01	2.00E+01 GA
AG-108M	C	-4.8971E-03					1.53E+05	
			433.94	-4.165E-02	?(P	7.101E-01	9.93E+02	9.05E+01 G
			722.94	3.171E-02	?(	1.067E+00	9.33E+02	9.08E+01 G
			614.28	6.164E-08	%	2.074E+00	9.78E+08	8.98E+01 G
AG-110M	F	3.6294E-01					2.50E+02	
			884.68	0.000E+00	?(	1.919E+00	1.00E+03	7.27E+01 G
			657.76	4.305E-02	?(	8.646E-01	5.55E+02	9.46E+01 G
			937.49	-5.829E-01	&	2.420E+00	1.76E+02	3.44E+01 G
			1384.30	2.695E+00	&(	1.655E+00	2.89E+01	2.43E+01 G
			763.94	-1.997E+00	+	4.710E+00	7.09E+01	2.23E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 10
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SN-113	F	-2.3998E-01					1.15E+02	
			391.69	-2.400E-01	?(	9.909E-01	1.69E+02	6.40E+01 G
SB-124	F	-9.7479E-02					6.02E+01	
			602.73	-4.295E-01	?(	2.061E+00	1.42E+02	9.83E+01 G
			1690.98	0.000E+00	+	9.906E-01	1.00E+03	4.78E+01 G
			722.79	2.920E+00	?(	7.679E+00	7.82E+01	1.08E+01 G
SB-125	I	1.0093E+00					1.01E+03	
			427.88	7.068E-01	?(	1.666E+00	9.63E+01	2.96E+01 G
			600.50	-2.353E+00	+	1.168E+01	1.47E+02	1.79E+01 G
			635.89	1.398E+00	(	3.636E+00	7.69E+01	1.13E+01 G
			463.37	1.444E+00	(P	7.939E+00	1.59E+02	1.05E+01 G
I-131	I	5.8003E-01					8.02E+00	
			364.48	2.680E-01	?(	6.223E-01	9.23E+01	8.17E+01 G
			284.30	3.065E+00	&(	7.470E+00	9.70E+01	6.14E+00 G
			636.97	2.007E+00	?(P	7.596E+00	1.08E+02	7.17E+00 G
Gd-153	F	3.5466E-01					2.42E+02	
			97.50	-1.348E-07	%(	4.863E+00	1.07E+09	3.00E+01 G
			103.20	8.427E-01	?(	4.784E+00	1.69E+02	2.18E+01 G
Ga-68	C	4.7613E+00					4.71E-02	
			1077.40	4.761E+00	&(	3.388E+01	3.09E+02	3.30E+00 G
Tc-99m	I	-2.2842E-01					2.51E-01	
			140.51	-2.284E-01	?(	1.129E+00	1.47E+02	8.93E+01 G
BA-133	F	-4.6764E-01					3.85E+03	
			356.00	-4.676E-01	?(	2.067E+00	1.31E+02	6.20E+01 G
			302.85	0.000E+00	+	7.690E+00	1.00E+03	1.83E+01 G
			383.84	-1.859E+00	+ P	9.568E+00	2.06E+02	8.94E+00 GA
			80.99	-6.952E-01	+	4.885E+00	2.10E+02	3.41E+01 GA
CS-134	I	5.0798E-01					7.54E+02	
			795.87	1.941E-01	?(	9.429E-01	1.38E+02	8.55E+01 G
			604.71	-4.338E-01	+	2.009E+00	1.37E+02	9.76E+01 G
			569.32	8.923E-01	&(	4.642E+00	1.48E+02	1.54E+01 G
			801.95	2.917E+00	&(	1.313E+01	1.31E+02	8.69E+00 G
			563.24	2.174E-01	%	8.225E+00	1.54E+03	8.35E+00 G
CS-137	I	-2.8359E-01					1.10E+04	
			661.66	-2.836E-01	?(P	1.144E+00	6.88E+01	8.52E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 11
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	F	1.1891E-02					1.38E+02	
			165.85	1.189E-02	%(	7.481E-01	1.81E+03	7.99E+01 G
Ba-140	I	-1.4515E-01					1.28E+01	
			537.26	-1.452E-01	&(P	2.668E+00	7.68E+02	2.44E+01 G
			162.66	-1.904E+00	+	1.064E+01	1.64E+02	6.22E+00 G
			304.85	0.000E+00	+	3.301E+01	1.00E+03	4.29E+00 G
La-140	I	2.8840E-01					1.28E+01	
			1596.21	-7.735E-02	%(P	9.194E-01	1.10E+03	9.54E+01 G
			487.02	6.547E-01	?(	2.460E+00	1.11E+02	4.55E+01 G
			328.76	1.186E+00	&(	5.367E+00	1.34E+02	2.03E+01 G
			815.77	0.000E+00	-	4.020E+00	1.00E+03	2.33E+01 G
CE-141	I	-4.4517E-01					3.25E+01	
			145.44	-4.452E-01	?(	2.122E+00	1.42E+02	4.82E+01 G
CE-144	I	1.3079E+00					2.85E+02	
			133.54	1.308E+00	&(	6.767E+00	1.53E+02	1.11E+01 G
PM-144	C	-3.2858E-01					3.63E+02	
			696.54	-3.286E-01	?(P	1.063E+00	5.38E+01	9.90E+01 G
			618.06	1.766E-01	+	8.056E-01	1.31E+02	9.91E+01 G
EU-152	F	5.2304E-01					4.94E+03	
			121.78	-5.496E-01	?(	1.906E+00	1.03E+02	2.86E+01 G
			344.29	0.000E+00	+	4.423E+00	1.00E+03	2.65E+01 G
			1112.07	-2.629E+00	+	1.173E+01	1.30E+02	1.36E+01 G
			778.92	5.367E-01	?(	4.682E+00	3.55E+02	1.29E+01 G
			964.11	1.777E+00	?(	4.337E+00	7.29E+01	1.46E+01 G
			244.69	2.128E+00	?(	1.626E+01	2.26E+02	7.58E+00 G
			1408.00	1.141E+00	?	3.635E+00	1.37E+02	2.10E+01 GA
EU-154	I	3.4111E-01					3.14E+03	
			123.10	0.000E+00	(	1.256E+00	1.00E+03	4.08E+01 G
			1274.54	0.000E+00	?(	2.922E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	&(	4.852E+00	1.00E+03	2.02E+01 G
			873.23	1.370E+00	?(P	6.140E+00	1.27E+02	1.23E+01 G
			1004.77	-1.565E-01	%	6.390E+00	1.12E+03	1.80E+01 G
			996.33	2.245E+00	?(	9.602E+00	1.23E+02	1.06E+01 G
EU-155	I	-9.2066E-01					1.81E+03	
			105.31	-9.207E-01	&(	3.747E+00	1.21E+02	2.12E+01 G
			86.54	-7.474E-01	+	5.110E+00	2.05E+02	3.07E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 12
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
HF-181	F	2.2464E-01					4.24E+01	
			482.00	0.000E+00	?(	1.389E+00	1.00E+03	8.05E+01 G
			133.02	3.344E-01	(	1.676E+00	1.49E+02	4.33E+01 G
			345.83	-2.037E+00	&	9.035E+00	1.32E+02	1.51E+01 G
			136.30	2.503E+00	?(	1.332E+01	1.58E+02	5.85E+00 G
Ta-182	F	4.4026E-02					1.14E+02	
			1121.30	4.403E-02	%(	4.768E+00	3.04E+03	3.49E+01 G
			1221.41	0.000E+00	-	4.006E+00	1.00E+03	2.70E+01 G
			1189.05	-3.975E-01	+	5.484E+00	5.98E+02	1.62E+01 G
Hg-203	F	-2.1766E-01					4.66E+01	
			279.20	-2.177E-01	?(P	8.226E-01	2.20E+02	8.15E+01 G
TL-208	N	2.0732E+00					6.98E+02	
			583.02	2.042E+00	(P	4.070E-01	1.37E+01	8.45E+01 G
			277.28	6.092E-01	-	9.108E+00	4.24E+02	6.31E+00 G
			860.56	2.289E+00	?(P	5.442E+00	1.00E+02	1.24E+01 G
PM-146	C	-2.0761E-01					2.02E+03	
			453.88	-5.012E-01	?(	1.139E+00	9.49E+01	6.50E+01 G
			747.16	1.319E-01	+	2.260E+00	6.93E+02	3.40E+01 G
			735.72	6.404E-01	&(	3.376E+00	2.17E+02	2.25E+01 G
Y-88	F	-3.6969E-01					1.07E+02	
			1836.06	-3.697E-01	?(	1.001E+00	1.25E+02	9.92E+01 G
			898.04	-5.712E-01	+ P	1.091E+00	4.20E+01	9.37E+01 G
Cd-113m		-3.9805E+02					5.33E+03	
			263.70	-3.981E+02	?(	9.679E+03	6.88E+02	6.00E-03 K
Cd-109	F	-6.0136E+00					4.53E+02	
			88.04	-6.014E+00	?(	3.962E+01	1.97E+02	3.79E+00 G
Cf-251	T	-9.5793E-01					3.28E+05	
			176.60	-9.579E-01	?(	3.269E+00	1.32E+02	1.70E+01 G
			227.00	-4.732E+00	+	1.148E+01	9.89E+01	6.30E+00 GA
Cf-249	T	-1.0506E-02					1.28E+05	
			387.95	-1.051E-02	&(	1.332E+00	3.60E+03	6.60E+01 G
			333.44	0.000E+00	+	7.391E+00	1.00E+03	1.55E+01 G
Sn-126		2.0896E+00					3.65E+07	
			87.57	-6.090E-01	&	4.063E+00	2.00E+02	3.75E+01 GA
			64.28	2.090E+00	&(	8.545E+00	1.21E+02	9.70E+00 G
			86.94	-2.533E+00	+	1.712E+01	2.02E+02	9.04E+00 GA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 13
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-210	N	8.9791E+00					8.14E+03	
			46.54	8.979E+00	?(	2.212E+01	7.40E+01	4.25E+00 G
PB-212	N	4.0609E+00					6.98E+02	
			238.63	4.061E+00	(	1.118E+00	1.20E+01	4.33E+01 G
			300.03	-7.885E+00	&	4.464E+01	1.68E+02	3.28E+00 GA
PB-214	N	5.2483E+00					5.84E+05	
			351.93	4.869E+00	(P	1.638E+00	1.76E+01	3.76E+01 G
			295.09	5.987E+00	(P	2.283E+00	1.61E+01	1.93E+01 G
			242.00	2.751E+00	& P	1.599E+01	1.73E+02	7.43E+00 GA
BI-207	C	3.7858E-01					1.18E+04	
			1063.66	3.786E-01	?(P	8.048E-01	9.17E+01	7.45E+01 G
			569.70	0.000E+00	-	7.933E-01	1.00E+03	9.77E+01 G
BI-212	N	2.9520E+00					6.98E+02	
			727.17	2.952E+00	?(P	1.160E+01	1.14E+02	7.55E+00 G
			785.42	1.559E+01	? P	5.027E+01	9.36E+01	1.28E+00 GA
U-235	N	-3.4667E-01					2.57E+11	
			143.79	-1.829E+00	&(	8.781E+00	1.43E+02	1.10E+01 G
			205.33	-3.765E+00	+	1.075E+01	1.15E+02	5.01E+00 G
			163.38	2.851E+00	?(	8.959E+00	9.31E+01	5.08E+00 G
			185.72	3.554E-01	@	8.709E-01	9.48E+01	5.40E+01 GA
BI-214	N	4.4253E+00					5.84E+05	
			609.31	4.071E+00	(P	1.475E+00	1.77E+01	4.61E+01 G
			1120.29	-7.626E-03	& P	1.143E+01	4.24E+04	1.51E+01 G
			1764.49	5.487E+00	?(P	5.346E+00	3.67E+01	1.54E+01 G
BI-210M	T	-5.0492E-01					1.10E+09	
			265.83	-5.049E-01	?(P	1.368E+00	1.49E+02	5.00E+01 G
			304.90	0.000E+00	+	5.058E+00	1.00E+03	2.80E+01 G
AC-228	N	1.0872E+00					2.10E+03	
			911.07	1.034E+00	?(P	3.718E+00	1.52E+02	2.90E+01 G
			968.97	1.176E+00	?(	7.662E+00	1.87E+02	1.75E+01 G
			338.32	0.000E+00	-	9.642E+00	1.00E+03	1.20E+01 G
			93.35	-1.008E+00	+	2.651E+01	7.83E+02	5.56E+00 XA
TH-227	N	1.2209E+00					7.95E+03	
			256.24	-1.785E+00	?(	8.921E+00	1.99E+02	7.00E+00 G
			235.97	1.771E+00	&(	9.713E+00	1.63E+02	1.23E+01 G
			50.14	3.005E+00	?(	1.157E+01	1.14E+02	8.00E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 14
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	-1.3001E-02					2.68E+06	
			193.51	-2.062E+00	(	1.178E+01	2.27E+02	4.40E+00 G
			210.85	3.002E+00	&(	1.476E+01	1.93E+02	2.99E+00 G
TH-234	N	4.9273E-02					1.63E+12	
			92.59	-4.015E+00	*(	2.615E+01	1.95E+02	5.58E+00 G
			63.29	6.006E+00	&(	2.407E+01	1.19E+02	3.81E+00 G
PA-234	N	1.6148E+00					1.63E+12	
			131.29	8.000E-01	&(	3.880E+00	1.44E+02	1.80E+01 G
			946.02	2.709E+00	?(	6.249E+00	1.00E+02	1.34E+01 G
			569.47	-1.339E+00	&	9.870E+00	2.09E+02	8.20E+00 G
			883.24	0.000E+00	-	1.451E+01	1.00E+03	9.60E+00 G
			880.53	-6.147E+00	+	2.108E+01	1.01E+02	6.00E+00 GA
AM-241	T	6.8070E-01					1.58E+05	
			59.54	6.807E-01	(	2.616E+00	1.14E+02	3.59E+01 G
Np-237	F	-1.7521E+00					2.14E+06	
			86.49	-1.752E+00	(	1.212E+01	2.07E+02	1.31E+01 G
Ir-192	F	2.3826E-01					7.40E+01	
			316.49	2.383E-01	&(	1.319E+00	1.64E+02	8.70E+01 G
			468.06	-6.257E-01	&	1.878E+00	8.93E+01	5.18E+01 G
			308.44	0.000E+00	-	4.496E+00	1.00E+03	3.18E+01 G
Cs-136	F	-2.0995E-01					1.30E+01	
			818.50	-2.099E-01	?(	1.092E+00	1.50E+02	1.00E+02 G
			1048.07	-3.460E-01	+	1.078E+00	9.07E+01	8.00E+01 G
			340.57	0.000E+00	+	2.481E+00	1.00E+03	4.69E+01 G
Np-239	T	-8.2609E-01					2.36E+00	
			103.70	7.654E-01	?	4.389E+00	1.71E+02	2.40E+01 X
			106.13	-8.261E-01	(	3.346E+00	1.21E+02	2.27E+01 G
			99.50	1.230E+00	&	6.864E+00	1.66E+02	1.50E+01 X
Nd-147		1.5380E+00					1.11E+01	
			531.00	1.538E+00	?(	4.436E+00	1.17E+02	1.30E+01 G
			91.10	-7.960E-01	-	5.165E+00	1.94E+02	2.83E+01 G
TL-210	N	2.9210E-01					5.84E+05	
			799.60	2.921E-01	?(	9.035E-01	9.08E+01	9.90E+01 G
			296.00	-3.233E-01	-	1.911E+00	1.76E+02	7.90E+01 G
			1313.00	2.987E+00	&	1.835E+00	2.89E+01	2.10E+01 GA

(- This peak used in the nuclide activity average.

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 15
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

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  * - 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	77.	18.	0.010	74.03	8.979E+00
TH-227	50.14	96.	13.	0.007	113.82	3.005E+00
AM-241	59.54	161.	16.	0.009	114.25	6.807E-01
TH-234	63.29	177.	16.	0.009	119.15	6.006E+00
Sn-126	64.28	148.	15.	0.008	121.31	2.090E+00
BA-133	80.99	928.	-21.	-0.011	210.42	-6.952E-01
Np-237	86.49	907.	-21.	-0.011	207.04	-1.752E+00
EU-155	86.54	887.	-21.	-0.011	204.70	-7.474E-01
Sn-126	86.94	866.	-21.	-0.011	202.27	-2.533E+00
Sn-126	87.57	845.	-21.	-0.012	199.73	-6.090E-01
Cd-109	88.04	825.	-21.	-0.012	197.21	-6.014E+00
Nd-147	91.10	804.	-21.	-0.012	194.22	-7.960E-01
TH-234	92.59	812.	-21.	-0.012	194.92	-4.015E+00
AC-228	93.35	833.	-5.	-0.003	783.24	-1.008E+00
Gd-153	103.20	432.	18.	0.010	169.29	8.427E-01
EU-155	105.31	248.	-19.	-0.010	121.32	-9.207E-01
EU-152	121.78	112.	-15.	-0.008	103.06	-5.496E-01
CO-57	122.06	105.	7.	0.004	210.44	8.567E-02
PA-234	131.29	182.	14.	0.008	143.70	8.000E-01

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 16
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
HF-181	133.02	196.	14.	0.008	148.54	3.344E-01		
CE-144	133.54	209.	14.	0.008	153.36	1.308E+00		
HF-181	136.30	223.	14.	0.008	157.73	2.503E+00		
CO-57	136.47	236.	14.	0.008	162.33	1.372E+00		
Tc-99m	140.51	348.	-18.	-0.010	147.32	-2.284E-01		
U-235	143.79	329.	-18.	-0.010	143.12	-1.829E+00		
CE-141	145.44	369.	-19.	-0.011	142.27	-4.452E-01		
Ba-140	162.66	130.	-10.	-0.006	164.32	-1.904E+00		
U-235	163.38	58.	12.	0.007	93.12	2.851E+00		
Cf-251	176.60	84.	-13.	-0.007	131.73	-9.579E-01		
U-235	185.72	55.	15.	0.008	94.75	3.554E-01		
TH-229	193.51	64.	-7.	-0.004	226.93	-2.062E+00		
U-235	205.33	64.	-14.	-0.008	115.03	-3.765E+00		
TH-229	210.85	40.	7.	0.004	193.14	3.002E+00		
Cf-251	227.00	104.	-21.	-0.012	98.91	-4.732E+00		
TH-227	235.97	281.	15.	0.008	162.95	1.771E+00		
EU-152	244.69	285.	11.	0.006	226.25	2.128E+00		
TH-227	256.24	64.	-8.	-0.004	198.96	-1.785E+00		
Cd-113m	263.70	52.	-2.	-0.001	687.99	-3.981E+02		
BI-210M	265.83	74.	-16.	-0.009	149.06	-5.049E-01		P
Hg-203	279.20	66.	-11.	-0.006	220.09	-2.177E-01		P
I-131	284.30	28.	11.	0.006	96.97	3.065E+00		
TL-210	296.00	332.	-15.	-0.008	175.74	-3.233E-01		
PA-231	300.07	291.	-12.	-0.007	202.44	-8.511E+00		
Ir-192	316.49	171.	11.	0.006	163.56	2.383E-01		
CR-51	320.08	291.	-12.	-0.007	91.18	-2.187E+00		P
La-140	328.76	145.	13.	0.007	133.90	1.186E+00		
HF-181	345.83	214.	-16.	-0.009	131.86	-2.037E+00		
BA-133	356.00	182.	-15.	-0.008	131.16	-4.676E-01		
I-131	364.48	24.	11.	0.006	92.26	2.680E-01		
BA-133	383.84	69.	-8.	-0.004	205.91	-1.859E+00		P
SN-113	391.69	35.	-7.	-0.004	168.76	-2.400E-01		
AG-108M	433.94	31.	-2.	-0.001	993.04	-4.165E-02		P
PM-146	453.88	39.	-14.	-0.008	94.90	-5.012E-01		
Ir-192	468.06	67.	-14.	-0.008	89.26	-6.257E-01		
BE-7	477.60	75.	-12.	-0.006	108.76	-2.677E+00		
La-140	487.02	85.	12.	0.007	111.04	6.547E-01		
RU-103	497.05	31.	-6.	-0.003	176.89	-1.584E-01		P
RH-106	511.86	35.	68.	0.038	17.28	8.632E+00		
Nd-147	531.00	17.	8.	0.004	116.58	1.538E+00		
Ba-140	537.26	22.	-1.	-0.001	767.93	-1.452E-01		P
CS-134	569.32	25.	5.	0.003	148.32	8.923E-01		
PA-234	569.47	33.	-4.	-0.002	209.17	-1.339E+00		
SB-124	602.73	213.	-15.	-0.008	142.47	-4.295E-01		
CS-134	604.71	198.	-15.	-0.008	137.48	-4.338E-01		
RU-103	610.30	184.	-10.	-0.005	201.84	-4.834E+00		
PM-144	618.06	28.	6.	0.003	131.23	1.766E-01		
I-131	636.97	11.	5.	0.003	108.19	2.007E+00		P

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:13 PMPage 17
TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
AG-110M	657.76	27.	1.	0.001	554.53	4.305E-02		
CS-137	661.66	39.	-8.	-0.004	68.77	-2.836E-01		P
PM-144	696.54	42.	-10.	-0.006	53.79	-3.286E-01		P
NB-94	702.63	54.	4.	0.002	239.81	1.446E-01		P
SB-124	722.79	24.	10.	0.005	78.20	2.920E+00		
AG-108M	722.94	33.	1.	0.000	933.33	3.171E-02		
BI-212	727.17	26.	7.	0.004	113.95	2.952E+00		P
PM-146	735.72	19.	4.	0.002	216.89	6.404E-01		
PM-146	747.16	19.	1.	0.001	692.82	1.319E-01		
ZR-95	756.73	30.	-11.	-0.006	69.20	-6.983E-01		P
AG-110M	763.94	36.	-13.	-0.007	70.92	-1.997E+00		
NB-95	765.79	45.	5.	0.003	182.43	1.832E-01		
EU-152	778.92	10.	2.	0.001	354.73	5.367E-01		
BI-212	785.42	11.	6.	0.003	93.57	1.559E+01		P
CS-134	795.87	19.	5.	0.003	137.89	1.941E-01		
TL-210	799.60	23.	8.	0.005	90.81	2.921E-01		
CS-134	801.95	40.	7.	0.004	130.54	2.917E+00		
Cs-136	818.50	35.	-6.	-0.003	149.60	-2.099E-01		
MN-54	834.85	30.	-12.	-0.007	104.42	-4.395E-01		
NB-94	871.10	13.	6.	0.004	88.85	2.399E-01		
EU-154	873.23	14.	4.	0.002	126.93	1.370E+00		P
PA-234	880.53	43.	-10.	-0.005	100.83	-6.147E+00		
Sc-46	889.28	64.	-10.	-0.005	123.28	-3.653E-01		
Y-88	898.04	26.	-14.	-0.008	41.98	-5.712E-01		P
AC-228	911.07	28.	8.	0.004	152.32	1.034E+00		P
AG-110M	937.49	15.	-5.	-0.003	176.07	-5.829E-01		
PA-234	946.02	15.	9.	0.005	100.31	2.709E+00		
EU-152	964.11	8.	6.	0.004	72.87	1.777E+00		
AC-228	968.97	41.	5.	0.003	186.77	1.176E+00		
EU-154	996.33	21.	6.	0.003	122.69	2.245E+00		
Cs-136	1048.07	13.	-6.	-0.004	90.70	-3.460E-01		
RH-106	1050.36	34.	-12.	-0.007	74.22	-3.368E+01		
BI-207	1063.66	5.	6.	0.004	91.71	3.786E-01		P
Ga-68	1077.40	16.	3.	0.002	308.52	4.761E+00		
FE-59	1099.25	16.	-1.	-0.001	914.69	-8.031E-02		
EU-152	1112.07	48.	-8.	-0.004	129.87	-2.629E+00		
Sc-46	1120.55	53.	-3.	-0.001	432.16	-1.163E-01		P
Ta-182	1189.05	11.	-1.	-0.001	598.44	-3.975E-01		
NA-22	1274.53	11.	3.	0.001	188.75	1.362E-01		
FE-59	1291.60	6.	1.	0.001	438.38	1.556E-01		P
TL-210	1313.00	0.	12.	0.007	28.87	2.987E+00		
CO-60	1332.50	6.	-2.	-0.001	343.80	-8.819E-02		
AG-110M	1384.30	0.	12.	0.007	28.87	2.695E+00		
EU-152	1408.00	6.	4.	0.002	137.50	1.141E+00		
Y-88	1836.06	6.	-5.	-0.003	124.92	-3.697E-01		

P - Peakbackground subtraction

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TestAmerica Inc Spectrum name: 9_Gamma_20193494.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 *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty Counting 1 Sigma	MDA Bq/Sample
BE-7	#A	-2.6771E+00	-2.6771E+00	1.088E+02%	9.86E+00
NA-22	#A	1.3620E-01	1.3620E-01	1.887E+02%	9.40E-01
K-40		8.4467E+01	8.4467E+01	8.348E+00%	8.42E+00
Sc-46	#A	-3.6531E-01	-3.6531E-01	1.233E+02%	1.54E+00
CR-51	#A	-2.1865E+00	-2.1866E+00	9.118E+01%	1.50E+01
MN-54	#A	-4.3954E-01	-4.3954E-01	1.044E+02%	1.03E+00
FE-59	#A	2.1889E-02	2.1889E-02	4.384E+02%	1.71E+00
Co-56	#	5.6091E-01	5.6091E-01	3.015E+01%	4.93E-01
CO-57	#A	2.2833E-01	2.2833E-01	1.329E+02%	6.18E-01
CO-58	#	9.0006E-01	9.0006E-01	2.000E+01%	2.65E-01
CO-60	#A	-8.8190E-02	-8.8190E-02	3.438E+02%	7.30E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.26E+00
NB-94	#A	1.9274E-01	1.9274E-01	8.885E+01%	1.21E+00
ZR-95	#A	-6.9826E-01	-6.9826E-01	6.920E+01%	1.77E+00
NB-95	#A	1.8321E-01	1.8322E-01	1.824E+02%	1.16E+00
RU-103	#A	-1.5844E-01	-1.5844E-01	1.769E+02%	7.81E-01
RH-106	#A	-2.0420E-01	-2.0420E-01	1.670E+03%	8.90E+00
AG-108M	#A	-4.8971E-03	-4.8971E-03	6.814E+02%	7.10E-01
AG-110M	#A	3.6293E-01	3.6294E-01	2.887E+01%	1.92E+00
SN-113	#A	-2.3998E-01	-2.3998E-01	1.688E+02%	9.91E-01
SB-124	#A	-9.7478E-02	-9.7479E-02	7.820E+01%	2.06E+00
SB-125	A	1.0093E+00	1.0093E+00	6.709E+01%	1.67E+00
I-131	#A	5.8000E-01	5.8003E-01	5.737E+01%	6.22E-01
Gd-153	#A	3.5466E-01	3.5466E-01	1.693E+02%	4.86E+00
Ga-68	#A	4.7153E+00	4.7613E+00	3.085E+02%	3.39E+01
Tc-99m	#A	-2.2800E-01	-2.2842E-01	1.473E+02%	1.13E+00
BA-133	#A	-4.6764E-01	-4.6764E-01	1.312E+02%	2.07E+00
CS-134	#A	5.0798E-01	5.0798E-01	8.031E+01%	9.43E-01
CS-137	#A	-2.8359E-01	-2.8359E-01	6.877E+01%	1.14E+00
CE-139	#A	1.1891E-02	1.1891E-02	1.811E+03%	7.48E-01
Ba-140	#A	-1.4515E-01	-1.4515E-01	7.679E+02%	2.67E+00
La-140	#A	2.8839E-01	2.8840E-01	1.110E+02%	9.19E-01
CE-141	#A	-4.4516E-01	-4.4517E-01	1.423E+02%	2.12E+00
CE-144	#A	1.3079E+00	1.3079E+00	1.534E+02%	6.77E+00
PM-144	#A	-3.2858E-01	-3.2858E-01	5.379E+01%	1.06E+00
EU-152	#A	5.2304E-01	5.2304E-01	7.287E+01%	1.91E+00
EU-154	#A	3.4111E-01	3.4111E-01	1.227E+02%	1.26E+00
EU-155	#A	-9.2066E-01	-9.2066E-01	1.213E+02%	3.75E+00
HF-181	#A	2.2463E-01	2.2464E-01	1.485E+02%	1.39E+00
Ta-182	#A	4.4025E-02	4.4026E-02	3.045E+03%	4.77E+00
Hg-203	#A	-2.1765E-01	-2.1766E-01	2.201E+02%	8.23E-01
TL-208		2.0732E+00	2.0732E+00	1.367E+01%	4.07E-01
PM-146	#A	-2.0761E-01	-2.0761E-01	9.490E+01%	1.14E+00

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TestAmerica Inc Spectrum name: 9_Gamma_20193494.An1

Y-88 #A	-3.6969E-01	-3.6969E-01	1.249E+02%		1.00E+00
Cd-113m#A	-3.9805E+02	-3.9805E+02	6.880E+02%		9.68E+03
Cd-109 #A	-6.0136E+00	-6.0136E+00	1.972E+02%		3.96E+01
Cf-251 #A	-9.5793E-01	-9.5793E-01	1.317E+02%		3.27E+00
Cf-249 #A	-1.0506E-02	-1.0506E-02	3.604E+03%		1.33E+00
Sn-126 #A	2.0896E+00	2.0896E+00	1.213E+02%		8.55E+00
PB-210 #A	8.9791E+00	8.9791E+00	7.403E+01%		2.21E+01
PB-212	4.0609E+00	4.0609E+00	1.197E+01%		1.12E+00
PB-214	5.2483E+00	5.2483E+00	1.191E+01%		1.64E+00
BI-207 #A	3.7858E-01	3.7858E-01	9.171E+01%		8.05E-01
BI-212 #A	2.9520E+00	2.9520E+00	1.140E+02%		1.16E+01
U-235 #A	-3.4667E-01	-3.4667E-01	8.538E+01%		8.78E+00
BI-214	4.4253E+00	4.4253E+00	1.775E+01%		1.47E+00
BI-210M#A	-5.0492E-01	-5.0492E-01	1.491E+02%		1.37E+00
AC-228 #A	1.0872E+00	1.0872E+00	1.205E+02%		3.72E+00
TH-227 #A	1.2209E+00	1.2209E+00	9.374E+01%		8.92E+00
TH-229 #A	-1.3001E-02	-1.3001E-02	1.490E+02%		1.18E+01
TH-234 #A	4.9273E-02	4.9273E-02	1.142E+02%		2.61E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%		4.89E+01
PA-233 #A	0.0000E+00	0.0000E+00	7.071E+02%		4.00E+00
PA-234 #A	1.6148E+00	1.6148E+00	8.763E+01%		3.88E+00
PA-234M#A	0.0000E+00	0.0000E+00	1.000E+03%		1.36E+02
AM-241 #A	6.8070E-01	6.8070E-01	1.143E+02%		2.62E+00
Np-237 #A	-1.7521E+00	-1.7521E+00	2.070E+02%		1.21E+01
Ir-192 #A	2.3826E-01	2.3826E-01	1.636E+02%		1.32E+00
Cs-136 #A	-2.0994E-01	-2.0995E-01	1.496E+02%		1.09E+00
Np-239 #A	-8.2593E-01	-8.2609E-01	1.207E+02%		3.35E+00
Nd-147 #A	1.5379E+00	1.5380E+00	1.166E+02%		4.44E+00
TL-210 #A	2.9210E-01	2.9210E-01	9.081E+01%		9.04E-01
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%		2.96E+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) 1.003E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 1.0027452E+02 Bq/Sample

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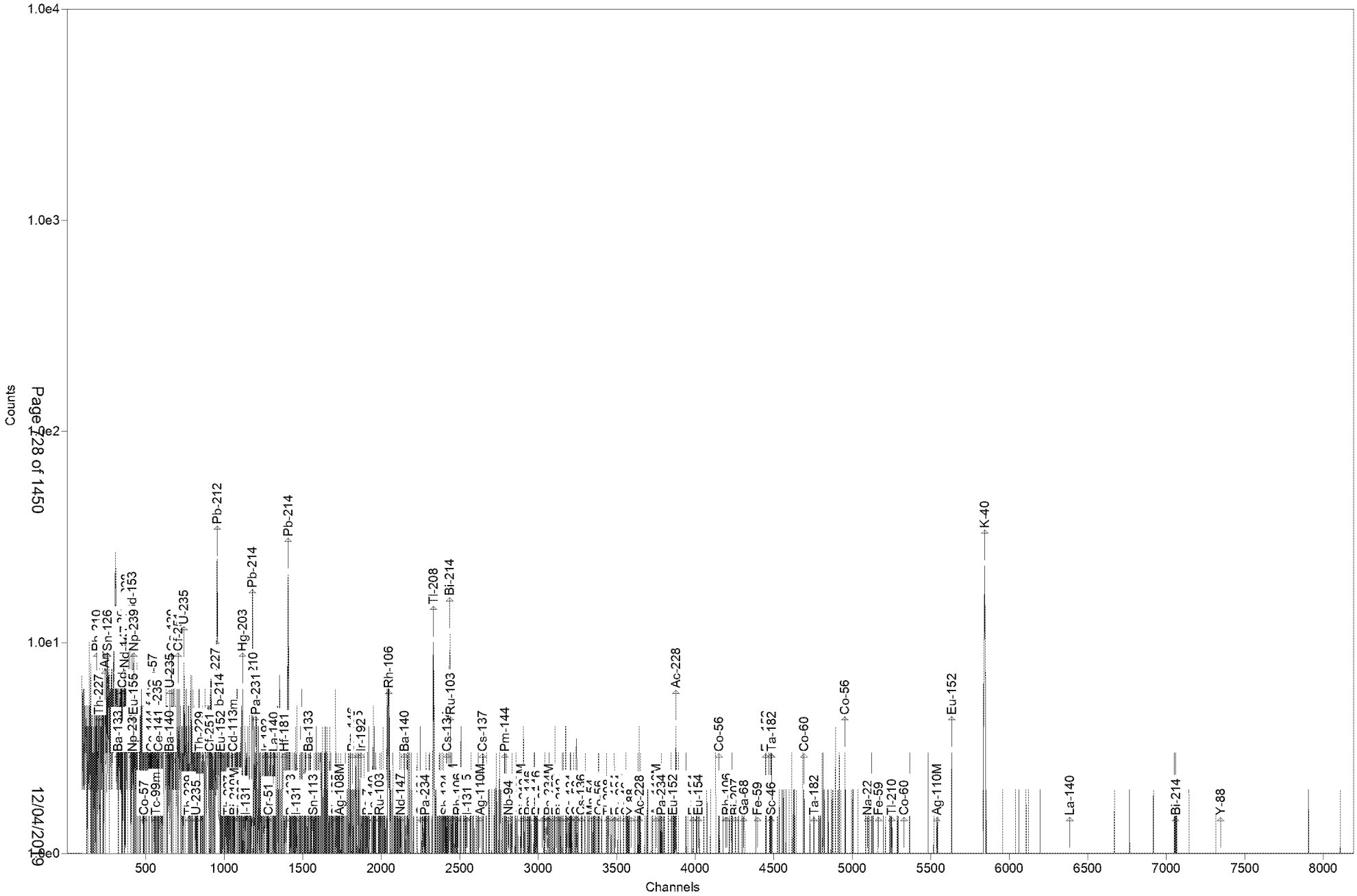
448571_Gamma_160-36160-A-3-C. 9_Gamma_20193494.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193349

Sample Description: 448571_Gamma_160-36160-A-4-C
Detector: Detector #12
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-4-C

Decay to Time: 11/23/2019 21:09 Live Time: 1800 sec
Acquisition Time: 11/23/2019 21:09:34 Real Time: 1801 sec
Analysis Time: 11/23/2019 21:39 Dead Time: 0.06 %
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_2019-11-10_1422.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	2.499E+00	108.4	2.708E+00	2.711E+00	9.294E+00
NA-22	9.366E-02	266.9	2.500E-01	2.500E-01	9.696E-01
K-40	8.273E+01	9.4	7.782E+00	8.833E+00	5.395E+00
Sc-46	-5.395E-01	90.2	4.865E-01	4.873E-01	1.648E+00
CR-51	2.970E+00	168.8	5.013E+00	5.016E+00	1.696E+01
MN-54	-4.113E-01	144.7	5.951E-01	5.955E-01	1.407E+00
FE-59	-1.601E+00	85.7	1.371E+00	1.374E+00	2.976E+00
Co-56	8.314E-01	25.0	2.079E-01	2.121E-01	3.830E-01
CO-57	-2.091E-01	97.9	2.047E-01	2.050E-01	6.918E-01
CO-58	3.964E-01	86.4	3.426E-01	3.432E-01	1.165E+00
CO-60	-4.419E-02	202.9	8.965E-02	8.967E-02	1.337E+00
ZN-65	0.000E+00	1.#INF	4.695E-01	4.695E-01	4.038E+00
NB-94	-7.066E-02	163.0	1.152E-01	1.152E-01	1.269E+00
ZR-95	4.718E-01	95.7	4.515E-01	4.521E-01	1.123E+00
NB-95	1.151E-01	271.3	3.122E-01	3.123E-01	1.130E+00
RU-103	-3.868E-02	881.3	3.409E-01	3.409E-01	9.109E-01
RH-106	4.121E+00	130.1	5.363E+00	5.367E+00	1.827E+01
AG-108M	-4.526E-01	95.2	4.308E-01	4.314E-01	1.076E+00
AG-110M	-7.397E-02	62.1	4.591E-02	4.607E-02	2.067E+00
SN-113	-1.831E-01	408.9	7.487E-01	7.487E-01	2.573E+00
SB-124	-5.682E-01	150.2	8.532E-01	8.537E-01	2.878E+00
SB-125	4.248E-02	69.5	2.953E-02	2.961E-02	3.253E+00
I-131	4.115E-01	96.6	3.976E-01	3.981E-01	8.680E-01
Gd-153	6.508E-01	145.2	9.447E-01	9.455E-01	3.192E+00
Ga-68	-1.752E+01	119.0	2.086E+01	2.088E+01	4.676E+01
Tc-99m	1.687E-08	2224365560.7	3.752E-01	3.752E-01	1.284E+00
BA-133	1.099E-01	600.7	6.600E-01	6.600E-01	2.282E+00
CS-134	4.601E-01	91.5	4.209E-01	4.216E-01	1.273E+00
CS-137	1.461E-01	268.4	3.920E-01	3.921E-01	1.398E+00
CE-139	-5.816E-02	484.6	2.819E-01	2.819E-01	9.771E-01
Ba-140	3.370E-01	78.8	2.656E-01	2.662E-01	4.336E+00
La-140	3.047E-01	110.8	3.376E-01	3.380E-01	1.243E+00
CE-141	3.007E-01	106.1	3.190E-01	3.194E-01	1.087E+00

CE-144	4.326E-01	686.2	2.968E+00	2.968E+00	1.012E+01
PM-144	-3.188E-01	164.8	5.253E-01	5.255E-01	1.247E+00
EU-152	1.543E+00	30.2	4.652E-01	4.720E-01	2.102E+00
EU-154	8.025E-01	94.2	7.561E-01	7.572E-01	1.411E+00
EU-155	4.843E-01	141.7	6.863E-01	6.868E-01	4.744E+00
HF-181	2.836E-01	134.6	3.817E-01	3.820E-01	1.353E+00
Ta-182	-2.377E+00	86.2	2.049E+00	2.052E+00	6.886E+00
Hg-203	-3.152E-01	94.0	2.964E-01	2.969E-01	1.002E+00
TL-208	2.155E+00	14.7	3.177E-01	3.360E-01	3.453E-01
PM-146	-3.438E-02	397.9	1.368E-01	1.368E-01	1.078E+00
Y-88	2.809E-02	658.6	1.850E-01	1.850E-01	7.036E-01
Cd-113m	1.692E+03	193.3	3.269E+03	3.271E+03	1.144E+04
Cd-109	-1.561E-06	604638386.7	9.440E+00	9.440E+00	3.222E+01
Cf-251	1.121E+00	109.0	1.222E+00	1.223E+00	3.197E+00
Cf-249	-6.338E-01	112.1	7.102E-01	7.109E-01	2.394E+00
Sn-126	1.356E+00	292.1	3.961E+00	3.962E+00	1.346E+01
PB-210	1.915E+01	58.0	1.112E+01	1.118E+01	3.071E+01
PB-212	2.356E+00	21.6	5.100E-01	5.246E-01	1.386E+00
PB-214	4.960E+00	17.1	8.492E-01	8.857E-01	1.730E+00
BI-207	7.405E-01	33.3	2.468E-01	2.496E-01	6.064E-01
BI-212	3.902E+00	121.3	4.733E+00	4.737E+00	1.640E+01
U-235	2.330E+00	90.4	2.107E+00	2.110E+00	5.946E+00
BI-214	6.182E+00	13.8	8.547E-01	9.108E-01	1.101E+00
BI-210M	2.471E-01	148.7	3.675E-01	3.677E-01	1.694E+00
AC-228	5.133E+00	22.4	1.149E+00	1.178E+00	2.479E+00
TH-227	2.346E+00	96.5	2.265E+00	2.268E+00	8.506E+00
TH-229	-2.814E+00	201.8	5.679E+00	5.681E+00	1.498E+01
TH-234	-5.326E+00	71.5	3.810E+00	3.821E+00	1.381E+01
PA-231	-3.990E-07	4294469832.4	1.713E+01	1.713E+01	5.872E+01
PA-233	-7.985E-01	145.0	1.158E+00	1.158E+00	3.922E+00
PA-234	2.469E-01	81.0	2.000E-01	2.004E-01	5.466E+00
PA-234M	0.000E+00	1.#INF	7.005E+00	7.005E+00	1.778E+02
AM-241	8.731E-01	129.9	1.135E+00	1.136E+00	3.817E+00
Np-237	1.919E+00	137.3	2.634E+00	2.636E+00	8.859E+00
Ir-192	-3.490E-02	116.4	4.063E-02	4.068E-02	2.196E+00
Cs-136	2.090E-01	28.9	6.032E-02	6.147E-02	1.684E+00
Np-239	-5.908E-01	216.3	1.278E+00	1.278E+00	4.339E+00
Nd-147	-3.719E+00	95.9	3.567E+00	3.573E+00	8.567E+00
TL-210	0.000E+00	1.#INF	5.035E-02	5.035E-02	1.286E+00
Kr-85	1.014E+02	105.8	1.072E+02	1.074E+02	3.627E+02
Total	1.949E+03				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 9:39:45 PMPage  1
TestAmerica Inc                 Spectrum name: 12_Gamma_20193349.An1

Sample description
     448571_Gamma_160-36160-A-4-C


Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193349.An1

Acquisition information
       Start time:                 11/23/2019 9:09:34 PM
       Live time:               1800
       Real time:               1801
       Dead time:                  0.06 %
       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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 2
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11/23/2019 9:09:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-11-10_1422.PBC 11/10/2019 2:22:07 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 8 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1093

***** 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
46.56	26.	58.05	0.62	1.802E-02	46.54	4.250	PBC<MDA	PB210
59.54	16.	129.94	0.86	2.817E-02	59.54	35.900	PBC<MDA	AM241
63.29	-6.	342.33	0.87	2.978E-02	63.29	3.810	PBC<MDA	TH234
64.28	7.	292.07	0.87	3.015E-02	64.28	9.700	PBC<MDA	Sn126
77.22	55.	33.84	0.85	3.388E-02				
86.49	16.	137.30	0.89	3.559E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	8.185E-01	EU155
86.54	16.	141.71	0.89	3.560E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	8.187E-01	EU155
					86.94	9.040	2.776E+00	Sn126
86.94	16.	142.78	0.89	3.566E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	2.725E+00	Sn126
87.57	3.	693.76	0.89	3.575E-02	87.57	37.500	PBC<MDA	Sn126
92.59	-19.	71.54	0.90	3.637E-02	92.59	5.584	PBC<MDA	TH234
93.37	14.	99.84	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
97.50	13.	145.17	0.90	3.683E-02	97.50	30.000	PBC<MDA	Gd153
99.50	10.	192.76	0.91	3.697E-02	99.50	15.000	PBC<MDA	Np239
121.78	7.	167.21	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.220E-01	CO57
123.10	10.	115.13	0.93	3.721E-02	123.10	40.790	PBC<MDA	EU154
133.02	13.	167.81	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
133.54	3.	686.18	0.94	3.670E-02	133.54	11.090	PBC<MDA	CE144
143.79	6.	220.36	0.95	3.599E-02	143.79	10.960	PBC<MDA	U235
145.44	9.	106.10	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
162.66	11.	109.83	0.97	3.435E-02	162.66	6.220	PBC<MDA	Ba140
163.38	11.	117.61	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
176.60	11.	108.97	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 3
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.72	15.	95.41	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
205.33	12.	105.80	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235
235.97	11.	164.05	1.04	2.764E-02	235.97	12.300	PBC<MDA	TH227
238.57	50.	21.64	1.05	2.743E-02	238.63	43.300	2.356E+00	PB212
241.93	12.	162.06	1.05	2.716E-02	242.00	7.430	PBC<MDA	PB214
244.69	12.	165.40	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152
256.24	10.	101.80	1.06	2.608E-02	256.24	7.000	PBC<MDA	TH227
263.70	5.	193.25	1.07	2.554E-02	263.70	0.006	PBC<MDA	Cd113m
278.04	6.	124.72	1.08	2.462E-02	277.28	6.310	PBC<MDA	TL208
284.30	8.	100.56	1.09	2.416E-02	284.30	6.140	PBC<MDA	I131
295.11	28.	31.08	1.04	2.350E-02	295.09	19.300	3.447E+00	PB214
304.85	10.	156.38	1.11	2.293E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	8.841E-01	BI210M
304.90	9.	148.70	1.11	2.293E-02	304.85	4.290	5.343E+00	Ba140
					304.90	28.000	8.187E-01	BI210M
308.44	3.	436.64	1.11	2.273E-02	308.44	31.750	PBC<MDA	Ir192
320.08	12.	168.82	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
337.90	30.	34.16	1.15	2.118E-02	338.32	12.010	6.588E+00	AC228
340.57	9.	137.14	1.15	2.108E-02	340.57	46.900	PBC<MDA	Cs136
344.29	5.	273.22	1.15	2.090E-02	344.29	26.500	PBC<MDA	EU152
351.93	69.	17.12	1.06	2.055E-02	351.93	37.600	4.960E+00	PB214
356.00	2.	600.67	1.16	2.037E-02	356.00	62.050	PBC<MDA	BA133
364.48	6.	164.99	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
463.37	9.	69.51	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
468.06	6.	116.43	1.27	1.653E-02	468.06	51.750	PBC<MDA	Ir192
477.60	8.	108.37	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
482.00	4.	210.43	1.28	1.617E-02	482.00	80.500	PBC<MDA	HF181
487.02	6.	133.62	1.29	1.604E-02	487.02	45.500	PBC<MDA	La140
511.86	27.	45.33	2.56	1.546E-02	511.86	20.000	PBC<MDA	RH106
513.98	12.	105.76	1.31	1.541E-02	513.98	0.430	PBC<MDA	Kr85
569.32	3.	179.51	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	1.424E+00	PA234
					569.70	97.740	1.195E-01	BI207
583.49	46.	14.74	1.44	1.403E-02	583.02	84.500	2.155E+00	TL208
609.44	70.	13.83	1.52	1.358E-02	609.31	46.090	6.182E+00	BI214
621.92	10.	130.14	1.42	1.338E-02	621.92	9.930	PBC<MDA	RH106
657.76	7.	79.86	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
661.66	3.	268.40	1.45	1.279E-02	661.66	85.210	PBC<MDA	CS137
727.17	6.	121.28	1.52	1.194E-02	727.17	7.550	PBC<MDA	BI212
747.16	1.	979.80	1.53	1.171E-02	747.16	34.000	PBC<MDA	PM146
756.73	5.	95.69	1.54	1.160E-02	756.73	54.460	PBC<MDA	ZR95
763.94	8.	73.00	1.55	1.152E-02	763.94	22.280	PBC<MDA	AG110M
765.79	2.	271.30	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	3.909E+01	PA234M
778.92	11.	30.15	1.56	1.136E-02	778.92	12.940	4.156E+00	EU152
785.42	3.	147.99	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
795.87	7.	91.47	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
810.78	8.	86.42	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 4
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
815.77	6.	110.80	1.60	1.099E-02	815.77	23.280	PBC<MDA	La140
846.77	16.	25.00	1.63	1.070E-02	846.77	99.935	8.314E-01	Co56
860.80	8.	93.20	1.64	1.057E-02	860.56	12.420	PBC<MDA	TL208
871.10	2.	263.82	1.65	1.048E-02	871.10	99.890	PBC<MDA	NB94
873.23	6.	94.21	1.65	1.046E-02	873.23	12.270	PBC<MDA	EU154
880.53	6.	89.80	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
883.24	6.	107.25	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
898.04	1.	857.32	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
911.62	24.	28.92	1.68	1.015E-02	911.07	29.000	4.531E+00	AC228
964.11	7.	105.36	1.73	9.739E-03	964.11	14.605	PBC<MDA	EU152
969.46	-2.	463.60	1.74	9.703E-03	968.97	17.460	PBC<MDA	AC228
1004.77	1.	530.33	1.77	9.450E-03	1004.77	18.010	PBC<MDA	EU154
1048.07	12.	28.87	1.81	9.162E-03	1048.07	80.000	9.096E-01	Cs136
1063.66	9.	33.33	1.82	9.063E-03	1063.66	74.500	7.405E-01	BI207
1120.27	9.	90.42	1.87	8.722E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	5.862E-01	Sc46
1120.55	9.	81.04	1.87	8.721E-03	1120.29	15.100	3.881E+00	BI214
					1120.55	99.987	5.862E-01	Sc46
					1121.30	34.900	1.680E+00	Ta182
1173.24	2.	324.82	1.92	8.426E-03	1173.24	99.900	PBC<MDA	CO60
1238.28	22.	21.32	1.97	8.090E-03	1238.28	66.070	2.287E+00	Co56
1274.53	1.	266.93	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	2.660E-01	EU154
1291.60	5.	113.28	2.02	7.834E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	8.	35.36	2.04	7.735E-03	1313.00	21.000	2.736E+00	TL210
1408.00	7.	37.80	2.12	7.324E-03	1408.00	21.005	PBC<MDA	EU152
1460.73	113.	9.41	1.62	7.112E-03	1460.83	10.670	8.273E+01	K40
1764.49	20.	22.36	2.40	6.075E-03	1764.49	15.400	1.188E+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
308.45	77.22	84.	55.	1.611E+03	33.84	0.853	-

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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 5
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

********** 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	46.56	73.	26.	0.015	58.05	0.616s
TH-227	200.18	50.14	173.	-7.	-0.004	268.40	0.855s
AM-241	237.74	59.54	205.	16.	0.009	129.94	0.865s
TH-234	252.74	63.29	244.	-6.	-0.004	342.33	0.868
Sn-126	256.71	64.28	214.	7.	0.004	292.07	0.869s
BA-133	323.50	80.99	288.	-19.	-0.011	125.30	0.887
Np-237	345.49	86.49	236.	16.	0.009	137.30	0.892s
EU-155	345.70	86.54	252.	16.	0.009	141.71	0.892s
Sn-126	347.29	86.94	247.	16.	0.009	142.78	0.892s
Sn-126	349.81	87.57	263.	3.	0.002	693.76	0.893s
TH-234	369.87	92.59	105.	-19.	-0.011	71.54	0.898s
AC-228	372.91	93.35	90.	14.	0.008	99.84	0.899s
Gd-153	389.50	97.50	170.	13.	0.007	145.17	0.903s
Np-239	397.50	99.50	183.	10.	0.006	192.76	0.905s
Gd-153	412.29	103.20	193.	0.	0.000	1000.00	0.909s
Np-239	414.29	103.70	193.	0.	0.000	1000.00	0.909s
EU-155	420.73	105.31	193.	0.	0.000	1000.00	0.911s
Np-239	424.00	106.13	185.	-9.	-0.005	216.31	0.912s
EU-152	486.56	121.78	65.	7.	0.004	167.21	0.928s
CO-57	487.69	122.06	63.	-12.	-0.007	97.89	0.928s
EU-154	491.84	123.10	59.	10.	0.005	115.13	0.929s
PA-234	524.60	131.29	180.	-16.	-0.009	121.48	0.938s
HF-181	531.51	133.02	248.	13.	0.007	167.81	0.939s
CE-144	533.57	133.54	235.	3.	0.002	686.18	0.940s
CO-57	545.30	136.47	222.	-5.	-0.003	453.56	0.943s
U-235	574.53	143.79	72.	6.	0.003	220.36	0.950s
CE-141	581.15	145.44	45.	9.	0.005	106.10	0.952s
Ba-140	649.99	162.66	70.	11.	0.006	109.83	0.969s
U-235	652.87	163.38	81.	11.	0.006	117.61	0.970s
CE-139	662.76	165.85	94.	-3.	-0.002	484.62	0.973s
Cf-251	705.72	176.60	40.	11.	0.006	108.97	0.983s
U-235	742.18	185.72	64.	15.	0.009	95.41	0.992s
TH-229	773.32	193.51	55.	-7.	-0.004	201.78	1.000s
U-235	820.59	205.33	44.	12.	0.007	105.80	1.012s
TH-229	842.65	210.85	81.	-17.	-0.009	104.23	1.018s
Cf-251	907.22	227.00	48.	-4.	-0.002	356.12	1.034s
TH-227	943.09	235.97	171.	11.	0.006	164.05	1.043s
PB-212	953.73	238.63	33.	50.	0.028	21.64	1.045D
PB-214	967.18	242.00	169.	12.	0.006	162.06	1.049s
EU-152	977.96	244.69	177.	12.	0.006	165.40	1.051s
TH-227	1024.13	256.24	29.	10.	0.006	101.80	1.063s
Cd-113m	1053.96	263.70	38.	5.	0.003	193.25	1.070s
BI-210M	1062.48	265.83	60.	-2.	-0.001	660.00	1.072s
TL-208	1108.27	277.28	25.	6.	0.003	124.72	1.084s

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 6
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Hg-203	1115.93	279.20	51.	-11.	-0.006	94.04	1.086s
I-131	1136.32	284.30	18.	8.	0.005	100.56	1.091s
PB-214	1179.55	295.11	17.	28.	0.016	31.08	1.035
TL-210	1183.11	296.00	238.	-12.	-0.007	182.18	1.102s
PB-212	1199.22	300.03	225.	-12.	-0.007	176.96	1.106
PA-231	1199.38	300.07	213.	-12.	-0.007	172.25	1.106
PA-233	1199.82	300.18	206.	-4.	-0.002	500.92	1.107
Ba-140	1218.49	304.85	122.	10.	0.006	156.38	1.111s
BI-210M	1218.68	304.90	94.	9.	0.005	148.70	1.111s
Ir-192	1232.85	308.44	104.	3.	0.002	436.64	1.115s
PA-233	1247.13	312.01	137.	-12.	-0.006	144.97	1.118s
Ir-192	1265.04	316.49	252.	-14.	-0.008	161.80	1.123s
CR-51	1279.41	320.08	191.	12.	0.007	168.82	1.126s
La-140	1314.10	328.76	59.	-7.	-0.004	167.03	1.135s
Cf-249	1332.81	333.44	91.	-14.	-0.008	101.81	1.139s
AC-228	1350.65	337.90	20.	30.	0.017	34.16	1.150s
Cs-136	1361.32	340.57	70.	9.	0.005	137.14	1.146s
EU-152	1376.18	344.29	88.	5.	0.003	273.22	1.150s
PB-214	1406.75	351.93	21.	69.	0.038	17.12	1.065
BA-133	1423.02	356.00	112.	2.	0.001	600.67	1.162
I-131	1456.95	364.48	24.	6.	0.003	164.99	1.170s
BA-133	1534.35	383.84	108.	-14.	-0.008	106.27	1.189s
Cf-249	1550.79	387.95	122.	-14.	-0.008	112.05	1.193s
SN-113	1565.74	391.69	131.	-4.	-0.002	408.94	1.196s
SB-125	1710.45	427.88	36.	-9.	-0.005	134.72	1.232s
AG-108M	1734.69	433.94	36.	-13.	-0.007	95.19	1.238s
PM-146	1814.45	453.88	16.	-2.	-0.001	397.91	1.257s
SB-125	1852.39	463.37	15.	9.	0.005	69.51	1.266s
Ir-192	1871.16	468.06	23.	6.	0.003	116.43	1.271s
BE-7	1909.29	477.60	31.	8.	0.004	108.37	1.280s
HF-181	1926.90	482.00	39.	4.	0.002	210.43	1.284s
La-140	1946.98	487.02	33.	6.	0.004	133.62	1.289s
RU-103	1987.11	497.05	20.	-1.	-0.001	881.29	1.298s
RH-106	2046.35	511.86	60.	27.	0.015	45.33	2.563s
Kr-85	2054.81	513.98	76.	12.	0.007	105.76	1.315s
Nd-147	2122.88	531.00	35.	-13.	-0.007	95.90	1.331s
Ba-140	2147.92	537.26	30.	-8.	-0.005	139.28	1.337
CS-134	2276.15	569.32	13.	3.	0.002	179.51	1.367s
TL-208	2332.82	583.49	0.	46.	0.026	14.74	1.438
SB-125	2400.87	600.50	220.	-14.	-0.008	155.16	1.397s
SB-124	2409.79	602.73	207.	-14.	-0.008	150.17	1.399s
CS-134	2417.71	604.71	193.	-14.	-0.008	145.06	1.401s
BI-214	2436.64	609.44	4.	70.	0.039	13.83	1.523
RU-103	2440.06	610.30	179.	-14.	-0.008	139.46	1.406s
AG-108M	2455.99	614.28	165.	-14.	-0.008	133.82	1.410s
PM-144	2471.12	618.06	151.	-3.	-0.002	520.32	1.414s
RH-106	2486.54	621.92	77.	10.	0.005	130.14	1.417s
SB-125	2542.43	635.89	26.	-8.	-0.004	98.47	1.430s

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TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
I-131	2546.77	636.97	34.	-1.	-0.001	826.64	1.432s
AG-110M	2629.92	657.76	13.	7.	0.004	79.86	1.451
CS-137	2645.51	661.66	28.	3.	0.002	268.40	1.455
PM-144	2785.05	696.54	28.	-7.	-0.004	164.75	1.487s
NB-94	2809.41	702.63	28.	-6.	-0.003	191.49	1.493s
SB-124	2890.04	722.79	29.	-3.	-0.002	236.22	1.512s
AG-108M	2890.65	722.94	33.	0.	0.000	1000.00	1.512s
EU-154	2892.34	723.36	33.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	33.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	26.	6.	0.004	121.28	1.516s
PM-146	2941.78	735.72	14.	0.	0.000	1000.00	1.524s
PM-146	2987.55	747.16	9.	1.	0.000	979.80	1.535s
ZR-95	3025.83	756.73	5.	5.	0.003	95.69	1.543s
AG-110M	3054.69	763.94	12.	8.	0.004	73.00	1.550s
NB-95	3062.08	765.79	20.	2.	0.001	271.30	1.552s
PA-234M	3064.57	766.41	54.	-14.	-0.008	77.64	1.552s
EU-152	3114.61	778.92	0.	11.	0.006	30.15	1.564s
BI-212	3140.62	785.42	5.	3.	0.002	147.99	1.570s
CS-134	3182.43	795.87	17.	7.	0.004	91.47	1.579s
TL-210	3197.35	799.60	24.	0.	0.000	1000.00	1.583s
CO-58	3242.06	810.78	19.	8.	0.004	86.42	1.593s
La-140	3262.05	815.77	16.	6.	0.003	110.80	1.598s
Cs-136	3272.97	818.50	43.	-10.	-0.005	101.36	1.600s
MN-54	3338.38	834.85	28.	-8.	-0.004	144.70	1.615
Co-56	3386.08	846.77	0.	16.	0.009	25.00	1.626s
TL-208	3441.27	860.56	10.	8.	0.004	93.20	1.638
NB-94	3483.41	871.10	20.	2.	0.001	263.82	1.648s
EU-154	3491.95	873.23	16.	6.	0.004	94.21	1.650s
PA-234	3521.16	880.53	10.	6.	0.003	89.80	1.657s
PA-234	3532.00	883.24	16.	6.	0.003	107.25	1.659s
AG-110M	3537.78	884.68	30.	-8.	-0.005	100.40	1.660s
Sc-46	3556.17	889.28	36.	-10.	-0.006	90.18	1.664s
Y-88	3591.22	898.04	15.	1.	0.001	857.32	1.672s
AC-228	3643.36	911.07	5.	24.	0.013	28.92	1.684s
AG-110M	3749.09	937.49	15.	-5.	-0.003	176.07	1.708s
PA-234	3783.21	946.02	15.	-2.	-0.001	431.57	1.716s
EU-152	3855.60	964.11	21.	7.	0.004	105.36	1.732s
AC-228	3875.05	968.97	35.	-2.	-0.001	463.60	1.736s
EU-154	3984.54	996.33	20.	-3.	-0.002	199.00	1.761s
PA-234M	4003.22	1001.00	24.	0.	0.000	1000.00	1.765s
EU-154	4018.33	1004.77	24.	1.	0.001	530.33	1.768
Co-56	4150.66	1037.84	16.	-2.	-0.001	460.07	1.798s
Cs-136	4191.60	1048.07	0.	12.	0.007	28.87	1.807s
RH-106	4200.76	1050.36	19.	-6.	-0.003	113.06	1.809s
BI-207	4253.99	1063.66	0.	9.	0.005	33.33	1.820s
Ga-68	4308.98	1077.40	16.	-8.	-0.004	119.02	1.833s
FE-59	4396.44	1099.25	27.	-14.	-0.008	85.66	1.852s
EU-152	4447.76	1112.07	48.	-8.	-0.004	127.48	1.863s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZN-65	4461.66	1115.55	40.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	30.	9.	0.005	90.42	1.870s
Sc-46	4481.68	1120.55	23.	9.	0.005	81.04	1.870s
Ta-182	4484.69	1121.30	56.	-13.	-0.007	86.17	1.871s
CO-60	4692.57	1173.24	11.	2.	0.001	324.82	1.916s
Ta-182	4755.86	1189.05	16.	-5.	-0.003	187.26	1.930s
Ta-182	4885.39	1221.41	23.	-3.	-0.001	423.16	1.957s
Co-56	4952.92	1238.28	0.	22.	0.012	21.32	1.972s
NA-22	5098.03	1274.53	6.	1.	0.001	266.93	2.003s
EU-154	5098.08	1274.54	7.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	6.	5.	0.003	113.28	2.017s
TL-210	5252.04	1313.00	0.	8.	0.004	35.36	2.036s
CO-60	5330.11	1332.50	11.	-3.	-0.002	243.10	2.052
AG-110M	5537.48	1384.30	11.	-4.	-0.002	188.42	2.096s
EU-152	5632.39	1408.00	0.	7.	0.004	37.80	2.115s
K-40	5843.50	1460.73	0.	113.	0.063	9.41	1.623s
La-140	6386.02	1596.21	6.	0.	0.000	1000.00	2.269s
SB-124	6765.58	1690.98	0.	0.	0.000	1000.00	2.345s
BI-214	7060.00	1764.49	0.	20.	0.011	22.36	2.403s
Co-56	7087.48	1771.35	20.	0.	0.000	1000.00	2.408s
Y-88	7346.69	1836.06	0.	0.	0.000	1000.00	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
BE-7	C	2.4988E+00				5.31E+01	
			477.60	2.499E+00	&(	9.294E+00 1.08E+02 1.05E+01	G
NA-22	C	9.3656E-02				9.50E+02	
			1274.53	9.366E-02	?(	9.696E-01 2.67E+02 9.99E+01	G
K-40	N	8.2725E+01				4.66E+11	
			1460.83	8.273E+01	(	5.395E+00 9.41E+00 1.07E+01	G
Sc-46	F	-5.3951E-01				8.38E+01	
			889.28	-5.395E-01	?(	1.648E+00 9.02E+01 1.00E+02	G
			1120.55	5.862E-01	+	1.603E+00 8.10E+01 1.00E+02	G
CR-51	F	2.9696E+00				2.77E+01	
			320.08	2.970E+00	?(	1.696E+01 1.69E+02 9.94E+00	G

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TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	C	-4.1130E-01					3.12E+02	
			834.85	-4.113E-01	?(	1.407E+00	1.45E+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	8.756E-01	+	2.266E+00	1.13E+02	4.32E+01 G
Co-56	C	8.3144E-01					7.73E+01	
			846.77	8.314E-01	?(	3.830E-01	2.50E+01	9.99E+01 G
			1238.28	2.287E+00	+	7.660E-01	2.13E+01	6.61E+01 G
			1037.84	-8.521E-01	-	9.096E+00	4.60E+02	1.41E+01 G
			1771.35	0.000E+00	-	1.396E+01	1.00E+03	1.55E+01 A
CO-57	C	-2.0913E-01					2.72E+02	
			122.06	-2.091E-01	?(	6.918E-01	9.79E+01	8.56E+01 G
			136.47	-6.648E-01	+	1.027E+01	4.54E+02	1.07E+01 G
CO-58	C	3.9640E-01					7.09E+01	
			810.78	3.964E-01	?(	1.165E+00	8.64E+01	9.95E+01 G
CO-60	F	-4.4192E-02					1.93E+03	
			1332.50	-2.422E-01	?(	1.337E+00	2.43E+02	1.00E+02 G
			1173.24	1.540E-01	?(	1.183E+00	3.25E+02	9.99E+01 G
NB-94	I	-7.0662E-02					7.41E+06	
			702.63	-2.781E-01	?(	1.269E+00	1.91E+02	9.79E+01 G
			871.10	1.327E-01	?(	1.263E+00	2.64E+02	9.99E+01 G
ZR-95	I	4.7181E-01					6.40E+01	
			756.73	4.718E-01	?(	1.123E+00	9.57E+01	5.45E+01 G
			724.20	0.000E+00	-	3.083E+00	1.00E+03	4.42E+01 G
NB-95	I	1.1509E-01					6.40E+01	
			765.79	1.151E-01	?(	1.130E+00	2.71E+02	9.98E+01 G
RU-103	I	-3.8681E-02					3.93E+01	
			497.05	-3.868E-02	?(	9.109E-01	8.81E+02	9.09E+01 G
			610.30	-9.848E+00	+	4.634E+01	1.39E+02	5.75E+00 GA
RH-106	I	4.1208E+00					3.74E+02	
			621.92	4.121E+00	?(	1.827E+01	1.30E+02	9.93E+00 G
			1050.36	-2.271E+01	+	8.928E+01	1.13E+02	1.56E+00 G
			511.86	4.803E+00	?	6.974E+00	4.53E+01	2.00E+01 GA
AG-108M	C	-4.5255E-01					1.53E+05	
			433.94	-4.526E-01	&(	1.076E+00	9.52E+01	9.05E+01 G
			722.94	0.000E+00	+	1.496E+00	1.00E+03	9.08E+01 G

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TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		614.28	-6.350E-01	+	2.867E+00	1.34E+02	8.98E+01 G
AG-110M F	-7.3972E-02					2.50E+02	
		884.68	-6.022E-01	?(	2.067E+00	1.00E+02	7.27E+01 G
		657.76	3.261E-01	+	8.818E-01	7.99E+01	9.46E+01 G
		937.49	-8.134E-01	+	3.377E+00	1.76E+02	3.44E+01 G
		1384.30	-1.335E+00	+	5.669E+00	1.88E+02	2.43E+01 G
		763.94	1.649E+00	?(	4.031E+00	7.30E+01	2.23E+01 G
SN-113 F	-1.8308E-01					1.15E+02	
		391.69	-1.831E-01	&(	2.573E+00	4.09E+02	6.40E+01 G
SB-124 F	-5.6815E-01					6.02E+01	
		602.73	-5.682E-01	?(	2.878E+00	1.50E+02	9.83E+01 G
		1690.98	0.000E+00	+	1.359E+00	1.00E+03	4.78E+01 G
		722.79	-1.428E+00	+	1.198E+01	2.36E+02	1.08E+01 G
SB-125 I	4.2480E-02					1.01E+03	
		427.88	-9.545E-01	?(	3.253E+00	1.35E+02	2.96E+01 G
		600.50	-3.113E+00	+	1.629E+01	1.55E+02	1.79E+01 G
		635.89	-2.923E+00	+	9.848E+00	9.85E+01	1.13E+01 G
		463.37	2.861E+00	?(	6.612E+00	6.95E+01	1.05E+01 G
I-131 I	4.1153E-01					8.02E+00	
		364.48	2.039E-01	?(	8.680E-01	1.65E+02	8.17E+01 G
		284.30	3.174E+00	&(	8.486E+00	1.01E+02	6.14E+00 G
		636.97	-5.893E-01	&	1.753E+01	8.27E+02	7.17E+00 G
Gd-153 F	6.5075E-01					2.42E+02	
		97.50	6.508E-01	*(	3.192E+00	1.45E+02	3.00E+01 G
		103.20	0.000E+00	-	4.624E+00	1.00E+03	2.18E+01 G
Ga-68 C	-1.7522E+01					4.71E-02	
		1077.40	-1.752E+01	?(	4.676E+01	1.19E+02	3.30E+00 G
Tc-99m I	1.6870E-08					2.51E-01	
		140.51	1.687E-08	%(	1.284E+00	2.22E+09	8.93E+01 G
BA-133 F	1.0987E-01					3.85E+03	
		356.00	1.099E-01	?(	2.282E+00	6.01E+02	6.20E+01 G
		302.85	-6.271E-08	%	9.231E+00	4.29E+09	1.83E+01 G
		383.84	-4.625E+00	+	1.656E+01	1.06E+02	8.94E+00 GA
		80.99	-9.168E-01	+	3.851E+00	1.25E+02	3.41E+01 GA
CS-134 I	4.6013E-01					7.54E+02	
		795.87	4.064E-01	?(	1.273E+00	9.15E+01	8.55E+01 G
		604.71	-5.740E-01	+	2.809E+00	1.45E+02	9.76E+01 G
		569.32	7.588E-01	?(	4.935E+00	1.80E+02	1.54E+01 G

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TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	-3.831E-01	&	1.486E+01	1.06E+03	8.69E+00 G
			563.24	3.081E-01	%	1.022E+01	1.28E+03	8.35E+00 G
CS-137	I	1.4606E-01					1.10E+04	
			661.66	1.461E-01	?(	1.398E+00	2.68E+02	8.52E+01 G
CE-139	F	-5.8162E-02					1.38E+02	
			165.85	-5.816E-02	(	9.771E-01	4.85E+02	7.99E+01 G
Ba-140	I	3.3699E-01					1.28E+01	
			537.26	-1.273E+00	?(	4.336E+00	1.39E+02	2.44E+01 G
			162.66	2.904E+00	*(	1.082E+01	1.10E+02	6.22E+00 G
			304.85	5.770E+00	?(	3.066E+01	1.56E+02	4.29E+00 G
La-140	I	3.0468E-01					1.28E+01	
			1596.21	0.000E+00	?(	1.243E+00	1.00E+03	9.54E+01 G
			487.02	4.822E-01	?(	2.233E+00	1.34E+02	4.55E+01 G
			328.76	-8.427E-01	+	4.854E+00	1.67E+02	2.03E+01 G
			815.77	1.206E+00	?(	4.657E+00	1.11E+02	2.33E+01 G
CE-141	I	3.0070E-01					3.25E+01	
			145.44	3.007E-01	&(	1.087E+00	1.06E+02	4.82E+01 G
CE-144	I	4.3258E-01					2.85E+02	
			133.54	4.326E-01	(	1.012E+01	6.86E+02	1.11E+01 G
PM-144	C	-3.1884E-01					3.63E+02	
			696.54	-3.188E-01	?(	1.247E+00	1.65E+02	9.90E+01 G
			618.06	-1.402E-01	+	2.504E+00	5.20E+02	9.91E+01 G
EU-152	F	1.5427E+00					4.94E+03	
			121.78	3.653E-01	?(	2.102E+00	1.67E+02	2.86E+01 G
			344.29	4.940E-01	?(	4.658E+00	2.73E+02	2.65E+01 G
			1112.07	-3.714E+00	+	1.625E+01	1.27E+02	1.36E+01 G
			778.92	4.156E+00	?(	2.785E+00	3.02E+01	1.29E+01 G
			964.11	2.604E+00	?(	9.466E+00	1.05E+02	1.46E+01 G
			244.69	3.142E+00	?(	1.759E+01	1.65E+02	7.58E+00 G
			1408.00	2.528E+00	?	2.662E+00	3.78E+01	2.10E+01 GA
EU-154	I	8.0253E-01					3.14E+03	
			123.10	3.600E-01	(	1.411E+00	1.15E+02	4.08E+01 G
			1274.54	0.000E+00	-	3.000E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	6.726E+00	1.00E+03	2.02E+01 G
			873.23	2.813E+00	?(	9.112E+00	9.42E+01	1.23E+01 G
			1004.77	4.352E-01	?(	8.388E+00	5.30E+02	1.80E+01 G
			996.33	-1.837E+00	+	1.308E+01	1.99E+02	1.06E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 12
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	4.8430E-01					1.81E+03	
			105.31	0.000E+00	&(	4.744E+00	1.00E+03	2.12E+01 G
			86.54	8.187E-01	&(	3.901E+00	1.42E+02	3.07E+01 G
HF-181	F	2.8364E-01					4.24E+01	
			482.00	1.833E-01	?(	1.353E+00	2.10E+02	8.05E+01 G
			133.02	4.701E-01	(	2.660E+00	1.68E+02	4.33E+01 G
			345.83	-1.770E-01	&	8.686E+00	1.41E+03	1.51E+01 G
			136.30	-9.299E-08	%	1.920E+01	6.04E+09	5.85E+00 G
Ta-182	F	-2.3772E+00					1.14E+02	
			1121.30	-2.377E+00	?(	6.886E+00	8.62E+01	3.49E+01 G
			1221.41	-6.712E-01	+	6.266E+00	4.23E+02	2.70E+01 G
			1189.05	-2.055E+00	+	8.777E+00	1.87E+02	1.62E+01 G
Hg-203	F	-3.1522E-01					4.66E+01	
			279.20	-3.152E-01	?(	1.002E+00	9.40E+01	8.15E+01 G
TL-208	N	2.1547E+00					6.98E+02	
			583.02	2.155E+00	(	3.453E-01	1.47E+01	8.45E+01 G
			277.28	2.146E+00	&(	9.303E+00	1.25E+02	6.31E+00 G
			860.56	3.409E+00	+	7.380E+00	9.32E+01	1.24E+01 G
PM-146	C	-3.4376E-02					2.02E+03	
			453.88	-1.010E-01	?(	1.078E+00	3.98E+02	6.50E+01 G
			747.16	9.303E-02	?(	2.365E+00	9.80E+02	3.40E+01 G
			735.72	0.000E+00	+	4.201E+00	1.00E+03	2.25E+01 G
Y-88	F	2.8089E-02					1.07E+02	
			1836.06	0.000E+00	?(	7.036E-01	1.00E+03	9.92E+01 G
			898.04	5.783E-02	?(	1.200E+00	8.57E+02	9.37E+01 G
Cd-113m		1.6917E+03					5.33E+03	
			263.70	1.692E+03	&(	1.144E+04	1.93E+02	6.00E-03 K
Cd-109	F	-1.5613E-06					4.53E+02	
			88.04	-1.561E-06	%(	3.222E+01	6.05E+08	3.79E+00 G
Cf-251	T	1.1214E+00					3.28E+05	
			176.60	1.121E+00	&(	3.197E+00	1.09E+02	1.70E+01 G
			227.00	-1.139E+00	+	1.084E+01	3.56E+02	6.30E+00 GA
Cf-249	T	-6.3382E-01					1.28E+05	
			387.95	-6.338E-01	?(	2.394E+00	1.12E+02	6.60E+01 G
			333.44	-2.294E+00	+	7.874E+00	1.02E+02	1.55E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 13
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Sn-126		1.3562E+00					3.65E+07	
			87.57	1.373E-01	-	3.242E+00	6.94E+02	3.75E+01 GA
			64.28	1.356E+00	?(	1.346E+01	2.92E+02	9.70E+00 G
			86.94	2.725E+00	@	1.309E+01	1.43E+02	9.04E+00 GA
PB-210	N	1.9154E+01					8.14E+03	
			46.54	1.915E+01	(P	3.071E+01	5.80E+01	4.25E+00 G
PB-212	N	2.3563E+00					6.98E+02	
			238.63	2.356E+00	(P	1.386E+00	2.16E+01	4.33E+01 G
			300.03	-8.874E+00	-	5.304E+01	1.77E+02	3.28E+00 GA
PB-214	N	4.9599E+00					5.84E+05	
			351.93	4.960E+00	(P	1.730E+00	1.71E+01	3.76E+01 G
			295.09	3.447E+00	- P	2.676E+00	3.11E+01	1.93E+01 G
			242.00	3.173E+00	-	1.741E+01	1.62E+02	7.43E+00 GA
BI-207	C	7.4052E-01					1.18E+04	
			1063.66	7.405E-01	?(	6.064E-01	3.33E+01	7.45E+01 G
			569.70	-1.991E-02	&	8.617E-01	1.16E+03	9.77E+01 G
BI-212	N	3.9025E+00					6.98E+02	
			727.17	3.902E+00	?(	1.640E+01	1.21E+02	7.55E+00 G
			785.42	1.281E+01	?	4.910E+01	1.48E+02	1.28E+00 GA
U-235	N	2.3297E+00					2.57E+11	
			143.79	7.833E-01	&(P	5.946E+00	2.20E+02	1.10E+01 G
			205.33	4.459E+00	&(	1.231E+01	1.06E+02	5.01E+00 G
			163.38	3.566E+00	*(	1.423E+01	1.18E+02	5.08E+00 G
			185.72	4.934E-01	* P	1.276E+00	9.54E+01	5.40E+01 GA
BI-214	N	6.1820E+00					5.84E+05	
			609.31	6.182E+00	(	1.101E+00	1.38E+01	4.61E+01 G
			1120.29	3.881E+00	-	1.191E+01	9.04E+01	1.51E+01 G
			1764.49	1.188E+01	+	4.376E+00	2.24E+01	1.54E+01 G
BI-210M	T	2.4713E-01					1.10E+09	
			265.83	-7.293E-02	?(	1.694E+00	6.60E+02	5.00E+01 G
			304.90	8.187E-01	&(	4.149E+00	1.49E+02	2.80E+01 G
AC-228	N	5.1335E+00					2.10E+03	
			911.07	4.531E+00	?(	2.479E+00	2.89E+01	2.90E+01 G
			968.97	-5.848E-01	- P	9.901E+00	4.64E+02	1.75E+01 G
			338.32	6.588E+00	(	5.124E+00	3.42E+01	1.20E+01 G
			93.35	3.828E+00	?	1.288E+01	9.98E+01	5.56E+00 XA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 14
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-227	N	2.3464E+00					7.95E+03	
			256.24	3.179E+00	&(	8.506E+00	1.02E+02	7.00E+00 G
			235.97	1.872E+00	?(	1.040E+01	1.64E+02	1.23E+01 G
			50.14	-2.216E+00	-	2.026E+01	2.68E+02	8.00E+00 G
TH-229	N	-2.8145E+00					2.68E+06	
			193.51	-2.814E+00	&(	1.498E+01	2.02E+02	4.40E+00 G
			210.85	-1.034E+01	+	2.779E+01	1.04E+02	2.99E+00 G
TH-234	N	-5.3256E+00					1.63E+12	
			92.59	-5.326E+00	*(P	1.381E+01	7.15E+01	5.58E+00 G
			63.29	-3.149E+00	+ P	3.695E+01	3.42E+02	3.81E+00 G
PA-231	N	-3.9895E-07					1.20E+07	
			302.65	-3.990E-07	%(	5.872E+01	4.29E+09	2.88E+00 G
			300.07	-1.183E+01	+	6.886E+01	1.72E+02	2.46E+00 G
PA-233	C	-7.9853E-01					7.82E+08	
			312.01	-7.985E-01	?(	3.922E+00	1.45E+02	3.60E+01 G
			300.18	-1.571E+00	+	2.686E+01	5.01E+02	6.20E+00 G
PA-234	N	2.4686E-01					1.63E+12	
			131.29	-1.338E+00	?(	5.466E+00	1.21E+02	1.80E+01 G
			946.02	-8.398E-01	+	8.716E+00	4.32E+02	1.34E+01 G
			569.47	-2.373E-01	%	1.027E+01	1.16E+03	8.20E+00 G
			883.24	3.218E+00	?(	1.199E+01	1.07E+02	9.60E+00 G
			880.53	5.129E+00	?	1.586E+01	8.98E+01	6.00E+00 GA
AM-241	T	8.7315E-01					1.58E+05	
			59.54	8.731E-01	&(	3.817E+00	1.30E+02	3.59E+01 G
Np-237	F	1.9186E+00					2.14E+06	
			86.49	1.919E+00	&(	8.859E+00	1.37E+02	1.31E+01 G
Ir-192	F	-3.4899E-02					7.40E+01	
			316.49	-4.029E-01	?(	2.196E+00	1.62E+02	8.70E+01 G
			468.06	4.056E-01	&(	1.637E+00	1.16E+02	5.18E+01 G
			308.44	2.559E-01	?(	3.862E+00	4.37E+02	3.18E+01 G
Cs-136	F	2.0895E-01					1.30E+01	
			818.50	-4.884E-01	?(	1.684E+00	1.01E+02	1.00E+02 G
			1048.07	9.096E-01	?(	5.586E-01	2.89E+01	8.00E+01 G
			340.57	5.007E-01	?(	2.346E+00	1.37E+02	4.69E+01 G
Np-239	T	-5.9081E-01					2.36E+00	
			103.70	0.000E+00	+	4.198E+00	1.00E+03	2.40E+01 X
			106.13	-5.908E-01	?(	4.339E+00	2.16E+02	2.27E+01 G

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 9:39:45 PMPage 15
 TestAmerica Inc                Spectrum name: 12_Gamma_20193349.An1

 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments
                           99.50 1.008E+00 ?   6.587E+00 1.93E+02 1.50E+01 X

Nd-147      -3.7190E+00                                     1.11E+01
                          531.00-3.719E+00 ?(  8.567E+00 9.59E+01 1.30E+01 G
                           91.10 2.068E-07 %   4.268E+00 6.05E+08 2.83E+01 G

Kr-85    I   1.0139E+02                                     3.92E+03
                          513.98 1.014E+02 ?(  3.627E+02 1.06E+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

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


 *************** 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 %

 ____________________________________________________________________________
 TH-227      50.14       173.        -7.    -0.004   268.40  -2.216E+00
 AM-241      59.54       205.        16.     0.009   129.94   8.731E-01
 TH-234      63.29       244.        -6.    -0.004   342.33  -3.149E+00  P
 Sn-126      64.28       214.         7.     0.004   292.07   1.356E+00
 BA-133      80.99       288.       -19.    -0.011   125.30  -9.168E-01
 Np-237      86.49       236.        16.     0.009   137.30   1.919E+00
 EU-155      86.54       252.        16.     0.009   141.71   8.187E-01

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 16
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Sn-126	86.94	247.	16.	0.009	142.78	2.725E+00		
Sn-126	87.57	263.	3.	0.002	693.76	1.373E-01		
TH-234	92.59	105.	-19.	-0.011	71.54	-5.326E+00		P
Gd-153	97.50	170.	13.	0.007	145.17	6.508E-01		
Np-239	99.50	183.	10.	0.006	192.76	1.008E+00		
Np-239	106.13	185.	-9.	-0.005	216.31	-5.908E-01		
EU-152	121.78	65.	7.	0.004	167.21	3.653E-01		
CO-57	122.06	63.	-12.	-0.007	97.89	-2.091E-01		
EU-154	123.10	59.	10.	0.005	115.13	3.600E-01		
PA-234	131.29	180.	-16.	-0.009	121.48	-1.338E+00		
HF-181	133.02	248.	13.	0.007	167.81	4.701E-01		
CE-144	133.54	235.	3.	0.002	686.18	4.326E-01		
CO-57	136.47	222.	-5.	-0.003	453.56	-6.648E-01		
U-235	143.79	72.	6.	0.003	220.36	7.833E-01		P
CE-141	145.44	45.	9.	0.005	106.10	3.007E-01		
Ba-140	162.66	70.	11.	0.006	109.83	2.904E+00		
U-235	163.38	81.	11.	0.006	117.61	3.566E+00		
CE-139	165.85	94.	-3.	-0.002	484.62	-5.816E-02		
Cf-251	176.60	40.	11.	0.006	108.97	1.121E+00		
U-235	185.72	64.	15.	0.009	95.41	4.934E-01		P
TH-229	193.51	55.	-7.	-0.004	201.78	-2.814E+00		
U-235	205.33	44.	12.	0.007	105.80	4.459E+00		
TH-229	210.85	81.	-17.	-0.009	104.23	-1.034E+01		
Cf-251	227.00	48.	-4.	-0.002	356.12	-1.139E+00		
TH-227	235.97	171.	11.	0.006	164.05	1.872E+00		
EU-152	244.69	177.	12.	0.006	165.40	3.142E+00		
TH-227	256.24	29.	10.	0.006	101.80	3.179E+00		
Cd-113m	263.70	38.	5.	0.003	193.25	1.692E+03		
BI-210M	265.83	60.	-2.	-0.001	660.00	-7.293E-02		
Hg-203	279.20	51.	-11.	-0.006	94.04	-3.152E-01		
I-131	284.30	18.	8.	0.005	100.56	3.174E+00		
TL-210	296.00	238.	-12.	-0.007	182.18	-3.634E-01		
PA-231	300.07	213.	-12.	-0.007	172.25	-1.183E+01		
PA-233	300.18	206.	-4.	-0.002	500.92	-1.571E+00		
Ba-140	304.85	122.	10.	0.006	156.38	5.770E+00		
BI-210M	304.90	94.	9.	0.005	148.70	8.187E-01		
Ir-192	308.44	104.	3.	0.002	436.64	2.559E-01		
PA-233	312.01	137.	-12.	-0.006	144.97	-7.985E-01		
Ir-192	316.49	252.	-14.	-0.008	161.80	-4.029E-01		
CR-51	320.08	191.	12.	0.007	168.82	2.970E+00		
La-140	328.76	59.	-7.	-0.004	167.03	-8.427E-01		
Cf-249	333.44	91.	-14.	-0.008	101.81	-2.294E+00		
Cs-136	340.57	70.	9.	0.005	137.14	5.007E-01		
EU-152	344.29	88.	5.	0.003	273.22	4.940E-01		
BA-133	356.00	112.	2.	0.001	600.67	1.099E-01		
I-131	364.48	24.	6.	0.003	164.99	2.039E-01		
BA-133	383.84	108.	-14.	-0.008	106.27	-4.625E+00		
Cf-249	387.95	122.	-14.	-0.008	112.05	-6.338E-01		

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 17
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SN-113	391.69	131.	-4.	-0.002	408.94	-1.831E-01	
SB-125	427.88	36.	-9.	-0.005	134.72	-9.545E-01	
AG-108M	433.94	36.	-13.	-0.007	95.19	-4.526E-01	
PM-146	453.88	16.	-2.	-0.001	397.91	-1.010E-01	
SB-125	463.37	15.	9.	0.005	69.51	2.861E+00	
Ir-192	468.06	23.	6.	0.003	116.43	4.056E-01	
BE-7	477.60	31.	8.	0.004	108.37	2.499E+00	
HF-181	482.00	39.	4.	0.002	210.43	1.833E-01	
La-140	487.02	33.	6.	0.004	133.62	4.822E-01	
RU-103	497.05	20.	-1.	-0.001	881.29	-3.868E-02	
RH-106	511.86	60.	27.	0.015	45.33	4.803E+00	
Kr-85	513.98	76.	12.	0.007	105.76	1.014E+02	
Nd-147	531.00	35.	-13.	-0.007	95.90	-3.719E+00	
Ba-140	537.26	30.	-8.	-0.005	139.28	-1.273E+00	
CS-134	569.32	13.	3.	0.002	179.51	7.588E-01	
SB-125	600.50	220.	-14.	-0.008	155.16	-3.113E+00	
SB-124	602.73	207.	-14.	-0.008	150.17	-5.682E-01	
CS-134	604.71	193.	-14.	-0.008	145.06	-5.740E-01	
RU-103	610.30	179.	-14.	-0.008	139.46	-9.848E+00	
AG-108M	614.28	165.	-14.	-0.008	133.82	-6.350E-01	
PM-144	618.06	151.	-3.	-0.002	520.32	-1.402E-01	
RH-106	621.92	77.	10.	0.005	130.14	4.121E+00	
SB-125	635.89	26.	-8.	-0.004	98.47	-2.923E+00	
I-131	636.97	34.	-1.	-0.001	826.64	-5.893E-01	
AG-110M	657.76	13.	7.	0.004	79.86	3.261E-01	
CS-137	661.66	28.	3.	0.002	268.40	1.461E-01	
PM-144	696.54	28.	-7.	-0.004	164.75	-3.188E-01	
NB-94	702.63	28.	-6.	-0.003	191.49	-2.781E-01	
SB-124	722.79	29.	-3.	-0.002	236.22	-1.428E+00	
BI-212	727.17	26.	6.	0.004	121.28	3.902E+00	
PM-146	747.16	9.	1.	0.000	979.80	9.303E-02	
ZR-95	756.73	5.	5.	0.003	95.69	4.718E-01	
AG-110M	763.94	12.	8.	0.004	73.00	1.649E+00	
NB-95	765.79	20.	2.	0.001	271.30	1.151E-01	
PA-234M	766.41	54.	-14.	-0.008	77.64	-2.347E+02	
EU-152	778.92	0.	11.	0.006	30.15	4.156E+00	
BI-212	785.42	5.	3.	0.002	147.99	1.281E+01	
CS-134	795.87	17.	7.	0.004	91.47	4.064E-01	
CO-58	810.78	19.	8.	0.004	86.42	3.964E-01	
La-140	815.77	16.	6.	0.003	110.80	1.206E+00	
Cs-136	818.50	43.	-10.	-0.005	101.36	-4.884E-01	
MN-54	834.85	28.	-8.	-0.004	144.70	-4.113E-01	
NB-94	871.10	20.	2.	0.001	263.82	1.327E-01	
EU-154	873.23	16.	6.	0.004	94.21	2.813E+00	
PA-234	880.53	10.	6.	0.003	89.80	5.129E+00	
PA-234	883.24	16.	6.	0.003	107.25	3.218E+00	
AG-110M	884.68	30.	-8.	-0.005	100.40	-6.022E-01	
Sc-46	889.28	36.	-10.	-0.006	90.18	-5.395E-01	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 18
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Y-88	898.04	15.	1.	0.001	857.32	5.783E-02	
AG-110M	937.49	15.	-5.	-0.003	176.07	-8.134E-01	
PA-234	946.02	15.	-2.	-0.001	431.57	-8.398E-01	
EU-152	964.11	21.	7.	0.004	105.36	2.604E+00	
EU-154	996.33	20.	-3.	-0.002	199.00	-1.837E+00	
EU-154	1004.77	24.	1.	0.001	530.33	4.352E-01	
Cs-136	1048.07	0.	12.	0.007	28.87	9.096E-01	
RH-106	1050.36	19.	-6.	-0.003	113.06	-2.271E+01	
Ga-68	1077.40	16.	-8.	-0.004	119.02	-1.752E+01	
FE-59	1099.25	27.	-14.	-0.008	85.66	-1.601E+00	
EU-152	1112.07	48.	-8.	-0.004	127.48	-3.714E+00	
Sc-46	1120.55	23.	9.	0.005	81.04	5.862E-01	
Ta-182	1121.30	56.	-13.	-0.007	86.17	-2.377E+00	
CO-60	1173.24	11.	2.	0.001	324.82	1.540E-01	
Ta-182	1189.05	16.	-5.	-0.003	187.26	-2.055E+00	
Ta-182	1221.41	23.	-3.	-0.001	423.16	-6.712E-01	
NA-22	1274.53	6.	1.	0.001	266.93	9.366E-02	
FE-59	1291.60	6.	5.	0.003	113.28	8.756E-01	
TL-210	1313.00	0.	8.	0.004	35.36	2.736E+00	
CO-60	1332.50	11.	-3.	-0.002	243.10	-2.422E-01	
AG-110M	1384.30	11.	-4.	-0.002	188.42	-1.335E+00	
EU-152	1408.00	0.	7.	0.004	37.80	2.528E+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	2.4988E+00	2.4988E+00	1.084E+02%	9.29E+00
NA-22	#A	9.3656E-02	9.3656E-02	2.669E+02%	9.70E-01
K-40		8.2725E+01	8.2725E+01	9.407E+00%	5.40E+00
Sc-46	#A	-5.3951E-01	-5.3951E-01	9.018E+01%	1.65E+00
CR-51	#A	2.9696E+00	2.9696E+00	1.688E+02%	1.70E+01
MN-54	#A	-4.1130E-01	-4.1130E-01	1.447E+02%	1.41E+00
FE-59	#A	-1.6009E+00	-1.6009E+00	8.566E+01%	2.98E+00
Co-56	#	8.3143E-01	8.3144E-01	2.500E+01%	3.83E-01
CO-57	#A	-2.0913E-01	-2.0913E-01	9.789E+01%	6.92E-01
CO-58	#A	3.9640E-01	3.9640E-01	8.642E+01%	1.16E+00
CO-60	#A	-4.4192E-02	-4.4192E-02	2.029E+02%	1.34E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.04E+00
NB-94	#A	-7.0662E-02	-7.0662E-02	1.630E+02%	1.27E+00
ZR-95	#A	4.7181E-01	4.7181E-01	9.569E+01%	1.12E+00
NB-95	#A	1.1509E-01	1.1509E-01	2.713E+02%	1.13E+00
RU-103	#A	-3.8680E-02	-3.8681E-02	8.813E+02%	9.11E-01
RH-106	#A	4.1208E+00	4.1208E+00	1.301E+02%	1.83E+01
AG-108M	#A	-4.5255E-01	-4.5255E-01	9.519E+01%	1.08E+00

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:39:45 PMPage 19
TestAmerica Inc Spectrum name: 12_Gamma_20193349.An1

AG-110M#A	-7.3971E-02	-7.3972E-02	6.207E+01%	2.07E+00
SN-113 #A	-1.8308E-01	-1.8308E-01	4.089E+02%	2.57E+00
SB-124 #A	-5.6815E-01	-5.6815E-01	1.502E+02%	2.88E+00
SB-125 #A	4.2480E-02	4.2480E-02	6.951E+01%	3.25E+00
I-131 #A	4.1151E-01	4.1153E-01	9.661E+01%	8.68E-01
Gd-153 #A	6.5075E-01	6.5075E-01	1.452E+02%	3.19E+00
Ga-68 #A	-1.7421E+01	-1.7522E+01	1.190E+02%	4.68E+01
Tc-99m #A	1.6851E-08	1.6870E-08	2.224E+09%	1.28E+00
BA-133 #A	1.0987E-01	1.0987E-01	6.007E+02%	2.28E+00
CS-134 #A	4.6013E-01	4.6013E-01	9.147E+01%	1.27E+00
CS-137 #A	1.4606E-01	1.4606E-01	2.684E+02%	1.40E+00
CE-139 #A	-5.8162E-02	-5.8162E-02	4.846E+02%	9.77E-01
Ba-140 #A	3.3698E-01	3.3699E-01	7.882E+01%	4.34E+00
La-140 #A	3.0467E-01	3.0468E-01	1.108E+02%	1.24E+00
CE-141 #A	3.0070E-01	3.0070E-01	1.061E+02%	1.09E+00
CE-144 #A	4.3258E-01	4.3258E-01	6.862E+02%	1.01E+01
PM-144 #A	-3.1884E-01	-3.1884E-01	1.648E+02%	1.25E+00
EU-152 #A	1.5427E+00	1.5427E+00	3.015E+01%	2.10E+00
EU-154 #A	8.0253E-01	8.0253E-01	9.421E+01%	1.41E+00
EU-155 #A	4.8430E-01	4.8430E-01	1.417E+02%	4.74E+00
HF-181 #A	2.8364E-01	2.8364E-01	1.346E+02%	1.35E+00
Ta-182 #A	-2.3772E+00	-2.3772E+00	8.617E+01%	6.89E+00
Hg-203 #A	-3.1522E-01	-3.1522E-01	9.404E+01%	1.00E+00
TL-208	2.1547E+00	2.1547E+00	1.474E+01%	3.45E-01
PM-146 #A	-3.4376E-02	-3.4376E-02	3.979E+02%	1.08E+00
Y-88 #A	2.8089E-02	2.8089E-02	6.586E+02%	7.04E-01
Cd-113m#A	1.6917E+03	1.6917E+03	1.933E+02%	1.14E+04
Cd-109 #A	-1.5613E-06	-1.5613E-06	6.046E+08%	3.22E+01
Cf-251 #A	1.1214E+00	1.1214E+00	1.090E+02%	3.20E+00
Cf-249 #A	-6.3382E-01	-6.3382E-01	1.121E+02%	2.39E+00
Sn-126 #A	1.3562E+00	1.3562E+00	2.921E+02%	1.35E+01
PB-210 #A	1.9154E+01	1.9154E+01	5.805E+01%	3.07E+01
PB-212	2.3563E+00	2.3563E+00	2.164E+01%	1.39E+00
PB-214	4.9599E+00	4.9599E+00	1.712E+01%	1.73E+00
BI-207 #	7.4052E-01	7.4052E-01	3.333E+01%	6.06E-01
BI-212 #A	3.9025E+00	3.9025E+00	1.213E+02%	1.64E+01
U-235 #A	2.3297E+00	2.3297E+00	9.042E+01%	5.95E+00
BI-214	6.1820E+00	6.1820E+00	1.383E+01%	1.10E+00
BI-210M#A	2.4713E-01	2.4713E-01	1.487E+02%	1.69E+00
AC-228 #	5.1335E+00	5.1335E+00	2.238E+01%	2.48E+00
TH-227 #A	2.3464E+00	2.3464E+00	9.653E+01%	8.51E+00
TH-229 #A	-2.8145E+00	-2.8145E+00	2.018E+02%	1.50E+01
TH-234 #A	-5.3256E+00	-5.3256E+00	7.154E+01%	1.38E+01
PA-231 #A	-3.9895E-07	-3.9895E-07	4.294E+09%	5.87E+01
PA-233 #A	-7.9853E-01	-7.9853E-01	1.450E+02%	3.92E+00
PA-234 #A	2.4686E-01	2.4686E-01	8.103E+01%	5.47E+00
PA-234M#A	0.0000E+00	0.0000E+00	1.000E+03%	1.78E+02
AM-241 #A	8.7315E-01	8.7315E-01	1.299E+02%	3.82E+00
Np-237 #A	1.9186E+00	1.9186E+00	1.373E+02%	8.86E+00

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 9:39:45 PMPage 20
TestAmerica Inc                 Spectrum name: 12_Gamma_20193349.An1

Ir-192 #A   -3.4898E-02   -3.4899E-02    1.164E+02%                2.20E+00
Cs-136 #A    2.0895E-01    2.0895E-01    2.887E+01%                1.68E+00
Np-239 #A   -5.9074E-01   -5.9081E-01    2.163E+02%                4.34E+00
Nd-147 #A   -3.7189E+00   -3.7190E+00    9.590E+01%                8.57E+00
TL-210 #A    0.0000E+00    0.0000E+00    1.000E+03%                1.29E+00
Kr-85  #A    1.0139E+02    1.0139E+02    1.058E+02%                3.63E+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)     1.227E+02  Bq/Sample
Total Decayed Activity (   25.1 to  1999.1 keV) 1.2266573E+02  Bq/Sample
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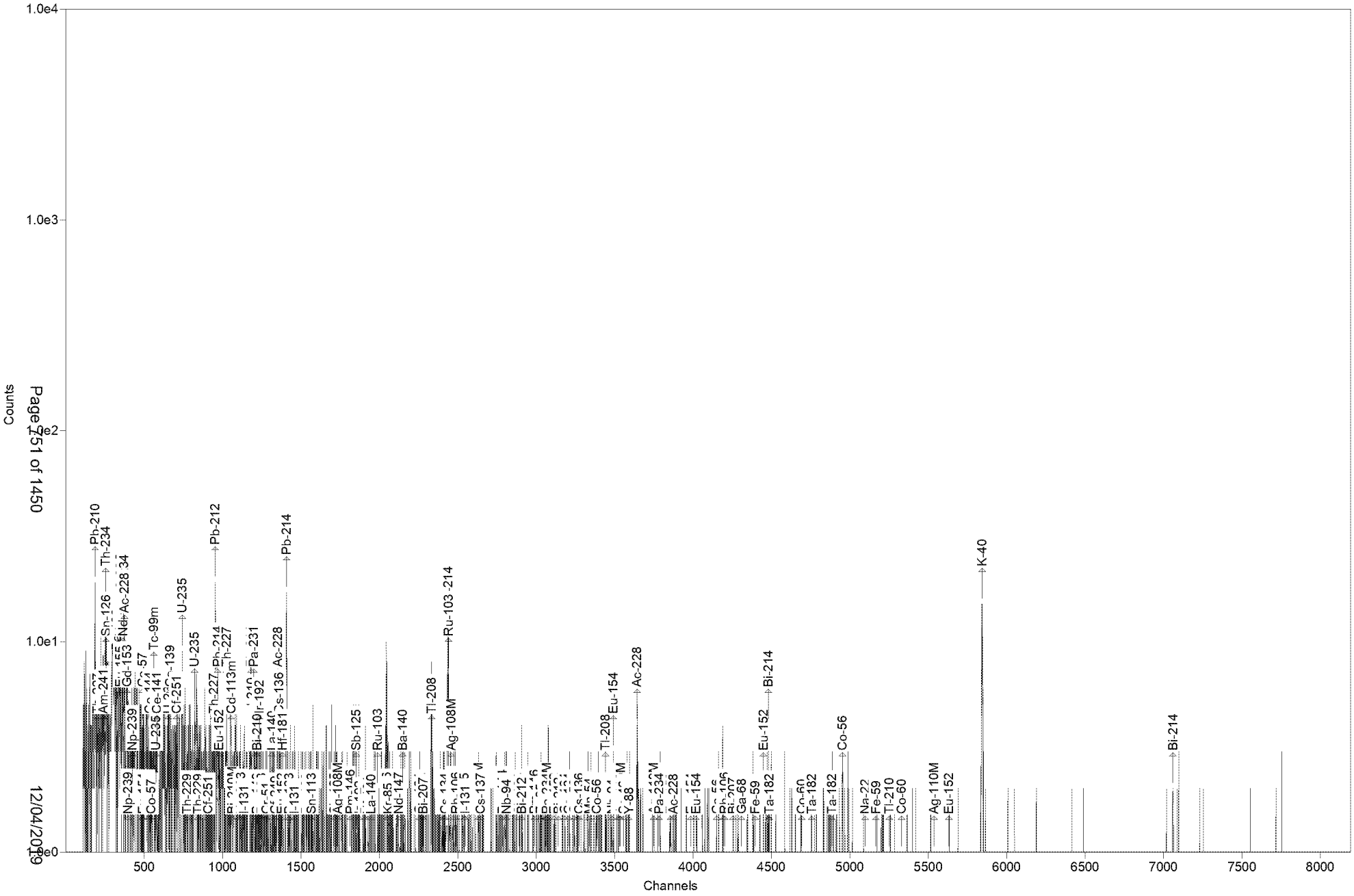
448571_Gamma_160-36160-A-4-C. 12_Gamma_20193349.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20193040

Sample Description: 448571_Gamma_160-36160-A-5-C
Detector: Detector # 5
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-5-C

Decay to Time: 11/23/2019 21:14 Live Time: 1800 sec
Acquisition Time: 11/23/2019 21:14:43 Real Time: 1807 sec
Analysis Time: 11/23/2019 21:45 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_2019-11-10_1418.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	1.108E+00	235.2	2.607E+00	2.608E+00	9.388E+00
NA-22	-1.234E+00	58.6	7.225E-01	7.252E-01	2.353E+00
K-40	9.184E+01	11.0	1.012E+01	1.115E+01	1.226E+01
Sc-46	2.488E-01	115.7	2.878E-01	2.880E-01	1.910E+00
CR-51	2.810E+00	119.9	3.367E+00	3.371E+00	1.149E+01
MN-54	-6.803E-02	800.0	5.442E-01	5.442E-01	1.370E+00
FE-59	-9.337E-01	82.9	7.741E-01	7.755E-01	3.162E+00
Co-56	4.803E-01	101.7	4.884E-01	4.890E-01	1.387E+00
CO-57	-1.988E-01	111.2	2.211E-01	2.214E-01	7.503E-01
CO-58	-6.908E-01	90.4	6.248E-01	6.258E-01	2.114E+00
CO-60	8.176E-02	37.8	3.090E-02	3.117E-02	1.807E+00
ZN-65	0.000E+00	1.#INF	1.714E-01	1.714E-01	4.913E+00
NB-94	8.017E-02	458.9	3.679E-01	3.680E-01	9.878E-01
ZR-95	-1.112E+00	103.4	1.150E+00	1.151E+00	2.806E+00
NB-95	4.227E-02	1109.1	4.687E-01	4.687E-01	1.707E+00
RU-103	-2.508E-01	126.3	3.169E-01	3.172E-01	1.146E+00
RH-106	3.505E+00	167.4	5.869E+00	5.871E+00	2.025E+01
AG-108M	1.987E-01	136.7	2.717E-01	2.718E-01	1.029E+00
AG-110M	3.839E-01	40.8	1.567E-01	1.580E-01	2.462E+00
SN-113	-5.844E-01	122.6	7.166E-01	7.172E-01	2.437E+00
SB-124	-6.036E-02	103.4	6.242E-02	6.250E-02	2.681E+00
SB-125	8.083E-03	160.2	1.295E-02	1.296E-02	3.095E+00
I-131	2.892E-01	106.3	3.073E-01	3.077E-01	1.037E+00
Gd-153	6.728E-01	83.2	5.599E-01	5.614E-01	2.192E+00
Ga-68	-3.929E+01	88.0	3.459E+01	3.466E+01	7.772E+01
Tc-99m	4.581E-01	50.8	2.328E-01	2.342E-01	7.544E-01
BA-133	-3.228E-01	241.5	7.796E-01	7.798E-01	2.678E+00
CS-134	4.250E-01	74.7	3.176E-01	3.183E-01	1.684E+00
CS-137	-7.407E-01	121.3	8.986E-01	8.994E-01	2.121E+00
CE-139	2.211E-01	116.9	2.585E-01	2.593E-01	8.799E-01
Ba-140	-4.268E-01	297.7	1.271E+00	1.271E+00	4.563E+00
La-140	4.732E-01	107.9	5.105E-01	5.111E-01	9.063E-01
CE-141	3.177E-01	151.7	4.821E-01	4.824E-01	1.644E+00

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CE-144	-1.745E+00	123.1	2.148E+00	2.149E+00	7.271E+00
PM-144	4.784E-01	88.4	4.227E-01	4.234E-01	1.152E+00
EU-152	1.236E+00	103.1	1.274E+00	1.276E+00	1.904E+00
EU-154	1.322E+00	73.0	9.658E-01	9.683E-01	1.440E+00
EU-155	-5.879E-01	232.4	1.366E+00	1.367E+00	4.546E+00
HF-181	1.642E-01	282.7	4.641E-01	4.641E-01	1.376E+00
Ta-182	-2.991E+00	96.6	2.889E+00	2.893E+00	9.761E+00
Hg-203	2.043E-01	148.3	3.031E-01	3.033E-01	1.052E+00
TL-208	1.780E+00	18.4	3.279E-01	3.407E-01	4.392E-01
PM-146	4.242E-01	102.5	4.348E-01	4.353E-01	1.377E+00
Y-88	4.038E-01	30.2	1.217E-01	1.240E-01	9.809E-01
Cd-113m	-5.238E+03	98.0	5.133E+03	5.144E+03	1.734E+04
Cd-109	5.019E+00	147.8	7.417E+00	7.423E+00	2.511E+01
Cf-251	-1.135E+00	140.5	1.595E+00	1.599E+00	4.372E+00
Cf-249	5.945E-01	85.4	5.075E-01	5.084E-01	1.650E+00
Sn-126	-3.463E-01	887.9	3.075E+00	3.075E+00	1.066E+01
PB-210	9.220E+00	72.8	6.716E+00	6.738E+00	1.981E+01
PB-212	3.887E+00	15.0	5.827E-01	6.346E-01	1.298E+00
PB-214	5.399E+00	13.6	7.339E-01	7.857E-01	1.173E+00
BI-207	7.552E-02	749.2	5.658E-01	5.658E-01	1.506E+00
BI-212	-4.948E+00	126.1	6.241E+00	6.246E+00	2.166E+01
U-235	7.883E-01	264.4	2.084E+00	2.085E+00	7.158E+00
BI-214	1.277E+00	106.1	1.354E+00	1.356E+00	5.453E+00
BI-210M	4.484E-01	113.7	5.099E-01	5.106E-01	1.744E+00
AC-228	5.391E+00	20.4	1.101E+00	1.134E+00	2.893E+00
TH-227	6.050E-01	612.9	3.708E+00	3.708E+00	1.015E+01
TH-229	2.244E+00	109.6	2.459E+00	2.466E+00	1.529E+01
TH-234	-2.444E+00	217.2	5.306E+00	5.308E+00	1.842E+01
PA-231	-5.795E+00	318.3	1.844E+01	1.845E+01	6.300E+01
PA-233	8.023E-01	155.5	1.248E+00	1.249E+00	4.248E+00
PA-234	3.811E-01	334.2	1.274E+00	1.274E+00	4.391E+00
PA-234M	-8.682E+00	338.6	2.940E+01	2.940E+01	2.639E+02
AM-241	-1.311E+00	46.4	6.078E-01	6.116E-01	2.959E+00
Np-237	1.482E+00	174.4	2.584E+00	2.585E+00	8.731E+00
Ir-192	-2.308E-02	94.1	2.171E-02	2.175E-02	1.401E+00
Cs-136	3.429E-02	1579.3	5.416E-01	5.416E-01	1.959E+00
Np-239	-8.431E-01	152.0	1.281E+00	1.282E+00	4.331E+00
Nd-147	5.136E-03	126.7	6.506E-03	6.513E-03	7.650E+00
TL-210	0.000E+00	1.#INF	6.629E-02	6.629E-02	1.526E+00
Kr-85	-9.068E+01	161.1	1.460E+02	1.461E+02	4.989E+02
Total	1.473E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 9:45:13 PMPage  1
TestAmerica Inc                 Spectrum name: 5_Gamma_20193040.An1

Sample description
     448571_Gamma_160-36160-A-5-C


Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20193040.An1

Acquisition information
       Start time:                 11/23/2019 9:14:43 PM
       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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:45:13 PMPage 2
TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

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	11/23/2019 9:14:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-11-10_1418.PBC 11/10/2019 2:18:51 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.2493

***** 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	13.	72.84	0.36	1.788E-02	46.54	4.250	PBC<MDA	PB210
63.29	-10.	141.87	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
77.17	67.	17.66	0.69	3.221E-02				
80.99	12.	117.48	0.82	3.320E-02	80.99	34.060	PBC<MDA	BA133
86.49	12.	174.40	0.82	3.435E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.320E-01	EU155
88.04	12.	147.77	0.83	3.462E-02	88.04	3.790	PBC<MDA	Cd109
91.10	12.	152.82	0.83	3.508E-02	91.10	28.300	PBC<MDA	Nd147
92.59	-9.	217.17	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.33	12.	160.77	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
97.50	11.	114.59	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
103.20	12.	120.71	0.84	3.612E-02	103.20	21.800	PBC<MDA	Gd153
121.78	9.	108.77	0.86	3.584E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.716E-01	CO57
123.10	10.	113.62	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
131.29	4.	334.15	0.87	3.509E-02	131.29	18.000	PBC<MDA	PA234
136.30	5.	308.46	0.88	3.458E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	7.244E-01	CO57
140.51	24.	50.82	0.88	3.411E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	5.	264.38	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235
145.44	9.	151.73	0.88	3.351E-02	145.44	48.200	PBC<MDA	CE141
165.85	10.	116.92	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:45:13 PMPage 3
TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.72	4.	410.94	0.93	2.854E-02	185.72	54.000	PBC<MDA	U235
210.85	10.	109.60	0.95	2.569E-02	210.85	2.990	PBC<MDA	TH229
238.60	62.	18.48	0.78	2.320E-02	238.63	43.300	3.448E+00	PB212
241.97	15.	50.54	0.98	2.293E-02	242.00	7.430	PBC<MDA	PB214
256.24	2.	612.86	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
265.83	9.	113.70	1.00	2.121E-02	265.83	50.000	PBC<MDA	BI210M
277.08	8.	97.71	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
279.20	6.	148.33	1.02	2.036E-02	279.20	81.460	PBC<MDA	Hg203
284.30	9.	106.28	1.02	2.006E-02	284.30	6.140	PBC<MDA	I131
295.21	36.	23.41	0.59	1.945E-02	295.09	19.300	5.328E+00	PB214
308.44	11.	157.64	1.05	1.875E-02	308.44	31.750	PBC<MDA	Ir192
312.01	10.	155.54	1.05	1.857E-02	312.01	36.000	PBC<MDA	PA233
320.08	9.	119.85	1.06	1.818E-02	320.08	9.940	PBC<MDA	CR51
328.76	6.	147.47	1.07	1.778E-02	328.76	20.300	PBC<MDA	La140
333.44	8.	110.55	1.07	1.757E-02	333.44	15.510	PBC<MDA	Cf249
338.00	27.	28.03	1.37	1.736E-02	338.32	12.010	7.155E+00	AC228
351.68	62.	13.83	1.24	1.680E-02	351.93	37.600	5.435E+00	PB214
383.84	7.	118.60	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
387.95	7.	130.11	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
453.88	2.	399.34	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
463.37	4.	228.59	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
477.60	3.	235.23	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
482.00	2.	473.76	1.21	1.293E-02	482.00	80.500	PBC<MDA	HF181
511.86	64.	13.70	2.48	1.230E-02	511.86	20.000	1.453E+01	RH106
569.32	6.	74.72	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.808E+00	PA234
					569.70	97.740	3.196E-01	BI207
582.92	30.	18.42	1.44	1.103E-02	583.02	84.500	1.780E+00	TL208
609.01	5.	301.51	1.32	1.063E-02	609.31	46.090	PBC<MDA	BI214
610.30	9.	142.49	1.32	1.062E-02	610.30	5.750	PBC<MDA	RU103
614.28	9.	136.68	1.33	1.056E-02	614.28	89.850	PBC<MDA	AG108M
618.06	9.	146.67	1.33	1.051E-02	618.06	99.100	PBC<MDA	PM144
621.92	7.	167.45	1.33	1.045E-02	621.92	9.930	PBC<MDA	RH106
657.76	2.	353.55	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
696.54	8.	98.56	1.40	9.507E-03	696.54	99.000	PBC<MDA	PM144
702.63	1.	458.94	1.40	9.438E-03	702.63	97.900	PBC<MDA	NB94
722.79	6.	103.40	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.761E-01	AG108M
					723.36	20.220	1.690E+00	EU154
735.72	5.	102.49	1.43	9.081E-03	735.72	22.500	PBC<MDA	PM146
766.41	1.	659.58	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
785.42	5.	100.08	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
795.87	2.	337.28	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
815.77	7.	107.89	1.49	8.328E-03	815.77	23.280	PBC<MDA	La140
873.23	5.	145.02	1.54	7.866E-03	873.23	12.270	PBC<MDA	EU154
880.53	5.	128.09	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
898.04	11.	30.15	1.56	7.684E-03	898.04	93.700	8.488E-01	Y88

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:45:13 PMPage 4
TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
910.65	18.	29.69	1.72	7.591E-03	911.07	29.000	4.661E+00	AC228
968.60	4.	167.82	1.61	7.209E-03	968.97	17.460	PBC<MDA	AC228
1004.77	6.	118.66	1.64	6.992E-03	1004.77	18.010	PBC<MDA	EU154
1037.84	4.	132.68	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1063.66	1.	749.17	1.68	6.666E-03	1063.66	74.500	PBC<MDA	BI207
1112.07	4.	175.24	1.72	6.421E-03	1112.07	13.644	PBC<MDA	EU152
1120.09	6.	106.05	1.72	6.381E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	6.	115.65	1.72	6.380E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	5.215E-01	Sc46
					1121.30	34.900	1.495E+00	Ta182
1173.24	7.	37.80	1.76	6.138E-03	1173.24	99.900	PBC<MDA	CO60
1238.28	8.	101.68	1.80	5.866E-03	1238.28	66.070	PBC<MDA	Co56
1313.00	5.	121.64	1.85	5.583E-03	1313.00	21.000	PBC<MDA	TL210
1384.30	6.	40.82	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	1.	796.87	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1460.17	90.	11.02	1.14	5.103E-03	1460.83	10.670	9.184E+01	K40
1764.39	2.	250.41	2.11	4.351E-03	1764.49	15.400	PBC<MDA	BI214
1771.35	2.	330.45	2.12	4.337E-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
308.30	77.17	27.	67.	2.090E+03	17.66	0.687	-

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	184.89	46.34	27.	13.	0.007	72.84	0.364s
TH-227	200.11	50.14	51.	-3.	-0.002	404.83	0.787s
AM-241	237.72	59.54	96.	-21.	-0.012	46.36	0.797
TH-234	252.74	63.29	100.	-10.	-0.005	141.87	0.801
Sn-126	256.71	64.28	109.	-2.	-0.001	887.92	0.802s
BA-133	323.61	80.99	63.	12.	0.007	117.48	0.819s
Np-237	345.63	86.49	213.	12.	0.007	174.40	0.825s
EU-155	345.84	86.54	224.	0.	0.000	1000.00	0.825s

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:45:13 PMPage 5
TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Sn-126	347.43	86.94	224.	0.	0.000	1000.00	0.825s
Sn-126	349.95	87.57	224.	0.	0.000	1000.00	0.826s
Cd-109	351.83	88.04	148.	12.	0.007	147.77	0.826
Nd-147	364.08	91.10	159.	12.	0.007	152.82	0.829s
TH-234	370.05	92.59	181.	-9.	-0.005	217.17	0.831s
AC-228	373.09	93.35	189.	12.	0.007	160.77	0.832s
Gd-153	389.70	97.50	72.	11.	0.006	114.59	0.836s
Np-239	397.71	99.50	81.	-4.	-0.002	331.34	0.838s
Gd-153	412.52	103.20	93.	12.	0.006	120.71	0.842s
Np-239	414.52	103.70	105.	0.	0.000	1000.00	0.842s
EU-155	420.98	105.31	166.	-8.	-0.005	232.41	0.844s
Np-239	424.25	106.13	173.	-12.	-0.007	151.97	0.845
EU-152	486.90	121.78	48.	9.	0.005	108.77	0.861
CO-57	488.03	122.06	69.	-11.	-0.006	111.23	0.861
EU-154	492.18	123.10	57.	10.	0.005	113.62	0.862s
PA-234	524.99	131.29	103.	4.	0.002	334.15	0.871s
HF-181	531.91	133.02	107.	0.	0.000	1000.00	0.872s
CE-144	533.97	133.54	106.	-12.	-0.007	123.07	0.873s
HF-181	545.02	136.30	108.	5.	0.003	308.46	0.876s
CO-57	545.72	136.47	126.	-13.	-0.007	125.90	0.876s
Tc-99m	561.88	140.51	64.	24.	0.014	50.82	0.880s
U-235	574.99	143.79	93.	5.	0.003	264.38	0.883s
CE-141	581.61	145.44	94.	9.	0.005	151.73	0.885s
Ba-140	650.54	162.66	82.	-10.	-0.005	139.05	0.902s
U-235	653.42	163.38	93.	-1.	-0.001	996.21	0.903s
CE-139	663.32	165.85	63.	10.	0.006	116.92	0.905s
Cf-251	706.34	176.60	63.	-10.	-0.006	140.54	0.916s
U-235	742.85	185.72	74.	4.	0.002	410.94	0.925
TH-229	774.03	193.51	43.	-2.	-0.001	639.49	0.933s
U-235	821.35	205.33	60.	-14.	-0.008	105.82	0.945
TH-229	843.44	210.85	34.	10.	0.005	109.60	0.950s
Cf-251	908.08	227.00	27.	-3.	-0.001	350.00	0.966s
TH-227	943.98	235.97	206.	-11.	-0.006	185.25	0.975s
PB-212	954.64	238.63	20.	70.	0.039	14.99	0.978D
PB-214	968.10	242.00	22.	15.	0.008	50.54	0.981D
TH-227	1025.11	256.24	29.	2.	0.001	612.86	0.995s
Cd-113m	1054.97	263.70	64.	-12.	-0.007	97.98	1.002s
BI-210M	1063.50	265.83	43.	9.	0.005	113.70	1.005s
TL-208	1109.33	277.28	26.	8.	0.004	97.71	1.016s
Hg-203	1117.00	279.20	38.	6.	0.003	148.33	1.017s
I-131	1137.41	284.30	22.	9.	0.005	106.28	1.022s
PB-214	1181.09	295.21	10.	36.	0.020	23.41	0.595s
TL-210	1184.24	296.00	194.	-11.	-0.006	175.91	1.034s
PB-212	1200.37	300.03	178.	-12.	-0.006	42.73	1.038s
PA-231	1200.53	300.07	167.	-11.	-0.006	162.60	1.038s
PA-233	1200.97	300.18	155.	-11.	-0.006	157.12	1.038s
PA-231	1210.86	302.65	163.	-6.	-0.003	318.31	1.040s
Ba-140	1219.66	304.85	165.	0.	0.000	1000.00	1.042s

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:45:13 PMPage 6
TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1219.85	304.90	165.	0.	0.000	1000.00	1.042s
Ir-192	1234.03	308.44	142.	11.	0.006	157.64	1.046s
PA-233	1248.32	312.01	108.	10.	0.005	155.54	1.049s
Ir-192	1266.25	316.49	65.	-12.	-0.006	102.70	1.053s
CR-51	1280.63	320.08	55.	9.	0.005	119.85	1.057s
La-140	1315.35	328.76	18.	6.	0.003	147.47	1.065s
Cf-249	1334.08	333.44	18.	8.	0.004	110.55	1.070s
AC-228	1352.31	338.00	8.	27.	0.015	28.03	1.366s
Cs-136	1362.62	340.57	82.	-6.	-0.003	217.31	1.077s
EU-152	1377.49	344.29	76.	0.	0.000	1000.00	1.080
HF-181	1383.66	345.83	76.	0.	0.000	1000.00	1.082s
PB-214	1407.07	351.68	5.	62.	0.034	13.83	1.235
BA-133	1424.36	356.00	102.	-6.	-0.003	241.52	1.091s
BA-133	1535.78	383.84	28.	7.	0.004	118.60	1.117s
Cf-249	1552.22	387.95	35.	7.	0.004	130.11	1.121s
SN-113	1567.19	391.69	75.	-10.	-0.006	122.61	1.125s
SB-125	1711.99	427.88	20.	-4.	-0.002	224.54	1.158s
AG-108M	1736.25	433.94	20.	-3.	-0.002	277.57	1.164s
PM-146	1816.05	453.88	17.	2.	0.001	399.34	1.182s
SB-125	1854.01	463.37	36.	4.	0.002	228.59	1.191s
Ir-192	1872.79	468.06	47.	-5.	-0.003	193.06	1.195s
BE-7	1910.94	477.59	19.	3.	0.002	235.23	1.204s
HF-181	1928.56	482.00	24.	2.	0.001	473.76	1.208s
RU-103	1988.80	497.05	20.	-5.	-0.003	126.33	1.221s
RH-106	2048.06	511.86	7.	64.	0.036	13.70	2.485s
Kr-85	2056.53	513.98	92.	-9.	-0.005	161.06	1.237s
Nd-147	2124.62	531.00	16.	-4.	-0.002	202.07	1.252
Ba-140	2149.67	537.26	20.	-2.	-0.001	297.69	1.258s
CS-134	2253.60	563.24	36.	-12.	-0.007	102.06	1.280s
CS-134	2277.94	569.32	8.	6.	0.004	74.72	1.286s
PA-234	2278.54	569.47	19.	-3.	-0.002	225.34	1.286s
BI-207	2279.47	569.70	16.	0.	0.000	1000.00	1.286s
TL-208	2332.37	582.92	0.	30.	0.017	18.42	1.437s
SB-125	2402.69	600.50	117.	-9.	-0.005	170.51	1.313s
SB-124	2411.61	602.73	107.	-8.	-0.004	189.20	1.315s
CS-134	2419.53	604.71	99.	0.	0.000	1000.00	1.317s
BI-214	2437.93	609.31	95.	5.	0.003	301.51	1.321
RU-103	2441.89	610.30	81.	9.	0.005	142.49	1.322s
AG-108M	2457.82	614.28	75.	9.	0.005	136.68	1.325s
PM-144	2472.94	618.06	84.	9.	0.005	146.67	1.328s
RH-106	2488.37	621.92	57.	7.	0.004	167.45	1.332s
SB-125	2544.26	635.89	19.	-2.	-0.001	537.69	1.344s
AG-110M	2631.76	657.76	24.	2.	0.001	353.55	1.362s
CS-137	2647.36	661.66	40.	-11.	-0.006	121.31	1.366s
PM-144	2786.90	696.54	13.	8.	0.004	98.56	1.395s
NB-94	2811.25	702.63	9.	1.	0.001	458.94	1.400s
SB-124	2891.88	722.79	14.	6.	0.003	103.40	1.417s
AG-108M	2892.48	722.94	20.	0.	0.000	1000.00	1.417s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	2894.17	723.36	20.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	20.	0.	0.000	1000.00	1.418s
BI-212	2909.41	727.17	27.	-6.	-0.003	126.13	1.421s
PM-146	2943.61	735.72	5.	5.	0.003	102.49	1.428s
PM-146	2989.37	747.16	13.	-6.	-0.003	78.12	1.437s
ZR-95	3027.65	756.73	22.	-10.	-0.005	103.42	1.445s
AG-110M	3056.50	763.94	21.	-4.	-0.002	158.21	1.451s
PA-234M	3066.38	766.41	27.	1.	0.001	659.58	1.453s
EU-152	3116.41	778.92	9.	-2.	-0.001	285.36	1.463s
BI-212	3142.41	785.42	5.	5.	0.003	100.08	1.468s
CS-134	3184.20	795.87	17.	2.	0.001	337.28	1.477s
TL-210	3199.12	799.60	19.	0.	0.000	1000.00	1.480s
CS-134	3208.53	801.95	29.	-9.	-0.005	70.02	1.482s
CO-58	3243.82	810.78	39.	-10.	-0.006	90.45	1.489s
La-140	3263.80	815.77	28.	7.	0.004	107.89	1.493s
MN-54	3340.10	834.85	14.	-1.	-0.001	800.00	1.508s
Co-56	3387.78	846.77	14.	-3.	-0.002	270.80	1.518s
TL-208	3442.95	860.56	23.	-11.	-0.006	95.17	1.529s
NB-94	3485.08	871.10	18.	-9.	-0.005	71.33	1.537s
EU-154	3493.61	873.23	21.	5.	0.003	145.02	1.539
PA-234	3522.80	880.53	21.	5.	0.003	128.09	1.544s
PA-234	3533.64	883.24	26.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	23.	0.	0.000	1000.00	1.547s
Y-88	3592.83	898.04	0.	11.	0.006	30.15	1.558s
AC-228	3643.25	910.65	4.	18.	0.010	29.69	1.721
AG-110M	3750.60	937.49	14.	-8.	-0.004	105.33	1.589s
PA-234	3784.70	946.02	14.	-3.	-0.002	270.80	1.595s
AC-228	3876.48	968.97	11.	4.	0.002	167.82	1.612
EU-154	3985.88	996.33	20.	-8.	-0.004	86.94	1.633s
PA-234M	4004.55	1001.00	29.	-2.	-0.001	338.57	1.636s
EU-154	4019.65	1004.77	20.	6.	0.003	118.66	1.639s
Co-56	4151.87	1037.84	5.	4.	0.002	132.68	1.664s
Cs-136	4192.77	1048.07	12.	-5.	-0.003	107.70	1.671s
RH-106	4201.93	1050.36	24.	-6.	-0.004	114.61	1.673s
BI-207	4255.11	1063.66	5.	1.	0.000	749.17	1.682s
Ga-68	4310.04	1077.40	25.	-13.	-0.007	88.02	1.692s
FE-59	4397.41	1099.25	15.	-6.	-0.003	82.91	1.708s
EU-152	4448.68	1112.07	27.	4.	0.002	175.24	1.717
ZN-65	4462.56	1115.55	31.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	15.	6.	0.003	106.05	1.723
Sc-46	4482.57	1120.55	21.	6.	0.003	115.65	1.723s
Ta-182	4485.56	1121.30	61.	-12.	-0.007	96.60	1.724s
CO-60	4693.21	1173.24	0.	7.	0.004	37.80	1.760s
Ta-182	4756.42	1189.05	10.	-6.	-0.003	122.85	1.771s
Ta-182	4885.79	1221.41	27.	-9.	-0.005	139.63	1.793s
Co-56	4953.23	1238.28	11.	8.	0.004	101.68	1.804s
NA-22	5098.13	1274.53	21.	-13.	-0.007	58.57	1.828s
TL-210	5251.91	1313.00	5.	5.	0.003	121.64	1.854s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CO-60	5329.85	1332.50	11.	-5.	-0.003	165.68	1.866s
AG-110M	5536.88	1384.30	0.	6.	0.003	40.82	1.899s
EU-152	5631.62	1408.00	5.	1.	0.000	796.87	1.914s
K-40	5840.11	1460.17	4.	90.	0.050	11.02	1.135s
SB-124	6762.39	1690.98	0.	0.	0.000	1000.00	2.076s
BI-214	7056.06	1764.49	10.	2.	0.001	250.41	2.114s
Co-56	7083.46	1771.35	14.	2.	0.001	330.45	2.117s

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
BE-7	C	1.1083E+00				5.31E+01	
			477.60	1.108E+00	?(P	9.388E+00 2.35E+02 1.05E+01	G
NA-22	C	-1.2336E+00				9.50E+02	
			1274.53	-1.234E+00	?(	2.353E+00 5.86E+01 9.99E+01	G
K-40	N	9.1838E+01				4.66E+11	
			1460.83	9.184E+01	(P	1.226E+01 1.10E+01 1.07E+01	G
Sc-46	F	2.4881E-01				8.38E+01	
			889.28	-2.391E-02	%(	1.910E+00 2.18E+03 1.00E+02	G
			1120.55	5.215E-01	?(	2.095E+00 1.16E+02 1.00E+02	G
CR-51	F	2.8097E+00				2.77E+01	
			320.08	2.810E+00	?(P	1.149E+01 1.20E+02 9.94E+00	G
MN-54	C	-6.8026E-02				3.12E+02	
			834.85	-6.803E-02	?(	1.370E+00 8.00E+02 1.00E+02	G
FE-59	F	-9.3366E-01				4.45E+01	
			1099.25	-9.337E-01	?(P	3.162E+00 8.29E+01 5.65E+01	G
			1291.60	-1.525E-01	% P	3.137E+00 1.20E+03 4.32E+01	G
Co-56	C	4.8033E-01				7.73E+01	
			846.77	-2.066E-01	?(	1.387E+00 2.71E+02 9.99E+01	G
			1238.28	1.128E+00	?(P	2.617E+00 1.02E+02 6.61E+01	G
			1037.84	2.311E+00	?(	7.587E+00 1.33E+02 1.41E+01	G
			1771.35	1.379E+00	?	1.684E+01 3.30E+02 1.55E+01	A

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TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	C	-1.9879E-01					2.72E+02	
			122.06	-1.988E-01	?(	7.503E-01	1.11E+02	8.56E+01 G
			136.47	-1.946E+00	+	8.280E+00	1.26E+02	1.07E+01 G
CO-58	C	-6.9080E-01					7.09E+01	
			810.78	-6.908E-01	?(	2.114E+00	9.04E+01	9.95E+01 G
CO-60	F	8.1758E-02					1.93E+03	
			1332.50	-4.702E-01	?(	1.807E+00	1.66E+02	1.00E+02 G
			1173.24	6.342E-01	?(	6.677E-01	3.78E+01	9.99E+01 G
NB-94	I	8.0170E-02					7.41E+06	
			702.63	8.017E-02	?(	9.878E-01	4.59E+02	9.79E+01 G
			871.10	-6.033E-01	+ P	1.569E+00	7.13E+01	9.99E+01 G
ZR-95	I	-1.1118E+00					6.40E+01	
			756.73	-1.112E+00	?(	2.806E+00	1.03E+02	5.45E+01 G
			724.20	0.000E+00	&	3.220E+00	1.00E+03	4.42E+01 G
NB-95	I	4.2265E-02					6.40E+01	
			765.79	4.227E-02	%(	1.707E+00	1.11E+03	9.98E+01 G
RU-103	I	-2.5085E-01					3.93E+01	
			497.05	-2.508E-01	?(P	1.146E+00	1.26E+02	9.09E+01 G
			610.30	8.363E+00	?	4.066E+01	1.42E+02	5.75E+00 GA
RH-106	I	3.5048E+00					3.74E+02	
			621.92	3.505E+00	?(	2.025E+01	1.67E+02	9.93E+00 G
			1050.36	-3.436E+01	+	1.363E+02	1.15E+02	1.56E+00 G
			511.86	1.453E+01	?	3.330E+00	1.37E+01	2.00E+01 GA
AG-108M	C	1.9875E-01					1.53E+05	
			433.94	-1.396E-01	?(P	1.029E+00	2.78E+02	9.05E+01 G
			722.94	0.000E+00	+	1.563E+00	1.00E+03	9.08E+01 G
			614.28	5.395E-01	?(	2.517E+00	1.37E+02	8.98E+01 G
AG-110M	F	3.8392E-01					2.50E+02	
			884.68	0.000E+00	?(	2.462E+00	1.00E+03	7.27E+01 G
			657.76	1.177E-01	?(	1.503E+00	3.54E+02	9.46E+01 G
			937.49	-1.745E+00	+	4.395E+00	1.05E+02	3.44E+01 G
			1384.30	2.570E+00	?(	3.157E+00	4.08E+01	2.43E+01 G
			763.94	-1.228E+00	+	6.867E+00	1.58E+02	2.23E+01 G
SN-113	F	-5.8444E-01					1.15E+02	
			391.69	-5.844E-01	?(	2.437E+00	1.23E+02	6.40E+01 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-124	F -6.0363E-02					6.02E+01	
		602.73	-4.146E-01	?(	2.681E+00	1.89E+02	9.83E+01 G
		1690.98	0.000E+00	+	1.899E+00	1.00E+03	4.78E+01 G
		722.79	3.160E+00	?(	1.135E+01	1.03E+02	1.08E+01 G
SB-125	I 8.0834E-03					1.01E+03	
		427.88	-5.257E-01	?(	3.095E+00	2.25E+02	2.96E+01 G
		600.50	-2.639E+00	+	1.533E+01	1.71E+02	1.79E+01 G
		635.89	-1.188E+00	+ P	1.114E+01	5.38E+02	1.13E+01 G
		463.37	1.517E+00	&(P	1.221E+01	2.29E+02	1.05E+01 G
I-131	I 2.8916E-01					8.02E+00	
		364.48	1.560E-02	%(P	1.037E+00	2.37E+03	8.17E+01 G
		284.30	3.929E+00	?(	1.108E+01	1.06E+02	6.14E+00 G
		636.97	-2.521E-01	%	1.895E+01	2.04E+03	7.17E+00 G
Gd-153	F 6.7277E-01					2.42E+02	
		97.50	5.634E-01	?(	2.192E+00	1.15E+02	3.00E+01 G
		103.20	8.232E-01	&(	3.368E+00	1.21E+02	2.18E+01 G
Ga-68	C -3.9293E+01					4.71E-02	
		1077.40	-3.929E+01	?(	7.772E+01	8.80E+01	3.30E+00 G
Tc-99m	I 4.5809E-01					2.51E-01	
		140.51	4.581E-01	*(	7.544E-01	5.08E+01	8.93E+01 G
BA-133	F -3.2280E-01					3.85E+03	
		356.00	-3.228E-01	&(	2.678E+00	2.42E+02	6.20E+01 G
		302.85	5.308E-02	%	9.973E+00	5.46E+03	1.83E+01 G
		383.84	2.676E+00	&	1.097E+01	1.19E+02	8.94E+00 GA
		80.99	6.103E-01	&	1.955E+00	1.17E+02	3.41E+01 GA
CS-134	I 4.2499E-01					7.54E+02	
		795.87	1.364E-01	?(P	1.684E+00	3.37E+02	8.55E+01 G
		604.71	0.000E+00	-	2.610E+00	1.00E+03	9.76E+01 G
		569.32	2.030E+00	?(	5.101E+00	7.47E+01	1.54E+01 G
		801.95	-6.568E+00	+ P	2.094E+01	7.00E+01	8.69E+00 G
		563.24	-7.032E+00	+	1.797E+01	1.02E+02	8.35E+00 G
CS-137	I -7.4071E-01					1.10E+04	
		661.66	-7.407E-01	?(P	2.121E+00	1.21E+02	8.52E+01 G
CE-139	F 2.2106E-01					1.38E+02	
		165.85	2.211E-01	&(	8.799E-01	1.17E+02	7.99E+01 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ba-140	I	-4.2685E-01					1.28E+01	
			537.26	-4.268E-01	?(P	4.563E+00	2.98E+02	2.44E+01 G
			162.66	-2.726E+00	+	1.292E+01	1.39E+02	6.22E+00 G
			304.85	0.000E+00	+	4.280E+01	1.00E+03	4.29E+00 G
La-140	I	4.7322E-01					1.28E+01	
			1596.21	-9.491E-03	%(P	9.063E-01	1.29E+04	9.54E+01 G
			487.02	-3.021E-02	% P	2.051E+00	2.05E+03	4.55E+01 G
			328.76	8.722E-01	&(	3.488E+00	1.47E+02	2.03E+01 G
			815.77	2.103E+00	?(	7.803E+00	1.08E+02	2.33E+01 G
CE-141	I	3.1773E-01					3.25E+01	
			145.44	3.177E-01	?(	1.644E+00	1.52E+02	4.82E+01 G
CE-144	I	-1.7449E+00					2.85E+02	
			133.54	-1.745E+00	&(	7.271E+00	1.23E+02	1.11E+01 G
PM-144	C	4.7838E-01					3.63E+02	
			696.54	4.722E-01	?(	1.152E+00	9.86E+01	9.90E+01 G
			618.06	4.845E-01	?(P	2.425E+00	1.47E+02	9.91E+01 G
EU-152	F	1.2357E+00					4.94E+03	
			121.78	5.138E-01	?(	1.904E+00	1.09E+02	2.86E+01 G
			344.29	0.000E+00	-	5.309E+00	1.00E+03	2.65E+01 G
			1112.07	2.748E+00	?(	1.698E+01	1.75E+02	1.36E+01 G
			778.92	-1.157E+00	+	8.404E+00	2.85E+02	1.29E+01 G
			964.11	3.503E-01	%	1.375E+01	1.07E+03	1.46E+01 G
			244.69	3.226E-01	%	2.176E+01	1.97E+03	7.58E+00 G
			1408.00	3.350E-01	-	6.769E+00	7.97E+02	2.10E+01 GA
EU-154	I	1.3222E+00					3.14E+03	
			123.10	3.725E-01	?(P	1.440E+00	1.14E+02	4.08E+01 G
			1274.54	-1.734E-01	%	8.245E+00	1.32E+03	3.52E+01 G
			723.36	0.000E+00	-	7.025E+00	1.00E+03	2.02E+01 G
			873.23	2.731E+00	?(P	1.393E+01	1.45E+02	1.23E+01 G
			1004.77	2.513E+00	?(	1.039E+01	1.19E+02	1.80E+01 G
			996.33	-5.973E+00	+	1.766E+01	8.69E+01	1.06E+01 G
EU-155	I	-5.8792E-01					1.81E+03	
			105.31	-5.879E-01	?(P	4.546E+00	2.32E+02	2.12E+01 G
			86.54	0.000E+00	+	3.816E+00	1.00E+03	3.07E+01 G
HF-181	F	1.6418E-01					4.24E+01	
			482.00	8.006E-02	?(	1.376E+00	4.74E+02	8.05E+01 G
			133.02	0.000E+00	-	1.871E+00	1.00E+03	4.33E+01 G
			345.83	0.000E+00	&	9.371E+00	1.00E+03	1.51E+01 G
			136.30	1.322E+00	?(	1.403E+01	3.08E+02	5.85E+00 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ta-182	F	-2.9908E+00					1.14E+02	
			1121.30	-2.991E+00	?(	9.761E+00	9.66E+01	3.49E+01 G
			1221.41	-3.005E+00	+	9.284E+00	1.40E+02	2.70E+01 G
			1189.05	-3.390E+00	+	9.858E+00	1.23E+02	1.62E+01 G
Hg-203	F	2.0434E-01					4.66E+01	
			279.20	2.043E-01	?(	1.052E+00	1.48E+02	8.15E+01 G
TL-208	N	1.7804E+00					6.98E+02	
			583.02	1.780E+00	(P	4.392E-01	1.84E+01	8.45E+01 G
			277.28	3.396E+00	+	1.135E+01	9.77E+01	6.31E+00 G
			860.56	-6.366E+00	-	1.417E+01	9.52E+01	1.24E+01 G
PM-146	C	4.2422E-01					2.02E+03	
			453.88	1.273E-01	?(P	1.377E+00	3.99E+02	6.50E+01 G
			747.16	-1.146E+00	+ P	3.590E+00	7.81E+01	3.40E+01 G
			735.72	1.282E+00	&(P	3.449E+00	1.02E+02	2.25E+01 G
Y-88	F	4.0378E-01					1.07E+02	
			1836.06	-1.660E-02	%(P	9.809E-01	3.81E+03	9.92E+01 G
			898.04	8.488E-01	?(	5.687E-01	3.02E+01	9.37E+01 G
Cd-113m		-5.2384E+03					5.33E+03	
			263.70	-5.238E+03	?(	1.734E+04	9.80E+01	6.00E-03 K
Cd-109	F	5.0194E+00					4.53E+02	
			88.04	5.019E+00	&(	2.511E+01	1.48E+02	3.79E+00 G
Cf-251	T	-1.1352E+00					3.28E+05	
			176.60	-1.135E+00	&(	4.372E+00	1.41E+02	1.70E+01 G
			227.00	-9.728E-01	+	9.768E+00	3.50E+02	6.30E+00 GA
Cf-249	T	5.9446E-01					1.28E+05	
			387.95	3.669E-01	?(	1.650E+00	1.30E+02	6.60E+01 G
			333.44	1.563E+00	(	4.620E+00	1.11E+02	1.55E+01 G
Sn-126		-3.4628E-01					3.65E+07	
			87.57	0.000E+00	+	3.108E+00	1.00E+03	3.75E+01 GA
			64.28	-3.463E-01	?(	1.066E+01	8.88E+02	9.70E+00 G
			86.94	0.000E+00	+	1.293E+01	1.00E+03	9.04E+00 GA
PB-210	N	9.2202E+00					8.14E+03	
			46.54	9.220E+00	(P	1.981E+01	7.28E+01	4.25E+00 G
PB-212	N	3.8871E+00					6.98E+02	
			238.63	3.887E+00	(P	1.298E+00	1.50E+01	4.33E+01 G
			300.03	-1.017E+01	& P	5.730E+01	4.27E+01	3.28E+00 GA

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TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	N	5.3986E+00					5.84E+05	
			351.93	5.435E+00	(P	1.173E+00	1.38E+01	3.76E+01 G
			295.09	5.328E+00	(	2.582E+00	2.34E+01	1.93E+01 G
			242.00	4.950E+00		7.984E+00	5.05E+01	7.43E+00 GA
BI-207	C	7.5523E-02					1.18E+04	
			1063.66	7.552E-02	?(P	1.506E+00	7.49E+02	7.45E+01 G
			569.70	0.000E+00	-	1.079E+00	1.00E+03	9.77E+01 G
BI-212	N	-4.9481E+00					6.98E+02	
			727.17	-4.948E+00	?(	2.166E+01	1.26E+02	7.55E+00 G
			785.42	2.577E+01	?	6.450E+01	1.00E+02	1.28E+00 GA
U-235	N	7.8832E-01					2.57E+11	
			143.79	7.883E-01	?(P	7.158E+00	2.64E+02	1.10E+01 G
			205.33	-6.016E+00	+ P	1.642E+01	1.06E+02	5.01E+00 G
			163.38	-4.947E-01	& P	1.683E+01	9.96E+02	5.08E+00 G
			185.72	1.318E-01	? P	1.540E+00	4.11E+02	5.40E+01 GA
BI-214	N	1.2767E+00					5.84E+05	
			609.31	5.254E-01	?(P	5.453E+00	3.02E+02	4.61E+01 G
			1120.29	3.279E+00	?(P	1.207E+01	1.06E+02	1.51E+01 G
			1764.49	1.561E+00	?(P	1.453E+01	2.50E+02	1.54E+01 G
BI-210M	T	4.4845E-01					1.10E+09	
			265.83	4.484E-01	&(	1.744E+00	1.14E+02	5.00E+01 G
			304.90	0.000E+00	-	6.559E+00	1.00E+03	2.80E+01 G
AC-228	N	5.3915E+00					2.10E+03	
			911.07	4.661E+00	(P	2.893E+00	2.97E+01	2.90E+01 G
			968.97	1.875E+00	- P	7.941E+00	1.68E+02	1.75E+01 G
			338.32	7.155E+00	*(P	4.266E+00	2.80E+01	1.20E+01 G
			93.35	3.468E+00	?	1.885E+01	1.61E+02	5.56E+00 XA
TH-227	N	6.0498E-01					7.95E+03	
			256.24	6.050E-01	(	1.015E+01	6.13E+02	7.00E+00 G
			235.97	-2.143E+00	+	1.343E+01	1.85E+02	1.23E+01 G
			50.14	-1.036E+00	+	1.242E+01	4.05E+02	8.00E+00 G
TH-229	N	2.2441E+00					2.68E+06	
			193.51	-1.077E+00	?(P	1.529E+01	6.39E+02	4.40E+00 G
			210.85	7.131E+00	?(P	2.159E+01	1.10E+02	2.99E+00 G
TH-234	N	-2.4435E+00					1.63E+12	
			92.59	-2.444E+00	(P	1.842E+01	2.17E+02	5.58E+00 G
			63.29	-5.246E+00	+ P	2.648E+01	1.42E+02	3.81E+00 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-231	N	-5.7947E+00					1.20E+07	
			302.65	-5.795E+00	?(	6.300E+01	3.18E+02	2.88E+00 G
			300.07	-1.344E+01	+	7.400E+01	1.63E+02	2.46E+00 G
PA-233	C	8.0233E-01					7.82E+08	
			312.01	8.023E-01	&(	4.248E+00	1.56E+02	3.60E+01 G
			300.18	-5.334E+00	+	2.839E+01	1.57E+02	6.20E+00 G
PA-234	N	3.8114E-01					1.63E+12	
			131.29	3.811E-01	?(	4.391E+00	3.34E+02	1.80E+01 G
			946.02	-1.691E+00	+	1.136E+01	2.71E+02	1.34E+01 G
			569.47	-1.700E+00	+	1.381E+01	2.25E+02	8.20E+00 G
			883.24	0.000E+00	-	1.966E+01	1.00E+03	9.60E+00 G
			880.53	6.322E+00	?	2.832E+01	1.28E+02	6.00E+00 GA
PA-234M	N	-8.6825E+00					1.63E+12	
			1001.00	-2.029E+01	?(P	2.639E+02	3.39E+02	8.37E-01 G
			766.41	2.435E+01	?(P	5.817E+02	6.60E+02	2.94E-01 G
AM-241	T	-1.3110E+00					1.58E+05	
			59.54	-1.311E+00	(P	2.959E+00	4.64E+01	3.59E+01 G
Np-237	F	1.4815E+00					2.14E+06	
			86.49	1.482E+00	*(	8.731E+00	1.74E+02	1.31E+01 G
Ir-192	F	-2.3078E-02					7.40E+01	
			316.49	-4.030E-01	?(	1.401E+00	1.03E+02	8.70E+01 G
			468.06	-4.186E-01	+	2.812E+00	1.93E+02	5.18E+01 G
			308.44	1.018E+00	?(	5.445E+00	1.58E+02	3.18E+01 G
Cs-136	F	3.4291E-02					1.30E+01	
			818.50	3.429E-02	%(	1.959E+00	1.58E+03	1.00E+02 G
			1048.07	-5.145E-01	+	1.940E+00	1.08E+02	8.00E+01 G
			340.57	-4.116E-01	+	3.081E+00	2.17E+02	4.69E+01 G
Np-239	T	-8.4312E-01					2.36E+00	
			103.70	0.000E+00	+	3.233E+00	1.00E+03	2.40E+01 X
			106.13	-8.431E-01	&(	4.331E+00	1.52E+02	2.27E+01 G
			99.50	-4.006E-01	+	4.601E+00	3.31E+02	1.50E+01 X
Nd-147		5.1359E-03					1.11E+01	
			531.00	-1.433E+00	?(	7.650E+00	2.02E+02	1.30E+01 G
			91.10	6.659E-01	?(	3.444E+00	1.53E+02	2.83E+01 G
Kr-85	I	-9.0675E+01					3.92E+03	
			513.98	-9.068E+01	?(	4.989E+02	1.61E+02	4.30E-01 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

(- 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	
TH-227	50.14	51.	-3.	-0.002	404.83	-1.036E+00	
AM-241	59.54	96.	-21.	-0.012	46.36	-1.311E+00	P
TH-234	63.29	100.	-10.	-0.005	141.87	-5.246E+00	P
Sn-126	64.28	109.	-2.	-0.001	887.92	-3.463E-01	
BA-133	80.99	63.	12.	0.007	117.48	6.103E-01	
Np-237	86.49	213.	12.	0.007	174.40	1.482E+00	
Cd-109	88.04	148.	12.	0.007	147.77	5.019E+00	
Nd-147	91.10	159.	12.	0.007	152.82	6.659E-01	
TH-234	92.59	181.	-9.	-0.005	217.17	-2.444E+00	P
Gd-153	97.50	72.	11.	0.006	114.59	5.634E-01	
Np-239	99.50	81.	-4.	-0.002	331.34	-4.006E-01	
Gd-153	103.20	93.	12.	0.006	120.71	8.232E-01	
EU-155	105.31	166.	-8.	-0.005	232.41	-5.879E-01	P
Np-239	106.13	173.	-12.	-0.007	151.97	-8.431E-01	
EU-152	121.78	48.	9.	0.005	108.77	5.138E-01	
CO-57	122.06	69.	-11.	-0.006	111.23	-1.988E-01	
EU-154	123.10	57.	10.	0.005	113.62	3.725E-01	P
PA-234	131.29	103.	4.	0.002	334.15	3.811E-01	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:45:13 PMPage 16
TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
CE-144	133.54	106.	-12.	-0.007	123.07	-1.745E+00		
HF-181	136.30	108.	5.	0.003	308.46	1.322E+00		
CO-57	136.47	126.	-13.	-0.007	125.90	-1.946E+00		
Tc-99m	140.51	64.	24.	0.014	50.82	4.581E-01		
U-235	143.79	93.	5.	0.003	264.38	7.883E-01		P
CE-141	145.44	94.	9.	0.005	151.73	3.177E-01		
Ba-140	162.66	82.	-10.	-0.005	139.05	-2.726E+00		
U-235	163.38	93.	-1.	-0.001	996.21	-4.947E-01		P
CE-139	165.85	63.	10.	0.006	116.92	2.211E-01		
Cf-251	176.60	63.	-10.	-0.006	140.54	-1.135E+00		
U-235	185.72	74.	4.	0.002	410.94	1.318E-01		P
TH-229	193.51	43.	-2.	-0.001	639.49	-1.077E+00		P
U-235	205.33	60.	-14.	-0.008	105.82	-6.016E+00		P
TH-229	210.85	34.	10.	0.005	109.60	7.131E+00		P
Cf-251	227.00	27.	-3.	-0.001	350.00	-9.728E-01		
TH-227	235.97	206.	-11.	-0.006	185.25	-2.143E+00		
TH-227	256.24	29.	2.	0.001	612.86	6.050E-01		
Cd-113m	263.70	64.	-12.	-0.007	97.98	-5.238E+03		
BI-210M	265.83	43.	9.	0.005	113.70	4.484E-01		
Hg-203	279.20	38.	6.	0.003	148.33	2.043E-01		
I-131	284.30	22.	9.	0.005	106.28	3.929E+00		
TL-210	296.00	194.	-11.	-0.006	175.91	-4.122E-01		
PA-231	300.07	167.	-11.	-0.006	162.60	-1.344E+01		
PA-233	300.18	155.	-11.	-0.006	157.12	-5.334E+00		
PA-231	302.65	163.	-6.	-0.003	318.31	-5.795E+00		
Ir-192	308.44	142.	11.	0.006	157.64	1.018E+00		
PA-233	312.01	108.	10.	0.005	155.54	8.023E-01		
Ir-192	316.49	65.	-12.	-0.006	102.70	-4.030E-01		
CR-51	320.08	55.	9.	0.005	119.85	2.810E+00		P
La-140	328.76	18.	6.	0.003	147.47	8.722E-01		
Cf-249	333.44	18.	8.	0.004	110.55	1.563E+00		
Cs-136	340.57	82.	-6.	-0.003	217.31	-4.116E-01		
BA-133	356.00	102.	-6.	-0.003	241.52	-3.228E-01		
BA-133	383.84	28.	7.	0.004	118.60	2.676E+00		
Cf-249	387.95	35.	7.	0.004	130.11	3.669E-01		
SN-113	391.69	75.	-10.	-0.006	122.61	-5.844E-01		
SB-125	427.88	20.	-4.	-0.002	224.54	-5.257E-01		
AG-108M	433.94	20.	-3.	-0.002	277.57	-1.396E-01		P
PM-146	453.88	17.	2.	0.001	399.34	1.273E-01		P
SB-125	463.37	36.	4.	0.002	228.59	1.517E+00		P
Ir-192	468.06	47.	-5.	-0.003	193.06	-4.186E-01		
BE-7	477.59	19.	3.	0.002	235.23	1.108E+00		P
HF-181	482.00	24.	2.	0.001	473.76	8.006E-02		
RU-103	497.05	20.	-5.	-0.003	126.33	-2.508E-01		P
RH-106	511.86	7.	64.	0.036	13.70	1.453E+01		
Kr-85	513.98	92.	-9.	-0.005	161.06	-9.068E+01		
Nd-147	531.00	16.	-4.	-0.002	202.07	-1.433E+00		
Ba-140	537.26	20.	-2.	-0.001	297.69	-4.268E-01		P

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:45:13 PMPage 17
TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
CS-134	563.24	36.	-12.	-0.007	102.06	-7.032E+00		
CS-134	569.32	8.	6.	0.004	74.72	2.030E+00		
PA-234	569.47	19.	-3.	-0.002	225.34	-1.700E+00		
SB-125	600.50	117.	-9.	-0.005	170.51	-2.639E+00		
SB-124	602.73	107.	-8.	-0.004	189.20	-4.146E-01		
RU-103	610.30	81.	9.	0.005	142.49	8.363E+00		
AG-108M	614.28	75.	9.	0.005	136.68	5.395E-01		
PM-144	618.06	84.	9.	0.005	146.67	4.845E-01		P
RH-106	621.92	57.	7.	0.004	167.45	3.505E+00		
SB-125	635.89	19.	-2.	-0.001	537.69	-1.188E+00		P
AG-110M	657.76	24.	2.	0.001	353.55	1.177E-01		
CS-137	661.66	40.	-11.	-0.006	121.31	-7.407E-01		P
PM-144	696.54	13.	8.	0.004	98.56	4.722E-01		
NB-94	702.63	9.	1.	0.001	458.94	8.017E-02		
SB-124	722.79	14.	6.	0.003	103.40	3.160E+00		
BI-212	727.17	27.	-6.	-0.003	126.13	-4.948E+00		
PM-146	735.72	5.	5.	0.003	102.49	1.282E+00		P
PM-146	747.16	13.	-6.	-0.003	78.12	-1.146E+00		P
ZR-95	756.73	22.	-10.	-0.005	103.42	-1.112E+00		
AG-110M	763.94	21.	-4.	-0.002	158.21	-1.228E+00		
PA-234M	766.41	27.	1.	0.001	659.58	2.435E+01		P
EU-152	778.92	9.	-2.	-0.001	285.36	-1.157E+00		
BI-212	785.42	5.	5.	0.003	100.08	2.577E+01		
CS-134	795.87	17.	2.	0.001	337.28	1.364E-01		P
CS-134	801.95	29.	-9.	-0.005	70.02	-6.568E+00		P
CO-58	810.78	39.	-10.	-0.006	90.45	-6.908E-01		
La-140	815.77	28.	7.	0.004	107.89	2.103E+00		
MN-54	834.85	14.	-1.	-0.001	800.00	-6.803E-02		
Co-56	846.77	14.	-3.	-0.002	270.80	-2.066E-01		
NB-94	871.10	18.	-9.	-0.005	71.33	-6.033E-01		P
EU-154	873.23	21.	5.	0.003	145.02	2.731E+00		P
PA-234	880.53	21.	5.	0.003	128.09	6.322E+00		
Y-88	898.04	0.	11.	0.006	30.15	8.488E-01		
AG-110M	937.49	14.	-8.	-0.004	105.33	-1.745E+00		
PA-234	946.02	14.	-3.	-0.002	270.80	-1.691E+00		
EU-154	996.33	20.	-8.	-0.004	86.94	-5.973E+00		
PA-234M	1001.00	29.	-2.	-0.001	338.57	-2.029E+01		P
EU-154	1004.77	20.	6.	0.003	118.66	2.513E+00		
Co-56	1037.84	5.	4.	0.002	132.68	2.311E+00		
Cs-136	1048.07	12.	-5.	-0.003	107.70	-5.145E-01		
RH-106	1050.36	24.	-6.	-0.004	114.61	-3.436E+01		
BI-207	1063.66	5.	1.	0.000	749.17	7.552E-02		P
Ga-68	1077.40	25.	-13.	-0.007	88.02	-3.929E+01		
FE-59	1099.25	15.	-6.	-0.003	82.91	-9.337E-01		P
EU-152	1112.07	27.	4.	0.002	175.24	2.748E+00		
Sc-46	1120.55	21.	6.	0.003	115.65	5.215E-01		
Ta-182	1121.30	61.	-12.	-0.007	96.60	-2.991E+00		
CO-60	1173.24	0.	7.	0.004	37.80	6.342E-01		

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:45:13 PMPage 18
TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Ta-182	1189.05	10.	-6.	-0.003	122.85	-3.390E+00		
Ta-182	1221.41	27.	-9.	-0.005	139.63	-3.005E+00		
Co-56	1238.28	11.	8.	0.004	101.68	1.128E+00		P
NA-22	1274.53	21.	-13.	-0.007	58.57	-1.234E+00		
TL-210	1313.00	5.	5.	0.003	121.64	2.211E+00		
CO-60	1332.50	11.	-5.	-0.003	165.68	-4.702E-01		
AG-110M	1384.30	0.	6.	0.003	40.82	2.570E+00		
EU-152	1408.00	5.	1.	0.000	796.87	3.350E-01		
Co-56	1771.35	14.	2.	0.001	330.45	1.379E+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	1.1083E+00	1.1083E+00	2.352E+02%	9.39E+00
NA-22	#A	-1.2336E+00	-1.2336E+00	5.857E+01%	2.35E+00
K-40		9.1838E+01	9.1838E+01	1.102E+01%	1.23E+01
Sc-46	#A	2.4881E-01	2.4881E-01	1.157E+02%	1.91E+00
CR-51	#A	2.8097E+00	2.8097E+00	1.199E+02%	1.15E+01
MN-54	#A	-6.8026E-02	-6.8026E-02	8.000E+02%	1.37E+00
FE-59	#A	-9.3365E-01	-9.3366E-01	8.291E+01%	3.16E+00
Co-56	#A	4.8033E-01	4.8033E-01	1.017E+02%	1.39E+00
CO-57	#A	-1.9879E-01	-1.9879E-01	1.112E+02%	7.50E-01
CO-58	#A	-6.9080E-01	-6.9080E-01	9.045E+01%	2.11E+00
CO-60	#A	8.1758E-02	8.1758E-02	3.780E+01%	1.81E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.91E+00
NB-94	#A	8.0170E-02	8.0170E-02	4.589E+02%	9.88E-01
ZR-95	#A	-1.1118E+00	-1.1118E+00	1.034E+02%	2.81E+00
NB-95	#A	4.2265E-02	4.2265E-02	1.109E+03%	1.71E+00
RU-103	#A	-2.5085E-01	-2.5085E-01	1.263E+02%	1.15E+00
RH-106	#A	3.5048E+00	3.5048E+00	1.674E+02%	2.03E+01
AG-108M	#A	1.9875E-01	1.9875E-01	1.367E+02%	1.03E+00
AG-110M	#A	3.8392E-01	3.8392E-01	4.082E+01%	2.46E+00
SN-113	#A	-5.8443E-01	-5.8444E-01	1.226E+02%	2.44E+00
SB-124	#A	-6.0363E-02	-6.0363E-02	1.034E+02%	2.68E+00
SB-125	#A	8.0834E-03	8.0834E-03	1.602E+02%	3.10E+00
I-131	#A	2.8915E-01	2.8916E-01	1.063E+02%	1.04E+00
Gd-153	#A	6.7277E-01	6.7277E-01	8.322E+01%	2.19E+00
Ga-68	#A	-3.9007E+01	-3.9293E+01	8.802E+01%	7.77E+01
Tc-99m	#A	4.5746E-01	4.5809E-01	5.082E+01%	7.54E-01
BA-133	#A	-3.2280E-01	-3.2280E-01	2.415E+02%	2.68E+00
CS-134	#A	4.2499E-01	4.2499E-01	7.472E+01%	1.68E+00
CS-137	#A	-7.4071E-01	-7.4071E-01	1.213E+02%	2.12E+00
CE-139	#A	2.2106E-01	2.2106E-01	1.169E+02%	8.80E-01
Ba-140	#A	-4.2684E-01	-4.2685E-01	2.977E+02%	4.56E+00

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 9:45:13 PMPage 19
TestAmerica Inc Spectrum name: 5_Gamma_20193040.An1

La-140 #A	4.7320E-01	4.7322E-01	1.079E+02%		9.06E-01
CE-141 #A	3.1773E-01	3.1773E-01	1.517E+02%		1.64E+00
CE-144 #A	-1.7449E+00	-1.7449E+00	1.231E+02%		7.27E+00
PM-144 #A	4.7838E-01	4.7838E-01	8.835E+01%		1.15E+00
EU-152 #A	1.2357E+00	1.2357E+00	1.031E+02%		1.90E+00
EU-154 #A	1.3222E+00	1.3222E+00	7.304E+01%		1.44E+00
EU-155 #A	-5.8792E-01	-5.8792E-01	2.324E+02%		4.55E+00
HF-181 #A	1.6418E-01	1.6418E-01	2.827E+02%		1.38E+00
Ta-182 #A	-2.9908E+00	-2.9908E+00	9.660E+01%		9.76E+00
Hg-203 #A	2.0434E-01	2.0434E-01	1.483E+02%		1.05E+00
TL-208 #	1.7804E+00	1.7804E+00	1.842E+01%		4.39E-01
PM-146 #A	4.2422E-01	4.2422E-01	1.025E+02%		1.38E+00
Y-88 #A	4.0377E-01	4.0378E-01	3.015E+01%		9.81E-01
Cd-113m#A	-5.2384E+03	-5.2384E+03	9.798E+01%		1.73E+04
Cd-109 #A	5.0194E+00	5.0194E+00	1.478E+02%		2.51E+01
Cf-251 #A	-1.1352E+00	-1.1352E+00	1.405E+02%		4.37E+00
Cf-249 #A	5.9446E-01	5.9446E-01	8.537E+01%		1.65E+00
Sn-126 #A	-3.4628E-01	-3.4628E-01	8.879E+02%		1.07E+01
PB-210 A	9.2202E+00	9.2202E+00	7.284E+01%		1.98E+01
PB-212	3.8871E+00	3.8871E+00	1.499E+01%		1.30E+00
PB-214	5.3986E+00	5.3986E+00	1.359E+01%		1.17E+00
BI-207 #A	7.5523E-02	7.5523E-02	7.492E+02%		1.51E+00
BI-212 #A	-4.9481E+00	-4.9481E+00	1.261E+02%		2.17E+01
U-235 #A	7.8832E-01	7.8832E-01	2.644E+02%		7.16E+00
BI-214 #A	1.2767E+00	1.2767E+00	1.061E+02%		5.45E+00
BI-210M#A	4.4845E-01	4.4845E-01	1.137E+02%		1.74E+00
AC-228	5.3915E+00	5.3915E+00	2.041E+01%		2.89E+00
TH-227 #A	6.0498E-01	6.0498E-01	6.129E+02%		1.01E+01
TH-229 #A	2.2441E+00	2.2441E+00	1.096E+02%		1.53E+01
TH-234 #A	-2.4435E+00	-2.4435E+00	2.172E+02%		1.84E+01
PA-231 #A	-5.7947E+00	-5.7947E+00	3.183E+02%		6.30E+01
PA-233 #A	8.0233E-01	8.0233E-01	1.555E+02%		4.25E+00
PA-234 #A	3.8114E-01	3.8114E-01	3.342E+02%		4.39E+00
PA-234M#A	-8.6825E+00	-8.6825E+00	3.386E+02%		2.64E+02
AM-241 #A	-1.3110E+00	-1.3110E+00	4.636E+01%		2.96E+00
Np-237 #A	1.4815E+00	1.4815E+00	1.744E+02%		8.73E+00
Ir-192 #A	-2.3078E-02	-2.3078E-02	9.407E+01%		1.40E+00
Cs-136 #A	3.4290E-02	3.4291E-02	1.579E+03%		1.96E+00
Np-239 #A	-8.4300E-01	-8.4312E-01	1.520E+02%		4.33E+00
Nd-147 #A	5.1358E-03	5.1359E-03	1.267E+02%		7.65E+00
TL-210 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.53E+00
Kr-85 #A	-9.0675E+01	-9.0675E+01	1.611E+02%		4.99E+02

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

```
     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 9:45:13 PMPage 20
TestAmerica Inc                 Spectrum name: 5_Gamma_20193040.An1

  < - 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)     1.175E+02  Bq/Sample
Total Decayed Activity (   37.6 to  2000.8 keV) 1.1751519E+02  Bq/Sample
```

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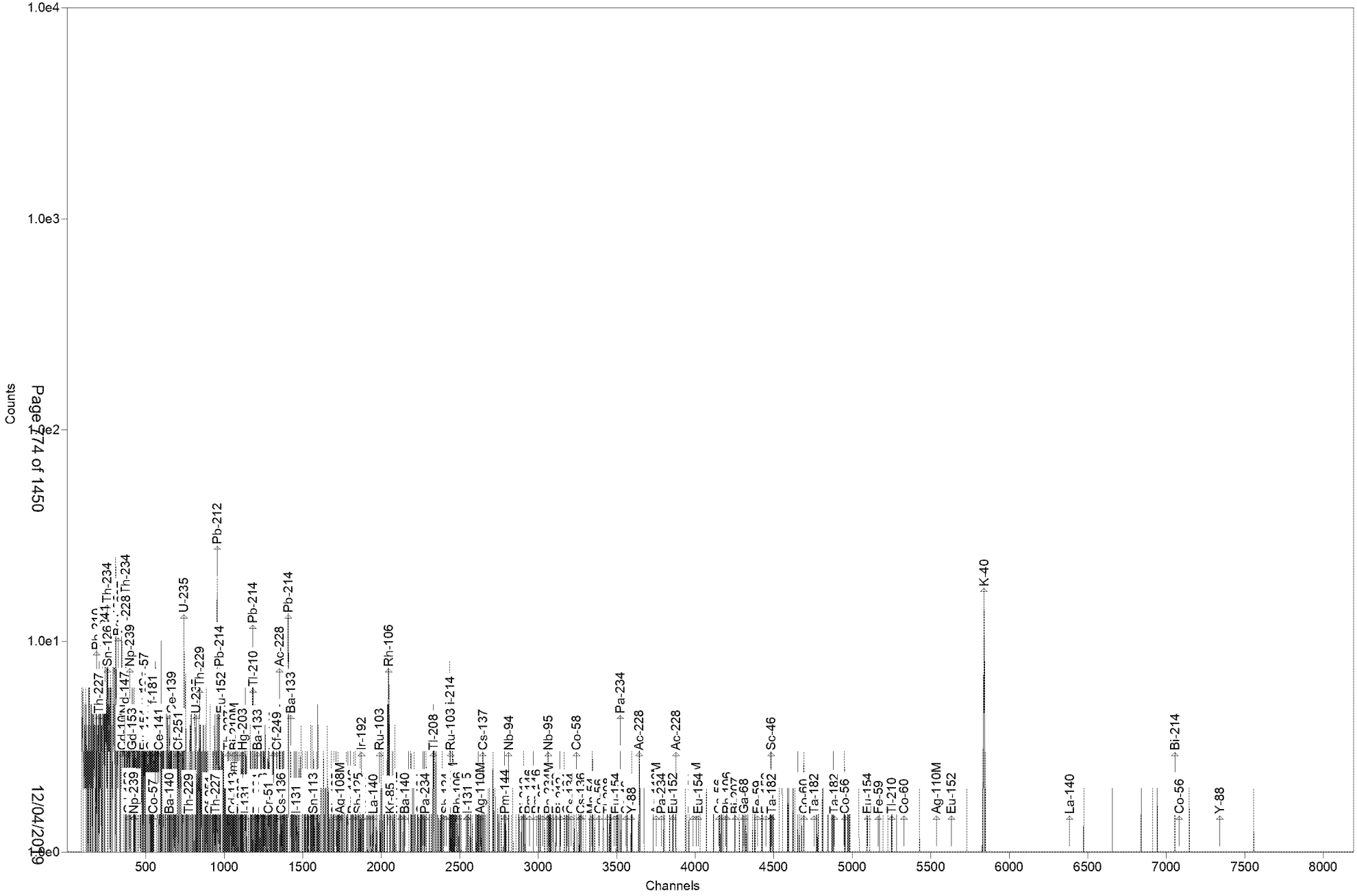
448571_Gamma_160-36160-A-5-C. 5_Gamma_20193040.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193495

Sample Description: 448571_Gamma_160-36160-A-6-C
Detector: Detector # 9
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-6-C

Decay to Time: 11/23/2019 21:47 Live Time: 1800 sec
Acquisition Time: 11/23/2019 21:47:19 Real Time: 1802 sec
Analysis Time: 11/23/2019 22:17 Dead Time: 0.10 %
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_2019-11-10_1422.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	1.924E+00	103.6	1.992E+00	1.995E+00	6.811E+00
NA-22	-1.532E-01	202.8	3.107E-01	3.108E-01	1.120E+00
K-40	8.767E+01	8.2	7.171E+00	8.459E+00	8.421E+00
Sc-46	4.624E-01	102.8	4.752E-01	4.758E-01	1.607E+00
CR-51	1.698E+00	220.5	3.745E+00	3.746E+00	1.269E+01
MN-54	3.663E-02	857.3	3.140E-01	3.140E-01	7.603E-01
FE-59	1.526E+00	22.9	3.501E-01	3.583E-01	5.919E-01
Co-56	8.875E-02	183.7	1.630E-01	1.631E-01	7.728E-01
CO-57	2.570E-01	96.5	2.481E-01	2.485E-01	4.186E-01
CO-58	3.600E-02	640.3	2.305E-01	2.305E-01	8.479E-01
CO-60	-8.514E-03	148.0	1.260E-02	1.260E-02	9.735E-01
ZN-65	0.000E+00	1.#INF	9.073E-02	9.073E-02	2.675E+00
NB-94	2.362E-01	65.1	1.537E-01	1.542E-01	9.228E-01
ZR-95	6.117E-01	32.7	2.003E-01	2.028E-01	4.597E-01
NB-95	2.290E-02	1095.4	2.509E-01	2.509E-01	9.146E-01
RU-103	5.115E-02	516.1	2.640E-01	2.640E-01	6.734E-01
RH-106	2.191E+00	225.0	4.930E+00	4.931E+00	1.682E+01
AG-108M	-2.242E-01	127.0	2.847E-01	2.850E-01	7.540E-01
AG-110M	-4.039E-01	163.1	6.588E-01	6.591E-01	2.260E+00
SN-113	-4.495E-01	107.7	4.840E-01	4.845E-01	1.633E+00
SB-124	1.987E-01	79.1	1.572E-01	1.576E-01	1.875E+00
SB-125	1.022E+00	67.6	6.910E-01	6.930E-01	1.995E+00
I-131	1.218E-01	180.7	2.202E-01	2.203E-01	5.738E-01
Gd-153	0.000E+00	1.#INF	1.414E-01	1.414E-01	3.605E+00
Ga-68	1.419E+01	33.3	4.731E+00	4.797E+00	1.162E+01
Tc-99m	1.385E-01	208.2	2.883E-01	2.884E-01	9.742E-01
BA-133	-3.892E-01	148.0	5.758E-01	5.762E-01	1.947E+00
CS-134	9.885E-01	21.8	2.157E-01	2.217E-01	1.255E+00
CS-137	3.563E-01	98.3	3.501E-01	3.506E-01	1.188E+00
CE-139	-2.471E-01	94.8	2.342E-01	2.354E-01	7.856E-01
Ba-140	-9.360E-01	112.3	1.051E+00	1.052E+00	2.888E+00
La-140	-9.122E-01	94.7	8.635E-01	8.649E-01	1.646E+00
CE-141	-3.492E-01	160.5	5.605E-01	5.607E-01	1.885E+00

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CE-144	1.357E+00	149.8	2.033E+00	2.035E+00	6.855E+00
PM-144	-3.984E-01	78.9	3.145E-01	3.152E-01	1.088E+00
EU-152	2.214E+00	24.5	5.432E-01	5.556E-01	1.065E+00
EU-154	-3.583E-01	97.8	3.503E-01	3.508E-01	1.180E+00
EU-155	8.075E-01	163.9	1.323E+00	1.324E+00	4.444E+00
HF-181	8.533E-02	84.4	7.197E-02	7.211E-02	1.133E+00
Ta-182	0.000E+00	1.#INF	2.642E-01	2.642E-01	3.486E+00
Hg-203	4.574E-02	581.2	2.658E-01	2.659E-01	9.247E-01
TL-208	1.017E+00	33.1	3.360E-01	3.401E-01	7.476E-01
PM-146	-6.156E-01	92.3	5.682E-01	5.690E-01	1.349E+00
Y-88	0.000E+00	1.#INF	9.803E-02	9.803E-02	5.109E-01
Cd-113m	1.902E+03	131.5	2.501E+03	2.504E+03	8.621E+03
Cd-109	-5.234E+00	167.8	8.780E+00	8.785E+00	2.943E+01
Cf-251	9.340E-01	99.4	9.284E-01	9.321E-01	2.415E+00
Cf-249	1.841E-01	206.9	3.810E-01	3.812E-01	1.316E+00
Sn-126	1.652E+00	183.3	3.029E+00	3.030E+00	1.024E+01
PB-210	6.815E+00	111.3	7.583E+00	7.594E+00	2.560E+01
PB-212	3.600E+00	12.4	4.447E-01	5.020E-01	9.892E-01
PB-214	5.197E+00	10.3	5.358E-01	6.000E-01	1.296E+00
BI-207	2.123E-01	156.7	3.327E-01	3.328E-01	8.048E-01
BI-212	-3.596E+00	100.8	3.625E+00	3.630E+00	1.425E+01
U-235	7.459E-01	139.1	1.038E+00	1.038E+00	7.947E+00
BI-214	5.729E+00	13.0	7.468E-01	8.040E-01	1.255E+00
BI-210M	2.093E-02	1480.1	3.097E-01	3.098E-01	1.103E+00
AC-228	4.546E+00	24.0	1.091E+00	1.116E+00	2.185E+00
TH-227	-2.967E-01	247.6	7.346E-01	7.348E-01	8.384E+00
TH-229	2.145E+00	186.5	4.001E+00	4.005E+00	1.107E+01
TH-234	3.249E+00	69.1	2.245E+00	2.252E+00	7.445E+00
PA-231	6.874E+00	149.9	1.031E+01	1.031E+01	4.552E+01
PA-233	0.000E+00	1.#INF	3.713E-01	3.713E-01	3.791E+00
PA-234	2.146E+00	27.7	5.952E-01	6.054E-01	3.928E+00
PA-234M	2.435E+01	74.1	1.804E+01	1.808E+01	1.602E+02
AM-241	-7.999E-01	109.5	8.760E-01	8.770E-01	2.937E+00
Np-237	1.364E+00	176.5	2.407E+00	2.408E+00	8.082E+00
Ir-192	1.429E-01	102.2	1.460E-01	1.462E-01	1.583E+00
Cs-136	1.978E-01	71.3	1.410E-01	1.415E-01	8.680E-01
Np-239	7.946E-01	164.6	1.308E+00	1.309E+00	4.388E+00
Nd-147	-1.137E+00	172.9	1.965E+00	1.966E+00	4.895E+00
TL-210	1.032E-01	207.4	2.141E-01	2.142E-01	1.112E+00
Kr-85	0.000E+00	1.#INF	2.778E+01	2.778E+01	3.002E+02
Total	2.092E+03				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 10:17:38 PMPage  1
TestAmerica Inc                 Spectrum name: 9_Gamma_20193495.An1

Sample description
     448571_Gamma_160-36160-A-6-C


Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193495.An1

Acquisition information
       Start time:                 11/23/2019 9:47:19 PM
       Live time:               1800
       Real time:               1802
       Dead time:                  0.10 %
       Detector ID:                    9

Detector system
     Ge9 S/N09363993


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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:17:38 PMPage 2
TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

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	11/23/2019 9:47:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-11-10_1422.PBC 11/10/2019 2:22:11 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 12 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1515

***** 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	13.	111.28	1.00	2.577E-02	46.54	4.250	PBC<MDA	PB210
50.14	3.	624.93	1.00	2.900E-02	50.14	8.000	PBC<MDA	TH227
64.28	12.	183.33	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
77.16	60.	30.57	0.43	4.678E-02				
86.49	16.	176.48	1.04	5.008E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	5.819E-01	EU155
					86.94	9.040	1.972E+00	Sn126
92.48	17.	69.09	1.04	5.156E-02	92.59	5.584	PBC<MDA	TH234
93.24	9.	327.53	1.04	5.171E-02	93.35	5.561	PBC<MDA	AC228
105.31	16.	163.87	1.05	5.318E-02	105.31	21.200	PBC<MDA	EU155
106.13	17.	164.62	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
121.78	14.	64.50	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.672E-01	CO57
122.06	9.	110.00	1.07	5.303E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.115E-01	CO57
131.29	14.	140.27	1.08	5.216E-02	131.29	18.000	PBC<MDA	PA234
133.02	14.	145.04	1.08	5.195E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	1.357E+00	CE144
133.54	14.	149.81	1.08	5.189E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	1.357E+00	CE144
136.30	14.	154.12	1.08	5.152E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.424E+00	CO57

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
136.47	14.	158.65	1.08	5.150E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.424E+00	CO57
140.51	11.	208.19	1.09	5.091E-02	140.51	89.300	PBC<MDA	Tc99m
163.38	10.	139.11	1.11	4.676E-02	163.38	5.080	PBC<MDA	U235
176.60	13.	99.41	1.12	4.549E-02	176.60	17.000	PBC<MDA	Cf251
185.72	6.	285.82	1.13	4.403E-02	185.72	54.000	PBC<MDA	U235
193.51	8.	186.53	1.14	4.287E-02	193.51	4.400	PBC<MDA	TH229
210.85	4.	440.64	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
238.35	96.	17.31	0.85	3.735E-02	238.63	43.300	3.300E+00	PB212
241.73	26.	35.62	1.18	3.697E-02	242.00	7.430	PBC<MDA	PB214
263.70	7.	131.51	1.20	3.489E-02	263.70	0.006	PBC<MDA	Cd113m
279.20	2.	581.17	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
294.90	64.	15.08	1.23	3.232E-02	295.09	19.300	5.667E+00	PB214
296.00	11.	207.44	1.23	3.225E-02	296.00	79.000	PBC<MDA	TL210
299.88	11.	194.20	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.030E+00	PA231
					300.18	6.200	3.187E+00	PA233
302.46	10.	228.45	1.24	3.176E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	9.254E-01	BA133
320.08	9.	220.55	1.25	3.056E-02	320.08	9.940	PBC<MDA	CR51
328.76	9.	203.59	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
338.03	13.	127.62	1.27	2.940E-02	338.32	12.010	PBC<MDA	AC228
340.57	11.	166.07	1.27	2.927E-02	340.57	46.900	PBC<MDA	Cs136
344.29	12.	140.74	1.28	2.905E-02	344.29	26.500	PBC<MDA	EU152
351.73	96.	14.07	1.13	2.860E-02	351.93	37.600	4.955E+00	PB214
364.48	5.	180.74	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
383.84	11.	104.07	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
387.95	6.	206.93	1.31	2.671E-02	387.95	66.000	PBC<MDA	Cf249
427.88	2.	525.20	1.35	2.491E-02	427.88	29.600	PBC<MDA	SB125
463.37	9.	95.87	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
468.06	8.	102.17	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
477.60	8.	103.55	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
487.02	7.	102.58	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
497.05	2.	516.09	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	57.	21.84	2.67	2.188E-02	511.86	20.000	7.235E+00	RH106
563.24	16.	37.41	1.47	2.040E-02	563.24	8.350	5.327E+00	CS134
569.32	21.	21.82	1.47	2.024E-02	569.32	15.380	3.748E+00	CS134
					569.47	8.200	7.031E+00	PA234
					569.70	97.740	5.900E-01	BI207
583.02	31.	33.05	1.48	1.989E-02	583.02	84.500	1.017E+00	TL208
609.04	88.	13.04	1.67	1.925E-02	609.31	46.090	5.521E+00	BI214
621.92	7.	225.00	1.51	1.896E-02	621.92	9.930	PBC<MDA	RH106
635.89	9.	67.59	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
661.45	10.	98.27	1.55	1.810E-02	661.66	85.210	PBC<MDA	CS137
702.63	8.	109.06	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
722.79	10.	79.12	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.432E-01	AG108M
					723.36	20.220	1.542E+00	EU154

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
724.20	1.	793.73	1.60	1.691E-02	724.20	44.150	PBC<MDA	ZR95
735.72	1.	979.80	1.61	1.671E-02	735.72	22.500	PBC<MDA	PM146
756.73	10.	32.75	1.62	1.635E-02	756.73	54.460	6.117E-01	ZR95
766.41	8.	74.07	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	9.367E+01	PA234M
778.92	7.	37.81	1.64	1.600E-02	778.92	12.940	PBC<MDA	EU152
795.87	2.	510.29	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
810.78	1.	640.31	1.67	1.551E-02	810.78	99.460	PBC<MDA	CO58
834.85	1.	857.32	1.69	1.517E-02	834.85	99.980	PBC<MDA	MN54
860.56	18.	36.53	1.71	1.482E-02	860.56	12.420	5.490E+00	TL208
871.10	6.	71.07	1.71	1.468E-02	871.10	99.890	PBC<MDA	NB94
889.28	12.	102.75	1.73	1.445E-02	889.28	99.984	PBC<MDA	Sc46
910.91	34.	24.00	1.75	1.418E-02	911.07	29.000	4.546E+00	AC228
946.02	13.	27.74	1.77	1.377E-02	946.02	13.400	3.913E+00	PA234
969.04	6.	111.78	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
1037.84	3.	229.35	1.84	1.281E-02	1037.84	14.130	PBC<MDA	Co56
1048.07	6.	71.32	1.85	1.271E-02	1048.07	80.000	PBC<MDA	Cs136
1063.66	4.	156.67	1.86	1.257E-02	1063.66	74.500	PBC<MDA	BI207
1077.40	9.	33.33	1.87	1.244E-02	1077.40	3.300	1.419E+01	Ga68
1099.25	19.	22.94	1.89	1.224E-02	1099.25	56.500	1.526E+00	FE59
1112.07	26.	24.53	1.89	1.213E-02	1112.07	13.644	8.671E+00	EU152
1118.58	-3.	197.44	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
1173.24	3.	168.73	1.94	1.163E-02	1173.24	99.900	PBC<MDA	CO60
1313.00	2.	248.05	2.03	1.063E-02	1313.00	21.000	PBC<MDA	TL210
1408.00	6.	40.82	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.57	164.	8.18	1.28	9.750E-03	1460.83	10.670	8.767E+01	K40
1763.33	15.	33.16	2.31	8.350E-03	1764.49	15.400	6.351E+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
308.23	77.16	78.	60.	1.272E+03	30.57	0.434	- 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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TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

********** 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	105.	13.	0.007	111.28	0.998s
TH-227	200.20	50.14	127.	3.	0.001	624.93	1.001
AM-241	237.77	59.54	205.	-19.	-0.011	109.51	1.010s
TH-234	252.77	63.29	222.	-13.	-0.007	163.32	1.014s
Sn-126	256.74	64.28	216.	12.	0.006	183.33	1.015s
BA-133	323.56	80.99	318.	-23.	-0.013	109.20	1.031s
Np-237	345.55	86.49	396.	16.	0.009	176.48	1.036
Sn-126	347.35	86.94	485.	-18.	-0.010	174.43	1.037
Sn-126	349.87	87.57	467.	-18.	-0.010	171.10	1.037
Cd-109	351.75	88.04	449.	-18.	-0.010	167.75	1.038
Nd-147	363.99	91.10	431.	-18.	-0.010	163.97	1.041s
TH-234	369.94	92.59	59.	17.	0.009	69.09	1.042D
AC-228	372.98	93.35	463.	9.	0.005	327.53	1.043s
Gd-153	389.58	97.50	454.	0.	0.000	1000.00	1.047s
Np-239	397.58	99.50	454.	0.	0.000	1000.00	1.049s
Gd-153	412.37	103.20	454.	0.	0.000	1000.00	1.052s
Np-239	414.37	103.70	454.	0.	0.000	1000.00	1.053s
EU-155	420.82	105.31	352.	16.	0.009	163.87	1.054s
Np-239	424.09	106.13	396.	17.	0.010	164.62	1.055s
EU-152	486.67	121.78	32.	14.	0.008	64.50	1.070s
CO-57	487.80	122.06	46.	9.	0.005	110.00	1.070s
EU-154	491.95	123.10	86.	-14.	-0.008	97.77	1.071s
PA-234	524.72	131.29	187.	14.	0.008	140.27	1.079s
HF-181	531.64	133.02	201.	14.	0.008	145.04	1.081s
CE-144	533.69	133.54	215.	14.	0.008	149.81	1.081s
HF-181	544.74	136.30	229.	14.	0.008	154.12	1.084s
CO-57	545.43	136.47	243.	14.	0.008	158.65	1.084s
Tc-99m	561.57	140.51	257.	11.	0.006	208.19	1.088
U-235	574.67	143.79	268.	0.	0.000	1000.00	1.091
CE-141	581.29	145.44	289.	-15.	-0.008	160.49	1.092s
Ba-140	650.15	162.66	143.	-18.	-0.010	96.50	1.108s
U-235	653.03	163.38	93.	10.	0.006	139.11	1.109s
CE-139	662.92	165.85	119.	-17.	-0.009	94.77	1.111s
Cf-251	705.90	176.60	44.	13.	0.007	99.41	1.122s
U-235	742.37	185.72	73.	6.	0.003	285.82	1.130s
TH-229	773.52	193.51	56.	8.	0.004	186.53	1.137s
U-235	820.80	205.33	92.	-19.	-0.011	100.74	1.148s
TH-229	842.87	210.85	80.	4.	0.002	440.64	1.153
Cf-251	907.45	227.00	72.	-4.	-0.002	418.33	1.168s
TH-227	943.33	235.97	287.	-16.	-0.009	153.34	1.176s
PB-212	953.97	238.63	31.	105.	0.058	12.35	1.179D
PB-214	967.43	242.00	30.	26.	0.014	35.62	1.182D
EU-152	978.21	244.69	264.	-8.	-0.004	301.74	1.185s
TH-227	1024.39	256.24	56.	-6.	-0.003	247.58	1.195s

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TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cd-113m	1054.23	263.70	41.	7.	0.004	131.51	1.202s
TL-208	1108.55	277.28	82.	-16.	-0.009	84.73	1.215s
Hg-203	1116.22	279.20	84.	2.	0.001	581.17	1.216s
I-131	1136.61	284.30	48.	-3.	-0.002	455.83	1.221s
PB-214	1179.77	295.09	13.	64.	0.035	15.08	1.230D
TL-210	1183.41	296.00	239.	11.	0.006	207.44	1.231s
PB-212	1199.52	300.03	250.	0.	0.000	1000.00	1.235
PA-231	1199.68	300.07	238.	11.	0.006	194.20	1.235s
PA-231	1210.00	302.65	240.	10.	0.005	228.45	1.237s
BA-133	1210.81	302.85	250.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	250.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	250.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	250.	0.	0.000	1000.00	1.243
PA-233	1247.44	312.01	250.	0.	0.000	1000.00	1.246
Ir-192	1265.35	316.49	250.	0.	0.000	1000.00	1.250s
CR-51	1279.73	320.08	205.	9.	0.005	220.55	1.253s
La-140	1314.43	328.76	151.	9.	0.005	203.59	1.261s
Cf-249	1333.15	333.44	160.	0.	0.000	1000.00	1.265s
AC-228	1352.66	338.32	136.	13.	0.007	127.62	1.270s
Cs-136	1361.66	340.57	149.	11.	0.006	166.07	1.272s
EU-152	1376.53	344.29	148.	12.	0.007	140.74	1.275s
PB-214	1406.29	351.73	23.	96.	0.053	14.07	1.129s
BA-133	1423.37	356.00	160.	-12.	-0.007	147.96	1.285s
I-131	1457.31	364.48	20.	5.	0.003	180.74	1.293s
BA-133	1534.73	383.84	59.	11.	0.006	104.07	1.310s
Cf-249	1551.17	387.95	70.	6.	0.003	206.93	1.314
SN-113	1566.12	391.69	102.	-14.	-0.008	107.66	1.317s
SB-125	1710.86	427.88	26.	2.	0.001	525.20	1.349s
AG-108M	1735.10	433.94	35.	-9.	-0.005	126.98	1.354s
PM-146	1814.87	453.88	56.	-17.	-0.010	92.30	1.372s
SB-125	1852.82	463.37	33.	9.	0.005	95.87	1.380s
Ir-192	1871.59	468.06	32.	8.	0.005	102.17	1.384s
BE-7	1909.73	477.60	34.	8.	0.005	103.55	1.392s
HF-181	1927.34	482.00	56.	-8.	-0.004	138.73	1.396s
La-140	1947.43	487.02	22.	7.	0.004	102.58	1.400s
RU-103	1987.56	497.05	22.	2.	0.001	516.09	1.409s
RH-106	2046.81	511.86	49.	57.	0.032	21.84	2.672s
Kr-85	2055.27	513.98	106.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	22.	-6.	-0.003	172.86	1.438s
Ba-140	2148.39	537.26	27.	-9.	-0.005	112.29	1.444s
CS-134	2252.30	563.24	5.	16.	0.009	37.41	1.466s
CS-134	2276.64	569.32	0.	21.	0.012	21.82	1.471s
PA-234	2277.24	569.47	21.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	21.	0.	0.000	1000.00	1.471s
TL-208	2331.45	583.02	18.	31.	0.017	33.05	1.482s
SB-125	2401.36	600.50	175.	0.	0.000	1000.00	1.497s
SB-124	2410.29	602.73	175.	0.	0.000	1000.00	1.499s
CS-134	2418.21	604.71	175.	0.	0.000	1000.00	1.500s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	2435.54	609.04	14.	88.	0.049	13.04	1.672
RU-103	2440.56	610.30	175.	0.	0.000	1000.00	1.505s
AG-108M	2456.49	614.28	175.	0.	0.000	1000.00	1.508s
PM-144	2471.62	618.06	175.	0.	0.000	1000.00	1.512s
RH-106	2487.04	621.92	136.	7.	0.004	225.00	1.515s
SB-125	2542.94	635.89	14.	9.	0.005	67.59	1.526s
I-131	2547.28	636.97	31.	-5.	-0.003	347.37	1.527s
AG-110M	2630.43	657.76	50.	-12.	-0.007	87.88	1.544s
CS-137	2646.03	661.66	42.	10.	0.005	98.27	1.548s
PM-144	2785.58	696.54	44.	-12.	-0.007	78.95	1.576s
NB-94	2809.93	702.63	30.	8.	0.004	109.06	1.581s
SB-124	2890.57	722.79	24.	10.	0.005	79.12	1.598s
AG-108M	2891.17	722.94	33.	0.	0.000	1000.00	1.598s
EU-154	2892.86	723.36	33.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	31.	1.	0.001	793.73	1.599s
BI-212	2908.11	727.17	41.	-8.	-0.005	100.81	1.601s
PM-146	2942.31	735.72	9.	1.	0.000	979.80	1.608s
PM-146	2988.08	747.16	33.	-15.	-0.008	86.69	1.617s
ZR-95	3026.36	756.73	0.	10.	0.005	32.75	1.625s
AG-110M	3055.23	763.94	24.	-1.	-0.001	700.00	1.631s
PA-234M	3065.10	766.41	14.	8.	0.004	74.07	1.633s
EU-152	3115.14	778.92	0.	7.	0.004	37.81	1.643s
BI-212	3141.15	785.42	35.	-1.	-0.001	320.10	1.648s
CS-134	3182.96	795.87	35.	2.	0.001	510.29	1.656s
TL-210	3197.88	799.60	37.	0.	0.000	1000.00	1.659s
CS-134	3207.29	801.95	56.	-14.	-0.008	79.18	1.661s
CO-58	3242.59	810.78	20.	1.	0.001	640.31	1.668s
La-140	3262.58	815.77	21.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	21.	0.	0.000	1000.00	1.674s
MN-54	3338.91	834.85	15.	1.	0.001	857.32	1.687s
Co-56	3386.61	846.77	15.	-1.	-0.001	286.95	1.696s
TL-208	3441.80	860.56	6.	18.	0.010	36.53	1.707s
NB-94	3483.94	871.10	6.	6.	0.003	71.07	1.715s
EU-154	3492.47	873.23	20.	-5.	-0.003	150.14	1.717s
PA-234	3521.68	880.53	53.	-13.	-0.007	81.81	1.722s
PA-234	3532.53	883.24	67.	-6.	-0.003	198.74	1.724s
AG-110M	3538.30	884.68	74.	-8.	-0.004	163.09	1.725s
Sc-46	3556.69	889.28	70.	12.	0.007	102.75	1.729s
AC-228	3643.88	911.07	8.	34.	0.019	24.00	1.746s
AG-110M	3749.60	937.49	10.	0.	0.000	1000.00	1.766s
PA-234	3783.72	946.02	0.	13.	0.007	27.74	1.772s
EU-152	3856.11	964.11	44.	-12.	-0.007	80.40	1.786s
AC-228	3875.56	968.97	21.	6.	0.003	111.78	1.790s
EU-154	3985.03	996.33	32.	-7.	-0.004	120.37	1.810s
PA-234M	4003.71	1001.00	39.	0.	0.000	1000.00	1.814s
EU-154	4018.82	1004.77	73.	-15.	-0.009	82.12	1.816s
Co-56	4151.13	1037.84	11.	3.	0.002	229.35	1.841s
Cs-136	4192.07	1048.07	5.	6.	0.003	71.32	1.848s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	4201.23	1050.36	47.	-16.	-0.009	66.27	1.850s
BI-207	4254.46	1063.66	5.	4.	0.002	156.67	1.860s
Ga-68	4309.44	1077.40	0.	9.	0.005	33.33	1.870s
FE-59	4396.88	1099.25	0.	19.	0.011	22.94	1.886s
EU-152	4448.20	1112.07	7.	26.	0.014	24.53	1.895s
ZN-65	4462.09	1115.55	33.	0.	0.000	1000.00	1.897s
BI-214	4481.06	1120.29	28.	-3.	-0.001	197.44	1.901s
Sc-46	4482.12	1120.55	26.	0.	0.000	1000.00	1.901s
Ta-182	4485.12	1121.30	26.	0.	0.000	1000.00	1.901s
CO-60	4692.96	1173.24	6.	3.	0.002	168.73	1.938s
Ta-182	4756.25	1189.05	11.	-4.	-0.002	188.42	1.949s
Ta-182	4885.75	1221.41	28.	-13.	-0.007	97.55	1.972s
NA-22	5098.35	1274.53	17.	-3.	-0.002	202.76	2.008s
EU-154	5098.39	1274.54	20.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	6.	-3.	-0.001	296.05	2.020s
TL-210	5252.32	1313.00	6.	2.	0.001	248.05	2.034s
CO-60	5330.37	1332.50	11.	-3.	-0.002	243.10	2.047s
AG-110M	5537.69	1384.30	6.	-1.	0.000	846.32	2.082s
EU-152	5632.56	1408.00	0.	6.	0.003	40.82	2.097s
K-40	5842.99	1460.57	8.	164.	0.091	8.18	1.276s
La-140	6385.95	1596.21	24.	-14.	-0.008	94.67	2.215s
SB-124	6765.35	1690.98	0.	0.	0.000	1000.00	2.272s
BI-214	7059.65	1764.49	4.	15.	0.008	33.16	2.314s
Co-56	7087.11	1771.35	19.	0.	0.000	1000.00	2.318s
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	1.9240E+00				5.31E+01	
			477.60	1.924E+00	?(	6.811E+00 1.04E+02 1.05E+01	G
NA-22	C	-1.5323E-01				9.50E+02	
			1274.53	-1.532E-01	?(	1.120E+00 2.03E+02 9.99E+01	G
K-40	N	8.7671E+01				4.66E+11	
			1460.83	8.767E+01	(P	8.421E+00 8.18E+00 1.07E+01	G
Sc-46	F	4.6244E-01				8.38E+01	
			889.28	4.624E-01	?(	1.607E+00 1.03E+02 1.00E+02	G
			1120.55	0.000E+00	-	1.216E+00 1.00E+03 1.00E+02	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F	1.6981E+00					2.77E+01	
			320.08	1.698E+00	?(P	1.269E+01	2.21E+02	9.94E+00 G
MN-54	C	3.6628E-02					3.12E+02	
			834.85	3.663E-02	?(	7.603E-01	8.57E+02	1.00E+02 G
FE-59	F	1.5259E+00					4.45E+01	
			1099.25	1.526E+00	?(	5.919E-01	2.29E+01	5.65E+01 G
			1291.60	-3.222E-01	- P	1.652E+00	2.96E+02	4.32E+01 G
Co-56	C	8.8752E-02					7.73E+01	
			846.77	-4.335E-02	?(P	7.728E-01	2.87E+02	9.99E+01 G
			1238.28	1.572E-02	% P	1.413E+00	3.83E+03	6.61E+01 G
			1037.84	1.023E+00	?(	5.503E+00	2.29E+02	1.41E+01 G
			1771.35	0.000E+00	-	9.927E+00	1.00E+03	1.55E+01 A
CO-57	C	2.5704E-01					2.72E+02	
			122.06	1.115E-01	?(	4.186E-01	1.10E+02	8.56E+01 G
			136.47	1.424E+00	?(	7.610E+00	1.59E+02	1.07E+01 G
CO-58	C	3.6002E-02					7.09E+01	
			810.78	3.600E-02	?(	8.479E-01	6.40E+02	9.95E+01 G
CO-60	F	-8.5140E-03					1.93E+03	
			1332.50	-1.764E-01	?(	9.735E-01	2.43E+02	1.00E+02 G
			1173.24	1.595E-01	?(P	6.601E-01	1.69E+02	9.99E+01 G
NB-94	I	2.3616E-01					7.41E+06	
			702.63	2.466E-01	?(P	9.228E-01	1.09E+02	9.79E+01 G
			871.10	2.259E-01	?(	5.350E-01	7.11E+01	9.99E+01 G
ZR-95	I	6.1169E-01					6.40E+01	
			756.73	6.117E-01	?(P	4.597E-01	3.27E+01	5.45E+01 G
			724.20	7.442E-02	-	2.133E+00	7.94E+02	4.42E+01 G
NB-95	I	2.2902E-02					6.40E+01	
			765.79	2.290E-02	%(	9.146E-01	1.10E+03	9.98E+01 G
RU-103	I	5.1151E-02					3.93E+01	
			497.05	5.115E-02	?(P	6.734E-01	5.16E+02	9.09E+01 G
			610.30	0.000E+00	-	3.234E+01	1.00E+03	5.75E+00 GA
RH-106	I	2.1909E+00					3.74E+02	
			621.92	2.191E+00	&(P	1.682E+01	2.25E+02	9.93E+00 G
			1050.36	-4.423E+01	+	9.694E+01	6.63E+01	1.56E+00 G
			511.86	7.235E+00		4.485E+00	2.18E+01	2.00E+01 GA

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TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-108M	C	-2.2425E-01					1.53E+05	
			433.94	-2.242E-01	&(P	7.540E-01	1.27E+02	9.05E+01 G
			722.94	0.000E+00	&	1.065E+00	1.00E+03	9.08E+01 G
			614.28	0.000E+00	&	2.080E+00	1.00E+03	8.98E+01 G
AG-110M	F	-4.0394E-01					2.50E+02	
			884.68	-4.039E-01	?(	2.260E+00	1.63E+02	7.27E+01 G
			657.76	-3.877E-01	+	1.148E+00	8.79E+01	9.46E+01 G
			937.49	0.000E+00	+	2.034E+00	1.00E+03	3.44E+01 G
			1384.30	-1.497E-01	+	3.100E+00	8.46E+02	2.43E+01 G
			763.94	-1.536E-01	+	3.922E+00	7.00E+02	2.23E+01 G
SN-113	F	-4.4953E-01					1.15E+02	
			391.69	-4.495E-01	&(	1.633E+00	1.08E+02	6.40E+01 G
SB-124	F	1.9870E-01					6.02E+01	
			602.73	0.000E+00	?(	1.875E+00	1.00E+03	9.83E+01 G
			1690.98	0.000E+00	?(	9.906E-01	1.00E+03	4.78E+01 G
			722.79	2.883E+00	&(	7.679E+00	7.91E+01	1.08E+01 G
SB-125	I	1.0224E+00					1.01E+03	
			427.88	1.507E-01	?(	1.995E+00	5.25E+02	2.96E+01 G
			600.50	0.000E+00	-	1.029E+01	1.00E+03	1.79E+01 G
			635.89	2.371E+00	?(	5.308E+00	6.76E+01	1.13E+01 G
			463.37	2.030E+00	?(P	6.613E+00	9.59E+01	1.05E+01 G
I-131	I	1.2183E-01					8.02E+00	
			364.48	1.218E-01	?(	5.738E-01	1.81E+02	8.17E+01 G
			284.30	-8.188E-01	&	9.551E+00	4.56E+02	6.14E+00 G
			636.97	-2.005E+00	& P	1.189E+01	3.47E+02	7.17E+00 G
Ga-68	C	1.4192E+01					4.71E-02	
			1077.40	1.419E+01	?(	1.162E+01	3.33E+01	3.30E+00 G
Tc-99m	I	1.3849E-01					2.51E-01	
			140.51	1.385E-01	?(	9.742E-01	2.08E+02	8.93E+01 G
BA-133	F	-3.8918E-01					3.85E+03	
			356.00	-3.892E-01	?(	1.947E+00	1.48E+02	6.20E+01 G
			302.85	0.000E+00	+	7.293E+00	1.00E+03	1.83E+01 G
			383.84	2.527E+00	? P	8.907E+00	1.04E+02	8.94E+00 GA
			80.99	-7.936E-01	+	2.896E+00	1.09E+02	3.41E+01 GA
CS-134	I	9.8850E-01					7.54E+02	
			795.87	6.879E-02	?(	1.255E+00	5.10E+02	8.55E+01 G
			604.71	0.000E+00	-	1.892E+00	1.00E+03	9.76E+01 G
			569.32	3.748E+00	?(	1.315E+00	2.18E+01	1.54E+01 G

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TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			801.95	-5.781E+00	+	1.531E+01	7.92E+01	8.69E+00 G
			563.24	5.327E+00	(	4.167E+00	3.74E+01	8.35E+00 G
CS-137	I	3.5630E-01					1.10E+04	
			661.66	3.563E-01	?(P	1.188E+00	9.83E+01	8.52E+01 G
CE-139	F	-2.4713E-01					1.38E+02	
			165.85	-2.471E-01	?(	7.856E-01	9.48E+01	7.99E+01 G
Ba-140	I	-9.3600E-01					1.28E+01	
			537.26	-9.360E-01	?(P	2.888E+00	1.12E+02	2.44E+01 G
			162.66	-3.441E+00	+	1.113E+01	9.65E+01	6.22E+00 G
			304.85	0.000E+00	+	3.130E+01	1.00E+03	4.29E+00 G
La-140	I	-9.1216E-01					1.28E+01	
			1596.21	-9.122E-01	?(P	1.646E+00	9.47E+01	9.54E+01 G
			487.02	3.705E-01	&	1.309E+00	1.03E+02	4.55E+01 G
			328.76	7.908E-01	+	5.478E+00	2.04E+02	2.03E+01 G
			815.77	0.000E+00	+	3.719E+00	1.00E+03	2.33E+01 G
CE-141	I	-3.4921E-01					3.25E+01	
			145.44	-3.492E-01	?(	1.885E+00	1.60E+02	4.82E+01 G
CE-144	I	1.3573E+00					2.85E+02	
			133.54	1.357E+00	?(	6.855E+00	1.50E+02	1.11E+01 G
PM-144	C	-3.9841E-01					3.63E+02	
			696.54	-3.984E-01	?(P	1.088E+00	7.89E+01	9.90E+01 G
			618.06	0.000E+00	+	1.894E+00	1.00E+03	9.91E+01 G
EU-152	F	2.2141E+00					4.94E+03	
			121.78	5.007E-01	?(	1.065E+00	6.45E+01	2.86E+01 G
			344.29	9.022E-01	?(	4.294E+00	1.41E+02	2.65E+01 G
			1112.07	8.671E+00	?(	5.097E+00	2.45E+01	1.36E+01 G
			778.92	1.877E+00	?(	1.978E+00	3.78E+01	1.29E+01 G
			964.11	-3.482E+00	-	9.391E+00	8.04E+01	1.46E+01 G
			244.69	-1.531E+00	-	1.565E+01	3.02E+02	7.58E+00 G
			1408.00	1.580E+00	?	1.941E+00	4.08E+01	2.10E+01 GA
EU-154	I	-3.5825E-01					3.14E+03	
			123.10	-3.583E-01	&(	1.180E+00	9.78E+01	4.08E+01 G
			1274.54	0.000E+00	+	3.416E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	&	4.786E+00	1.00E+03	2.02E+01 G
			873.23	-1.399E+00	& P	7.200E+00	1.50E+02	1.23E+01 G
			1004.77	-3.633E+00	+	9.983E+00	8.21E+01	1.80E+01 G
			996.33	-2.774E+00	+	1.152E+01	1.20E+02	1.06E+01 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	8.0747E-01					1.81E+03	
			105.31	8.075E-01	*(	4.444E+00	1.64E+02	2.12E+01 G
			86.54	3.148E-02	%	3.515E+00	3.30E+03	3.07E+01 G
HF-181	F	8.5326E-02					4.24E+01	
			482.00	-2.380E-01	?(	1.133E+00	1.39E+02	8.05E+01 G
			133.02	3.470E-01	?(	1.697E+00	1.45E+02	4.33E+01 G
			345.83	1.273E-01	%	8.058E+00	1.84E+03	1.51E+01 G
			136.30	2.598E+00	?(	1.349E+01	1.54E+02	5.85E+00 G
Hg-203	F	4.5743E-02					4.66E+01	
			279.20	4.574E-02	(P	9.247E-01	5.81E+02	8.15E+01 G
TL-208	N	1.0167E+00					6.98E+02	
			583.02	1.017E+00	?(P	7.476E-01	3.31E+01	8.45E+01 G
			277.28	-4.124E+00	-	1.170E+01	8.47E+01	6.31E+00 G
			860.56	5.490E+00	+ P	4.208E+00	3.65E+01	1.24E+01 G
PM-146	C	-6.1555E-01					2.02E+03	
			453.88	-6.156E-01	?(	1.349E+00	9.23E+01	6.50E+01 G
			747.16	-1.451E+00	+	2.904E+00	8.67E+01	3.40E+01 G
			735.72	9.853E-02	+	2.505E+00	9.80E+02	2.25E+01 G
Cd-113m		1.9018E+03					5.33E+03	
			263.70	1.902E+03	&(	8.621E+03	1.32E+02	6.00E-03 K
Cd-109	F	-5.2342E+00					4.53E+02	
			88.04	-5.234E+00	&(	2.943E+01	1.68E+02	3.79E+00 G
Cf-251	T	9.3398E-01					3.28E+05	
			176.60	9.340E-01	?(	2.415E+00	9.94E+01	1.70E+01 G
			227.00	-9.142E-01	-	9.656E+00	4.18E+02	6.30E+00 GA
Cf-249	T	1.8414E-01					1.28E+05	
			387.95	1.841E-01	&(	1.316E+00	2.07E+02	6.60E+01 G
			333.44	0.000E+00	-	7.436E+00	1.00E+03	1.55E+01 G
Sn-126		1.6521E+00					3.65E+07	
			87.57	-5.301E-01	&	3.040E+00	1.71E+02	3.75E+01 GA
			64.28	1.652E+00	?(	1.024E+01	1.83E+02	9.70E+00 G
			86.94	-2.205E+00	+	1.289E+01	1.74E+02	9.04E+00 GA
PB-210	N	6.8146E+00					8.14E+03	
			46.54	6.815E+00	&(	2.560E+01	1.11E+02	4.25E+00 G

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TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-212	N	3.6002E+00					6.98E+02	
			238.63	3.600E+00	(	9.892E-01	1.24E+01	4.33E+01 G
			300.03	0.000E+00	-	4.050E+01	1.00E+03	3.28E+00 GA
PB-214	N	5.1967E+00					5.84E+05	
			351.93	4.955E+00	@(P	1.296E+00	1.41E+01	3.76E+01 G
			295.09	5.667E+00	(P	1.759E+00	1.51E+01	1.93E+01 G
			242.00	5.273E+00	P	5.704E+00	3.56E+01	7.43E+00 GA
BI-207	C	2.1234E-01					1.18E+04	
			1063.66	2.123E-01	?(P	8.048E-01	1.57E+02	7.45E+01 G
			569.70	0.000E+00	-	6.761E-01	1.00E+03	9.77E+01 G
BI-212	N	-3.5963E+00					6.98E+02	
			727.17	-3.596E+00	?(P	1.425E+01	1.01E+02	7.55E+00 G
			785.42	-2.776E+00	+ P	8.269E+01	3.20E+02	1.28E+00 GA
U-235	N	7.4592E-01					2.57E+11	
			143.79	0.000E+00	?(	7.947E+00	1.00E+03	1.10E+01 G
			205.33	-5.148E+00	+	1.275E+01	1.01E+02	5.01E+00 G
			163.38	2.355E+00	?(	1.115E+01	1.39E+02	5.08E+00 G
			185.72	1.324E-01	?	9.958E-01	2.86E+02	5.40E+01 GA
BI-214	N	5.7291E+00					5.84E+05	
			609.31	5.521E+00	(P	1.255E+00	1.30E+01	4.61E+01 G
			1120.29	-7.702E-01	& P	8.396E+00	1.97E+02	1.51E+01 G
			1764.49	6.351E+00	&(P	5.346E+00	3.32E+01	1.54E+01 G
BI-210M	T	2.0928E-02					1.10E+09	
			265.83	2.093E-02	%(P	1.103E+00	1.48E+03	5.00E+01 G
			304.90	0.000E+00	-	4.797E+00	1.00E+03	2.80E+01 G
AC-228	N	4.5462E+00					2.10E+03	
			911.07	4.546E+00	?(P	2.185E+00	2.40E+01	2.90E+01 G
			968.97	1.465E+00	-	5.675E+00	1.12E+02	1.75E+01 G
			338.32	2.083E+00	-	8.982E+00	1.28E+02	1.20E+01 G
			93.35	1.805E+00	-	1.990E+01	3.28E+02	5.56E+00 XA
TH-227	N	-2.9672E-01					7.95E+03	
			256.24	-1.339E+00	?(	8.384E+00	2.48E+02	7.00E+00 G
			235.97	-1.903E+00	+	9.809E+00	1.53E+02	1.23E+01 G
			50.14	6.149E-01	?(	1.325E+01	6.25E+02	8.00E+00 G
TH-229	N	2.1452E+00					2.68E+06	
			193.51	2.356E+00	?(	1.107E+01	1.87E+02	4.40E+00 G
			210.85	1.834E+00	?(	2.036E+01	4.41E+02	2.99E+00 G

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TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-234	N	3.2493E+00					1.63E+12	
			92.59	3.249E+00	(	7.445E+00	6.91E+01	5.58E+00 G
			63.29	-4.867E+00	&	2.682E+01	1.63E+02	3.81E+00 G
PA-231	N	6.8744E+00					1.20E+07	
			302.65	5.887E+00	?(	4.552E+01	2.28E+02	2.88E+00 G
			300.07	8.030E+00	&(	5.270E+01	1.94E+02	2.46E+00 G
PA-234	N	2.1459E+00					1.63E+12	
			131.29	8.302E-01	&(	3.928E+00	1.40E+02	1.80E+01 G
			946.02	3.913E+00	?(	2.219E+00	2.77E+01	1.34E+01 G
			569.47	0.000E+00	-	8.057E+00	1.00E+03	8.20E+00 G
			883.24	-2.367E+00	+	1.624E+01	1.99E+02	9.60E+00 G
			880.53	-8.517E+00	+	2.336E+01	8.18E+01	6.00E+00 GA
PA-234M	N	2.4350E+01					1.63E+12	
			1001.00	0.000E+00	?(	1.602E+02	1.00E+03	8.37E-01 G
			766.41	9.367E+01	?(	2.326E+02	7.41E+01	2.94E-01 G
AM-241	T	-7.9992E-01					1.58E+05	
			59.54	-7.999E-01	(	2.937E+00	1.10E+02	3.59E+01 G
Np-237	F	1.3640E+00					2.14E+06	
			86.49	1.364E+00	?(	8.082E+00	1.76E+02	1.31E+01 G
Ir-192	F	1.4288E-01					7.40E+01	
			316.49	0.000E+00	?(	1.583E+00	1.00E+03	8.70E+01 G
			468.06	3.832E-01	?(	1.338E+00	1.02E+02	5.18E+01 G
			308.44	0.000E+00	-	4.264E+00	1.00E+03	3.18E+01 G
Cs-136	F	1.9776E-01					1.30E+01	
			818.50	0.000E+00	?(	8.680E-01	1.00E+03	1.00E+02 G
			1048.07	3.096E-01	&(	7.359E-01	7.13E+01	8.00E+01 G
			340.57	4.287E-01	?(	2.415E+00	1.66E+02	4.69E+01 G
Np-239	T	7.9458E-01					2.36E+00	
			103.70	0.000E+00	-	4.449E+00	1.00E+03	2.40E+01 X
			106.13	7.946E-01	?(	4.388E+00	1.65E+02	2.27E+01 G
			99.50	0.000E+00	-	7.174E+00	1.00E+03	1.50E+01 X
Nd-147		-1.1367E+00					1.11E+01	
			531.00	-1.137E+00	?(	4.895E+00	1.73E+02	1.30E+01 G
			91.10	-6.928E-01	+	3.808E+00	1.64E+02	2.83E+01 G
TL-210	N	1.0323E-01					5.84E+05	
			799.60	0.000E+00	?(	1.112E+00	1.00E+03	9.90E+01 G
			296.00	2.325E-01	?(	1.631E+00	2.07E+02	7.90E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:17:38 PMPage 15
TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1313.00	5.809E-01	?	3.436E+00	2.48E+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	

- -

********** 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	105.	13.	0.007	111.28	6.815E+00
TH-227	50.14	127.	3.	0.001	624.93	6.149E-01
AM-241	59.54	205.	-19.	-0.011	109.51	-7.999E-01
Sn-126	64.28	216.	12.	0.006	183.33	1.652E+00
BA-133	80.99	318.	-23.	-0.013	109.20	-7.936E-01
Np-237	86.49	396.	16.	0.009	176.48	1.364E+00
Sn-126	86.94	485.	-18.	-0.010	174.43	-2.205E+00
Sn-126	87.57	467.	-18.	-0.010	171.10	-5.301E-01
Cd-109	88.04	449.	-18.	-0.010	167.75	-5.234E+00
Nd-147	91.10	431.	-18.	-0.010	163.97	-6.928E-01
EU-155	105.31	352.	16.	0.009	163.87	8.075E-01
Np-239	106.13	396.	17.	0.010	164.62	7.946E-01
CO-57	122.06	46.	9.	0.005	110.00	1.115E-01
EU-154	123.10	86.	-14.	-0.008	97.77	-3.583E-01

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TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
PA-234	131.29	187.	14.	0.008	140.27	8.302E-01		
HF-181	133.02	201.	14.	0.008	145.04	3.470E-01		
CE-144	133.54	215.	14.	0.008	149.81	1.357E+00		
HF-181	136.30	229.	14.	0.008	154.12	2.598E+00		
CO-57	136.47	243.	14.	0.008	158.65	1.424E+00		
Tc-99m	140.51	257.	11.	0.006	208.19	1.385E-01		
CE-141	145.44	289.	-15.	-0.008	160.49	-3.492E-01		
Ba-140	162.66	143.	-18.	-0.010	96.50	-3.441E+00		
U-235	163.38	93.	10.	0.006	139.11	2.355E+00		
CE-139	165.85	119.	-17.	-0.009	94.77	-2.471E-01		
Cf-251	176.60	44.	13.	0.007	99.41	9.340E-01		
U-235	185.72	73.	6.	0.003	285.82	1.324E-01		
TH-229	193.51	56.	8.	0.004	186.53	2.356E+00		
U-235	205.33	92.	-19.	-0.011	100.74	-5.148E+00		
TH-229	210.85	80.	4.	0.002	440.64	1.834E+00		
Cf-251	227.00	72.	-4.	-0.002	418.33	-9.142E-01		
TH-227	235.97	287.	-16.	-0.009	153.34	-1.903E+00		
TH-227	256.24	56.	-6.	-0.003	247.58	-1.339E+00		
Cd-113m	263.70	41.	7.	0.004	131.51	1.902E+03		
Hg-203	279.20	84.	2.	0.001	581.17	4.574E-02		P
I-131	284.30	48.	-3.	-0.002	455.83	-8.188E-01		
TL-210	296.00	239.	11.	0.006	207.44	2.325E-01		
CR-51	320.08	205.	9.	0.005	220.55	1.698E+00		P
La-140	328.76	151.	9.	0.005	203.59	7.908E-01		
Cs-136	340.57	149.	11.	0.006	166.07	4.287E-01		
BA-133	356.00	160.	-12.	-0.007	147.96	-3.892E-01		
I-131	364.48	20.	5.	0.003	180.74	1.218E-01		
BA-133	383.84	59.	11.	0.006	104.07	2.527E+00		P
Cf-249	387.95	70.	6.	0.003	206.93	1.841E-01		
SN-113	391.69	102.	-14.	-0.008	107.66	-4.495E-01		
SB-125	427.88	26.	2.	0.001	525.20	1.507E-01		
AG-108M	433.94	35.	-9.	-0.005	126.98	-2.242E-01		P
PM-146	453.88	56.	-17.	-0.010	92.30	-6.156E-01		
SB-125	463.37	33.	9.	0.005	95.87	2.030E+00		P
Ir-192	468.06	32.	8.	0.005	102.17	3.832E-01		
BE-7	477.60	34.	8.	0.005	103.55	1.924E+00		
HF-181	482.00	56.	-8.	-0.004	138.73	-2.380E-01		
La-140	487.02	22.	7.	0.004	102.58	3.705E-01		
RU-103	497.05	22.	2.	0.001	516.09	5.115E-02		P
RH-106	511.86	49.	57.	0.032	21.84	7.235E+00		
Nd-147	531.00	22.	-6.	-0.003	172.86	-1.137E+00		
Ba-140	537.26	27.	-9.	-0.005	112.29	-9.360E-01		P
CS-134	563.24	5.	16.	0.009	37.41	5.327E+00		
CS-134	569.32	0.	21.	0.012	21.82	3.748E+00		
RH-106	621.92	136.	7.	0.004	225.00	2.191E+00		P
SB-125	635.89	14.	9.	0.005	67.59	2.371E+00		
I-131	636.97	31.	-5.	-0.003	347.37	-2.005E+00		P
AG-110M	657.76	50.	-12.	-0.007	87.88	-3.877E-01		

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TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-144	696.54	44.	-12.	-0.007	78.95	-3.984E-01	P
NB-94	702.63	30.	8.	0.004	109.06	2.466E-01	P
SB-124	722.79	24.	10.	0.005	79.12	2.883E+00	
BI-212	727.17	41.	-8.	-0.005	100.81	-3.596E+00	P
PM-146	735.72	9.	1.	0.000	979.80	9.853E-02	
PM-146	747.16	33.	-15.	-0.008	86.69	-1.451E+00	
AG-110M	763.94	24.	-1.	-0.001	700.00	-1.536E-01	
PA-234M	766.41	14.	8.	0.004	74.07	9.367E+01	
BI-212	785.42	35.	-1.	-0.001	320.10	-2.776E+00	P
CS-134	795.87	35.	2.	0.001	510.29	6.879E-02	
CS-134	801.95	56.	-14.	-0.008	79.18	-5.781E+00	
CO-58	810.78	20.	1.	0.001	640.31	3.600E-02	
MN-54	834.85	15.	1.	0.001	857.32	3.663E-02	
Co-56	846.77	15.	-1.	-0.001	286.95	-4.335E-02	P
NB-94	871.10	6.	6.	0.003	71.07	2.259E-01	
EU-154	873.23	20.	-5.	-0.003	150.14	-1.399E+00	P
PA-234	880.53	53.	-13.	-0.007	81.81	-8.517E+00	
PA-234	883.24	67.	-6.	-0.003	198.74	-2.367E+00	
AG-110M	884.68	74.	-8.	-0.004	163.09	-4.039E-01	
Sc-46	889.28	70.	12.	0.007	102.75	4.624E-01	
PA-234	946.02	0.	13.	0.007	27.74	3.913E+00	
EU-154	996.33	32.	-7.	-0.004	120.37	-2.774E+00	
EU-154	1004.77	73.	-15.	-0.009	82.12	-3.633E+00	
Co-56	1037.84	11.	3.	0.002	229.35	1.023E+00	
Cs-136	1048.07	5.	6.	0.003	71.32	3.096E-01	
RH-106	1050.36	47.	-16.	-0.009	66.27	-4.423E+01	
BI-207	1063.66	5.	4.	0.002	156.67	2.123E-01	P
CO-60	1173.24	6.	3.	0.002	168.73	1.595E-01	P
Ta-182	1189.05	11.	-4.	-0.002	188.42	-1.292E+00	
Ta-182	1221.41	28.	-13.	-0.007	97.55	-2.436E+00	
NA-22	1274.53	17.	-3.	-0.002	202.76	-1.532E-01	
TL-210	1313.00	6.	2.	0.001	248.05	5.809E-01	
CO-60	1332.50	11.	-3.	-0.002	243.10	-1.764E-01	
AG-110M	1384.30	6.	-1.	0.000	846.32	-1.497E-01	
La-140	1596.21	24.	-14.	-0.008	94.67	-9.122E-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 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	1.9240E+00	1.9240E+00	1.036E+02%	6.81E+00
NA-22	#A	-1.5323E-01	-1.5323E-01	2.028E+02%	1.12E+00
K-40		8.7671E+01	8.7671E+01	8.180E+00%	8.42E+00
Sc-46	#A	4.6244E-01	4.6244E-01	1.028E+02%	1.61E+00
CR-51	#A	1.6980E+00	1.6981E+00	2.205E+02%	1.27E+01

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MN-54	#A	3.6628E-02	3.6628E-02	8.573E+02%	7.60E-01
FE-59	#	1.5259E+00	1.5259E+00	2.294E+01%	5.92E-01
Co-56	#A	8.8752E-02	8.8752E-02	1.837E+02%	7.73E-01
CO-57	#A	2.5704E-01	2.5704E-01	9.653E+01%	4.19E-01
CO-58	#A	3.6002E-02	3.6002E-02	6.403E+02%	8.48E-01
CO-60	#A	-8.5140E-03	-8.5140E-03	1.480E+02%	9.74E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.67E+00
NB-94	#A	2.3616E-01	2.3616E-01	6.509E+01%	9.23E-01
ZR-95	#	6.1169E-01	6.1169E-01	3.275E+01%	4.60E-01
NB-95	#A	2.2902E-02	2.2902E-02	1.095E+03%	9.15E-01
RU-103	#A	5.1151E-02	5.1151E-02	5.161E+02%	6.73E-01
RH-106	#A	2.1909E+00	2.1909E+00	2.250E+02%	1.68E+01
AG-108M	#A	-2.2425E-01	-2.2425E-01	1.270E+02%	7.54E-01
AG-110M	#A	-4.0394E-01	-4.0394E-01	1.631E+02%	2.26E+00
SN-113	#A	-4.4953E-01	-4.4953E-01	1.077E+02%	1.63E+00
SB-124	#A	1.9870E-01	1.9870E-01	7.912E+01%	1.88E+00
SB-125	#A	1.0224E+00	1.0224E+00	6.759E+01%	1.99E+00
I-131	#A	1.2183E-01	1.2183E-01	1.807E+02%	5.74E-01
Gd-153	#A	0.0000E+00	0.0000E+00	7.071E+02%	3.60E+00
Ga-68	#	1.4146E+01	1.4192E+01	3.333E+01%	1.16E+01
Tc-99m	#A	1.3841E-01	1.3849E-01	2.082E+02%	9.74E-01
BA-133	#A	-3.8918E-01	-3.8918E-01	1.480E+02%	1.95E+00
CS-134	#A	9.8850E-01	9.8850E-01	2.182E+01%	1.26E+00
CS-137	#A	3.5630E-01	3.5630E-01	9.827E+01%	1.19E+00
CE-139	#A	-2.4713E-01	-2.4713E-01	9.477E+01%	7.86E-01
Ba-140	#A	-9.3598E-01	-9.3600E-01	1.123E+02%	2.89E+00
La-140	#A	-9.1215E-01	-9.1216E-01	9.467E+01%	1.65E+00
CE-141	#A	-3.4921E-01	-3.4921E-01	1.605E+02%	1.89E+00
CE-144	#A	1.3573E+00	1.3573E+00	1.498E+02%	6.85E+00
PM-144	#A	-3.9841E-01	-3.9841E-01	7.895E+01%	1.09E+00
EU-152	#	2.2141E+00	2.2141E+00	2.453E+01%	1.07E+00
EU-154	#A	-3.5825E-01	-3.5825E-01	9.777E+01%	1.18E+00
EU-155	#A	8.0747E-01	8.0747E-01	1.639E+02%	4.44E+00
HF-181	#A	8.5325E-02	8.5326E-02	8.435E+01%	1.13E+00
Ta-182	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.49E+00
Hg-203	#A	4.5743E-02	4.5743E-02	5.812E+02%	9.25E-01
TL-208	#	1.0167E+00	1.0167E+00	3.305E+01%	7.48E-01
PM-146	#A	-6.1555E-01	-6.1555E-01	9.230E+01%	1.35E+00
Y-88	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.11E-01
Cd-113m	#A	1.9018E+03	1.9018E+03	1.315E+02%	8.62E+03
Cd-109	#A	-5.2342E+00	-5.2342E+00	1.678E+02%	2.94E+01
Cf-251	#A	9.3398E-01	9.3398E-01	9.941E+01%	2.42E+00
Cf-249	#A	1.8414E-01	1.8414E-01	2.069E+02%	1.32E+00
Sn-126	#A	1.6521E+00	1.6521E+00	1.833E+02%	1.02E+01
PB-210	#A	6.8146E+00	6.8146E+00	1.113E+02%	2.56E+01
PB-212		3.6002E+00	3.6002E+00	1.235E+01%	9.89E-01
PB-214		5.1967E+00	5.1967E+00	1.031E+01%	1.30E+00
BI-207	#A	2.1234E-01	2.1234E-01	1.567E+02%	8.05E-01
BI-212	#A	-3.5963E+00	-3.5963E+00	1.008E+02%	1.42E+01

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TestAmerica Inc Spectrum name: 9_Gamma_20193495.An1

U-235 #A	7.4592E-01	7.4592E-01	1.391E+02%		7.95E+00
BI-214	5.7291E+00	5.7291E+00	1.304E+01%		1.26E+00
BI-210M#A	2.0928E-02	2.0928E-02	1.480E+03%		1.10E+00
AC-228 #	4.5462E+00	4.5462E+00	2.400E+01%		2.18E+00
TH-227 #A	-2.9672E-01	-2.9672E-01	2.476E+02%		8.38E+00
TH-229 #A	2.1452E+00	2.1452E+00	1.865E+02%		1.11E+01
TH-234 #A	3.2493E+00	3.2493E+00	6.909E+01%		7.44E+00
PA-231 #A	6.8744E+00	6.8744E+00	1.499E+02%		4.55E+01
PA-233 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.79E+00
PA-234 #A	2.1459E+00	2.1459E+00	2.774E+01%		3.93E+00
PA-234M#A	2.4350E+01	2.4350E+01	7.407E+01%		1.60E+02
AM-241 #A	-7.9992E-01	-7.9992E-01	1.095E+02%		2.94E+00
Np-237 #A	1.3640E+00	1.3640E+00	1.765E+02%		8.08E+00
Ir-192 #A	1.4287E-01	1.4288E-01	1.022E+02%		1.58E+00
Cs-136 #A	1.9776E-01	1.9776E-01	7.132E+01%		8.68E-01
Np-239 #A	7.9453E-01	7.9458E-01	1.646E+02%		4.39E+00
Nd-147 #A	-1.1367E+00	-1.1367E+00	1.729E+02%		4.89E+00
TL-210 #A	1.0323E-01	1.0323E-01	2.074E+02%		1.11E+00
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.00E+02

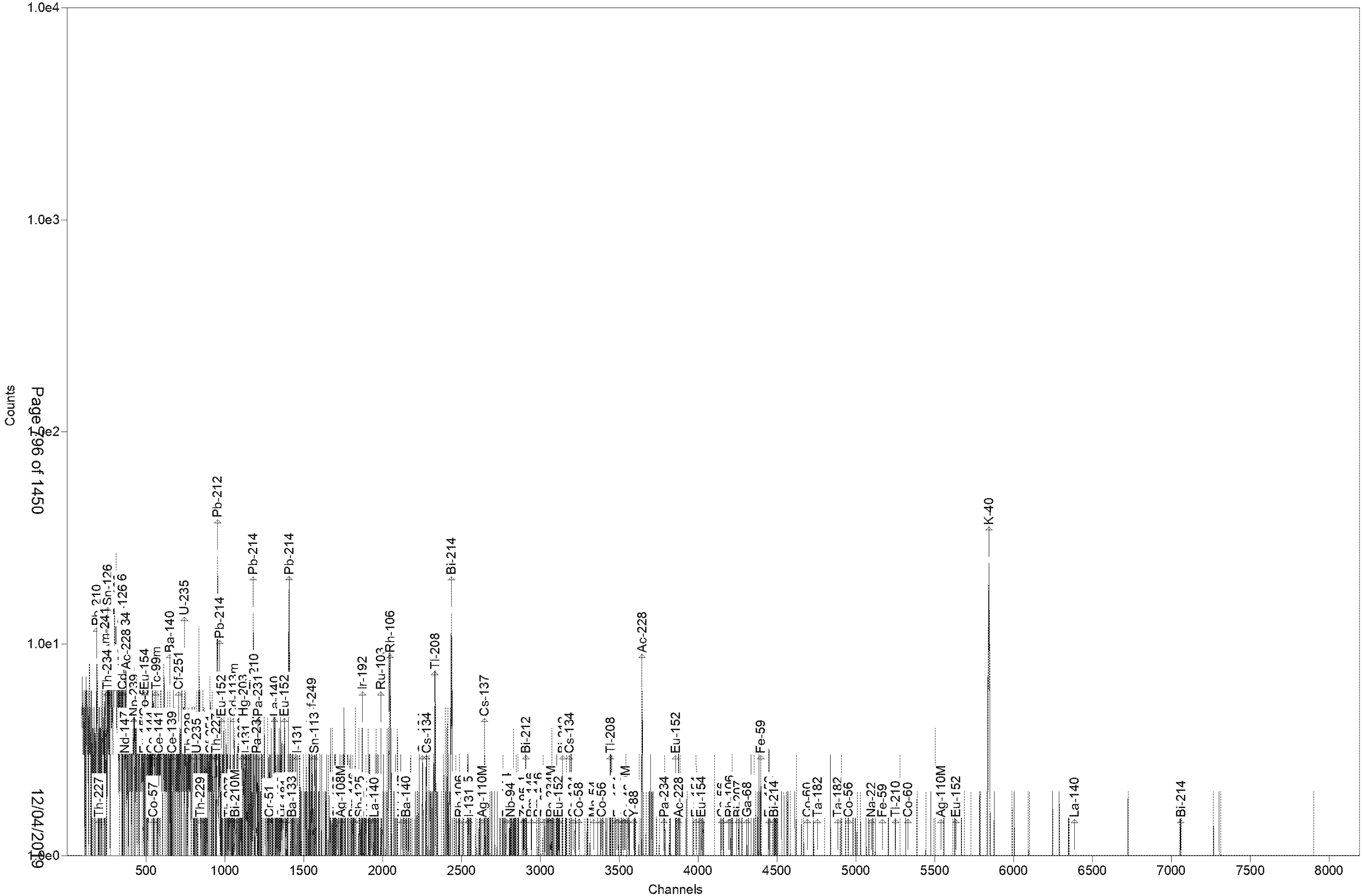
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line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

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

Total Activity (25.1 to 1999.3 keV) 1.067E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 1.0674358E+02 Bq/Sample

(Page 21 of 21)

448571_Gamma_160-36160-A-6-C. 9_Gamma_20193495.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193350

Sample Description: 448571_Gamma_160-36160-A-7-C
Detector: Detector #12
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-7-C

Decay to Time: 11/23/2019 21:48 Live Time: 1800 sec
Acquisition Time: 11/23/2019 21:48:20 Real Time: 1801 sec
Analysis Time: 11/23/2019 22:18 Dead Time: 0.06 %
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_2019-11-10_1422.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	1.178E+00	184.6	2.175E+00	2.176E+00	7.750E+00
NA-22	2.341E-01	114.9	2.690E-01	2.693E-01	9.696E-01
K-40	8.858E+01	9.1	8.053E+00	9.212E+00	5.395E+00
Sc-46	3.587E-02	1719.0	6.167E-01	6.167E-01	2.173E+00
CR-51	2.619E+00	184.4	4.830E+00	4.832E+00	1.637E+01
MN-54	2.887E-01	91.9	2.652E-01	2.656E-01	6.569E-01
FE-59	8.562E-01	66.2	5.671E-01	5.687E-01	1.498E+00
Co-56	1.959E-01	30.2	5.908E-02	5.991E-02	1.352E+00
CO-57	0.000E+00	1.#INF	9.222E-02	9.222E-02	8.220E-01
CO-58	-6.268E-01	83.7	5.244E-01	5.253E-01	1.762E+00
CO-60	-3.456E-02	84.0	2.902E-02	2.907E-02	1.593E+00
ZN-65	0.000E+00	1.#INF	1.775E-01	1.775E-01	3.518E+00
NB-94	2.258E-01	107.7	2.432E-01	2.434E-01	9.338E-01
ZR-95	2.752E-01	187.1	5.151E-01	5.153E-01	1.771E+00
NB-95	-8.066E-03	6345.0	5.118E-01	5.118E-01	1.816E+00
RU-103	-3.481E-01	119.8	4.172E-01	4.176E-01	1.059E+00
RH-106	-2.259E+00	77.0	1.740E+00	1.743E+00	2.686E+01
AG-108M	3.268E-01	46.7	1.525E-01	1.533E-01	4.219E-01
AG-110M	0.000E+00	1.#INF	7.375E-02	7.375E-02	2.949E+00
SN-113	3.813E-01	122.8	4.683E-01	4.687E-01	1.604E+00
SB-124	8.350E-02	44.7	3.734E-02	3.758E-02	2.826E+00
SB-125	-1.797E-02	350.2	6.293E-02	6.294E-02	2.902E+00
I-131	6.739E-01	64.3	4.331E-01	4.344E-01	6.408E-01
Gd-153	-2.011E-01	502.5	1.011E+00	1.011E+00	3.450E+00
Ga-68	-7.283E-01	1584.3	1.154E+01	1.154E+01	2.944E+01
Tc-99m	0.000E+00	1.#INF	1.299E-01	1.299E-01	1.429E+00
BA-133	-2.124E-01	301.6	6.407E-01	6.408E-01	2.206E+00
CS-134	9.211E-01	27.3	2.512E-01	2.555E-01	4.279E-01
CS-137	5.766E-01	86.6	4.994E-01	5.003E-01	1.684E+00
CE-139	2.672E-01	108.8	2.908E-01	2.911E-01	9.820E-01
Ba-140	1.004E+00	99.4	9.982E-01	9.995E-01	2.510E+00
La-140	3.442E-01	100.6	3.462E-01	3.466E-01	6.487E-01
CE-141	2.547E-02	2818.1	7.176E-01	7.176E-01	2.450E+00

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CE-144	-7.101E-01	453.6	3.221E+00	3.221E+00	1.093E+01
PM-144	1.726E-01	126.1	2.178E-01	2.179E-01	1.149E+00
EU-152	2.009E+00	41.4	8.318E-01	8.383E-01	2.317E+00
EU-154	3.342E-01	122.0	4.078E-01	4.081E-01	1.603E+00
EU-155	0.000E+00	1.#INF	6.963E-01	6.963E-01	4.872E+00
HF-181	2.694E-01	117.4	3.163E-01	3.165E-01	1.096E+00
Ta-182	1.658E+00	33.3	5.528E-01	5.589E-01	4.948E+00
Hg-203	1.253E-01	207.9	2.605E-01	2.606E-01	9.114E-01
TL-208	1.593E+00	17.1	2.732E-01	2.850E-01	3.453E-01
PM-146	5.175E-01	93.9	4.859E-01	4.866E-01	9.522E-01
Y-88	1.634E-01	94.1	1.538E-01	1.541E-01	7.036E-01
Cd-113m	-1.510E+03	225.8	3.410E+03	3.411E+03	1.195E+04
Cd-109	-7.410E+00	139.2	1.031E+01	1.032E+01	3.461E+01
Cf-251	8.246E-01	158.8	1.310E+00	1.310E+00	3.452E+00
Cf-249	6.304E-02	755.8	4.765E-01	4.765E-01	1.680E+00
Sn-126	2.629E+00	123.3	3.241E+00	3.244E+00	1.094E+01
PB-210	2.326E+01	41.7	9.693E+00	9.802E+00	2.719E+01
PB-212	2.798E+00	18.0	5.036E-01	5.244E-01	1.263E+00
PB-214	4.529E+00	15.6	7.056E-01	7.420E-01	1.403E+00
BI-207	-4.114E-01	187.3	7.704E-01	7.707E-01	1.757E+00
BI-212	-4.313E+00	125.4	5.407E+00	5.411E+00	1.866E+01
U-235	1.248E+00	248.9	3.107E+00	3.107E+00	1.052E+01
BI-214	5.502E+00	14.6	8.035E-01	8.510E-01	1.068E+00
BI-210M	4.612E-01	94.3	4.351E-01	4.358E-01	1.474E+00
AC-228	2.643E+00	26.7	7.064E-01	7.190E-01	1.391E+00
TH-227	4.971E+00	50.4	2.503E+00	2.517E+00	6.256E+00
TH-229	7.776E+00	49.4	3.843E+00	3.865E+00	1.185E+01
TH-234	1.142E+01	41.2	4.705E+00	4.747E+00	1.223E+01
PA-231	0.000E+00	1.#INF	3.347E+00	3.347E+00	6.023E+01
PA-233	0.000E+00	1.#INF	4.543E-01	4.543E-01	4.931E+00
PA-234	-1.327E-01	80.0	1.061E-01	1.064E-01	4.792E+00
PA-234M	3.261E+01	102.3	3.336E+01	3.340E+01	1.744E+02
AM-241	-6.775E-01	161.6	1.095E+00	1.095E+00	3.699E+00
Np-237	-2.582E-01	1082.9	2.796E+00	2.796E+00	9.517E+00
Ir-192	0.000E+00	1.#INF	5.728E-02	5.728E-02	2.062E+00
Cs-136	3.499E-01	108.6	3.802E-01	3.807E-01	1.807E+00
Np-239	8.576E-01	138.4	1.187E+00	1.188E+00	4.011E+00
Nd-147	8.525E-01	252.0	2.149E+00	2.149E+00	5.545E+00
TL-210	0.000E+00	1.#INF	7.121E-02	7.121E-02	9.970E-01
Kr-85	-5.590E+00	2245.0	1.255E+02	1.255E+02	4.356E+02
Total	2.087E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 10:18:28 PMPage  1
TestAmerica Inc                 Spectrum name: 12_Gamma_20193350.An1

Sample description
     448571_Gamma_160-36160-A-7-C


Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193350.An1

Acquisition information
       Start time:                 11/23/2019 9:48:20 PM
       Live time:               1800
       Real time:               1801
       Dead time:                  0.06 %
       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

                                (Page 3 of 21)
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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 2
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11/23/2019 9:48:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-11-10_1422.PBC 11/10/2019 2:22:07 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0801

***** 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
46.96	65.	18.46	1.03	1.852E-02	46.54	4.250	PBC<MDA	PB210
63.52	-8.	253.16	0.87	2.978E-02	63.29	3.810	PBC<MDA	TH234
64.28	14.	123.26	0.87	3.015E-02	64.28	9.700	PBC<MDA	Sn126
77.29	46.	25.85	0.39	3.390E-02				
92.45	42.	41.19	0.46	3.637E-02	92.59	5.584	PBC<MDA	TH234
106.13	13.	138.42	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
121.78	11.	118.88	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.917E-01	CO57
143.79	9.	248.86	0.95	3.599E-02	143.79	10.960	PBC<MDA	U235
165.85	13.	108.80	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
176.60	8.	158.82	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	24.	46.51	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
193.51	10.	112.03	1.00	3.140E-02	193.51	4.400	PBC<MDA	TH229
210.85	21.	49.42	1.02	2.980E-02	210.85	2.990	PBC<MDA	TH229
227.00	8.	140.29	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
238.61	66.	18.25	0.71	2.743E-02	238.63	43.300	3.065E+00	PB212
241.97	13.	148.22	1.05	2.716E-02	242.00	7.430	PBC<MDA	PB214
244.69	11.	162.87	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152
256.24	16.	50.36	1.06	2.608E-02	256.24	7.000	PBC<MDA	TH227
265.83	11.	94.34	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M
276.72	2.	668.33	1.08	2.462E-02	277.28	6.310	PBC<MDA	TL208
279.20	4.	207.87	1.09	2.449E-02	279.20	81.460	PBC<MDA	Hg203
284.30	8.	110.55	1.09	2.416E-02	284.30	6.140	PBC<MDA	I131
295.08	55.	23.23	1.15	2.350E-02	295.09	19.300	6.693E+00	PB214
320.08	10.	184.43	1.13	2.210E-02	320.08	9.940	PBC<MDA	CR51
328.76	11.	100.56	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
344.29	3.	435.89	1.15	2.090E-02	344.29	26.500	PBC<MDA	EU152

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 3
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
351.89	63.	15.58	0.86	2.055E-02	351.93	37.600	4.529E+00	PB214
364.48	6.	120.19	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
383.84	9.	111.40	1.19	1.923E-02	383.84	8.940	PBC<MDA	BA133
387.95	1.	755.80	1.19	1.907E-02	387.95	66.000	PBC<MDA	Cf249
391.69	8.	122.80	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
433.94	11.	46.65	1.24	1.751E-02	433.94	90.480	PBC<MDA	AG108M
453.88	7.	104.00	1.26	1.692E-02	453.88	65.000	PBC<MDA	PM146
463.37	2.	466.05	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
477.60	4.	184.63	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
482.00	6.	117.40	1.28	1.617E-02	482.00	80.500	PBC<MDA	HF181
487.02	8.	122.02	1.29	1.604E-02	487.02	45.500	PBC<MDA	La140
511.86	77.	15.62	2.56	1.546E-02	511.86	20.000	1.378E+01	RH106
531.00	3.	252.03	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
537.26	7.	99.40	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
563.24	6.	129.28	1.36	1.439E-02	563.24	8.350	PBC<MDA	CS134
569.32	7.	72.95	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.190E+00	PA234
					569.70	97.740	2.677E-01	BI207
569.47	5.	109.69	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.256E+00	PA234
					569.70	97.740	1.893E-01	BI207
583.22	34.	17.15	0.88	1.403E-02	583.02	84.500	1.593E+00	TL208
609.23	62.	14.61	0.95	1.358E-02	609.31	46.090	5.502E+00	BI214
618.06	13.	126.13	1.41	1.344E-02	618.06	99.100	PBC<MDA	PM144
636.97	7.	102.49	1.43	1.315E-02	636.97	7.170	PBC<MDA	I131
661.66	11.	86.62	1.45	1.279E-02	661.66	85.210	PBC<MDA	CS137
702.63	4.	204.63	1.49	1.224E-02	702.63	97.900	PBC<MDA	NB94
722.79	5.	83.43	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.736E-01	AG108M
					723.36	20.220	1.230E+00	EU154
722.94	5.	105.31	1.51	1.199E-02	722.79	10.810	2.253E+00	SB124
					722.94	90.840	2.681E-01	AG108M
					723.36	20.220	1.205E+00	EU154
723.36	5.	122.03	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.681E-01	AG108M
					723.36	20.220	1.205E+00	EU154
724.20	4.	187.15	1.51	1.198E-02	724.20	44.150	PBC<MDA	ZR95
735.72	7.	93.89	1.52	1.184E-02	735.72	22.500	PBC<MDA	PM146
747.16	1.	800.00	1.53	1.171E-02	747.16	34.000	PBC<MDA	PM146
756.73	2.	403.11	1.54	1.160E-02	756.73	54.460	PBC<MDA	ZR95
766.41	8.	102.29	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.255E+02	PA234M
785.42	1.	800.00	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
795.87	13.	27.27	1.58	1.119E-02	795.87	85.530	7.810E-01	CS134
818.50	10.	108.65	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
834.85	6.	91.87	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
871.10	5.	107.70	1.65	1.048E-02	871.10	99.890	PBC<MDA	NB94
898.04	6.	94.15	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 4
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
911.07	14.	26.73	1.68	1.015E-02	911.07	29.000	2.643E+00	AC228
964.11	6.	73.01	1.73	9.739E-03	964.11	14.605	PBC<MDA	EU152
968.97	2.	257.36	1.74	9.703E-03	968.97	17.460	PBC<MDA	AC228
1037.84	4.	152.39	1.80	9.228E-03	1037.84	14.130	PBC<MDA	Co56
1048.07	2.	208.49	1.81	9.162E-03	1048.07	80.000	PBC<MDA	Cs136
1050.36	6.	84.27	1.81	9.147E-03	1050.36	1.560	PBC<MDA	RH106
1099.25	6.	90.53	1.85	8.846E-03	1099.25	56.500	PBC<MDA	FE59
1112.07	16.	41.41	1.86	8.770E-03	1112.07	13.644	PBC<MDA	EU152
1121.30	7.	120.26	1.87	8.716E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.189E+00	Ta182
1173.24	7.	87.76	1.92	8.426E-03	1173.24	99.900	PBC<MDA	CO60
1189.05	1.	796.87	1.93	8.342E-03	1189.05	16.200	PBC<MDA	Ta182
1221.41	9.	33.33	1.96	8.175E-03	1221.41	27.000	2.265E+00	Ta182
1238.28	11.	30.15	1.97	8.090E-03	1238.28	66.070	1.143E+00	Co56
1274.53	3.	114.89	2.00	7.914E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	6.650E-01	EU154
1291.60	6.	96.69	2.02	7.834E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	3.	176.21	2.04	7.735E-03	1313.00	21.000	PBC<MDA	TL210
1408.00	7.	37.80	2.12	7.324E-03	1408.00	21.005	PBC<MDA	EU152
1460.87	121.	9.09	1.79	7.112E-03	1460.83	10.670	8.858E+01	K40
1690.98	5.	44.72	2.35	6.302E-03	1690.98	47.790	PBC<MDA	SB124
1763.05	19.	22.94	2.40	6.075E-03	1764.49	15.400	1.128E+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
308.72	77.29	34.	46.	1.344E+03	25.85	0.393	- 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

********** 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	187.46	46.96	56.	32.	0.018	41.68	1.033s
TH-227	200.18	50.14	246.	-17.	-0.010	130.32	0.855
AM-241	237.74	59.54	192.	-12.	-0.007	161.55	0.865s
TH-234	252.74	63.29	203.	-8.	-0.004	253.16	0.868
Sn-126	256.71	64.28	139.	14.	0.008	123.26	0.869s

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TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	323.50	80.99	245.	-18.	-0.010	125.53	0.887
EU-155	345.70	86.54	272.	0.	0.000	1000.00	0.892s
Sn-126	347.29	86.94	345.	-18.	-0.010	147.11	0.892s
Sn-126	349.81	87.57	327.	-18.	-0.010	143.18	0.893s
Cd-109	351.68	88.04	308.	-18.	-0.010	139.19	0.894s
Nd-147	363.92	91.10	290.	-18.	-0.010	134.71	0.897s
TH-234	369.33	92.45	81.	42.	0.023	41.19	0.456s
AC-228	372.91	93.35	259.	-5.	-0.003	484.23	0.899s
Gd-153	389.50	97.50	200.	-4.	-0.002	502.49	0.903s
Np-239	397.50	99.50	204.	0.	0.000	1000.00	0.905s
Gd-153	412.29	103.20	204.	0.	0.000	1000.00	0.909s
Np-239	414.29	103.70	204.	0.	0.000	1000.00	0.909s
EU-155	420.73	105.31	204.	0.	0.000	1000.00	0.911
Np-239	424.00	106.13	157.	13.	0.007	138.42	0.912s
EU-152	486.56	121.78	80.	11.	0.006	118.88	0.928
CO-57	487.69	122.06	91.	0.	0.000	1000.00	0.928
EU-154	491.84	123.10	78.	-3.	-0.001	471.37	0.929s
PA-234	524.60	131.29	137.	-15.	-0.008	116.46	0.938s
HF-181	531.51	133.02	262.	-14.	-0.008	162.93	0.939s
CE-144	533.57	133.54	276.	-5.	-0.003	453.59	0.940s
HF-181	544.61	136.30	281.	0.	0.000	1000.00	0.943s
CO-57	545.30	136.47	281.	0.	0.000	1000.00	0.943s
Tc-99m	561.44	140.51	281.	0.	0.000	1000.00	0.947s
U-235	574.53	143.79	238.	9.	0.005	248.86	0.950
Ba-140	649.99	162.66	120.	-12.	-0.007	128.97	0.969s
U-235	652.87	163.38	133.	0.	0.000	1000.00	0.970s
CE-139	662.76	165.85	95.	13.	0.007	108.80	0.973s
Cf-251	705.72	176.60	48.	8.	0.005	158.82	0.983s
U-235	742.18	185.72	34.	24.	0.013	46.51	0.992s
TH-229	773.32	193.51	33.	10.	0.006	112.03	1.000s
TH-229	842.65	210.85	26.	21.	0.012	49.42	1.018s
Cf-251	907.22	227.00	37.	8.	0.005	140.29	1.034
TH-227	943.09	235.97	225.	-13.	-0.007	164.88	1.043s
PB-212	953.73	238.63	27.	60.	0.033	18.00	1.045D
PB-214	967.18	242.00	183.	13.	0.007	148.22	1.049s
EU-152	977.96	244.69	154.	11.	0.006	162.87	1.051s
TH-227	1024.13	256.24	15.	16.	0.009	50.36	1.063s
Cd-113m	1053.96	263.70	42.	-4.	-0.002	225.78	1.070s
BI-210M	1062.48	265.83	44.	11.	0.006	94.34	1.072s
TL-208	1108.27	277.28	50.	2.	0.001	668.33	1.084s
Hg-203	1115.93	279.20	42.	4.	0.002	207.87	1.086s
I-131	1136.32	284.30	18.	8.	0.004	110.55	1.091s
PB-214	1179.43	295.08	23.	55.	0.030	23.23	1.148s
TL-210	1183.11	296.00	254.	-11.	-0.006	198.18	1.102s
PB-212	1199.22	300.03	241.	-12.	-0.006	192.67	1.106s
PA-231	1199.38	300.07	230.	-9.	-0.005	250.40	1.106s
PA-231	1209.70	302.65	221.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	221.	0.	0.000	1000.00	1.109s

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TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ba-140	1218.49	304.85	221.	0.	0.000	1000.00	1.111s
BI-210M	1218.68	304.90	221.	0.	0.000	1000.00	1.111s
Ir-192	1232.85	308.44	221.	0.	0.000	1000.00	1.115
PA-233	1247.13	312.01	221.	0.	0.000	1000.00	1.118
Ir-192	1265.04	316.49	221.	0.	0.000	1000.00	1.123s
CR-51	1279.41	320.08	177.	10.	0.006	184.43	1.126s
La-140	1314.10	328.76	57.	11.	0.006	100.56	1.135s
Cf-249	1332.81	333.44	81.	-10.	-0.006	129.33	1.139s
AC-228	1352.33	338.32	90.	-4.	-0.002	339.12	1.144s
Cs-136	1361.32	340.57	94.	0.	0.000	1000.00	1.146s
EU-152	1376.18	344.29	84.	3.	0.002	435.89	1.150s
HF-181	1382.35	345.83	91.	-3.	-0.002	453.38	1.151s
PB-214	1406.59	351.89	13.	63.	0.035	15.58	0.855s
BA-133	1423.02	356.00	104.	-5.	-0.003	301.60	1.162s
I-131	1456.95	364.48	12.	6.	0.003	120.19	1.170s
BA-133	1534.35	383.84	48.	9.	0.005	111.40	1.189s
Cf-249	1550.79	387.95	58.	1.	0.001	755.80	1.193
SN-113	1565.74	391.69	48.	8.	0.005	122.80	1.196s
SB-125	1710.45	427.88	28.	-2.	-0.001	522.81	1.232s
AG-108M	1734.69	433.94	4.	11.	0.006	46.65	1.238s
PM-146	1814.45	453.88	12.	7.	0.004	104.00	1.257s
SB-125	1852.39	463.37	29.	2.	0.001	466.05	1.266s
BE-7	1909.29	477.60	21.	4.	0.002	184.63	1.280s
HF-181	1926.90	482.00	24.	6.	0.004	117.40	1.284s
La-140	1946.98	487.02	41.	8.	0.004	122.02	1.289s
RU-103	1987.11	497.05	28.	-9.	-0.005	119.84	1.298s
RH-106	2046.35	511.86	33.	77.	0.043	15.62	2.563s
Nd-147	2122.88	531.00	13.	3.	0.002	252.03	1.331s
Ba-140	2147.92	537.26	9.	7.	0.004	99.40	1.337s
CS-134	2251.82	563.24	13.	6.	0.003	129.28	1.362s
CS-134	2276.15	569.32	9.	7.	0.004	72.95	1.367s
PA-234	2276.75	569.47	11.	5.	0.003	109.69	1.368s
BI-207	2277.68	569.70	21.	-1.	0.000	802.92	1.368s
TL-208	2331.74	583.22	0.	34.	0.019	17.15	0.875s
SB-125	2400.87	600.50	213.	-14.	-0.008	152.52	1.397s
SB-124	2409.79	602.73	199.	-14.	-0.008	147.45	1.399s
CS-134	2417.71	604.71	185.	-14.	-0.008	142.25	1.401s
BI-214	2435.80	609.23	4.	62.	0.034	14.61	0.949s
RU-103	2440.06	610.30	171.	-14.	-0.008	136.55	1.406s
AG-108M	2455.99	614.28	158.	-14.	-0.008	133.68	1.410s
PM-144	2471.12	618.06	128.	13.	0.007	126.13	1.414s
RH-106	2486.54	621.92	174.	-15.	-0.008	128.95	1.417
SB-125	2542.43	635.89	36.	-12.	-0.007	75.55	1.430s
I-131	2546.77	636.97	23.	7.	0.004	102.49	1.432s
AG-110M	2629.92	657.76	51.	-7.	-0.004	143.02	1.451s
CS-137	2645.51	661.66	42.	11.	0.006	86.62	1.455s
PM-144	2785.05	696.54	23.	-4.	-0.002	241.30	1.487s
NB-94	2809.41	702.63	14.	4.	0.002	204.63	1.493s

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TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	2890.04	722.79	7.	5.	0.003	83.43	1.512s
AG-108M	2890.65	722.94	13.	5.	0.003	105.31	1.512s
EU-154	2892.34	723.36	18.	5.	0.003	122.03	1.512
ZR-95	2895.69	724.20	23.	4.	0.002	187.15	1.513s
BI-212	2907.58	727.17	35.	-7.	-0.004	125.36	1.516
PM-146	2941.78	735.72	9.	7.	0.004	93.89	1.524s
PM-146	2987.55	747.16	14.	1.	0.001	800.00	1.535s
ZR-95	3025.83	756.73	14.	2.	0.001	403.11	1.543s
AG-110M	3054.69	763.94	41.	-14.	-0.008	70.64	1.550s
PA-234M	3064.57	766.41	27.	8.	0.004	102.29	1.552s
EU-152	3114.61	778.92	14.	-7.	-0.004	119.52	1.564s
BI-212	3140.62	785.42	14.	1.	0.001	800.00	1.570s
CS-134	3182.43	795.87	0.	13.	0.007	27.27	1.579s
TL-210	3197.35	799.60	13.	0.	0.000	1000.00	1.583s
CS-134	3206.76	801.95	40.	-5.	-0.003	186.05	1.585s
CO-58	3242.06	810.78	48.	-12.	-0.007	83.66	1.593s
La-140	3262.05	815.77	60.	-8.	-0.005	139.38	1.598s
Cs-136	3272.97	818.50	50.	10.	0.005	108.65	1.600s
MN-54	3338.38	834.85	5.	6.	0.003	91.87	1.615s
Co-56	3386.08	846.77	25.	-12.	-0.007	96.04	1.626s
TL-208	3441.27	860.56	30.	-8.	-0.004	154.62	1.638s
NB-94	3483.41	871.10	12.	5.	0.003	107.70	1.648s
EU-154	3491.95	873.23	18.	-1.	-0.001	608.28	1.650s
PA-234	3521.16	880.53	42.	-12.	-0.006	84.83	1.657s
PA-234	3532.00	883.24	54.	-10.	-0.006	103.46	1.659s
AG-110M	3537.78	884.68	64.	0.	0.000	1000.00	1.660s
Y-88	3591.22	898.04	5.	6.	0.003	94.15	1.672s
AC-228	3643.36	911.07	0.	14.	0.008	26.73	1.684s
AG-110M	3749.09	937.49	10.	0.	0.000	1000.00	1.708s
PA-234	3783.21	946.02	15.	-4.	-0.002	218.66	1.716s
EU-152	3855.60	964.11	7.	6.	0.003	73.01	1.732s
AC-228	3875.05	968.97	18.	2.	0.001	257.36	1.736s
EU-154	3984.54	996.33	20.	-2.	-0.001	281.03	1.761s
PA-234M	4003.22	1001.00	23.	0.	0.000	1000.00	1.765s
EU-154	4018.33	1004.77	2.	0.	0.000	1000.00	1.768s
Co-56	4150.66	1037.84	5.	4.	0.002	152.39	1.798s
Cs-136	4191.60	1048.07	11.	2.	0.001	208.49	1.807
RH-106	4200.76	1050.36	9.	6.	0.003	84.27	1.809s
BI-207	4253.99	1063.66	16.	-5.	-0.003	187.26	1.820s
FE-59	4396.44	1099.25	5.	6.	0.004	90.53	1.852s
EU-152	4447.76	1112.07	14.	16.	0.009	41.41	1.863s
ZN-65	4461.66	1115.55	30.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	16.	0.	0.000	1000.00	1.870s
Sc-46	4481.68	1120.55	16.	0.	0.000	1000.00	1.870s
Ta-182	4484.69	1121.30	27.	7.	0.004	120.26	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
Ta-182	4885.39	1221.41	0.	9.	0.005	33.33	1.957s

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TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	4952.92	1238.28	0.	11.	0.006	30.15	1.972s
NA-22	5098.03	1274.53	6.	3.	0.002	114.89	2.003s
EU-154	5098.08	1274.54	9.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	6.	6.	0.004	96.69	2.017s
TL-210	5252.04	1313.00	6.	3.	0.002	176.21	2.036s
CO-60	5330.11	1332.50	17.	-7.	-0.004	143.21	2.052s
AG-110M	5537.48	1384.30	11.	-6.	-0.004	130.84	2.096s
EU-152	5632.39	1408.00	0.	7.	0.004	37.80	2.115
K-40	5844.07	1460.87	0.	121.	0.067	9.09	1.785
La-140	6386.02	1596.21	0.	0.	0.000	1000.00	2.269s
SB-124	6765.58	1690.98	0.	5.	0.003	44.72	2.345s
BI-214	7060.00	1764.49	0.	19.	0.011	22.94	2.403s
Co-56	7087.48	1771.35	19.	0.	0.000	1000.00	2.408s
Y-88	7346.69	1836.06	0.	0.	0.000	1000.00	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
BE-7	C	1.1779E+00					5.31E+01	
			477.60	1.178E+00	?(	7.750E+00	1.85E+02	1.05E+01 G
NA-22	C	2.3414E-01					9.50E+02	
			1274.53	2.341E-01	?(	9.696E-01	1.15E+02	9.99E+01 G
K-40	N	8.8582E+01					4.66E+11	
			1460.83	8.858E+01	(	5.395E+00	9.09E+00	1.07E+01 G
Sc-46	F	3.5874E-02					8.38E+01	
			889.28	3.587E-02	%(	2.173E+00	1.72E+03	1.00E+02 G
			1120.55	0.000E+00	-	1.356E+00	1.00E+03	1.00E+02 G
CR-51	F	2.6190E+00					2.77E+01	
			320.08	2.619E+00	&(	1.637E+01	1.84E+02	9.94E+00 G
MN-54	C	2.8873E-01					3.12E+02	
			834.85	2.887E-01	*(	6.569E-01	9.19E+01	1.00E+02 G
FE-59	F	8.5623E-01					4.45E+01	
			1099.25	7.159E-01	?(	1.498E+00	9.05E+01	5.65E+01 G
			1291.60	1.040E+00	?(	2.266E+00	9.67E+01	4.32E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 9
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Co-56	C	1.9594E-01					7.73E+01	
			846.77	-6.236E-01	?(	1.352E+00	9.60E+01	9.99E+01 G
			1238.28	1.143E+00	?(	7.660E-01	3.02E+01	6.61E+01 G
			1037.84	1.562E+00	?(	5.740E+00	1.52E+02	1.41E+01 G
			1771.35	0.000E+00	-	1.365E+01	1.00E+03	1.55E+01 A
CO-58	C	-6.2677E-01					7.09E+01	
			810.78	-6.268E-01	?(	1.762E+00	8.37E+01	9.95E+01 G
CO-60	F	-3.4559E-02					1.93E+03	
			1332.50	-5.087E-01	?(	1.593E+00	1.43E+02	1.00E+02 G
			1173.24	4.399E-01	?(	8.891E-01	8.78E+01	9.99E+01 G
NB-94	I	2.2576E-01					7.41E+06	
			702.63	1.854E-01	?(	9.338E-01	2.05E+02	9.79E+01 G
			871.10	2.653E-01	?(	1.000E+00	1.08E+02	9.99E+01 G
ZR-95	I	2.7522E-01					6.40E+01	
			756.73	1.758E-01	?(	1.771E+00	4.03E+02	5.45E+01 G
			724.20	3.978E-01	?(	2.644E+00	1.87E+02	4.42E+01 G
NB-95	I	-8.0663E-03					6.40E+01	
			765.79	-8.066E-03	%(	1.816E+00	6.35E+03	9.98E+01 G
RU-103	I	-3.4813E-01					3.93E+01	
			497.05	-3.481E-01	?(	1.059E+00	1.20E+02	9.09E+01 G
			610.30	-9.848E+00	+	4.537E+01	1.37E+02	5.75E+00 GA
RH-106	I	-2.2586E+00					3.74E+02	
			621.92	-6.181E+00	?(	2.686E+01	1.29E+02	9.93E+00 G
			1050.36	2.271E+01	&(	6.548E+01	8.43E+01	1.56E+00 G
			511.86	1.378E+01	?	5.322E+00	1.56E+01	2.00E+01 GA
AG-108M	C	3.2681E-01					1.53E+05	
			433.94	3.857E-01	?(	4.219E-01	4.67E+01	9.05E+01 G
			722.94	2.681E-01	?(	9.850E-01	1.05E+02	9.08E+01 G
			614.28	-6.210E-01	-	2.803E+00	1.34E+02	8.98E+01 G
SN-113	F	3.8132E-01					1.15E+02	
			391.69	3.813E-01	&(	1.604E+00	1.23E+02	6.40E+01 G
SB-124	F	8.3502E-02					6.02E+01	
			602.73	-5.682E-01	&(	2.826E+00	1.47E+02	9.83E+01 G
			1690.98	9.223E-01	?(	1.359E+00	4.47E+01	4.78E+01 G
			722.79	2.299E+00	?(	6.568E+00	8.34E+01	1.08E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 10
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	-1.7970E-02					1.01E+03	
			427.88	-2.121E-01	?(	2.902E+00	5.23E+02	2.96E+01 G
			600.50	-3.113E+00	+	1.601E+01	1.53E+02	1.79E+01 G
			635.89	-4.539E+00	+	1.147E+01	7.56E+01	1.13E+01 G
			463.37	5.309E-01	?(	8.902E+00	4.66E+02	1.05E+01 G
I-131	I	6.7390E-01					8.02E+00	
			364.48	2.039E-01	&(	6.408E-01	1.20E+02	8.17E+01 G
			284.30	2.871E+00	?(	8.486E+00	1.11E+02	6.14E+00 G
			636.97	4.148E+00	?(	1.462E+01	1.02E+02	7.17E+00 G
Gd-153	F	-2.0114E-01					2.42E+02	
			97.50	-2.011E-01	?(	3.450E+00	5.02E+02	3.00E+01 G
			103.20	0.000E+00	+	4.748E+00	1.00E+03	2.18E+01 G
Ga-68	C	-7.2834E-01					4.71E-02	
			1077.40	-7.283E-01	%(	2.944E+01	1.58E+03	3.30E+00 G
BA-133	F	-2.1242E-01					3.85E+03	
			356.00	-2.124E-01	?(	2.206E+00	3.02E+02	6.20E+01 G
			302.85	0.000E+00	&	9.468E+00	1.00E+03	1.83E+01 G
			383.84	2.985E+00	&	1.135E+01	1.11E+02	8.94E+00 GA
			80.99	-8.453E-01	&	3.562E+00	1.26E+02	3.41E+01 GA
CS-134	I	9.2114E-01					7.54E+02	
			795.87	7.810E-01	&(	4.279E-01	2.73E+01	8.55E+01 G
			604.71	-5.740E-01	-	2.755E+00	1.42E+02	9.76E+01 G
			569.32	1.701E+00	?(	4.156E+00	7.30E+01	1.54E+01 G
			801.95	-2.845E+00	&	1.848E+01	1.86E+02	8.69E+00 G
			563.24	2.773E+00	+	9.019E+00	1.29E+02	8.35E+00 G
CS-137	I	5.7660E-01					1.10E+04	
			661.66	5.766E-01	(	1.684E+00	8.66E+01	8.52E+01 G
CE-139	F	2.6724E-01					1.38E+02	
			165.85	2.672E-01	&(	9.820E-01	1.09E+02	7.99E+01 G
Ba-140	I	1.0043E+00					1.28E+01	
			537.26	1.004E+00	?(	2.510E+00	9.94E+01	2.44E+01 G
			162.66	-3.207E+00	+	1.400E+01	1.29E+02	6.22E+00 G
			304.85	0.000E+00	-	4.065E+01	1.00E+03	4.29E+00 G
La-140	I	3.4423E-01					1.28E+01	
			1596.21	0.000E+00	?(	6.487E-01	1.00E+03	9.54E+01 G
			487.02	5.905E-01	(	2.475E+00	1.22E+02	4.55E+01 G
			328.76	1.410E+00	?(	4.803E+00	1.01E+02	2.03E+01 G
			815.77	-1.762E+00	+	8.419E+00	1.39E+02	2.33E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 11
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-141	I	2.5465E-02					3.25E+01	
			145.44	2.547E-02	%(	2.450E+00	2.82E+03	4.82E+01 G
CE-144	I	-7.1011E-01					2.85E+02	
			133.54	-7.101E-01	?(	1.093E+01	4.54E+02	1.11E+01 G
PM-144	C	1.7265E-01					3.63E+02	
			696.54	-1.974E-01	?(	1.149E+00	2.41E+02	9.90E+01 G
			618.06	5.423E-01	?(	2.312E+00	1.26E+02	9.91E+01 G
EU-152	F	2.0086E+00					4.94E+03	
			121.78	5.740E-01	&(	2.317E+00	1.19E+02	2.86E+01 G
			344.29	3.009E-01	?(	4.556E+00	4.36E+02	2.65E+01 G
			1112.07	7.370E+00	?(	9.257E+00	4.14E+01	1.36E+01 G
			778.92	-2.645E+00	+	7.612E+00	1.20E+02	1.29E+01 G
			964.11	2.401E+00	?(	5.874E+00	7.30E+01	1.46E+01 G
			244.69	2.981E+00	?(	1.646E+01	1.63E+02	7.58E+00 G
			1408.00	2.528E+00	?	2.662E+00	3.78E+01	2.10E+01 GA
EU-154	I	3.3416E-01					3.14E+03	
			123.10	-9.762E-02	?(	1.603E+00	4.71E+02	4.08E+01 G
			1274.54	0.000E+00	+	3.329E+00	1.00E+03	3.52E+01 G
			723.36	1.205E+00	?(	5.147E+00	1.22E+02	2.02E+01 G
			873.23	-4.327E-01	+	9.728E+00	6.08E+02	1.23E+01 G
			1004.77	0.000E+00	-	3.208E+00	1.00E+03	1.80E+01 G
			996.33	-1.286E+00	+	1.308E+01	2.81E+02	1.06E+01 G
HF-181	F	2.6939E-01					4.24E+01	
			482.00	2.694E-01	?(	1.096E+00	1.17E+02	8.05E+01 G
			133.02	-4.970E-01	+	2.727E+00	1.63E+02	4.33E+01 G
			345.83	-5.310E-01	&	8.347E+00	4.53E+02	1.51E+01 G
			136.30	0.000E+00	-	2.102E+01	1.00E+03	5.85E+00 G
Ta-182	F	1.6583E+00					1.14E+02	
			1121.30	1.189E+00	?(	4.948E+00	1.20E+02	3.49E+01 G
			1221.41	2.265E+00	?(	1.855E+00	3.33E+01	2.70E+01 G
			1189.05	2.741E-01	-	5.538E+00	7.97E+02	1.62E+01 G
Hg-203	F	1.2531E-01					4.66E+01	
			279.20	1.253E-01	&(	9.114E-01	2.08E+02	8.15E+01 G
TL-208	N	1.5931E+00					6.98E+02	
			583.02	1.593E+00	(	3.453E-01	1.71E+01	8.45E+01 G
			277.28	5.365E-01	&	1.270E+01	6.68E+02	6.31E+00 G
			860.56	-3.384E+00	&	1.194E+01	1.55E+02	1.24E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 12
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-146	C	5.1755E-01					2.02E+03	
			453.88	3.536E-01	?(	9.522E-01	1.04E+02	6.50E+01 G
			747.16	1.395E-01	?(	2.811E+00	8.00E+02	3.40E+01 G
			735.72	1.562E+00	?(	3.534E+00	9.39E+01	2.25E+01 G
Y-88	F	1.6337E-01					1.07E+02	
			1836.06	0.000E+00	?(	7.036E-01	1.00E+03	9.92E+01 G
			898.04	3.363E-01	&(	7.593E-01	9.41E+01	9.37E+01 G
Cd-113m		-1.5104E+03					5.33E+03	
			263.70	-1.510E+03	?(	1.195E+04	2.26E+02	6.00E-03 K
Cd-109	F	-7.4102E+00					4.53E+02	
			88.04	-7.410E+00	&(	3.461E+01	1.39E+02	3.79E+00 G
Cf-251	T	8.2461E-01					3.28E+05	
			176.60	8.246E-01	&(	3.452E+00	1.59E+02	1.70E+01 G
			227.00	2.589E+00	?	9.608E+00	1.40E+02	6.30E+00 GA
Cf-249	T	6.3044E-02					1.28E+05	
			387.95	6.304E-02	?(	1.680E+00	7.56E+02	6.60E+01 G
			333.44	-1.698E+00	&	7.474E+00	1.29E+02	1.55E+01 G
Sn-126		2.6294E+00					3.65E+07	
			87.57	-7.499E-01	-	3.602E+00	1.43E+02	3.75E+01 GA
			64.28	2.629E+00	?(	1.094E+01	1.23E+02	9.70E+00 G
			86.94	-3.116E+00	&	1.538E+01	1.47E+02	9.04E+00 GA
PB-210	N	2.3258E+01					8.14E+03	
			46.54	2.326E+01	*(P	2.719E+01	4.17E+01	4.25E+00 G
PB-212	N	2.7984E+00					6.98E+02	
			238.63	2.798E+00	(P	1.263E+00	1.80E+01	4.33E+01 G
			300.03	-8.418E+00	-	5.479E+01	1.93E+02	3.28E+00 GA
PB-214	N	4.5286E+00					5.84E+05	
			351.93	4.529E+00	(P	1.403E+00	1.56E+01	3.76E+01 G
			295.09	6.693E+00	+ P	3.091E+00	2.32E+01	1.93E+01 G
			242.00	3.617E+00	?	1.810E+01	1.48E+02	7.43E+00 GA
BI-207	C	-4.1140E-01					1.18E+04	
			1063.66	-4.114E-01	?(	1.757E+00	1.87E+02	7.45E+01 G
			569.70	-3.231E-02	&	9.545E-01	8.03E+02	9.77E+01 G
BI-212	N	-4.3133E+00					6.98E+02	
			727.17	-4.313E+00	?(	1.866E+01	1.25E+02	7.55E+00 G
			785.42	3.843E+00	?	7.742E+01	8.00E+02	1.28E+00 GA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 13
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
U-235	N	1.2484E+00					2.57E+11	
			143.79	1.248E+00	&(P	1.052E+01	2.49E+02	1.10E+01 G
			205.33	-3.660E-01	%	1.231E+01	1.24E+03	5.01E+00 G
			163.38	0.000E+00	&	1.799E+01	1.00E+03	5.08E+00 G
			185.72	7.601E-01	P	9.595E-01	4.65E+01	5.40E+01 GA
BI-214	N	5.5017E+00					5.84E+05	
			609.31	5.502E+00	(	1.068E+00	1.46E+01	4.61E+01 G
			1120.29	0.000E+00	-	8.975E+00	1.00E+03	1.51E+01 G
			1764.49	1.128E+01	&	4.376E+00	2.29E+01	1.54E+01 G
BI-210M	T	4.6123E-01					1.10E+09	
			265.83	4.612E-01	?(	1.474E+00	9.43E+01	5.00E+01 G
			304.90	0.000E+00	-	6.230E+00	1.00E+03	2.80E+01 G
AC-228	N	2.6432E+00					2.10E+03	
			911.07	2.643E+00	?(	1.391E+00	2.67E+01	2.90E+01 G
			968.97	7.942E-01	- P	7.360E+00	2.57E+02	1.75E+01 G
			338.32	-8.735E-01	&	1.025E+01	3.39E+02	1.20E+01 G
			93.35	-1.293E+00	-	2.128E+01	4.84E+02	5.56E+00 XA
TH-227	N	4.9707E+00					7.95E+03	
			256.24	4.971E+00	&(	6.256E+00	5.04E+01	7.00E+00 G
			235.97	-2.135E+00	-	1.188E+01	1.65E+02	1.23E+01 G
			50.14	-5.483E+00	-	2.400E+01	1.30E+02	8.00E+00 G
TH-229	N	7.7764E+00					2.68E+06	
			193.51	4.021E+00	&(	1.185E+01	1.12E+02	4.40E+00 G
			210.85	1.330E+01	&(	1.641E+01	4.94E+01	2.99E+00 G
TH-234	N	1.1422E+01					1.63E+12	
			92.59	1.142E+01	*(P	1.223E+01	4.12E+01	5.58E+00 G
			63.29	-3.882E+00	- P	3.387E+01	2.53E+02	3.81E+00 G
PA-234	N	-1.3269E-01					1.63E+12	
			131.29	-1.221E+00	?(	4.792E+00	1.16E+02	1.80E+01 G
			946.02	-1.680E+00	+	8.716E+00	2.19E+02	1.34E+01 G
			569.47	2.256E+00	&(	8.694E+00	1.10E+02	8.20E+00 G
			883.24	-5.843E+00	+	2.052E+01	1.03E+02	9.60E+00 G
			880.53	-1.026E+01	+	2.930E+01	8.48E+01	6.00E+00 GA
PA-234M	N	3.2615E+01					1.63E+12	
			1001.00	0.000E+00	?(	1.744E+02	1.00E+03	8.37E-01 G
			766.41	1.255E+02	?(	4.401E+02	1.02E+02	2.94E-01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 14
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	T -6.7751E-01					1.58E+05	
		59.54	-6.775E-01	(	3.699E+00	1.62E+02	3.59E+01 G
Np-237	F -2.5816E-01					2.14E+06	
		86.49	-2.582E-01	%(	9.517E+00	1.08E+03	1.31E+01 G
Cs-136	F 3.4992E-01					1.30E+01	
		818.50	4.884E-01	?(	1.807E+00	1.09E+02	1.00E+02 G
		1048.07	1.769E-01	&(	1.359E+00	2.08E+02	8.00E+01 G
		340.57	0.000E+00	-	2.692E+00	1.00E+03	4.69E+01 G
Np-239	T 8.5763E-01					2.36E+00	
		103.70	0.000E+00	-	4.311E+00	1.00E+03	2.40E+01 X
		106.13	8.576E-01	?(	4.011E+00	1.38E+02	2.27E+01 G
		99.50	0.000E+00	-	6.940E+00	1.00E+03	1.50E+01 X
Nd-147	8.5252E-01					1.11E+01	
		531.00	8.525E-01	&(	5.545E+00	2.52E+02	1.30E+01 G
		91.10	-9.850E-01	&	4.453E+00	1.35E+02	2.83E+01 G
Kr-85	I -5.5898E+00					3.92E+03	
		513.98	-5.590E+00	%(	4.356E+02	2.25E+03	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

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 15
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

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	246.	-17.	-0.010	130.32	-5.483E+00	
AM-241	59.54	192.	-12.	-0.007	161.55	-6.775E-01	
Sn-126	64.28	139.	14.	0.008	123.26	2.629E+00	
BA-133	80.99	245.	-18.	-0.010	125.53	-8.453E-01	
Sn-126	86.94	345.	-18.	-0.010	147.11	-3.116E+00	
Sn-126	87.57	327.	-18.	-0.010	143.18	-7.499E-01	
Cd-109	88.04	308.	-18.	-0.010	139.19	-7.410E+00	
Nd-147	91.10	290.	-18.	-0.010	134.71	-9.850E-01	
Gd-153	97.50	200.	-4.	-0.002	502.49	-2.011E-01	
Np-239	106.13	157.	13.	0.007	138.42	8.576E-01	
EU-152	121.78	80.	11.	0.006	118.88	5.740E-01	
EU-154	123.10	78.	-3.	-0.001	471.37	-9.762E-02	
PA-234	131.29	137.	-15.	-0.008	116.46	-1.221E+00	
HF-181	133.02	262.	-14.	-0.008	162.93	-4.970E-01	
CE-144	133.54	276.	-5.	-0.003	453.59	-7.101E-01	
U-235	143.79	238.	9.	0.005	248.86	1.248E+00	P
Ba-140	162.66	120.	-12.	-0.007	128.97	-3.207E+00	
CE-139	165.85	95.	13.	0.007	108.80	2.672E-01	
Cf-251	176.60	48.	8.	0.005	158.82	8.246E-01	
U-235	185.72	34.	24.	0.013	46.51	7.601E-01	P
TH-229	193.51	33.	10.	0.006	112.03	4.021E+00	
TH-229	210.85	26.	21.	0.012	49.42	1.330E+01	
Cf-251	227.00	37.	8.	0.005	140.29	2.589E+00	
TH-227	235.97	225.	-13.	-0.007	164.88	-2.135E+00	
EU-152	244.69	154.	11.	0.006	162.87	2.981E+00	
TH-227	256.24	15.	16.	0.009	50.36	4.971E+00	
Cd-113m	263.70	42.	-4.	-0.002	225.78	-1.510E+03	
BI-210M	265.83	44.	11.	0.006	94.34	4.612E-01	
Hg-203	279.20	42.	4.	0.002	207.87	1.253E-01	
TL-210	296.00	254.	-11.	-0.006	198.18	-3.447E-01	
PA-231	300.07	230.	-9.	-0.005	250.40	-8.407E+00	
CR-51	320.08	177.	10.	0.006	184.43	2.619E+00	
La-140	328.76	57.	11.	0.006	100.56	1.410E+00	
Cf-249	333.44	81.	-10.	-0.006	129.33	-1.698E+00	
EU-152	344.29	84.	3.	0.002	435.89	3.009E-01	
HF-181	345.83	91.	-3.	-0.002	453.38	-5.310E-01	
BA-133	356.00	104.	-5.	-0.003	301.60	-2.124E-01	
BA-133	383.84	48.	9.	0.005	111.40	2.985E+00	
Cf-249	387.95	58.	1.	0.001	755.80	6.304E-02	
SN-113	391.69	48.	8.	0.005	122.80	3.813E-01	
SB-125	427.88	28.	-2.	-0.001	522.81	-2.121E-01	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 16
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-108M	433.94	4.	11.	0.006	46.65	3.857E-01	
PM-146	453.88	12.	7.	0.004	104.00	3.536E-01	
SB-125	463.37	29.	2.	0.001	466.05	5.309E-01	
BE-7	477.60	21.	4.	0.002	184.63	1.178E+00	
HF-181	482.00	24.	6.	0.004	117.40	2.694E-01	
La-140	487.02	41.	8.	0.004	122.02	5.905E-01	
RU-103	497.05	28.	-9.	-0.005	119.84	-3.481E-01	
RH-106	511.86	33.	77.	0.043	15.62	1.378E+01	
Nd-147	531.00	13.	3.	0.002	252.03	8.525E-01	
Ba-140	537.26	9.	7.	0.004	99.40	1.004E+00	
PA-234	569.47	11.	5.	0.003	109.69	2.256E+00	
BI-207	569.70	21.	-1.	0.000	802.92	-3.231E-02	
SB-125	600.50	213.	-14.	-0.008	152.52	-3.113E+00	
SB-124	602.73	199.	-14.	-0.008	147.45	-5.682E-01	
RU-103	610.30	171.	-14.	-0.008	136.55	-9.848E+00	
AG-108M	614.28	158.	-14.	-0.008	133.68	-6.210E-01	
PM-144	618.06	128.	13.	0.007	126.13	5.423E-01	
RH-106	621.92	174.	-15.	-0.008	128.95	-6.181E+00	
SB-125	635.89	36.	-12.	-0.007	75.55	-4.539E+00	
AG-110M	657.76	51.	-7.	-0.004	143.02	-3.352E-01	
CS-137	661.66	42.	11.	0.006	86.62	5.766E-01	
PM-144	696.54	23.	-4.	-0.002	241.30	-1.974E-01	
NB-94	702.63	14.	4.	0.002	204.63	1.854E-01	
SB-124	722.79	7.	5.	0.003	83.43	2.299E+00	
AG-108M	722.94	13.	5.	0.003	105.31	2.681E-01	
EU-154	723.36	18.	5.	0.003	122.03	1.205E+00	
ZR-95	724.20	23.	4.	0.002	187.15	3.978E-01	
BI-212	727.17	35.	-7.	-0.004	125.36	-4.313E+00	
PM-146	735.72	9.	7.	0.004	93.89	1.562E+00	
PM-146	747.16	14.	1.	0.001	800.00	1.395E-01	
ZR-95	756.73	14.	2.	0.001	403.11	1.758E-01	
AG-110M	763.94	41.	-14.	-0.008	70.64	-2.993E+00	
PA-234M	766.41	27.	8.	0.004	102.29	1.255E+02	
EU-152	778.92	14.	-7.	-0.004	119.52	-2.645E+00	
BI-212	785.42	14.	1.	0.001	800.00	3.843E+00	
CO-58	810.78	48.	-12.	-0.007	83.66	-6.268E-01	
La-140	815.77	60.	-8.	-0.005	139.38	-1.762E+00	
Cs-136	818.50	50.	10.	0.005	108.65	4.884E-01	
MN-54	834.85	5.	6.	0.003	91.87	2.887E-01	
Co-56	846.77	25.	-12.	-0.007	96.04	-6.236E-01	
NB-94	871.10	12.	5.	0.003	107.70	2.653E-01	
EU-154	873.23	18.	-1.	-0.001	608.28	-4.327E-01	
PA-234	880.53	42.	-12.	-0.006	84.83	-1.026E+01	
PA-234	883.24	54.	-10.	-0.006	103.46	-5.843E+00	
Y-88	898.04	5.	6.	0.003	94.15	3.363E-01	
PA-234	946.02	15.	-4.	-0.002	218.66	-1.680E+00	
EU-152	964.11	7.	6.	0.003	73.01	2.401E+00	
EU-154	996.33	20.	-2.	-0.001	281.03	-1.286E+00	

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 17
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Co-56	1037.84	5.	4.	0.002	152.39	1.562E+00	
Cs-136	1048.07	11.	2.	0.001	208.49	1.769E-01	
RH-106	1050.36	9.	6.	0.003	84.27	2.271E+01	
BI-207	1063.66	16.	-5.	-0.003	187.26	-4.114E-01	
FE-59	1099.25	5.	6.	0.004	90.53	7.159E-01	
EU-152	1112.07	14.	16.	0.009	41.41	7.370E+00	
Ta-182	1121.30	27.	7.	0.004	120.26	1.189E+00	
CO-60	1173.24	5.	7.	0.004	87.76	4.399E-01	
Ta-182	1189.05	5.	1.	0.000	796.87	2.741E-01	
Ta-182	1221.41	0.	9.	0.005	33.33	2.265E+00	
Co-56	1238.28	0.	11.	0.006	30.15	1.143E+00	
NA-22	1274.53	6.	3.	0.002	114.89	2.341E-01	
FE-59	1291.60	6.	6.	0.004	96.69	1.040E+00	
TL-210	1313.00	6.	3.	0.002	176.21	1.140E+00	
CO-60	1332.50	17.	-7.	-0.004	143.21	-5.087E-01	
AG-110M	1384.30	11.	-6.	-0.004	130.84	-1.952E+00	
EU-152	1408.00	0.	7.	0.004	37.80	2.528E+00	
SB-124	1690.98	0.	5.	0.003	44.72	9.223E-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	1.1779E+00	1.1779E+00	1.846E+02%	7.75E+00
NA-22	#A	2.3414E-01	2.3414E-01	1.149E+02%	9.70E-01
K-40		8.8582E+01	8.8582E+01	9.091E+00%	5.40E+00
Sc-46	#A	3.5874E-02	3.5874E-02	1.719E+03%	2.17E+00
CR-51	#A	2.6189E+00	2.6190E+00	1.844E+02%	1.64E+01
MN-54	#A	2.8873E-01	2.8873E-01	9.187E+01%	6.57E-01
FE-59	#A	8.5623E-01	8.5623E-01	6.623E+01%	1.50E+00
Co-56	#A	1.9594E-01	1.9594E-01	3.015E+01%	1.35E+00
CO-57	#A	0.0000E+00	0.0000E+00	7.071E+02%	8.22E-01
CO-58	#A	-6.2677E-01	-6.2677E-01	8.366E+01%	1.76E+00
CO-60	#A	-3.4559E-02	-3.4559E-02	8.398E+01%	1.59E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.52E+00
NB-94	#A	2.2576E-01	2.2576E-01	1.077E+02%	9.34E-01
ZR-95	#A	2.7522E-01	2.7522E-01	1.871E+02%	1.77E+00
NB-95	#A	-8.0663E-03	-8.0663E-03	6.345E+03%	1.82E+00
RU-103	#A	-3.4812E-01	-3.4813E-01	1.198E+02%	1.06E+00
RH-106	#A	-2.2586E+00	-2.2586E+00	7.702E+01%	2.69E+01
AG-108M	#A	3.2681E-01	3.2681E-01	4.665E+01%	4.22E-01
AG-110M	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.95E+00
SN-113	#A	3.8132E-01	3.8132E-01	1.228E+02%	1.60E+00
SB-124	#A	8.3502E-02	8.3502E-02	4.472E+01%	2.83E+00
SB-125	#A	-1.7970E-02	-1.7970E-02	3.502E+02%	2.90E+00

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:18:28 PMPage 18
TestAmerica Inc Spectrum name: 12_Gamma_20193350.An1

I-131	#C	6.7389E-01	6.7390E-01	6.426E+01%	6.41E-01
Gd-153	#A	-2.0114E-01	-2.0114E-01	5.025E+02%	3.45E+00
Ga-68	#A	-7.2587E-01	-7.2834E-01	1.584E+03%	2.94E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.43E+00
BA-133	#A	-2.1242E-01	-2.1242E-01	3.016E+02%	2.21E+00
CS-134	#	9.2113E-01	9.2114E-01	2.727E+01%	4.28E-01
CS-137	#A	5.7660E-01	5.7660E-01	8.662E+01%	1.68E+00
CE-139	#A	2.6724E-01	2.6724E-01	1.088E+02%	9.82E-01
Ba-140	#A	1.0043E+00	1.0043E+00	9.940E+01%	2.51E+00
La-140	#A	3.4422E-01	3.4423E-01	1.006E+02%	6.49E-01
CE-141	#A	2.5465E-02	2.5465E-02	2.818E+03%	2.45E+00
CE-144	#A	-7.1010E-01	-7.1011E-01	4.536E+02%	1.09E+01
PM-144	#A	1.7265E-01	1.7265E-01	1.261E+02%	1.15E+00
EU-152	#A	2.0086E+00	2.0086E+00	4.141E+01%	2.32E+00
EU-154	#A	3.3416E-01	3.3416E-01	1.220E+02%	1.60E+00
EU-155	#A	0.0000E+00	0.0000E+00	7.071E+02%	4.87E+00
HF-181	#A	2.6939E-01	2.6939E-01	1.174E+02%	1.10E+00
Ta-182	#A	1.6583E+00	1.6583E+00	3.333E+01%	4.95E+00
Hg-203	#A	1.2531E-01	1.2531E-01	2.079E+02%	9.11E-01
TL-208	#	1.5931E+00	1.5931E+00	1.715E+01%	3.45E-01
PM-146	#A	5.1755E-01	5.1755E-01	9.389E+01%	9.52E-01
Y-88	#A	1.6337E-01	1.6337E-01	9.415E+01%	7.04E-01
Cd-113m	#A	-1.5104E+03	-1.5104E+03	2.258E+02%	1.20E+04
Cd-109	#A	-7.4101E+00	-7.4102E+00	1.392E+02%	3.46E+01
Cf-251	#A	8.2461E-01	8.2461E-01	1.588E+02%	3.45E+00
Cf-249	#A	6.3044E-02	6.3044E-02	7.558E+02%	1.68E+00
Sn-126	#A	2.6294E+00	2.6294E+00	1.233E+02%	1.09E+01
PB-210	#A	2.3258E+01	2.3258E+01	4.168E+01%	2.72E+01
PB-212		2.7984E+00	2.7984E+00	1.800E+01%	1.26E+00
PB-214		4.5286E+00	4.5286E+00	1.558E+01%	1.40E+00
BI-207	#A	-4.1140E-01	-4.1140E-01	1.873E+02%	1.76E+00
BI-212	#A	-4.3133E+00	-4.3133E+00	1.254E+02%	1.87E+01
U-235	#A	1.2484E+00	1.2484E+00	2.489E+02%	1.05E+01
BI-214		5.5017E+00	5.5017E+00	1.461E+01%	1.07E+00
BI-210M	#A	4.6123E-01	4.6123E-01	9.434E+01%	1.47E+00
AC-228	#	2.6432E+00	2.6432E+00	2.673E+01%	1.39E+00
TH-227	#A	4.9707E+00	4.9707E+00	5.036E+01%	6.26E+00
TH-229	#A	7.7764E+00	7.7764E+00	4.942E+01%	1.19E+01
TH-234	#A	1.1422E+01	1.1422E+01	4.119E+01%	1.22E+01
PA-231	#A	0.0000E+00	0.0000E+00	1.000E+03%	6.02E+01
PA-233	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.93E+00
PA-234	#A	-1.3269E-01	-1.3269E-01	7.999E+01%	4.79E+00
PA-234M	#A	3.2615E+01	3.2615E+01	1.023E+02%	1.74E+02
AM-241	#A	-6.7751E-01	-6.7751E-01	1.616E+02%	3.70E+00
Np-237	#A	-2.5816E-01	-2.5816E-01	1.083E+03%	9.52E+00
Ir-192	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.06E+00
Cs-136	#A	3.4991E-01	3.4992E-01	1.086E+02%	1.81E+00
Np-239	#A	8.5757E-01	8.5763E-01	1.384E+02%	4.01E+00
Nd-147	#A	8.5251E-01	8.5252E-01	2.520E+02%	5.54E+00

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 10:18:28 PMPage 19
TestAmerica Inc                 Spectrum name: 12_Gamma_20193350.An1

TL-210 #A    0.0000E+00    0.0000E+00    1.000E+03%                9.97E-01
Kr-85  #A   -5.5898E+00   -5.5898E+00    2.245E+03%                4.36E+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)     1.377E+02  Bq/Sample
Total Decayed Activity (   25.1 to  1999.1 keV) 1.3768304E+02  Bq/Sample
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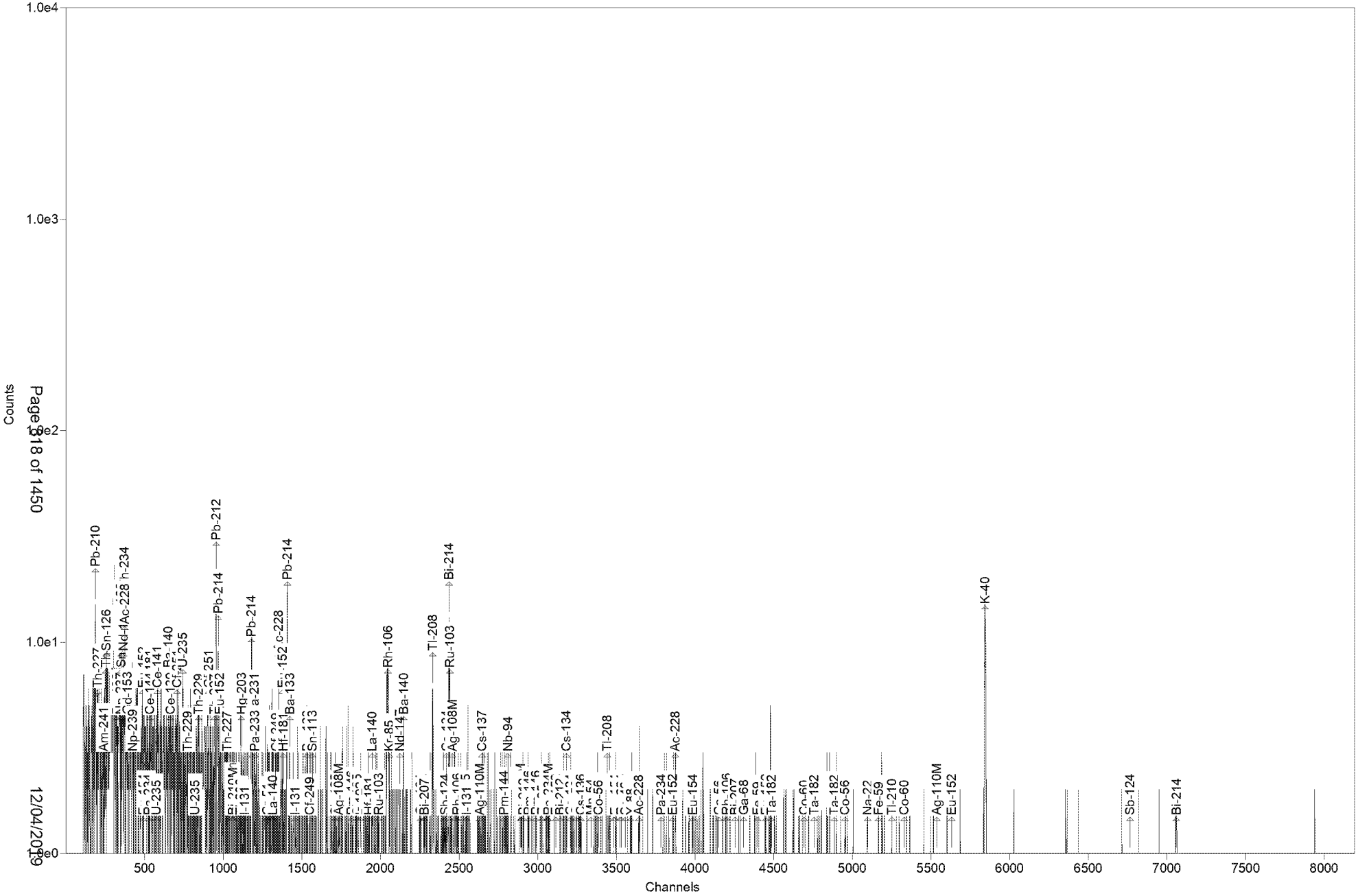
448571_Gamma_160-36160-A-7-C. 12_Gamma_20193350.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20193041

Sample Description: 448571_Gamma_160-36160-A-8-C
Detector: Detector # 5
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-8-C

Decay to Time: 11/23/2019 21:48 Live Time: 1800 sec
Acquisition Time: 11/23/2019 21:48:47 Real Time: 1806 sec
Analysis Time: 11/23/2019 22:19 Dead Time: 0.33 %
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_2019-11-10_1418.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	9.056E-01	289.6	2.623E+00	2.623E+00	9.495E+00
NA-22	6.797E-01	37.8	2.569E-01	2.591E-01	7.156E-01
K-40	5.817E+01	14.2	8.245E+00	8.766E+00	1.226E+01
Sc-46	0.000E+00	1.#INF	1.434E-01	1.435E-01	1.406E+00
CR-51	-2.980E-01	1765.2	5.259E+00	5.259E+00	9.661E+00
MN-54	2.494E-01	184.3	4.597E-01	4.599E-01	1.153E+00
FE-59	5.829E-01	138.7	8.083E-01	8.088E-01	2.016E+00
Co-56	2.899E-01	238.8	6.923E-01	6.925E-01	1.387E+00
CO-57	0.000E+00	1.#INF	1.202E-01	1.202E-01	7.803E-01
CO-58	-4.671E-01	115.2	5.380E-01	5.385E-01	1.855E+00
CO-60	6.046E-01	40.8	2.468E-01	2.487E-01	7.427E-01
ZN-65	0.000E+00	1.#INF	3.429E-01	3.429E-01	2.422E+00
NB-94	-2.606E-01	201.9	5.261E-01	5.263E-01	1.329E+00
ZR-95	2.684E-01	265.7	7.131E-01	7.133E-01	1.890E+00
NB-95	0.000E+00	1.#INF	1.793E-01	1.793E-01	1.425E+00
RU-103	4.011E-02	683.1	2.740E-01	2.740E-01	7.775E-01
RH-106	-1.071E+00	374.7	4.012E+00	4.012E+00	1.044E+01
AG-108M	-5.660E-01	106.9	6.048E-01	6.054E-01	1.403E+00
AG-110M	7.601E-01	23.6	1.792E-01	1.833E-01	1.926E+00
SN-113	3.483E-01	139.3	4.853E-01	4.856E-01	1.684E+00
SB-124	3.592E-01	40.7	1.462E-01	1.474E-01	2.386E+00
SB-125	7.037E-02	108.3	7.623E-02	7.631E-02	3.597E+00
I-131	3.148E-02	90.8	2.857E-02	2.862E-02	1.037E+00
Gd-153	4.918E-01	135.0	6.639E-01	6.646E-01	2.264E+00
Ga-68	-2.990E+00	702.4	2.100E+01	2.100E+01	5.216E+01
Tc-99m	-1.379E-01	183.0	2.522E-01	2.523E-01	8.649E-01
BA-133	-1.973E-01	399.9	7.889E-01	7.889E-01	2.723E+00
CS-134	1.364E-01	337.3	4.602E-01	4.602E-01	1.684E+00
CS-137	-2.020E-02	2577.0	5.205E-01	5.205E-01	1.891E+00
CE-139	2.097E-01	110.7	2.322E-01	2.330E-01	7.914E-01
Ba-140	-4.268E-01	258.1	1.102E+00	1.102E+00	3.663E+00
La-140	4.534E-02	341.7	1.549E-01	1.549E-01	9.063E-01
CE-141	-4.737E-01	124.8	5.909E-01	5.914E-01	1.994E+00

CE-144	-1.811E+00	140.7	2.549E+00	2.550E+00	8.617E+00
PM-144	-2.558E-01	201.9	5.165E-01	5.166E-01	1.305E+00
EU-152	8.470E-01	147.8	1.252E+00	1.252E+00	2.299E+00
EU-154	2.060E+00	27.7	5.714E-01	5.815E-01	1.500E+00
EU-155	6.811E-01	95.3	6.494E-01	6.505E-01	2.863E+00
HF-181	-1.333E-01	95.0	1.266E-01	1.268E-01	1.529E+00
Ta-182	0.000E+00	1.#INF	3.531E-01	3.531E-01	5.473E+00
Hg-203	-3.353E-01	111.7	3.745E-01	3.750E-01	1.274E+00
TL-208	1.642E+00	36.4	5.972E-01	6.032E-01	1.129E+00
PM-146	3.570E-01	139.3	4.973E-01	4.977E-01	1.377E+00
Y-88	5.757E-02	86.4	4.975E-02	4.986E-02	1.896E+00
Cd-113m	1.446E+03	329.5	4.764E+03	4.765E+03	1.665E+04
Cd-109	5.019E+00	165.5	8.309E+00	8.314E+00	2.810E+01
Cf-251	-1.831E-01	651.2	1.192E+00	1.192E+00	3.398E+00
Cf-249	9.983E-02	468.7	4.679E-01	4.679E-01	1.670E+00
Sn-126	-2.656E+00	106.9	2.840E+00	2.843E+00	9.594E+00
PB-210	1.543E+01	57.6	8.893E+00	8.939E+00	2.403E+01
PB-212	2.741E-01	279.0	7.649E-01	7.651E-01	2.631E+00
PB-214	4.986E-01	155.6	7.759E-01	7.764E-01	4.237E+00
BI-207	7.552E-02	1044.8	7.890E-01	7.891E-01	1.978E+00
BI-212	0.000E+00	1.#INF	1.965E+00	1.965E+00	1.136E+01
U-235	-5.976E-01	293.9	1.757E+00	1.757E+00	7.331E+00
BI-214	4.061E+00	19.0	7.720E-01	8.003E-01	1.434E+00
BI-210M	4.484E-01	102.7	4.604E-01	4.612E-01	1.573E+00
AC-228	3.607E+00	44.7	1.613E+00	1.624E+00	3.449E+00
TH-227	1.505E+00	111.5	1.678E+00	1.681E+00	1.266E+01
TH-229	-6.818E+00	88.2	6.013E+00	6.038E+00	1.909E+01
TH-234	-3.085E+00	194.5	6.000E+00	6.003E+00	2.074E+01
PA-231	0.000E+00	1.#INF	4.751E+00	4.751E+00	6.094E+01
PA-233	2.770E-02	5210.5	1.443E+00	1.443E+00	4.979E+00
PA-234	-7.036E-01	188.7	1.328E+00	1.329E+00	4.537E+00
PA-234M	-7.914E+00	1098.5	8.693E+01	8.693E+01	1.897E+02
AM-241	-2.001E-01	390.2	7.806E-01	7.807E-01	2.376E+00
Np-237	1.736E+00	127.3	2.209E+00	2.211E+00	7.451E+00
Ir-192	4.422E-01	39.9	1.764E-01	1.783E-01	5.075E-01
Cs-136	2.189E-01	333.5	7.302E-01	7.303E-01	2.554E+00
Np-239	6.591E-01	111.5	7.346E-01	7.357E-01	2.502E+00
Nd-147	2.206E+00	98.6	2.174E+00	2.178E+00	5.694E+00
TL-210	1.637E-01	161.7	2.647E-01	2.648E-01	1.526E+00
Kr-85	3.514E+00	3254.2	1.144E+02	1.144E+02	4.048E+02
Total	1.555E+03				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 10:19:16 PMPage  1
TestAmerica Inc                 Spectrum name: 5_Gamma_20193041.An1

Sample description
     448571_Gamma_160-36160-A-8-C


Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20193041.An1

Acquisition information
       Start time:                 11/23/2019 9:48:47 PM
       Live time:               1800
       Real time:               1806
       Dead time:                  0.33 %
       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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:19:16 PMPage 2
TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

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	11/23/2019 9:48:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-11-10_1418.PBC 11/10/2019 2:18:51 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 9 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1752

***** 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
46.60	21.	57.62	0.62	1.788E-02	46.54	4.250	PBC<MDA	PB210
50.14	9.	111.52	0.79	2.012E-02	50.14	8.000	PBC<MDA	TH227
59.54	-3.	390.19	0.80	2.533E-02	59.54	35.900	PBC<MDA	AM241
63.29	-6.	222.17	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
74.96	34.	32.33	0.81	3.156E-02				
77.07	78.	16.52	0.81	3.219E-02				
80.99	3.	491.17	0.82	3.320E-02	80.99	34.060	PBC<MDA	BA133
86.50	14.	127.26	0.82	3.435E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	7.404E-01	EU155
86.54	12.	152.85	0.82	3.436E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.412E-01	EU155
					86.94	9.040	2.173E+00	Sn126
86.94	12.	158.08	0.83	3.443E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	2.174E+00	Sn126
87.57	12.	163.04	0.83	3.454E-02	87.57	37.500	PBC<MDA	Sn126
88.04	12.	165.54	0.83	3.462E-02	88.04	3.790	PBC<MDA	Cd109
91.10	12.	169.93	0.83	3.508E-02	91.10	28.300	PBC<MDA	Nd147
92.59	-11.	194.48	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
97.50	10.	135.01	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
105.31	10.	114.03	0.84	3.618E-02	105.31	21.200	PBC<MDA	EU155
106.13	10.	111.46	0.84	3.620E-02	106.13	22.700	PBC<MDA	Np239
120.97	2.	485.80	0.86	3.584E-02	121.78	28.580	PBC<MDA	EU152

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:19:16 PMPage 3
TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
123.10	2.	527.37	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
165.85	9.	110.71	0.91	3.133E-02	165.85	79.900	PBC<MDA	CE139
185.72	13.	98.71	0.93	2.854E-02	185.72	54.000	PBC<MDA	U235
210.85	9.	133.93	0.95	2.569E-02	210.85	2.990	PBC<MDA	TH229
235.97	10.	169.41	0.98	2.341E-02	235.97	12.300	PBC<MDA	TH227
238.53	44.	20.35	0.61	2.320E-02	238.63	43.300	PBC<MDA	PB212
241.92	12.	135.40	0.98	2.293E-02	242.00	7.430	PBC<MDA	PB214
244.88	11.	149.82	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
263.70	3.	329.55	1.00	2.135E-02	263.70	0.006	PBC<MDA	Cd113m
265.83	9.	102.66	1.00	2.121E-02	265.83	50.000	PBC<MDA	BI210M
277.28	18.	36.37	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
295.54	10.	155.64	1.03	1.945E-02	295.09	19.300	PBC<MDA	PB214
					296.00	79.000	3.684E-01	TL210
296.00	10.	161.72	1.03	1.940E-02	295.09	19.300	PBC<MDA	PB214
					296.00	79.000	3.687E-01	TL210
300.03	10.	168.96	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
316.49	13.	39.88	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
338.32	4.	261.01	1.07	1.736E-02	338.32	12.010	PBC<MDA	AC228
343.87	7.	147.77	1.08	1.711E-02	344.29	26.500	PBC<MDA	EU152
345.83	5.	148.39	1.08	1.705E-02	345.83	15.070	PBC<MDA	HF181
351.78	67.	17.03	1.16	1.681E-02	351.93	37.600	5.874E+00	PB214
383.84	5.	120.00	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
387.95	2.	468.66	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
391.69	6.	139.34	1.12	1.537E-02	391.69	64.000	PBC<MDA	SN113
453.88	4.	203.98	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
463.37	2.	304.02	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
477.60	2.	289.60	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
487.02	2.	341.70	1.21	1.282E-02	487.02	45.500	PBC<MDA	La140
497.05	1.	683.12	1.22	1.260E-02	497.05	90.900	PBC<MDA	RU103
511.86	31.	29.37	2.48	1.230E-02	511.86	20.000	7.077E+00	RH106
531.00	6.	98.56	1.25	1.193E-02	531.00	13.000	PBC<MDA	Nd147
583.02	17.	47.14	1.30	1.103E-02	583.02	84.500	PBC<MDA	TL208
600.50	6.	196.17	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
609.45	35.	19.01	1.06	1.063E-02	609.31	46.090	4.019E+00	BI214
636.97	5.	90.77	1.34	1.025E-02	636.97	7.170	PBC<MDA	I131
657.76	7.	87.08	1.36	9.974E-03	657.76	94.640	PBC<MDA	AG110M
722.79	6.	40.71	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	4.005E-01	AG108M
					723.36	20.220	1.800E+00	EU154
735.72	2.	189.82	1.43	9.081E-03	735.72	22.500	PBC<MDA	PM146
756.73	2.	265.73	1.45	8.869E-03	756.73	54.460	PBC<MDA	ZR95
763.94	18.	23.57	1.45	8.799E-03	763.94	22.280	5.101E+00	AG110M
785.42	5.	100.08	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
795.87	2.	337.28	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
818.50	3.	333.53	1.50	8.305E-03	818.50	100.000	PBC<MDA	Cs136
834.85	4.	184.30	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:19:16 PMPage 4
TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
846.77	1.	800.00	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
860.56	5.	96.53	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
880.53	13.	27.58	1.54	7.812E-03	880.53	6.000	1.559E+01	PA234
898.04	5.	94.90	1.56	7.684E-03	898.04	93.700	PBC<MDA	Y88
911.07	13.	44.72	1.57	7.591E-03	911.07	29.000	PBC<MDA	AC228
937.49	1.	354.44	1.59	7.411E-03	937.49	34.360	PBC<MDA	AG110M
968.97	9.	101.47	1.61	7.209E-03	968.97	17.460	PBC<MDA	AC228
996.33	13.	27.74	1.63	7.042E-03	996.33	10.600	9.675E+00	EU154
1037.84	3.	238.82	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1099.25	4.	138.66	1.71	6.484E-03	1099.25	56.500	PBC<MDA	FE59
1120.32	17.	24.98	1.72	6.381E-03	1120.29	15.100	9.629E+00	BI214
					1120.55	99.987	PBC<MDA	Sc46
1238.28	2.	252.07	1.80	5.866E-03	1238.28	66.070	PBC<MDA	Co56
1274.53	7.	37.80	1.83	5.725E-03	1274.53	99.940	PBC<MDA	NA22
					1274.54	35.190	1.930E+00	EU154
1332.50	6.	40.82	1.87	5.514E-03	1332.50	99.980	PBC<MDA	CO60
1384.30	3.	206.16	1.90	5.340E-03	1384.30	24.290	PBC<MDA	AG110M
1407.85	5.	44.72	1.91	5.264E-03	1408.00	21.005	PBC<MDA	EU152
1460.42	57.	14.18	2.00	5.103E-03	1460.83	10.670	5.817E+01	K40
1764.22	5.	59.65	2.11	4.351E-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	
299.46	74.98	44.	34.	1.090E+03	32.33	0.813	-	D
307.92	77.10	44.	78.	2.425E+03	16.52	0.815	-	D
1407.48	351.78	16.	67.	3.974E+03	17.03	1.162	-	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

********** 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	42.	21.	0.012	57.62	0.620
TH-227	200.11	50.14	33.	9.	0.005	111.52	0.787s
AM-241	237.72	59.54	60.	-3.	-0.002	390.19	0.797s
TH-234	252.74	63.29	64.	-6.	-0.003	222.17	0.801
Sn-126	256.71	64.28	87.	-13.	-0.007	106.90	0.802

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:19:16 PMPage 5
TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BA-133	323.61	80.99	53.	3.	0.001	491.17	0.819s
Np-237	345.63	86.49	153.	14.	0.008	127.26	0.825s
EU-155	345.84	86.54	167.	12.	0.007	152.85	0.825s
Sn-126	347.43	86.94	179.	12.	0.007	158.08	0.825
Sn-126	349.95	87.57	191.	12.	0.007	163.04	0.826
Cd-109	351.83	88.04	187.	12.	0.007	165.54	0.826s
Nd-147	364.08	91.10	198.	12.	0.007	169.93	0.829s
TH-234	370.05	92.59	231.	-11.	-0.006	194.48	0.831s
AC-228	373.09	93.35	225.	-7.	-0.004	305.39	0.832s
Gd-153	389.70	97.50	78.	10.	0.005	135.01	0.836s
EU-155	420.98	105.31	62.	10.	0.006	114.03	0.844s
Np-239	424.25	106.13	54.	10.	0.005	111.46	0.845s
EU-152	486.90	121.78	72.	2.	0.001	485.80	0.861s
CO-57	488.03	122.06	75.	0.	0.000	1000.00	0.861s
EU-154	492.18	123.10	62.	2.	0.001	527.37	0.862s
PA-234	524.99	131.29	110.	-8.	-0.004	188.75	0.871s
HF-181	531.91	133.02	138.	-13.	-0.007	128.48	0.872
CE-144	533.97	133.54	151.	-13.	-0.007	140.75	0.873
HF-181	545.02	136.30	164.	0.	0.000	1000.00	0.876
CO-57	545.72	136.47	164.	0.	0.000	1000.00	0.876
Tc-99m	561.88	140.51	86.	-7.	-0.004	182.95	0.880s
U-235	574.99	143.79	98.	-4.	-0.002	293.94	0.883s
CE-141	581.61	145.44	141.	-14.	-0.008	124.76	0.885s
Ba-140	650.54	162.66	72.	-2.	-0.001	604.15	0.902s
U-235	653.42	163.38	75.	-1.	-0.001	842.58	0.903s
CE-139	663.32	165.85	50.	9.	0.005	110.71	0.905s
Cf-251	706.34	176.60	37.	-2.	-0.001	651.15	0.916s
U-235	742.85	185.72	54.	13.	0.007	98.71	0.925s
TH-229	774.03	193.51	70.	-15.	-0.008	88.19	0.933s
TH-229	843.44	210.85	44.	9.	0.005	133.93	0.950s
Cf-251	908.08	227.00	53.	-13.	-0.007	100.42	0.966s
TH-227	943.98	235.97	127.	10.	0.005	169.41	0.975
PB-212	954.64	238.63	93.	5.	0.003	279.02	0.978s
PB-214	968.10	242.00	122.	12.	0.007	135.40	0.981
EU-152	978.89	244.69	126.	11.	0.006	149.82	0.984s
TH-227	1025.11	256.24	48.	-3.	-0.001	488.22	0.995s
Cd-113m	1054.97	263.70	59.	3.	0.002	329.55	1.002
BI-210M	1063.50	265.83	34.	9.	0.005	102.66	1.005s
TL-208	1109.33	277.28	12.	18.	0.010	36.37	1.016s
Hg-203	1117.00	279.20	58.	-10.	-0.006	111.69	1.017s
I-131	1137.41	284.30	40.	-9.	-0.005	131.44	1.022s
PB-214	1180.60	295.09	120.	10.	0.006	155.64	1.033s
TL-210	1184.24	296.00	130.	10.	0.006	161.72	1.034s
PB-212	1200.37	300.03	140.	10.	0.006	168.96	1.038
PA-233	1200.97	300.18	152.	0.	0.000	1000.00	1.038s
PA-231	1210.86	302.65	152.	0.	0.000	1000.00	1.040s
BA-133	1211.66	302.85	152.	0.	0.000	1000.00	1.040s
Ba-140	1219.66	304.85	152.	0.	0.000	1000.00	1.042s

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TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1219.85	304.90	152.	0.	0.000	1000.00	1.042s
Ir-192	1234.03	308.44	152.	0.	0.000	1000.00	1.046
Ir-192	1266.25	316.49	6.	13.	0.007	39.88	1.053s
La-140	1315.35	328.76	37.	-2.	-0.001	684.11	1.065
Cf-249	1334.08	333.44	26.	-2.	-0.001	573.93	1.070s
AC-228	1353.61	338.32	53.	4.	0.002	261.01	1.074s
Cs-136	1362.62	340.57	57.	0.	0.000	1000.00	1.077s
EU-152	1377.49	344.29	50.	7.	0.004	147.77	1.080s
HF-181	1383.66	345.83	28.	5.	0.003	148.39	1.082
BA-133	1424.36	356.00	106.	-4.	-0.002	399.90	1.091s
I-131	1458.32	364.48	23.	-7.	-0.004	209.47	1.099s
BA-133	1535.78	383.84	19.	5.	0.003	120.00	1.117s
Cf-249	1552.22	387.95	36.	2.	0.001	468.66	1.121s
SN-113	1567.19	391.69	34.	6.	0.003	139.34	1.125s
SB-125	1711.99	427.88	28.	-10.	-0.006	108.32	1.158
AG-108M	1736.25	433.94	40.	-13.	-0.007	106.85	1.164s
PM-146	1816.05	453.88	17.	4.	0.002	203.98	1.182s
SB-125	1854.01	463.37	24.	2.	0.001	304.02	1.191s
BE-7	1910.94	477.59	20.	2.	0.001	289.60	1.204s
HF-181	1928.56	482.00	31.	-7.	-0.004	118.67	1.208s
La-140	1948.65	487.02	8.	2.	0.001	341.70	1.212
RU-103	1988.80	497.05	8.	1.	0.000	683.12	1.221s
RH-106	2048.06	511.86	27.	31.	0.017	29.37	2.485s
Nd-147	2124.62	531.00	8.	6.	0.003	98.56	1.252s
Ba-140	2149.67	537.26	12.	-2.	-0.001	258.13	1.258s
CS-134	2253.60	563.24	12.	-5.	-0.003	142.83	1.280s
CS-134	2277.94	569.32	16.	-7.	-0.004	89.21	1.286s
BI-207	2279.47	569.70	23.	0.	0.000	1000.00	1.286s
TL-208	2332.76	583.02	12.	17.	0.009	47.14	1.298s
SB-125	2402.69	600.50	77.	6.	0.004	196.17	1.313s
CS-134	2419.53	604.71	84.	0.	0.000	1000.00	1.317s
BI-214	2438.50	609.45	5.	35.	0.020	19.01	1.062s
RU-103	2441.89	610.30	84.	0.	0.000	1000.00	1.322
AG-108M	2457.82	614.28	84.	0.	0.000	1000.00	1.325s
RH-106	2488.37	621.92	13.	-2.	-0.001	374.72	1.332s
SB-125	2544.26	635.89	15.	-2.	-0.001	414.32	1.344s
I-131	2548.61	636.97	7.	5.	0.003	90.77	1.345s
AG-110M	2631.76	657.76	14.	7.	0.004	87.08	1.362s
PM-144	2786.90	696.54	17.	-4.	-0.002	201.91	1.395s
NB-94	2811.25	702.63	17.	-4.	-0.002	201.91	1.400s
SB-124	2891.88	722.79	0.	6.	0.003	40.71	1.417s
AG-108M	2892.48	722.94	6.	0.	0.000	1000.00	1.417s
EU-154	2894.17	723.36	6.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	6.	0.	0.000	1000.00	1.418s
BI-212	2909.41	727.17	6.	0.	0.000	1000.00	1.421s
PM-146	2943.61	735.72	5.	2.	0.001	189.82	1.428s
PM-146	2989.37	747.16	13.	-3.	-0.002	142.17	1.437s
ZR-95	3027.65	756.73	9.	2.	0.001	265.73	1.445s

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TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	3056.50	763.94	0.	18.	0.010	23.57	1.451s
NB-95	3063.89	765.79	18.	0.	0.000	1000.00	1.453s
PA-234M	3066.38	766.41	36.	-9.	-0.005	52.89	1.453s
EU-152	3116.41	778.92	14.	-3.	-0.002	270.80	1.463s
BI-212	3142.41	785.42	5.	5.	0.003	100.08	1.468s
CS-134	3184.20	795.87	17.	2.	0.001	337.28	1.477s
TL-210	3199.12	799.60	19.	0.	0.000	1000.00	1.480s
CS-134	3208.53	801.95	38.	-10.	-0.006	57.97	1.482s
CO-58	3243.82	810.78	29.	-7.	-0.004	115.18	1.489s
La-140	3263.80	815.77	48.	-12.	-0.006	89.24	1.493s
Cs-136	3274.72	818.50	58.	3.	0.002	333.53	1.495s
MN-54	3340.10	834.85	9.	4.	0.002	184.30	1.508s
Co-56	3387.78	846.77	14.	1.	0.001	800.00	1.518s
TL-208	3442.95	860.56	5.	5.	0.003	96.53	1.529
PA-234	3522.80	880.53	0.	13.	0.007	27.58	1.544s
PA-234	3533.64	883.24	13.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	13.	0.	0.000	1000.00	1.547s
Sc-46	3557.79	889.28	13.	0.	0.000	1000.00	1.551s
Y-88	3592.83	898.04	5.	5.	0.003	94.90	1.558s
AC-228	3644.94	911.07	6.	13.	0.007	44.72	1.568s
AG-110M	3750.60	937.49	5.	1.	0.001	354.44	1.589s
PA-234	3784.70	946.02	14.	-7.	-0.004	119.52	1.595s
EU-152	3857.05	964.11	35.	-13.	-0.007	72.65	1.609s
AC-228	3876.48	968.97	37.	9.	0.005	101.47	1.612s
EU-154	3985.88	996.33	0.	13.	0.007	27.74	1.633s
EU-154	4019.65	1004.77	15.	-8.	-0.004	112.15	1.639s
Co-56	4151.87	1037.84	10.	3.	0.002	238.82	1.664s
Cs-136	4192.77	1048.07	5.	0.	0.000	1000.00	1.671s
RH-106	4201.93	1050.36	13.	-7.	-0.004	82.07	1.673s
Ga-68	4310.04	1077.40	10.	-1.	-0.001	702.38	1.692s
FE-59	4397.41	1099.25	5.	4.	0.002	138.66	1.708s
EU-152	4448.68	1112.07	6.	0.	0.000	1000.00	1.717
ZN-65	4462.56	1115.55	6.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	0.	17.	0.009	24.98	1.723
Sc-46	4482.57	1120.55	17.	0.	0.000	1000.00	1.723
Ta-182	4485.56	1121.30	17.	0.	0.000	1000.00	1.724s
CO-60	4693.21	1173.24	25.	-14.	-0.008	84.81	1.760s
Ta-182	4756.42	1189.05	20.	-9.	-0.005	114.22	1.771s
Ta-182	4885.79	1221.41	11.	-4.	-0.002	209.09	1.793
Co-56	4953.23	1238.28	6.	2.	0.001	252.07	1.804s
NA-22	5098.13	1274.53	0.	7.	0.004	37.80	1.828s
EU-154	5098.17	1274.54	7.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	11.	-2.	-0.001	280.28	1.840s
TL-210	5251.91	1313.00	16.	-11.	-0.006	87.98	1.854s
CO-60	5329.85	1332.50	0.	6.	0.003	40.82	1.866s
AG-110M	5536.88	1384.30	5.	3.	0.001	206.16	1.899s
EU-152	5631.62	1408.00	0.	5.	0.003	44.72	1.914s
K-40	5841.10	1460.42	4.	57.	0.032	14.18	2.002s

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TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	6762.39	1690.98	6.	-3.	-0.001	218.12	2.076s
BI-214	7056.06	1764.49	2.	5.	0.003	59.65	2.114s
Co-56	7083.46	1771.35	7.	0.	0.000	1000.00	2.117s
Y-88	7341.96	1836.06	6.	-2.	-0.001	144.45	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	9.0563E-01					5.31E+01	
			477.60	9.056E-01	?(P	9.495E+00	2.90E+02 1.05E+01	G
NA-22	C	6.7971E-01					9.50E+02	
			1274.53	6.797E-01	?(	7.156E-01	3.78E+01 9.99E+01	G
K-40	N	5.8168E+01					4.66E+11	
			1460.83	5.817E+01	(P	1.226E+01	1.42E+01 1.07E+01	G
CR-51	F	-2.9795E-01					2.77E+01	
			320.08	-2.980E-01	&(P	9.661E+00	1.77E+03 9.94E+00	G
MN-54	C	2.4943E-01					3.12E+02	
			834.85	2.494E-01	?(	1.153E+00	1.84E+02 1.00E+02	G
FE-59	F	5.8291E-01					4.45E+01	
			1099.25	5.829E-01	?(P	2.016E+00	1.39E+02 5.65E+01	G
			1291.60	-4.554E-01	+ P	4.127E+00	2.80E+02 4.32E+01	G
Co-56	C	2.8989E-01					7.73E+01	
			846.77	6.887E-02	?(	1.387E+00	8.00E+02 9.99E+01	G
			1238.28	3.155E-01	?(P	1.997E+00	2.52E+02 6.61E+01	G
			1037.84	1.733E+00	?(	1.008E+01	2.39E+02 1.41E+01	G
			1771.35	0.000E+00	-	1.244E+01	1.00E+03 1.55E+01	A
CO-58	C	-4.6707E-01					7.09E+01	
			810.78	-4.671E-01	?(	1.855E+00	1.15E+02 9.95E+01	G
CO-60	F	6.0460E-01					1.93E+03	
			1332.50	6.046E-01	?(	7.427E-01	4.08E+01 1.00E+02	G
			1173.24	-1.239E+00	-	2.357E+00	8.48E+01 9.99E+01	G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:19:16 PMPage 9
TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
NB-94	I	-2.6055E-01					7.41E+06	
			702.63	-2.606E-01	?(	1.329E+00	2.02E+02	9.79E+01 G
			871.10	1.993E-02	% P	1.317E+00	1.73E+03	9.99E+01 G
ZR-95	I	2.6837E-01					6.40E+01	
			756.73	2.684E-01	?(	1.890E+00	2.66E+02	5.45E+01 G
			724.20	0.000E+00	-	1.936E+00	1.00E+03	4.42E+01 G
RU-103	I	4.0114E-02					3.93E+01	
			497.05	4.011E-02	?(P	7.775E-01	6.83E+02	9.09E+01 G
			610.30	0.000E+00	&	4.133E+01	1.00E+03	5.75E+00 GA
RH-106	I	-1.0705E+00					3.74E+02	
			621.92	-1.071E+00	?(	1.044E+01	3.75E+02	9.93E+00 G
			1050.36	-3.701E+01	&	1.032E+02	8.21E+01	1.56E+00 G
			511.86	7.077E+00		6.047E+00	2.94E+01	2.00E+01 GA
AG-108M	C	-5.6596E-01					1.53E+05	
			433.94	-5.660E-01	?(P	1.403E+00	1.07E+02	9.05E+01 G
			722.94	0.000E+00	+	9.395E-01	1.00E+03	9.08E+01 G
			614.28	0.000E+00	+	2.659E+00	1.00E+03	8.98E+01 G
AG-110M	F	7.6012E-01					2.50E+02	
			884.68	0.000E+00	?(	1.926E+00	1.00E+03	7.27E+01 G
			657.76	3.943E-01	?(	1.173E+00	8.71E+01	9.46E+01 G
			937.49	2.909E-01	?(	2.787E+00	3.54E+02	3.44E+01 G
			1384.30	1.142E+00	?(	5.770E+00	2.06E+02	2.43E+01 G
			763.94	5.101E+00	?(	2.088E+00	2.36E+01	2.23E+01 G
SN-113	F	3.4827E-01					1.15E+02	
			391.69	3.483E-01	?(	1.684E+00	1.39E+02	6.40E+01 G
SB-124	F	3.5923E-01					6.02E+01	
			602.73	2.860E-02	%(	2.386E+00	2.38E+03	9.83E+01 G
			1690.98	-6.873E-01	+	3.557E+00	2.18E+02	4.78E+01 G
			722.79	3.365E+00	?(	4.109E+00	4.07E+01	1.08E+01 G
SB-125	I	7.0370E-02					1.01E+03	
			427.88	-1.314E+00	?(	3.597E+00	1.08E+02	2.96E+01 G
			600.50	1.866E+00	&(	1.260E+01	1.96E+02	1.79E+01 G
			635.89	-7.889E-01	+ P	9.836E+00	4.14E+02	1.13E+01 G
			463.37	9.216E-01	?(P	1.008E+01	3.04E+02	1.05E+01 G
I-131	I	3.1479E-02					8.02E+00	
			364.48	-2.761E-01	?(P	1.037E+00	2.09E+02	8.17E+01 G
			284.30	-4.210E+00	+	1.457E+01	1.31E+02	6.14E+00 G
			636.97	3.536E+00	?(	1.115E+01	9.08E+01	7.17E+00 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Gd-153	F	4.9178E-01					2.42E+02	
			97.50	4.918E-01	?(	2.264E+00	1.35E+02	3.00E+01 G
			103.20	-1.176E-02	%	3.466E+00	8.45E+03	2.18E+01 G
Ga-68	C	-2.9899E+00					4.71E-02	
			1077.40	-2.990E+00	?(	5.216E+01	7.02E+02	3.30E+00 G
Tc-99m	I	-1.3786E-01					2.51E-01	
			140.51	-1.379E-01	?(	8.649E-01	1.83E+02	8.93E+01 G
BA-133	F	-1.9727E-01					3.85E+03	
			356.00	-1.973E-01	?(	2.723E+00	4.00E+02	6.20E+01 G
			302.85	0.000E+00	&	9.580E+00	1.00E+03	1.83E+01 G
			383.84	2.185E+00	?	9.153E+00	1.20E+02	8.94E+00 GA
			80.99	1.310E-01	&	1.805E+00	4.91E+02	3.41E+01 GA
CS-134	I	1.3644E-01					7.54E+02	
			795.87	1.364E-01	?(P	1.684E+00	3.37E+02	8.55E+01 G
			604.71	0.000E+00	-	2.416E+00	1.00E+03	9.76E+01 G
			569.32	-2.247E+00	+	6.853E+00	8.92E+01	1.54E+01 G
			801.95	-7.933E+00	+ P	2.365E+01	5.80E+01	8.69E+00 G
			563.24	-2.930E+00	+	1.105E+01	1.43E+02	8.35E+00 G
CS-137	I	-2.0197E-02					1.10E+04	
			661.66	-2.020E-02	%(P	1.891E+00	2.58E+03	8.52E+01 G
CE-139	F	2.0972E-01					1.38E+02	
			165.85	2.097E-01	?(	7.914E-01	1.11E+02	7.99E+01 G
Ba-140	I	-4.2685E-01					1.28E+01	
			537.26	-4.268E-01	?(P	3.663E+00	2.58E+02	2.44E+01 G
			162.66	-5.739E-01	&	1.212E+01	6.04E+02	6.22E+00 G
			304.85	0.000E+00	+	4.116E+01	1.00E+03	4.29E+00 G
La-140	I	4.5335E-02					1.28E+01	
			1596.21	-9.491E-03	%(P	9.063E-01	1.05E+04	9.54E+01 G
			487.02	1.603E-01	?(P	1.538E+00	3.42E+02	4.55E+01 G
			328.76	-2.565E-01	&	4.761E+00	6.84E+02	2.03E+01 G
			815.77	-3.326E+00	+	1.001E+01	8.92E+01	2.33E+01 G
CE-141	I	-4.7365E-01					3.25E+01	
			145.44	-4.737E-01	?(	1.994E+00	1.25E+02	4.82E+01 G
CE-144	I	-1.8107E+00					2.85E+02	
			133.54	-1.811E+00	?(	8.617E+00	1.41E+02	1.11E+01 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-144	C	-2.5579E-01					3.63E+02	
			696.54	-2.558E-01	?(	1.305E+00	2.02E+02	9.90E+01 G
			618.06	-8.346E-03	& P	2.426E+00	4.34E+03	9.91E+01 G
EU-152	F	8.4697E-01					4.94E+03	
			121.78	1.356E-01	&(	2.299E+00	4.86E+02	2.86E+01 G
			344.29	8.576E-01	?(	4.369E+00	1.48E+02	2.65E+01 G
			1112.07	0.000E+00	-	8.957E+00	1.00E+03	1.36E+01 G
			778.92	-1.488E+00	+	9.991E+00	2.71E+02	1.29E+01 G
			964.11	-6.569E+00	+	1.591E+01	7.27E+01	1.46E+01 G
			244.69	3.492E+00	?(	1.775E+01	1.50E+02	7.58E+00 G
			1408.00	2.512E+00	?	3.703E+00	4.47E+01	2.10E+01 GA
EU-154	I	2.0601E+00					3.14E+03	
			123.10	8.112E-02	(P	1.500E+00	5.27E+02	4.08E+01 G
			1274.54	0.000E+00	-	4.147E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	4.223E+00	1.00E+03	2.02E+01 G
			873.23	-2.429E-01	% P	4.242E+00	1.18E+03	1.23E+01 G
			1004.77	-3.529E+00	+	9.158E+00	1.12E+02	1.80E+01 G
			996.33	9.675E+00	?(	5.485E+00	2.77E+01	1.06E+01 G
EU-155	I	6.8113E-01					1.81E+03	
			105.31	7.389E-01	(P	2.863E+00	1.14E+02	2.12E+01 G
			86.54	6.412E-01	?(	3.315E+00	1.53E+02	3.07E+01 G
HF-181	F	-1.3329E-01					4.24E+01	
			482.00	-3.736E-01	?(	1.529E+00	1.19E+02	8.05E+01 G
			133.02	-4.860E-01	+	2.110E+00	1.28E+02	4.33E+01 G
			345.83	1.150E+00	?(	5.966E+00	1.48E+02	1.51E+01 G
			136.30	0.000E+00	+	1.711E+01	1.00E+03	5.85E+00 G
Hg-203	F	-3.3528E-01					4.66E+01	
			279.20	-3.353E-01	&(	1.274E+00	1.12E+02	8.15E+01 G
TL-208	N	1.6421E+00					6.98E+02	
			583.02	1.006E+00	(P	1.129E+00	4.71E+01	8.45E+01 G
			277.28	7.523E+00	*(	7.959E+00	3.64E+01	6.31E+00 G
			860.56	2.985E+00	?(	7.177E+00	9.65E+01	1.24E+01 G
PM-146	C	3.5698E-01					2.02E+03	
			453.88	2.531E-01	?(P	1.377E+00	2.04E+02	6.50E+01 G
			747.16	-5.987E-01	+ P	3.590E+00	1.42E+02	3.40E+01 G
			735.72	6.572E-01	?(P	3.449E+00	1.90E+02	2.25E+01 G
Y-88	F	5.7567E-02					1.07E+02	
			1836.06	-2.828E-01	?(P	1.896E+00	1.44E+02	9.92E+01 G
			898.04	4.179E-01	?(	9.859E-01	9.49E+01	9.37E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:19:16 PMPage 12
TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Cd-113m		1.4456E+03					5.33E+03	
			263.70	1.446E+03	?(	1.665E+04	3.30E+02	6.00E-03 K
Cd-109	F	5.0194E+00					4.53E+02	
			88.04	5.019E+00	?(	2.810E+01	1.66E+02	3.79E+00 G
Cf-251	T	-1.8309E-01					3.28E+05	
			176.60	-1.831E-01	(	3.398E+00	6.51E+02	1.70E+01 G
			227.00	-4.906E+00	+	1.340E+01	1.00E+02	6.30E+00 GA
Cf-249	T	9.9830E-02					1.28E+05	
			387.95	9.983E-02	(	1.670E+00	4.69E+02	6.60E+01 G
			333.44	-3.397E-01	+	5.365E+00	5.74E+02	1.55E+01 G
Sn-126		-2.6561E+00					3.65E+07	
			87.57	5.229E-01	+	2.882E+00	1.63E+02	3.75E+01 GA
			64.28	-2.656E+00	(	9.594E+00	1.07E+02	9.70E+00 G
			86.94	2.174E+00	+	1.162E+01	1.58E+02	9.04E+00 GA
PB-210	N	1.5434E+01					8.14E+03	
			46.54	1.543E+01	(P	2.403E+01	5.76E+01	4.25E+00 G
PB-212	N	2.7414E-01					6.98E+02	
			238.63	2.741E-01	?(P	2.631E+00	2.79E+02	4.33E+01 G
			300.03	8.917E+00	P	5.115E+01	1.69E+02	3.28E+00 GA
PB-214	N	4.9856E-01					5.84E+05	
			351.93	-1.759E-02	%(P	4.237E+00	6.91E+03	3.76E+01 G
			295.09	1.504E+00	?(	7.956E+00	1.56E+02	1.93E+01 G
			242.00	3.856E+00		1.769E+01	1.35E+02	7.43E+00 GA
BI-207	C	7.5523E-02					1.18E+04	
			1063.66	7.552E-02	%(P	1.978E+00	1.04E+03	7.45E+01 G
			569.70	0.000E+00	-	1.275E+00	1.00E+03	9.77E+01 G
U-235	N	-5.9763E-01					2.57E+11	
			143.79	-5.976E-01	?(P	7.331E+00	2.94E+02	1.10E+01 G
			205.33	1.285E-02	% P	1.136E+01	3.03E+04	5.01E+00 G
			163.38	-4.947E-01	& P	1.522E+01	8.43E+02	5.08E+00 G
			185.72	4.791E-01	* P	1.329E+00	9.87E+01	5.40E+01 GA
BI-214	N	4.0609E+00					5.84E+05	
			609.31	4.019E+00	(P	1.434E+00	1.90E+01	4.61E+01 G
			1120.29	9.629E+00	+ P	4.249E+00	2.50E+01	1.51E+01 G
			1764.49	4.187E+00	?(P	7.641E+00	5.96E+01	1.54E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:19:16 PMPage 13
TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-210M	T	4.4845E-01					1.10E+09	
			265.83	4.484E-01	?(	1.573E+00	1.03E+02	5.00E+01 G
			304.90	0.000E+00	-	6.306E+00	1.00E+03	2.80E+01 G
AC-228	N	3.6073E+00					2.10E+03	
			911.07	3.399E+00	?(P	3.449E+00	4.47E+01	2.90E+01 G
			968.97	3.953E+00	?(P	1.367E+01	1.01E+02	1.75E+01 G
			338.32	1.071E+00	- P	9.759E+00	2.61E+02	1.20E+01 G
			93.35	-1.978E+00	-	2.051E+01	3.05E+02	5.56E+00 XA
TH-227	N	1.5047E+00					7.95E+03	
			256.24	-9.680E-01	?(	1.266E+01	4.88E+02	7.00E+00 G
			235.97	1.851E+00	?(	1.067E+01	1.69E+02	1.23E+01 G
			50.14	3.135E+00	*(	1.018E+01	1.12E+02	8.00E+00 G
TH-229	N	-6.8183E+00					2.68E+06	
			193.51	-6.818E+00	?(P	1.909E+01	8.82E+01	4.40E+00 G
			210.85	6.561E+00	+ P	2.429E+01	1.34E+02	2.99E+00 G
TH-234	N	-3.0852E+00					1.63E+12	
			92.59	-3.085E+00	*(P	2.074E+01	1.94E+02	5.58E+00 G
			63.29	-3.096E+00	+ P	2.146E+01	2.22E+02	3.81E+00 G
PA-233	C	2.7702E-02					7.82E+08	
			312.01	2.770E-02	%(	4.979E+00	5.21E+03	3.60E+01 G
			300.18	0.000E+00	-	2.811E+01	1.00E+03	6.20E+00 G
PA-234	N	-7.0365E-01					1.63E+12	
			131.29	-7.036E-01	?(	4.537E+00	1.89E+02	1.80E+01 G
			946.02	-3.946E+00	+	1.136E+01	1.20E+02	1.34E+01 G
			569.47	2.007E-01	%	1.528E+01	2.07E+03	8.20E+00 G
			883.24	0.000E+00	+	1.456E+01	1.00E+03	9.60E+00 G
			880.53	1.559E+01	?	8.736E+00	2.76E+01	6.00E+00 GA
PA-234M	N	-7.9136E+00					1.63E+12	
			1001.00	-7.914E+00	%(P	1.897E+02	1.10E+03	8.37E-01 G
			766.41	-1.928E+02	& P	6.579E+02	5.29E+01	2.94E-01 G
AM-241	T	-2.0006E-01					1.58E+05	
			59.54	-2.001E-01	(P	2.376E+00	3.90E+02	3.59E+01 G
Np-237	F	1.7357E+00					2.14E+06	
			86.49	1.736E+00	?(	7.451E+00	1.27E+02	1.31E+01 G
Ir-192	F	4.4224E-01					7.40E+01	
			316.49	4.422E-01	?(	5.075E-01	3.99E+01	8.70E+01 G
			468.06	-2.701E-02	%	2.333E+00	2.38E+03	5.18E+01 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			308.44	0.000E+00	-	5.615E+00	1.00E+03	3.18E+01 G
Cs-136	F	2.1894E-01					1.30E+01	
			818.50	2.189E-01	?(	2.554E+00	3.34E+02	1.00E+02 G
			1048.07	0.000E+00	-	1.351E+00	1.00E+03	8.00E+01 G
			340.57	0.000E+00	-	2.600E+00	1.00E+03	4.69E+01 G
Np-239	T	6.5911E-01					2.36E+00	
			103.70	7.475E-02	%	2.929E+00	1.12E+03	2.40E+01 X
			106.13	6.591E-01	(	2.502E+00	1.11E+02	2.27E+01 G
			99.50	5.156E-02	%	4.564E+00	2.53E+03	1.50E+01 X
Nd-147		2.2061E+00					1.11E+01	
			531.00	2.206E+00	?(	5.694E+00	9.86E+01	1.30E+01 G
			91.10	6.659E-01	-	3.826E+00	1.70E+02	2.83E+01 G
TL-210	N	1.6365E-01					5.84E+05	
			799.60	0.000E+00	?(	1.526E+00	1.00E+03	9.90E+01 G
			296.00	3.687E-01	?(	2.026E+00	1.62E+02	7.90E+01 G
			1313.00	-5.212E+00	+	1.012E+01	8.80E+01	2.10E+01 GA
Kr-85	I	3.5139E+00					3.92E+03	
			513.98	3.514E+00	%(	4.048E+02	3.25E+03	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

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:19:16 PMPage 15
TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded

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	33.	9.	0.005	111.52	3.135E+00	
AM-241	59.54	60.	-3.	-0.002	390.19	-2.001E-01	P
TH-234	63.29	64.	-6.	-0.003	222.17	-3.096E+00	P
BA-133	80.99	53.	3.	0.001	491.17	1.310E-01	
EU-155	86.54	167.	12.	0.007	152.85	6.412E-01	
Cd-109	88.04	187.	12.	0.007	165.54	5.019E+00	
Nd-147	91.10	198.	12.	0.007	169.93	6.659E-01	
TH-234	92.59	231.	-11.	-0.006	194.48	-3.085E+00	P
Gd-153	97.50	78.	10.	0.005	135.01	4.918E-01	
EU-155	105.31	62.	10.	0.006	114.03	7.389E-01	P
Np-239	106.13	54.	10.	0.005	111.46	6.591E-01	
PA-234	131.29	110.	-8.	-0.004	188.75	-7.036E-01	
HF-181	133.02	138.	-13.	-0.007	128.48	-4.860E-01	
CE-144	133.54	151.	-13.	-0.007	140.75	-1.811E+00	
Tc-99m	140.51	86.	-7.	-0.004	182.95	-1.379E-01	
U-235	143.79	98.	-4.	-0.002	293.94	-5.976E-01	P
CE-141	145.44	141.	-14.	-0.008	124.76	-4.737E-01	
Ba-140	162.66	72.	-2.	-0.001	604.15	-5.739E-01	
U-235	163.38	75.	-1.	-0.001	842.58	-4.947E-01	P
CE-139	165.85	50.	9.	0.005	110.71	2.097E-01	
Cf-251	176.60	37.	-2.	-0.001	651.15	-1.831E-01	
U-235	185.72	54.	13.	0.007	98.71	4.791E-01	P
TH-229	193.51	70.	-15.	-0.008	88.19	-6.818E+00	P
TH-229	210.85	44.	9.	0.005	133.93	6.561E+00	P
Cf-251	227.00	53.	-13.	-0.007	100.42	-4.906E+00	
TH-227	235.97	127.	10.	0.005	169.41	1.851E+00	
PB-214	242.00	122.	12.	0.007	135.40	3.856E+00	
TH-227	256.24	48.	-3.	-0.001	488.22	-9.680E-01	
Cd-113m	263.70	59.	3.	0.002	329.55	1.446E+03	
BI-210M	265.83	34.	9.	0.005	102.66	4.484E-01	
Hg-203	279.20	58.	-10.	-0.006	111.69	-3.353E-01	
I-131	284.30	40.	-9.	-0.005	131.44	-4.210E+00	
PB-214	295.09	120.	10.	0.006	155.64	1.504E+00	
TL-210	296.00	130.	10.	0.006	161.72	3.687E-01	
Ir-192	316.49	6.	13.	0.007	39.88	4.422E-01	
La-140	328.76	37.	-2.	-0.001	684.11	-2.565E-01	
Cf-249	333.44	26.	-2.	-0.001	573.93	-3.397E-01	
HF-181	345.83	28.	5.	0.003	148.39	1.150E+00	
BA-133	356.00	106.	-4.	-0.002	399.90	-1.973E-01	
I-131	364.48	23.	-7.	-0.004	209.47	-2.761E-01	P
BA-133	383.84	19.	5.	0.003	120.00	2.185E+00	

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TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Cf-249	387.95	36.	2.	0.001	468.66	9.983E-02		
SN-113	391.69	34.	6.	0.003	139.34	3.483E-01		
SB-125	427.88	28.	-10.	-0.006	108.32	-1.314E+00		
AG-108M	433.94	40.	-13.	-0.007	106.85	-5.660E-01		P
PM-146	453.88	17.	4.	0.002	203.98	2.531E-01		P
SB-125	463.37	24.	2.	0.001	304.02	9.216E-01		P
BE-7	477.59	20.	2.	0.001	289.60	9.056E-01		P
HF-181	482.00	31.	-7.	-0.004	118.67	-3.736E-01		
La-140	487.02	8.	2.	0.001	341.70	1.603E-01		P
RU-103	497.05	8.	1.	0.000	683.12	4.011E-02		P
RH-106	511.86	27.	31.	0.017	29.37	7.077E+00		
Nd-147	531.00	8.	6.	0.003	98.56	2.206E+00		
Ba-140	537.26	12.	-2.	-0.001	258.13	-4.268E-01		P
CS-134	563.24	12.	-5.	-0.003	142.83	-2.930E+00		
CS-134	569.32	16.	-7.	-0.004	89.21	-2.247E+00		
SB-125	600.50	77.	6.	0.004	196.17	1.866E+00		
RH-106	621.92	13.	-2.	-0.001	374.72	-1.071E+00		
SB-125	635.89	15.	-2.	-0.001	414.32	-7.889E-01		P
I-131	636.97	7.	5.	0.003	90.77	3.536E+00		
AG-110M	657.76	14.	7.	0.004	87.08	3.943E-01		
PM-144	696.54	17.	-4.	-0.002	201.91	-2.558E-01		
NB-94	702.63	17.	-4.	-0.002	201.91	-2.606E-01		
SB-124	722.79	0.	6.	0.003	40.71	3.365E+00		
PM-146	735.72	5.	2.	0.001	189.82	6.572E-01		P
PM-146	747.16	13.	-3.	-0.002	142.17	-5.987E-01		P
ZR-95	756.73	9.	2.	0.001	265.73	2.684E-01		
AG-110M	763.94	0.	18.	0.010	23.57	5.101E+00		
PA-234M	766.41	36.	-9.	-0.005	52.89	-1.928E+02		P
BI-212	785.42	5.	5.	0.003	100.08	2.577E+01		
CS-134	795.87	17.	2.	0.001	337.28	1.364E-01		P
CS-134	801.95	38.	-10.	-0.006	57.97	-7.933E+00		P
CO-58	810.78	29.	-7.	-0.004	115.18	-4.671E-01		
La-140	815.77	48.	-12.	-0.006	89.24	-3.326E+00		
Cs-136	818.50	58.	3.	0.002	333.53	2.189E-01		
MN-54	834.85	9.	4.	0.002	184.30	2.494E-01		
Co-56	846.77	14.	1.	0.001	800.00	6.887E-02		
PA-234	880.53	0.	13.	0.007	27.58	1.559E+01		
Y-88	898.04	5.	5.	0.003	94.90	4.179E-01		
AG-110M	937.49	5.	1.	0.001	354.44	2.909E-01		
PA-234	946.02	14.	-7.	-0.004	119.52	-3.946E+00		
Co-56	1037.84	10.	3.	0.002	238.82	1.733E+00		
RH-106	1050.36	13.	-7.	-0.004	82.07	-3.701E+01		
Ga-68	1077.40	10.	-1.	-0.001	702.38	-2.990E+00		
FE-59	1099.25	5.	4.	0.002	138.66	5.829E-01		P
CO-60	1173.24	25.	-14.	-0.008	84.81	-1.239E+00		
Ta-182	1189.05	20.	-9.	-0.005	114.22	-5.085E+00		
Ta-182	1221.41	11.	-4.	-0.002	209.09	-1.271E+00		
Co-56	1238.28	6.	2.	0.001	252.07	3.155E-01		P

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TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
NA-22	1274.53	0.	7.	0.004	37.80	6.797E-01		
FE-59	1291.60	11.	-2.	-0.001	280.28	-4.554E-01		P
TL-210	1313.00	16.	-11.	-0.006	87.98	-5.212E+00		
CO-60	1332.50	0.	6.	0.003	40.82	6.046E-01		
AG-110M	1384.30	5.	3.	0.001	206.16	1.142E+00		
SB-124	1690.98	6.	-3.	-0.001	218.12	-6.873E-01		
Y-88	1836.06	6.	-2.	-0.001	144.45	-2.828E-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 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	9.0562E-01	9.0563E-01	2.896E+02%	9.50E+00
NA-22	#A	6.7971E-01	6.7971E-01	3.780E+01%	7.16E-01
K-40	#	5.8168E+01	5.8168E+01	1.418E+01%	1.23E+01
Sc-46	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.41E+00
CR-51	#A	-2.9795E-01	-2.9795E-01	1.765E+03%	9.66E+00
MN-54	#A	2.4943E-01	2.4943E-01	1.843E+02%	1.15E+00
FE-59	#A	5.8291E-01	5.8291E-01	1.387E+02%	2.02E+00
Co-56	#A	2.8988E-01	2.8989E-01	2.388E+02%	1.39E+00
CO-57	#A	0.0000E+00	0.0000E+00	7.071E+02%	7.80E-01
CO-58	#A	-4.6707E-01	-4.6707E-01	1.152E+02%	1.86E+00
CO-60	#A	6.0460E-01	6.0460E-01	4.082E+01%	7.43E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.42E+00
NB-94	#A	-2.6055E-01	-2.6055E-01	2.019E+02%	1.33E+00
ZR-95	#A	2.6837E-01	2.6837E-01	2.657E+02%	1.89E+00
NB-95	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.43E+00
RU-103	#A	4.0114E-02	4.0114E-02	6.831E+02%	7.77E-01
RH-106	#A	-1.0705E+00	-1.0705E+00	3.747E+02%	1.04E+01
AG-108M	#A	-5.6596E-01	-5.6596E-01	1.069E+02%	1.40E+00
AG-110M	#A	7.6012E-01	7.6012E-01	2.357E+01%	1.93E+00
SN-113	#A	3.4827E-01	3.4827E-01	1.393E+02%	1.68E+00
SB-124	#A	3.5923E-01	3.5923E-01	4.071E+01%	2.39E+00
SB-125	#A	7.0370E-02	7.0370E-02	1.083E+02%	3.60E+00
I-131	#A	3.1478E-02	3.1479E-02	9.077E+01%	1.04E+00
Gd-153	#A	4.9178E-01	4.9178E-01	1.350E+02%	2.26E+00
Ga-68	#A	-2.9660E+00	-2.9899E+00	7.024E+02%	5.22E+01
Tc-99m	#A	-1.3765E-01	-1.3786E-01	1.830E+02%	8.65E-01
BA-133	#A	-1.9727E-01	-1.9727E-01	3.999E+02%	2.72E+00
CS-134	#A	1.3644E-01	1.3644E-01	3.373E+02%	1.68E+00
CS-137	#A	-2.0197E-02	-2.0197E-02	2.577E+03%	1.89E+00
CE-139	#A	2.0972E-01	2.0972E-01	1.107E+02%	7.91E-01
Ba-140	#A	-4.2684E-01	-4.2685E-01	2.581E+02%	3.66E+00
La-140	#A	4.5334E-02	4.5335E-02	3.417E+02%	9.06E-01
CE-141	#A	-4.7365E-01	-4.7365E-01	1.248E+02%	1.99E+00

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:19:16 PMPage 18
TestAmerica Inc Spectrum name: 5_Gamma_20193041.An1

CE-144 #A	-1.8107E+00	-1.8107E+00	1.407E+02%		8.62E+00
PM-144 #A	-2.5579E-01	-2.5579E-01	2.019E+02%		1.31E+00
EU-152 #A	8.4697E-01	8.4697E-01	1.478E+02%		2.30E+00
EU-154 #C	2.0601E+00	2.0601E+00	2.774E+01%		1.50E+00
EU-155 #A	6.8112E-01	6.8113E-01	9.535E+01%		2.86E+00
HF-181 #A	-1.3329E-01	-1.3329E-01	9.500E+01%		1.53E+00
Ta-182 #A	0.0000E+00	0.0000E+00	1.000E+03%		5.47E+00
Hg-203 #A	-3.3527E-01	-3.3528E-01	1.117E+02%		1.27E+00
TL-208 #	1.6421E+00	1.6421E+00	3.637E+01%		1.13E+00
PM-146 #A	3.5698E-01	3.5698E-01	1.393E+02%		1.38E+00
Y-88 #A	5.7567E-02	5.7567E-02	8.642E+01%		1.90E+00
Cd-113m#A	1.4456E+03	1.4456E+03	3.295E+02%		1.67E+04
Cd-109 #A	5.0194E+00	5.0194E+00	1.655E+02%		2.81E+01
Cf-251 #A	-1.8309E-01	-1.8309E-01	6.512E+02%		3.40E+00
Cf-249 #A	9.9830E-02	9.9830E-02	4.687E+02%		1.67E+00
Sn-126 A	-2.6561E+00	-2.6561E+00	1.069E+02%		9.59E+00
PB-210 A	1.5434E+01	1.5434E+01	5.762E+01%		2.40E+01
PB-212 A	2.7414E-01	2.7414E-01	2.790E+02%		2.63E+00
PB-214 #A	4.9856E-01	4.9856E-01	1.556E+02%		4.24E+00
BI-207 #A	7.5523E-02	7.5523E-02	1.045E+03%		1.98E+00
BI-212 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.14E+01
U-235 #A	-5.9763E-01	-5.9763E-01	2.939E+02%		7.33E+00
BI-214 #	4.0609E+00	4.0609E+00	1.901E+01%		1.43E+00
BI-210M#A	4.4845E-01	4.4845E-01	1.027E+02%		1.57E+00
AC-228 #	3.6073E+00	3.6073E+00	4.472E+01%		3.45E+00
TH-227 #A	1.5047E+00	1.5047E+00	1.115E+02%		1.27E+01
TH-229 #A	-6.8183E+00	-6.8183E+00	8.819E+01%		1.91E+01
TH-234 #A	-3.0852E+00	-3.0852E+00	1.945E+02%		2.07E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%		6.09E+01
PA-233 #A	2.7702E-02	2.7702E-02	5.211E+03%		4.98E+00
PA-234 #A	-7.0365E-01	-7.0365E-01	1.887E+02%		4.54E+00
PA-234M#A	-7.9136E+00	-7.9136E+00	1.098E+03%		1.90E+02
AM-241 #A	-2.0006E-01	-2.0006E-01	3.902E+02%		2.38E+00
Np-237 #A	1.7357E+00	1.7357E+00	1.273E+02%		7.45E+00
Ir-192 #A	4.4223E-01	4.4224E-01	3.988E+01%		5.07E-01
Cs-136 #A	2.1893E-01	2.1894E-01	3.335E+02%		2.55E+00
Np-239 #A	6.5900E-01	6.5911E-01	1.115E+02%		2.50E+00
Nd-147 #A	2.2060E+00	2.2061E+00	9.856E+01%		5.69E+00
TL-210 #A	1.6365E-01	1.6365E-01	1.617E+02%		1.53E+00
Kr-85 #A	3.5139E+00	3.5139E+00	3.254E+03%		4.05E+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

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```
     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 10:19:16 PMPage 19
TestAmerica Inc                 Spectrum name: 5_Gamma_20193041.An1

-----------------------------   S U M M A R Y   ----------------------------
Total Activity (   37.6 to  2000.8 keV)     7.766E+01  Bq/Sample
Total Decayed Activity (   37.6 to  2000.8 keV) 7.7663223E+01  Bq/Sample
```

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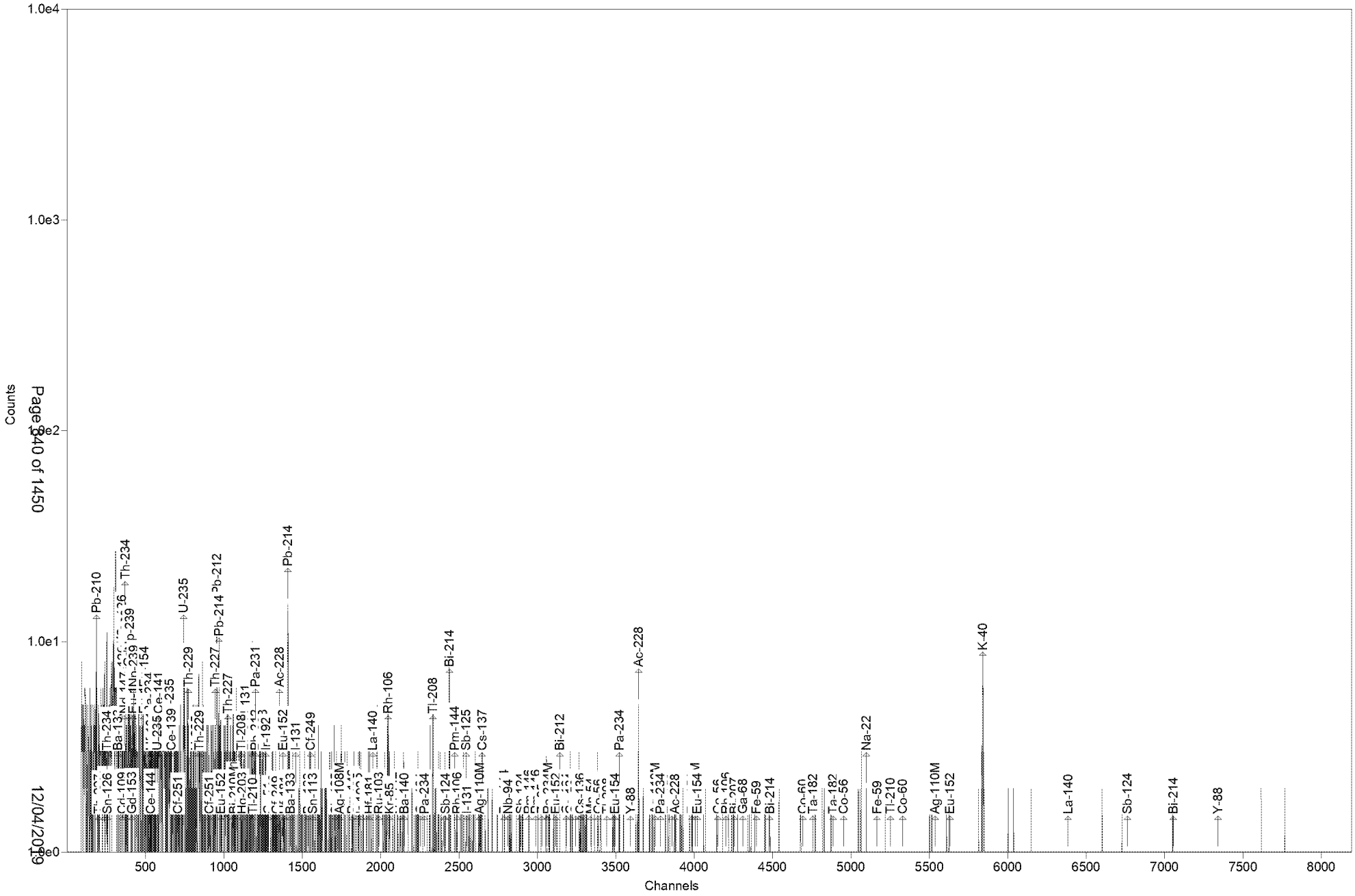
448571_Gamma_160-36160-A-8-C. 5_Gamma_20193041.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193496

Sample Description: 448571_Gamma_160-36160-A-9-C
Detector: Detector # 9
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-9-C

Decay to Time: 11/23/2019 22:21 Live Time: 1800 sec
Acquisition Time: 11/23/2019 22:22:02 Real Time: 1802 sec
Analysis Time: 11/23/2019 22:52 Dead Time: 0.09 %
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_2019-11-10_1422.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	-1.186E+00	246.0	2.916E+00	2.917E+00	1.008E+01
NA-22	4.086E-01	35.4	1.445E-01	1.459E-01	3.764E-01
K-40	7.752E+01	8.7	6.783E+00	7.858E+00	8.421E+00
Sc-46	1.282E-02	3263.4	4.183E-01	4.183E-01	1.481E+00
CR-51	1.698E+00	205.5	3.489E+00	3.490E+00	1.184E+01
MN-54	5.860E-01	50.1	2.938E-01	2.953E-01	6.390E-01
FE-59	-3.734E-02	160.1	5.979E-02	5.982E-02	1.946E+00
Co-56	3.003E-01	24.6	7.377E-02	7.537E-02	9.665E-01
CO-57	-2.086E-01	97.3	2.030E-01	2.033E-01	6.810E-01
CO-58	2.340E-01	120.6	2.823E-01	2.826E-01	9.774E-01
CO-60	-3.528E-01	171.9	6.064E-01	6.067E-01	1.317E+00
ZN-65	0.000E+00	1.#INF	2.222E-01	2.222E-01	2.986E+00
NB-94	2.117E-01	108.6	2.298E-01	2.300E-01	1.152E+00
ZR-95	7.988E-01	47.8	3.819E-01	3.841E-01	8.315E-01
NB-95	3.377E-01	89.7	3.031E-01	3.036E-01	1.027E+00
RU-103	1.605E-01	111.8	1.794E-01	1.796E-01	4.590E-01
RH-106	2.685E+00	92.2	2.475E+00	2.479E+00	8.399E+00
AG-108M	1.399E-01	97.6	1.366E-01	1.368E-01	7.101E-01
AG-110M	7.484E-02	354.7	2.655E-01	2.655E-01	2.018E+00
SN-113	-3.233E-01	134.9	4.362E-01	4.365E-01	1.485E+00
SB-124	1.093E-01	78.2	8.548E-02	8.566E-02	1.785E+00
SB-125	3.742E-02	76.1	2.846E-02	2.853E-02	2.138E+00
I-131	1.896E-01	147.1	2.789E-01	2.791E-01	5.202E-01
Gd-153	-6.925E-01	145.5	1.007E+00	1.008E+00	3.374E+00
Ga-68	9.001E+00	101.7	9.156E+00	9.170E+00	2.140E+01
Tc-99m	-2.521E-01	144.0	3.630E-01	3.633E-01	1.216E+00
BA-133	1.504E-01	159.7	2.402E-01	2.404E-01	1.868E+00
CS-134	-2.064E-01	194.9	4.023E-01	4.024E-01	1.402E+00
CS-137	-1.807E-01	141.2	2.553E-01	2.554E-01	1.476E+00
CE-139	-9.039E-02	235.6	2.130E-01	2.132E-01	7.313E-01
Ba-140	1.511E+00	72.6	1.097E+00	1.099E+00	1.829E+00
La-140	1.877E-01	144.6	2.714E-01	2.715E-01	4.733E-01
CE-141	1.086E-01	607.9	6.603E-01	6.603E-01	2.232E+00

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CE-144	-1.920E+00	144.3	2.769E+00	2.771E+00	9.276E+00
PM-144	-4.390E-01	52.4	2.301E-01	2.312E-01	1.063E+00
EU-152	8.715E-01	79.9	6.967E-01	6.982E-01	1.906E+00
EU-154	2.566E+00	18.3	4.685E-01	4.874E-01	1.380E+00
EU-155	-4.786E-01	318.9	1.526E+00	1.527E+00	5.138E+00
HF-181	-1.521E-01	79.7	1.212E-01	1.215E-01	1.388E+00
Ta-182	5.839E-01	89.9	5.250E-01	5.258E-01	4.370E+00
Hg-203	8.375E-02	265.9	2.227E-01	2.228E-01	7.754E-01
TL-208	1.298E+00	22.2	2.881E-01	2.958E-01	6.062E-01
PM-146	4.411E-01	89.8	3.963E-01	3.969E-01	7.915E-01
Y-88	1.048E-01	107.0	1.121E-01	1.123E-01	5.109E-01
Cd-113m	-9.730E+02	352.4	3.429E+03	3.430E+03	1.189E+04
Cd-109	5.536E-07	1597143466.8	8.841E+00	8.841E+00	2.992E+01
Cf-251	9.100E-01	97.9	8.911E-01	8.947E-01	2.321E+00
Cf-249	3.219E-01	101.7	3.274E-01	3.278E-01	1.112E+00
Sn-126	-5.028E-01	700.5	3.522E+00	3.523E+00	1.196E+01
PB-210	-3.889E+00	249.9	9.719E+00	9.722E+00	2.533E+01
PB-212	3.232E+00	12.8	4.126E-01	4.625E-01	8.942E-01
PB-214	4.472E+00	12.2	5.436E-01	5.912E-01	1.262E+00
BI-207	-1.833E-01	213.5	3.914E-01	3.915E-01	1.270E+00
BI-212	-3.221E-01	1409.2	4.540E+00	4.540E+00	1.433E+01
U-235	-2.018E+00	147.0	2.967E+00	2.969E+00	9.937E+00
BI-214	4.018E+00	15.5	6.245E-01	6.584E-01	1.215E+00
BI-210M	1.438E-01	116.9	1.682E-01	1.684E-01	1.477E+00
AC-228	4.816E+00	18.4	8.867E-01	9.201E-01	1.518E+00
TH-227	1.043E+00	89.6	9.340E-01	9.361E-01	8.657E+00
TH-229	-5.822E+00	101.6	5.914E+00	5.932E+00	1.452E+01
TH-234	-3.764E+00	149.6	5.630E+00	5.634E+00	1.886E+01
PA-231	-8.665E+00	162.3	1.407E+01	1.407E+01	4.738E+01
PA-233	5.685E-01	179.3	1.019E+00	1.020E+00	3.447E+00
PA-234	1.268E+00	84.6	1.072E+00	1.074E+00	4.021E+00
PA-234M	1.972E+01	128.8	2.541E+01	2.543E+01	1.422E+02
AM-241	-9.035E-01	113.6	1.026E+00	1.027E+00	3.434E+00
Np-237	-7.197E-01	352.1	2.534E+00	2.534E+00	8.539E+00
Ir-192	2.984E-01	100.3	2.992E-01	2.997E-01	1.478E+00
Cs-136	1.984E-01	138.1	2.741E-01	2.743E-01	1.113E+00
Np-239	-4.599E-02	3020.5	1.389E+00	1.389E+00	4.699E+00
Nd-147	-3.343E-01	575.3	1.924E+00	1.924E+00	4.895E+00
TL-210	0.000E+00	1.#INF	5.063E-02	5.063E-02	1.277E+00
Kr-85	0.000E+00	1.#INF	8.375E+00	8.375E+00	2.961E+02
Total	1.434E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 10:52:23 PMPage  1
TestAmerica Inc                 Spectrum name: 9_Gamma_20193496.An1

Sample description
     448571_Gamma_160-36160-A-9-C


Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193496.An1

Acquisition information
       Start time:                 11/23/2019 10:22:02 PM
       Live time:               1800
       Real time:               1802
       Dead time:                  0.09 %
       Detector ID:                    9

Detector system
     Ge9 S/N09363993


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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:23 PMPage 2
TestAmerica Inc Spectrum name: 9_Gamma_20193496.An1

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	11/23/2019 10:21:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-11-10_1422.PBC 11/10/2019 2:22:11 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.2201

***** 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
50.14	15.	119.27	1.00	2.900E-02	50.14	8.000	PBC<MDA	TH227
92.90	20.	58.15	1.03	5.171E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	3.767E+00	AC228
123.10	6.	280.07	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
131.29	14.	143.61	1.08	5.216E-02	131.29	18.000	PBC<MDA	PA234
133.02	14.	148.27	1.08	5.195E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	1.357E+00	CE144
145.44	5.	607.91	1.09	5.012E-02	145.44	48.200	PBC<MDA	CE141
162.66	13.	97.51	1.11	4.690E-02	162.66	6.220	PBC<MDA	Ba140
176.87	13.	97.92	1.12	4.549E-02	176.60	17.000	PBC<MDA	Cf251
185.72	39.	38.21	1.13	4.403E-02	185.72	54.000	9.035E-01	U235
210.85	2.	761.58	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
227.00	5.	316.44	1.17	3.858E-02	227.00	6.300	PBC<MDA	Cf251
235.81	11.	184.31	1.18	3.760E-02	235.97	12.300	PBC<MDA	TH227
238.53	94.	13.01	0.94	3.733E-02	238.63	43.300	3.220E+00	PB212
241.84	26.	33.80	1.18	3.697E-02	242.00	7.430	PBC<MDA	PB214
244.69	6.	374.32	1.18	3.670E-02	244.69	7.580	PBC<MDA	EU152
277.28	10.	94.87	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
279.20	4.	265.92	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
284.30	4.	244.95	1.22	3.315E-02	284.30	6.140	PBC<MDA	I131
295.08	49.	19.42	1.23	3.232E-02	295.09	19.300	4.404E+00	PB214
300.02	12.	41.29	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
					300.07	2.460	8.682E+00	PA231
					300.18	6.200	3.446E+00	PA233
302.85	11.	159.75	1.24	3.175E-02	302.65	2.880	6.914E+00	PA231
					302.85	18.330	1.087E+00	BA133
304.85	11.	164.92	1.24	3.160E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	7.158E-01	BI210M
304.90	11.	170.15	1.24	3.160E-02	304.85	4.290	4.672E+00	Ba140
					304.90	28.000	7.158E-01	BI210M
308.44	11.	174.79	1.24	3.135E-02	308.44	31.750	PBC<MDA	Ir192
312.01	11.	179.28	1.25	3.110E-02	312.01	36.000	PBC<MDA	PA233
316.49	4.	487.60	1.25	3.080E-02	316.49	87.040	PBC<MDA	Ir192
320.08	9.	205.48	1.25	3.056E-02	320.08	9.940	PBC<MDA	CR51
328.76	12.	144.60	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
337.33	12.	132.44	1.27	2.940E-02	338.32	12.010	PBC<MDA	AC228
340.57	13.	138.14	1.27	2.927E-02	340.57	46.900	PBC<MDA	Cs136
344.29	13.	143.44	1.28	2.905E-02	344.29	26.500	PBC<MDA	EU152
345.83	11.	128.85	1.28	2.896E-02	345.83	15.070	PBC<MDA	HF181
351.71	87.	14.62	1.43	2.860E-02	351.93	37.600	4.507E+00	PB214
364.48	5.	162.89	1.29	2.791E-02	364.48	81.700	PBC<MDA	I131
383.84	7.	173.45	1.31	2.691E-02	383.84	8.940	PBC<MDA	BA133
387.95	10.	101.70	1.31	2.671E-02	387.95	66.000	PBC<MDA	Cf249
453.88	9.	103.77	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
468.06	10.	100.27	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
497.05	6.	111.80	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	75.	15.26	2.67	2.188E-02	511.86	20.000	9.520E+00	RH106
537.26	6.	103.44	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
582.71	41.	22.19	0.69	1.989E-02	583.02	84.500	1.347E+00	TL208
609.40	64.	15.54	0.76	1.925E-02	609.31	46.090	4.018E+00	BI214
621.92	9.	92.18	1.51	1.896E-02	621.92	9.930	PBC<MDA	RH106
635.89	8.	86.92	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
702.63	10.	108.56	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
722.79	10.	78.20	1.60	1.693E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.476E-01	AG108M
					723.36	20.220	1.562E+00	EU154
722.94	9.	97.63	1.60	1.693E-02	722.79	10.810	2.694E+00	SB124
					722.94	90.840	3.207E-01	AG108M
					723.36	20.220	1.441E+00	EU154
735.72	6.	121.84	1.61	1.671E-02	735.72	22.500	PBC<MDA	PM146
747.16	4.	216.89	1.62	1.651E-02	747.16	34.000	PBC<MDA	PM146
756.73	13.	47.80	1.62	1.635E-02	756.73	54.460	PBC<MDA	ZR95
765.79	10.	89.74	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.147E+02	PA234M
766.41	7.	128.82	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	7.587E+01	PA234M
778.92	6.	95.70	1.64	1.600E-02	778.92	12.940	PBC<MDA	EU152
785.42	3.	276.01	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
810.78	6.	120.65	1.67	1.551E-02	810.78	99.460	PBC<MDA	CO58
818.50	2.	575.42	1.67	1.540E-02	818.50	100.000	PBC<MDA	Cs136

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
834.85	16.	50.13	1.69	1.517E-02	834.85	99.980	PBC<MDA	MN54
858.87	3.	275.99	1.71	1.482E-02	860.56	12.420	PBC<MDA	TL208
871.10	3.	213.44	1.71	1.468E-02	871.10	99.890	PBC<MDA	NB94
898.04	5.	106.97	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88
911.51	36.	18.41	0.35	1.418E-02	911.07	29.000	4.816E+00	AC228
937.49	2.	354.73	1.77	1.387E-02	937.49	34.360	PBC<MDA	AG110M
946.02	6.	89.35	1.77	1.377E-02	946.02	13.400	PBC<MDA	PA234
964.11	9.	97.35	1.79	1.357E-02	964.11	14.605	PBC<MDA	EU152
968.72	9.	88.76	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.33	30.	18.26	1.81	1.323E-02	996.33	10.600	1.189E+01	EU154
1077.40	6.	101.72	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1112.07	4.	205.98	1.89	1.213E-02	1112.07	13.644	PBC<MDA	EU152
1121.31	1.	801.57	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	PBC<MDA	Ta182
1173.24	2.	237.17	1.94	1.163E-02	1173.24	99.900	PBC<MDA	CO60
1221.41	7.	89.90	1.97	1.126E-02	1221.41	27.000	PBC<MDA	Ta182
1238.28	18.	24.57	1.98	1.114E-02	1238.28	66.070	1.324E+00	Co56
1274.53	8.	35.36	2.01	1.088E-02	1274.53	99.940	4.086E-01	NA22
					1274.54	35.190	1.160E+00	EU154
1291.60	4.	248.90	2.02	1.077E-02	1291.60	43.200	PBC<MDA	FE59
1408.00	1.	427.57	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.71	145.	8.75	1.42	9.749E-03	1460.83	10.670	7.752E+01	K40
1764.58	-4.	156.27	2.31	8.350E-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	185.80	46.54	103.	-8.	-0.004	249.88	0.998s
TH-227	200.20	50.14	146.	15.	0.008	119.27	1.001
AM-241	237.77	59.54	284.	-21.	-0.012	113.58	1.010s
TH-234	252.77	63.29	250.	-18.	-0.010	127.69	1.014s
Sn-126	256.74	64.28	299.	-4.	-0.002	700.53	1.015s
BA-133	323.56	80.99	103.	-19.	-0.011	102.57	1.031s
Np-237	345.55	86.49	444.	-8.	-0.005	352.06	1.036s
EU-155	345.76	86.54	435.	0.	0.000	1000.00	1.036s
Sn-126	347.35	86.94	453.	-18.	-0.010	165.50	1.037s
Sn-126	349.87	87.57	449.	-15.	-0.008	206.58	1.037s
TH-234	369.94	92.59	416.	-20.	-0.011	149.58	1.042
AC-228	371.20	92.90	38.	20.	0.011	58.15	1.034
Gd-153	389.58	97.50	396.	-20.	-0.011	145.46	1.047s
Np-239	397.58	99.50	416.	-20.	-0.011	148.66	1.049

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Gd-153	412.37	103.20	436.	-20.	-0.011	151.57	1.052s
Np-239	414.37	103.70	455.	-20.	-0.011	154.81	1.053s
EU-155	420.82	105.31	475.	-10.	-0.005	318.95	1.054s
EU-152	486.67	121.78	112.	-17.	-0.009	91.11	1.070s
CO-57	487.80	122.06	129.	-17.	-0.009	97.31	1.070s
EU-154	491.95	123.10	120.	6.	0.003	280.07	1.071s
PA-234	524.72	131.29	196.	14.	0.008	143.61	1.079s
HF-181	531.64	133.02	210.	14.	0.008	148.27	1.081s
CE-144	533.69	133.54	401.	-20.	-0.011	144.27	1.081s
HF-181	544.74	136.30	382.	-20.	-0.011	140.40	1.084s
CO-57	545.43	136.47	385.	-20.	-0.011	141.03	1.084s
Tc-99m	561.57	140.51	405.	-20.	-0.011	144.02	1.088s
U-235	574.67	143.79	425.	-20.	-0.011	147.04	1.091s
CE-141	581.29	145.44	410.	5.	0.003	607.91	1.092
Ba-140	650.15	162.66	78.	13.	0.007	97.51	1.108s
U-235	653.03	163.38	97.	-16.	-0.009	88.83	1.109s
CE-139	662.92	165.85	102.	-6.	-0.003	235.65	1.111s
Cf-251	705.90	176.60	40.	13.	0.007	97.92	1.122s
U-235	742.37	185.72	51.	39.	0.021	38.21	1.130s
TH-229	773.52	193.51	100.	-20.	-0.011	101.57	1.137
U-235	820.80	205.33	80.	-18.	-0.010	100.92	1.148s
TH-229	842.87	210.85	60.	2.	0.001	761.58	1.153s
Cf-251	907.45	227.00	64.	5.	0.003	316.44	1.168
TH-227	943.33	235.97	193.	11.	0.006	184.31	1.176
PB-212	953.97	238.63	25.	94.	0.052	12.77	1.179D
PB-214	967.43	242.00	25.	26.	0.014	33.80	1.182D
EU-152	978.21	244.69	230.	6.	0.003	374.32	1.185s
TH-227	1024.39	256.24	60.	-10.	-0.006	154.92	1.195s
Cd-113m	1054.23	263.70	82.	-4.	-0.002	352.44	1.202s
BI-210M	1062.75	265.83	87.	-6.	-0.003	160.49	1.204s
TL-208	1108.55	277.28	40.	10.	0.006	94.87	1.215
Hg-203	1116.22	279.20	58.	4.	0.002	265.92	1.216s
I-131	1136.61	284.30	24.	4.	0.002	244.95	1.221s
PB-214	1179.77	295.09	21.	49.	0.027	19.42	1.231D
TL-210	1183.41	296.00	304.	-14.	-0.008	175.64	1.231s
PB-212	1199.52	300.03	7.	12.	0.007	41.29	1.235D
PA-231	1199.68	300.07	290.	-14.	-0.008	171.05	1.235
PA-233	1200.12	300.18	275.	-14.	-0.008	166.90	1.235
PA-231	1210.00	302.65	261.	-14.	-0.008	162.34	1.237s
BA-133	1210.81	302.85	160.	11.	0.006	159.75	1.238s
Ba-140	1218.80	304.85	171.	11.	0.006	164.92	1.240s
BI-210M	1218.99	304.90	182.	11.	0.006	170.15	1.240s
Ir-192	1233.16	308.44	194.	11.	0.006	174.79	1.243s
PA-233	1247.44	312.01	205.	11.	0.006	179.28	1.246s
Ir-192	1265.35	316.49	217.	4.	0.002	487.60	1.250s
CR-51	1279.73	320.08	177.	9.	0.005	205.48	1.253s
La-140	1314.43	328.76	154.	12.	0.007	144.60	1.261s
AC-228	1352.66	338.32	130.	12.	0.007	132.44	1.270s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cs-136	1361.66	340.57	143.	13.	0.007	138.14	1.272s
EU-152	1376.53	344.29	155.	13.	0.007	143.44	1.275s
HF-181	1382.70	345.83	93.	11.	0.006	128.85	1.276s
PB-214	1406.21	351.71	22.	87.	0.048	14.62	1.425
BA-133	1423.37	356.00	147.	-4.	-0.002	431.57	1.285s
I-131	1457.31	364.48	16.	5.	0.003	162.89	1.293s
BA-133	1534.73	383.84	69.	7.	0.004	173.45	1.310s
Cf-249	1551.17	387.95	49.	10.	0.006	101.70	1.314s
SN-113	1566.12	391.69	84.	-10.	-0.005	134.90	1.317s
SB-125	1710.86	427.88	30.	-9.	-0.005	124.82	1.349s
AG-108M	1735.10	433.94	31.	-2.	-0.001	723.50	1.354s
PM-146	1814.87	453.88	17.	9.	0.005	103.77	1.372
SB-125	1852.82	463.37	49.	-12.	-0.007	98.54	1.380s
Ir-192	1871.59	468.06	42.	10.	0.005	100.27	1.384s
BE-7	1909.73	477.60	78.	-5.	-0.003	245.97	1.392s
HF-181	1927.34	482.00	86.	-15.	-0.008	93.89	1.396s
La-140	1947.43	487.02	114.	-8.	-0.004	197.75	1.400s
RU-103	1987.56	497.05	9.	6.	0.003	111.80	1.409s
RH-106	2046.81	511.86	28.	75.	0.042	15.26	2.672
Kr-85	2055.27	513.98	103.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	22.	-2.	-0.001	575.33	1.438s
Ba-140	2148.39	537.26	9.	6.	0.004	103.44	1.444s
CS-134	2252.30	563.24	37.	-8.	-0.005	159.35	1.466s
CS-134	2276.64	569.32	28.	-3.	-0.002	256.04	1.471s
PA-234	2277.24	569.47	31.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	42.	-9.	-0.005	110.67	1.471s
TL-208	2330.19	582.71	11.	41.	0.023	22.19	0.695s
SB-125	2401.36	600.50	170.	-12.	-0.006	160.90	1.497s
SB-124	2410.29	602.73	158.	-7.	-0.004	261.73	1.499s
CS-134	2418.21	604.71	151.	0.	0.000	1000.00	1.500s
BI-214	2436.97	609.40	13.	64.	0.036	15.54	0.763s
PM-144	2471.62	618.06	33.	-9.	-0.005	96.22	1.512
RH-106	2487.04	621.92	31.	9.	0.005	92.18	1.515s
SB-125	2542.94	635.89	18.	8.	0.004	86.92	1.526s
AG-110M	2630.43	657.76	60.	-15.	-0.008	76.55	1.544s
CS-137	2646.03	661.66	67.	-5.	-0.003	141.24	1.548s
PM-144	2785.58	696.54	42.	-14.	-0.008	52.42	1.576s
NB-94	2809.93	702.63	48.	10.	0.005	108.56	1.581s
SB-124	2890.57	722.79	24.	10.	0.005	78.20	1.598s
AG-108M	2891.17	722.94	33.	9.	0.005	97.63	1.598s
EU-154	2892.86	723.36	56.	-12.	-0.007	89.77	1.598s
ZR-95	2896.22	724.20	44.	-3.	-0.001	367.91	1.599s
PM-146	2942.31	735.72	9.	6.	0.003	121.84	1.608s
PM-146	2988.08	747.16	19.	4.	0.002	216.89	1.617s
ZR-95	3026.36	756.73	5.	13.	0.007	47.80	1.625s
AG-110M	3055.23	763.94	42.	-15.	-0.008	66.33	1.631s
NB-95	3062.61	765.79	34.	10.	0.005	89.74	1.632s
PA-234M	3065.10	766.41	32.	7.	0.004	128.82	1.633s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	3115.14	778.92	5.	6.	0.003	95.70	1.643s
BI-212	3141.15	785.42	24.	3.	0.001	276.01	1.648s
CS-134	3182.96	795.87	45.	-5.	-0.003	194.94	1.656s
TL-210	3197.88	799.60	50.	0.	0.000	1000.00	1.659s
CS-134	3207.29	801.95	59.	-8.	-0.004	140.31	1.661s
CO-58	3242.59	810.78	28.	6.	0.004	120.65	1.668s
La-140	3262.58	815.77	34.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	36.	2.	0.001	575.42	1.674
MN-54	3338.91	834.85	10.	16.	0.009	50.13	1.687s
Co-56	3386.61	846.77	25.	-10.	-0.006	71.04	1.696s
TL-208	3441.80	860.56	16.	3.	0.002	275.99	1.707s
NB-94	3483.94	871.10	19.	3.	0.002	213.44	1.715s
EU-154	3492.47	873.23	36.	-14.	-0.008	65.76	1.717s
PA-234	3521.68	880.53	43.	-12.	-0.007	82.35	1.722s
PA-234	3532.53	883.24	55.	-4.	-0.002	288.22	1.724s
AG-110M	3538.30	884.68	58.	0.	0.000	1000.00	1.725s
Y-88	3591.74	898.04	6.	5.	0.003	106.97	1.736s
AC-228	3645.66	911.51	3.	36.	0.020	18.41	0.348s
AG-110M	3749.60	937.49	10.	2.	0.001	354.73	1.766s
PA-234	3783.72	946.02	5.	6.	0.003	89.35	1.772s
EU-152	3856.11	964.11	32.	9.	0.005	97.35	1.786s
AC-228	3875.56	968.97	26.	9.	0.005	88.76	1.790s
EU-154	3985.03	996.33	0.	30.	0.017	18.26	1.810s
PA-234M	4003.71	1001.00	30.	0.	0.000	1000.00	1.814s
EU-154	4018.82	1004.77	41.	-6.	-0.004	148.77	1.816s
Co-56	4151.13	1037.84	27.	-14.	-0.008	86.15	1.841s
Cs-136	4192.07	1048.07	16.	-9.	-0.005	71.15	1.848s
RH-106	4201.23	1050.36	30.	-2.	-0.001	313.69	1.850s
BI-207	4254.46	1063.66	16.	-3.	-0.002	213.50	1.860s
Ga-68	4309.44	1077.40	5.	6.	0.003	101.72	1.870s
FE-59	4396.88	1099.25	21.	-5.	-0.003	201.56	1.886s
EU-152	4448.20	1112.07	38.	4.	0.002	205.98	1.895s
ZN-65	4462.09	1115.55	42.	0.	0.000	1000.00	1.897s
BI-214	4481.06	1120.29	41.	1.	0.001	801.57	1.901s
Sc-46	4482.12	1120.55	42.	0.	0.000	1000.00	1.901s
CO-60	4692.96	1173.24	6.	2.	0.001	237.17	1.938s
Ta-182	4756.25	1189.05	11.	-1.	-0.001	598.44	1.949s
Ta-182	4885.75	1221.41	6.	7.	0.004	89.90	1.972s
Co-56	4953.27	1238.28	0.	18.	0.010	24.57	1.984s
NA-22	5098.35	1274.53	0.	8.	0.004	35.36	2.008s
EU-154	5098.39	1274.54	8.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	17.	4.	0.002	248.90	2.020s
TL-210	5252.32	1313.00	17.	-7.	-0.004	143.21	2.034s
CO-60	5330.37	1332.50	23.	-7.	-0.004	171.90	2.047s
AG-110M	5537.69	1384.30	11.	-3.	-0.002	243.10	2.082s
EU-152	5632.56	1408.00	6.	1.	0.001	427.57	2.097s
K-40	5843.55	1460.71	8.	145.	0.081	8.75	1.421s
SB-124	6765.35	1690.98	6.	-2.	-0.001	275.72	2.272s

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:23 PMPage 8
TestAmerica Inc Spectrum name: 9_Gamma_20193496.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-214	7059.65	1764.49	21.	-4.	-0.002	156.27	2.314s
Co-56	7087.11	1771.35	0.	0.	0.000	1000.00	2.318s
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	Peak Code	Peak MDA Value Bq/Sample		COMMENTS
BE-7	C	-1.1856E+00					5.31E+01	
			477.60	-1.186E+00	?(	1.008E+01	2.46E+02	1.05E+01 G
NA-22	C	4.0861E-01					9.50E+02	
			1274.53	4.086E-01	?(	3.764E-01	3.54E+01	9.99E+01 G
K-40	N	7.7524E+01					4.66E+11	
			1460.83	7.752E+01	(P	8.421E+00	8.75E+00	1.07E+01 G
Sc-46	F	1.2818E-02					8.38E+01	
			889.28	1.282E-02	%(	1.481E+00	3.26E+03	1.00E+02 G
			1120.55	0.000E+00	&	1.516E+00	1.00E+03	1.00E+02 G
CR-51	F	1.6981E+00					2.77E+01	
			320.08	1.698E+00	&(P	1.184E+01	2.05E+02	9.94E+00 G
MN-54	C	5.8605E-01					3.12E+02	
			834.85	5.860E-01	&(	6.390E-01	5.01E+01	1.00E+02 G
FE-59	F	-3.7335E-02					4.45E+01	
			1099.25	-4.283E-01	?(	1.946E+00	2.02E+02	5.65E+01 G
			1291.60	4.740E-01	?(P	2.620E+00	2.49E+02	4.32E+01 G
Co-56	C	3.0027E-01					7.73E+01	
			846.77	-3.768E-01	?(P	9.665E-01	7.10E+01	9.99E+01 G
			1238.28	1.324E+00	&(P	5.564E-01	2.46E+01	6.61E+01 G
			1037.84	-4.394E+00	+	8.217E+00	8.61E+01	1.41E+01 G
			1771.35	0.000E+00	-	3.178E+00	1.00E+03	1.55E+01 A
CO-57	C	-2.0860E-01					2.72E+02	
			122.06	-2.086E-01	&(	6.810E-01	9.73E+01	8.56E+01 G
			136.47	-2.013E+00	&	9.510E+00	1.41E+02	1.07E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:23 PMPage 9
TestAmerica Inc Spectrum name: 9_Gamma_20193496.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-58	C	2.3402E-01					7.09E+01	
			810.78	2.340E-01	?(	9.774E-01	1.21E+02	9.95E+01 G
CO-60	F	-3.5276E-01					1.93E+03	
			1332.50	-3.528E-01	?(	1.317E+00	1.72E+02	1.00E+02 G
			1173.24	1.117E-01	+ P	6.601E-01	2.37E+02	9.99E+01 G
NB-94	I	2.1167E-01					7.41E+06	
			702.63	3.117E-01	?(P	1.152E+00	1.09E+02	9.79E+01 G
			871.10	1.136E-01	?(	8.721E-01	2.13E+02	9.99E+01 G
ZR-95	I	7.9883E-01					6.40E+01	
			756.73	7.988E-01	?(P	8.315E-01	4.78E+01	5.45E+01 G
			724.20	-1.916E-01	-	2.491E+00	3.68E+02	4.42E+01 G
NB-95	I	3.3771E-01					6.40E+01	
			765.79	3.377E-01	&(	1.027E+00	8.97E+01	9.98E+01 G
RU-103	I	1.6050E-01					3.93E+01	
			497.05	1.605E-01	?(P	4.590E-01	1.12E+02	9.09E+01 G
			610.30	-1.917E-06	%	3.014E+01	4.56E+08	5.75E+00 GA
RH-106	I	2.6850E+00					3.74E+02	
			621.92	2.685E+00	?(P	8.399E+00	9.22E+01	9.93E+00 G
			1050.36	-7.016E+00	+	7.863E+01	3.14E+02	1.56E+00 G
			511.86	9.520E+00	?	3.474E+00	1.53E+01	2.00E+01 GA
AG-108M	C	1.3988E-01					1.53E+05	
			433.94	-4.165E-02	?(P	7.101E-01	7.23E+02	9.05E+01 G
			722.94	3.207E-01	?(	1.067E+00	9.76E+01	9.08E+01 G
			614.28	3.699E-07	%	1.938E+00	1.52E+08	8.98E+01 G
AG-110M	F	7.4840E-02					2.50E+02	
			884.68	0.000E+00	?(	2.018E+00	1.00E+03	7.27E+01 G
			657.76	-4.905E-01	+	1.253E+00	7.66E+01	9.46E+01 G
			937.49	2.331E-01	?(	2.034E+00	3.55E+02	3.44E+01 G
			1384.30	-7.487E-01	+	4.132E+00	2.43E+02	2.43E+01 G
			763.94	-2.304E+00	+	5.054E+00	6.63E+01	2.23E+01 G
SN-113	F	-3.2331E-01					1.15E+02	
			391.69	-3.233E-01	?(	1.485E+00	1.35E+02	6.40E+01 G
SB-124	F	1.0930E-01					6.02E+01	
			602.73	-2.000E-01	?(	1.785E+00	2.62E+02	9.83E+01 G
			1690.98	-3.136E-01	+	1.941E+00	2.76E+02	4.78E+01 G
			722.79	2.920E+00	?(	7.679E+00	7.82E+01	1.08E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:23 PMPage 10
TestAmerica Inc Spectrum name: 9_Gamma_20193496.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	3.7424E-02					1.01E+03	
			427.88	-7.033E-01	&(	2.138E+00	1.25E+02	2.96E+01 G
			600.50	-1.861E+00	+	1.013E+01	1.61E+02	1.79E+01 G
			635.89	1.976E+00	?(	5.850E+00	8.69E+01	1.13E+01 G
			463.37	-2.786E+00	+ P	7.939E+00	9.85E+01	1.05E+01 G
I-131	I	1.8963E-01					8.02E+00	
			364.48	1.218E-01	?(	5.202E-01	1.63E+02	8.17E+01 G
			284.30	1.092E+00	?(	6.971E+00	2.45E+02	6.14E+00 G
			636.97	5.722E-03	% P	1.062E+01	5.05E+04	7.17E+00 G
Gd-153	F	-6.9247E-01					2.42E+02	
			97.50	-6.925E-01	?(	3.374E+00	1.45E+02	3.00E+01 G
			103.20	-9.463E-01	+	4.804E+00	1.52E+02	2.18E+01 G
Ga-68	C	9.0012E+00					4.71E-02	
			1077.40	9.001E+00	?(	2.140E+01	1.02E+02	3.30E+00 G
Tc-99m	I	-2.5207E-01					2.51E-01	
			140.51	-2.521E-01	?(	1.216E+00	1.44E+02	8.93E+01 G
BA-133	F	1.5039E-01					3.85E+03	
			356.00	-1.262E-01	?(	1.868E+00	4.32E+02	6.20E+01 G
			302.85	1.087E+00	(	5.880E+00	1.60E+02	1.83E+01 G
			383.84	1.605E+00	? P	9.568E+00	1.73E+02	8.94E+00 GA
			80.99	-6.404E-01	+	1.686E+00	1.03E+02	3.41E+01 GA
CS-134	I	-2.0638E-01					7.54E+02	
			795.87	-2.064E-01	&(	1.402E+00	1.95E+02	8.55E+01 G
			604.71	0.000E+00	+	1.763E+00	1.00E+03	9.76E+01 G
			569.32	-5.354E-01	+	4.884E+00	2.56E+02	1.54E+01 G
			801.95	-3.269E+00	+	1.573E+01	1.40E+02	8.69E+00 G
			563.24	-2.718E+00	+	1.017E+01	1.59E+02	8.35E+00 G
CS-137	I	-1.8073E-01					1.10E+04	
			661.66	-1.807E-01	?(P	1.476E+00	1.41E+02	8.52E+01 G
CE-139	F	-9.0393E-02					1.38E+02	
			165.85	-9.039E-02	?(	7.313E-01	2.36E+02	7.99E+01 G
Ba-140	I	1.5109E+00					1.28E+01	
			537.26	6.922E-01	?(P	1.829E+00	1.03E+02	2.44E+01 G
			162.66	2.542E+00	?(	8.354E+00	9.75E+01	6.22E+00 G
			304.85	4.672E+00	?(	2.608E+01	1.65E+02	4.29E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:23 PMPage 11
TestAmerica Inc Spectrum name: 9_Gamma_20193496.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
La-140	I	1.8765E-01					1.28E+01	
			1596.21	-1.313E-02	%(P	4.733E-01	6.22E+03	9.54E+01 G
			487.02	-4.183E-01	+	2.826E+00	1.98E+02	4.55E+01 G
			328.76	1.131E+00	?(	5.532E+00	1.45E+02	2.03E+01 G
			815.77	0.000E+00	-	4.618E+00	1.00E+03	2.33E+01 G
CE-141	I	1.0861E-01					3.25E+01	
			145.44	1.086E-01	(	2.232E+00	6.08E+02	4.82E+01 G
CE-144	I	-1.9195E+00					2.85E+02	
			133.54	-1.920E+00	?(	9.276E+00	1.44E+02	1.11E+01 G
PM-144	C	-4.3900E-01					3.63E+02	
			696.54	-4.390E-01	?(P	1.063E+00	5.24E+01	9.90E+01 G
			618.06	-2.649E-01	+	8.678E-01	9.62E+01	9.91E+01 G
EU-152	F	8.7149E-01					4.94E+03	
			121.78	-6.244E-01	?(	1.906E+00	9.11E+01	2.86E+01 G
			344.29	9.049E-01	?(	4.389E+00	1.43E+02	2.65E+01 G
			1112.07	1.454E+00	?(	1.051E+01	2.06E+02	1.36E+01 G
			778.92	1.533E+00	?(	3.524E+00	9.57E+01	1.29E+01 G
			964.11	2.462E+00	?(	8.168E+00	9.73E+01	1.46E+01 G
			244.69	1.152E+00	?(	1.466E+01	3.74E+02	7.58E+00 G
			1408.00	3.511E-01	?	3.635E+00	4.28E+02	2.10E+01 GA
EU-154	I	2.5660E+00					3.14E+03	
			123.10	1.437E-01	(	1.380E+00	2.80E+02	4.08E+01 G
			1274.54	0.000E+00	-	2.305E+00	1.00E+03	3.52E+01 G
			723.36	-2.017E+00	+	6.102E+00	8.98E+01	2.02E+01 G
			873.23	-4.191E+00	+ P	9.424E+00	6.58E+01	1.23E+01 G
			1004.77	-1.483E+00	+	7.641E+00	1.49E+02	1.80E+01 G
			996.33	1.189E+01	?(	2.920E+00	1.83E+01	1.06E+01 G
EU-155	I	-4.7859E-01					1.81E+03	
			105.31	-4.786E-01	(	5.138E+00	3.19E+02	2.12E+01 G
			86.54	0.000E+00	+	3.609E+00	1.00E+03	3.07E+01 G
HF-181	F	-1.5205E-01					4.24E+01	
			482.00	-4.396E-01	?(	1.388E+00	9.39E+01	8.05E+01 G
			133.02	3.471E-01	+	1.735E+00	1.48E+02	4.33E+01 G
			345.83	1.384E+00	&(	6.055E+00	1.29E+02	1.51E+01 G
			136.30	-3.674E+00	&	1.728E+01	1.40E+02	5.85E+00 G
Ta-182	F	5.8394E-01					1.14E+02	
			1121.30	6.604E-02	%(	4.370E+00	1.85E+03	3.49E+01 G
			1221.41	1.253E+00	&(	2.522E+00	8.99E+01	2.70E+01 G
			1189.05	-3.975E-01	+	5.484E+00	5.98E+02	1.62E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:23 PMPage 12
TestAmerica Inc Spectrum name: 9_Gamma_20193496.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Hg-203	F	8.3749E-02					4.66E+01	
			279.20	8.375E-02	?(P	7.754E-01	2.66E+02	8.15E+01 G
TL-208	N	1.2980E+00					6.98E+02	
			583.02	1.347E+00	(P	6.062E-01	2.22E+01	8.45E+01 G
			277.28	2.611E+00	+	8.402E+00	9.49E+01	6.31E+00 G
			860.56	9.627E-01	&(P	6.410E+00	2.76E+02	1.24E+01 G
PM-146	C	4.4106E-01					2.02E+03	
			453.88	3.102E-01	?(	7.915E-01	1.04E+02	6.50E+01 G
			747.16	4.288E-01	?(	2.260E+00	2.17E+02	3.40E+01 G
			735.72	8.375E-01	?(	2.505E+00	1.22E+02	2.25E+01 G
Y-88	F	1.0484E-01					1.07E+02	
			1836.06	0.000E+00	?(	5.109E-01	1.00E+03	9.92E+01 G
			898.04	2.158E-01	&(P	5.767E-01	1.07E+02	9.37E+01 G
Cd-113m		-9.7301E+02					5.33E+03	
			263.70	-9.730E+02	(	1.189E+04	3.52E+02	6.00E-03 K
Cd-109	F	5.5357E-07					4.53E+02	
			88.04	5.536E-07	%(	2.992E+01	1.60E+09	3.79E+00 G
Cf-251	T	9.1003E-01					3.28E+05	
			176.60	9.100E-01	?(	2.321E+00	9.79E+01	1.70E+01 G
			227.00	1.143E+00		9.139E+00	3.16E+02	6.30E+00 GA
Cf-249	T	3.2189E-01					1.28E+05	
			387.95	3.219E-01	?(	1.112E+00	1.02E+02	6.60E+01 G
			333.44	1.329E-01	%	7.587E+00	1.66E+03	1.55E+01 G
Sn-126		-5.0282E-01					3.65E+07	
			87.57	-4.302E-01	+	2.984E+00	2.07E+02	3.75E+01 GA
			64.28	-5.028E-01	?(	1.196E+01	7.01E+02	9.70E+00 G
			86.94	-2.248E+00	&	1.247E+01	1.66E+02	9.04E+00 GA
PB-210	N	-3.8895E+00					8.14E+03	
			46.54	-3.889E+00	?(	2.533E+01	2.50E+02	4.25E+00 G
PB-212	N	3.2317E+00					6.98E+02	
			238.63	3.232E+00	(	8.942E-01	1.28E+01	4.33E+01 G
			300.03	6.511E+00	+	7.840E+00	4.13E+01	3.28E+00 GA
PB-214	N	4.4724E+00					5.84E+05	
			351.93	4.507E+00	(P	1.262E+00	1.46E+01	3.76E+01 G
			295.09	4.404E+00	(P	2.123E+00	1.94E+01	1.93E+01 G
			242.00	5.231E+00	P	5.273E+00	3.38E+01	7.43E+00 GA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:23 PMPage 13
TestAmerica Inc Spectrum name: 9_Gamma_20193496.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-207	C	-1.8330E-01					1.18E+04	
			1063.66	-1.833E-01	?(P	1.270E+00	2.14E+02	7.45E+01 G
			569.70	-2.435E-01	+	9.213E-01	1.11E+02	9.77E+01 G
BI-212	N	-3.2215E-01					6.98E+02	
			727.17	-3.221E-01	%(P	1.433E+01	1.41E+03	7.55E+00 G
			785.42	7.100E+00	& P	7.025E+01	2.76E+02	1.28E+00 GA
U-235	N	-2.0180E+00					2.57E+11	
			143.79	-2.018E+00	?(	9.937E+00	1.47E+02	1.10E+01 G
			205.33	-4.800E+00	+	1.194E+01	1.01E+02	5.01E+00 G
			163.38	-3.825E+00	+	1.139E+01	8.88E+01	5.08E+00 G
			185.72	9.035E-01	+	8.435E-01	3.82E+01	5.40E+01 GA
BI-214	N	4.0184E+00					5.84E+05	
			609.31	4.018E+00	(P	1.215E+00	1.55E+01	4.61E+01 G
			1120.29	3.483E-01	& P	9.913E+00	8.02E+02	1.51E+01 G
			1764.49	-1.714E+00	- P	1.039E+01	1.56E+02	1.54E+01 G
BI-210M	T	1.4380E-01					1.10E+09	
			265.83	-1.765E-01	(P	1.477E+00	1.60E+02	5.00E+01 G
			304.90	7.158E-01	?(	4.122E+00	1.70E+02	2.80E+01 G
AC-228	N	4.8164E+00					2.10E+03	
			911.07	4.816E+00	(P	1.518E+00	1.84E+01	2.90E+01 G
			968.97	2.072E+00	-	6.243E+00	8.88E+01	1.75E+01 G
			338.32	1.964E+00	&	8.800E+00	1.32E+02	1.20E+01 G
			93.35	3.767E+00		6.110E+00	5.82E+01	5.56E+00 XA
TH-227	N	1.0428E+00					7.95E+03	
			256.24	-2.231E+00	?(	8.657E+00	1.55E+02	7.00E+00 G
			235.97	1.300E+00	?(	8.110E+00	1.84E+02	1.23E+01 G
			50.14	3.512E+00	(	1.412E+01	1.19E+02	8.00E+00 G
TH-229	N	-5.8222E+00					2.68E+06	
			193.51	-5.822E+00	?(	1.452E+01	1.02E+02	4.40E+00 G
			210.85	9.171E-01	+	1.780E+01	7.62E+02	2.99E+00 G
TH-234	N	-3.7637E+00					1.63E+12	
			92.59	-3.764E+00	(	1.886E+01	1.50E+02	5.58E+00 G
			63.29	-6.621E+00	+	2.838E+01	1.28E+02	3.81E+00 G
PA-231	N	-8.6651E+00					1.20E+07	
			302.65	-8.665E+00	(	4.738E+01	1.62E+02	2.88E+00 G
			300.07	-1.007E+01	&	5.797E+01	1.71E+02	2.46E+00 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-233	C	5.6855E-01					7.82E+08	
			312.01	5.685E-01	?(	3.447E+00	1.79E+02	3.60E+01 G
			300.18	-3.995E+00	&	2.245E+01	1.67E+02	6.20E+00 G
PA-234	N	1.2677E+00					1.63E+12	
			131.29	8.302E-01	?(	4.021E+00	1.44E+02	1.80E+01 G
			946.02	1.855E+00	?(	3.952E+00	8.94E+01	1.34E+01 G
			569.47	0.000E+00	-	9.594E+00	1.00E+03	8.20E+00 G
			883.24	-1.469E+00	+	1.480E+01	2.88E+02	9.60E+00 G
			880.53	-7.617E+00	+	2.108E+01	8.24E+01	6.00E+00 GA
PA-234M	N	1.9722E+01					1.63E+12	
			1001.00	0.000E+00	?(	1.422E+02	1.00E+03	8.37E-01 G
			766.41	7.587E+01	?(	3.384E+02	1.29E+02	2.94E-01 G
AM-241	T	-9.0354E-01					1.58E+05	
			59.54	-9.035E-01	*(	3.434E+00	1.14E+02	3.59E+01 G
Np-237	F	-7.1974E-01					2.14E+06	
			86.49	-7.197E-01	?(	8.539E+00	3.52E+02	1.31E+01 G
Ir-192	F	2.9842E-01					7.40E+01	
			316.49	8.893E-02	?(	1.478E+00	4.88E+02	8.70E+01 G
			468.06	4.425E-01	&(	1.509E+00	1.00E+02	5.18E+01 G
			308.44	6.379E-01	?(	3.773E+00	1.75E+02	3.18E+01 G
Cs-136	F	1.9842E-01					1.30E+01	
			818.50	5.411E-02	?(	1.113E+00	5.75E+02	1.00E+02 G
			1048.07	-4.917E-01	+	1.166E+00	7.11E+01	8.00E+01 G
			340.57	5.061E-01	&(	2.365E+00	1.38E+02	4.69E+01 G
Np-239	T	-4.5990E-02					2.36E+00	
			103.70	-8.595E-01	+	4.456E+00	1.55E+02	2.40E+01 X
			106.13	-4.599E-02	%(	4.699E+00	3.02E+03	2.27E+01 G
			99.50	-1.381E+00	+	6.876E+00	1.49E+02	1.50E+01 X
Nd-147		-3.3434E-01					1.11E+01	
			531.00	-3.343E-01	?(	4.895E+00	5.75E+02	1.30E+01 G
			91.10	-7.307E-08	%	3.949E+00	1.60E+09	2.83E+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.

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% - 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
PB-210	46.54	103.	-8.	-0.004	249.88	-3.889E+00
AM-241	59.54	284.	-21.	-0.012	113.58	-9.035E-01
TH-234	63.29	250.	-18.	-0.010	127.69	-6.621E+00
Sn-126	64.28	299.	-4.	-0.002	700.53	-5.028E-01
BA-133	80.99	103.	-19.	-0.011	102.57	-6.404E-01
Np-237	86.49	444.	-8.	-0.005	352.06	-7.197E-01
Sn-126	86.94	453.	-18.	-0.010	165.50	-2.248E+00
Sn-126	87.57	449.	-15.	-0.008	206.58	-4.302E-01
TH-234	92.59	416.	-20.	-0.011	149.58	-3.764E+00
Gd-153	97.50	396.	-20.	-0.011	145.46	-6.925E-01
Np-239	99.50	416.	-20.	-0.011	148.66	-1.381E+00
Gd-153	103.20	436.	-20.	-0.011	151.57	-9.463E-01
Np-239	103.70	455.	-20.	-0.011	154.81	-8.595E-01
EU-155	105.31	475.	-10.	-0.005	318.95	-4.786E-01
EU-152	121.78	112.	-17.	-0.009	91.11	-6.244E-01
CO-57	122.06	129.	-17.	-0.009	97.31	-2.086E-01
PA-234	131.29	196.	14.	0.008	143.61	8.302E-01
HF-181	133.02	210.	14.	0.008	148.27	3.471E-01
CE-144	133.54	401.	-20.	-0.011	144.27	-1.920E+00
HF-181	136.30	382.	-20.	-0.011	140.40	-3.674E+00
CO-57	136.47	385.	-20.	-0.011	141.03	-2.013E+00
Tc-99m	140.51	405.	-20.	-0.011	144.02	-2.521E-01
U-235	143.79	425.	-20.	-0.011	147.04	-2.018E+00
CE-141	145.44	410.	5.	0.003	607.91	1.086E-01

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TestAmerica Inc Spectrum name: 9_Gamma_20193496.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Ba-140	162.66	78.	13.	0.007	97.51	2.542E+00		
U-235	163.38	97.	-16.	-0.009	88.83	-3.825E+00		
CE-139	165.85	102.	-6.	-0.003	235.65	-9.039E-02		
U-235	185.72	51.	39.	0.021	38.21	9.035E-01		
TH-229	193.51	100.	-20.	-0.011	101.57	-5.822E+00		
U-235	205.33	80.	-18.	-0.010	100.92	-4.800E+00		
TH-229	210.85	60.	2.	0.001	761.58	9.171E-01		
EU-152	244.69	230.	6.	0.003	374.32	1.152E+00		
Cd-113m	263.70	82.	-4.	-0.002	352.44	-9.730E+02		
BI-210M	265.83	87.	-6.	-0.003	160.49	-1.765E-01		P
Hg-203	279.20	58.	4.	0.002	265.92	8.375E-02		P
I-131	284.30	24.	4.	0.002	244.95	1.092E+00		
TL-210	296.00	304.	-14.	-0.008	175.64	-3.096E-01		
PA-231	300.07	290.	-14.	-0.008	171.05	-1.007E+01		
PA-233	300.18	275.	-14.	-0.008	166.90	-3.995E+00		
PA-231	302.65	261.	-14.	-0.008	162.34	-8.665E+00		
BA-133	302.85	160.	11.	0.006	159.75	1.087E+00		
Ba-140	304.85	171.	11.	0.006	164.92	4.672E+00		
BI-210M	304.90	182.	11.	0.006	170.15	7.158E-01		
Ir-192	308.44	194.	11.	0.006	174.79	6.379E-01		
PA-233	312.01	205.	11.	0.006	179.28	5.685E-01		
Ir-192	316.49	217.	4.	0.002	487.60	8.893E-02		
CR-51	320.08	177.	9.	0.005	205.48	1.698E+00		P
La-140	328.76	154.	12.	0.007	144.60	1.131E+00		
Cs-136	340.57	143.	13.	0.007	138.14	5.061E-01		
EU-152	344.29	155.	13.	0.007	143.44	9.049E-01		
HF-181	345.83	93.	11.	0.006	128.85	1.384E+00		
BA-133	356.00	147.	-4.	-0.002	431.57	-1.262E-01		
I-131	364.48	16.	5.	0.003	162.89	1.218E-01		
BA-133	383.84	69.	7.	0.004	173.45	1.605E+00		P
Cf-249	387.95	49.	10.	0.006	101.70	3.219E-01		
SN-113	391.69	84.	-10.	-0.005	134.90	-3.233E-01		
SB-125	427.88	30.	-9.	-0.005	124.82	-7.033E-01		
AG-108M	433.94	31.	-2.	-0.001	723.50	-4.165E-02		P
PM-146	453.88	17.	9.	0.005	103.77	3.102E-01		
SB-125	463.37	49.	-12.	-0.007	98.54	-2.786E+00		P
Ir-192	468.06	42.	10.	0.005	100.27	4.425E-01		
BE-7	477.60	78.	-5.	-0.003	245.97	-1.186E+00		
HF-181	482.00	86.	-15.	-0.008	93.89	-4.396E-01		
La-140	487.02	114.	-8.	-0.004	197.75	-4.183E-01		
RU-103	497.05	9.	6.	0.003	111.80	1.605E-01		P
RH-106	511.86	28.	75.	0.042	15.26	9.520E+00		
Nd-147	531.00	22.	-2.	-0.001	575.33	-3.343E-01		
Ba-140	537.26	9.	6.	0.004	103.44	6.922E-01		P
CS-134	563.24	37.	-8.	-0.005	159.35	-2.718E+00		
CS-134	569.32	28.	-3.	-0.002	256.04	-5.354E-01		
BI-207	569.70	42.	-9.	-0.005	110.67	-2.435E-01		
SB-125	600.50	170.	-12.	-0.006	160.90	-1.861E+00		

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TestAmerica Inc Spectrum name: 9_Gamma_20193496.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
SB-124	602.73	158.	-7.	-0.004	261.73	-2.000E-01		
PM-144	618.06	33.	-9.	-0.005	96.22	-2.649E-01		
RH-106	621.92	31.	9.	0.005	92.18	2.685E+00		P
SB-125	635.89	18.	8.	0.004	86.92	1.976E+00		
AG-110M	657.76	60.	-15.	-0.008	76.55	-4.905E-01		
CS-137	661.66	67.	-5.	-0.003	141.24	-1.807E-01		P
PM-144	696.54	42.	-14.	-0.008	52.42	-4.390E-01		P
NB-94	702.63	48.	10.	0.005	108.56	3.117E-01		P
SB-124	722.79	24.	10.	0.005	78.20	2.920E+00		
AG-108M	722.94	33.	9.	0.005	97.63	3.207E-01		
ZR-95	724.20	44.	-3.	-0.001	367.91	-1.916E-01		
PM-146	735.72	9.	6.	0.003	121.84	8.375E-01		
PM-146	747.16	19.	4.	0.002	216.89	4.288E-01		
ZR-95	756.73	5.	13.	0.007	47.80	7.988E-01		P
AG-110M	763.94	42.	-15.	-0.008	66.33	-2.304E+00		
NB-95	765.79	34.	10.	0.005	89.74	3.377E-01		
PA-234M	766.41	32.	7.	0.004	128.82	7.587E+01		
EU-152	778.92	5.	6.	0.003	95.70	1.533E+00		
BI-212	785.42	24.	3.	0.001	276.01	7.100E+00		P
CS-134	795.87	45.	-5.	-0.003	194.94	-2.064E-01		
CS-134	801.95	59.	-8.	-0.004	140.31	-3.269E+00		
CO-58	810.78	28.	6.	0.004	120.65	2.340E-01		
Cs-136	818.50	36.	2.	0.001	575.42	5.411E-02		
MN-54	834.85	10.	16.	0.009	50.13	5.860E-01		
Co-56	846.77	25.	-10.	-0.006	71.04	-3.768E-01		P
NB-94	871.10	19.	3.	0.002	213.44	1.136E-01		
PA-234	880.53	43.	-12.	-0.007	82.35	-7.617E+00		
PA-234	883.24	55.	-4.	-0.002	288.22	-1.469E+00		
Y-88	898.04	6.	5.	0.003	106.97	2.158E-01		P
AG-110M	937.49	10.	2.	0.001	354.73	2.331E-01		
PA-234	946.02	5.	6.	0.003	89.35	1.855E+00		
EU-152	964.11	32.	9.	0.005	97.35	2.462E+00		
Co-56	1037.84	27.	-14.	-0.008	86.15	-4.394E+00		
Cs-136	1048.07	16.	-9.	-0.005	71.15	-4.917E-01		
RH-106	1050.36	30.	-2.	-0.001	313.69	-7.016E+00		
BI-207	1063.66	16.	-3.	-0.002	213.50	-1.833E-01		P
Ga-68	1077.40	5.	6.	0.003	101.72	9.001E+00		
FE-59	1099.25	21.	-5.	-0.003	201.56	-4.283E-01		
EU-152	1112.07	38.	4.	0.002	205.98	1.454E+00		
CO-60	1173.24	6.	2.	0.001	237.17	1.117E-01		P
Ta-182	1189.05	11.	-1.	-0.001	598.44	-3.975E-01		
Ta-182	1221.41	6.	7.	0.004	89.90	1.253E+00		
Co-56	1238.28	0.	18.	0.010	24.57	1.324E+00		P
FE-59	1291.60	17.	4.	0.002	248.90	4.740E-01		P
TL-210	1313.00	17.	-7.	-0.004	143.21	-1.743E+00		
CO-60	1332.50	23.	-7.	-0.004	171.90	-3.528E-01		
AG-110M	1384.30	11.	-3.	-0.002	243.10	-7.487E-01		
EU-152	1408.00	6.	1.	0.001	427.57	3.511E-01		

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	1690.98	6.	-2.	-0.001	275.72	-3.136E-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	-1.1856E+00	-1.1856E+00	2.460E+02%	1.01E+01
NA-22	#	4.0861E-01	4.0861E-01	3.536E+01%	3.76E-01
K-40		7.7524E+01	7.7524E+01	8.749E+00%	8.42E+00
Sc-46	#A	1.2818E-02	1.2818E-02	3.263E+03%	1.48E+00
CR-51	#A	1.6980E+00	1.6981E+00	2.055E+02%	1.18E+01
MN-54	#A	5.8605E-01	5.8605E-01	5.013E+01%	6.39E-01
FE-59	#A	-3.7335E-02	-3.7335E-02	1.601E+02%	1.95E+00
Co-56	#A	3.0027E-01	3.0027E-01	2.457E+01%	9.67E-01
CO-57	#A	-2.0860E-01	-2.0860E-01	9.731E+01%	6.81E-01
CO-58	#A	2.3402E-01	2.3402E-01	1.206E+02%	9.77E-01
CO-60	#A	-3.5276E-01	-3.5276E-01	1.719E+02%	1.32E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.99E+00
NB-94	#A	2.1167E-01	2.1167E-01	1.086E+02%	1.15E+00
ZR-95	#A	7.9883E-01	7.9883E-01	4.780E+01%	8.32E-01
NB-95	#A	3.3770E-01	3.3771E-01	8.974E+01%	1.03E+00
RU-103	#A	1.6050E-01	1.6050E-01	1.118E+02%	4.59E-01
RH-106	#A	2.6850E+00	2.6850E+00	9.218E+01%	8.40E+00
AG-108M	#A	1.3988E-01	1.3988E-01	9.763E+01%	7.10E-01
AG-110M	#A	7.4840E-02	7.4840E-02	3.547E+02%	2.02E+00
SN-113	#A	-3.2331E-01	-3.2331E-01	1.349E+02%	1.49E+00
SB-124	#A	1.0930E-01	1.0930E-01	7.820E+01%	1.79E+00
SB-125	#A	3.7424E-02	3.7424E-02	7.605E+01%	2.14E+00
I-131	#A	1.8962E-01	1.8963E-01	1.471E+02%	5.20E-01
Gd-153	#A	-6.9247E-01	-6.9247E-01	1.455E+02%	3.37E+00
Ga-68	#A	8.9066E+00	9.0012E+00	1.017E+02%	2.14E+01
Tc-99m	#A	-2.5157E-01	-2.5207E-01	1.440E+02%	1.22E+00
BA-133	#A	1.5039E-01	1.5039E-01	1.597E+02%	1.87E+00
CS-134	#A	-2.0638E-01	-2.0638E-01	1.949E+02%	1.40E+00
CS-137	#A	-1.8073E-01	-1.8073E-01	1.412E+02%	1.48E+00
CE-139	#A	-9.0393E-02	-9.0393E-02	2.356E+02%	7.31E-01
Ba-140	#A	1.5109E+00	1.5109E+00	7.258E+01%	1.83E+00
La-140	#A	1.8764E-01	1.8765E-01	1.446E+02%	4.73E-01
CE-141	#A	1.0861E-01	1.0861E-01	6.079E+02%	2.23E+00
CE-144	#A	-1.9195E+00	-1.9195E+00	1.443E+02%	9.28E+00
PM-144	#A	-4.3900E-01	-4.3900E-01	5.242E+01%	1.06E+00
EU-152	#A	8.7149E-01	8.7149E-01	7.994E+01%	1.91E+00
EU-154	#C	2.5660E+00	2.5660E+00	1.826E+01%	1.38E+00
EU-155	#A	-4.7859E-01	-4.7859E-01	3.189E+02%	5.14E+00
HF-181	#A	-1.5205E-01	-1.5205E-01	7.971E+01%	1.39E+00

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Ta-182 #A	5.8394E-01	5.8394E-01	8.990E+01%	4.37E+00
Hg-203 #A	8.3748E-02	8.3749E-02	2.659E+02%	7.75E-01
TL-208	1.2980E+00	1.2980E+00	2.219E+01%	6.06E-01
PM-146 #A	4.4106E-01	4.4106E-01	8.985E+01%	7.92E-01
Y-88 #A	1.0484E-01	1.0484E-01	1.070E+02%	5.11E-01
Cd-113m#A	-9.7301E+02	-9.7301E+02	3.524E+02%	1.19E+04
Cd-109 #A	5.5357E-07	5.5357E-07	1.597E+09%	2.99E+01
Cf-251 A	9.1003E-01	9.1003E-01	9.792E+01%	2.32E+00
Cf-249 #A	3.2189E-01	3.2189E-01	1.017E+02%	1.11E+00
Sn-126 #A	-5.0282E-01	-5.0282E-01	7.005E+02%	1.20E+01
PB-210 #A	-3.8895E+00	-3.8895E+00	2.499E+02%	2.53E+01
PB-212	3.2317E+00	3.2317E+00	1.277E+01%	8.94E-01
PB-214	4.4724E+00	4.4724E+00	1.215E+01%	1.26E+00
BI-207 #A	-1.8330E-01	-1.8330E-01	2.135E+02%	1.27E+00
BI-212 #A	-3.2215E-01	-3.2215E-01	1.409E+03%	1.43E+01
U-235 #A	-2.0180E+00	-2.0180E+00	1.470E+02%	9.94E+00
BI-214	4.0184E+00	4.0184E+00	1.554E+01%	1.22E+00
BI-210M#A	1.4380E-01	1.4380E-01	1.169E+02%	1.48E+00
AC-228	4.8164E+00	4.8164E+00	1.841E+01%	1.52E+00
TH-227 A	1.0428E+00	1.0428E+00	8.956E+01%	8.66E+00
TH-229 #A	-5.8222E+00	-5.8222E+00	1.016E+02%	1.45E+01
TH-234 #A	-3.7637E+00	-3.7637E+00	1.496E+02%	1.89E+01
PA-231 #A	-8.6651E+00	-8.6651E+00	1.623E+02%	4.74E+01
PA-233 #A	5.6855E-01	5.6855E-01	1.793E+02%	3.45E+00
PA-234 #A	1.2677E+00	1.2677E+00	8.457E+01%	4.02E+00
PA-234M#A	1.9722E+01	1.9722E+01	1.288E+02%	1.42E+02
AM-241 #A	-9.0354E-01	-9.0354E-01	1.136E+02%	3.43E+00
Np-237 #A	-7.1974E-01	-7.1974E-01	3.521E+02%	8.54E+00
Ir-192 #A	2.9842E-01	2.9842E-01	1.003E+02%	1.48E+00
Cs-136 #A	1.9841E-01	1.9842E-01	1.381E+02%	1.11E+00
Np-239 #A	-4.5980E-02	-4.5990E-02	3.020E+03%	4.70E+00
Nd-147 #A	-3.3433E-01	-3.3434E-01	5.753E+02%	4.89E+00
TL-210 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.28E+00
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%	2.96E+02

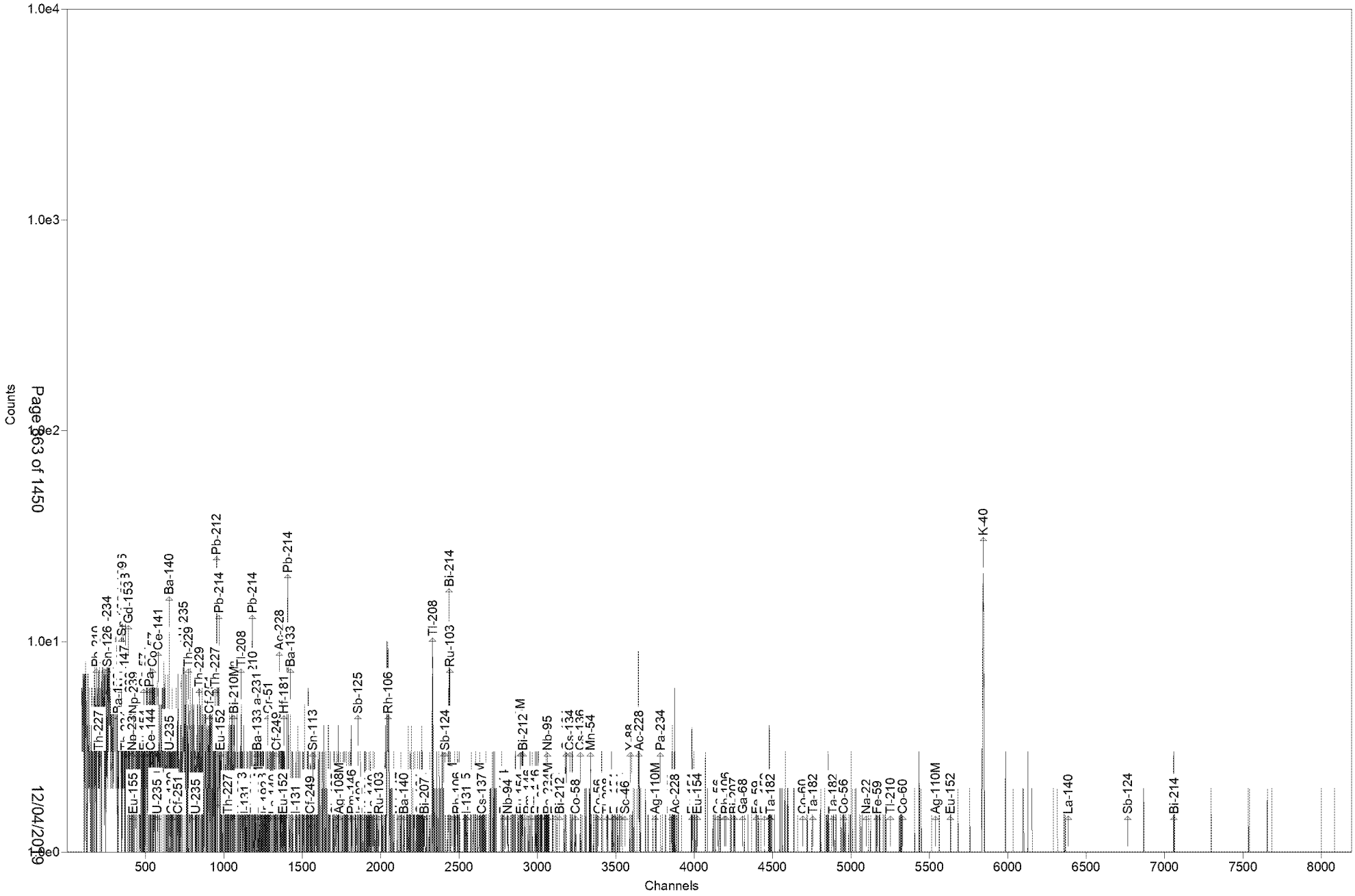
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line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

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

Total Activity (25.1 to 1999.3 keV) 9.536E+01 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 9.5360519E+01 Bq/Sample

(Page 21 of 22)

448571_Gamma_160-36160-A-9-C. 9_Gamma_20193496.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193351

Sample Description: 448571_Gamma_160-36160-A-10-C
Detector: Detector #12
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-10-C

Decay to Time: 11/23/2019 22:22 Live Time: 1800 sec
Acquisition Time: 11/23/2019 22:22:46 Real Time: 1801 sec
Analysis Time: 11/23/2019 22:52 Dead Time: 0.06 %
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_2019-11-10_1422.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	-3.817E+00	106.3	4.057E+00	4.061E+00	1.373E+01
NA-22	-2.107E-01	202.8	4.273E-01	4.274E-01	1.540E+00
K-40	1.032E+02	8.4	8.693E+00	1.014E+01	5.395E+00
Sc-46	5.187E-01	76.8	3.981E-01	3.990E-01	2.462E+00
CR-51	-2.580E+00	225.4	5.815E+00	5.817E+00	1.966E+01
MN-54	2.887E-01	91.9	2.652E-01	2.656E-01	6.569E-01
FE-59	1.321E-01	176.2	2.328E-01	2.329E-01	1.993E+00
Co-56	-5.716E-01	94.3	5.392E-01	5.400E-01	1.224E+00
CO-57	2.147E-01	120.3	2.583E-01	2.585E-01	8.742E-01
CO-58	3.964E-01	86.4	3.426E-01	3.432E-01	1.165E+00
CO-60	5.156E-01	25.0	1.289E-01	1.314E-01	1.337E+00
ZN-65	0.000E+00	1.#INF	2.510E-01	2.510E-01	2.987E+00
NB-94	1.383E-01	73.5	1.016E-01	1.018E-01	1.059E+00
ZR-95	-5.568E-01	166.6	9.277E-01	9.281E-01	2.217E+00
NB-95	-8.066E-03	6230.5	5.026E-01	5.026E-01	1.786E+00
RU-103	1.547E-01	147.2	2.277E-01	2.279E-01	6.147E-01
RH-106	0.000E+00	1.#INF	1.322E+00	1.322E+00	2.265E+01
AG-108M	8.780E-02	163.5	1.436E-01	1.436E-01	8.956E-01
AG-110M	-1.014E+00	101.8	1.033E+00	1.034E+00	3.483E+00
SN-113	4.263E-01	110.0	4.690E-01	4.695E-01	1.599E+00
SB-124	4.966E-01	121.4	6.029E-01	6.034E-01	1.924E+00
SB-125	7.369E-02	51.6	3.801E-02	3.819E-02	3.711E+00
I-131	3.112E-01	114.4	3.559E-01	3.563E-01	6.408E-01
Gd-153	-8.201E-01	144.6	1.186E+00	1.187E+00	3.987E+00
Ga-68	1.399E+01	91.4	1.278E+01	1.281E+01	2.957E+01
Tc-99m	5.722E-01	39.6	2.268E-01	2.291E-01	5.120E-01
BA-133	-3.223E-01	231.4	7.458E-01	7.460E-01	2.545E+00
CS-134	3.517E-01	95.2	3.347E-01	3.352E-01	1.524E+00
CS-137	-3.314E-01	133.7	4.430E-01	4.433E-01	1.534E+00
CE-139	1.826E-01	121.9	2.225E-01	2.227E-01	7.604E-01
Ba-140	1.134E+00	89.1	1.011E+00	1.013E+00	2.510E+00
La-140	-1.144E+00	83.6	9.562E-01	9.580E-01	1.979E+00
CE-141	1.546E-01	476.6	7.367E-01	7.367E-01	2.503E+00

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CE-144	0.000E+00	1.#INF	7.959E-01	7.960E-01	1.105E+01
PM-144	8.047E-01	43.7	3.518E-01	3.542E-01	7.719E-01
EU-152	1.397E+00	83.1	1.162E+00	1.164E+00	2.448E+00
EU-154	5.159E-01	103.2	5.324E-01	5.330E-01	1.883E+00
EU-155	7.848E-01	122.7	9.632E-01	9.641E-01	5.199E+00
HF-181	-1.345E-01	201.4	2.709E-01	2.710E-01	1.940E+00
Ta-182	1.781E+00	47.0	8.367E-01	8.415E-01	3.565E+00
Hg-203	-1.671E-01	168.3	2.812E-01	2.814E-01	9.745E-01
TL-208	2.964E+00	16.5	4.880E-01	5.107E-01	7.820E-01
PM-146	-5.051E-02	881.3	4.451E-01	4.451E-01	1.189E+00
Y-88	0.000E+00	1.#INF	9.547E-02	9.547E-02	7.036E-01
Cd-113m	-5.721E+03	78.6	4.495E+03	4.507E+03	1.501E+04
Cd-109	-7.834E+00	136.8	1.072E+01	1.073E+01	3.593E+01
Cf-251	1.979E-01	624.5	1.236E+00	1.236E+00	3.327E+00
Cf-249	-2.942E-01	171.0	5.032E-01	5.034E-01	1.735E+00
Sn-126	2.811E+00	125.4	3.524E+00	3.527E+00	1.187E+01
PB-210	6.843E+00	128.0	8.757E+00	8.767E+00	2.800E+01
PB-212	2.828E-01	314.3	8.888E-01	8.889E-01	3.024E+00
PB-214	5.986E+00	15.1	9.058E-01	9.553E-01	1.813E+00
BI-207	2.194E-01	206.2	4.523E-01	4.525E-01	1.108E+00
BI-212	4.593E+00	99.2	4.554E+00	4.560E+00	1.562E+01
U-235	-2.743E+00	75.6	2.073E+00	2.078E+00	1.198E+01
BI-214	4.881E+00	16.2	7.887E-01	8.269E-01	1.253E+00
BI-210M	5.157E-01	101.6	5.239E-01	5.246E-01	1.772E+00
AC-228	1.802E+00	89.0	1.605E+00	1.607E+00	3.919E+00
TH-227	-1.014E+00	360.6	3.658E+00	3.659E+00	9.831E+00
TH-229	4.192E+00	107.6	4.512E+00	4.517E+00	1.185E+01
TH-234	2.422E+00	162.1	3.927E+00	3.929E+00	1.329E+01
PA-231	0.000E+00	1.#INF	1.183E+00	1.183E+00	6.391E+01
PA-233	0.000E+00	1.#INF	1.370E-01	1.370E-01	5.232E+00
PA-234	1.126E+00	122.0	1.373E+00	1.374E+00	4.637E+00
PA-234M	2.306E+01	120.2	2.771E+01	2.774E+01	1.886E+02
AM-241	-9.334E-01	135.7	1.267E+00	1.268E+00	4.257E+00
Np-237	1.771E+00	155.3	2.750E+00	2.752E+00	9.257E+00
Ir-192	3.160E-01	176.2	5.568E-01	5.571E-01	1.885E+00
Cs-136	1.460E-01	69.3	1.011E-01	1.015E-01	1.501E+00
Np-239	8.826E-01	152.2	1.343E+00	1.344E+00	4.531E+00
Nd-147	2.937E+00	97.1	2.850E+00	2.855E+00	6.934E+00
TL-210	0.000E+00	1.#INF	7.121E-02	7.121E-02	1.422E+00
Kr-85	-2.795E+00	3459.8	9.670E+01	9.670E+01	3.410E+02
Total	1.966E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 10:52:54 PMPage  1
TestAmerica Inc                 Spectrum name: 12_Gamma_20193351.An1

Sample description
     448571_Gamma_160-36160-A-10-C


Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193351.An1

Acquisition information
       Start time:                 11/23/2019 10:22:46 PM
       Live time:               1800
       Real time:               1801
       Dead time:                  0.06 %
       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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 2
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11/23/2019 10:22:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-11-10_1422.PBC 11/10/2019 2:22:07 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 15 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0795

***** 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
46.59	9.	127.96	0.96	1.805E-02	46.54	4.250	PBC<MDA	PB210
63.37	-14.	164.82	0.87	2.978E-02	63.29	3.810	PBC<MDA	TH234
64.28	15.	125.36	0.87	3.015E-02	64.28	9.700	PBC<MDA	Sn126
77.22	67.	24.18	0.92	3.388E-02				
86.49	15.	155.30	0.89	3.559E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	7.554E-01	EU155
86.54	12.	193.33	0.89	3.560E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.221E-01	EU155
					86.94	9.040	2.109E+00	Sn126
92.53	9.	162.14	0.90	3.637E-02	92.59	5.584	PBC<MDA	TH234
93.29	17.	132.19	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
105.31	15.	151.24	0.91	3.726E-02	105.31	21.200	PBC<MDA	EU155
106.13	13.	152.15	0.91	3.729E-02	106.13	22.700	PBC<MDA	Np239
121.78	14.	101.73	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.384E-01	CO57
122.06	12.	120.31	0.93	3.724E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.147E-01	CO57
131.29	13.	121.97	0.94	3.683E-02	131.29	18.000	PBC<MDA	PA234
133.02	4.	606.75	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
140.03	32.	39.64	0.36	3.623E-02	140.51	89.300	5.722E-01	Tc99m
145.44	5.	476.58	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
162.66	7.	145.62	0.97	3.435E-02	162.66	6.220	PBC<MDA	Ba140
163.38	10.	113.28	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
165.85	9.	121.89	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
176.60	2.	624.50	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	21.	67.48	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
193.51	10.	107.63	1.00	3.140E-02	193.51	4.400	PBC<MDA	TH229

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 3
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
205.33	9.	141.24	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235
227.00	3.	449.74	1.03	2.839E-02	227.00	6.300	PBC<MDA	Cf251
238.44	76.	18.25	0.98	2.744E-02	238.63	43.300	3.556E+00	PB212
241.90	25.	36.38	1.05	2.716E-02	242.00	7.430	PBC<MDA	PB214
244.69	15.	131.48	1.05	2.695E-02	244.69	7.580	PBC<MDA	EU152
265.83	12.	101.60	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M
284.30	5.	194.63	1.09	2.416E-02	284.30	6.140	PBC<MDA	I131
295.35	54.	25.98	1.25	2.350E-02	295.09	19.300	6.632E+00	PB214
316.49	11.	176.19	1.12	2.229E-02	316.49	87.040	PBC<MDA	Ir192
328.76	9.	95.21	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
351.76	79.	15.51	1.40	2.055E-02	351.93	37.600	5.655E+00	PB214
364.48	6.	120.19	1.17	2.001E-02	364.48	81.700	PBC<MDA	I131
383.84	6.	206.05	1.19	1.923E-02	383.84	8.940	PBC<MDA	BA133
391.69	9.	110.00	1.20	1.893E-02	391.69	64.000	PBC<MDA	SN113
463.37	9.	93.33	1.27	1.666E-02	463.37	10.470	PBC<MDA	SB125
497.05	4.	147.20	1.30	1.580E-02	497.05	90.900	PBC<MDA	RU103
511.86	38.	24.98	2.56	1.546E-02	511.86	20.000	6.889E+00	RH106
531.00	10.	97.07	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
537.26	6.	102.87	1.34	1.491E-02	537.26	24.390	PBC<MDA	Ba140
569.32	5.	111.36	1.37	1.428E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.373E+00	PA234
					569.70	97.740	1.991E-01	BI207
583.23	65.	16.46	1.44	1.403E-02	583.02	84.500	3.046E+00	TL208
602.73	7.	197.29	1.40	1.369E-02	602.73	98.260	PBC<MDA	SB124
604.71	7.	204.25	1.40	1.366E-02	604.71	97.620	PBC<MDA	CS134
609.28	55.	16.16	1.35	1.358E-02	609.31	46.090	4.881E+00	BI214
					610.30	5.750	3.917E+01	RU103
614.28	7.	216.66	1.41	1.350E-02	614.28	89.850	PBC<MDA	AG108M
618.06	6.	270.01	1.41	1.344E-02	618.06	99.100	PBC<MDA	PM144
635.89	5.	78.67	1.43	1.317E-02	635.89	11.310	PBC<MDA	SB125
657.76	6.	108.24	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
696.54	18.	43.72	1.49	1.232E-02	696.54	99.000	8.047E-01	PM144
722.79	6.	141.54	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	2.890E-01	AG108M
					723.36	20.220	1.299E+00	EU154
727.17	7.	99.15	1.52	1.194E-02	727.17	7.550	PBC<MDA	BI212
766.41	5.	120.16	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	8.872E+01	PA234M
785.42	2.	398.21	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
795.87	4.	165.55	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
810.78	8.	86.42	1.59	1.104E-02	810.78	99.460	PBC<MDA	CO58
815.77	6.	128.49	1.60	1.099E-02	815.77	23.280	PBC<MDA	La140
834.85	6.	91.87	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
859.96	6.	95.91	1.64	1.057E-02	860.56	12.420	PBC<MDA	TL208
871.10	6.	73.48	1.65	1.048E-02	871.10	99.890	PBC<MDA	NB94
889.28	12.	116.61	1.66	1.033E-02	889.28	99.984	PBC<MDA	Sc46
910.23	10.	89.61	1.68	1.015E-02	911.07	29.000	PBC<MDA	AC228
968.97	5.	153.88	1.74	9.703E-03	968.97	17.460	PBC<MDA	AC228

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 4
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
996.33	7.	103.20	1.76	9.508E-03	996.33	10.600	PBC<MDA	EU154
1048.07	6.	69.27	1.81	9.162E-03	1048.07	80.000	PBC<MDA	Cs136
1063.66	3.	206.16	1.82	9.063E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	6.	91.39	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1120.24	7.	82.55	1.87	8.722E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	4.145E-01	Sc46
1120.55	7.	99.83	1.87	8.721E-03	1120.29	15.100	2.744E+00	BI214
					1120.55	99.987	4.145E-01	Sc46
1173.24	16.	25.00	1.92	8.426E-03	1173.24	99.900	1.056E+00	CO60
1188.58	14.	46.98	1.93	8.342E-03	1189.05	16.200	5.618E+00	Ta182
1291.60	3.	176.21	2.02	7.834E-03	1291.60	43.200	PBC<MDA	FE59
1384.30	1.	427.57	2.10	7.423E-03	1384.30	24.290	PBC<MDA	AG110M
1408.00	7.	37.80	2.12	7.324E-03	1408.00	21.005	PBC<MDA	EU152
1460.69	141.	8.42	1.61	7.112E-03	1460.83	10.670	1.032E+02	K40
1764.24	13.	27.74	2.40	6.075E-03	1764.49	15.400	7.719E+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
308.43	77.22	63.	67.	1.970E+03	24.18	0.920	- 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

********** 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	186.00	46.59	60.	9.	0.005	127.96	0.965
TH-227	200.18	50.14	149.	-10.	-0.005	181.26	0.855s
AM-241	237.74	59.54	258.	-17.	-0.009	135.74	0.865s
TH-234	252.74	63.29	274.	-14.	-0.008	164.82	0.868
Sn-126	256.71	64.28	165.	15.	0.008	125.36	0.869s
BA-133	323.50	80.99	383.	-22.	-0.012	125.19	0.887
Np-237	345.49	86.49	259.	15.	0.008	155.30	0.892s
EU-155	345.70	86.54	274.	12.	0.007	193.33	0.892s
Sn-126	347.29	86.94	372.	-19.	-0.011	144.47	0.892s
Sn-126	349.81	87.57	353.	-19.	-0.011	140.68	0.893s
Cd-109	351.68	88.04	333.	-19.	-0.011	136.83	0.894s
Nd-147	363.92	91.10	314.	-19.	-0.011	132.51	0.897s

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TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-234	369.87	92.59	97.	9.	0.005	162.14	0.898D
AC-228	372.91	93.35	256.	17.	0.010	132.19	0.899s
Gd-153	389.50	97.50	270.	-16.	-0.009	144.62	0.903s
Np-239	397.50	99.50	286.	-16.	-0.009	148.51	0.905s
Gd-153	412.29	103.20	303.	-16.	-0.009	151.94	0.909s
Np-239	414.29	103.70	319.	-6.	-0.003	427.33	0.909s
EU-155	420.73	105.31	234.	15.	0.008	151.24	0.911s
Np-239	424.00	106.13	202.	13.	0.007	152.15	0.912s
EU-152	486.56	121.78	90.	14.	0.008	101.73	0.928s
CO-57	487.69	122.06	104.	12.	0.007	120.31	0.928s
EU-154	491.84	123.10	109.	-8.	-0.005	180.80	0.929
PA-234	524.60	131.29	128.	13.	0.007	121.97	0.938s
HF-181	531.51	133.02	278.	4.	0.002	606.75	0.939s
CE-144	533.57	133.54	282.	0.	0.000	1000.00	0.940s
HF-181	544.61	136.30	282.	0.	0.000	1000.00	0.943
CO-57	545.30	136.47	323.	-15.	-0.008	171.19	0.943
Tc-99m	559.54	140.03	32.	32.	0.018	39.64	0.357s
U-235	574.53	143.79	312.	-19.	-0.011	75.56	0.950
CE-141	581.15	145.44	260.	5.	0.003	476.58	0.952s
Ba-140	649.99	162.66	47.	7.	0.004	145.62	0.969s
U-235	652.87	163.38	54.	10.	0.005	113.28	0.970
CE-139	662.76	165.85	55.	9.	0.005	121.89	0.973s
Cf-251	705.72	176.60	44.	2.	0.001	624.50	0.983s
U-235	742.18	185.72	56.	21.	0.012	67.48	0.992s
TH-229	773.32	193.51	33.	10.	0.006	107.63	1.000s
U-235	820.59	205.33	40.	9.	0.005	141.24	1.012s
TH-229	842.65	210.85	77.	-11.	-0.006	152.26	1.018
Cf-251	907.22	227.00	40.	3.	0.001	449.74	1.034s
TH-227	943.09	235.97	266.	-14.	-0.008	161.25	1.043s
PB-212	953.73	238.63	177.	6.	0.003	314.33	1.046
PB-214	967.18	242.00	30.	25.	0.014	36.38	1.049D
EU-152	977.96	244.69	177.	15.	0.008	131.48	1.051s
TH-227	1024.13	256.24	40.	-3.	-0.002	360.62	1.063s
Cd-113m	1053.96	263.70	69.	-16.	-0.009	78.58	1.070s
BI-210M	1062.48	265.83	66.	12.	0.007	101.60	1.072s
TL-208	1108.27	277.28	36.	-3.	-0.002	288.68	1.084s
Hg-203	1115.93	279.20	48.	-6.	-0.003	168.33	1.086s
I-131	1136.32	284.30	22.	5.	0.003	194.63	1.091s
PB-214	1180.49	295.35	33.	54.	0.030	25.98	1.253s
TL-210	1183.11	296.00	289.	-13.	-0.007	191.39	1.102s
PB-212	1199.22	300.03	277.	-13.	-0.007	186.57	1.106
PA-231	1199.38	300.07	264.	-13.	-0.007	182.32	1.106s
PA-231	1209.70	302.65	250.	0.	0.000	1000.00	1.109s
BA-133	1210.50	302.85	250.	0.	0.000	1000.00	1.109s
Ba-140	1218.49	304.85	250.	0.	0.000	1000.00	1.111
BI-210M	1218.68	304.90	250.	0.	0.000	1000.00	1.111
Ir-192	1232.85	308.44	250.	0.	0.000	1000.00	1.115s
PA-233	1247.13	312.01	250.	0.	0.000	1000.00	1.118s

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TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ir-192	1265.04	316.49	184.	11.	0.006	176.19	1.123s
CR-51	1279.41	320.08	259.	-10.	-0.006	225.36	1.126s
La-140	1314.10	328.76	31.	9.	0.005	95.21	1.135s
Cf-249	1332.81	333.44	72.	-12.	-0.007	104.97	1.139s
Cs-136	1361.32	340.57	83.	0.	0.000	1000.00	1.146s
EU-152	1376.18	344.29	83.	0.	0.000	1000.00	1.150s
HF-181	1382.35	345.83	143.	-17.	-0.010	99.86	1.151s
PB-214	1406.07	351.76	23.	79.	0.044	15.51	1.396s
BA-133	1423.02	356.00	140.	-7.	-0.004	231.42	1.162s
I-131	1456.95	364.48	12.	6.	0.003	120.19	1.170s
BA-133	1534.35	383.84	65.	6.	0.003	206.05	1.189s
Cf-249	1550.79	387.95	62.	-7.	-0.004	171.03	1.193s
SN-113	1565.74	391.69	48.	9.	0.005	110.00	1.196s
SB-125	1710.45	427.88	48.	-15.	-0.008	95.09	1.232s
AG-108M	1734.69	433.94	24.	-4.	-0.002	244.95	1.238s
PM-146	1814.45	453.88	20.	-1.	-0.001	881.29	1.257s
SB-125	1852.39	463.37	29.	9.	0.005	93.33	1.266s
Ir-192	1871.16	468.06	52.	-11.	-0.006	99.03	1.271s
BE-7	1909.29	477.60	72.	-12.	-0.007	106.28	1.280s
HF-181	1926.90	482.00	84.	-7.	-0.004	201.38	1.284s
La-140	1946.98	487.02	111.	-13.	-0.007	114.33	1.289s
RU-103	1987.11	497.05	8.	4.	0.002	147.20	1.298s
RH-106	2046.35	511.86	27.	38.	0.021	24.98	2.563s
Nd-147	2122.88	531.00	22.	10.	0.006	97.07	1.331s
Ba-140	2147.92	537.26	9.	6.	0.004	102.87	1.337s
CS-134	2251.82	563.24	26.	-5.	-0.003	212.92	1.362s
CS-134	2276.15	569.32	13.	5.	0.003	111.36	1.367s
PA-234	2276.75	569.47	23.	-3.	-0.002	233.33	1.368s
BI-207	2277.68	569.70	21.	-1.	0.000	972.11	1.368s
TL-208	2331.80	583.23	9.	65.	0.036	16.46	1.445
SB-124	2409.79	602.73	89.	7.	0.004	197.29	1.399s
CS-134	2417.71	604.71	96.	7.	0.004	204.25	1.401s
BI-214	2436.01	609.28	6.	55.	0.031	16.16	1.345
RU-103	2440.06	610.30	102.	7.	0.004	210.47	1.406s
AG-108M	2455.99	614.28	109.	7.	0.004	216.66	1.410s
PM-144	2471.12	618.06	116.	6.	0.003	270.01	1.414s
RH-106	2486.54	621.92	122.	0.	0.000	1000.00	1.417s
SB-125	2542.43	635.89	5.	5.	0.003	78.67	1.430s
I-131	2546.77	636.97	15.	-2.	-0.001	248.76	1.432s
AG-110M	2629.92	657.76	22.	6.	0.004	108.24	1.451s
CS-137	2645.51	661.66	34.	-6.	-0.004	133.68	1.455s
PM-144	2785.05	696.54	9.	18.	0.010	43.72	1.487s
SB-124	2890.04	722.79	29.	6.	0.003	141.54	1.512s
AG-108M	2890.65	722.94	35.	0.	0.000	1000.00	1.512s
EU-154	2892.34	723.36	35.	0.	0.000	1000.00	1.512s
ZR-95	2895.69	724.20	48.	-14.	-0.008	75.09	1.513s
BI-212	2907.58	727.17	24.	7.	0.004	99.15	1.516s
PM-146	2941.78	735.72	23.	-5.	-0.003	196.95	1.524s

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TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-146	2987.55	747.16	14.	-2.	-0.001	403.11	1.535s
ZR-95	3025.83	756.73	23.	-6.	-0.004	166.60	1.543s
AG-110M	3054.69	763.94	41.	-12.	-0.007	81.71	1.550s
PA-234M	3064.57	766.41	18.	5.	0.003	120.16	1.552s
EU-152	3114.61	778.92	19.	-6.	-0.003	167.10	1.564s
BI-212	3140.62	785.42	19.	2.	0.001	398.21	1.570
CS-134	3182.43	795.87	26.	4.	0.002	165.55	1.579s
TL-210	3197.35	799.60	30.	0.	0.000	1000.00	1.583s
CS-134	3206.76	801.95	31.	0.	0.000	1000.00	1.585s
CO-58	3242.06	810.78	19.	8.	0.004	86.42	1.593s
La-140	3262.05	815.77	25.	6.	0.003	128.49	1.598s
Cs-136	3272.97	818.50	33.	-2.	-0.001	356.00	1.600s
MN-54	3338.38	834.85	5.	6.	0.003	91.87	1.615s
Co-56	3386.08	846.77	20.	-11.	-0.006	94.33	1.626s
TL-208	3441.27	860.56	5.	6.	0.003	95.91	1.638s
NB-94	3483.41	871.10	6.	6.	0.003	73.48	1.648s
EU-154	3491.95	873.23	25.	-10.	-0.006	78.20	1.650s
PA-234	3521.16	880.53	63.	-14.	-0.008	83.88	1.657s
PA-234	3532.00	883.24	77.	-14.	-0.008	91.81	1.659s
AG-110M	3537.78	884.68	91.	-14.	-0.008	101.84	1.660s
Sc-46	3556.17	889.28	85.	12.	0.006	116.61	1.664s
Y-88	3591.22	898.04	10.	-4.	-0.002	180.85	1.672s
AC-228	3643.36	911.07	15.	10.	0.006	89.61	1.684s
AG-110M	3749.09	937.49	25.	-9.	-0.005	126.60	1.708s
PA-234	3783.21	946.02	15.	-8.	-0.004	112.15	1.716s
EU-152	3855.60	964.11	15.	-6.	-0.003	147.67	1.732s
AC-228	3875.05	968.97	26.	5.	0.003	153.88	1.736
EU-154	3984.54	996.33	20.	7.	0.004	103.20	1.761s
PA-234M	4003.22	1001.00	27.	0.	0.000	1000.00	1.765s
Cs-136	4191.60	1048.07	6.	6.	0.003	69.27	1.807s
RH-106	4200.76	1050.36	6.	0.	0.000	1000.00	1.809s
BI-207	4253.99	1063.66	5.	3.	0.001	206.16	1.820s
Ga-68	4308.98	1077.40	5.	6.	0.004	91.39	1.833s
FE-59	4396.44	1099.25	11.	-2.	-0.001	452.11	1.852s
EU-152	4447.76	1112.07	20.	0.	0.000	1000.00	1.863s
ZN-65	4461.66	1115.55	20.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	11.	7.	0.004	82.55	1.870s
Sc-46	4481.68	1120.55	18.	7.	0.004	99.83	1.870s
Ta-182	4484.69	1121.30	13.	0.	0.000	1000.00	1.871s
CO-60	4692.57	1173.24	0.	16.	0.009	25.00	1.916s
Ta-182	4755.86	1189.05	5.	14.	0.008	46.98	1.930s
Ta-182	4885.39	1221.41	40.	-18.	-0.010	85.30	1.957
Co-56	4952.92	1238.28	28.	-4.	-0.002	292.05	1.972s
NA-22	5098.03	1274.53	17.	-3.	-0.002	202.76	2.003s
EU-154	5098.08	1274.54	20.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	6.	3.	0.002	176.21	2.017s
TL-210	5252.04	1313.00	23.	-13.	-0.007	92.52	2.036s
AG-110M	5537.48	1384.30	6.	1.	0.001	427.57	2.096s

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TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-152	5632.39	1408.00	0.	7.	0.004	37.80	2.115s
K-40	5843.36	1460.69	0.	141.	0.078	8.42	1.608s
La-140	6386.02	1596.21	18.	-13.	-0.007	83.56	2.269s
SB-124	6765.58	1690.98	0.	0.	0.000	1000.00	2.345s
BI-214	7060.00	1764.49	0.	13.	0.007	27.74	2.403s
Co-56	7087.48	1771.35	13.	0.	0.000	1000.00	2.408s
Y-88	7346.69	1836.06	0.	0.	0.000	1000.00	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
BE-7	C	-3.8170E+00				5.31E+01	
			477.60	-3.817E+00	?(	1.373E+01 1.06E+02 1.05E+01	G
NA-22	C	-2.1073E-01				9.50E+02	
			1274.53	-2.107E-01	?(	1.540E+00 2.03E+02 9.99E+01	G
K-40	N	1.0322E+02				4.66E+11	
			1460.83	1.032E+02	(	5.395E+00 8.42E+00 1.07E+01	G
Sc-46	F	5.1875E-01				8.38E+01	
			889.28	6.230E-01	?(	2.462E+00 1.17E+02 1.00E+02	G
			1120.55	4.145E-01	?(	1.427E+00 9.98E+01 1.00E+02	G
CR-51	F	-2.5804E+00				2.77E+01	
			320.08	-2.580E+00	&(	1.966E+01 2.25E+02 9.94E+00	G
MN-54	C	2.8873E-01				3.12E+02	
			834.85	2.887E-01	?(	6.569E-01 9.19E+01 1.00E+02	G
FE-59	F	1.3212E-01				4.45E+01	
			1099.25	-1.853E-01	?(	1.993E+00 4.52E+02 5.65E+01	G
			1291.60	5.472E-01	?(	2.266E+00 1.76E+02 4.32E+01	G
Co-56	C	-5.7161E-01				7.73E+01	
			846.77	-5.716E-01	?(	1.224E+00 9.43E+01 9.99E+01	G
			1238.28	-4.504E-01	+	2.860E+00 2.92E+02 6.61E+01	G
			1037.84	-2.840E-01	%	7.639E+00 1.12E+03 1.41E+01	G
			1771.35	0.000E+00	+	1.157E+01 1.00E+03 1.55E+01	A

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 9
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-57	C	2.1471E-01					2.72E+02	
			122.06	2.147E-01	*(	8.742E-01	1.20E+02	8.56E+01 G
			136.47	-2.138E+00	+	1.231E+01	1.71E+02	1.07E+01 G
CO-58	C	3.9640E-01					7.09E+01	
			810.78	3.964E-01	?(	1.165E+00	8.64E+01	9.95E+01 G
CO-60	F	5.1564E-01					1.93E+03	
			1332.50	-2.422E-02	%(	1.337E+00	2.37E+03	1.00E+02 G
			1173.24	1.056E+00	?(	4.864E-01	2.50E+01	9.99E+01 G
NB-94	I	1.3828E-01					7.41E+06	
			702.63	-3.090E-02	&(	1.059E+00	1.38E+03	9.79E+01 G
			871.10	3.041E-01	?(	7.495E-01	7.35E+01	9.99E+01 G
ZR-95	I	-5.5684E-01					6.40E+01	
			756.73	-5.568E-01	?(	2.217E+00	1.67E+02	5.45E+01 G
			724.20	-1.462E+00	+	3.665E+00	7.51E+01	4.42E+01 G
NB-95	I	-8.0663E-03					6.40E+01	
			765.79	-8.066E-03	%(	1.786E+00	6.23E+03	9.98E+01 G
RU-103	I	1.5472E-01					3.93E+01	
			497.05	1.547E-01	?(	6.147E-01	1.47E+02	9.09E+01 G
			610.30	4.924E+00	?	3.552E+01	2.10E+02	5.75E+00 GA
AG-108M	C	8.7804E-02					1.53E+05	
			433.94	-1.403E-01	?(	8.956E-01	2.45E+02	9.05E+01 G
			722.94	0.000E+00	+	1.544E+00	1.00E+03	9.08E+01 G
			614.28	3.175E-01	?(	2.355E+00	2.17E+02	8.98E+01 G
AG-110M	F	-1.0145E+00					2.50E+02	
			884.68	-1.014E+00	?(	3.483E+00	1.02E+02	7.27E+01 G
			657.76	2.971E-01	+	1.111E+00	1.08E+02	9.46E+01 G
			937.49	-1.464E+00	+	4.231E+00	1.27E+02	3.44E+01 G
			1384.30	4.109E-01	+	4.253E+00	4.28E+02	2.43E+01 G
			763.94	-2.561E+00	+	7.030E+00	8.17E+01	2.23E+01 G
SN-113	F	4.2633E-01					1.15E+02	
			391.69	4.263E-01	?(	1.599E+00	1.10E+02	6.40E+01 G
SB-124	F	4.9657E-01					6.02E+01	
			602.73	2.841E-01	?(	1.924E+00	1.97E+02	9.83E+01 G
			1690.98	0.000E+00	-	1.359E+00	1.00E+03	4.78E+01 G
			722.79	2.428E+00	?(	1.198E+01	1.42E+02	1.08E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 10
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	7.3692E-02					1.01E+03	
			427.88	-1.573E+00	?(	3.711E+00	9.51E+01	2.96E+01 G
			600.50	-1.510E-01	%	1.264E+01	2.42E+03	1.79E+01 G
			635.89	1.855E+00	?(	4.963E+00	7.87E+01	1.13E+01 G
			463.37	2.803E+00	&(	8.902E+00	9.33E+01	1.05E+01 G
I-131	I	3.1119E-01					8.02E+00	
			364.48	2.039E-01	?(	6.408E-01	1.20E+02	8.17E+01 G
			284.30	1.738E+00	?(	9.199E+00	1.95E+02	6.14E+00 G
			636.97	-1.359E+00	+	1.234E+01	2.49E+02	7.17E+00 G
Gd-153	F	-8.2011E-01					2.42E+02	
			97.50	-8.201E-01	?(	3.987E+00	1.45E+02	3.00E+01 G
			103.20	-1.125E+00	+	5.743E+00	1.52E+02	2.18E+01 G
Ga-68	C	1.3989E+01					4.71E-02	
			1077.40	1.399E+01	?(	2.957E+01	9.14E+01	3.30E+00 G
Tc-99m	I	5.7217E-01					2.51E-01	
			140.51	5.722E-01	@(	5.120E-01	3.96E+01	8.93E+01 G
BA-133	F	-3.2229E-01					3.85E+03	
			356.00	-3.223E-01	?(	2.545E+00	2.31E+02	6.20E+01 G
			302.85	0.000E+00	+	1.005E+01	1.00E+03	1.83E+01 G
			383.84	1.831E+00	?	1.305E+01	2.06E+02	8.94E+00 GA
			80.99	-1.055E+00	&	4.419E+00	1.25E+02	3.41E+01 GA
CS-134	I	3.5167E-01					7.54E+02	
			795.87	2.613E-01	?(	1.524E+00	1.66E+02	8.55E+01 G
			604.71	2.870E-01	?(	2.011E+00	2.04E+02	9.76E+01 G
			569.32	1.265E+00	?(	4.935E+00	1.11E+02	1.54E+01 G
			801.95	0.000E+00	&	1.647E+01	1.00E+03	8.69E+00 G
			563.24	-2.311E+00	+	1.224E+01	2.13E+02	8.35E+00 G
CS-137	I	-3.3137E-01					1.10E+04	
			661.66	-3.314E-01	?(	1.534E+00	1.34E+02	8.52E+01 G
CE-139	F	1.8256E-01					1.38E+02	
			165.85	1.826E-01	(	7.604E-01	1.22E+02	7.99E+01 G
Ba-140	I	1.1343E+00					1.28E+01	
			537.26	9.677E-01	?(	2.510E+00	1.03E+02	2.44E+01 G
			162.66	1.788E+00	?(	8.982E+00	1.46E+02	6.22E+00 G
			304.85	0.000E+00	-	4.314E+01	1.00E+03	4.29E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 11
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
La-140	I	-1.1443E+00					1.28E+01	
			1596.21	-1.144E+00	?(	1.979E+00	8.36E+01	9.54E+01 G
			487.02	-1.023E+00	+	3.948E+00	1.14E+02	4.55E+01 G
			328.76	1.115E+00	&	3.613E+00	9.52E+01	2.03E+01 G
			815.77	1.267E+00	+	5.665E+00	1.28E+02	2.33E+01 G
CE-141	I	1.5458E-01					3.25E+01	
			145.44	1.546E-01	&(	2.503E+00	4.77E+02	4.82E+01 G
PM-144	C	8.0469E-01					3.63E+02	
			696.54	8.047E-01	?(	7.719E-01	4.37E+01	9.90E+01 G
			618.06	2.384E-01	-	2.209E+00	2.70E+02	9.91E+01 G
EU-152	F	1.3975E+00					4.94E+03	
			121.78	7.139E-01	*(	2.448E+00	1.02E+02	2.86E+01 G
			344.29	0.000E+00	-	4.530E+00	1.00E+03	2.65E+01 G
			1112.07	0.000E+00	-	1.105E+01	1.00E+03	1.36E+01 G
			778.92	-2.141E+00	+	8.631E+00	1.67E+02	1.29E+01 G
			964.11	-2.344E+00	+	8.108E+00	1.48E+02	1.46E+01 G
			244.69	3.975E+00	?(	1.761E+01	1.31E+02	7.58E+00 G
			1408.00	2.528E+00	?	2.662E+00	3.78E+01	2.10E+01 GA
EU-154	I	5.1586E-01					3.14E+03	
			123.10	-3.051E-01	?(	1.883E+00	1.81E+02	4.08E+01 G
			1274.54	0.000E+00	+	4.698E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	6.940E+00	1.00E+03	2.02E+01 G
			873.23	-4.301E+00	+	1.130E+01	7.82E+01	1.23E+01 G
			1004.77	-2.176E-01	%	8.886E+00	1.12E+03	1.80E+01 G
			996.33	3.675E+00	?(	1.308E+01	1.03E+02	1.06E+01 G
EU-155	I	7.8479E-01					1.81E+03	
			105.31	1.020E+00	?(	5.199E+00	1.51E+02	2.12E+01 G
			86.54	6.221E-01	&(	4.057E+00	1.93E+02	3.07E+01 G
HF-181	F	-1.3452E-01					4.24E+01	
			482.00	-2.802E-01	?(	1.940E+00	2.01E+02	8.05E+01 G
			133.02	1.363E-01	?(	2.809E+00	6.07E+02	4.33E+01 G
			345.83	-3.087E+00	+	1.034E+01	9.99E+01	1.51E+01 G
			136.30	0.000E+00	+	2.105E+01	1.00E+03	5.85E+00 G
Ta-182	F	1.7811E+00					1.14E+02	
			1121.30	0.000E+00	?(	3.565E+00	1.00E+03	3.49E+01 G
			1221.41	-4.535E+00	+	8.069E+00	8.53E+01	2.70E+01 G
			1189.05	5.618E+00	?(	5.538E+00	4.70E+01	1.62E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 12
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Hg-203	F	-1.6708E-01					4.66E+01	
			279.20	-1.671E-01	?(	9.745E-01	1.68E+02	8.15E+01 G
TL-208	N	2.9642E+00					6.98E+02	
			583.02	3.046E+00	(	7.820E-01	1.65E+01	8.45E+01 G
			277.28	-1.073E+00	&	1.097E+01	2.89E+02	6.31E+00 G
			860.56	2.410E+00	?(	5.554E+00	9.59E+01	1.24E+01 G
PM-146	C	-5.0509E-02					2.02E+03	
			453.88	-5.051E-02	?(	1.189E+00	8.81E+02	6.50E+01 G
			747.16	-2.791E-01	+	2.811E+00	4.03E+02	3.40E+01 G
			735.72	-1.112E+00	+	5.259E+00	1.97E+02	2.25E+01 G
Cd-113m		-5.7209E+03					5.33E+03	
			263.70	-5.721E+03	&(	1.501E+04	7.86E+01	6.00E-03 K
Cd-109	F	-7.8339E+00					4.53E+02	
			88.04	-7.834E+00	&(	3.593E+01	1.37E+02	3.79E+00 G
Cf-251	T	1.9791E-01					3.28E+05	
			176.60	1.979E-01	?(	3.327E+00	6.24E+02	1.70E+01 G
			227.00	8.285E-01	?	1.004E+01	4.50E+02	6.30E+00 GA
Cf-249	T	-2.9422E-01					1.28E+05	
			387.95	-2.942E-01	?(	1.735E+00	1.71E+02	6.60E+01 G
			333.44	-1.987E+00	+	7.057E+00	1.05E+02	1.55E+01 G
Sn-126		2.8110E+00					3.65E+07	
			87.57	-7.928E-01	&	3.738E+00	1.41E+02	3.75E+01 GA
			64.28	2.811E+00	(	1.187E+01	1.25E+02	9.70E+00 G
			86.94	-3.294E+00	+	1.595E+01	1.44E+02	9.04E+00 GA
PB-210	N	6.8434E+00					8.14E+03	
			46.54	6.843E+00	(P	2.800E+01	1.28E+02	4.25E+00 G
PB-212	N	2.8277E-01					6.98E+02	
			238.63	2.828E-01	?(P	3.024E+00	3.14E+02	4.33E+01 G
			300.03	-9.307E+00	+	5.854E+01	1.87E+02	3.28E+00 GA
PB-214	N	5.9863E+00					5.84E+05	
			351.93	5.655E+00	*(P	1.813E+00	1.55E+01	3.76E+01 G
			295.09	6.632E+00	@(P	3.604E+00	2.60E+01	1.93E+01 G
			242.00	6.964E+00		7.737E+00	3.64E+01	7.43E+00 GA
BI-207	C	2.1941E-01					1.18E+04	
			1063.66	2.194E-01	?(	1.108E+00	2.06E+02	7.45E+01 G
			569.70	-2.655E-02	-	9.515E-01	9.72E+02	9.77E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 13
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-212	N	4.5933E+00					6.98E+02	
			727.17	4.593E+00	?(	1.562E+01	9.92E+01	7.55E+00 G
			785.42	8.966E+00	?	8.778E+01	3.98E+02	1.28E+00 GA
U-235	N	-2.7434E+00					2.57E+11	
			143.79	-2.743E+00	?(P	1.198E+01	7.56E+01	1.10E+01 G
			205.33	3.172E+00	&	1.182E+01	1.41E+02	5.01E+00 G
			163.38	3.041E+00	+	1.174E+01	1.13E+02	5.08E+00 G
			185.72	6.641E-01	+ P	1.205E+00	6.75E+01	5.40E+01 GA
BI-214	N	4.8805E+00					5.84E+05	
			609.31	4.881E+00	(	1.253E+00	1.62E+01	4.61E+01 G
			1120.29	2.744E+00	-	7.712E+00	8.26E+01	1.51E+01 G
			1764.49	7.719E+00	+	4.376E+00	2.77E+01	1.54E+01 G
BI-210M	T	5.1567E-01					1.10E+09	
			265.83	5.157E-01	?(	1.772E+00	1.02E+02	5.00E+01 G
			304.90	0.000E+00	-	6.611E+00	1.00E+03	2.80E+01 G
AC-228	N	1.8023E+00					2.10E+03	
			911.07	1.915E+00	?(	3.919E+00	8.96E+01	2.90E+01 G
			968.97	1.614E+00	(P	8.673E+00	1.54E+02	1.75E+01 G
			338.32	1.092E-01	%	9.835E+00	2.57E+03	1.20E+01 G
			93.35	4.766E+00	?	2.116E+01	1.32E+02	5.56E+00 XA
TH-227	N	-1.0144E+00					7.95E+03	
			256.24	-1.014E+00	?(	9.831E+00	3.61E+02	7.00E+00 G
			235.97	-2.368E+00	+	1.286E+01	1.61E+02	1.23E+01 G
			50.14	-3.061E+00	&	1.885E+01	1.81E+02	8.00E+00 G
TH-229	N	4.1922E+00					2.68E+06	
			193.51	4.192E+00	?(	1.185E+01	1.08E+02	4.40E+00 G
			210.85	-6.860E+00	+	2.719E+01	1.52E+02	2.99E+00 G
TH-234	N	2.4217E+00					1.63E+12	
			92.59	2.422E+00	(P	1.329E+01	1.62E+02	5.58E+00 G
			63.29	-6.890E+00	+ P	3.911E+01	1.65E+02	3.81E+00 G
PA-234	N	1.1257E+00					1.63E+12	
			131.29	1.126E+00	&(	4.637E+00	1.22E+02	1.80E+01 G
			946.02	-3.359E+00	+	8.716E+00	1.12E+02	1.34E+01 G
			569.47	-1.424E+00	+	1.189E+01	2.33E+02	8.20E+00 G
			883.24	-7.881E+00	+	2.433E+01	9.18E+01	9.60E+00 G
			880.53	-1.256E+01	&	3.534E+01	8.39E+01	6.00E+00 GA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 14
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-234M	N	2.3062E+01					1.63E+12	
			1001.00	0.000E+00	?(	1.886E+02	1.00E+03	8.37E-01 G
			766.41	8.872E+01	?(	3.725E+02	1.20E+02	2.94E-01 G
AM-241	T	-9.3343E-01					1.58E+05	
			59.54	-9.334E-01	(	4.257E+00	1.36E+02	3.59E+01 G
Np-237	F	1.7708E+00					2.14E+06	
			86.49	1.771E+00	(	9.257E+00	1.55E+02	1.31E+01 G
Ir-192	F	3.1603E-01					7.40E+01	
			316.49	3.160E-01	?(	1.885E+00	1.76E+02	8.70E+01 G
			468.06	-7.013E-01	+	2.354E+00	9.90E+01	5.18E+01 G
			308.44	0.000E+00	-	5.881E+00	1.00E+03	3.18E+01 G
Cs-136	F	1.4601E-01					1.30E+01	
			818.50	-1.182E-01	?(	1.501E+00	3.56E+02	1.00E+02 G
			1048.07	4.763E-01	?(	1.094E+00	6.93E+01	8.00E+01 G
			340.57	0.000E+00	-	2.539E+00	1.00E+03	4.69E+01 G
Np-239	T	8.8257E-01					2.36E+00	
			103.70	-3.696E-01	-	5.350E+00	4.27E+02	2.40E+01 X
			106.13	8.826E-01	?(	4.531E+00	1.52E+02	2.27E+01 G
			99.50	-1.637E+00	&	8.172E+00	1.49E+02	1.50E+01 X
Nd-147		2.9365E+00					1.11E+01	
			531.00	2.937E+00	?(	6.934E+00	9.71E+01	1.30E+01 G
			91.10	-1.041E+00	&	4.626E+00	1.33E+02	2.83E+01 G
Kr-85	I	-2.7949E+00					3.92E+03	
			513.98	-2.795E+00	%(	3.410E+02	3.46E+03	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.

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 15
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

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	149.	-10.	-0.005	181.26	-3.061E+00	
AM-241	59.54	258.	-17.	-0.009	135.74	-9.334E-01	
Sn-126	64.28	165.	15.	0.008	125.36	2.811E+00	
BA-133	80.99	383.	-22.	-0.012	125.19	-1.055E+00	
Np-237	86.49	259.	15.	0.008	155.30	1.771E+00	
EU-155	86.54	274.	12.	0.007	193.33	6.221E-01	
Sn-126	86.94	372.	-19.	-0.011	144.47	-3.294E+00	
Sn-126	87.57	353.	-19.	-0.011	140.68	-7.928E-01	
Cd-109	88.04	333.	-19.	-0.011	136.83	-7.834E+00	
Nd-147	91.10	314.	-19.	-0.011	132.51	-1.041E+00	
Gd-153	97.50	270.	-16.	-0.009	144.62	-8.201E-01	
Np-239	99.50	286.	-16.	-0.009	148.51	-1.637E+00	
Gd-153	103.20	303.	-16.	-0.009	151.94	-1.125E+00	
Np-239	103.70	319.	-6.	-0.003	427.33	-3.696E-01	
EU-155	105.31	234.	15.	0.008	151.24	1.020E+00	
Np-239	106.13	202.	13.	0.007	152.15	8.826E-01	
EU-152	121.78	90.	14.	0.008	101.73	7.139E-01	
CO-57	122.06	104.	12.	0.007	120.31	2.147E-01	
EU-154	123.10	109.	-8.	-0.005	180.80	-3.051E-01	
PA-234	131.29	128.	13.	0.007	121.97	1.126E+00	
HF-181	133.02	278.	4.	0.002	606.75	1.363E-01	
CO-57	136.47	323.	-15.	-0.008	171.19	-2.138E+00	
U-235	143.79	312.	-19.	-0.011	75.56	-2.743E+00	P
CE-141	145.44	260.	5.	0.003	476.58	1.546E-01	
Ba-140	162.66	47.	7.	0.004	145.62	1.788E+00	
U-235	163.38	54.	10.	0.005	113.28	3.041E+00	
CE-139	165.85	55.	9.	0.005	121.89	1.826E-01	
Cf-251	176.60	44.	2.	0.001	624.50	1.979E-01	
U-235	185.72	56.	21.	0.012	67.48	6.641E-01	P
TH-229	193.51	33.	10.	0.006	107.63	4.192E+00	
U-235	205.33	40.	9.	0.005	141.24	3.172E+00	
TH-229	210.85	77.	-11.	-0.006	152.26	-6.860E+00	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 16
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-251	227.00	40.	3.	0.001	449.74	8.285E-01	
TH-227	235.97	266.	-14.	-0.008	161.25	-2.368E+00	
EU-152	244.69	177.	15.	0.008	131.48	3.975E+00	
TH-227	256.24	40.	-3.	-0.002	360.62	-1.014E+00	
Cd-113m	263.70	69.	-16.	-0.009	78.58	-5.721E+03	
BI-210M	265.83	66.	12.	0.007	101.60	5.157E-01	
Hg-203	279.20	48.	-6.	-0.003	168.33	-1.671E-01	
I-131	284.30	22.	5.	0.003	194.63	1.738E+00	
TL-210	296.00	289.	-13.	-0.007	191.39	-3.811E-01	
PA-231	300.07	264.	-13.	-0.007	182.32	-1.241E+01	
Ir-192	316.49	184.	11.	0.006	176.19	3.160E-01	
CR-51	320.08	259.	-10.	-0.006	225.36	-2.580E+00	
La-140	328.76	31.	9.	0.005	95.21	1.115E+00	
Cf-249	333.44	72.	-12.	-0.007	104.97	-1.987E+00	
HF-181	345.83	143.	-17.	-0.010	99.86	-3.087E+00	
BA-133	356.00	140.	-7.	-0.004	231.42	-3.223E-01	
I-131	364.48	12.	6.	0.003	120.19	2.039E-01	
BA-133	383.84	65.	6.	0.003	206.05	1.831E+00	
Cf-249	387.95	62.	-7.	-0.004	171.03	-2.942E-01	
SN-113	391.69	48.	9.	0.005	110.00	4.263E-01	
SB-125	427.88	48.	-15.	-0.008	95.09	-1.573E+00	
AG-108M	433.94	24.	-4.	-0.002	244.95	-1.403E-01	
PM-146	453.88	20.	-1.	-0.001	881.29	-5.051E-02	
SB-125	463.37	29.	9.	0.005	93.33	2.803E+00	
Ir-192	468.06	52.	-11.	-0.006	99.03	-7.013E-01	
BE-7	477.60	72.	-12.	-0.007	106.28	-3.817E+00	
HF-181	482.00	84.	-7.	-0.004	201.38	-2.802E-01	
La-140	487.02	111.	-13.	-0.007	114.33	-1.023E+00	
RU-103	497.05	8.	4.	0.002	147.20	1.547E-01	
RH-106	511.86	27.	38.	0.021	24.98	6.889E+00	
Nd-147	531.00	22.	10.	0.006	97.07	2.937E+00	
Ba-140	537.26	9.	6.	0.004	102.87	9.677E-01	
CS-134	563.24	26.	-5.	-0.003	212.92	-2.311E+00	
CS-134	569.32	13.	5.	0.003	111.36	1.265E+00	
PA-234	569.47	23.	-3.	-0.002	233.33	-1.424E+00	
BI-207	569.70	21.	-1.	0.000	972.11	-2.655E-02	
SB-124	602.73	89.	7.	0.004	197.29	2.841E-01	
CS-134	604.71	96.	7.	0.004	204.25	2.870E-01	
RU-103	610.30	102.	7.	0.004	210.47	4.924E+00	
AG-108M	614.28	109.	7.	0.004	216.66	3.175E-01	
SB-125	635.89	5.	5.	0.003	78.67	1.855E+00	
I-131	636.97	15.	-2.	-0.001	248.76	-1.359E+00	
AG-110M	657.76	22.	6.	0.004	108.24	2.971E-01	
CS-137	661.66	34.	-6.	-0.004	133.68	-3.314E-01	
SB-124	722.79	29.	6.	0.003	141.54	2.428E+00	
ZR-95	724.20	48.	-14.	-0.008	75.09	-1.462E+00	
BI-212	727.17	24.	7.	0.004	99.15	4.593E+00	
PM-146	735.72	23.	-5.	-0.003	196.95	-1.112E+00	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 17
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
PM-146	747.16	14.	-2.	-0.001	403.11	-2.791E-01	
ZR-95	756.73	23.	-6.	-0.004	166.60	-5.568E-01	
AG-110M	763.94	41.	-12.	-0.007	81.71	-2.561E+00	
PA-234M	766.41	18.	5.	0.003	120.16	8.872E+01	
EU-152	778.92	19.	-6.	-0.003	167.10	-2.141E+00	
BI-212	785.42	19.	2.	0.001	398.21	8.966E+00	
CS-134	795.87	26.	4.	0.002	165.55	2.613E-01	
CO-58	810.78	19.	8.	0.004	86.42	3.964E-01	
La-140	815.77	25.	6.	0.003	128.49	1.267E+00	
Cs-136	818.50	33.	-2.	-0.001	356.00	-1.182E-01	
MN-54	834.85	5.	6.	0.003	91.87	2.887E-01	
Co-56	846.77	20.	-11.	-0.006	94.33	-5.716E-01	
NB-94	871.10	6.	6.	0.003	73.48	3.041E-01	
EU-154	873.23	25.	-10.	-0.006	78.20	-4.301E+00	
PA-234	880.53	63.	-14.	-0.008	83.88	-1.256E+01	
PA-234	883.24	77.	-14.	-0.008	91.81	-7.881E+00	
AG-110M	884.68	91.	-14.	-0.008	101.84	-1.014E+00	
Sc-46	889.28	85.	12.	0.006	116.61	6.230E-01	
Y-88	898.04	10.	-4.	-0.002	180.85	-2.313E-01	
AG-110M	937.49	25.	-9.	-0.005	126.60	-1.464E+00	
PA-234	946.02	15.	-8.	-0.004	112.15	-3.359E+00	
EU-152	964.11	15.	-6.	-0.003	147.67	-2.344E+00	
EU-154	996.33	20.	7.	0.004	103.20	3.675E+00	
Cs-136	1048.07	6.	6.	0.003	69.27	4.763E-01	
BI-207	1063.66	5.	3.	0.001	206.16	2.194E-01	
Ga-68	1077.40	5.	6.	0.004	91.39	1.399E+01	
FE-59	1099.25	11.	-2.	-0.001	452.11	-1.853E-01	
Sc-46	1120.55	18.	7.	0.004	99.83	4.145E-01	
CO-60	1173.24	0.	16.	0.009	25.00	1.056E+00	
Co-56	1238.28	28.	-4.	-0.002	292.05	-4.504E-01	
NA-22	1274.53	17.	-3.	-0.002	202.76	-2.107E-01	
FE-59	1291.60	6.	3.	0.002	176.21	5.472E-01	
TL-210	1313.00	23.	-13.	-0.007	92.52	-4.332E+00	
AG-110M	1384.30	6.	1.	0.001	427.57	4.109E-01	
EU-152	1408.00	0.	7.	0.004	37.80	2.528E+00	
La-140	1596.21	18.	-13.	-0.007	83.56	-1.144E+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	-3.8170E+00	-3.8170E+00	1.063E+02%	1.37E+01
NA-22	#A	-2.1073E-01	-2.1073E-01	2.028E+02%	1.54E+00
K-40		1.0322E+02	1.0322E+02	8.422E+00%	5.40E+00
Sc-46	#A	5.1875E-01	5.1875E-01	7.675E+01%	2.46E+00

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 18
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

CR-51	#A	-2.5804E+00	-2.5804E+00	2.254E+02%	1.97E+01
MN-54	#A	2.8873E-01	2.8873E-01	9.187E+01%	6.57E-01
FE-59	#A	1.3212E-01	1.3212E-01	1.762E+02%	1.99E+00
Co-56	#A	-5.7161E-01	-5.7161E-01	9.433E+01%	1.22E+00
CO-57	#A	2.1471E-01	2.1471E-01	1.203E+02%	8.74E-01
CO-58	#A	3.9640E-01	3.9640E-01	8.642E+01%	1.16E+00
CO-60	#A	5.1564E-01	5.1564E-01	2.500E+01%	1.34E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.99E+00
NB-94	#A	1.3828E-01	1.3828E-01	7.348E+01%	1.06E+00
ZR-95	#A	-5.5684E-01	-5.5684E-01	1.666E+02%	2.22E+00
NB-95	#A	-8.0663E-03	-8.0663E-03	6.231E+03%	1.79E+00
RU-103	#A	1.5472E-01	1.5472E-01	1.472E+02%	6.15E-01
RH-106	#A	0.0000E+00	0.0000E+00	7.071E+02%	2.27E+01
AG-108M	#A	8.7804E-02	8.7804E-02	1.635E+02%	8.96E-01
AG-110M	#A	-1.0145E+00	-1.0145E+00	1.018E+02%	3.48E+00
SN-113	#A	4.2633E-01	4.2633E-01	1.100E+02%	1.60E+00
SB-124	#A	4.9657E-01	4.9657E-01	1.214E+02%	1.92E+00
SB-125	#A	7.3692E-02	7.3692E-02	5.158E+01%	3.71E+00
I-131	#A	3.1118E-01	3.1119E-01	1.144E+02%	6.41E-01
Gd-153	#A	-8.2011E-01	-8.2011E-01	1.446E+02%	3.99E+00
Ga-68	#A	1.3880E+01	1.3989E+01	9.139E+01%	2.96E+01
Tc-99m	#	5.7132E-01	5.7217E-01	3.964E+01%	5.12E-01
BA-133	#A	-3.2229E-01	-3.2229E-01	2.314E+02%	2.55E+00
CS-134	#A	3.5167E-01	3.5167E-01	9.518E+01%	1.52E+00
CS-137	#A	-3.3137E-01	-3.3137E-01	1.337E+02%	1.53E+00
CE-139	#A	1.8256E-01	1.8256E-01	1.219E+02%	7.60E-01
Ba-140	#A	1.1343E+00	1.1343E+00	8.914E+01%	2.51E+00
La-140	#A	-1.1443E+00	-1.1443E+00	8.356E+01%	1.98E+00
CE-141	#A	1.5457E-01	1.5458E-01	4.766E+02%	2.50E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.11E+01
PM-144	#	8.0469E-01	8.0469E-01	4.372E+01%	7.72E-01
EU-152	#A	1.3975E+00	1.3975E+00	8.312E+01%	2.45E+00
EU-154	#A	5.1586E-01	5.1586E-01	1.032E+02%	1.88E+00
EU-155	#A	7.8479E-01	7.8479E-01	1.227E+02%	5.20E+00
HF-181	#A	-1.3452E-01	-1.3452E-01	2.014E+02%	1.94E+00
Ta-182	#A	1.7811E+00	1.7811E+00	4.698E+01%	3.56E+00
Hg-203	#A	-1.6708E-01	-1.6708E-01	1.683E+02%	9.74E-01
TL-208		2.9642E+00	2.9642E+00	1.646E+01%	7.82E-01
PM-146	#A	-5.0509E-02	-5.0509E-02	8.813E+02%	1.19E+00
Y-88	#A	0.0000E+00	0.0000E+00	1.000E+03%	7.04E-01
Cd-113m	#A	-5.7209E+03	-5.7209E+03	7.858E+01%	1.50E+04
Cd-109	#A	-7.8339E+00	-7.8339E+00	1.368E+02%	3.59E+01
Cf-251	#A	1.9791E-01	1.9791E-01	6.245E+02%	3.33E+00
Cf-249	#A	-2.9422E-01	-2.9422E-01	1.710E+02%	1.73E+00
Sn-126	#A	2.8110E+00	2.8110E+00	1.254E+02%	1.19E+01
PB-210	A	6.8434E+00	6.8434E+00	1.280E+02%	2.80E+01
PB-212	#A	2.8277E-01	2.8277E-01	3.143E+02%	3.02E+00
PB-214	#	5.9863E+00	5.9863E+00	1.513E+01%	1.81E+00
BI-207	#A	2.1941E-01	2.1941E-01	2.062E+02%	1.11E+00

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:52:54 PMPage 19
TestAmerica Inc Spectrum name: 12_Gamma_20193351.An1

BI-212 #A	4.5933E+00	4.5933E+00	9.915E+01%	1.56E+01
U-235 #A	-2.7434E+00	-2.7434E+00	7.556E+01%	1.20E+01
BI-214	4.8805E+00	4.8805E+00	1.616E+01%	1.25E+00
BI-210M#A	5.1567E-01	5.1567E-01	1.016E+02%	1.77E+00
AC-228 A	1.8023E+00	1.8023E+00	8.903E+01%	3.92E+00
TH-227 #A	-1.0144E+00	-1.0144E+00	3.606E+02%	9.83E+00
TH-229 #A	4.1922E+00	4.1922E+00	1.076E+02%	1.19E+01
TH-234 #A	2.4217E+00	2.4217E+00	1.621E+02%	1.33E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%	6.39E+01
PA-233 #A	0.0000E+00	0.0000E+00	1.000E+03%	5.23E+00
PA-234 #A	1.1257E+00	1.1257E+00	1.220E+02%	4.64E+00
PA-234M#A	2.3062E+01	2.3062E+01	1.202E+02%	1.89E+02
AM-241 #A	-9.3343E-01	-9.3343E-01	1.357E+02%	4.26E+00
Np-237 #A	1.7708E+00	1.7708E+00	1.553E+02%	9.26E+00
Ir-192 #A	3.1603E-01	3.1603E-01	1.762E+02%	1.89E+00
Cs-136 #A	1.4600E-01	1.4601E-01	6.927E+01%	1.50E+00
Np-239 #A	8.8244E-01	8.8257E-01	1.522E+02%	4.53E+00
Nd-147 #A	2.9364E+00	2.9365E+00	9.707E+01%	6.93E+00
TL-210 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.42E+00
Kr-85 #A	-2.7949E+00	-2.7949E+00	3.460E+03%	3.41E+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) 1.194E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.1 keV) 1.1942872E+02 Bq/Sample

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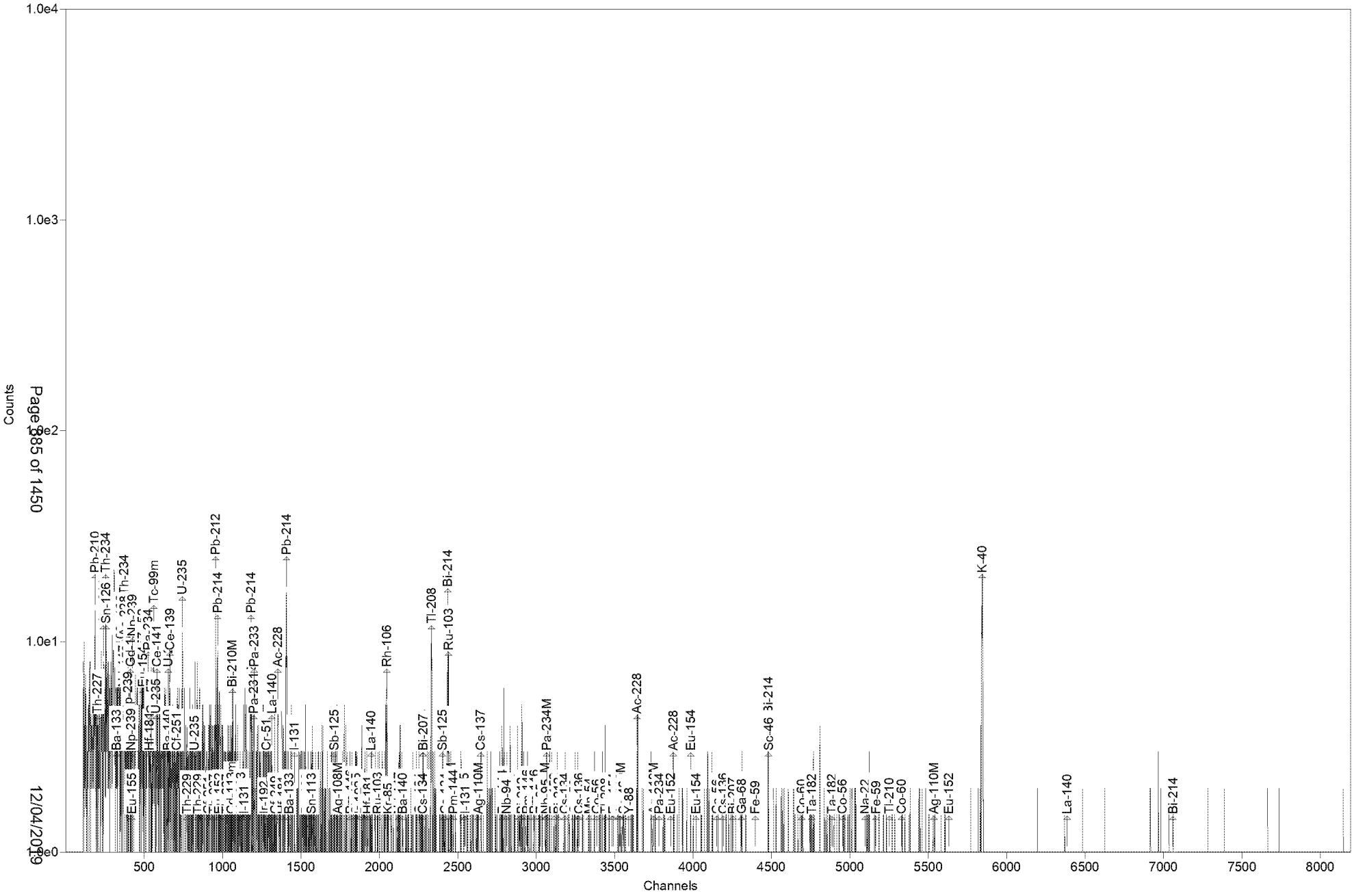
448571_Gamma_160-36160-A-10-C. 12_Gamma_20193351.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20193042

Sample Description: 448571_Gamma_160-36160-A-11-C
Detector: Detector # 5
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-11-C

Decay to Time: 11/23/2019 22:22 Live Time: 1800 sec
Acquisition Time: 11/23/2019 22:23:08 Real Time: 1806 sec
Analysis Time: 11/23/2019 22:53 Dead Time: 0.33 %
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_2019-11-10_1418.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	-4.799E+00	63.7	3.056E+00	3.066E+00	1.311E+01
NA-22	-5.502E-01	91.7	5.046E-01	5.053E-01	1.741E+00
K-40	6.531E+01	13.3	8.676E+00	9.297E+00	1.226E+01
Sc-46	-6.699E-01	110.8	7.424E-01	7.431E-01	2.531E+00
CR-51	-1.359E+00	204.0	2.773E+00	2.774E+00	1.178E+01
MN-54	7.483E-01	30.2	2.256E-01	2.289E-01	5.014E-01
FE-59	-1.692E+00	53.8	9.107E-01	9.146E-01	3.584E+00
Co-56	4.135E-01	121.8	5.038E-01	5.042E-01	1.167E+00
CO-57	-1.933E-01	123.4	2.385E-01	2.388E-01	8.106E-01
CO-58	-4.671E-01	95.8	4.476E-01	4.483E-01	1.536E+00
CO-60	-4.702E-01	165.7	7.791E-01	7.794E-01	1.807E+00
ZN-65	0.000E+00	1.#INF	1.714E-01	1.714E-01	3.454E+00
NB-94	2.814E-01	41.6	1.171E-01	1.180E-01	9.878E-01
ZR-95	-2.684E-01	370.1	9.931E-01	9.932E-01	2.543E+00
NB-95	3.202E-01	95.1	3.044E-01	3.048E-01	1.058E+00
RU-103	-1.539E-01	142.6	2.194E-01	2.196E-01	1.040E+00
RH-106	3.747E+00	149.2	5.589E+00	5.592E+00	1.808E+01
AG-108M	8.617E-02	168.4	1.451E-01	1.451E-01	9.341E-01
AG-110M	-3.504E-01	97.9	3.432E-01	3.437E-01	3.268E+00
SN-113	3.491E-01	164.8	5.754E-01	5.757E-01	1.992E+00
SB-124	1.433E+00	21.3	3.055E-01	3.144E-01	2.003E+00
SB-125	9.636E-01	105.9	1.020E+00	1.021E+00	2.089E+00
I-131	5.265E-01	28.3	1.491E-01	1.516E-01	9.585E-01
Gd-153	-5.832E-01	114.5	6.675E-01	6.684E-01	2.264E+00
Ga-68	-3.001E+00	857.3	2.572E+01	2.572E+01	6.229E+01
Tc-99m	-2.230E-01	139.1	3.104E-01	3.106E-01	1.051E+00
BA-133	-4.536E-02	130.5	5.920E-02	5.924E-02	2.319E+00
CS-134	2.532E-01	147.2	3.726E-01	3.729E-01	1.684E+00
CS-137	-4.931E-01	124.3	6.127E-01	6.132E-01	2.483E+00
CE-139	-4.470E-02	530.2	2.370E-01	2.370E-01	8.342E-01
Ba-140	6.076E-01	186.8	1.135E+00	1.135E+00	3.663E+00
La-140	-2.526E-02	114.5	2.894E-02	2.897E-02	1.707E+00
CE-141	-4.102E-01	132.2	5.423E-01	5.427E-01	1.837E+00

CE-144	-2.046E+00	139.3	2.851E+00	2.853E+00	9.611E+00
PM-144	-4.616E-02	91.9	4.243E-02	4.250E-02	1.305E+00
EU-152	1.823E+00	26.7	4.873E-01	4.967E-01	1.993E+00
EU-154	1.167E+00	79.5	9.275E-01	9.296E-01	1.663E+00
EU-155	3.470E-01	151.6	5.261E-01	5.264E-01	4.280E+00
HF-181	6.645E-01	84.0	5.582E-01	5.593E-01	1.699E+00
Ta-182	0.000E+00	1.#INF	3.531E-01	3.531E-01	5.030E+00
Hg-203	-2.791E-02	1035.8	2.891E-01	2.891E-01	1.038E+00
TL-208	5.483E-01	94.4	5.178E-01	5.186E-01	1.277E+00
PM-146	3.864E-01	119.8	4.629E-01	4.633E-01	1.226E+00
Y-88	8.454E-01	25.1	2.121E-01	2.176E-01	9.809E-01
Cd-113m	-4.277E+03	98.9	4.231E+03	4.240E+03	1.438E+04
Cd-109	4.870E+00	166.1	8.087E+00	8.092E+00	2.737E+01
Cf-251	-2.197E-01	492.4	1.082E+00	1.082E+00	3.102E+00
Cf-249	3.669E-01	127.6	4.680E-01	4.684E-01	1.618E+00
Sn-126	1.524E+00	222.7	3.393E+00	3.394E+00	1.159E+01
PB-210	-3.207E+00	305.1	9.787E+00	9.789E+00	3.015E+01
PB-212	2.867E+00	19.9	5.694E-01	5.989E-01	1.218E+00
PB-214	4.482E+00	17.1	7.663E-01	8.009E-01	1.660E+00
BI-207	-3.720E-01	179.4	6.673E-01	6.676E-01	1.506E+00
BI-212	-3.963E+00	161.1	6.383E+00	6.386E+00	2.237E+01
U-235	3.862E+00	38.4	1.484E+00	1.497E+00	3.526E+00
BI-214	2.090E+00	37.3	7.803E-01	7.878E-01	3.511E+00
BI-210M	4.933E-01	117.1	5.778E-01	5.785E-01	1.703E+00
AC-228	1.109E+00	187.1	2.075E+00	2.076E+00	5.218E+00
TH-227	-3.993E+00	116.8	4.663E+00	4.669E+00	1.220E+01
TH-229	1.365E+00	273.7	3.735E+00	3.736E+00	1.078E+01
TH-234	-2.981E+00	176.1	5.248E+00	5.251E+00	1.828E+01
PA-231	6.815E+00	112.9	7.695E+00	7.704E+00	3.714E+01
PA-233	3.111E-01	159.9	4.974E-01	4.977E-01	2.187E+00
PA-234	-2.302E-01	121.1	2.788E-01	2.791E-01	5.444E+00
PA-234M	1.251E+01	446.0	5.579E+01	5.580E+01	2.057E+02
AM-241	-1.177E+00	72.2	8.504E-01	8.526E-01	2.779E+00
Np-237	1.584E+00	146.4	2.319E+00	2.321E+00	7.836E+00
Ir-192	-2.957E-01	117.4	3.470E-01	3.474E-01	1.188E+00
Cs-136	-4.460E-02	1102.3	4.916E-01	4.916E-01	1.791E+00
Np-239	5.962E-01	163.4	9.740E-01	9.746E-01	3.324E+00
Nd-147	1.141E-01	205.6	2.346E-01	2.347E-01	6.755E+00
TL-210	0.000E+00	1.#INF	6.629E-02	6.629E-02	1.490E+00
Kr-85	4.534E+01	274.4	1.244E+02	1.244E+02	4.322E+02
Total	1.711E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 10:53:39 PMPage  1
TestAmerica Inc                 Spectrum name: 5_Gamma_20193042.An1

Sample description
     448571_Gamma_160-36160-A-11-C


Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20193042.An1

Acquisition information
       Start time:                 11/23/2019 10:23:08 PM
       Live time:               1800
       Real time:               1806
       Dead time:                  0.33 %
       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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 2
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

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	11/23/2019 10:22:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-11-10_1418.PBC 11/10/2019 2:18:51 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 7 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1539

***** 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
46.74	24.	32.68	0.75	1.825E-02	46.54	4.250	PBC<MDA	PB210
64.28	7.	222.68	0.80	2.757E-02	64.28	9.700	PBC<MDA	Sn126
74.74	49.	19.67	0.81	3.150E-02				
77.10	38.	26.01	0.81	3.220E-02				
86.49	13.	146.37	0.82	3.435E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.759E-01	EU155
86.54	13.	151.60	0.82	3.436E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	6.759E-01	EU155
					86.94	9.040	2.291E+00	Sn126
86.94	11.	155.50	0.83	3.443E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	2.049E+00	Sn126
87.57	11.	160.86	0.83	3.454E-02	87.57	37.500	PBC<MDA	Sn126
88.04	12.	166.08	0.83	3.462E-02	88.04	3.790	PBC<MDA	Cd109
91.10	9.	221.56	0.83	3.508E-02	91.10	28.300	PBC<MDA	Nd147
92.59	-11.	176.06	0.83	3.527E-02	92.59	5.584	PBC<MDA	TH234
93.35	10.	188.23	0.83	3.536E-02	93.35	5.561	PBC<MDA	AC228
99.50	2.	566.42	0.84	3.592E-02	99.50	15.000	PBC<MDA	Np239
106.13	9.	163.36	0.84	3.620E-02	106.13	22.700	PBC<MDA	Np239
123.10	10.	131.14	0.86	3.575E-02	123.10	40.790	PBC<MDA	EU154
143.63	26.	38.44	0.77	3.371E-02	143.79	10.960	3.938E+00	U235
163.39	13.	62.67	1.78	3.102E-02	162.66	6.220	PBC<MDA	Ba140
					163.38	5.080	PBC<MDA	U235

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 3
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
185.94	16.	66.27	1.03	2.854E-02	185.72	54.000	PBC<MDA	U235
193.51	3.	273.69	0.93	2.758E-02	193.51	4.400	PBC<MDA	TH229
204.99	7.	123.04	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
227.00	5.	142.93	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
235.97	7.	206.92	0.98	2.341E-02	235.97	12.300	PBC<MDA	TH227
238.53	52.	19.86	0.65	2.320E-02	238.63	43.300	2.867E+00	PB212
242.00	7.	212.67	0.98	2.293E-02	242.00	7.430	PBC<MDA	PB214
244.69	3.	372.64	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
265.83	8.	120.38	1.00	2.121E-02	265.83	50.000	PBC<MDA	BI210M
277.28	2.	469.75	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
284.30	20.	28.32	1.02	2.006E-02	284.30	6.140	9.172E+00	I131
295.09	10.	157.29	1.03	1.945E-02	295.09	19.300	PBC<MDA	PB214
300.03	6.	145.50	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	PBC<MDA	PA231
					300.18	6.200	PBC<MDA	PA233
300.07	6.	149.55	1.04	1.918E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	7.362E+00	PA231
					300.18	6.200	2.922E+00	PA233
300.18	6.	159.89	1.04	1.917E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	7.362E+00	PA231
					300.18	6.200	2.922E+00	PA233
302.65	6.	169.22	1.04	1.904E-02	302.65	2.880	PBC<MDA	PA231
					302.85	18.330	9.979E-01	BA133
302.85	6.	178.36	1.04	1.903E-02	302.65	2.880	6.349E+00	PA231
					302.85	18.330	9.981E-01	BA133
304.85	6.	186.75	1.04	1.893E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	6.583E-01	BI210M
304.90	6.	200.96	1.04	1.893E-02	304.85	4.290	PBC<MDA	Ba140
					304.90	28.000	6.386E-01	BI210M
344.29	8.	131.19	1.08	1.711E-02	344.29	26.500	PBC<MDA	EU152
345.83	8.	126.35	1.08	1.705E-02	345.83	15.070	PBC<MDA	HF181
351.93	51.	17.10	1.09	1.680E-02	351.93	37.600	4.482E+00	PB214
383.84	7.	115.78	1.12	1.563E-02	383.84	8.940	PBC<MDA	BA133
387.95	7.	127.56	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
391.69	6.	164.81	1.12	1.537E-02	391.69	64.000	PBC<MDA	SN113
427.88	6.	105.85	1.16	1.428E-02	427.88	29.600	PBC<MDA	SB125
453.88	6.	119.79	1.18	1.360E-02	453.88	65.000	PBC<MDA	PM146
482.00	8.	110.74	1.21	1.293E-02	482.00	80.500	PBC<MDA	HF181
487.02	4.	114.55	1.21	1.282E-02	487.02	45.500	PBC<MDA	La140
511.86	61.	15.40	2.48	1.230E-02	511.86	20.000	1.370E+01	RH106
513.98	4.	274.43	1.24	1.226E-02	513.98	0.430	PBC<MDA	Kr85
563.24	4.	147.20	1.28	1.135E-02	563.24	8.350	PBC<MDA	CS134
569.47	3.	204.94	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.007E+00	PA234
					569.70	97.740	1.685E-01	BI207
583.02	9.	94.44	1.30	1.103E-02	583.02	84.500	PBC<MDA	TL208
600.50	5.	229.94	1.31	1.076E-02	600.50	17.860	PBC<MDA	SB125
602.73	5.	238.93	1.32	1.073E-02	602.73	98.260	PBC<MDA	SB124

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 4
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
604.71	5.	247.59	1.32	1.070E-02	604.71	97.620	PBC<MDA	CS134
610.30	5.	152.08	1.32	1.062E-02	610.30	5.750	PBC<MDA	RU103
614.28	5.	168.36	1.33	1.056E-02	614.28	89.850	PBC<MDA	AG108M
618.06	6.	137.89	1.33	1.051E-02	618.06	99.100	PBC<MDA	PM144
621.92	7.	149.17	1.33	1.045E-02	621.92	9.930	PBC<MDA	RH106
702.63	2.	265.73	1.40	9.438E-03	702.63	97.900	PBC<MDA	NB94
722.79	22.	21.32	1.42	9.217E-03	722.79	10.810	1.227E+01	SB124
					722.94	90.840	1.460E+00	AG108M
					723.36	20.220	6.562E+00	EU154
763.94	3.	149.00	1.45	8.799E-03	763.94	22.280	PBC<MDA	AG110M
765.79	5.	95.07	1.45	8.781E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
766.41	1.	935.13	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
778.92	4.	184.30	1.46	8.657E-03	778.92	12.940	PBC<MDA	EU152
785.42	1.	800.00	1.47	8.597E-03	785.42	1.280	PBC<MDA	BI212
795.87	1.	755.78	1.48	8.503E-03	795.87	85.530	PBC<MDA	CS134
834.85	11.	30.15	1.51	8.168E-03	834.85	99.980	7.483E-01	MN54
846.77	6.	121.84	1.52	8.072E-03	846.77	99.935	PBC<MDA	Co56
871.10	6.	41.62	1.54	7.882E-03	871.10	99.890	PBC<MDA	NB94
880.53	25.	20.00	1.54	7.812E-03	880.53	6.000	2.963E+01	PA234
897.71	10.	31.62	1.56	7.684E-03	898.04	93.700	7.717E-01	Y88
911.15	3.	262.78	1.57	7.591E-03	911.07	29.000	PBC<MDA	AC228
968.39	4.	266.35	1.61	7.209E-03	968.97	17.460	PBC<MDA	AC228
996.33	6.	89.86	1.63	7.042E-03	996.33	10.600	PBC<MDA	EU154
1001.00	1.	446.01	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1037.84	1.	702.38	1.66	6.805E-03	1037.84	14.130	PBC<MDA	Co56
1050.36	1.	574.46	1.67	6.736E-03	1050.36	1.560	PBC<MDA	RH106
1112.07	14.	26.73	1.72	6.421E-03	1112.07	13.644	8.878E+00	EU152
1291.60	1.	409.65	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1460.50	64.	13.28	1.21	5.103E-03	1460.83	10.670	6.531E+01	K40
1764.22	10.	37.33	2.11	4.351E-03	1764.49	15.400	8.332E+00	BI214
1835.90	7.	38.96	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	
298.58	74.79	21.	49.	1.547E+03	19.67	0.813	-	D
308.04	77.15	28.	38.	1.165E+03	26.01	0.815	-	sD

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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 5
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

********** 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	68.	-4.	-0.002	305.13	0.783s
TH-227	200.11	50.14	57.	-12.	-0.007	110.33	0.787s
AM-241	237.72	59.54	84.	-19.	-0.011	72.23	0.797s
TH-234	252.74	63.29	121.	-32.	-0.018	47.66	0.801s
Sn-126	256.71	64.28	130.	7.	0.004	222.68	0.802s
Np-237	345.63	86.49	170.	13.	0.007	146.37	0.825s
EU-155	345.84	86.54	183.	13.	0.007	151.60	0.825s
Sn-126	347.43	86.94	154.	11.	0.006	155.50	0.825s
Sn-126	349.95	87.57	165.	11.	0.006	160.86	0.826s
Cd-109	351.83	88.04	177.	12.	0.006	166.08	0.826s
Nd-147	364.08	91.10	188.	9.	0.005	221.56	0.829s
TH-234	370.05	92.59	178.	-11.	-0.006	176.06	0.831s
AC-228	373.09	93.35	173.	10.	0.006	188.23	0.832
Gd-153	389.70	97.50	78.	-11.	-0.006	114.45	0.836s
Np-239	397.71	99.50	81.	2.	0.001	566.42	0.838s
Gd-153	412.52	103.20	69.	-8.	-0.005	145.49	0.842s
Np-239	414.52	103.70	78.	0.	0.000	1000.00	0.842s
Np-239	424.25	106.13	99.	9.	0.005	163.36	0.845s
EU-152	486.90	121.78	53.	-11.	-0.006	95.85	0.861s
CO-57	488.03	122.06	81.	-11.	-0.006	123.43	0.861s
EU-154	492.18	123.10	77.	10.	0.005	131.14	0.862s
PA-234	524.99	131.29	161.	-14.	-0.008	129.20	0.871s
HF-181	531.91	133.02	176.	-14.	-0.008	134.27	0.872s
CE-144	533.97	133.54	190.	-14.	-0.008	139.32	0.873s
HF-181	545.02	136.30	204.	-14.	-0.008	143.82	0.876s
CO-57	545.72	136.47	221.	-15.	-0.008	143.18	0.876s
Tc-99m	561.88	140.51	130.	-12.	-0.007	139.15	0.880s
U-235	574.35	143.63	20.	26.	0.015	38.44	0.768
CE-141	581.61	145.44	118.	-12.	-0.007	132.21	0.885s
Ba-140	650.54	162.66	92.	-11.	-0.006	123.47	0.902s
U-235	653.46	163.39	15.	13.	0.007	62.67	1.780s
CE-139	663.32	165.85	56.	-2.	-0.001	530.21	0.905s
Cf-251	706.34	176.60	30.	-2.	-0.001	492.44	0.916s
U-235	743.73	185.94	31.	16.	0.009	66.27	1.028s
TH-229	774.03	193.51	20.	3.	0.002	273.69	0.933s
U-235	821.35	205.33	24.	7.	0.004	123.04	0.945s
TH-229	843.44	210.85	31.	-3.	-0.001	352.76	0.950s
Cf-251	908.08	227.00	17.	5.	0.003	142.93	0.966s
TH-227	943.98	235.97	95.	7.	0.004	206.92	0.975s
PB-212	954.21	238.53	17.	52.	0.029	19.86	0.655s
PB-214	968.10	242.00	102.	7.	0.004	212.67	0.981s
EU-152	978.89	244.69	80.	3.	0.002	372.64	0.984s
TH-227	1025.11	256.24	44.	-11.	-0.006	116.77	0.995s
Cd-113m	1054.97	263.70	43.	-10.	-0.005	98.93	1.002s

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TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
BI-210M	1063.50	265.83	41.	8.	0.004	120.38	1.005
TL-208	1109.33	277.28	36.	2.	0.001	469.75	1.016s
I-131	1137.41	284.30	4.	20.	0.011	28.32	1.022
PB-214	1180.60	295.09	123.	10.	0.006	157.29	1.033
PB-212	1200.37	300.03	37.	6.	0.003	145.50	1.038
PA-231	1200.53	300.07	41.	6.	0.003	149.55	1.038s
PA-233	1200.97	300.18	47.	6.	0.003	159.89	1.038s
PA-231	1210.86	302.65	53.	6.	0.003	169.22	1.040s
BA-133	1211.66	302.85	59.	6.	0.003	178.36	1.040s
Ba-140	1219.66	304.85	66.	6.	0.003	186.75	1.042s
BI-210M	1219.85	304.90	72.	6.	0.003	200.96	1.042s
PA-233	1248.32	312.01	26.	-2.	-0.001	573.93	1.049s
Ir-192	1266.25	316.49	46.	-8.	-0.005	117.35	1.053s
CR-51	1280.63	320.08	58.	-4.	-0.002	203.98	1.057s
La-140	1315.35	328.76	40.	-6.	-0.004	191.76	1.065s
Cf-249	1334.08	333.44	40.	-12.	-0.007	100.41	1.070s
AC-228	1353.61	338.32	73.	-11.	-0.006	31.94	1.074s
Cs-136	1362.62	340.57	84.	-7.	-0.004	195.34	1.077s
EU-152	1377.49	344.29	57.	8.	0.005	131.19	1.080s
HF-181	1383.66	345.83	52.	8.	0.005	126.35	1.082s
PB-214	1408.09	351.93	12.	51.	0.028	17.10	1.087s
BA-133	1424.36	356.00	75.	-7.	-0.004	190.59	1.091s
I-131	1458.32	364.48	19.	-3.	-0.002	297.41	1.099s
BA-133	1535.78	383.84	27.	7.	0.004	115.78	1.117s
Cf-249	1552.22	387.95	34.	7.	0.004	127.56	1.121s
SN-113	1567.19	391.69	49.	6.	0.003	164.81	1.125s
SB-125	1711.99	427.88	8.	6.	0.003	105.85	1.158s
AG-108M	1736.25	433.94	16.	-2.	-0.001	399.82	1.164s
PM-146	1816.05	453.88	13.	6.	0.003	119.79	1.182s
SB-125	1854.01	463.37	29.	-2.	-0.001	368.93	1.191s
Ir-192	1872.79	468.06	52.	-11.	-0.006	97.37	1.195s
BE-7	1910.94	477.59	40.	-12.	-0.007	63.68	1.204s
HF-181	1928.56	482.00	39.	8.	0.005	110.74	1.208s
La-140	1948.65	487.02	4.	4.	0.002	114.55	1.212s
RU-103	1988.80	497.05	16.	-3.	-0.002	142.63	1.221s
RH-106	2048.06	511.86	13.	61.	0.034	15.40	2.485
Kr-85	2056.53	513.98	68.	4.	0.002	274.43	1.237s
Nd-147	2124.62	531.00	12.	-2.	-0.001	346.41	1.252s
CS-134	2253.60	563.24	8.	4.	0.002	147.20	1.280s
CS-134	2277.94	569.32	20.	-5.	-0.003	134.16	1.286s
PA-234	2278.54	569.47	22.	3.	0.002	204.94	1.286s
TL-208	2332.76	583.02	16.	9.	0.005	94.44	1.298s
SB-125	2402.69	600.50	53.	5.	0.003	229.94	1.313s
SB-124	2411.61	602.73	57.	5.	0.003	238.93	1.315
CS-134	2419.53	604.71	62.	5.	0.003	247.59	1.317s
RU-103	2441.89	610.30	23.	5.	0.003	152.08	1.322s
AG-108M	2457.82	614.28	28.	5.	0.003	168.36	1.325s
PM-144	2472.94	618.06	35.	6.	0.004	137.89	1.328s

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TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
RH-106	2488.37	621.92	44.	7.	0.004	149.17	1.332s
I-131	2548.61	636.97	18.	-8.	-0.004	118.59	1.345s
AG-110M	2631.76	657.76	41.	-12.	-0.006	83.38	1.362s
CS-137	2647.36	661.66	57.	-8.	-0.004	124.27	1.366s
PM-144	2786.90	696.54	17.	-7.	-0.004	121.63	1.395s
NB-94	2811.25	702.63	9.	2.	0.001	265.73	1.400s
SB-124	2891.88	722.79	0.	22.	0.012	21.32	1.417s
AG-108M	2892.48	722.94	22.	0.	0.000	1000.00	1.417s
EU-154	2894.17	723.36	22.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	22.	0.	0.000	1000.00	1.418s
BI-212	2909.41	727.17	29.	-5.	-0.003	161.05	1.421s
PM-146	2989.37	747.16	13.	-5.	-0.003	177.90	1.437s
ZR-95	3027.65	756.73	17.	-2.	-0.001	370.05	1.445s
AG-110M	3056.50	763.94	11.	3.	0.002	149.00	1.451s
NB-95	3063.89	765.79	9.	5.	0.003	95.07	1.453s
PA-234M	3066.38	766.41	14.	1.	0.000	935.13	1.453s
EU-152	3116.41	778.92	9.	4.	0.002	184.30	1.463s
BI-212	3142.41	785.42	14.	1.	0.001	800.00	1.468s
CS-134	3184.20	795.87	17.	1.	0.000	755.78	1.477s
TL-210	3199.12	799.60	18.	0.	0.000	1000.00	1.480s
CS-134	3208.53	801.95	19.	-1.	0.000	708.45	1.482s
CO-58	3243.82	810.78	19.	-7.	-0.004	95.83	1.489s
La-140	3263.80	815.77	26.	0.	0.000	1000.00	1.493s
MN-54	3340.10	834.85	0.	11.	0.006	30.15	1.508s
Co-56	3387.78	846.77	9.	6.	0.003	121.84	1.518s
TL-208	3442.95	860.56	14.	-2.	-0.001	403.11	1.529s
NB-94	3485.08	871.10	0.	6.	0.003	41.62	1.537s
EU-154	3493.61	873.23	13.	-6.	-0.003	47.85	1.539s
PA-234	3522.80	880.53	0.	25.	0.014	20.00	1.544s
PA-234	3533.64	883.24	25.	0.	0.000	1000.00	1.547s
AG-110M	3539.41	884.68	43.	-8.	-0.004	127.18	1.547s
Sc-46	3557.79	889.28	49.	-9.	-0.005	110.82	1.551s
Y-88	3592.83	898.04	0.	10.	0.006	31.62	1.558s
AC-228	3644.94	911.07	15.	3.	0.002	262.78	1.568s
AG-110M	3750.60	937.49	9.	-1.	-0.001	493.71	1.589s
PA-234	3784.70	946.02	14.	-7.	-0.004	119.52	1.595s
EU-152	3857.05	964.11	45.	-15.	-0.008	69.31	1.609s
AC-228	3876.48	968.97	47.	4.	0.002	266.35	1.612s
EU-154	3985.88	996.33	10.	6.	0.003	89.86	1.633s
PA-234M	4004.55	1001.00	17.	1.	0.001	446.01	1.636s
EU-154	4019.65	1004.77	50.	-11.	-0.006	93.04	1.639s
Co-56	4151.87	1037.84	10.	1.	0.001	702.38	1.664s
Cs-136	4192.77	1048.07	10.	-3.	-0.002	159.86	1.671s
RH-106	4201.93	1050.36	16.	1.	0.001	574.46	1.673s
BI-207	4255.11	1063.66	5.	-3.	-0.002	179.40	1.682s
Ga-68	4310.04	1077.40	15.	-1.	-0.001	857.32	1.692s
FE-59	4397.41	1099.25	20.	-11.	-0.006	53.82	1.708s
EU-152	4448.68	1112.07	0.	14.	0.008	26.73	1.717s

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TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZN-65	4462.56	1115.55	14.	0.	0.000	1000.00	1.720s
Ta-182	4485.56	1121.30	14.	0.	0.000	1000.00	1.724s
CO-60	4693.21	1173.24	0.	0.	0.000	1000.00	1.760s
Ta-182	4756.42	1189.05	10.	-1.	-0.001	702.38	1.771s
Ta-182	4885.79	1221.41	11.	-7.	-0.004	117.90	1.793s
Co-56	4953.23	1238.28	11.	-2.	-0.001	291.86	1.804s
NA-22	5098.13	1274.53	11.	-6.	-0.003	91.70	1.828s
EU-154	5098.17	1274.54	16.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	6.	1.	0.001	409.65	1.840s
CO-60	5329.85	1332.50	11.	-5.	-0.003	165.68	1.866s
EU-152	5631.62	1408.00	0.	0.	0.000	1000.00	1.914s
K-40	5841.41	1460.50	4.	64.	0.036	13.28	1.209s
La-140	6383.73	1596.21	6.	-2.	-0.001	488.41	2.024s
SB-124	6762.39	1690.98	0.	0.	0.000	1000.00	2.076s
BI-214	7056.06	1764.49	2.	10.	0.006	37.33	2.114s
Co-56	7083.46	1771.35	12.	0.	0.000	1000.00	2.117s
Y-88	7341.96	1836.06	0.	7.	0.004	38.96	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	-4.7994E+00				5.31E+01	
			477.60	-4.799E+00	&(P	1.311E+01 6.37E+01 1.05E+01	G
NA-22	C	-5.5024E-01				9.50E+02	
			1274.53	-5.502E-01	?(	1.741E+00 9.17E+01 9.99E+01	G
K-40	N	6.5310E+01				4.66E+11	
			1460.83	6.531E+01	(P	1.226E+01 1.33E+01 1.07E+01	G
Sc-46	F	-6.6986E-01				8.38E+01	
			889.28	-6.699E-01	?(	2.531E+00 1.11E+02 1.00E+02	G
			1120.55	-2.610E-02	% P	1.771E+00 2.05E+03 1.00E+02	G
CR-51	F	-1.3594E+00				2.77E+01	
			320.08	-1.359E+00	?(P	1.178E+01 2.04E+02 9.94E+00	G
MN-54	C	7.4828E-01				3.12E+02	
			834.85	7.483E-01	&(	5.014E-01 3.02E+01 1.00E+02	G

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TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
FE-59	F	-1.6919E+00					4.45E+01	
			1099.25	-1.692E+00	?(P	3.584E+00	5.38E+01	5.65E+01 G
			1291.60	3.018E-01	+ P	3.137E+00	4.10E+02	4.32E+01 G
Co-56	C	4.1350E-01					7.73E+01	
			846.77	3.903E-01	&(	1.167E+00	1.22E+02	9.99E+01 G
			1238.28	-3.057E-01	+ P	2.617E+00	2.92E+02	6.61E+01 G
			1037.84	5.778E-01	?(	1.008E+01	7.02E+02	1.41E+01 G
			1771.35	0.000E+00	-	1.560E+01	1.00E+03	1.55E+01 A
CO-57	C	-1.9327E-01					2.72E+02	
			122.06	-1.933E-01	?(	8.106E-01	1.23E+02	8.56E+01 G
			136.47	-2.247E+00	&	1.083E+01	1.43E+02	1.07E+01 G
CO-58	C	-4.6707E-01					7.09E+01	
			810.78	-4.671E-01	?(	1.536E+00	9.58E+01	9.95E+01 G
CO-60	F	-4.7025E-01					1.93E+03	
			1332.50	-4.702E-01	?(	1.807E+00	1.66E+02	1.00E+02 G
			1173.24	0.000E+00	+	6.677E-01	1.00E+03	9.99E+01 G
NB-94	I	2.8143E-01					7.41E+06	
			702.63	1.403E-01	?(	9.878E-01	2.66E+02	9.79E+01 G
			871.10	4.198E-01	?(P	5.200E-01	4.16E+01	9.99E+01 G
ZR-95	I	-2.6837E-01					6.40E+01	
			756.73	-2.684E-01	?(	2.543E+00	3.70E+02	5.45E+01 G
			724.20	0.000E+00	+	3.360E+00	1.00E+03	4.42E+01 G
NB-95	I	3.2015E-01					6.40E+01	
			765.79	3.202E-01	?(	1.058E+00	9.51E+01	9.98E+01 G
RU-103	I	-1.5386E-01					3.93E+01	
			497.05	-1.539E-01	?(P	1.040E+00	1.43E+02	9.09E+01 G
			610.30	4.268E+00	?	2.284E+01	1.52E+02	5.75E+00 GA
RH-106	I	3.7467E+00					3.74E+02	
			621.92	3.505E+00	?(	1.808E+01	1.49E+02	9.93E+00 G
			1050.36	5.287E+00	?(	1.129E+02	5.74E+02	1.56E+00 G
			511.86	1.370E+01		4.455E+00	1.54E+01	2.00E+01 GA
AG-108M	C	8.6169E-02					1.53E+05	
			433.94	-9.614E-02	?(P	9.341E-01	4.00E+02	9.05E+01 G
			722.94	0.000E+00	+	1.630E+00	1.00E+03	9.08E+01 G
			614.28	2.698E-01	&(	1.597E+00	1.68E+02	8.98E+01 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AG-110M	F -3.5038E-01					2.50E+02	
		884.68	-7.474E-01	(	3.268E+00	1.27E+02	7.27E+01 G
		657.76	-6.829E-01	+	1.916E+00	8.34E+01	9.46E+01 G
		937.49	-2.909E-01	+	3.697E+00	4.94E+02	3.44E+01 G
		1384.30	-1.428E-01	%	5.770E+00	1.58E+03	2.43E+01 G
		763.94	9.446E-01	&(	5.081E+00	1.49E+02	2.23E+01 G
SN-113	F 3.4915E-01					1.15E+02	
		391.69	3.491E-01	?(	1.992E+00	1.65E+02	6.40E+01 G
SB-124	F 1.4329E+00					6.02E+01	
		602.73	2.410E-01	?(	2.003E+00	2.39E+02	9.83E+01 G
		1690.98	0.000E+00	-	1.899E+00	1.00E+03	4.78E+01 G
		722.79	1.227E+01	?(	4.109E+00	2.13E+01	1.08E+01 G
SB-125	I 9.6358E-01					1.01E+03	
		427.88	7.487E-01	?(	2.089E+00	1.06E+02	2.96E+01 G
		600.50	1.320E+00	?(	1.057E+01	2.30E+02	1.79E+01 G
		635.89	-3.899E-01	% P	7.921E+00	1.08E+03	1.13E+01 G
		463.37	-7.991E-01	& P	1.104E+01	3.69E+02	1.05E+01 G
I-131	I 5.2646E-01					8.02E+00	
		364.48	-1.233E-01	(P	9.585E-01	2.97E+02	8.17E+01 G
		284.30	9.172E+00	&(	5.248E+00	2.83E+01	6.14E+00 G
		636.97	-5.799E+00	+	1.700E+01	1.19E+02	7.17E+00 G
Gd-153	F -5.8322E-01					2.42E+02	
		97.50	-5.832E-01	?(	2.264E+00	1.14E+02	3.00E+01 G
		103.20	-5.880E-01	+	2.929E+00	1.45E+02	2.18E+01 G
Ga-68	C -3.0006E+00					4.71E-02	
		1077.40	-3.001E+00	?(	6.229E+01	8.57E+02	3.30E+00 G
Tc-99m	I -2.2304E-01					2.51E-01	
		140.51	-2.230E-01	?(	1.051E+00	1.39E+02	8.93E+01 G
BA-133	F -4.5356E-02					3.85E+03	
		356.00	-3.536E-01	?(	2.319E+00	1.91E+02	6.20E+01 G
		302.85	9.981E-01	?(	6.148E+00	1.78E+02	1.83E+01 G
		383.84	2.676E+00	?	1.070E+01	1.16E+02	8.94E+00 GA
		80.99	-4.913E-02	%	2.049E+00	1.49E+03	3.41E+01 GA
CS-134	I 2.5316E-01					7.54E+02	
		795.87	6.004E-02	?(P	1.684E+00	7.56E+02	8.55E+01 G
		604.71	2.435E-01	?(	2.095E+00	2.48E+02	9.76E+01 G
		569.32	-1.605E+00	+	7.560E+00	1.34E+02	1.54E+01 G
		801.95	-6.403E-01	+ P	1.736E+01	7.08E+02	8.69E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 11
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			563.24	2.344E+00	?(	9.311E+00	1.47E+02	8.35E+00 G
CS-137	I	-4.9305E-01					1.10E+04	
			661.66	-4.931E-01	?(P	2.483E+00	1.24E+02	8.52E+01 G
CE-139	F	-4.4700E-02					1.38E+02	
			165.85	-4.470E-02	?(	8.342E-01	5.30E+02	7.99E+01 G
Ba-140	I	6.0762E-01					1.28E+01	
			537.26	-4.114E-02	%(P	3.663E+00	2.16E+03	2.44E+01 G
			162.66	-3.248E+00	&	1.360E+01	1.23E+02	6.22E+00 G
			304.85	4.296E+00	?(	2.768E+01	1.87E+02	4.29E+00 G
La-140	I	-2.5264E-02					1.28E+01	
			1596.21	-2.144E-01	?(P	1.707E+00	4.88E+02	9.54E+01 G
			487.02	3.714E-01	(P	1.180E+00	1.15E+02	4.55E+01 G
			328.76	-9.749E-01	&	4.973E+00	1.92E+02	2.03E+01 G
			815.77	0.000E+00	+	7.585E+00	1.00E+03	2.33E+01 G
CE-141	I	-4.1020E-01					3.25E+01	
			145.44	-4.102E-01	?(	1.837E+00	1.32E+02	4.82E+01 G
CE-144	I	-2.0461E+00					2.85E+02	
			133.54	-2.046E+00	?(	9.611E+00	1.39E+02	1.11E+01 G
PM-144	C	-4.6156E-02					3.63E+02	
			696.54	-4.329E-01	?(	1.305E+00	1.22E+02	9.90E+01 G
			618.06	3.402E-01	?(P	1.624E+00	1.38E+02	9.91E+01 G
EU-152	F	1.8235E+00					4.94E+03	
			121.78	-6.147E-01	?(	1.993E+00	9.58E+01	2.86E+01 G
			344.29	1.029E+00	?(	4.624E+00	1.31E+02	2.65E+01 G
			1112.07	8.878E+00	&(	4.674E+00	2.67E+01	1.36E+01 G
			778.92	1.818E+00	?(	8.404E+00	1.84E+02	1.29E+01 G
			964.11	-7.773E+00	+	1.788E+01	6.93E+01	1.46E+01 G
			244.69	1.104E+00	?(	1.429E+01	3.73E+02	7.58E+00 G
			1408.00	0.000E+00	-	3.703E+00	1.00E+03	2.10E+01 GA
EU-154	I	1.1669E+00					3.14E+03	
			123.10	3.725E-01	&(P	1.663E+00	1.31E+02	4.08E+01 G
			1274.54	0.000E+00	-	5.941E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	7.328E+00	1.00E+03	2.02E+01 G
			873.23	-3.217E+00	+ P	1.108E+01	4.78E+01	1.23E+01 G
			1004.77	-5.027E+00	+	1.580E+01	9.30E+01	1.80E+01 G
			996.33	4.224E+00	?(	1.308E+01	8.99E+01	1.06E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 12
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
EU-155	I	3.4702E-01					1.81E+03	
			105.31	-1.293E-01	%(P	4.280E+00	1.05E+03	2.12E+01 G
			86.54	6.759E-01	?(	3.461E+00	1.52E+02	3.07E+01 G
HF-181	F	6.6451E-01					4.24E+01	
			482.00	4.484E-01	?(	1.699E+00	1.11E+02	8.05E+01 G
			133.02	-5.230E-01	+	2.368E+00	1.34E+02	4.33E+01 G
			345.83	1.819E+00	&(	7.872E+00	1.26E+02	1.51E+01 G
			136.30	-3.924E+00	+	1.902E+01	1.44E+02	5.85E+00 G
Hg-203	F	-2.7911E-02					4.66E+01	
			279.20	-2.791E-02	%(	1.038E+00	1.04E+03	8.15E+01 G
TL-208	N	5.4828E-01					6.98E+02	
			583.02	5.304E-01	*(P	1.277E+00	9.44E+01	8.45E+01 G
			277.28	7.882E-01	&(	1.321E+01	4.70E+02	6.31E+00 G
			860.56	-1.123E+00	+	1.132E+01	4.03E+02	1.24E+01 G
PM-146	C	3.8641E-01					2.02E+03	
			453.88	3.864E-01	(P	1.226E+00	1.20E+02	6.50E+01 G
			747.16	-9.633E-01	+ P	3.590E+00	1.78E+02	3.40E+01 G
			735.72	-2.492E-01	% P	4.520E+00	1.02E+03	2.25E+01 G
Y-88	F	8.4542E-01					1.07E+02	
			1836.06	9.151E-01	?(P	9.809E-01	3.90E+01	9.92E+01 G
			898.04	7.717E-01	?(	5.687E-01	3.16E+01	9.37E+01 G
Cd-113m		-4.2771E+03					5.33E+03	
			263.70	-4.277E+03	?(	1.438E+04	9.89E+01	6.00E-03 K
Cd-109	F	4.8695E+00					4.53E+02	
			88.04	4.870E+00	?(	2.737E+01	1.66E+02	3.79E+00 G
Cf-251	T	-2.1971E-01					3.28E+05	
			176.60	-2.197E-01	?(	3.102E+00	4.92E+02	1.70E+01 G
			227.00	1.946E+00	&	7.929E+00	1.43E+02	6.30E+00 GA
Cf-249	T	3.6691E-01					1.28E+05	
			387.95	3.669E-01	&(	1.618E+00	1.28E+02	6.60E+01 G
			333.44	-2.515E+00	+	6.585E+00	1.00E+02	1.55E+01 G
Sn-126		1.5236E+00					3.65E+07	
			87.57	4.930E-01		2.685E+00	1.61E+02	3.75E+01 GA
			64.28	1.524E+00	?(	1.159E+01	2.23E+02	9.70E+00 G
			86.94	2.049E+00	?	1.079E+01	1.56E+02	9.04E+00 GA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 13
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-210	N	-3.2074E+00					8.14E+03	
			46.54	-3.207E+00	&(P	3.015E+01	3.05E+02	4.25E+00 G
PB-212	N	2.8675E+00					6.98E+02	
			238.63	2.867E+00	(P	1.218E+00	1.99E+01	4.33E+01 G
			300.03	5.423E+00	+ P	2.734E+01	1.45E+02	3.28E+00 GA
PB-214	N	4.4821E+00					5.84E+05	
			351.93	4.482E+00	@(P	1.660E+00	1.71E+01	3.76E+01 G
			295.09	1.504E+00	-	8.040E+00	1.57E+02	1.93E+01 G
			242.00	2.226E+00	-	1.623E+01	2.13E+02	7.43E+00 GA
BI-207	C	-3.7198E-01					1.18E+04	
			1063.66	-3.720E-01	?(P	1.506E+00	1.79E+02	7.45E+01 G
			569.70	-6.025E-09	%	1.145E+00	5.08E+09	9.77E+01 G
BI-212	N	-3.9631E+00					6.98E+02	
			727.17	-3.963E+00	?(	2.237E+01	1.61E+02	7.55E+00 G
			785.42	5.048E+00	?	1.017E+02	8.00E+02	1.28E+00 GA
U-235	N	3.8619E+00					2.57E+11	
			143.79	3.938E+00	(P	3.526E+00	3.84E+01	1.10E+01 G
			205.33	3.109E+00	?(P	1.071E+01	1.23E+02	5.01E+00 G
			163.38	4.441E+00	*(P	7.403E+00	6.27E+01	5.08E+00 G
			185.72	5.633E-01	- P	1.039E+00	6.63E+01	5.40E+01 GA
BI-214	N	2.0903E+00					5.84E+05	
			609.31	4.799E-03	%(P	3.511E+00	2.04E+04	4.61E+01 G
			1120.29	-1.728E-01	% P	1.172E+01	2.03E+03	1.51E+01 G
			1764.49	8.332E+00	?(P	7.641E+00	3.73E+01	1.54E+01 G
BI-210M	T	4.9330E-01					1.10E+09	
			265.83	4.119E-01	&(	1.703E+00	1.20E+02	5.00E+01 G
			304.90	6.386E-01	?(	4.426E+00	2.01E+02	2.80E+01 G
AC-228	N	1.1093E+00					2.10E+03	
			911.07	7.917E-01	?(P	5.218E+00	2.63E+02	2.90E+01 G
			968.97	1.637E+00	?(P	1.528E+01	2.66E+02	1.75E+01 G
			338.32	-2.855E+00	+ P	1.137E+01	3.19E+01	1.20E+01 G
			93.35	2.832E+00		1.808E+01	1.88E+02	5.56E+00 XA
TH-227	N	-3.9929E+00					7.95E+03	
			256.24	-3.993E+00	?(	1.220E+01	1.17E+02	7.00E+00 G
			235.97	1.309E+00	&	9.294E+00	2.07E+02	1.23E+01 G
			50.14	-4.120E+00	+	1.308E+01	1.10E+02	8.00E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 14
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	1.3646E+00					2.68E+06	
			193.51	1.365E+00	?(P	1.078E+01	2.74E+02	4.40E+00 G
			210.85	-1.875E+00	+ P	2.060E+01	3.53E+02	2.99E+00 G
TH-234	N	-2.9809E+00					1.63E+12	
			92.59	-2.981E+00	*(P	1.828E+01	1.76E+02	5.58E+00 G
			63.29	-1.707E+01	+ P	2.899E+01	4.77E+01	3.81E+00 G
PA-231	N	6.8146E+00					1.20E+07	
			302.65	6.347E+00	?(	3.714E+01	1.69E+02	2.88E+00 G
			300.07	7.362E+00	?(	3.815E+01	1.50E+02	2.46E+00 G
PA-233	C	3.1110E-01					7.82E+08	
			312.01	-1.385E-01	?(	2.187E+00	5.74E+02	3.60E+01 G
			300.18	2.922E+00	?(	1.617E+01	1.60E+02	6.20E+00 G
PA-234	N	-2.3019E-01					1.63E+12	
			131.29	-1.249E+00	&(	5.444E+00	1.29E+02	1.80E+01 G
			946.02	-3.946E+00	+	1.136E+01	1.20E+02	1.34E+01 G
			569.47	2.007E+00	?(	1.469E+01	2.05E+02	8.20E+00 G
			883.24	0.000E+00	+	1.932E+01	1.00E+03	9.60E+00 G
			880.53	2.963E+01	?	8.736E+00	2.00E+01	6.00E+00 GA
PA-234M	N	1.2509E+01					1.63E+12	
			1001.00	1.251E+01	?(P	2.057E+02	4.46E+02	8.37E-01 G
			766.41	1.251E+01	?(P	4.394E+02	9.35E+02	2.94E-01 G
AM-241	T	-1.1774E+00					1.58E+05	
			59.54	-1.177E+00	?(P	2.779E+00	7.22E+01	3.59E+01 G
Np-237	F	1.5844E+00					2.14E+06	
			86.49	1.584E+00	?(	7.836E+00	1.46E+02	1.31E+01 G
Ir-192	F	-2.9565E-01					7.40E+01	
			316.49	-2.957E-01	?(	1.188E+00	1.17E+02	8.70E+01 G
			468.06	-8.909E-01	+	2.938E+00	9.74E+01	5.18E+01 G
			308.44	7.121E-07	%	4.094E+00	1.64E+08	3.18E+01 G
Cs-136	F	-4.4598E-02					1.30E+01	
			818.50	-4.460E-02	%(	1.791E+00	1.10E+03	1.00E+02 G
			1048.07	-3.087E-01	+	1.795E+00	1.60E+02	8.00E+01 G
			340.57	-4.640E-01	&	3.114E+00	1.95E+02	4.69E+01 G
Np-239	T	5.9623E-01					2.36E+00	
			103.70	0.000E+00	-	2.805E+00	1.00E+03	2.40E+01 X
			106.13	5.962E-01	?(	3.324E+00	1.63E+02	2.27E+01 G
			99.50	2.337E-01	?	4.612E+00	5.66E+02	1.50E+01 X

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 15
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

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 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Nd-147       1.1410E-01                                      1.11E+01
                           531.00-7.166E-01 ?(  6.755E+00 3.46E+02 1.30E+01 G
                            91.10 4.957E-01 ?(  3.729E+00 2.22E+02 2.83E+01 G

Kr-85    I   4.5338E+01                                      3.92E+03
                           513.98 4.534E+01 ?(  4.322E+02 2.74E+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	68.	-4.	-0.002	305.13	-3.207E+00	P
TH-227	50.14	57.	-12.	-0.007	110.33	-4.120E+00	
AM-241	59.54	84.	-19.	-0.011	72.23	-1.177E+00	P
TH-234	63.29	121.	-32.	-0.018	47.66	-1.707E+01	P
Sn-126	64.28	130.	7.	0.004	222.68	1.524E+00	
Np-237	86.49	170.	13.	0.007	146.37	1.584E+00	
EU-155	86.54	183.	13.	0.007	151.60	6.759E-01	
Sn-126	86.94	154.	11.	0.006	155.50	2.049E+00	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 16
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Sn-126	87.57	165.	11.	0.006	160.86	4.930E-01		
Cd-109	88.04	177.	12.	0.006	166.08	4.870E+00		
Nd-147	91.10	188.	9.	0.005	221.56	4.957E-01		
TH-234	92.59	178.	-11.	-0.006	176.06	-2.981E+00		P
Gd-153	97.50	78.	-11.	-0.006	114.45	-5.832E-01		
Np-239	99.50	81.	2.	0.001	566.42	2.337E-01		
Gd-153	103.20	69.	-8.	-0.005	145.49	-5.880E-01		
Np-239	106.13	99.	9.	0.005	163.36	5.962E-01		
EU-152	121.78	53.	-11.	-0.006	95.85	-6.147E-01		
CO-57	122.06	81.	-11.	-0.006	123.43	-1.933E-01		
EU-154	123.10	77.	10.	0.005	131.14	3.725E-01		P
PA-234	131.29	161.	-14.	-0.008	129.20	-1.249E+00		
HF-181	133.02	176.	-14.	-0.008	134.27	-5.230E-01		
CE-144	133.54	190.	-14.	-0.008	139.32	-2.046E+00		
HF-181	136.30	204.	-14.	-0.008	143.82	-3.924E+00		
CO-57	136.47	221.	-15.	-0.008	143.18	-2.247E+00		
Tc-99m	140.51	130.	-12.	-0.007	139.15	-2.230E-01		
CE-141	145.44	118.	-12.	-0.007	132.21	-4.102E-01		
Ba-140	162.66	92.	-11.	-0.006	123.47	-3.248E+00		
CE-139	165.85	56.	-2.	-0.001	530.21	-4.470E-02		
Cf-251	176.60	30.	-2.	-0.001	492.44	-2.197E-01		
TH-229	193.51	20.	3.	0.002	273.69	1.365E+00		P
TH-229	210.85	31.	-3.	-0.001	352.76	-1.875E+00		P
Cf-251	227.00	17.	5.	0.003	142.93	1.946E+00		
TH-227	235.97	95.	7.	0.004	206.92	1.309E+00		
EU-152	244.69	80.	3.	0.002	372.64	1.104E+00		
TH-227	256.24	44.	-11.	-0.006	116.77	-3.993E+00		
Cd-113m	263.70	43.	-10.	-0.005	98.93	-4.277E+03		
BI-210M	265.83	41.	8.	0.004	120.38	4.119E-01		
TL-208	277.28	36.	2.	0.001	469.75	7.882E-01		
I-131	284.30	4.	20.	0.011	28.32	9.172E+00		
PA-231	300.07	41.	6.	0.003	149.55	7.362E+00		
PA-233	300.18	47.	6.	0.003	159.89	2.922E+00		
PA-231	302.65	53.	6.	0.003	169.22	6.347E+00		
BA-133	302.85	59.	6.	0.003	178.36	9.981E-01		
Ba-140	304.85	66.	6.	0.003	186.75	4.296E+00		
BI-210M	304.90	72.	6.	0.003	200.96	6.386E-01		
PA-233	312.01	26.	-2.	-0.001	573.93	-1.385E-01		
Ir-192	316.49	46.	-8.	-0.005	117.35	-2.957E-01		
CR-51	320.08	58.	-4.	-0.002	203.98	-1.359E+00		P
La-140	328.76	40.	-6.	-0.004	191.76	-9.749E-01		
Cf-249	333.44	40.	-12.	-0.007	100.41	-2.515E+00		
Cs-136	340.57	84.	-7.	-0.004	195.34	-4.640E-01		
EU-152	344.29	57.	8.	0.005	131.19	1.029E+00		
HF-181	345.83	52.	8.	0.005	126.35	1.819E+00		
BA-133	356.00	75.	-7.	-0.004	190.59	-3.536E-01		
I-131	364.48	19.	-3.	-0.002	297.41	-1.233E-01		P
BA-133	383.84	27.	7.	0.004	115.78	2.676E+00		

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 17
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Cf-249	387.95	34.	7.	0.004	127.56	3.669E-01		
SN-113	391.69	49.	6.	0.003	164.81	3.491E-01		
SB-125	427.88	8.	6.	0.003	105.85	7.487E-01		
AG-108M	433.94	16.	-2.	-0.001	399.82	-9.614E-02		P
PM-146	453.88	13.	6.	0.003	119.79	3.864E-01		P
SB-125	463.37	29.	-2.	-0.001	368.93	-7.991E-01		P
Ir-192	468.06	52.	-11.	-0.006	97.37	-8.909E-01		
BE-7	477.59	40.	-12.	-0.007	63.68	-4.799E+00		P
HF-181	482.00	39.	8.	0.005	110.74	4.484E-01		
La-140	487.02	4.	4.	0.002	114.55	3.714E-01		P
RU-103	497.05	16.	-3.	-0.002	142.63	-1.539E-01		P
RH-106	511.86	13.	61.	0.034	15.40	1.370E+01		
Kr-85	513.98	68.	4.	0.002	274.43	4.534E+01		
Nd-147	531.00	12.	-2.	-0.001	346.41	-7.166E-01		
CS-134	563.24	8.	4.	0.002	147.20	2.344E+00		
CS-134	569.32	20.	-5.	-0.003	134.16	-1.605E+00		
PA-234	569.47	22.	3.	0.002	204.94	2.007E+00		
TL-208	583.02	16.	9.	0.005	94.44	5.304E-01		P
SB-125	600.50	53.	5.	0.003	229.94	1.320E+00		
SB-124	602.73	57.	5.	0.003	238.93	2.410E-01		
CS-134	604.71	62.	5.	0.003	247.59	2.435E-01		
RU-103	610.30	23.	5.	0.003	152.08	4.268E+00		
AG-108M	614.28	28.	5.	0.003	168.36	2.698E-01		
PM-144	618.06	35.	6.	0.004	137.89	3.402E-01		P
RH-106	621.92	44.	7.	0.004	149.17	3.505E+00		
I-131	636.97	18.	-8.	-0.004	118.59	-5.799E+00		
AG-110M	657.76	41.	-12.	-0.006	83.38	-6.829E-01		
CS-137	661.66	57.	-8.	-0.004	124.27	-4.931E-01		P
PM-144	696.54	17.	-7.	-0.004	121.63	-4.329E-01		
NB-94	702.63	9.	2.	0.001	265.73	1.403E-01		
SB-124	722.79	0.	22.	0.012	21.32	1.227E+01		
BI-212	727.17	29.	-5.	-0.003	161.05	-3.963E+00		
PM-146	747.16	13.	-5.	-0.003	177.90	-9.633E-01		P
ZR-95	756.73	17.	-2.	-0.001	370.05	-2.684E-01		
AG-110M	763.94	11.	3.	0.002	149.00	9.446E-01		
NB-95	765.79	9.	5.	0.003	95.07	3.202E-01		
PA-234M	766.41	14.	1.	0.000	935.13	1.251E+01		P
EU-152	778.92	9.	4.	0.002	184.30	1.818E+00		
BI-212	785.42	14.	1.	0.001	800.00	5.048E+00		
CS-134	795.87	17.	1.	0.000	755.78	6.004E-02		P
CS-134	801.95	19.	-1.	0.000	708.45	-6.403E-01		P
CO-58	810.78	19.	-7.	-0.004	95.83	-4.671E-01		
Co-56	846.77	9.	6.	0.003	121.84	3.903E-01		
TL-208	860.56	14.	-2.	-0.001	403.11	-1.123E+00		
NB-94	871.10	0.	6.	0.003	41.62	4.198E-01		P
EU-154	873.23	13.	-6.	-0.003	47.85	-3.217E+00		P
PA-234	880.53	0.	25.	0.014	20.00	2.963E+01		
AG-110M	884.68	43.	-8.	-0.004	127.18	-7.474E-01		

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 18
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Sc-46	889.28	49.	-9.	-0.005	110.82	-6.699E-01		
AG-110M	937.49	9.	-1.	-0.001	493.71	-2.909E-01		
PA-234	946.02	14.	-7.	-0.004	119.52	-3.946E+00		
EU-152	964.11	45.	-15.	-0.008	69.31	-7.773E+00		
EU-154	996.33	10.	6.	0.003	89.86	4.224E+00		
PA-234M	1001.00	17.	1.	0.001	446.01	1.251E+01		P
EU-154	1004.77	50.	-11.	-0.006	93.04	-5.027E+00		
Co-56	1037.84	10.	1.	0.001	702.38	5.778E-01		
Cs-136	1048.07	10.	-3.	-0.002	159.86	-3.087E-01		
RH-106	1050.36	16.	1.	0.001	574.46	5.287E+00		
BI-207	1063.66	5.	-3.	-0.002	179.40	-3.720E-01		P
Ga-68	1077.40	15.	-1.	-0.001	857.32	-3.001E+00		
FE-59	1099.25	20.	-11.	-0.006	53.82	-1.692E+00		P
EU-152	1112.07	0.	14.	0.008	26.73	8.878E+00		
Ta-182	1189.05	10.	-1.	-0.001	702.38	-5.650E-01		
Ta-182	1221.41	11.	-7.	-0.004	117.90	-2.312E+00		
Co-56	1238.28	11.	-2.	-0.001	291.86	-3.057E-01		P
NA-22	1274.53	11.	-6.	-0.003	91.70	-5.502E-01		
FE-59	1291.60	6.	1.	0.001	409.65	3.018E-01		P
CO-60	1332.50	11.	-5.	-0.003	165.68	-4.702E-01		
La-140	1596.21	6.	-2.	-0.001	488.41	-2.144E-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	-4.7994E+00	-4.7994E+00	6.368E+01%	1.31E+01
NA-22	#A	-5.5024E-01	-5.5024E-01	9.170E+01%	1.74E+00
K-40		6.5310E+01	6.5310E+01	1.328E+01%	1.23E+01
Sc-46	#A	-6.6985E-01	-6.6986E-01	1.108E+02%	2.53E+00
CR-51	#A	-1.3593E+00	-1.3594E+00	2.040E+02%	1.18E+01
MN-54	#	7.4828E-01	7.4828E-01	3.015E+01%	5.01E-01
FE-59	#A	-1.6919E+00	-1.6919E+00	5.382E+01%	3.58E+00
Co-56	#A	4.1350E-01	4.1350E-01	1.218E+02%	1.17E+00
CO-57	#A	-1.9327E-01	-1.9327E-01	1.234E+02%	8.11E-01
CO-58	#A	-4.6707E-01	-4.6707E-01	9.583E+01%	1.54E+00
CO-60	#A	-4.7025E-01	-4.7025E-01	1.657E+02%	1.81E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.45E+00
NB-94	#A	2.8143E-01	2.8143E-01	4.162E+01%	9.88E-01
ZR-95	#A	-2.6837E-01	-2.6837E-01	3.701E+02%	2.54E+00
NB-95	#A	3.2015E-01	3.2015E-01	9.507E+01%	1.06E+00
RU-103	#A	-1.5386E-01	-1.5386E-01	1.426E+02%	1.04E+00
RH-106	#A	3.7467E+00	3.7467E+00	1.492E+02%	1.81E+01
AG-108M	#A	8.6169E-02	8.6169E-02	1.684E+02%	9.34E-01
AG-110M	#A	-3.5038E-01	-3.5038E-01	9.795E+01%	3.27E+00

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 19
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

SN-113	#A	3.4914E-01	3.4915E-01	1.648E+02%	1.99E+00
SB-124	#A	1.4329E+00	1.4329E+00	2.132E+01%	2.00E+00
SB-125	#A	9.6358E-01	9.6358E-01	1.059E+02%	2.09E+00
I-131	#A	5.2642E-01	5.2646E-01	2.832E+01%	9.58E-01
Gd-153	#A	-5.8322E-01	-5.8322E-01	1.145E+02%	2.26E+00
Ga-68	#A	-2.9660E+00	-3.0006E+00	8.573E+02%	6.23E+01
Tc-99m	#A	-2.2255E-01	-2.2304E-01	1.391E+02%	1.05E+00
BA-133	#A	-4.5356E-02	-4.5356E-02	1.305E+02%	2.32E+00
CS-134	#A	2.5316E-01	2.5316E-01	1.472E+02%	1.68E+00
CS-137	#A	-4.9305E-01	-4.9305E-01	1.243E+02%	2.48E+00
CE-139	#A	-4.4700E-02	-4.4700E-02	5.302E+02%	8.34E-01
Ba-140	#A	6.0760E-01	6.0762E-01	1.868E+02%	3.66E+00
La-140	#A	-2.5263E-02	-2.5264E-02	1.145E+02%	1.71E+00
CE-141	#A	-4.1019E-01	-4.1020E-01	1.322E+02%	1.84E+00
CE-144	#A	-2.0461E+00	-2.0461E+00	1.393E+02%	9.61E+00
PM-144	#A	-4.6156E-02	-4.6156E-02	9.194E+01%	1.31E+00
EU-152	#A	1.8235E+00	1.8235E+00	2.673E+01%	1.99E+00
EU-154	#A	1.1669E+00	1.1669E+00	7.949E+01%	1.66E+00
EU-155	#A	3.4702E-01	3.4702E-01	1.516E+02%	4.28E+00
HF-181	#A	6.6450E-01	6.6451E-01	8.400E+01%	1.70E+00
Ta-182	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.03E+00
Hg-203	#A	-2.7910E-02	-2.7911E-02	1.036E+03%	1.04E+00
TL-208	#A	5.4828E-01	5.4828E-01	9.444E+01%	1.28E+00
PM-146	#A	3.8641E-01	3.8641E-01	1.198E+02%	1.23E+00
Y-88	#A	8.4541E-01	8.4542E-01	2.509E+01%	9.81E-01
Cd-113m	#A	-4.2771E+03	-4.2771E+03	9.893E+01%	1.44E+04
Cd-109	#A	4.8695E+00	4.8695E+00	1.661E+02%	2.74E+01
Cf-251	#A	-2.1971E-01	-2.1971E-01	4.924E+02%	3.10E+00
Cf-249	#A	3.6691E-01	3.6691E-01	1.276E+02%	1.62E+00
Sn-126	#A	1.5236E+00	1.5236E+00	2.227E+02%	1.16E+01
PB-210	#A	-3.2074E+00	-3.2074E+00	3.051E+02%	3.02E+01
PB-212		2.8675E+00	2.8675E+00	1.986E+01%	1.22E+00
PB-214	#	4.4821E+00	4.4821E+00	1.710E+01%	1.66E+00
BI-207	#A	-3.7198E-01	-3.7198E-01	1.794E+02%	1.51E+00
BI-212	#A	-3.9631E+00	-3.9631E+00	1.611E+02%	2.24E+01
U-235		3.8619E+00	3.8619E+00	3.844E+01%	3.53E+00
BI-214	#A	2.0903E+00	2.0903E+00	3.733E+01%	3.51E+00
BI-210M	#A	4.9330E-01	4.9330E-01	1.171E+02%	1.70E+00
AC-228	A	1.1093E+00	1.1093E+00	1.871E+02%	5.22E+00
TH-227	#A	-3.9929E+00	-3.9929E+00	1.168E+02%	1.22E+01
TH-229	#A	1.3646E+00	1.3646E+00	2.737E+02%	1.08E+01
TH-234	#A	-2.9809E+00	-2.9809E+00	1.761E+02%	1.83E+01
PA-231	#A	6.8146E+00	6.8146E+00	1.129E+02%	3.71E+01
PA-233	#A	3.1110E-01	3.1110E-01	1.599E+02%	2.19E+00
PA-234	#A	-2.3019E-01	-2.3019E-01	1.211E+02%	5.44E+00
PA-234M	#A	1.2509E+01	1.2509E+01	4.460E+02%	2.06E+02
AM-241	#A	-1.1774E+00	-1.1774E+00	7.223E+01%	2.78E+00
Np-237	#A	1.5844E+00	1.5844E+00	1.464E+02%	7.84E+00
Ir-192	#A	-2.9565E-01	-2.9565E-01	1.174E+02%	1.19E+00

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 10:53:39 PMPage 20
TestAmerica Inc Spectrum name: 5_Gamma_20193042.An1

Cs-136	#A	-4.4596E-02	-4.4598E-02	1.102E+03%	1.79E+00
Np-239	#A	5.9609E-01	5.9623E-01	1.634E+02%	3.32E+00
Nd-147	#A	1.1409E-01	1.1410E-01	2.056E+02%	6.76E+00
TL-210	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.49E+00
Kr-85	#A	4.5338E+01	4.5338E+01	2.744E+02%	4.32E+02

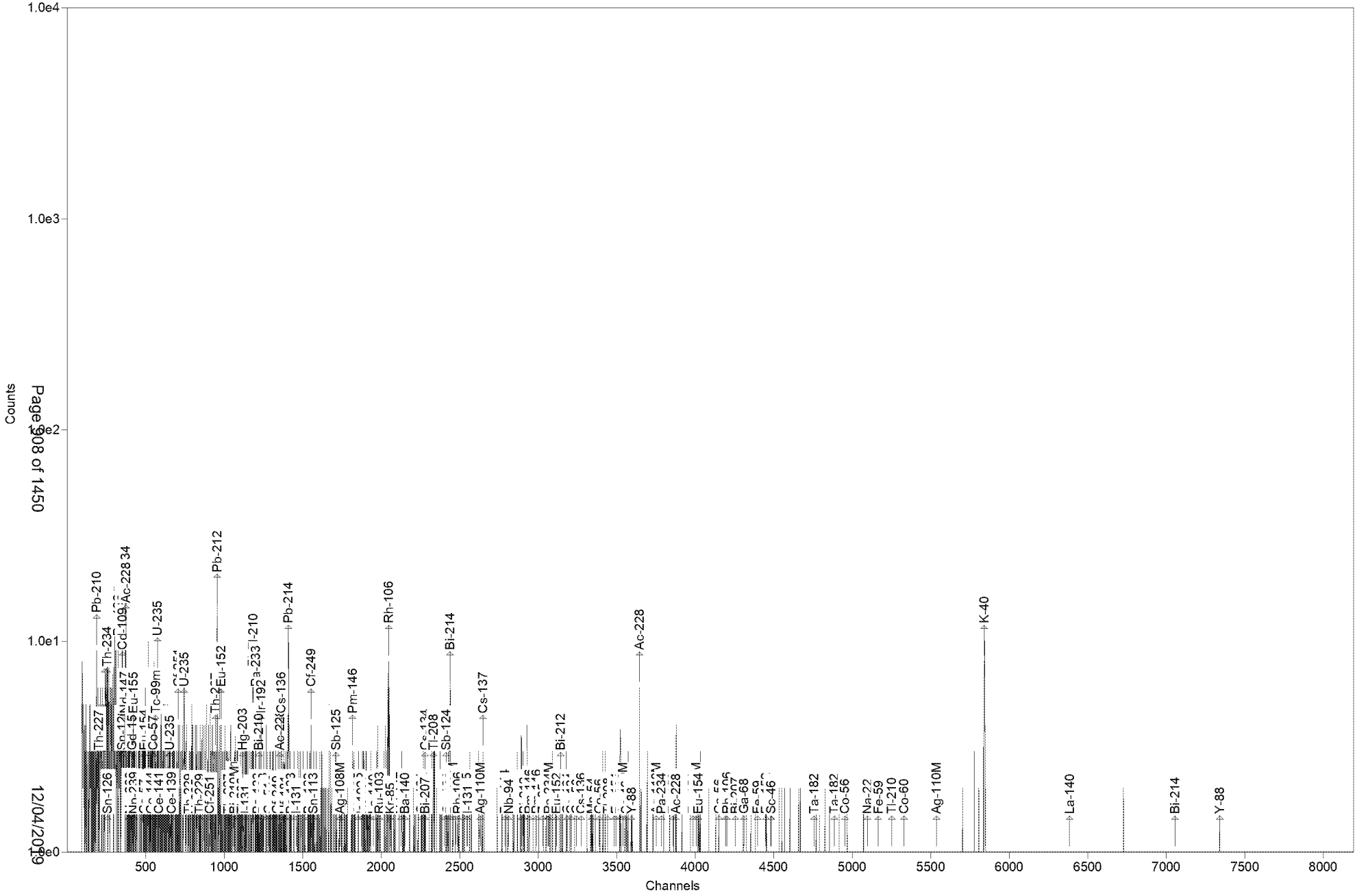
- All peaks for activity calculation had bad shape.
* - Activity omitted from total
& - Activity omitted from total and all peaks had bad shape.
< - MDA value printed.
A - Activity printed, but activity < MDA.
B - Activity < MDA and failed test.
C - Area < Critical level.
F - Failed fraction or key line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

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

Total Activity (37.6 to 2000.8 keV) 7.289E+01 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 7.2885178E+01 Bq/Sample

(Page 22 of 22)

448571_Gamma_160-36160-A-11-C. 5_Gamma_20193042.spc.



Test America St. Louis Spectrum ID: 9_Gamma_20193497

Sample Description: 448571_Gamma_160-36160-A-12-C
Detector: Detector # 9
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-12-C

Decay to Time: 11/23/2019 22:55 Live Time: 1800 sec
Acquisition Time: 11/23/2019 22:55:51 Real Time: 1802 sec
Analysis Time: 11/23/2019 23:26 Dead Time: 0.10 %
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_2019-11-10_1422.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	2.222E+00	102.8	2.283E+00	2.286E+00	7.769E+00
NA-22	-5.959E-01	64.7	3.856E-01	3.868E-01	1.272E+00
K-40	8.714E+01	9.7	8.433E+00	9.539E+00	1.254E+01
Sc-46	2.200E-01	94.0	2.069E-01	2.072E-01	1.500E+00
CR-51	2.307E+00	174.9	4.035E+00	4.036E+00	1.361E+01
MN-54	-7.326E-02	496.7	3.638E-01	3.639E-01	8.626E-01
FE-59	3.856E-01	30.4	1.171E-01	1.187E-01	1.715E+00
Co-56	-8.040E-02	278.9	2.243E-01	2.243E-01	8.757E-01
CO-57	1.908E-02	101.5	1.936E-02	1.939E-02	6.289E-01
CO-58	8.341E-01	28.3	2.356E-01	2.395E-01	6.237E-01
CO-60	3.276E-02	753.2	2.467E-01	2.467E-01	7.304E-01
ZN-65	-1.439E-01	594.2	8.547E-01	8.548E-01	3.037E+00
NB-94	1.831E-01	174.3	3.191E-01	3.192E-01	1.108E+00
ZR-95	-1.209E-02	5078.9	6.143E-01	6.143E-01	1.302E+00
NB-95	3.897E-01	91.9	3.582E-01	3.587E-01	1.210E+00
RU-103	1.514E-01	140.8	2.132E-01	2.133E-01	5.415E-01
RH-106	1.547E+00	128.8	1.992E+00	1.993E+00	6.961E+00
AG-108M	5.795E-02	373.2	2.163E-01	2.163E-01	5.553E-01
AG-110M	4.989E-01	123.9	6.184E-01	6.189E-01	2.109E+00
SN-113	-1.909E-01	185.8	3.547E-01	3.549E-01	1.228E+00
SB-124	-3.719E-01	151.6	5.640E-01	5.643E-01	1.905E+00
SB-125	6.150E-01	71.5	4.397E-01	4.408E-01	1.995E+00
I-131	-7.310E-02	395.8	2.893E-01	2.894E-01	7.473E-01
Gd-153	0.000E+00	1.#INF	1.118E-01	1.118E-01	3.907E+00
Ga-68	5.285E+00	229.3	1.212E+01	1.212E+01	2.843E+01
Tc-99m	1.579E-01	155.1	2.449E-01	2.451E-01	8.277E-01
BA-133	-3.944E-01	141.2	5.569E-01	5.573E-01	1.883E+00
CS-134	2.787E-01	45.5	1.269E-01	1.277E-01	1.255E+00
CS-137	2.328E-01	160.6	3.738E-01	3.740E-01	1.291E+00
CE-139	1.517E-01	138.8	2.105E-01	2.110E-01	7.159E-01
Ba-140	8.817E-01	97.0	8.552E-01	8.564E-01	2.151E+00
La-140	4.364E-01	39.7	1.731E-01	1.747E-01	4.733E-01
CE-141	-3.381E-01	154.8	5.233E-01	5.236E-01	1.762E+00

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CE-144	1.147E+00	144.3	1.655E+00	1.656E+00	5.603E+00
PM-144	3.393E-01	74.0	2.512E-01	2.519E-01	8.633E-01
EU-152	8.757E-01	66.2	5.793E-01	5.811E-01	1.772E+00
EU-154	5.928E-01	83.5	4.949E-01	4.959E-01	1.208E+00
EU-155	0.000E+00	1.#INF	1.844E-01	1.844E-01	5.448E+00
HF-181	-2.127E-01	90.8	1.931E-01	1.934E-01	1.347E+00
Ta-182	8.999E-01	31.6	2.846E-01	2.881E-01	4.370E+00
Hg-203	-2.109E-01	204.1	4.304E-01	4.306E-01	8.569E-01
TL-208	1.435E+00	18.9	2.715E-01	2.815E-01	5.137E-01
PM-146	8.616E-02	184.3	1.588E-01	1.589E-01	9.476E-01
Y-88	8.491E-04	163.6	1.389E-03	1.390E-03	1.001E+00
Cd-113m	-1.769E+02	1454.3	2.573E+03	2.573E+03	9.167E+03
Cd-109	-5.338E+00	172.8	9.222E+00	9.227E+00	3.090E+01
Cf-251	-4.311E-01	256.6	1.106E+00	1.107E+00	2.915E+00
Cf-249	0.000E+00	1.#INF	2.229E-01	2.229E-01	1.314E+00
Sn-126	1.428E+00	166.1	2.371E+00	2.373E+00	8.060E+00
PB-210	-8.455E-02	7695.5	6.507E+00	6.507E+00	2.280E+01
PB-212	3.156E+00	12.9	4.071E-01	4.554E-01	8.812E-01
PB-214	4.561E+00	12.0	5.458E-01	5.951E-01	1.214E+00
BI-207	1.134E-01	482.0	5.467E-01	5.467E-01	1.270E+00
BI-212	-3.014E+00	142.2	4.285E+00	4.288E+00	1.446E+01
U-235	1.965E+00	99.9	1.962E+00	1.964E+00	6.824E+00
BI-214	4.332E+00	16.1	6.967E-01	7.321E-01	1.294E+00
BI-210M	-3.206E-01	210.8	6.757E-01	6.760E-01	1.092E+00
AC-228	4.762E+00	18.7	8.914E-01	9.239E-01	1.518E+00
TH-227	-6.693E-01	436.7	2.923E+00	2.923E+00	7.500E+00
TH-229	-1.043E-01	144.4	1.505E-01	1.507E-01	1.245E+01
TH-234	3.564E+00	182.2	6.492E+00	6.495E+00	2.174E+01
PA-231	0.000E+00	1.#INF	1.215E+00	1.215E+00	4.772E+01
PA-233	0.000E+00	1.#INF	9.924E-02	9.924E-02	3.899E+00
PA-234	1.508E-01	599.1	9.037E-01	9.037E-01	3.500E+00
PA-234M	3.121E+01	79.5	2.482E+01	2.487E+01	1.301E+02
AM-241	5.640E-02	1174.3	6.623E-01	6.623E-01	1.760E+00
Np-237	-1.555E+00	173.2	2.693E+00	2.694E+00	9.022E+00
Ir-192	1.319E-01	144.2	1.902E-01	1.903E-01	1.628E+00
Cs-136	-6.012E-03	4892.9	2.941E-01	2.941E-01	1.066E+00
Np-239	-9.081E-01	170.9	1.552E+00	1.553E+00	5.194E+00
Nd-147	-1.003E+00	212.9	2.136E+00	2.136E+00	5.310E+00
TL-210	-6.501E-02	538.2	3.499E-01	3.499E-01	1.239E+00
Kr-85	0.000E+00	1.#INF	1.451E+01	1.451E+01	3.055E+02
Total	1.648E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 11:26:05 PMPage  1
TestAmerica Inc                 Spectrum name: 9_Gamma_20193497.An1

Sample description
     448571_Gamma_160-36160-A-12-C


Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193497.An1

Acquisition information
       Start time:                11/23/2019 10:55:51 PM
       Live time:               1800
       Real time:               1802
       Dead time:                 0.10 %
       Detector ID:                   9

Detector system
     Ge9 S/N09363993


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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 2
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

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	11/23/2019 10:55:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-11-10_1422.PBC 11/10/2019 2:22:11 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 11 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1508

***** 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
64.28	10.	166.11	1.02	3.987E-02	64.28	9.700	PBC<MDA	Sn126
92.89	18.	182.16	1.04	5.156E-02	92.59	5.584	PBC<MDA	TH234
93.65	16.	215.43	1.04	5.171E-02	93.35	5.561	PBC<MDA	AC228
121.78	16.	91.36	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.931E-01	CO57
123.10	4.	354.02	1.07	5.296E-02	123.10	40.790	PBC<MDA	EU154
133.02	12.	138.37	1.08	5.195E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	1.147E+00	CE144
133.54	12.	144.27	1.08	5.189E-02	133.02	43.300	PBC<MDA	HF181
					133.54	11.090	1.147E+00	CE144
136.30	12.	149.63	1.08	5.152E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.203E+00	CO57
136.47	12.	150.41	1.08	5.150E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.262E+00	CO57
140.51	13.	155.08	1.09	5.091E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	13.	159.69	1.09	5.039E-02	143.79	10.960	PBC<MDA	U235
162.66	15.	97.00	1.11	4.690E-02	162.66	6.220	PBC<MDA	Ba140
165.85	10.	138.78	1.11	4.736E-02	165.85	79.900	PBC<MDA	CE139
185.72	26.	50.32	1.13	4.403E-02	185.72	54.000	PBC<MDA	U235
205.33	13.	119.91	1.15	4.123E-02	205.33	5.010	PBC<MDA	U235
210.85	7.	197.43	1.15	4.052E-02	210.85	2.990	PBC<MDA	TH229
227.00	6.	229.73	1.17	3.858E-02	227.00	6.300	PBC<MDA	Cf251

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 3
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
238.32	92.	12.90	1.18	3.732E-02	238.63	43.300	3.156E+00	PB212
241.68	13.	161.76	1.18	3.697E-02	242.00	7.430	PBC<MDA	PB214
295.02	55.	18.82	1.51	3.232E-02	295.09	19.300	4.882E+00	PB214
320.08	13.	174.90	1.25	3.056E-02	320.08	9.940	PBC<MDA	CR51
338.42	32.	37.80	0.71	2.940E-02	338.32	12.010	4.956E+00	AC228
351.66	85.	14.79	1.49	2.860E-02	351.93	37.600	4.396E+00	PB214
433.94	2.	373.24	1.35	2.466E-02	433.94	90.480	PBC<MDA	AG108M
468.06	8.	144.19	1.38	2.335E-02	468.06	51.750	PBC<MDA	Ir192
477.60	10.	102.78	1.39	2.301E-02	477.60	10.520	PBC<MDA	BE7
497.05	6.	140.81	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	96.	11.60	2.67	2.188E-02	511.86	20.000	1.219E+01	RH106
537.26	3.	231.38	1.44	2.112E-02	537.26	24.390	PBC<MDA	Ba140
563.24	7.	97.34	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
569.32	9.	68.54	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	2.965E+00	PA234
					569.70	97.740	2.489E-01	BI207
569.47	1.	599.14	1.47	2.024E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.825E-01	PA234
					569.70	97.740	3.210E-02	BI207
583.30	43.	18.91	1.45	1.989E-02	583.02	84.500	1.435E+00	TL208
609.05	69.	16.08	1.36	1.925E-02	609.31	46.090	4.332E+00	BI214
618.06	13.	121.05	1.51	1.904E-02	618.06	99.100	PBC<MDA	PM144
621.92	5.	128.75	1.51	1.896E-02	621.92	9.930	PBC<MDA	RH106
635.89	9.	71.49	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
661.66	6.	160.62	1.55	1.810E-02	661.66	85.210	PBC<MDA	CS137
696.54	9.	85.28	1.58	1.741E-02	696.54	99.000	PBC<MDA	PM144
702.63	6.	174.26	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
735.72	4.	184.30	1.61	1.671E-02	735.72	22.500	PBC<MDA	PM146
765.79	11.	91.91	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.323E+02	PA234M
766.41	10.	79.54	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.147E+02	PA234M
778.92	6.	95.70	1.64	1.600E-02	778.92	12.940	PBC<MDA	EU152
785.42	6.	105.04	1.65	1.590E-02	785.42	1.280	PBC<MDA	BI212
801.95	8.	113.21	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
810.78	23.	28.25	1.67	1.551E-02	810.78	99.460	8.341E-01	CO58
884.68	9.	123.95	1.73	1.451E-02	884.68	72.680	PBC<MDA	AG110M
898.04	4.	176.14	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88
911.14	35.	18.72	1.50	1.418E-02	911.07	29.000	4.681E+00	AC228
967.95	12.	90.39	1.79	1.352E-02	968.97	17.460	PBC<MDA	AC228
996.33	6.	83.50	1.81	1.323E-02	996.33	10.600	PBC<MDA	EU154
1063.66	2.	481.99	1.86	1.257E-02	1063.66	74.500	PBC<MDA	BI207
1077.40	3.	229.35	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1120.15	9.	116.90	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
1120.55	10.	94.04	1.90	1.206E-02	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	4.400E-01	Sc46
					1121.30	34.900	1.261E+00	Ta182

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 4
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
1173.24	1.	753.24	1.94	1.163E-02	1173.24	99.900	PBC<MDA	CO60
1189.05	10.	31.62	1.95	1.150E-02	1189.05	16.200	2.981E+00	Ta182
1291.60	11.	30.38	2.02	1.077E-02	1291.60	43.200	1.310E+00	FE59
1460.79	163.	9.68	2.13	9.749E-03	1460.83	10.670	8.714E+01	K40
1596.21	7.	39.67	2.22	9.069E-03	1596.21	95.400	PBC<MDA	La140
1764.44	4.	144.68	2.31	8.350E-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
TH-227	200.20	50.14	70.	-6.	-0.004	243.70	1.001s
TH-234	252.77	63.29	247.	-20.	-0.011	113.63	1.014
Sn-126	256.74	64.28	131.	10.	0.006	166.11	1.015s
BA-133	323.56	80.99	103.	-19.	-0.011	102.57	1.031
Np-237	345.55	86.49	497.	-18.	-0.010	173.16	1.036s
EU-155	345.76	86.54	478.	-18.	-0.010	169.99	1.036s
Sn-126	347.35	86.94	460.	-18.	-0.010	166.72	1.037s
Sn-126	349.87	87.57	477.	-18.	-0.010	169.66	1.037s
Cd-109	351.75	88.04	496.	-18.	-0.010	172.76	1.038s
Nd-147	363.99	91.10	514.	-18.	-0.010	175.40	1.041s
TH-234	369.94	92.59	557.	18.	0.010	182.16	1.042
AC-228	372.98	93.35	551.	16.	0.009	215.43	1.043
Gd-153	389.58	97.50	536.	0.	0.000	1000.00	1.047s
Np-239	397.58	99.50	536.	0.	0.000	1000.00	1.049s
Gd-153	412.37	103.20	536.	0.	0.000	1000.00	1.052
Np-239	414.37	103.70	536.	0.	0.000	1000.00	1.053
EU-155	420.82	105.31	536.	0.	0.000	1000.00	1.054s
Np-239	424.09	106.13	560.	-20.	-0.011	170.93	1.055s
EU-152	486.67	121.78	96.	16.	0.009	91.36	1.070s
CO-57	487.80	122.06	109.	-11.	-0.006	136.30	1.070s
EU-154	491.95	123.10	90.	4.	0.002	354.02	1.071s
HF-181	531.64	133.02	129.	12.	0.007	138.37	1.081
CE-144	533.69	133.54	141.	12.	0.007	144.27	1.081
HF-181	544.74	136.30	153.	12.	0.007	149.63	1.084s
CO-57	545.43	136.47	170.	12.	0.007	150.41	1.084s
Tc-99m	561.57	140.51	183.	13.	0.007	155.08	1.088s
U-235	574.67	143.79	195.	13.	0.007	159.69	1.091s
CE-141	581.29	145.44	252.	-15.	-0.008	154.78	1.092s
Ba-140	650.15	162.66	104.	15.	0.009	97.00	1.108s
CE-139	662.92	165.85	98.	10.	0.006	138.78	1.111s
Cf-251	705.90	176.60	66.	-6.	-0.003	256.58	1.122s
U-235	742.37	185.72	40.	26.	0.014	50.32	1.130s

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 5
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-229	773.52	193.51	72.	-8.	-0.004	210.65	1.137
U-235	820.80	205.33	60.	13.	0.007	119.91	1.148s
TH-229	842.87	210.85	48.	7.	0.004	197.43	1.153s
Cf-251	907.45	227.00	48.	6.	0.003	229.73	1.168s
PB-212	953.97	238.63	24.	92.	0.051	12.90	1.179D
PB-214	967.43	242.00	215.	13.	0.007	161.76	1.182s
EU-152	978.21	244.69	237.	-4.	-0.002	599.89	1.185s
TH-227	1024.39	256.24	44.	-3.	-0.002	436.74	1.195s
BI-210M	1062.75	265.83	45.	-10.	-0.006	210.77	1.204s
TL-208	1108.55	277.28	64.	-3.	-0.002	362.13	1.215
Hg-203	1116.22	279.20	72.	-10.	-0.006	204.09	1.216s
I-131	1136.61	284.30	48.	-12.	-0.007	116.67	1.221s
PB-214	1179.48	295.02	17.	55.	0.030	18.82	1.505s
TL-210	1183.41	296.00	272.	-7.	-0.004	335.33	1.231s
PB-212	1199.52	300.03	265.	0.	0.000	1000.00	1.235
PA-231	1199.68	300.07	265.	0.	0.000	1000.00	1.235
PA-233	1200.12	300.18	265.	0.	0.000	1000.00	1.235
PA-231	1210.00	302.65	265.	0.	0.000	1000.00	1.237s
BA-133	1210.81	302.85	265.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	265.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	265.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	265.	0.	0.000	1000.00	1.243s
PA-233	1247.44	312.01	265.	0.	0.000	1000.00	1.246s
Ir-192	1265.35	316.49	265.	0.	0.000	1000.00	1.250
CR-51	1279.73	320.08	237.	13.	0.007	174.90	1.253s
La-140	1314.43	328.76	206.	-15.	-0.008	141.95	1.261s
Cf-249	1333.15	333.44	191.	-15.	-0.008	136.57	1.265s
AC-228	1353.07	338.42	24.	32.	0.018	37.80	0.708s
Cs-136	1361.66	340.57	177.	-14.	-0.008	141.39	1.272s
HF-181	1382.70	345.83	41.	-3.	-0.001	475.98	1.276s
PB-214	1406.01	351.66	20.	85.	0.047	14.79	1.489
BA-133	1423.37	356.00	150.	-12.	-0.007	141.19	1.285s
I-131	1457.31	364.48	36.	-3.	-0.002	395.81	1.293s
Cf-249	1551.17	387.95	70.	0.	0.000	1000.00	1.314s
SN-113	1566.12	391.69	56.	-6.	-0.003	185.82	1.317s
AG-108M	1735.10	433.94	18.	2.	0.001	373.24	1.354s
PM-146	1814.87	453.88	26.	-2.	-0.001	525.20	1.372s
SB-125	1852.82	463.37	57.	-13.	-0.007	66.06	1.380s
Ir-192	1871.59	468.06	58.	8.	0.004	144.19	1.384s
BE-7	1909.73	477.60	45.	10.	0.005	102.78	1.392s
HF-181	1927.34	482.00	81.	-13.	-0.007	102.88	1.396s
La-140	1947.43	487.02	77.	-13.	-0.007	100.08	1.400s
RU-103	1987.56	497.05	13.	6.	0.003	140.81	1.409s
RH-106	2046.81	511.86	14.	96.	0.053	11.60	2.672s
Kr-85	2055.27	513.98	110.	0.	0.000	1000.00	1.424s
Nd-147	2123.35	531.00	26.	-5.	-0.003	212.92	1.438s
Ba-140	2148.39	537.26	14.	3.	0.002	231.38	1.444s
CS-134	2252.30	563.24	9.	7.	0.004	97.34	1.466s

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 6
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
CS-134	2276.64	569.32	14.	9.	0.005	68.54	1.471s
PA-234	2277.24	569.47	23.	1.	0.001	599.14	1.471s
BI-207	2278.16	569.70	34.	-8.	-0.005	107.10	1.471s
TL-208	2332.55	583.30	8.	43.	0.024	18.91	1.448
SB-125	2401.36	600.50	194.	-13.	-0.007	156.90	1.497s
SB-124	2410.29	602.73	181.	-13.	-0.007	151.63	1.499s
CS-134	2418.21	604.71	168.	-13.	-0.007	146.21	1.500s
BI-214	2435.58	609.05	15.	69.	0.038	16.08	1.360
PM-144	2471.62	618.06	115.	13.	0.007	121.05	1.512s
RH-106	2487.04	621.92	20.	5.	0.003	128.75	1.515s
SB-125	2542.94	635.89	17.	9.	0.005	71.49	1.526s
I-131	2547.28	636.97	36.	-10.	-0.006	66.16	1.527s
AG-110M	2630.43	657.76	45.	-13.	-0.007	78.07	1.544s
CS-137	2646.03	661.66	51.	6.	0.004	160.62	1.548s
PM-144	2785.58	696.54	27.	9.	0.005	85.28	1.576
NB-94	2809.93	702.63	44.	6.	0.003	174.26	1.581s
SB-124	2890.57	722.79	31.	-4.	-0.002	188.89	1.598s
AG-108M	2891.17	722.94	36.	0.	0.000	1000.00	1.598s
EU-154	2892.86	723.36	36.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	36.	0.	0.000	1000.00	1.599s
BI-212	2908.11	727.17	43.	-7.	-0.004	142.16	1.601s
PM-146	2942.31	735.72	9.	4.	0.002	184.30	1.608s
PM-146	2988.08	747.16	23.	-1.	-0.001	773.39	1.617s
AG-110M	3055.23	763.94	54.	-17.	-0.009	65.73	1.631s
NB-95	3062.61	765.79	49.	11.	0.006	91.91	1.632s
PA-234M	3065.10	766.41	26.	10.	0.005	79.54	1.633s
EU-152	3115.14	778.92	5.	6.	0.003	95.70	1.643s
BI-212	3141.15	785.42	15.	6.	0.003	105.04	1.648s
CS-134	3182.96	795.87	35.	-12.	-0.006	78.71	1.656s
TL-210	3197.88	799.60	47.	-2.	-0.001	538.20	1.659s
CS-134	3207.29	801.95	40.	8.	0.005	113.21	1.661s
CO-58	3242.59	810.78	10.	23.	0.013	28.25	1.668s
La-140	3262.58	815.77	33.	0.	0.000	1000.00	1.672s
MN-54	3338.91	834.85	20.	-2.	-0.001	496.66	1.687s
Co-56	3386.61	846.77	20.	-2.	-0.001	278.94	1.696s
TL-208	3441.80	860.56	26.	-5.	-0.003	129.22	1.707s
NB-94	3483.94	871.10	15.	-3.	-0.002	191.49	1.715s
EU-154	3492.47	873.23	23.	-2.	-0.001	336.16	1.717s
PA-234	3521.68	880.53	53.	-13.	-0.007	81.81	1.722s
PA-234	3532.53	883.24	67.	-13.	-0.007	90.38	1.724s
AG-110M	3538.30	884.68	64.	9.	0.005	123.95	1.725s
Sc-46	3556.69	889.28	61.	0.	0.000	1000.00	1.729s
Y-88	3591.74	898.04	11.	4.	0.002	176.14	1.736s
AC-228	3644.17	911.14	3.	35.	0.019	18.72	1.500
AG-110M	3749.60	937.49	35.	-12.	-0.007	112.17	1.766s
PA-234	3783.72	946.02	15.	-9.	-0.005	100.31	1.772s
AC-228	3875.56	968.97	22.	12.	0.007	90.39	1.790s
EU-154	3985.03	996.33	11.	6.	0.003	83.50	1.810s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	4018.82	1004.77	22.	-7.	-0.004	162.59	1.816s
Co-56	4151.13	1037.84	11.	-2.	-0.001	452.11	1.841s
Cs-136	4192.07	1048.07	20.	-1.	-0.001	640.31	1.848s
BI-207	4254.46	1063.66	16.	2.	0.001	481.99	1.860s
Ga-68	4309.44	1077.40	11.	3.	0.002	229.35	1.870s
FE-59	4396.88	1099.25	16.	-4.	-0.002	232.74	1.886s
EU-152	4448.20	1112.07	55.	-11.	-0.006	96.53	1.895s
ZN-65	4462.09	1115.55	44.	-2.	-0.001	594.16	1.897s
BI-214	4481.06	1120.29	50.	9.	0.005	116.90	1.901s
Sc-46	4482.12	1120.55	36.	10.	0.005	94.04	1.901s
CO-60	4692.96	1173.24	11.	1.	0.001	753.24	1.938s
Ta-182	4756.25	1189.05	0.	10.	0.006	31.62	1.949s
Co-56	4953.27	1238.28	23.	-1.	-0.001	677.06	1.984s
NA-22	5098.35	1274.53	23.	-12.	-0.006	64.71	2.008s
EU-154	5098.39	1274.54	34.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	0.	11.	0.006	30.38	2.020s
TL-210	5252.32	1313.00	23.	-11.	-0.006	109.06	2.034s
AG-110M	5537.69	1384.30	0.	0.	0.000	1000.00	2.082s
EU-152	5632.56	1408.00	0.	0.	0.000	1000.00	2.097s
K-40	5844.03	1460.83	20.	163.	0.091	9.68	2.131
La-140	6385.95	1596.21	0.	7.	0.004	39.67	2.215s
SB-124	6765.35	1690.98	6.	-4.	-0.002	152.01	2.272s
BI-214	7059.65	1764.49	13.	4.	0.002	144.68	2.314s
Co-56	7087.11	1771.35	19.	-1.	0.000	701.86	2.318s
Y-88	7346.20	1836.06	6.	-2.	-0.001	275.72	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	2.2217E+00				5.31E+01	
			477.60	2.222E+00	?(	7.769E+00 1.03E+02 1.05E+01	G
NA-22	C	-5.9589E-01				9.50E+02	
			1274.53	-5.959E-01	?(	1.272E+00 6.47E+01 9.99E+01	G
K-40	N	8.7137E+01				4.66E+11	
			1460.83	8.714E+01	?(P	1.254E+01 9.68E+00 1.07E+01	G
Sc-46	F	2.2001E-01				8.38E+01	
			889.28	0.000E+00	?(	1.500E+00 1.00E+03 1.00E+02	G
			1120.55	4.400E-01	?(	1.405E+00 9.40E+01 1.00E+02	G

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Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CR-51	F 2.3069E+00					2.77E+01	
		320.08	2.307E+00	(P	1.361E+01	1.75E+02	9.94E+00 G
MN-54	C -7.3256E-02					3.12E+02	
		834.85	-7.326E-02	?(	8.626E-01	4.97E+02	1.00E+02 G
FE-59	F 3.8559E-01					4.45E+01	
		1099.25	-3.212E-01	?(	1.715E+00	2.33E+02	5.65E+01 G
		1291.60	1.310E+00	?(P	8.802E-01	3.04E+01	4.32E+01 G
Co-56	C -8.0396E-02					7.73E+01	
		846.77	-8.040E-02	?(P	8.757E-01	2.79E+02	9.99E+01 G
		1238.28	-8.494E-02	+ P	1.896E+00	6.77E+02	6.61E+01 G
		1037.84	-5.115E-01	+	5.503E+00	4.52E+02	1.41E+01 G
		1771.35	-3.820E-01	+	9.900E+00	7.02E+02	1.55E+01 A
CO-57	C 1.9077E-02					2.72E+02	
		122.06	-1.360E-01	?(	6.289E-01	1.36E+02	8.56E+01 G
		136.47	1.262E+00	?(	6.416E+00	1.50E+02	1.07E+01 G
CO-58	C 8.3406E-01					7.09E+01	
		810.78	8.341E-01	?(	6.237E-01	2.83E+01	9.95E+01 G
CO-60	F 3.2757E-02					1.93E+03	
		1332.50	1.764E-02	%(	7.304E-01	1.68E+03	1.00E+02 G
		1173.24	4.789E-02	?(P	8.688E-01	7.53E+02	9.99E+01 G
ZN-65	F -1.4385E-01					2.44E+02	
		1115.55	-1.439E-01	?(	3.037E+00	5.94E+02	5.06E+01 G
NB-94	I 1.8310E-01					7.41E+06	
		702.63	1.831E-01	(P	1.108E+00	1.74E+02	9.79E+01 G
		871.10	-1.136E-01	+	7.863E-01	1.91E+02	9.99E+01 G
ZR-95	I -1.2095E-02					6.40E+01	
		756.73	-1.209E-02	%(P	1.302E+00	5.08E+03	5.45E+01 G
		724.20	0.000E+00	+	2.273E+00	1.00E+03	4.42E+01 G
NB-95	I 3.8969E-01					6.40E+01	
		765.79	3.897E-01	?(	1.210E+00	9.19E+01	9.98E+01 G
RU-103	I 1.5139E-01					3.93E+01	
		497.05	1.514E-01	?(P	5.415E-01	1.41E+02	9.09E+01 G
		610.30	-6.909E-01	%	3.056E+01	1.29E+03	5.75E+00 GA

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TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
RH-106	I	1.5470E+00					3.74E+02	
			621.92	1.547E+00	?(P	6.961E+00	1.29E+02	9.93E+00 G
			1050.36	-1.403E+00	%	6.824E+01	1.32E+03	1.56E+00 G
			511.86	1.219E+01	?	2.557E+00	1.16E+01	2.00E+01 GA
AG-108M	C	5.7950E-02					1.53E+05	
			433.94	5.795E-02	?(P	5.553E-01	3.73E+02	9.05E+01 G
			722.94	0.000E+00	-	1.103E+00	1.00E+03	9.08E+01 G
			614.28	1.233E-07	%	1.957E+00	4.60E+08	8.98E+01 G
AG-110M	F	4.9888E-01					2.50E+02	
			884.68	4.989E-01	?(	2.109E+00	1.24E+02	7.27E+01 G
			657.76	-4.198E-01	+	1.097E+00	7.81E+01	9.46E+01 G
			937.49	-1.399E+00	+	3.530E+00	1.12E+02	3.44E+01 G
			1384.30	0.000E+00	-	1.655E+00	1.00E+03	2.43E+01 G
			763.94	-2.612E+00	+	5.675E+00	6.57E+01	2.23E+01 G
SN-113	F	-1.9089E-01					1.15E+02	
			391.69	-1.909E-01	?(	1.228E+00	1.86E+02	6.40E+01 G
SB-124	F	-3.7195E-01					6.02E+01	
			602.73	-3.719E-01	?(	1.905E+00	1.52E+02	9.83E+01 G
			1690.98	-5.825E-01	+	1.941E+00	1.52E+02	4.78E+01 G
			722.79	-1.315E+00	+	8.739E+00	1.89E+02	1.08E+01 G
SB-125	I	6.1504E-01					1.01E+03	
			427.88	-7.535E-02	%(	1.995E+00	1.05E+03	2.96E+01 G
			600.50	-2.038E+00	+	1.080E+01	1.57E+02	1.79E+01 G
			635.89	2.422E+00	?(	5.776E+00	7.15E+01	1.13E+01 G
			463.37	-2.998E+00	+ P	8.520E+00	6.61E+01	1.05E+01 G
I-131	I	-7.3099E-02					8.02E+00	
			364.48	-7.310E-02	&(	7.473E-01	3.96E+02	8.17E+01 G
			284.30	-3.275E+00	&	9.552E+00	1.17E+02	6.14E+00 G
			636.97	-4.305E+00	+ P	1.282E+01	6.62E+01	7.17E+00 G
Ga-68	C	5.2850E+00					4.71E-02	
			1077.40	5.285E+00	?(	2.843E+01	2.29E+02	3.30E+00 G
Tc-99m	I	1.5794E-01					2.51E-01	
			140.51	1.579E-01	?(	8.277E-01	1.55E+02	8.93E+01 G
BA-133	F	-3.9444E-01					3.85E+03	
			356.00	-3.944E-01	?(	1.883E+00	1.41E+02	6.20E+01 G
			302.85	0.000E+00	+	7.501E+00	1.00E+03	1.83E+01 G
			383.84	2.194E-01	% P	9.568E+00	1.24E+03	8.94E+00 GA
			80.99	-6.404E-01	+	1.686E+00	1.03E+02	3.41E+01 GA

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CS-134	I	2.7865E-01					7.54E+02	
			795.87	-4.754E-01	?(	1.255E+00	7.87E+01	8.55E+01 G
			604.71	-3.757E-01	+	1.856E+00	1.46E+02	9.76E+01 G
			569.32	1.581E+00	?(	3.595E+00	6.85E+01	1.54E+01 G
			801.95	3.405E+00	?(	1.320E+01	1.13E+02	8.69E+00 G
			563.24	2.350E+00	?(	5.527E+00	9.73E+01	8.35E+00 G
CS-137	I	2.3275E-01					1.10E+04	
			661.66	2.328E-01	?(P	1.291E+00	1.61E+02	8.52E+01 G
CE-139	F	1.5171E-01					1.38E+02	
			165.85	1.517E-01	(	7.159E-01	1.39E+02	7.99E+01 G
Ba-140	I	8.8169E-01					1.28E+01	
			537.26	3.581E-01	?(P	2.151E+00	2.31E+02	2.44E+01 G
			162.66	2.935E+00	(	9.567E+00	9.70E+01	6.22E+00 G
			304.85	0.000E+00	-	3.220E+01	1.00E+03	4.29E+00 G
La-140	I	4.3639E-01					1.28E+01	
			1596.21	4.364E-01	?(P	4.733E-01	3.97E+01	9.54E+01 G
			487.02	-6.932E-01	-	2.341E+00	1.00E+02	4.55E+01 G
			328.76	-1.326E+00	-	6.345E+00	1.42E+02	2.03E+01 G
			815.77	0.000E+00	-	4.556E+00	1.00E+03	2.33E+01 G
CE-141	I	-3.3813E-01					3.25E+01	
			145.44	-3.381E-01	?(	1.762E+00	1.55E+02	4.82E+01 G
CE-144	I	1.1471E+00					2.85E+02	
			133.54	1.147E+00	(	5.603E+00	1.44E+02	1.11E+01 G
PM-144	C	3.3934E-01					3.63E+02	
			696.54	2.996E-01	&(P	8.633E-01	8.53E+01	9.90E+01 G
			618.06	3.790E-01	?(	1.551E+00	1.21E+02	9.91E+01 G
EU-152	F	8.7567E-01					4.94E+03	
			121.78	5.781E-01	?(	1.772E+00	9.14E+01	2.86E+01 G
			344.29	-9.624E-02	%	4.729E+00	1.43E+03	2.65E+01 G
			1112.07	-3.831E+00	+	1.251E+01	9.65E+01	1.36E+01 G
			778.92	1.533E+00	?(	3.524E+00	9.57E+01	1.29E+01 G
			964.11	9.343E-02	%	9.391E+00	2.81E+03	1.46E+01 G
			244.69	-7.271E-01	-	1.486E+01	6.00E+02	7.58E+00 G
			1408.00	0.000E+00	-	1.941E+00	1.00E+03	2.10E+01 GA
EU-154	I	5.9276E-01					3.14E+03	
			123.10	9.859E-02	?(	1.208E+00	3.54E+02	4.08E+01 G
			1274.54	0.000E+00	-	4.354E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	-	4.958E+00	1.00E+03	2.02E+01 G

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TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			873.23	-5.864E-01	+ P	7.727E+00	3.36E+02	1.23E+01 G
			1004.77	-1.574E+00	+	5.733E+00	1.63E+02	1.80E+01 G
			996.33	2.494E+00	?(	7.104E+00	8.35E+01	1.06E+01 G
HF-181	F	-2.1267E-01					4.24E+01	
			482.00	-3.877E-01	?(	1.347E+00	1.03E+02	8.05E+01 G
			133.02	2.933E-01	+	1.375E+00	1.38E+02	4.33E+01 G
			345.83	-3.395E-01	+	4.159E+00	4.76E+02	1.51E+01 G
			136.30	2.195E+00	?(	1.112E+01	1.50E+02	5.85E+00 G
Ta-182	F	8.9995E-01					1.14E+02	
			1121.30	-6.604E-02	&(	4.370E+00	1.85E+03	3.49E+01 G
			1221.41	-6.091E-02	%	3.362E+00	2.37E+03	2.70E+01 G
			1189.05	2.981E+00	?(	2.197E+00	3.16E+01	1.62E+01 G
Hg-203	F	-2.1088E-01					4.66E+01	
			279.20	-2.109E-01	?(P	8.569E-01	2.04E+02	8.15E+01 G
TL-208	N	1.4355E+00					6.98E+02	
			583.02	1.435E+00	(P	5.137E-01	1.89E+01	8.45E+01 G
			277.28	-8.268E-01	-	1.045E+01	3.62E+02	6.31E+00 G
			860.56	-1.452E+00	- P	7.963E+00	1.29E+02	1.24E+01 G
PM-146	C	8.6160E-02					2.02E+03	
			453.88	-7.159E-02	?(	9.476E-01	5.25E+02	6.50E+01 G
			747.16	-1.319E-01	+	2.496E+00	7.73E+02	3.40E+01 G
			735.72	5.419E-01	?(	2.505E+00	1.84E+02	2.25E+01 G
Y-88	F	8.4912E-04					1.07E+02	
			1836.06	-1.617E-01	?(	1.001E+00	2.76E+02	9.92E+01 G
			898.04	1.730E-01	?(P	7.457E-01	1.76E+02	9.37E+01 G
Cd-113m		-1.7691E+02					5.33E+03	
			263.70	-1.769E+02	%(	9.167E+03	1.45E+03	6.00E-03 K
Cd-109	F	-5.3378E+00					4.53E+02	
			88.04	-5.338E+00	?(	3.090E+01	1.73E+02	3.79E+00 G
Cf-251	T	-4.3107E-01					3.28E+05	
			176.60	-4.311E-01	&(	2.915E+00	2.57E+02	1.70E+01 G
			227.00	1.371E+00	&	7.998E+00	2.30E+02	6.30E+00 GA
Sn-126		1.4276E+00					3.65E+07	
			87.57	-5.406E-01	-	3.073E+00	1.70E+02	3.75E+01 GA
			64.28	1.428E+00	?(	8.060E+00	1.66E+02	9.70E+00 G
			86.94	-2.248E+00	&	1.256E+01	1.67E+02	9.04E+00 GA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 12
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-210	N	-8.4552E-02					8.14E+03	
			46.54	-8.455E-02	&(	2.280E+01	7.70E+03	4.25E+00 G
PB-212	N	3.1563E+00					6.98E+02	
			238.63	3.156E+00	(	8.812E-01	1.29E+01	4.33E+01 G
			300.03	0.000E+00	-	4.165E+01	1.00E+03	3.28E+00 GA
PB-214	N	4.5605E+00					5.84E+05	
			351.93	4.396E+00	(P	1.214E+00	1.48E+01	3.76E+01 G
			295.09	4.882E+00	(P	1.962E+00	1.88E+01	1.93E+01 G
			242.00	2.633E+00	- P	1.437E+01	1.62E+02	7.43E+00 GA
BI-207	C	1.1343E-01					1.18E+04	
			1063.66	1.134E-01	?(P	1.270E+00	4.82E+02	7.45E+01 G
			569.70	-2.295E-01	+	8.415E-01	1.07E+02	9.77E+01 G
BI-212	N	-3.0142E+00					6.98E+02	
			727.17	-3.014E+00	?(P	1.446E+01	1.42E+02	7.55E+00 G
			785.42	1.559E+01	& P	5.679E+01	1.05E+02	1.28E+00 GA
U-235	N	1.9648E+00					2.57E+11	
			143.79	1.265E+00	(	6.824E+00	1.60E+02	1.10E+01 G
			205.33	3.496E+00	&(	1.044E+01	1.20E+02	5.01E+00 G
			163.38	1.381E-01	%	1.254E+01	2.62E+03	5.08E+00 G
			185.72	5.998E-01		7.549E-01	5.03E+01	5.40E+01 GA
BI-214	N	4.3316E+00					5.84E+05	
			609.31	4.332E+00	(P	1.294E+00	1.61E+01	4.61E+01 G
			1120.29	2.723E+00	- P	1.083E+01	1.17E+02	1.51E+01 G
			1764.49	1.621E+00	- P	8.327E+00	1.45E+02	1.54E+01 G
BI-210M	T	-3.2060E-01					1.10E+09	
			265.83	-3.206E-01	?(P	1.092E+00	2.11E+02	5.00E+01 G
			304.90	0.000E+00	+	4.933E+00	1.00E+03	2.80E+01 G
AC-228	N	4.7617E+00					2.10E+03	
			911.07	4.681E+00	(P	1.518E+00	1.87E+01	2.90E+01 G
			968.97	2.903E+00	&	5.744E+00	9.04E+01	1.75E+01 G
			338.32	4.956E+00	(	4.055E+00	3.78E+01	1.20E+01 G
			93.35	2.999E+00	&	2.166E+01	2.15E+02	5.56E+00 XA
TH-227	N	-6.6926E-01					7.95E+03	
			256.24	-6.693E-01	?(	7.500E+00	4.37E+02	7.00E+00 G
			235.97	-2.282E-01	%	9.245E+00	1.19E+03	1.23E+01 G
			50.14	-1.557E+00	+	9.975E+00	2.44E+02	8.00E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 13
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
TH-229	N	-1.0426E-01					2.68E+06	
			193.51	-2.356E+00	?(	1.245E+01	2.11E+02	4.40E+00 G
			210.85	3.210E+00	?(	1.605E+01	1.97E+02	2.99E+00 G
TH-234	N	3.5637E+00					1.63E+12	
			92.59	3.564E+00	?(	2.174E+01	1.82E+02	5.58E+00 G
			63.29	-7.414E+00	+	2.822E+01	1.14E+02	3.81E+00 G
PA-234	N	1.5084E-01					1.63E+12	
			131.29	4.529E-02	%(	3.500E+00	2.24E+03	1.80E+01 G
			946.02	-2.709E+00	+	6.249E+00	1.00E+02	1.34E+01 G
			569.47	3.825E-01	?(	8.366E+00	5.99E+02	8.20E+00 G
			883.24	-5.342E+00	+	1.624E+01	9.04E+01	9.60E+00 G
			880.53	-8.517E+00	+	2.336E+01	8.18E+01	6.00E+00 GA
PA-234M	N	3.1207E+01					1.63E+12	
			1001.00	1.871E+00	%(	1.301E+02	1.90E+03	8.37E-01 G
			766.41	1.147E+02	?(	3.071E+02	7.95E+01	2.94E-01 G
AM-241	T	5.6396E-02					1.58E+05	
			59.54	5.640E-02	%(	1.760E+00	1.17E+03	3.59E+01 G
Np-237	F	-1.5552E+00					2.14E+06	
			86.49	-1.555E+00	&(	9.022E+00	1.73E+02	1.31E+01 G
Ir-192	F	1.3189E-01					7.40E+01	
			316.49	0.000E+00	&(	1.628E+00	1.00E+03	8.70E+01 G
			468.06	3.537E-01	?(	1.752E+00	1.44E+02	5.18E+01 G
			308.44	0.000E+00	-	4.386E+00	1.00E+03	3.18E+01 G
Cs-136	F	-6.0117E-03					1.30E+01	
			818.50	-6.012E-03	&(	1.066E+00	4.89E+03	1.00E+02 G
			1048.07	-5.463E-02	+	1.287E+00	6.40E+02	8.00E+01 G
			340.57	-5.481E-01	+	2.616E+00	1.41E+02	4.69E+01 G
Np-239	T	-9.0806E-01					2.36E+00	
			103.70	0.000E+00	+	4.823E+00	1.00E+03	2.40E+01 X
			106.13	-9.081E-01	?(	5.194E+00	1.71E+02	2.27E+01 G
			99.50	0.000E+00	+	7.777E+00	1.00E+03	1.50E+01 X
Nd-147		-1.0030E+00					1.11E+01	
			531.00	-1.003E+00	?(	5.310E+00	2.13E+02	1.30E+01 G
			91.10	-7.065E-01	+	4.151E+00	1.75E+02	2.83E+01 G
TL-210	N	-6.5014E-02					5.84E+05	
			799.60	-6.501E-02	?(	1.239E+00	5.38E+02	9.90E+01 G
			296.00	-1.526E-01	+	1.735E+00	3.35E+02	7.90E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 14
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
		1313.00	-2.655E+00 +	6.198E+00	1.09E+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	

- -

********** 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	70.	-6.	-0.004	243.70	-1.557E+00
Sn-126	64.28	131.	10.	0.006	166.11	1.428E+00
BA-133	80.99	103.	-19.	-0.011	102.57	-6.404E-01
Np-237	86.49	497.	-18.	-0.010	173.16	-1.555E+00
EU-155	86.54	478.	-18.	-0.010	169.99	-6.634E-01
Sn-126	86.94	460.	-18.	-0.010	166.72	-2.248E+00
Sn-126	87.57	477.	-18.	-0.010	169.66	-5.406E-01
Cd-109	88.04	496.	-18.	-0.010	172.76	-5.338E+00
Nd-147	91.10	514.	-18.	-0.010	175.40	-7.065E-01
Np-239	106.13	560.	-20.	-0.011	170.93	-9.081E-01
EU-152	121.78	96.	16.	0.009	91.36	5.781E-01
CO-57	122.06	109.	-11.	-0.006	136.30	-1.360E-01
EU-154	123.10	90.	4.	0.002	354.02	9.859E-02
HF-181	133.02	129.	12.	0.007	138.37	2.933E-01

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TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
CE-144	133.54	141.	12.	0.007	144.27	1.147E+00		
HF-181	136.30	153.	12.	0.007	149.63	2.195E+00		
CO-57	136.47	170.	12.	0.007	150.41	1.262E+00		
Tc-99m	140.51	183.	13.	0.007	155.08	1.579E-01		
U-235	143.79	195.	13.	0.007	159.69	1.265E+00		
CE-141	145.44	252.	-15.	-0.008	154.78	-3.381E-01		
Ba-140	162.66	104.	15.	0.009	97.00	2.935E+00		
CE-139	165.85	98.	10.	0.006	138.78	1.517E-01		
Cf-251	176.60	66.	-6.	-0.003	256.58	-4.311E-01		
U-235	185.72	40.	26.	0.014	50.32	5.998E-01		
TH-229	193.51	72.	-8.	-0.004	210.65	-2.356E+00		
U-235	205.33	60.	13.	0.007	119.91	3.496E+00		
TH-229	210.85	48.	7.	0.004	197.43	3.210E+00		
Cf-251	227.00	48.	6.	0.003	229.73	1.371E+00		
EU-152	244.69	237.	-4.	-0.002	599.89	-7.271E-01		
TH-227	256.24	44.	-3.	-0.002	436.74	-6.693E-01		
BI-210M	265.83	45.	-10.	-0.006	210.77	-3.206E-01		P
Hg-203	279.20	72.	-10.	-0.006	204.09	-2.109E-01		P
I-131	284.30	48.	-12.	-0.007	116.67	-3.275E+00		
TL-210	296.00	272.	-7.	-0.004	335.33	-1.526E-01		
CR-51	320.08	237.	13.	0.007	174.90	2.307E+00		P
La-140	328.76	206.	-15.	-0.008	141.95	-1.326E+00		
Cf-249	333.44	191.	-15.	-0.008	136.57	-1.759E+00		
Cs-136	340.57	177.	-14.	-0.008	141.39	-5.481E-01		
HF-181	345.83	41.	-3.	-0.001	475.98	-3.395E-01		
BA-133	356.00	150.	-12.	-0.007	141.19	-3.944E-01		
I-131	364.48	36.	-3.	-0.002	395.81	-7.310E-02		
SN-113	391.69	56.	-6.	-0.003	185.82	-1.909E-01		
AG-108M	433.94	18.	2.	0.001	373.24	5.795E-02		P
PM-146	453.88	26.	-2.	-0.001	525.20	-7.159E-02		
SB-125	463.37	57.	-13.	-0.007	66.06	-2.998E+00		P
Ir-192	468.06	58.	8.	0.004	144.19	3.537E-01		
BE-7	477.60	45.	10.	0.005	102.78	2.222E+00		
HF-181	482.00	81.	-13.	-0.007	102.88	-3.877E-01		
La-140	487.02	77.	-13.	-0.007	100.08	-6.932E-01		
RU-103	497.05	13.	6.	0.003	140.81	1.514E-01		P
RH-106	511.86	14.	96.	0.053	11.60	1.219E+01		
Nd-147	531.00	26.	-5.	-0.003	212.92	-1.003E+00		
Ba-140	537.26	14.	3.	0.002	231.38	3.581E-01		P
CS-134	563.24	9.	7.	0.004	97.34	2.350E+00		
CS-134	569.32	14.	9.	0.005	68.54	1.581E+00		
PA-234	569.47	23.	1.	0.001	599.14	3.825E-01		
BI-207	569.70	34.	-8.	-0.005	107.10	-2.295E-01		
SB-125	600.50	194.	-13.	-0.007	156.90	-2.038E+00		
SB-124	602.73	181.	-13.	-0.007	151.63	-3.719E-01		
CS-134	604.71	168.	-13.	-0.007	146.21	-3.757E-01		
PM-144	618.06	115.	13.	0.007	121.05	3.790E-01		
RH-106	621.92	20.	5.	0.003	128.75	1.547E+00		P

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 16
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
SB-125	635.89	17.	9.	0.005	71.49	2.422E+00		
I-131	636.97	36.	-10.	-0.006	66.16	-4.305E+00		P
AG-110M	657.76	45.	-13.	-0.007	78.07	-4.198E-01		
CS-137	661.66	51.	6.	0.004	160.62	2.328E-01		P
PM-144	696.54	27.	9.	0.005	85.28	2.996E-01		P
NB-94	702.63	44.	6.	0.003	174.26	1.831E-01		P
SB-124	722.79	31.	-4.	-0.002	188.89	-1.315E+00		
BI-212	727.17	43.	-7.	-0.004	142.16	-3.014E+00		P
PM-146	735.72	9.	4.	0.002	184.30	5.419E-01		
PM-146	747.16	23.	-1.	-0.001	773.39	-1.319E-01		
AG-110M	763.94	54.	-17.	-0.009	65.73	-2.612E+00		
NB-95	765.79	49.	11.	0.006	91.91	3.897E-01		
PA-234M	766.41	26.	10.	0.005	79.54	1.147E+02		
EU-152	778.92	5.	6.	0.003	95.70	1.533E+00		
BI-212	785.42	15.	6.	0.003	105.04	1.559E+01		P
CS-134	795.87	35.	-12.	-0.006	78.71	-4.754E-01		
TL-210	799.60	47.	-2.	-0.001	538.20	-6.501E-02		
CS-134	801.95	40.	8.	0.005	113.21	3.405E+00		
MN-54	834.85	20.	-2.	-0.001	496.66	-7.326E-02		
Co-56	846.77	20.	-2.	-0.001	278.94	-8.040E-02		P
NB-94	871.10	15.	-3.	-0.002	191.49	-1.136E-01		
EU-154	873.23	23.	-2.	-0.001	336.16	-5.864E-01		P
PA-234	880.53	53.	-13.	-0.007	81.81	-8.517E+00		
PA-234	883.24	67.	-13.	-0.007	90.38	-5.342E+00		
AG-110M	884.68	64.	9.	0.005	123.95	4.989E-01		
Y-88	898.04	11.	4.	0.002	176.14	1.730E-01		P
AG-110M	937.49	35.	-12.	-0.007	112.17	-1.399E+00		
PA-234	946.02	15.	-9.	-0.005	100.31	-2.709E+00		
EU-154	996.33	11.	6.	0.003	83.50	2.494E+00		
EU-154	1004.77	22.	-7.	-0.004	162.59	-1.574E+00		
Co-56	1037.84	11.	-2.	-0.001	452.11	-5.115E-01		
Cs-136	1048.07	20.	-1.	-0.001	640.31	-5.463E-02		
BI-207	1063.66	16.	2.	0.001	481.99	1.134E-01		P
Ga-68	1077.40	11.	3.	0.002	229.35	5.285E+00		
FE-59	1099.25	16.	-4.	-0.002	232.74	-3.212E-01		
EU-152	1112.07	55.	-11.	-0.006	96.53	-3.831E+00		
ZN-65	1115.55	44.	-2.	-0.001	594.16	-1.439E-01		
Sc-46	1120.55	36.	10.	0.005	94.04	4.400E-01		
CO-60	1173.24	11.	1.	0.001	753.24	4.789E-02		P
Ta-182	1189.05	0.	10.	0.006	31.62	2.981E+00		
Co-56	1238.28	23.	-1.	-0.001	677.06	-8.494E-02		P
NA-22	1274.53	23.	-12.	-0.006	64.71	-5.959E-01		
FE-59	1291.60	0.	11.	0.006	30.38	1.310E+00		P
TL-210	1313.00	23.	-11.	-0.006	109.06	-2.655E+00		
La-140	1596.21	0.	7.	0.004	39.67	4.364E-01		P
SB-124	1690.98	6.	-4.	-0.002	152.01	-5.825E-01		
Co-56	1771.35	19.	-1.	0.000	701.86	-3.820E-01		
Y-88	1836.06	6.	-2.	-0.001	275.72	-1.617E-01		

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TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

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	2.2217E+00	2.2217E+00	1.028E+02%	7.77E+00
NA-22	#A	-5.9589E-01	-5.9589E-01	6.471E+01%	1.27E+00
K-40	#	8.7137E+01	8.7137E+01	9.677E+00%	1.25E+01
Sc-46	#A	2.2001E-01	2.2001E-01	9.404E+01%	1.50E+00
CR-51	#A	2.3068E+00	2.3069E+00	1.749E+02%	1.36E+01
MN-54	#A	-7.3256E-02	-7.3256E-02	4.967E+02%	8.63E-01
FE-59	#A	3.8559E-01	3.8559E-01	3.038E+01%	1.71E+00
Co-56	#A	-8.0396E-02	-8.0396E-02	2.789E+02%	8.76E-01
CO-57	#A	1.9077E-02	1.9077E-02	1.015E+02%	6.29E-01
CO-58	#	8.3405E-01	8.3406E-01	2.825E+01%	6.24E-01
CO-60	#A	3.2757E-02	3.2757E-02	7.532E+02%	7.30E-01
ZN-65	#A	-1.4385E-01	-1.4385E-01	5.942E+02%	3.04E+00
NB-94	#A	1.8310E-01	1.8310E-01	1.743E+02%	1.11E+00
ZR-95	#A	-1.2094E-02	-1.2095E-02	5.079E+03%	1.30E+00
NB-95	#A	3.8968E-01	3.8969E-01	9.191E+01%	1.21E+00
RU-103	#A	1.5139E-01	1.5139E-01	1.408E+02%	5.42E-01
RH-106	#A	1.5470E+00	1.5470E+00	1.288E+02%	6.96E+00
AG-108M	#A	5.7950E-02	5.7950E-02	3.732E+02%	5.55E-01
AG-110M	#A	4.9888E-01	4.9888E-01	1.239E+02%	2.11E+00
SN-113	#A	-1.9089E-01	-1.9089E-01	1.858E+02%	1.23E+00
SB-124	#A	-3.7195E-01	-3.7195E-01	1.516E+02%	1.91E+00
SB-125	#A	6.1504E-01	6.1504E-01	7.149E+01%	1.99E+00
I-131	#A	-7.3095E-02	-7.3099E-02	3.958E+02%	7.47E-01
Gd-153	#A	0.0000E+00	0.0000E+00	7.071E+02%	3.91E+00
Ga-68	#A	5.2392E+00	5.2850E+00	2.293E+02%	2.84E+01
Tc-99m	#A	1.5768E-01	1.5794E-01	1.551E+02%	8.28E-01
BA-133	#A	-3.9444E-01	-3.9444E-01	1.412E+02%	1.88E+00
CS-134	#A	2.7865E-01	2.7865E-01	4.554E+01%	1.26E+00
CS-137	#A	2.3275E-01	2.3275E-01	1.606E+02%	1.29E+00
CE-139	#A	1.5171E-01	1.5171E-01	1.388E+02%	7.16E-01
Ba-140	#A	8.8167E-01	8.8169E-01	9.700E+01%	2.15E+00
La-140	#A	4.3638E-01	4.3639E-01	3.967E+01%	4.73E-01
CE-141	#A	-3.3812E-01	-3.3813E-01	1.548E+02%	1.76E+00
CE-144	#A	1.1471E+00	1.1471E+00	1.443E+02%	5.60E+00
PM-144	#A	3.3934E-01	3.3934E-01	7.404E+01%	8.63E-01
EU-152	#A	8.7567E-01	8.7567E-01	6.615E+01%	1.77E+00
EU-154	#A	5.9276E-01	5.9276E-01	8.350E+01%	1.21E+00
EU-155	#A	0.0000E+00	0.0000E+00	1.000E+03%	5.45E+00
HF-181	#A	-2.1267E-01	-2.1267E-01	9.079E+01%	1.35E+00
Ta-182	#A	8.9994E-01	8.9995E-01	3.162E+01%	4.37E+00
Hg-203	#A	-2.1088E-01	-2.1088E-01	2.041E+02%	8.57E-01

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:05 PMPage 18
TestAmerica Inc Spectrum name: 9_Gamma_20193497.An1

TL-208	1.4355E+00	1.4355E+00	1.891E+01%	5.14E-01
PM-146 #A	8.6160E-02	8.6160E-02	1.843E+02%	9.48E-01
Y-88 #A	8.4912E-04	8.4912E-04	1.636E+02%	1.00E+00
Cd-113m#B	-1.7691E+02	-1.7691E+02	1.454E+03%	9.17E+03
Cd-109 #A	-5.3378E+00	-5.3378E+00	1.728E+02%	3.09E+01
Cf-251 #A	-4.3107E-01	-4.3107E-01	2.566E+02%	2.91E+00
Cf-249 #A	0.0000E+00	0.0000E+00	1.000E+03%	1.31E+00
Sn-126 #A	1.4276E+00	1.4276E+00	1.661E+02%	8.06E+00
PB-210 #A	-8.4552E-02	-8.4552E-02	7.696E+03%	2.28E+01
PB-212	3.1563E+00	3.1563E+00	1.290E+01%	8.81E-01
PB-214	4.5605E+00	4.5605E+00	1.197E+01%	1.21E+00
BI-207 #A	1.1343E-01	1.1343E-01	4.820E+02%	1.27E+00
BI-212 #A	-3.0142E+00	-3.0142E+00	1.422E+02%	1.45E+01
U-235 #A	1.9648E+00	1.9648E+00	9.985E+01%	6.82E+00
BI-214	4.3316E+00	4.3316E+00	1.608E+01%	1.29E+00
BI-210M#A	-3.2060E-01	-3.2060E-01	2.108E+02%	1.09E+00
AC-228	4.7617E+00	4.7617E+00	1.872E+01%	1.52E+00
TH-227 #A	-6.6926E-01	-6.6926E-01	4.367E+02%	7.50E+00
TH-229 #A	-1.0426E-01	-1.0426E-01	1.444E+02%	1.24E+01
TH-234 #A	3.5637E+00	3.5637E+00	1.822E+02%	2.17E+01
PA-231 #A	0.0000E+00	0.0000E+00	7.071E+02%	4.77E+01
PA-233 #A	0.0000E+00	0.0000E+00	7.071E+02%	3.90E+00
PA-234 #A	1.5084E-01	1.5084E-01	5.991E+02%	3.50E+00
PA-234M#A	3.1207E+01	3.1207E+01	7.954E+01%	1.30E+02
AM-241 #A	5.6396E-02	5.6396E-02	1.174E+03%	1.76E+00
Np-237 #A	-1.5552E+00	-1.5552E+00	1.732E+02%	9.02E+00
Ir-192 #A	1.3189E-01	1.3189E-01	1.442E+02%	1.63E+00
Cs-136 #A	-6.0115E-03	-6.0117E-03	4.893E+03%	1.07E+00
Np-239 #A	-9.0790E-01	-9.0806E-01	1.709E+02%	5.19E+00
Nd-147 #A	-1.0030E+00	-1.0030E+00	2.129E+02%	5.31E+00
TL-210 #A	-6.5014E-02	-6.5014E-02	5.382E+02%	1.24E+00
Kr-85 #A	0.0000E+00	0.0000E+00	1.000E+03%	3.05E+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) 1.054E+02 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 1.0538281E+02 Bq/Sample

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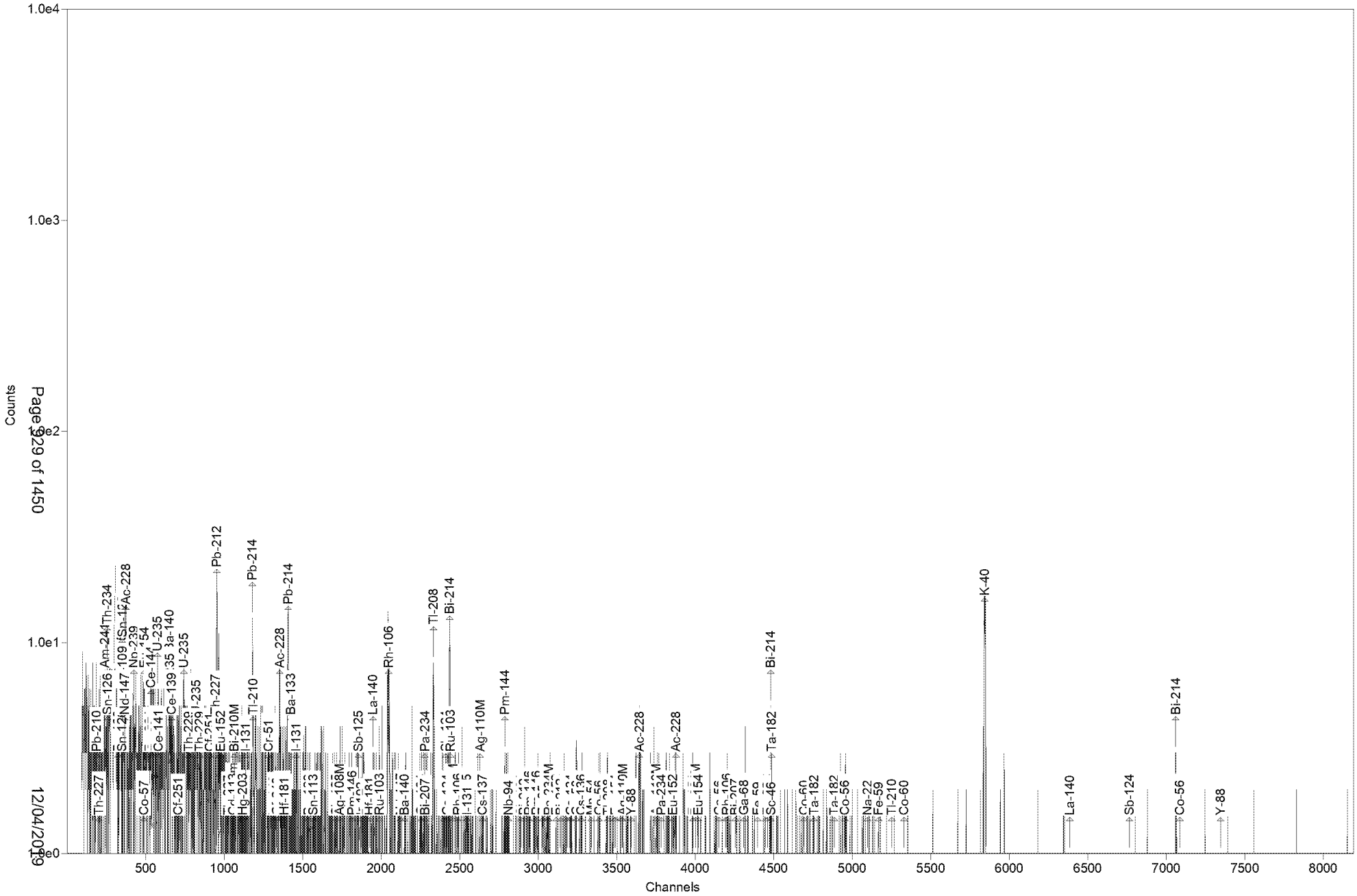
448571_Gamma_160-36160-A-12-C. 9_Gamma_20193497.spc.



Test America St. Louis Spectrum ID: 12_Gamma_20193352

Sample Description: 448571_Gamma_160-36160-A-13-C
Detector: Detector #12
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-13-C

Decay to Time: 11/23/2019 22:56 Live Time: 1800 sec
Acquisition Time: 11/23/2019 22:56:36 Real Time: 1801 sec
Analysis Time: 11/23/2019 23:26 Dead Time: 0.06 %
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_2019-11-10_1422.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	2.499E+00	108.4	2.708E+00	2.711E+00	9.294E+00
NA-22	-3.044E-01	119.9	3.650E-01	3.653E-01	1.292E+00
K-40	5.051E+01	14.8	7.466E+00	7.890E+00	1.034E+01
Sc-46	8.968E-03	3786.8	3.396E-01	3.396E-01	1.263E+00
CR-51	4.637E+00	36.9	1.711E+00	1.728E+00	4.155E+00
MN-54	3.427E-02	979.8	3.358E-01	3.358E-01	8.713E-01
FE-59	-1.964E-01	187.3	3.678E-01	3.679E-01	2.373E+00
Co-56	-9.158E-02	68.9	6.309E-02	6.326E-02	1.467E+00
CO-57	7.147E-02	643.6	4.600E-01	4.600E-01	7.829E-01
CO-58	-4.554E-01	102.4	4.665E-01	4.671E-01	1.591E+00
CO-60	9.606E-01	19.3	1.858E-01	1.919E-01	5.355E-01
ZN-65	0.000E+00	1.#INF	1.775E-01	1.775E-01	2.670E+00
NB-94	-4.944E-01	117.7	5.820E-01	5.826E-01	1.360E+00
ZR-95	1.260E+00	41.5	5.226E-01	5.266E-01	1.123E+00
NB-95	3.146E-01	96.7	3.042E-01	3.046E-01	1.047E+00
RU-103	0.000E+00	1.#INF	1.223E-01	1.223E-01	8.258E-01
RH-106	-5.047E+00	174.7	8.817E+00	8.821E+00	2.979E+01
AG-108M	-4.526E-01	95.2	4.308E-01	4.314E-01	1.076E+00
AG-110M	2.786E-01	82.3	2.293E-01	2.298E-01	1.678E+00
SN-113	-4.585E-02	1100.0	5.043E-01	5.043E-01	1.779E+00
SB-124	3.801E-01	81.6	3.100E-01	3.106E-01	2.731E+00
SB-125	7.111E-01	30.5	2.166E-01	2.195E-01	2.708E+00
I-131	-1.020E-01	373.7	3.810E-01	3.810E-01	9.881E-01
Gd-153	6.705E-01	157.8	1.058E+00	1.059E+00	3.570E+00
Ga-68	1.607E+01	107.8	1.731E+01	1.734E+01	3.928E+01
Tc-99m	0.000E+00	1.#INF	1.251E-01	1.251E-01	1.405E+00
BA-133	-3.516E-01	225.7	7.935E-01	7.937E-01	2.702E+00
CS-134	7.934E-01	77.2	6.129E-01	6.142E-01	1.563E+00
CS-137	-2.416E-01	186.6	4.509E-01	4.510E-01	1.578E+00
CE-139	2.582E-01	102.7	2.652E-01	2.655E-01	8.958E-01
Ba-140	-5.093E-01	260.8	1.328E+00	1.328E+00	3.378E+00
La-140	3.295E-01	138.2	4.552E-01	4.555E-01	1.243E+00
CE-141	4.253E-01	167.8	7.134E-01	7.138E-01	2.406E+00

CE-144	1.891E+00	160.3	3.031E+00	3.033E+00	1.022E+01
PM-144	4.573E-02	124.4	5.691E-02	5.695E-02	1.247E+00
EU-152	2.631E+00	25.1	6.604E-01	6.743E-01	2.176E+00
EU-154	5.248E-01	36.5	1.916E-01	1.935E-01	1.661E+00
EU-155	-3.048E-01	492.2	1.500E+00	1.500E+00	5.110E+00
HF-181	-2.880E-01	97.4	2.805E-01	2.808E-01	2.020E+00
Ta-182	1.687E+00	74.3	1.253E+00	1.256E+00	4.948E+00
Hg-203	2.670E-01	131.4	3.509E-01	3.511E-01	1.196E+00
TL-208	2.889E+00	16.6	4.795E-01	5.015E-01	7.573E-01
PM-146	7.289E-01	43.9	3.203E-01	3.224E-01	1.189E+00
Y-88	-7.956E-01	117.0	9.305E-01	9.316E-01	1.883E+00
Cd-113m	-5.222E+03	79.0	4.124E+03	4.135E+03	1.379E+04
Cd-109	0.000E+00	1.#INF	2.315E+00	2.315E+00	3.297E+01
Cf-251	4.948E-01	281.1	1.391E+00	1.391E+00	3.688E+00
Cf-249	0.000E+00	1.#INF	1.396E-01	1.396E-01	1.713E+00
Sn-126	-4.116E-01	1024.3	4.215E+00	4.216E+00	1.437E+01
PB-210	2.229E+01	44.3	9.866E+00	9.964E+00	2.771E+01
PB-212	3.803E+00	15.2	5.776E-01	6.107E-01	1.411E+00
PB-214	8.451E+00	10.4	8.759E-01	9.751E-01	1.848E+00
BI-207	1.872E-01	76.3	1.428E-01	1.431E-01	1.475E+00
BI-212	-4.519E+00	127.9	5.780E+00	5.785E+00	1.991E+01
U-235	8.124E-01	104.1	8.456E-01	8.466E-01	1.127E+01
BI-214	9.288E+00	10.4	9.685E-01	1.078E+00	9.954E-01
BI-210M	4.892E-01	102.0	4.989E-01	4.995E-01	1.690E+00
AC-228	4.909E+00	33.2	1.628E+00	1.647E+00	3.294E+00
TH-227	-1.927E+00	215.3	4.150E+00	4.152E+00	1.099E+01
TH-229	5.412E+00	106.6	5.770E+00	5.777E+00	1.498E+01
TH-234	5.823E+00	31.5	1.836E+00	1.865E+00	2.271E+01
PA-231	-1.070E+01	189.9	2.031E+01	2.032E+01	6.848E+01
PA-233	-1.598E-01	765.5	1.223E+00	1.223E+00	4.202E+00
PA-234	3.427E-01	153.9	5.273E-01	5.276E-01	5.243E+00
PA-234M	1.086E+02	35.6	3.869E+01	3.907E+01	1.084E+02
AM-241	-4.212E-01	305.1	1.285E+00	1.285E+00	4.353E+00
Np-237	2.010E-01	1514.2	3.043E+00	3.043E+00	1.034E+01
Ir-192	4.033E-02	52.6	2.121E-02	2.134E-02	1.452E+00
Cs-136	3.988E-01	102.6	4.092E-01	4.098E-01	1.402E+00
Np-239	-1.061E+00	138.7	1.471E+00	1.472E+00	4.947E+00
Nd-147	1.421E+00	153.8	2.186E+00	2.187E+00	5.545E+00
TL-210	2.260E-01	196.1	4.433E-01	4.435E-01	1.554E+00
Kr-85	8.569E+01	130.4	1.117E+02	1.118E+02	3.801E+02
Total	3.497E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 11:26:44 PMPage  1
TestAmerica Inc                 Spectrum name: 12_Gamma_20193352.An1

Sample description
     448571_Gamma_160-36160-A-13-C


Spectrum Filename: C:\User\SPC\Det12\12_Gamma_20193352.An1

Acquisition information
       Start time:                 11/23/2019 10:56:36 PM
       Live time:               1800
       Real time:               1801
       Dead time:                  0.06 %
       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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:44 PMPage 2
TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

Activity range factor: 2.000
Min. step backg. energy 0.000
Multiplet shift channel 2.000

Corrections	Status	Comments
Decay correct to date:	YES	11/23/2019 10:56:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	12_2019-11-10_1422.PBC 11/10/2019 2:22:07 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 18 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1138

***** 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
46.27	63.	19.27	0.75	1.784E-02	46.54	4.250	PBC<MDA	PB210
63.26	42.	31.54	1.26	2.978E-02	63.29	3.810	2.054E+01	TH234
77.24	72.	25.75	0.55	3.388E-02				
86.94	16.	147.06	0.89	3.566E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	2.729E+00	Sn126
92.45	-15.	156.44	0.90	3.637E-02	92.59	5.584	PBC<MDA	TH234
93.21	17.	137.68	0.90	3.645E-02	93.35	5.561	PBC<MDA	AC228
97.50	13.	157.80	0.90	3.683E-02	97.50	30.000	PBC<MDA	Gd153
121.78	12.	102.21	0.93	3.725E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.103E-01	CO57
133.02	13.	165.29	0.94	3.673E-02	133.02	43.300	PBC<MDA	HF181
133.54	14.	160.27	0.94	3.670E-02	133.54	11.090	PBC<MDA	CE144
136.30	14.	164.23	0.94	3.652E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	1.980E+00	CO57
136.47	4.	643.60	0.94	3.651E-02	136.30	5.850	PBC<MDA	HF181
					136.47	10.680	5.136E-01	CO57
143.79	-4.	560.17	0.95	3.599E-02	143.79	10.960	PBC<MDA	U235
145.44	13.	167.77	0.95	3.586E-02	145.44	48.200	PBC<MDA	CE141
163.38	12.	104.08	0.97	3.428E-02	163.38	5.080	PBC<MDA	U235
166.61	13.	102.71	0.97	3.405E-02	165.85	79.900	PBC<MDA	CE139
176.56	5.	281.07	0.98	3.303E-02	176.60	17.000	PBC<MDA	Cf251
185.72	12.	127.86	0.99	3.215E-02	185.72	54.000	PBC<MDA	U235
193.51	13.	106.62	1.00	3.140E-02	193.51	4.400	PBC<MDA	TH229
205.33	3.	506.37	1.01	3.030E-02	205.33	5.010	PBC<MDA	U235
238.43	81.	15.19	1.05	2.744E-02	238.63	43.300	3.802E+00	PB212
241.91	33.	26.48	1.05	2.716E-02	242.00	7.430	9.214E+00	PB214
265.83	11.	101.98	1.07	2.539E-02	265.83	50.000	PBC<MDA	BI210M

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:44 PMPage 3
TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
279.20	10.	131.43	1.09	2.449E-02	279.20	81.460	PBC<MDA	Hg203
295.02	80.	15.89	1.08	2.350E-02	295.09	19.300	9.837E+00	PB214
320.56	18.	36.91	0.60	2.210E-02	320.08	9.940	4.637E+00	CR51
328.76	3.	363.32	1.13	2.165E-02	328.76	20.300	PBC<MDA	La140
351.83	108.	13.31	0.91	2.056E-02	351.93	37.600	7.740E+00	PB214
383.84	4.	269.26	1.19	1.923E-02	383.84	8.940	PBC<MDA	BA133
463.37	11.	30.46	1.27	1.666E-02	463.37	10.470	3.433E+00	SB125
468.06	11.	52.60	1.27	1.653E-02	468.06	51.750	PBC<MDA	Ir192
477.60	8.	108.37	1.28	1.628E-02	477.60	10.520	PBC<MDA	BE7
487.02	8.	138.15	1.29	1.604E-02	487.02	45.500	PBC<MDA	La140
511.86	49.	25.61	2.56	1.546E-02	511.86	20.000	8.746E+00	RH106
513.98	10.	130.39	1.31	1.541E-02	513.98	0.430	PBC<MDA	Kr85
531.00	5.	153.84	1.33	1.504E-02	531.00	13.000	PBC<MDA	Nd147
569.70	9.	76.26	1.37	1.427E-02	569.32	15.380	2.361E+00	CS134
					569.47	8.200	4.429E+00	PA234
					569.70	97.740	3.717E-01	BI207
583.05	62.	16.59	1.69	1.403E-02	583.02	84.500	2.889E+00	TL208
609.30	105.	10.43	1.28	1.358E-02	609.31	46.090	9.288E+00	BI214
618.06	10.	186.52	1.41	1.344E-02	618.06	99.100	PBC<MDA	PM144
635.89	6.	40.52	1.43	1.317E-02	635.89	11.310	PBC<MDA	SB125
657.76	9.	82.31	1.45	1.284E-02	657.76	94.640	PBC<MDA	AG110M
722.79	7.	81.57	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	3.791E-01	AG108M
					723.36	20.220	1.704E+00	EU154
722.94	7.	96.65	1.51	1.199E-02	722.79	10.810	3.186E+00	SB124
					722.94	90.840	3.792E-01	AG108M
					723.36	20.220	1.704E+00	EU154
723.36	2.	318.29	1.51	1.199E-02	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	1.257E-01	AG108M
					723.36	20.220	5.649E-01	EU154
735.72	7.	93.89	1.52	1.184E-02	735.72	22.500	PBC<MDA	PM146
747.16	13.	43.95	1.53	1.171E-02	747.16	34.000	1.861E+00	PM146
756.73	14.	41.47	1.54	1.160E-02	756.73	54.460	1.260E+00	ZR95
763.94	4.	139.66	1.55	1.152E-02	763.94	22.280	PBC<MDA	AG110M
765.79	6.	96.69	1.55	1.150E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.068E+02	PA234M
778.92	5.	94.56	1.56	1.136E-02	778.92	12.940	PBC<MDA	EU152
785.42	1.	800.00	1.57	1.129E-02	785.42	1.280	PBC<MDA	BI212
795.87	10.	83.79	1.58	1.119E-02	795.87	85.530	PBC<MDA	CS134
799.60	4.	196.15	1.58	1.115E-02	799.60	98.960	PBC<MDA	TL210
801.95	6.	129.80	1.58	1.113E-02	801.95	8.690	PBC<MDA	CS134
818.50	8.	102.62	1.60	1.096E-02	818.50	100.000	PBC<MDA	Cs136
834.85	1.	979.80	1.61	1.081E-02	834.85	99.980	PBC<MDA	MN54
871.10	4.	132.29	1.65	1.048E-02	871.10	99.890	PBC<MDA	NB94
880.53	6.	89.80	1.66	1.040E-02	880.53	6.000	PBC<MDA	PA234
883.24	4.	161.05	1.66	1.038E-02	883.24	9.600	PBC<MDA	PA234
898.04	1.	857.32	1.67	1.025E-02	898.04	93.700	PBC<MDA	Y88
910.21	26.	33.16	1.68	1.015E-02	911.07	29.000	4.909E+00	AC228

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pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
937.49	1.	501.66	1.71	9.939E-03	937.49	34.360	PBC<MDA	AG110M
968.83	5.	189.59	1.74	9.703E-03	968.97	17.460	PBC<MDA	AC228
996.33	8.	36.51	1.76	9.508E-03	996.33	10.600	4.134E+00	EU154
1001.00	15.	35.63	1.76	9.476E-03	1001.00	0.837	1.086E+02	PA234M
1077.40	7.	107.76	1.83	8.978E-03	1077.40	3.300	PBC<MDA	Ga68
1112.07	16.	25.10	1.86	8.770E-03	1112.07	13.644	7.370E+00	EU152
1121.25	7.	120.26	1.87	8.716E-03	1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	1.189E+00	Ta182
1173.24	17.	24.25	1.92	8.426E-03	1173.24	99.900	1.122E+00	CO60
1189.17	7.	87.20	1.93	8.342E-03	1189.05	16.200	PBC<MDA	Ta182
1238.28	7.	89.88	1.97	8.090E-03	1238.28	66.070	PBC<MDA	Co56
1291.60	2.	480.00	2.02	7.834E-03	1291.60	43.200	PBC<MDA	FE59
1332.50	11.	30.15	2.05	7.647E-03	1332.50	99.980	7.993E-01	CO60
1408.00	9.	33.33	2.12	7.324E-03	1408.00	21.005	3.250E+00	EU152
1460.96	69.	14.78	2.16	7.112E-03	1460.83	10.670	5.051E+01	K40
1596.21	2.	304.14	2.27	6.616E-03	1596.21	95.400	PBC<MDA	La140
1765.21	6.	87.69	2.40	6.075E-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
308.50	77.24	76.	72.	2.117E+03	25.75	0.548	- 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

********** 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	184.69	46.27	58.	31.	0.017	44.26	0.754s
TH-227	200.18	50.14	168.	-6.	-0.003	300.11	0.855s
AM-241	237.74	59.54	270.	-8.	-0.004	305.06	0.865s
TH-234	252.63	63.26	54.	42.	0.023	31.54	1.261s
BA-133	323.50	80.99	322.	-20.	-0.011	127.66	0.887s
EU-155	345.70	86.54	327.	0.	0.000	1000.00	0.892s
Sn-126	347.29	86.94	263.	16.	0.009	147.06	0.892s
Sn-126	349.81	87.57	279.	0.	0.000	1000.00	0.893s
Cd-109	351.68	88.04	279.	0.	0.000	1000.00	0.894s
Nd-147	363.92	91.10	279.	0.	0.000	1000.00	0.897s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-234	369.87	92.59	297.	-15.	-0.009	156.44	0.898s
AC-228	372.91	93.35	278.	17.	0.010	137.68	0.899
Gd-153	389.50	97.50	215.	13.	0.007	157.80	0.903
Np-239	397.50	99.50	228.	0.	0.000	1000.00	0.905
Gd-153	412.29	103.20	228.	0.	0.000	1000.00	0.909s
Np-239	414.29	103.70	228.	0.	0.000	1000.00	0.909s
EU-155	420.73	105.31	225.	-4.	-0.002	492.25	0.911s
Np-239	424.00	106.13	243.	-16.	-0.009	138.69	0.912s
EU-152	486.56	121.78	70.	12.	0.007	102.21	0.928s
EU-154	491.84	123.10	84.	-12.	-0.007	113.22	0.929s
PA-234	524.60	131.29	165.	-7.	-0.004	262.25	0.938s
HF-181	531.51	133.02	212.	13.	0.007	165.29	0.939
CE-144	533.57	133.54	240.	14.	0.008	160.27	0.940s
HF-181	544.61	136.30	253.	14.	0.008	164.23	0.943s
CO-57	545.30	136.47	267.	4.	0.002	643.60	0.943s
Tc-99m	561.44	140.51	271.	0.	0.000	1000.00	0.947s
U-235	574.53	143.79	275.	-4.	-0.002	560.17	0.950s
CE-141	581.15	145.44	240.	13.	0.007	167.77	0.952s
Ba-140	649.99	162.66	121.	-11.	-0.006	148.82	0.969s
U-235	652.87	163.38	68.	12.	0.006	104.08	0.970s
CE-139	662.76	165.85	78.	13.	0.007	102.71	0.973
Cf-251	705.72	176.60	55.	5.	0.003	281.07	0.983s
U-235	742.18	185.72	71.	12.	0.007	127.86	0.992s
TH-229	773.32	193.51	55.	13.	0.007	106.62	1.000
U-235	820.59	205.33	51.	3.	0.001	506.37	1.012s
Cf-251	907.22	227.00	59.	-3.	-0.001	540.83	1.034
TH-227	943.09	235.97	281.	-14.	-0.008	165.77	1.043s
PB-212	953.73	238.63	35.	81.	0.045	15.19	1.045D
PB-214	967.18	242.00	21.	34.	0.019	25.39	1.049D
EU-152	977.96	244.69	243.	-14.	-0.008	163.36	1.051s
TH-227	1024.13	256.24	51.	-6.	-0.004	215.34	1.063s
Cd-113m	1053.96	263.70	58.	-14.	-0.008	78.96	1.070s
BI-210M	1062.48	265.83	59.	11.	0.006	101.98	1.072s
TL-208	1108.27	277.28	80.	-15.	-0.008	90.58	1.084s
Hg-203	1115.93	279.20	75.	10.	0.005	131.43	1.086s
I-131	1136.32	284.30	55.	-11.	-0.006	129.68	1.091s
PB-214	1179.18	295.02	21.	80.	0.045	15.89	1.077
TL-210	1183.11	296.00	339.	-13.	-0.007	206.94	1.102s
PB-212	1199.22	300.03	327.	-13.	-0.007	202.38	1.106
PA-231	1199.38	300.07	314.	-13.	-0.007	198.47	1.106s
PA-233	1199.82	300.18	301.	-13.	-0.007	194.43	1.107s
PA-231	1209.70	302.65	288.	-13.	-0.007	189.94	1.109s
BA-133	1210.50	302.85	276.	-13.	-0.007	185.73	1.109s
Ba-140	1218.49	304.85	263.	-3.	-0.002	821.27	1.111
PA-233	1247.13	312.01	158.	-2.	-0.001	765.45	1.118s
Ir-192	1265.04	316.49	106.	-12.	-0.007	121.40	1.123s
CR-51	1281.33	320.56	9.	18.	0.010	36.91	0.597s
La-140	1314.10	328.76	72.	3.	0.002	363.32	1.135s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-249	1332.81	333.44	94.	-14.	-0.008	99.78	1.139s
AC-228	1352.33	338.32	90.	-2.	-0.001	674.54	1.144
Cs-136	1361.32	340.57	92.	0.	0.000	1000.00	1.146s
EU-152	1376.18	344.29	92.	0.	0.000	1000.00	1.150s
HF-181	1382.35	345.83	92.	0.	0.000	1000.00	1.151s
PB-214	1406.34	351.83	24.	108.	0.060	13.31	0.907s
BA-133	1423.02	356.00	159.	-8.	-0.004	225.69	1.162s
I-131	1456.95	364.48	32.	-3.	-0.002	373.67	1.170
BA-133	1534.35	383.84	56.	4.	0.002	269.26	1.189s
Cf-249	1550.79	387.95	60.	0.	0.000	1000.00	1.193s
SB-125	1710.45	427.88	24.	-8.	-0.004	125.00	1.232s
AG-108M	1734.69	433.94	36.	-13.	-0.007	95.19	1.238s
PM-146	1814.45	453.88	20.	-3.	-0.002	297.52	1.257
SB-125	1852.39	463.37	0.	11.	0.006	30.46	1.266s
Ir-192	1871.16	468.06	11.	11.	0.006	52.60	1.271s
BE-7	1909.29	477.60	31.	8.	0.004	108.37	1.280s
HF-181	1926.90	482.00	92.	-13.	-0.007	104.77	1.284s
La-140	1946.98	487.02	57.	8.	0.004	138.15	1.289s
RU-103	1987.11	497.05	16.	0.	0.000	1000.00	1.298s
RH-106	2046.35	511.86	53.	49.	0.027	25.61	2.563s
Kr-85	2054.81	513.98	84.	10.	0.006	130.39	1.315s
Nd-147	2122.88	531.00	13.	5.	0.003	153.84	1.331s
Ba-140	2147.92	537.26	17.	-3.	-0.002	260.77	1.337s
CS-134	2251.82	563.24	26.	-8.	-0.004	134.82	1.362s
CS-134	2276.15	569.32	30.	-2.	-0.001	393.70	1.367s
PA-234	2276.75	569.47	32.	0.	0.000	1000.00	1.368s
BI-207	2277.68	569.70	21.	9.	0.005	76.26	1.368s
TL-208	2331.07	583.05	8.	62.	0.034	16.59	1.695s
SB-125	2400.87	600.50	218.	-12.	-0.007	177.75	1.397s
CS-134	2417.71	604.71	187.	0.	0.000	1000.00	1.401s
BI-214	2436.05	609.30	3.	105.	0.058	10.43	1.275
RU-103	2440.06	610.30	187.	0.	0.000	1000.00	1.406s
AG-108M	2455.99	614.28	187.	0.	0.000	1000.00	1.410s
PM-144	2471.12	618.06	163.	10.	0.005	186.52	1.414s
RH-106	2486.54	621.92	216.	-12.	-0.007	174.70	1.417s
SB-125	2542.43	635.89	0.	6.	0.003	40.52	1.430s
I-131	2546.77	636.97	6.	0.	0.000	1000.00	1.432s
AG-110M	2629.92	657.76	22.	9.	0.005	82.31	1.451s
CS-137	2645.51	661.66	37.	-5.	-0.003	186.64	1.455s
PM-144	2785.05	696.54	28.	-7.	-0.004	164.75	1.487s
NB-94	2809.41	702.63	33.	-11.	-0.006	117.72	1.493s
SB-124	2890.04	722.79	15.	7.	0.004	81.57	1.512s
AG-108M	2890.65	722.94	22.	7.	0.004	96.65	1.512s
EU-154	2892.34	723.36	30.	2.	0.001	318.29	1.512s
ZR-95	2895.69	724.20	32.	0.	0.000	1000.00	1.513s
BI-212	2907.58	727.17	40.	-7.	-0.004	127.92	1.516s
PM-146	2941.78	735.72	9.	7.	0.004	93.89	1.524s
PM-146	2987.55	747.16	5.	13.	0.007	43.95	1.535s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
ZR-95	3025.83	756.73	5.	14.	0.008	41.47	1.543s
AG-110M	3054.69	763.94	18.	4.	0.002	139.66	1.550s
NB-95	3062.08	765.79	16.	6.	0.004	96.69	1.552s
EU-152	3114.61	778.92	5.	5.	0.003	94.56	1.564s
BI-212	3140.62	785.42	14.	1.	0.001	800.00	1.570s
CS-134	3182.43	795.87	27.	10.	0.005	83.79	1.579s
TL-210	3197.35	799.60	37.	4.	0.002	196.15	1.583s
CS-134	3206.76	801.95	23.	6.	0.003	129.80	1.585s
CO-58	3242.06	810.78	38.	-9.	-0.005	102.44	1.593s
La-140	3262.05	815.77	47.	0.	0.000	1000.00	1.598s
Cs-136	3272.97	818.50	29.	8.	0.004	102.62	1.600s
MN-54	3338.38	834.85	9.	1.	0.000	979.80	1.615s
Co-56	3386.08	846.77	30.	-12.	-0.007	104.42	1.626s
TL-208	3441.27	860.56	30.	-12.	-0.007	104.42	1.638s
NB-94	3483.41	871.10	12.	4.	0.002	132.29	1.648s
EU-154	3491.95	873.23	24.	-6.	-0.004	112.53	1.650s
PA-234	3521.16	880.53	10.	6.	0.003	89.80	1.657s
PA-234	3532.00	883.24	16.	4.	0.002	161.05	1.659s
Y-88	3591.22	898.04	15.	1.	0.001	857.32	1.672s
AC-228	3643.36	911.07	10.	26.	0.014	33.16	1.684s
AG-110M	3749.09	937.49	5.	1.	0.001	501.66	1.708s
PA-234	3783.21	946.02	15.	-3.	-0.002	289.64	1.716s
EU-152	3855.60	964.11	76.	-21.	-0.012	63.01	1.732s
AC-228	3875.05	968.97	41.	5.	0.003	189.59	1.736s
EU-154	3984.54	996.33	0.	8.	0.004	36.51	1.761s
PA-234M	4003.22	1001.00	8.	15.	0.009	35.63	1.765s
EU-154	4018.33	1004.77	23.	0.	0.000	1000.00	1.768s
Cs-136	4191.60	1048.07	11.	-3.	-0.001	183.71	1.807s
RH-106	4200.76	1050.36	16.	0.	0.000	1000.00	1.809s
Ga-68	4308.98	1077.40	11.	7.	0.004	107.76	1.833s
FE-59	4396.44	1099.25	16.	-5.	-0.003	187.26	1.852s
EU-152	4447.76	1112.07	0.	16.	0.009	25.10	1.863s
ZN-65	4461.66	1115.55	16.	0.	0.000	1000.00	1.866s
BI-214	4480.63	1120.29	16.	0.	0.000	1000.00	1.870s
Sc-46	4481.68	1120.55	16.	0.	0.000	1000.00	1.870s
Ta-182	4484.69	1121.30	27.	7.	0.004	120.26	1.871s
CO-60	4692.57	1173.24	0.	17.	0.009	24.25	1.916s
Ta-182	4755.86	1189.05	5.	7.	0.004	87.20	1.930s
Ta-182	4885.39	1221.41	11.	-2.	-0.001	344.64	1.957s
Co-56	4952.92	1238.28	6.	7.	0.004	89.88	1.972s
NA-22	5098.03	1274.53	11.	-4.	-0.002	119.91	2.003s
EU-154	5098.08	1274.54	16.	0.	0.000	1000.00	2.003s
FE-59	5166.35	1291.60	11.	2.	0.001	480.00	2.017s
CO-60	5330.11	1332.50	0.	11.	0.006	30.15	2.052s
AG-110M	5537.48	1384.30	0.	0.	0.000	1000.00	2.096s
EU-152	5632.39	1408.00	0.	9.	0.005	33.33	2.115s
K-40	5843.92	1460.83	6.	69.	0.038	14.78	2.159s
La-140	6386.02	1596.21	6.	2.	0.001	304.14	2.269s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	6765.58	1690.98	13.	-11.	-0.006	88.33	2.345s
BI-214	7060.00	1764.49	10.	6.	0.003	87.69	2.403s
Co-56	7087.48	1771.35	6.	0.	0.000	1000.00	2.408s
Y-88	7346.69	1836.06	13.	-8.	-0.005	116.96	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
BE-7	C	2.4988E+00					5.31E+01		
			477.60	2.499E+00	?(	9.294E+00	1.08E+02	1.05E+01	G
NA-22	C	-3.0438E-01					9.50E+02		
			1274.53	-3.044E-01	?(	1.292E+00	1.20E+02	9.99E+01	G
K-40	N	5.0514E+01					4.66E+11		
			1460.83	5.051E+01	?(	1.034E+01	1.48E+01	1.07E+01	G
Sc-46	F	8.9684E-03					8.38E+01		
			889.28	8.968E-03	%(	1.263E+00	3.79E+03	1.00E+02	G
			1120.55	0.000E+00	-	1.356E+00	1.00E+03	1.00E+02	G
CR-51	F	4.6371E+00					2.77E+01		
			320.08	4.637E+00	(	4.155E+00	3.69E+01	9.94E+00	G
MN-54	C	3.4275E-02					3.12E+02		
			834.85	3.427E-02	?(	8.713E-01	9.80E+02	1.00E+02	G
FE-59	F	-1.9642E-01					4.45E+01		
			1099.25	-5.558E-01	?(	2.373E+00	1.87E+02	5.65E+01	G
			1291.60	2.736E-01	&(	3.020E+00	4.80E+02	4.32E+01	G
Co-56	C	-9.1582E-02					7.73E+01		
			846.77	-6.236E-01	?(	1.467E+00	1.04E+02	9.99E+01	G
			1238.28	7.131E-01	?(	1.435E+00	8.99E+01	6.61E+01	G
			1037.84	-2.840E-01	%	7.639E+00	1.12E+03	1.41E+01	G
			1771.35	0.000E+00	+	8.278E+00	1.00E+03	1.55E+01	A
CO-57	C	7.1466E-02					2.72E+02		
			122.06	1.630E-02	%(	7.829E-01	1.37E+03	8.56E+01	G
			136.47	5.136E-01	&(	1.124E+01	6.44E+02	1.07E+01	G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:44 PMPage 9
TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-58	C	-4.5541E-01					7.09E+01	
			810.78	-4.554E-01	?(	1.591E+00	1.02E+02	9.95E+01 G
CO-60	F	9.6055E-01					1.93E+03	
			1332.50	7.993E-01	?(	5.355E-01	3.02E+01	1.00E+02 G
			1173.24	1.122E+00	?(	4.864E-01	2.43E+01	9.99E+01 G
NB-94	I	-4.9442E-01					7.41E+06	
			702.63	-4.944E-01	?(	1.360E+00	1.18E+02	9.79E+01 G
			871.10	2.122E-01	+	1.000E+00	1.32E+02	9.99E+01 G
ZR-95	I	1.2602E+00					6.40E+01	
			756.73	1.260E+00	?(	1.123E+00	4.15E+01	5.45E+01 G
			724.20	0.000E+00	-	3.054E+00	1.00E+03	4.42E+01 G
NB-95	I	3.1458E-01					6.40E+01	
			765.79	3.146E-01	?(	1.047E+00	9.67E+01	9.98E+01 G
RH-106	I	-5.0469E+00					3.74E+02	
			621.92	-5.047E+00	?(	2.979E+01	1.75E+02	9.93E+00 G
			1050.36	0.000E+00	+	8.387E+01	1.00E+03	1.56E+00 G
			511.86	8.746E+00	?	6.603E+00	2.56E+01	2.00E+01 GA
AG-108M	C	-4.5255E-01					1.53E+05	
			433.94	-4.526E-01	?(	1.076E+00	9.52E+01	9.05E+01 G
			722.94	3.792E-01	+	1.255E+00	9.66E+01	9.08E+01 G
			614.28	0.000E+00	+	3.042E+00	1.00E+03	8.98E+01 G
AG-110M	F	2.7863E-01					2.50E+02	
			884.68	-3.687E-02	%(	1.678E+00	1.22E+03	7.27E+01 G
			657.76	3.994E-01	&(	1.111E+00	8.23E+01	9.46E+01 G
			937.49	1.627E-01	?(	2.136E+00	5.02E+02	3.44E+01 G
			1384.30	0.000E+00	-	2.271E+00	1.00E+03	2.43E+01 G
			763.94	9.738E-01	?(	4.805E+00	1.40E+02	2.23E+01 G
SN-113	F	-4.5847E-02					1.15E+02	
			391.69	-4.585E-02	%(	1.779E+00	1.10E+03	6.40E+01 G
SB-124	F	3.8009E-01					6.02E+01	
			602.73	7.148E-02	&(	2.731E+00	1.11E+03	9.83E+01 G
			1690.98	-1.968E+00	+	3.559E+00	8.83E+01	4.78E+01 G
			722.79	3.185E+00	?(	8.808E+00	8.16E+01	1.08E+01 G
SB-125	I	7.1106E-01					1.01E+03	
			427.88	-8.484E-01	?(	2.708E+00	1.25E+02	2.96E+01 G
			600.50	-2.696E+00	+	1.619E+01	1.78E+02	1.79E+01 G
			635.89	2.273E+00	?(	2.750E+00	4.05E+01	1.13E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:44 PMPage 10
TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			463.37	3.433E+00	(	2.347E+00	3.05E+01	1.05E+01 G
I-131	I	-1.0196E-01						8.02E+00
			364.48	-1.020E-01	(	9.881E-01	3.74E+02	8.17E+01 G
			284.30	-4.119E+00	+	1.396E+01	1.30E+02	6.14E+00 G
			636.97	0.000E+00	+	8.374E+00	1.00E+03	7.17E+00 G
Gd-153	F	6.7047E-01						2.42E+02
			97.50	6.705E-01	&(	3.570E+00	1.58E+02	3.00E+01 G
			103.20	0.000E+00	-	5.009E+00	1.00E+03	2.18E+01 G
Ga-68	C	1.6067E+01						4.71E-02
			1077.40	1.607E+01	&(	3.928E+01	1.08E+02	3.30E+00 G
BA-133	F	-3.5159E-01						3.85E+03
			356.00	-3.516E-01	?(	2.702E+00	2.26E+02	6.20E+01 G
			302.85	-1.682E+00	+	1.053E+01	1.86E+02	1.83E+01 G
			383.84	1.293E+00	&	1.215E+01	2.69E+02	8.94E+00 GA
			80.99	-9.506E-01	+	4.065E+00	1.28E+02	3.41E+01 GA
CS-134	I	7.9337E-01						7.54E+02
			795.87	5.522E-01	?(	1.563E+00	8.38E+01	8.55E+01 G
			604.71	0.000E+00	-	2.768E+00	1.00E+03	9.76E+01 G
			569.32	-5.059E-01	-	7.142E+00	3.94E+02	1.54E+01 G
			801.95	3.167E+00	&(	1.435E+01	1.30E+02	8.69E+00 G
			563.24	-3.698E+00	+	1.224E+01	1.35E+02	8.35E+00 G
CS-137	I	-2.4156E-01						1.10E+04
			661.66	-2.416E-01	?(	1.578E+00	1.87E+02	8.52E+01 G
CE-139	F	2.5818E-01						1.38E+02
			165.85	2.582E-01	&(	8.958E-01	1.03E+02	7.99E+01 G
Ba-140	I	-5.0932E-01						1.28E+01
			537.26	-5.093E-01	?(	3.378E+00	2.61E+02	2.44E+01 G
			162.66	-2.774E+00	+	1.401E+01	1.49E+02	6.22E+00 G
			304.85	-1.581E+00	+	4.420E+01	8.21E+02	4.29E+00 G
La-140	I	3.2949E-01						1.28E+01
			1596.21	1.760E-01	?(	1.243E+00	3.04E+02	9.54E+01 G
			487.02	6.102E-01	?(	2.892E+00	1.38E+02	4.55E+01 G
			328.76	4.213E-01	?(	5.329E+00	3.63E+02	2.03E+01 G
			815.77	0.000E+00	-	7.526E+00	1.00E+03	2.33E+01 G
CE-141	I	4.2525E-01						3.25E+01
			145.44	4.253E-01	?(	2.406E+00	1.68E+02	4.82E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:44 PMPage 11
TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-144	I	1.8914E+00					2.85E+02	
			133.54	1.891E+00	&(	1.022E+01	1.60E+02	1.11E+01 G
PM-144	C	4.5732E-02					3.63E+02	
			696.54	-3.188E-01	?(	1.247E+00	1.65E+02	9.90E+01 G
			618.06	4.099E-01	&(	2.595E+00	1.87E+02	9.91E+01 G
EU-152	F	2.6309E+00					4.94E+03	
			121.78	6.296E-01	&(	2.176E+00	1.02E+02	2.86E+01 G
			344.29	0.000E+00	-	4.755E+00	1.00E+03	2.65E+01 G
			1112.07	7.370E+00	?(	3.422E+00	2.51E+01	1.36E+01 G
			778.92	2.055E+00	?(	4.828E+00	9.46E+01	1.29E+01 G
			964.11	-8.151E+00	+	1.693E+01	6.30E+01	1.46E+01 G
			244.69	-3.718E+00	+	2.047E+01	1.63E+02	7.58E+00 G
			1408.00	3.250E+00	?	2.662E+00	3.33E+01	2.10E+01 GA
EU-154	I	5.2476E-01					3.14E+03	
			123.10	-4.332E-01	?(	1.661E+00	1.13E+02	4.08E+01 G
			1274.54	0.000E+00	+	4.220E+00	1.00E+03	3.52E+01 G
			723.36	5.649E-01	?(	6.426E+00	3.18E+02	2.02E+01 G
			873.23	-2.813E+00	+	1.095E+01	1.13E+02	1.23E+01 G
			1004.77	0.000E+00	+	8.180E+00	1.00E+03	1.80E+01 G
			996.33	4.134E+00	?(	4.063E+00	3.65E+01	1.06E+01 G
EU-155	I	-3.0477E-01					1.81E+03	
			105.31	-3.048E-01	*(	5.110E+00	4.92E+02	2.12E+01 G
			86.54	0.000E+00	&	4.421E+00	1.00E+03	3.07E+01 G
HF-181	F	-2.8795E-01					4.24E+01	
			482.00	-5.715E-01	?(	2.020E+00	1.05E+02	8.05E+01 G
			133.02	4.416E-01	+	2.465E+00	1.65E+02	4.33E+01 G
			345.83	0.000E+00	+	8.390E+00	1.00E+03	1.51E+01 G
			136.30	3.613E+00	&(	2.000E+01	1.64E+02	5.85E+00 G
Ta-182	F	1.6867E+00					1.14E+02	
			1121.30	1.189E+00	?(	4.948E+00	1.20E+02	3.49E+01 G
			1221.41	-5.873E-01	-	4.631E+00	3.45E+02	2.70E+01 G
			1189.05	2.760E+00	?(	5.538E+00	8.72E+01	1.62E+01 G
Hg-203	F	2.6697E-01					4.66E+01	
			279.20	2.670E-01	?(	1.196E+00	1.31E+02	8.15E+01 G
TL-208	N	2.8894E+00					6.98E+02	
			583.02	2.889E+00	(	7.573E-01	1.66E+01	8.45E+01 G
			277.28	-5.217E+00	-	1.588E+01	9.06E+01	6.31E+00 G
			860.56	-5.076E+00	-	1.194E+01	1.04E+02	1.24E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:44 PMPage 12
TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PM-146	C	7.2893E-01					2.02E+03	
			453.88	-1.515E-01	?(	1.189E+00	2.98E+02	6.50E+01 G
			747.16	1.861E+00	?(	1.783E+00	4.39E+01	3.40E+01 G
			735.72	1.562E+00	?(	3.534E+00	9.39E+01	2.25E+01 G
Y-88	F	-7.9557E-01					1.07E+02	
			1836.06	-7.956E-01	?(	1.883E+00	1.17E+02	9.92E+01 G
			898.04	5.783E-02	+	1.200E+00	8.57E+02	9.37E+01 G
Cd-113m		-5.2225E+03					5.33E+03	
			263.70	-5.222E+03	&(	1.379E+04	7.90E+01	6.00E-03 K
Cf-251	T	4.9476E-01					3.28E+05	
			176.60	4.948E-01	?(	3.688E+00	2.81E+02	1.70E+01 G
			227.00	-8.285E-01	+	1.193E+01	5.41E+02	6.30E+00 GA
Sn-126		-4.1156E-01					3.65E+07	
			87.57	0.000E+00	+	3.338E+00	1.00E+03	3.75E+01 GA
			64.28	-4.116E-01	%(	1.437E+01	1.02E+03	9.70E+00 G
			86.94	2.729E+00		1.350E+01	1.47E+02	9.04E+00 GA
PB-210	N	2.2292E+01					8.14E+03	
			46.54	2.229E+01	@(P	2.771E+01	4.43E+01	4.25E+00 G
PB-212	N	3.8027E+00					6.98E+02	
			238.63	3.803E+00	(P	1.411E+00	1.52E+01	4.33E+01 G
			300.03	-9.307E+00	-	6.344E+01	2.02E+02	3.28E+00 GA
PB-214	N	8.4512E+00					5.84E+05	
			351.93	7.740E+00	@(P	1.848E+00	1.33E+01	3.76E+01 G
			295.09	9.837E+00	(P	2.928E+00	1.59E+01	1.93E+01 G
			242.00	9.436E+00		6.586E+00	2.54E+01	7.43E+00 GA
BI-207	C	1.8719E-01					1.18E+04	
			1063.66	-5.485E-02	%(	1.475E+00	1.12E+03	7.45E+01 G
			569.70	3.717E-01	&(	9.515E-01	7.63E+01	9.77E+01 G
BI-212	N	-4.5187E+00					6.98E+02	
			727.17	-4.519E+00	?(	1.991E+01	1.28E+02	7.55E+00 G
			785.42	3.843E+00	?	7.742E+01	8.00E+02	1.28E+00 GA
U-235	N	8.1241E-01					2.57E+11	
			143.79	-6.120E-01	*(P	1.127E+01	5.60E+02	1.10E+01 G
			205.33	9.760E-01	?(	1.321E+01	5.06E+02	5.01E+00 G
			163.38	3.724E+00	&(	1.312E+01	1.04E+02	5.08E+00 G
			185.72	3.867E-01	P	1.343E+00	1.28E+02	5.40E+01 GA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:44 PMPage 13
TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
BI-214	N	9.2878E+00					5.84E+05	
			609.31	9.288E+00	(	9.954E-01	1.04E+01	4.61E+01 G
			1120.29	0.000E+00	-	8.975E+00	1.00E+03	1.51E+01 G
			1764.49	3.464E+00	-	1.043E+01	8.77E+01	1.54E+01 G
BI-210M	T	4.8921E-01					1.10E+09	
			265.83	4.892E-01	&(	1.690E+00	1.02E+02	5.00E+01 G
			304.90	3.301E-07	%	6.737E+00	5.98E+08	2.80E+01 G
AC-228	N	4.9088E+00					2.10E+03	
			911.07	4.909E+00	&(	3.294E+00	3.32E+01	2.90E+01 G
			968.97	1.614E+00	- P	1.065E+01	1.90E+02	1.75E+01 G
			338.32	-4.368E-01	-	1.025E+01	6.75E+02	1.20E+01 G
			93.35	4.766E+00	?	2.204E+01	1.38E+02	5.56E+00 XA
TH-227	N	-1.9274E+00					7.95E+03	
			256.24	-1.927E+00	&(	1.099E+01	2.15E+02	7.00E+00 G
			235.97	-2.368E+00	+	1.322E+01	1.66E+02	1.23E+01 G
			50.14	-1.952E+00	&	1.999E+01	3.00E+02	8.00E+00 G
TH-229	N	5.4120E+00					2.68E+06	
			193.51	5.412E+00	&(	1.498E+01	1.07E+02	4.40E+00 G
			210.85	8.315E-01	%	2.594E+01	1.17E+03	2.99E+00 G
TH-234	N	5.8225E+00					1.63E+12	
			92.59	-4.218E+00	?(P	2.271E+01	1.56E+02	5.58E+00 G
			63.29	2.054E+01	(P	1.811E+01	3.15E+01	3.81E+00 G
PA-231	N	-1.0695E+01					1.20E+07	
			302.65	-1.070E+01	?(	6.848E+01	1.90E+02	2.88E+00 G
			300.07	-1.241E+01	&	8.298E+01	1.98E+02	2.46E+00 G
PA-233	C	-1.5982E-01					7.82E+08	
			312.01	-1.598E-01	&(	4.202E+00	7.65E+02	3.60E+01 G
			300.18	-4.926E+00	+	3.228E+01	1.94E+02	6.20E+00 G
PA-234	N	3.4271E-01					1.63E+12	
			131.29	-5.866E-01	?(	5.243E+00	2.62E+02	1.80E+01 G
			946.02	-1.260E+00	+	8.716E+00	2.90E+02	1.34E+01 G
			569.47	0.000E+00	+	1.379E+01	1.00E+03	8.20E+00 G
			883.24	2.085E+00	?(	1.199E+01	1.61E+02	9.60E+00 G
			880.53	5.129E+00	?	1.586E+01	8.98E+01	6.00E+00 GA
PA-234M	N	1.0857E+02					1.63E+12	
			1001.00	1.086E+02	&(	1.084E+02	3.56E+01	8.37E-01 G
			766.41	5.479E+00	%	4.172E+02	2.07E+03	2.94E-01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:44 PMPage 14
TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
AM-241	T -4.2115E-01					1.58E+05	
		59.54	-4.212E-01	?(	4.353E+00	3.05E+02	3.59E+01 G
Np-237	F 2.0098E-01					2.14E+06	
		86.49	2.010E-01	%(	1.034E+01	1.51E+03	1.31E+01 G
Ir-192	F 4.0333E-02					7.40E+01	
		316.49	-3.533E-01	?(	1.452E+00	1.21E+02	8.70E+01 G
		468.06	7.024E-01	?(	1.169E+00	5.26E+01	5.18E+01 G
		308.44	-2.937E-07	%	5.994E+00	5.98E+08	3.18E+01 G
Cs-136	F 3.9875E-01					1.30E+01	
		818.50	3.988E-01	?(	1.402E+00	1.03E+02	1.00E+02 G
		1048.07	-2.021E-01	-	1.359E+00	1.84E+02	8.00E+01 G
		340.57	0.000E+00	-	2.665E+00	1.00E+03	4.69E+01 G
Np-239	T -1.0607E+00					2.36E+00	
		103.70	0.000E+00	+	4.548E+00	1.00E+03	2.40E+01 X
		106.13	-1.061E+00	&(	4.947E+00	1.39E+02	2.27E+01 G
		99.50	0.000E+00	&	7.322E+00	1.00E+03	1.50E+01 X
Nd-147	1.4209E+00					1.11E+01	
		531.00	1.421E+00	?(	5.545E+00	1.54E+02	1.30E+01 G
		91.10	0.000E+00	-	4.367E+00	1.00E+03	2.83E+01 G
TL-210	N 2.2600E-01					5.84E+05	
		799.60	2.260E-01	?(	1.554E+00	1.96E+02	9.90E+01 G
		296.00	-3.811E-01	+	2.656E+00	2.07E+02	7.90E+01 G
		1313.00	-1.140E-01	%	6.293E+00	2.37E+03	2.10E+01 GA
Kr-85	I 8.5688E+01					3.92E+03	
		513.98	8.569E+01	?(	3.801E+02	1.30E+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

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TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

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	168.	-6.	-0.003	300.11	-1.952E+00	
AM-241	59.54	270.	-8.	-0.004	305.06	-4.212E-01	
BA-133	80.99	322.	-20.	-0.011	127.66	-9.506E-01	
Sn-126	86.94	263.	16.	0.009	147.06	2.729E+00	
Gd-153	97.50	215.	13.	0.007	157.80	6.705E-01	
EU-155	105.31	225.	-4.	-0.002	492.25	-3.048E-01	
Np-239	106.13	243.	-16.	-0.009	138.69	-1.061E+00	
EU-154	123.10	84.	-12.	-0.007	113.22	-4.332E-01	
PA-234	131.29	165.	-7.	-0.004	262.25	-5.866E-01	
HF-181	133.02	212.	13.	0.007	165.29	4.416E-01	
CE-144	133.54	240.	14.	0.008	160.27	1.891E+00	
HF-181	136.30	253.	14.	0.008	164.23	3.613E+00	
CO-57	136.47	267.	4.	0.002	643.60	5.136E-01	
U-235	143.79	275.	-4.	-0.002	560.17	-6.120E-01	P
CE-141	145.44	240.	13.	0.007	167.77	4.253E-01	
Ba-140	162.66	121.	-11.	-0.006	148.82	-2.774E+00	
U-235	163.38	68.	12.	0.006	104.08	3.724E+00	
U-235	185.72	71.	12.	0.007	127.86	3.867E-01	P
TH-229	193.51	55.	13.	0.007	106.62	5.412E+00	
U-235	205.33	51.	3.	0.001	506.37	9.760E-01	
TH-227	235.97	281.	-14.	-0.008	165.77	-2.368E+00	
TH-227	256.24	51.	-6.	-0.004	215.34	-1.927E+00	
Cd-113m	263.70	58.	-14.	-0.008	78.96	-5.222E+03	
BI-210M	265.83	59.	11.	0.006	101.98	4.892E-01	
Hg-203	279.20	75.	10.	0.005	131.43	2.670E-01	
I-131	284.30	55.	-11.	-0.006	129.68	-4.119E+00	
TL-210	296.00	339.	-13.	-0.007	206.94	-3.811E-01	
PA-231	300.07	314.	-13.	-0.007	198.47	-1.241E+01	
PA-233	300.18	301.	-13.	-0.007	194.43	-4.926E+00	
PA-231	302.65	288.	-13.	-0.007	189.94	-1.070E+01	
BA-133	302.85	276.	-13.	-0.007	185.73	-1.682E+00	

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TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Ba-140	304.85	263.	-3.	-0.002	821.27	-1.581E+00	
PA-233	312.01	158.	-2.	-0.001	765.45	-1.598E-01	
Ir-192	316.49	106.	-12.	-0.007	121.40	-3.533E-01	
La-140	328.76	72.	3.	0.002	363.32	4.213E-01	
Cf-249	333.44	94.	-14.	-0.008	99.78	-2.388E+00	
BA-133	356.00	159.	-8.	-0.004	225.69	-3.516E-01	
I-131	364.48	32.	-3.	-0.002	373.67	-1.020E-01	
BA-133	383.84	56.	4.	0.002	269.26	1.293E+00	
SB-125	427.88	24.	-8.	-0.004	125.00	-8.484E-01	
AG-108M	433.94	36.	-13.	-0.007	95.19	-4.526E-01	
PM-146	453.88	20.	-3.	-0.002	297.52	-1.515E-01	
SB-125	463.37	0.	11.	0.006	30.46	3.433E+00	
Ir-192	468.06	11.	11.	0.006	52.60	7.024E-01	
BE-7	477.60	31.	8.	0.004	108.37	2.499E+00	
HF-181	482.00	92.	-13.	-0.007	104.77	-5.715E-01	
La-140	487.02	57.	8.	0.004	138.15	6.102E-01	
RH-106	511.86	53.	49.	0.027	25.61	8.746E+00	
Kr-85	513.98	84.	10.	0.006	130.39	8.569E+01	
Nd-147	531.00	13.	5.	0.003	153.84	1.421E+00	
Ba-140	537.26	17.	-3.	-0.002	260.77	-5.093E-01	
CS-134	563.24	26.	-8.	-0.004	134.82	-3.698E+00	
CS-134	569.32	30.	-2.	-0.001	393.70	-5.059E-01	
BI-207	569.70	21.	9.	0.005	76.26	3.717E-01	
SB-125	600.50	218.	-12.	-0.007	177.75	-2.696E+00	
PM-144	618.06	163.	10.	0.005	186.52	4.099E-01	
RH-106	621.92	216.	-12.	-0.007	174.70	-5.047E+00	
SB-125	635.89	0.	6.	0.003	40.52	2.273E+00	
AG-110M	657.76	22.	9.	0.005	82.31	3.994E-01	
CS-137	661.66	37.	-5.	-0.003	186.64	-2.416E-01	
PM-144	696.54	28.	-7.	-0.004	164.75	-3.188E-01	
NB-94	702.63	33.	-11.	-0.006	117.72	-4.944E-01	
SB-124	722.79	15.	7.	0.004	81.57	3.185E+00	
AG-108M	722.94	22.	7.	0.004	96.65	3.792E-01	
EU-154	723.36	30.	2.	0.001	318.29	5.649E-01	
BI-212	727.17	40.	-7.	-0.004	127.92	-4.519E+00	
PM-146	735.72	9.	7.	0.004	93.89	1.562E+00	
PM-146	747.16	5.	13.	0.007	43.95	1.861E+00	
AG-110M	763.94	18.	4.	0.002	139.66	9.738E-01	
NB-95	765.79	16.	6.	0.004	96.69	3.146E-01	
BI-212	785.42	14.	1.	0.001	800.00	3.843E+00	
CS-134	795.87	27.	10.	0.005	83.79	5.522E-01	
TL-210	799.60	37.	4.	0.002	196.15	2.260E-01	
CS-134	801.95	23.	6.	0.003	129.80	3.167E+00	
CO-58	810.78	38.	-9.	-0.005	102.44	-4.554E-01	
Cs-136	818.50	29.	8.	0.004	102.62	3.988E-01	
MN-54	834.85	9.	1.	0.000	979.80	3.427E-02	
Co-56	846.77	30.	-12.	-0.007	104.42	-6.236E-01	
NB-94	871.10	12.	4.	0.002	132.29	2.122E-01	

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TestAmerica Inc Spectrum name: 12_Gamma_20193352.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
EU-154	873.23	24.	-6.	-0.004	112.53	-2.813E+00	
PA-234	880.53	10.	6.	0.003	89.80	5.129E+00	
PA-234	883.24	16.	4.	0.002	161.05	2.085E+00	
Y-88	898.04	15.	1.	0.001	857.32	5.783E-02	
AG-110M	937.49	5.	1.	0.001	501.66	1.627E-01	
PA-234	946.02	15.	-3.	-0.002	289.64	-1.260E+00	
EU-154	996.33	0.	8.	0.004	36.51	4.134E+00	
Cs-136	1048.07	11.	-3.	-0.001	183.71	-2.021E-01	
Ga-68	1077.40	11.	7.	0.004	107.76	1.607E+01	
FE-59	1099.25	16.	-5.	-0.003	187.26	-5.558E-01	
Co-56	1238.28	6.	7.	0.004	89.88	7.131E-01	
NA-22	1274.53	11.	-4.	-0.002	119.91	-3.044E-01	
FE-59	1291.60	11.	2.	0.001	480.00	2.736E-01	
La-140	1596.21	6.	2.	0.001	304.14	1.760E-01	
SB-124	1690.98	13.	-11.	-0.006	88.33	-1.968E+00	
Y-88	1836.06	13.	-8.	-0.005	116.96	-7.956E-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	2.4988E+00	2.4988E+00	1.084E+02%	9.29E+00
NA-22	#A	-3.0438E-01	-3.0438E-01	1.199E+02%	1.29E+00
K-40	#	5.0514E+01	5.0514E+01	1.478E+01%	1.03E+01
Sc-46	#A	8.9683E-03	8.9684E-03	3.787E+03%	1.26E+00
CR-51		4.6371E+00	4.6371E+00	3.691E+01%	4.16E+00
MN-54	#A	3.4275E-02	3.4275E-02	9.798E+02%	8.71E-01
FE-59	#A	-1.9642E-01	-1.9642E-01	1.873E+02%	2.37E+00
Co-56	#A	-9.1581E-02	-9.1582E-02	6.889E+01%	1.47E+00
CO-57	#A	7.1466E-02	7.1466E-02	6.436E+02%	7.83E-01
CO-58	#A	-4.5541E-01	-4.5541E-01	1.024E+02%	1.59E+00
CO-60	#	9.6055E-01	9.6055E-01	1.935E+01%	5.36E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.67E+00
NB-94	#A	-4.9442E-01	-4.9442E-01	1.177E+02%	1.36E+00
ZR-95	#	1.2602E+00	1.2602E+00	4.147E+01%	1.12E+00
NB-95	#A	3.1458E-01	3.1458E-01	9.669E+01%	1.05E+00
RU-103	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.26E-01
RH-106	#A	-5.0469E+00	-5.0469E+00	1.747E+02%	2.98E+01
AG-108M	#A	-4.5255E-01	-4.5255E-01	9.519E+01%	1.08E+00
AG-110M	#A	2.7863E-01	2.7863E-01	8.231E+01%	1.68E+00
SN-113	#A	-4.5847E-02	-4.5847E-02	1.100E+03%	1.78E+00
SB-124	#A	3.8008E-01	3.8009E-01	8.157E+01%	2.73E+00
SB-125	#A	7.1106E-01	7.1106E-01	3.046E+01%	2.71E+00
I-131	#A	-1.0196E-01	-1.0196E-01	3.737E+02%	9.88E-01
Gd-153	#A	6.7047E-01	6.7047E-01	1.578E+02%	3.57E+00

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:26:44 PMPage 18
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Ga-68	#A	1.5969E+01	1.6067E+01	1.078E+02%	3.93E+01
Tc-99m	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.41E+00
BA-133	#A	-3.5159E-01	-3.5159E-01	2.257E+02%	2.70E+00
CS-134	#A	7.9337E-01	7.9337E-01	7.725E+01%	1.56E+00
CS-137	#A	-2.4156E-01	-2.4156E-01	1.866E+02%	1.58E+00
CE-139	#A	2.5818E-01	2.5818E-01	1.027E+02%	8.96E-01
Ba-140	#A	-5.0931E-01	-5.0932E-01	2.608E+02%	3.38E+00
La-140	#A	3.2948E-01	3.2949E-01	1.382E+02%	1.24E+00
CE-141	#A	4.2525E-01	4.2525E-01	1.678E+02%	2.41E+00
CE-144	#A	1.8914E+00	1.8914E+00	1.603E+02%	1.02E+01
PM-144	#A	4.5732E-02	4.5732E-02	1.244E+02%	1.25E+00
EU-152	#C	2.6309E+00	2.6309E+00	2.510E+01%	2.18E+00
EU-154	#A	5.2476E-01	5.2476E-01	3.651E+01%	1.66E+00
EU-155	#A	-3.0477E-01	-3.0477E-01	4.922E+02%	5.11E+00
HF-181	#A	-2.8795E-01	-2.8795E-01	9.740E+01%	2.02E+00
Ta-182	#A	1.6867E+00	1.6867E+00	7.427E+01%	4.95E+00
Hg-203	#A	2.6697E-01	2.6697E-01	1.314E+02%	1.20E+00
TL-208		2.8894E+00	2.8894E+00	1.659E+01%	7.57E-01
PM-146	#A	7.2893E-01	7.2893E-01	4.395E+01%	1.19E+00
Y-88	#A	-7.9557E-01	-7.9557E-01	1.170E+02%	1.88E+00
Cd-113m	#A	-5.2225E+03	-5.2225E+03	7.896E+01%	1.38E+04
Cd-109	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.30E+01
Cf-251	#A	4.9476E-01	4.9476E-01	2.811E+02%	3.69E+00
Cf-249	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.71E+00
Sn-126	#A	-4.1156E-01	-4.1156E-01	1.024E+03%	1.44E+01
PB-210	#A	2.2292E+01	2.2292E+01	4.426E+01%	2.77E+01
PB-212		3.8027E+00	3.8027E+00	1.519E+01%	1.41E+00
PB-214		8.4512E+00	8.4512E+00	1.036E+01%	1.85E+00
BI-207	#A	1.8719E-01	1.8719E-01	7.626E+01%	1.48E+00
BI-212	#A	-4.5187E+00	-4.5187E+00	1.279E+02%	1.99E+01
U-235	#A	8.1241E-01	8.1241E-01	1.041E+02%	1.13E+01
BI-214		9.2878E+00	9.2878E+00	1.043E+01%	9.95E-01
BI-210M	#A	4.8921E-01	4.8921E-01	1.020E+02%	1.69E+00
AC-228	#	4.9088E+00	4.9088E+00	3.316E+01%	3.29E+00
TH-227	#A	-1.9274E+00	-1.9274E+00	2.153E+02%	1.10E+01
TH-229	#A	5.4120E+00	5.4120E+00	1.066E+02%	1.50E+01
TH-234	A	5.8225E+00	5.8225E+00	3.154E+01%	2.27E+01
PA-231	#A	-1.0695E+01	-1.0695E+01	1.899E+02%	6.85E+01
PA-233	#A	-1.5982E-01	-1.5982E-01	7.655E+02%	4.20E+00
PA-234	#A	3.4271E-01	3.4271E-01	1.539E+02%	5.24E+00
PA-234M	#	1.0857E+02	1.0857E+02	3.563E+01%	1.08E+02
AM-241	#A	-4.2115E-01	-4.2115E-01	3.051E+02%	4.35E+00
Np-237	#A	2.0098E-01	2.0098E-01	1.514E+03%	1.03E+01
Ir-192	#A	4.0333E-02	4.0333E-02	5.260E+01%	1.45E+00
Cs-136	#A	3.9874E-01	3.9875E-01	1.026E+02%	1.40E+00
Np-239	#A	-1.0606E+00	-1.0607E+00	1.387E+02%	4.95E+00
Nd-147	#A	1.4208E+00	1.4209E+00	1.538E+02%	5.54E+00
TL-210	#A	2.2600E-01	2.2600E-01	1.961E+02%	1.55E+00
Kr-85	#A	8.5688E+01	8.5688E+01	1.304E+02%	3.80E+02

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 11:26:44 PMPage 19
TestAmerica Inc                 Spectrum name: 12_Gamma_20193352.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 (   25.1 to  1999.1 keV)     1.068E+02  Bq/Sample
Total Decayed Activity (   25.1 to  1999.1 keV) 1.0678286E+02  Bq/Sample
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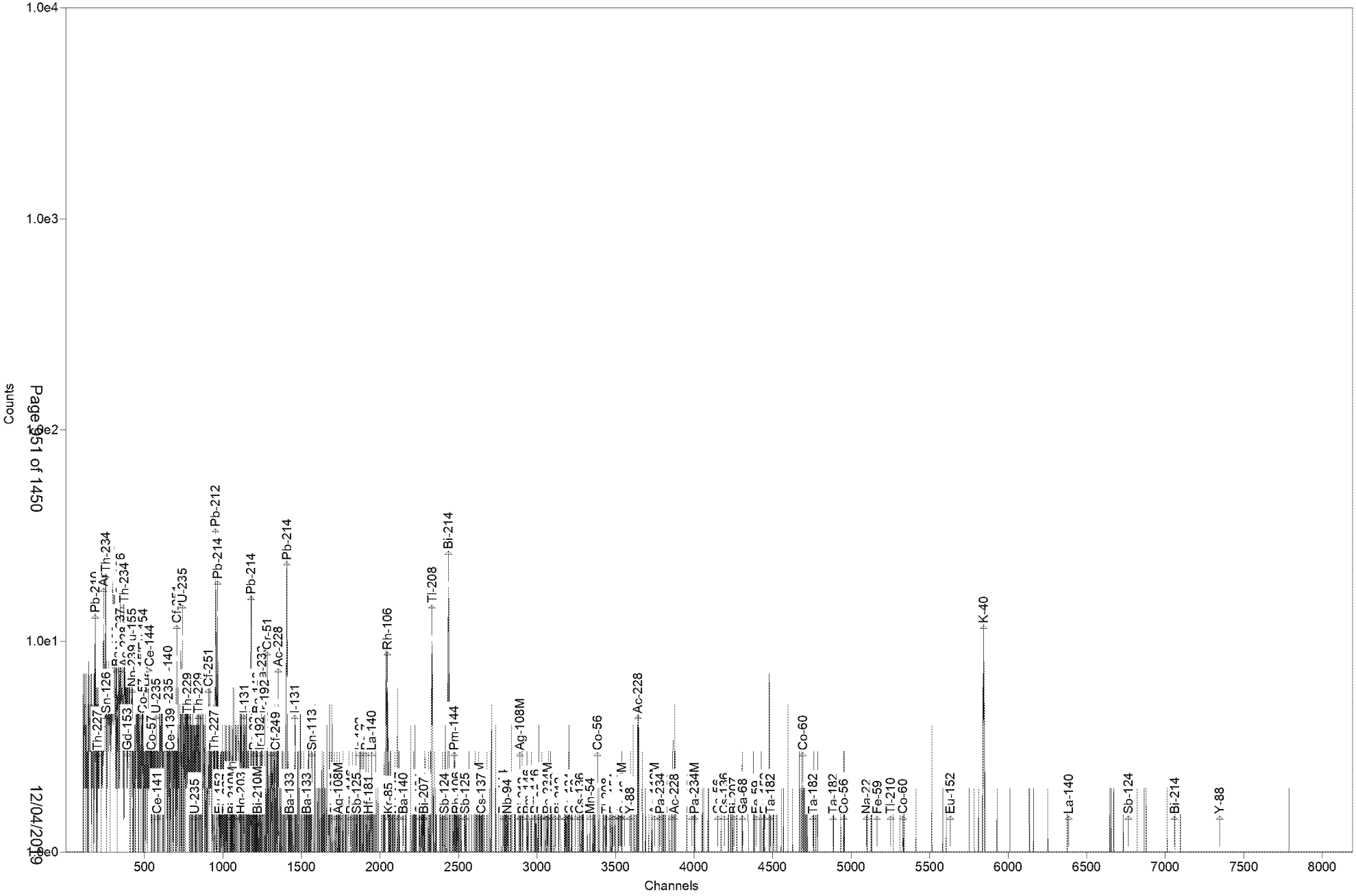
448571_Gamma_160-36160-A-13-C. 12_Gamma_20193352.spc.



Test America St. Louis Spectrum ID: 5_Gamma_20193043

Sample Description: 448571_Gamma_160-36160-A-14-C
Detector: Detector # 5
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-14-C

Decay to Time: 11/23/2019 22:56 Live Time: 1800 sec
Acquisition Time: 11/23/2019 22:56:59 Real Time: 1807 sec
Analysis Time: 11/23/2019 23:27 Dead Time: 0.36 %
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_2019-11-10_1418.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	2.089E+00	115.5	2.414E+00	2.416E+00	8.437E+00
NA-22	0.000E+00	1.#INF	9.710E-02	9.710E-02	7.156E-01
K-40	6.293E+01	16.0	1.008E+01	1.058E+01	1.728E+01
Sc-46	-1.270E-02	77.3	9.817E-03	9.839E-03	2.231E+00
CR-51	-3.572E+00	21.7	7.768E-01	7.999E-01	1.166E+01
MN-54	2.041E-01	270.8	5.526E-01	5.527E-01	1.370E+00
FE-59	1.876E-01	49.8	9.352E-02	9.399E-02	2.663E+00
Co-56	0.000E+00	1.#INF	9.740E-02	9.740E-02	1.387E+00
CO-57	1.381E-01	157.6	2.177E-01	2.178E-01	7.473E-01
CO-58	3.454E-01	95.6	3.303E-01	3.308E-01	1.148E+00
CO-60	5.121E-01	75.7	3.874E-01	3.883E-01	1.358E+00
ZN-65	0.000E+00	1.#INF	3.429E-01	3.429E-01	4.459E+00
NB-94	-8.279E-01	91.4	7.563E-01	7.575E-01	1.813E+00
ZR-95	-7.668E-02	909.7	6.975E-01	6.975E-01	1.890E+00
NB-95	6.974E-01	84.5	5.891E-01	5.902E-01	1.985E+00
RU-103	1.371E-01	152.5	2.091E-01	2.093E-01	5.930E-01
RH-106	-3.033E+00	172.9	5.243E+00	5.245E+00	1.306E+01
AG-108M	-4.442E-01	80.3	3.567E-01	3.574E-01	1.195E+00
AG-110M	5.285E-01	128.2	6.773E-01	6.779E-01	2.368E+00
SN-113	2.824E-02	1940.8	5.480E-01	5.480E-01	1.954E+00
SB-124	2.869E-01	40.7	1.168E-01	1.178E-01	3.296E+00
SB-125	2.106E+00	35.0	7.376E-01	7.454E-01	3.095E+00
I-131	2.506E-01	156.8	3.930E-01	3.932E-01	9.585E-01
Gd-153	5.217E-01	103.2	5.382E-01	5.391E-01	1.829E+00
Ga-68	1.762E+01	93.2	1.642E+01	1.645E+01	3.934E+01
Tc-99m	1.821E-01	127.8	2.326E-01	2.329E-01	7.929E-01
BA-133	-7.639E-01	135.0	1.031E+00	1.032E+00	3.478E+00
CS-134	-8.008E-01	66.1	5.290E-01	5.306E-01	2.207E+00
CS-137	-1.095E+00	28.9	3.160E-01	3.211E-01	2.577E+00
CE-139	-1.258E-01	269.4	3.388E-01	3.390E-01	1.163E+00
Ba-140	-1.777E+00	47.7	8.474E-01	8.524E-01	4.945E+00
La-140	4.136E-01	104.9	4.339E-01	4.344E-01	1.707E+00
CE-141	-3.819E-01	134.6	5.140E-01	5.143E-01	1.744E+00

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CE-144	0.000E+00	1.#INF	2.873E-01	2.873E-01	7.723E+00
PM-144	-8.264E-01	94.9	7.842E-01	7.854E-01	1.878E+00
EU-152	1.619E+00	76.4	1.237E+00	1.240E+00	2.072E+00
EU-154	4.354E-01	87.2	3.797E-01	3.804E-01	1.706E+00
EU-155	7.668E-01	168.5	1.292E+00	1.293E+00	4.381E+00
HF-181	3.171E-01	113.9	3.611E-01	3.615E-01	1.255E+00
Ta-182	-2.590E+00	95.0	2.462E+00	2.465E+00	8.343E+00
Hg-203	1.121E-01	268.3	3.008E-01	3.009E-01	1.061E+00
TL-208	1.820E+00	18.1	3.297E-01	3.430E-01	4.392E-01
PM-146	-6.899E-01	75.9	5.237E-01	5.249E-01	1.747E+00
Y-88	2.039E-01	121.8	2.484E-01	2.487E-01	9.809E-01
Cd-113m	-2.168E+03	230.7	5.001E+03	5.003E+03	1.734E+04
Cd-109	0.000E+00	1.#INF	2.872E+00	2.872E+00	3.296E+01
Cf-251	9.155E-01	149.9	1.373E+00	1.375E+00	3.795E+00
Cf-249	3.723E-01	152.5	5.678E-01	5.681E-01	1.959E+00
Sn-126	-5.682E-01	559.6	3.180E+00	3.180E+00	1.098E+01
PB-210	1.288E+01	65.3	8.406E+00	8.440E+00	2.416E+01
PB-212	3.938E-01	233.9	9.210E-01	9.214E-01	3.140E+00
PB-214	7.151E+00	12.1	8.641E-01	9.406E-01	2.240E+00
BI-207	6.177E-01	99.9	6.171E-01	6.179E-01	1.506E+00
BI-212	5.605E+00	101.9	5.711E+00	5.718E+00	1.965E+01
U-235	1.996E+00	106.6	2.127E+00	2.130E+00	6.879E+00
BI-214	8.818E+00	13.7	1.211E+00	1.295E+00	1.911E+00
BI-210M	-7.980E-01	97.7	7.798E-01	7.813E-01	2.622E+00
AC-228	2.958E+00	26.2	7.758E-01	7.904E-01	6.469E+00
TH-227	2.332E+00	118.9	2.773E+00	2.776E+00	9.553E+00
TH-229	-3.823E+00	145.9	5.577E+00	5.585E+00	1.822E+01
TH-234	-9.473E+00	44.2	4.189E+00	4.222E+00	2.313E+01
PA-231	0.000E+00	1.#INF	3.203E+00	3.203E+00	6.245E+01
PA-233	-9.590E-01	164.1	1.574E+00	1.574E+00	5.326E+00
PA-234	1.513E+00	112.8	1.707E+00	1.708E+00	4.656E+00
PA-234M	4.198E+01	80.5	3.381E+01	3.388E+01	2.439E+02
AM-241	2.275E-01	383.7	8.731E-01	8.732E-01	2.586E+00
Np-237	0.000E+00	1.#INF	3.139E+00	3.139E+00	1.056E+01
Ir-192	5.686E-02	541.1	3.077E-01	3.077E-01	9.967E-01
Cs-136	-4.036E-01	134.8	5.439E-01	5.444E-01	1.890E+00
Np-239	7.697E-01	155.7	1.198E+00	1.199E+00	4.060E+00
Nd-147	1.792E+00	119.4	2.140E+00	2.142E+00	5.694E+00
TL-210	-2.694E-01	229.9	6.192E-01	6.194E-01	2.172E+00
Kr-85	4.836E+01	268.2	1.297E+02	1.297E+02	4.495E+02
Total	2.332E+02				

Analyst: Shiloh Smith

```
     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 11:27:31 PMPage  1
TestAmerica Inc                 Spectrum name: 5_Gamma_20193043.An1

Sample description
     448571_Gamma_160-36160-A-14-C


Spectrum Filename: C:\User\SPC\Det5\5_Gamma_20193043.An1

Acquisition information
       Start time:                 11/23/2019 10:56:59 PM
       Live time:               1800
       Real time:               1807
       Dead time:                  0.36 %
       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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 2
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

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	11/23/2019 10:56:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	5_2019-11-10_1418.PBC 11/10/2019 2:18:51 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 20 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1727

***** 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
46.91	18.	65.29	1.64	1.788E-02	46.54	4.250	PBC<MDA	PB210
50.14	5.	206.88	0.79	2.012E-02	50.14	8.000	PBC<MDA	TH227
59.54	4.	383.71	0.80	2.533E-02	59.54	35.900	PBC<MDA	AM241
63.29	-3.	521.85	0.80	2.712E-02	63.29	3.810	PBC<MDA	TH234
74.83	58.	21.23	0.81	3.151E-02				
77.16	94.	14.06	0.82	3.220E-02				
80.99	5.	321.46	0.82	3.320E-02	80.99	34.060	PBC<MDA	BA133
86.53	14.	82.49	0.82	3.436E-02	86.49	13.100	PBC<MDA	Np237
					86.54	30.700	7.177E-01	EU155
					86.94	9.040	2.432E+00	Sn126
86.93	6.	209.68	0.83	3.443E-02	86.54	30.700	PBC<MDA	EU155
					86.94	9.040	9.943E-01	Sn126
92.81	15.	149.68	0.83	3.536E-02	92.59	5.584	PBC<MDA	TH234
					93.35	5.561	4.326E+00	AC228
97.50	10.	103.17	0.84	3.577E-02	97.50	30.000	PBC<MDA	Gd153
105.31	11.	168.52	0.84	3.618E-02	105.31	21.200	PBC<MDA	EU155
106.13	11.	155.70	0.84	3.620E-02	106.13	22.700	PBC<MDA	Np239
121.78	10.	108.35	0.86	3.584E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.880E-01	CO57
122.06	8.	157.59	0.86	3.582E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.381E-01	CO57
131.29	4.	400.90	0.87	3.509E-02	131.29	18.000	PBC<MDA	PA234

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 3
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
140.51	10.	127.78	0.88	3.411E-02	140.51	89.300	PBC<MDA	Tc99m
143.79	6.	232.10	0.88	3.371E-02	143.79	10.960	PBC<MDA	U235
176.60	8.	149.93	0.92	2.975E-02	176.60	17.000	PBC<MDA	Cf251
185.72	42.	28.99	0.93	2.854E-02	185.72	54.000	1.513E+00	U235
205.33	11.	106.56	0.94	2.626E-02	205.33	5.010	PBC<MDA	U235
227.00	9.	120.00	0.97	2.417E-02	227.00	6.300	PBC<MDA	Cf251
238.62	97.	13.71	0.78	2.319E-02	238.63	43.300	5.348E+00	PB212
242.00	12.	133.15	0.98	2.293E-02	242.00	7.430	PBC<MDA	PB214
244.69	11.	139.66	0.98	2.272E-02	244.69	7.580	PBC<MDA	EU152
256.24	8.	118.89	1.00	2.186E-02	256.24	7.000	PBC<MDA	TH227
277.28	9.	97.14	1.02	2.048E-02	277.28	6.310	PBC<MDA	TL208
279.20	3.	268.31	1.02	2.036E-02	279.20	81.460	PBC<MDA	Hg203
284.30	7.	156.84	1.02	2.006E-02	284.30	6.140	PBC<MDA	I131
295.26	52.	18.04	0.98	1.944E-02	295.09	19.300	7.696E+00	PB214
					296.00	79.000	1.885E+00	TL210
316.49	1.	793.73	1.05	1.835E-02	316.49	87.040	PBC<MDA	Ir192
338.00	30.	26.23	1.06	1.736E-02	338.32	12.010	8.088E+00	AC228
351.80	78.	16.08	0.92	1.681E-02	351.93	37.600	6.871E+00	PB214
364.48	1.	783.79	1.10	1.632E-02	364.48	81.700	PBC<MDA	I131
387.95	7.	152.52	1.12	1.549E-02	387.95	66.000	PBC<MDA	Cf249
427.88	1.	881.29	1.16	1.428E-02	427.88	29.600	PBC<MDA	SB125
463.37	7.	95.63	1.19	1.336E-02	463.37	10.470	PBC<MDA	SB125
468.06	1.	735.64	1.20	1.325E-02	468.06	51.750	PBC<MDA	Ir192
477.60	5.	115.52	1.20	1.303E-02	477.60	10.520	PBC<MDA	BE7
482.00	6.	113.90	1.21	1.293E-02	482.00	80.500	PBC<MDA	HF181
487.02	7.	104.90	1.21	1.282E-02	487.02	45.500	PBC<MDA	La140
497.05	3.	152.54	1.22	1.260E-02	497.05	90.900	PBC<MDA	RU103
511.86	53.	13.75	2.48	1.230E-02	511.86	20.000	1.195E+01	RH106
513.98	5.	268.25	1.24	1.226E-02	513.98	0.430	PBC<MDA	Kr85
531.00	5.	119.44	1.25	1.193E-02	531.00	13.000	PBC<MDA	Nd147
569.32	6.	100.41	1.29	1.125E-02	569.32	15.380	PBC<MDA	CS134
					569.47	8.200	3.312E+00	PA234
					569.70	97.740	2.780E-01	BI207
582.86	31.	18.11	1.46	1.103E-02	583.02	84.500	1.840E+00	TL208
609.19	78.	13.74	1.59	1.063E-02	609.31	46.090	8.818E+00	BI214
635.89	14.	35.03	1.34	1.026E-02	635.89	11.310	6.712E+00	SB125
722.79	6.	40.71	1.42	9.217E-03	722.79	10.810	PBC<MDA	SB124
					722.94	90.840	4.005E-01	AG108M
					723.36	20.220	1.800E+00	EU154
722.94	6.	70.51	1.42	9.215E-03	722.79	10.810	3.365E+00	SB124
					722.94	90.840	4.005E-01	AG108M
					723.36	20.220	1.800E+00	EU154
727.17	7.	101.89	1.42	9.170E-03	727.17	7.550	PBC<MDA	BI212
735.72	4.	156.36	1.43	9.081E-03	735.72	22.500	PBC<MDA	PM146
765.79	11.	84.47	1.45	8.781E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M
766.41	9.	80.54	1.45	8.776E-03	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	PBC<MDA	PA234M

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 4
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
810.78	5.	95.64	1.49	8.371E-03	810.78	99.460	PBC<MDA	CO58
815.77	5.	113.78	1.49	8.328E-03	815.77	23.280	PBC<MDA	La140
834.85	3.	270.80	1.51	8.168E-03	834.85	99.980	PBC<MDA	MN54
860.55	3.	270.80	1.53	7.963E-03	860.56	12.420	PBC<MDA	TL208
880.53	5.	95.05	1.54	7.812E-03	880.53	6.000	PBC<MDA	PA234
883.24	5.	112.81	1.55	7.791E-03	883.24	9.600	PBC<MDA	PA234
884.68	5.	128.17	1.55	7.781E-03	884.68	72.680	PBC<MDA	AG110M
898.04	6.	121.84	1.56	7.684E-03	898.04	93.700	PBC<MDA	Y88
911.29	3.	373.44	1.57	7.591E-03	911.07	29.000	PBC<MDA	AC228
946.02	2.	207.02	1.60	7.355E-03	946.02	13.400	PBC<MDA	PA234
964.11	5.	145.91	1.61	7.239E-03	964.11	14.605	PBC<MDA	EU152
968.10	7.	99.00	1.61	7.209E-03	968.97	17.460	PBC<MDA	AC228
1001.00	-1.	864.53	1.64	7.014E-03	1001.00	0.837	PBC<MDA	PA234M
1004.77	6.	101.89	1.64	6.992E-03	1004.77	18.010	PBC<MDA	EU154
1063.66	6.	99.89	1.68	6.666E-03	1063.66	74.500	PBC<MDA	BI207
1077.40	6.	93.21	1.69	6.594E-03	1077.40	3.300	PBC<MDA	Ga68
1120.33	8.	94.78	1.72	6.381E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	PBC<MDA	Sc46
					1121.30	34.900	PBC<MDA	Ta182
1120.55	6.	99.07	1.72	6.380E-03	1120.29	15.100	PBC<MDA	BI214
					1120.55	99.987	5.215E-01	Sc46
					1121.30	34.900	1.495E+00	Ta182
1173.24	6.	89.98	1.76	6.138E-03	1173.24	99.900	PBC<MDA	CO60
1189.03	2.	354.73	1.77	6.069E-03	1189.05	16.200	PBC<MDA	Ta182
1220.55	5.	44.72	1.79	5.934E-03	1221.41	27.000	PBC<MDA	Ta182
1291.60	5.	49.85	1.84	5.661E-03	1291.60	43.200	PBC<MDA	FE59
1313.00	8.	35.36	1.85	5.583E-03	1313.00	21.000	3.791E+00	TL210
1332.50	5.	121.64	1.87	5.514E-03	1332.50	99.980	PBC<MDA	CO60
1460.63	62.	16.01	1.95	5.103E-03	1460.83	10.670	6.293E+01	K40
1690.98	5.	44.72	2.08	4.511E-03	1690.98	47.790	PBC<MDA	SB124
1764.95	19.	25.22	2.11	4.351E-03	1764.49	15.400	1.579E+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	
298.93	74.81	47.	58.	1.846E+03	21.23	0.813	-	sD
308.26	77.15	41.	94.	2.933E+03	14.06	0.815	-	sD

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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 5
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

********** 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	187.17	46.91	42.	18.	0.010	65.29	1.643s
TH-227	200.11	50.14	36.	5.	0.003	206.88	0.787s
AM-241	237.72	59.54	72.	4.	0.002	383.71	0.797s
TH-234	252.74	63.29	99.	-3.	-0.001	521.85	0.801s
Sn-126	256.71	64.28	116.	-3.	-0.002	559.56	0.802s
BA-133	323.61	80.99	80.	5.	0.003	321.46	0.819s
Np-237	345.63	86.49	316.	0.	0.000	170.50	0.825A
EU-155	345.84	86.54	301.	14.	0.008	82.49	0.825D
Sn-126	347.43	86.94	254.	6.	0.003	209.68	0.825D
Cd-109	351.83	88.04	260.	0.	0.000	1000.00	0.826s
Nd-147	364.08	91.10	260.	0.	0.000	1000.00	0.829s
TH-234	370.05	92.59	290.	-34.	-0.019	44.22	0.831s
AC-228	373.09	93.35	255.	15.	0.009	149.68	0.832s
Gd-153	389.70	97.50	49.	10.	0.006	103.17	0.836s
Np-239	397.71	99.50	99.	-13.	-0.007	114.06	0.838s
Gd-153	412.52	103.20	138.	-14.	-0.008	124.04	0.842s
Np-239	414.52	103.70	119.	-11.	-0.006	138.96	0.842s
EU-155	420.98	105.31	154.	11.	0.006	168.52	0.844s
Np-239	424.25	106.13	151.	11.	0.006	155.70	0.845s
EU-152	486.90	121.78	58.	10.	0.006	108.35	0.861s
CO-57	488.03	122.06	68.	8.	0.004	157.59	0.861s
EU-154	492.18	123.10	82.	-13.	-0.007	141.58	0.862s
PA-234	524.99	131.29	116.	4.	0.002	400.90	0.871s
HF-181	531.91	133.02	120.	0.	0.000	1000.00	0.872s
CE-144	533.97	133.54	120.	0.	0.000	1000.00	0.873s
HF-181	545.02	136.30	120.	0.	0.000	1000.00	0.876s
CO-57	545.72	136.47	120.	0.	0.000	1000.00	0.876s
Tc-99m	561.88	140.51	72.	10.	0.005	127.78	0.880s
U-235	574.99	143.79	85.	6.	0.003	232.10	0.883s
CE-141	581.61	145.44	106.	-11.	-0.006	134.59	0.885s
Ba-140	650.54	162.66	114.	-7.	-0.004	219.00	0.902s
U-235	653.42	163.38	122.	-1.	-0.001	958.42	0.903s
CE-139	663.32	165.85	114.	-6.	-0.003	269.37	0.905s
Cf-251	706.34	176.60	47.	8.	0.005	149.93	0.916s
U-235	742.85	185.72	37.	42.	0.023	28.99	0.925s
TH-229	774.03	193.51	63.	-8.	-0.005	145.88	0.933s
U-235	821.35	205.33	37.	11.	0.006	106.56	0.945s
TH-229	843.44	210.85	67.	-10.	-0.006	110.76	0.950s
Cf-251	908.08	227.00	37.	9.	0.005	120.00	0.966
TH-227	943.98	235.97	249.	-10.	-0.005	230.21	0.975
PB-212	954.64	238.63	135.	7.	0.004	233.90	0.978
PB-214	968.10	242.00	118.	12.	0.007	133.15	0.981s
EU-152	978.89	244.69	109.	11.	0.006	139.66	0.984s
TH-227	1025.11	256.24	26.	8.	0.005	118.89	0.995s

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TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cd-113m	1054.97	263.70	64.	-5.	-0.003	230.65	1.002s
BI-210M	1063.50	265.83	103.	-15.	-0.008	97.72	1.005s
TL-208	1109.33	277.28	31.	9.	0.005	97.14	1.016
Hg-203	1117.00	279.20	39.	3.	0.002	268.31	1.017s
I-131	1137.41	284.30	29.	7.	0.004	156.84	1.022s
PB-214	1181.30	295.26	9.	52.	0.029	18.04	0.982
TL-210	1184.24	296.00	190.	-11.	-0.006	183.03	1.034s
PB-212	1200.37	300.03	178.	-11.	-0.006	20.26	1.038s
PA-231	1200.53	300.07	167.	-7.	-0.004	268.01	1.038s
PA-233	1200.97	300.18	160.	0.	0.000	1000.00	1.038s
PA-231	1210.86	302.65	160.	0.	0.000	1000.00	1.040s
BA-133	1211.66	302.85	160.	0.	0.000	1000.00	1.040s
Ba-140	1219.66	304.85	160.	0.	0.000	1000.00	1.042s
BI-210M	1219.85	304.90	160.	0.	0.000	1000.00	1.042s
Ir-192	1234.03	308.44	160.	0.	0.000	1000.00	1.046s
PA-233	1248.32	312.01	174.	-12.	-0.006	164.10	1.049s
Ir-192	1266.25	316.49	31.	1.	0.001	793.73	1.053s
CR-51	1280.63	320.08	57.	-12.	-0.006	21.75	1.057s
La-140	1315.35	328.76	29.	-1.	-0.001	764.85	1.065s
Cf-249	1334.08	333.44	29.	-6.	-0.004	164.85	1.070s
AC-228	1352.31	338.00	9.	30.	0.017	26.23	1.065
Cs-136	1362.62	340.57	122.	-12.	-0.007	135.17	1.077s
EU-152	1377.49	344.29	91.	-11.	-0.006	123.16	1.080s
HF-181	1383.66	345.83	99.	-12.	-0.007	121.83	1.082s
PB-214	1407.54	351.80	24.	78.	0.043	16.08	0.923s
BA-133	1424.36	356.00	177.	-14.	-0.008	135.03	1.091s
I-131	1458.32	364.48	19.	1.	0.001	783.79	1.099s
BA-133	1535.78	383.84	57.	-10.	-0.005	116.75	1.117s
Cf-249	1552.22	387.95	51.	7.	0.004	152.52	1.121s
SB-125	1711.99	427.88	20.	1.	0.001	881.29	1.158s
AG-108M	1736.25	433.94	28.	-10.	-0.006	80.30	1.164s
PM-146	1816.05	453.88	29.	-11.	-0.006	75.91	1.182s
SB-125	1854.01	463.37	18.	7.	0.004	95.63	1.191s
Ir-192	1872.79	468.06	36.	1.	0.001	735.64	1.195s
BE-7	1910.94	477.59	15.	5.	0.003	115.52	1.204s
HF-181	1928.56	482.00	20.	6.	0.003	113.90	1.208
La-140	1948.65	487.02	12.	7.	0.004	104.90	1.212s
RU-103	1988.80	497.05	4.	3.	0.002	152.54	1.221s
RH-106	2048.06	511.86	0.	53.	0.029	13.75	2.485s
Kr-85	2056.53	513.98	73.	5.	0.003	268.25	1.237s
Nd-147	2124.62	531.00	8.	5.	0.003	119.44	1.252s
Ba-140	2149.67	537.26	24.	-9.	-0.005	47.69	1.258s
CS-134	2253.60	563.24	20.	-4.	-0.002	224.54	1.280s
CS-134	2277.94	569.32	12.	6.	0.003	100.41	1.286s
PA-234	2278.54	569.47	18.	0.	0.000	1000.00	1.286s
BI-207	2279.47	569.70	18.	0.	0.000	1000.00	1.286s
TL-208	2332.10	582.86	0.	31.	0.017	18.11	1.462
SB-125	2402.69	600.50	156.	-9.	-0.005	196.44	1.313s

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TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SB-124	2411.61	602.73	165.	-10.	-0.006	180.32	1.315s
CS-134	2419.53	604.71	155.	-10.	-0.006	174.59	1.317s
BI-214	2437.44	609.19	9.	78.	0.043	13.74	1.587s
AG-108M	2457.82	614.28	143.	0.	0.000	1000.00	1.325s
RH-106	2488.37	621.92	22.	-6.	-0.003	172.86	1.332s
SB-125	2544.26	635.89	5.	14.	0.008	35.03	1.344s
AG-110M	2631.76	657.76	38.	-9.	-0.005	97.59	1.362s
CS-137	2647.36	661.66	61.	-17.	-0.009	28.85	1.366s
PM-144	2786.90	696.54	39.	-14.	-0.008	94.90	1.395s
NB-94	2811.25	702.63	35.	-14.	-0.008	91.35	1.400s
SB-124	2891.88	722.79	0.	6.	0.003	40.71	1.417s
AG-108M	2892.48	722.94	6.	6.	0.003	70.51	1.417s
EU-154	2894.17	723.36	12.	0.	0.000	1000.00	1.418s
ZR-95	2897.53	724.20	31.	-5.	-0.003	177.44	1.418s
BI-212	2909.41	727.17	22.	7.	0.004	101.89	1.421s
PM-146	2943.61	735.72	9.	4.	0.002	156.36	1.428s
PM-146	2989.37	747.16	18.	-2.	-0.001	398.25	1.437s
ZR-95	3027.65	756.73	9.	-1.	0.000	909.67	1.445s
AG-110M	3056.50	763.94	37.	-9.	-0.005	98.20	1.451s
NB-95	3063.89	765.79	38.	11.	0.006	84.47	1.453s
PA-234M	3066.38	766.41	19.	9.	0.005	80.54	1.453s
EU-152	3116.41	778.92	19.	-6.	-0.003	167.10	1.463s
BI-212	3142.41	785.42	14.	-3.	-0.002	270.80	1.468s
CS-134	3184.20	795.87	32.	-10.	-0.006	66.06	1.477s
TL-210	3199.12	799.60	42.	-4.	-0.002	229.85	1.480s
CS-134	3208.53	801.95	59.	-10.	-0.006	69.63	1.482s
CO-58	3243.82	810.78	10.	5.	0.003	95.64	1.489s
La-140	3263.80	815.77	15.	5.	0.003	113.78	1.493s
Cs-136	3274.72	818.50	30.	-6.	-0.003	134.75	1.495s
MN-54	3340.10	834.85	14.	3.	0.002	270.80	1.508s
Co-56	3387.78	846.77	14.	0.	0.000	1000.00	1.518s
TL-208	3442.95	860.56	14.	3.	0.002	270.80	1.529
NB-94	3485.08	871.10	12.	-1.	0.000	974.33	1.537s
EU-154	3493.61	873.23	20.	-6.	-0.003	112.92	1.539s
PA-234	3522.80	880.53	10.	5.	0.003	95.05	1.544s
PA-234	3533.64	883.24	16.	5.	0.003	112.81	1.547s
AG-110M	3539.41	884.68	21.	5.	0.003	128.17	1.547s
Sc-46	3557.79	889.28	37.	-8.	-0.004	118.66	1.551s
Y-88	3592.83	898.04	9.	6.	0.003	121.84	1.558s
AC-228	3644.94	911.07	24.	3.	0.002	373.44	1.568s
AG-110M	3750.60	937.49	14.	-5.	-0.003	164.92	1.589s
PA-234	3784.70	946.02	5.	2.	0.001	207.02	1.595s
EU-152	3857.05	964.11	26.	5.	0.003	145.91	1.609s
AC-228	3876.48	968.97	22.	7.	0.004	99.00	1.612s
EU-154	3985.88	996.33	20.	-3.	-0.002	199.00	1.633s
PA-234M	4004.55	1001.00	25.	-1.	0.000	864.53	1.636s
EU-154	4019.65	1004.77	14.	6.	0.003	101.89	1.639s
Co-56	4151.87	1037.84	15.	-6.	-0.003	147.67	1.664s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cs-136	4192.77	1048.07	18.	-6.	-0.003	108.01	1.671s
BI-207	4255.11	1063.66	5.	6.	0.003	99.89	1.682s
Ga-68	4310.04	1077.40	5.	6.	0.003	93.21	1.692s
FE-59	4397.41	1099.25	10.	-3.	-0.002	176.11	1.708s
EU-152	4448.68	1112.07	30.	-5.	-0.003	176.00	1.717s
ZN-65	4462.56	1115.55	25.	0.	0.000	1000.00	1.720s
BI-214	4481.51	1120.29	26.	8.	0.005	94.78	1.723
Sc-46	4482.57	1120.55	15.	6.	0.003	99.07	1.723s
Ta-182	4485.56	1121.30	43.	-10.	-0.006	95.04	1.724s
CO-60	4693.21	1173.24	5.	6.	0.003	89.98	1.760s
Ta-182	4756.42	1189.05	10.	2.	0.001	354.73	1.771s
Ta-182	4885.79	1221.41	0.	5.	0.003	44.72	1.793s
Co-56	4953.23	1238.28	16.	-3.	-0.002	225.38	1.804s
NA-22	5098.13	1274.53	0.	0.	0.000	1000.00	1.828s
EU-154	5098.17	1274.54	0.	0.	0.000	1000.00	1.828s
FE-59	5166.35	1291.60	0.	5.	0.003	49.85	1.840s
TL-210	5251.91	1313.00	0.	8.	0.004	35.36	1.854s
CO-60	5329.85	1332.50	5.	5.	0.003	121.64	1.866
AG-110M	5536.88	1384.30	0.	0.	0.000	1000.00	1.899s
EU-152	5631.62	1408.00	0.	0.	0.000	1000.00	1.914s
K-40	5842.75	1460.83	9.	62.	0.034	16.01	1.946
SB-124	6762.39	1690.98	0.	5.	0.003	44.72	2.076s
BI-214	7056.06	1764.49	2.	19.	0.011	25.22	2.114s
Co-56	7083.46	1771.35	32.	-7.	-0.004	114.09	2.117s

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	MDA Value Bq/Sample	COMMENTS
BE-7	C	2.0893E+00				5.31E+01	
			477.60	2.089E+00	?(P	8.437E+00 1.16E+02 1.05E+01	G
K-40	N	6.2930E+01				4.66E+11	
			1460.83	6.293E+01	?(P	1.728E+01 1.60E+01 1.07E+01	G
Sc-46	F	-1.2702E-02				8.38E+01	
			889.28	-5.469E-01	?(	2.231E+00 1.19E+02 1.00E+02	G
			1120.55	5.215E-01	?(	1.787E+00 9.91E+01 1.00E+02	G
CR-51	F	-3.5717E+00				2.77E+01	
			320.08	-3.572E+00	?(P	1.166E+01 2.17E+01 9.94E+00	G

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TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
MN-54	C	2.0408E-01					3.12E+02	
			834.85	2.041E-01	?(	1.370E+00	2.71E+02	1.00E+02 G
FE-59	F	1.8761E-01					4.45E+01	
			1099.25	-4.787E-01	?(P	2.663E+00	1.76E+02	5.65E+01 G
			1291.60	1.059E+00	?(P	1.674E+00	4.98E+01	4.32E+01 G
CO-57	C	1.3815E-01					2.72E+02	
			122.06	1.381E-01	&(	7.473E-01	1.58E+02	8.56E+01 G
			136.47	0.000E+00	-	8.090E+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	5.1213E-01					1.93E+03	
			1332.50	4.702E-01	?(	1.358E+00	1.22E+02	1.00E+02 G
			1173.24	5.541E-01	?(	1.190E+00	9.00E+01	9.99E+01 G
NB-94	I	-8.2791E-01					7.41E+06	
			702.63	-8.279E-01	?(	1.813E+00	9.14E+01	9.79E+01 G
			871.10	-5.062E-02	+ P	1.317E+00	9.74E+02	9.99E+01 G
ZR-95	I	-7.6677E-02					6.40E+01	
			756.73	-7.668E-02	?(	1.890E+00	9.10E+02	5.45E+01 G
			724.20	-6.247E-01	+	3.894E+00	1.77E+02	4.42E+01 G
NB-95	I	6.9738E-01					6.40E+01	
			765.79	6.974E-01	?(	1.985E+00	8.45E+01	9.98E+01 G
RU-103	I	1.3710E-01					3.93E+01	
			497.05	1.371E-01	?(P	5.930E-01	1.53E+02	9.09E+01 G
			610.30	-1.278E+00	%	5.342E+01	1.21E+03	5.75E+00 GA
RH-106	I	-3.0332E+00					3.74E+02	
			621.92	-3.033E+00	?(	1.306E+01	1.73E+02	9.93E+00 G
			1050.36	-2.643E+00	%	1.387E+02	1.44E+03	1.56E+00 G
			511.86	1.195E+01	?	1.665E+00	1.37E+01	2.00E+01 GA
AG-108M	C	-4.4417E-01					1.53E+05	
			433.94	-4.442E-01	?(P	1.195E+00	8.03E+01	9.05E+01 G
			722.94	4.005E-01	+	9.395E-01	7.05E+01	9.08E+01 G
			614.28	0.000E+00	+	3.421E+00	1.00E+03	8.98E+01 G
AG-110M	F	5.2846E-01					2.50E+02	
			884.68	5.285E-01	?(	2.368E+00	1.28E+02	7.27E+01 G
			657.76	-5.576E-01	+	1.850E+00	9.76E+01	9.46E+01 G
			937.49	-1.091E+00	+	4.395E+00	1.65E+02	3.44E+01 G

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TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			1384.30	0.000E+00	-	3.157E+00	1.00E+03	2.43E+01 G
			763.94	-2.645E+00	&	8.837E+00	9.82E+01	2.23E+01 G
SN-113	F	2.8238E-02					1.15E+02	
			391.69	2.824E-02	%(	1.954E+00	1.94E+03	6.40E+01 G
SB-124	F	2.8694E-01					6.02E+01	
			602.73	-5.388E-01	?(	3.296E+00	1.80E+02	9.83E+01 G
			1690.98	1.289E+00	?(	1.899E+00	4.47E+01	4.78E+01 G
			722.79	3.365E+00	?(	4.109E+00	4.07E+01	1.08E+01 G
SB-125	I	2.1056E+00					1.01E+03	
			427.88	1.314E-01	?(	3.095E+00	8.81E+02	2.96E+01 G
			600.50	-2.639E+00	&	1.762E+01	1.96E+02	1.79E+01 G
			635.89	6.712E+00	?(P	6.277E+00	3.50E+01	1.13E+01 G
			463.37	2.711E+00	&(P	8.893E+00	9.56E+01	1.05E+01 G
I-131	I	2.5056E-01					8.02E+00	
			364.48	4.338E-02	?(P	9.585E-01	7.84E+02	8.17E+01 G
			284.30	3.007E+00	?(	1.261E+01	1.57E+02	6.14E+00 G
			636.97	-2.521E-01	%	1.755E+01	1.87E+03	7.17E+00 G
Gd-153	F	5.2165E-01					2.42E+02	
			97.50	5.217E-01	@(	1.829E+00	1.03E+02	3.00E+01 G
			103.20	-9.695E-01	+	4.059E+00	1.24E+02	2.18E+01 G
Ga-68	C	1.7620E+01					4.71E-02	
			1077.40	1.762E+01	&(	3.934E+01	9.32E+01	3.30E+00 G
Tc-99m	I	1.8206E-01					2.51E-01	
			140.51	1.821E-01	?(	7.929E-01	1.28E+02	8.93E+01 G
BA-133	F	-7.6386E-01					3.85E+03	
			356.00	-7.639E-01	&(	3.478E+00	1.35E+02	6.20E+01 G
			302.85	0.000E+00	+	9.817E+00	1.00E+03	1.83E+01 G
			383.84	-3.784E+00	+	1.506E+01	1.17E+02	8.94E+00 GA
			80.99	2.456E-01	+	2.181E+00	3.21E+02	3.41E+01 GA
CS-134	I	-8.0085E-01					7.54E+02	
			795.87	-8.008E-01	?(P	2.207E+00	6.61E+01	8.55E+01 G
			604.71	-5.445E-01	&	3.226E+00	1.75E+02	9.76E+01 G
			569.32	1.765E+00	&	6.159E+00	1.00E+02	1.54E+01 G
			801.95	-7.577E+00	& P	2.906E+01	6.96E+01	8.69E+00 G
			563.24	-2.344E+00	+	1.380E+01	2.25E+02	8.35E+00 G
CS-137	I	-1.0952E+00					1.10E+04	
			661.66	-1.095E+00	?(P	2.577E+00	2.89E+01	8.52E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 11
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide	Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-139	F -1.2576E-01					1.38E+02	
		165.85	-1.258E-01	*(	1.163E+00	2.69E+02	7.99E+01 G
Ba-140	I -1.7769E+00					1.28E+01	
		537.26	-1.777E+00	?(P	4.945E+00	4.77E+01	2.44E+01 G
		162.66	-2.009E+00	&	1.505E+01	2.19E+02	6.22E+00 G
		304.85	0.000E+00	&	4.218E+01	1.00E+03	4.29E+00 G
La-140	I 4.1360E-01					1.28E+01	
		1596.21	3.150E-02	%(P	1.707E+00	2.20E+03	9.54E+01 G
		487.02	6.654E-01	?(P	1.816E+00	1.05E+02	4.55E+01 G
		328.76	-2.052E-01	+	4.302E+00	7.65E+02	2.03E+01 G
		815.77	1.487E+00	?(	5.921E+00	1.14E+02	2.33E+01 G
CE-141	I -3.8187E-01					3.25E+01	
		145.44	-3.819E-01	?(	1.744E+00	1.35E+02	4.82E+01 G
PM-144	C -8.2639E-01					3.63E+02	
		696.54	-8.264E-01	?(	1.878E+00	9.49E+01	9.90E+01 G
		618.06	-8.346E-03	& P	3.120E+00	6.85E+03	9.91E+01 G
EU-152	F 1.6193E+00					4.94E+03	
		121.78	5.628E-01	?(	2.072E+00	1.08E+02	2.86E+01 G
		344.29	-1.381E+00	+	5.768E+00	1.23E+02	2.65E+01 G
		1112.07	-2.873E+00	+	1.778E+01	1.76E+02	1.36E+01 G
		778.92	-2.810E+00	+	1.133E+01	1.67E+02	1.29E+01 G
		964.11	2.715E+00	?(	1.387E+01	1.46E+02	1.46E+01 G
		244.69	3.492E+00	&(	1.656E+01	1.40E+02	7.58E+00 G
		1408.00	0.000E+00	-	3.703E+00	1.00E+03	2.10E+01 GA
EU-154	I 4.3540E-01					3.14E+03	
		123.10	-4.821E-01	(P	1.706E+00	1.42E+02	4.08E+01 G
		1274.54	0.000E+00	+	2.032E+00	1.00E+03	3.52E+01 G
		723.36	0.000E+00	+	5.637E+00	1.00E+03	2.02E+01 G
		873.23	-3.600E+00	+ P	1.343E+01	1.13E+02	1.23E+01 G
		1004.77	2.513E+00	?(	8.888E+00	1.02E+02	1.80E+01 G
		996.33	-2.481E+00	+	1.766E+01	1.99E+02	1.06E+01 G
EU-155	I 7.6684E-01					1.81E+03	
		105.31	7.668E-01	?(P	4.381E+00	1.69E+02	2.12E+01 G
		86.54	7.177E-01	}	4.399E+00	8.25E+01	3.07E+01 G
HF-181	F 3.1706E-01					4.24E+01	
		482.00	3.171E-01	?(	1.255E+00	1.14E+02	8.05E+01 G
		133.02	0.000E+00	-	1.975E+00	1.00E+03	4.33E+01 G
		345.83	-2.572E+00	&	1.062E+01	1.22E+02	1.51E+01 G
		136.30	0.000E+00	&	1.476E+01	1.00E+03	5.85E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 12
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Ta-182	F	-2.5901E+00					1.14E+02	
			1121.30	-2.590E+00	?(	8.343E+00	9.50E+01	3.49E+01 G
			1221.41	1.734E+00	+	2.556E+00	4.47E+01	2.70E+01 G
			1189.05	1.130E+00	+	9.858E+00	3.55E+02	1.62E+01 G
Hg-203	F	1.1211E-01					4.66E+01	
			279.20	1.121E-01	?(	1.061E+00	2.68E+02	8.15E+01 G
TL-208	N	1.8201E+00					6.98E+02	
			583.02	1.840E+00	(P	4.392E-01	1.81E+01	8.45E+01 G
			277.28	3.720E+00	+	1.232E+01	9.71E+01	6.31E+00 G
			860.56	1.685E+00	?(	1.132E+01	2.71E+02	1.24E+01 G
PM-146	C	-6.8995E-01					2.02E+03	
			453.88	-6.899E-01	?(P	1.747E+00	7.59E+01	6.50E+01 G
			747.16	-2.950E-01	+ P	4.059E+00	3.98E+02	3.40E+01 G
			735.72	1.110E+00	+ P	4.520E+00	1.56E+02	2.25E+01 G
Y-88	F	2.0387E-01					1.07E+02	
			1836.06	-1.660E-02	%(P	9.809E-01	3.88E+03	9.92E+01 G
			898.04	4.373E-01	?(	1.308E+00	1.22E+02	9.37E+01 G
Cd-113m		-2.1684E+03					5.33E+03	
			263.70	-2.168E+03	?(	1.734E+04	2.31E+02	6.00E-03 K
Cf-251	T	9.1547E-01					3.28E+05	
			176.60	9.155E-01	?(	3.795E+00	1.50E+02	1.70E+01 G
			227.00	3.405E+00	?	1.128E+01	1.20E+02	6.30E+00 GA
Cf-249	T	3.7228E-01					1.28E+05	
			387.95	3.723E-01	?(	1.959E+00	1.53E+02	6.60E+01 G
			333.44	-1.291E+00	+	5.697E+00	1.65E+02	1.55E+01 G
Sn-126		-5.6823E-01					3.65E+07	
			87.57	6.800E-02	%	3.329E+00	1.44E+03	3.75E+01 GA
			64.28	-5.682E-01	&(	1.098E+01	5.60E+02	9.70E+00 G
			86.94	9.943E-01	}	1.375E+01	2.10E+02	9.04E+00 GA
PB-210	N	1.2875E+01					8.14E+03	
			46.54	1.288E+01	*(P	2.416E+01	6.53E+01	4.25E+00 G
PB-212	N	3.9377E-01					6.98E+02	
			238.63	3.938E-01	?(P	3.140E+00	2.34E+02	4.33E+01 G
			300.03	-9.656E+00	+ P	5.726E+01	2.03E+01	3.28E+00 GA

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 13
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PB-214	N	7.1510E+00					5.84E+05	
			351.93	6.871E+00	@(P	2.240E+00	1.61E+01	3.76E+01 G
			295.09	7.696E+00	(	2.470E+00	1.80E+01	1.93E+01 G
			242.00	3.856E+00	&	1.739E+01	1.33E+02	7.43E+00 GA
BI-207	C	6.1774E-01					1.18E+04	
			1063.66	6.177E-01	?(P	1.506E+00	9.99E+01	7.45E+01 G
			569.70	0.000E+00	-	1.136E+00	1.00E+03	9.77E+01 G
BI-212	N	5.6047E+00					6.98E+02	
			727.17	5.605E+00	?(	1.965E+01	1.02E+02	7.55E+00 G
			785.42	-1.515E+01	+	1.017E+02	2.71E+02	1.28E+00 GA
U-235	N	1.9963E+00					2.57E+11	
			143.79	8.633E-01	(P	6.879E+00	2.32E+02	1.10E+01 G
			205.33	4.475E+00	&(P	1.311E+01	1.07E+02	5.01E+00 G
			163.38	-4.947E-01	- P	1.913E+01	9.58E+02	5.08E+00 G
			185.72	1.513E+00	@ P	1.120E+00	2.90E+01	5.40E+01 GA
BI-214	N	8.8180E+00					5.84E+05	
			609.31	8.818E+00	(P	1.911E+00	1.37E+01	4.61E+01 G
			1120.29	4.709E+00	- P	1.522E+01	9.48E+01	1.51E+01 G
			1764.49	1.579E+01	+ P	7.641E+00	2.52E+01	1.54E+01 G
BI-210M	T	-7.9802E-01					1.10E+09	
			265.83	-7.980E-01	?(	2.622E+00	9.77E+01	5.00E+01 G
			304.90	0.000E+00	&	6.463E+00	1.00E+03	2.80E+01 G
AC-228	N	2.9577E+00					2.10E+03	
			911.07	7.075E-01	?(P	6.469E+00	3.73E+02	2.90E+01 G
			968.97	3.166E+00	&(P	1.075E+01	9.90E+01	1.75E+01 G
			338.32	8.088E+00	(P	4.373E+00	2.62E+01	1.20E+01 G
			93.35	4.326E+00	&	2.179E+01	1.50E+02	5.56E+00 XA
TH-227	N	2.3322E+00					7.95E+03	
			256.24	3.025E+00	(	9.553E+00	1.19E+02	7.00E+00 G
			235.97	-1.888E+00	-	1.470E+01	2.30E+02	1.23E+01 G
			50.14	1.726E+00	&(	1.059E+01	2.07E+02	8.00E+00 G
TH-229	N	-3.8231E+00					2.68E+06	
			193.51	-3.823E+00	?(P	1.822E+01	1.46E+02	4.40E+00 G
			210.85	-7.419E+00	+ P	2.960E+01	1.11E+02	2.99E+00 G
TH-234	N	-9.4727E+00					1.63E+12	
			92.59	-9.473E+00	*(P	2.313E+01	4.42E+01	5.58E+00 G
			63.29	-1.446E+00	+ P	2.637E+01	5.22E+02	3.81E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 14
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
PA-233	C	-9.5897E-01					7.82E+08	
			312.01	-9.590E-01	?(	5.326E+00	1.64E+02	3.60E+01 G
			300.18	0.000E+00	&	2.881E+01	1.00E+03	6.20E+00 G
PA-234	N	1.5128E+00					1.63E+12	
			131.29	3.372E-01	(	4.656E+00	4.01E+02	1.80E+01 G
			946.02	1.315E+00	?(	7.202E+00	2.07E+02	1.34E+01 G
			569.47	0.000E+00	&	1.354E+01	1.00E+03	8.20E+00 G
			883.24	3.993E+00	?(	1.573E+01	1.13E+02	9.60E+00 G
			880.53	6.363E+00	?	2.097E+01	9.50E+01	6.00E+00 GA
PA-234M	N	4.1983E+01					1.63E+12	
			1001.00	-7.914E+00	?(P	2.439E+02	8.65E+02	8.37E-01 G
			766.41	1.840E+02	?(P	5.000E+02	8.05E+01	2.94E-01 G
AM-241	T	2.2755E-01					1.58E+05	
			59.54	2.275E-01	*(P	2.586E+00	3.84E+02	3.59E+01 G
Ir-192	F	5.6860E-02					7.40E+01	
			316.49	3.478E-02	(	9.967E-01	7.94E+02	8.70E+01 G
			468.06	9.399E-02	?(	2.480E+00	7.36E+02	5.18E+01 G
			308.44	0.000E+00	-	5.755E+00	1.00E+03	3.18E+01 G
Cs-136	F	-4.0362E-01					1.30E+01	
			818.50	-4.036E-01	?(	1.890E+00	1.35E+02	1.00E+02 G
			1048.07	-6.174E-01	+	2.313E+00	1.08E+02	8.00E+01 G
			340.57	-8.124E-01	+	3.720E+00	1.35E+02	4.69E+01 G
Np-239	T	7.6970E-01					2.36E+00	
			103.70	-7.293E-01	+	3.436E+00	1.39E+02	2.40E+01 X
			106.13	7.697E-01	&(	4.060E+00	1.56E+02	2.27E+01 G
			99.50	-1.311E+00	+	5.055E+00	1.14E+02	1.50E+01 X
Nd-147		1.7916E+00					1.11E+01	
			531.00	1.792E+00	?(	5.694E+00	1.19E+02	1.30E+01 G
			91.10	0.000E+00	-	4.357E+00	1.00E+03	2.83E+01 G
TL-210	N	-2.6941E-01					5.84E+05	
			799.60	-2.694E-01	?(	2.172E+00	2.30E+02	9.90E+01 G
			296.00	-3.910E-01	+	2.424E+00	1.83E+02	7.90E+01 G
			1313.00	3.791E+00	?	3.492E+00	3.54E+01	2.10E+01 GA
Kr-85	I	4.8357E+01					3.92E+03	
			513.98	4.836E+01	?(	4.495E+02	2.68E+02	4.30E-01 G

(- This peak used in the nuclide activity average.

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 15
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

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  * - 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	36.	5.	0.003	206.88	1.726E+00	
AM-241	59.54	72.	4.	0.002	383.71	2.275E-01	P
TH-234	63.29	99.	-3.	-0.001	521.85	-1.446E+00	P
BA-133	80.99	80.	5.	0.003	321.46	2.456E-01	
TH-234	92.59	290.	-34.	-0.019	44.22	-9.473E+00	P
Gd-153	97.50	49.	10.	0.006	103.17	5.217E-01	
Gd-153	103.20	138.	-14.	-0.008	124.04	-9.695E-01	
EU-152	121.78	58.	10.	0.006	108.35	5.628E-01	
CO-57	122.06	68.	8.	0.004	157.59	1.381E-01	
EU-154	123.10	82.	-13.	-0.007	141.58	-4.821E-01	P
PA-234	131.29	116.	4.	0.002	400.90	3.372E-01	
Tc-99m	140.51	72.	10.	0.005	127.78	1.821E-01	
U-235	143.79	85.	6.	0.003	232.10	8.633E-01	P
CE-141	145.44	106.	-11.	-0.006	134.59	-3.819E-01	
Ba-140	162.66	114.	-7.	-0.004	219.00	-2.009E+00	
U-235	163.38	122.	-1.	-0.001	958.42	-4.947E-01	P
CE-139	165.85	114.	-6.	-0.003	269.37	-1.258E-01	
Cf-251	176.60	47.	8.	0.005	149.93	9.155E-01	
U-235	185.72	37.	42.	0.023	28.99	1.513E+00	P

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:27:31 PMPage 16
TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
TH-229	193.51	63.	-8.	-0.005	145.88	-3.823E+00	P
U-235	205.33	37.	11.	0.006	106.56	4.475E+00	P
TH-229	210.85	67.	-10.	-0.006	110.76	-7.419E+00	P
Cf-251	227.00	37.	9.	0.005	120.00	3.405E+00	
TH-227	235.97	249.	-10.	-0.005	230.21	-1.888E+00	
EU-152	244.69	109.	11.	0.006	139.66	3.492E+00	
TH-227	256.24	26.	8.	0.005	118.89	3.025E+00	
Cd-113m	263.70	64.	-5.	-0.003	230.65	-2.168E+03	
BI-210M	265.83	103.	-15.	-0.008	97.72	-7.980E-01	
Hg-203	279.20	39.	3.	0.002	268.31	1.121E-01	
I-131	284.30	29.	7.	0.004	156.84	3.007E+00	
TL-210	296.00	190.	-11.	-0.006	183.03	-3.910E-01	
PA-231	300.07	167.	-7.	-0.004	268.01	-8.109E+00	
PA-233	312.01	174.	-12.	-0.006	164.10	-9.590E-01	
Ir-192	316.49	31.	1.	0.001	793.73	3.478E-02	
CR-51	320.08	57.	-12.	-0.006	21.75	-3.572E+00	P
La-140	328.76	29.	-1.	-0.001	764.85	-2.052E-01	
Cf-249	333.44	29.	-6.	-0.004	164.85	-1.291E+00	
Cs-136	340.57	122.	-12.	-0.007	135.17	-8.124E-01	
EU-152	344.29	91.	-11.	-0.006	123.16	-1.381E+00	
HF-181	345.83	99.	-12.	-0.007	121.83	-2.572E+00	
BA-133	356.00	177.	-14.	-0.008	135.03	-7.639E-01	
I-131	364.48	19.	1.	0.001	783.79	4.338E-02	P
BA-133	383.84	57.	-10.	-0.005	116.75	-3.784E+00	
Cf-249	387.95	51.	7.	0.004	152.52	3.723E-01	
SB-125	427.88	20.	1.	0.001	881.29	1.314E-01	
AG-108M	433.94	28.	-10.	-0.006	80.30	-4.442E-01	P
PM-146	453.88	29.	-11.	-0.006	75.91	-6.899E-01	P
SB-125	463.37	18.	7.	0.004	95.63	2.711E+00	P
Ir-192	468.06	36.	1.	0.001	735.64	9.399E-02	
BE-7	477.59	15.	5.	0.003	115.52	2.089E+00	P
HF-181	482.00	20.	6.	0.003	113.90	3.171E-01	
La-140	487.02	12.	7.	0.004	104.90	6.654E-01	P
RU-103	497.05	4.	3.	0.002	152.54	1.371E-01	P
RH-106	511.86	0.	53.	0.029	13.75	1.195E+01	
Kr-85	513.98	73.	5.	0.003	268.25	4.836E+01	
Nd-147	531.00	8.	5.	0.003	119.44	1.792E+00	
Ba-140	537.26	24.	-9.	-0.005	47.69	-1.777E+00	P
CS-134	563.24	20.	-4.	-0.002	224.54	-2.344E+00	
CS-134	569.32	12.	6.	0.003	100.41	1.765E+00	
SB-125	600.50	156.	-9.	-0.005	196.44	-2.639E+00	
SB-124	602.73	165.	-10.	-0.006	180.32	-5.388E-01	
CS-134	604.71	155.	-10.	-0.006	174.59	-5.445E-01	
RH-106	621.92	22.	-6.	-0.003	172.86	-3.033E+00	
SB-125	635.89	5.	14.	0.008	35.03	6.712E+00	P
AG-110M	657.76	38.	-9.	-0.005	97.59	-5.576E-01	
CS-137	661.66	61.	-17.	-0.009	28.85	-1.095E+00	P
PM-144	696.54	39.	-14.	-0.008	94.90	-8.264E-01	

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TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
NB-94	702.63	35.	-14.	-0.008	91.35	-8.279E-01		
SB-124	722.79	0.	6.	0.003	40.71	3.365E+00		
AG-108M	722.94	6.	6.	0.003	70.51	4.005E-01		
ZR-95	724.20	31.	-5.	-0.003	177.44	-6.247E-01		
BI-212	727.17	22.	7.	0.004	101.89	5.605E+00		
PM-146	735.72	9.	4.	0.002	156.36	1.110E+00		P
PM-146	747.16	18.	-2.	-0.001	398.25	-2.950E-01		P
ZR-95	756.73	9.	-1.	0.000	909.67	-7.668E-02		
AG-110M	763.94	37.	-9.	-0.005	98.20	-2.645E+00		
NB-95	765.79	38.	11.	0.006	84.47	6.974E-01		
PA-234M	766.41	19.	9.	0.005	80.54	1.840E+02		P
EU-152	778.92	19.	-6.	-0.003	167.10	-2.810E+00		
BI-212	785.42	14.	-3.	-0.002	270.80	-1.515E+01		
CS-134	795.87	32.	-10.	-0.006	66.06	-8.008E-01		P
TL-210	799.60	42.	-4.	-0.002	229.85	-2.694E-01		
CS-134	801.95	59.	-10.	-0.006	69.63	-7.577E+00		P
CO-58	810.78	10.	5.	0.003	95.64	3.454E-01		
La-140	815.77	15.	5.	0.003	113.78	1.487E+00		
Cs-136	818.50	30.	-6.	-0.003	134.75	-4.036E-01		
MN-54	834.85	14.	3.	0.002	270.80	2.041E-01		
NB-94	871.10	12.	-1.	0.000	974.33	-5.062E-02		P
EU-154	873.23	20.	-6.	-0.003	112.92	-3.600E+00		P
PA-234	880.53	10.	5.	0.003	95.05	6.363E+00		
PA-234	883.24	16.	5.	0.003	112.81	3.993E+00		
AG-110M	884.68	21.	5.	0.003	128.17	5.285E-01		
Sc-46	889.28	37.	-8.	-0.004	118.66	-5.469E-01		
Y-88	898.04	9.	6.	0.003	121.84	4.373E-01		
AG-110M	937.49	14.	-5.	-0.003	164.92	-1.091E+00		
PA-234	946.02	5.	2.	0.001	207.02	1.315E+00		
EU-152	964.11	26.	5.	0.003	145.91	2.715E+00		
EU-154	996.33	20.	-3.	-0.002	199.00	-2.481E+00		
PA-234M	1001.00	25.	-1.	0.000	864.53	-7.914E+00		P
EU-154	1004.77	14.	6.	0.003	101.89	2.513E+00		
Co-56	1037.84	15.	-6.	-0.003	147.67	-3.467E+00		
Cs-136	1048.07	18.	-6.	-0.003	108.01	-6.174E-01		
BI-207	1063.66	5.	6.	0.003	99.89	6.177E-01		P
Ga-68	1077.40	5.	6.	0.003	93.21	1.762E+01		
FE-59	1099.25	10.	-3.	-0.002	176.11	-4.787E-01		P
EU-152	1112.07	30.	-5.	-0.003	176.00	-2.873E+00		
Sc-46	1120.55	15.	6.	0.003	99.07	5.215E-01		
CO-60	1173.24	5.	6.	0.003	89.98	5.541E-01		
Co-56	1238.28	16.	-3.	-0.002	225.38	-4.969E-01		P
FE-59	1291.60	0.	5.	0.003	49.85	1.059E+00		P
TL-210	1313.00	0.	8.	0.004	35.36	3.791E+00		
CO-60	1332.50	5.	5.	0.003	121.64	4.702E-01		
SB-124	1690.98	0.	5.	0.003	44.72	1.289E+00		
Co-56	1771.35	32.	-7.	-0.004	114.09	-6.083E+00		

P - Peakbackground subtraction

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TestAmerica Inc Spectrum name: 5_Gamma_20193043.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 *****

Nuclide		Time of Count Activity Bq/Sample	Time Corrected Activity Bq/Sample	Uncertainty 1 Sigma Counting	MDA Bq/Sample
BE-7	#A	2.0893E+00	2.0893E+00	1.155E+02%	8.44E+00
NA-22	#A	0.0000E+00	0.0000E+00	1.000E+03%	7.16E-01
K-40	#	6.2930E+01	6.2930E+01	1.601E+01%	1.73E+01
Sc-46	#A	-1.2702E-02	-1.2702E-02	7.729E+01%	2.23E+00
CR-51	#A	-3.5717E+00	-3.5717E+00	2.175E+01%	1.17E+01
MN-54	#A	2.0408E-01	2.0408E-01	2.708E+02%	1.37E+00
FE-59	#A	1.8761E-01	1.8761E-01	4.985E+01%	2.66E+00
Co-56	#A	0.0000E+00	0.0000E+00	1.000E+03%	1.39E+00
CO-57	#A	1.3815E-01	1.3815E-01	1.576E+02%	7.47E-01
CO-58	#A	3.4540E-01	3.4540E-01	9.564E+01%	1.15E+00
CO-60	#A	5.1213E-01	5.1213E-01	7.565E+01%	1.36E+00
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	4.46E+00
NB-94	#A	-8.2791E-01	-8.2791E-01	9.135E+01%	1.81E+00
ZR-95	#A	-7.6676E-02	-7.6677E-02	9.097E+02%	1.89E+00
NB-95	#A	6.9737E-01	6.9738E-01	8.447E+01%	1.98E+00
RU-103	#A	1.3710E-01	1.3710E-01	1.525E+02%	5.93E-01
RH-106	#A	-3.0332E+00	-3.0332E+00	1.729E+02%	1.31E+01
AG-108M	#A	-4.4417E-01	-4.4417E-01	8.030E+01%	1.19E+00
AG-110M	#A	5.2846E-01	5.2846E-01	1.282E+02%	2.37E+00
SN-113	#A	2.8238E-02	2.8238E-02	1.941E+03%	1.95E+00
SB-124	#A	2.8694E-01	2.8694E-01	4.071E+01%	3.30E+00
SB-125	#A	2.1056E+00	2.1056E+00	3.503E+01%	3.10E+00
I-131	#A	2.5055E-01	2.5056E-01	1.568E+02%	9.58E-01
Gd-153	#A	5.2165E-01	5.2165E-01	1.032E+02%	1.83E+00
Ga-68	#A	1.7444E+01	1.7620E+01	9.321E+01%	3.93E+01
Tc-99m	#A	1.8172E-01	1.8206E-01	1.278E+02%	7.93E-01
BA-133	#A	-7.6386E-01	-7.6386E-01	1.350E+02%	3.48E+00
CS-134	#A	-8.0085E-01	-8.0085E-01	6.606E+01%	2.21E+00
CS-137	#A	-1.0952E+00	-1.0952E+00	2.885E+01%	2.58E+00
CE-139	#A	-1.2576E-01	-1.2576E-01	2.694E+02%	1.16E+00
Ba-140	#A	-1.7768E+00	-1.7769E+00	4.769E+01%	4.94E+00
La-140	#A	4.1359E-01	4.1360E-01	1.049E+02%	1.71E+00
CE-141	#A	-3.8187E-01	-3.8187E-01	1.346E+02%	1.74E+00
CE-144	#A	0.0000E+00	0.0000E+00	1.000E+03%	7.72E+00
PM-144	#A	-8.2639E-01	-8.2639E-01	9.490E+01%	1.88E+00
EU-152	#A	1.6193E+00	1.6193E+00	7.640E+01%	2.07E+00
EU-154	#A	4.3540E-01	4.3540E-01	8.722E+01%	1.71E+00
EU-155	#A	7.6684E-01	7.6684E-01	1.685E+02%	4.38E+00
HF-181	#A	3.1706E-01	3.1706E-01	1.139E+02%	1.25E+00
Ta-182	#A	-2.5901E+00	-2.5901E+00	9.504E+01%	8.34E+00
Hg-203	#A	1.1211E-01	1.1211E-01	2.683E+02%	1.06E+00
TL-208		1.8201E+00	1.8201E+00	1.811E+01%	4.39E-01
PM-146	#A	-6.8995E-01	-6.8995E-01	7.591E+01%	1.75E+00

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TestAmerica Inc Spectrum name: 5_Gamma_20193043.An1

Y-88 #A	2.0387E-01	2.0387E-01	1.218E+02%		9.81E-01
Cd-113m#A	-2.1684E+03	-2.1684E+03	2.307E+02%		1.73E+04
Cd-109 #A	0.0000E+00	0.0000E+00	1.000E+03%		3.30E+01
Cf-251 #A	9.1547E-01	9.1547E-01	1.499E+02%		3.79E+00
Cf-249 #A	3.7228E-01	3.7228E-01	1.525E+02%		1.96E+00
Sn-126 #A	-5.6823E-01	-5.6823E-01	5.596E+02%		1.10E+01
PB-210 #A	1.2875E+01	1.2875E+01	6.529E+01%		2.42E+01
PB-212 #A	3.9377E-01	3.9377E-01	2.339E+02%		3.14E+00
PB-214	7.1510E+00	7.1510E+00	1.208E+01%		2.24E+00
BI-207 #A	6.1774E-01	6.1774E-01	9.989E+01%		1.51E+00
BI-212 #A	5.6047E+00	5.6047E+00	1.019E+02%		1.96E+01
U-235 #A	1.9963E+00	1.9963E+00	1.066E+02%		6.88E+00
BI-214	8.8180E+00	8.8180E+00	1.374E+01%		1.91E+00
BI-210M#A	-7.9802E-01	-7.9802E-01	9.772E+01%		2.62E+00
AC-228 A	2.9577E+00	2.9577E+00	2.623E+01%		6.47E+00
TH-227 #A	2.3322E+00	2.3322E+00	1.189E+02%		9.55E+00
TH-229 #A	-3.8231E+00	-3.8231E+00	1.459E+02%		1.82E+01
TH-234 #A	-9.4727E+00	-9.4727E+00	4.422E+01%		2.31E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%		6.24E+01
PA-233 #A	-9.5897E-01	-9.5897E-01	1.641E+02%		5.33E+00
PA-234 #A	1.5128E+00	1.5128E+00	1.128E+02%		4.66E+00
PA-234M#A	4.1983E+01	4.1983E+01	8.054E+01%		2.44E+02
AM-241 #A	2.2755E-01	2.2755E-01	3.837E+02%		2.59E+00
Np-237 #A	0.0000E+00	0.0000E+00	1.000E+03%		1.06E+01
Ir-192 #A	5.6859E-02	5.6860E-02	5.411E+02%		9.97E-01
Cs-136 #A	-4.0361E-01	-4.0362E-01	1.348E+02%		1.89E+00
Np-239 #A	7.6955E-01	7.6970E-01	1.557E+02%		4.06E+00
Nd-147 #A	1.7915E+00	1.7916E+00	1.194E+02%		5.69E+00
TL-210 #A	-2.6941E-01	-2.6941E-01	2.299E+02%		2.17E+00
Kr-85 #A	4.8357E+01	4.8357E+01	2.682E+02%		4.49E+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) 9.359E+01 Bq/Sample
Total Decayed Activity (37.6 to 2000.8 keV) 9.3594177E+01 Bq/Sample

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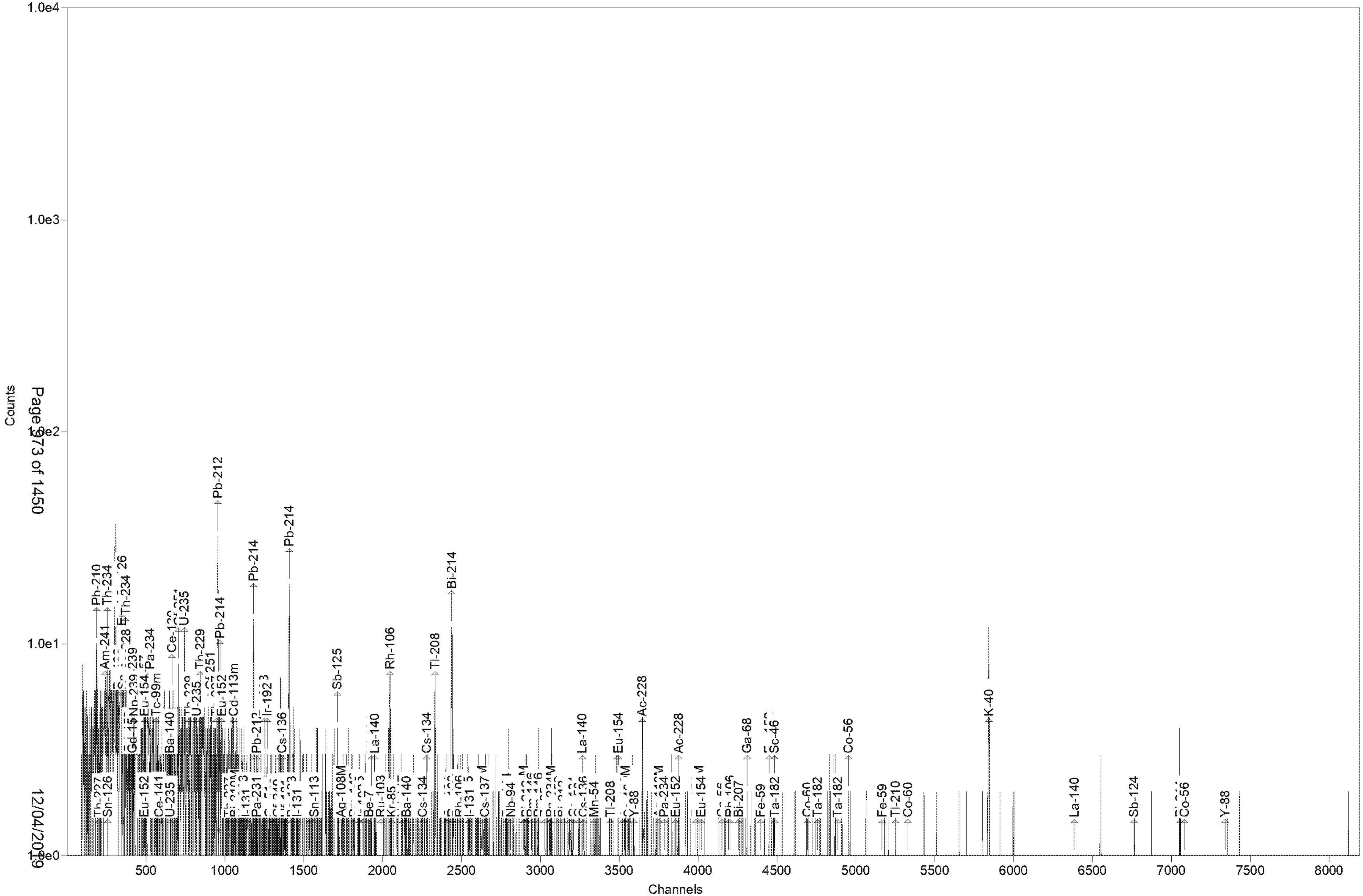
448571_Gamma_160-36160-A-14-C. 5_Gamma_20193043.spc.



J-1231

Test America St. Louis Spectrum ID: 9_Gamma_20193498

Sample Description: 448571_Gamma_160-36160-A-15-C
Detector: Detector # 9
Batch ID: 448571
Work Order Number: Gamma
Lot Number: 160-36160-A-15-C

Decay to Time: 11/23/2019 23:28 Live Time: 1800 sec
Acquisition Time: 11/23/2019 23:28:31 Real Time: 1802 sec
Analysis Time: 11/23/2019 23:58 Dead Time: 0.09 %
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_2019-11-10_1422.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	102.0	3.205E+00	3.209E+00	1.080E+01
NA-22	-2.043E-01	154.1	3.149E-01	3.150E-01	1.120E+00
K-40	5.936E+01	10.2	6.026E+00	6.748E+00	8.421E+00
Sc-46	-2.174E-01	163.1	3.544E-01	3.546E-01	1.233E+00
CR-51	-8.385E-02	2569.5	2.154E+00	2.154E+00	1.444E+01
MN-54	0.000E+00	1.#INF	5.180E-02	5.180E-02	8.626E-01
FE-59	-1.676E-01	45.5	7.620E-02	7.666E-02	1.946E+00
Co-56	3.271E-01	102.5	3.351E-01	3.356E-01	7.728E-01
CO-57	2.449E-02	731.1	1.790E-01	1.790E-01	6.203E-01
CO-58	1.440E-01	200.0	2.880E-01	2.881E-01	1.016E+00
CO-60	1.764E-02	1683.7	2.970E-01	2.970E-01	7.304E-01
ZN-65	0.000E+00	1.#INF	1.283E-01	1.283E-01	2.470E+00
NB-94	4.613E-01	28.9	1.334E-01	1.355E-01	7.132E-01
ZR-95	3.442E-01	88.7	3.054E-01	3.059E-01	1.475E+00
NB-95	3.899E-01	69.4	2.705E-01	2.713E-01	8.988E-01
RU-103	5.115E-02	516.1	2.640E-01	2.640E-01	6.734E-01
RH-106	4.105E+00	121.8	5.001E+00	5.006E+00	1.687E+01
AG-108M	4.698E-01	54.9	2.579E-01	2.590E-01	5.553E-01
AG-110M	4.537E-01	56.8	2.579E-01	2.589E-01	1.311E+00
SN-113	-5.403E-01	109.0	5.891E-01	5.897E-01	1.980E+00
SB-124	-8.657E-02	44.7	3.872E-02	3.898E-02	2.164E+00
SB-125	5.575E-01	99.8	5.566E-01	5.574E-01	9.351E-01
I-131	1.983E-01	97.3	1.931E-01	1.933E-01	7.083E-01
Gd-153	0.000E+00	1.#INF	4.121E-01	4.122E-01	4.627E+00
Ga-68	1.027E+01	89.7	9.221E+00	9.239E+00	2.129E+01
Tc-99m	0.000E+00	1.#INF	1.207E-01	1.207E-01	1.315E+00
BA-133	-5.276E-01	126.4	6.669E-01	6.675E-01	2.242E+00
CS-134	6.080E-01	81.0	4.923E-01	4.933E-01	9.203E-01
CS-137	-5.797E-01	105.9	6.140E-01	6.147E-01	1.477E+00
CE-139	2.153E-01	101.0	2.174E-01	2.184E-01	7.319E-01
Ba-140	-4.687E-01	224.3	1.051E+00	1.051E+00	2.668E+00
La-140	-5.739E-02	78.8	4.521E-02	4.531E-02	1.219E+00
CE-141	-5.091E-01	146.3	7.446E-01	7.450E-01	2.490E+00

CE-144	-1.953E+00	149.3	2.917E+00	2.919E+00	9.767E+00
PM-144	1.699E-01	87.9	1.494E-01	1.496E-01	7.279E-01
EU-152	2.886E+00	19.7	5.682E-01	5.882E-01	1.725E+00
EU-154	1.746E-01	187.5	3.274E-01	3.275E-01	1.258E+00
EU-155	0.000E+00	1.#INF	4.928E-01	4.928E-01	6.451E+00
HF-181	3.472E-01	114.6	3.979E-01	3.983E-01	1.144E+00
Ta-182	1.512E+00	25.0	3.780E-01	3.855E-01	3.838E+00
Hg-203	1.592E-01	161.7	2.574E-01	2.575E-01	8.814E-01
TL-208	1.926E+00	19.8	3.804E-01	3.933E-01	7.200E-01
PM-146	3.188E-01	113.2	3.610E-01	3.613E-01	8.735E-01
Y-88	-5.488E-02	150.6	8.266E-02	8.272E-02	1.001E+00
Cd-113m	-4.704E+03	85.1	4.005E+03	4.016E+03	1.339E+04
Cd-109	-6.281E+00	174.0	1.093E+01	1.094E+01	3.653E+01
Cf-251	-3.113E-01	344.2	1.072E+00	1.072E+00	2.838E+00
Cf-249	-1.011E-01	86.4	8.734E-02	8.749E-02	1.716E+00
Sn-126	-2.682E+00	115.4	3.096E+00	3.099E+00	1.038E+01
PB-210	-8.438E+00	110.6	9.336E+00	9.349E+00	3.137E+01
PB-212	4.486E+00	10.5	4.733E-01	5.552E-01	9.634E-01
PB-214	5.814E+00	10.8	6.304E-01	6.990E-01	1.262E+00
BI-207	-2.427E-01	286.6	6.954E-01	6.955E-01	1.270E+00
BI-212	-1.766E-01	2881.0	5.089E+00	5.089E+00	1.797E+01
U-235	1.348E+00	104.3	1.406E+00	1.408E+00	1.051E+01
BI-214	3.332E+00	20.2	6.714E-01	6.934E-01	4.585E+00
BI-210M	-4.628E-01	65.0	3.009E-01	3.022E-01	1.741E+00
AC-228	1.402E+00	97.7	1.370E+00	1.372E+00	3.718E+00
TH-227	1.785E+00	180.0	3.212E+00	3.214E+00	8.101E+00
TH-229	-5.302E+00	102.4	5.431E+00	5.448E+00	1.338E+01
TH-234	6.353E-01	119.3	7.582E-01	7.590E-01	2.501E+01
PA-231	0.000E+00	1.#INF	3.841E+00	3.841E+00	4.789E+01
PA-233	0.000E+00	1.#INF	9.924E-02	9.924E-02	3.913E+00
PA-234	5.171E-02	88.5	4.577E-02	4.584E-02	5.716E+00
PA-234M	-6.754E+01	84.6	5.711E+01	5.721E+01	1.918E+02
AM-241	6.643E-01	114.3	7.594E-01	7.602E-01	2.555E+00
Np-237	-1.830E+00	166.4	3.045E+00	3.047E+00	1.018E+01
Ir-192	0.000E+00	1.#INF	4.145E-02	4.145E-02	1.634E+00
Cs-136	1.047E-01	209.7	2.196E-01	2.197E-01	1.078E+00
Np-239	8.761E-01	182.5	1.599E+00	1.600E+00	5.352E+00
Nd-147	-1.337E-01	1430.5	1.913E+00	1.913E+00	4.895E+00
TL-210	2.796E-01	94.8	2.650E-01	2.655E-01	9.446E-01
Kr-85	0.000E+00	1.#INF	2.648E+01	2.648E+01	3.042E+02
Total	1.063E+02				

Analyst: Shiloh Smith

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 11:58:46 PMPage  1
TestAmerica Inc                 Spectrum name: 9_Gamma_20193498.An1

Sample description
     448571_Gamma_160-36160-A-15-C


Spectrum Filename: C:\User\SPC\Det9\9_Gamma_20193498.An1

Acquisition information
       Start time:                11/23/2019 11:28:31 PM
       Live time:               1800
       Real time:               1802
       Dead time:                 0.09 %
       Detector ID:                   9

Detector system
     Ge9 S/N09363993


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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 2
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

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	11/23/2019 11:28:00 PM
Decay during acquisition:	YES	
Decay during collection:	NO	
True coincidence correction:	NO	
Peaked background correction:	YES	9_2019-11-10_1422.PBC 11/10/2019 2:22:11 PM
Absorption (Internal):	NO	
Geometry correction:	NO	
Random summing:	NO	

total peaks alloc. 10 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.1904

***** 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	16.	114.32	1.01	3.659E-02	59.54	35.900	PBC<MDA	AM241
63.29	16.	119.34	1.01	3.921E-02	63.29	3.810	PBC<MDA	TH234
77.09	83.	22.15	0.83	4.675E-02				
106.13	19.	182.50	1.05	5.323E-02	106.13	22.700	PBC<MDA	Np239
121.78	15.	91.46	1.07	5.305E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	1.876E-01	CO57
122.06	2.	731.14	1.07	5.303E-02	121.78	28.580	PBC<MDA	EU152
					122.06	85.600	2.449E-02	CO57
163.38	8.	181.14	1.11	4.676E-02	163.38	5.080	PBC<MDA	U235
165.85	15.	100.98	1.11	4.736E-02	165.85	79.900	PBC<MDA	CE139
185.72	13.	138.51	1.13	4.403E-02	185.72	54.000	PBC<MDA	U235
205.33	14.	104.33	1.15	4.123E-02	205.33	5.010	PBC<MDA	U235
227.00	28.	41.55	1.17	3.858E-02	227.00	6.300	6.399E+00	Cf251
238.36	128.	11.67	1.03	3.735E-02	238.63	43.300	4.418E+00	PB212
241.76	34.	27.50	1.18	3.697E-02	242.00	7.430	6.839E+00	PB214
244.69	7.	336.01	1.18	3.670E-02	244.69	7.580	PBC<MDA	EU152
256.24	8.	179.99	1.20	3.558E-02	256.24	7.000	PBC<MDA	TH227
277.28	13.	97.43	1.21	3.372E-02	277.28	6.310	PBC<MDA	TL208
279.20	8.	161.66	1.22	3.356E-02	279.20	81.460	PBC<MDA	Hg203
284.30	10.	97.34	1.22	3.315E-02	284.30	6.140	PBC<MDA	I131
294.72	64.	18.17	1.71	3.232E-02	295.09	19.300	5.743E+00	PB214
296.00	12.	183.48	1.23	3.225E-02	296.00	79.000	PBC<MDA	TL210

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 3
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
300.03	12.	187.35	1.24	3.195E-02	300.03	3.280	PBC<MDA	PB212
					300.07	2.460	8.585E+00	PA231
					300.18	6.200	3.407E+00	PA233
328.76	12.	130.16	1.26	2.999E-02	328.76	20.300	PBC<MDA	La140
333.44	12.	135.77	1.27	2.970E-02	333.44	15.510	PBC<MDA	Cf249
338.32	12.	141.07	1.27	2.940E-02	338.32	12.010	PBC<MDA	AC228
340.57	9.	209.74	1.27	2.927E-02	340.57	46.900	PBC<MDA	Cs136
345.83	5.	211.97	1.28	2.896E-02	345.83	15.070	PBC<MDA	HF181
351.84	113.	11.84	0.83	2.861E-02	351.93	37.600	5.851E+00	PB214
427.88	5.	99.84	1.35	2.491E-02	427.88	29.600	PBC<MDA	SB125
433.94	17.	54.89	1.35	2.466E-02	433.94	90.480	PBC<MDA	AG108M
453.88	6.	155.20	1.37	2.388E-02	453.88	65.000	PBC<MDA	PM146
463.37	3.	270.69	1.38	2.352E-02	463.37	10.470	PBC<MDA	SB125
482.00	10.	114.60	1.40	2.286E-02	482.00	80.500	PBC<MDA	HF181
487.02	5.	119.48	1.40	2.269E-02	487.02	45.500	PBC<MDA	La140
497.05	2.	516.09	1.41	2.236E-02	497.05	90.900	PBC<MDA	RU103
511.86	88.	12.96	2.67	2.188E-02	511.86	20.000	1.117E+01	RH106
563.24	9.	96.03	1.47	2.040E-02	563.24	8.350	PBC<MDA	CS134
583.41	58.	19.75	0.61	1.989E-02	583.02	84.500	1.926E+00	TL208
609.25	6.	348.54	1.50	1.925E-02	609.31	46.090	PBC<MDA	BI214
610.30	16.	131.01	1.51	1.922E-02	610.30	5.750	PBC<MDA	RU103
614.28	16.	125.80	1.51	1.913E-02	614.28	89.850	PBC<MDA	AG108M
618.06	3.	570.90	1.51	1.904E-02	618.06	99.100	PBC<MDA	PM144
621.92	14.	121.82	1.51	1.896E-02	621.92	9.930	PBC<MDA	RH106
635.89	3.	191.31	1.53	1.864E-02	635.89	11.310	PBC<MDA	SB125
657.76	8.	86.60	1.54	1.818E-02	657.76	94.640	PBC<MDA	AG110M
696.54	8.	87.93	1.58	1.741E-02	696.54	99.000	PBC<MDA	PM144
702.63	5.	118.83	1.58	1.730E-02	702.63	97.900	PBC<MDA	NB94
724.20	15.	88.72	1.60	1.691E-02	724.20	44.150	PBC<MDA	ZR95
747.16	5.	164.92	1.62	1.651E-02	747.16	34.000	PBC<MDA	PM146
765.79	11.	69.38	1.63	1.621E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	1.324E+02	PA234M
766.41	4.	224.64	1.63	1.620E-02	765.79	99.790	PBC<MDA	NB95
					766.41	0.294	4.646E+01	PA234M
778.92	1.	702.38	1.64	1.600E-02	778.92	12.940	PBC<MDA	EU152
795.87	8.	80.96	1.66	1.574E-02	795.87	85.530	PBC<MDA	CS134
799.60	8.	94.77	1.66	1.568E-02	799.60	98.960	PBC<MDA	TL210
801.95	3.	313.06	1.66	1.565E-02	801.95	8.690	PBC<MDA	CS134
810.78	4.	200.00	1.67	1.551E-02	810.78	99.460	PBC<MDA	CO58
846.77	9.	102.46	1.70	1.501E-02	846.77	99.935	PBC<MDA	Co56
860.61	14.	44.66	1.71	1.482E-02	860.56	12.420	4.283E+00	TL208
871.10	20.	28.91	1.71	1.468E-02	871.10	99.890	7.450E-01	NB94
873.23	-1.	723.76	1.72	1.465E-02	873.23	12.270	PBC<MDA	EU154
880.53	6.	87.27	1.72	1.456E-02	880.53	6.000	PBC<MDA	PA234
883.24	6.	104.55	1.72	1.453E-02	883.24	9.600	PBC<MDA	PA234
884.68	6.	119.38	1.73	1.451E-02	884.68	72.680	PBC<MDA	AG110M
898.04	3.	229.33	1.74	1.434E-02	898.04	93.700	PBC<MDA	Y88
911.07	9.	135.21	1.75	1.418E-02	911.07	29.000	PBC<MDA	AC228

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 4
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

pk energy	area	uncert	fwhm	corr	nuclide	brnch.	act.	nuc
964.11	38.	19.69	1.79	1.357E-02	964.11	14.605	1.051E+01	EU152
1004.77	4.	300.00	1.82	1.314E-02	1004.77	18.010	PBC<MDA	EU154
1048.07	2.	319.37	1.85	1.271E-02	1048.07	80.000	PBC<MDA	Cs136
1077.40	7.	89.75	1.87	1.244E-02	1077.40	3.300	PBC<MDA	Ga68
1119.92	36.	20.15	1.90	1.206E-02	1120.29	15.100	1.100E+01	BI214
					1120.55	99.987	PBC<MDA	Sc46
1188.74	16.	25.00	1.95	1.150E-02	1189.05	16.200	4.770E+00	Ta182
1291.60	5.	45.46	2.02	1.077E-02	1291.60	43.200	PBC<MDA	FE59
1384.30	7.	85.58	2.08	1.018E-02	1384.30	24.290	PBC<MDA	AG110M
1408.00	6.	40.82	2.10	1.004E-02	1408.00	21.005	PBC<MDA	EU152
1460.74	111.	10.15	1.82	9.749E-03	1460.83	10.670	5.936E+01	K40
1690.98	5.	44.72	2.27	8.649E-03	1690.98	47.790	PBC<MDA	SB124
1765.08	11.	41.54	2.31	8.350E-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 **********

Channel	Peak Centroid Energy	Background Counts	Net Area Counts	Efficiency * Area	Uncert 1 Sigma %	FWHM keV	Suspected Nuclide
307.97	77.09	80.	83.	1.772E+03	22.15	0.828	-

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	161.	-17.	-0.009	110.63	0.998s
TH-227	200.20	50.14	173.	-18.	-0.010	107.37	1.001s
AM-241	237.77	59.54	153.	16.	0.009	114.32	1.010s
TH-234	252.77	63.29	169.	16.	0.009	119.34	1.014s
Sn-126	256.74	64.28	223.	-19.	-0.010	115.43	1.015s
BA-133	323.56	80.99	431.	-27.	-0.015	109.25	1.031s
Np-237	345.55	86.49	636.	-22.	-0.012	166.42	1.036s
EU-155	345.76	86.54	658.	-22.	-0.012	169.18	1.036s
Sn-126	347.35	86.94	655.	-22.	-0.012	168.84	1.037s
Sn-126	349.87	87.57	677.	-22.	-0.012	171.44	1.037s
Cd-109	351.75	88.04	698.	-22.	-0.012	174.04	1.038s
Nd-147	363.99	91.10	720.	-22.	-0.012	176.19	1.041s
TH-234	369.94	92.59	742.	-15.	-0.008	254.95	1.042
AC-228	372.98	93.35	757.	0.	0.000	1000.00	1.043s

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 5
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Gd-153	389.58	97.50	757.	0.	0.000	1000.00	1.047s
Np-239	397.58	99.50	757.	0.	0.000	1000.00	1.049s
Gd-153	412.37	103.20	757.	0.	0.000	1000.00	1.052s
Np-239	414.37	103.70	757.	0.	0.000	1000.00	1.053s
EU-155	420.82	105.31	757.	0.	0.000	1000.00	1.054s
Np-239	424.09	106.13	595.	19.	0.011	182.50	1.055s
EU-152	486.67	121.78	91.	15.	0.009	91.46	1.070
CO-57	487.80	122.06	106.	2.	0.001	731.14	1.070
EU-154	491.95	123.10	98.	-6.	-0.004	224.97	1.071
PA-234	524.72	131.29	406.	-20.	-0.011	142.85	1.079s
HF-181	531.64	133.02	426.	-20.	-0.011	146.06	1.081s
CE-144	533.69	133.54	446.	-20.	-0.011	149.34	1.081s
HF-181	544.74	136.30	467.	-10.	-0.006	296.90	1.084s
CO-57	545.43	136.47	477.	0.	0.000	1000.00	1.084s
Tc-99m	561.57	140.51	477.	0.	0.000	1000.00	1.088s
U-235	574.67	143.79	477.	0.	0.000	1000.00	1.091s
CE-141	581.29	145.44	513.	-22.	-0.012	146.27	1.092s
Ba-140	650.15	162.66	130.	-17.	-0.009	97.90	1.108
U-235	653.03	163.38	101.	8.	0.004	181.14	1.109s
CE-139	662.92	165.85	102.	15.	0.008	100.98	1.111
Cf-251	705.90	176.60	62.	-4.	-0.002	344.23	1.122s
U-235	742.37	185.72	84.	13.	0.007	138.51	1.130s
TH-229	773.52	193.51	84.	-18.	-0.010	102.44	1.137s
U-235	820.80	205.33	52.	14.	0.008	104.33	1.148s
TH-229	842.87	210.85	80.	-6.	-0.003	294.71	1.153s
Cf-251	907.45	227.00	28.	28.	0.016	41.55	1.168s
TH-227	943.33	235.97	352.	-17.	-0.010	154.70	1.176s
PB-212	953.97	238.63	30.	130.	0.072	10.55	1.179D
PB-214	967.43	242.00	26.	34.	0.019	27.50	1.182D
EU-152	978.21	244.69	286.	7.	0.004	336.01	1.185s
TH-227	1024.39	256.24	52.	8.	0.004	179.99	1.195s
Cd-113m	1054.23	263.70	105.	-18.	-0.010	85.13	1.202s
BI-210M	1062.75	265.83	123.	-14.	-0.008	65.02	1.204s
TL-208	1108.55	277.28	71.	13.	0.007	97.43	1.215s
Hg-203	1116.22	279.20	76.	8.	0.004	161.66	1.216s
I-131	1136.61	284.30	24.	10.	0.006	97.34	1.221s
PB-214	1178.27	294.72	21.	64.	0.036	18.17	1.706s
TL-210	1183.41	296.00	241.	12.	0.007	183.48	1.231s
PB-212	1199.52	300.03	253.	12.	0.007	187.35	1.235
PA-233	1200.12	300.18	267.	0.	0.000	1000.00	1.235
PA-231	1210.00	302.65	267.	0.	0.000	1000.00	1.237
BA-133	1210.81	302.85	267.	0.	0.000	1000.00	1.238s
Ba-140	1218.80	304.85	267.	0.	0.000	1000.00	1.240s
BI-210M	1218.99	304.90	267.	0.	0.000	1000.00	1.240s
Ir-192	1233.16	308.44	267.	0.	0.000	1000.00	1.243s
PA-233	1247.44	312.01	267.	0.	0.000	1000.00	1.246s
Ir-192	1265.35	316.49	267.	0.	0.000	1000.00	1.250s
La-140	1314.43	328.76	124.	12.	0.007	130.16	1.261s

ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 6
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
Cf-249	1333.15	333.44	136.	12.	0.007	135.77	1.265s
AC-228	1352.66	338.32	149.	12.	0.007	141.07	1.270s
Cs-136	1361.66	340.57	161.	9.	0.005	209.74	1.272
HF-181	1382.70	345.83	28.	5.	0.003	211.97	1.276s
PB-214	1406.72	351.84	22.	113.	0.063	11.84	0.833s
BA-133	1423.37	356.00	215.	-17.	-0.009	126.42	1.285s
I-131	1457.31	364.48	32.	0.	0.000	1000.00	1.293s
BA-133	1534.73	383.84	108.	-15.	-0.009	87.76	1.310s
Cf-249	1551.17	387.95	123.	-15.	-0.008	106.79	1.314s
SN-113	1566.12	391.69	154.	-17.	-0.009	109.03	1.317s
SB-125	1710.86	427.88	4.	5.	0.003	99.84	1.349s
AG-108M	1735.10	433.94	18.	17.	0.010	54.89	1.354s
PM-146	1814.87	453.88	22.	6.	0.004	155.20	1.372s
SB-125	1852.82	463.37	41.	3.	0.002	270.69	1.380s
Ir-192	1871.59	468.06	42.	-2.	-0.001	369.86	1.384s
BE-7	1909.73	477.60	91.	-14.	-0.008	101.99	1.392s
HF-181	1927.34	482.00	57.	10.	0.005	114.60	1.396s
La-140	1947.43	487.02	14.	5.	0.003	119.48	1.400s
RU-103	1987.56	497.05	22.	2.	0.001	516.09	1.409s
RH-106	2046.81	511.86	21.	88.	0.049	12.96	2.672s
Kr-85	2055.27	513.98	109.	0.	0.000	1000.00	1.424s
Ba-140	2148.39	537.26	22.	-4.	-0.002	224.25	1.444s
CS-134	2252.30	563.24	14.	9.	0.005	96.03	1.466s
CS-134	2276.64	569.32	23.	-2.	-0.001	300.00	1.471s
PA-234	2277.24	569.47	26.	0.	0.000	1000.00	1.471s
BI-207	2278.16	569.70	31.	-5.	-0.003	175.84	1.471s
TL-208	2333.02	583.41	17.	58.	0.032	19.75	0.613s
SB-125	2401.36	600.50	252.	-16.	-0.009	145.85	1.497s
SB-124	2410.29	602.73	236.	-16.	-0.009	141.22	1.499s
CS-134	2418.21	604.71	220.	-16.	-0.009	136.46	1.500
BI-214	2436.61	609.31	229.	6.	0.003	348.54	1.505
RU-103	2440.56	610.30	204.	16.	0.009	131.01	1.505s
AG-108M	2456.49	614.28	188.	16.	0.009	125.80	1.508s
PM-144	2471.62	618.06	173.	3.	0.002	570.90	1.512s
RH-106	2487.04	621.92	137.	14.	0.008	121.82	1.515s
SB-125	2542.94	635.89	19.	3.	0.002	191.31	1.526s
I-131	2547.28	636.97	36.	-10.	-0.005	172.95	1.527s
AG-110M	2630.43	657.76	20.	8.	0.004	86.60	1.544s
CS-137	2646.03	661.66	68.	-16.	-0.009	105.91	1.548s
PM-144	2785.58	696.54	18.	8.	0.004	87.93	1.576s
NB-94	2809.93	702.63	17.	5.	0.003	118.83	1.581s
SB-124	2890.57	722.79	70.	-17.	-0.009	75.34	1.598s
AG-108M	2891.17	722.94	87.	-13.	-0.007	106.60	1.598s
EU-154	2892.86	723.36	100.	0.	0.000	1000.00	1.598s
ZR-95	2896.22	724.20	77.	15.	0.008	88.72	1.599s
PM-146	2942.31	735.72	19.	-2.	-0.001	555.34	1.608s
PM-146	2988.08	747.16	14.	5.	0.003	164.92	1.617s
ZR-95	3026.36	756.73	20.	-4.	-0.002	278.57	1.625

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
AG-110M	3055.23	763.94	25.	0.	0.000	1000.00	1.631
NB-95	3062.61	765.79	25.	11.	0.006	69.38	1.632s
PA-234M	3065.10	766.41	38.	4.	0.002	224.64	1.633s
EU-152	3115.14	778.92	10.	1.	0.001	702.38	1.643s
BI-212	3141.15	785.42	48.	-13.	-0.007	91.13	1.648s
CS-134	3182.96	795.87	18.	8.	0.005	80.96	1.656s
TL-210	3197.88	799.60	26.	8.	0.005	94.77	1.659s
CS-134	3207.29	801.95	34.	3.	0.001	313.06	1.661s
CO-58	3242.59	810.78	30.	4.	0.002	200.00	1.668s
La-140	3262.58	815.77	34.	0.	0.000	1000.00	1.672s
Cs-136	3273.50	818.50	34.	0.	0.000	1000.00	1.674s
MN-54	3338.91	834.85	20.	0.	0.000	1000.00	1.687s
Co-56	3386.61	846.77	15.	9.	0.005	102.46	1.696s
TL-208	3441.80	860.56	6.	14.	0.008	44.66	1.707s
NB-94	3483.94	871.10	6.	20.	0.011	28.91	1.715s
EU-154	3492.47	873.23	27.	-1.	0.000	723.76	1.717
PA-234	3521.68	880.53	11.	6.	0.003	87.27	1.722s
PA-234	3532.53	883.24	17.	6.	0.003	104.55	1.724s
AG-110M	3538.30	884.68	23.	6.	0.003	119.38	1.725s
Sc-46	3556.69	889.28	40.	-6.	-0.003	163.05	1.729s
Y-88	3591.74	898.04	11.	3.	0.002	229.33	1.736s
AC-228	3643.88	911.07	28.	9.	0.005	135.21	1.746s
AG-110M	3749.60	937.49	15.	-3.	-0.002	289.64	1.766s
PA-234	3783.72	946.02	25.	-3.	-0.002	370.93	1.772s
EU-152	3856.11	964.11	8.	38.	0.021	19.69	1.786s
AC-228	3875.56	968.97	55.	-8.	-0.004	138.38	1.790s
EU-154	3985.03	996.33	43.	-13.	-0.007	78.60	1.810s
PA-234M	4003.71	1001.00	58.	-13.	-0.007	84.56	1.814s
EU-154	4018.82	1004.77	70.	4.	0.002	300.00	1.816s
Co-56	4151.13	1037.84	16.	-4.	-0.002	232.74	1.841s
Cs-136	4192.07	1048.07	13.	2.	0.001	319.37	1.848s
BI-207	4254.46	1063.66	16.	-4.	-0.002	286.60	1.860
Ga-68	4309.44	1077.40	5.	7.	0.004	89.75	1.870s
FE-59	4396.88	1099.25	21.	-9.	-0.005	117.15	1.886s
EU-152	4448.20	1112.07	28.	0.	0.000	1000.00	1.895s
ZN-65	4462.09	1115.55	28.	0.	0.000	1000.00	1.897s
BI-214	4481.06	1120.29	8.	36.	0.020	20.15	1.901
Sc-46	4482.12	1120.55	55.	-7.	-0.004	163.34	1.901
Ta-182	4485.12	1121.30	32.	0.	0.000	1000.00	1.901s
Ta-182	4756.25	1189.05	0.	16.	0.009	25.00	1.949s
Ta-182	4885.75	1221.41	28.	-12.	-0.007	105.15	1.972s
Co-56	4953.27	1238.28	17.	-1.	-0.001	633.09	1.984s
NA-22	5098.35	1274.53	17.	-4.	-0.002	154.11	2.008s
EU-154	5098.39	1274.54	21.	0.	0.000	1000.00	2.008s
FE-59	5166.65	1291.60	0.	5.	0.003	45.46	2.020s
TL-210	5252.32	1313.00	23.	-12.	-0.006	100.08	2.034s
AG-110M	5537.69	1384.30	6.	7.	0.004	85.58	2.082s
EU-152	5632.56	1408.00	0.	6.	0.003	40.82	2.097s

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Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
K-40	5843.65	1460.74	8.	111.	0.062	10.15	1.820
La-140	6385.95	1596.21	12.	-7.	-0.004	156.93	2.215s
SB-124	6765.35	1690.98	0.	5.	0.003	44.72	2.272s
BI-214	7059.65	1764.49	4.	11.	0.006	41.54	2.314s
Co-56	7087.11	1771.35	15.	0.	0.000	1000.00	2.318s
Y-88	7346.20	1836.06	6.	-3.	-0.002	195.32	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	?(	1.080E+01 1.02E+02 1.05E+01	G
NA-22	C	-2.0431E-01				9.50E+02	
			1274.53	-2.043E-01	?(	1.120E+00 1.54E+02 9.99E+01	G
K-40	N	5.9364E+01				4.66E+11	
			1460.83	5.936E+01	(P	8.421E+00 1.02E+01 1.07E+01	G
Sc-46	F	-2.1738E-01				8.38E+01	
			889.28	-2.174E-01	?(	1.233E+00 1.63E+02 1.00E+02	G
			1120.55	-3.046E-01	+	1.717E+00 1.63E+02 1.00E+02	G
CR-51	F	-8.3847E-02				2.77E+01	
			320.08	-8.385E-02	&(P	1.444E+01 2.57E+03 9.94E+00	G
FE-59	F	-1.6764E-01				4.45E+01	
			1099.25	-7.496E-01	?(	1.946E+00 1.17E+02 5.65E+01	G
			1291.60	5.935E-01	?(P	8.802E-01 4.55E+01 4.32E+01	G
Co-56	C	3.2711E-01				7.73E+01	
			846.77	3.271E-01	?(P	7.728E-01 1.02E+02 9.99E+01	G
			1238.28	-1.101E-01	- P	1.675E+00 6.33E+02 6.61E+01	G
			1037.84	-1.228E+00	+	6.553E+00 2.33E+02 1.41E+01	G
			1771.35	0.000E+00	-	8.950E+00 1.00E+03 1.55E+01	A
CO-57	C	2.4487E-02				2.72E+02	
			122.06	2.449E-02	&(	6.203E-01 7.31E+02 8.56E+01	G
			136.47	0.000E+00	&	1.055E+01 1.00E+03 1.07E+01	G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CO-58	C	1.4401E-01					7.09E+01	
			810.78	1.440E-01	&(	1.016E+00	2.00E+02	9.95E+01 G
CO-60	F	1.7638E-02					1.93E+03	
			1332.50	1.764E-02	%(	7.304E-01	1.68E+03	1.00E+02 G
			1173.24	3.194E-02	% P	1.030E+00	1.37E+03	9.99E+01 G
NB-94	I	4.6133E-01					7.41E+06	
			702.63	1.719E-01	&(P	7.132E-01	1.19E+02	9.79E+01 G
			871.10	7.450E-01	?(	5.469E-01	2.89E+01	9.99E+01 G
ZR-95	I	3.4422E-01					6.40E+01	
			756.73	-2.616E-01	&(P	1.475E+00	2.79E+02	5.45E+01 G
			724.20	1.092E+00	?(	3.252E+00	8.87E+01	4.42E+01 G
NB-95	I	3.8995E-01					6.40E+01	
			765.79	3.899E-01	?(	8.988E-01	6.94E+01	9.98E+01 G
RU-103	I	5.1151E-02					3.93E+01	
			497.05	5.115E-02	?(P	6.734E-01	5.16E+02	9.09E+01 G
			610.30	7.891E+00	?	3.479E+01	1.31E+02	5.75E+00 GA
RH-106	I	4.1053E+00					3.74E+02	
			621.92	4.105E+00	?(P	1.687E+01	1.22E+02	9.93E+00 G
			1050.36	-9.354E-01	%	5.881E+01	1.67E+03	1.56E+00 G
			511.86	1.117E+01	?	3.055E+00	1.30E+01	2.00E+01 GA
AG-108M	C	4.6984E-01					1.53E+05	
			433.94	4.314E-01	&(P	5.553E-01	5.49E+01	9.05E+01 G
			722.94	-4.636E-01	-	1.669E+00	1.07E+02	9.08E+01 G
			614.28	5.085E-01	?(	2.153E+00	1.26E+02	8.98E+01 G
AG-110M	F	4.5371E-01					2.50E+02	
			884.68	3.161E-01	&(	1.311E+00	1.19E+02	7.27E+01 G
			657.76	2.583E-01	?(	7.605E-01	8.66E+01	9.46E+01 G
			937.49	-3.497E-01	+	2.420E+00	2.90E+02	3.44E+01 G
			1384.30	1.627E+00	?(	3.100E+00	8.56E+01	2.43E+01 G
			763.94	0.000E+00	&	3.995E+00	1.00E+03	2.23E+01 G
SN-113	F	-5.4027E-01					1.15E+02	
			391.69	-5.403E-01	?(	1.980E+00	1.09E+02	6.40E+01 G
SB-124	F	-8.6572E-02					6.02E+01	
			602.73	-4.555E-01	?(	2.164E+00	1.41E+02	9.83E+01 G
			1690.98	6.721E-01	?(	9.906E-01	4.47E+01	4.78E+01 G
			722.79	-5.058E+00	+	1.270E+01	7.53E+01	1.08E+01 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
SB-125	I	5.5750E-01					1.01E+03	
			427.88	3.607E-01	?(	9.351E-01	9.98E+01	2.96E+01 G
			600.50	-2.496E+00	&	1.225E+01	1.46E+02	1.79E+01 G
			635.89	8.782E-01	?(	6.018E+00	1.91E+02	1.13E+01 G
			463.37	7.675E-01	&(P	7.309E+00	2.71E+02	1.05E+01 G
I-131	I	1.9833E-01					8.02E+00	
			364.48	0.000E+00	?(	7.083E-01	1.00E+03	8.17E+01 G
			284.30	2.837E+00	&(	6.971E+00	9.73E+01	6.14E+00 G
			636.97	-4.086E+00	+ P	1.273E+01	1.73E+02	7.17E+00 G
Ga-68	C	1.0275E+01					4.71E-02	
			1077.40	1.027E+01	?(	2.129E+01	8.97E+01	3.30E+00 G
BA-133	F	-5.2757E-01					3.85E+03	
			356.00	-5.276E-01	&(	2.242E+00	1.26E+02	6.20E+01 G
			302.85	0.000E+00	+	7.528E+00	1.00E+03	1.83E+01 G
			383.84	-3.539E+00	+ P	1.183E+01	8.78E+01	8.94E+00 GA
			80.99	-9.216E-01	+	3.358E+00	1.09E+02	3.41E+01 GA
CS-134	I	6.0800E-01					7.54E+02	
			795.87	3.362E-01	?(	9.203E-01	8.10E+01	8.55E+01 G
			604.71	-4.602E-01	-	2.113E+00	1.36E+02	9.76E+01 G
			569.32	-4.164E-01	-	4.501E+00	3.00E+02	1.54E+01 G
			801.95	1.102E+00	?(	1.226E+01	3.13E+02	8.69E+00 G
			563.24	2.878E+00	?(	6.570E+00	9.60E+01	8.35E+00 G
CS-137	I	-5.7975E-01					1.10E+04	
			661.66	-5.797E-01	?(P	1.477E+00	1.06E+02	8.52E+01 G
CE-139	F	2.1532E-01					1.38E+02	
			165.85	2.153E-01	&(	7.319E-01	1.01E+02	7.99E+01 G
Ba-140	I	-4.6868E-01					1.28E+01	
			537.26	-4.687E-01	?(P	2.668E+00	2.24E+02	2.44E+01 G
			162.66	-3.238E+00	+	1.063E+01	9.79E+01	6.22E+00 G
			304.85	0.000E+00	+	3.231E+01	1.00E+03	4.29E+00 G
La-140	I	-5.7394E-02					1.28E+01	
			1596.21	-4.626E-01	?(P	1.219E+00	1.57E+02	9.54E+01 G
			487.02	2.620E-01	&(	1.100E+00	1.19E+02	4.55E+01 G
			328.76	1.131E+00	?(	4.982E+00	1.30E+02	2.03E+01 G
			815.77	0.000E+00	+	4.618E+00	1.00E+03	2.33E+01 G
CE-141	I	-5.0906E-01					3.25E+01	
			145.44	-5.091E-01	@(	2.490E+00	1.46E+02	4.82E+01 G

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Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
CE-144	I	-1.9535E+00					2.85E+02	
			133.54	-1.953E+00	&(	9.767E+00	1.49E+02	1.11E+01 G
PM-144	C	1.6986E-01					3.63E+02	
			696.54	2.435E-01	?(P	7.279E-01	8.79E+01	9.90E+01 G
			618.06	9.629E-02	&(	1.883E+00	5.71E+02	9.91E+01 G
EU-152	F	2.8865E+00					4.94E+03	
			121.78	5.618E-01	&(	1.725E+00	9.15E+01	2.86E+01 G
			344.29	-2.753E-07	%	4.581E+00	4.83E+08	2.65E+01 G
			1112.07	0.000E+00	-	9.136E+00	1.00E+03	1.36E+01 G
			778.92	2.684E-01	?(	4.682E+00	7.02E+02	1.29E+01 G
			964.11	1.051E+01	?(	4.568E+00	1.97E+01	1.46E+01 G
			244.69	1.430E+00	&(	1.628E+01	3.36E+02	7.58E+00 G
			1408.00	1.580E+00	?	1.941E+00	4.08E+01	2.10E+01 GA
EU-154	I	1.7462E-01					3.14E+03	
			123.10	-1.629E-01	&(	1.258E+00	2.25E+02	4.08E+01 G
			1274.54	0.000E+00	+	3.491E+00	1.00E+03	3.52E+01 G
			723.36	0.000E+00	+	8.006E+00	1.00E+03	2.02E+01 G
			873.23	-2.774E-01	+ P	8.305E+00	7.24E+02	1.23E+01 G
			1004.77	9.390E-01	?(	9.789E+00	3.00E+02	1.80E+01 G
			996.33	-4.989E+00	+	1.313E+01	7.86E+01	1.06E+01 G
HF-181	F	3.4722E-01					4.24E+01	
			482.00	2.930E-01	&(	1.144E+00	1.15E+02	8.05E+01 G
			133.02	-4.995E-01	+	2.443E+00	1.46E+02	4.33E+01 G
			345.83	6.366E-01	?(	3.485E+00	2.12E+02	1.51E+01 G
			136.30	-1.907E+00	+	1.905E+01	2.97E+02	5.85E+00 G
Ta-182	F	1.5121E+00					1.14E+02	
			1121.30	0.000E+00	?(	3.838E+00	1.00E+03	3.49E+01 G
			1221.41	-2.254E+00	+	5.028E+00	1.05E+02	2.70E+01 G
			1189.05	4.770E+00	?(	2.197E+00	2.50E+01	1.62E+01 G
Hg-203	F	1.5919E-01					4.66E+01	
			279.20	1.592E-01	&(P	8.814E-01	1.62E+02	8.15E+01 G
TL-208	N	1.9258E+00					6.98E+02	
			583.02	1.926E+00	@(P	7.200E-01	1.98E+01	8.45E+01 G
			277.28	3.339E+00	+	1.097E+01	9.74E+01	6.31E+00 G
			860.56	4.283E+00	+ P	4.208E+00	4.47E+01	1.24E+01 G
PM-146	C	3.1878E-01					2.02E+03	
			453.88	2.267E-01	?(	8.735E-01	1.55E+02	6.50E+01 G
			747.16	4.948E-01	?(	1.994E+00	1.65E+02	3.40E+01 G
			735.72	-2.463E-01	+	3.376E+00	5.55E+02	2.25E+01 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 12
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
Y-88	F	-5.4880E-02					1.07E+02	
			1836.06	-2.311E-01	?(	1.001E+00	1.95E+02	9.92E+01 G
			898.04	1.316E-01	?(P	7.457E-01	2.29E+02	9.37E+01 G
Cd-113m		-4.7039E+03					5.33E+03	
			263.70	-4.704E+03	?(	1.339E+04	8.51E+01	6.00E-03 K
Cd-109	F	-6.2810E+00					4.53E+02	
			88.04	-6.281E+00	?(	3.653E+01	1.74E+02	3.79E+00 G
Cf-251	T	-3.1133E-01					3.28E+05	
			176.60	-3.113E-01	?(	2.838E+00	3.44E+02	1.70E+01 G
			227.00	6.399E+00	?	6.255E+00	4.15E+01	6.30E+00 GA
Cf-249	T	-1.0112E-01					1.28E+05	
			387.95	-4.774E-01	?(	1.716E+00	1.07E+02	6.60E+01 G
			333.44	1.500E+00	?(	6.890E+00	1.36E+02	1.55E+01 G
Sn-126		-2.6818E+00					3.65E+07	
			87.57	-6.361E-01	+	3.645E+00	1.71E+02	3.75E+01 GA
			64.28	-2.682E+00	?(	1.038E+01	1.15E+02	9.70E+00 G
			86.94	-2.646E+00	+	1.493E+01	1.69E+02	9.04E+00 GA
PB-210	N	-8.4384E+00					8.14E+03	
			46.54	-8.438E+00	?(	3.137E+01	1.11E+02	4.25E+00 G
PB-212	N	4.4864E+00					6.98E+02	
			238.63	4.486E+00	(	9.634E-01	1.05E+01	4.33E+01 G
			300.03	6.438E+00	+	4.071E+01	1.87E+02	3.28E+00 GA
PB-214	N	5.8140E+00					5.84E+05	
			351.93	5.851E+00	(P	1.262E+00	1.18E+01	3.76E+01 G
			295.09	5.743E+00	(P	2.122E+00	1.82E+01	1.93E+01 G
			242.00	6.839E+00	P	5.371E+00	2.75E+01	7.43E+00 GA
BI-207	C	-2.4265E-01					1.18E+04	
			1063.66	-2.427E-01	?(P	1.270E+00	2.87E+02	7.45E+01 G
			569.70	-1.311E-01	+	8.090E-01	1.76E+02	9.77E+01 G
BI-212	N	-1.7663E-01					6.98E+02	
			727.17	-1.766E-01	%(P	1.797E+01	2.88E+03	7.55E+00 G
			785.42	-3.504E+01	+ P	9.526E+01	9.11E+01	1.28E+00 GA
U-235	N	1.3477E+00					2.57E+11	
			143.79	0.000E+00	?(	1.051E+01	1.00E+03	1.10E+01 G
			205.33	3.765E+00	*(	9.766E+00	1.04E+02	5.01E+00 G
			163.38	1.871E+00	?(	1.159E+01	1.81E+02	5.08E+00 G

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 13
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

Nuclide		Ave activity	Energy	Activity	Code	Peak	MDA	Comments
			185.72	2.960E-01	&	1.063E+00	1.39E+02	5.40E+01 GA
BI-214	N	3.3318E+00					5.84E+05	
			609.31	3.878E-01	?(P	4.585E+00	3.49E+02	4.61E+01 G
			1120.29	1.100E+01	?(P	4.831E+00	2.02E+01	1.51E+01 G
			1764.49	4.623E+00	?(P	5.346E+00	4.15E+01	1.54E+01 G
BI-210M	T	-4.6279E-01					1.10E+09	
			265.83	-4.628E-01	?(P	1.741E+00	6.50E+01	5.00E+01 G
			304.90	0.000E+00	+	4.951E+00	1.00E+03	2.80E+01 G
AC-228	N	1.4019E+00					2.10E+03	
			911.07	1.169E+00	?(P	3.718E+00	1.35E+02	2.90E+01 G
			968.97	-1.844E+00	+	8.760E+00	1.38E+02	1.75E+01 G
			338.32	1.964E+00	*(	9.371E+00	1.41E+02	1.20E+01 G
			93.35	0.000E+00	-	2.529E+01	1.00E+03	5.56E+00 XA
TH-227	N	1.7847E+00					7.95E+03	
			256.24	1.785E+00	&(	8.101E+00	1.80E+02	7.00E+00 G
			235.97	-2.084E+00	&	1.082E+01	1.55E+02	1.23E+01 G
			50.14	-4.250E+00	+	1.531E+01	1.07E+02	8.00E+00 G
TH-229	N	-5.3020E+00					2.68E+06	
			193.51	-5.302E+00	?(	1.338E+01	1.02E+02	4.40E+00 G
			210.85	-2.751E+00	+	2.036E+01	2.95E+02	2.99E+00 G
TH-234	N	6.3531E-01					1.63E+12	
			92.59	-2.930E+00	(	2.501E+01	2.55E+02	5.58E+00 G
			63.29	5.861E+00	(	2.354E+01	1.19E+02	3.81E+00 G
PA-234	N	5.1706E-02					1.63E+12	
			131.29	-1.195E+00	?(	5.716E+00	1.43E+02	1.80E+01 G
			946.02	-9.031E-01	+	7.830E+00	3.71E+02	1.34E+01 G
			569.47	0.000E+00	+	8.812E+00	1.00E+03	8.20E+00 G
			883.24	2.389E+00	?(	8.656E+00	1.05E+02	9.60E+00 G
			880.53	3.809E+00	?	1.140E+01	8.73E+01	6.00E+00 GA
PA-234M	N	-6.7538E+01					1.63E+12	
			1001.00	-6.754E+01	?(	1.918E+02	8.46E+01	8.37E-01 G
			766.41	4.646E+01	+	3.669E+02	2.25E+02	2.94E-01 G
AM-241	T	6.6430E-01					1.58E+05	
			59.54	6.643E-01	?(	2.555E+00	1.14E+02	3.59E+01 G
Np-237	F	-1.8300E+00					2.14E+06	
			86.49	-1.830E+00	?(	1.018E+01	1.66E+02	1.31E+01 G

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     ORTEC g v - i (3263) Env32  G800W064  11/23/2019 11:58:46 PMPage 14
 TestAmerica Inc                 Spectrum name: 9_Gamma_20193498.An1

 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

Cs-136   F   1.0471E-01                                      1.30E+01
                          818.50 0.000E+00 ?(  1.078E+00 1.00E+03 1.00E+02 G
                         1048.07 9.105E-02 ?(  1.078E+00 3.19E+02 8.00E+01 G
                          340.57 3.513E-01 ?(  2.505E+00 2.10E+02 4.69E+01 G

Np-239   T   8.7612E-01                                      2.36E+00
                          103.70 0.000E+00 -   5.711E+00 1.00E+03 2.40E+01 X
                          106.13 8.761E-01 ?(  5.352E+00 1.83E+02 2.27E+01 G
                           99.50 0.000E+00 &   9.209E+00 1.00E+03 1.50E+01 X

Nd-147      -1.3373E-01                                      1.11E+01
                          531.00-1.337E-01 %(  4.895E+00 1.43E+03 1.30E+01 G
                           91.10-8.314E-01 +   4.894E+00 1.76E+02 2.83E+01 G

TL-210   N   2.7962E-01                                      5.84E+05
                          799.60 2.921E-01 ?(  9.446E-01 9.48E+01 9.90E+01 G
                          296.00 2.640E-01 ?(  1.636E+00 1.83E+02 7.90E+01 G
                         1313.00-2.904E+00 +   6.198E+00 1.00E+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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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 15
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

********** 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	161.	-17.	-0.009	110.63	-8.438E+00	
TH-227	50.14	173.	-18.	-0.010	107.37	-4.250E+00	
AM-241	59.54	153.	16.	0.009	114.32	6.643E-01	
TH-234	63.29	169.	16.	0.009	119.34	5.861E+00	
Sn-126	64.28	223.	-19.	-0.010	115.43	-2.682E+00	
BA-133	80.99	431.	-27.	-0.015	109.25	-9.216E-01	
Np-237	86.49	636.	-22.	-0.012	166.42	-1.830E+00	
EU-155	86.54	658.	-22.	-0.012	169.18	-7.806E-01	
Sn-126	86.94	655.	-22.	-0.012	168.84	-2.646E+00	
Sn-126	87.57	677.	-22.	-0.012	171.44	-6.361E-01	
Cd-109	88.04	698.	-22.	-0.012	174.04	-6.281E+00	
Nd-147	91.10	720.	-22.	-0.012	176.19	-8.314E-01	
TH-234	92.59	742.	-15.	-0.008	254.95	-2.930E+00	
Np-239	106.13	595.	19.	0.011	182.50	8.761E-01	
CO-57	122.06	106.	2.	0.001	731.14	2.449E-02	
EU-154	123.10	98.	-6.	-0.004	224.97	-1.629E-01	
PA-234	131.29	406.	-20.	-0.011	142.85	-1.195E+00	
HF-181	133.02	426.	-20.	-0.011	146.06	-4.995E-01	
CE-144	133.54	446.	-20.	-0.011	149.34	-1.953E+00	
HF-181	136.30	467.	-10.	-0.006	296.90	-1.907E+00	
CE-141	145.44	513.	-22.	-0.012	146.27	-5.091E-01	
Ba-140	162.66	130.	-17.	-0.009	97.90	-3.238E+00	
U-235	163.38	101.	8.	0.004	181.14	1.871E+00	
CE-139	165.85	102.	15.	0.008	100.98	2.153E-01	
Cf-251	176.60	62.	-4.	-0.002	344.23	-3.113E-01	
U-235	185.72	84.	13.	0.007	138.51	2.960E-01	
TH-229	193.51	84.	-18.	-0.010	102.44	-5.302E+00	
U-235	205.33	52.	14.	0.008	104.33	3.765E+00	
TH-229	210.85	80.	-6.	-0.003	294.71	-2.751E+00	
Cf-251	227.00	28.	28.	0.016	41.55	6.399E+00	
TH-227	235.97	352.	-17.	-0.010	154.70	-2.084E+00	
TH-227	256.24	52.	8.	0.004	179.99	1.785E+00	
Cd-113m	263.70	105.	-18.	-0.010	85.13	-4.704E+03	
BI-210M	265.83	123.	-14.	-0.008	65.02	-4.628E-01	P
I-131	284.30	24.	10.	0.006	97.34	2.837E+00	
TL-210	296.00	241.	12.	0.007	183.48	2.640E-01	
La-140	328.76	124.	12.	0.007	130.16	1.131E+00	
Cf-249	333.44	136.	12.	0.007	135.77	1.500E+00	
AC-228	338.32	149.	12.	0.007	141.07	1.964E+00	
Cs-136	340.57	161.	9.	0.005	209.74	3.513E-01	
HF-181	345.83	28.	5.	0.003	211.97	6.366E-01	
BA-133	356.00	215.	-17.	-0.009	126.42	-5.276E-01	
BA-133	383.84	108.	-15.	-0.009	87.76	-3.539E+00	P
Cf-249	387.95	123.	-15.	-0.008	106.79	-4.774E-01	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 16
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM
SN-113	391.69	154.	-17.	-0.009	109.03	-5.403E-01	
SB-125	427.88	4.	5.	0.003	99.84	3.607E-01	
AG-108M	433.94	18.	17.	0.010	54.89	4.314E-01	P
PM-146	453.88	22.	6.	0.004	155.20	2.267E-01	
SB-125	463.37	41.	3.	0.002	270.69	7.675E-01	P
Ir-192	468.06	42.	-2.	-0.001	369.86	-1.149E-01	
BE-7	477.60	91.	-14.	-0.008	101.99	-3.142E+00	
HF-181	482.00	57.	10.	0.005	114.60	2.930E-01	
La-140	487.02	14.	5.	0.003	119.48	2.620E-01	
RU-103	497.05	22.	2.	0.001	516.09	5.115E-02	P
RH-106	511.86	21.	88.	0.049	12.96	1.117E+01	
Ba-140	537.26	22.	-4.	-0.002	224.25	-4.687E-01	P
CS-134	563.24	14.	9.	0.005	96.03	2.878E+00	
CS-134	569.32	23.	-2.	-0.001	300.00	-4.164E-01	
BI-207	569.70	31.	-5.	-0.003	175.84	-1.311E-01	
SB-125	600.50	252.	-16.	-0.009	145.85	-2.496E+00	
SB-124	602.73	236.	-16.	-0.009	141.22	-4.555E-01	
CS-134	604.71	220.	-16.	-0.009	136.46	-4.602E-01	
RU-103	610.30	204.	16.	0.009	131.01	7.891E+00	
AG-108M	614.28	188.	16.	0.009	125.80	5.085E-01	
PM-144	618.06	173.	3.	0.002	570.90	9.629E-02	
RH-106	621.92	137.	14.	0.008	121.82	4.105E+00	P
SB-125	635.89	19.	3.	0.002	191.31	8.782E-01	
I-131	636.97	36.	-10.	-0.005	172.95	-4.086E+00	P
AG-110M	657.76	20.	8.	0.004	86.60	2.583E-01	
CS-137	661.66	68.	-16.	-0.009	105.91	-5.797E-01	P
PM-144	696.54	18.	8.	0.004	87.93	2.435E-01	P
NB-94	702.63	17.	5.	0.003	118.83	1.719E-01	P
SB-124	722.79	70.	-17.	-0.009	75.34	-5.058E+00	
AG-108M	722.94	87.	-13.	-0.007	106.60	-4.636E-01	
ZR-95	724.20	77.	15.	0.008	88.72	1.092E+00	
PM-146	735.72	19.	-2.	-0.001	555.34	-2.463E-01	
PM-146	747.16	14.	5.	0.003	164.92	4.948E-01	
ZR-95	756.73	20.	-4.	-0.002	278.57	-2.616E-01	P
NB-95	765.79	25.	11.	0.006	69.38	3.899E-01	
PA-234M	766.41	38.	4.	0.002	224.64	4.646E+01	
BI-212	785.42	48.	-13.	-0.007	91.13	-3.504E+01	P
CS-134	795.87	18.	8.	0.005	80.96	3.362E-01	
TL-210	799.60	26.	8.	0.005	94.77	2.921E-01	
CS-134	801.95	34.	3.	0.001	313.06	1.102E+00	
CO-58	810.78	30.	4.	0.002	200.00	1.440E-01	
Co-56	846.77	15.	9.	0.005	102.46	3.271E-01	P
NB-94	871.10	6.	20.	0.011	28.91	7.450E-01	
EU-154	873.23	27.	-1.	0.000	723.76	-2.774E-01	P
PA-234	880.53	11.	6.	0.003	87.27	3.809E+00	
PA-234	883.24	17.	6.	0.003	104.55	2.389E+00	
AG-110M	884.68	23.	6.	0.003	119.38	3.161E-01	
Sc-46	889.28	40.	-6.	-0.003	163.05	-2.174E-01	

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ORTEC g v - i (3263) Env32 G800W064 11/23/2019 11:58:46 PMPage 17
TestAmerica Inc Spectrum name: 9_Gamma_20193498.An1

Nuclide	Channel	Energy	Background	Net area	Cnts/sec	Uncert	FWHM	
Y-88	898.04	11.	3.	0.002	229.33	1.316E-01		P
AC-228	911.07	28.	9.	0.005	135.21	1.169E+00		P
AG-110M	937.49	15.	-3.	-0.002	289.64	-3.497E-01		
PA-234	946.02	25.	-3.	-0.002	370.93	-9.031E-01		
AC-228	968.97	55.	-8.	-0.004	138.38	-1.844E+00		
EU-154	996.33	43.	-13.	-0.007	78.60	-4.989E+00		
PA-234M	1001.00	58.	-13.	-0.007	84.56	-6.754E+01		
EU-154	1004.77	70.	4.	0.002	300.00	9.390E-01		
Co-56	1037.84	16.	-4.	-0.002	232.74	-1.228E+00		
Cs-136	1048.07	13.	2.	0.001	319.37	9.105E-02		
BI-207	1063.66	16.	-4.	-0.002	286.60	-2.427E-01		P
Ga-68	1077.40	5.	7.	0.004	89.75	1.027E+01		
FE-59	1099.25	21.	-9.	-0.005	117.15	-7.496E-01		
Sc-46	1120.55	55.	-7.	-0.004	163.34	-3.046E-01		
Co-56	1238.28	17.	-1.	-0.001	633.09	-1.101E-01		P
NA-22	1274.53	17.	-4.	-0.002	154.11	-2.043E-01		
FE-59	1291.60	0.	5.	0.003	45.46	5.935E-01		P
TL-210	1313.00	23.	-12.	-0.006	100.08	-2.904E+00		
AG-110M	1384.30	6.	7.	0.004	85.58	1.627E+00		
La-140	1596.21	12.	-7.	-0.004	156.93	-4.626E-01		P
SB-124	1690.98	0.	5.	0.003	44.72	6.721E-01		
Y-88	1836.06	6.	-3.	-0.002	195.32	-2.311E-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	-3.1419E+00	-3.1419E+00	1.020E+02%	1.08E+01
NA-22	#A	-2.0431E-01	-2.0431E-01	1.541E+02%	1.12E+00
K-40		5.9364E+01	5.9364E+01	1.015E+01%	8.42E+00
Sc-46	#A	-2.1738E-01	-2.1738E-01	1.631E+02%	1.23E+00
CR-51	#A	-8.3846E-02	-8.3847E-02	2.569E+03%	1.44E+01
MN-54	#A	0.0000E+00	0.0000E+00	1.000E+03%	8.63E-01
FE-59	#A	-1.6764E-01	-1.6764E-01	4.546E+01%	1.95E+00
Co-56	#A	3.2711E-01	3.2711E-01	1.025E+02%	7.73E-01
CO-57	#A	2.4487E-02	2.4487E-02	7.311E+02%	6.20E-01
CO-58	#A	1.4401E-01	1.4401E-01	2.000E+02%	1.02E+00
CO-60	#A	1.7638E-02	1.7638E-02	1.684E+03%	7.30E-01
ZN-65	#A	0.0000E+00	0.0000E+00	1.000E+03%	2.47E+00
NB-94	#A	4.6133E-01	4.6133E-01	2.891E+01%	7.13E-01
ZR-95	#A	3.4422E-01	3.4422E-01	8.872E+01%	1.48E+00
NB-95	#A	3.8995E-01	3.8995E-01	6.938E+01%	8.99E-01
RU-103	#A	5.1151E-02	5.1151E-02	5.161E+02%	6.73E-01
RH-106	#A	4.1053E+00	4.1053E+00	1.218E+02%	1.69E+01
AG-108M	#A	4.6984E-01	4.6984E-01	5.489E+01%	5.55E-01

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AG-110M#A	4.5371E-01	4.5371E-01	5.684E+01%	1.31E+00
SN-113 #A	-5.4027E-01	-5.4027E-01	1.090E+02%	1.98E+00
SB-124 #A	-8.6571E-02	-8.6572E-02	4.472E+01%	2.16E+00
SB-125 #A	5.5750E-01	5.5750E-01	9.984E+01%	9.35E-01
I-131 #A	1.9832E-01	1.9833E-01	9.734E+01%	7.08E-01
Gd-153 #A	0.0000E+00	0.0000E+00	7.071E+02%	4.63E+00
Ga-68 #A	1.0221E+01	1.0275E+01	8.975E+01%	2.13E+01
Tc-99m #A	0.0000E+00	0.0000E+00	1.000E+03%	1.32E+00
BA-133 #A	-5.2757E-01	-5.2757E-01	1.264E+02%	2.24E+00
CS-134 #A	6.0800E-01	6.0800E-01	8.096E+01%	9.20E-01
CS-137 #A	-5.7975E-01	-5.7975E-01	1.059E+02%	1.48E+00
CE-139 #A	2.1532E-01	2.1532E-01	1.010E+02%	7.32E-01
Ba-140 #A	-4.6867E-01	-4.6868E-01	2.243E+02%	2.67E+00
La-140 #A	-5.7393E-02	-5.7394E-02	7.877E+01%	1.22E+00
CE-141 #A	-5.0906E-01	-5.0906E-01	1.463E+02%	2.49E+00
CE-144 #A	-1.9535E+00	-1.9535E+00	1.493E+02%	9.77E+00
PM-144 #A	1.6986E-01	1.6986E-01	8.793E+01%	7.28E-01
EU-152 #C	2.8865E+00	2.8865E+00	1.969E+01%	1.73E+00
EU-154 #A	1.7462E-01	1.7462E-01	1.875E+02%	1.26E+00
EU-155 #A	0.0000E+00	0.0000E+00	1.000E+03%	6.45E+00
HF-181 #A	3.4722E-01	3.4722E-01	1.146E+02%	1.14E+00
Ta-182 #A	1.5121E+00	1.5121E+00	2.500E+01%	3.84E+00
Hg-203 #A	1.5919E-01	1.5919E-01	1.617E+02%	8.81E-01
TL-208 #	1.9258E+00	1.9258E+00	1.975E+01%	7.20E-01
PM-146 #A	3.1878E-01	3.1878E-01	1.132E+02%	8.73E-01
Y-88 #A	-5.4880E-02	-5.4880E-02	1.506E+02%	1.00E+00
Cd-113m#A	-4.7039E+03	-4.7039E+03	8.513E+01%	1.34E+04
Cd-109 #A	-6.2810E+00	-6.2810E+00	1.740E+02%	3.65E+01
Cf-251 #A	-3.1133E-01	-3.1133E-01	3.442E+02%	2.84E+00
Cf-249 #A	-1.0112E-01	-1.0112E-01	8.637E+01%	1.72E+00
Sn-126 #A	-2.6818E+00	-2.6818E+00	1.154E+02%	1.04E+01
PB-210 #A	-8.4384E+00	-8.4384E+00	1.106E+02%	3.14E+01
PB-212	4.4864E+00	4.4864E+00	1.055E+01%	9.63E-01
PB-214	5.8140E+00	5.8140E+00	1.084E+01%	1.26E+00
BI-207 #A	-2.4265E-01	-2.4265E-01	2.866E+02%	1.27E+00
BI-212 #A	-1.7663E-01	-1.7663E-01	2.881E+03%	1.80E+01
U-235 #A	1.3477E+00	1.3477E+00	1.043E+02%	1.05E+01
BI-214 #A	3.3318E+00	3.3318E+00	2.015E+01%	4.58E+00
BI-210M#A	-4.6279E-01	-4.6279E-01	6.502E+01%	1.74E+00
AC-228 #A	1.4019E+00	1.4019E+00	9.770E+01%	3.72E+00
TH-227 #A	1.7847E+00	1.7847E+00	1.800E+02%	8.10E+00
TH-229 #A	-5.3020E+00	-5.3020E+00	1.024E+02%	1.34E+01
TH-234 #A	6.3531E-01	6.3531E-01	1.193E+02%	2.50E+01
PA-231 #A	0.0000E+00	0.0000E+00	1.000E+03%	4.79E+01
PA-233 #A	0.0000E+00	0.0000E+00	7.071E+02%	3.91E+00
PA-234 #A	5.1706E-02	5.1706E-02	8.851E+01%	5.72E+00
PA-234M#A	-6.7538E+01	-6.7538E+01	8.456E+01%	1.92E+02
AM-241 #A	6.6430E-01	6.6430E-01	1.143E+02%	2.56E+00
Np-237 #A	-1.8300E+00	-1.8300E+00	1.664E+02%	1.02E+01

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Ir-192	#A	0.0000E+00	0.0000E+00	7.071E+02%	1.63E+00
Cs-136	#A	1.0471E-01	1.0471E-01	2.097E+02%	1.08E+00
Np-239	#A	8.7603E-01	8.7612E-01	1.825E+02%	5.35E+00
Nd-147	#A	-1.3373E-01	-1.3373E-01	1.430E+03%	4.89E+00
TL-210	#A	2.7962E-01	2.7962E-01	9.477E+01%	9.45E-01
Kr-85	#A	0.0000E+00	0.0000E+00	1.000E+03%	3.04E+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) 7.159E+01 Bq/Sample
Total Decayed Activity (25.1 to 1999.3 keV) 7.1590698E+01 Bq/Sample

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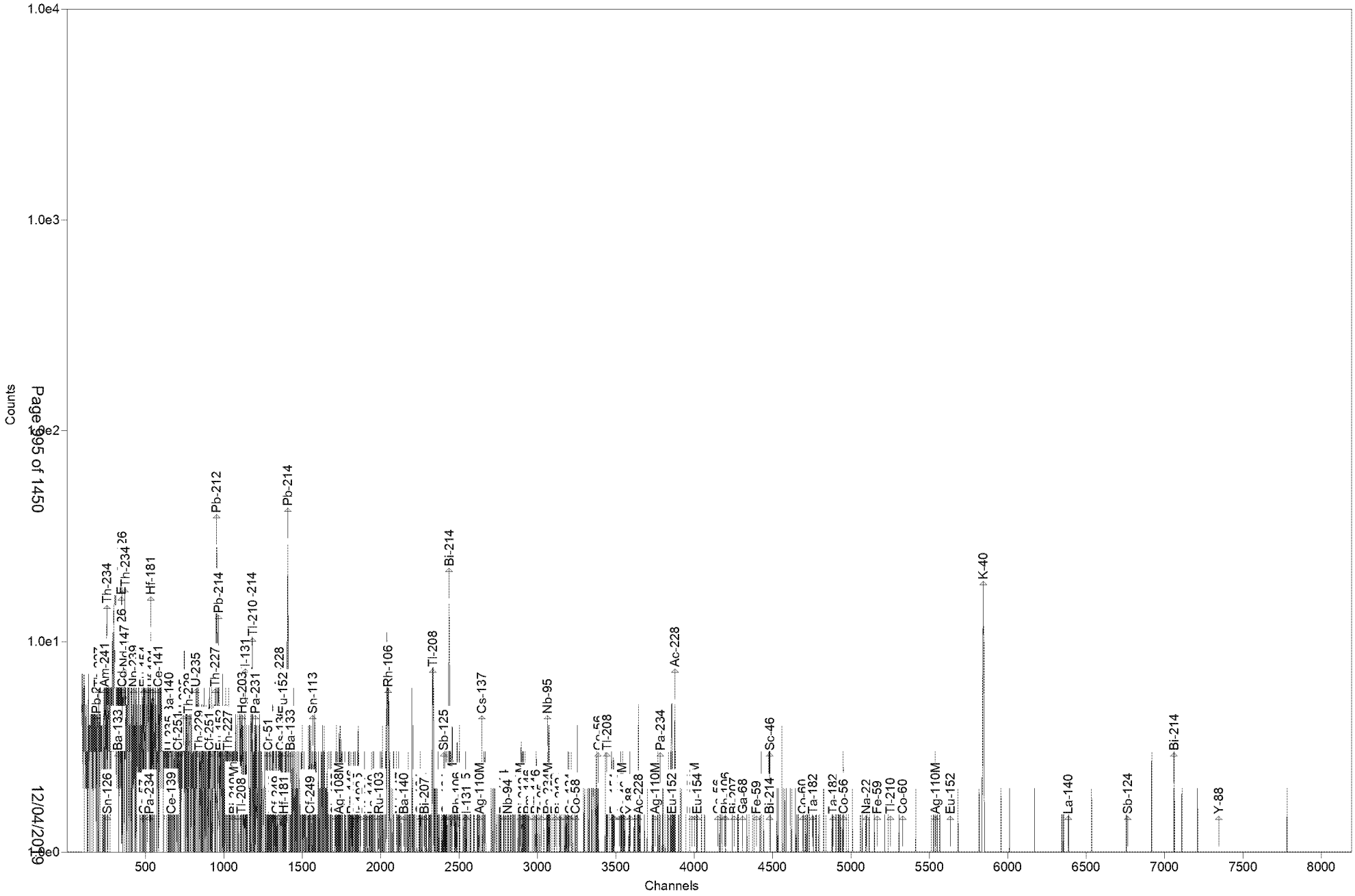
448571_Gamma_160-36160-A-15-C. 9_Gamma_20193498.spc.



Daily Checks

Test America
St. Louis
Background Check

Spectrum: 5_20191123001_BG
Description: Background Contamination Check
Acquired: 11/23/2019 7:18:37 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	1.51	1.55	1.60	PASS

Analyst: Shiloh Smith Reviewer: Shiloh Smith

Test America
St. Louis
Quality Control Check

Spectrum: 5_20191123002_QCAsLeft
Description: Quality control Check (QC Source 'A') Post Stabilization
Acquired: 11/23/2019 8:12:30 PM
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	0.74	1.84	1.94	PASS
ActivityDiff	636.60	-5.00	-4.00	-1.25	4.00	5.00	PASS
QA-662							
FWHM	1.36	0.00	0.00	1.34	3.06	3.16	PASS
ActivityDiff	596.80	-5.00	-4.00	-2.16	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5328.20	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.10	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.72	4.10	4.20	PASS
ActivityDiff	1164.20	-5.00	-4.00	-2.22	4.00	5.00	PASS

Analyst: Shiloh Smith Reviewer: Shiloh Smith

Test America
St. Louis
Quality Control Check

Spectrum: 5_20191126001_QCAsLeft
Description: Quality control Check (QC Source 'A') Post Stabilization
Acquired: 11/26/2019 12:37:39 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	59.58	59.79	60.04	PASS
FWHM	0.74	0.00	0.00	0.75	1.84	1.94	PASS
ActivityDiff	636.60	-5.00	-4.00	0.13	4.00	5.00	PASS
QA-662							
FWHM	1.36	0.00	0.00	1.35	3.06	3.16	PASS
ActivityDiff	596.80	-5.00	-4.00	-0.51	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5328.20	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.11	1333.01	1333.26	PASS
FWHM	1.90	0.00	0.00	1.92	4.10	4.20	PASS
ActivityDiff	1164.20	-5.00	-4.00	-1.50	4.00	5.00	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Background Check

Spectrum: 5_20191126002_BG
Description: Background Contamination Check
Acquired: 11/26/2019 1:07:15 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	1.52	1.55	1.60	PASS

Analyst: Justin Banner Reviewer: kody Saulters

Test America
St. Louis
Quality Control Check

Spectrum: 9_20191123001_QCAsLeft
Description: Quality control Check (QC Source 'E') Post Stabilization
Acquired: 11/23/2019 8:28:51 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	237.80	239.00	240.00	PASS
Energy	59.54	59.04	59.29	59.56	59.79	60.04	PASS
FWHM	1.08	0.00	0.00	0.93	2.18	2.28	PASS
ActivityDiff	649.44	-5.00	-4.00	-1.59	4.00	5.00	PASS
QA-662							
FWHM	1.62	0.00	0.00	1.51	3.32	3.42	PASS
ActivityDiff	607.56	-5.00	-4.00	0.08	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5329.70	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.35	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	0.99	4.00	5.00	PASS

Analyst: Kellene Robbs Reviewer: Kellene Robbs

Test America
St. Louis
Background Check

Spectrum: 9_20191123002_BG
Description: Background Contamination Check
Acquired: 11/23/2019 8:47:20 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	1.86	2.14	2.26	PASS

Analyst: Kellene Robbs Reviewer: Kellene Robbs

Test America
St. Louis
Quality Control Check

Spectrum: 12_20191123001_QCAsLeft
Description: Quality control Check (QC Source 'H') Post Stabilization
Acquired: 11/23/2019 8:29:26 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	237.90	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	0.83	2.00	2.10	PASS
ActivityDiff	691.00	-5.00	-4.00	1.29	4.00	5.00	PASS
QA-662							
FWHM	1.48	0.00	0.00	1.45	3.18	3.28	PASS
ActivityDiff	659.00	-5.00	-4.00	0.03	4.00	5.00	PASS
QA-1332							
Channel	5330.00	5327.00	5328.00	5330.30	5332.00	5333.00	PASS
Energy	1332.51	1331.76	1332.01	1332.55	1333.01	1333.26	PASS
FWHM	2.00	0.00	0.00	1.93	4.20	4.30	PASS
ActivityDiff	1274.00	-5.00	-4.00	0.93	4.00	5.00	PASS

Analyst: Kellene Robbs Reviewer: Kellene Robbs

Test America
St. Louis
Background Check

Spectrum: 12_20191123002_BG
Description: Background Contamination Check
Acquired: 11/23/2019 8:47:47 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	2.02	2.07	2.10	PASS

Analyst: Kellene Robbs Reviewer: Kellene Robbs

Initial Calibrations

Ge05_90099_solidcert 2012.xls

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 Channel	Centroid 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 Counting 1 Sigma	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

Ge09_90099_solidcert 2012 TALS.xls

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 Channel	Centroid 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	Peak 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:	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

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 Counting	1 Sigma	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

Ge12_108513_solidcert 2018 TALS.xls

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

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```
     ORTEC g v - i (3263) Env32  G800W064  4/20/2018 11:55:21 AMPage  1
TestAmerica Inc                  Spectrum name: 12_TunaCan_20180005.An1

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

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ORTEC g v - i (3263) Env32 G800W064 4/20/2018 11:55:21 AMPage 2
TestAmerica Inc Spectrum name: 12_TunaCan_20180005.An1

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				

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ORTEC g v - i (3263) Env32 G800W064 4/20/2018 11:55:21 AMPage 3
TestAmerica Inc Spectrum name: 12_TunaCan_20180005.An1

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

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ORTEC g v - 1 (3263) Env32 G800W064 4/20/2018 11:55:21 AMPage 4
TestAmerica Inc Spectrum name: 12_TunaCan_20180005.An1

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	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	

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ORTEC g v - i (3263) Env32 G800W064 4/20/2018 11:55:21 AMPage 5
TestAmerica Inc Spectrum name: 12_TunaCan_20180005.Anl

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

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     ORTEC g v - i (3263) Env32  G800W064  4/20/2018 11:55:21 AMPage  6
TestAmerica Inc                  Spectrum name: 12_TunaCan_20180005.Anl

      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
-------------------------------------------------------------------------
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
```

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Initial Calibration Verifications

Ge05_90099_solidcert 2012

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

5_TunaCan2nd_20120813

```
     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
```

5_TunaCan2nd_20120813

```
      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				

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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 Channel	Centroid 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

ORTEC g v - i (3263) Env32 G53W4.25 3/28/2012 7:35:49 AM Page 3
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

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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.

ORTEC g v - i (3263) Env32 G53W4.25 3/28/2012 7:35:49 AM Page 4
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	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.

5_TunaCan2nd_20120813

ORTEC g v - i (3263) Env32 G53W4.25 3/28/2012 7:35:49 AM Page 5
TestAmerica Spectrum name: 5_TunaCan2nd_20120813.An1

@ - 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

ORTEC g v - i (3263) Env32 G53W4.25 3/28/2012 7:35:49 AM Page 6
TestAmerica Spectrum name: 5_TunaCan2nd_20120813.An1

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

Page 5

5_TunaCan2nd_20120813

```
  < - 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
```

Page 6

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

9_TunaCan_20120371

```
     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
```

9_TunaCan_20120371

```
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

9_TunaCan_20120371
TestAmerica, Inc Spectrum name: 9_TunaCan_20120371.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	1.3971E+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.

ORTEC g v - i (3263) Env32 G53W4.25 6/14/2012 1:20:45 PM Page 5
TestAmerica, Inc Spectrum name: 9_TunaCan_20120371.An1

@ - 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

Page 4

9_TunaCan_20120371

```
      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
```

ORTEC g v - i (3263) Env32 G53W4.25 6/14/2012 1:20:45 PM Page 6
TestAmerica, Inc Spectrum name: 9_TunaCan_20120371.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 (  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
```

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Ge12_108513_solidcert 2018 TALS.xls

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

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```
     ORTEC g v - i (3263) Env32  G800W064  4/24/2018 10:50:03 AMPage  1
TestAmerica Inc                  Spectrum name: 12_TunaCan_20180012.An1

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

                                 (Page 2 of 7)
```

ORTEC g v - i (3263) Env32 G800W064 4/24/2018 10:50:03 AMPage 2
TestAmerica Inc Spectrum name: 12_TunaCan_20180012.An1

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

(Page 3 of 7)

ORTEC g v - i (3263) Env32 G800W064 4/24/2018 10:50:03 AMPage 3
TestAmerica Inc Spectrum name: 12_TunaCan_20180012.An1

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

(Page 4 of 7)

ORTEC g v - i (3263) Env32 G800W064 4/24/2018 10:50:03 AMPage 4
TestAmerica Inc Spectrum name: 12_TunaCan_20180012.An1

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	Peak 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

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```
     ORTEC g v - i (3263) Env32  G800W064  4/24/2018 10:50:03 AMPage  5
TestAmerica Inc                  Spectrum name: 12_TunaCan_20180012.An1

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:                      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 %

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
```

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ORTEC g v - i (3263) Env32 G800W064 4/24/2018 10:50:03 AMPage 6
TestAmerica Inc Spectrum name: 12_TunaCan_20180012.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 *****

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)

Monthly Backgrounds

Test America
St. Louis
Background Check

Spectrum: 5_20191109017_BGLong
Description: Background Long PBC Count
Acquired: 11/9/2019 6:15:16 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	1.45	1.55	1.60	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

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```
     ORTEC g v - i (1087) Env32  G800W064  11/10/2019 2:18:49 PMPage  1
TestAmerica Inc                 Spectrum name: 5_20191109017_BGLong.An1

Sample description
     Background Long PBC Count


Spectrum Filename: C:\User\SPC\Det5\5_20191109017_BGLong.An1

Acquisition information
       Start time:                 11/9/2019 6:15:16 PM
       Live time:              72000
       Real time:              72190
       Dead time:                  0.26 %
       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


                                (Page 2 of 7)
```

ORTEC g v - i (1087) Env32 G800W064 11/10/2019 2:18:49 PMPage 2
TestAmerica Inc Spectrum name: 5_20191109017_BGLong.An1

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: 0.1200

***** 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	576.	9.43	0.73	5.680E-02	46.54	4.250	3.314E+00	PB210
59.54	251.	16.09	0.91	7.420E-02	59.54	35.900	1.309E-01	AM241
63.34	630.	8.75	0.77	7.930E-02	63.29	3.810	2.900E+00	TH234
74.85	164.	20.27	0.81	9.476E-02				
77.20	114.	28.63	0.82	9.790E-02				
92.46	823.	6.12	1.07	1.129E-01	92.59	5.584	1.814E+00	TH234
					93.35	5.561	1.820E+00	AC228
143.71	159.	27.85	1.78	1.085E-01	143.79	10.960	1.857E-01	U235
					145.44	48.200	4.245E-02	CE141
185.71	463.	10.63	1.05	9.608E-02	185.72	54.000	1.239E-01	U235
					185.99	3.280	2.041E+00	Ra226
238.54	187.	21.70	0.85	8.326E-02	238.63	43.300	7.194E-02	PB212
352.02	208.	18.24	1.67	5.571E-02	351.93	37.600	1.379E-01	PB214
					351.93	37.600	1.379E-01	PB214
510.88	1762.	5.17	2.41	3.837E-02	511.86	20.000	3.195E+00	RH106
609.17	182.	20.52	1.10	3.200E-02	609.31	46.090	1.714E-01	BI214
661.44	164.	16.46	1.32	2.860E-02	661.66	85.210	9.364E-02	CS137
1460.63	160.	14.27	1.47	1.300E-02	1460.83	10.670	1.597E+00	K40
1764.75	78.	18.04	1.15	1.105E-02	1764.49	15.400	6.365E-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	
299.05	74.85	468.	164.	1.727E+03	20.27	0.813	-	D

(Page 3 of 7)

ORTEC g v - i (1087) Env32 G800W064 11/10/2019 2:18:49 PMPage 3
TestAmerica Inc Spectrum name: 5_20191109017_BGLong.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected
308.44	77.20	479.	114.	1.169E+03	28.63	0.815	- D
2044.11	510.88	642.	1762.	4.593E+04	5.17	2.408	-

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	185.82	46.57	678.	576.	0.008	9.43	0.731s
AM-241	237.73	59.54	460.	251.	0.003	16.09	0.909s
TH-234	252.93	63.34	659.	630.	0.009	8.75	0.768
TH-234	369.55	92.46	542.	823.	0.011	6.12	1.066s
U-235	574.68	143.71	515.	159.	0.002	27.85	1.778s
U-235	742.85	185.72	533.	415.	0.006	8.68	1.053D
PB-212	954.26	238.54	436.	187.	0.003	21.70	0.848s
PB-214	1408.43	352.02	336.	208.	0.003	18.24	1.673s
BI-214	2437.37	609.17	280.	182.	0.003	20.52	1.097
CS-137	2646.47	661.44	155.	164.	0.002	16.46	1.319
K-40	5841.95	1460.63	52.	160.	0.002	14.27	1.467s
BI-214	7057.09	1764.75	20.	78.	0.001	18.04	1.153s

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	Code	Average Activity DPS	Peak Energy keV	Peak Activity DPS	Code	MDA Value DPS		COMMENTS
K-40	N	1.5973E+00					4.66E+11	
			1460.83	1.597E+00	*(	3.653E-01	1.43E+01	1.07E+01 G
CS-137	I	9.3644E-02					1.10E+04	
			661.66	9.364E-02	(	3.457E-02	1.65E+01	8.52E+01 G
PB-210	N	3.3138E+00					8.14E+03	
			46.54	3.314E+00	@(	7.140E-01	9.43E+00	4.25E+00 G

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```
     ORTEC g v - i (1087) Env32  G800W064  11/10/2019 2:18:49 PMPage  4
 TestAmerica Inc                Spectrum name: 5_20191109017_BGLong.An1

 Nuclide  Ave activity   Energy    Activity  Code Peak MDA  Comments

PB-212   N   7.1937E-02                                     6.98E+02
                         238.63 7.194E-02 *(  3.856E-02 2.17E+01 4.33E+01 G
                         300.03 0.000E+00 %   3.744E-01 3.89E+02 3.28E+00 GA

PB-214   N   1.3786E-01                                     5.84E+05
                         351.93 1.379E-01 *(  5.841E-02 1.82E+01 3.76E+01 G

BI-214   N   1.7142E-01                                     5.84E+05
                         609.31 1.714E-01  (  7.600E-02 2.05E+01 4.61E+01 G
                        1120.29 0.000E+00 %   2.143E-01 1.05E+02 1.51E+01 G
                        1764.49 6.365E-01 +   1.922E-01 1.80E+01 1.54E+01 G

TH-234   N   2.9000E+00                                     1.63E+12
                          63.29 2.900E+00  (  5.627E-01 8.75E+00 3.81E+00 G
                          92.59 1.814E+00 -   2.449E-01 6.12E+00 5.58E+00 G

U-235    N   1.8569E-01                                     2.57E+11
                         185.72 1.111E-01 }   2.954E-02 8.68E+00 5.40E+01 GA
                         143.79 1.857E-01 *(  1.267E-01 2.79E+01 1.10E+01 G
                         205.33 0.000E+00 %   2.049E-01 1.58E+02 5.01E+00 G
                         163.38 0.000E+00 %   1.784E-01 3.56E+01 5.08E+00 G

AM-241   T   1.3087E-01                                     1.58E+05
                          59.54 1.309E-01 *(  5.353E-02 1.61E+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
```

(Page 5 of 7)

ORTEC g v - i (1087) Env32 G800W064 11/10/2019 2:18:49 PMPage 5
TestAmerica Inc Spectrum name: 5_20191109017_BGLong.An1

N - Naturally Occurring Isotope
P - Photon Reaction
C - Charged Particle Reaction
M - No MDA Calculation
R - Coincidence Corrected
H - Halflife limit exceeded
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 DPS	Uncertainty 1 Sigma Counting	MDA
BE-7	<	1.4392E-01		
NA-22	<	4.4927E-02		
K-40	#	1.5973E+00	1.4273E+01%	3.653E-01
Sc-46	<	3.8334E-02		
CR-51	<	1.1758E-01		
MN-54	<	2.5602E-02		
FE-59	<	5.1814E-02		
Co-56	<	2.6088E-02		
CO-57	<	1.1088E-02		
CO-58	<	3.3486E-02		
CO-60	<	3.1788E-02		
ZN-65	<	8.2174E-02		
NB-94	<	2.3230E-02		
ZR-95	<	4.1996E-02		
NB-95	<	3.7907E-02		
RU-103	<	1.6933E-02		
RH-106	<	2.6905E-01		
AG-108M	<	1.6469E-02		
AG-110M	<	2.8387E-02		
SN-113	<	2.2758E-02		
SB-124	<	2.4715E-02		
SB-125	<	4.6676E-02		
I-131	<	1.5721E-02		
BA-133	<	2.4129E-02		
CS-134	<	3.9275E-02		
CS-137		9.3644E-02	1.6458E+01%	3.457E-02
CE-139	<	1.5227E-02		
Ba-140	<	7.6718E-02		
La-140	<	2.9781E-02		
CE-141	<	1.8836E-02		
CE-144	<	6.9934E-02		

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     ORTEC g v - i (1087) Env32  G800W064  11/10/2019 2:18:49 PMPage  6
TestAmerica Inc                 Spectrum name: 5_20191109017_BGLong.An1

PM-144  <    2.6900E-02
EU-152  <    7.0454E-02
EU-154  <    2.0163E-01
EU-155  <    3.8788E-02
HF-181  <    2.0466E-02
Ta-182  <    4.7217E-02
Hg-203  <    1.3926E-02
TL-208  <    2.4999E-02
pm-146  <    6.4296E-02
y-88    <    2.8781E-02
PB-210 #     3.3138E+00   9.4325E+00%              7.140E-01
PB-212 #     7.1937E-02   2.1702E+01%              3.856E-02
PB-214 #     1.3786E-01   1.8244E+01%              5.841E-02
BI-207  <    3.3519E-02
BI-212  <    4.4942E-01
BI-214       1.7142E-01   2.0524E+01%              7.600E-02
BI-210M <    2.2349E-02
RA-224  <    2.6945E-01
AC-228  <    8.9060E-02
TH-227  <    1.2432E-01
TH-229  <    2.2624E-01
TH-234       2.9000E+00   8.7550E+00%              5.627E-01
PA-231  <    5.8269E-01
PA-233  <    3.5067E-02
PA-234  <    7.2257E-02
PA-234M <    3.0459E+00
U-235  #     1.8569E-01   2.7855E+01%              1.267E-01
AM-241 #     1.3087E-01   1.6090E+01%              5.353E-02
Np-237  <    9.6605E-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)     8.603E+00  DPS
```

(Page 7 of 7)

Test America
St. Louis
Background Check

Spectrum: 9_20191109017_BGLong
Description: Background Long PBC Count
Acquired: 11/9/2019 6:20:37 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	1.84	2.14	2.26	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

(Page 1 of 7)

```
     ORTEC g v - i (1087) Env32  G800W064  11/10/2019 2:22:10 PMPage  1
TestAmerica Inc                 Spectrum name: 9_20191109017_BGLong.An1

Sample description
     Background Long PBC Count


Spectrum Filename: C:\User\SPC\Det9\9_20191109017_BGLong.An1

Acquisition information
       Start time:                 11/9/2019 6:20:37 PM
       Live time:              72000
       Real time:              72075
       Dead time:                  0.10 %
       Detector ID:                    9

Detector system
     Ge9 S/N09363993


Calibration
       Filename:                   9_QC.Clb
     9_QC-E_79670-334_060211


       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:               6/3/2011 12:03:10 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 (    37.59keV )
       Stop channel:            8000 (  1999.34keV )
       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


                                (Page 2 of 7)
```

ORTEC g v - i (1087) Env32 G800W064 11/10/2019 2:22:10 PMPage 2
TestAmerica Inc Spectrum name: 9_20191109017_BGLong.An1

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. 11 cutoff: 5.00E+01 %
Energy Calibration
Normalized diff: 0.0951

***** 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
198.33	176.	23.05	0.89	1.358E-01				
295.36	221.	23.22	1.09	1.046E-01	295.09	19.300	1.519E-01	PB214
351.95	336.	11.58	1.39	8.639E-02	351.93	37.600	1.438E-01	PB214
583.05	170.	24.33	1.34	5.512E-02	583.02	84.500	5.064E-02	TL208
609.72	380.	14.18	1.38	5.254E-02	609.31	46.090	2.178E-01	BI214
					610.30	5.750	1.749E+00	RU103
911.99	134.	25.76	1.38	3.083E-02	911.16	29.000	2.078E-01	AC228
					911.16	29.000	2.078E-01	AC228
1460.75	314.	8.40	1.96	2.339E-02	1460.83	10.670	1.747E+00	K40
1764.24	172.	15.73	2.02	2.159E-02	1764.49	15.400	7.183E-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	
792.80	198.33	521.	176.	1.298E+03	23.05	0.888	-	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

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ORTEC g v - i (1087) Env32 G800W064 11/10/2019 2:22:10 PMPage 3
TestAmerica Inc Spectrum name: 9_20191109017_BGLong.An1

********** 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-214	1180.83	295.36	603.	221.	0.003	23.22	1.085
PB-214	1407.19	351.95	373.	336.	0.005	11.58	1.386
TL-208	2331.56	583.05	318.	170.	0.002	24.33	1.341
BI-214	2438.27	609.72	459.	380.	0.005	14.18	1.384s
AC-228	3647.56	911.99	204.	134.	0.002	25.76	1.383
K-40	5843.70	1460.75	62.	314.	0.004	8.40	1.962
BI-214	7058.66	1764.24	70.	172.	0.002	15.73	2.015

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
K-40	N	1.7473E+00				4.66E+11		
			1460.83	1.747E+00	(	2.193E-01	8.40E+00	1.07E+01 G
TL-208	N	5.0643E-02				6.98E+02		
			583.02	5.064E-02	(	2.559E-02	2.43E+01	8.45E+01 G
			277.28	0.000E+00	%	1.343E-01	1.00E+03	6.31E+00 G
			860.56	0.000E+00	%	1.688E-01	5.33E+01	1.24E+01 G
PB-214	N	1.4655E-01				5.84E+05		
			351.93	1.438E-01	?(	3.962E-02	1.16E+01	3.76E+01 G
			295.09	1.519E-01	(	8.052E-02	2.32E+01	1.93E+01 G
			242.00	0.000E+00	%	1.152E-01	4.56E+01	7.43E+00 GA
BI-214	N	2.1778E-01				5.84E+05		
			609.31	2.178E-01	@(	5.877E-02	1.42E+01	4.61E+01 G
			1120.29	0.000E+00	%	1.461E-01	3.73E+01	1.51E+01 G
			1764.49	7.183E-01	+	1.741E-01	1.57E+01	1.54E+01 G
AC-228	N	2.0778E-01				2.10E+03		
			911.16	2.078E-01	(	1.076E-01	2.58E+01	2.90E+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.

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```
     ORTEC g v - i (1087) Env32  G800W064  11/10/2019 2:22:10 PMPage  4
TestAmerica Inc                 Spectrum name: 9_20191109017_BGLong.An1

  @ - 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    <    1.2060E-01
NA-22   <    3.5807E-02
K-40         1.7473E+00   8.4039E+00%              2.193E-01
Sc-46   <    2.0586E-02
CR-51   <    1.0554E-01
MN-54   <    2.1558E-02
FE-59   <    3.9626E-02
Co-56   <    2.0528E-02
CO-57   <    8.9475E-03
CO-58   <    9.2395E-03
CO-60   <    2.2578E-02
ZN-65   <    5.8318E-02
NB-94   <    1.7780E-02
ZR-95   <    2.8138E-02
NB-95   <    1.6471E-02
```

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ORTEC g v - i (1087) Env32 G800W064 11/10/2019 2:22:10 PMPage 5
TestAmerica Inc Spectrum name: 9_20191109017_BGLong.An1

RU-103	<	1.2958E-02		
RH-106	<	1.5048E-01		
AG-108M	<	1.3700E-02		
AG-110M	<	1.5542E-02		
SN-113	<	1.9333E-02		
SB-124	<	1.7578E-02		
SB-125	<	4.3615E-02		
I-131	<	1.4842E-02		
BA-133	<	3.0310E-02		
CS-134	<	2.6955E-02		
CS-137	<	1.7033E-02		
CE-139	<	1.4453E-02		
Ba-140	<	5.2617E-02		
La-140	<	1.8998E-02		
CE-141	<	2.4453E-02		
CE-144	<	9.1771E-02		
PM-144	<	1.7855E-02		
EU-152	<	5.0842E-02		
EU-154	<	1.4448E-01		
EU-155	<	3.1009E-02		
HF-181	<	1.5443E-02		
Ta-182	<	9.0225E-02		
Hg-203	<	1.0219E-02		
TL-208		5.0643E-02	2.4332E+01%	2.559E-02
pm-146	<	4.4930E-02		
y-88	<	2.2221E-02		
PB-210	<	4.5692E-01		
PB-212	<	1.9360E-02		
PB-214		1.4655E-01	1.1578E+01%	3.962E-02
BI-207	<	2.5942E-02		
BI-212	<	1.9703E-01		
BI-214		2.1778E-01	1.4182E+01%	5.877E-02
BI-210M	<	1.6536E-02		
RA-224	<	3.6255E-01		
AC-228	#	2.0778E-01	2.5761E+01%	1.076E-01
TH-227	<	8.4955E-02		
TH-229	<	1.7779E-01		
TH-234	<	5.1737E-01		
PA-231	<	2.8285E-01		
PA-233	<	2.5132E-02		
PA-234	<	6.4057E-02		
PA-234M	<	2.6151E+00		
Ra-226	<	2.9957E-01		
U-235	<	1.1745E-01		
AM-241	<	5.5161E-02		
Np-237	<	7.3943E-02		

(Page 6 of 7)

```
     ORTEC g v - i (1087) Env32  G800W064  11/10/2019 2:22:10 PMPage  6
TestAmerica Inc                 Spectrum name: 9_20191109017_BGLong.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  1999.3 keV)     2.370E+00  DPS
```

(Page 7 of 7)

Test America
St. Louis
Background Check

Spectrum: 12_20191109017_BGLong
Description: Background Long PBC Count
Acquired: 11/9/2019 6:21:13 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	1.99	2.07	2.10	PASS

Analyst: Shiloh Smith Reviewer: kody Saulters

(Page 1 of 5)

```
     ORTEC g v - i (1087) Env32  G800W064  11/10/2019 2:22:06 PMPage  1
TestAmerica Inc                 Spectrum name: 12_20191109017_BGLong.An1

Sample description
     Background Long PBC Count


Spectrum Filename: C:\User\SPC\Det12\12_20191109017_BGLong.An1

Acquisition information
       Start time:                 11/9/2019 6:21:13 PM
       Live time:              72000
       Real time:              72040
       Dead time:                  0.05 %
       Detector ID:                   12

Detector system
     Ge12 S/N10034336


Calibration
       Filename:                   12_QC.Clb
     12_SourceCheck_H_2018


       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:               4/24/2018 2:08:25 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:      Null.lib
       Library Match Width:        0.500
       Peak stripping:             Library based

Analysis parameters
       Analysis engine:            Env32   G800W064
       Start channel:            150 (    37.59keV )
       Stop channel:            8000 (  1999.13keV )
       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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```

ORTEC g v - i (1087) Env32 G800W064 11/10/2019 2:22:06 PMPage 2
TestAmerica Inc Spectrum name: 12_20191109017_BGLong.An1

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	

***** 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
46.54	1302.	6.28	0.86	5.832E-02				
63.38	896.	8.67	0.89	7.865E-02				
74.91	211.	23.40	0.88	9.260E-02				
77.17	277.	17.03	0.88	9.532E-02				
92.62	1323.	5.53	1.08	1.066E-01				
139.90	138.	29.32	0.95	9.294E-02				
143.73	174.	21.90	0.95	9.250E-02				
185.73	637.	9.49	1.00	8.763E-02				
238.47	340.	15.58	1.06	8.152E-02				
294.93	241.	23.36	0.73	7.498E-02				
351.75	334.	12.51	1.08	6.839E-02				
510.65	2310.	3.81	2.38	4.997E-02				
609.62	330.	15.92	1.21	3.850E-02				
969.13	145.	20.87	0.60	2.411E-02				

********** 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	
185.81	46.54	1292.	1302.	2.232E+04	6.28	0.861	-	
253.10	63.38	1340.	896.	1.139E+04	8.67	0.888	-	s
299.20	74.93	1110.	211.	2.275E+03	23.40	0.880	-	D
308.22	77.18	976.	277.	2.908E+03	17.03	0.883	-	D
369.97	92.62	1005.	1323.	1.241E+04	5.53	1.083	-	s
559.00	139.96	745.	138.	1.481E+03	29.32	0.946	-	sD
574.29	143.79	637.	174.	1.879E+03	21.90	0.950	-	sD

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ORTEC g v - i (1087) Env32 G800W064 11/10/2019 2:22:06 PMPage 3
TestAmerica Inc Spectrum name: 12_20191109017_BGLong.An1

Channel	Energy	Background	Net area	Eff*Area	Uncert	FWHM	Suspected	
742.21	185.73	821.	637.	7.265E+03	9.49	1.000	-	
953.08	238.47	702.	340.	4.165E+03	15.58	1.059	-	
1178.82	294.93	703.	241.	3.214E+03	23.36	0.730	-	s
1406.03	351.75	422.	334.	4.879E+03	12.51	1.080	-	
2041.50	510.65	638.	2310.	4.622E+04	3.81	2.382	-	s
2437.35	609.62	502.	330.	8.568E+03	15.92	1.210	-	
3875.69	969.13	135.	145.	5.999E+03	20.87	0.599	-	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: Null.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

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	MDA Value DPS	COMMENTS

(- 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

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     ORTEC g v - i (1087) Env32  G800W064  11/10/2019 2:22:06 PMPage  4
TestAmerica Inc                 Spectrum name: 12_20191109017_BGLong.An1

      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
_____________________________________________________________________________
DUMMY    No in-range peaks
  < - 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  1999.1 keV)     0.000E+00  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
11/09/19 18:15		ICB 160-449819/1		449819			JLW
11/23/19 19:18		CCB 160-451822/1		451822			KLS
11/23/19 19:51		CCV 160-451822/2		451822			
11/23/19 20:12		CCV 160-451822/3		451822			KLS
11/23/19 21:14	30	160-36160-5	F-SU3-B09-S001	451822	448571	GA-01-R	KLS
11/23/19 21:48	30	160-36160-8	F-SU3-B14-S001	451822	448571	GA-01-R	KLS
11/23/19 22:23	30	160-36160-11	F-SU3-B29-S001	451822	448571	GA-01-R	KLS
11/23/19 22:56	30	160-36160-14	F-SU5-B05-S001	451822	448571	GA-01-R	KLS
11/26/19 00:16		CCV 160-452002/1		452002			
11/26/19 00:37		CCV 160-452002/2		452002			KLS
11/26/19 01:07		CCB 160-452002/3		452002			KLS
11/26/19 02:25	60	ZZZZZ		452002			
11/26/19 04:04	60	ZZZZZ		452002			
11/26/19 06:09	30	ZZZZZ		452002			
11/26/19 07:12	30	ZZZZZ		452002			
11/26/19 07:53	30	ZZZZZ		452002			
11/26/19 08:25	30	ZZZZZ		452002			
11/26/19 08:58	30	ZZZZZ		452002			
11/26/19 09:34	30	160-36160-1	F-SU3-B01-S001	452002	448571	GA-01-R	KLS
11/26/19 12:23	30	ZZZZZ		452002			
11/26/19 13:17	30	ZZZZZ		452002			
11/26/19 13:50	30	ZZZZZ		452002			
11/26/19 14:26	30	ZZZZZ		452002			
11/26/19 14:59	30	ZZZZZ		452002			
11/26/19 15:45	30	ZZZZZ		452002			
11/26/19 16:33	30	ZZZZZ		452002			
11/26/19 17:12	30	ZZZZZ		452002			
11/26/19 17:50	30	ZZZZZ		452002			
11/26/19 18:28	30	ZZZZZ		452002			
11/26/19 19:07	30	ZZZZZ		452002			
11/26/19 19:46	30	ZZZZZ		452002			
11/26/19 20:26	30	ZZZZZ		452002			
11/26/19 21:15	30	ZZZZZ		452002			
11/26/19 21:50	30	ZZZZZ		452002			
11/26/19 22:28	30	ZZZZZ		452002			
11/26/19 23:07	30	ZZZZZ		452002			
11/26/19 23:46		ZZZZZ		452002			

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
11/09/19 18:20		ICB 160-449821/1		449821			JLW
11/23/19 08:08		CCV 160-451807/1		451807			
11/23/19 08:28		CCV 160-451807/2		451807			KLS
11/23/19 08:47		CCB 160-451807/3		451807			KLS
11/23/19 09:28	30	ZZZZZ		451807			
11/23/19 10:00	30	ZZZZZ		451807			
11/23/19 10:34	30	ZZZZZ		451807			
11/23/19 11:08	30	ZZZZZ		451807			

Gamma Spectroscopy Run Log

Detector: GV9 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
11/23/19 11:42	30	ZZZZZ		451807			
11/23/19 12:25	30	ZZZZZ		451807			
11/23/19 13:04	30	ZZZZZ		451807			
11/23/19 13:53	30	ZZZZZ		451807			
11/23/19 14:26	30	ZZZZZ		451807			
11/23/19 19:14	30	ZZZZZ		451807			
11/23/19 19:47	30	LCS 160-448571/2-A		451807	448571	GA-01-R	KLS
11/23/19 20:22	30	160-36160-1 DU	F-SU3-B01-S001 DU	451807	448571	GA-01-R	KLS
11/23/19 21:08	30	160-36160-3	F-SU3-B05-S001	451807	448571	GA-01-R	KLS
11/23/19 21:47	30	160-36160-6	F-SU3-B11-S001	451807	448571	GA-01-R	KLS
11/23/19 22:22	30	160-36160-9	F-SU3-B15-S001	451807	448571	GA-01-R	KLS
11/23/19 22:55	30	160-36160-12	F-SU3-B30-S001	451807	448571	GA-01-R	KLS
11/23/19 23:28	30	160-36160-15	F-SU5-B10-S001	451807	448571	GA-01-R	KLS

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
11/09/19 18:21		ICB 160-449820/1		449820			JLW
11/23/19 08:08		CCV 160-451809/1		451809			
11/23/19 08:29		CCV 160-451809/2		451809			KLS
11/23/19 08:47		CCB 160-451809/3		451809			KLS
11/23/19 09:28	30	ZZZZZ		451809			
11/23/19 10:01	30	ZZZZZ		451809			
11/23/19 10:35	30	ZZZZZ		451809			
11/23/19 11:09	30	ZZZZZ		451809			
11/23/19 11:42	30	ZZZZZ		451809			
11/23/19 12:26	30	ZZZZZ		451809			
11/23/19 13:04	30	ZZZZZ		451809			
11/23/19 13:53	30	ZZZZZ		451809			
11/23/19 14:28	30	ZZZZZ		451809			
11/23/19 19:15	30	MB 160-448571/1-A		451809	448571	GA-01-R	KLS
11/23/19 19:48	30	ZZZZZ		451809			
11/23/19 20:23	30	160-36160-2	F-SU3-B04-S001	451809	448571	GA-01-R	KLS
11/23/19 21:09	30	160-36160-4	F-SU3-B07-S001	451809	448571	GA-01-R	KLS
11/23/19 21:48	30	160-36160-7	F-SU3-B12-S001	451809	448571	GA-01-R	KLS
11/23/19 22:22	30	160-36160-10	F-SU3-B23-S001	451809	448571	GA-01-R	KLS
11/23/19 22:56	30	160-36160-13	F-SU4-B04-S001	451809	448571	GA-01-R	KLS
11/23/19 23:29	30	ZZZZZ		451809			

GAS FLOW PROPORTIONAL COUNTER

Method 905.0 Sr

Total Strontium (GFPC) by Method 905.0

Prep Batch: 448689

Preparation, Digestion/ Precipitate

Gas Flow Proportional Counter Analysis Detail Report
Prep Batch: 448689

Lab Id: LCS 160-448689/1-A | Analyzed: 11/23/19 11:02 | Decay Corrected: No | Ts: 200
Client ID: | Detector: Purple0 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	LCS Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	6.656	0.299	0.554		pCi/g	0.331	0.0573	2193	500	.	1.	0.41673	1.9878	1.	451797

Carrier	LCS Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.08960				g		0.105	85.5	40 - 110

Lab Id: 160-36160-1 | Analyzed: 11/23/19 11:02 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B01-S001 | Detector: Purple3 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	0.0455	0.0799	0.0799	U	pCi/g	0.331	0.0622	104	457	.	1.	0.42279	1.9878	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0775				g		0.105	74.0	40 - 110

Lab Id: 160-36160-2 | Analyzed: 11/23/19 11:02 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B04-S001 | Detector: Purple5 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	0.109	0.0725	0.0729		pCi/g	0.331	0.0513	118	415	.	1.	0.41149	1.9878	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0926				g		0.105	88.4	40 - 110

Lab Id: 160-36160-3 | Analyzed: 11/23/19 11:02 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B05-S001 | Detector: Purple6 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	0.0136	0.0797	0.0797	U	pCi/g	0.331	0.0645	94	452	.	1.	0.41978	1.9878	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0753				g		0.105	71.9	40 - 110

Gas Flow Proportional Counter Analysis Detail Report
Prep Batch: 448689

Lab Id: 160-36160-4 | Analyzed: 11/23/19 11:03 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B07-S001 | Detector: Purple7 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	0.0772	0.0722	0.0724		pCi/g	0.331	0.0529	95	363	.	1.	0.41233	1.9878	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0841				g		0.105	80.2	40 - 110

Lab Id: 160-36160-5 | Analyzed: 11/23/19 11:03 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B09-S001 | Detector: Purple10 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0185	0.0775	0.0775	U	pCi/g	0.331	0.0653	77	408	.	1.	0.42513	1.9878	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0690				g		0.105	65.8	40 - 110

Lab Id: 160-36160-6 | Analyzed: 11/23/19 11:03 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B11-S001 | Detector: Purple11 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0487	0.0795	0.0796	U	pCi/g	0.331	0.0692	86	493	.	1.	0.41788	1.9878	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0731				g		0.105	69.8	40 - 110

Lab Id: 160-36160-7 | Analyzed: 11/23/19 11:03 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B12-S001 | Detector: Purple17 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0586	0.0619	0.0621	U	pCi/g	0.331	0.0565	54	348	.	1.	0.39736	1.9878	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0798				g		0.105	76.1	40 - 110

Gas Flow Proportional Counter Analysis Detail Report
Prep Batch: 448689

Lab Id: 160-36160-8 | Analyzed: 11/23/19 11:03 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B14-S001 | Detector: Purple18 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0281	0.0734	0.0734	U	pCi/g	0.331	0.0626	81	443	.	1.	0.41551	1.9878	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0778				g		0.105	74.2	40 - 110

Lab Id: 160-36160-9 | Analyzed: 11/23/19 11:03 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B15-S001 | Detector: Purple19 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0931	0.0744	0.0747	U	pCi/g	0.331	0.0681	87	566	.	1.	0.41765	1.9878	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0804				g		0.105	76.7	40 - 110

Lab Id: 160-36160-10 | Analyzed: 11/23/19 19:01 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B23-S001 | Detector: Purple0 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0214	0.0760	0.0760	U	pCi/g	0.331	0.0642	94	500	.	1.	0.42103	1.9888	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0792				g		0.105	75.6	40 - 110

Lab Id: 160-36160-11 | Analyzed: 11/23/19 19:01 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B29-S001 | Detector: Purple1 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0448	0.0784	0.0784	U	pCi/g	0.331	0.0679	87	494	.	1.	0.41961	1.9888	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0741				g		0.105	70.7	40 - 110

Gas Flow Proportional Counter Analysis Detail Report
Prep Batch: 448689

Lab Id: 160-36160-12 | Analyzed: 11/23/19 19:01 | Decay Corrected: No | Ts: 200
Client ID: F-SU3-B30-S001 | Detector: Purple2 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0593	0.0724	0.0725	U	pCi/g	0.331	0.0640	89	531	.	1.	0.42268	1.9888	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0820				g		0.105	78.2	40 - 110

Lab Id: 160-36160-13 | Analyzed: 11/23/19 19:02 | Decay Corrected: No | Ts: 200
Client ID: F-SU4-B04-S001 | Detector: Purple3 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	0.0379	0.0720	0.0720	U	pCi/g	0.331	0.0563	103	457	.	1.	0.41863	1.9888	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0874				g		0.105	83.4	40 - 110

Lab Id: 160-36160-14 | Analyzed: 11/23/19 19:02 | Decay Corrected: No | Ts: 200
Client ID: F-SU5-B05-S001 | Detector: Purple5 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0530	0.0700	0.0701	U	pCi/g	0.331	0.0621	69	415	.	1.	0.41903	1.9888	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0742				g		0.105	70.8	40 - 110

Lab Id: 160-36160-15 | Analyzed: 11/23/19 19:02 | Decay Corrected: No | Ts: 200
Client ID: F-SU5-B10-S001 | Detector: Purple6 | Yield Truncated: No | Tb: 1000
Sigma: 2 | Dil Fac: 1 | Calibration Type: 1

Analyte	Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	-0.0503	0.0678	0.0679	U	pCi/g	0.331	0.0599	76	452	.	1.	0.41712	1.9888	1.	451797

Carrier	Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.0819				g		0.105	78.1	40 - 110

Gas Flow Proportional Counter Analysis Detail Report
Prep Batch: 448689

Lab Id:	MB 160-448689/19-A	Analyzed:	11/23/19 19:02	Decay Corrected:	No	Ts:	200
Client ID:		Detector:	Purple7	Yield Truncated:	No	Tb:	1000
Sigma:	2	Dil Fac:	1	Calibration Type:	1		

Analyte	MB Result	Count Unc	Total Unc	Qualifier	Unit	LOQ	DLC	Cs	Cb	X Talk	Decay	Eff	I	A	Anly Batch
Total Beta Strontium	0.06655	0.0676	0.0678		pCi/g	0.331	0.0501	93	363	.	1.	0.41063	1.9888	1.	451797

Carrier	MB Result	Count Unc	Total Unc	Qualifier	Unit	DLC	Spike Added	% Rec	% Rec Limits
Sr Carrier	0.08860				g		0.105	84.5	40 - 110

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 160-448689/19-A	Total Beta Strontium			0.06655		pCi/g							1.9627

Lab Control Sample ID:	Analyte	Parent Result	Spike Added	LCS Result	Qualifier	Unit	% Rec	% Rec Limits	RPD	RER	DER	RER Limit	Z Factor
LCS 160-448689/1-A	Total Beta Strontium		7.96	6.656		pCi/g	84	75 - 125					-4.3504

Glossary:

- Ts = Count Duration, Sample
- Tb = Count Duration, Background
- Cs = Total Counts, Sample
- Cb = Total Counts, Background
- X Talk = Crosstalk
- Decay = Decay Factor
- Eff = Efficiency
- I = Ingrowth Factor
- A = Abundance

GAS FLOW PROPORTIONAL COUNTER BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 160-36160-2

SDG No.:

Batch Number: 448689 Batch Start Date: 11/04/19 09:55 Batch Analyst: Ratcliff, Rachael B

Batch Method: DPS-0 Batch End Date: 11/14/19 10:54

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	Sr_TareWt	Sr_GrossWt	Sr_Mass	IngDecDate1	FinalSrWashTime
LCS 160-448689/1		DPS-0, 905.0		1 g	8.8347 g	8.9243 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-1-A	F-SU3-B01-S001	DPS-0, 905.0	T	1.0033 g	8.7473 g	8.8248 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-2-A	F-SU3-B04-S001	DPS-0, 905.0	T	0.9969 g	8.7349 g	8.8275 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-3-A	F-SU3-B05-S001	DPS-0, 905.0	T	0.9977 g	8.7884 g	8.8637 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-4-A	F-SU3-B07-S001	DPS-0, 905.0	T	0.9930 g	8.7479 g	8.8320 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-5-A	F-SU3-B09-S001	DPS-0, 905.0	T	1.0087 g	8.7212 g	8.7902 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-6-A	F-SU3-B11-S001	DPS-0, 905.0	T	1.0056 g	8.6648 g	8.7379 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-7-A	F-SU3-B12-S001	DPS-0, 905.0	T	0.9969 g	8.6274 g	8.7072 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-8-A	F-SU3-B14-S001	DPS-0, 905.0	T	0.9948 g	8.6697 g	8.7475 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-9-A	F-SU3-B15-S001	DPS-0, 905.0	T	0.9952 g	8.7799 g	8.8603 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-10-A	F-SU3-B23-S001	DPS-0, 905.0	T	0.9996 g	8.7646 g	8.8438 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-11-A	F-SU3-B29-S001	DPS-0, 905.0	T	1.0064 g	8.7897 g	8.8638 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-12-A	F-SU3-B30-S001	DPS-0, 905.0	T	0.9933 g	8.7932 g	8.8752 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-13-A	F-SU4-B04-S001	DPS-0, 905.0	T	0.9926 g	8.7872 g	8.8746 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-14-A	F-SU5-B05-S001	DPS-0, 905.0	T	1.0089 g	8.8067 g	8.8809 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
160-36160-A-15-A	F-SU5-B10-S001	DPS-0, 905.0	T	0.9943 g	8.7591 g	8.8410 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20
MB 160-448689/19		DPS-0, 905.0		1 g	8.8305 g	8.9191 g	0.1048 g	11/06/2019 12:35	11/06/2019 13:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	NativeMassSr	Sr Carrier 00050	Sr-90 00039			
LCS 160-448689/1		DPS-0, 905.0		0 g	2 mL	1 mL			
160-36160-A-1-A	F-SU3-B01-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-2-A	F-SU3-B04-S001	DPS-0, 905.0	T	0 g	2 mL				

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.

GAS FLOW PROPORTIONAL COUNTER BATCH WORKSHEET

Lab Name: Eurofins TestAmerica, St. Loui Job No.: 160-36160-2

SDG No.:

Batch Number: 448689 Batch Start Date: 11/04/19 09:55 Batch Analyst: Ratcliff, Rachael B

Batch Method: DPS-0 Batch End Date: 11/14/19 10:54

Lab Sample ID	Client Sample ID	Method Chain	Basis	NativeMassSr	Sr Carrier 00050	Sr-90 00039			
160-36160-A-3-A	F-SU3-B05-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-4-A	F-SU3-B07-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-5-A	F-SU3-B09-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-6-A	F-SU3-B11-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-7-A	F-SU3-B12-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-8-A	F-SU3-B14-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-9-A	F-SU3-B15-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-10-A	F-SU3-B23-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-11-A	F-SU3-B29-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-12-A	F-SU3-B30-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-13-A	F-SU4-B04-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-14-A	F-SU5-B05-S001	DPS-0, 905.0	T	0 g	2 mL				
160-36160-A-15-A	F-SU5-B10-S001	DPS-0, 905.0	T	0 g	2 mL				
MB 160-448689/19		DPS-0, 905.0		0 g	2 mL				

Batch Notes	
Balance ID	0034150037
Batch Comment	Out (EJQ)
Pipette ID	RAD110, RAD112
Analyst ID - Reagent Drop Witness	EJQ per RBR
Analyst ID - Reagent Drop	RBR
SOP Number	ST-RC-0050, ST-RC-0002

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.

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID LCS 160-448689/1-A

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:02:15 AM

Count Ended 11/23/2019 2:22:31 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.191	47	0.235	0.044
sd	0.014	6.856	0.034	0.037
Beta	0.500	2,193	10.965	10.465
sd	0.022	46.829	0.234	0.235

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID 160-36160-A-1-H

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:02:39 AM

Count Ended 11/23/2019 2:22:55 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.191	46	0.230	0.039
sd	0.014	6.782	0.034	0.037
Beta	0.457	104	0.520	0.063
sd	0.021	10.198	0.051	0.055

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID 160-36160-A-2-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:02:50 AM

Count Ended 11/23/2019 2:23:04 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.189	40	0.200	0.011
sd	0.014	6.325	0.032	0.034
Beta	0.415	118	0.590	0.175
sd	0.020	10.863	0.054	0.058

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID 160-36160-A-3-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:02:58 AM

Count Ended 11/23/2019 2:23:12 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.187	31	0.155	-0.032
sd	0.014	5.568	0.028	0.036
Beta	0.452	94	0.470	0.018
sd	0.021	9.695	0.048	0.053

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID 160-36160-A-4-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:03:05 AM

Count Ended 11/23/2019 2:23:19 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.158	22	0.110	-0.048
sd	0.013	4.690	0.023	0.034
Beta	0.363	95	0.475	0.112
sd	0.019	9.747	0.049	0.052

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID 160-36160-A-5-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:03:13 AM

Count Ended 11/23/2019 2:23:28 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.199	28	0.140	-0.059
sd	0.014	5.292	0.026	0.039
Beta	0.408	77	0.385	-0.023
sd	0.020	8.775	0.044	0.051

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID 160-36160-A-6-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:03:20 AM

Count Ended 11/23/2019 2:23:35 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.164	14	0.070	-0.094
sd	0.013	3.742	0.019	0.038
Beta	0.493	86	0.430	-0.063
sd	0.022	9.274	0.046	0.057

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID 160-36160-A-7-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:03:29 AM

Count Ended 11/23/2019 2:23:44 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.244	32	0.160	-0.084
sd	0.016	5.657	0.028	0.043
Beta	0.348	54	0.270	-0.078
sd	0.019	7.348	0.037	0.050

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID 160-36160-A-8-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:03:34 AM

Count Ended 11/23/2019 2:23:51 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.198	24	0.120	-0.078
sd	0.014	4.899	0.024	0.040
Beta	0.443	81	0.405	-0.038
sd	0.021	9.000	0.045	0.053

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID 160-36160-A-9-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 11:03:38 AM

Count Ended 11/23/2019 2:23:51 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.183	26	0.130	-0.053
sd	0.014	5.099	0.025	0.037
Beta	0.566	87	0.435	-0.131
sd	0.024	9.327	0.047	0.064

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID 160-36160-A-10-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 7:01:33 PM

Count Ended 11/23/2019 10:21:50 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.191	40	0.200	0.009
sd	0.014	6.325	0.032	0.035
Beta	0.500	94	0.470	-0.030
sd	0.022	9.695	0.048	0.056

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID 160-36160-A-11-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 7:01:39 PM

Count Ended 11/23/2019 10:21:58 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.220	20	0.100	-0.120
sd	0.015	4.472	0.022	0.044
Beta	0.494	87	0.435	-0.059
sd	0.022	9.327	0.047	0.057

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID 160-36160-A-12-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 7:01:54 PM

Count Ended 11/23/2019 10:22:12 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.243	30	0.150	-0.093
sd	0.016	5.477	0.027	0.044
Beta	0.531	89	0.445	-0.086
sd	0.023	9.434	0.047	0.060

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID 160-36160-A-13-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 7:02:01 PM

Count Ended 11/23/2019 10:22:19 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.191	56	0.280	0.089
sd	0.014	7.483	0.037	0.040
Beta	0.457	103	0.515	0.058
sd	0.021	10.149	0.051	0.055

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID 160-36160-A-14-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 7:02:07 PM

Count Ended 11/23/2019 10:22:20 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.189	15	0.075	-0.114
sd	0.014	3.873	0.019	0.041
Beta	0.415	69	0.345	-0.070
sd	0.020	8.307	0.042	0.053

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID 160-36160-A-15-E

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 7:02:11 PM

Count Ended 11/23/2019 10:22:28 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.187	28	0.140	-0.047
sd	0.014	5.292	0.026	0.037
Beta	0.452	76	0.380	-0.072
sd	0.021	8.718	0.044	0.055

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID MB 160-448689/19-A

Repeat 1

Carrier No. 0

Batch ID 448689

Count Method Gross Alpha Beta

Detector Volts 1515

Count Began 11/23/2019 7:02:15 PM

Count Ended 11/23/2019 10:22:28 PM

Sample Count Time 200.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.158	20	0.100	-0.058
sd	0.013	4.472	0.022	0.035
Beta	0.363	93	0.465	0.102
sd	0.019	9.644	0.048	0.052

Daily Checks

APPROVED
By Kody Saulters at 6:32 pm, Nov 24, 2019

eurofins | Environment Testing TestAmerica

Gas Proportional Counter Daily Quality Control Checks

Instrument: Purple

	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	A>>B XT CPM	A>>B XT Mean	A>>B XT +/- limit	A>>B XT Deviation	A>>B XT Flag
Check Type = Alpha										
Detector 0										
11/22/2019 12:39:00 AM	11913.32	12818.03	384.54	-904.70	FAIL	3953.50	4137.60	27.33	-184.100	DOEF
11/23/2019 9:55:00 AM	11912.87	12818.03	384.54	-905.15	FAIL	3993.00	4137.60	27.33	-144.600	DOEF
Detector 1										
11/22/2019 12:39:00 AM	13076.12	13847.28	415.42	-771.15	FAIL	4259.00	4251.53	66.02	7.475	Pass
11/23/2019 9:55:00 AM	13027.04	13847.28	415.42	-820.24	FAIL	4282.50	4251.53	66.02	30.975	Pass
Detector 2										
11/22/2019 12:39:00 AM	13071.26	14354.23	430.63	-1282.97	FAIL	4509.00	4891.15	60.37	-382.150	DOEF
11/23/2019 9:55:00 AM	13153.53	14354.23	430.63	-1200.70	FAIL	4441.00	4891.15	60.37	-450.150	DOEF
Detector 3										
11/22/2019 12:39:00 AM	12786.11	13419.20	402.58	-633.09	FAIL	4595.50	4922.70	84.85	-327.200	DOEF
11/23/2019 9:55:00 AM	12890.94	13419.20	402.58	-528.26	FAIL	4630.50	4922.70	84.85	-292.200	DOEF
Detector 4										
11/22/2019 12:39:00 AM	16388.53	16907.73	507.23	-519.20	FAIL	5748.00	5249.05	86.84	498.950	DOEF
11/22/2019 1:43:00 AM	16376.49	16907.73	507.23	-531.23	FAIL	5787.50	5249.05	86.84	538.450	DOEF
11/22/2019 1:46:00 AM	16311.31	16907.73	507.23	-596.42	FAIL	5614.00	5249.05	86.84	364.950	DOEF
11/23/2019 9:55:00 AM	16561.59	16907.73	507.23	-346.14	Pass	5817.00	5249.05	86.84	567.950	DOEF
Detector 5										
11/22/2019 12:40:00 AM	16604.14	16603.10	498.09	1.04	Pass	6029.00	5630.28	57.62	398.725	DOEF
11/23/2019 9:56:00 AM	16488.38	16603.10	498.09	-114.72	Pass	5876.50	5630.28	57.62	246.225	DOEF
Detector 6										
11/22/2019 12:40:00 AM	14502.67	15352.98	460.59	-850.30	FAIL	5344.00	5483.13	60.86	-139.125	WARNING
11/23/2019 9:56:00 AM	14521.29	15352.98	460.59	-831.69	FAIL	5305.50	5483.13	60.86	-177.625	WARNING
Detector 7										
11/22/2019 12:40:00 AM	14472.70	15273.85	458.22	-801.15	FAIL	5434.00	5724.88	85.05	-290.875	DOEF
11/23/2019 9:56:00 AM	14541.94	15273.85	458.22	-731.91	FAIL	5293.50	5724.88	85.05	-431.375	DOEF
Detector 8										
11/22/2019 12:45:00 AM	11809.02	12654.18	379.63	-845.15	FAIL	3895.50	3940.58	65.19	-45.075	Pass
11/23/2019 10:00:00 AM	11773.47	12654.18	379.63	-880.70	FAIL	3909.00	3940.58	65.19	-31.575	Pass
Detector 9										
11/22/2019 12:45:00 AM	12779.37	13595.78	407.87	-816.40	FAIL	4354.50	4722.55	71.26	-368.050	DOEF
11/23/2019 10:00:00 AM	12811.01	13595.78	407.87	-784.76	FAIL	4364.50	4722.55	71.26	-358.050	DOEF

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Gas Proportional Counter Daily Quality Control Checks

Instrument: Purple

	Alpha CPM	Alpha Mean	Alpha +/- limit	Alpha Deviation	Alpha Flag	A>>B XT CPM	A>>B XT Mean	A>>B XT +/- limit	A>>B XT Deviation	A>>B XT Flag
Detector 10										
11/22/2019 12:45:00 AM	12893.88	14277.18	428.32	-1383.29	FAIL	4506.00	5018.53	72.48	-512.525	DOEF
11/23/2019 10:00:00 AM	13081.43	14277.18	428.32	-1195.74	FAIL	4582.50	5018.53	72.48	-436.025	DOEF
Detector 11										
11/22/2019 12:45:00 AM	12614.81	13390.48	401.71	-775.67	FAIL	4500.50	4510.73	57.64	-10.225	Pass
11/23/2019 10:00:00 AM	12847.02	13390.48	401.71	-543.45	FAIL	4464.00	4510.73	57.64	-46.725	Pass
Detector 16										
11/22/2019 12:49:00 AM	11529.72	12631.78	378.95	-1102.06	FAIL	3921.00	3761.83	61.84	159.175	WARNING
11/23/2019 10:07:00 AM	11651.62	12631.78	378.95	-980.16	FAIL	3795.50	3761.83	61.84	33.675	Pass
Detector 17										
11/22/2019 12:49:00 AM	12944.08	13889.18	416.68	-945.09	FAIL	3930.00	4215.80	68.01	-285.800	DOEF
11/23/2019 10:07:00 AM	13118.06	13889.18	416.68	-771.12	FAIL	4024.00	4215.80	68.01	-191.800	WARNING
Detector 18										
11/22/2019 12:49:00 AM	12926.18	14192.53	425.78	-1266.34	FAIL	4567.50	4822.80	47.76	-255.300	DOEF
11/23/2019 10:08:00 AM	13191.49	14192.53	425.78	-1001.03	FAIL	4669.00	4822.80	47.76	-153.800	DOEF
Detector 19										
11/22/2019 12:49:00 AM	13194.94	13562.28	406.87	-367.33	Pass	4302.50	4355.90	55.82	-53.400	Pass
11/22/2019 1:43:00 AM	13117.73	13562.28	406.87	-444.55	FAIL	4345.50	4355.90	55.82	-10.400	Pass
11/23/2019 10:08:00 AM	13041.07	13562.28	406.87	-521.21	FAIL	4371.00	4355.90	55.82	15.100	Pass

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Gas Proportional Counter Daily Quality Control Checks

Instrument: Purple

	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag	B>>A XT CPM	B>>A XT Mean	B>>A XT +/- limit	B>>A XT Deviation	B>>A XT Flag
Check Type = Beta										
Detector 0										
11/22/2019 12:55:00 AM	50246.21	50226.98	1506.81	19.24	Pass	NA	NA	NA	NA	NA
11/23/2019 10:13:00 AM	50362.35	50226.98	1506.81	135.38	Pass	NA	NA	NA	NA	NA
Detector 1										
11/22/2019 12:55:00 AM	49312.19	48796.70	1463.90	515.49	Pass	NA	NA	NA	NA	NA
11/23/2019 10:13:00 AM	49220.40	48796.70	1463.90	423.70	Pass	NA	NA	NA	NA	NA
Detector 2										
11/22/2019 12:55:00 AM	50874.34	50875.48	1526.26	-1.13	Pass	NA	NA	NA	NA	NA
11/23/2019 10:13:00 AM	50915.98	50875.48	1526.26	40.50	Pass	NA	NA	NA	NA	NA
Detector 3										
11/22/2019 12:55:00 AM	59673.47	60107.23	1803.22	-433.75	Pass	NA	NA	NA	NA	NA
11/23/2019 10:13:00 AM	59547.38	60107.23	1803.22	-559.85	Pass	NA	NA	NA	NA	NA
Detector 4										
11/22/2019 12:55:00 AM	56343.05	56940.95	1708.23	-597.90	Pass	NA	NA	NA	NA	NA
11/23/2019 10:13:00 AM	56350.42	56940.95	1708.23	-590.53	Pass	NA	NA	NA	NA	NA
Detector 5										
11/22/2019 12:55:00 AM	55220.59	54659.90	1639.80	560.69	Pass	NA	NA	NA	NA	NA
11/23/2019 10:13:00 AM	54946.34	54659.90	1639.80	286.44	Pass	NA	NA	NA	NA	NA
Detector 6										
11/22/2019 12:55:00 AM	51731.63	52013.25	1560.40	-281.62	Pass	NA	NA	NA	NA	NA
11/23/2019 10:13:00 AM	51904.40	52013.25	1560.40	-108.85	Pass	NA	NA	NA	NA	NA
Detector 7										
11/22/2019 12:55:00 AM	45294.83	45069.13	1352.07	225.71	Pass	NA	NA	NA	NA	NA
11/23/2019 10:13:00 AM	45304.11	45069.13	1352.07	234.99	Pass	NA	NA	NA	NA	NA
Detector 8										
11/22/2019 1:11:00 AM	50295.24	50025.35	1500.76	269.89	Pass	NA	NA	NA	NA	NA
11/23/2019 10:18:00 AM	49811.46	50025.35	1500.76	-213.89	Pass	NA	NA	NA	NA	NA
Detector 9										
11/22/2019 1:00:00 AM	48652.64	48665.90	1459.98	-13.26	Pass	NA	NA	NA	NA	NA
11/23/2019 10:18:00 AM	48798.99	48665.90	1459.98	133.09	Pass	NA	NA	NA	NA	NA
Detector 10										
11/22/2019 1:00:00 AM	50508.10	50649.48	1519.48	-141.37	Pass	NA	NA	NA	NA	NA
11/23/2019 10:18:00 AM	50645.14	50649.48	1519.48	-4.33	Pass	NA	NA	NA	NA	NA

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Gas Proportional Counter Daily Quality Control Checks

Instrument: Purple

	Beta CPM	Beta Mean	Beta +/- limit	Beta Deviation	Beta Flag	B>>A XT CPM	B>>A XT Mean	B>>A XT +/- limit	B>>A XT Deviation	B>>A XT Flag
Detector 11										
11/22/2019 1:00:00 AM	59656.46	59849.50	1795.49	-193.04	Pass	NA	NA	NA	NA	NA
11/23/2019 10:18:00 AM	59650.44	59849.50	1795.49	-199.06	Pass	NA	NA	NA	NA	NA
Detector 16										
11/22/2019 1:07:00 AM	48997.00	49489.98	1484.70	-492.98	Pass	NA	NA	NA	NA	NA
11/23/2019 10:23:00 AM	49321.65	49489.98	1484.70	-168.33	Pass	NA	NA	NA	NA	NA
Detector 17										
11/22/2019 1:07:00 AM	46805.99	46812.78	1404.38	-6.78	Pass	NA	NA	NA	NA	NA
11/23/2019 10:23:00 AM	46534.86	46812.78	1404.38	-277.91	Pass	NA	NA	NA	NA	NA
Detector 18										
11/22/2019 1:07:00 AM	49876.23	50124.63	1503.74	-248.39	Pass	NA	NA	NA	NA	NA
11/23/2019 10:23:00 AM	49933.01	50124.63	1503.74	-191.62	Pass	NA	NA	NA	NA	NA
Detector 19										
11/22/2019 1:07:00 AM	57721.73	57663.50	1729.91	58.23	Pass	NA	NA	NA	NA	NA
11/23/2019 10:23:00 AM	57382.67	57663.50	1729.91	-280.83	Pass	NA	NA	NA	NA	NA

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Gas Proportional Counter Daily Quality Control Checks

Instrument: Purple

	AlphaBKG CPM	BKG Mean	BKG +/- limit	BKG Deviation	BKG Flag	BetaBKG CPM	BetaBKG Mean	BetaBKG +/- limit	BetaBKG Deviation	BetaBKG Flag
Check Type = BKG										
Detector 0										
11/22/2019 5:07:00 AM	0.30	0.19	0.03	0.11	FAIL	0.51	0.53	0.08	-0.023	Pass
11/23/2019 3:29:00 AM	0.18	0.19	0.03	-0.01	Pass	0.47	0.53	0.08	-0.068	Pass
Detector 1										
11/22/2019 5:07:00 AM	0.17	0.18	0.02	-0.01	Pass	0.52	0.48	0.06	0.044	Pass
11/23/2019 3:29:00 AM	0.15	0.18	0.02	-0.03	Pass	0.53	0.48	0.06	0.054	Pass
Detector 2										
11/22/2019 5:07:00 AM	0.17	0.18	0.02	-0.02	Pass	0.48	0.52	0.08	-0.041	Pass
11/23/2019 3:29:00 AM	0.22	0.18	0.02	0.03	Pass	0.55	0.52	0.08	0.035	Pass
Detector 3										
11/22/2019 5:07:00 AM	0.23	0.18	0.02	0.06	Pass	0.40	0.47	0.08	-0.076	Pass
11/23/2019 3:29:00 AM	0.24	0.18	0.02	0.07	Pass	0.42	0.47	0.08	-0.051	Pass
Detector 4										
11/22/2019 5:07:00 AM	0.26	0.16	0.03	0.10	FAIL	0.60	0.47	0.07	0.129	Pass
11/23/2019 3:29:00 AM	0.22	0.16	0.03	0.06	Pass	0.44	0.47	0.07	-0.026	Pass
Detector 5										
11/22/2019 5:07:00 AM	0.28	0.17	0.03	0.11	FAIL	0.40	0.47	0.08	-0.071	Pass
11/23/2019 3:29:00 AM	0.24	0.17	0.03	0.06	Pass	0.34	0.47	0.08	-0.131	Pass
Detector 6										
11/22/2019 5:07:00 AM	0.16	0.16	0.03	0.00	Pass	0.45	0.47	0.06	-0.016	Pass
11/23/2019 3:29:00 AM	0.23	0.16	0.03	0.07	Pass	0.51	0.47	0.06	0.039	Pass
Detector 7										
11/22/2019 5:07:00 AM	0.18	0.16	0.03	0.02	Pass	0.60	0.45	0.06	0.146	Pass
11/23/2019 3:29:00 AM	0.26	0.16	0.03	0.10	FAIL	0.48	0.45	0.06	0.031	Pass
Detector 8										
11/22/2019 5:07:00 AM	0.25	0.17	0.03	0.08	Pass	0.58	0.51	0.07	0.066	Pass
11/23/2019 3:29:00 AM	0.19	0.17	0.03	0.02	Pass	0.47	0.51	0.07	-0.044	Pass
Detector 9										
11/22/2019 5:07:00 AM	0.20	0.19	0.02	0.01	Pass	0.49	0.45	0.05	0.038	Pass
11/23/2019 3:29:00 AM	0.26	0.19	0.02	0.07	FAIL	0.54	0.45	0.05	0.083	Pass
Detector 10										
11/22/2019 5:07:00 AM	0.24	0.17	0.03	0.07	Pass	0.43	0.37	0.06	0.057	Pass
11/23/2019 3:29:00 AM	0.18	0.17	0.03	0.01	Pass	0.51	0.37	0.06	0.142	Pass

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Gas Proportional Counter Daily Quality Control Checks

Instrument: Purple

	AlphaBKG CPM	BKG Mean	BKG +/- limit	BKG Deviation	BKG Flag	BetaBKG CPM	BetaBKG Mean	BetaBKG +/- limit	BetaBKG Deviation	BetaBKG Flag
Detector 11										
11/22/2019 5:07:00 AM	0.21	0.17	0.04	0.03	Pass	0.53	0.48	0.09	0.046	Pass
11/23/2019 3:29:00 AM	0.15	0.17	0.04	-0.03	Pass	0.41	0.48	0.09	-0.074	Pass
Detector 16										
11/22/2019 5:07:00 AM	0.22	0.17	0.03	0.05	Pass	0.60	0.45	0.05	0.145	**FAIL**
11/23/2019 3:29:00 AM	0.31	0.17	0.03	0.14	**FAIL**	0.79	0.45	0.05	0.340	**FAIL**
Detector 17										
11/22/2019 5:07:00 AM	0.16	0.17	0.03	-0.01	Pass	0.34	0.33	0.05	0.003	Pass
11/23/2019 3:29:00 AM	0.28	0.17	0.03	0.11	**FAIL**	0.46	0.33	0.05	0.123	Pass
Detector 18										
11/22/2019 5:07:00 AM	0.21	0.16	0.03	0.05	Pass	0.52	0.41	0.07	0.103	Pass
11/23/2019 3:29:00 AM	0.16	0.16	0.03	-0.01	Pass	0.40	0.41	0.07	-0.012	Pass
Detector 19										
11/22/2019 5:07:00 AM	0.17	0.18	0.03	-0.01	Pass	0.48	0.52	0.08	-0.045	Pass
11/23/2019 3:29:00 AM	0.21	0.18	0.03	0.03	Pass	0.54	0.52	0.08	0.021	Pass

The Alpha and Beta +/- limit are based upon initial 20-point population.

The Alpha and Beta +/- limit for Efficiency is stated at 3%. Flags are "FAIL" > 3%.

The Alpha and Beta +/- limit for Background is stated at 1 StDev. Flags are "FAIL" > 3 StDev.

The Alpha +/- limit for Crosstalk is stated at 1 StDev. Flags are "Warning > 2 StDev and "DOEF" > 3 StDev. Beta is negligible, for trend only ("NA").

Times shown reflect the end of the count duration.

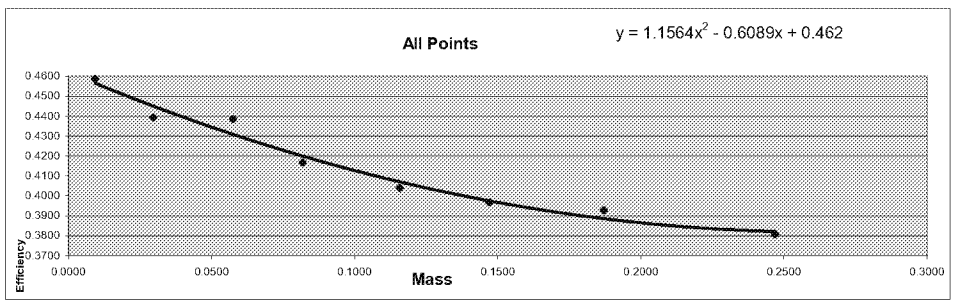
Alpha Beta Calibrations

Curve is for Gross Beta
Strontium 90
and
Total Strontium

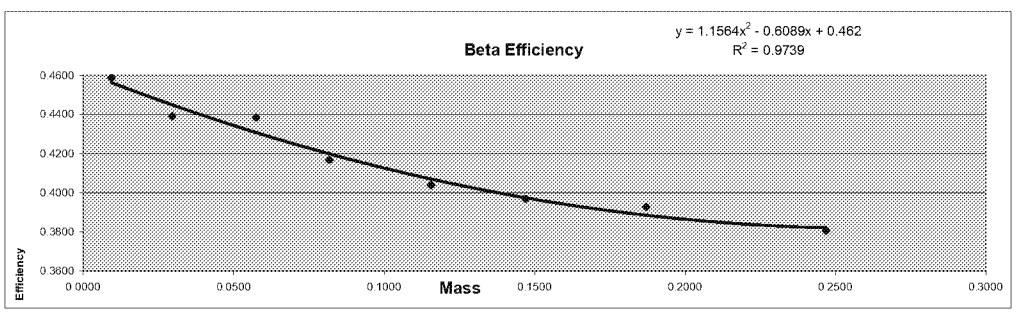
Purple 0

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
0	B1	2/3/2013 15:26	0.0093	5	95312	19062.400	0.4587	1mL
0	B2	2/3/2013 17:14	0.0296	5	91281	18256.200	0.4393	1mL
0	B3	2/3/2013 17:05	0.0574	5	91120	18224.000	0.4385	1mL
0	B4	2/3/2013 16:48	0.0818	5	86609	17321.800	0.4168	1mL
0	B5	2/3/2013 16:41	0.1157	5	83957	16791.400	0.4040	1mL
0	B6	2/3/2013 16:34	0.1470	5	82467	16493.400	0.3969	1mL
0	B7	2/3/2013 16:23	0.1871	5	81608	16321.600	0.3927	1mL
0	B8	2/3/2013 16:02	0.2469	5	79105	15821.000	0.3807	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Efficiency
0.0093	0.4587	0.4564	0.49%
0.0296	0.4393	0.4450	-1.28%
0.0574	0.4385	0.4309	1.78%
0.0818	0.4168	0.4199	-0.74%
0.1157	0.4040	0.4070	-0.73%
0.1470	0.3969	0.3975	-0.15%
0.1871	0.3927	0.3886	1.08%
0.2469	0.3807	0.3822	-0.38%



Mass	Efficiency
0.0093	0.4587
0.0296	0.4393
0.0574	0.4385
0.0818	0.4168
0.1157	0.4040
0.1470	0.3969
0.1871	0.3927
0.2469	0.3807



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.92105537
Corrected Activity:	20779.0092 dpm/mL
Decay Activity (Sr/Y-90)	41558.0185 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-6322;B1 **Repeat** 28

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 3:26:56 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 3:32:07 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	1,085	217.000	216.913
sd	0.000			0.009	32.939	6.588	6.588
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	95,312	19,062.400	19,061.995
sd	0.000			0.020	308.726	61.745	61.745

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-6322;B8 **Repeat** 28

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:02:02 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:07:11 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	821	164.200	164.113
sd	0.000			0.009	28.653	5.731	5.731
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	79,105	15,821.000	15,820.595
sd	0.000			0.020	281.256	56.251	56.251

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-6322;B7 **Repeat** 29

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:23:17 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:28:26 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	891	178.200	178.113
sd	0.000			0.009	29.850	5.970	5.970
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	81,608	16,321.600	16,321.195
sd	0.000			0.020	285.671	57.134	57.134

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-6322;B6 **Repeat** 30

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:34:26 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:39:36 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	898	179.600	179.513
sd	0.000			0.009	29.967	5.993	5.993
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	82,467	16,493.400	16,492.995
sd	0.000			0.020	287.171	57.434	57.434

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-6322;B5 **Repeat** 31

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:41:38 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:46:48 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	890	178.000	177.913
sd	0.000			0.009	29.833	5.967	5.967
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	83,957	16,791.400	16,790.995
sd	0.000			0.020	289.753	57.951	57.951

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-6322;B4 **Repeat** 33

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:48:03 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:53:12 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	986	197.200	197.113
sd	0.000			0.009	31.401	6.280	6.280
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	86,609	17,321.800	17,321.395
sd	0.000			0.020	294.294	58.859	58.859

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-6322;B3 **Repeat** 34

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:05:20 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:10:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	1,116	223.200	223.113
sd	0.000			0.009	33.407	6.681	6.681
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	91,120	18,224.000	18,223.595
sd	0.000			0.020	301.861	60.372	60.372

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-6322;B2 **Repeat** 35

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:14:13 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:19:23 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	1,106	221.200	221.113
sd	0.000			0.009	33.257	6.651	6.651
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	91,281	18,256.200	18,255.795
sd	0.000			0.020	302.127	60.425	60.425

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

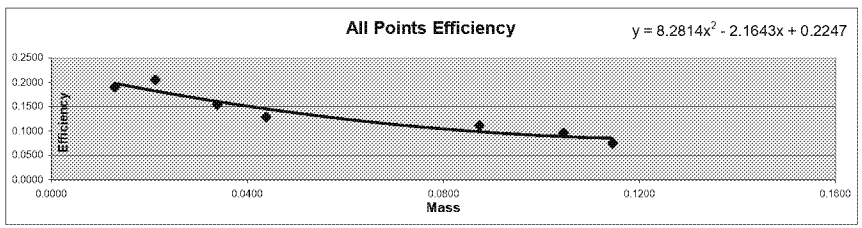
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

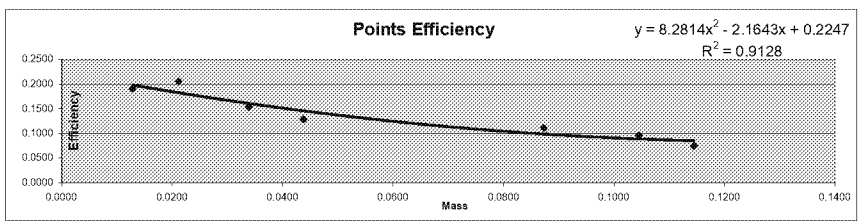
Purple 0

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
0	ICABT-51465;A1	1/16/2016 10:15	40	18103	452.575	2374.5	0.1906	1mL	0.0129
0	ICABT-51465;A2	1/16/2016 15:15	40	19498	487.450	2374.5	0.2053	1mL	0.0212
0	ICABT-51465;A3	1/16/2016 14:32	40	14616	365.400	2374.5	0.1539	1mL	0.0339
0	ICABT-51465;A4	1/16/2016 13:49	40	12219	305.475	2374.5	0.1286	1mL	0.0438
0	ICABT-51465;A6	1/16/2016 12:25	40	21130	528.250	4749.0	0.1112	2mL	0.0873
0	ICABT-51465;A7	1/16/2016 11:43	40	18214	455.350	4749.0	0.0959	2mL	0.1045
0	ICABT-51465;A8	1/16/2016 11:01	40	14219	355.475	4749.0	0.0749	2mL	0.1145

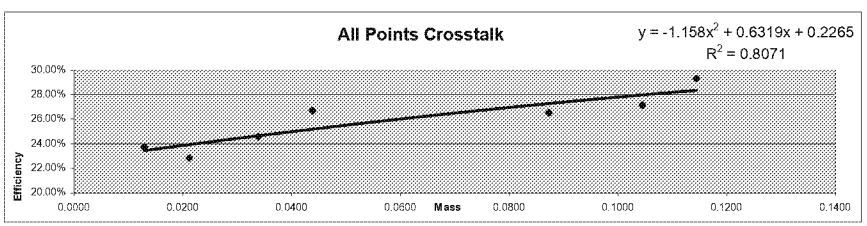
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1906	0.1982	-3.82%
0.0212	0.2053	0.1825	12.46%
0.0339	0.1539	0.1608	-4.33%
0.0438	0.1286	0.1458	-11.76%
0.0873	0.1112	0.0989	12.50%
0.1045	0.0959	0.0890	7.78%
0.1145	0.0749	0.0855	-12.41%



Mass	Efficiency
0.0129	0.1906
0.0212	0.2053
0.0339	0.1539
0.0438	0.1286
0.0873	0.1112
0.1045	0.0959
0.1145	0.0749



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
0	ICABT-51465;A1	0.0129	40.00	18103	5640	452.58	141.00	23.75%	Min
0	ICABT-51465;A2	0.0212	40.00	19498	5772	487.45	144.30	22.84%	22.84%
0	ICABT-51465;A3	0.0339	40.00	14616	4765	365.40	119.13	24.59%	
0	ICABT-51465;A4	0.0438	40.00	12219	4453	305.48	111.33	26.71%	Max
0	ICABT-51465;A6	0.0873	40.00	21130	7624	528.25	190.60	26.51%	
0	ICABT-51465;A7	0.1045	40.00	18214	6792	455.35	189.80	27.16%	Mean
0	ICABT-51465;A8	0.1145	40.00	14219	5901	355.48	147.53	29.33%	25.84%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

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12/04/2019

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-51465;A1 **Repeat** 49

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 10:15:12 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 10:55:18 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	18,103	452.575	452.430
sd	0.000			0.012	134.547	3.364	3.364
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	5,640	141.000	140.491
sd	0.000			0.023	75.100	1.877	1.878

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-51465;A8 **Repeat** 50

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:01:41 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 11:41:47 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	14,219	355.475	355.330
sd	0.000			0.012	119.243	2.981	2.981
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	5,901	147.525	147.016
sd	0.000			0.023	76.818	1.920	1.921

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-51465;A7 **Repeat** 51

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:43:26 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 12:23:33 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	18,214	455.350	455.205
sd	0.000			0.012	134.959	3.374	3.374
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	6,792	169.800	169.291
sd	0.000			0.023	82.414	2.060	2.060

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-51465;A6 **Repeat** 129

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 12:25:26 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:05:32 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	21,130	528.250	528.105
sd	0.000			0.012	145.362	3.634	3.634
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	7,624	190.600	190.091
sd	0.000			0.023	87.316	2.183	2.183

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-51465;A5 **Repeat** 53

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:06:35 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:46:40 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	17,802	445.050	444.905
sd	0.000			0.012	133.424	3.336	3.336
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	7,096	177.400	176.891
sd	0.000			0.023	84.238	2.106	2.106

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-51465;A4 **Repeat** 54

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:49:23 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 2:29:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	12,219	305.475	305.330
sd	0.000			0.012	110.540	2.763	2.764
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	4,453	111.325	110.816
sd	0.000			0.023	66.731	1.668	1.668

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-51465;A3 **Repeat** 55

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 2:32:20 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:12:24 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	14,616	365.400	365.255
sd	0.000			0.012	120.897	3.022	3.022
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	4,765	119.125	118.616
sd	0.000			0.023	69.029	1.726	1.726

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICABT-51465;A2 **Repeat** 56

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 3:15:17 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:55:22 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	19,498	487.450	487.305
sd	0.000			0.012	139.635	3.491	3.491
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	5,772	144.300	143.791
sd	0.000			0.023	75.974	1.899	1.899

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

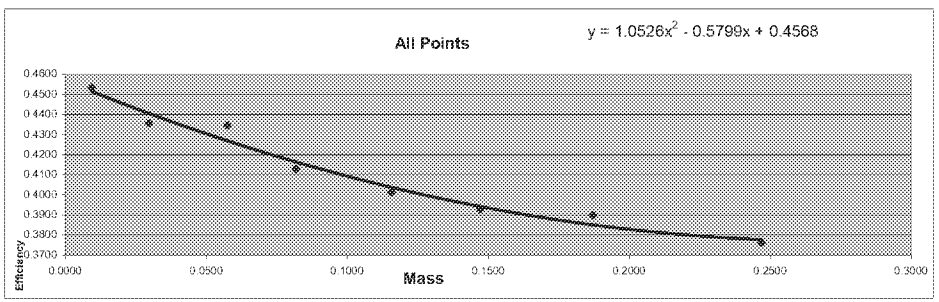
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

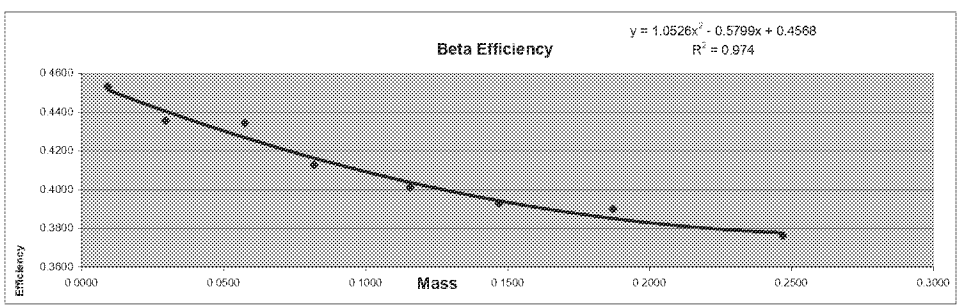
Purple 1

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
1	B1	2/3/2013 16:02	0.0093	5	94185	18837.000	0.4533	1mL
1	B2	2/3/2013 15:27	0.0296	5	90520	18104.000	0.4356	1mL
1	B3	2/3/2013 17:14	0.0574	5	90261	18052.200	0.4344	1mL
1	B4	2/3/2013 17:05	0.0818	5	85768	17153.600	0.4128	1mL
1	B5	2/3/2013 16:48	0.1157	5	83386	16677.200	0.4013	1mL
1	B6	2/3/2013 16:41	0.1470	5	81616	16323.200	0.3928	1mL
1	B7	2/3/2013 16:34	0.1871	5	81038	16207.600	0.3900	1mL
1	B8	2/3/2013 16:23	0.2469	5	78148	15629.600	0.3761	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0093	0.4533	0.4515	0.39%
0.0296	0.4356	0.4406	-1.12%
0.0574	0.4344	0.4270	1.73%
0.0818	0.4128	0.4164	-0.88%
0.1157	0.4013	0.4038	-0.62%
0.1470	0.3928	0.3943	-0.39%
0.1871	0.3900	0.3851	1.26%
0.2469	0.3761	0.3778	-0.45%



Mass	Efficiency
0.0093	0.4533
0.0296	0.4356
0.0574	0.4344
0.0818	0.4128
0.1157	0.4013
0.1470	0.3928
0.1871	0.3900
0.2469	0.3761



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.921055374
Corrected Activity:	20779.00924 dpm/mL
Decay Activity (Sr/Y-90)	41558.01848 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-6322;B2 **Repeat** 28

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 3:27:01 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 3:32:12 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	1,275	255.000	254.907
sd	0.000			0.010	35.707	7.141	7.141
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	90,520	18,104.000	18,103.614
sd	0.000			0.020	300.865	60.173	60.173

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-6322;B1 **Repeat** 29

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:02:07 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:07:18 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	1,355	271.000	270.907
sd	0.000			0.010	36.810	7.362	7.362
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	94,185	18,837.000	18,836.614
sd	0.000			0.020	306.896	61.379	61.379

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-6322;B8 **Repeat** 29

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:23:22 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:28:31 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	969	193.800	193.707
sd	0.000			0.010	31.129	6.226	6.226
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	78,148	15,629.600	15,629.214
sd	0.000			0.020	279.550	55.910	55.910

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-6322;B7 **Repeat** 30

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:34:31 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:39:51 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	1,053	210.600	210.507
sd	0.000			0.010	32.450	6.490	6.490
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	81,038	16,207.600	16,207.214
sd	0.000			0.020	284.672	56.934	56.934

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-6322;B6 **Repeat** 31

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:41:43 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:46:51 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	1,016	203.200	203.107
sd	0.000			0.010	31.875	6.375	6.375
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	81,616	16,323.200	16,322.814
sd	0.000			0.020	285.685	57.137	57.137

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-6322;B5 **Repeat** 32

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:48:08 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:53:17 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	1,088	217.600	217.507
sd	0.000			0.010	32.985	6.597	6.597
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	83,386	16,677.200	16,676.814
sd	0.000			0.020	288.766	57.753	57.753

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-6322;B4 **Repeat** 34

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:05:25 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:10:34 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	1,184	236.800	236.707
sd	0.000			0.010	34.409	6.882	6.882
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	85,768	17,153.600	17,153.214
sd	0.000			0.020	292.862	58.572	58.572

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-6322;B3 **Repeat** 35

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:14:17 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:19:27 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	1,274	254.800	254.707
sd	0.000			0.010	35.693	7.139	7.139
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	90,261	18,052.200	18,051.814
sd	0.000			0.020	300.435	60.087	60.087

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

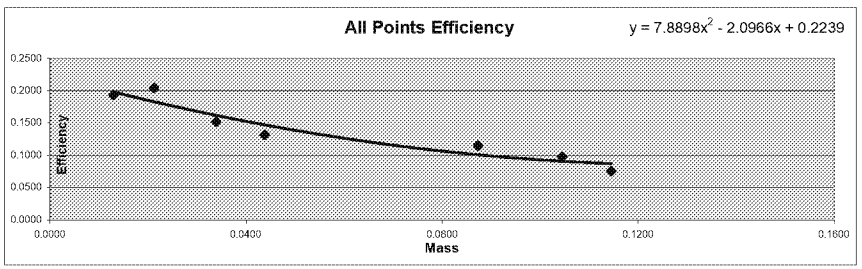
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

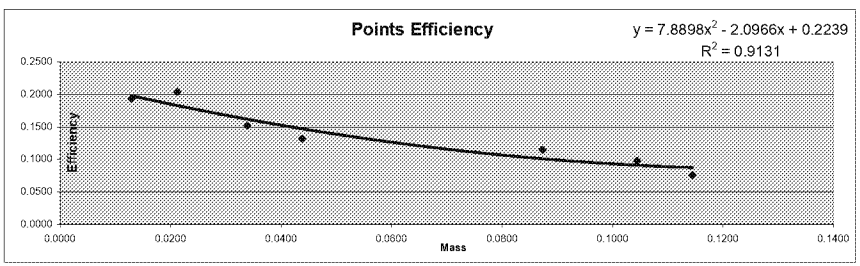
Purple 1

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
1	ICABT-51465;A1	1/16/2016 11:01	40	18343	458.575	2374.5	0.1931	1mL	0.0129
1	ICABT-51465;A2	1/16/2016 10:15	40	19386	484.650	2374.5	0.2041	1mL	0.0212
1	ICABT-51465;A3	1/16/2016 15:15	40	14428	360.700	2374.5	0.1519	1mL	0.0339
1	ICABT-51465;A4	1/16/2016 14:32	40	12505	312.625	2374.5	0.1317	1mL	0.0438
1	ICABT-51465;A6	1/16/2016 13:06	40	21827	545.675	4749.0	0.1149	2mL	0.0873
1	ICABT-51465;A7	1/16/2016 12:25	40	18609	465.225	4749.0	0.0980	2mL	0.1045
1	ICABT-51465;A8	1/16/2016 11:43	40	14412	360.300	4749.0	0.0759	2mL	0.1145

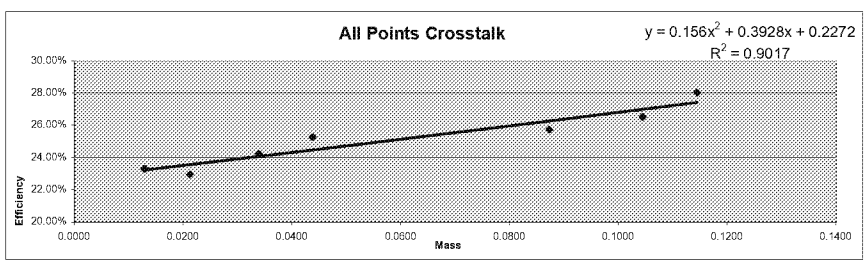
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1931	0.1982	-2.54%
0.0212	0.2041	0.1830	11.53%
0.0339	0.1519	0.1619	-6.17%
0.0438	0.1317	0.1472	-10.56%
0.0873	0.1149	0.1010	13.77%
0.1045	0.0980	0.0910	7.69%
0.1145	0.0759	0.0873	-13.07%



Mass	Efficiency
0.0129	0.1931
0.0212	0.2041
0.0339	0.1519
0.0438	0.1317
0.0873	0.1149
0.1045	0.0980
0.1145	0.0759



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
1	ICABT-51465;A1	0.0129	40.00	18343	5575	458.58	139.38	23.31%	Min
1	ICABT-51465;A2	0.0212	40.00	19386	5774	484.65	144.35	22.95%	22.95%
1	ICABT-51465;A3	0.0339	40.00	14428	4614	360.70	115.35	24.23%	
1	ICABT-51465;A4	0.0438	40.00	12505	4228	312.63	105.70	25.27%	Max
1	ICABT-51465;A6	0.0873	40.00	21827	7564	545.68	189.10	25.74%	
1	ICABT-51465;A7	0.1045	40.00	18609	6714	465.23	167.85	26.51%	Mean
1	ICABT-51465;A8	0.1145	40.00	14412	5613	360.30	140.33	28.03%	25.15%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-51465;A2 **Repeat** 49

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 10:15:17 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 10:55:22 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	19,386	484.650	484.503
sd	0.000			0.012	139.234	3.481	3.481
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	5,774	144.350	143.873
sd	0.000			0.022	75.987	1.900	1.900

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-51465;A1 **Repeat** 50

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:01:46 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 11:41:52 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	18,343	458.575	458.428
sd	0.000			0.012	135.436	3.386	3.386
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	5,575	139.375	138.898
sd	0.000			0.022	74.666	1.867	1.867

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-51465;A8 **Repeat** 51

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:43:30 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 12:23:34 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	14,412	360.300	360.153
sd	0.000			0.012	120.050	3.001	3.001
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	5,613	140.325	139.848
sd	0.000			0.022	74.920	1.873	1.873

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-51465;A7 **Repeat** 52

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 12:25:30 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:05:36 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	18,609	465.225	465.078
sd	0.000			0.012	136.415	3.410	3.410
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	6,714	167.850	167.373
sd	0.000			0.022	81.939	2.048	2.049

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-51465;A6 **Repeat** 130

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:06:40 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:46:47 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	21,827	545.675	545.528
sd	0.000			0.012	147.740	3.693	3.694
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	7,564	189.100	188.623
sd	0.000			0.022	86.971	2.174	2.174

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-51465;A5 **Repeat** 54

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:49:27 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 2:29:32 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	17,865	446.625	446.478
sd	0.000			0.012	133.660	3.342	3.342
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	6,820	170.500	170.023
sd	0.000			0.022	82.583	2.065	2.065

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-51465;A4 **Repeat** 55

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 2:32:24 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:12:28 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	12,505	312.625	312.478
sd	0.000			0.012	111.826	2.796	2.796
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	4,228	105.700	105.223
sd	0.000			0.022	65.023	1.626	1.626

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICABT-51465;A3 **Repeat** 56

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 3:15:21 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:55:26 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	14,428	360.700	360.553
sd	0.000			0.012	120.117	3.003	3.003
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	4,614	115.350	114.873
sd	0.000			0.022	67.926	1.698	1.698

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

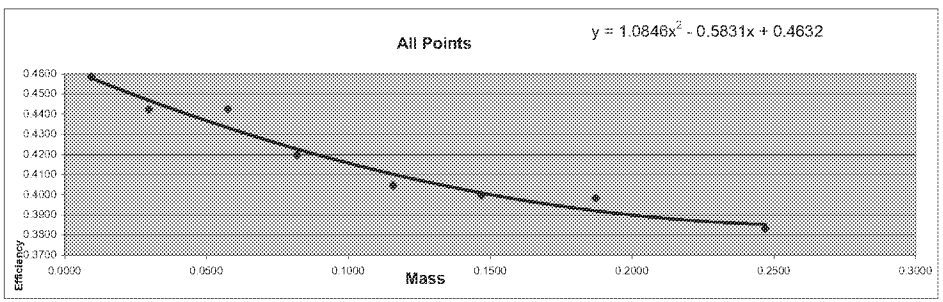
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

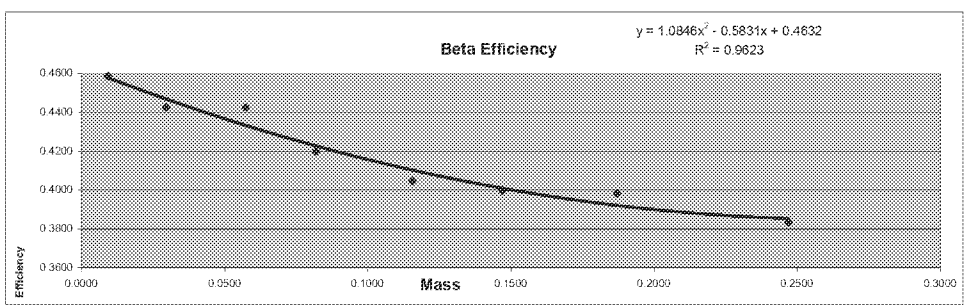
Purple 2

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
2	B1	2/3/2013 16:23	0.0093	5	95309	19061.800	0.4587	1mL
2	B2	2/3/2013 16:02	0.0296	5	91945	18389.000	0.4425	1mL
2	B3	2/3/2013 15:27	0.0574	5	91932	18386.400	0.4424	1mL
2	B4	2/3/2013 17:14	0.0818	5	87233	17446.600	0.4198	1mL
2	B5	2/3/2013 17:05	0.1157	5	84097	16819.400	0.4047	1mL
2	B6	2/3/2013 16:48	0.1470	5	83042	16608.400	0.3996	1mL
2	B7	2/3/2013 16:41	0.1871	5	82761	16552.200	0.3983	1mL
2	B8	2/3/2013 16:34	0.2469	5	79652	15930.400	0.3833	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Δ Efficiency
0.0093	0.4587	0.4579	0.18%
0.0296	0.4425	0.4469	-0.98%
0.0574	0.4424	0.4333	2.11%
0.0818	0.4198	0.4228	-0.70%
0.1157	0.4047	0.4103	-1.35%
0.1470	0.3996	0.4009	-0.32%
0.1871	0.3983	0.3921	1.59%
0.2469	0.3833	0.3853	-0.52%



Mass	Efficiency
0.0093	0.4587
0.0296	0.4425
0.0574	0.4424
0.0818	0.4198
0.1157	0.4047
0.1470	0.3996
0.1871	0.3983
0.2469	0.3833



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.921055374
Corrected Activity:	20779.00924 dpm/mL
Decay Activity (Sr/Y-90)	41558.01848 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-6322;B3 **Repeat** 28

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 3:27:06 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 3:32:17 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	304	60.800	60.729
sd	0.000			0.008	17.436	3.487	3.487
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	91,932	18,386.400	18,386.043
sd	0.000			0.019	303.203	60.641	60.641

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-6322;B2 **Repeat** 29

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:02:12 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:07:21 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	314	62.800	62.729
sd	0.000			0.008	17.720	3.544	3.544
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	91,945	18,389.000	18,388.643
sd	0.000			0.019	303.224	60.645	60.645

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-6322;B1 **Repeat** 30

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:23:26 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:28:36 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	330	66.000	65.929
sd	0.000			0.008	18.166	3.633	3.633
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	95,309	19,061.800	19,061.443
sd	0.000			0.019	308.722	61.744	61.744

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-6322;B8 **Repeat** 30

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:34:50 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:40:00 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	264	52.800	52.729
sd	0.000			0.008	16.248	3.250	3.250
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	79,652	15,930.400	15,930.043
sd	0.000			0.019	282.227	56.445	56.445

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-6322;B7 **Repeat** 31

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:41:47 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:46:56 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	264	52.800	52.729
sd	0.000			0.008	16.248	3.250	3.250
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	82,761	16,552.200	16,551.843
sd	0.000			0.019	287.682	57.536	57.536

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-6322;B6 **Repeat** 32

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:48:13 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:53:22 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	282	56.400	56.329
sd	0.000			0.008	16.793	3.359	3.359
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	83,042	16,608.400	16,608.043
sd	0.000			0.019	288.170	57.634	57.634

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-6322;B5 **Repeat** 33

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:05:33 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:10:43 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	301	60.200	60.129
sd	0.000			0.008	17.349	3.470	3.470
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	84,097	16,819.400	16,819.043
sd	0.000			0.019	289.995	57.999	57.999

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-6322;B4 **Repeat** 35

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:14:22 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:19:32 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	304	60.800	60.729
sd	0.000			0.008	17.436	3.487	3.487
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	87,233	17,446.600	17,446.243
sd	0.000			0.019	295.352	59.070	59.070

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

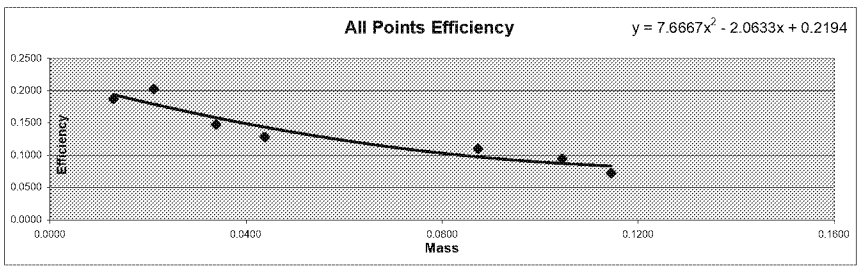
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

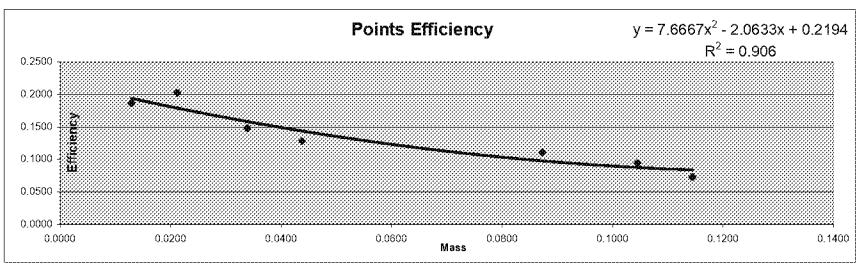
Purple 2

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
2	ICABT-51465;A1	1/16/2016 11:43	40	17766	444.150	2374.5	0.1870	1mL	0.0129
2	ICABT-51465;A2	1/16/2016 11:01	40	19252	481.300	2374.5	0.2027	1mL	0.0212
2	ICABT-51465;A3	1/16/2016 10:15	40	14048	351.200	2374.5	0.1479	1mL	0.0339
2	ICABT-51465;A4	1/16/2016 15:15	40	12208	305.200	2374.5	0.1285	1mL	0.0438
2	ICABT-51465;A6	1/16/2016 13:49	40	20997	524.925	4749.0	0.1105	2mL	0.0873
2	ICABT-51465;A7	1/16/2016 13:06	40	17971	449.275	4749.0	0.0946	2mL	0.1045
2	ICABT-51465;A8	1/16/2016 12:25	40	13811	345.275	4749.0	0.0727	2mL	0.1145

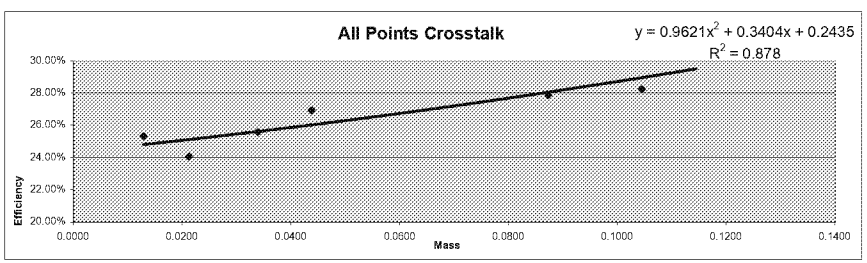
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1870	0.1941	-3.61%
0.0212	0.2027	0.1791	13.17%
0.0339	0.1479	0.1583	-6.55%
0.0438	0.1285	0.1437	-10.58%
0.0873	0.1105	0.0977	13.13%
0.1045	0.0946	0.0875	8.11%
0.1145	0.0727	0.0837	-13.10%



Mass	Efficiency
0.0129	0.1870
0.0212	0.2027
0.0339	0.1479
0.0438	0.1285
0.0873	0.1105
0.1045	0.0946
0.1145	0.0727



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
2	ICABT-51465;A1	0.0129	40.00	17766	6023	444.15	150.58	25.32%	Min
2	ICABT-51465;A2	0.0212	40.00	19252	6100	481.30	152.50	24.06%	24.06%
2	ICABT-51465;A3	0.0339	40.00	14048	4827	351.20	120.68	25.57%	
2	ICABT-51465;A4	0.0438	40.00	12208	4498	305.20	112.45	26.92%	Max
2	ICABT-51465;A6	0.0873	40.00	20997	8109	524.93	202.73	27.86%	
2	ICABT-51465;A7	0.1045	40.00	17971	7075	449.28	176.88	28.25%	Mean
2	ICABT-51465;A8	0.1145	40.00	13811	5955	345.28	148.88	30.13%	26.87%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

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Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-51465;A3

Repeat 49

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 10:15:21 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 10:55:26 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	14,048	351.200	351.087
sd	0.000			0.011	118.524	2.963	2.963
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	4,827	120.675	120.107
sd	0.000			0.024	69.477	1.737	1.737

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-51465;A2

Repeat 50

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 *Sample* **sd** 0 *Sample*

Residual Wt 0 *mg* **sd** 0 *mg*

Count Began 1/16/2016 11:01:50 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 *days*

Count Ended 1/16/2016 11:41:55 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	19,252	481.300	481.187
sd	0.000			0.011	138.752	3.469	3.469
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	6,100	152.500	151.932
sd	0.000			0.024	78.102	1.953	1.953

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-51465;A1 **Repeat** 51

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:43:38 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 12:23:44 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	17,766	444.150	444.037
sd	0.000			0.011	133.289	3.332	3.332
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	6,023	150.575	150.007
sd	0.000			0.024	77.608	1.940	1.940

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-51465;A8 **Repeat** 52

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 12:25:34 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:05:39 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	13,811	345.275	345.162
sd	0.000			0.011	117.520	2.938	2.938
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	5,955	148.875	148.307
sd	0.000			0.024	77.169	1.929	1.929

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-51465;A7 **Repeat** 53

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:06:44 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:46:50 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	17,971	449.275	449.162
sd	0.000			0.011	134.056	3.351	3.351
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	7,075	176.875	176.307
sd	0.000			0.024	84.113	2.103	2.103

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-51465;A6 **Repeat** 131

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:49:30 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 2:29:36 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	20,997	524.925	524.812
sd	0.000			0.011	144.903	3.623	3.623
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	8,109	202.725	202.157
sd	0.000			0.024	90.050	2.251	2.251

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-51465;A5 **Repeat** 55

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 2:32:28 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:12:33 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	17,130	428.250	428.137
sd	0.000			0.011	130.882	3.272	3.272
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	7,230	180.750	180.182
sd	0.000			0.024	85.029	2.126	2.126

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICABT-51465;A4 **Repeat** 56

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 3:15:25 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:55:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	12,208	305.200	305.087
sd	0.000			0.011	110.490	2.762	2.762
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	4,498	112.450	111.882
sd	0.000			0.024	67.067	1.677	1.677

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

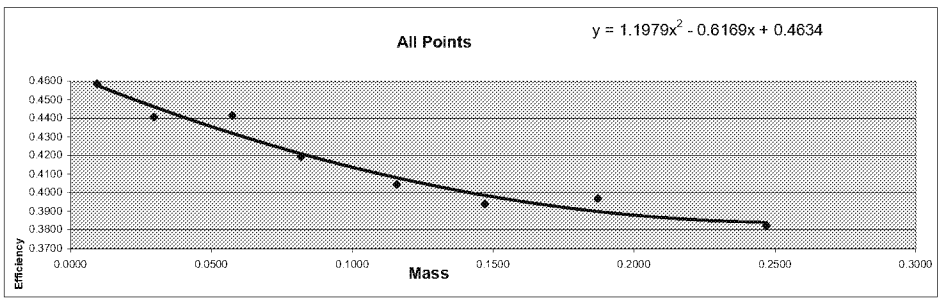
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

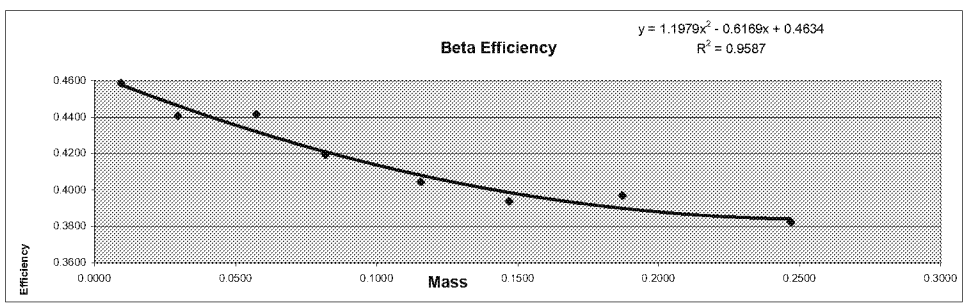
Purple 3

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
3	B1	2/3/2013 16:34	0.0093	5	95314	19062.800	0.4587	1mL
3	B2	2/3/2013 16:23	0.0296	5	91571	18314.200	0.4407	1mL
3	B3	2/3/2013 16:02	0.0574	5	91745	18349.000	0.4415	1mL
3	B4	2/3/2013 15:27	0.0818	5	87137	17427.400	0.4194	1mL
3	B5	2/3/2013 17:14	0.1157	5	84039	16807.800	0.4044	1mL
3	B6	2/3/2013 17:05	0.1470	5	81832	16366.400	0.3938	1mL
3	B7	2/3/2013 16:48	0.1871	5	82490	16498.000	0.3970	1mL
3	B8	2/3/2013 16:41	0.2469	5	79454	15890.800	0.3824	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent ∅ Efficiency
0.0093	0.4587	0.4578	0.20%
0.0296	0.4407	0.4462	-1.23%
0.0574	0.4415	0.4319	2.22%
0.0818	0.4194	0.4210	-0.38%
0.1157	0.4044	0.4081	-0.89%
0.1470	0.3938	0.3986	-1.20%
0.1871	0.3970	0.3899	1.81%
0.2469	0.3824	0.3841	-0.45%



Mass	Efficiency
0.0093	0.4587
0.0296	0.4407
0.0574	0.4415
0.0818	0.4194
0.1157	0.4044
0.1470	0.3938
0.1871	0.3970
0.2469	0.3824



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.921055374
Corrected Activity:	20779.00924 dpm/mL
Decay Activity (Sr/Y-90)	41558.01848 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-6322;B4 **Repeat** 28

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 3:27:12 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 3:32:22 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	68	13.600	13.543
sd	0.000			0.008	8.246	1.649	1.649
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	87,137	17,427.400	17,426.925
sd	0.000			0.022	295.190	59.038	59.038

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-6322;B3 **Repeat** 29

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:02:17 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:07:25 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	67	13.400	13.343
sd	0.000			0.008	8.185	1.637	1.637
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	91,745	18,349.000	18,348.525
sd	0.000			0.022	302.894	60.579	60.579

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-6322;B2 **Repeat** 30

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:23:31 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:28:41 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	77	15.400	15.343
sd	0.000			0.008	8.775	1.755	1.755
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	91,571	18,314.200	18,313.725
sd	0.000			0.022	302.607	60.521	60.521

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-6322;B1 **Repeat** 31

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:34:56 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:40:07 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	70	14.000	13.943
sd	0.000			0.008	8.367	1.673	1.673
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	95,314	19,062.800	19,062.325
sd	0.000			0.022	308.730	61.746	61.746

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-6322;B8 **Repeat** 31

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:41:53 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:47:00 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	65	13.000	12.943
sd	0.000			0.008	8.062	1.612	1.612
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	79,454	15,890.800	15,890.325
sd	0.000			0.022	281.876	56.375	56.375

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-6322;B7 **Repeat** 32

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:48:18 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:53:26 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	61	12.200	12.143
sd	0.000			0.008	7.810	1.562	1.562
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	82,490	16,498.000	16,497.525
sd	0.000			0.022	287.211	57.442	57.442

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-6322;B6 **Repeat** 33

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:05:37 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:10:46 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	62	12.400	12.343
sd	0.000			0.008	7.874	1.575	1.575
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	81,832	16,366.400	16,365.925
sd	0.000			0.022	286.063	57.213	57.213

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-6322;B5 **Repeat** 34

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:14:26 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:19:35 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	71	14.200	14.143
sd	0.000			0.008	8.426	1.685	1.685
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	84,039	16,807.800	16,807.325
sd	0.000			0.022	289.895	57.979	57.979

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

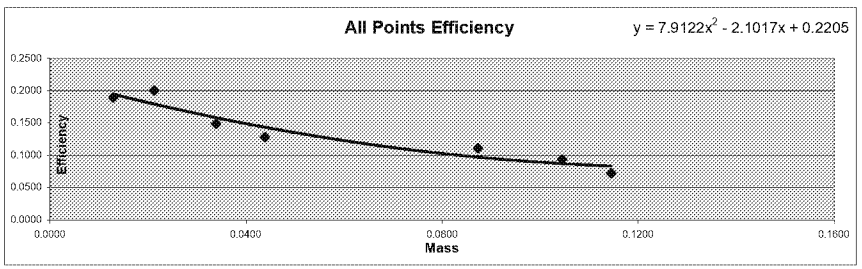
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

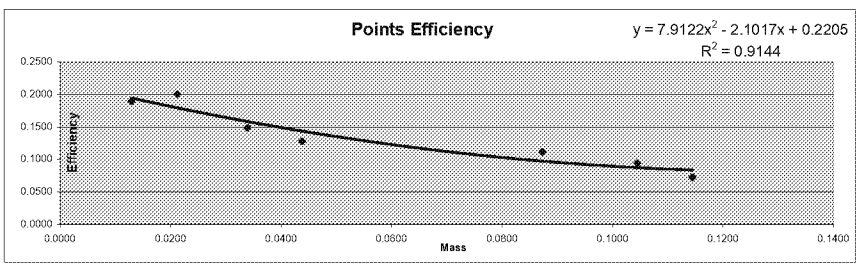
Purple 3

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
3	ICABT-51465;A1	1/16/2016 12:25	40	18022	450.550	2374.5	0.1897	1mL	0.0129
3	ICABT-51465;A2	1/16/2016 11:43	40	19031	475.775	2374.5	0.2004	1mL	0.0212
3	ICABT-51465;A3	1/16/2016 11:01	40	14114	352.850	2374.5	0.1486	1mL	0.0339
3	ICABT-51465;A4	1/16/2016 10:15	40	12152	303.800	2374.5	0.1279	1mL	0.0438
3	ICABT-51465;A6	1/16/2016 14:32	40	21154	528.850	4749.0	0.1114	2mL	0.0873
3	ICABT-51465;A7	1/16/2016 13:49	40	17853	446.325	4749.0	0.0940	2mL	0.1045
3	ICABT-51465;A8	1/16/2016 13:06	40	13738	343.450	4749.0	0.0723	2mL	0.1145

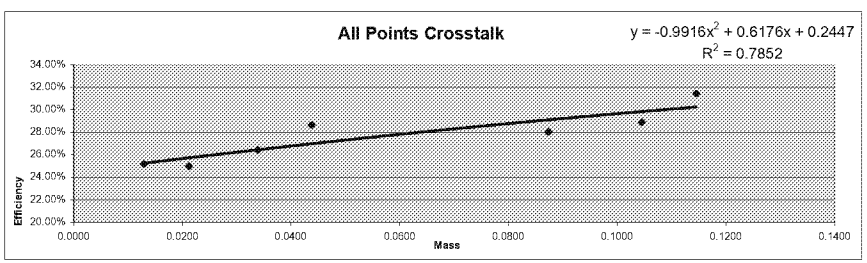
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1897	0.1947	-2.55%
0.0212	0.2004	0.1795	11.63%
0.0339	0.1486	0.1583	-6.15%
0.0438	0.1279	0.1436	-10.92%
0.0873	0.1114	0.0973	14.42%
0.1045	0.0940	0.0873	7.69%
0.1145	0.0723	0.0836	-13.48%



Mass	Efficiency
0.0129	0.1897
0.0212	0.2004
0.0339	0.1486
0.0438	0.1279
0.0873	0.1114
0.1045	0.0940
0.1145	0.0723



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
3	ICABT-51465;A1	0.0129	40.00	18022	6062	450.55	151.55	25.17%	Min
3	ICABT-51465;A2	0.0212	40.00	19031	6335	475.78	158.38	24.97%	24.97%
3	ICABT-51465;A3	0.0339	40.00	14114	5078	352.85	126.95	26.46%	
3	ICABT-51465;A4	0.0438	40.00	12152	4877	303.80	121.93	28.64%	Max
3	ICABT-51465;A6	0.0873	40.00	21154	8241	528.85	206.03	28.04%	
3	ICABT-51465;A7	0.1045	40.00	17853	7252	446.33	181.30	28.89%	Mean
3	ICABT-51465;A8	0.1145	40.00	13738	6301	343.45	157.53	31.44%	27.66%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

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12/04/2019

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-51465;A4 **Repeat** 49

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 10:15:24 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 10:55:30 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	12,152	303.800	303.692
sd	0.000			0.010	110.236	2.756	2.756
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	4,877	121.925	121.365
sd	0.000			0.024	69.836	1.746	1.746

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-51465;A3

Repeat 50

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:01:54 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 11:42:00 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	14,114	352.850	352.742
sd	0.000			0.010	118.802	2.970	2.970
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	5,078	126.950	126.390
sd	0.000			0.024	71.260	1.782	1.782

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-51465;A2 **Repeat** 51

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:43:41 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 12:23:47 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	19,031	475.775	475.667
sd	0.000			0.010	137.953	3.449	3.449
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	6,335	158.375	157.815
sd	0.000			0.024	79.593	1.990	1.990

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-51465;A1 **Repeat** 52

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 12:25:40 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:05:45 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	18,022	450.550	450.442
sd	0.000			0.010	134.246	3.356	3.356
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	6,062	151.550	150.990
sd	0.000			0.024	77.859	1.946	1.947

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-51465;A8 **Repeat** 53

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:06:48 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:46:53 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	13,738	343.450	343.342
sd	0.000			0.010	117.209	2.930	2.930
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	6,301	157.525	156.965
sd	0.000			0.024	79.379	1.984	1.985

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-51465;A7 **Repeat** 54

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:49:33 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 2:29:38 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	17,853	446.325	446.217
sd	0.000			0.010	133.615	3.340	3.340
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	7,252	181.300	180.740
sd	0.000			0.024	85.159	2.129	2.129

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-51465;A6 **Repeat** 132

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 2:32:31 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:12:38 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	21,154	528.850	528.742
sd	0.000			0.010	145.444	3.636	3.636
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	8,241	206.025	205.465
sd	0.000			0.024	90.780	2.269	2.270

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICABT-51465;A5 **Repeat** 56

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 3:15:29 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:55:34 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	17,016	425.400	425.292
sd	0.000			0.010	130.445	3.261	3.261
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	7,415	185.375	184.815
sd	0.000			0.024	86.110	2.153	2.153

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

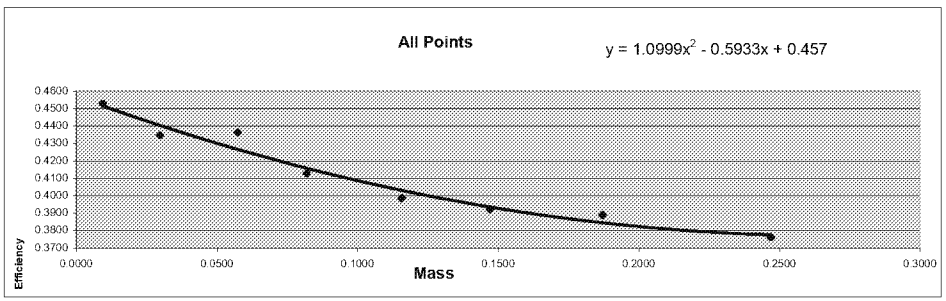
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

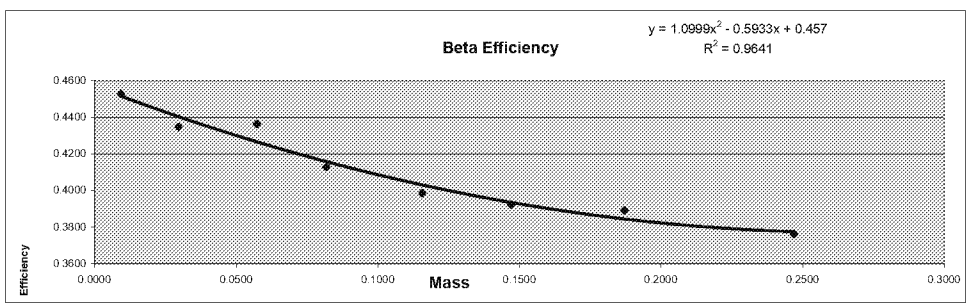
Purple 5

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
5	B1	2/3/2013 16:48	0.0093	5	94066	18813.200	0.4527	1mL
5	B2	2/3/2013 16:42	0.0296	5	90338	18067.600	0.4348	1mL
5	B3	2/3/2013 16:35	0.0574	5	90693	18138.600	0.4365	1mL
5	B4	2/3/2013 16:23	0.0818	5	85792	17158.400	0.4129	1mL
5	B5	2/3/2013 16:02	0.1157	5	82828	16565.600	0.3986	1mL
5	B6	2/3/2013 15:27	0.1470	5	81509	16301.800	0.3923	1mL
5	B7	2/3/2013 17:14	0.1871	5	80863	16172.600	0.3892	1mL
5	B8	2/3/2013 17:05	0.2469	5	78165	15633.000	0.3762	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Efficiency
0.0093	0.4527	0.4516	0.25%
0.0296	0.4348	0.4404	-1.28%
0.0574	0.4365	0.4266	2.32%
0.0818	0.4129	0.4158	-0.71%
0.1157	0.3986	0.4031	-1.11%
0.1470	0.3923	0.3936	-0.33%
0.1871	0.3892	0.3845	1.21%
0.2469	0.3762	0.3776	-0.37%



Mass	Efficiency
0.0093	0.4527
0.0296	0.4348
0.0574	0.4365
0.0818	0.4129
0.1157	0.3986
0.1470	0.3923
0.1871	0.3892
0.2469	0.3762



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.921055374
Corrected Activity:	20779.00924 dpm/mL
Decay Activity (Sr/Y-90)	41558.01848 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-6322;B6 **Repeat** 27

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 3:27:30 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 3:32:39 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	11	2.200	2.144
sd	0.000			0.007	3.317	0.663	0.663
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	81,509	16,301.800	16,301.474
sd	0.000			0.018	285.498	57.100	57.100

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-6322;B5 **Repeat** 28

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:02:28 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:07:37 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	8	1.600	1.544
sd	0.000			0.007	2.828	0.566	0.566
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	82,828	16,565.600	16,565.274
sd	0.000			0.018	287.799	57.560	57.560

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-6322;B4 **Repeat** 30

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:23:42 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:28:52 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	10	2.000	1.944
sd	0.000			0.007	3.162	0.632	0.632
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	85,792	17,158.400	17,158.074
sd	0.000			0.018	292.903	58.581	58.581

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-6322;B3 **Repeat** 31

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:35:11 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:40:20 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	10	2.000	1.944
sd	0.000			0.007	3.162	0.632	0.632
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	90,693	18,138.600	18,138.274
sd	0.000			0.018	301.153	60.231	60.231

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-6322;B2 **Repeat** 32

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:42:01 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:47:10 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	20	4.000	3.944
sd	0.000			0.007	4.472	0.894	0.894
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	90,338	18,067.600	18,067.274
sd	0.000			0.018	300.563	60.113	60.113

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-6322;B1 **Repeat** 33

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:48:30 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:53:39 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	12	2.400	2.344
sd	0.000			0.007	3.464	0.693	0.693
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	94,066	18,813.200	18,812.874
sd	0.000			0.018	306.702	61.340	61.340

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-6322;B8 **Repeat** 33

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:05:48 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:10:57 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	11	2.200	2.144
sd	0.000			0.007	3.317	0.663	0.663
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	78,165	15,633.000	15,632.674
sd	0.000			0.018	279.580	55.916	55.916

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-6322;B7 **Repeat** 34

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:14:35 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:19:44 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	15	3.000	2.944
sd	0.000			0.007	3.873	0.775	0.775
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	80,863	16,172.600	16,172.274
sd	0.000			0.018	284.364	56.873	56.873

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

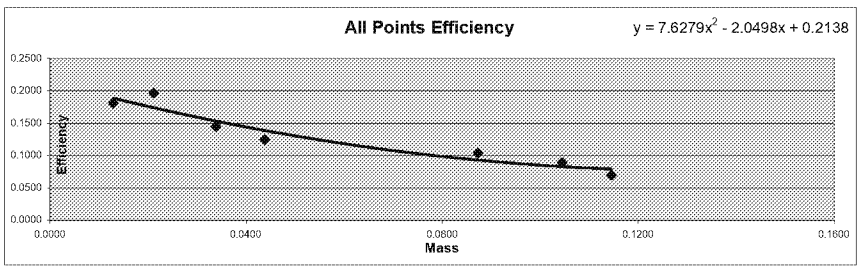
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

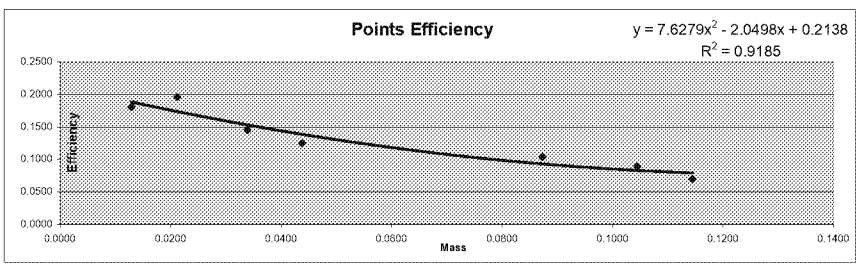
Purple 5

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
5	ICABT-51465;A1	1/16/2016 13:49	40	17192	429.800	2374.5	0.1810	1mL	0.0129
5	ICABT-51465;A2	1/16/2016 13:06	40	18638	465.950	2374.5	0.1962	1mL	0.0212
5	ICABT-51465;A3	1/16/2016 12:25	40	13749	343.725	2374.5	0.1448	1mL	0.0339
5	ICABT-51465;A4	1/16/2016 11:43	40	11825	295.625	2374.5	0.1245	1mL	0.0438
5	ICABT-51465;A6	1/16/2016 10:15	40	19733	493.325	4749.0	0.1039	2mL	0.0873
5	ICABT-51465;A7	1/16/2016 15:15	40	16940	423.500	4749.0	0.0892	2mL	0.1045
5	ICABT-51465;A8	1/16/2016 14:32	40	13247	331.175	4749.0	0.0697	2mL	0.1145

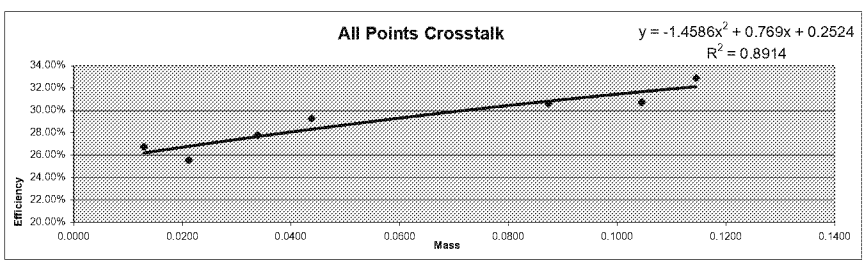
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1810	0.1886	-4.04%
0.0212	0.1962	0.1738	12.92%
0.0339	0.1448	0.1531	-5.44%
0.0438	0.1245	0.1387	-10.21%
0.0873	0.1039	0.0930	11.71%
0.1045	0.0892	0.0829	7.58%
0.1145	0.0697	0.0791	-11.84%



Mass	Efficiency
0.0129	0.1810
0.0212	0.1962
0.0339	0.1448
0.0438	0.1245
0.0873	0.1039
0.1045	0.0892
0.1145	0.0697



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
5	ICABT-51465;A1	0.0129	40.00	17192	6282	429.80	157.05	26.76%	Min
5	ICABT-51465;A2	0.0212	40.00	18638	6400	465.95	160.00	25.56%	25.56%
5	ICABT-51465;A3	0.0339	40.00	13749	5285	343.73	132.13	27.77%	
5	ICABT-51465;A4	0.0438	40.00	11825	4898	295.63	122.45	29.29%	Max
5	ICABT-51465;A6	0.0873	40.00	19733	8711	493.33	217.78	30.63%	
5	ICABT-51465;A7	0.1045	40.00	16940	7527	423.50	188.18	30.76%	Mean
5	ICABT-51465;A8	0.1145	40.00	13247	6499	331.18	162.48	32.91%	29.10%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

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12/04/2019

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-51465;A6 **Repeat** 126

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 10:15:34 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 10:55:39 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	19,733	493.325	493.253
sd	0.000			0.008	140.474	3.512	3.512
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	8,711	217.775	217.365
sd	0.000			0.020	93.333	2.333	2.333

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-51465;A5

Repeat 50

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 *Sample* **sd** 0 *Sample*

Residual Wt 0 *mg* **sd** 0 *mg*

Count Began 1/16/2016 11:02:03 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 *days*

Count Ended 1/16/2016 11:42:08 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	16,412	410.300	410.228
sd	0.000			0.008	128.109	3.203	3.203
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	7,720	193.000	192.590
sd	0.000			0.020	87.864	2.197	2.197

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-51465;A4 **Repeat** 51

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:43:49 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 12:23:55 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	11,825	295.625	295.553
sd	0.000			0.008	108.743	2.719	2.719
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	4,898	122.450	122.040
sd	0.000			0.020	69.986	1.750	1.750

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-51465;A3 **Repeat** 52

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 12:25:49 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:05:54 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	13,749	343.725	343.653
sd	0.000			0.008	117.256	2.931	2.931
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	5,285	132.125	131.715
sd	0.000			0.020	72.698	1.817	1.818

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-51465;A2 **Repeat** 53

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:06:56 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:47:01 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	18,638	465.950	465.878
sd	0.000			0.008	136.521	3.413	3.413
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	6,400	160.000	159.590
sd	0.000			0.020	80.000	2.000	2.000

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-51465;A1 **Repeat** 54

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:49:41 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 2:29:46 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	17,192	429.800	429.728
sd	0.000			0.008	131.118	3.278	3.278
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	6,282	157.050	156.640
sd	0.000			0.020	79.259	1.981	1.982

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-51465;A8 **Repeat** 55

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 2:32:41 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:12:46 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	13,247	331.175	331.103
sd	0.000			0.008	115.096	2.877	2.877
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	6,499	162.475	162.065
sd	0.000			0.020	80.616	2.015	2.016

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICABT-51465;A7 **Repeat** 56

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 3:15:38 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:55:43 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	16,940	423.500	423.428
sd	0.000			0.008	130.154	3.254	3.254
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	7,527	188.175	187.765
sd	0.000			0.020	86.758	2.169	2.169

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

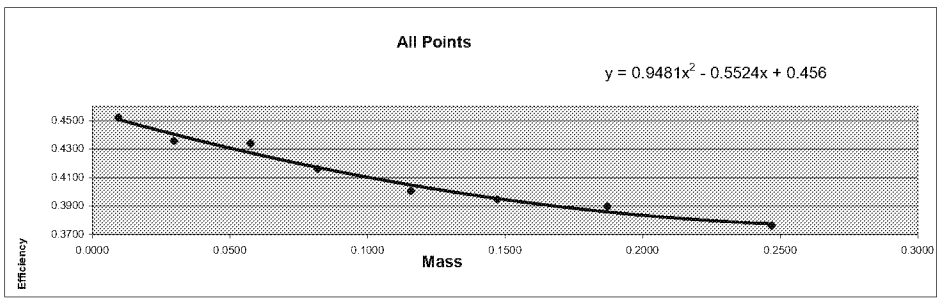
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

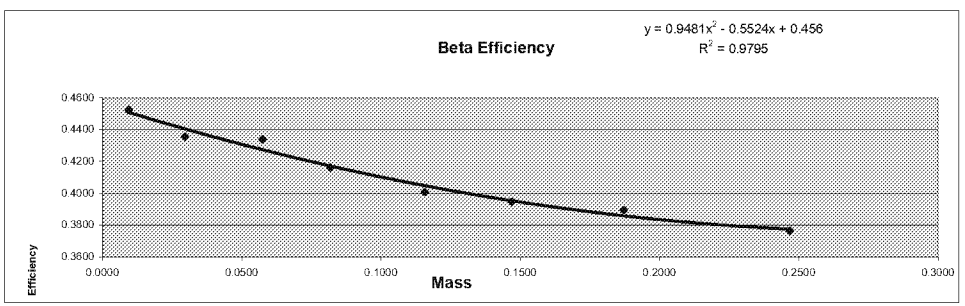
Purple 6

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
6	B1	2/3/2013 17:05	0.0093	5	93999	18799.800	0.4524	1mL
6	B2	2/3/2013 16:48	0.0296	5	90540	18108.000	0.4357	1mL
6	B3	2/3/2013 16:42	0.0574	5	90180	18036.000	0.4340	1mL
6	B4	2/3/2013 16:35	0.0818	5	86481	17296.200	0.4162	1mL
6	B5	2/3/2013 16:23	0.1157	5	83265	16653.000	0.4007	1mL
6	B6	2/3/2013 16:02	0.1470	5	82005	16401.000	0.3947	1mL
6	B7	2/3/2013 15:27	0.1871	5	80934	16186.800	0.3895	1mL
6	B8	2/3/2013 17:14	0.2469	5	78186	15637.200	0.3763	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Efficiency
0.0093	0.4524	0.4509	0.32%
0.0296	0.4357	0.4405	-1.08%
0.0574	0.4340	0.4274	1.54%
0.0818	0.4162	0.4172	-0.23%
0.1157	0.4007	0.4048	-1.00%
0.1470	0.3947	0.3953	-0.16%
0.1871	0.3895	0.3858	0.95%
0.2469	0.3763	0.3774	-0.30%



Mass	Efficiency
0.0093	0.4524
0.0296	0.4357
0.0574	0.4340
0.0818	0.4162
0.1157	0.4007
0.1470	0.3947
0.1871	0.3895
0.2469	0.3763



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.921055374
Corrected Activity:	20779.00924 dpm/mL
Decay Activity (Sr/Y-90)	41558.01848 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-6322;B7 **Repeat** 27

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 3:27:35 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 3:32:43 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	6	1.200	1.150
sd	0.000			0.007	2.449	0.490	0.490
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	80,934	16,186.800	16,186.381
sd	0.000			0.020	284.489	56.898	56.898

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-6322;B6 **Repeat** 28

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:02:32 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:07:41 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	6	1.200	1.150
sd	0.000			0.007	2.449	0.490	0.490
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	82,005	16,401.000	16,400.581
sd	0.000			0.020	286.365	57.273	57.273

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-6322;B5 **Repeat** 29

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:23:47 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:28:56 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	9	1.800	1.750
sd	0.000			0.007	3.000	0.600	0.600
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	83,265	16,653.000	16,652.581
sd	0.000			0.020	288.557	57.711	57.711

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-6322;B4 **Repeat** 31

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:35:15 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:40:25 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	10	2.000	1.950
sd	0.000			0.007	3.162	0.632	0.632
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	86,481	17,296.200	17,295.781
sd	0.000			0.020	294.077	58.815	58.815

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-6322;B3 **Repeat** 32

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:42:05 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:47:14 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	12	2.400	2.350
sd	0.000			0.007	3.464	0.693	0.693
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	90,180	18,036.000	18,035.581
sd	0.000			0.020	300.300	60.060	60.060

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-6322;B2 **Repeat** 33

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:48:36 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:53:46 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	10	2.000	1.950
sd	0.000			0.007	3.162	0.632	0.632
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	90,540	18,108.000	18,107.581
sd	0.000			0.020	300.899	60.180	60.180

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-6322;B1 **Repeat** 34

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:05:52 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:11:01 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	6	1.200	1.150
sd	0.000			0.007	2.449	0.490	0.490
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	93,999	18,799.800	18,799.381
sd	0.000			0.020	306.593	61.319	61.319

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-6322;B8 **Repeat** 34

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:14:40 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:19:48 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	9	1.800	1.750
sd	0.000			0.007	3.000	0.600	0.600
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	78,186	15,637.200	15,636.781
sd	0.000			0.020	279.618	55.924	55.924

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

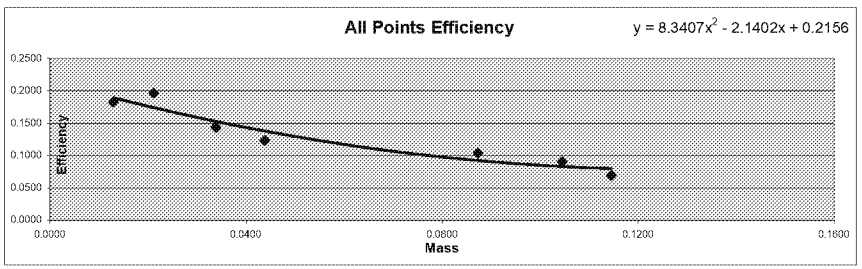
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

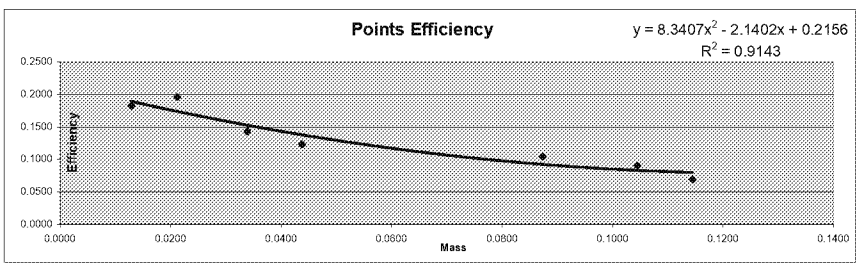
Purple 6

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
6	ICABT-51465;A1	1/16/2016 14:32	40	17362	434.050	2374.5	0.1828	1mL	0.0129
6	ICABT-51465;A2	1/16/2016 13:49	40	18620	465.500	2374.5	0.1960	1mL	0.0212
6	ICABT-51465;A3	1/16/2016 13:06	40	13609	340.225	2374.5	0.1433	1mL	0.0339
6	ICABT-51465;A4	1/16/2016 12:25	40	11705	292.625	2374.5	0.1232	1mL	0.0438
6	ICABT-51465;A6	1/16/2016 11:02	40	19780	494.500	4749.0	0.1041	2mL	0.0873
6	ICABT-51465;A7	1/16/2016 10:15	40	17171	429.275	4749.0	0.0904	2mL	0.1045
6	ICABT-51465;A8	1/16/2016 15:15	40	13139	328.475	4749.0	0.0692	2mL	0.1145

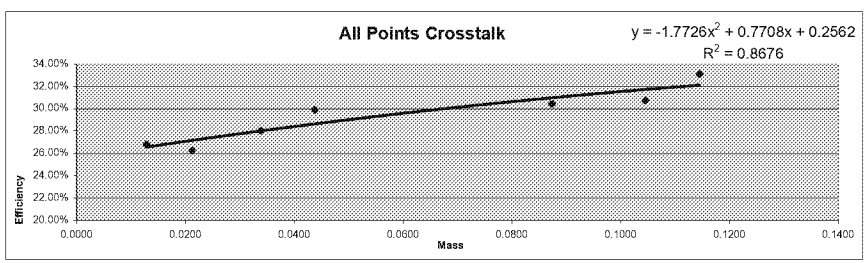
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1828	0.1894	-3.48%
0.0212	0.1960	0.1740	12.68%
0.0339	0.1433	0.1526	-6.13%
0.0438	0.1232	0.1379	-10.61%
0.0873	0.1041	0.0923	12.78%
0.1045	0.0904	0.0830	8.87%
0.1145	0.0692	0.0799	-13.43%



Mass	Efficiency
0.0129	0.1828
0.0212	0.1960
0.0339	0.1433
0.0438	0.1232
0.0873	0.1041
0.1045	0.0904
0.1145	0.0692



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
6	ICABT-51465;A1	0.0129	40.00	17362	6355	434.05	158.88	26.80%	Min
6	ICABT-51465;A2	0.0212	40.00	18620	6629	465.50	165.73	26.25%	26.25%
6	ICABT-51465;A3	0.0339	40.00	13609	5300	340.23	132.50	28.03%	
6	ICABT-51465;A4	0.0438	40.00	11705	4992	292.63	124.80	29.90%	Max
6	ICABT-51465;A6	0.0873	40.00	19780	8656	494.50	216.40	30.44%	
6	ICABT-51465;A7	0.1045	40.00	17171	7625	429.28	190.63	30.75%	Mean
6	ICABT-51465;A8	0.1145	40.00	13139	6502	328.48	162.55	33.10%	29.32%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-51465;A7 **Repeat** 49

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 10:15:39 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 10:55:45 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	17,171	429.275	429.213
sd	0.000			0.008	131.038	3.276	3.276
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	7,625	190.625	190.075
sd	0.000			0.023	87.321	2.183	2.183

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-51465;A6 **Repeat** 127

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:02:06 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 11:42:12 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	19,780	494.500	494.438
sd	0.000			0.008	140.641	3.516	3.516
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	8,656	216.400	215.850
sd	0.000			0.023	93.038	2.326	2.326

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-51465;A5 **Repeat** 51

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:43:52 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 12:23:58 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	16,067	401.675	401.613
sd	0.000			0.008	126.756	3.169	3.169
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	8,007	200.175	199.625
sd	0.000			0.023	89.482	2.237	2.237

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-51465;A4 **Repeat** 52

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 12:25:53 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:05:58 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	11,705	292.625	292.563
sd	0.000			0.008	108.190	2.705	2.705
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	4,992	124.800	124.250
sd	0.000			0.023	70.654	1.766	1.767

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-51465;A3 **Repeat** 53

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:06:59 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:47:04 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	13,609	340.225	340.163
sd	0.000			0.008	116.658	2.916	2.916
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	5,300	132.500	131.950
sd	0.000			0.023	72.801	1.820	1.820

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-51465;A2 **Repeat** 54

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:49:44 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 2:29:49 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	18,620	465.500	465.438
sd	0.000			0.008	136.455	3.411	3.411
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	6,629	165.725	165.175
sd	0.000			0.023	81.419	2.035	2.036

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-51465;A1 **Repeat** 55

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 2:32:46 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:12:51 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	17,362	434.050	433.988
sd	0.000			0.008	131.765	3.294	3.294
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	6,355	158.875	158.325
sd	0.000			0.023	79.718	1.993	1.993

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICABT-51465;A8 **Repeat** 56

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 3:15:42 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:55:47 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	13,139	328.475	328.413
sd	0.000			0.008	114.625	2.866	2.866
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	6,502	162.550	162.000
sd	0.000			0.023	80.635	2.016	2.016

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

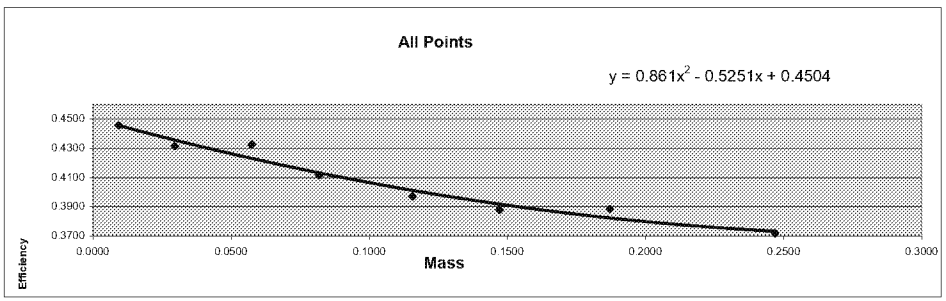
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

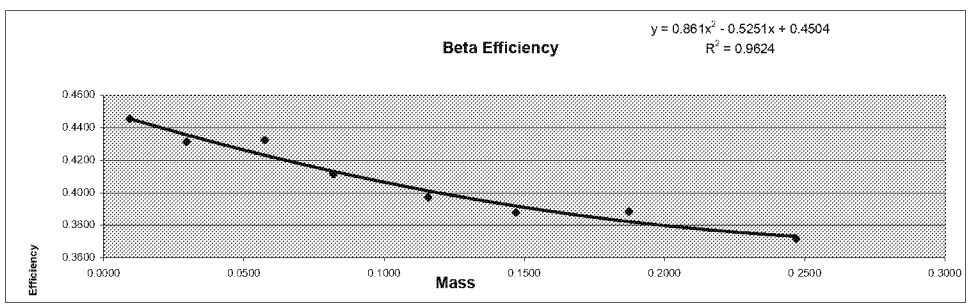
Purple 7

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
7	B1	2/3/2013 17:14	0.0093	5	92582	18516.400	0.4456	1mL
7	B2	2/3/2013 17:05	0.0296	5	89651	17930.200	0.4314	1mL
7	B3	2/3/2013 16:48	0.0574	5	89847	17969.400	0.4324	1mL
7	B4	2/3/2013 16:42	0.0818	5	85484	17096.800	0.4114	1mL
7	B5	2/3/2013 16:35	0.1157	5	82525	16505.000	0.3972	1mL
7	B6	2/3/2013 16:23	0.1470	5	80585	16117.000	0.3878	1mL
7	B7	2/3/2013 16:02	0.1871	5	80726	16145.200	0.3885	1mL
7	B8	2/3/2013 15:27	0.2469	5	77238	15447.600	0.3717	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Efficiency
0.0093	0.4456	0.4456	-0.01%
0.0296	0.4314	0.4356	-0.96%
0.0574	0.4324	0.4231	2.20%
0.0818	0.4114	0.4132	-0.44%
0.1157	0.3972	0.4012	-1.00%
0.1470	0.3878	0.3918	-1.02%
0.1871	0.3885	0.3823	1.62%
0.2469	0.3717	0.3732	-0.41%



Mass	Efficiency
0.0093	0.4456
0.0296	0.4314
0.0574	0.4324
0.0818	0.4114
0.1157	0.3972
0.1470	0.3878
0.1871	0.3885
0.2469	0.3717



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.921055374
Corrected Activity:	20779.00924 dpm/mL
Decay Activity (Sr/Y-90)	41558.01848 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-6322;B8 **Repeat** 27

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 3:27:41 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 3:32:49 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	4	0.800	0.769
sd	0.000			0.006	2.000	0.400	0.400
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	77,238	15,447.600	15,447.251
sd	0.000			0.019	277.917	55.583	55.583

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-6322;B7 **Repeat** 28

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:02:37 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:07:45 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	8	1.600	1.569
sd	0.000			0.006	2.828	0.566	0.566
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	80,726	16,145.200	16,144.851
sd	0.000			0.019	284.123	56.825	56.825

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-6322;B6 **Repeat** 29

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:23:53 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:29:02 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	6	1.200	1.169
sd	0.000			0.006	2.449	0.490	0.490
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	80,585	16,117.000	16,116.651
sd	0.000			0.019	283.875	56.775	56.775

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-6322;B5 **Repeat** 30

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:35:20 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:40:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	5	1.000	0.969
sd	0.000			0.006	2.236	0.447	0.447
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	82,525	16,505.000	16,504.651
sd	0.000			0.019	287.272	57.454	57.454

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-6322;B4 **Repeat** 32

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:42:09 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:47:18 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	2	0.400	0.369
sd	0.000			0.006	1.414	0.283	0.283
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	85,484	17,096.800	17,096.451
sd	0.000			0.019	292.376	58.475	58.475

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-6322;B3 **Repeat** 33

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 4:48:40 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 4:53:50 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	6	1.200	1.169
sd	0.000			0.006	2.449	0.490	0.490
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	89,847	17,969.400	17,969.051
sd	0.000			0.019	299.745	59.949	59.949

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-6322;B2 **Repeat** 34

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:05:57 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:11:08 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	2	0.400	0.369
sd	0.000			0.006	1.414	0.283	0.283
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	89,651	17,930.200	17,929.851
sd	0.000			0.019	299.418	59.884	59.884

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-6322;B1 **Repeat** 35

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:14:44 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:19:55 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	2	0.400	0.369
sd	0.000			0.006	1.414	0.283	0.283
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	92,582	18,516.400	18,516.051
sd	0.000			0.019	304.273	60.855	60.855

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

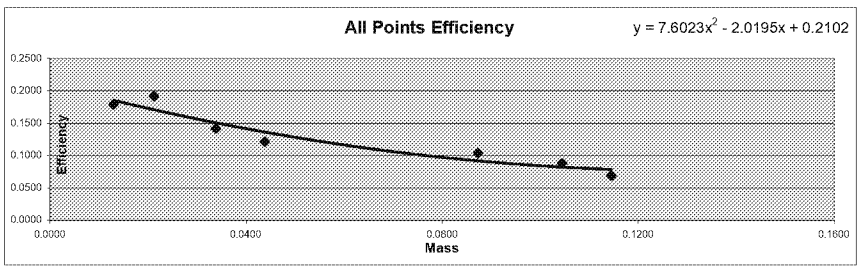
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

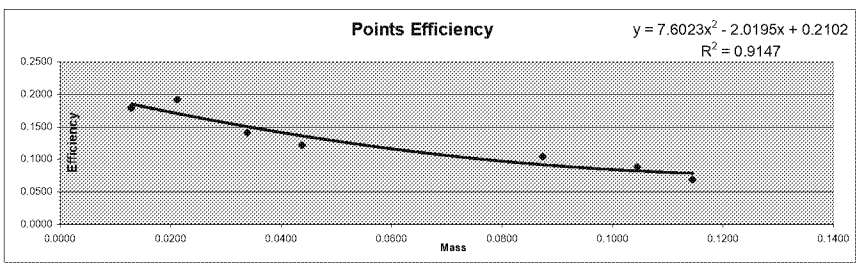
Purple 7

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
7	ICABT-51465;A1	1/16/2016 15:15	40	17012	425.300	2374.5	0.1791	1mL	0.0129
7	ICABT-51465;A2	1/16/2016 14:32	40	18242	456.050	2374.5	0.1921	1mL	0.0212
7	ICABT-51465;A3	1/16/2016 13:49	40	13460	336.500	2374.5	0.1417	1mL	0.0339
7	ICABT-51465;A4	1/16/2016 13:07	40	11542	288.550	2374.5	0.1215	1mL	0.0438
7	ICABT-51465;A6	1/16/2016 11:43	40	19774	494.350	4749.0	0.1041	2mL	0.0873
7	ICABT-51465;A7	1/16/2016 11:02	40	16773	419.325	4749.0	0.0883	2mL	0.1045
7	ICABT-51465;A8	1/16/2016 10:15	40	13029	325.725	4749.0	0.0686	2mL	0.1145

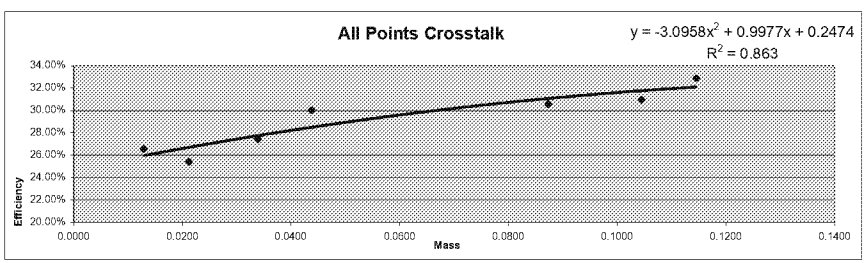
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1791	0.1854	-3.40%
0.0212	0.1921	0.1708	12.45%
0.0339	0.1417	0.1505	-5.82%
0.0438	0.1215	0.1363	-10.86%
0.0873	0.1041	0.0918	13.35%
0.1045	0.0883	0.0822	7.44%
0.1145	0.0686	0.0786	-12.78%



Mass	Efficiency
0.0129	0.1791
0.0212	0.1921
0.0339	0.1417
0.0438	0.1215
0.0873	0.1041
0.1045	0.0883
0.1145	0.0686



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
7	ICABT-51465;A1	0.0129	40.00	17012	6159	425.30	153.98	26.58%	Min
7	ICABT-51465;A2	0.0212	40.00	18242	6217	456.05	155.43	25.42%	25.42%
7	ICABT-51465;A3	0.0339	40.00	13460	5087	336.50	127.18	27.43%	
7	ICABT-51465;A4	0.0438	40.00	11542	4953	288.55	123.83	30.03%	Max
7	ICABT-51465;A6	0.0873	40.00	19774	8713	494.35	217.83	30.59%	
7	ICABT-51465;A7	0.1045	40.00	16773	7528	419.33	188.20	30.98%	Mean
7	ICABT-51465;A8	0.1145	40.00	13029	6389	325.73	159.73	32.90%	29.13%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

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12/04/2019

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-51465;A8 **Repeat** 49

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 10:15:44 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 10:55:49 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	13,029	325.725	325.630
sd	0.000			0.010	114.145	2.854	2.854
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	6,389	159.725	159.261
sd	0.000			0.022	79.931	1.998	1.998

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-51465;A7

Repeat 50

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:02:10 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 11:42:15 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	16,773	419.325	419.230
sd	0.000			0.010	129.511	3.238	3.238
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	7,528	188.200	187.736
sd	0.000			0.022	86.764	2.169	2.169

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-51465;A6 **Repeat** 128

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 11:43:55 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 12:24:01 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	19,774	494.350	494.255
sd	0.000			0.010	140.620	3.516	3.516
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	8,713	217.825	217.361
sd	0.000			0.022	93.343	2.334	2.334

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-51465;A5 **Repeat** 52

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 12:25:56 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:06:02 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	15,783	394.575	394.480
sd	0.000			0.010	125.630	3.141	3.141
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	7,769	194.225	193.761
sd	0.000			0.022	88.142	2.204	2.204

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-51465;A4 **Repeat** 53

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:07:04 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 1:47:09 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	11,542	288.550	288.455
sd	0.000			0.010	107.434	2.686	2.686
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	4,953	123.825	123.361
sd	0.000			0.022	70.378	1.759	1.760

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-51465;A3 **Repeat** 54

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 1:49:48 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 2:29:52 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	13,460	336.500	336.405
sd	0.000			0.010	116.017	2.900	2.900
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	5,087	127.175	126.711
sd	0.000			0.022	71.323	1.783	1.783

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-51465;A2

Repeat 55

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 *Sample* **sd** 0 *Sample*

Residual Wt 0 *mg* **sd** 0 *mg*

Count Began 1/16/2016 2:32:49 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 *days*

Count Ended 1/16/2016 3:12:54 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 *mins* **Background Count Time** 1,000.00 *mins*

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	18,242	456.050	455.955
sd	0.000			0.010	135.063	3.377	3.377
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	6,217	155.425	154.961
sd	0.000			0.022	78.848	1.971	1.971

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICABT-51465;A1 **Repeat** 56

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/16/2016 3:15:45 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/16/2016 3:55:50 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	17,012	425.300	425.205
sd	0.000			0.010	130.430	3.261	3.261
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	6,159	153.975	153.511
sd	0.000			0.022	78.479	1.962	1.962

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

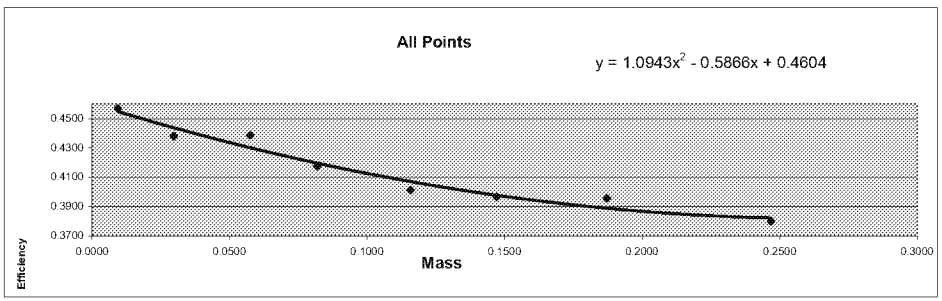
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

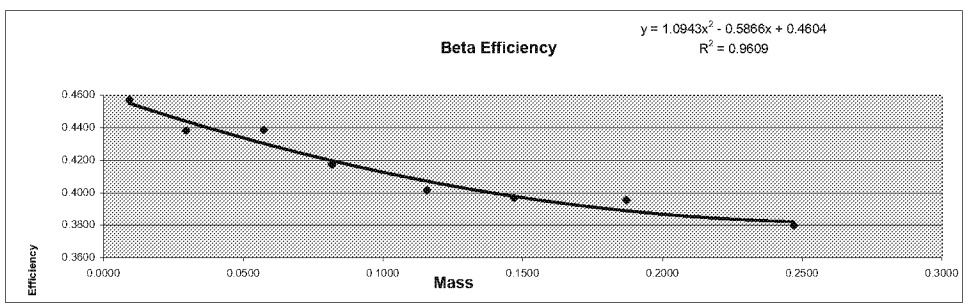
Purple 10

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
10	B1	2/3/2013 17:43	0.0093	5	94979	18995.800	0.4571	1mL
10	B2	2/3/2013 17:29	0.0296	5	91052	18210.400	0.4382	1mL
10	B3	2/3/2013 17:22	0.0574	5	91150	18230.000	0.4387	1mL
10	B4	2/3/2013 18:51	0.0818	5	86754	17350.800	0.4175	1mL
10	B5	2/3/2013 18:32	0.1157	5	83407	16681.400	0.4014	1mL
10	B6	2/3/2013 18:19	0.1470	5	82434	16486.800	0.3967	1mL
10	B7	2/3/2013 18:07	0.1871	5	82188	16437.600	0.3955	1mL
10	B8	2/3/2013 17:51	0.2469	5	78950	15790.000	0.3800	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Efficiency
0.0093	0.4571	0.4550	0.45%
0.0296	0.4382	0.4440	-1.31%
0.0574	0.4387	0.4303	1.94%
0.0818	0.4175	0.4197	-0.53%
0.1157	0.4014	0.4072	-1.42%
0.1470	0.3967	0.3978	-0.28%
0.1871	0.3955	0.3890	1.69%
0.2469	0.3800	0.3823	-0.61%



Mass	Efficiency
0.0093	0.4571
0.0296	0.4382
0.0574	0.4387
0.0818	0.4175
0.1157	0.4014
0.1470	0.3967
0.1871	0.3955
0.2469	0.3800



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.921055374
Corrected Activity:	20779.00924 dpm/mL
Decay Activity (Sr/Y-90)	41558.01848 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-6322;B3 **Repeat** 36

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:22:36 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:27:45 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	141	28.200	28.142
sd	0.000			0.008	11.874	2.375	2.375
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	91,150	18,230.000	18,229.703
sd	0.000			0.017	301.911	60.382	60.382

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-6322;B2 **Repeat** 37

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:29:32 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:34:42 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	160	32.000	31.942
sd	0.000			0.008	12.649	2.530	2.530
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	91,052	18,210.400	18,210.103
sd	0.000			0.017	301.748	60.350	60.350

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-6322;B1 **Repeat** 38

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:43:37 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:48:46 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	182	36.400	36.342
sd	0.000			0.008	13.491	2.698	2.698
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	94,979	18,995.800	18,995.503
sd	0.000			0.017	308.187	61.637	61.637

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-6322;B8 **Repeat** 38

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 5:51:36 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 5:56:45 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	117	23.400	23.342
sd	0.000			0.008	10.817	2.163	2.163
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	78,950	15,790.000	15,789.703
sd	0.000			0.017	280.980	56.196	56.196

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-6322;B7 **Repeat** 39

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 6:07:09 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 6:12:19 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	154	30.800	30.742
sd	0.000			0.008	12.410	2.482	2.482
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	82,188	16,437.600	16,437.303
sd	0.000			0.017	286.684	57.337	57.337

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-6322;B6 **Repeat** 40

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 6:19:54 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 6:25:04 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	143	28.600	28.542
sd	0.000			0.008	11.958	2.392	2.392
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	82,434	16,486.800	16,486.503
sd	0.000			0.017	287.113	57.423	57.423

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-6322;B5 **Repeat** 41

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 6:32:25 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 6:37:34 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	126	25.200	25.142
sd	0.000			0.008	11.225	2.245	2.245
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	83,407	16,681.400	16,681.103
sd	0.000			0.017	288.803	57.761	57.761

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-6322;B4 **Repeat** 43

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 6:51:10 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 6:56:19 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	129	25.800	25.742
sd	0.000			0.008	11.358	2.272	2.272
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	86,754	17,350.800	17,350.503
sd	0.000			0.017	294.540	58.908	58.908

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

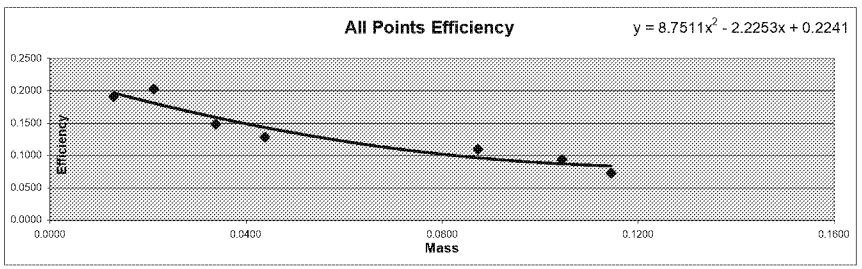
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

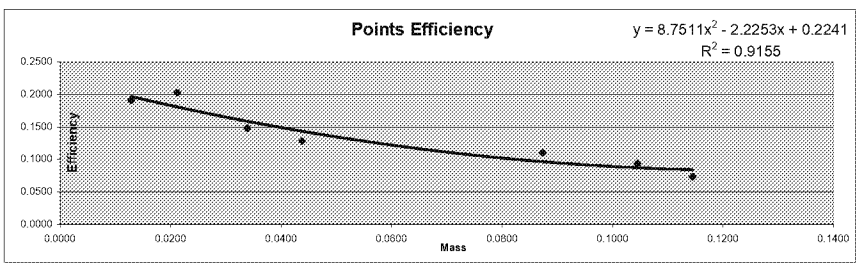
Purple 10

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
10	ICABT-51465;A1	1/17/2016 19:02	40	18150	453.750	2374.5	0.1911	1mL	0.0129
10	ICABT-51465;A2	1/17/2016 18:09	40	19262	481.550	2374.5	0.2028	1mL	0.0212
10	ICABT-51465;A3	1/17/2016 17:25	40	14102	352.550	2374.5	0.1485	1mL	0.0339
10	ICABT-51465;A4	1/17/2016 23:37	40	12188	304.700	2374.5	0.1283	1mL	0.0438
10	ICABT-51465;A6	1/17/2016 21:41	40	20898	522.450	4749.0	0.1100	2mL	0.0873
10	ICABT-51465;A7	1/17/2016 20:45	40	17813	445.325	4749.0	0.0938	2mL	0.1045
10	ICABT-51465;A8	1/17/2016 19:57	40	13886	347.150	4749.0	0.0731	2mL	0.1145

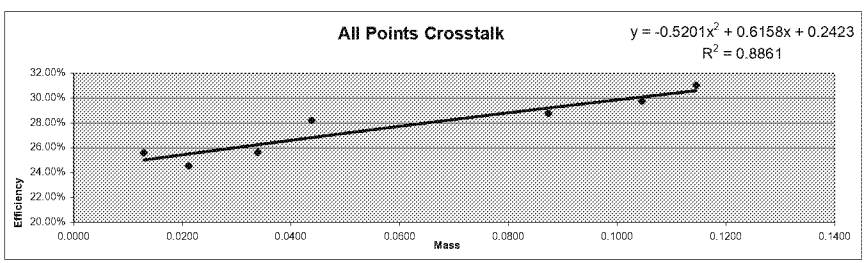
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1911	0.1968	-2.92%
0.0212	0.2028	0.1809	12.13%
0.0339	0.1485	0.1587	-6.46%
0.0438	0.1283	0.1434	-10.53%
0.0873	0.1100	0.0965	13.97%
0.1045	0.0938	0.0871	7.64%
0.1145	0.0731	0.0840	-13.01%



Mass	Efficiency
0.0129	0.1911
0.0212	0.2028
0.0339	0.1485
0.0438	0.1283
0.0873	0.1100
0.1045	0.0938
0.1145	0.0731



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
10	ICABT-51465;A1	0.0129	40.00	18150	6242	453.75	156.05	25.59%	Min
10	ICABT-51465;A2	0.0212	40.00	19262	6260	481.55	156.50	24.53%	24.53%
10	ICABT-51465;A3	0.0339	40.00	14102	4866	352.55	121.65	25.65%	
10	ICABT-51465;A4	0.0438	40.00	12188	4784	304.70	119.60	28.19%	Max
10	ICABT-51465;A6	0.0873	40.00	20898	8442	522.45	211.05	28.77%	
10	ICABT-51465;A7	0.1045	40.00	17813	7538	445.33	188.45	29.73%	Mean
10	ICABT-51465;A8	0.1145	40.00	13886	6246	347.15	156.15	31.03%	27.64%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-51465;A3 **Repeat** 57

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 5:25:43 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 6:05:47 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	14,102	352.550	352.492
sd	0.000			0.008	118.752	2.969	2.969
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	4,866	121.650	121.301
sd	0.000			0.019	69.757	1.744	1.744

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-51465;A2 **Repeat** 58

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 6:09:47 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 6:49:52 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	19,262	481.550	481.492
sd	0.000			0.008	138.788	3.470	3.470
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	6,260	156.500	156.151
sd	0.000			0.019	79.120	1.978	1.978

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-51465;A1 **Repeat** 59

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 7:02:53 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 7:42:59 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	18,150	453.750	453.692
sd	0.000			0.008	134.722	3.368	3.368
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	6,242	156.050	155.701
sd	0.000			0.019	79.006	1.975	1.975

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-51465;A8 **Repeat** 60

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 7:57:57 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 8:38:02 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	13,886	347.150	347.092
sd	0.000			0.008	117.839	2.946	2.946
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	6,246	156.150	155.801
sd	0.000			0.019	79.032	1.976	1.976

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-51465;A7 **Repeat** 61

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 8:45:46 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 9:25:52 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	17,813	445.325	445.267
sd	0.000			0.008	133.465	3.337	3.337
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	7,538	188.450	188.101
sd	0.000			0.019	86.822	2.171	2.171

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-51465;A6 **Repeat** 139

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 9:41:47 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 10:21:53 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	20,898	522.450	522.392
sd	0.000			0.008	144.561	3.614	3.614
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	8,442	211.050	210.701
sd	0.000			0.019	91.880	2.297	2.297

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-51465;A5 **Repeat** 63

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 10:54:07 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 11:34:20 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	17,134	428.350	428.292
sd	0.000			0.008	130.897	3.272	3.272
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	7,597	189.925	189.576
sd	0.000			0.019	87.161	2.179	2.179

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICABT-51465;A4 **Repeat** 64

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 11:37:10 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 12:17:15 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	12,188	304.700	304.642
sd	0.000			0.008	110.399	2.760	2.760
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	4,784	119.600	119.251
sd	0.000			0.019	69.166	1.729	1.729

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

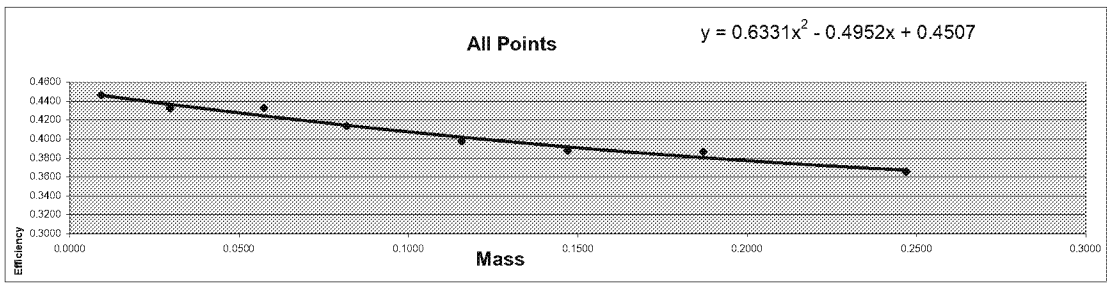
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

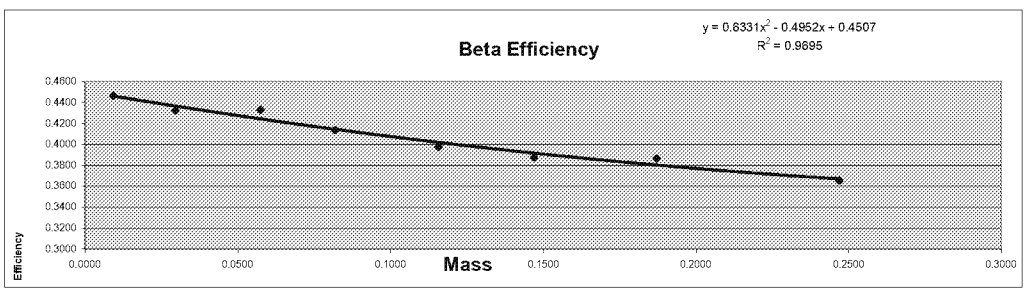
Purple 11

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 38756.83632 CPM	Sr-90 Eff	Standard Aliquot
11	ICABT-6322;B1	12/18/2015 9:33	0.0093	5	86485	17297.000	0.4463	1mL
11	ICABT-6322;B2	12/18/2015 11:20	0.0296	5	83797	16759.400	0.4324	1mL
11	ICABT-6322;B3	12/18/2015 9:41	0.0574	5	83886	16777.200	0.4329	1mL
11	ICABT-6322;B4	12/18/2015 11:31	0.0818	5	80173	16034.600	0.4137	1mL
11	ICABT-6322;B5	12/18/2015 9:48	0.1157	5	77067	15413.400	0.3977	1mL
11	ICABT-6322;B6	12/18/2015 11:37	0.1470	5	75072	15014.400	0.3874	1mL
11	ICABT-6322;B7	12/18/2015 9:58	0.1871	5	74910	14982.000	0.3866	1mL
11	ICABT-6322;B8	12/18/2015 11:44	0.2469	5	70838	14167.600	0.3656	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Efficiency
0.0093	0.4463	0.4461	0.03%
0.0296	0.4324	0.4366	-0.96%
0.0574	0.4329	0.4244	2.01%
0.0818	0.4137	0.4144	-0.17%
0.1157	0.3977	0.4019	-1.04%
0.1470	0.3874	0.3916	-1.07%
0.1871	0.3866	0.3802	1.67%
0.2469	0.3656	0.3670	-0.40%



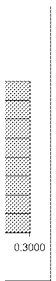
Mass	Efficiency
0.0093	0.4463
0.0296	0.4324
0.0574	0.4329
0.0818	0.4137
0.1157	0.3977
0.1470	0.3874
0.1871	0.3866
0.2469	0.3656



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560
Reference Date:	9/17/2009
Count Date:	12/18/2015
Elapsed Time:	2283.000
Half Life:	10409.625
Exponential Term:	0.858972436
Corrected Activity:	19378.41816
Decay Activity (Sr/Y-90)	38756.83632

Curve is for Gross Beta
Strontium 90
and
Total Strontium



dpm/mL

days
days

dpm/mL
dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-6322;B1 **Repeat** 55

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 9:33:56 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 9:39:06 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	18	3.600	3.453
sd	0.000			0.012	4.243	0.849	0.849
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	86,485	17,297.000	17,296.531
sd	0.000			0.022	294.083	58.817	58.817

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-6322;B3 **Repeat** 54

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 9:41:38 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 9:46:48 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	11	2.200	2.053
sd	0.000			0.012	3.317	0.663	0.663
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	83,886	16,777.200	16,776.731
sd	0.000			0.022	289.631	57.926	57.926

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-6322;B5 **Repeat** 53

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 9:48:21 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 9:53:30 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	10	2.000	1.853
sd	0.000			0.012	3.162	0.632	0.633
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	77,067	15,413.400	15,412.931
sd	0.000			0.022	277.609	55.522	55.522

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-6322;B7 **Repeat** 53

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 9:58:06 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 10:03:15 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	10	2.000	1.853
sd	0.000			0.012	3.162	0.632	0.633
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	74,910	14,982.000	14,981.531
sd	0.000			0.022	273.697	54.739	54.739

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-6322;B2 **Repeat** 56

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 11:20:20 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 11:25:28 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	19	3.800	3.653
sd	0.000			0.012	4.359	0.872	0.872
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	83,797	16,759.400	16,758.931
sd	0.000			0.022	289.477	57.895	57.895

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-6322;B4 **Repeat** 55

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 11:31:04 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 11:36:12 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	15	3.000	2.853
sd	0.000			0.012	3.873	0.775	0.775
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	80,173	16,034.600	16,034.131
sd	0.000			0.022	283.148	56.630	56.630

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-6322;B6 **Repeat** 54

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 11:37:58 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 11:43:06 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	18	3.600	3.453
sd	0.000			0.012	4.243	0.849	0.849
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	75,072	15,014.400	15,013.931
sd	0.000			0.022	273.993	54.799	54.799

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-6322;B8 **Repeat** 54

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 11:44:12 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 11:49:19 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	15	3.000	2.853
sd	0.000			0.012	3.873	0.775	0.775
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	70,838	14,167.600	14,167.131
sd	0.000			0.022	266.154	53.231	53.231

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

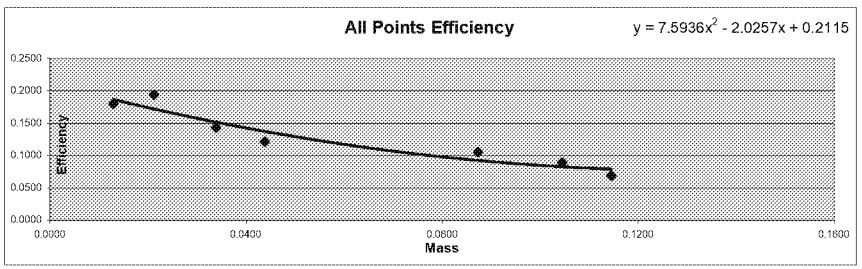
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

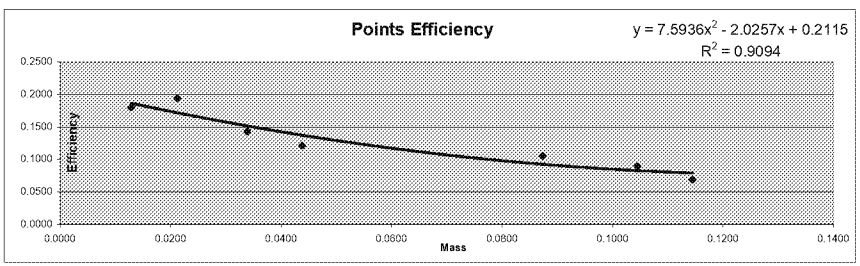
Purple 11

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
11	ICABT-51465;A1	1/17/2016 19:57	40	17101	427.525	2374.5	0.1800	1mL	0.0129
11	ICABT-51465;A2	1/17/2016 19:02	40	18417	460.425	2374.5	0.1939	1mL	0.0212
11	ICABT-51465;A3	1/17/2016 18:09	40	13595	339.875	2374.5	0.1431	1mL	0.0339
11	ICABT-51465;A4	1/17/2016 17:25	40	11530	288.250	2374.5	0.1214	1mL	0.0438
11	ICABT-51465;A6	1/17/2016 22:54	40	20000	500.000	4749.0	0.1053	2mL	0.0873
11	ICABT-51465;A7	1/17/2016 21:41	40	16956	423.900	4749.0	0.0893	2mL	0.1045
11	ICABT-51465;A8	1/17/2016 20:45	40	13023	325.575	4749.0	0.0686	2mL	0.1145

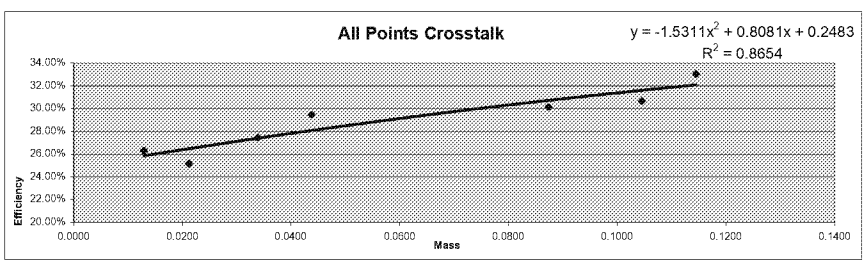
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1800	0.1866	-3.53%
0.0212	0.1939	0.1720	12.76%
0.0339	0.1431	0.1516	-5.56%
0.0438	0.1214	0.1373	-11.61%
0.0873	0.1053	0.0925	13.79%
0.1045	0.0893	0.0827	7.88%
0.1145	0.0686	0.0791	-13.34%



Mass	Efficiency
0.0129	0.1800
0.0212	0.1939
0.0339	0.1431
0.0438	0.1214
0.0873	0.1053
0.1045	0.0893
0.1145	0.0686



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
11	ICABT-51465;A1	0.0129	40.00	17101	6109	427.53	152.73	26.32%	Min
11	ICABT-51465;A2	0.0212	40.00	18417	6189	460.43	154.73	25.15%	25.15%
11	ICABT-51465;A3	0.0339	40.00	13595	5144	339.88	128.60	27.45%	
11	ICABT-51465;A4	0.0438	40.00	11530	4814	288.25	120.35	29.45%	Max
11	ICABT-51465;A6	0.0873	40.00	20000	8623	500.00	215.58	30.13%	
11	ICABT-51465;A7	0.1045	40.00	16956	7499	423.90	187.48	30.66%	Mean
11	ICABT-51465;A8	0.1145	40.00	13023	6427	325.58	160.68	33.04%	28.89%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-51465;A4 **Repeat** 57

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 5:25:48 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 6:05:52 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	11,530	288.250	288.112
sd	0.000			0.012	107.378	2.684	2.684
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	4,814	120.350	119.744
sd	0.000			0.025	69.383	1.735	1.735

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-51465;A3 **Repeat** 58

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 6:09:50 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 6:49:54 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	13,595	339.875	339.737
sd	0.000			0.012	116.598	2.915	2.915
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	5,144	128.600	127.994
sd	0.000			0.025	71.722	1.793	1.793

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-51465;A2 **Repeat** 59

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 7:02:57 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 7:43:02 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	18,417	460.425	460.287
sd	0.000			0.012	135.709	3.393	3.393
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	6,189	154.725	154.119
sd	0.000			0.025	78.670	1.967	1.967

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-51465;A1 **Repeat** 60

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 7:57:31 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 8:37:37 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	17,101	427.525	427.387
sd	0.000			0.012	130.771	3.269	3.269
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	6,109	152.725	152.119
sd	0.000			0.025	78.160	1.954	1.954

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-51465;A8 **Repeat** 61

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 8:45:49 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 9:25:55 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	13,023	325.575	325.437
sd	0.000			0.012	114.118	2.853	2.853
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	6,427	160.675	160.069
sd	0.000			0.025	80.169	2.004	2.004

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-51465;A7 **Repeat** 62

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 9:41:49 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 10:21:54 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	16,956	423.900	423.762
sd	0.000			0.012	130.215	3.255	3.255
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	7,499	187.475	186.869
sd	0.000			0.025	86.597	2.165	2.165

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-51465;A6 **Repeat** 140

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 10:54:09 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 11:34:21 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	20,000	500.000	499.862
sd	0.000			0.012	141.421	3.536	3.536
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	8,623	215.575	214.969
sd	0.000			0.025	92.860	2.322	2.322

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICABT-51465;A5 **Repeat** 64

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 11:37:13 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 12:17:20 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	16,303	407.575	407.437
sd	0.000			0.012	127.683	3.192	3.192
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	7,802	195.050	194.444
sd	0.000			0.025	88.329	2.208	2.208

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

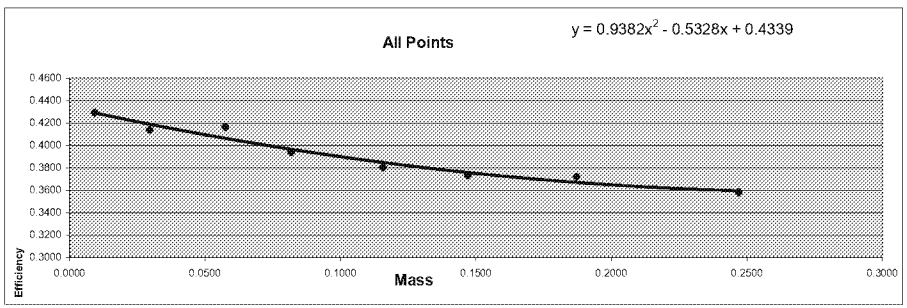
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

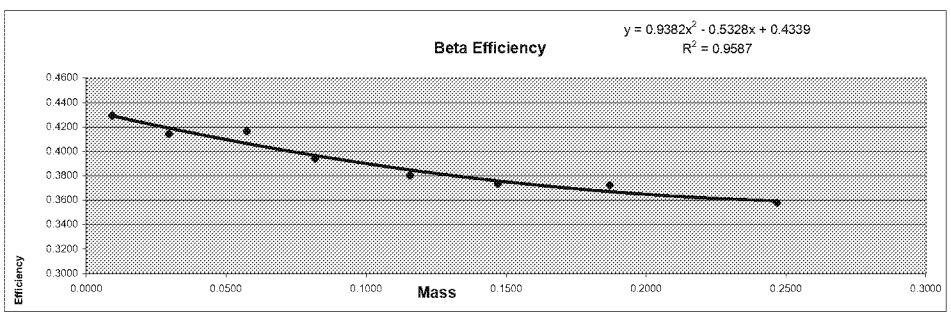
Purple 17

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 38746.51487 CPM	Sr-90 Eff	Standard Aliquot
17	ICABT-6322;B1	12/22/2015 12:04	0.0093	5	83172	16634.400	0.4293	1mL
17	ICABT-6322;B2	12/22/2015 12:09	0.0296	5	80252	16050.400	0.4142	1mL
17	ICABT-6322;B3	12/22/2015 12:15	0.0574	5	80691	16138.200	0.4165	1mL
17	ICABT-6322;B4	12/22/2015 12:57	0.0818	5	76364	15272.800	0.3942	1mL
17	ICABT-6322;B5	12/22/2015 14:52	0.1157	5	73694	14738.800	0.3804	1mL
17	ICABT-6322;B6	12/22/2015 14:58	0.1470	5	72329	14465.800	0.3733	1mL
17	ICABT-6322;B7	12/22/2015 15:10	0.1871	5	72141	14428.200	0.3724	1mL
17	ICABT-6322;B8	12/22/2015 15:18	0.2469	5	69400	13880.000	0.3582	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent ℄ Efficiency
0.0093	0.4293	0.4290	0.07%
0.0296	0.4142	0.4190	-1.12%
0.0574	0.4165	0.4064	2.48%
0.0818	0.3942	0.3966	-0.61%
0.1157	0.3804	0.3848	-1.15%
0.1470	0.3733	0.3759	-0.67%
0.1871	0.3724	0.3671	1.45%
0.2469	0.3582	0.3595	-0.37%



Mass	Efficiency
0.0093	0.4293
0.0296	0.4142
0.0574	0.4165
0.0818	0.3942
0.1157	0.3804
0.1470	0.3733
0.1871	0.3724
0.2469	0.3582



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	12/22/2015
Elapsed Time:	2287.000 days
Half Life:	10409.625 days
Exponential Term:	0.858743681
Corrected Activity:	19373.25743 dpm/mL
Decay Activity (Sr/Y-90)	38746.51487 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-6322;B1 **Repeat** 57

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 12:04:10 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 12:09:31 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	4,339	867.800	867.800
sd	0.000			0.000	65.871	13.174	13.174
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	83,172	16,634.400	16,633.946
sd	0.000			0.021	288.396	57.679	57.679

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-6322;B2 **Repeat** 57

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 12:09:47 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 12:14:56 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	4,042	808.400	808.400
sd	0.000			0.000	63.577	12.715	12.715
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	80,252	16,050.400	16,049.946
sd	0.000			0.021	283.288	56.658	56.658

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-6322;B3 **Repeat** 56

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 12:15:21 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 12:20:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	3,850	770.000	770.000
sd	0.000			0.000	62.048	12.410	12.410
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	80,691	16,138.200	16,137.746
sd	0.000			0.021	284.062	56.812	56.812

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-6322;B4 **Repeat** 56

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 12:57:54 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 1:03:03 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	3,593	718.600	718.600
sd	0.000			0.000	59.942	11.988	11.988
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	76,364	15,272.800	15,272.346
sd	0.000			0.021	276.340	55.268	55.268

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-6322;B5 **Repeat** 55

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 2:52:57 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 2:58:07 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	3,381	676.200	676.200
sd	0.000			0.000	58.146	11.629	11.629
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	73,694	14,738.800	14,738.346
sd	0.000			0.021	271.466	54.293	54.293

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-6322;B6 **Repeat** 55

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 2:58:53 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 3:04:03 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	3,345	669.000	669.000
sd	0.000			0.000	57.836	11.567	11.567
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	72,329	14,465.800	14,465.346
sd	0.000			0.021	268.941	53.788	53.788

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-6322;B7 **Repeat** 55

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 3:10:33 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 3:15:42 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	3,131	626.200	626.200
sd	0.000			0.000	55.955	11.191	11.191
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	72,141	14,428.200	14,427.746
sd	0.000			0.021	268.591	53.718	53.718

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-6322;B8 **Repeat** 55

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 3:18:42 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 3:23:51 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	2,825	565.000	565.000
sd	0.000			0.000	53.151	10.630	10.630
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	69,400	13,880.000	13,879.546
sd	0.000			0.021	263.439	52.688	52.688

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

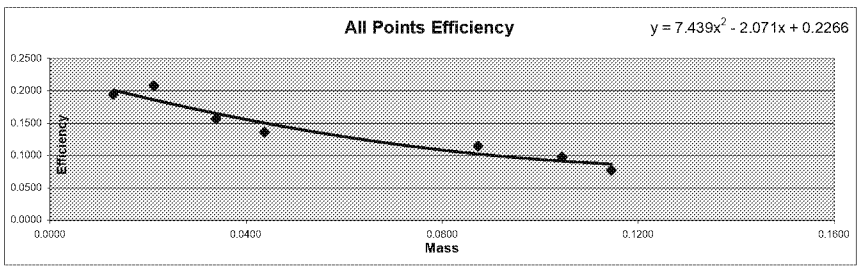
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

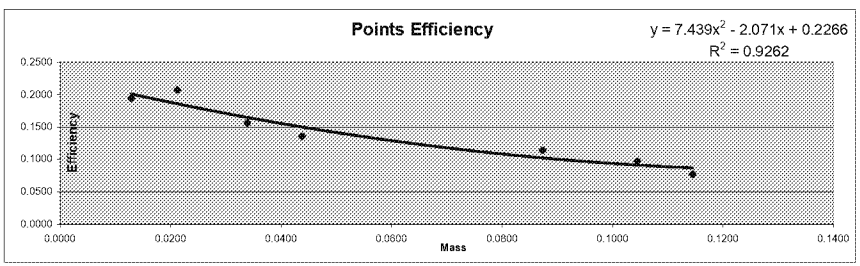
Purple 17

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
17	ICABT-51465;A1	1/18/2016 8:07	40	18468	461.700	2374.5	0.1944	1mL	0.0129
17	ICABT-51465;A2	1/18/2016 7:03	40	19699	492.475	2374.5	0.2074	1mL	0.0212
17	ICABT-51465;A3	1/18/2016 21:03	40	14888	372.200	2374.5	0.1567	1mL	0.0339
17	ICABT-51465;A4	1/18/2016 15:14	40	12882	322.050	2374.5	0.1356	1mL	0.0438
17	ICABT-51465;A6	1/18/2016 11:45	40	21662	541.550	4749.0	0.1140	2mL	0.0873
17	ICABT-51465;A7	1/18/2016 11:01	40	18567	464.175	4749.0	0.0977	2mL	0.1045
17	ICABT-51465;A8	1/18/2016 9:22	40	14673	366.825	4749.0	0.0772	2mL	0.1145

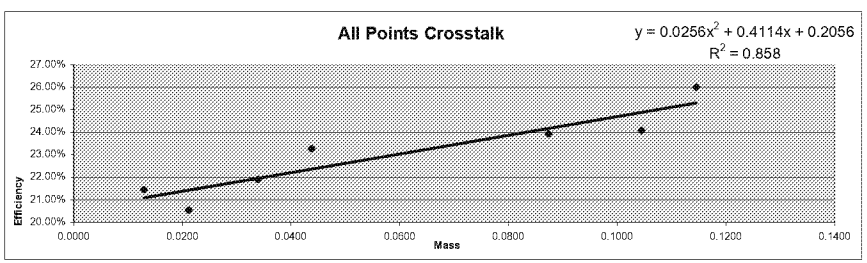
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1944	0.2011	-3.32%
0.0212	0.2074	0.1860	11.48%
0.0339	0.1567	0.1649	-4.97%
0.0438	0.1356	0.1502	-9.68%
0.0873	0.1140	0.1025	11.26%
0.1045	0.0977	0.0914	6.92%
0.1145	0.0772	0.0870	-11.21%



Mass	Efficiency
0.0129	0.1944
0.0212	0.2074
0.0339	0.1567
0.0438	0.1356
0.0873	0.1140
0.1045	0.0977
0.1145	0.0772



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
17	ICABT-51465;A1	0.0129	40.00	18468	5046	461.70	126.15	21.46%	Min
17	ICABT-51465;A2	0.0212	40.00	19699	5091	492.48	127.28	20.54%	20.54%
17	ICABT-51465;A3	0.0339	40.00	14888	4176	372.20	104.40	21.91%	
17	ICABT-51465;A4	0.0438	40.00	12882	3907	322.05	97.68	23.27%	Max
17	ICABT-51465;A6	0.0873	40.00	21662	6817	541.55	170.43	23.94%	
17	ICABT-51465;A7	0.1045	40.00	18567	5890	464.18	147.25	24.08%	Mean
17	ICABT-51465;A8	0.1145	40.00	14673	5156	366.83	128.90	26.00%	23.03%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-51465;A2 **Repeat** 65

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 7:03:21 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 7:43:26 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	19,699	492.475	492.368
sd	0.000			0.010	140.353	3.509	3.509
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	5,091	127.275	126.992
sd	0.000			0.017	71.351	1.784	1.784

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-51465;A1 **Repeat** 66

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 8:07:27 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 8:47:32 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	18,468	461.700	461.593
sd	0.000			0.010	135.897	3.397	3.397
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	5,046	126.150	125.867
sd	0.000			0.017	71.035	1.776	1.776

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-51465;A8 **Repeat** 67

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 9:22:19 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 10:02:24 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	14,673	366.825	366.718
sd	0.000			0.010	121.132	3.028	3.028
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	5,156	128.900	128.617
sd	0.000			0.017	71.805	1.795	1.795

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-51465;A7 **Repeat** 68

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 11:01:23 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 11:41:28 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	18,567	464.175	464.068
sd	0.000			0.010	136.261	3.407	3.407
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	5,890	147.250	146.967
sd	0.000			0.017	76.746	1.919	1.919

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-51465;A6 **Repeat** 146

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 11:45:53 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 12:25:58 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	21,662	541.550	541.443
sd	0.000			0.010	147.180	3.680	3.680
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	6,817	170.425	170.142
sd	0.000			0.017	82.565	2.064	2.064

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-51465;A5 **Repeat** 70

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 12:30:49 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 1:10:55 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	17,959	448.975	448.868
sd	0.000			0.010	134.011	3.350	3.350
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	6,078	151.950	151.667
sd	0.000			0.017	77.962	1.949	1.949

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-51465;A4 **Repeat** 71

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 3:14:01 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 3:54:05 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	12,882	322.050	321.943
sd	0.000			0.010	113.499	2.837	2.837
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	3,907	97.675	97.392
sd	0.000			0.017	62.506	1.563	1.563

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICABT-51465;A3 **Repeat** 72

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 9:03:04 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 9:43:09 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	14,888	372.200	372.093
sd	0.000			0.010	122.016	3.050	3.050
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	4,176	104.400	104.117
sd	0.000			0.017	64.622	1.616	1.616

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

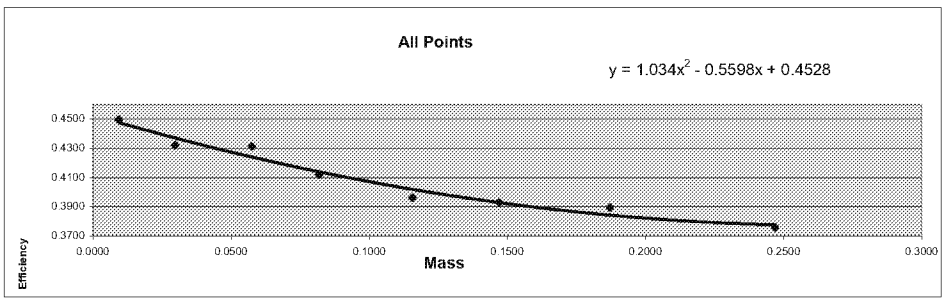
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

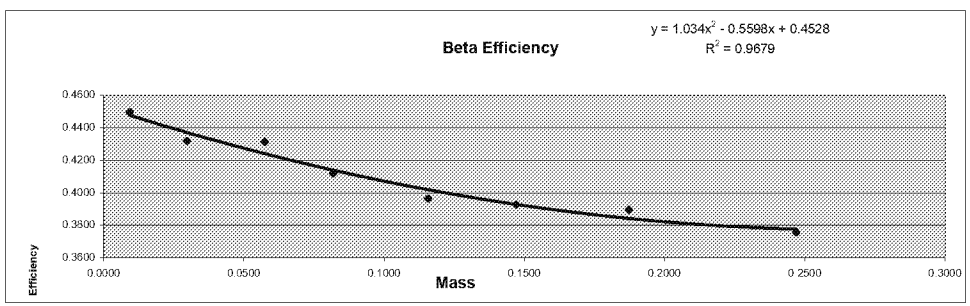
Purple 18

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
18	B1	2/3/2013 19:21	0.0093	5	93422	18684.400	0.4496	1mL
18	B2	2/3/2013 19:13	0.0296	5	89762	17952.400	0.4320	1mL
18	B3	2/3/2013 19:04	0.0574	5	89614	17922.800	0.4313	1mL
18	B4	2/3/2013 20:25	0.0818	5	85627	17125.400	0.4121	1mL
18	B5	2/3/2013 20:17	0.1157	5	82362	16472.400	0.3964	1mL
18	B6	2/3/2013 20:08	0.1470	5	81610	16322.000	0.3928	1mL
18	B7	2/3/2013 20:01	0.1871	5	80938	16187.600	0.3895	1mL
18	B8	2/3/2013 19:53	0.2469	5	78059	15611.800	0.3757	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Efficiency
0.0093	0.4496	0.4477	0.43%
0.0296	0.4320	0.4371	-1.18%
0.0574	0.4313	0.4241	1.70%
0.0818	0.4121	0.4139	-0.45%
0.1157	0.3964	0.4019	-1.37%
0.1470	0.3928	0.3929	-0.03%
0.1871	0.3895	0.3843	1.37%
0.2469	0.3757	0.3776	-0.52%



Mass	Efficiency
0.0093	0.4496
0.0296	0.4320
0.0574	0.4313
0.0818	0.4121
0.1157	0.3964
0.1470	0.3928
0.1871	0.3895
0.2469	0.3757



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.921055374
Corrected Activity:	20779.00924 dpm/mL
Decay Activity (Sr/Y-90)	41558.01848 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-6322;B3 **Repeat** 44

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 7:04:53 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 7:10:03 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	62	12.400	12.278
sd	0.000			0.011	7.874	1.575	1.575
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	89,614	17,922.800	17,922.342
sd	0.000			0.021	299.356	59.871	59.871

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-6322;B2 **Repeat** 45

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 7:13:58 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 7:19:08 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	70	14.000	13.878
sd	0.000			0.011	8.367	1.673	1.673
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	89,762	17,952.400	17,951.942
sd	0.000			0.021	299.603	59.921	59.921

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-6322;B1 **Repeat** 46

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 7:21:15 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 7:26:25 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	79	15.800	15.678
sd	0.000			0.011	8.888	1.778	1.778
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	93,422	18,684.400	18,683.942
sd	0.000			0.021	305.650	61.130	61.130

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-6322;B8 **Repeat** 46

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 7:53:29 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 7:58:38 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	43	8.600	8.478
sd	0.000			0.011	6.557	1.311	1.312
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	78,059	15,611.800	15,611.342
sd	0.000			0.021	279.390	55.878	55.878

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-6322;B7 **Repeat** 47

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 8:01:00 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 8:06:09 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	53	10.600	10.478
sd	0.000			0.011	7.280	1.456	1.456
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	80,938	16,187.600	16,187.142
sd	0.000			0.021	284.496	56.899	56.899

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-6322;B6 **Repeat** 48

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 8:08:19 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 8:13:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	58	11.600	11.478
sd	0.000			0.011	7.616	1.523	1.523
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	81,610	16,322.000	16,321.542
sd	0.000			0.021	285.675	57.135	57.135

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-6322;B5 **Repeat** 49

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 8:17:59 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 8:23:07 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	63	12.600	12.478
sd	0.000			0.011	7.937	1.587	1.587
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	82,362	16,472.400	16,471.942
sd	0.000			0.021	286.988	57.398	57.398

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-6322;B4 **Repeat** 51

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 8:25:31 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 8:30:40 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	56	11.200	11.078
sd	0.000			0.011	7.483	1.497	1.497
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	85,627	17,125.400	17,124.942
sd	0.000			0.021	292.621	58.524	58.524

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

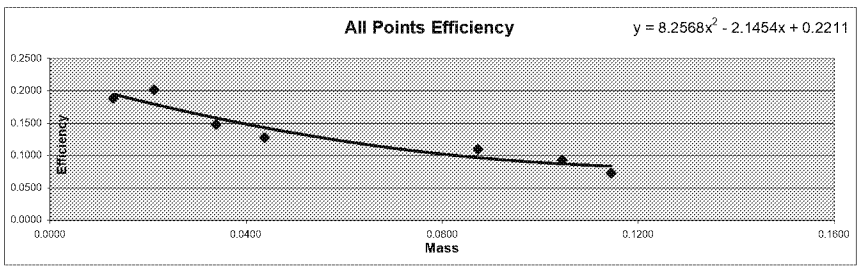
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

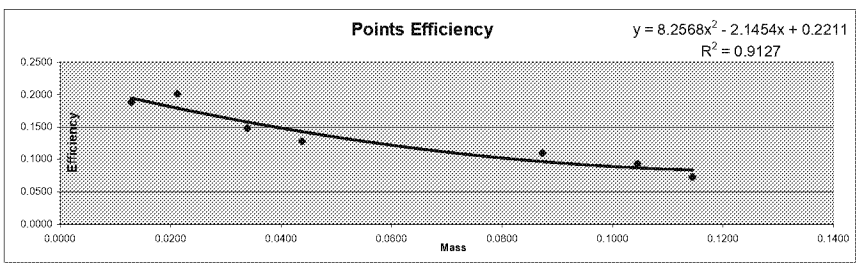
Purple 18

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
18	ICABT-51465;A1	1/18/2016 10:08	40	17900	447.500	2374.5	0.1885	1mL	0.0129
18	ICABT-51465;A2	1/18/2016 8:07	40	19165	479.125	2374.5	0.2018	1mL	0.0212
18	ICABT-51465;A3	1/18/2016 7:03	40	14072	351.800	2374.5	0.1482	1mL	0.0339
18	ICABT-51465;A4	1/18/2016 21:03	40	12133	303.325	2374.5	0.1277	1mL	0.0438
18	ICABT-51465;A6	1/18/2016 12:30	40	20882	522.050	4749.0	0.1099	2mL	0.0873
18	ICABT-51465;A7	1/18/2016 11:46	40	17768	444.200	4749.0	0.0935	2mL	0.1045
18	ICABT-51465;A8	1/18/2016 11:01	40	13896	347.400	4749.0	0.0732	2mL	0.1145

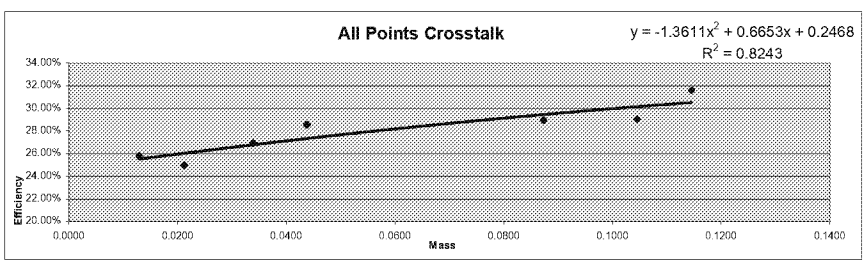
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1885	0.1948	-3.25%
0.0212	0.2018	0.1793	12.52%
0.0339	0.1482	0.1579	-6.15%
0.0438	0.1277	0.1430	-10.65%
0.0873	0.1099	0.0967	13.64%
0.1045	0.0935	0.0871	7.42%
0.1145	0.0732	0.0837	-12.60%



Mass	Efficiency
0.0129	0.1885
0.0212	0.2018
0.0339	0.1482
0.0438	0.1277
0.0873	0.1099
0.1045	0.0935
0.1145	0.0732



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
18	ICABT-51465;A1	0.0129	40.00	17900	6222	447.50	155.55	25.79%	Min
18	ICABT-51465;A2	0.0212	40.00	19165	6380	479.13	159.50	24.98%	24.98%
18	ICABT-51465;A3	0.0339	40.00	14072	5178	351.80	129.45	26.90%	
18	ICABT-51465;A4	0.0438	40.00	12133	4850	303.33	121.25	28.56%	Max
18	ICABT-51465;A6	0.0873	40.00	20882	8508	522.05	212.70	28.95%	
18	ICABT-51465;A7	0.1045	40.00	17768	7270	444.20	181.75	29.04%	Mean
18	ICABT-51465;A8	0.1145	40.00	13896	6415	347.40	160.38	31.58%	27.97%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-51465;A3 **Repeat** 65

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 7:03:54 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 7:43:59 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	14,072	351.800	351.762
sd	0.000			0.006	118.625	2.966	2.966
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	5,178	129.450	129.120
sd	0.000			0.018	71.958	1.799	1.799

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-51465;A2 **Repeat** 66

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 8:07:35 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 8:47:40 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	19,165	479.125	479.087
sd	0.000			0.006	138.438	3.461	3.461
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	6,380	159.500	159.170
sd	0.000			0.018	79.875	1.997	1.997

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-51465;A1 **Repeat** 67

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 10:08:28 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 10:48:33 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	17,900	447.500	447.462
sd	0.000			0.006	133.791	3.345	3.345
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	6,222	155.550	155.220
sd	0.000			0.018	78.880	1.972	1.972

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-51465;A8 **Repeat** 68

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 11:01:30 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 11:41:35 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	13,896	347.400	347.362
sd	0.000			0.006	117.881	2.947	2.947
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	6,415	160.375	160.045
sd	0.000			0.018	80.094	2.002	2.002

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-51465;A7 **Repeat** 69

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 11:46:00 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 12:26:05 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	17,768	444.200	444.162
sd	0.000			0.006	133.297	3.332	3.332
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	7,270	181.750	181.420
sd	0.000			0.018	85.264	2.132	2.132

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-51465;A6 **Repeat** 147

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 12:30:56 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 1:11:02 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	20,882	522.050	522.012
sd	0.000			0.006	144.506	3.613	3.613
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	8,508	212.700	212.370
sd	0.000			0.018	92.239	2.306	2.306

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-51465;A5 **Repeat** 71

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 3:14:07 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 3:54:12 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	16,970	424.250	424.212
sd	0.000			0.006	130.269	3.257	3.257
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	7,622	190.550	190.220
sd	0.000			0.018	87.304	2.183	2.183

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICABT-51465;A4 **Repeat** 72

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 9:03:08 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 9:43:13 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	12,133	303.325	303.287
sd	0.000			0.006	110.150	2.754	2.754
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	4,850	121.250	120.920
sd	0.000			0.018	69.642	1.741	1.741

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

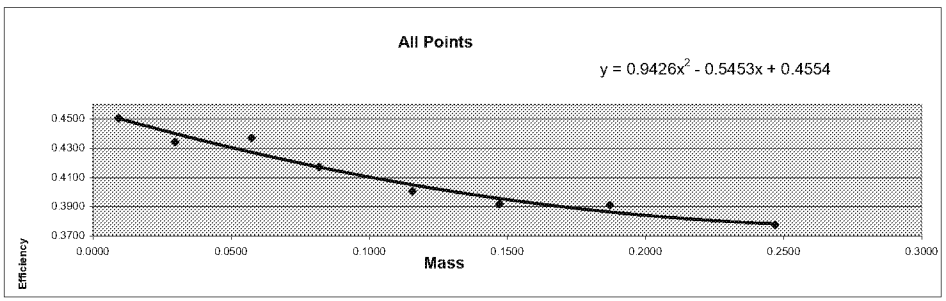
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Beta
Strontium 90
and
Total Strontium

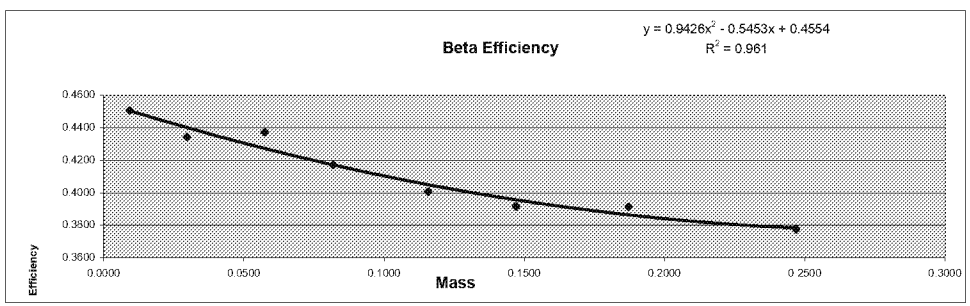
Purple 19

Detector ID	Std ID	Count Date	Sample Wt	Count Time	Beta Counts	DPM 41558.018 CPM	Sr-90 Eff	Standard Aliquot
19	B1	2/3/2013 19:53	0.0093	5	93648	18729.600	0.4507	1mL
19	B2	2/3/2013 19:21	0.0296	5	90261	18052.200	0.4344	1mL
19	B3	2/3/2013 19:14	0.0574	5	90824	18164.800	0.4371	1mL
19	B4	2/3/2013 19:04	0.0818	5	86694	17338.800	0.4172	1mL
19	B5	2/3/2013 20:25	0.1157	5	83246	16649.200	0.4006	1mL
19	B6	2/3/2013 20:18	0.1470	5	81376	16275.200	0.3916	1mL
19	B7	2/3/2013 20:08	0.1871	5	81281	16256.200	0.3912	1mL
19	B8	2/3/2013 20:01	0.2469	5	78431	15686.200	0.3775	1mL

Mass	Measured Efficiency	Theoretical Efficiency	Percent Efficiency
0.0093	0.4507	0.4504	0.06%
0.0296	0.4344	0.4401	-1.30%
0.0574	0.4371	0.4272	2.31%
0.0818	0.4172	0.4171	0.03%
0.1157	0.4006	0.4049	-1.06%
0.1470	0.3916	0.3956	-1.01%
0.1871	0.3912	0.3864	1.24%
0.2469	0.3775	0.3782	-0.20%



Mass	Efficiency
0.0093	0.4507
0.0296	0.4344
0.0574	0.4371
0.0818	0.4172
0.1157	0.4006
0.1470	0.3916
0.1871	0.3912
0.2469	0.3775



Standard ID
Strontium 90
Sr-90_00004 #6322
Cert# 80573-334 Ref. date 9/172009

Initial Activity:	22560 dpm/mL
Reference Date:	9/17/2009
Count Date:	2/3/2013
Elapsed Time:	1235.000 days
Half Life:	10409.625 days
Exponential Term:	0.921055374
Corrected Activity:	20779.00924 dpm/mL
Decay Activity (Sr/Y-90)	41558.01848 dpm

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-6322;B4 **Repeat** 44

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 7:04:57 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 7:10:06 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	225	45.000	44.914
sd	0.000			0.009	15.000	3.000	3.000
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	86,694	17,338.800	17,338.324
sd	0.000			0.022	294.438	58.888	58.888

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-6322;B3 **Repeat** 45

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 7:14:03 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 7:19:14 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	222	44.400	44.314
sd	0.000			0.009	14.900	2.980	2.980
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	90,824	18,164.800	18,164.324
sd	0.000			0.022	301.370	60.274	60.274

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-6322;B2 **Repeat** 46

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 7:21:19 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 7:26:28 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	229	45.800	45.714
sd	0.000			0.009	15.133	3.027	3.027
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	90,261	18,052.200	18,051.724
sd	0.000			0.022	300.435	60.087	60.087

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-6322;B1 **Repeat** 47

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 7:53:35 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 7:58:46 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	218	43.600	43.514
sd	0.000			0.009	14.765	2.953	2.953
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	93,648	18,729.600	18,729.124
sd	0.000			0.022	306.020	61.204	61.204

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-6322;B8 **Repeat** 47

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 8:01:05 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 8:06:15 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	168	33.600	33.514
sd	0.000			0.009	12.961	2.592	2.592
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	78,431	15,686.200	15,685.724
sd	0.000			0.022	280.055	56.011	56.011

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-6322;B7 **Repeat** 48

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 8:08:24 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 8:13:34 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	175	35.000	34.914
sd	0.000			0.009	13.229	2.646	2.646
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	81,281	16,256.200	16,255.724
sd	0.000			0.022	285.098	57.020	57.020

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-6322;B6 **Repeat** 49

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 8:18:05 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 8:23:15 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	204	40.800	40.714
sd	0.000			0.009	14.283	2.857	2.857
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	81,376	16,275.200	16,274.724
sd	0.000			0.022	285.265	57.053	57.053

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-6322;B5 **Repeat** 50

Carrier No. 0

Batch ID M122627

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/3/2013 8:25:35 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/3/2013 8:30:46 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	203	40.600	40.514
sd	0.000			0.009	14.248	2.850	2.850
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	83,246	16,649.200	16,648.724
sd	0.000			0.022	288.524	57.705	57.705

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

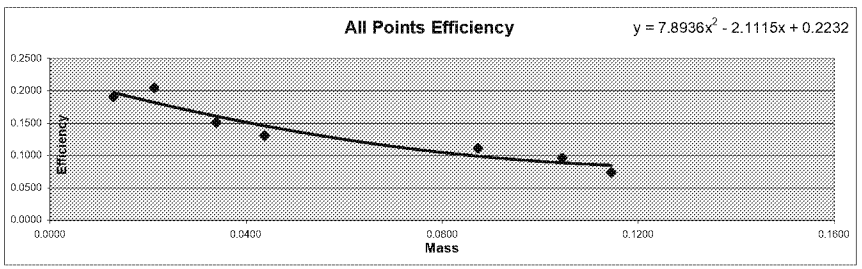
*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Curve is for Gross Alpha

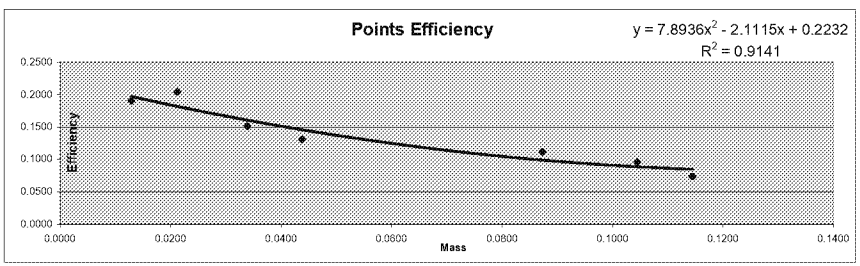
Purple 19

Detector ID	Sample ID	Count Date	Count Time	Alpha Counts	Net CPM	DPM	Th-230 Efficiency	Standard Aliquot	Mass
19	ICABT-51465;A1	1/18/2016 11:00	40	18121	453.025	2374.5	0.1908	1mL	0.0129
19	ICABT-51465;A2	1/18/2016 10:08	40	19428	485.700	2374.5	0.2045	1mL	0.0212
19	ICABT-51465;A3	1/18/2016 8:07	40	14341	358.525	2374.5	0.1510	1mL	0.0339
19	ICABT-51465;A4	1/18/2016 7:04	40	12427	310.675	2374.5	0.1308	1mL	0.0438
19	ICABT-51465;A6	1/18/2016 15:14	40	21193	529.825	4749.0	0.1116	2mL	0.0873
19	ICABT-51465;A7	1/18/2016 12:31	40	18249	456.225	4749.0	0.0961	2mL	0.1045
19	ICABT-51465;A8	1/18/2016 11:46	40	14057	351.425	4749.0	0.0740	2mL	0.1145

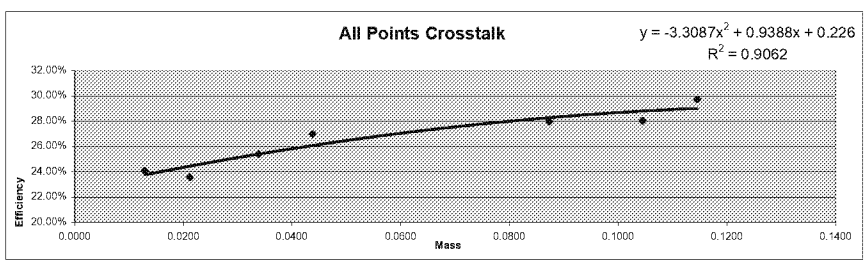
Mass	Measured Efficiency	Theoretical Efficiency	Percent Ø Efficiency
0.0129	0.1908	0.1973	-3.29%
0.0212	0.2045	0.1820	12.40%
0.0339	0.1510	0.1607	-6.04%
0.0438	0.1308	0.1459	-10.30%
0.0873	0.1116	0.0990	12.66%
0.1045	0.0961	0.0887	8.25%
0.1145	0.0740	0.0849	-12.86%



Mass	Efficiency
0.0129	0.1908
0.0212	0.2045
0.0339	0.1510
0.0438	0.1308
0.0873	0.1116
0.1045	0.0961
0.1145	0.0740



Detector ID	Sample ID	Mass	Count Time	Alpha Counts	Beta Counts	Alpha CPM	Beta CPM	% α into β	
19	ICABT-51465;A1	0.0129	40.00	18121	5748	453.03	143.70	24.08%	Min
19	ICABT-51465;A2	0.0212	40.00	19428	5991	485.70	149.78	23.57%	23.57%
19	ICABT-51465;A3	0.0339	40.00	14341	4882	358.53	122.05	25.40%	
19	ICABT-51465;A4	0.0438	40.00	12427	4592	310.68	114.80	26.98%	Max
19	ICABT-51465;A6	0.0873	40.00	21193	8236	529.83	205.90	27.99%	
19	ICABT-51465;A7	0.1045	40.00	18249	7102	456.23	177.55	28.01%	Mean
19	ICABT-51465;A8	0.1145	40.00	14057	5945	351.43	148.63	29.72%	26.54%



Standard ID
Thorium-230
Th-230_00016
Container#: 51465
Cert #: 92523 Ref. date 11/29/2012
Activity 2374.5 dpm/mL

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-51465;A4 **Repeat** 65

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 7:04:02 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 7:44:07 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	12,427	310.675	310.628
sd	0.000			0.007	111.476	2.787	2.787
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	4,592	114.800	114.348
sd	0.000			0.021	67.764	1.694	1.694

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-51465;A3 **Repeat** 66

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 8:07:43 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 8:47:48 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	14,341	358.525	358.478
sd	0.000			0.007	119.754	2.994	2.994
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	4,882	122.050	121.598
sd	0.000			0.021	69.871	1.747	1.747

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-51465;A2 **Repeat** 67

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 10:08:36 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 10:48:41 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	19,428	485.700	485.653
sd	0.000			0.007	139.384	3.485	3.485
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	5,991	149.775	149.323
sd	0.000			0.021	77.402	1.935	1.935

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-51465;A1 **Repeat** 68

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 11:00:30 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 11:40:36 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	18,121	453.025	452.978
sd	0.000			0.007	134.614	3.365	3.365
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	5,748	143.700	143.248
sd	0.000			0.021	75.816	1.895	1.896

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-51465;A8 **Repeat** 69

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 11:46:09 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 12:26:14 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	14,057	351.425	351.378
sd	0.000			0.007	118.562	2.964	2.964
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	5,945	148.625	148.173
sd	0.000			0.021	77.104	1.928	1.928

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-51465;A7 **Repeat** 70

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 12:31:04 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 1:11:09 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	18,249	456.225	456.178
sd	0.000			0.007	135.089	3.377	3.377
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	7,102	177.550	177.098
sd	0.000			0.021	84.273	2.107	2.107

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-51465;A6 **Repeat** 148

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 3:14:10 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 3:54:16 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	21,193	529.825	529.778
sd	0.000			0.007	145.578	3.639	3.639
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	8,236	205.900	205.448
sd	0.000			0.021	90.752	2.269	2.269

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICABT-51465;A5 **Repeat** 72

Carrier No. 0

Batch ID m153000

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 9:03:11 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 9:43:17 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 40.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	17,239	430.975	430.928
sd	0.000			0.007	131.297	3.282	3.282
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	7,185	179.625	179.173
sd	0.000			0.021	84.764	2.119	2.119

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha Beta Calibration Verifications

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
0	97.22%	100.50%	100.16%	99.29%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Count Date:	2/4/2013		(or date at which you wish to determine activity)
Elapsed Time:	67.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.995548598		
Corrected Activity:	2228.734647	dpm	
Decay Activity (Sr/Y-90)	4457.469295	dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICVABT-51512;Beta 1 **Repeat** 19

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:27:35 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:32:38 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	107	21.400	21.313
sd	0.000			0.009	10.344	2.069	2.069
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	9,402	1,880.400	1,879.995
sd	0.000			0.020	96.964	19.393	19.393

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICVABT-51512;Beta 3 **Repeat** 43

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 11:10:35 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:15:40 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	104	20.800	20.713
sd	0.000			0.009	10.198	2.040	2.040
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	8,700	1,740.000	1,739.595
sd	0.000			0.020	93.274	18.655	18.655

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICVABT-51512;Beta 2 **Repeat** 26

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 11:19:39 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:24:41 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.087	90	18.000	17.913
sd	0.000			0.009	9.487	1.897	1.897
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.405	9,154	1,830.800	1,830.395
sd	0.000			0.020	95.677	19.135	19.135

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
0	96.20%	96.68%	95.70%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/17/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
0	5.22E+00	5.19E+00	5.24E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICVABT-181198;A1 **Repeat** 1

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 5:23:51 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 5:53:56 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	13,346	444.867	444.722
sd	0.000			0.012	115.525	3.851	3.851
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	4,118	137.267	136.758
sd	0.000			0.023	64.172	2.139	2.139

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICVABT-181198;A3

Repeat 7

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 10:54:54 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 11:24:57 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	7,446	248.200	248.055
sd	0.000			0.012	86.290	2.876	2.876
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	2,702	90.067	89.558
sd	0.000			0.023	51.981	1.733	1.733

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - A

Addr: 0

Sample ID ICVABT-181198;A2

Repeat 8

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 11:37:46 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 12:07:49 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.145	9,026	300.867	300.722
sd	0.000			0.012	95.005	3.167	3.167
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.509	3,022	100.733	100.224
sd	0.000			0.023	54.973	1.832	1.833

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
1	97.82%	98.11%	97.82%	97.91%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Current Date:	2/4/2013		(or date at which you wish to determine activity)
Elapsed Time:	67.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.995548598		
Corrected Activity:	2228.734647	dpm	
Decay Activity (Sr/Y-90)	4457.469295	dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICVABT-51512;Beta 2 **Repeat** 19

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:27:40 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:32:43 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	122	24.400	24.307
sd	0.000			0.010	11.045	2.209	2.209
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	8,864	1,772.800	1,772.414
sd	0.000			0.020	94.149	18.830	18.830

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICVABT-51512;Beta 1 **Repeat** 20

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:35:45 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:40:48 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	143	28.600	28.507
sd	0.000			0.010	11.958	2.392	2.392
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	9,371	1,874.200	1,873.814
sd	0.000			0.020	96.804	19.361	19.361

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICVABT-51512;Beta 3 **Repeat** 44

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 11:19:43 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:24:44 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.093	128	25.600	25.507
sd	0.000			0.010	11.314	2.263	2.263
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.386	8,421	1,684.200	1,683.814
sd	0.000			0.020	91.766	18.353	18.353

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
1	95.45%	96.49%	94.98%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/17/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
1	5.26E+00	5.20E+00	5.28E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICVABT-181198;A2

Repeat 1

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 5:23:57 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 5:54:01 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	9,163	305.433	305.286
sd	0.000			0.012	95.724	3.191	3.191
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	2,975	99.167	98.690
sd	0.000			0.022	54.544	1.818	1.818

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICVABT-181198;A1

Repeat 2

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 6:08:15 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 6:38:21 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	13,464	448.800	448.653
sd	0.000			0.012	116.034	3.868	3.868
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	4,040	134.667	134.190
sd	0.000			0.022	63.561	2.119	2.119

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - B

Addr: 1

Sample ID ICVABT-181198;A3

Repeat 8

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 11:37:51 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 12:07:55 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	7,650	255.000	254.853
sd	0.000			0.012	87.464	2.915	2.916
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.477	2,588	86.267	85.790
sd	0.000			0.022	50.872	1.696	1.696

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
2	97.32%	98.16%	98.56%	98.01%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7 dpm	
Reference Date:	11/29/2012	
Current Date:	2/4/2013	(or date at which you wish to determine activity)
Elapsed Time:	67.000 days	
Half Life:	10409.625 days	
Exponential Term:	0.995548598	
Corrected Activity:	2228.734647 dpm	
Decay Activity (Sr/Y-90)	4457.469295 dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICVABT-51512;Beta 3 **Repeat** 37

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:27:46 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:32:48 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	37	7.400	7.329
sd	0.000			0.008	6.083	1.217	1.217
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	8,637	1,727.400	1,727.043
sd	0.000			0.019	92.935	18.587	18.587

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICVABT-51512;Beta 2 **Repeat** 20

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:35:50 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:40:52 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	38	7.600	7.529
sd	0.000			0.008	6.164	1.233	1.233
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	9,007	1,801.400	1,801.043
sd	0.000			0.019	94.905	18.981	18.981

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICVABT-51512;Beta 1 **Repeat** 21

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:42:38 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:47:41 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.071	36	7.200	7.129
sd	0.000			0.008	6.000	1.200	1.200
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.357	9,460	1,892.000	1,891.643
sd	0.000			0.019	97.263	19.453	19.453

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
2	95.45%	98.17%	100.35%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/17/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
2	5.26E+00	5.11E+00	5.00E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICVABT-181198;A3 **Repeat** 1

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 5:24:02 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 5:54:05 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	7,022	234.067	233.954
sd	0.000			0.011	83.797	2.793	2.793
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	2,693	89.767	89.199
sd	0.000			0.024	51.894	1.730	1.730

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICVABT-181198;A2

Repeat 2

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 6:08:21 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 6:38:25 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	8,778	292.600	292.487
sd	0.000			0.011	93.691	3.123	3.123
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	3,164	105.467	104.899
sd	0.000			0.024	56.249	1.875	1.875

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - C

Addr: 2

Sample ID ICVABT-181198;A1 **Repeat** 3

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 7:01:42 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 7:31:47 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.113	13,181	439.367	439.254
sd	0.000			0.011	114.809	3.827	3.827
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.568	4,263	142.100	141.532
sd	0.000			0.024	65.292	2.176	2.177

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
3	98.41%	98.26%	98.61%	98.43%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Current Date:	2/4/2013		(or date at which you wish to determine activity)
Elapsed Time:	67.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.995548598		
Corrected Activity:	2228.734647	dpm	
Decay Activity (Sr/Y-90)	4457.469295	dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICVABT-51512;Beta 3 **Repeat** 38

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:35:54 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:40:57 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	1	0.200	0.143
sd	0.000			0.008	1.000	0.200	0.200
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	8,594	1,718.800	1,718.325
sd	0.000			0.022	92.704	18.541	18.541

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICVABT-51512;Beta 2 **Repeat** 21

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:42:43 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:47:46 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	6	1.200	1.143
sd	0.000			0.008	2.449	0.490	0.490
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	8,972	1,794.400	1,793.925
sd	0.000			0.022	94.721	18.944	18.944

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICVABT-51512;Beta 1 **Repeat** 22

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:50:07 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:55:09 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.057	12	2.400	2.343
sd	0.000			0.008	3.464	0.693	0.693
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.475	9,542	1,908.400	1,907.925
sd	0.000			0.022	97.683	19.537	19.537

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
3	96.88%	97.16%	95.92%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/17/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
3	5.18E+00	5.17E+00	5.23E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICVABT-181198;A3

Repeat 2

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 6:08:26 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 6:38:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	7,318	243.933	243.825
sd	0.000			0.010	85.545	2.852	2.852
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	2,971	99.033	98.473
sd	0.000			0.024	54.507	1.817	1.817

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICVABT-181198;A2

Repeat 3

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 7:01:46 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 7:31:49 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	8,851	295.033	294.925
sd	0.000			0.010	94.080	3.136	3.136
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	3,303	110.100	109.540
sd	0.000			0.024	57.472	1.916	1.916

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 0-3 - D

Addr: 3

Sample ID ICVABT-181198;A1 **Repeat** 4

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 7:56:13 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 8:26:18 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.108	13,023	434.100	433.992
sd	0.000			0.010	114.118	3.804	3.804
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.560	4,463	148.767	148.207
sd	0.000			0.024	66.806	2.227	2.227

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
5	96.82%	96.57%	99.16%	97.52%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Current Date:	2/4/2013		(or date at which you wish to determine activity)
Elapsed Time:	67.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.995548598		
Corrected Activity:	2228.734647	dpm	
Decay Activity (Sr/Y-90)	4457.469295	dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICVABT-51512;Beta 3 **Repeat** 40

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:50:15 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 10:55:18 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	3	0.600	0.544
sd	0.000			0.007	1.732	0.346	0.346
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	8,522	1,704.400	1,704.074
sd	0.000			0.018	92.315	18.463	18.463

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICVABT-51512;Beta 2 **Repeat** 23

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:57:22 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:02:24 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	0	0.000	-0.056
sd	0.000			0.007	0.000	0.000	0.150
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	8,711	1,742.200	1,741.874
sd	0.000			0.018	93.333	18.667	18.667

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICVABT-51512;Beta 1 **Repeat** 24

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 11:03:03 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:08:05 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.056	1	0.200	0.144
sd	0.000			0.007	1.000	0.200	0.200
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.326	9,267	1,853.400	1,853.074
sd	0.000			0.018	96.265	19.253	19.253

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
5	94.67%	98.17%	98.65%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/17/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
5	5.30E+00	5.11E+00	5.09E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICVABT-181198;A3 **Repeat** 4

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 7:56:25 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 8:26:28 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	6,818	227.267	227.195
sd	0.000			0.008	82.571	2.752	2.752
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	2,957	98.567	98.157
sd	0.000			0.020	54.378	1.813	1.813

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICVABT-181198;A2

Repeat 5

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 8:44:20 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 9:14:25 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	8,439	281.300	281.228
sd	0.000			0.008	91.864	3.062	3.062
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	3,330	111.000	110.590
sd	0.000			0.020	57.706	1.924	1.924

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - B

Addr: 5

Sample ID ICVABT-181198;A1 **Repeat** 6

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 9:40:30 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 10:10:35 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.072	12,907	430.233	430.161
sd	0.000			0.008	113.609	3.787	3.787
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.410	4,621	154.033	153.623
sd	0.000			0.020	67.978	2.266	2.266

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
6	96.72%	96.47%	98.11%	97.10%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Current Date:	2/4/2013		(or date at which you wish to determine activity)
Elapsed Time:	67.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.995548598		
Corrected Activity:	2228.734647	dpm	
Decay Activity (Sr/Y-90)	4457.469295	dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICVABT-51512;Beta 3 **Repeat** 41

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 10:57:26 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:02:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	0	0.000	-0.050
sd	0.000			0.007	0.000	0.000	0.142
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	8,466	1,693.200	1,692.781
sd	0.000			0.020	92.011	18.402	18.402

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICVABT-51512;Beta 2 **Repeat** 24

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 11:03:08 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:08:09 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	0	0.000	-0.050
sd	0.000			0.007	0.000	0.000	0.142
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	8,737	1,747.400	1,746.981
sd	0.000			0.020	93.472	18.694	18.694

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICVABT-51512;Beta 1 **Repeat** 25

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 11:10:27 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:15:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.050	1	0.200	0.150
sd	0.000			0.007	1.000	0.200	0.200
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.419	9,273	1,854.600	1,854.181
sd	0.000			0.020	96.296	19.259	19.259

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
6	94.28%	97.01%	95.08%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/17/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	5.28E+03
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
6	5.32E+00	5.17E+00	5.28E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICVABT-181198;A3

Repeat 5

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 8:44:24 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 9:14:29 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	7,008	233.600	233.538
sd	0.000			0.008	83.714	2.790	2.790
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	3,030	101.000	100.450
sd	0.000			0.023	55.045	1.835	1.835

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICVABT-181198;A2

Repeat 6

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 9:40:34 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 10:10:39 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	8,468	282.267	282.205
sd	0.000			0.008	92.022	3.067	3.067
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	3,414	113.800	113.250
sd	0.000			0.023	58.429	1.948	1.948

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - C

Addr: 6

Sample ID ICVABT-181198;A1 **Repeat** 7

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 10:54:45 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 11:24:49 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.062	12,999	433.300	433.238
sd	0.000			0.008	114.013	3.800	3.800
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.550	4,536	151.200	150.650
sd	0.000			0.023	67.350	2.245	2.245

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
7	97.07%	99.01%	98.51%	98.20%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Current Date:	2/4/2013		(or date at which you wish to determine activity)
Elapsed Time:	67.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.995548598		
Corrected Activity:	2228.734647	dpm	
Decay Activity (Sr/Y-90)	4457.469295	dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICVABT-51512;Beta 3 **Repeat** 42

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 11:03:12 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:08:14 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	1	0.200	0.169
sd	0.000			0.006	1.000	0.200	0.200
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	8,421	1,684.200	1,683.851
sd	0.000			0.019	91.766	18.353	18.353

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICVABT-51512;Beta 2 **Repeat** 25

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 11:10:31 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:15:39 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	1	0.200	0.169
sd	0.000			0.006	1.000	0.200	0.200
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	8,887	1,777.400	1,777.051
sd	0.000			0.019	94.271	18.854	18.854

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICVABT-51512;Beta 1 **Repeat** 26

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 11:19:35 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 11:24:38 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.031	1	0.200	0.169
sd	0.000			0.006	1.000	0.200	0.200
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	9,214	1,842.800	1,842.451
sd	0.000			0.019	95.990	19.198	19.198

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
7	95.65%	98.29%	99.99%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/17/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
7	5.25E+00	5.11E+00	5.02E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICVABT-181198;A3

Repeat 6

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 9:40:39 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 10:10:43 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	6,634	221.133	221.038
sd	0.000			0.010	81.449	2.715	2.715
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	3,028	100.933	100.469
sd	0.000			0.022	55.027	1.834	1.834

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICVABT-181198;A2

Repeat 7

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 10:54:49 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/17/2016 11:24:53 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	8,293	276.433	276.338
sd	0.000			0.010	91.066	3.036	3.036
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	3,371	112.367	111.903
sd	0.000			0.022	58.060	1.935	1.935

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 4-7 - D

Addr: 7

Sample ID ICVABT-181198;A1

Repeat 8

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/17/2016 11:37:40 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 12:07:45 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.095	12,560	418.667	418.572
sd	0.000			0.010	112.071	3.736	3.736
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.464	4,500	150.000	149.536
sd	0.000			0.022	67.082	2.236	2.236

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
10	98.06%	98.56%	98.06%	98.23%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Current Date:	2/4/2013		(or date at which you wish to determine activity)
Elapsed Time:	67.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.995548598		
Corrected Activity:	2228.734647	dpm	
Decay Activity (Sr/Y-90)	4457.469295	dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICVABT-51512;Beta 3 **Repeat** 21

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 6:35:10 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 6:40:12 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	19	3.800	3.742
sd	0.000			0.008	4.359	0.872	0.872
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	8,525	1,705.000	1,704.703
sd	0.000			0.017	92.331	18.466	18.466

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICVABT-51512;Beta 2 **Repeat** 4

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 6:57:08 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 7:02:09 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	17	3.400	3.342
sd	0.000			0.008	4.123	0.825	0.825
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	8,978	1,795.600	1,795.303
sd	0.000			0.017	94.752	18.950	18.950

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICVABT-51512;Beta 1 **Repeat** 5

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 7:02:55 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 7:07:57 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	22	4.400	4.342
sd	0.000			0.008	4.690	0.938	0.938
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.297	9,468	1,893.600	1,893.303
sd	0.000			0.017	97.304	19.461	19.461

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
10	96.47%	95.12%	97.28%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/18/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
10	5.20E+00	5.28E+00	5.16E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICVABT-181198;A3 **Repeat** 9

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/18/2016 9:07:28 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/18/2016 9:37:32 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	7,150	238.333	238.275
sd	0.000			0.008	84.558	2.819	2.819
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	2,820	94.000	93.651
sd	0.000			0.019	53.104	1.770	1.770

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICVABT-181198;A2 **Repeat** 10

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 12:27:04 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 12:57:08 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	8,992	299.733	299.675
sd	0.000			0.008	94.826	3.161	3.161
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	3,314	110.467	110.118
sd	0.000			0.019	57.567	1.919	1.919

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - C

Addr: 10

Sample ID ICVABT-181198;A1 **Repeat** 11

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 1:35:59 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 2:06:03 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.058	13,205	440.167	440.109
sd	0.000			0.008	114.913	3.830	3.830
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.349	4,412	147.067	146.718
sd	0.000			0.019	66.423	2.214	2.214

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
11	99.48%	95.32%	97.35%	97.38%

Beta Activity	12/18/2015	1872.6551 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Count Date:	12/18/2015		(or date at which you wish to determine activity)
Elapsed Time:	1114.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.928506334		
Corrected Activity:	2078.64713	dpm	
Decay Activity (Sr/Y-90)	4157.29426	dpm	1872.655 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICVABT-51512;B1 **Repeat** 3

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 1:10:51 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 1:15:54 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	2	0.400	0.253
sd	0.000			0.012	1.414	0.283	0.283
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	8,830	1,766.000	1,765.531
sd	0.000			0.022	93.968	18.794	18.794

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICVABT-51512;B3 **Repeat** 3

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 1:16:58 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 1:21:59 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	4	0.800	0.653
sd	0.000			0.012	2.000	0.400	0.400
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	7,726	1,545.200	1,544.731
sd	0.000			0.022	87.898	17.580	17.580

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICVABT-51512;B2 **Repeat** 53

Carrier No. 0

Batch ID M122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/18/2015 1:22:51 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/18/2015 1:27:53 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.147	0	0.000	-0.147
sd	0.000			0.012	0.000	0.000	0.243
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.469	7,997	1,599.400	1,598.931
sd	0.000			0.022	89.426	17.885	17.885

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
11	94.64%	96.32%	98.36%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/19/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
11	5.30E+00	5.21E+00	5.10E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICVABT-181198;A3 **Repeat** 10

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 12:27:11 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 12:57:15 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	6,797	226.567	226.429
sd	0.000			0.012	82.444	2.748	2.748
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	2,990	99.667	99.061
sd	0.000			0.025	54.681	1.823	1.823

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICVABT-181198;A2 **Repeat** 11

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 1:36:04 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 2:06:08 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	8,528	284.267	284.129
sd	0.000			0.012	92.347	3.078	3.078
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	3,286	109.533	108.927
sd	0.000			0.025	57.324	1.911	1.911

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 8-11 - D

Addr: 11

Sample ID ICVABT-181198;A1 **Repeat** 12

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 2:31:57 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 3:02:01 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.138	12,778	425.933	425.795
sd	0.000			0.012	113.040	3.768	3.768
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.606	4,459	148.633	148.027
sd	0.000			0.025	66.776	2.226	2.226

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
17	96.89%	95.77%	98.07%	96.91%

Beta Activity	12/22/2015	1872.1564 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7 dpm	
Reference Date:	11/29/2012	
Count Date:	12/22/2015	(or date at which you wish to determine activity)
Elapsed Time:	1118.000 days	
Half Life:	10409.625 days	
Exponential Term:	0.928259061	
Corrected Activity:	2078.093559 dpm	
Decay Activity (Sr/Y-90)	4156.187118 dpm	1872.156 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICVABT-51512; B1 **Repeat** 10

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 3:29:34 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 3:34:38 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	446	89.200	89.200
sd	0.000			0.000	21.119	4.224	4.224
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	8,239	1,647.800	1,647.346
sd	0.000			0.021	90.769	18.154	18.154

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICVABT-51512; B2

Repeat 11

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta

Detector Volts 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 4:45:01 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 4:50:02 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	390	78.000	78.000
sd	0.000			0.000	19.748	3.950	3.950
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	7,687	1,537.400	1,536.946
sd	0.000			0.021	87.676	17.535	17.535

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICVABT-51512;B3 **Repeat** 27

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 12/22/2015 5:21:27 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 12/22/2015 5:26:28 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.000	361	72.200	72.200
sd	0.000			0.000	19.000	3.800	3.800
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.454	7,504	1,500.800	1,500.346
sd	0.000			0.021	86.626	17.325	17.325

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
17	96.31%	97.86%	96.31%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/19/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
17	5.21E+00	5.13E+00	5.21E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICVABT-181198;A2 **Repeat** 17

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 9:39:02 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 10:09:06 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	9,221	307.367	307.260
sd	0.000			0.010	96.026	3.201	3.201
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	2,729	90.967	90.684
sd	0.000			0.017	52.240	1.741	1.741

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICVABT-181198;A1 **Repeat** 18

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 11:09:28 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 11:39:32 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	13,550	451.667	451.560
sd	0.000			0.010	116.404	3.880	3.880
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	3,709	123.633	123.350
sd	0.000			0.017	60.902	2.030	2.030

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - B

Addr: 17

Sample ID ICVABT-181198;A3 **Repeat** 24

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/20/2016 1:28:39 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/20/2016 1:58:42 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.107	7,680	256.000	255.893
sd	0.000			0.010	87.636	2.921	2.921
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.283	2,428	80.933	80.650
sd	0.000			0.017	49.275	1.642	1.643

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
18	99.11%	97.62%	97.91%	98.21%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Current Date:	2/4/2013		(or date at which you wish to determine activity)
Elapsed Time:	67.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.995548598		
Corrected Activity:	2228.734647	dpm	
Decay Activity (Sr/Y-90)	4457.469295	dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICVABT-51512;Beta 3 **Repeat** 29

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 8:45:40 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 8:50:43 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	9	1.800	1.678
sd	0.000			0.011	3.000	0.600	0.600
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	8,412	1,682.400	1,681.942
sd	0.000			0.021	91.717	18.343	18.343

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICVABT-51512;Beta 2 **Repeat** 12

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 8:54:49 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 8:59:52 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	6	1.200	1.078
sd	0.000			0.011	2.449	0.490	0.490
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	8,774	1,754.800	1,754.342
sd	0.000			0.021	93.670	18.734	18.734

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICVABT-51512;Beta 1 **Repeat** 13

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 9:00:37 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 9:05:39 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.122	10	2.000	1.878
sd	0.000			0.011	3.162	0.632	0.633
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.458	9,428	1,885.600	1,885.142
sd	0.000			0.021	97.098	19.420	19.420

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
18	95.66%	95.96%	96.36%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/19/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
18	5.25E+00	5.23E+00	5.21E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICVABT-181198;A3 **Repeat** 17

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 9:39:06 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 10:09:10 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	7,233	241.100	241.062
sd	0.000			0.006	85.047	2.835	2.835
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	3,022	100.733	100.403
sd	0.000			0.018	54.973	1.832	1.833

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICVABT-181198;A2 **Repeat** 18

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 11:09:32 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 11:39:35 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	8,906	296.867	296.829
sd	0.000			0.006	94.372	3.146	3.146
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	3,332	111.067	110.737
sd	0.000			0.018	57.723	1.924	1.924

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - C

Addr: 18

Sample ID ICVABT-181198;A1 **Repeat** 19

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 12:08:03 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 12:38:08 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.038	13,187	439.567	439.529
sd	0.000			0.006	114.835	3.828	3.828
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.330	4,404	146.800	146.470
sd	0.000			0.018	66.363	2.212	2.212

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Beta
Strontium 90
and
Total Strontium

Purple Beta ICV 2013				
Detector	Low Mass Recovery	Medium Mass Recovery	High Mass Recovery	Mean Recovery
19	98.16%	97.37%	99.31%	98.28%

Beta Activity 2007.869 pCi

Standard ID

Strontium 90
Sr-90_00018 #51512
Cert# 92352 Ref. date 11/29/12

Initial Activity:	2238.7	dpm	
Reference Date:	11/29/2012		
Current Date:	2/4/2013		(or date at which you wish to determine activity)
Elapsed Time:	67.000	days	
Half Life:	10409.625	days	
Exponential Term:	0.995548598		
Corrected Activity:	2228.734647	dpm	
Decay Activity (Sr/Y-90)	4457.469295	dpm	2007.869 pCi

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICVABT-51512;Beta 3 **Repeat** 30

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 8:54:54 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 8:59:55 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	19	3.800	3.714
sd	0.000			0.009	4.359	0.872	0.872
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	8,579	1,715.800	1,715.324
sd	0.000			0.022	92.623	18.525	18.525

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICVABT-51512;Beta 2 **Repeat** 13

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 9:00:41 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 9:05:44 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	19	3.800	3.714
sd	0.000			0.009	4.359	0.872	0.872
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	8,820	1,764.000	1,763.524
sd	0.000			0.022	93.915	18.783	18.783

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICVABT-51512;Beta 1 **Repeat** 14

Carrier No. 0

Batch ID m122640

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 2/4/2013 9:06:27 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 2/4/2013 9:11:30 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 5.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.086	25	5.000	4.914
sd	0.000			0.009	5.000	1.000	1.000
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.476	9,409	1,881.800	1,881.324
sd	0.000			0.022	97.000	19.400	19.400

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

ICV is for Gross Alpha

Purple Alpha ICV 2016				
	Low Mass	Medium Mass	High Mass	Mean
Detector	Recovery	Recovery	Recovery	Recovery
19	95.28%	97.86%	95.03%	102.24%

Standard ID

Thorium-230
Th-230_00019
Container#: 181198
Ref. date 08/08/2013
Activity: 5.0185 pCi/mL

Prep Batch: M163021
Date counted: 1/19/16

	Low Mass	Medium Mass	High Mass
	0.161g	0.0552g	0.0777g
Detector	Activity (pCi/mL)	Activity (pCi/mL)	Activity (pCi/mL)
19	5.27E+00	5.13E+00	5.28E+00

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICVABT-181198;A3 **Repeat** 18

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 11:09:36 AM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 11:39:40 AM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	7,514	250.467	250.420
sd	0.000			0.007	86.683	2.889	2.889
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	2,771	92.367	91.915
sd	0.000			0.021	52.640	1.755	1.755

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICVABT-181198;A2 **Repeat** 19

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 12:08:07 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 12:38:11 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	8,928	297.600	297.553
sd	0.000			0.007	94.488	3.150	3.150
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	3,154	105.133	104.681
sd	0.000			0.021	56.160	1.872	1.872

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Alpha/Beta Count Results

Sample Activity Report

Purple 16-19 - D

Addr: 19

Sample ID ICVABT-181198;A1 **Repeat** 20

Carrier No. 0

Batch ID m163021

Count Method Gross Alpha Beta **Detector Volts** 1515

Sample Qty 0 ***Sample*** **sd** 0 ***Sample***

Residual Wt 0 ***mg*** **sd** 0 ***mg***

Count Began 1/19/2016 12:54:36 PM **Collection Date 1** 1/1/1900 **Half Life** 0.00 ***days***

Count Ended 1/19/2016 1:24:40 PM **Collection Date 2** 1/1/1900 **Decay Factor** 1.000

Sample Count Time 30.00 ***mins*** **Background Count Time** 1,000.00 ***mins***

	Efficiency %	Attenuation Factor	Activity Divisor	Background cpm	Gross counts	Gross cpm	Net cpm
Alpha	0.000	1.000	1.000	0.047	13,420	447.333	447.286
sd	0.000			0.007	115.845	3.861	3.861
A to B	0.000	1.000				0.000	
sd	0.000					0.000	
Beta	0.000	1.000	1.000	0.452	4,269	142.300	141.848
sd	0.000			0.021	65.338	2.178	2.178

	Net Activity dpm	LLD dpm	MDC DPM	MPC DPM	Net Concentration * DPM	Conc / MPC Ratio
Alpha	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	
Beta	0.000	0.000	0.000	0.000	0.000 ± 0.000	0.000
sd	0.000				0.000	

*** Note: Decay Corrected** **MDC Method** Currie **Error =** .00 **x sd**

Monthly Backgrounds

Alpha/Beta Count Results

Source Count Report

Purple 0-3 - A

Addr: 0

Sample ID ICB
None

Repeat 2334
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:06 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:56:10 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	191	0.191	0.000	0.191
sd	13.820	0.014	0.000	0.014
Beta	500	0.500	0.000	0.500
sd	22.361	0.022	0.000	0.022

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 0-3 - B

Addr: 1

Sample ID ICB
None

Repeat 2335
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:10 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:56:10 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	220	0.220	0.000	0.220
sd	14.832	0.015	0.000	0.015
Beta	494	0.494	0.000	0.494
sd	22.226	0.022	0.000	0.022

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 0-3 - C

Addr: 2

Sample ID ICB
None

Repeat 2336
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:14 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:56:19 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	243	0.243	0.000	0.243
sd	15.588	0.016	0.000	0.016
Beta	531	0.531	0.000	0.531
sd	23.043	0.023	0.000	0.023

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 0-3 - D

Addr: 3

Sample ID ICB
None

Repeat 2337
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:17 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:56:19 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	191	0.191	0.000	0.191
sd	13.820	0.014	0.000	0.014
Beta	457	0.457	0.000	0.457
sd	21.378	0.021	0.000	0.021

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 4-7 - B

Addr: 5

Sample ID ICB
None

Repeat 2339
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:23 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:56:20 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	189	0.189	0.000	0.189
sd	13.748	0.014	0.000	0.014
Beta	415	0.415	0.000	0.415
sd	20.372	0.020	0.000	0.020

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 4-7 - C

Addr: 6

Sample ID ICB
None

Repeat 2340
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:26 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:56:28 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	187	0.187	0.000	0.187
sd	13.675	0.014	0.000	0.014
Beta	452	0.452	0.000	0.452
sd	21.260	0.021	0.000	0.021

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 4-7 - D

Addr: 7

Sample ID ICB
None

Repeat 2341
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:28 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:56:29 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	158	0.158	0.000	0.158
sd	12.570	0.013	0.000	0.013
Beta	363	0.363	0.000	0.363
sd	19.053	0.019	0.000	0.019

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 8-11 - C

Addr: 10

Sample ID ICB
None

Repeat 2344
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:37 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:56:37 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	199	0.199	0.000	0.199
sd	14.107	0.014	0.000	0.014
Beta	408	0.408	0.000	0.408
sd	20.199	0.020	0.000	0.020

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 8-11 - D

Addr: 11

Sample ID ICB
None

Repeat 2345
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:40 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:56:38 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	164	0.164	0.000	0.164
sd	12.806	0.013	0.000	0.013
Beta	493	0.493	0.000	0.493
sd	22.204	0.022	0.000	0.022

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 16-19 - B

Addr: 17

Sample ID ICB
None

Repeat 2347
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:15:58 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:57:01 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	244	0.244	0.000	0.244
sd	15.620	0.016	0.000	0.016
Beta	348	0.348	0.000	0.348
sd	18.655	0.019	0.000	0.019

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 16-19 - C

Addr: 18

Sample ID ICB
None

Repeat 2348
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:16:01 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:57:01 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	198	0.198	0.000	0.198
sd	14.071	0.014	0.000	0.014
Beta	443	0.443	0.000	0.443
sd	21.048	0.021	0.000	0.021

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Alpha/Beta Count Results

Source Count Report

Purple 16-19 - D

Addr: 19

Sample ID ICB
None

Repeat 2349
Carrier No. 0

Batch ID ICB;Monthly Background

Detector Volts 1515

Residual Wt 0 *mg*
Half Life 0.00 *Years*
Count Began 11/9/2019 5:16:04 PM
Calibration Date 7/27/2018 3:07:26 PM
Decay Factor 1.000
Count Ended 11/10/2019 9:57:01 AM
Backgrounds From

Sample Count Time 1,000.00 *mins*
Background Count Time 0.00

	Gross counts	Gross cpm	Background cpm	Net cpm
Alpha	183	0.183	0.000	0.183
sd	13.528	0.014	0.000	0.014
Beta	566	0.566	0.000	0.566
sd	23.791	0.024	0.000	0.024

	Uncorrected DPM	Corrected DPM	Corrected dpm	Efficiency %
Alpha	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000
Alpha to Beta				0.000
sd				0.000
Beta	0.000	0.000	0.000	0.000
sd	0.000	0.000	0.000	0.000

Run Logs

Gas Flow Proportional Counter Run Log

Detector: Purple0

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/03/13 15:26	5	ICABT 160-233497/12		233497			JLW
02/03/13 16:02	5	ICABT 160-233497/13		233497			JLW
02/03/13 16:23	5	ICABT 160-233497/14		233497			JLW
02/03/13 16:34	5	ICABT 160-233497/15		233497			JLW
02/03/13 16:41	5	ICABT 160-233497/16		233497			JLW
02/03/13 16:48	5	ICABT 160-233497/17		233497			JLW
02/03/13 17:05	5	ICABT 160-233497/18		233497			JLW
02/03/13 17:14	5	ICABT 160-233497/19		233497			JLW
02/04/13 22:27	5	ICVABT 160-233497/20		233497			JLW
02/04/13 23:10	5	ICVABT 160-233497/21		233497			JLW
02/04/13 23:19	5	ICVABT 160-233497/22		233497			JLW
01/16/16 10:15	40	ICABT 160-233497/1		233497			JLW
01/16/16 11:01	40	ICABT 160-233497/2		233497			JLW
01/16/16 11:43	40	ICABT 160-233497/3		233497			JLW
01/16/16 12:25	40	ICABT 160-233497/4		233497			JLW
01/16/16 13:06	40	ICABT 160-233497/5		233497			JLW
01/16/16 13:49	40	ICABT 160-233497/6		233497			JLW
01/16/16 14:32	40	ICABT 160-233497/7		233497			JLW
01/16/16 15:15	40	ICABT 160-233497/8		233497			JLW
01/17/16 17:23	30	ICVABT 160-233497/9		233497			JLW
01/17/16 22:54	30	ICVABT 160-233497/10		233497			JLW
01/17/16 23:37	30	ICVABT 160-233497/11		233497			JLW
11/09/19 17:15	1000	ICB 160-449741/1		449741			PS
11/23/19 00:08	200	CCB 160-451797/1		451797			AJD
11/23/19 09:53	2	CCVA 160-451797/17		451797			AJD
11/23/19 10:11	2	CCVB 160-451797/33		451797			AJD
11/23/19 11:02	200	LCS 160-448689/1-A		451797	448689	905.0	AJD
11/23/19 19:01	200	160-36160-10	F-SU3-B23-S001	451797	448689	905.0	AJD

Detector: Purple1

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/03/13 15:27	5	ICABT 160-233498/12		233498			JLW
02/03/13 16:02	5	ICABT 160-233498/13		233498			JLW
02/03/13 16:23	5	ICABT 160-233498/14		233498			JLW
02/03/13 16:34	5	ICABT 160-233498/15		233498			JLW
02/03/13 16:41	5	ICABT 160-233498/16		233498			JLW
02/03/13 16:48	5	ICABT 160-233498/17		233498			JLW
02/03/13 17:05	5	ICABT 160-233498/18		233498			JLW
02/03/13 17:14	5	ICABT 160-233498/19		233498			JLW
02/04/13 22:27	5	ICVABT 160-233498/20		233498			JLW
02/04/13 22:35	5	ICVABT 160-233498/21		233498			JLW
02/04/13 23:19	5	ICVABT 160-233498/22		233498			JLW
01/16/16 10:15	40	ICABT 160-233498/1		233498			JLW
01/16/16 11:01	40	ICABT 160-233498/2		233498			JLW
01/16/16 11:43	40	ICABT 160-233498/3		233498			JLW
01/16/16 12:25	40	ICABT 160-233498/4		233498			JLW
01/16/16 13:06	40	ICABT 160-233498/5		233498			JLW
01/16/16 13:49	40	ICABT 160-233498/6		233498			JLW
01/16/16 14:32	40	ICABT 160-233498/7		233498			JLW
01/16/16 15:15	40	ICABT 160-233498/8		233498			JLW
01/17/16 17:23	30	ICVABT 160-233498/9		233498			JLW
01/17/16 18:08	30	ICVABT 160-233498/10		233498			JLW

Gas Flow Proportional Counter Run Log

Detector: Purple1 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
01/17/16 23:37	30	ICVABT 160-233498/11		233498			JLW
11/09/19 17:15	1000	ICB 160-449741/2		449741			PS
11/23/19 00:08	200	CCB 160-451797/2		451797			AJD
11/23/19 09:53	2	CCVA 160-451797/18		451797			AJD
11/23/19 10:11	2	CCVB 160-451797/34		451797			AJD
11/23/19 11:02	200	ZZZZZ		451797			
11/23/19 19:01	200	160-36160-11	F-SU3-B29-S001	451797	448689	905.0	AJD

Detector: Purple2

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/03/13 15:27	5	ICABT 160-233499/12		233499			PS
02/03/13 16:02	5	ICABT 160-233499/13		233499			PS
02/03/13 16:23	5	ICABT 160-233499/14		233499			PS
02/03/13 16:34	5	ICABT 160-233499/15		233499			PS
02/03/13 16:41	5	ICABT 160-233499/16		233499			PS
02/03/13 16:48	5	ICABT 160-233499/17		233499			PS
02/03/13 17:05	5	ICABT 160-233499/18		233499			PS
02/03/13 17:14	5	ICABT 160-233499/19		233499			PS
02/04/13 22:27	5	ICVABT 160-233499/20		233499			PS
02/04/13 22:35	5	ICVABT 160-233499/21		233499			PS
02/04/13 22:42	5	ICVABT 160-233499/22		233499			PS
01/16/16 10:15	40	ICABT 160-233499/1		233499			PS
01/16/16 11:01	40	ICABT 160-233499/2		233499			PS
01/16/16 11:43	40	ICABT 160-233499/3		233499			PS
01/16/16 12:25	40	ICABT 160-233499/4		233499			PS
01/16/16 13:06	40	ICABT 160-233499/5		233499			PS
01/16/16 13:49	40	ICABT 160-233499/6		233499			PS
01/16/16 14:32	40	ICABT 160-233499/7		233499			PS
01/16/16 15:15	40	ICABT 160-233499/8		233499			PS
01/17/16 17:24	30	ICVABT 160-233499/9		233499			PS
01/17/16 18:08	30	ICVABT 160-233499/10		233499			PS
01/17/16 19:01	30	ICVABT 160-233499/11		233499			PS
11/09/19 17:15	1000	ICB 160-449741/3		449741			PS
11/23/19 00:08	200	CCB 160-451797/3		451797			AJD
11/23/19 09:53	2	CCVA 160-451797/19		451797			AJD
11/23/19 10:11	2	CCVB 160-451797/35		451797			AJD
11/23/19 11:02	200	ZZZZZ		451797			
11/23/19 19:01	200	160-36160-12	F-SU3-B30-S001	451797	448689	905.0	AJD

Detector: Purple3

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/03/13 15:27	5	ICABT 160-233500/12		233500			PS
02/03/13 16:02	5	ICABT 160-233500/13		233500			PS
02/03/13 16:23	5	ICABT 160-233500/14		233500			PS
02/03/13 16:34	5	ICABT 160-233500/15		233500			PS
02/03/13 16:41	5	ICABT 160-233500/16		233500			PS
02/03/13 16:48	5	ICABT 160-233500/17		233500			PS
02/03/13 17:05	5	ICABT 160-233500/18		233500			PS
02/03/13 17:14	5	ICABT 160-233500/19		233500			PS
02/04/13 22:35	5	ICVABT 160-233500/20		233500			PS

Gas Flow Proportional Counter Run Log

Detector: Purple3 (Continued)

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/04/13 22:42	5	ICVABT 160-233500/21		233500			PS
02/04/13 22:50	5	ICVABT 160-233500/22		233500			PS
01/16/16 10:15	40	ICABT 160-233500/1		233500			PS
01/16/16 11:01	40	ICABT 160-233500/2		233500			PS
01/16/16 11:43	40	ICABT 160-233500/3		233500			PS
01/16/16 12:25	40	ICABT 160-233500/4		233500			PS
01/16/16 13:06	40	ICABT 160-233500/5		233500			PS
01/16/16 13:49	40	ICABT 160-233500/6		233500			PS
01/16/16 14:32	40	ICABT 160-233500/7		233500			PS
01/16/16 15:15	40	ICABT 160-233500/8		233500			PS
01/17/16 18:08	30	ICVABT 160-233500/9		233500			PS
01/17/16 19:01	30	ICVABT 160-233500/10		233500			PS
01/17/16 19:56	30	ICVABT 160-233500/11		233500			PS
11/09/19 17:15	1000	ICB 160-449741/4		449741			PS
11/23/19 00:08	200	CCB 160-451797/4		451797			AJD
11/23/19 09:53	2	CCVA 160-451797/20		451797			AJD
11/23/19 10:11	2	CCVB 160-451797/36		451797			AJD
11/23/19 11:02	200	160-36160-1	F-SU3-B01-S001	451797	448689	905.0	AJD
11/23/19 19:02	200	160-36160-13	F-SU4-B04-S001	451797	448689	905.0	AJD

Detector: Purple5

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/03/13 15:27	5	ICABT 160-233502/12		233502			PS
02/03/13 16:02	5	ICABT 160-233502/13		233502			PS
02/03/13 16:23	5	ICABT 160-233502/14		233502			PS
02/03/13 16:35	5	ICABT 160-233502/15		233502			PS
02/03/13 16:42	5	ICABT 160-233502/16		233502			PS
02/03/13 16:48	5	ICABT 160-233502/17		233502			PS
02/03/13 17:05	5	ICABT 160-233502/18		233502			PS
02/03/13 17:14	5	ICABT 160-233502/19		233502			PS
02/04/13 22:50	5	ICVABT 160-233502/20		233502			PS
02/04/13 22:57	5	ICVABT 160-233502/21		233502			PS
02/04/13 23:03	5	ICVABT 160-233502/22		233502			PS
01/16/16 10:15	40	ICABT 160-233502/1		233502			PS
01/16/16 11:02	40	ICABT 160-233502/2		233502			PS
01/16/16 11:43	40	ICABT 160-233502/3		233502			PS
01/16/16 12:25	40	ICABT 160-233502/4		233502			PS
01/16/16 13:06	40	ICABT 160-233502/5		233502			PS
01/16/16 13:49	40	ICABT 160-233502/6		233502			PS
01/16/16 14:32	40	ICABT 160-233502/7		233502			PS
01/16/16 15:15	40	ICABT 160-233502/8		233502			PS
01/17/16 19:56	30	ICVABT 160-233502/9		233502			PS
01/17/16 20:44	30	ICVABT 160-233502/10		233502			PS
01/17/16 21:40	30	ICVABT 160-233502/11		233502			PS
11/09/19 17:15	1000	ICB 160-449741/6		449741			PS
11/23/19 00:09	200	CCB 160-451797/6		451797			AJD
11/23/19 09:53	2	CCVA 160-451797/22		451797			AJD
11/23/19 10:11	2	CCVB 160-451797/38		451797			AJD
11/23/19 11:02	200	160-36160-2	F-SU3-B04-S001	451797	448689	905.0	AJD
11/23/19 19:02	200	160-36160-14	F-SU5-B05-S001	451797	448689	905.0	AJD

Gas Flow Proportional Counter Run Log

Detector: Purple6

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/03/13 15:27	5	ICABT 160-233503/12		233503			PS
02/03/13 16:02	5	ICABT 160-233503/13		233503			PS
02/03/13 16:23	5	ICABT 160-233503/14		233503			PS
02/03/13 16:35	5	ICABT 160-233503/15		233503			PS
02/03/13 16:42	5	ICABT 160-233503/16		233503			PS
02/03/13 16:48	5	ICABT 160-233503/17		233503			PS
02/03/13 17:05	5	ICABT 160-233503/18		233503			PS
02/03/13 17:14	5	ICABT 160-233503/19		233503			PS
02/04/13 22:57	5	ICVABT 160-233503/20		233503			PS
02/04/13 23:03	5	ICVABT 160-233503/21		233503			PS
02/04/13 23:10	5	ICVABT 160-233503/22		233503			PS
01/16/16 10:15	40	ICABT 160-233503/1		233503			PS
01/16/16 11:02	40	ICABT 160-233503/2		233503			PS
01/16/16 11:43	40	ICABT 160-233503/3		233503			PS
01/16/16 12:25	40	ICABT 160-233503/4		233503			PS
01/16/16 13:06	40	ICABT 160-233503/5		233503			PS
01/16/16 13:49	40	ICABT 160-233503/6		233503			PS
01/16/16 14:32	40	ICABT 160-233503/7		233503			PS
01/16/16 15:15	40	ICABT 160-233503/8		233503			PS
01/17/16 20:44	30	ICVABT 160-233503/9		233503			PS
01/17/16 21:40	30	ICVABT 160-233503/10		233503			PS
01/17/16 22:54	30	ICVABT 160-233503/11		233503			PS
11/09/19 17:15	1000	ICB 160-449741/7		449741			PS
11/23/19 00:09	200	CCB 160-451797/7		451797			AJD
11/23/19 09:53	2	CCVA 160-451797/23		451797			AJD
11/23/19 10:11	2	CCVB 160-451797/39		451797			AJD
11/23/19 11:02	200	160-36160-3	F-SU3-B05-S001	451797	448689	905.0	AJD
11/23/19 19:02	200	160-36160-15	F-SU5-B10-S001	451797	448689	905.0	AJD

Detector: Purple7

Analysis Date	Count Minutes	Lab Sample ID	Client Sample ID	Analysis Batch	Prep Batch	Method	Analyst Initials
02/03/13 15:27	5	ICABT 160-233504/12		233504			PS
02/03/13 16:02	5	ICABT 160-233504/13		233504			PS
02/03/13 16:23	5	ICABT 160-233504/14		233504			PS
02/03/13 16:35	5	ICABT 160-233504/15		233504			PS
02/03/13 16:42	5	ICABT 160-233504/16		233504			PS
02/03/13 16:48	5	ICABT 160-233504/17		233504			PS
02/03/13 17:05	5	ICABT 160-233504/18		233504			PS
02/03/13 17:14	5	ICABT 160-233504/19		233504			PS
02/04/13 23:03	5	ICVABT 160-233504/20		233504			PS
02/04/13 23:10	5	ICVABT 160-233504/21		233504			PS
02/04/13 23:19	5	ICVABT 160-233504/22		233504			PS
01/16/16 10:15	40	ICABT 160-233504/1		233504			PS
01/16/16 11:02	40	ICABT 160-233504/2		233504			PS
01/16/16 11:43	40	ICABT 160-233504/3		233504			PS
01/16/16 12:25	40	ICABT 160-233504/4		233504			PS
01/16/16 13:07	40	ICABT 160-233504/5		233504			PS
01/16/16 13:49	40	ICABT 160-233504/6		233504			PS
01/16/16 14:32	40	ICABT 160-233504/7		233504			PS
01/16/16 15:15	40	ICABT 160-233504/8		233504			PS
01/17/16 21:40	30	ICVABT 160-233504/9		233504			PS
01/17/16 22:54	30	ICVABT 160-233504/10		233504			PS