

US EPA ARCHIVE DOCUMENT

105
4/24/13

Apex-Alpha™

Sample Description: SPIKE
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 01
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_033
 Chamber Serial Number: 04026479A
 Detector Serial Number: 91132
 Env. Background: System Bkgd 55203
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/23/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:06 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.454 mL
 Effective Efficiency: 0.2274 +/- 0.0135
 Counting Efficiency: 0.1825 +/- 0.0032 on 12/16/2012 5:49:18 PM
 Chem. Recovery Factor: 1.2461 +/- 0.0770

Control Certificate Name: NatTh_Th-8
 Chem. Recov. of Control: TH-232 0.935265 +/- 0.078154
 Peak Match Tolerance: 0.175 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.819	16.49	49.13	0.51	0.00E+000	3.0
TH-228	5.381	366.32	10.25	0.68	0.00E+000	12.4
TH-229 T	4.876	394.00	9.89	0.00	0.00E+000	15.0
TH-230	4.643	400.49	9.80	0.51	0.00E+000	31.3
TH-232	3.973	389.00	9.95	0.00	0.00E+000	26.1

T = Tracer Peak used for Effective Efficiency

 ----- NUCLIDE ANALYSIS RESULTS -----

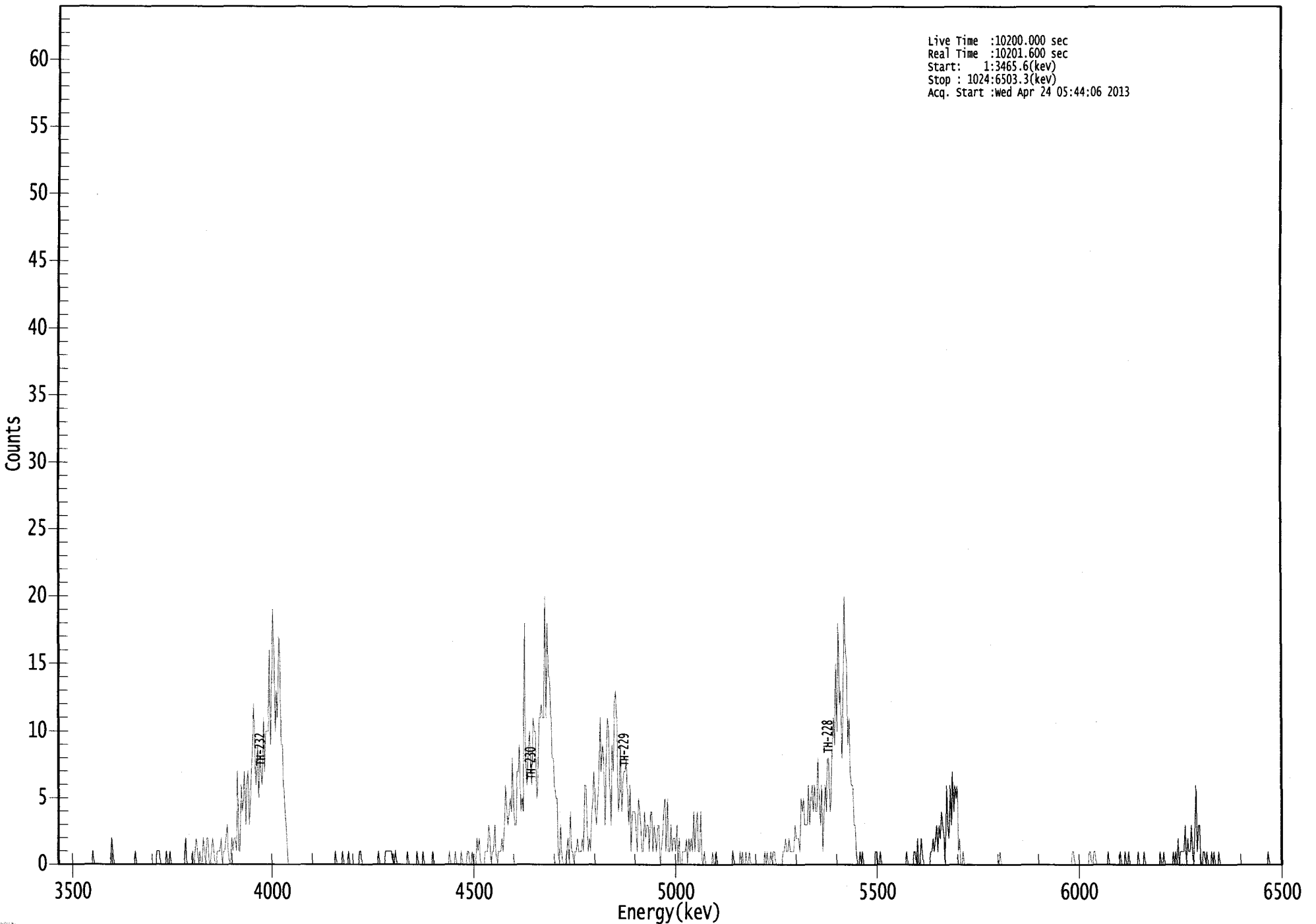
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.995	5850.00*	1.97E-001 +/- 9.95E-002	6.27E-002 +/- 7.28E-003
TH-228	0.998	5400.00*	4.28E+000 +/- 6.62E-001	6.58E-002 +/- 7.64E-003
TH-229	1.000	4872.00*	4.61E+000 +/- 5.35E-001	7.02E-002 +/- 8.15E-003
TH-230	0.996	4672.00*	4.68E+000 +/- 7.10E-001	6.13E-002 +/- 7.11E-003
TH-232	0.997	3997.00*	4.53E+000 +/- 6.93E-001	6.99E-002 +/- 8.11E-003

AG
4/24/13

US EPA ARCHIVE DOCUMENT

000056274.CNF

Live Time :10200.000 sec
Real Time :10201.600 sec
Start: 1:3465.6(kev)
Stop : 1024:6503.3(kev)
Acq. Start :wed Apr 24 05:44:06 2013



ROI Type: 1

ROI Type: 3

6120

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 01

Elapsed Live time: 10200

Elapsed Real Time: 10202

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	1	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	2	1	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	1	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	1	1	1	0	0
89:	0	0	0	1	0	0	1	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	2	0	0	0	0
113:	0	1	0	1	2	1	0	1
121:	0	0	2	1	0	2	2	0
129:	0	1	2	1	0	0	1	1
137:	1	2	0	1	1	2	3	1
145:	0	0	2	1	2	2	1	7
153:	1	1	6	4	5	7	3	6
161:	7	3	5	7	10	12	7	6
169:	9	5	8	7	6	11	7	10
177:	10	10	16	9	13	19	16	10
185:	13	11	17	15	9	9	6	4
193:	3	1	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	1	0	0	0	0	0	1
241:	0	0	0	0	1	0	0	0
249:	0	0	0	0	0	1	1	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	1	0	0
273:	0	0	0	1	1	1	1	1
281:	1	0	0	1	0	0	0	0
289:	0	0	0	0	0	1	0	0
297:	0	0	0	0	0	1	0	0
305:	0	0	1	0	0	0	0	0
313:	0	0	1	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	1	0	0	0	0	1	0	0
337:	0	0	1	0	0	0	0	1
345:	1	0	0	1	0	0	0	2
353:	1	2	0	0	0	0	1	1
361:	1	3	2	0	1	1	3	1

369: 0 1 1 1 2 1 3 6

Sample Title: 01

Channel	1	2	3	4	5	6	7	8
377:	4	3	4	5	4	8	4	3
385:	3	7	7	9	4	5	4	18
393:	8	6	8	10	8	6	11	10
401:	10	5	6	11	11	12	11	11
409:	20	11	18	14	14	11	8	8
417:	6	5	5	1	0	3	1	0
425:	0	0	1	2	0	4	1	1
433:	0	1	1	2	1	1	1	2
441:	1	6	6	3	1	2	1	4
449:	5	7	4	3	5	6	11	7
457:	9	8	3	8	11	10	6	3
465:	9	7	12	13	11	4	5	9
473:	4	6	7	7	8	5	3	6
481:	1	4	4	4	3	1	5	4
489:	3	1	1	4	2	3	3	1
497:	4	4	1	3	2	1	3	3
505:	0	1	2	4	5	1	5	1
513:	1	3	1	2	2	1	3	0
521:	2	0	0	1	1	1	2	0
529:	2	1	2	1	4	1	3	4
537:	1	1	4	0	0	1	0	0
545:	0	0	0	0	1	0	0	1
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	1	0	0
569:	0	0	0	1	0	1	0	0
577:	1	0	0	1	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	1	0	1	0	0	1	0	1
601:	1	0	0	0	0	0	0	1
609:	1	2	1	1	2	1	1	1
617:	1	3	2	2	2	1	5	4
625:	5	3	3	3	6	3	5	6
633:	4	6	4	4	8	5	3	6
641:	1	4	6	4	8	8	4	5
649:	9	11	9	15	10	18	12	13
657:	8	11	20	16	15	9	11	7
665:	6	6	3	3	1	0	0	1
673:	0	1	0	0	0	0	0	0
681:	0	0	0	0	1	1	0	0
689:	1	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	1	0
713:	0	0	0	0	1	1	0	2
721:	0	0	2	1	0	0	0	0
729:	0	0	1	1	2	1	2	3
737:	1	3	2	4	3	2	0	6
745:	3	2	6	3	7	4	6	5
753:	6	1	2	0	0	1	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	1	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0 0

Sample Title: 01

Channel								
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	1	1	0	0	0	0	0	0
857:	0	0	0	0	0	0	1	1
865:	0	0	1	1	0	0	0	0
873:	0	0	0	0	0	0	1	0
881:	0	0	0	0	0	0	0	0
889:	1	0	0	0	1	0	0	1
897:	0	0	0	0	0	0	0	1
905:	0	0	0	0	1	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	1	0	0	1	0	0	0
929:	0	0	0	0	1	0	1	0
937:	2	0	1	1	1	1	3	0
945:	2	1	1	3	1	0	3	6
953:	1	3	3	0	0	1	1	0
961:	1	0	0	0	1	0	1	0
969:	0	0	1	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	1	0	0	0	0
1017:	0	0	0	0	0	0	0	0

ICB
4/24/13



Sample Description: BLANK
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 02
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_034
 Chamber Serial Number: 04026479B
 Detector Serial Number: 91136
 Env. Background: System Bkgd 55204
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/23/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:08 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.227 mL
 Effective Efficiency: 0.1787 +/- 0.0154
 Counting Efficiency: 0.1856 +/- 0.0032 on 12/16/2012 5:49:43 PM
 Chem. Recovery Factor: 0.9628 +/- 0.0847

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.790	0.66	305.43	0.34	0.00E+000	3.0
TH-228	5.297	-0.34	592.90	0.34	0.00E+000	0.0
TH-229 T	4.871	154.83	15.76	0.17	0.00E+000	4.8
TH-230	4.637	12.66	55.94	0.34	0.00E+000	3.0
TH-232	3.958	1.83	152.56	0.17	0.00E+000	3.0

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

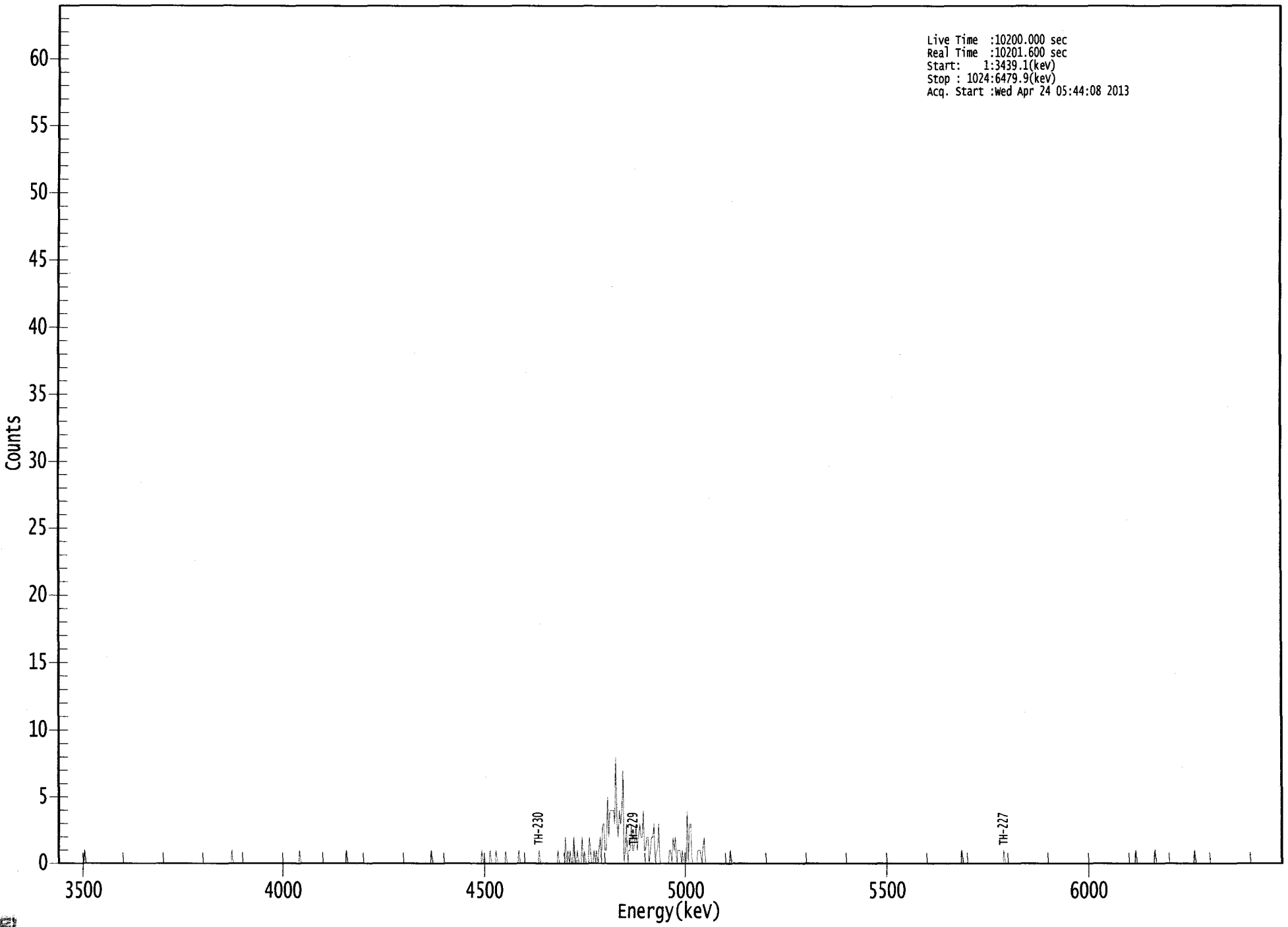
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.982	5850.00*	1.00E-002 +/- 3.07E-002	7.27E-002 +/- 1.23E-002
TH-228	0.946	5400.00*	-5.05E-003 +/- 3.00E-002	7.10E-002 +/- 1.20E-002
TH-229	1.000	4872.00*	2.31E+000 +/- 3.90E-001	6.22E-002 +/- 1.05E-002
TH-230	0.993	4672.00*	1.88E-001 +/- 1.10E-001	7.10E-002 +/- 1.20E-002
TH-232	0.992	3997.00*	2.71E-002 +/- 4.17E-002	6.19E-002 +/- 1.05E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

000056273.CNF

Live Time :10200.000 sec
Real Time :10201.600 sec
Start: 1:3439.1(kev)
Stop : 1024:6479.9(kev)
Acq. Start :Wed Apr 24 05:44:08 2013



ROI Type: 1

ROI Type: 3

0220

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 02

Elapsed Live time: 10200

Elapsed Real Time: 10202

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	1	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	1	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	1	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	1	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	1	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	1	0	0	0	0
361:	0	0	1	0	0	0	0	1

369: 0 0 0 0 0 0 0 0 1

Sample Title: 02

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	1	0	0	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	0	0	1	0	0	0	0
409:	0	0	0	0	0	0	0	0
417:	0	0	0	1	0	0	0	0
425:	0	2	0	1	0	1	0	0
433:	2	0	0	1	0	0	0	2
441:	0	1	0	0	0	2	1	0
449:	0	1	0	1	0	1	2	0
457:	3	3	1	1	5	2	4	4
465:	4	4	3	8	3	2	4	3
473:	4	7	0	1	3	0	1	1
481:	3	1	1	2	3	1	2	3
489:	2	2	4	1	1	2	2	0
497:	1	2	2	3	0	1	1	3
505:	0	0	0	0	0	0	0	0
513:	1	1	0	2	1	2	0	1
521:	1	1	0	1	0	0	0	4
529:	0	3	3	0	0	0	0	0
537:	1	1	1	0	1	2	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	1	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	1	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	1
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 02

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	1	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	1	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	1	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



10/5
4/24/13

Sample Description: S-61 TOT-DUP
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 03
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_035
 Chamber Serial Number: 04026477A
 Detector Serial Number: 58771
 Env. Background: System Bkgd 55205
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:09 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.226 mL
 Effective Efficiency: 0.1940 +/- 0.0162
 Counting Efficiency: 0.1826 +/- 0.0032 on 12/16/2012 5:49:42 PM
 Chem. Recovery Factor: 1.0627 +/- 0.0906

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.786	4.00	109.57	0.00	0.00E+000	2.9
TH-228	5.350	2.83	120.53	0.17	0.00E+000	2.9
TH-229 T	4.890	167.32	15.19	0.68	0.00E+000	6.3
TH-230	4.638	18.00	47.46	0.00	0.00E+000	4.4
TH-232	3.938	2.66	128.85	0.34	0.00E+000	2.9

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

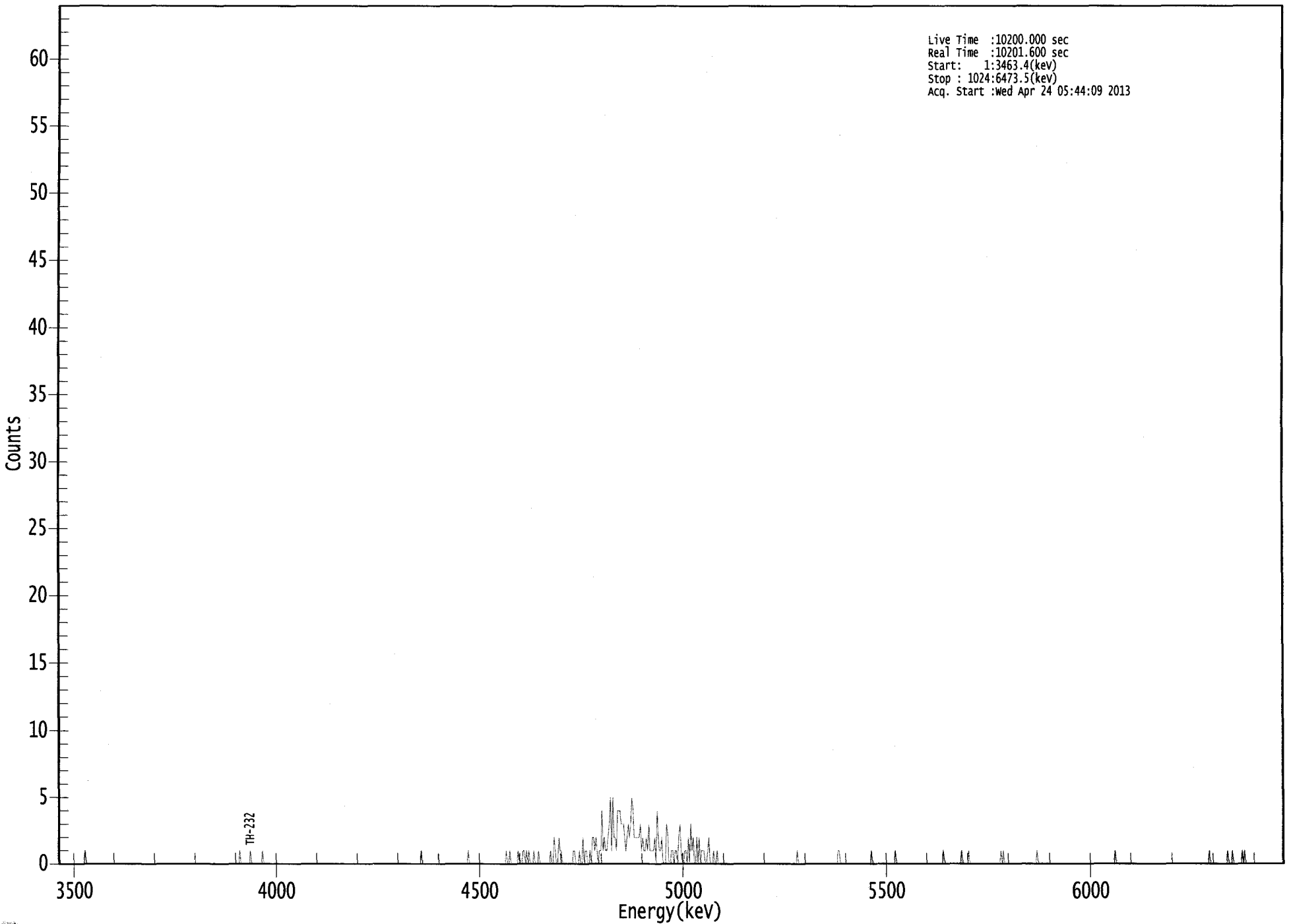
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.979	5850.00*	5.61E-002 +/- 6.22E-002	8.41E-002 +/- 1.38E-002
TH-228	0.987	5400.00*	3.94E-002 +/- 4.79E-002	5.81E-002 +/- 9.51E-003
TH-229	0.998	4872.00*	2.30E+000 +/- 3.76E-001	7.74E-002 +/- 1.27E-002
TH-230	0.994	4672.00*	2.46E-001 +/- 1.24E-001	8.20E-002 +/- 1.34E-002
TH-232	0.982	3997.00*	3.63E-002 +/- 4.72E-002	6.53E-002 +/- 1.07E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

000056278.CNF

Live Time :10200.000 sec
Real Time :10201.600 sec
Start: 1:3463.4(kev)
Stop : 1024:6473.5(kev)
Acq. Start :Wed Apr 24 05:44:09 2013



ROI Type: 1

ROI Type: 3

***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 03

Elapsed Live time: 10200

Elapsed Real Time: 10202

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	1	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	1	0	0	0	0	0	0	0
161:	0	1	0	0	0	0	0	0
169:	0	0	0	1	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	1	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	1
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 0 0 0 0 1

Sample Title: 03

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	1	0	0	0	0	0
385:	0	1	0	0	0	1	1	0
393:	1	0	1	0	0	0	1	0
401:	0	0	1	0	0	0	0	0
409:	0	0	0	0	1	0	0	2
417:	1	0	0	2	1	1	0	0
425:	0	0	0	0	0	0	0	1
433:	1	0	0	0	1	0	0	2
441:	0	1	1	0	0	1	0	2
449:	2	1	2	1	0	1	1	4
457:	1	2	1	1	2	3	5	1
465:	5	2	2	1	4	4	4	3
473:	3	3	2	1	2	3	2	3
481:	5	4	2	2	2	2	2	3
489:	1	2	1	1	2	1	3	1
497:	1	1	1	2	0	4	2	1
505:	1	2	0	0	0	3	2	0
513:	0	1	1	0	1	1	0	2
521:	3	1	0	0	1	1	0	2
529:	0	3	1	2	0	0	2	0
537:	2	0	1	1	1	0	0	1
545:	2	0	0	0	1	0	0	1
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	1	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	1	1	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	1	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	1	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	1	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	1	0	0	0	0
761:	0	1	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	1	0	1	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 03

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	1	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	1	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	1	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	1	0	0	0	1	0	0	0
985:	0	0	0	0	1	0	1	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

ICB
4/24/13

Apex-Alpha™

Sample Description: S-61 TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 04
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_037
 Chamber Serial Number: 04026478A
 Detector Serial Number: 91133
 Env. Background: System Bkgd 55207
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:11 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.227 mL
 Effective Efficiency: 0.1963 +/- 0.0163
 Counting Efficiency: 0.1783 +/- 0.0033 on 1/26/2013 3:28:25 PM
 Chem. Recovery Factor: 1.1012 +/- 0.0934

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.699	0.83	239.53	0.17	0.00E+000	2.9
TH-228	5.317	5.66	85.23	0.34	0.00E+000	2.9
TH-229 T	4.874	169.83	15.05	0.17	0.00E+000	3.3
TH-230	4.661	22.83	41.20	0.17	0.00E+000	2.9
TH-232	3.994	1.66	169.38	0.34	0.00E+000	2.9

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

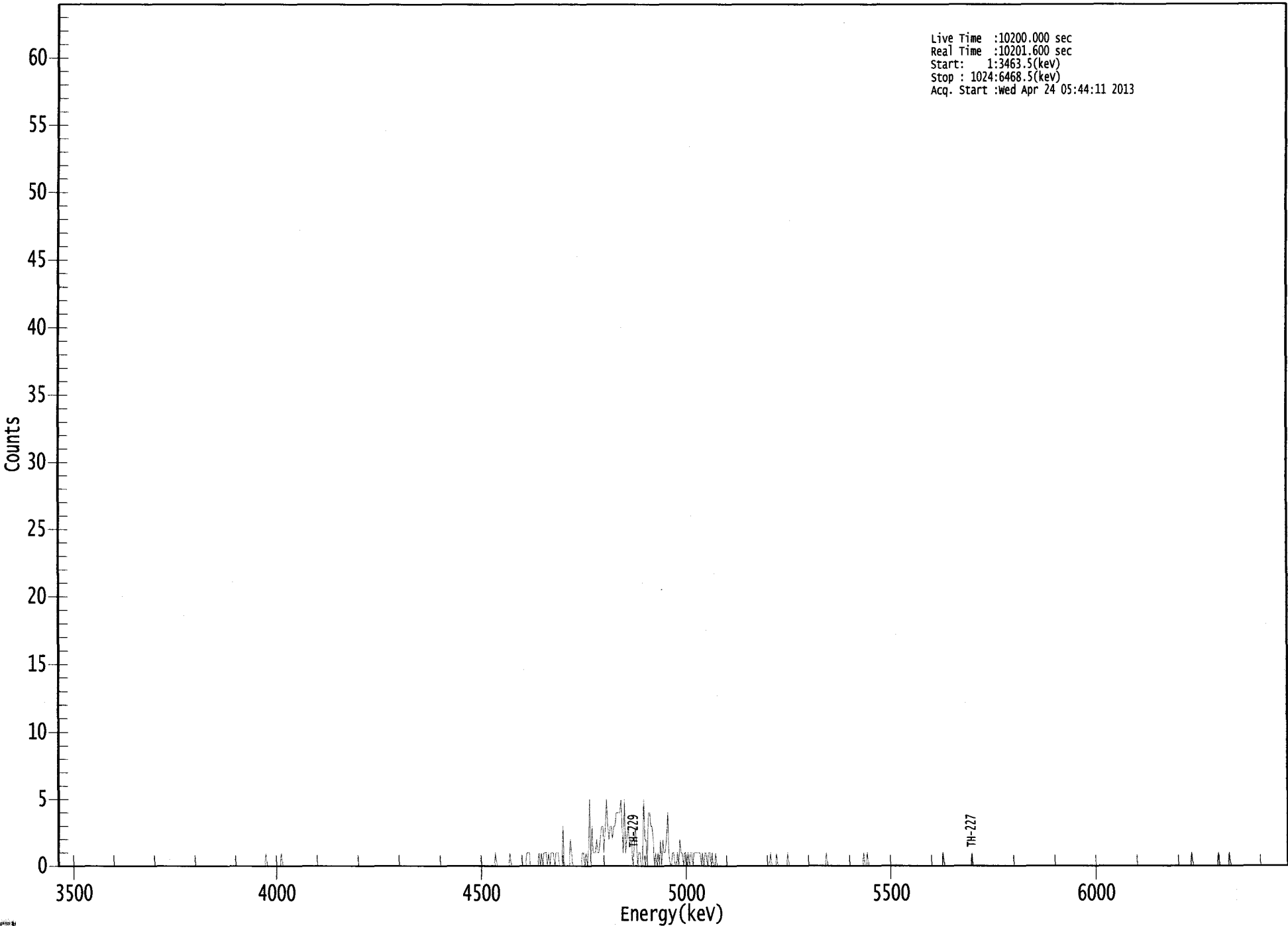
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.888	5850.00*	1.15E-002 +/- 2.76E-002	5.79E-002 +/- 9.39E-003
TH-228	0.965	5400.00*	7.79E-002 +/- 6.76E-002	6.58E-002 +/- 1.07E-002
TH-229	1.000	4872.00*	2.30E+000 +/- 3.74E-001	5.66E-002 +/- 9.19E-003
TH-230	0.999	4672.00*	3.09E-001 +/- 1.37E-001	5.64E-002 +/- 9.16E-003
TH-232	1.000	3997.00*	2.24E-002 +/- 3.81E-002	6.45E-002 +/- 1.05E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

000056272.CNF

Live Time :10200.000 sec
Real Time :10201.600 sec
Start: 1:3463.5(kev)
Stop : 1024:6468.5(kev)
Acq. Start :wed Apr 24 05:44:11 2013



ROI Type: 1

ROI Type: 3

0230

***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 04

Elapsed Live time: 10200

Elapsed Real Time: 10202

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	1	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	1	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	1	0	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 04

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	1	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	1
393:	1	1	0	0	0	0	0	0
401:	0	1	0	1	0	1	1	1
409:	0	1	0	1	1	1	0	1
417:	1	1	0	0	0	3	0	0
425:	0	0	0	2	1	0	0	0
433:	0	0	0	0	0	1	1	0
441:	1	0	1	5	0	3	1	1
449:	1	2	1	1	2	3	3	1
457:	3	5	3	2	3	3	2	3
465:	3	4	4	4	4	5	3	1
473:	5	1	2	3	2	2	2	0
481:	1	3	2	0	1	1	0	0
489:	5	2	2	0	4	4	3	3
497:	2	0	1	0	1	0	2	0
505:	2	1	1	2	4	1	0	0
513:	1	1	0	0	1	0	2	1
521:	1	0	1	1	0	1	0	1
529:	1	0	1	1	1	1	1	1
537:	0	1	0	1	1	0	1	1
545:	0	1	0	0	1	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	1	0	0	0	0	1
601:	0	0	0	0	0	0	0	0
609:	1	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	1	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	1
673:	0	0	1	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	1	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	1	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 04

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	1
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	1	0	0
969:	0	0	0	0	0	0	1	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

1013
4/24/13

Sample Description: S-61 DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 05
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_040
 Chamber Serial Number: 06027396B
 Detector Serial Number: 91135
 Env. Background: System Bkgd 55210
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:13 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.227 mL
 Effective Efficiency: 0.2062 +/- 0.0167
 Counting Efficiency: 0.1900 +/- 0.0033 on 12/16/2012 5:49:33 PM
 Chem. Recovery Factor: 1.0851 +/- 0.0899

Peak Match Tolerance: 0.175 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.703	2.00	169.74	0.00	0.00E+000	5.9
TH-228	5.425	0.83	239.53	0.17	0.00E+000	3.0
TH-229 T	4.872	178.66	14.68	0.34	0.00E+000	4.5
TH-230	4.650	6.66	78.18	0.34	0.00E+000	3.0
TH-232	3.927	2.00	169.74	0.00	0.00E+000	3.0

T = Tracer Peak used for Effective Efficiency

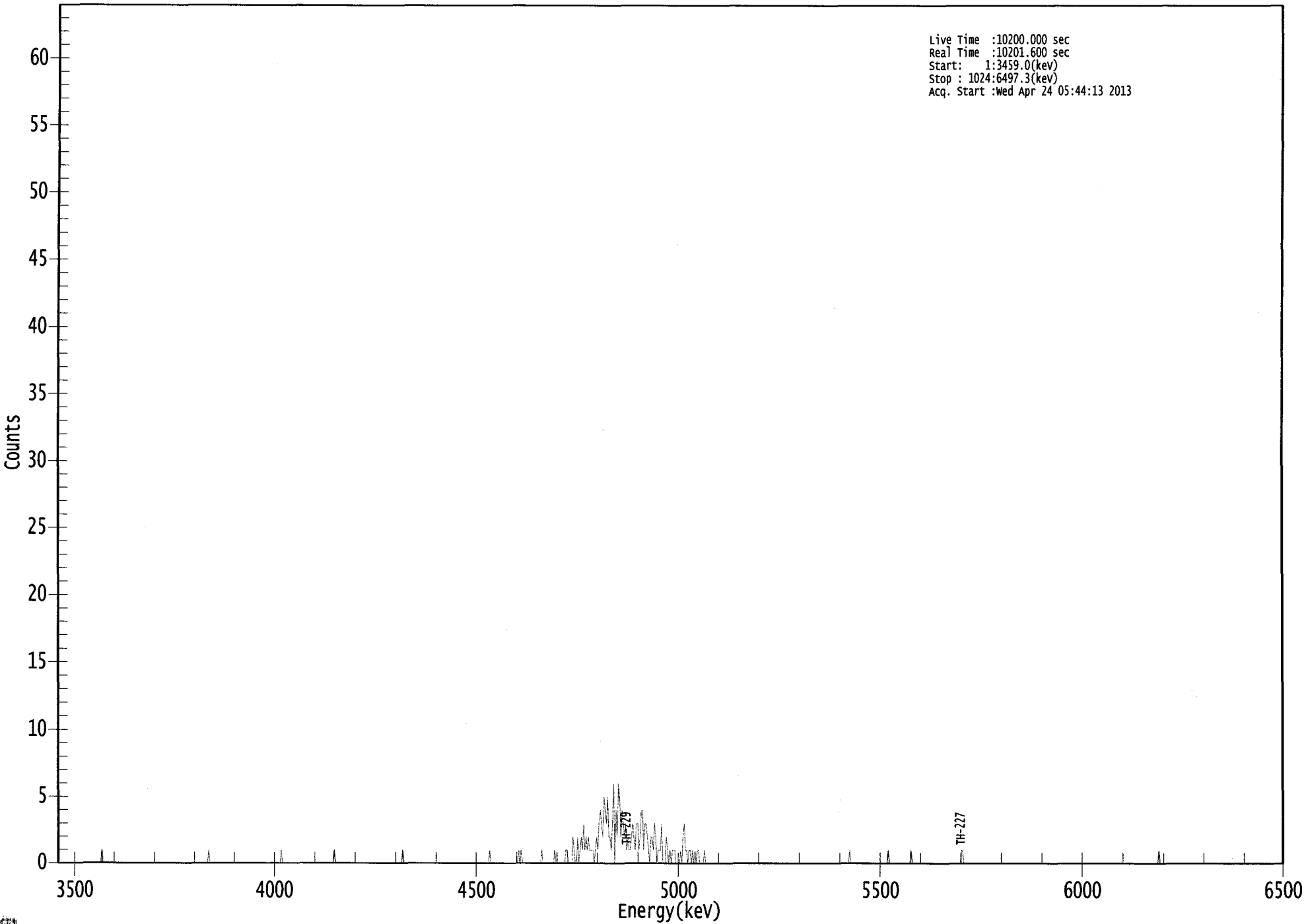
 ----- NUCLIDE ANALYSIS RESULTS -----

Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.893	5850.00*	2.64E-002 +/- 4.50E-002	7.92E-002 +/- 1.26E-002
TH-228	0.997	5400.00*	1.09E-002 +/- 2.61E-002	5.47E-002 +/- 8.69E-003
TH-229	1.000	4872.00*	2.31E+000 +/- 3.67E-001	6.17E-002 +/- 9.81E-003
TH-230	0.998	4672.00*	8.57E-002 +/- 6.84E-002	6.16E-002 +/- 9.78E-003
TH-232	0.975	3997.00*	2.57E-002 +/- 4.38E-002	7.71E-002 +/- 1.22E-002

AG
4/24/13

0000056279.CNF

Live Time :10200.000 sec
Real Time :10201.600 sec
Start: 1:3459.0(kev)
Stop : 1024:6497.3(kev)
Acq. Start :Wed Apr 24 05:44:13 2013



ROI Type: 1

ROI Type: 3

5279

***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 05

Elapsed Live time: 10200

Elapsed Real Time: 10202

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	1	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	1
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	1	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	1	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	1	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	1	0	0	0	0	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 05

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	1	0	1	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	0	0	0	0	1	0	0
409:	0	0	0	0	0	0	0	0
417:	1	0	0	0	0	0	0	0
425:	0	1	1	0	0	0	0	2
433:	1	0	0	2	0	1	2	1
441:	3	1	2	1	2	1	1	1
449:	1	0	1	2	1	3	4	3
457:	2	5	4	3	5	2	2	1
465:	3	6	0	4	2	6	5	2
473:	4	3	2	3	1	2	1	1
481:	2	3	2	1	3	3	1	2
489:	4	4	1	3	3	2	1	0
497:	2	2	1	3	2	0	1	1
505:	1	3	0	0	0	2	1	0
513:	1	0	1	1	1	0	0	0
521:	0	1	0	2	3	1	1	0
529:	1	1	0	1	0	1	0	1
537:	1	0	0	0	0	1	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	1	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	1	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	1	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	1	1	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0 0

Sample Title: 05

Channel								
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	1
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

1013
4/24/13

Apex-Alpha™

Sample Description: PZ-115-SS TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 06
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_041
 Chamber Serial Number: 05026930A
 Detector Serial Number: 91087
 Env. Background: System Bkgd 55211
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:16 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.227 mL
 Effective Efficiency: 0.2129 +/- 0.0170
 Counting Efficiency: 0.1978 +/- 0.0034 on 12/16/2012 5:49:31 PM
 Chem. Recovery Factor: 1.0761 +/- 0.0881

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.874	-1.19	180.60	1.19	0.00E+000	0.0
TH-228	5.404	1.49	190.02	0.51	0.00E+000	3.0
TH-229 T	4.887	184.49	14.45	0.51	0.00E+000	6.4
TH-230	4.686	0.81	359.09	1.19	0.00E+000	3.0
TH-232	3.965	-0.89	347.60	2.89	0.00E+000	3.0

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

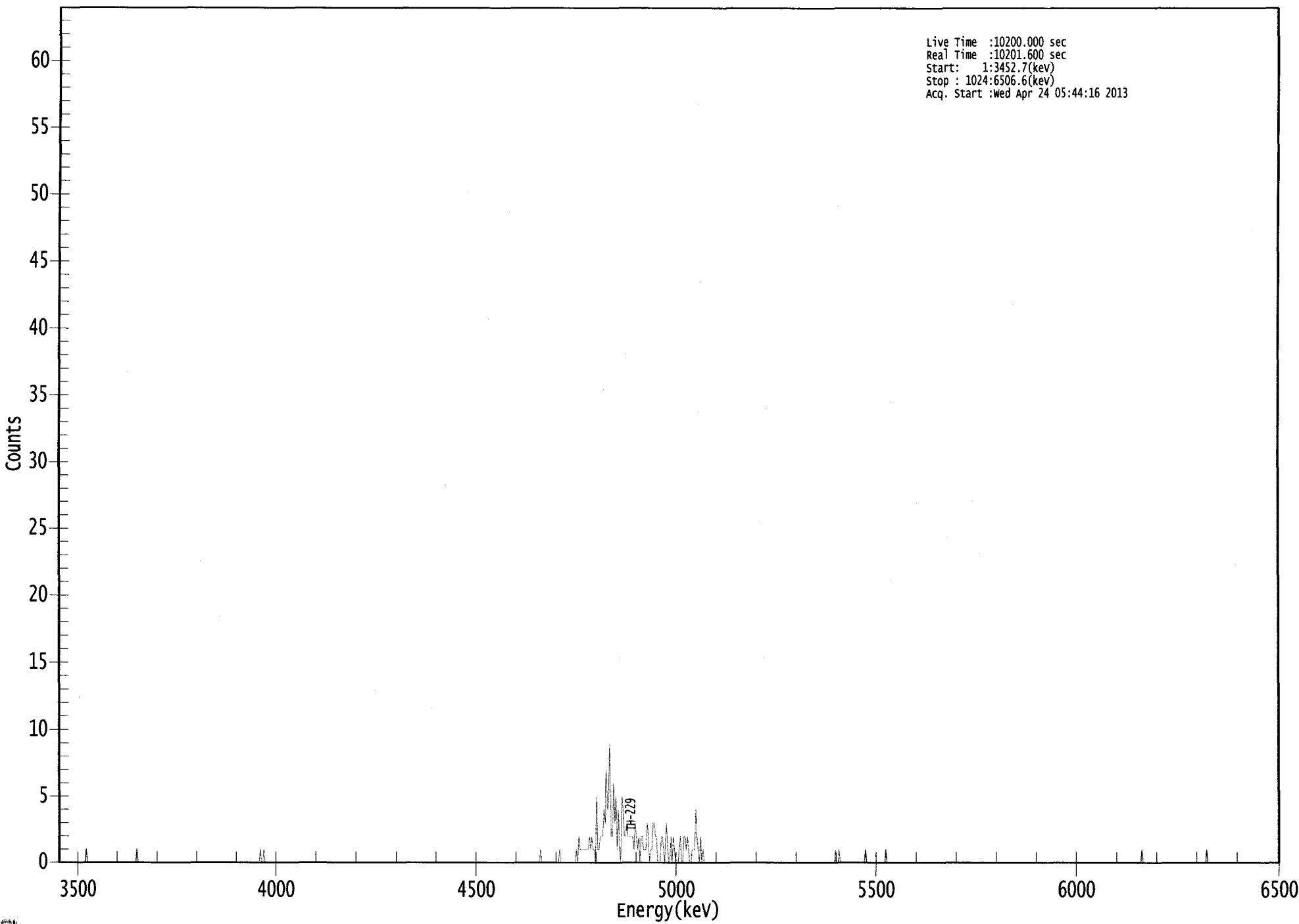
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.997	5850.00*	-1.52E-002 +/- 2.76E-002	8.42E-002 +/- 1.32E-002
TH-228	1.000	5400.00*	1.89E-002 +/- 3.60E-002	6.66E-002 +/- 1.04E-002
TH-229	0.999	4872.00*	2.31E+000 +/- 3.62E-001	6.56E-002 +/- 1.03E-002
TH-230	0.999	4672.00*	1.01E-002 +/- 3.63E-002	8.21E-002 +/- 1.29E-002
TH-232	0.995	3997.00*	-1.11E-002 +/- 3.85E-002	1.09E-001 +/- 1.71E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

0000056277.CNF

Live Time :10200.000 sec
Real Time :10201.600 sec
Start: 1:3452.7(kev)
Stop : 1024:6506.6(kev)
Acq. Start :Wed Apr 24 05:44:16 2013



ROI Type: 1

ROI Type: 3

0246

369: 0 0 0 0 0 0 0 0 0

Sample Title: 06

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	0	0	0	0	1	0	0
409:	0	0	0	0	0	0	0	0
417:	0	0	0	0	0	1	0	0
425:	0	0	0	0	0	0	0	0
433:	0	0	0	1	0	2	1	1
441:	1	1	1	1	1	1	2	1
449:	2	1	1	0	5	1	1	2
457:	2	2	4	3	7	4	5	9
465:	2	2	6	3	5	1	4	1
473:	0	5	4	2	2	3	2	2
481:	2	2	2	1	3	2	1	2
489:	0	2	2	1	1	1	3	2
497:	0	1	1	3	3	2	2	0
505:	0	0	2	2	1	0	3	2
513:	0	0	2	0	2	1	0	0
521:	0	1	2	0	0	2	2	1
529:	2	1	0	0	1	1	1	4
537:	2	1	0	2	0	1	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	1	0	0	1
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	1	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	1	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 06

Channel								
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	1	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	1	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



103
4/24/13

Sample Description: PZ-115-SS DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 07
 Sample Geometry: Shelf 2
 Procedure Description: Th iso
 Detector Name: Alpha_042
 Chamber Serial Number: 05026930B
 Detector Serial Number: 84185
 Env. Background: System Bkgd 55212
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:18 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.227 mL
 Effective Efficiency: 0.1865 +/- 0.0158
 Counting Efficiency: 0.1846 +/- 0.0032 on 12/16/2012 5:49:29 PM
 Chem. Recovery Factor: 1.0103 +/- 0.0874

Peak Match Tolerance: 0.175 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.769	4.66	94.59	0.34	0.00E+000	3.0
TH-228	5.394	2.98	134.36	1.02	0.00E+000	3.0
TH-229 T	4.865	161.49	15.45	0.51	0.00E+000	12.9
TH-230	4.616	14.83	51.24	0.17	0.00E+000	3.0
TH-232	3.941	4.66	94.59	0.34	0.00E+000	3.0

T = Tracer Peak used for Effective Efficiency

 ----- NUCLIDE ANALYSIS RESULTS -----

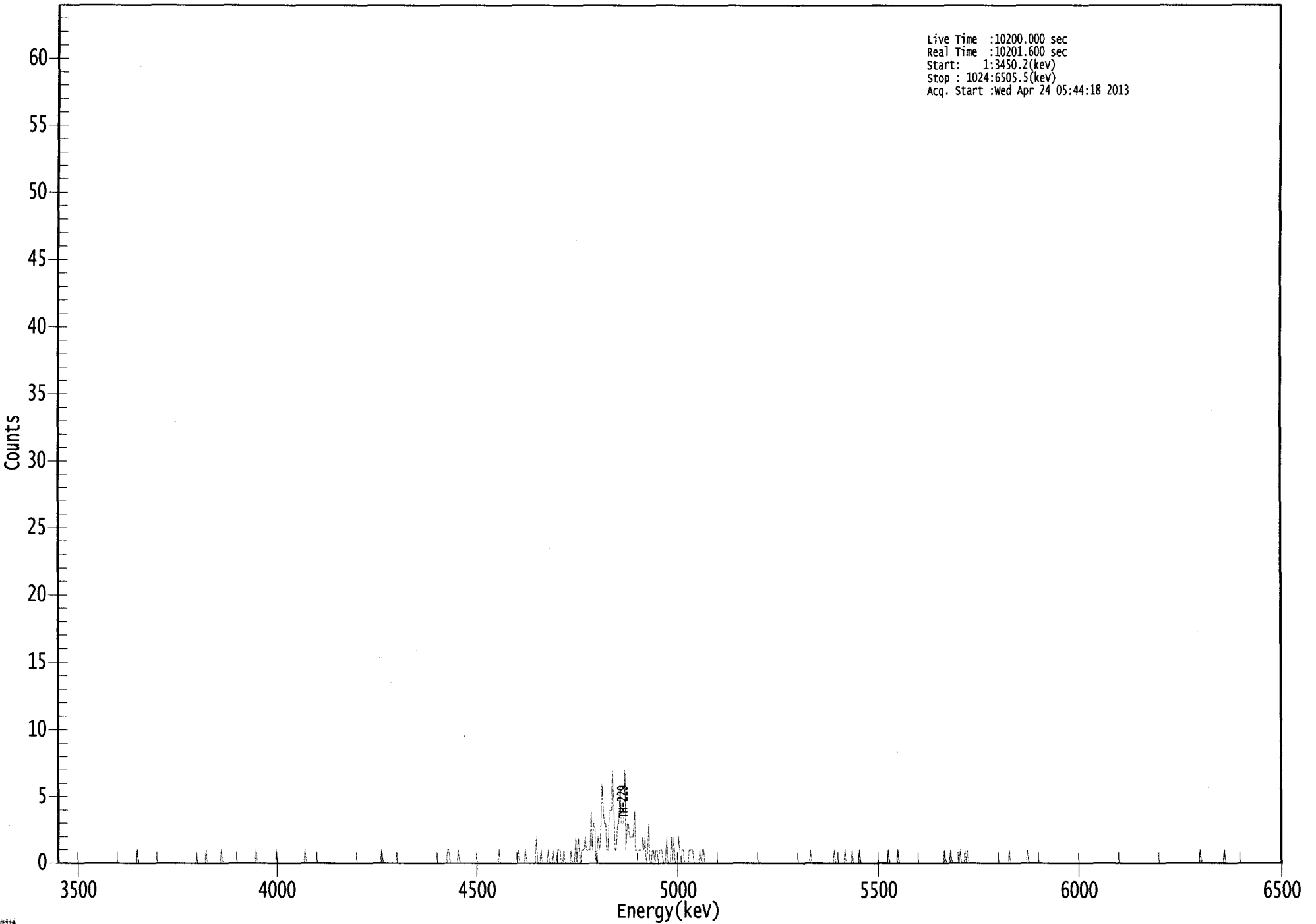
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.966	5850.00*	6.80E-002 +/- 6.53E-002	6.98E-002 +/- 1.16E-002
TH-228	1.000	5400.00*	4.32E-002 +/- 5.84E-002	9.13E-002 +/- 1.52E-002
TH-229	1.000	4872.00*	2.31E+000 +/- 3.83E-001	7.49E-002 +/- 1.24E-002
TH-230	0.984	4672.00*	2.11E-001 +/- 1.14E-001	5.94E-002 +/- 9.86E-003
TH-232	0.984	3997.00*	6.62E-002 +/- 6.36E-002	6.79E-002 +/- 1.13E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

000056276.CNF

Live Time :10200.000 sec
Real Time :10201.600 sec
Start: 1:3450.2(kev)
Stop : 1024:6505.5(kev)
Acq. Start :wed Apr 24 05:44:18 2013



ROI Type: 1

ROI Type: 3

0215

***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 07

Elapsed Live time: 10200

Elapsed Real Time: 10202

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	1	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	1	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	1	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	1
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	1	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	1	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	1	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	1
329:	1	0	0	0	0	0	0	0
337:	1	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 1 0 0 0 0 0 0

Sample Title: 07

Channel	1	2	3	4	5	6	7	8
377:	0	0	0	0	0	0	0	0
385:	0	0	1	0	0	0	0	0
393:	1	0	0	0	0	0	0	0
401:	0	2	0	0	0	1	0	0
409:	0	0	0	1	0	0	0	1
417:	0	0	0	1	1	1	0	0
425:	1	0	0	0	0	0	1	0
433:	0	0	2	0	2	1	0	1
441:	1	1	2	1	1	1	1	4
449:	1	3	3	0	1	2	1	2
457:	6	4	3	3	1	1	4	4
465:	4	7	4	1	1	3	3	6
473:	3	3	3	7	1	3	3	2
481:	2	2	2	4	1	1	1	1
489:	1	1	2	1	2	0	1	3
497:	0	0	1	1	0	1	1	0
505:	1	1	1	0	0	0	2	0
513:	0	0	2	0	2	0	0	0
521:	2	1	0	1	1	0	0	0
529:	0	1	1	1	1	0	0	0
537:	0	0	1	0	1	1	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	1	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	1	0	0	0	0	0
657:	0	0	0	1	0	0	0	0
665:	0	1	0	0	0	0	0	1
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	1
697:	0	0	0	0	0	0	0	1
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	1	0
745:	0	0	0	1	0	0	0	0
753:	0	0	0	1	0	0	0	1
761:	0	1	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	1	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 07

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	1	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	1	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	1
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

1045
4/24/13

Apex-Alpha™

Sample Description: MW-104 TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 08
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_044
 Chamber Serial Number: 04026481B
 Detector Serial Number: 84168
 Env. Background: System Bkgd 55214
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:21 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.226 mL
 Effective Efficiency: 0.2083 +/- 0.0168
 Counting Efficiency: 0.1902 +/- 0.0033 on 12/16/2012 5:49:26 PM
 Chem. Recovery Factor: 1.0951 +/- 0.0905

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.824	8.49	69.59	0.51	0.00E+000	3.0
TH-228	5.342	15.83	49.57	0.17	0.00E+000	3.0
TH-229 T	4.883	179.83	14.62	0.17	0.00E+000	4.8
TH-230	4.637	27.00	38.41	0.00	0.00E+000	5.9
TH-232	3.972	14.00	54.22	0.00	0.00E+000	4.5

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

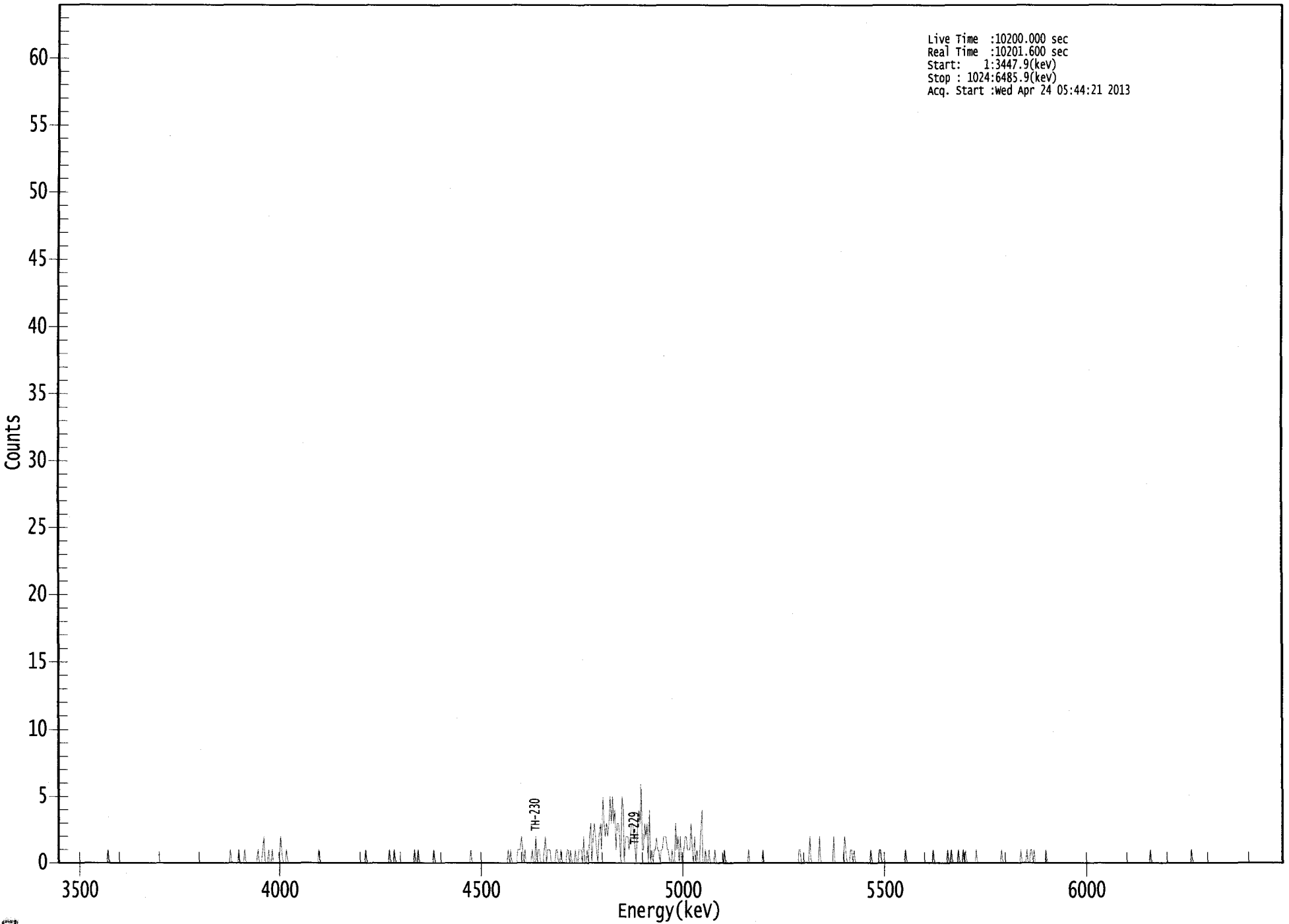
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.996	5850.00*	1.11E-001 +/- 7.92E-002	6.86E-002 +/- 1.09E-002
TH-228	0.983	5400.00*	2.05E-001 +/- 1.07E-001	5.41E-002 +/- 8.57E-003
TH-229	0.999	4872.00*	2.30E+000 +/- 3.64E-001	5.34E-002 +/- 8.45E-003
TH-230	0.994	4672.00*	3.44E-001 +/- 1.43E-001	7.64E-002 +/- 1.21E-002
TH-232	0.997	3997.00*	1.78E-001 +/- 1.01E-001	7.63E-002 +/- 1.21E-002

AG
 4/24/13

US EPA ARCHIVE DOCUMENT

000056275.CNF

Live Time :10200.000 sec
Real Time :10201.600 sec
Start: 1:3447.9(kev)
Stop : 1024:6485.9(kev)
Acq. Start :Wed Apr 24 05:44:21 2013



ROI Type: 1

ROI Type: 3

0250

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 08

Elapsed Live time: 10200

Elapsed Real Time: 10202

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	1	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	1	0	0	0	0	0	0
153:	1	0	0	0	0	1	0	0
161:	0	0	0	0	0	0	0	0
169:	1	0	0	0	1	2	0	0
177:	0	1	0	0	1	0	0	0
185:	0	0	0	2	1	0	0	0
193:	1	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	1	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	1	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	1	0
281:	0	0	1	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	1	0	0	1	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	1	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	1	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 08

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	1	0	1	0	0	0	0
385:	0	1	1	1	2	1	0	1
393:	0	0	0	0	0	1	0	0
401:	2	0	1	1	0	0	0	1
409:	2	0	1	1	1	0	0	0
417:	0	1	1	0	0	1	0	0
425:	0	0	1	1	0	1	0	0
433:	0	1	0	0	1	1	1	0
441:	2	0	0	1	0	2	3	0
449:	2	3	2	1	0	2	3	1
457:	5	3	2	3	2	3	5	3
465:	5	3	4	1	3	3	2	0
473:	5	4	0	2	2	2	1	2
481:	3	3	2	1	0	3	4	3
489:	6	1	1	3	2	3	0	4
497:	0	1	0	1	1	2	1	1
505:	0	1	1	2	2	2	1	1
513:	0	0	1	0	0	3	1	2
521:	0	2	0	0	1	2	2	1
529:	1	1	3	1	0	2	0	1
537:	0	0	2	4	0	0	1	0
545:	0	1	0	0	0	0	1	0
553:	0	0	0	0	0	0	1	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	1	0	0	0	0	0
585:	0	0	0	0	0	0	1	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	1	1	0	0
625:	0	0	0	0	0	2	0	0
633:	0	0	0	0	0	2	0	0
641:	0	0	0	0	0	0	0	0
649:	0	2	0	0	0	0	0	0
657:	0	0	2	1	0	0	0	1
665:	1	0	1	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	1	0	0	0	0	0	0	1
689:	1	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	1	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	1	0	0	0
737:	0	0	0	0	0	0	0	0
745:	1	0	0	1	0	0	0	0
753:	0	1	0	0	0	1	0	1
761:	0	0	0	0	0	0	0	0
769:	1	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	1	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 1 0 0

Sample Title: 08

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	1	0	0	1	1	0
817:	1	0	0	0	0	0	0	0
825:	0	0	1	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	1	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	1	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



106
7/24/13

Sample Description: MW-104 DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 09
 Sample Geometry: Shelf 2
 Procedure Description: Th iso
 Detector Name: Alpha_046
 Chamber Serial Number: 04026482B
 Detector Serial Number: 58762
 Env. Background: System Bkgd 55215
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:24 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.227 mL
 Effective Efficiency: 0.2066 +/- 0.0168
 Counting Efficiency: 0.1789 +/- 0.0031 on 12/16/2012 5:49:23 PM
 Chem. Recovery Factor: 1.1544 +/- 0.0958

Peak Match Tolerance: 0.175 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.974	0.66	305.43	0.34	0.00E+000	3.0
TH-228	5.351	0.83	239.53	0.17	0.00E+000	3.0
TH-229 T	4.872	179.00	14.69	0.00	0.00E+000	4.5
TH-230	4.638	13.83	53.08	0.17	0.00E+000	3.0
TH-232	3.889	1.49	190.02	0.51	0.00E+000	3.0

T = Tracer Peak used for Effective Efficiency

 ----- NUCLIDE ANALYSIS RESULTS -----

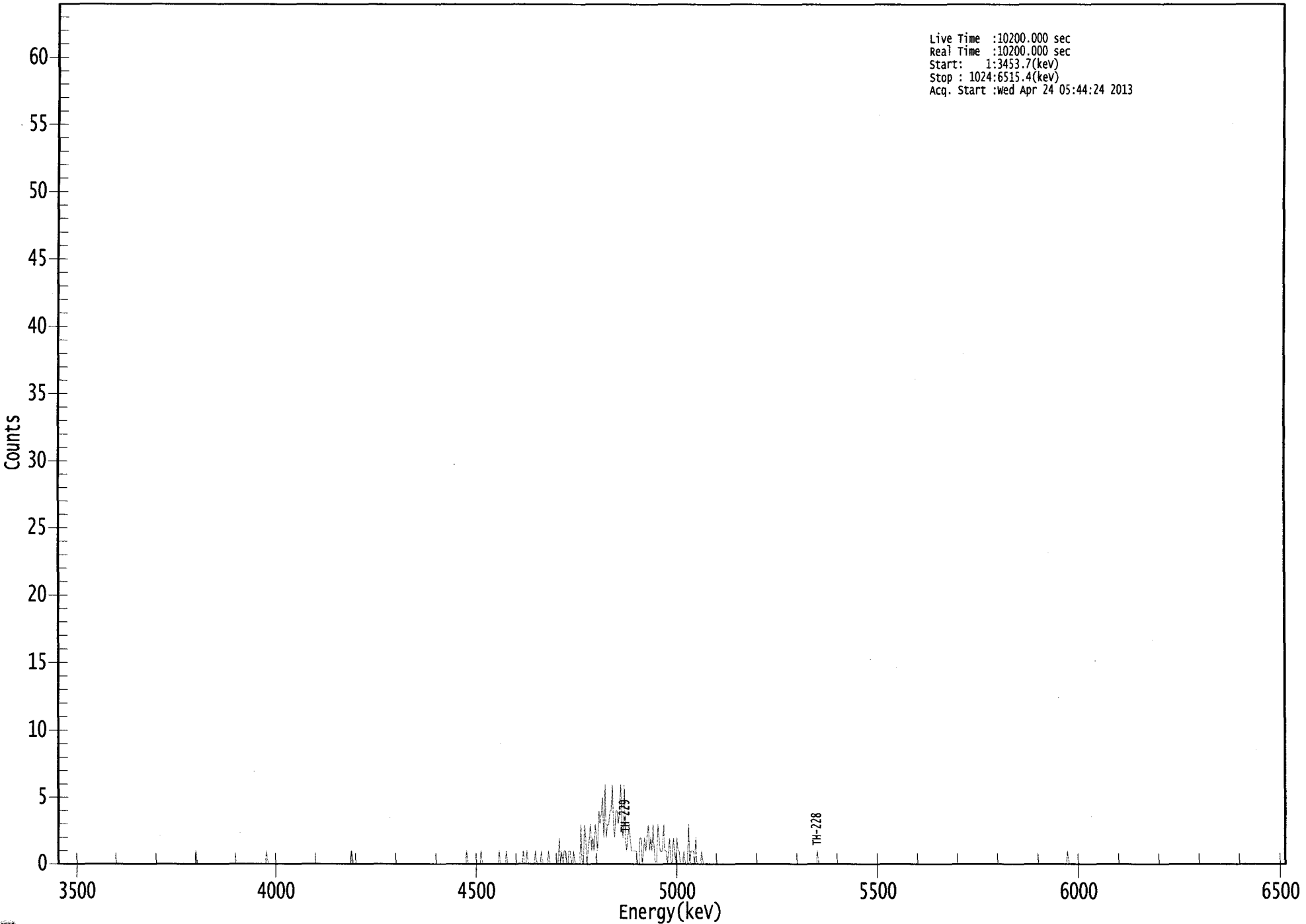
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.923	5850.00*	8.70E-003 +/- 2.66E-002	6.30E-002 +/- 1.00E-002
TH-228	0.988	5400.00*	1.09E-002 +/- 2.61E-002	5.46E-002 +/- 8.68E-003
TH-229	1.000	4872.00*	2.31E+000 +/- 3.67E-001	7.73E-002 +/- 1.23E-002
TH-230	0.994	4672.00*	1.78E-001 +/- 9.85E-002	5.36E-002 +/- 8.53E-003
TH-232	0.941	3997.00*	1.91E-002 +/- 3.64E-002	6.73E-002 +/- 1.07E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

000056271.CNF

Live Time :10200.000 sec
Real Time :10200.000 sec
Start: 1:3453.7(kev)
Stop : 1024:6515.4(kev)
Acq. Start :Wed Apr 24 05:44:24 2013



ROI Type: 1

ROI Type: 3

0255

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 09

Elapsed Live time: 10200
 Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	1	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	1
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	1	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	1	0
345:	0	0	0	0	0	0	0	0
353:	0	0	1	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 1 0 0 0 0 0 0 1

Sample Title: 09

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	1	0	0
393:	1	0	0	0	0	0	0	1
401:	0	0	0	0	1	0	0	0
409:	0	0	1	0	0	0	0	0
417:	0	0	0	2	0	1	0	1
425:	1	0	0	1	1	0	0	1
433:	0	0	0	0	0	3	0	0
441:	3	2	0	1	2	3	1	2
449:	1	3	2	1	4	3	4	5
457:	2	6	2	3	3	4	4	6
465:	3	2	4	4	3	4	6	3
473:	2	6	2	1	2	3	2	1
481:	1	1	1	1	0	0	2	2
489:	0	1	2	1	2	3	1	2
497:	1	3	1	0	0	3	2	1
505:	1	1	3	1	1	0	1	2
513:	0	0	2	1	0	2	1	1
521:	0	0	0	1	0	0	0	3
529:	0	1	1	1	0	2	0	0
537:	0	0	1	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	1	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0 0

Sample Title: 09

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	1	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

KB
4/24/13

Apex-Alpha™

Sample Description: PZ-100-SD TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 10
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_047
 Chamber Serial Number: 02030596A
 Detector Serial Number: 91086
 Env. Background: System Bkgd 55216
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:26 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.227 mL
 Effective Efficiency: 0.2007 +/- 0.0165
 Counting Efficiency: 0.1822 +/- 0.0032 on 12/16/2012 5:49:21 PM
 Chem. Recovery Factor: 1.1017 +/- 0.0923

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.950	1.00	277.19	0.00	0.00E+000	2.9
TH-228	5.323	1.83	152.56	0.17	0.00E+000	2.9
TH-229 T	4.870	173.83	14.87	0.17	0.00E+000	6.0
TH-230	4.678	11.66	58.37	0.34	0.00E+000	4.4
TH-232	4.016	2.66	128.85	0.34	0.00E+000	2.9

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

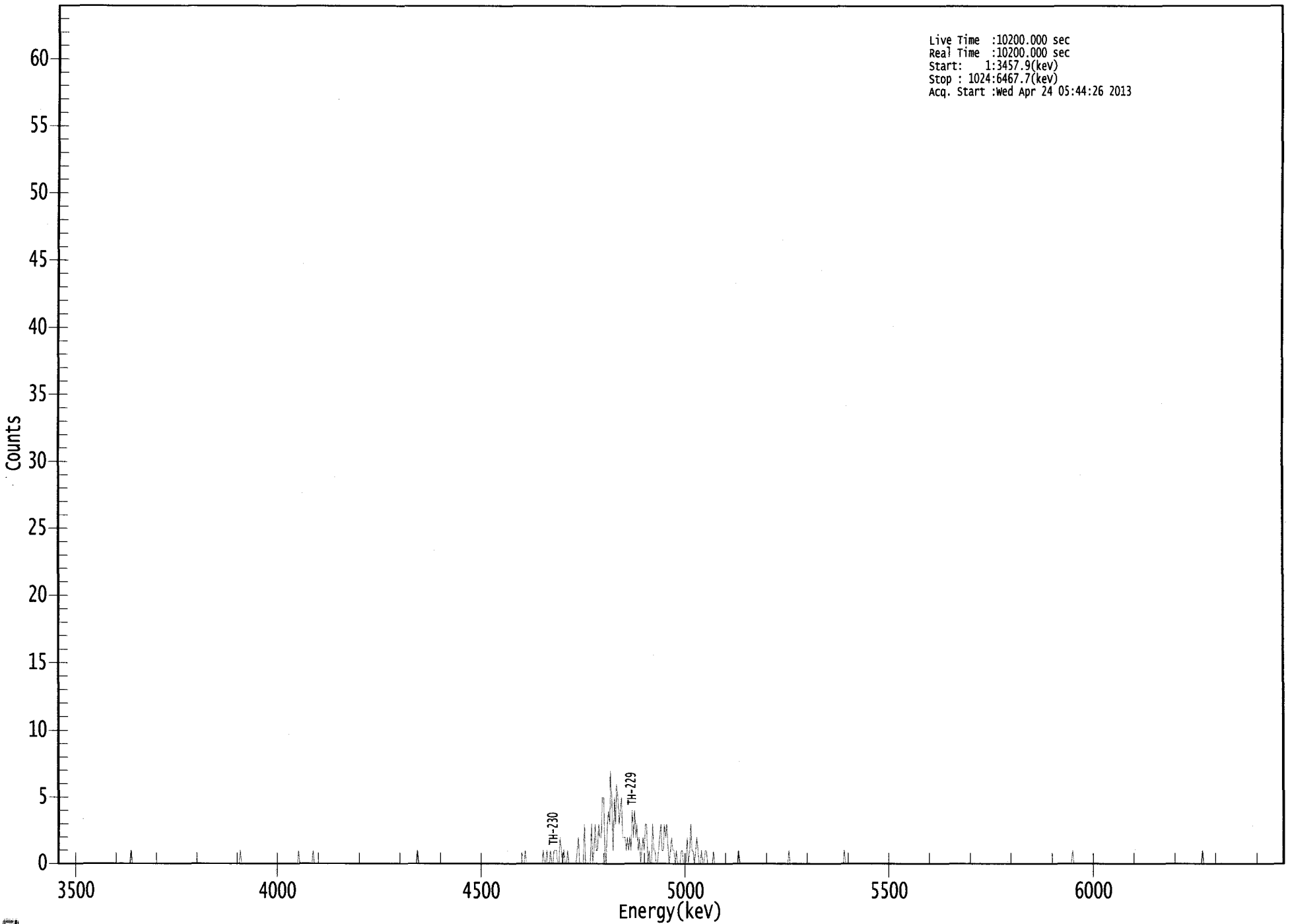
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.949	5850.00*	1.36E-002 +/- 3.77E-002	8.13E-002 +/- 1.31E-002
TH-228	0.970	5400.00*	2.46E-002 +/- 3.78E-002	5.62E-002 +/- 9.03E-003
TH-229	1.000	4872.00*	2.31E+000 +/- 3.71E-001	5.54E-002 +/- 8.90E-003
TH-230	1.000	4672.00*	1.54E-001 +/- 9.34E-002	6.32E-002 +/- 1.02E-002
TH-232	0.998	3997.00*	3.51E-002 +/- 4.56E-002	6.31E-002 +/- 1.01E-002

AK
4/24/13

US EPA ARCHIVE DOCUMENT

0000056281.CNF

Live Time :10200.000 sec
Real Time :10200.000 sec
Start: 1:3457.9(kev)
Stop : 1024:6467.7(kev)
Acq. Start :Wed Apr 24 05:44:26 2013



ROI Type: 1

ROI Type: 3

***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 10

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	1	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	1	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	1	0	0	0	0	0
209:	0	0	0	0	0	0	1	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	1	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 10

Channel	1	2	3	4	5	6	7	8	9
377:	0	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	0	1
393:	0	0	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0	1	0
409:	0	1	0	0	1	0	0	0	1
417:	1	1	0	0	2	1	0	0	1
425:	0	0	1	0	0	0	0	0	0
433:	0	0	1	2	0	0	0	0	0
441:	3	0	0	0	0	0	0	3	0
449:	1	3	1	1	3	2	2	2	5
457:	5	1	0	3	4	3	7	4	4
465:	1	5	3	6	5	3	4	5	5
473:	2	2	2	1	2	1	2	1	1
481:	4	2	4	2	3	1	2	0	0
489:	1	2	1	3	3	0	1	0	0
497:	0	3	1	1	0	0	1	2	0
505:	3	1	1	3	2	3	1	0	0
513:	1	2	1	1	0	1	0	0	0
521:	0	1	1	0	0	0	2	0	0
529:	1	3	1	1	0	1	2	1	0
537:	0	0	1	0	0	1	1	0	0
545:	0	0	0	0	1	0	0	0	0
553:	0	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0	0
569:	0	1	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0	0
609:	0	0	0	1	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0	0
657:	0	1	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 10

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	1
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	1	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



103
4/24/13

Sample Description: PZ-100-SD DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 11
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_048
 Chamber Serial Number: 02030596B
 Detector Serial Number: 83111
 Env. Background: System Bkgd 55217
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 5:44:29 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.226 mL
 Effective Efficiency: 0.1920 +/- 0.0161
 Counting Efficiency: 0.1680 +/- 0.0030 on 12/16/2012 5:49:20 PM
 Chem. Recovery Factor: 1.1433 +/- 0.0978

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	6.012	0.83	239.53	0.17	0.00E+000	3.0
TH-228	5.303	0.15	1397.8	0.85	0.00E+000	3.0
TH-229 T	4.865	165.83	15.23	0.17	0.00E+000	16.7
TH-230	4.623	4.83	91.00	0.17	0.00E+000	3.0
TH-232	3.949	-0.17	1169.4	0.17	0.00E+000	0.0

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

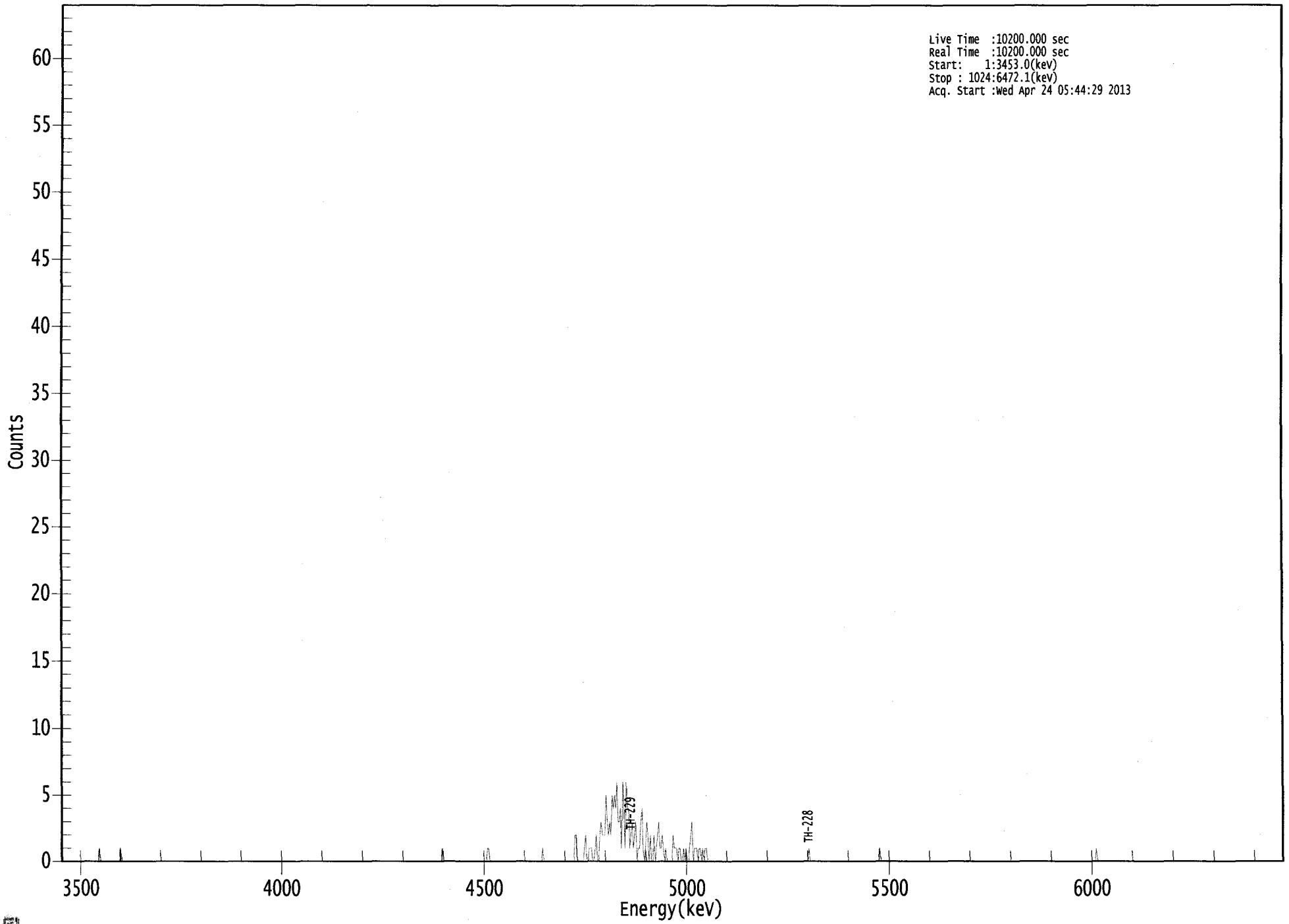
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.872	5850.00*	1.18E-002 +/- 2.82E-002	5.92E-002 +/- 9.70E-003
TH-228	0.952	5400.00*	2.11E-003 +/- 2.95E-002	8.42E-002 +/- 1.38E-002
TH-229	1.000	4872.00*	2.30E+000 +/- 3.77E-001	5.79E-002 +/- 9.49E-003
TH-230	0.988	4672.00*	6.68E-002 +/- 6.17E-002	5.77E-002 +/- 9.46E-003
TH-232	0.988	3997.00*	-2.35E-003 +/- 2.74E-002	5.76E-002 +/- 9.44E-003

AG
4/24/13

US EPA ARCHIVE DOCUMENT

0000056280.CNF

Live Time :10200.000 sec
Real Time :10200.000 sec
Start: 1:3453.0(kev)
Stop : 1024:6472.1(kev)
Acq. Start :wed Apr 24 05:44:29 2013



ROI Type: 1

ROI Type: 3

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 11

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	1	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	1	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	1	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	1	1
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 11

Channel	1	2	3	4	5	6	7	8	9
377:	0	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0
401:	0	0	0	0	1	0	0	0	0
409:	0	0	0	0	0	0	0	0	0
417:	0	0	0	0	0	0	0	0	0
425:	0	0	0	0	0	0	0	0	2
433:	2	0	0	0	0	0	0	0	1
441:	2	0	0	1	1	1	1	0	0
449:	1	2	0	0	2	3	2	2	2
457:	2	5	3	2	3	2	5	4	4
465:	5	4	6	3	3	4	1	6	6
473:	4	1	6	4	4	1	2	3	3
481:	1	2	3	0	1	1	3	4	4
489:	1	0	1	3	2	0	2	0	0
497:	0	2	0	1	2	3	1	1	1
505:	2	1	0	1	0	0	0	0	0
513:	0	2	1	1	1	0	1	1	1
521:	0	0	1	0	1	0	0	1	1
529:	2	3	0	1	1	1	0	1	1
537:	1	0	1	0	1	1	0	0	0
545:	0	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0
625:	0	0	0	1	0	0	0	0	0
633:	0	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	1	0	0
689:	0	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0 0

Sample Title: 11

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	1	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



KCS
4/24/13

Sample Description: I-67 TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 12
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_033
 Chamber Serial Number: 04026479A
 Detector Serial Number: 91132
 Env. Background: System Bkgd 55203
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 8:55:56 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.226 mL
 Effective Efficiency: 0.1669 +/- 0.0149
 Counting Efficiency: 0.1825 +/- 0.0032 on 12/16/2012 5:49:18 PM
 Chem. Recovery Factor: 0.9147 +/- 0.0831

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.893	1.49	190.02	0.51	0.00E+000	3.0
TH-228	5.330	3.32	119.77	0.68	0.00E+000	3.0
TH-229 T	4.884	144.00	16.39	0.00	0.00E+000	5.2
TH-230	4.649	38.49	31.84	0.51	0.00E+000	4.5
TH-232	3.947	0.00	1960.0	0.00	0.00E+000	0.0

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

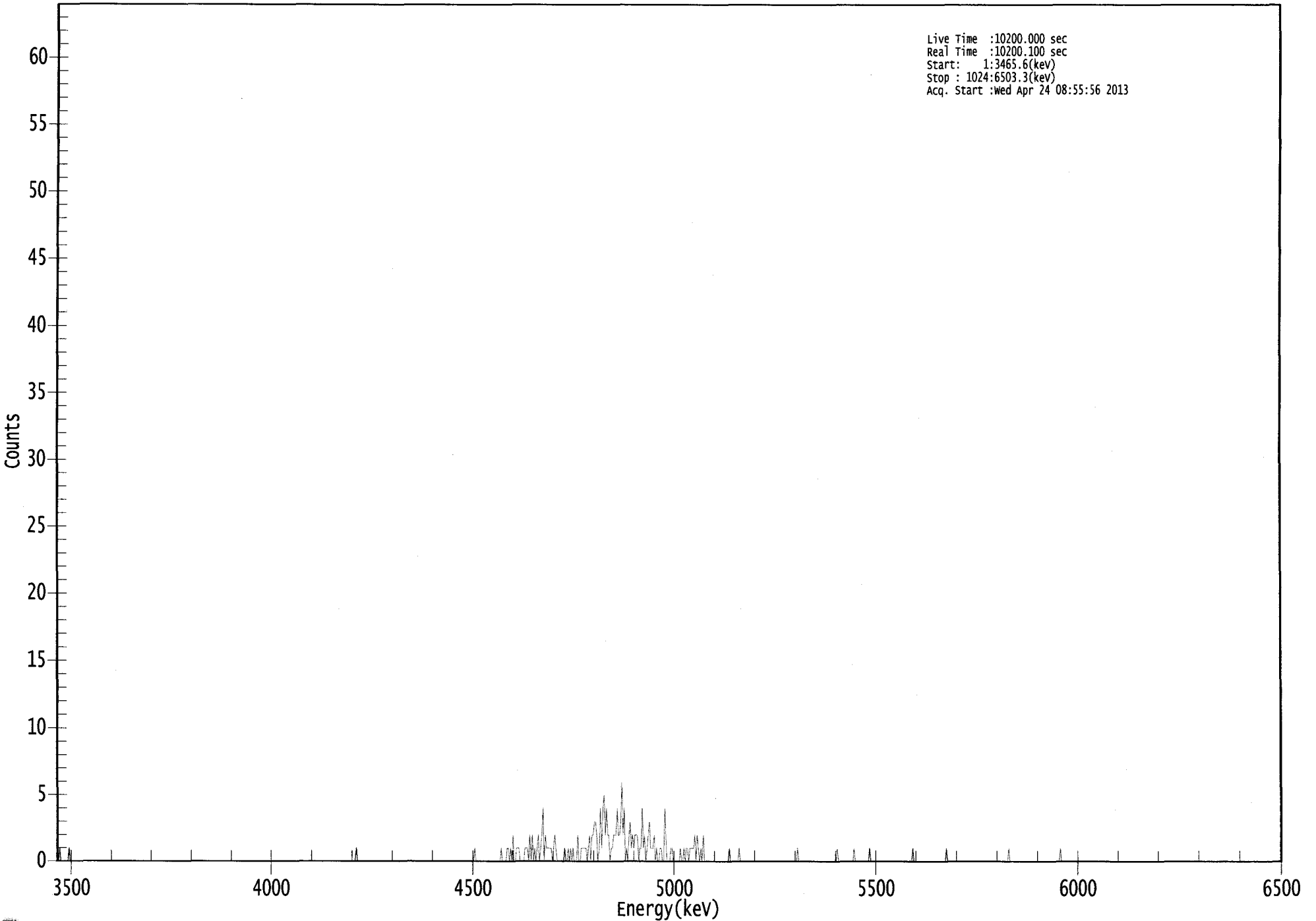
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.990	5850.00*	2.43E-002 +/- 4.64E-002	8.56E-002 +/- 1.50E-002
TH-228	0.974	5400.00*	5.37E-002 +/- 6.50E-002	9.13E-002 +/- 1.60E-002
TH-229	0.999	4872.00*	2.30E+000 +/- 4.02E-001	9.56E-002 +/- 1.67E-002
TH-230	0.997	4672.00*	6.12E-001 +/- 2.22E-001	8.35E-002 +/- 1.46E-002
TH-232	0.987	3997.00*	0.00E+000 +/- 4.40E-002	9.52E-002 +/- 1.66E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

000056282.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3465.6(kev)
Stop : 1024:6503.3(kev)
Acq. Start :Wed Apr 24 08:55:56 2013



ROI Type: 1

ROI Type: 3

0270

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 12

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	1	0	0	0	0	0
9:	0	0	1	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	1	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	1	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 1 0 0 0

Sample Title: 12

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	1	1	0	1	0	2	0
385:	0	1	1	1	0	0	0	0
393:	1	1	1	0	2	0	2	0
401:	1	0	1	2	0	1	2	4
409:	0	2	1	1	1	1	1	0
417:	1	2	1	0	0	0	0	0
425:	0	1	0	0	1	0	1	0
433:	1	0	0	0	2	0	0	1
441:	1	1	1	1	0	1	2	0
449:	2	2	3	3	2	0	1	4
457:	1	4	5	2	4	2	2	0
465:	1	1	2	2	2	4	2	2
473:	3	6	2	4	0	1	0	2
481:	3	1	2	1	2	2	2	0
489:	1	1	4	1	2	0	1	2
497:	3	1	1	1	2	0	1	0
505:	0	1	1	0	0	4	1	0
513:	0	0	1	1	0	0	0	0
521:	0	0	1	0	0	1	0	1
529:	1	0	1	1	1	1	2	0
537:	2	1	0	1	0	2	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	1	0	0	0	0
569:	0	0	0	1	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	1	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	1	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	1	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	1	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	1	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	1	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	1	0	0	0

801: 0 0 0 0 0 0 0 0 0

Sample Title: 12

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	1
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

ICB
4/24/13



Sample Description: I-67 DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 13
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_034
 Chamber Serial Number: 04026479B
 Detector Serial Number: 91136
 Env. Background: System Bkgd 55204
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 8:55:58 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.226 mL
 Effective Efficiency: 0.1935 +/- 0.0161
 Counting Efficiency: 0.1856 +/- 0.0032 on 12/16/2012 5:49:43 PM
 Chem. Recovery Factor: 1.0425 +/- 0.0889

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.734	0.66	305.43	0.34	0.00E+000	3.0
TH-228	5.341	1.66	169.38	0.34	0.00E+000	3.0
TH-229 T	4.867	166.83	15.18	0.17	0.00E+000	3.7
TH-230	4.629	9.66	64.35	0.34	0.00E+000	3.0
TH-232	3.947	-0.17	1169.4	0.17	0.00E+000	0.0

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

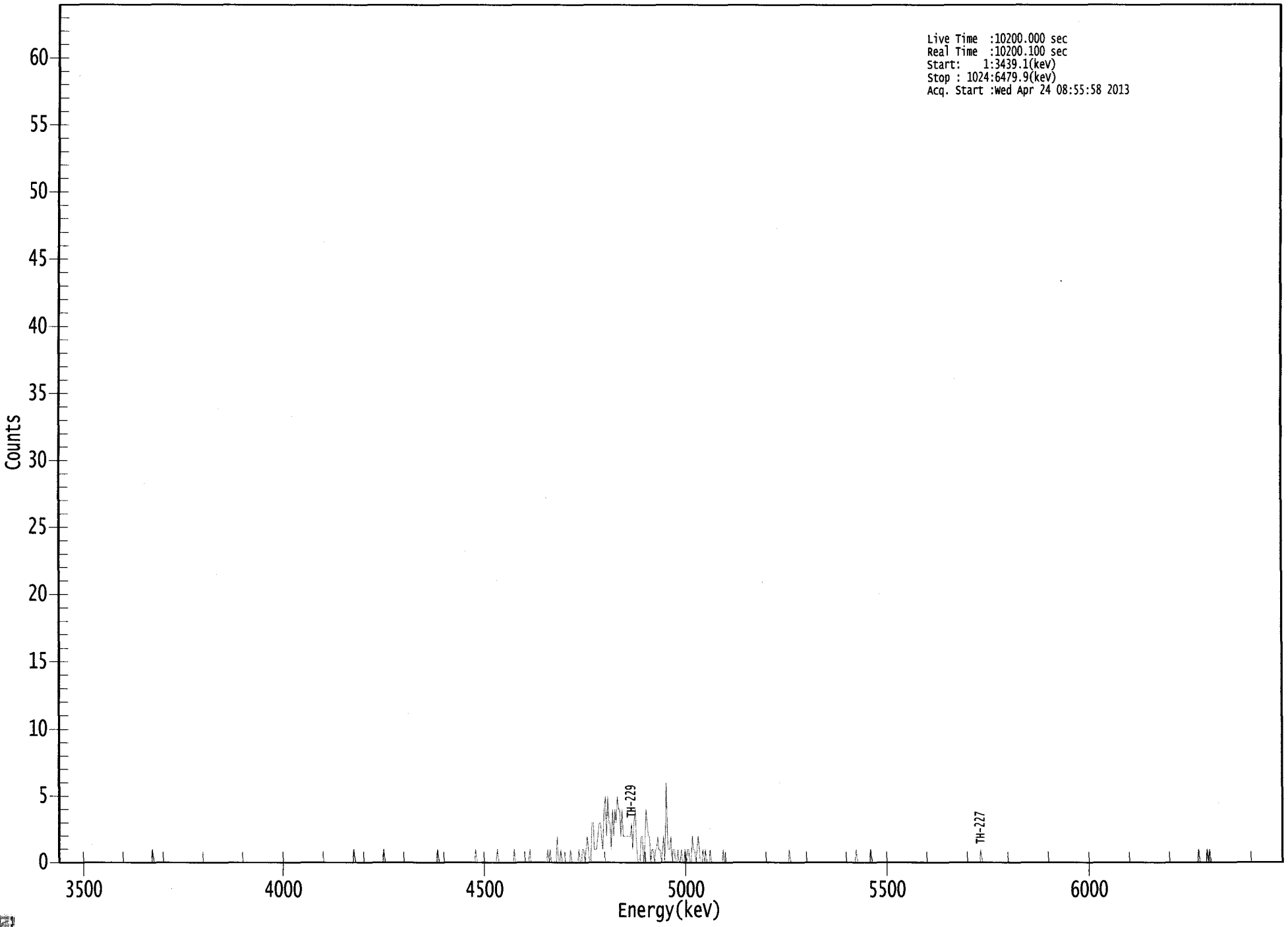
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.932	5850.00*	9.29E-003 +/- 2.84E-002	6.73E-002 +/- 1.10E-002
TH-228	0.982	5400.00*	2.32E-002 +/- 3.95E-002	6.68E-002 +/- 1.09E-002
TH-229	1.000	4872.00*	2.30E+000 +/- 3.76E-001	5.74E-002 +/- 9.39E-003
TH-230	0.990	4672.00*	1.33E-001 +/- 8.80E-002	6.56E-002 +/- 1.07E-002
TH-232	0.987	3997.00*	-2.33E-003 +/- 2.72E-002	5.72E-002 +/- 9.35E-003

AG
 4/24/13

US EPA ARCHIVE DOCUMENT

0000056283.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3439.1(kev)
Stop : 1024:6479.9(kev)
Acq. Start :wed Apr 24 08:55:58 2013



ROI Type: 1

ROI Type: 3

5275

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 13

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	1
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	1	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	1	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	1	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	1	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 1 0 0 0 0 0 0 0 0

Sample Title: 13

Channel	1	2	3	4	5	6	7	8
377:	0	0	0	0	0	0	1	0
385:	0	0	0	0	0	0	0	0
393:	0	0	0	1	0	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	1	0	1	0	0	0
417:	0	0	2	0	0	1	0	0
425:	0	0	0	0	0	1	0	0
433:	0	0	0	0	1	0	0	1
441:	1	0	1	2	1	0	0	3
449:	3	1	1	1	2	3	3	2
457:	1	4	5	2	5	3	3	1
465:	4	2	4	3	5	4	4	2
473:	4	2	2	2	2	2	2	2
481:	3	1	3	4	2	0	0	0
489:	2	2	0	1	4	3	2	2
497:	0	1	1	0	1	1	2	1
505:	1	0	1	2	0	6	2	1
513:	1	2	0	1	1	0	0	1
521:	0	0	1	0	0	1	0	1
529:	1	0	0	2	1	1	0	1
537:	2	1	0	0	1	0	1	0
545:	0	0	1	0	0	0	0	0
553:	0	0	0	0	0	1	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	1	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	1	0	0	0
673:	0	0	0	0	0	0	0	0
681:	1	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	1	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 13

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	1	0	0	0	0	0	0
961:	1	0	1	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

*KS
4/24/13*

Sample Description: PZ-203-SS TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 14
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_035
 Chamber Serial Number: 04026477A
 Detector Serial Number: 58771
 Env. Background: System Bkgd 55205
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 8:55:52 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.226 mL
 Effective Efficiency: 0.2446 +/- 0.0185
 Counting Efficiency: 0.1826 +/- 0.0032 on 12/16/2012 5:49:42 PM
 Chem. Recovery Factor: 1.3397 +/- 0.1039

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.819	4.00	109.57	0.00	0.00E+000	2.9
TH-228	5.248	1.83	152.56	0.17	0.00E+000	2.9
TH-229 T	4.911	211.32	13.51	0.68	0.00E+000	6.7
TH-230	4.617	8.00	73.50	0.00	0.00E+000	2.9
TH-232	3.937	2.66	128.85	0.34	0.00E+000	2.9

T = Tracer Peak used for Effective Efficiency

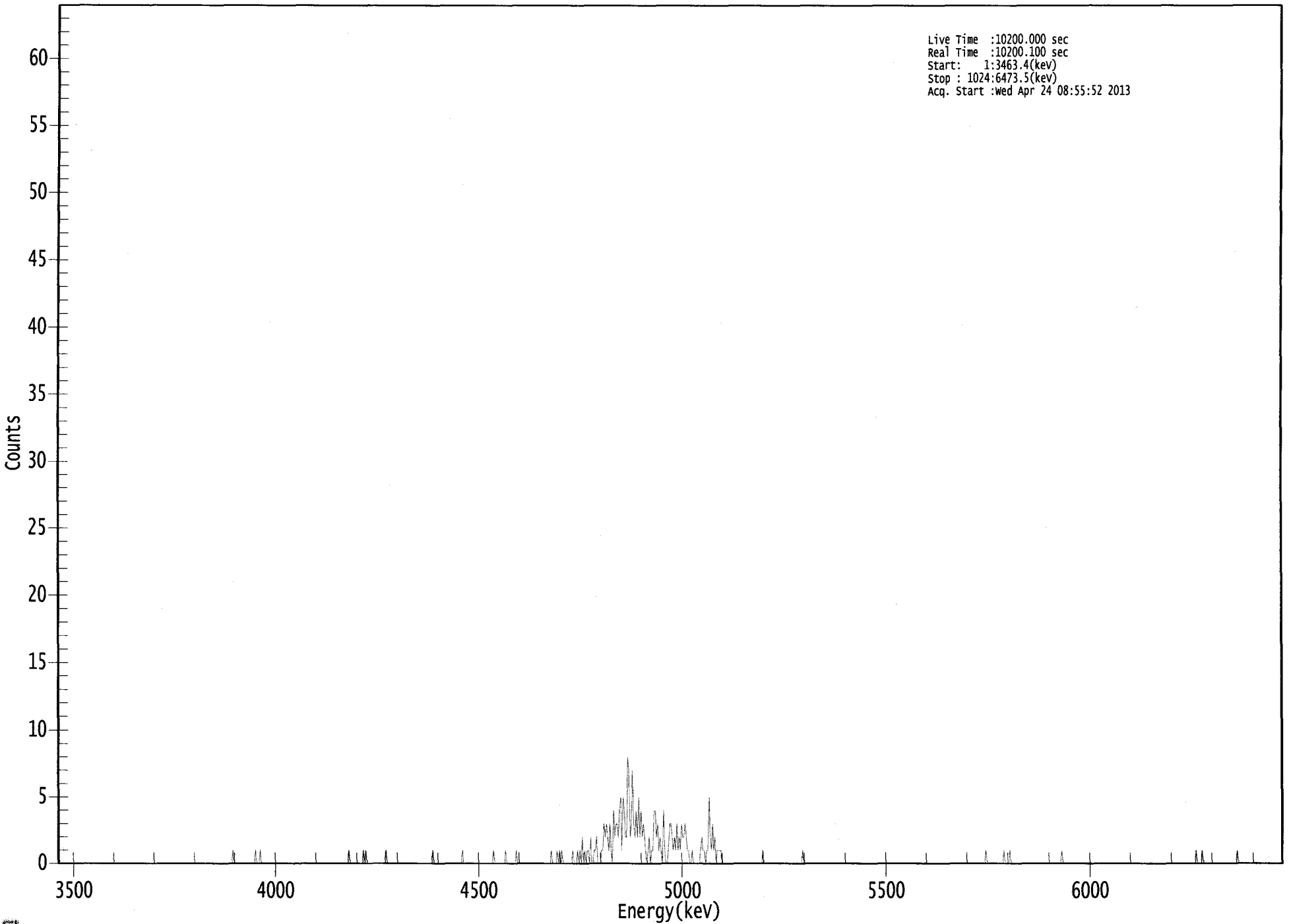
 NUCLIDE ANALYSIS RESULTS

Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.995	5850.00*	4.45E-002 +/- 4.92E-002	6.67E-002 +/- 9.88E-003
TH-228	0.886	5400.00*	2.02E-002 +/- 3.10E-002	4.61E-002 +/- 6.83E-003
TH-229	0.992	4872.00*	2.30E+000 +/- 3.41E-001	6.14E-002 +/- 9.09E-003
TH-230	0.984	4672.00*	8.68E-002 +/- 6.51E-002	6.51E-002 +/- 9.64E-003
TH-232	0.981	3997.00*	2.88E-002 +/- 3.74E-002	5.18E-002 +/- 7.67E-003

*AG
4/24/13*

000056287.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3463.4(kev)
Stop : 1024:6473.5(kev)
Acq. Start :wed Apr 24 08:55:52 2013



ROI Type: 1

ROI Type: 3

0260

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 14

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	1	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	1	0
169:	0	0	1	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	1	0	0	0
249:	0	0	0	0	0	0	0	0
257:	1	0	1	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	1	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	1	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	1	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	1	0	0

369: 0 0 0 0 0 0 0 0 1

Sample Title: 14

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	1	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	1	0	0
417:	0	0	1	0	1	0	1	0
425:	0	0	0	0	0	0	0	1
433:	0	0	0	1	0	1	0	2
441:	0	1	0	1	1	0	2	0
449:	0	1	1	2	0	0	0	1
457:	1	3	2	3	2	1	3	1
465:	0	4	2	3	3	2	4	5
473:	1	5	4	2	2	8	7	2
481:	3	7	3	2	4	2	5	2
489:	4	2	3	2	1	0	1	2
497:	0	1	1	4	4	2	3	1
505:	2	1	0	4	1	0	0	1
513:	3	3	2	1	2	1	3	1
521:	2	1	3	2	2	3	2	1
529:	1	0	0	1	0	0	0	0
537:	0	0	1	2	1	1	0	1
545:	1	5	2	1	3	1	2	0
553:	1	1	1	1	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	1	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	1
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	1	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	1
793:	0	0	0	0	1	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 14

Channel	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	1
841:	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	1
953:	0	0	0	0	1	0	0
961:	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0
985:	0	1	0	0	0	0	0
993:	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0



1013
4/24/13

Sample Description: PZ-203-SS DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 15
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_037
 Chamber Serial Number: 04026478A
 Detector Serial Number: 91133
 Env. Background: System Bkgd 55207
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 8:55:54 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.226 mL
 Effective Efficiency: 0.1911 +/- 0.0160
 Counting Efficiency: 0.1783 +/- 0.0033 on 1/26/2013 3:28:25 PM
 Chem. Recovery Factor: 1.0720 +/- 0.0921

Peak Match Tolerance: 0.175 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.834	1.83	152.56	0.17	0.00E+000	2.9
TH-228	5.232	1.66	169.38	0.34	0.00E+000	2.9
TH-229 T	4.879	164.83	15.28	0.17	0.00E+000	5.1
TH-230	4.650	15.83	49.57	0.17	0.00E+000	2.9
TH-232	3.977	2.66	128.85	0.34	0.00E+000	2.9

T = Tracer Peak used for Effective Efficiency

 ----- NUCLIDE ANALYSIS RESULTS -----

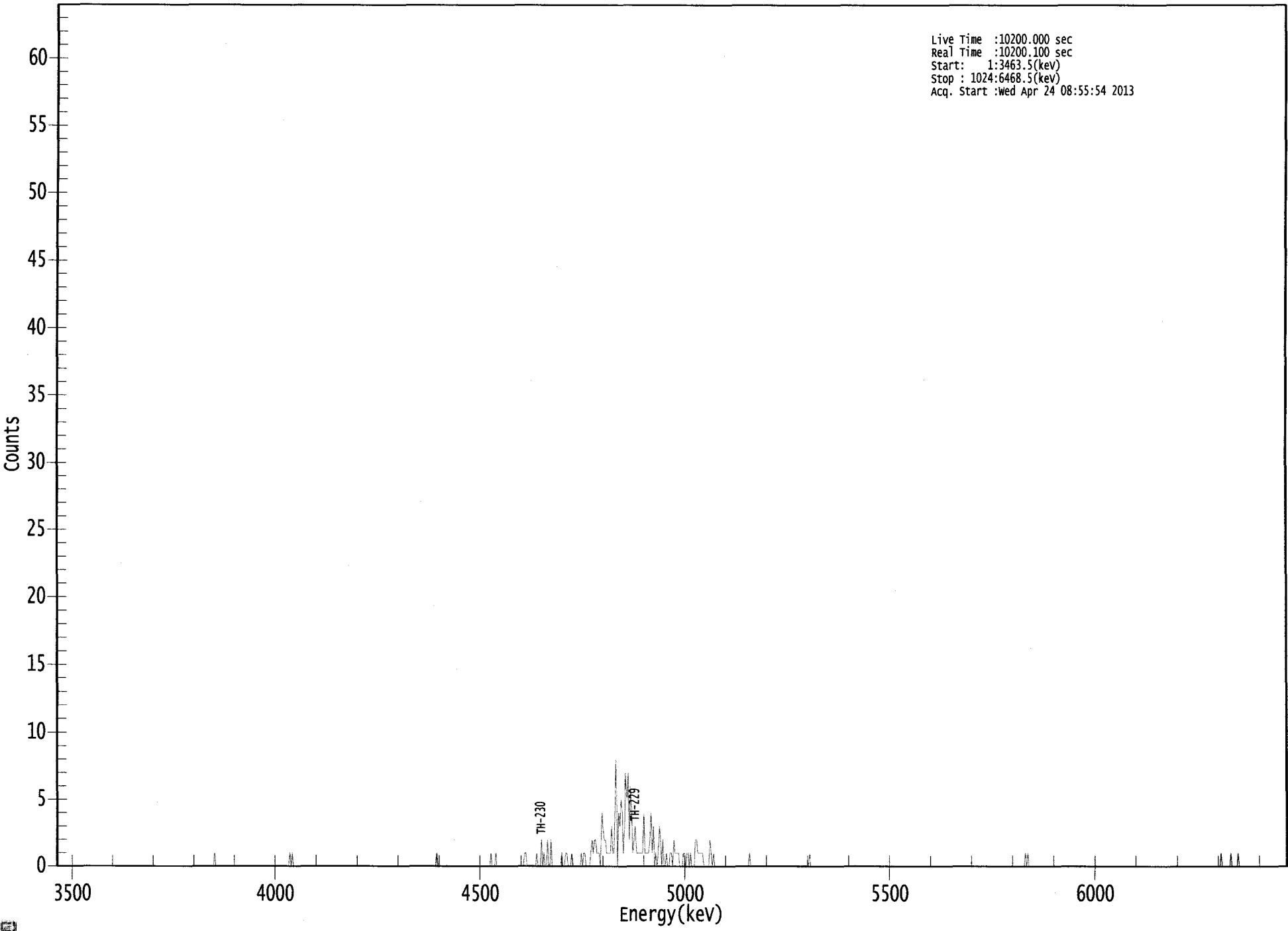
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.999	5850.00*	2.61E-002 +/- 4.00E-002	5.94E-002 +/- 9.77E-003
TH-228	0.863	5400.00*	2.35E-002 +/- 3.99E-002	6.76E-002 +/- 1.11E-002
TH-229	1.000	4872.00*	2.30E+000 +/- 3.77E-001	5.81E-002 +/- 9.56E-003
TH-230	0.998	4672.00*	2.20E-001 +/- 1.15E-001	5.80E-002 +/- 9.53E-003
TH-232	0.998	3997.00*	3.69E-002 +/- 4.79E-002	6.63E-002 +/- 1.09E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

000056284.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3463.5(kev)
Stop : 1024:6468.5(kev)
Acq. Start :wed Apr 24 08:55:54 2013



ROI Type: 1

ROI Type: 3

0283

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 15

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	1	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	1	0	1	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	1	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	1	0	0	0	1	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 15

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	1	1
393:	0	0	0	0	0	0	0	0
401:	1	0	0	0	2	0	1	0
409:	0	2	0	0	2	0	0	0
417:	0	0	0	0	0	1	0	0
425:	1	1	0	0	0	1	0	0
433:	0	0	0	0	0	1	0	1
441:	1	0	0	0	0	1	2	1
449:	2	2	1	1	1	0	4	3
457:	2	2	1	1	1	1	3	1
465:	1	5	8	0	4	3	5	4
473:	1	3	7	5	7	2	6	4
481:	1	2	3	1	1	1	1	1
489:	1	4	1	1	1	1	2	4
497:	1	3	0	1	0	1	3	2
505:	0	2	0	0	1	0	0	1
513:	1	0	2	1	1	1	1	0
521:	0	0	1	1	0	1	1	0
529:	1	0	0	0	2	2	1	1
537:	1	1	1	0	0	0	0	0
545:	2	1	0	1	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	1	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	1	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 1 0

Sample Title: 15

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	1	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	1	0	0	0	0	0	0	0
977:	1	0	0	0	0	0	1	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



103
4/24/13

Sample Description: PZ-100-SS TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 16
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_040
 Chamber Serial Number: 06027396B
 Detector Serial Number: 91135
 Env. Background: System Bkgd 55210
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 8:56:09 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.226 mL
 Effective Efficiency: 0.1297 +/- 0.0129
 Counting Efficiency: 0.1900 +/- 0.0033 on 12/16/2012 5:49:33 PM
 Chem. Recovery Factor: 0.6824 +/- 0.0691

Peak Match Tolerance: 0.175 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.874	0.00	1960.0	0.00	0.00E+000	0.0
TH-228	5.315	0.83	239.53	0.17	0.00E+000	3.0
TH-229 T	4.887	111.66	18.58	0.34	0.00E+000	3.7
TH-230	4.636	4.66	94.59	0.34	0.00E+000	3.0
TH-232	3.872	1.00	277.19	0.00	0.00E+000	3.0

T = Tracer Peak used for Effective Efficiency

 ----- NUCLIDE ANALYSIS RESULTS -----

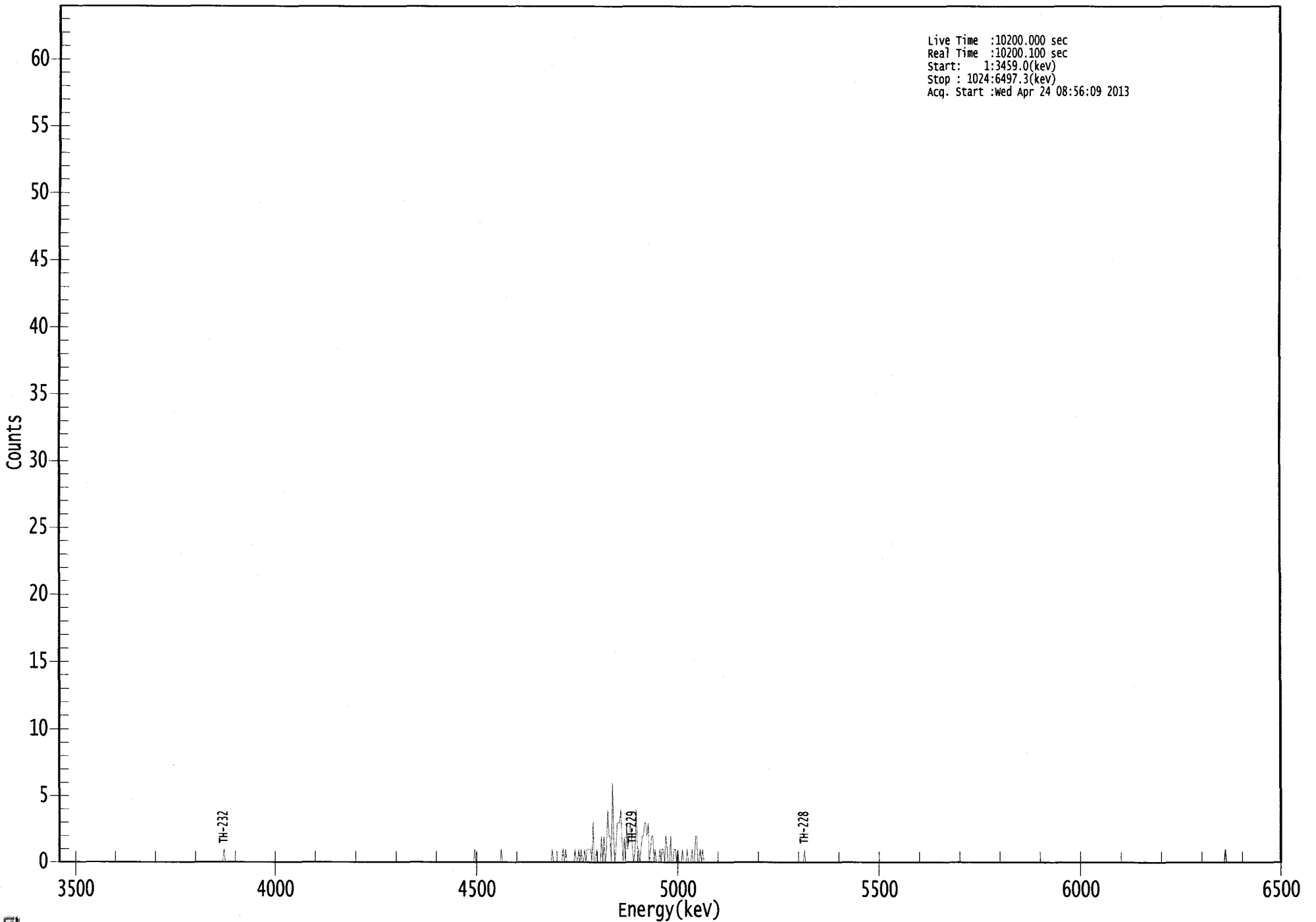
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.997	5850.00*	0.00E+000 +/- 5.82E-002	1.26E-001 +/- 2.46E-002
TH-228	0.963	5400.00*	1.73E-002 +/- 4.16E-002	8.70E-002 +/- 1.70E-002
TH-229	0.999	4872.00*	2.29E+000 +/- 4.48E-001	9.82E-002 +/- 1.92E-002
TH-230	0.993	4672.00*	9.54E-002 +/- 9.22E-002	9.79E-002 +/- 1.91E-002
TH-232	0.921	3997.00*	2.04E-002 +/- 5.68E-002	1.23E-001 +/- 2.40E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

0000056286.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3459.0(kev)
Stop : 1024:6497.3(kev)
Acq. Start :wed Apr 24 08:56:09 2013



ROI Type: 1

ROI Type: 3

0290

***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 16

Elapsed Live time: 10200
Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	1	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	1	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 1 0 0 0 0

Sample Title: 16

Channel	1	2	3	4	5	6	7	8
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	0	1	0
417:	0	0	0	0	0	0	0	1
425:	0	1	0	0	0	0	0	0
433:	0	1	0	0	1	0	1	0
441:	0	1	0	1	1	1	1	0
449:	3	0	0	1	0	0	0	2
457:	0	2	0	1	4	2	2	0
465:	6	2	0	1	3	3	3	4
473:	2	0	2	0	3	1	2	3
481:	2	1	0	1	4	1	1	0
489:	1	2	2	3	3	2	3	0
497:	1	2	2	0	1	0	0	0
505:	1	0	1	1	0	2	1	0
513:	0	2	0	0	1	1	0	1
521:	0	0	0	1	0	0	0	1
529:	0	0	0	1	0	0	2	2
537:	0	0	1	0	1	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	1	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 16

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	1	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



10/13
4/24/13

Sample Description: PZ-100-SS DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 17
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_041
 Chamber Serial Number: 05026930A
 Detector Serial Number: 91087
 Env. Background: System Bkgd 55211
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 8:56:04 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.225 mL
 Effective Efficiency: 0.2008 +/- 0.0165
 Counting Efficiency: 0.1978 +/- 0.0034 on 12/16/2012 5:49:31 PM
 Chem. Recovery Factor: 1.0150 +/- 0.0854

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.710	-0.19	1131.1	1.19	0.00E+000	3.0
TH-228	5.298	-0.51	400.63	0.51	0.00E+000	0.0
TH-229 T	4.881	172.49	14.95	0.51	0.00E+000	6.6
TH-230	4.631	7.81	76.13	1.19	0.00E+000	3.0
TH-232	3.975	-1.89	126.64	2.89	0.00E+000	3.0

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

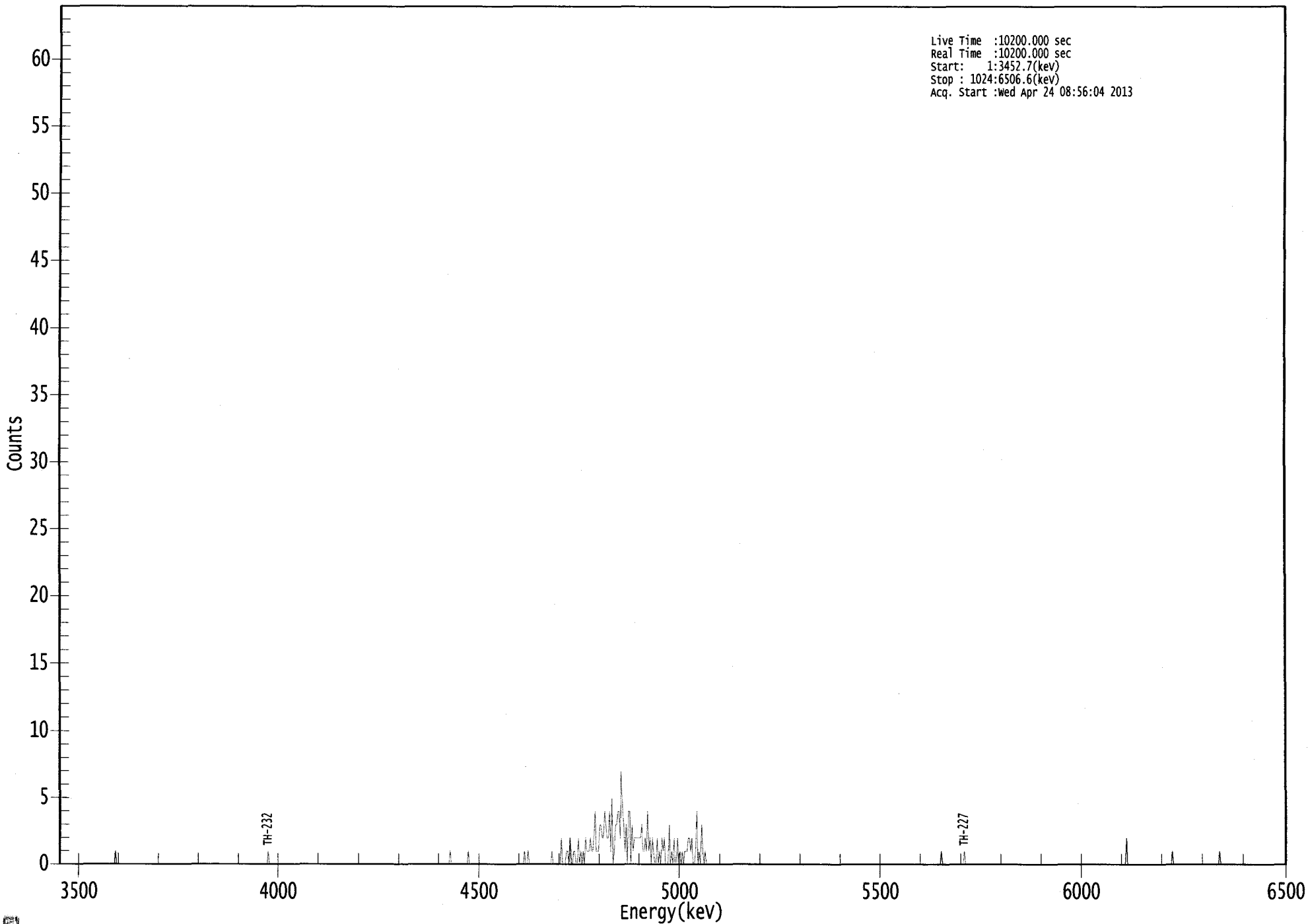
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.902	5850.00*	-2.58E-003 +/- 2.91E-002	8.93E-002 +/- 1.44E-002
TH-228	0.947	5400.00*	-6.86E-003 +/- 2.75E-002	7.06E-002 +/- 1.14E-002
TH-229	1.000	4872.00*	2.29E+000 +/- 3.69E-001	6.96E-002 +/- 1.12E-002
TH-230	0.991	4672.00*	1.03E-001 +/- 8.03E-002	8.71E-002 +/- 1.41E-002
TH-232	0.997	3997.00*	-2.49E-002 +/- 3.18E-002	1.16E-001 +/- 1.86E-002

AG
4/24/13

US EPA ARCHIVE DOCUMENT

0000056292.CNF

Live Time :10200.000 sec
Real Time :10200.000 sec
Start: 1:3452.7(kev)
Stop : 1024:6506.6(kev)
Acq. Start :wed Apr 24 08:56:04 2013



ROI Type: 1

ROI Type: 3

0299

***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 17

Elapsed Live time: 10200
Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	1
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	1
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	1
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	1	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 17

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	1	0	0
393:	1	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	1	0	0	0
417:	0	0	0	0	2	0	0	0
425:	1	1	0	2	0	0	1	1
433:	0	0	2	0	1	0	1	0
441:	2	1	1	1	2	1	1	2
449:	4	1	1	1	3	3	2	2
457:	4	3	2	2	4	1	5	0
465:	1	3	3	4	4	2	7	4
473:	3	1	3	0	4	4	0	3
481:	1	2	2	2	2	2	2	3
489:	1	1	2	1	4	1	2	0
497:	2	1	0	0	2	0	1	0
505:	2	1	2	0	0	0	3	0
513:	1	0	2	0	0	2	0	1
521:	0	1	0	1	1	1	2	2
529:	1	2	0	0	1	4	0	1
537:	0	3	1	0	1	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	1	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	1	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 17

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	2	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	1	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	1	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



lets
4/24/13

Sample Description: I-66 TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 18
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_042
 Chamber Serial Number: 05026930B
 Detector Serial Number: 84185
 Env. Background: System Bkgd 55212
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 8:56:06 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.225 mL
 Effective Efficiency: 0.1481 +/- 0.0139
 Counting Efficiency: 0.1846 +/- 0.0032 on 12/16/2012 5:49:29 PM
 Chem. Recovery Factor: 0.8022 +/- 0.0767

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.726	0.66	305.43	0.34	0.00E+000	3.0
TH-228	5.336	1.98	176.34	1.02	0.00E+000	3.0
TH-229 T	4.870	127.49	17.40	0.51	0.00E+000	6.3
TH-230	4.667	6.83	76.08	0.17	0.00E+000	3.0
TH-232	3.949	-0.34	592.90	0.34	0.00E+000	0.0

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

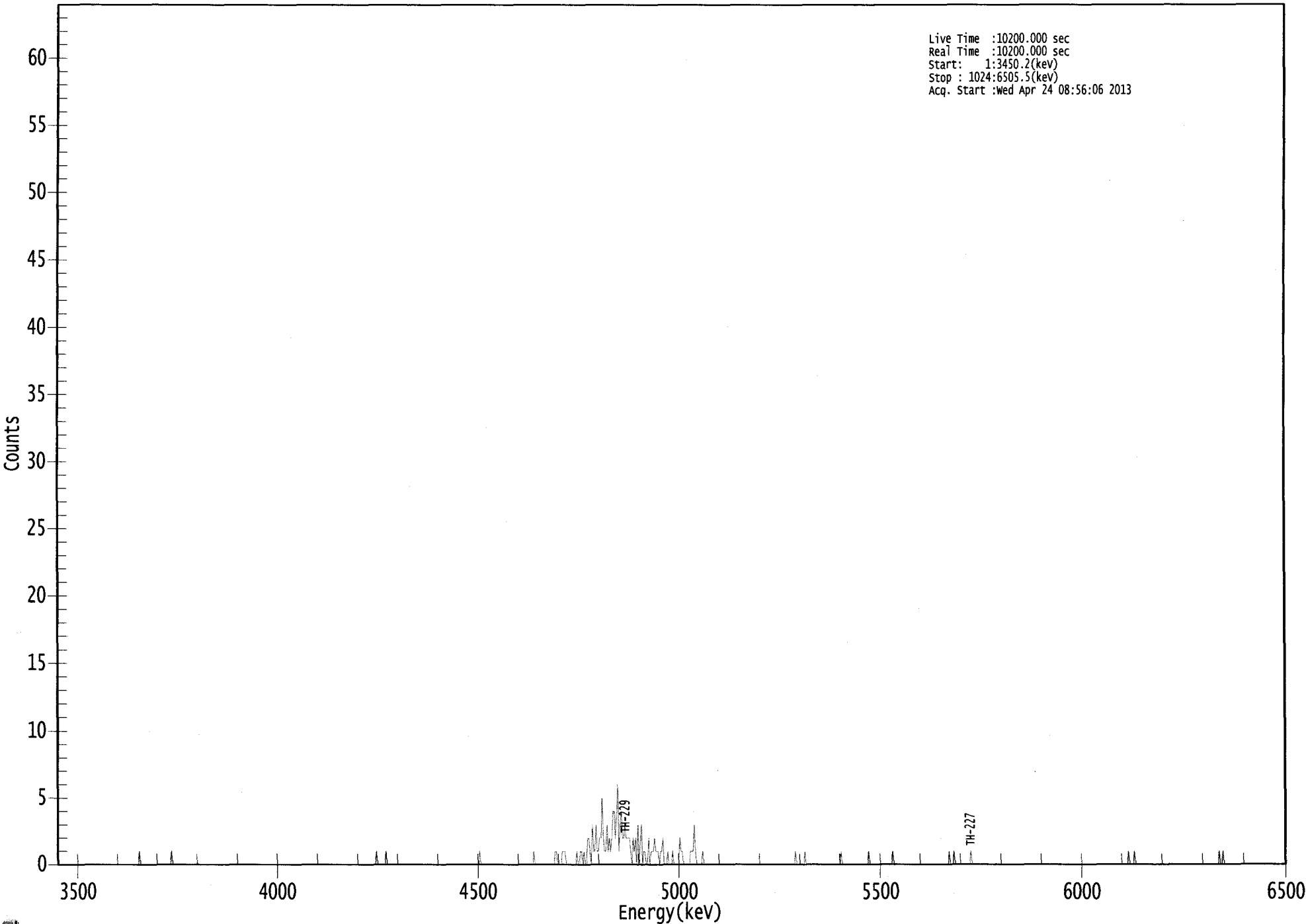
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.923	5850.00*	1.21E-002 +/- 3.71E-002	8.79E-002 +/- 1.62E-002
TH-228	0.979	5400.00*	3.61E-002 +/- 6.40E-002	1.15E-001 +/- 2.12E-002
TH-229	1.000	4872.00*	2.29E+000 +/- 4.22E-001	9.43E-002 +/- 1.74E-002
TH-230	1.000	4672.00*	1.22E-001 +/- 9.58E-002	7.48E-002 +/- 1.38E-002
TH-232	0.988	3997.00*	-6.08E-003 +/- 3.61E-002	8.55E-002 +/- 1.58E-002

AG
 4/24/13

US EPA ARCHIVE DOCUMENT

000056291.CNF

Live Time :10200.000 sec
Real Time :10200.000 sec
Start: 1:3450.2(keV)
Stop : 1024:6505.5(keV)
Acq. Start :Wed Apr 24 08:56:06 2013



ROI Type: 1

ROI Type: 3

0300

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 18

Elapsed Live time: 10200
 Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	1	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	1	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	1	0	0	0	0
273:	0	0	0	1	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	1	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 18

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	1	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	0	0	0
417:	1	1	0	0	0	0	1	1
425:	1	0	0	0	0	0	0	0
433:	0	0	1	0	0	1	1	0
441:	1	0	0	2	2	1	0	3
449:	1	1	3	1	1	2	2	5
457:	2	1	1	3	1	2	1	2
465:	4	4	2	4	6	1	3	4
473:	2	2	3	2	2	2	2	1
481:	0	2	1	2	0	3	0	2
489:	3	0	1	1	0	0	2	0
497:	1	1	1	2	1	1	1	0
505:	1	1	2	0	0	0	1	0
513:	0	0	1	0	0	0	0	0
521:	2	1	1	0	0	0	0	0
529:	0	1	1	1	3	1	0	0
537:	0	0	0	1	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	1	0	0	0	0	0	0	0
625:	1	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	1	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	1	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	1	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	1	0	0	0	1	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	1	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0 0

Sample Title: 18

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	1	0	0
897:	0	0	1	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	1	0	0	1	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

103
4/24/13

Apex-Alpha™

Sample Description: I-66 DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000562
 Batch Identification: 1304052A-TH
 Sample Identification: 19
 Sample Geometry: Shelf 2
 Procedure Description: Th iso

Detector Name: Alpha_044
 Chamber Serial Number: 04026481B
 Detector Serial Number: 84168
 Env. Background: System Bkgd 55214
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Sample Date/Time: 4/5/2013 7:44:58 AM
 Acquisition Date/Time: 4/24/2013 8:56:01 AM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_TH-18A
 Tracer Quantity: 0.225 mL
 Effective Efficiency: 0.2115 +/- 0.0170
 Counting Efficiency: 0.1902 +/- 0.0033 on 12/16/2012 5:49:26 PM
 Chem. Recovery Factor: 1.1122 +/- 0.0915

Peak Match Tolerance: 0.175 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-227	5.823	3.49	113.53	0.51	0.00E+000	3.0
TH-228	5.310	2.83	120.53	0.17	0.00E+000	3.0
TH-229 T	4.882	181.83	14.54	0.17	0.00E+000	4.0
TH-230	4.640	13.00	56.41	0.00	0.00E+000	3.0
TH-232	4.030	3.00	130.67	0.00	0.00E+000	3.0

T = Tracer Peak used for Effective Efficiency

 NUCLIDE ANALYSIS RESULTS

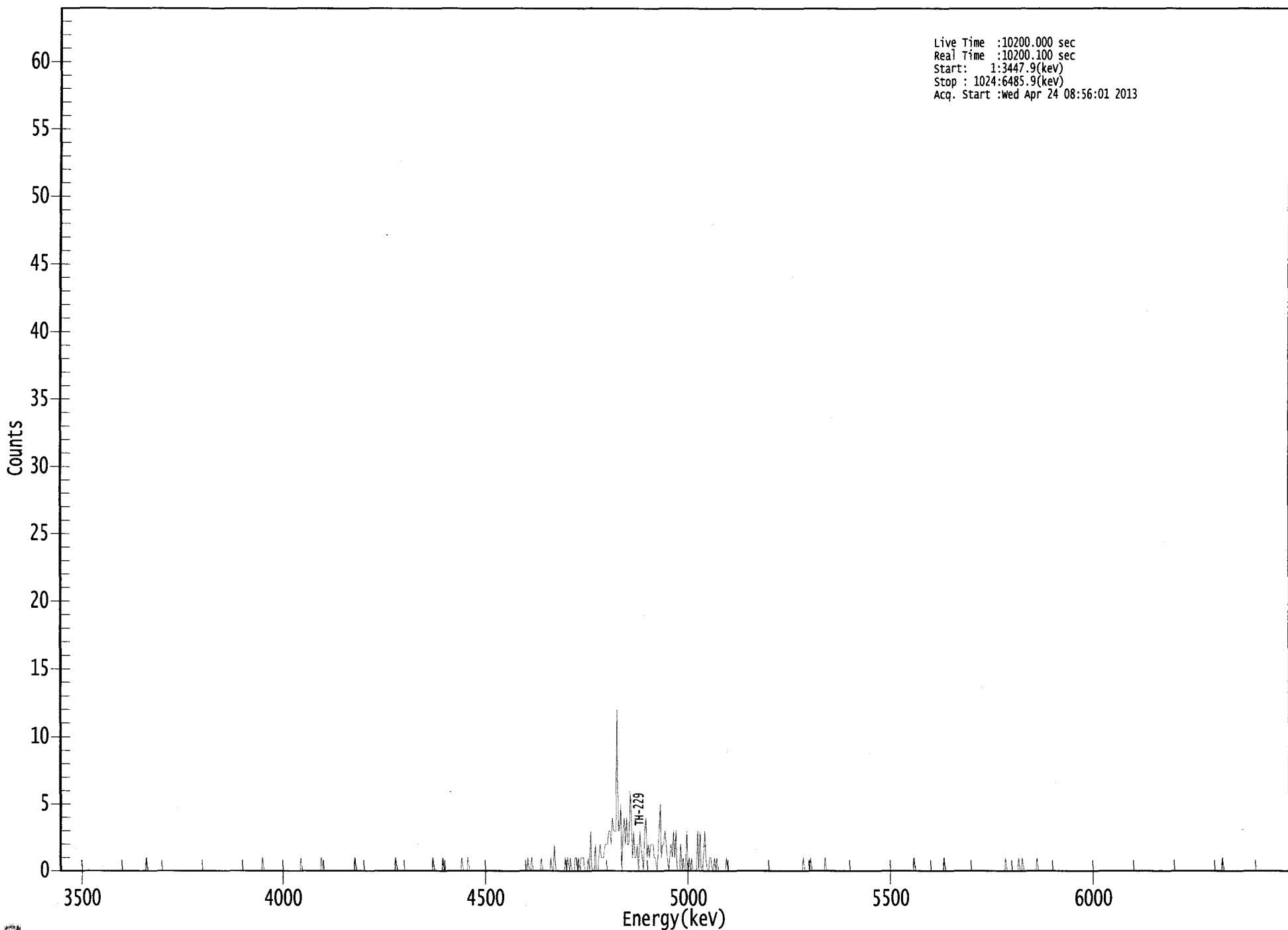
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
TH-227	0.996	5850.00*	4.49E-002 +/- 5.15E-002	6.75E-002 +/- 1.06E-002
TH-228	0.958	5400.00*	3.62E-002 +/- 4.39E-002	5.33E-002 +/- 8.40E-003
TH-229	1.000	4872.00*	2.29E+000 +/- 3.61E-001	5.25E-002 +/- 8.28E-003
TH-230	0.995	4672.00*	1.63E-001 +/- 9.56E-002	7.53E-002 +/- 1.19E-002
TH-232	0.994	3997.00*	3.76E-002 +/- 4.95E-002	7.51E-002 +/- 1.18E-002

AG
 4/24/13

US EPA ARCHIVE DOCUMENT

0000056285.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3447.9(kev)
Stop : 1024:6485.9(kev)
Acq. Start :wed Apr 24 08:56:01 2013



ROI Type: 1

ROI Type: 3

5309

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 19

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	1	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	1	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	1	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	1	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	1	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	1	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	1
313:	0	0	0	0	0	0	0	1
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	1
337:	0	0	0	0	1	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 19

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	1	0
393:	0	1	0	0	0	0	0	0
401:	0	1	0	0	0	0	0	0
409:	0	1	0	0	2	0	0	0
417:	0	0	0	0	0	1	0	1
425:	0	1	0	0	0	1	1	0
433:	1	0	1	1	1	0	0	0
441:	1	0	3	0	0	0	2	0
449:	0	1	2	1	1	1	2	2
457:	2	3	3	2	4	3	3	3
465:	12	3	3	5	0	3	4	2
473:	4	2	2	6	4	1	3	1
481:	1	2	0	3	2	1	0	3
489:	4	1	2	1	2	2	2	1
497:	1	0	1	3	5	1	2	2
505:	3	2	1	0	1	2	1	3
513:	1	3	0	0	0	2	0	1
521:	0	0	3	0	1	0	1	0
529:	0	0	0	3	0	3	0	0
537:	1	3	1	0	0	1	1	0
545:	0	1	0	1	0	0	0	0
553:	0	0	0	1	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	1	0	0	0	0
625:	0	1	0	0	0	0	0	0
633:	0	0	0	0	0	1	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	1
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	1	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	1	0	0	0	0
793:	0	0	0	0	0	0	1	0

801: 0 1 0 0 0 0 0 0

Sample Title: 19

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	1	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	1
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

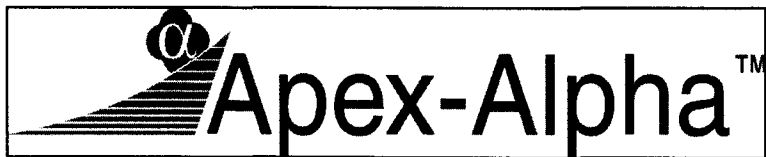


QA SUMMARY REPORT
Review Of QA Results - Pulser Check

Date : 4/23/2013
Time : 5:57:22 AM

CHAMBER	DEVICE	PARAMETER	FLAG	DATE
Alpha 001	21f	ALL	Not Done	
Alpha 002	21f	ALL	Not Done	
Alpha 003	21f	ALL	Passed	4/23/2013 5:09:55 AM
Alpha 004	21f	ALL	Passed	4/23/2013 5:09:56 AM
Alpha 005	21f	ALL	Not Done	
Alpha 006	21f	ALL	Not Done	
Alpha 007	21f	ALL	Not Done	
Alpha 008	21f	ALL	Not Done	
Alpha 009	21f	ALL	Not Done	
Alpha 010	21f	ALL	Passed	4/23/2013 5:09:57 AM
Alpha 011	21f	ALL	Passed	4/23/2013 5:09:58 AM
Alpha 012	21f	ALL	Not Done	
Alpha 013	21f	ALL	Passed	4/23/2013 5:09:59 AM
Alpha 014	21f	ALL	Passed	4/23/2013 5:09:59 AM
Alpha 015	21f	ALL	Not Done	
Alpha 016	21f	ALL	Not Done	
Alpha 017	AIM730	ALL	Not Done	
Alpha 018	AIM730	ALL	Passed	4/23/2013 5:10:00 AM
Alpha 019	AIM730	ALL	Not Done	
Alpha 020	AIM730	ALL	Not Done	
Alpha 021	AIM730	ALL	Not Done	
Alpha 022	AIM730	ALL	Passed	4/23/2013 5:10:01 AM
Alpha 023	AIM730	ALL	Not Done	
Alpha 024	AIM730	ALL	Passed	4/23/2013 5:10:02 AM
Alpha 025	AIM730	ALL	Passed	4/23/2013 5:10:03 AM
Alpha 026	AIM730	ALL	Not Done	
Alpha 027	AIM730	ALL	Passed	4/23/2013 5:10:04 AM
Alpha 028	AIM730	ALL	Not Done	
Alpha 029	AIM730	ALL	Passed	4/23/2013 5:10:04 AM
Alpha 030	AIM730	ALL	Not Done	
Alpha 031	AIM730	ALL	Not Done	
Alpha 032	AIM730	ALL	Not Done	
Alpha 033	Alpha Analyst100DC	ALL	Passed	4/23/2013 5:10:06 AM
Alpha 034	Alpha Analyst100DC	ALL	Passed	4/23/2013 5:10:07 AM
Alpha 035	Alpha Analyst100DC	ALL	Passed	4/23/2013 5:10:08 AM
Alpha 036	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:41:48 AM
Alpha 037	Alpha Analyst100DC	ALL	Passed	4/23/2013 5:10:10 AM
Alpha 038	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:41:52 AM
Alpha 039	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:41:54 AM
Alpha 040	Alpha Analyst100DC	ALL	Passed	4/23/2013 5:10:12 AM
Alpha 041	Alpha Analyst100DC	ALL	Passed	4/23/2013 5:10:14 AM
Alpha 042	Alpha Analyst100DC	ALL	Passed	4/23/2013 5:10:15 AM

US EPA ARCHIVE DOCUMENT



QA SUMMARY REPORT

Review Of QA Results - Pulser Check

Date : 4/24/2013
Time : 5:32:06 AM

CHAMBER	DEVICE	PARAMETER	FLAG	DATE
Alpha 001	21f	ALL	Not Done	
Alpha 002	21f	ALL	Not Done	
Alpha 003	21f	ALL	Passed	4/24/2013 5:07:46 AM
Alpha 004	21f	ALL	Passed	4/24/2013 5:07:47 AM
Alpha 005	21f	ALL	Not Done	
Alpha 006	21f	ALL	Not Done	
Alpha 007	21f	ALL	Not Done	
Alpha 008	21f	ALL	Not Done	
Alpha 009	21f	ALL	Not Done	
Alpha 010	21f	ALL	Passed	4/24/2013 5:07:48 AM
Alpha 011	21f	ALL	Passed	4/24/2013 5:07:48 AM
Alpha 012	21f	ALL	Not Done	
Alpha 013	21f	ALL	Passed	4/24/2013 5:07:49 AM
Alpha 014	21f	ALL	Passed	4/24/2013 5:07:50 AM
Alpha 015	21f	ALL	Not Done	
Alpha 016	21f	ALL	Not Done	
Alpha 017	AIM730	ALL	Not Done	
Alpha 018	AIM730	ALL	Passed	4/24/2013 5:07:51 AM
Alpha 019	AIM730	ALL	Not Done	
Alpha 020	AIM730	ALL	Not Done	
Alpha 021	AIM730	ALL	Not Done	
Alpha 022	AIM730	ALL	Passed	4/24/2013 5:07:52 AM
Alpha 023	AIM730	ALL	Not Done	
Alpha 024	AIM730	ALL	Passed	4/24/2013 5:07:53 AM
Alpha 025	AIM730	ALL	Passed	4/24/2013 5:07:54 AM
Alpha 026	AIM730	ALL	Not Done	
Alpha 027	AIM730	ALL	Passed	4/24/2013 5:07:54 AM
Alpha 028	AIM730	ALL	Not Done	
Alpha 029	AIM730	ALL	Passed	4/24/2013 5:07:55 AM
Alpha 030	AIM730	ALL	Not Done	
Alpha 031	AIM730	ALL	Not Done	
Alpha 032	AIM730	ALL	Not Done	
Alpha 033	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:07:56 AM
Alpha 034	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:07:58 AM
Alpha 035	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:08:00 AM
Alpha 036	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:41:48 AM
Alpha 037	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:08:02 AM
Alpha 038	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:41:52 AM
Alpha 039	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:41:54 AM
Alpha 040	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:08:04 AM
Alpha 041	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:08:06 AM
Alpha 042	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:08:09 AM

CHAMBER	DEVICE	PARAMETER	FLAG	DATE
Alpha 043	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:42:02 AM
Alpha 044	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:08:11 AM
Alpha 045	Alpha Analyst100DC	ALL	Not Done	
Alpha 046	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:08:14 AM
Alpha 047	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:08:17 AM
Alpha 048	Alpha Analyst100DC	ALL	Passed	4/24/2013 5:08:19 AM

APPROVED BY: _____ *e*

APPROVAL DATE: _____ *4/24/13*

US EPA ARCHIVE DOCUMENT

 ***** LIBRARY LISTING REPORT *****

Nuclide Library Title: Thorium

Nuclide Library Description: Th-227,-228,-229,-230,-232

Nuclide Name	Half-Life (Seconds)	Energy (keV)	Energy Uncert. (keV)	Yield (%)	Yield Uncert. (Abs.+)
TH-227	6.873E+008	5850.000*	0.000	97.5000	0.0000
TH-228	6.034E+007	5400.000*	0.000	99.9400	0.0000
TH-229	2.487E+011	4872.000*	0.000	99.5200	0.0000
TH-230	2.379E+012	4672.000*	0.000	99.8200	0.0000
TH-232	4.434E+017	3997.000*	0.000	100.0000	0.0000

* = key line

TOTALS: 5 Nuclides 5 Energy Lines

SECTION X
ANALYTICAL DATA (RADIUM-226)

Work Order	13-04052	Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
Analysis Code	Ra226	01	LCS	LCS		04/09/13 00:00	1.0000E+00
Run	1	02	MBL	BLANK		04/09/13 00:00	1.5000E+00
Date Received	4/9/2013	03	DUP	PZ-203-SS TOT	43	04/05/13 14:58	1.5000E+00
Lab Deadline	4/30/2013	04	TRG	S-61 TOT	47	04/05/13 11:18	1.5000E+00
Client	Engineering Management Support, Inc.	05	TRG	S-61 DIS	47	04/05/13 11:18	1.5000E+00
Project	West Lake OU-1	06	TRG	PZ-115-SS TOT	43	04/05/13 12:23	1.5000E+00
Report Level	4	07	TRG	PZ-115-SS DIS	43	04/05/13 12:23	1.5000E+00
Activity Units	pCi	08	TRG	MW-104 TOT	41	04/05/13 12:56	1.5000E+00
Aliquot Units	I	09	TRG	MW-104 DIS	41	04/05/13 12:56	1.5000E+00
Matrix	WA	10	TRG	PZ-100-SD TOT	39	04/05/13 14:03	1.5000E+00
Method	EPA 903.0 Modified	11	TRG	PZ-100-SD DIS	39	04/05/13 14:03	1.5000E+00
Instrument Type	Alpha Spectroscopy	12	TRG	I-67 TOT	39	04/05/13 14:09	1.5000E+00
Radiometric Tracer	Ba-133	13	TRG	I-67 DIS	39	04/05/13 14:09	1.5000E+00
Radiometric Sol#	Ba-6a	14	DO	PZ-203-SS TOT	43	04/05/13 14:58	1.5000E+00
Tracer Act (dpm/g)	1010.327	15	TRG	PZ-203-SS DIS	43	04/05/13 14:58	1.5000E+00
Carrier		16	TRG	PZ-100-SS TOT	36	04/05/13 14:58	1.5000E+00
Carrier Conc (mg/ml)		17	TRG	PZ-100-SS DIS	36	04/05/13 14:58	1.5000E+00
		18	TRG	I-66 TOT	35	04/05/13 14:59	1.5000E+00
		19	TRG	I-66 DIS	35	04/05/13 14:59	1.5000E+00

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

001101

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.9198	929.3	420.1	100.36		0.0228	0.0287	0.0059		100.36	2.12	1.00
02	MBL	0.9111	920.5	405.9	97.89		0.0226	0.0281	0.0055		97.89	1.95	1.00
03	DUP	0.9116	921.0	414.1	99.81		0.0228	0.0286	0.0058		99.81	2.08	1.00
04	TRG	0.9107	920.1	400.7	96.68		0.0226	0.0287	0.0061		96.68	2.20	1.00
05	TRG	0.9076	917.0	375.7	90.96		0.0227	0.0288	0.0061		90.96	2.20	1.00
06	TRG	0.9108	920.2	397.4	95.87		0.0227	0.0298	0.0071		95.87	2.53	1.00
07	TRG	0.9085	917.9	417.8	101.05		0.0226	0.0296	0.0070		101.05	2.50	1.00
08	TRG	0.9074	916.8	361.1	87.44		0.0224	0.0300	0.0076		87.44	2.66	1.00
09	TRG	0.9056	915.0	394.8	95.79		0.0229	0.0299	0.0070		95.79	2.50	1.00
10	TRG	0.9050	914.3	393.5	95.54		0.0226	0.0296	0.0070		95.54	2.50	1.00
11	TRG	0.9057	915.1	427.3	103.67		0.0227	0.0296	0.0069		103.67	2.47	1.00
12	TRG	0.9069	916.3	390.1	94.52		0.0226	0.0299	0.0073		94.52	2.58	1.00
13	TRG	0.9059	915.3	407.4	98.82		0.0228	0.0301	0.0073		98.82	2.58	1.00
14	DO	0.9048	914.1	358.0	86.94		0.0226	0.0293	0.0067		86.94	2.40	1.00
15	TRG	0.8935	902.7	398.8	98.07		0.0228	0.0293	0.0065		98.07	2.34	1.00
16	TRG	0.9040	913.3	367.9	89.42		0.0226	0.0293	0.0067		89.42	2.40	1.00
17	TRG	0.9034	912.7	422.6	102.79		0.0230	0.0296	0.0066		102.79	2.37	1.00
18	TRG	0.9050	914.3	341.6	82.94		0.0229	0.0293	0.0064		82.94	2.31	1.00
19	TRG	0.9080	917.4	365.4	88.42		0.0228	0.0295	0.0067		88.42	2.40	1.00


* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
02	MBL			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
03	DUP			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
04	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
05	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
06	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
07	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
08	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
09	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
10	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
11	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
12	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
13	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
14	DO			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
15	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
16	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
17	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
18	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		
19	TRG			04/18/13 08:06	JBARNARD	04/19/13 09:40	TSMITH		

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

0317

Preliminary Data Report & Analytical Calculations
Work Order: 13-04052-Ra226-1

	
Run	1
Analysis Code	Ra226
Eberline Services Work Order	13-04052
Client	Engineering Management Support, Inc.

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	RA-226	LCS	LCS	pCi/l	9.98E+00	1.25E+00	2.20E-01	1.04E+01	96.40	OK		OK	
02	RA-226	MBL	BLANK	pCi/l	-2.84E-02	4.78E-02	1.69E-01					OK	OK
03	RA-226	DUP	PZ-203-SS TOT	pCi/l	6.53E-01	2.37E-01	1.40E-01				NA	OK	
04	RA-226	TRG	S-61 TOT	pCi/l	1.93E+00	4.27E-01	1.76E-01					OK	
05	RA-226	TRG	S-61 DIS	pCi/l	3.73E-01	1.84E-01	1.38E-01					OK	
06	RA-226	TRG	PZ-115-SS TOT	pCi/l	7.70E+00	9.10E-01	1.34E-01					OK	
07	RA-226	TRG	PZ-115-SS DIS	pCi/l	7.35E+00	8.57E-01	1.14E-01					OK	
08	RA-226	TRG	MW-104 TOT	pCi/l	3.68E-01	2.09E-01	1.54E-01					OK	
09	RA-226	TRG	MW-104 DIS	pCi/l	2.45E-01	1.61E-01	1.36E-01					OK	
10	RA-226	TRG	PZ-100-SD TOT	pCi/l	2.40E+00	4.82E-01	1.16E-01					OK	
11	RA-226	TRG	PZ-100-SD DIS	pCi/l	2.41E+00	4.63E-01	1.67E-01					OK	
12	RA-226	TRG	I-67 TOT	pCi/l	6.87E-01	2.68E-01	1.47E-01					OK	
13	RA-226	TRG	I-67 DIS	pCi/l	4.57E-01	2.08E-01	1.01E-01					OK	
14	RA-226	DO	PZ-203-SS TOT	pCi/l	1.22E+00	3.61E-01	1.14E-01					OK	
15	RA-226	TRG	PZ-203-SS DIS	pCi/l	1.44E+00	3.64E-01	1.31E-01					OK	
16	RA-226	TRG	PZ-100-SS TOT	pCi/l	4.60E+00	7.24E-01	1.18E-01					OK	
17	RA-226	TRG	PZ-100-SS DIS	pCi/l	3.80E+00	5.94E-01	1.20E-01					OK	
18	RA-226	TRG	I-66 TOT	pCi/l	2.30E-01	1.57E-01	1.27E-01					OK	
19	RA-226	TRG	I-66 DIS	pCi/l	1.97E-01	1.47E-01	1.38E-01					OK	

Preliminary Data Report & Analytical Calculations
Work Order: 13-04052-Ra226-1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	RA-226	LCS	04/09/13 00:00	1.00E+00	100.00	0.00	100.36		4/19/2013 9:40	
02	RA-226	MBL	04/09/13 00:00	1.50E+00	97.89	0.00	97.89		4/19/2013 9:40	
03	RA-226	DUP	04/05/13 14:58	1.50E+00	99.81	0.00	99.81		4/19/2013 9:40	
04	RA-226	TRG	04/05/13 11:18	1.50E+00	96.68	0.00	96.68		4/19/2013 9:40	
05	RA-226	TRG	04/05/13 11:18	1.50E+00	90.96	0.00	90.96		4/19/2013 9:40	
06	RA-226	TRG	04/05/13 12:23	1.50E+00	95.87	0.00	95.87		4/19/2013 9:40	
07	RA-226	TRG	04/05/13 12:23	1.50E+00	100.00	0.00	101.05		4/19/2013 9:40	
08	RA-226	TRG	04/05/13 12:56	1.50E+00	87.44	0.00	87.44		4/19/2013 9:40	
09	RA-226	TRG	04/05/13 12:56	1.50E+00	95.79	0.00	95.79		4/19/2013 9:40	
10	RA-226	TRG	04/05/13 14:03	1.50E+00	95.54	0.00	95.54		4/19/2013 9:40	
11	RA-226	TRG	04/05/13 14:03	1.50E+00	100.00	0.00	103.67		4/19/2013 9:40	
12	RA-226	TRG	04/05/13 14:09	1.50E+00	94.52	0.00	94.52		4/19/2013 9:40	
13	RA-226	TRG	04/05/13 14:09	1.50E+00	98.82	0.00	98.82		4/19/2013 9:40	
14	RA-226	DO	04/05/13 14:58	1.50E+00	86.94	0.00	86.94		4/19/2013 9:40	
15	RA-226	TRG	04/05/13 14:58	1.50E+00	98.07	0.00	98.07		4/19/2013 9:40	
16	RA-226	TRG	04/05/13 14:58	1.50E+00	89.42	0.00	89.42		4/19/2013 9:40	
17	RA-226	TRG	04/05/13 14:58	1.50E+00	100.00	0.00	102.79		4/19/2013 9:40	
18	RA-226	TRG	04/05/13 14:59	1.50E+00	82.94	0.00	82.94		4/19/2013 9:40	
19	RA-226	TRG	04/05/13 14:59	1.50E+00	88.42	0.00	88.42		4/19/2013 9:40	

Run	1
Analysis Code	Ra226
Eberline Services Work Order	13-04052
Client	Engineering Management Support, Inc.

Preliminary Data Report & Analytical Calculations
Work Order: 13-04052-Ra226-1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Half-life (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	RA-226	LCS	04/22/13 12:20		A_Spec	Alpha_022	170	2.72 E+02	5.00 E-03	15.3
02	RA-226	MBL	04/22/13 12:20		A_Spec	Alpha_024	170	-1.38 E+00	1.40 E-02	17.1
03	RA-226	DUP	04/22/13 12:20		A_Spec	Alpha_025	170	3.08 E+01	7.00 E-03	17.4
04	RA-226	TRG	04/22/13 12:20		A_Spec	Alpha_027	170	8.31 E+01	1.10 E-02	17.3
05	RA-226	TRG	04/22/13 12:20		A_Spec	Alpha_029	170.02	1.70 E+01	6.00 E-03	19.5
06	RA-226	TRG	04/22/13 12:20		A_Spec	Alpha_033	170	3.01 E+02	3.00 E-03	18.2
07	RA-226	TRG	04/22/13 12:20		A_Spec	Alpha_034	170	3.09 E+02	2.00 E-03	18.6
08	RA-226	TRG	04/22/13 12:20		A_Spec	Alpha_035	170	1.25 E+01	3.00 E-03	18.3
09	RA-226	TRG	04/22/13 12:20		A_Spec	Alpha_037	170	9.49 E+00	3.00 E-03	17.8
10	RA-226	TRG	04/22/13 12:45		A_Spec	Alpha_040	170	9.87 E+01	2.00 E-03	19
11	RA-226	TRG	04/22/13 12:45		A_Spec	Alpha_041	170	1.09 E+02	1.10 E-02	19.8
12	RA-226	TRG	04/22/13 12:45		A_Spec	Alpha_042	170	2.63 E+01	4.00 E-03	18.5
13	RA-226	TRG	04/22/13 12:45		A_Spec	Alpha_044	170	1.88 E+01	1.00 E-03	19
14	RA-226	DO	04/22/13 12:45		A_Spec	Alpha_046	170	4.48 E+01	1.00 E-03	17.9
15	RA-226	TRG	04/22/13 12:45		A_Spec	Alpha_047	170	6.23 E+01	4.00 E-03	18.2
16	RA-226	TRG	04/22/13 12:45		A_Spec	Alpha_048	170	1.63 E+02	1.00 E-03	16.8
17	RA-226	TRG	04/22/13 16:36		A_Spec	Alpha_033	170	1.65 E+02	3.00 E-03	18.2
18	RA-226	TRG	04/22/13 16:36		A_Spec	Alpha_034	170	8.66 E+00	2.00 E-03	18.6
19	RA-226	TRG	04/22/13 16:36		A_Spec	Alpha_035	170	7.49 E+00	3.00 E-03	18.3

	
Run	1
Analysis Code	Ra226
Eberline Services Work Order	13-04052
Client	Engineering Management Support, Inc.

0250

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	04/09/13 00:00	1.0000	0.9198	929.2988	420.1000	100.36	2.12	1.00
02	MBL	BLANK	04/09/13 00:00	1.5000	0.9111	920.5089	405.9000	97.89	1.95	1.00
03	DUP	PZ-203-SS TOT	04/05/13 14:58	1.5000	0.9116	921.0141	414.1000	99.81	2.08	1.00
04	TRG	S-61 TOT	04/05/13 11:18	1.5000	0.9107	920.1048	400.7000	96.68	2.20	1.00
05	TRG	S-61 DIS	04/05/13 11:18	1.5000	0.9076	916.9728	375.7000	90.96	2.20	1.00
06	TRG	PZ-115-SS TOT	04/05/13 12:23	1.5000	0.9108	920.2058	397.4000	95.87	2.53	1.00
07	TRG	PZ-115-SS DIS	04/05/13 12:23	1.5000	0.9085	917.8821	417.8000	101.05	2.50	1.00
08	TRG	MW-104 TOT	04/05/13 12:56	1.5000	0.9074	916.7707	361.1000	87.44	2.66	1.00
09	TRG	MW-104 DIS	04/05/13 12:56	1.5000	0.9056	914.9521	394.8000	95.79	2.50	1.00
10	TRG	PZ-100-SD TOT	04/05/13 14:03	1.5000	0.9050	914.3459	393.5000	95.54	2.50	1.00
11	TRG	PZ-100-SD DIS	04/05/13 14:03	1.5000	0.9057	915.0532	427.3000	103.67	2.47	1.00
12	TRG	I-67 TOT	04/05/13 14:09	1.5000	0.9069	916.2656	390.1000	94.52	2.58	1.00
13	TRG	I-67 DIS	04/05/13 14:09	1.5000	0.9059	915.2552	407.4000	98.82	2.58	1.00
14	DO	PZ-203-SS TOT	04/05/13 14:58	1.5000	0.9048	914.1439	358.0000	86.94	2.40	1.00
15	TRG	PZ-203-SS DIS	04/05/13 14:58	1.5000	0.8935	902.7272	398.8000	98.07	2.34	1.00
16	TRG	PZ-100-SS TOT	04/05/13 14:58	1.5000	0.9040	913.3356	367.9000	89.42	2.40	1.00
17	TRG	PZ-100-SS DIS	04/05/13 14:58	1.5000	0.9034	912.7294	422.6000	102.79	2.37	1.00
18	TRG	I-66 TOT	04/05/13 14:59	1.5000	0.9050	914.3459	341.6000	82.94	2.31	1.00
19	TRG	I-66 DIS	04/05/13 14:59	1.5000	0.9080	917.3769	365.4000	88.42	2.40	1.00

22-29

33-32

33-33

0321

Spike and Tracer Worksheet

Internal Work Order					Run	Analysis Code			Date	Technician			Technician Initials		Witness Initials	
13-04052					1	Ra226			4/18/2013 8:04	JBARNARD						
LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/g	Solution Date	Approx Addition	Volume Used (g)	Volume Used (g)	Volume Used (g)	Volume Used (g)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Ra-226	Ra-5b	44.072	4/18/2013	0.500	0.5216				10.35	0.476	0.00	0.000	0.00	0.000	0.00	0.000

Tracers							Balance Printer Tapes														
fraction	Isotope	Sol #	Activity dpm/g	Solution Date	Volume Used (g)	Approx Addition	Tracer					LCS									
01	Ba-133	Ba-6a	1010.327	4/18/2013	0.9198	1.0000															
02	Ba-133	Ba-6a	1010.327	4/18/2013	0.9111	1.0000															
03	Ba-133	Ba-6a	1010.327	4/18/2013	0.9116	1.0000															
04	Ba-133	Ba-6a	1010.327	4/18/2013	0.9107	1.0000															
05	Ba-133	Ba-6a	1010.327	4/18/2013	0.9076	1.0000															
06	Ba-133	Ba-6a	1010.327	4/18/2013	0.9108	1.0000															
07	Ba-133	Ba-6a	1010.327	4/18/2013	0.9085	1.0000															
08	Ba-133	Ba-6a	1010.327	4/18/2013	0.9074	1.0000															
09	Ba-133	Ba-6a	1010.327	4/18/2013	0.9056	1.0000															
10	Ba-133	Ba-6a	1010.327	4/18/2013	0.9050	1.0000															
11	Ba-133	Ba-6a	1010.327	4/18/2013	0.9057	1.0000															
12	Ba-133	Ba-6a	1010.327	4/18/2013	0.9069	1.0000															
13	Ba-133	Ba-6a	1010.327	4/18/2013	0.9059	1.0000															
14	Ba-133	Ba-6a	1010.327	4/18/2013	0.9048	1.0000															
15	Ba-133	Ba-6a	1010.327	4/18/2013	0.8935	1.0000															
16	Ba-133	Ba-6a	1010.327	4/18/2013	0.9040	1.0000															
17	Ba-133	Ba-6a	1010.327	4/18/2013	0.9034	1.0000															
18	Ba-133	Ba-6a	1010.327	4/18/2013	0.9050	1.0000															
19	Ba-133	Ba-6a	1010.327	4/18/2013	0.9080	1.0000															

0.9198 g
0.9111 g
-0.9116 g
-0.9107 g
-0.9076 g
-0.9108 g
-0.9085 g
-0.9074 g
-0.9056 g
-0.9050 g
-0.9057 g
-0.9069 g
-0.9059 g
-0.9048 g
-0.8935 g
-0.9040 g
-0.9034 g
-0.9050 g
-0.9080 g

0.5216 g
0.5150 g

Matrix Spike

0322


Aliquot Worksheet

Work Order	Run	Analysis Code	Rpt Units	Lab Deadline	Technician
13-04052	1	Ra226	liters	4/30/2013	JBARNARD

Lab Fraction	Engineering Management Support, Inc. Client ID	Sample Type	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
			Ratio Post/Pre	No of Dils	Dil Factor	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.5000E+00	1.5000E+00				
03	PZ-203-SS TOT	DUP					1.5000E+00	1.5000E+00				
04	S-61 TOT	TRG					1.5000E+00	1.5000E+00				
05	S-61 DIS	TRG					1.5000E+00	1.5000E+00				
06	PZ-115-SS TOT	TRG					1.5000E+00	1.5000E+00				
07	PZ-115-SS DIS	TRG					1.5000E+00	1.5000E+00				
08	MW-104 TOT	TRG					1.5000E+00	1.5000E+00				
09	MW-104 DIS	TRG					1.5000E+00	1.5000E+00				
10	PZ-100-SD TOT	TRG					1.5000E+00	1.5000E+00				
11	PZ-100-SD DIS	TRG					1.5000E+00	1.5000E+00				
12	I-67 TOT	TRG					1.5000E+00	1.5000E+00				
13	I-67 DIS	TRG					1.5000E+00	1.5000E+00				
14	PZ-203-SS TOT	DO					1.5000E+00	1.5000E+00				
15	PZ-203-SS DIS	TRG					1.5000E+00	1.5000E+00				
16	PZ-100-SS TOT	TRG					1.5000E+00	1.5000E+00				
17	PZ-100-SS DIS	TRG					1.5000E+00	1.5000E+00				
18	I-66 TOT	TRG					1.5000E+00	1.5000E+00				
19	I-66 DIS	TRG					1.5000E+00	1.5000E+00				

Comments

Technician: _____

 Date: 4.18.13

5225

Gravimetric Worksheet

Work Order	Run	Analysis Code	Gravimetric Carrier	Carrier Conc (mg/ml)	Technician
13-04052	1	Ra226			TSMITH

TRetec Fraction	Engineering Management Support, Inc. Client ID	Sample Type	Carrier Data	Filter Data			Gravimetric %
			Carrier Added (ml)	Filter Tare (g)	Filter Final (g)	Filter Net (g)	Recovery
01	LCS	LCS		0.0228	0.0287	0.0059	
02	BLANK	MBL		0.0226	0.0281	0.0055	
03	DUP	DUP		0.0228	0.0286	0.0058	
04	S-61 TOT	TRG		0.0226	0.0287	0.0061	
05	S-61 DIS	TRG		0.0227	0.0288	0.0061	
06	PZ-115-SS TOT	TRG		0.0227	0.0298	0.0071	
07	PZ-115-SS DIS	TRG		0.0226	0.0296	0.0070	
08	MW-104 TOT	TRG		0.0224	0.0300	0.0076	
09	MW-104 DIS	TRG		0.0229	0.0299	0.0070	
10	PZ-100-SD TOT	TRG		0.0226	0.0296	0.0070	
11	PZ-100-SD DIS	TRG		0.0227	0.0296	0.0069	
12	I-67 TOT	TRG		0.0226	0.0299	0.0073	
13	I-67 DIS	TRG		0.0228	0.0301	0.0073	
14	PZ-203-SS TOT	DO		0.0226	0.0293	0.0067	
15	PZ-203-SS DIS	TRG		0.0228	0.0293	0.0065	
16	PZ-100-SS TOT	TRG		0.0226	0.0293	0.0067	
17	PZ-100-SS DIS	TRG		0.0230	0.0296	0.0066	
18	I-66 TOT	TRG		0.0229	0.0293	0.0064	
19	I-66 DIS	TRG		0.0228	0.0295	0.0067	

Technician: OW Lt Date: 4, 19, 13

0324



Sample Description: SPIKE
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 01
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_022
 Chamber Serial Number:
 Detector Serial Number: 22
 Env. Background: System Bkgd 55198
 Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.120E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/22/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:20:08 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 1.0000 +/- 0.0000
 Counting Efficiency: 0.1531 +/- 0.0029 on 12/15/2012 1:57:26 PM
 Effective Efficiency: 0.1531 +/- 0.0029

Control Certificate Name: Ra226_Ra-5b
 Chem. Recov. of Control: RA-226 0.454709 +/- 0.031994
 Peak Match Tolerance: 0.350 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.532	538.13	8.47	1.87	0.00E+000	5.3
RA-226	4.705	272.15	11.90	0.85	0.00E+000	5.6

 NUCLIDE ANALYSIS RESULTS

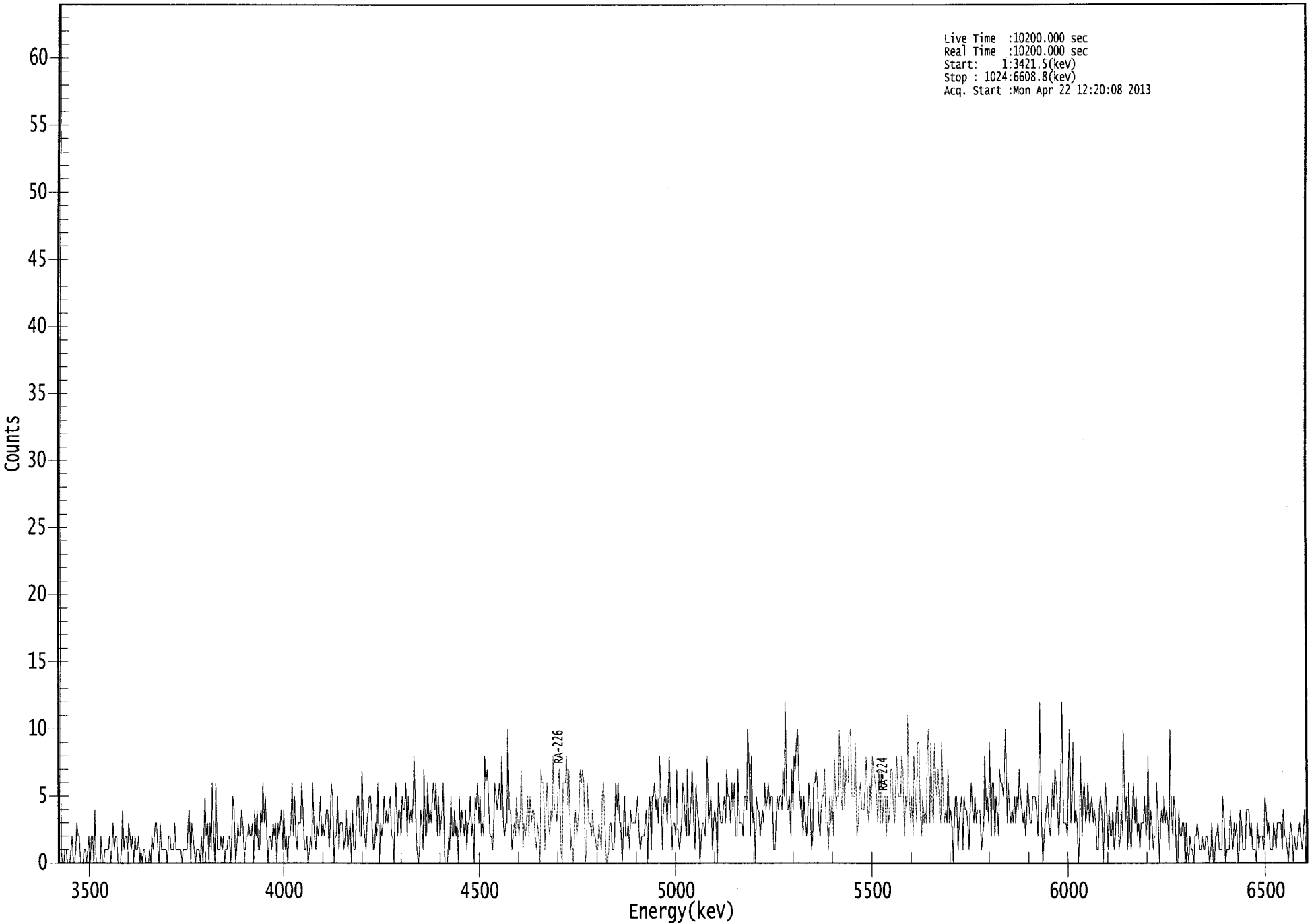
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.970	5685.50*	2.12E+001 +/- 6.10E+002	2.98E-001 +/- 8.58E+000
RA-226	0.992	4785.00*	9.98E+000 +/- 1.25E+000	2.20E-001 +/- 8.20E-003

AG
 4/23/13

US EPA ARCHIVE DOCUMENT

000056179.CNF

Live Time :10200.000 sec
Real Time :10200.000 sec
Start: 1:3421.5(kev)
Stop : 1024:6608.8(kev)
Acq. Start :Mon Apr 22 12:20:08 2013



0326
ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 01

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	10200	10200	1	0	0	1	1	0
9:	0	0	1	2	0	0	1	3
17:	2	2	0	0	0	1	1	0
25:	1	2	0	2	2	0	4	0
33:	0	0	0	2	0	0	1	1
41:	1	1	2	0	1	3	1	2
49:	2	0	0	0	1	4	1	2
57:	2	1	3	2	1	2	0	2
65:	1	1	2	0	1	0	1	1
73:	0	0	0	1	0	2	1	2
81:	3	3	1	0	3	1	1	1
89:	1	1	0	2	2	1	1	1
97:	3	1	1	1	1	1	0	1
105:	1	1	1	3	4	0	3	2
113:	1	0	1	1	1	0	2	0
121:	2	5	2	3	0	3	1	6
129:	2	0	6	1	1	1	2	1
137:	2	0	1	1	2	2	0	2
145:	5	4	0	1	3	2	2	4
153:	3	1	1	2	2	3	2	2
161:	3	0	4	2	4	1	1	4
169:	3	6	3	5	2	0	2	2
177:	1	3	2	3	0	3	2	3
185:	4	1	4	1	2	0	2	2
193:	3	6	2	5	2	1	3	3
201:	3	6	4	1	1	2	0	1
209:	2	1	6	2	1	3	2	3
217:	5	2	3	2	3	4	4	1
225:	3	6	5	0	2	2	5	1
233:	3	3	3	1	2	4	1	2
241:	3	0	4	1	1	3	5	5
249:	2	2	7	3	2	1	3	4
257:	5	5	3	1	1	3	2	6
265:	0	3	2	3	5	3	4	3
273:	4	5	2	2	0	4	6	2
281:	4	4	2	5	4	4	6	2
289:	5	3	4	3	5	8	3	1
297:	0	1	4	3	1	7	2	2
305:	6	3	4	3	5	6	4	6
313:	2	5	2	3	4	6	0	0
321:	0	2	1	5	2	2	4	2
329:	3	0	5	2	4	3	2	4
337:	1	3	3	5	2	3	0	5
345:	4	6	3	5	2	3	2	8
353:	6	7	4	2	2	1	3	6
361:	5	4	5	6	4	8	3	2

369: 3 3 10 4 4 1 2 3

Sample Title: 01

Channel	1	2	3	4	5	6	7	8	9	10
377:	2	5	3	2	4	7	1	3		
385:	2	3	5	2	5	3	4	4		
393:	2	1	3	2	0	7	6	6		
401:	1	4	6	3	2	4	3	8		
409:	4	4	3	6	7	1	0	6		
417:	6	6	8	4	7	1	2	0		
425:	2	4	2	3	4	7	6	7		
433:	6	0	1	6	3	3	2	4		
441:	2	2	1	1	3	2	1	5		
449:	6	3	0	0	1	3	3	1		
457:	1	2	6	4	6	3	3	0		
465:	2	5	2	2	3	1	4	3		
473:	3	3	3	4	5	2	1	2		
481:	2	2	3	4	0	4	5	1		
489:	5	5	6	4	5	3	8	6		
497:	1	4	5	5	3	5	8	4		
505:	1	3	3	2	7	2	1	2		
513:	3	6	5	3	2	7	2	3		
521:	5	7	3	1	6	4	3	0		
529:	2	3	3	2	4	8	3	4		
537:	5	1	3	4	3	0	6	4		
545:	3	3	4	5	3	7	5	5		
553:	3	6	4	6	2	2	7	3		
561:	3	3	2	5	5	4	10	8		
569:	2	8	3	4	0	5	4	4		
577:	2	3	4	3	6	4	5	6		
585:	4	5	5	1	1	3	5	4		
593:	5	5	4	7	5	12	4	4		
601:	5	2	7	4	8	7	9	10		
609:	6	4	5	2	5	3	2	4		
617:	6	4	1	2	6	6	7	6		
625:	3	2	4	5	5	7	3	3		
633:	1	5	3	5	2	8	4	5		
641:	5	10	5	4	8	4	7	6		
649:	6	10	10	5	5	5	9	2		
657:	3	5	6	4	4	4	6	8		
665:	4	3	6	4	8	7	6	5		
673:	3	7	3	7	3	5	5	2		
681:	5	3	4	7	7	4	3	6		
689:	8	5	5	5	8	7	2	5		
697:	4	11	5	3	5	2	8	5		
705:	3	9	9	4	2	5	3	4		
713:	3	8	10	3	9	4	3	9		
721:	6	5	7	4	3	9	5	3		
729:	4	3	7	3	4	3	0	3		
737:	5	5	1	3	4	5	1	5		
745:	4	4	3	1	4	6	4	3		
753:	5	3	4	4	4	1	2	3		
761:	8	4	5	3	9	2	6	6		
769:	2	5	4	2	7	6	6	5		
777:	7	10	3	6	4	3	4	3		
785:	5	3	5	4	7	5	4	3		
793:	4	2	4	6	4	3	3	5		

801: 5 5 4 2 6 12 3 0

Sample Title: 01

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	2	3	4	5	3	2	4	6
817:	4	7	6	4	2	4	7	12
825:	3	3	3	2	6	10	3	5
833:	9	3	4	3	0	2	8	2
841:	5	6	3	4	6	3	4	5
849:	3	4	3	1	1	4	5	4
857:	0	3	6	4	1	4	2	2
865:	4	1	2	4	5	1	2	4
873:	2	10	3	5	1	6	2	1
881:	4	6	3	5	2	3	1	3
889:	3	3	5	2	3	8	1	4
897:	3	1	2	2	6	3	0	3
905:	4	3	5	3	4	3	1	10
913:	4	2	5	4	0	0	4	2
921:	2	3	3	0	3	1	0	2
929:	1	1	0	2	2	3	2	1
937:	1	2	1	1	2	2	1	0
945:	1	3	0	0	2	2	3	1
953:	1	1	5	3	0	1	1	1
961:	4	2	1	3	2	3	0	1
969:	4	3	1	1	1	4	4	4
977:	2	3	1	1	1	0	3	1
985:	2	2	2	1	5	4	2	3
993:	1	1	1	3	2	1	3	3
1001:	3	3	1	4	2	2	1	0
1009:	2	3	2	0	2	1	1	2
1017:	3	2	1	2	4	0	3	0



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4/27/13

Sample Description: BLANK
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 02
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_024
 Chamber Serial Number:
 Detector Serial Number: 24
 Env. Background: System Bkgd 55199
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 1.950E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/22/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:20:09 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9789 +/- 0.0000
 Counting Efficiency: 0.1710 +/- 0.0032 on 12/15/2012 2:02:15 PM
 Effective Efficiency: 0.1674 +/- 0.0031

Peak Match Tolerance: 0.350 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.630	-0.57	653.05	3.57	0.00E+000	3.1
RA-226	4.620	-1.38	168.33	2.38	0.00E+000	3.1

 NUCLIDE ANALYSIS RESULTS

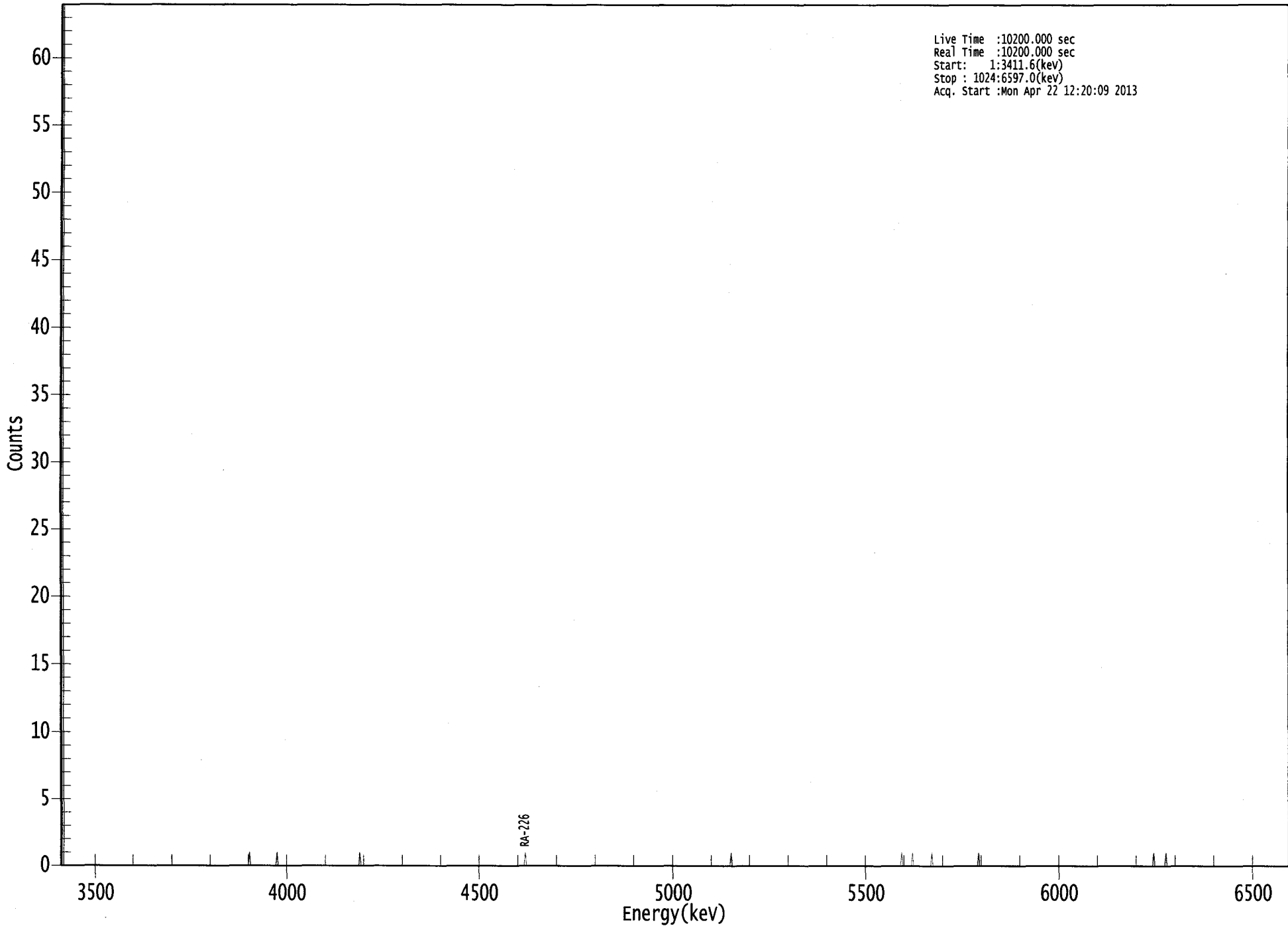
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.996	5685.50*	-1.26E-002 +/- 3.71E-001	2.08E-001 +/- 5.99E+000
RA-226	0.965	4785.00*	-2.84E-002 +/- 4.78E-002	1.69E-001 +/- 6.18E-003

AG
4/23/13

US EPA ARCHIVE DOCUMENT

0000056130.CNF

Live Time :10200.000 sec
Real Time :10200.000 sec
Start: 1:3411.6(kev)
Stop : 1024:6597.0(kev)
Acq. Start :Mon Apr 22 12:20:09 2013



ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 02

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	10200	10200	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	1	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	1	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	1	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 0 0 0 0 0

Sample Title: 02

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	1	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	0	0	0
417:	0	0	0	0	0	0	0	0
425:	0	0	0	0	0	0	0	0
433:	0	0	0	0	0	0	0	0
441:	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0
457:	0	0	0	0	0	0	0	0
465:	0	0	0	0	0	0	0	0
473:	0	0	0	0	0	0	0	0
481:	0	0	0	0	0	0	0	0
489:	0	0	0	0	0	0	0	0
497:	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	0	0	0	0	0	0
529:	0	0	0	0	0	0	0	0
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	1
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	1	0	0
705:	0	0	0	0	0	0	1	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	1	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	1	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 02

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	1	0
913:	0	0	0	0	0	0	0	0
921:	1	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



Sample Description: PZ-203-SS TOT DUP
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 03
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_025
 Chamber Serial Number:
 Detector Serial Number: 25
 Env. Background: System Bkgd 55200
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.080E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:20:10 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9981 +/- 0.0000
 Counting Efficiency: 0.1736 +/- 0.0032 on 12/15/2012 1:57:27 PM
 Effective Efficiency: 0.1732 +/- 0.0032

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.498	10.47	65.55	1.53	0.00E+000	3.1
RA-226	4.468	30.81	36.10	1.19	0.00E+000	3.1

 ----- NUCLIDE ANALYSIS RESULTS -----

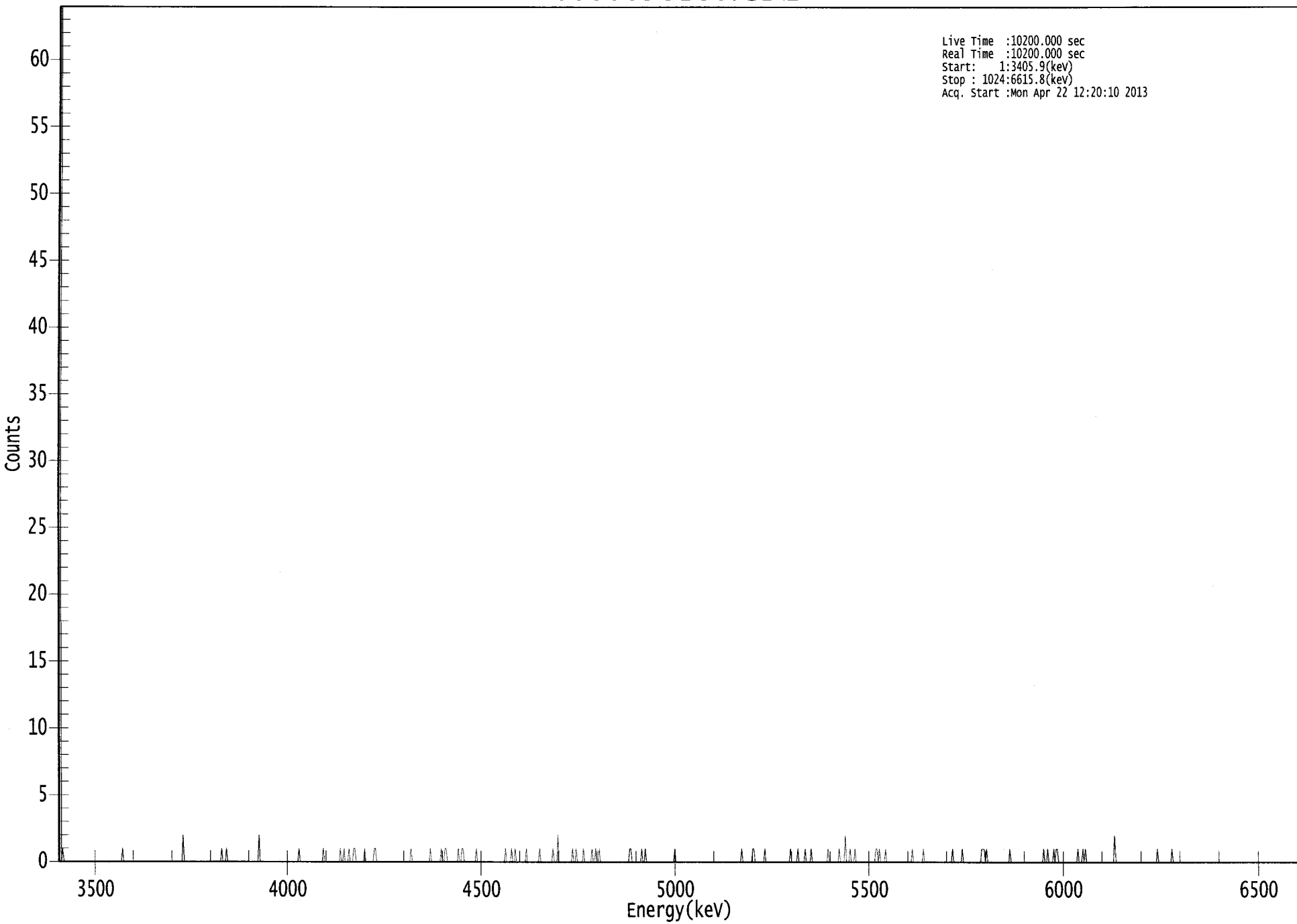
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.952	5685.50*	4.21E-001 +/- 3.40E+002	2.86E-001 +/- 2.30E+002
RA-226	0.877	4785.00*	6.53E-001 +/- 2.37E-001	1.40E-001 +/- 5.11E-003

AG
 4/23/13

US EPA ARCHIVE DOCUMENT

000056180.CNF

Live Time :10200.000 sec
Real Time :10200.000 sec
Start: 1:3405.9(kev)
Stop : 1024:6615.8(kev)
Acq. Start :Mon Apr 22 12:20:10 2013



ROI Type: 1

5556
9556

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 03

Elapsed Live time: 10200
 Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	10200	10200	0	1	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	1	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	2
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	1
137:	0	0	0	1	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	2	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	1
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	1	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	1	0	0	1	0	0	0
241:	1	0	0	0	1	1	0	0
249:	0	0	0	0	0	1	0	0
257:	0	0	0	0	0	1	1	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	1	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	1	0	0	0	0
313:	0	0	0	0	1	0	0	1
321:	1	0	0	0	0	0	0	0
329:	0	0	1	0	0	1	1	0
337:	0	0	0	0	0	0	0	0
345:	0	1	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 1 0 0 0 0 1 0

Sample Title: 03

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	1	0	0	0	0	0	0
385:	0	0	1	0	0	0	0	0
393:	0	0	0	0	0	1	0	0
401:	0	0	0	0	0	0	0	0
409:	1	0	0	0	2	0	0	0
417:	0	0	0	0	0	0	0	0
425:	1	0	0	1	0	0	0	0
433:	0	1	0	0	0	0	0	0
441:	1	0	0	1	0	0	1	0
449:	0	0	0	0	0	0	0	0
457:	0	0	0	0	0	0	0	0
465:	0	0	0	0	0	0	0	1
473:	1	0	0	0	0	0	0	0
481:	0	1	0	0	1	0	0	0
489:	0	0	0	0	0	0	0	0
497:	0	0	0	0	0	0	0	0
505:	0	0	0	0	1	0	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	0	0	0	0	0	0
529:	0	0	0	0	0	0	0	0
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	1	0	0	0	0
569:	0	0	0	0	1	1	0	0
577:	0	0	0	0	0	0	1	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	1	0	0	0	0
609:	0	1	0	0	0	0	0	1
617:	0	0	0	0	1	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	1	0	0	0	0	0
641:	0	0	0	1	0	0	0	0
649:	2	0	0	0	1	0	0	0
657:	1	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	1	1	0	1	0	0	0
681:	0	1	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	1
705:	0	0	0	0	0	0	0	0
713:	1	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	1	0	0	0	0	0	0	0
745:	1	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	1	1	1	0	1	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	1
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0 0

Sample Title: 03

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	1	0	0	1	0
817:	0	0	0	1	0	1	1	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	1
841:	0	0	0	1	0	1	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	2	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	1	0	0	0	0	0	0	0
913:	0	0	0	0	1	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



C
4/22/13

Sample Description: S-61 TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 04
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_027
 Chamber Serial Number:
 Detector Serial Number: 27
 Env. Background: System Bkgd 55201
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.200E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:20:11 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9668 +/- 0.0000
 Counting Efficiency: 0.1728 +/- 0.0032 on 12/15/2012 2:27:41 PM
 Effective Efficiency: 0.1670 +/- 0.0031

Peak Match Tolerance: 0.350 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.506	35.81	33.38	1.19	0.00E+000	4.8
RA-226	4.600	83.13	21.78	1.87	0.00E+000	3.7

 NUCLIDE ANALYSIS RESULTS

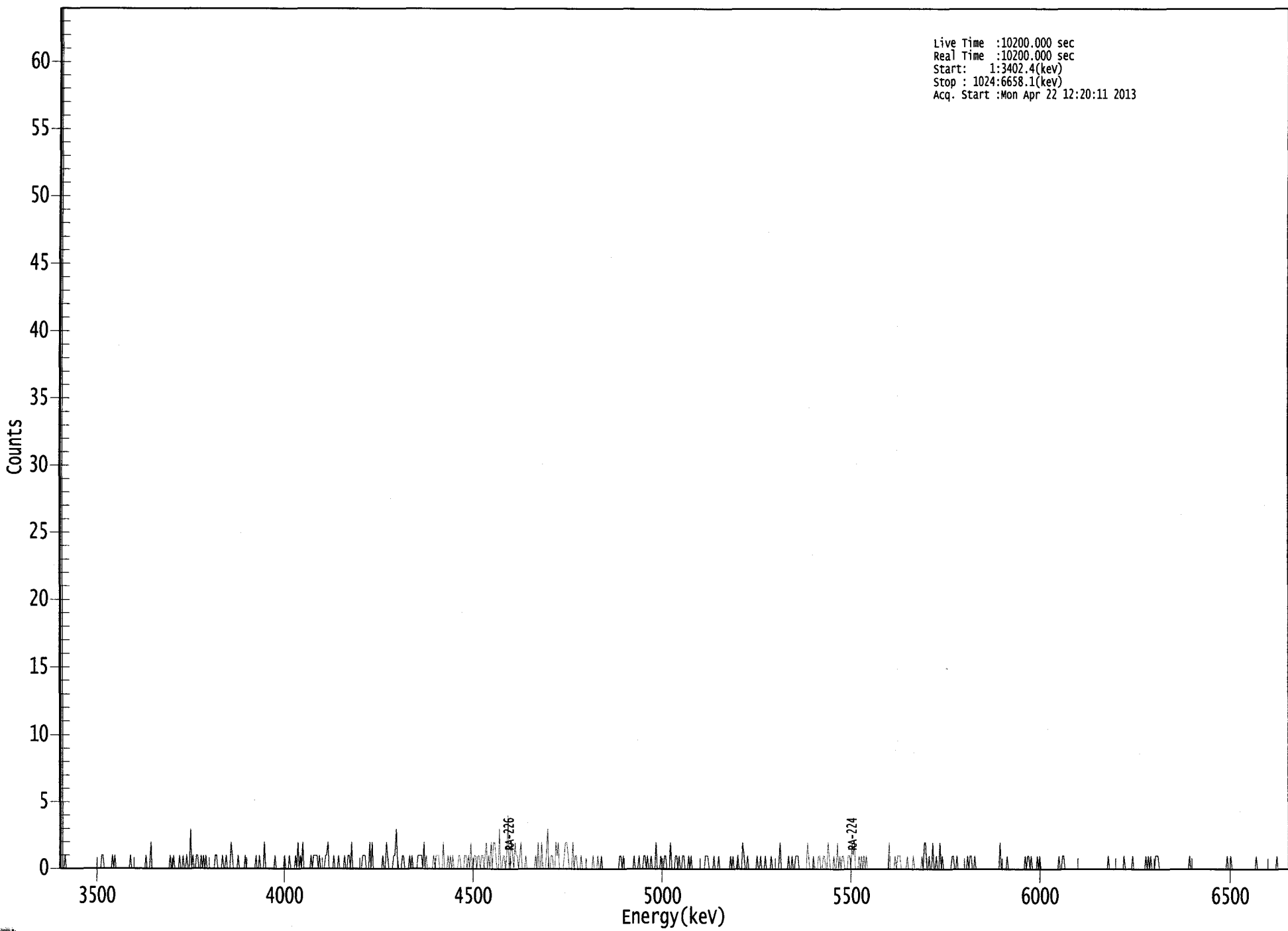
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.955	5685.50*	1.58E+000 +/- 1.27E+003	2.91E-001 +/- 2.34E+002
RA-226	0.956	4785.00*	1.93E+000 +/- 4.27E-001	1.76E-001 +/- 6.47E-003

AG
4/23/13

US EPA ARCHIVE DOCUMENT

0000056133.CNF

Live Time :10200.000 sec
Real Time :10200.000 sec
Start: 1:3402.4(kev)
Stop : 1024:6658.1(kev)
Acq. Start :Mon Apr 22 12:20:11 2013



100

ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 04

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	10200	10200	0	0	1	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	1	1	0	0	0
41:	0	0	0	0	1	0	1	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	1	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	1	0	0	0	2	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	1	0	0	1
97:	0	0	0	0	1	0	0	1
105:	0	0	1	0	0	3	0	1
113:	0	0	1	1	0	0	1	0
121:	1	0	1	0	0	0	0	0
129:	0	0	1	1	0	0	0	0
137:	1	0	0	1	0	0	0	2
145:	1	0	0	0	0	1	0	0
153:	0	0	0	1	0	0	0	0
161:	0	0	0	0	1	0	0	1
169:	0	0	0	2	0	0	0	0
177:	0	0	0	0	1	0	0	0
185:	0	0	0	0	1	0	0	0
193:	1	0	0	0	0	1	0	2
201:	0	1	0	2	0	0	0	0
209:	0	0	1	0	1	1	1	1
217:	0	1	0	0	0	0	1	1
225:	2	0	0	0	0	1	0	0
233:	0	1	0	0	0	0	1	0
241:	0	1	1	0	2	0	0	0
249:	0	0	0	0	0	1	1	1
257:	0	0	0	2	0	2	0	0
265:	0	0	0	0	0	0	1	0
273:	0	2	1	0	0	0	0	1
281:	1	3	1	0	0	0	1	1
289:	0	0	0	0	1	0	1	0
297:	0	0	0	1	1	1	1	0
305:	2	0	1	0	0	0	0	0
313:	1	0	1	1	1	0	0	0
321:	2	0	0	0	1	0	1	0
329:	1	0	0	0	0	1	1	0
337:	0	0	1	1	0	1	0	2
345:	0	0	1	1	0	1	1	0
353:	1	1	0	1	2	0	1	0
361:	2	0	2	2	1	0	0	3

369: 0 0 1 1 0 1 4 0

Sample Title: 04

Channel	1	2	3	4	5	6	7	8
377:	1	2	1	0	2	1	1	0
385:	1	2	0	0	0	1	0	0
393:	0	0	0	0	0	1	0	2
401:	0	0	2	0	0	0	1	3
409:	0	0	1	1	0	0	2	1
417:	2	0	0	0	0	1	2	2
425:	1	0	0	0	2	0	1	1
433:	0	0	0	1	0	0	0	0
441:	0	0	0	0	0	1	0	0
449:	0	1	0	0	1	0	0	0
457:	0	0	0	0	0	0	0	0
465:	0	0	0	1	1	0	1	0
473:	0	0	0	0	0	0	0	1
481:	0	0	0	1	0	0	0	1
489:	1	0	1	0	0	1	0	0
497:	0	2	0	0	0	1	0	0
505:	1	1	0	0	0	2	0	0
513:	0	1	1	0	1	0	0	1
521:	1	0	0	0	1	0	1	0
529:	0	0	0	0	0	0	0	0
537:	0	0	1	1	1	0	0	0
545:	0	1	0	0	0	1	0	0
553:	0	0	0	0	0	0	0	1
561:	0	1	0	0	0	1	0	0
569:	0	2	1	0	0	1	0	0
577:	0	0	0	0	0	1	0	0
585:	1	0	0	0	1	0	0	0
593:	0	1	0	0	0	0	0	0
601:	2	0	0	0	0	0	0	1
609:	0	0	1	0	0	1	1	1
617:	0	0	0	0	0	0	0	2
625:	1	0	0	0	1	0	0	0
633:	1	1	0	0	1	1	0	0
641:	2	1	0	0	0	1	0	0
649:	2	0	1	0	1	1	0	0
657:	0	1	1	0	2	1	2	0
665:	0	0	1	0	1	0	1	0
673:	1	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	2	0	0	0	0
697:	1	0	1	1	1	0	0	0
705:	0	0	1	0	0	0	0	1
713:	0	0	0	0	0	0	1	0
721:	2	2	0	0	1	0	0	2
729:	0	0	1	0	0	2	0	1
737:	0	0	0	0	0	0	0	1
745:	1	0	0	1	0	0	0	0
753:	0	0	0	0	1	0	1	1
761:	0	0	1	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	2
785:	0	0	0	0	0	1	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 1 0 1 1

Sample Title: 04

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	1	0	0	0	0	1	0
817:	1	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	1	0	0	1	1	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	1	0	0	0	0	0	0
881:	0	0	0	0	0	0	1	0
889:	0	0	0	0	0	1	0	0
897:	0	0	0	0	0	0	0	0
905:	1	0	1	0	1	0	0	0
913:	1	1	1	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	1	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	1	0	0	1	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	1	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	1	0	0	0
1017:	0	0	0	0	0	0	0	0



C
4/23/13

Sample Description: S-61 DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 05
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_029
 Chamber Serial Number:
 Detector Serial Number: 29
 Env. Background: System Bkgd 55202
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.200E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:20:12 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9096 +/- 0.0000
 Counting Efficiency: 0.1945 +/- 0.0036 on 12/15/2012 2:30:02 PM
 Effective Efficiency: 0.1769 +/- 0.0032

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.496	15.13	53.91	1.87	0.00E+000	3.9
RA-226	4.662	16.98	49.21	1.02	0.00E+000	3.1

 ----- NUCLIDE ANALYSIS RESULTS -----

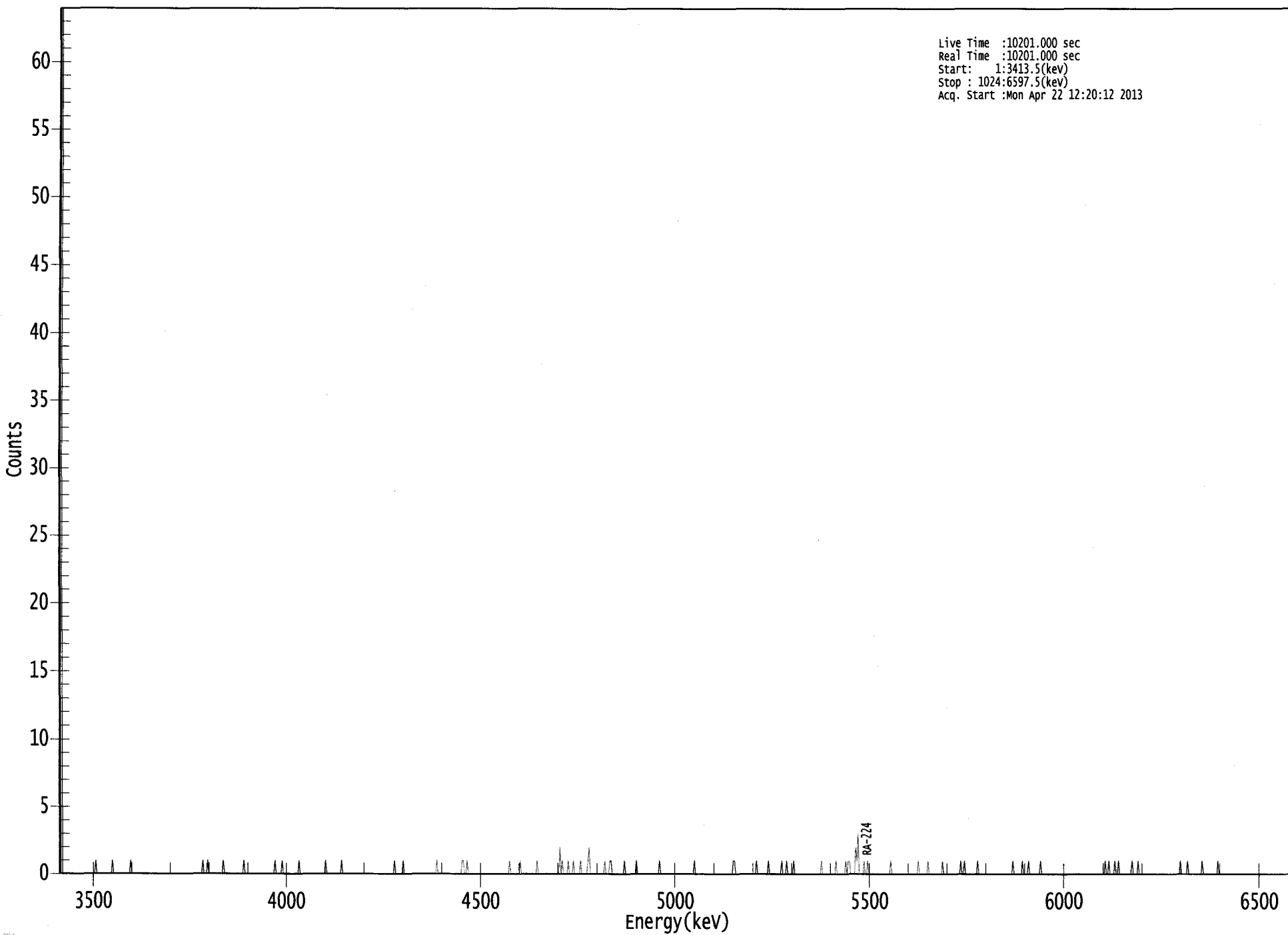
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.951	5685.50*	6.30E-001 +/- 5.08E+002	3.15E-001 +/- 2.54E+002
RA-226	0.981	4785.00*	3.73E-001 +/- 1.84E-001	1.38E-001 +/- 4.98E-003

AG
4/23/13

US EPA ARCHIVE DOCUMENT

0000056134.CNF

Live Time :10201.000 sec
Real Time :10201.000 sec
Start: 1:3413.5(kev)
Stop : 1024:6597.5(kev)
Acq. Start :Mon Apr 22 12:20:12 2013



0315
9750

ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 05

Elapsed Live time: 10201

Elapsed Real Time: 10201

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	10201	10201	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	1	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	1	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	1	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	1
121:	0	0	0	1	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	1	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	1	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	1	0	0	0	0
185:	0	1	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	1
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	1	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	1	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	1	0
281:	0	0	0	0	0	1	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	1	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	1	1
337:	0	0	1	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 0 0 1 0 0

Sample Title: 05

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	1	0
385:	0	0	0	0	0	0	0	0
393:	0	0	0	0	1	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	0	0	2
417:	0	1	0	0	0	0	1	0
425:	0	0	1	0	0	0	0	0
433:	1	0	0	0	0	0	1	2
441:	0	0	0	0	0	0	0	0
449:	0	0	0	0	1	0	0	0
457:	1	1	0	0	0	0	0	0
465:	0	0	0	0	1	0	0	0
473:	0	0	0	0	0	0	1	0
481:	0	0	0	0	0	0	0	0
489:	0	0	0	0	0	0	0	0
497:	0	1	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	0	0	0	0	1	0
529:	0	0	0	0	0	0	0	0
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	1	1
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	1	0	0	0	0	0	0
585:	0	0	0	1	0	0	0	0
593:	0	0	0	0	0	0	1	0
601:	0	0	1	0	0	0	0	0
609:	1	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	1
633:	0	0	0	0	0	0	0	0
641:	0	0	0	1	0	0	0	0
649:	0	0	0	1	0	1	1	0
657:	0	0	0	2	1	3	0	0
665:	0	0	1	0	0	1	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	1	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	1
713:	0	0	0	0	0	0	0	1
721:	0	0	0	0	0	0	0	0
729:	0	0	0	1	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	1	0	0	1	0	0
753:	0	0	0	0	0	0	0	0
761:	1	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	1	0	0
793:	0	0	0	0	0	1	0	0

801: 0 0 1 0 0 0 0 0 0

Sample Title: 05

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	1	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	1	0	0	1	0	0	0
873:	0	1	0	0	1	0	0	0
881:	0	0	0	0	0	0	0	1
889:	0	0	0	0	1	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	1
929:	0	0	0	0	0	1	0	0
937:	0	0	0	0	0	0	0	0
945:	0	1	0	0	0	0	0	0
953:	0	0	0	0	0	0	1	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	1	0	0	0	0	0	0



✓
Y/M/D

Sample Description: PZ-115-SS TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 06
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_033
 Chamber Serial Number: 04026479A
 Detector Serial Number: 91132
 Env. Background: System Bkgd 55203
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.530E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:20:36 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9587 +/- 0.0000
 Counting Efficiency: 0.1825 +/- 0.0032 on 12/16/2012 5:49:18 PM
 Effective Efficiency: 0.1749 +/- 0.0031

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.508	116.81	18.24	1.19	0.00E+000	3.5
RA-226	4.593	301.49	11.30	0.51	0.00E+000	4.2

 ----- NUCLIDE ANALYSIS RESULTS -----

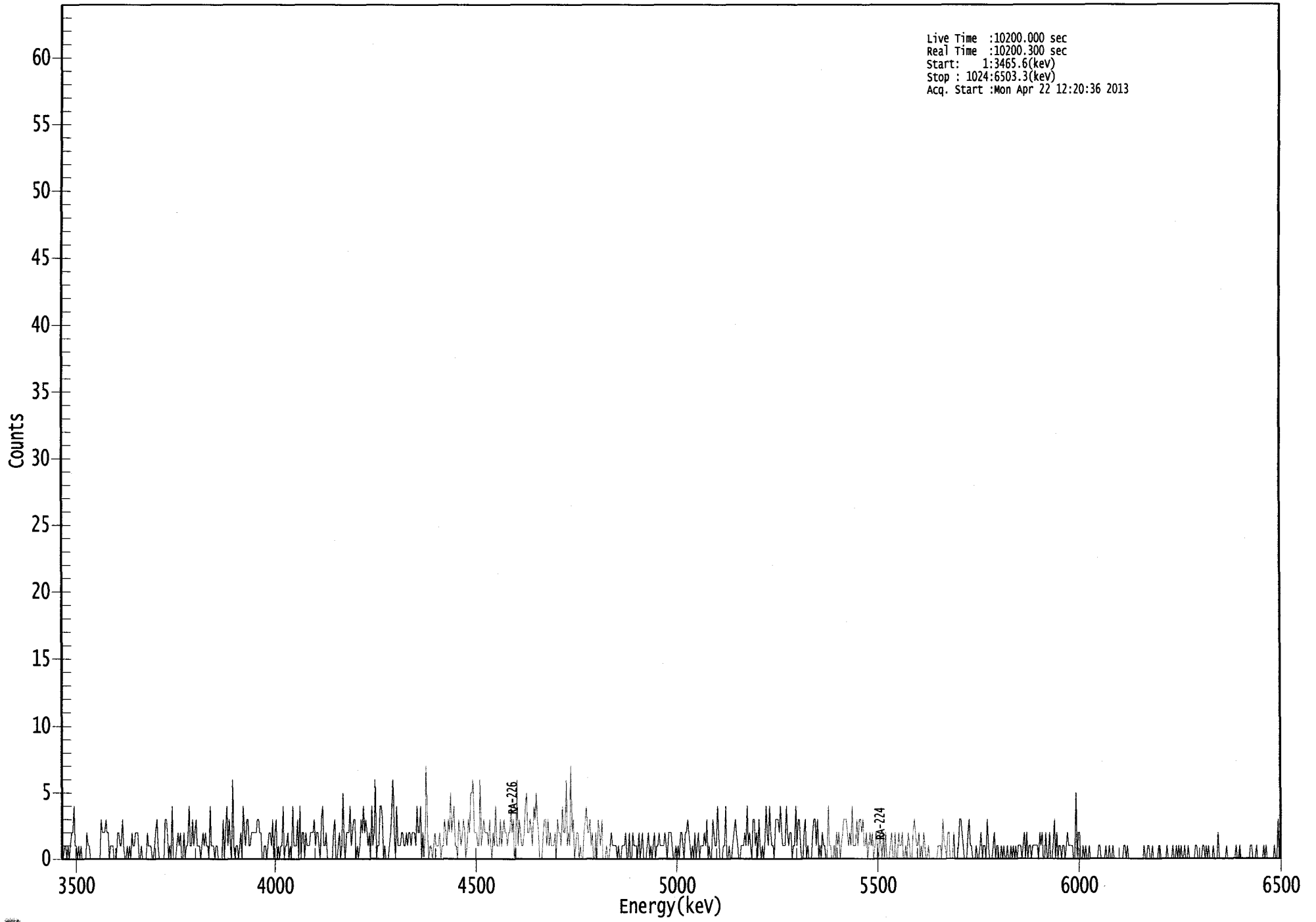
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.956	5685.50*	5.66E+000 +/- 4.56E+003	3.19E-001 +/- 2.57E+002
RA-226	0.953	4785.00*	7.70E+000 +/- 9.10E-001	1.34E-001 +/- 4.62E-003

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4/23/13

US EPA ARCHIVE DOCUMENT

0000056138.CNF

Live Time :10200.000 sec
Real Time :10200.300 sec
Start: 1:3465.6(kev)
Stop : 1024:6503.3(kev)
Acq. Start :Mon Apr 22 12:20:36 2013



ROI Type: 1

1111

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 06

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	1	1	0	1	0	1
9:	2	2	4	1	1	0	1	0
17:	1	0	0	0	0	2	1	1
25:	0	0	0	0	0	0	0	0
33:	0	3	2	2	2	3	2	2
41:	0	1	1	1	0	0	0	2
49:	2	1	1	3	1	0	0	1
57:	0	1	0	2	1	1	2	2
65:	2	0	0	1	0	0	0	0
73:	2	1	1	1	0	0	1	2
81:	3	1	0	0	0	0	0	3
89:	3	2	0	1	0	4	0	0
97:	0	1	2	1	2	0	0	2
105:	0	1	1	4	1	1	3	1
113:	2	3	1	1	1	0	1	2
121:	1	2	1	1	0	4	1	1
129:	1	0	1	1	0	0	0	0
137:	3	0	2	4	1	3	1	0
145:	6	1	0	1	1	0	1	2
153:	0	4	2	1	3	3	1	1
161:	2	2	2	2	2	3	3	2
169:	2	0	0	1	1	0	1	2
177:	2	1	3	0	2	3	0	1
185:	0	1	1	4	0	1	1	2
193:	0	1	0	4	1	1	1	3
201:	0	4	0	2	2	0	2	1
209:	1	1	2	2	2	3	1	2
217:	2	1	0	3	4	1	1	2
225:	0	0	0	0	0	2	3	0
233:	0	1	2	0	1	5	1	0
241:	2	2	2	4	1	2	3	3
249:	0	1	0	1	3	2	4	2
257:	3	2	1	2	0	4	1	2
265:	6	0	1	1	4	4	3	0
273:	1	0	0	0	1	2	4	6
281:	2	0	4	1	1	1	2	2
289:	1	1	2	1	2	2	1	2
297:	2	2	1	4	2	2	4	0
305:	2	0	2	7	2	0	1	1
313:	0	1	2	1	1	1	2	0
321:	1	1	3	2	1	3	2	5
329:	2	3	4	1	1	0	3	2
337:	1	2	3	2	0	1	3	2
345:	5	5	6	2	2	2	1	1
353:	6	1	2	3	2	2	2	1
361:	3	1	0	2	1	4	1	1

369: 1 3 1 2 3 2 2 1

Sample Title: 06

Channel	1	2	3	4	5	6	7	8
377:	2	2	4	2	3	0	1	6
385:	1	3	2	1	1	2	4	5
393:	2	2	3	2	1	4	3	5
401:	3	2	0	0	0	2	3	3
409:	1	3	1	2	1	1	1	2
417:	0	3	2	2	1	4	2	2
425:	6	1	2	1	7	2	3	0
433:	1	2	2	0	1	0	0	2
441:	3	4	2	2	3	1	2	0
449:	0	2	0	3	2	1	3	0
457:	0	0	1	0	0	1	2	1
465:	1	1	1	0	1	0	0	1
473:	1	1	2	0	0	2	0	0
481:	2	1	1	1	0	2	0	1
489:	2	0	0	0	1	2	0	1
497:	0	1	2	0	1	1	2	1
505:	1	1	1	2	1	0	2	2
513:	2	1	0	0	1	0	1	0
521:	2	2	1	0	2	2	3	2
529:	1	0	1	0	2	0	1	2
537:	0	1	1	1	2	1	3	0
545:	1	0	0	3	2	1	1	4
553:	2	0	0	0	1	1	4	0
561:	0	1	0	0	1	2	3	2
569:	1	0	0	1	1	1	2	1
577:	4	1	2	1	0	3	3	1
585:	2	0	3	1	0	1	0	1
593:	4	2	1	4	2	1	1	0
601:	3	3	3	2	4	2	1	1
609:	1	4	2	1	2	2	0	1
617:	1	4	1	3	3	1	0	0
625:	2	3	0	1	0	0	0	2
633:	3	3	1	3	0	1	0	2
641:	1	1	0	0	4	1	1	0
649:	0	1	0	2	1	2	0	1
657:	2	3	3	3	2	1	2	1
665:	4	1	1	1	3	1	3	3
673:	2	3	1	1	2	0	1	2
681:	1	2	0	1	2	1	0	2
689:	1	0	2	0	2	0	0	0
697:	1	2	0	0	2	0	0	2
705:	1	1	2	0	0	1	0	2
713:	1	0	0	2	3	2	1	1
721:	2	0	1	0	2	1	0	0
729:	1	0	0	0	0	0	0	0
737:	1	1	1	0	3	1	1	0
745:	2	2	0	0	0	2	0	0
753:	0	1	3	3	2	1	0	0
761:	0	2	3	1	1	0	0	0
769:	1	0	0	1	2	0	1	1
777:	0	3	1	0	0	0	1	2
785:	0	1	1	0	0	1	0	1
793:	0	0	1	0	0	1	0	1

801: 0 1 0 1 1 1 0 1

Sample Title: 06

Channel	1	2	3	4	5	6	7	8
809:	2	0	2	0	1	1	0	1
817:	1	1	1	1	0	2	1	2
825:	0	0	2	0	0	2	0	0
833:	1	3	0	2	0	1	1	0
841:	1	1	0	1	2	1	1	1
849:	1	0	0	5	0	2	2	0
857:	0	1	0	1	0	0	1	0
865:	0	0	0	0	0	0	1	1
873:	0	0	0	0	1	0	0	1
881:	0	0	1	0	0	0	0	0
889:	0	0	0	1	1	0	1	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	1	0	0	1
913:	1	0	0	1	0	0	0	0
921:	1	1	0	0	0	0	0	1
929:	0	0	0	0	1	0	0	1
937:	0	1	0	1	0	0	1	0
945:	0	1	0	0	0	0	0	1
953:	1	0	0	0	0	1	1	0
961:	1	0	1	0	0	0	1	0
969:	0	0	2	0	0	0	0	0
977:	0	1	0	0	0	0	0	0
985:	0	1	0	0	1	0	0	0
993:	0	0	0	0	0	1	1	0
1001:	0	0	1	0	0	0	0	0
1009:	1	0	1	0	0	0	0	0
1017:	0	1	0	0	3	0	0	0



C
4/22/13

Sample Description: PZ-115-SS DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 07
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_034
 Chamber Serial Number: 04026479B
 Detector Serial Number: 91136
 Env. Background: System Bkgd 55204
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.500E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:20:38 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 1.0000 +/- 0.0000
 Counting Efficiency: 0.1856 +/- 0.0032 on 12/16/2012 5:49:43 PM
 Effective Efficiency: 0.1856 +/- 0.0032

Peak Match Tolerance: 0.350 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.509	117.49	18.13	0.51	0.00E+000	3.3
RA-226	4.608	308.66	11.16	0.34	0.00E+000	9.2

 NUCLIDE ANALYSIS RESULTS

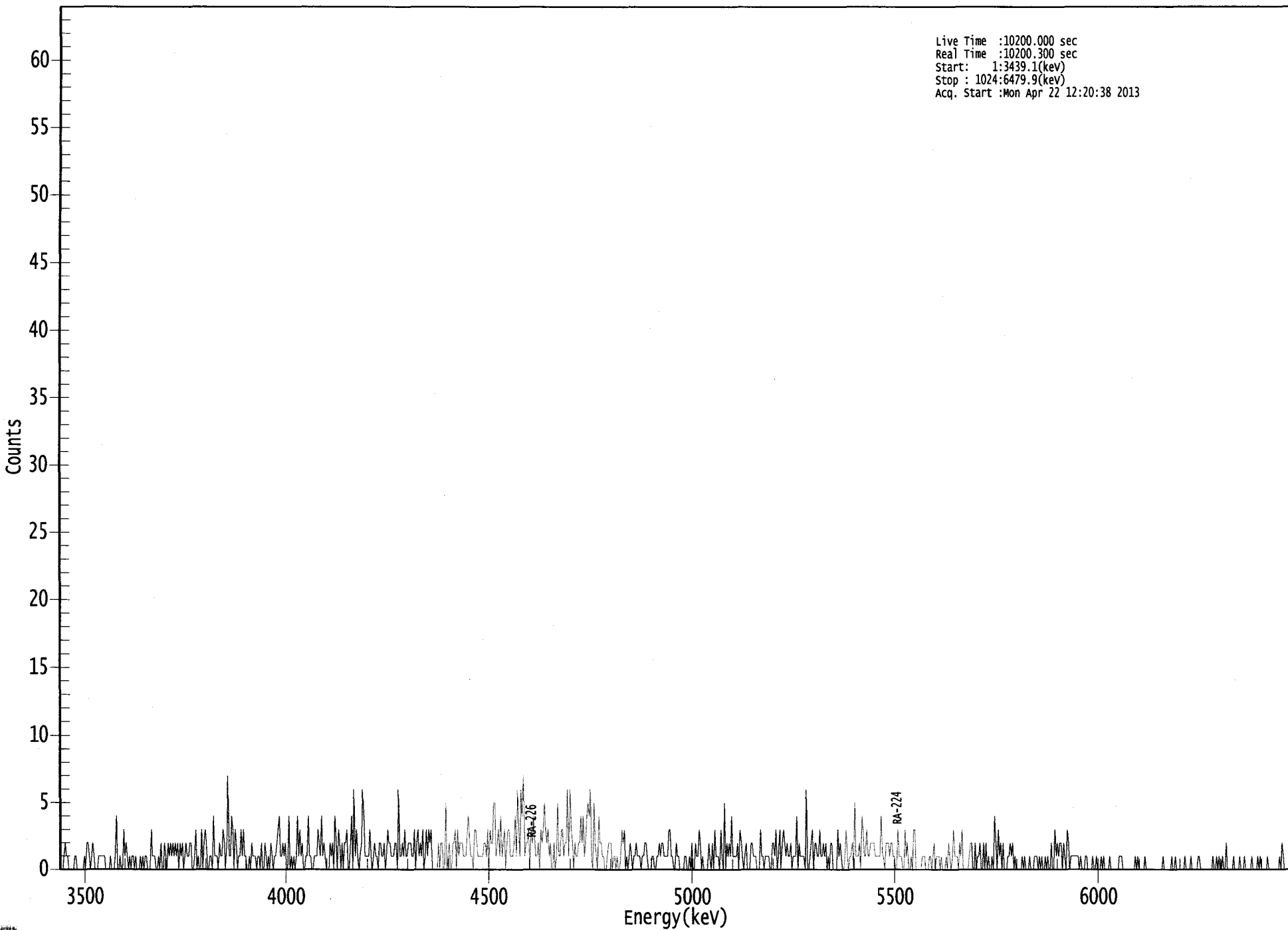
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.957	5685.50*	5.30E+000 +/- 4.28E+003	2.37E-001 +/- 1.91E+002
RA-226	0.960	4785.00*	7.35E+000 +/- 8.57E-001	1.14E-001 +/- 3.88E-003

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4/23/13

US EPA ARCHIVE DOCUMENT

000056137.CNF

Live Time : 10200.000 sec
Real Time : 10200.300 sec
Start : 1:3439.1(keV)
Stop : 1024:6479.9(keV)
Acq. Start : Mon Apr 22 12:20:38 2013



ROI Type: 1

03550

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 07

Elapsed Live time: 10200
 Elapsed Real Time: 10200

Channel	1	2	3	4	5	6	7	8	9
1:	1	0	0	1	2	1	1	0	
9:	0	0	0	0	1	1	0	0	
17:	0	0	0	0	1	0	2	2	
25:	1	0	1	2	1	0	0	0	
33:	1	1	1	1	1	1	0	0	
41:	0	0	1	0	0	0	1	4	
49:	0	0	1	0	0	3	1	2	
57:	1	0	1	0	1	1	0	1	
65:	0	0	0	1	0	1	0	1	
73:	1	0	0	0	3	1	1	1	
81:	0	0	1	0	2	0	0	2	
89:	1	0	2	1	2	1	2	1	
97:	2	1	2	0	2	1	2	0	
105:	1	2	1	1	2	2	0	0	
113:	1	3	0	1	0	0	3	0	
121:	2	3	2	0	0	1	1	0	
129:	4	1	1	1	0	2	1	1	
137:	3	2	0	2	7	1	1	4	
145:	3	0	3	2	0	1	1	3	
153:	1	3	1	1	0	0	1	0	
161:	2	1	1	1	0	1	1	0	
169:	2	0	0	2	1	0	1	0	
177:	2	1	0	1	1	2	3	4	
185:	1	1	2	1	2	0	0	4	
193:	0	1	0	1	0	1	4	1	
201:	3	1	2	0	0	1	1	4	
209:	1	1	0	0	1	1	1	3	
217:	2	1	4	1	2	1	0	0	
225:	0	2	1	2	0	4	2	0	
233:	3	2	0	2	0	2	2	3	
241:	0	0	2	4	0	6	1	3	
249:	1	0	1	2	6	4	1	1	
257:	1	1	3	1	0	1	2	1	
265:	1	0	2	2	1	1	2	0	
273:	1	3	2	2	1	1	1	2	
281:	2	0	6	1	1	2	1	3	
289:	1	1	2	2	2	1	1	3	
297:	0	2	3	1	2	1	3	0	
305:	1	3	1	3	2	3	0	0	
313:	0	0	0	2	0	2	2	0	
321:	0	5	0	1	2	0	0	2	
329:	2	3	0	3	1	2	2	2	
337:	1	1	1	3	4	2	1	1	
345:	0	3	3	2	1	1	1	1	
353:	1	2	2	1	3	0	3	2	
361:	2	5	5	1	2	3	1	4	

369: 1 2 3 0 2 3 3 1

Sample Title: 07

Channel	1	2	3	0	2	3	3	1
377:	1	1	2	4	1	6	3	1
385:	6	4	7	1	2	2	3	0
393:	3	2	4	2	1	1	2	0
401:	3	2	3	5	3	2	3	1
409:	2	0	0	2	0	1	5	1
417:	1	3	3	1	2	2	6	1
425:	6	3	2	0	2	1	1	2
433:	2	4	2	4	1	2	4	5
441:	4	6	1	0	5	2	1	0
449:	4	2	2	1	1	0	0	1
457:	2	2	2	0	1	1	0	1
465:	0	0	1	3	2	3	0	1
473:	0	1	2	1	0	1	1	2
481:	1	1	1	0	1	1	2	2
489:	1	0	0	0	1	1	0	0
497:	1	1	2	1	2	2	1	1
505:	1	1	3	3	1	1	0	0
513:	2	1	1	0	0	0	0	1
521:	1	0	0	1	0	2	0	0
529:	2	1	1	3	2	0	1	0
537:	0	0	0	2	1	0	2	0
545:	3	1	1	1	0	3	1	0
553:	5	0	2	1	2	1	4	1
561:	1	1	1	2	0	3	2	1
569:	0	1	2	0	0	0	2	2
577:	1	1	1	0	0	0	3	1
585:	1	0	1	1	1	1	0	0
593:	2	2	1	3	0	1	3	0
601:	2	3	2	1	2	1	1	2
609:	0	1	1	1	4	0	2	1
617:	1	1	1	0	6	0	0	1
625:	2	3	0	2	2	1	1	3
633:	1	1	2	1	2	0	1	0
641:	2	2	0	0	0	0	3	1
649:	2	1	0	0	1	3	1	0
657:	1	1	2	0	5	1	1	1
665:	2	0	4	3	1	1	3	1
673:	1	2	2	2	2	1	1	1
681:	1	1	4	1	1	0	2	2
689:	2	1	2	2	1	1	0	0
697:	3	1	1	1	0	0	3	1
705:	2	0	0	1	0	3	3	0
713:	0	0	0	0	1	1	1	0
721:	0	0	1	1	0	1	2	0
729:	1	1	1	0	1	0	0	0
737:	1	0	2	1	0	1	3	1
745:	1	1	0	2	1	3	0	0
753:	0	0	0	1	2	2	0	0
761:	2	0	1	1	2	0	0	2
769:	0	2	0	1	0	0	1	0
777:	4	2	0	3	1	2	0	2
785:	0	0	0	1	1	2	1	2
793:	0	1	0	0	0	0	0	1

801: 0 1 0 0 0 1 0 0

Sample Title: 07

Channel	1	2	3	4	5	6	7	8
809:	0	1	1	1	0	1	0	1
817:	0	0	1	0	1	0	0	2
825:	0	0	3	1	2	1	2	2
833:	0	2	1	0	3	2	0	1
841:	1	1	1	1	1	1	0	1
849:	0	0	0	1	1	0	0	0
857:	0	1	0	0	1	0	0	0
865:	1	0	1	0	0	0	0	1
873:	0	0	0	0	0	0	0	1
881:	1	1	0	0	0	0	0	0
889:	0	0	0	0	1	0	1	0
897:	0	0	0	0	1	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	1	0	0	0	0
921:	0	0	1	0	0	1	0	0
929:	0	0	0	0	0	1	0	0
937:	0	0	1	0	0	0	0	0
945:	1	1	0	0	0	0	0	0
953:	0	0	0	0	1	0	0	1
961:	0	1	0	0	1	0	0	2
969:	0	0	0	0	0	1	0	0
977:	0	0	1	0	0	0	1	0
985:	0	0	0	0	1	0	0	0
993:	0	1	0	1	0	0	0	0
1001:	0	1	0	0	0	0	0	0
1009:	0	0	0	1	0	2	1	0
1017:	0	0	0	0	1	0	1	0



C
4/27/13

Sample Description: MW-104 TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 08
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_035
 Chamber Serial Number: 04026477A
 Detector Serial Number: 58771
 Env. Background: System Bkgd 55205
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.660E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:20:32 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.8744 +/- 0.0000
 Counting Efficiency: 0.1826 +/- 0.0032 on 12/16/2012 5:49:42 PM
 Effective Efficiency: 0.1596 +/- 0.0028

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.505	14.00	54.22	0.00	0.00E+000	2.9
RA-226	4.679	12.49	56.77	0.51	0.00E+000	2.9

 ----- NUCLIDE ANALYSIS RESULTS -----

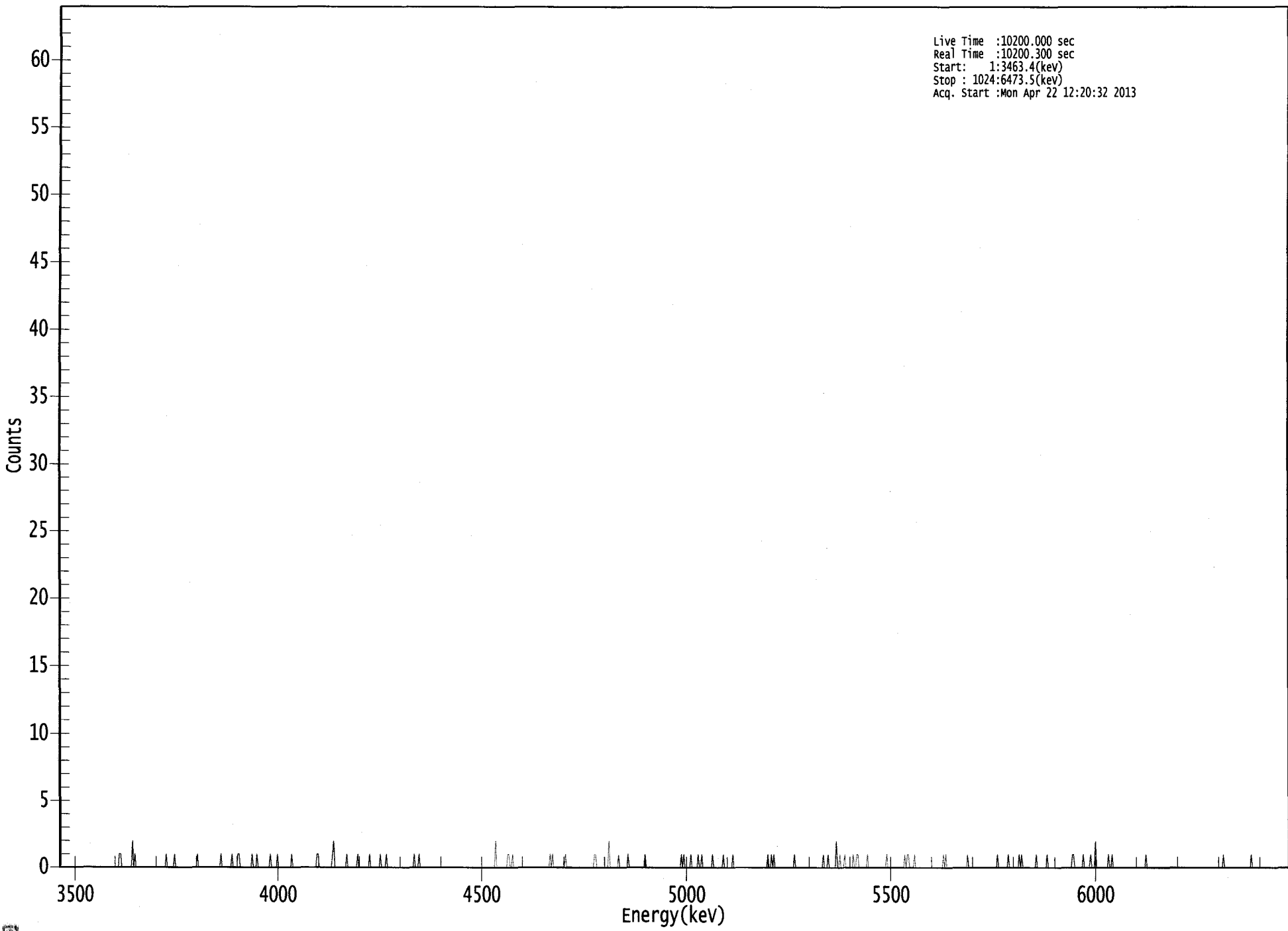
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.955	5685.50*	7.81E-001 +/- 6.30E+002	3.34E-001 +/- 2.70E+002
RA-226	0.986	4785.00*	3.68E-001 +/- 2.09E-001	1.54E-001 +/- 5.29E-003

AG
4/23/13

US EPA ARCHIVE DOCUMENT

0000056136.CNF

Live Time :10200.000 sec
Real Time :10200.300 sec
Start: 1:3463.4(kev)
Stop : 1024:6473.5(kev)
Acq. Start :Mon Apr 22 12:20:32 2013



0361

ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 08

Elapsed Live time: 10200
Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	1	1	0	0	0	0
57:	0	0	0	0	0	2	0	1
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	1	0	0	0	0	0	0
97:	1	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	1	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	1
137:	0	0	0	0	0	0	0	0
145:	1	0	0	0	0	1	1	0
153:	0	0	0	0	0	0	0	0
161:	0	1	0	0	0	1	0	0
169:	0	0	0	0	0	0	0	0
177:	1	0	0	0	0	0	1	0
185:	0	0	0	0	0	0	0	0
193:	0	0	1	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	1
217:	1	0	0	0	0	0	0	0
225:	0	0	0	0	1	2	0	0
233:	0	0	0	0	0	0	0	0
241:	1	0	0	0	0	0	0	0
249:	0	1	0	0	0	0	0	0
257:	0	0	0	1	0	0	0	0
265:	0	0	0	0	1	0	0	0
273:	0	1	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	1	0	0	0	1	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	2	0	0	0

369: 0 0 0 0 0 0 1 1

Sample Title: 08

Channel	-----	-----	-----	-----	-----	-----	-----
377:	0	0	1	0	0	0	0
385:	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0
409:	0	1	0	1	0	0	0
417:	0	0	0	0	0	0	1
425:	0	0	0	0	0	0	0
433:	0	0	0	0	0	0	0
441:	0	0	0	0	0	0	1
449:	0	0	0	0	0	0	0
457:	0	0	2	0	0	0	0
465:	0	0	1	0	0	0	0
473:	0	0	1	0	0	0	0
481:	0	0	0	0	0	0	0
489:	1	0	0	0	0	0	0
497:	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0
513:	0	0	0	0	0	0	1
521:	1	0	0	0	0	0	1
529:	0	0	0	0	1	0	0
537:	0	0	0	0	0	0	0
545:	1	0	0	0	0	0	0
553:	0	1	0	0	0	0	0
561:	0	1	0	0	0	0	0
569:	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	1
593:	0	1	0	1	0	0	0
601:	0	0	0	0	0	0	0
609:	0	0	0	0	1	0	0
617:	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0
633:	0	0	0	0	1	0	0
641:	1	0	0	0	0	0	0
649:	0	0	1	0	0	0	1
657:	0	0	0	0	0	1	0
665:	1	1	0	0	0	0	0
673:	0	1	0	0	0	0	0
681:	0	0	0	0	0	0	0
689:	0	1	0	0	0	0	0
697:	0	0	0	0	0	0	0
705:	1	0	1	1	0	0	0
713:	1	0	0	0	0	0	0
721:	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0
737:	1	0	1	0	0	0	0
745:	0	0	0	0	0	0	0
753:	0	0	0	0	1	0	0
761:	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0
777:	0	0	0	0	0	1	0
785:	0	0	0	0	0	0	1
793:	0	0	0	0	0	0	1

801: 0 1 0 0 0 0 0 0

Sample Title: 08

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	1	0	0
817:	0	0	0	0	0	0	1	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	1	1	0	0	0
849:	0	0	0	0	1	0	0	0
857:	0	0	1	0	0	0	2	0
865:	0	0	0	0	0	0	0	0
873:	0	1	0	0	1	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	1	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	1	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	1
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



4127117

Sample Description: MW-104 DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 09
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_037
 Chamber Serial Number: 04026478A
 Detector Serial Number: 91133
 Env. Background: System Bkgd 55207
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.500E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:20:34 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9579 +/- 0.0000
 Counting Efficiency: 0.1783 +/- 0.0033 on 1/26/2013 3:28:25 PM
 Effective Efficiency: 0.1708 +/- 0.0032

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.506	7.66	72.63	0.34	0.00E+000	2.9
RA-226	4.663	9.49	65.59	0.51	0.00E+000	2.9

 ----- NUCLIDE ANALYSIS RESULTS -----

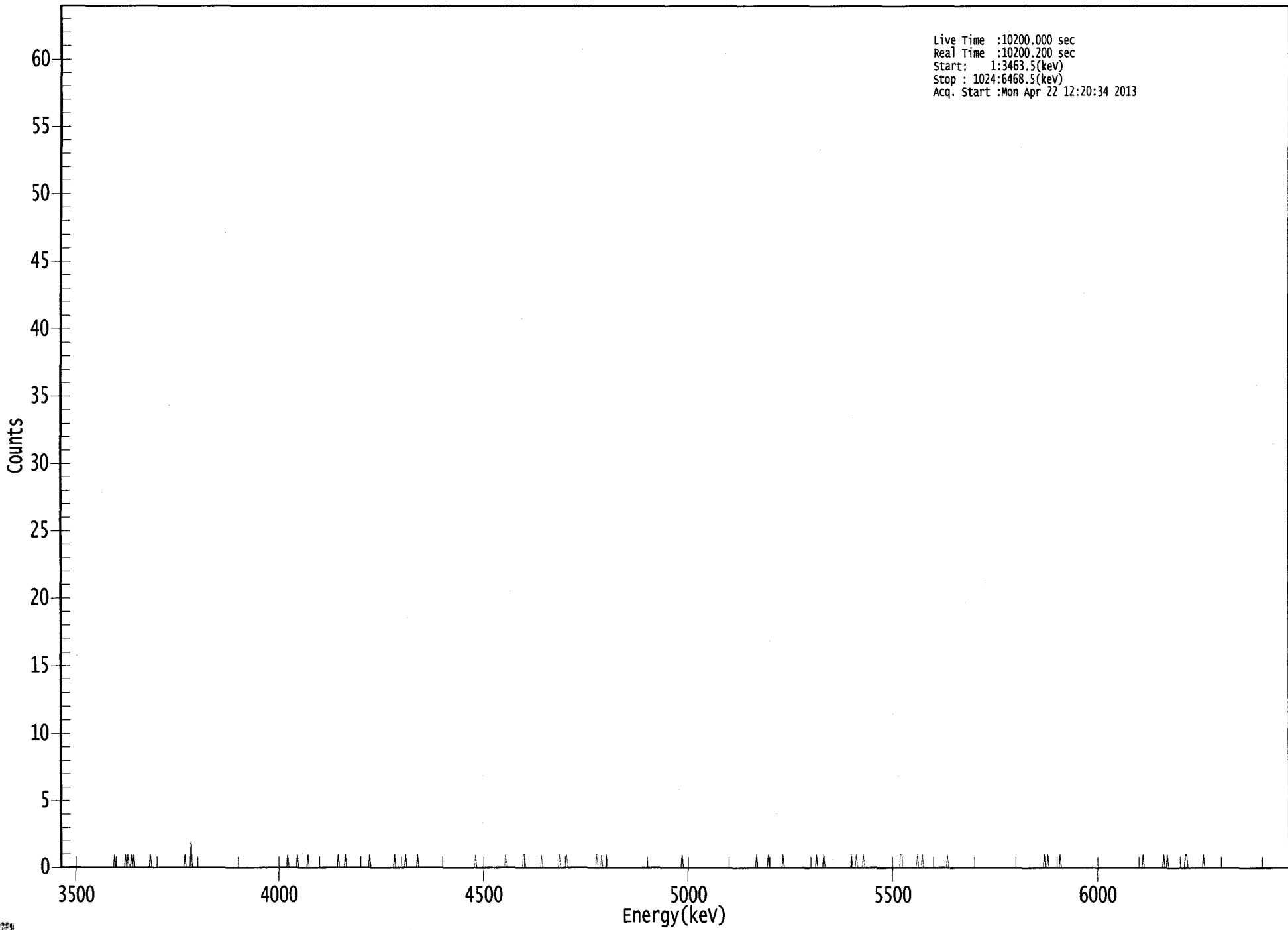
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.955	5685.50*	3.75E-001 +/- 3.03E+002	2.34E-001 +/- 1.89E+002
RA-226	0.981	4785.00*	2.45E-001 +/- 1.61E-001	1.36E-001 +/- 4.94E-003

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 4/23/13

US EPA ARCHIVE DOCUMENT

0000056135.CNF

Live Time :10200.000 sec
Real Time :10200.200 sec
Start: 1:3463.5(kev)
Stop : 1024:6468.5(kev)
Acq. Start :Mon Apr 22 12:20:34 2013



0356

ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 09

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	1	0	0
49:	0	0	0	0	0	0	1	0
57:	1	0	0	1	0	1	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	1	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	1	0	0	0	0	2	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	1	0
193:	0	0	0	0	0	0	1	0
201:	0	0	0	0	0	0	0	1
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	1	0	0	0	0	0	1	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	1	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	1
281:	0	0	0	0	0	0	0	0
289:	1	0	0	0	0	0	0	0
297:	0	0	1	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	1	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0

369: 0 0 0 1 0 0 0 0

Sample Title: 09

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	1	1	0	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	1	0	0	0	0	0	0
409:	0	0	0	0	0	0	0	0
417:	1	0	0	0	0	0	1	0
425:	0	0	0	0	0	0	0	0
433:	0	0	0	0	0	0	0	0
441:	0	0	0	0	0	0	0	1
449:	0	0	0	1	0	0	0	1
457:	0	0	0	0	0	0	0	0
465:	0	0	0	0	0	0	0	0
473:	0	0	0	0	0	0	0	0
481:	0	0	0	0	0	0	0	0
489:	0	0	0	0	0	0	0	0
497:	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0
513:	0	0	0	0	0	0	1	0
521:	0	0	0	0	0	0	0	0
529:	0	0	0	0	0	0	0	0
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	1	0	0	0
585:	0	0	0	0	0	0	1	0
593:	0	0	0	0	0	0	0	0
601:	0	0	1	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	1	0
633:	0	0	0	0	1	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	1	0	0	0	1
665:	0	0	0	0	0	1	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	1	1	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	1	0	0	0	1	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	1	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 09

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	1	0	0	1	0
825:	0	0	0	0	0	0	0	0
833:	1	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	1	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	1	0
921:	0	1	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	1	1	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	1
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



C
4/23/13

Sample Description: PZ-100-SD TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 10
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_040
 Chamber Serial Number: 06027396B
 Detector Serial Number: 91135
 Env. Background: System Bkgd 55210
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.500E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:45:17 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9554 +/- 0.0000
 Counting Efficiency: 0.1900 +/- 0.0033 on 12/16/2012 5:49:33 PM
 Effective Efficiency: 0.1815 +/- 0.0031

Peak Match Tolerance: 0.350 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.523	37.49	32.26	0.51	0.00E+000	7.4
RA-226	4.603	98.66	19.77	0.34	0.00E+000	3.5

 NUCLIDE ANALYSIS RESULTS

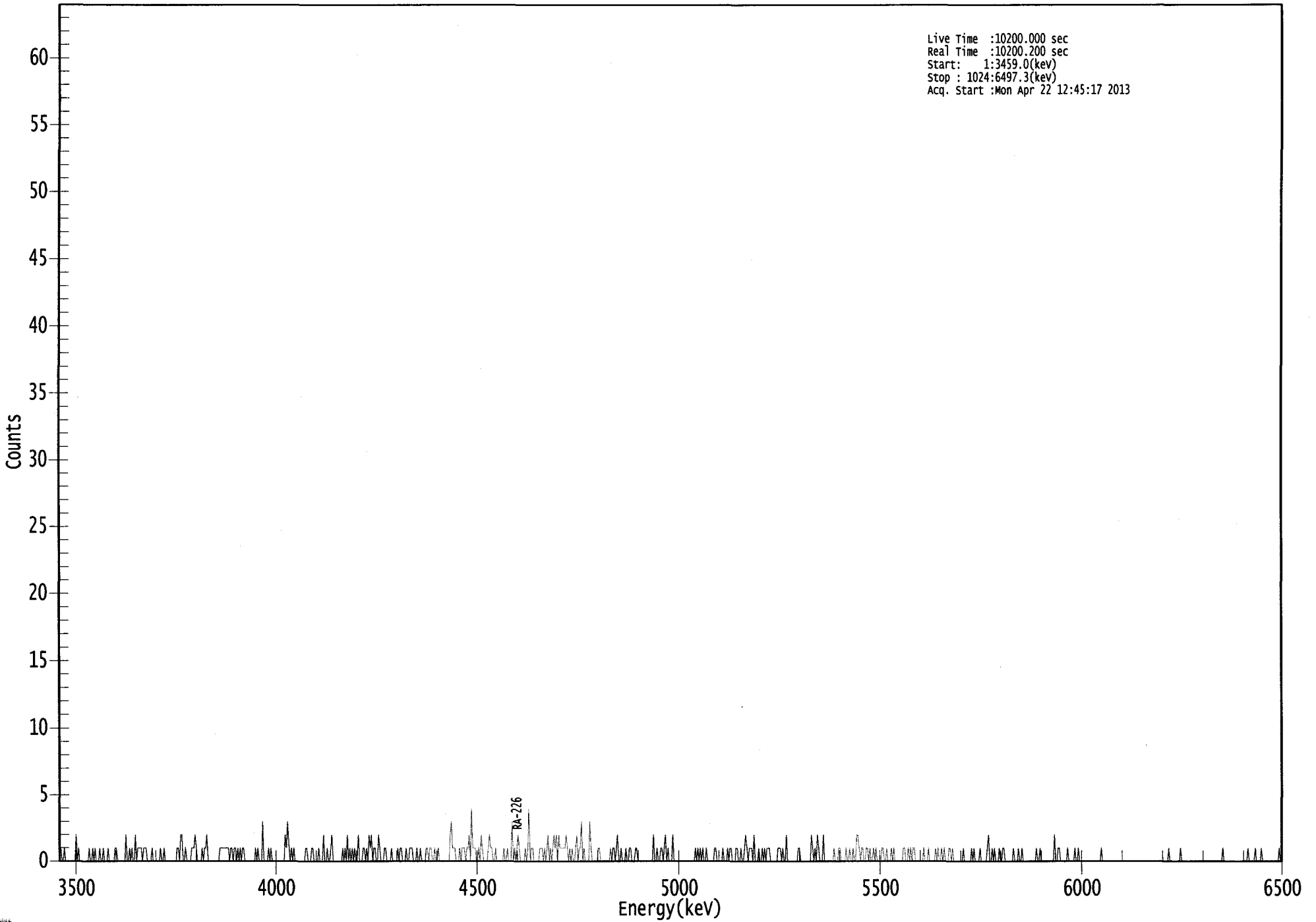
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.963	5685.50*	1.73E+000 +/- 1.41E+003	2.43E-001 +/- 1.97E+002
RA-226	0.958	4785.00*	2.40E+000 +/- 4.82E-001	1.16E-001 +/- 3.96E-003

AG
4/23/13

US EPA ARCHIVE DOCUMENT

000056143.CNF

Live Time :10200.000 sec
Real Time :10200.200 sec
Start: 1:3459.0(kev)
Stop : 1024:6497.3(kev)
Acq. Start :Mon Apr 22 12:45:17 2013



1250

ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 10

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	1	0	0	1	0	0	0
9:	0	0	0	0	0	0	2	0
17:	1	0	0	0	0	0	0	0
25:	0	1	0	0	1	0	1	0
33:	0	0	1	0	0	1	0	0
41:	0	1	0	0	0	0	0	1
49:	1	0	0	0	0	0	0	0
57:	2	0	0	1	0	1	0	0
65:	2	0	1	1	1	1	0	1
73:	1	1	0	0	0	0	1	0
81:	0	0	0	0	0	1	0	0
89:	1	0	0	0	0	0	0	0
97:	0	0	0	1	1	0	2	2
105:	0	0	1	0	0	0	0	1
113:	1	1	2	1	0	0	0	0
121:	1	0	1	1	2	0	0	0
129:	0	0	0	0	0	0	0	1
137:	1	1	1	1	1	1	1	0
145:	1	1	0	1	1	0	1	0
153:	1	0	1	1	0	0	0	0
161:	0	0	0	0	0	1	0	1
169:	0	0	0	3	0	0	0	0
177:	1	0	1	0	0	0	0	0
185:	0	0	0	0	0	0	2	1
193:	3	1	0	1	0	1	0	0
201:	0	0	0	0	0	0	0	1
209:	1	0	0	0	1	1	0	0
217:	0	0	1	0	0	0	2	0
225:	0	1	0	0	1	2	0	0
233:	0	0	0	0	0	0	1	0
241:	1	0	2	0	1	0	1	0
249:	1	0	0	2	0	0	0	1
257:	1	0	1	0	2	1	2	0
265:	1	1	0	0	2	1	0	0
273:	0	1	1	0	0	0	0	1
281:	0	0	0	0	1	0	1	1
289:	0	0	0	1	0	0	1	1
297:	1	0	0	0	1	0	0	1
305:	0	0	0	0	1	1	0	1
313:	1	0	0	1	0	0	1	0
321:	0	0	0	0	0	0	0	0
329:	2	3	1	1	1	0	0	0
337:	1	0	1	1	1	0	1	1
345:	2	0	4	1	1	1	0	0
353:	1	0	2	1	0	0	0	0
361:	1	2	1	1	0	0	1	0

369: 0 0 0 0 0 1 0 0

Sample Title: 10

Channel	1	2	3	4	5	6	7	8	9
377:	1	0	0	0	3	0	1	0	
385:	1	2	1	0	0	0	0	1	
393:	0	1	4	0	1	1	0	0	
401:	0	0	0	1	1	1	0	1	
409:	0	1	2	0	1	0	1	2	
417:	1	2	0	2	1	1	1	1	
425:	1	2	1	0	1	0	1	0	
433:	0	1	2	0	1	1	3	0	
441:	1	0	0	0	0	3	1	0	
449:	0	0	0	0	1	1	0	0	
457:	0	0	0	0	0	0	1	0	
465:	1	1	0	1	2	0	0	1	
473:	0	0	0	1	0	0	1	1	
481:	0	0	0	1	1	0	0	0	
489:	0	0	0	0	0	0	0	0	
497:	0	0	2	0	0	1	0	0	
505:	1	1	0	1	2	0	1	0	
513:	0	0	2	0	0	0	0	0	
521:	0	0	0	0	0	0	0	0	
529:	0	0	0	0	0	1	0	1	
537:	0	1	0	1	0	0	1	0	
545:	0	0	0	0	0	1	1	0	
553:	0	0	0	0	1	0	0	0	
561:	1	0	1	1	0	0	0	1	
569:	1	0	0	1	0	0	1	2	
577:	1	0	1	1	1	0	2	0	
585:	0	0	1	0	0	1	0	1	
593:	0	1	1	1	0	0	0	0	
601:	0	0	1	1	1	0	1	0	
609:	0	2	0	0	0	0	0	0	
617:	0	0	0	1	1	0	0	0	
625:	0	0	0	0	0	0	2	1	
633:	0	1	0	2	1	0	0	0	
641:	2	0	0	0	0	0	0	0	
649:	0	1	0	0	0	1	1	0	
657:	0	0	0	1	0	0	1	0	
665:	0	1	0	0	2	2	1	0	
673:	1	1	0	0	1	1	0	1	
681:	0	0	1	0	1	0	0	0	
689:	0	1	1	0	0	1	0	0	
697:	0	1	0	1	0	0	0	0	
705:	0	0	0	1	1	0	0	1	
713:	0	1	0	1	1	0	0	0	
721:	0	0	0	0	1	0	0	0	
729:	1	0	0	0	0	0	1	0	
737:	1	0	0	1	0	1	0	0	
745:	0	1	1	0	1	0	0	0	
753:	0	0	0	0	0	1	0	0	
761:	0	0	0	0	1	0	1	0	
769:	0	0	0	1	0	0	0	0	
777:	0	1	2	0	0	1	0	1	
785:	0	0	0	1	0	0	1	1	
793:	0	0	0	0	0	0	0	1	

801: 0 0 0 1 0 0 1 0

Sample Title: 10

Channel	1	2	3	4	5	6	7	8
809:	0	0	0	0	0	0	0	0
817:	0	0	1	0	0	1	0	0
825:	0	0	0	0	0	0	0	0
833:	0	2	0	0	1	1	0	0
841:	0	0	0	0	1	0	0	0
849:	0	0	1	0	0	1	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	1	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	1	0	0	0	0	0	0	0
937:	0	0	1	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	1	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	1	0	0	0	0	0
1001:	1	0	0	0	0	1	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	1	0	0	0



4/23/13

Sample Description: PZ-100-SD DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 11
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_041
 Chamber Serial Number: 05026930A
 Detector Serial Number: 91087
 Env. Background: System Bkgd 55211
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.470E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:45:13 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 1.0000 +/- 0.0000
 Counting Efficiency: 0.1978 +/- 0.0034 on 12/16/2012 5:49:31 PM
 Effective Efficiency: 0.1978 +/- 0.0034

Peak Match Tolerance: 0.350 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.516	41.15	30.92	0.85	0.00E+000	3.7
RA-226	4.588	109.13	18.95	1.87	0.00E+000	4.5

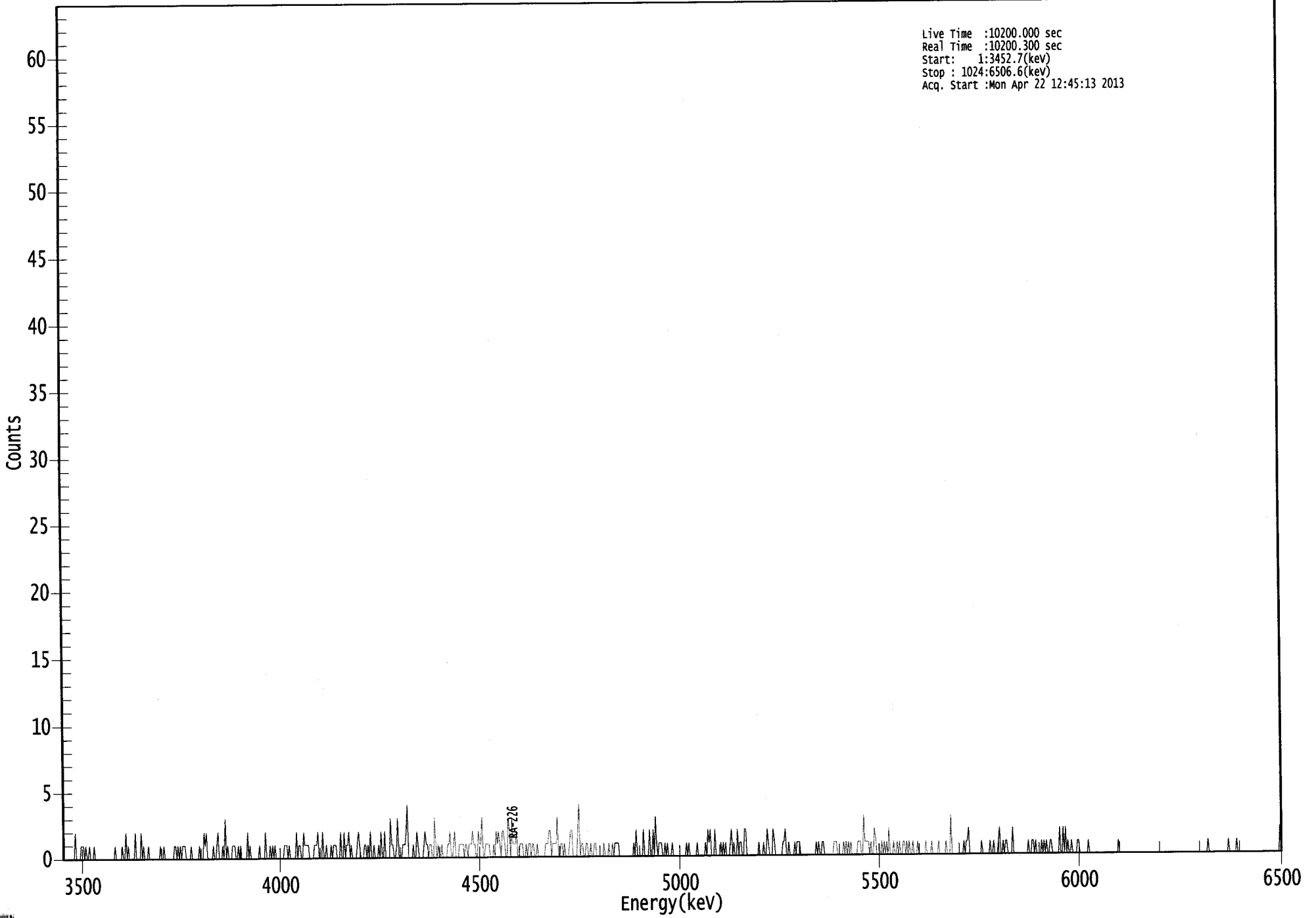
 NUCLIDE ANALYSIS RESULTS

Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.960	5685.50*	1.73E+000 +/- 1.40E+003	2.51E-001 +/- 2.04E+002
RA-226	0.950	4785.00*	2.41E+000 +/- 4.63E-001	1.67E-001 +/- 5.65E-003

AG
 4/23/13

000056144.CNF

Live Time :10200.000 sec
Real Time :10200.300 sec
Start: 1:3452.7(kev)
Stop : 1024:6506.6(kev)
Acq. Start :Mon Apr 22 12:45:13 2013



0376
9250

ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 11

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	2	0	0	0	0	1
17:	1	1	0	1	0	0	1	0
25:	0	0	1	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	1	0	0	0
49:	0	0	1	0	0	2	0	1
57:	0	0	0	0	0	2	0	0
65:	0	0	2	0	1	0	0	0
73:	1	0	0	0	0	0	0	0
81:	0	0	1	0	0	1	0	0
89:	0	0	0	0	0	0	1	1
97:	0	1	0	1	0	1	1	1
105:	0	0	0	0	1	0	0	0
113:	0	0	0	1	0	0	0	2
121:	1	2	0	0	0	0	0	1
129:	0	0	1	2	0	0	0	1
137:	0	3	0	1	0	0	0	1
145:	1	1	0	0	1	0	1	0
153:	0	0	0	0	2	0	1	0
161:	0	0	0	0	0	0	1	0
169:	0	0	0	2	0	0	0	1
177:	0	1	0	1	0	0	0	0
185:	0	0	0	1	1	1	0	1
193:	0	0	0	0	0	2	0	1
201:	1	0	0	2	1	1	1	1
209:	0	0	0	0	1	1	1	2
217:	0	0	0	2	0	0	1	0
225:	0	0	1	0	1	1	1	0
233:	0	0	2	0	0	2	0	1
241:	1	2	0	1	0	0	0	0
249:	1	2	1	0	0	0	1	1
257:	0	1	0	2	0	0	1	0
265:	0	0	1	0	2	0	0	2
273:	0	0	0	0	3	1	1	0
281:	0	1	3	0	0	0	1	1
289:	1	2	4	0	0	0	0	1
297:	0	0	2	1	0	0	0	0
305:	1	2	1	1	0	1	1	0
313:	0	3	1	0	1	0	0	1
321:	0	0	0	0	1	1	2	0
329:	0	1	2	0	0	0	1	1
337:	1	1	0	1	1	0	1	1
345:	1	2	1	1	0	0	2	1
353:	1	3	0	0	1	1	1	1
361:	0	0	0	1	0	2	1	2

369: 1 0 2 2 1 0 0 3

Sample Title: 11

Channel	1	2	3	4	5	6	7	8
377:	2	0	3	1	1	1	2	0
385:	0	1	1	1	0	0	1	0
393:	1	1	0	1	1	0	0	1
401:	0	0	0	0	0	0	1	1
409:	1	2	2	0	1	1	1	1
417:	3	0	0	1	1	0	1	0
425:	0	0	1	2	2	0	0	0
433:	0	2	4	0	1	1	0	0
441:	1	1	0	0	1	0	0	1
449:	1	0	0	0	0	0	0	1
457:	0	0	0	1	0	0	1	0
465:	1	1	1	1	0	0	0	0
473:	0	0	0	0	0	0	0	0
481:	1	0	2	0	0	0	0	0
489:	2	0	0	0	0	2	0	0
497:	2	0	3	1	0	1	1	1
505:	0	0	1	0	1	0	0	0
513:	1	0	0	0	0	0	0	0
521:	0	0	0	0	1	0	1	0
529:	0	0	0	0	0	1	0	0
537:	0	0	0	0	1	0	2	1
545:	2	0	0	0	2	0	0	0
553:	0	1	0	1	0	1	0	0
561:	0	1	2	0	1	0	0	2
569:	0	1	1	0	0	2	2	0
577:	0	0	0	0	0	0	0	0
585:	0	1	0	0	0	1	0	0
593:	2	1	0	0	0	2	1	0
601:	0	0	0	0	0	1	1	2
609:	0	0	1	0	0	0	0	1
617:	0	1	1	1	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	1	0	1	0	0	1	1
641:	0	0	0	0	0	0	0	0
649:	1	1	1	0	0	0	0	0
657:	1	0	1	0	1	0	1	0
665:	0	0	0	0	1	1	1	0
673:	0	3	1	1	1	1	0	1
681:	0	0	2	1	0	0	0	0
689:	1	0	1	0	1	0	2	0
697:	0	0	1	0	0	1	0	1
705:	0	0	1	1	0	1	0	1
713:	0	0	1	0	0	0	1	0
721:	0	0	0	0	0	1	0	0
729:	0	0	1	0	0	0	0	0
737:	1	0	0	0	0	0	1	0
745:	0	0	3	0	0	0	0	0
753:	0	0	0	0	0	1	0	1
761:	1	2	0	0	0	0	0	0
769:	0	0	0	0	1	0	0	0
777:	0	0	0	1	0	0	1	0
785:	0	0	1	2	0	0	1	0
793:	1	1	0	0	0	0	2	0

801: 0 0 0 0 0 0 0 0

Sample Title: 11

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	1	0	0	1	1
817:	0	1	0	0	0	0	1	0
825:	1	0	1	0	0	1	1	0
833:	0	0	0	0	0	2	0	0
841:	2	0	2	0	1	0	0	1
849:	0	0	0	0	1	1	0	0
857:	0	0	0	0	0	1	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	1	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	1	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	1	0	0	0	0	0
985:	0	1	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	2	0	0



C
4/27/13

Sample Description: I-67 DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 12
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_042
 Chamber Serial Number: 05026930B
 Detector Serial Number: 84185
 Env. Background: System Bkgd 55212
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.580E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:45:15 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9452 +/- 0.0000
 Counting Efficiency: 0.1846 +/- 0.0032 on 12/16/2012 5:49:29 PM
 Effective Efficiency: 0.1745 +/- 0.0030

Peak Match Tolerance: 0.350 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.515	10.66	61.14	0.34	0.00E+000	3.0
RA-226	4.608	26.32	38.78	0.68	0.00E+000	4.5

 NUCLIDE ANALYSIS RESULTS

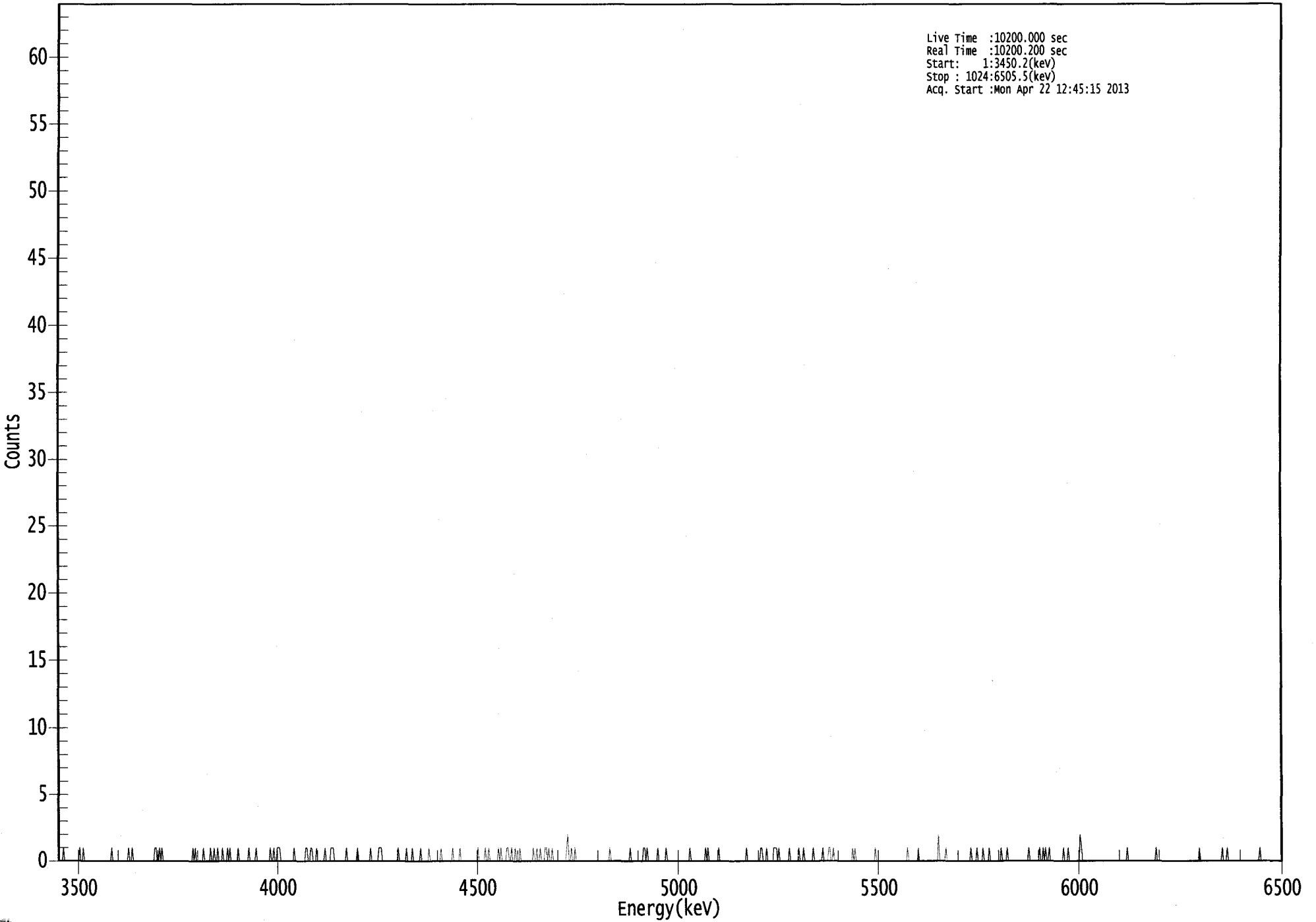
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.959	5685.50*	5.29E-001 +/- 4.29E+002	2.37E-001 +/- 1.93E+002
RA-226	0.960	4785.00*	6.87E-001 +/- 2.68E-001	1.47E-001 +/- 5.02E-003

AG
4/23/13

US EPA ARCHIVE DOCUMENT

000056145.CNF

Live Time :10200.000 sec
Real Time :10200.200 sec
Start: 1:3450.2(kev)
Stop : 1024:6505.5(kev)
Acq. Start :Mon Apr 22 12:45:15 2013



100

ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 12

Elapsed Live time: 10200
 Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	1	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	1	0	0	1	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	1	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	1	0	0	1	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	1	1	0	0	1	0	1
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	1	0	1	0	0	0	0
121:	0	0	1	0	0	0	0	0
129:	1	0	0	1	0	0	1	0
137:	0	0	1	0	0	0	1	0
145:	1	0	0	0	0	0	0	1
153:	0	0	0	0	0	0	0	0
161:	1	0	0	0	0	0	1	0
169:	0	0	0	0	0	0	0	0
177:	0	0	1	0	0	1	0	0
185:	1	1	1	0	0	0	0	0
193:	0	0	0	0	0	0	1	0
201:	0	0	0	0	0	0	0	0
209:	1	1	0	0	1	1	0	0
217:	0	1	0	0	0	0	0	0
225:	1	0	0	0	0	1	1	1
233:	0	0	0	0	0	0	0	0
241:	0	0	1	0	0	0	0	0
249:	0	0	0	1	0	0	0	0
257:	0	0	0	0	0	0	1	0
265:	0	0	0	0	0	1	1	1
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	1	0	0
289:	0	0	0	0	1	0	0	0
297:	0	1	0	0	0	0	0	0
305:	1	0	0	0	0	0	0	1
313:	0	0	0	0	0	0	0	0
321:	0	1	0	0	0	0	0	0
329:	0	0	0	1	0	0	0	0
337:	0	1	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	1	0	0	0	0	0	1	0
361:	0	1	0	0	0	0	0	0

369: 0 1 0 1 0 0 0 0

Sample Title: 12

Channel	1	2	3	4	5	6	7	8
377:	1	1	0	0	1	0	0	1
385:	0	0	0	1	0	0	0	0
393:	0	0	0	0	0	0	1	0
401:	0	1	0	0	1	0	0	0
409:	1	1	0	1	0	0	1	0
417:	0	0	0	0	0	0	0	0
425:	0	0	1	2	0	0	1	0
433:	0	1	0	0	0	0	0	0
441:	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0
457:	0	0	0	0	0	0	1	0
465:	0	0	0	0	0	0	0	0
473:	0	0	0	0	0	0	0	1
481:	0	0	0	0	0	0	0	0
489:	0	0	1	1	0	1	0	0
497:	0	0	0	0	0	0	1	0
505:	0	0	0	0	0	1	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	0	0	0	0	0	0
529:	0	1	0	0	0	0	0	0
537:	0	0	0	0	0	0	1	0
545:	1	0	0	0	0	0	0	0
553:	0	1	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	1	0	0	0	0	0	0	0
585:	0	0	0	0	1	1	0	0
593:	0	1	0	0	0	0	0	1
601:	1	1	0	1	0	0	0	0
609:	0	0	0	0	1	0	0	0
617:	0	0	0	0	1	0	0	0
625:	1	0	0	0	0	0	0	0
633:	1	0	0	0	0	0	0	0
641:	1	0	0	0	0	1	1	0
649:	0	1	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	1	0	1	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	1	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	1
713:	0	0	0	0	0	0	0	0
721:	1	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	2	0	0	0	0	0	1
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	1	0	0	0
769:	0	1	0	0	0	0	1	0
777:	0	0	0	1	0	0	0	0
785:	0	0	0	0	0	1	0	0
793:	0	0	1	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 12

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	1	0	0	0
817:	0	0	0	0	0	1	0	0
825:	1	0	1	0	0	1	0	0
833:	0	0	0	0	0	0	0	0
841:	0	1	0	0	0	1	0	0
849:	0	0	0	0	0	0	0	2
857:	1	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	1	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	1	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	1	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	1	0	0
977:	0	1	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	1	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



4/22/13

Sample Description: I-67 DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 13
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_044
 Chamber Serial Number: 04026481B
 Detector Serial Number: 84168
 Env. Background: System Bkgd 55214
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.580E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:45:10 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9882 +/- 0.0000
 Counting Efficiency: 0.1902 +/- 0.0033 on 12/16/2012 5:49:26 PM
 Effective Efficiency: 0.1879 +/- 0.0033

Peak Match Tolerance: 0.350 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.478	9.66	64.35	0.34	0.00E+000	3.0
RA-226	4.568	18.83	45.41	0.17	0.00E+000	3.0

 NUCLIDE ANALYSIS RESULTS

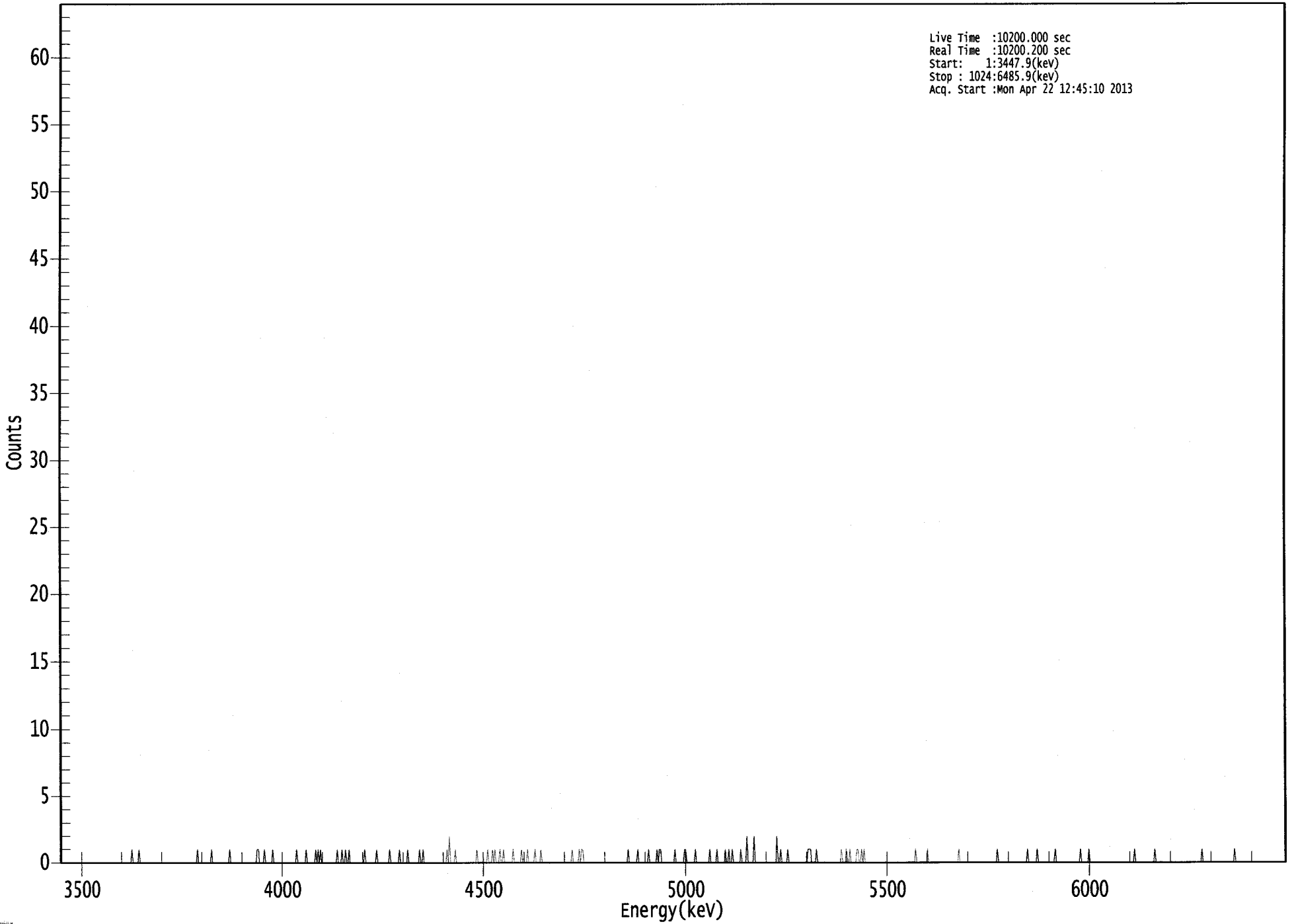
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.942	5685.50*	4.46E-001 +/- 3.61E+002	2.20E-001 +/- 1.79E+002
RA-226	0.941	4785.00*	4.57E-001 +/- 2.08E-001	1.01E-001 +/- 3.46E-003

AG
 4/23/13

US EPA ARCHIVE DOCUMENT

000056142.CNF

Live Time :10200.000 sec
Real Time :10200.200 sec
Start: 1:3447.9(kev)
Stop : 1024:6485.9(kev)
Acq. Start :Mon Apr 22 12:45:10 2013



9936

ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 13

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	1	0	0	0
65:	0	0	1	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	1	0	0	0	0
121:	0	0	0	0	0	0	0	1
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	1	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	1	1	0
169:	0	0	0	1	0	0	0	0
177:	0	0	1	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	1	0
201:	0	0	0	0	0	0	1	0
209:	0	0	0	0	0	0	1	0
217:	1	0	1	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	1	0	0	0	1	0	0	1
241:	0	0	1	0	0	0	0	0
249:	0	0	0	0	0	0	0	1
257:	0	0	0	0	0	0	0	0
265:	0	1	0	0	0	0	0	0
273:	0	0	0	0	1	0	0	0
281:	0	0	0	0	1	0	0	0
289:	0	0	0	1	0	0	0	0
297:	0	0	0	0	0	1	0	0
305:	1	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	1	0	2	0
329:	0	0	0	1	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	1	0	0
353:	0	0	0	0	0	0	1	0
361:	0	0	1	0	1	0	0	0

369: 1 0 0 1 0 0 0 0

Sample Title: 13

Channel	1	2	3	4	5	6	7	8
377:	0	0	0	1	0	0	0	0
385:	0	0	1	0	0	0	0	1
393:	0	0	0	0	0	1	0	0
401:	0	0	1	0	0	0	0	0
409:	0	0	0	0	0	0	0	0
417:	0	0	0	0	0	0	0	0
425:	0	0	0	0	1	0	0	0
433:	0	0	1	0	1	1	0	0
441:	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0
457:	0	0	0	0	0	0	0	0
465:	0	0	0	0	0	0	0	0
473:	0	0	0	1	0	0	0	0
481:	0	0	0	1	0	0	0	0
489:	0	0	0	0	1	0	0	0
497:	0	0	0	1	0	1	1	0
505:	0	0	0	0	0	0	0	0
513:	0	0	1	0	0	0	0	0
521:	0	0	1	1	0	0	0	0
529:	0	0	0	1	0	0	0	0
537:	0	0	0	0	0	0	0	1
545:	0	0	0	0	0	1	0	0
553:	0	0	0	0	1	0	0	1
561:	0	0	1	0	0	0	0	0
569:	0	1	0	0	0	0	2	0
577:	0	0	0	0	2	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	2
601:	0	0	1	0	0	0	0	0
609:	1	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	1	1	1	0	0	0	0
633:	1	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	1	0	0
657:	0	1	0	0	1	0	0	0
665:	0	0	1	1	0	0	1	0
673:	1	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	1	0	0	0	0
721:	0	0	0	0	0	1	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	1
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	1
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 13

Channel	1	2	3	4	5	6	7	8
809:	1	0	0	0	0	0	0	0
817:	1	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	1
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	1	0	0	0
857:	0	0	0	1	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	1	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	1	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	1	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	1	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



Sample Description: PZ-203-SS TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 14
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_046
 Chamber Serial Number: 04026482B
 Detector Serial Number: 58762
 Env. Background: System Bkgd 55215
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.400E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:45:11 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.8694 +/- 0.0000
 Counting Efficiency: 0.1789 +/- 0.0031 on 12/16/2012 5:49:23 PM
 Effective Efficiency: 0.1556 +/- 0.0027

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.518	25.83	38.71	0.17	0.00E+000	4.5
RA-226	4.683	44.83	29.34	0.17	0.00E+000	3.7

 ----- NUCLIDE ANALYSIS RESULTS -----

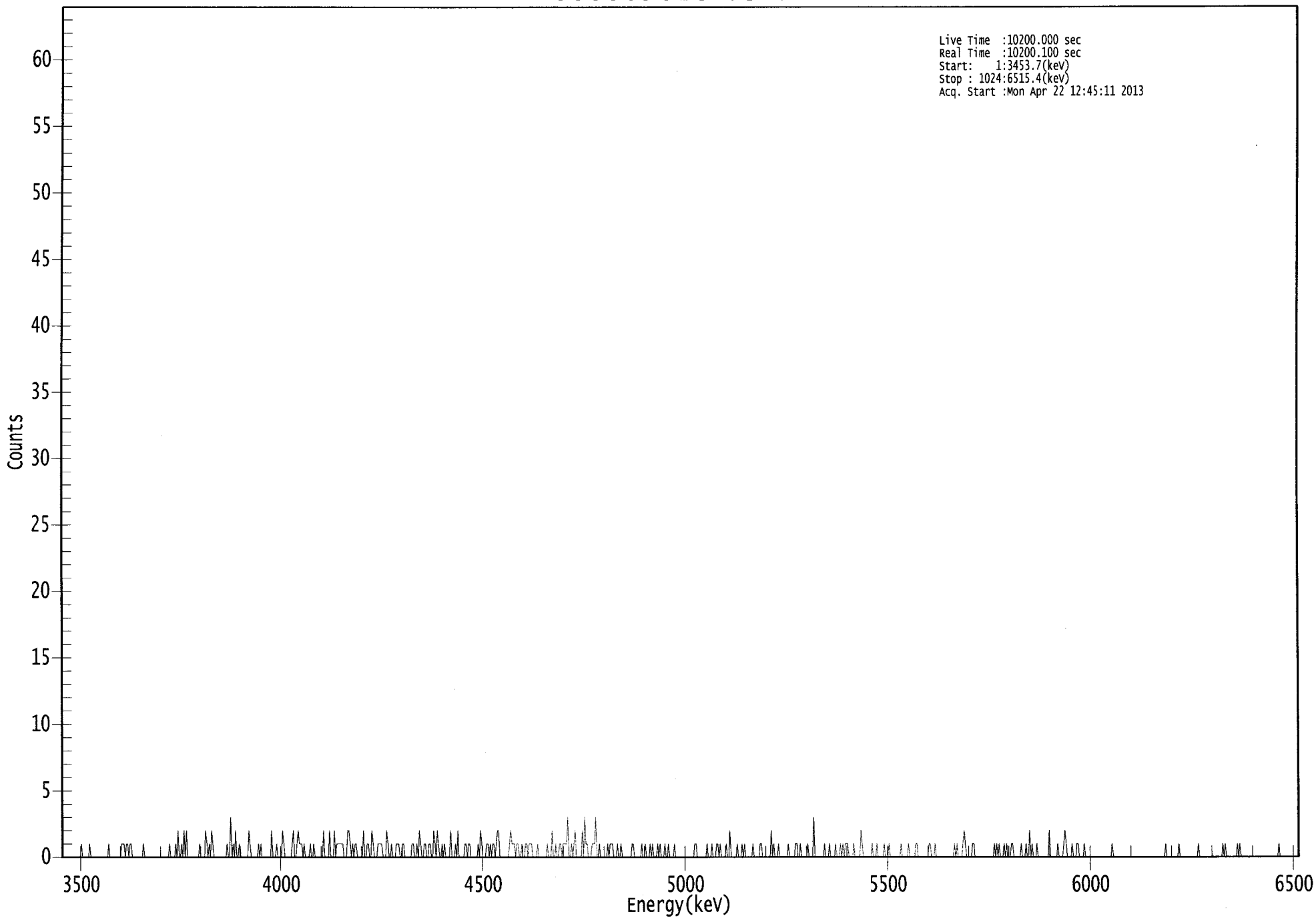
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.960	5685.50*	1.34E+000 +/- 1.09E+003	2.16E-001 +/- 1.75E+002
RA-226	0.987	4785.00*	1.22E+000 +/- 3.61E-001	1.14E-001 +/- 3.91E-003

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4/23/13

US EPA ARCHIVE DOCUMENT

000056182.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3453.7(kev)
Stop : 1024:6515.4(kev)
Acq. Start :Mon Apr 22 12:45:11 2013



ROI Type: 1

000056182

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 14

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	1	0	0	0	0	0	0	1
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	1
41:	0	0	0	0	0	0	0	0
49:	0	0	1	1	1	0	1	1
57:	0	1	1	0	0	0	0	0
65:	0	0	0	0	1	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	1	0	0	0	0	1
97:	0	2	0	0	1	0	2	0
105:	2	0	0	0	0	0	0	0
113:	0	0	0	1	0	0	0	0
121:	2	1	0	1	0	2	1	0
129:	0	0	0	0	0	0	0	0
137:	0	0	1	0	0	3	0	1
145:	0	2	0	0	1	0	0	0
153:	0	0	0	0	2	1	0	0
161:	0	0	0	0	1	0	1	0
169:	0	0	0	0	0	0	0	2
177:	0	0	0	1	0	0	0	0
185:	2	1	0	0	0	0	0	0
193:	1	2	0	0	1	2	1	1
201:	1	0	1	0	0	0	0	1
209:	0	0	1	0	0	0	0	0
217:	0	0	2	0	0	0	0	2
225:	0	0	0	2	0	1	1	1
233:	1	1	1	0	0	0	2	2
241:	1	0	1	0	1	1	0	0
249:	0	0	0	2	0	0	1	1
257:	0	0	2	1	0	0	0	1
265:	1	1	1	0	0	0	2	1
273:	0	0	1	0	0	0	1	1
281:	1	0	0	1	1	0	0	0
289:	0	0	0	1	1	0	0	1
297:	0	2	1	0	0	1	1	0
305:	0	1	1	0	0	2	1	0
313:	2	1	0	0	1	0	1	0
321:	0	0	0	2	0	0	0	1
329:	0	2	0	0	0	0	0	1
337:	1	0	1	1	0	0	0	0
345:	0	0	1	0	2	1	0	0
353:	0	1	1	0	1	0	1	1
361:	0	1	2	2	0	0	0	0

369: 0 0 0 0 1 2 1 1

Sample Title: 14

Channel	1	2	3	4	5	6	7	8
377:	1	0	1	1	0	0	1	0
385:	0	1	1	0	1	1	1	0
393:	0	0	0	1	0	0	0	0
401:	0	0	0	1	0	0	0	2
409:	0	0	1	0	0	1	1	0
417:	1	1	1	1	3	0	0	1
425:	0	1	2	0	0	0	0	0
433:	2	0	3	1	1	0	0	0
441:	1	1	1	3	0	0	1	0
449:	0	0	0	0	0	1	0	1
457:	1	1	0	0	0	1	0	0
465:	1	0	0	0	0	0	0	0
473:	0	1	1	0	0	0	0	0
481:	0	1	0	0	1	0	0	0
489:	1	0	1	0	0	0	1	0
497:	1	0	0	0	1	0	0	1
505:	0	0	0	0	1	0	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	0	0	0	1	1	0
529:	0	0	0	0	0	0	0	1
537:	0	0	0	1	0	0	0	1
545:	1	0	1	0	0	0	0	1
553:	0	0	2	0	0	0	0	0
561:	1	0	0	0	1	0	1	0
569:	0	0	0	0	0	1	0	0
577:	0	0	0	1	1	0	0	0
585:	0	0	0	0	2	0	1	0
593:	0	0	1	0	0	0	0	0
601:	0	0	1	0	0	0	0	0
609:	1	1	0	0	1	0	0	0
617:	0	0	1	0	0	0	0	3
625:	0	0	0	0	0	0	0	0
633:	1	0	0	0	1	0	0	0
641:	0	1	0	0	0	1	0	1
649:	0	1	1	1	0	0	0	0
657:	1	0	0	0	0	0	2	1
665:	0	0	0	0	0	0	0	1
673:	0	0	0	1	0	0	0	0
681:	0	1	0	0	0	1	0	0
689:	0	0	0	0	0	0	0	1
697:	0	0	0	0	0	1	0	0
705:	0	0	0	1	1	0	0	0
713:	0	0	0	0	0	0	1	1
721:	0	0	0	1	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	1	0	1	0	0
745:	0	0	1	2	1	0	0	0
753:	0	0	1	1	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	1	0	1	0
777:	1	0	0	0	1	0	1	0
785:	0	0	1	1	0	0	0	0
793:	0	0	1	0	0	0	1	0

801: 0 2 0 1 0 0 0 1

Sample Title: 14

Channel	1	2	3	4	5	6	7	8
809:	0	0	0	0	0	0	0	0
817:	0	2	0	0	0	0	0	0
825:	1	0	0	0	0	1	2	1
833:	0	0	0	0	1	0	0	0
841:	1	1	0	0	0	0	1	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	1	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	1	0	0	0	0	0	0
921:	0	0	0	0	1	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	1	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	1	0	1	0	0	0	0	0
969:	0	0	0	0	1	0	1	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	1	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



✓
4/23/13

Sample Description: PZ-203-SS DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 15
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_047
 Chamber Serial Number: 02030596A
 Detector Serial Number: 91086
 Env. Background: System Bkgd 55216
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.340E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:45:07 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.9807 +/- 0.0000
 Counting Efficiency: 0.1822 +/- 0.0032 on 12/16/2012 5:49:21 PM
 Effective Efficiency: 0.1786 +/- 0.0031

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.512	33.66	33.98	0.34	0.00E+000	4.4
RA-226	4.583	62.32	24.99	0.68	0.00E+000	3.7

 ----- NUCLIDE ANALYSIS RESULTS -----

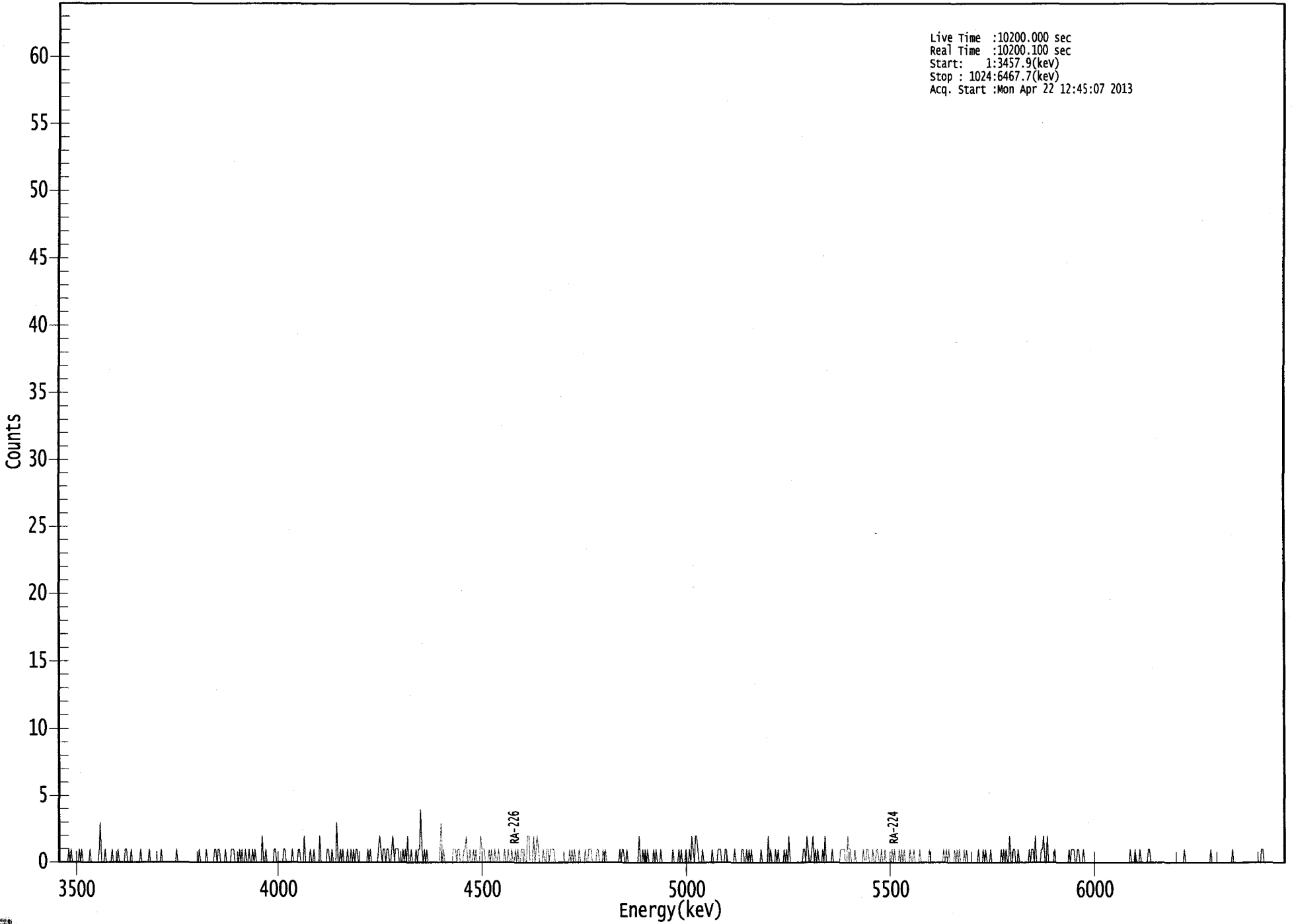
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.958	5685.50*	1.48E+000 +/- 1.20E+003	2.10E-001 +/- 1.71E+002
RA-226	0.948	4785.00*	1.44E+000 +/- 3.64E-001	1.31E-001 +/- 4.48E-003

AG
4/23/13

US EPA ARCHIVE DOCUMENT

000056146.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3457.9(keV)
Stop : 1024:6467.7(keV)
Acq. Start :Mon Apr 22 12:45:07 2013



ROI Type: 1

0000

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 15

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	1	0	1	0	0	0	0	0
17:	0	1	0	1	0	0	0	0
25:	0	0	1	0	0	0	0	0
33:	0	0	1	3	0	0	0	1
41:	0	0	0	0	0	1	0	0
49:	0	0	1	0	0	0	0	0
57:	1	1	0	0	0	1	0	0
65:	0	0	0	0	0	1	0	0
73:	0	0	0	0	1	0	0	0
81:	0	0	0	0	0	0	1	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	1	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	1	0
121:	0	0	0	0	1	0	0	0
129:	0	0	0	1	1	0	1	1
137:	0	0	0	0	1	0	0	0
145:	0	1	1	1	0	0	0	0
153:	1	0	1	0	0	1	0	0
161:	1	0	0	1	0	1	0	0
169:	0	0	0	2	0	0	1	0
177:	0	0	0	0	0	1	1	0
185:	0	0	0	0	0	1	1	0
193:	0	0	0	0	1	0	0	0
201:	0	1	1	0	0	0	2	0
209:	0	0	0	1	0	0	1	0
217:	0	0	0	2	0	0	0	0
225:	0	1	1	0	0	1	0	0
233:	0	3	0	0	1	0	1	0
241:	0	0	1	0	0	1	0	1
249:	0	1	1	0	0	0	0	0
257:	0	0	0	1	0	1	0	0
265:	0	0	0	0	1	2	1	0
273:	1	1	0	1	1	0	0	1
281:	2	0	1	1	1	0	0	0
289:	1	0	1	0	2	0	0	1
297:	0	0	0	1	0	1	1	4
305:	1	0	1	0	1	0	0	0
313:	0	0	0	0	0	0	0	1
321:	3	0	1	0	0	0	0	0
329:	0	0	1	1	1	0	1	1
337:	0	0	0	1	1	2	0	0
345:	1	0	0	1	0	1	0	0
353:	0	2	1	1	1	0	0	0
361:	1	0	1	0	0	1	0	0

369: 1 0 0 0 0 1 0 0

Sample Title: 15

Channel	1	2	3	4	5	6	7	8
377:	1	0	0	1	0	0	1	0
385:	1	0	0	1	1	1	0	0
393:	2	2	0	0	0	2	0	1
401:	2	1	0	0	0	1	0	0
409:	1	1	0	1	1	1	1	0
417:	0	0	0	0	0	0	0	0
425:	0	0	0	1	0	1	0	1
433:	0	0	0	1	0	0	0	0
441:	1	0	0	1	1	1	0	0
449:	0	0	1	1	0	0	0	1
457:	0	1	0	0	0	0	0	0
465:	0	0	0	0	0	1	0	1
473:	1	0	0	1	0	0	0	0
481:	0	0	0	0	0	2	0	0
489:	1	0	1	0	1	0	0	0
497:	0	1	0	1	0	0	0	1
505:	0	0	0	0	0	0	0	0
513:	0	1	0	0	0	0	1	0
521:	1	0	0	0	1	0	0	1
529:	0	2	1	0	2	2	1	0
537:	0	0	1	0	0	0	0	0
545:	0	0	1	0	0	0	0	1
553:	1	1	0	0	0	1	1	0
561:	0	0	0	0	0	1	0	0
569:	0	0	0	1	1	0	0	1
577:	0	1	0	1	0	0	0	0
585:	0	0	0	1	0	0	0	0
593:	0	2	0	1	0	0	0	1
601:	0	1	0	0	0	0	1	0
609:	1	0	2	0	0	0	0	0
617:	0	0	0	0	0	0	1	1
625:	0	2	1	0	0	1	2	0
633:	1	0	1	0	0	0	1	0
641:	2	0	0	0	0	0	1	0
649:	0	0	0	0	0	1	1	1
657:	1	0	0	2	1	1	0	0
665:	0	1	0	0	0	0	0	0
673:	1	0	0	1	1	0	0	0
681:	1	0	0	1	1	0	0	1
689:	0	0	1	0	0	0	0	0
697:	1	0	1	0	0	0	1	0
705:	1	0	1	0	0	0	0	1
713:	0	0	1	0	0	0	0	1
721:	0	0	0	0	0	0	0	1
729:	0	0	0	0	0	0	0	0
737:	0	0	0	1	0	1	0	1
745:	0	0	0	0	1	0	1	0
753:	1	0	0	0	1	0	1	0
761:	0	0	0	0	0	0	0	0
769:	1	0	0	0	1	0	1	0
777:	0	0	1	0	0	0	0	0
785:	0	0	0	1	0	1	0	1
793:	0	0	2	0	0	1	1	0

801: 0 1 0 0 0 0 0 0

Sample Title: 15

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	1	0	1	1	0	2
817:	0	0	0	0	1	1	2	0
825:	0	2	0	0	0	0	0	1
833:	0	0	0	0	0	0	0	0
841:	0	0	0	1	0	1	1	1
849:	0	0	1	1	0	0	0	1
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	1	0
897:	0	0	1	0	0	0	1	0
905:	0	0	0	0	0	1	1	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	1	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	1	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	1	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	1	1	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



Apex-Alpha™

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4/27/13

Sample Description: PZ-100-SS TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 16
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_048
 Chamber Serial Number: 02030596B
 Detector Serial Number: 83111
 Env. Background: System Bkgd 55217
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.400E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 12:45:08 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.8942 +/- 0.0000
 Counting Efficiency: 0.1680 +/- 0.0030 on 12/16/2012 5:49:20 PM
 Effective Efficiency: 0.1502 +/- 0.0027

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.501	46.98	28.96	1.02	0.00E+000	3.4
RA-226	4.599	162.83	15.37	0.17	0.00E+000	3.3

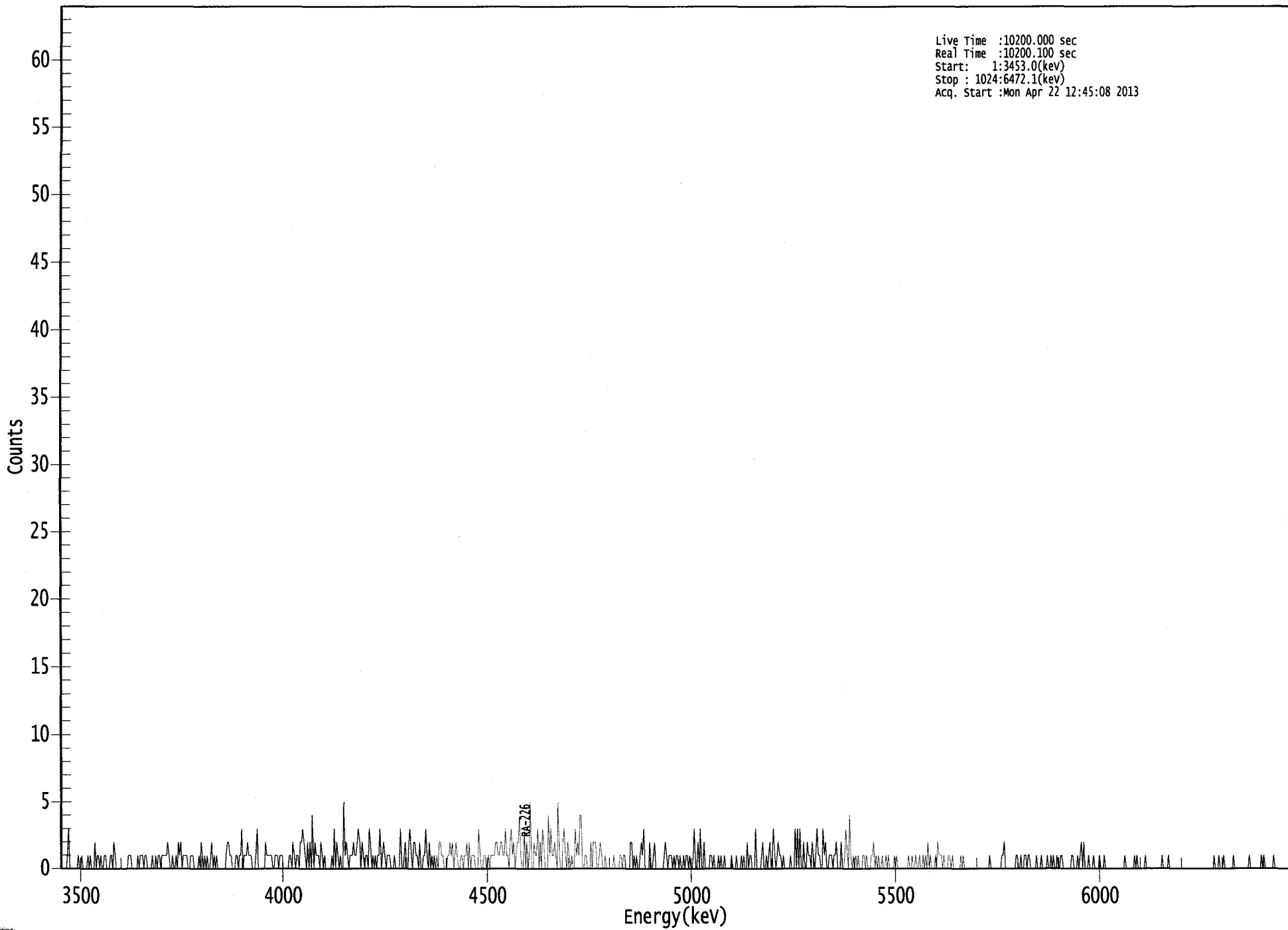
 ----- NUCLIDE ANALYSIS RESULTS -----

Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.953	5685.50*	2.52E+000 +/- 2.05E+003	3.38E-001 +/- 2.74E+002
RA-226	0.956	4785.00*	4.60E+000 +/- 7.24E-001	1.18E-001 +/- 4.08E-003

AG
4/23/13

0000056147.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3453.0(kev)
Stop : 1024:6472.1(kev)
Acq. Start :Mon Apr 22 12:45:08 2013



ROI Type: 1

1070

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 16

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	1	3	0
9:	0	0	0	0	0	0	1	0
17:	0	1	0	0	0	0	1	0
25:	1	0	0	0	2	0	1	1
33:	0	1	0	0	1	1	0	0
41:	0	1	1	0	2	1	0	0
49:	0	0	0	0	0	0	0	0
57:	1	1	1	0	0	0	0	0
65:	1	0	1	1	1	0	1	1
73:	0	0	0	0	1	0	0	1
81:	0	1	1	0	1	1	1	1
89:	1	2	1	0	0	1	0	0
97:	1	0	2	1	2	0	1	1
105:	1	1	0	0	1	1	1	0
113:	0	0	0	1	0	2	1	0
121:	1	0	1	0	0	1	2	0
129:	1	0	1	0	0	0	0	0
137:	0	0	1	2	2	1	1	0
145:	0	0	1	1	0	1	1	3
153:	0	1	1	1	2	1	1	1
161:	0	0	0	1	3	0	0	0
169:	0	0	0	2	1	1	1	1
177:	1	0	0	1	1	1	0	1
185:	1	1	0	0	0	0	0	1
193:	1	0	2	1	0	1	1	0
201:	2	2	3	2	1	0	2	0
209:	2	0	4	0	2	1	1	1
217:	0	2	1	0	1	0	0	0
225:	0	0	1	0	3	0	2	1
233:	0	1	0	0	5	1	2	1
241:	0	1	1	1	2	1	1	2
249:	3	2	0	2	1	0	1	1
257:	0	3	2	0	1	0	1	0
265:	1	1	3	0	1	2	1	0
273:	1	1	1	0	0	0	1	0
281:	0	0	0	3	0	0	1	2
289:	0	0	2	3	1	0	2	2
297:	1	1	0	2	0	0	1	1
305:	3	1	0	2	0	1	0	1
313:	0	1	0	2	2	1	1	0
321:	0	0	1	1	2	1	2	0
329:	1	2	1	0	0	1	1	0
337:	1	1	2	0	2	0	1	1
345:	1	0	0	0	3	1	0	0
353:	1	1	0	0	1	0	1	1
361:	1	1	2	2	1	1	2	2

369: 1 1 3 1 1 0 2 3

Sample Title: 16

Channel	1	2	3	4	5	6	7	8
377:	1	2	0	1	2	2	4	1
385:	0	0	3	0	2	0	1	5
393:	0	0	2	1	1	3	0	2
401:	0	3	2	0	0	0	4	1
409:	3	1	1	2	1	0	5	1
417:	0	0	2	3	1	0	2	1
425:	0	1	0	0	3	1	2	1
433:	4	4	0	0	1	1	0	0
441:	0	2	0	2	2	2	0	0
449:	1	2	1	0	0	1	0	0
457:	0	0	0	0	1	0	0	0
465:	0	1	1	0	1	1	0	0
473:	0	0	2	2	0	1	0	1
481:	0	0	1	2	1	3	0	0
489:	0	0	2	0	0	1	2	0
497:	0	0	0	0	0	0	1	2
505:	1	0	1	1	1	0	1	0
513:	1	1	0	1	0	0	1	0
521:	1	1	0	1	0	0	1	3
529:	0	0	2	0	3	0	0	2
537:	0	0	0	0	1	1	0	1
545:	0	0	0	1	0	1	0	0
553:	1	0	0	0	0	0	1	0
561:	0	0	1	0	0	0	1	0
569:	1	0	0	2	0	1	1	0
577:	0	0	3	0	0	0	0	1
585:	2	0	0	1	0	1	2	0
593:	1	3	1	0	1	2	1	1
601:	0	1	0	0	0	0	0	1
609:	0	0	0	3	0	3	0	3
617:	0	0	2	0	0	2	1	1
625:	0	2	1	0	1	3	1	1
633:	0	0	3	1	2	0	0	1
641:	1	1	0	1	1	2	0	0
649:	0	2	0	0	1	3	1	0
657:	4	1	0	1	0	1	0	1
665:	0	0	0	1	1	0	1	0
673:	0	0	1	1	2	0	1	0
681:	1	0	0	1	0	0	1	0
689:	1	0	0	0	0	1	0	1
697:	0	0	0	0	0	0	0	0
705:	0	1	0	0	1	0	0	1
713:	0	0	1	0	0	1	0	1
721:	0	2	0	1	0	0	0	1
729:	0	2	1	1	1	0	1	0
737:	0	0	1	1	0	1	0	0
745:	0	0	0	0	1	0	1	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	1	0	0	0
777:	0	0	0	0	0	0	1	1
785:	2	0	0	0	0	0	0	0
793:	0	0	1	1	0	0	1	0

801: 0 1 1 0 1 1 0 0

Sample Title: 16

Channel	1	2	3	4	5	6	7	8
809:	0	0	0	1	0	0	0	1
817:	0	0	0	0	1	0	0	1
825:	0	1	0	0	1	0	0	1
833:	1	0	0	0	0	0	0	0
841:	1	1	0	0	0	1	0	1
849:	2	0	2	0	0	0	1	0
857:	0	0	1	0	0	0	0	1
865:	0	0	0	1	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	1	0	0	0
889:	0	0	0	0	1	0	1	0
897:	0	0	0	0	0	1	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	1	0	0	0	0
921:	1	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	1	0
961:	0	0	1	0	0	0	1	0
969:	0	0	0	0	0	0	1	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	1	0	0	0	0
993:	0	0	0	0	0	1	0	1
1001:	0	0	0	0	0	0	0	1
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



2
4/22/13

Sample Description: PZ-100-SS DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 17
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_033
 Chamber Serial Number: 04026479A
 Detector Serial Number: 91132
 Env. Background: System Bkgd 55203
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.370E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 4:36:46 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 1.0000 +/- 0.0000
 Counting Efficiency: 0.1825 +/- 0.0032 on 12/16/2012 5:49:18 PM
 Effective Efficiency: 0.1825 +/- 0.0032

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.480	62.81	25.00	1.19	0.00E+000	3.5
RA-226	4.604	165.49	15.26	0.51	0.00E+000	4.0

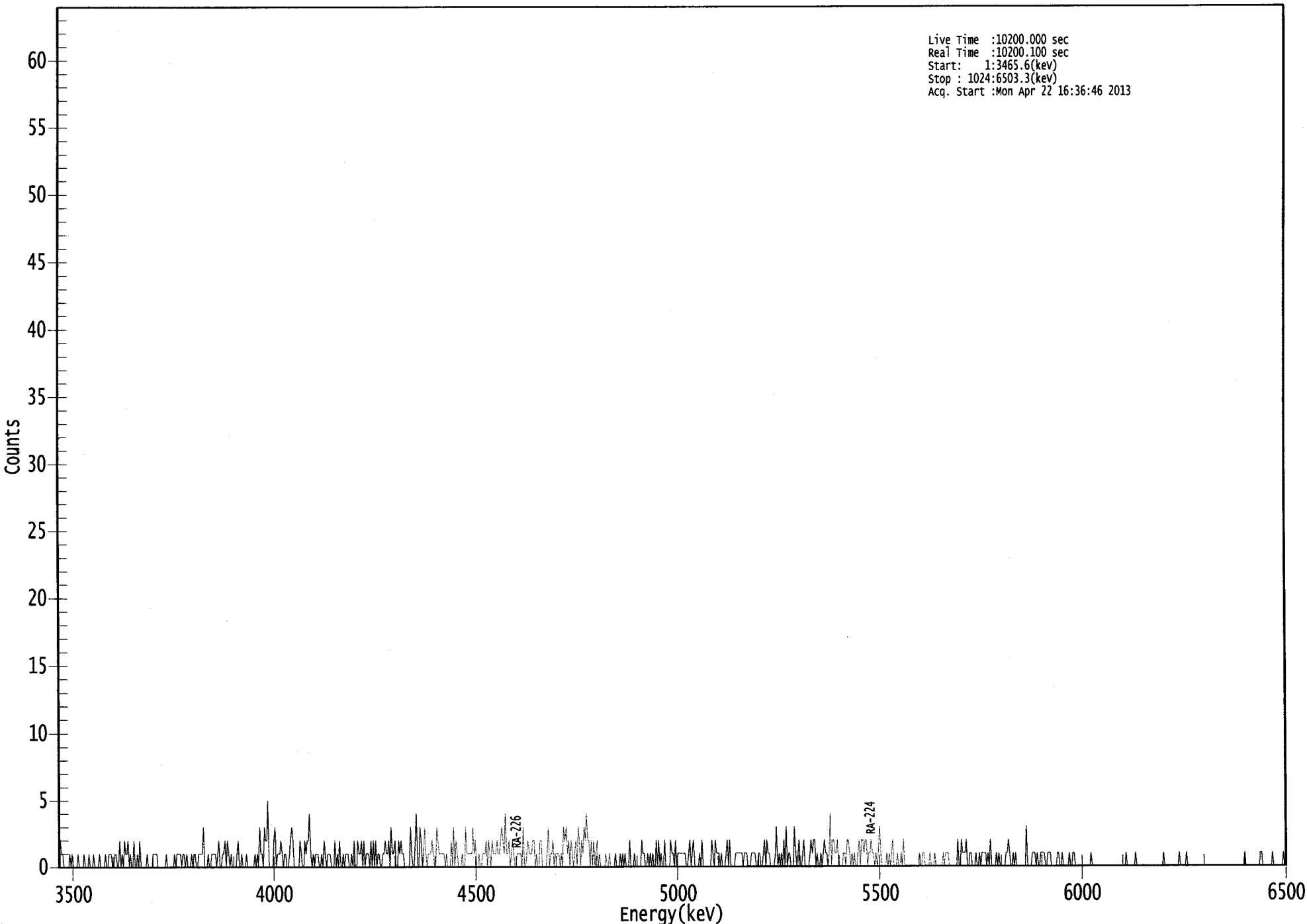
 ----- NUCLIDE ANALYSIS RESULTS -----

Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.943	5685.50*	2.83E+000 +/- 2.41E+003	2.96E-001 +/- 2.53E+002
RA-226	0.958	4785.00*	3.80E+000 +/- 5.94E-001	1.20E-001 +/- 4.15E-003

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4/23/13

US EPA ARCHIVE DOCUMENT

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3465.6(kev)
Stop : 1024:6503.3(kev)
Acq. Start :Mon Apr 22 16:36:46 2013



ROI Type: 1

0499
9070

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 17

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	2	1	1	0	0	0	0
9:	0	1	0	1	0	0	0	0
17:	1	0	0	0	0	1	0	0
25:	0	1	0	0	0	1	0	0
33:	0	0	1	0	0	0	0	1
41:	0	0	1	1	1	0	0	1
49:	1	0	0	2	0	1	0	2
57:	1	1	2	0	1	0	0	2
65:	0	0	1	0	2	0	0	0
73:	0	0	1	0	0	0	0	1
81:	1	1	1	0	0	0	0	0
89:	0	0	1	0	0	0	0	0
97:	0	1	0	1	1	1	1	0
105:	1	1	0	1	0	0	0	1
113:	0	1	1	0	0	1	1	1
121:	1	3	0	0	0	1	0	0
129:	1	1	1	1	0	1	2	0
137:	0	1	1	2	0	2	1	0
145:	1	0	0	0	0	1	2	0
153:	0	1	0	0	0	1	0	0
161:	0	0	0	0	1	0	1	0
169:	3	1	1	0	3	2	2	5
177:	0	0	0	0	2	3	0	1
185:	1	1	2	1	0	1	1	0
193:	0	1	2	3	2	0	0	0
201:	0	0	2	1	0	0	2	1
209:	2	2	4	1	0	1	0	1
217:	1	1	0	0	1	0	2	1
225:	0	1	1	1	0	0	0	2
233:	0	1	0	2	0	0	1	0
241:	1	1	1	0	0	1	0	2
249:	0	0	2	1	1	2	0	2
257:	0	1	1	1	0	2	0	2
265:	0	2	0	1	1	0	0	1
273:	1	2	1	1	2	0	3	1
281:	1	2	0	0	2	1	2	1
289:	1	0	0	0	0	0	3	1
297:	0	0	2	4	0	0	3	2
305:	0	1	3	1	0	1	1	1
313:	2	1	0	0	3	2	1	1
321:	1	1	1	0	1	0	0	0
329:	2	0	3	0	2	1	0	0
337:	0	1	0	0	3	1	1	1
345:	1	1	3	1	2	0	0	1
353:	0	0	1	1	1	2	0	2
361:	1	0	2	1	1	1	2	1

369: 1 2 3 2 1 4 1 1

Sample Title: 17

Channel	1	2	3	2	1	4	1	1
377:	2	0	1	2	1	0	0	1
385:	1	1	1	0	3	0	0	1
393:	2	1	1	1	2	2	0	1
401:	0	0	2	2	0	0	0	0
409:	1	3	0	1	1	2	0	1
417:	1	1	1	0	1	0	3	2
425:	3	1	2	0	2	1	0	1
433:	2	0	3	2	0	2	1	3
441:	2	4	2	2	0	2	0	2
449:	0	1	2	0	1	0	0	0
457:	0	1	0	0	1	0	0	0
465:	0	1	0	0	0	1	0	1
473:	0	1	0	0	0	2	0	0
481:	0	1	0	0	0	0	0	2
489:	1	1	0	0	1	0	1	0
497:	1	0	0	2	0	2	0	1
505:	0	0	2	0	0	0	0	2
513:	1	1	0	2	0	1	1	1
521:	1	1	1	1	0	0	1	2
529:	0	1	2	0	0	0	0	1
537:	0	2	0	0	0	0	0	0
545:	0	2	1	0	2	1	1	1
553:	0	1	0	0	0	1	2	0
561:	2	0	0	0	0	1	1	1
569:	1	1	1	0	1	1	1	0
577:	0	0	1	1	1	1	0	0
585:	1	1	0	0	1	2	0	2
593:	1	1	0	0	0	0	1	3
601:	0	1	0	1	0	2	0	3
609:	0	1	1	0	0	0	3	1
617:	0	1	2	0	0	1	2	0
625:	0	0	0	1	2	1	2	2
633:	0	1	0	0	1	0	1	2
641:	1	1	0	1	4	0	2	2
649:	1	1	2	0	0	0	0	1
657:	1	0	2	2	1	0	1	0
665:	1	0	0	1	2	0	2	2
673:	1	2	2	0	1	1	2	1
681:	1	0	1	0	1	3	1	0
689:	0	0	0	1	0	1	0	1
697:	2	0	0	0	1	0	0	1
705:	0	2	0	0	0	0	0	0
713:	0	0	0	0	0	0	1	0
721:	0	1	1	0	0	0	0	1
729:	0	0	0	1	0	0	0	0
737:	0	0	1	0	1	1	1	0
745:	0	0	0	0	0	0	2	0
753:	0	2	1	1	1	2	0	0
761:	1	1	0	0	0	1	0	0
769:	1	0	1	1	1	1	0	1
777:	0	2	0	0	0	0	1	0
785:	1	0	0	0	0	0	1	1
793:	2	1	0	0	1	0	1	0

801: 0 0 0 0 0 0 0 0 3

Sample Title: 17

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	1	1	1	0
817:	1	0	0	1	1	1	1	0
825:	0	1	1	1	0	0	0	0
833:	0	1	1	0	0	1	0	0
841:	0	0	0	1	0	0	1	1
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	1	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	1	0	0	0	0	0
897:	0	0	1	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	1	0	0	0	0	0	0
929:	0	0	0	0	0	0	1	0
937:	0	0	0	0	1	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	1	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	1	1	0	0	0	0	0
1009:	0	0	0	1	0	0	0	0
1017:	0	0	0	0	1	0	1	0



41-7117

Sample Description: I-66 TOT
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 18
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_034
 Chamber Serial Number: 04026479B
 Detector Serial Number: 91136
 Env. Background: System Bkgd 55204
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.310E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 4:36:48 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.8294 +/- 0.0000
 Counting Efficiency: 0.1856 +/- 0.0032 on 12/16/2012 5:49:43 PM
 Effective Efficiency: 0.1539 +/- 0.0027

Peak Match Tolerance: 0.350 MeV

 PEAK AREA REPORT

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.546	4.49	98.45	0.51	0.00E+000	5.9
RA-226	4.658	8.66	68.12	0.34	0.00E+000	3.0

 NUCLIDE ANALYSIS RESULTS

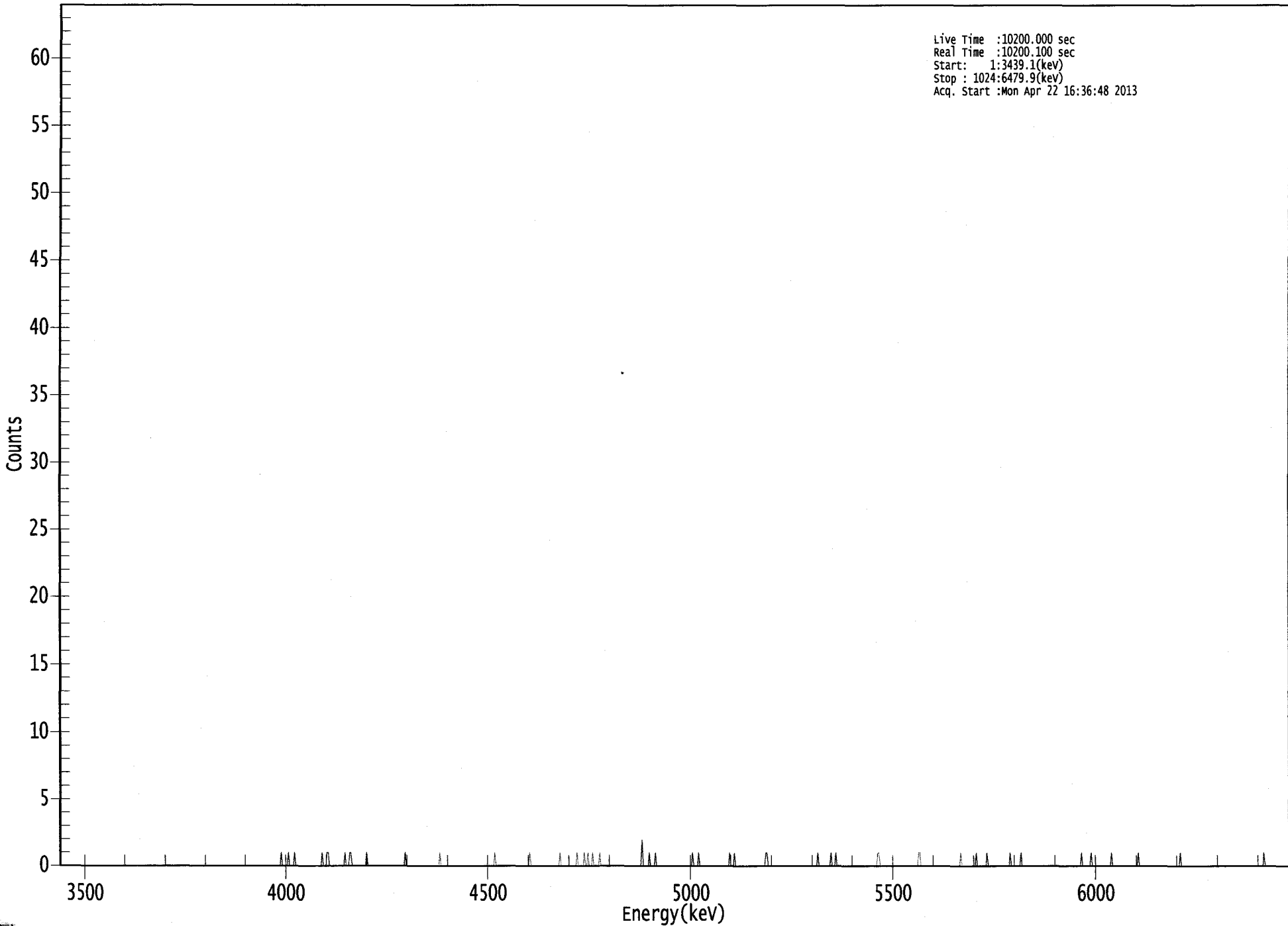
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.971	5685.50*	2.33E-001 +/- 1.99E+002	2.73E-001 +/- 2.33E+002
RA-226	0.979	4785.00*	2.30E-001 +/- 1.57E-001	1.27E-001 +/- 4.33E-003

AG
 4/23/13

US EPA ARCHIVE DOCUMENT

0000056150.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3439.1(kev)
Stop : 1024:6479.9(kev)
Acq. Start :Mon Apr 22 16:36:48 2013



1170

ROI Type: 1

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 18

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0
185:	0	1	0	0	0	0	1
193:	0	0	0	0	1	0	0
201:	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0
217:	0	0	0	1	0	0	1
225:	1	0	0	0	0	0	0
233:	0	0	0	0	0	0	1
241:	0	0	1	1	0	0	0
249:	0	0	0	0	0	0	0
257:	1	0	0	0	0	0	0
265:	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0
289:	1	0	0	0	0	0	0
297:	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0
313:	0	0	0	0	0	1	0
321:	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0
361:	0	0	0	1	0	0	0

369: 0 0 0 0 0 0 0 0

Sample Title: 18

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	0
393:	1	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	0	0	0
417:	0	1	0	0	0	0	0	0
425:	0	0	0	0	0	0	0	1
433:	0	0	0	0	0	1	0	0
441:	1	0	0	0	1	0	0	0
449:	0	0	1	0	0	0	0	0
457:	0	0	0	0	0	0	0	0
465:	0	0	0	0	0	0	0	0
473:	0	0	0	0	0	0	0	0
481:	0	0	0	0	0	2	0	0
489:	0	0	0	1	0	0	0	0
497:	1	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	0	0	0	0	0	1
529:	0	0	0	0	1	0	0	0
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	1	0
561:	0	0	1	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	1	1	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	1
633:	0	0	0	0	0	0	0	0
641:	0	0	1	0	0	0	1	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	1	1	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	1	1	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	1	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	1	0	0	0	0
769:	0	0	0	0	1	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	1
793:	0	0	0	0	0	0	0	0

801: 1 0 0 0 0 0 0 0

Sample Title: 18

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	1	0	0	0	0	0
857:	0	0	1	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	1	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	1	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	1	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	1	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



4/22/13

Sample Description: I-66 DIS
 Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00000561
 Batch Identification: 1304052A-RA
 Sample Identification: 19
 Sample Geometry: Shelf 2
 Procedure Description: Ra

Detector Name: Alpha_035
 Chamber Serial Number: 04026477A
 Detector Serial Number: 58771
 Env. Background: System Bkgd 55205
 Reagent Blank: <not performed>

Sample Size: 1.500E+000 +/- 0.000E+000 liter
 Generic Mult. Factor: 2.400E+000 Generic Div. Factor: 1.000E+000
 Sample Date/Time: 4/19/2013 9:40:27 AM
 Acquisition Date/Time: 4/22/2013 4:36:44 PM
 Acquisition Live Time: 170.0 minutes
 Acquisition Real Time: 170.0 minutes

Chem. Recovery Factor: 0.8842 +/- 0.0000
 Counting Efficiency: 0.1826 +/- 0.0032 on 12/16/2012 5:49:42 PM
 Effective Efficiency: 0.1614 +/- 0.0028

Peak Match Tolerance: 0.350 MeV

 ----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
RA-224	5.604	6.00	86.43	0.00	0.00E+000	2.9
RA-226	4.612	7.49	74.41	0.51	0.00E+000	2.9

 ----- NUCLIDE ANALYSIS RESULTS -----

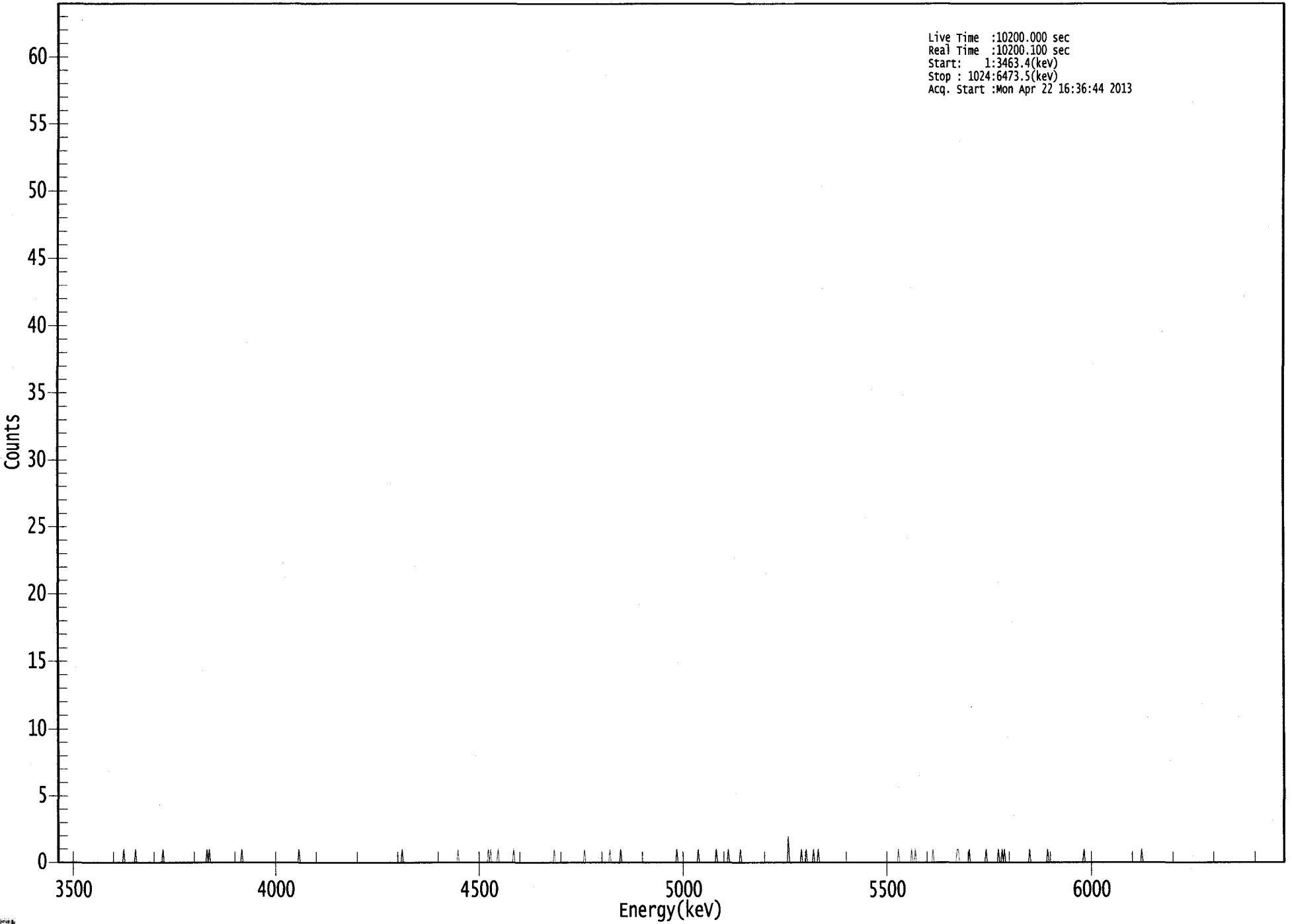
Nuclide	Id Conf.	Energy (keV)	Activity (pCi/liter)	MDA (pCi/liter)
RA-224	0.987	5685.50*	3.09E-001 +/- 2.63E+002	3.09E-001 +/- 2.63E+002
RA-226	0.962	4785.00*	1.97E-001 +/- 1.47E-001	1.38E-001 +/- 4.72E-003

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 4/23/13

US EPA ARCHIVE DOCUMENT

000056148.CNF

Live Time :10200.000 sec
Real Time :10200.100 sec
Start: 1:3463.4(kev)
Stop : 1024:6473.5(kev)
Acq. Start :Mon Apr 22 16:36:44 2013



ROI Type: 1

0129

 ***** S P E C T R A L D A T A R E P O R T *****

Sample Title: 19

Elapsed Live time: 10200

Elapsed Real Time: 10200

Channel	-----	-----	-----	-----	-----	-----	-----	-----
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	1
57:	0	0	0	0	0	0	0	0
65:	0	1	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	1	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	1	0	1
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	1	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	1	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	1	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	1
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	1	0	1	0	0	0	0	0

369: 1 0 0 0 0 0 0 0

Sample Title: 19

Channel	-----	-----	-----	-----	-----	-----	-----	-----
377:	0	0	0	0	0	1	0	0
385:	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	0	0	1
417:	0	0	0	0	0	0	0	0
425:	0	0	0	0	0	0	0	0
433:	0	0	0	0	0	0	0	0
441:	1	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0
457:	0	0	0	0	0	1	0	0
465:	0	0	0	0	0	0	1	0
473:	0	0	0	0	0	0	0	0
481:	0	0	0	0	0	0	0	0
489:	0	0	0	0	0	0	0	0
497:	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0
513:	0	0	0	0	0	1	0	0
521:	0	0	0	0	0	0	0	0
529:	0	0	0	0	0	0	0	1
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	1	0
553:	0	0	0	0	0	0	0	0
561:	1	0	0	0	0	0	0	0
569:	0	0	1	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	2	0	0	0	0	0
617:	0	0	0	0	0	1	0	0
625:	0	1	0	0	0	0	0	1
633:	0	0	0	1	0	0	0	0
641:	0	0	0	0	0	0	0	0
649:	0	0	0	0	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	1	0
705:	0	0	0	0	0	0	0	0
713:	0	1	0	0	1	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	1	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	1
753:	1	0	0	0	0	0	0	0
761:	0	1	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	1
777:	0	0	0	0	0	0	0	0
785:	0	1	0	0	1	0	1	0
793:	0	0	0	0	0	0	0	0

801: 0 0 0 0 0 0 0 0

Sample Title: 19

Channel	-----	-----	-----	-----	-----	-----	-----	-----
809:	0	0	0	1	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	1	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	1	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	1	0	0	0	0	0	0	0
913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0



QA SUMMARY REPORT

Review Of QA Results - Pulser Check

Date : 4/22/2013
Time : 5:43:46 AM

CHAMBER	DEVICE	PARAMETER	FLAG	DATE
Alpha 001	21f	ALL	Not Done	
Alpha 002	21f	ALL	Not Done	
Alpha 003	21f	ALL	Passed	4/22/2013 5:27:58 AM
Alpha 004	21f	ALL	Passed	4/22/2013 5:27:59 AM
Alpha 005	21f	ALL	Not Done	
Alpha 006	21f	ALL	Not Done	
Alpha 007	21f	ALL	Not Done	
Alpha 008	21f	ALL	Not Done	
Alpha 009	21f	ALL	Not Done	
Alpha 010	21f	ALL	Passed	4/22/2013 5:27:59 AM
Alpha 011	21f	ALL	Passed	4/22/2013 5:28:00 AM
Alpha 012	21f	ALL	Not Done	
Alpha 013	21f	ALL	Passed	4/22/2013 5:28:01 AM
Alpha 014	21f	ALL	Passed	4/22/2013 5:28:02 AM
Alpha 015	21f	ALL	Not Done	
Alpha 016	21f	ALL	Not Done	
Alpha 017	AIM730	ALL	Not Done	
Alpha 018	AIM730	ALL	Passed	4/22/2013 5:28:03 AM
Alpha 019	AIM730	ALL	Not Done	
Alpha 020	AIM730	ALL	Not Done	
Alpha 021	AIM730	ALL	Not Done	
Alpha 022	AIM730	ALL	Passed	4/22/2013 5:28:04 AM
Alpha 023	AIM730	ALL	Not Done	
Alpha 024	AIM730	ALL	Passed	4/22/2013 5:28:05 AM
Alpha 025	AIM730	ALL	Passed	4/22/2013 5:28:05 AM
Alpha 026	AIM730	ALL	Not Done	
Alpha 027	AIM730	ALL	Passed	4/22/2013 5:28:06 AM
Alpha 028	AIM730	ALL	Not Done	
Alpha 029	AIM730	ALL	Passed	4/22/2013 5:28:07 AM
Alpha 030	AIM730	ALL	Not Done	
Alpha 031	AIM730	ALL	Not Done	
Alpha 032	AIM730	ALL	Not Done	
Alpha 033	Alpha Analyst100DC	ALL	Passed	4/22/2013 5:28:08 AM
Alpha 034	Alpha Analyst100DC	ALL	Passed	4/22/2013 5:28:09 AM
Alpha 035	Alpha Analyst100DC	ALL	Passed	4/22/2013 5:28:11 AM
Alpha 036	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:41:48 AM
Alpha 037	Alpha Analyst100DC	ALL	Passed	4/22/2013 5:28:12 AM
Alpha 038	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:41:52 AM
Alpha 039	Alpha Analyst100DC	ALL	Passed	4/20/2013 10:41:54 AM
Alpha 040	Alpha Analyst100DC	ALL	Passed	4/22/2013 5:28:14 AM
Alpha 041	Alpha Analyst100DC	ALL	Passed	4/22/2013 5:28:15 AM
Alpha 042	Alpha Analyst100DC	ALL	Passed	4/22/2013 5:28:17 AM

***** LIBRARY LISTING REPORT *****

Nuclide Library Title: Radium

Nuclide Library Description: Ra-226, Po-218, Rn-222

Nuclide Name	Half-Life (Seconds)	Energy (keV)	Energy Uncert. (keV)	Yield (%)	Yield Uncert. (Abs.+)
PO-218	5.049E+010	6003.000*	0.000	99.9800	0.0000
RN-222	5.049E+010	5490.000*	0.000	99.9200	0.0000
RA-226	5.049E+010	4785.000*	0.000	100.0000	0.0000

* = key line

TOTALS: 3 Nuclides 3 Energy Lines

**SECTION XI
ANALYTICAL DATA (RADIUM-228)**

Work Order	13-04052	Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
Analysis Code	Ra228	01	LCS	LCS		04/09/13 00:00	1.0000E+00
Run	1	02	MBL	BLANK		04/09/13 00:00	1.5000E+00
Date Received	4/9/2013	03	DUP	PZ-203-SS TOT	43	04/05/13 14:58	1.5000E+00
Lab Deadline	4/30/2013	04	TRG	S-61 TOT	47	04/05/13 11:18	1.5000E+00
Client	Engineering Management Support, Inc.	05	TRG	S-61 DIS	47	04/05/13 11:18	1.5000E+00
Project	West Lake OU-1	06	TRG	PZ-115-SS TOT	43	04/05/13 12:23	1.5000E+00
Report Level	4	07	TRG	PZ-115-SS DIS	43	04/05/13 12:23	1.5000E+00
Activity Units	pCi	08	TRG	MW-104 TOT	41	04/05/13 12:56	1.5000E+00
Aliquot Units	I	09	TRG	MW-104 DIS	41	04/05/13 12:56	1.5000E+00
Matrix	WA	10	TRG	PZ-100-SD TOT	39	04/05/13 14:03	1.5000E+00
Method	EPA 904.0 Modified	11	TRG	PZ-100-SD DIS	39	04/05/13 14:03	1.5000E+00
Instrument Type	Alpha/Beta GPC	12	TRG	I-67 TOT	39	04/05/13 14:09	1.5000E+00
Radiometric Tracer	Ba-133	13	TRG	I-67 DIS	39	04/05/13 14:09	1.5000E+00
Radiometric Sol#	Ba-6a	14	DO	PZ-203-SS TOT	43	04/05/13 14:58	1.5000E+00
Tracer Act (dpm/g)	1010.327	15	TRG	PZ-203-SS DIS	43	04/05/13 14:58	1.5000E+00
Carrier	Yttirum	16	TRG	PZ-100-SS TOT	36	04/05/13 14:58	1.5000E+00
Carrier Conc (mg/ml)	34	17	TRG	PZ-100-SS DIS	36	04/05/13 14:58	1.5000E+00
		18	TRG	I-66 TOT	35	04/05/13 14:59	1.5000E+00
		19	TRG	I-66 DIS	35	04/05/13 14:59	1.5000E+00

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

0424

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.9198	929.3	420.1	100.36	2.000	0.0952	0.1510	0.0558	82.06	82.35	1.00	1.00
02	MBL	0.9111	920.5	405.9	97.89	2.000	0.0950	0.1490	0.0540	79.41	77.74	1.00	1.00
03	DUP	0.9116	921.0	414.1	99.81	2.000	0.0952	0.1492	0.0540	79.41	79.26	1.00	1.00
04	TRG	0.9107	920.1	400.7	96.68	2.000	0.0948	0.1472	0.0524	77.06	74.50	1.00	1.00
05	TRG	0.9076	917.0	375.7	90.96	2.000	0.0952	0.1475	0.0523	76.91	69.96	1.00	1.00
06	TRG	0.9108	920.2	397.4	95.87	2.000	0.0952	0.1495	0.0543	79.85	76.56	1.00	1.00
07	TRG	0.9085	917.9	417.8	101.05	2.000	0.0950	0.1479	0.0529	77.79	78.61	1.00	1.00
08	TRG	0.9074	916.8	361.1	87.44	2.000	0.0955	0.1488	0.0533	78.38	68.54	1.00	1.00
09	TRG	0.9056	915.0	394.8	95.79	2.000	0.0953	0.1472	0.0519	76.32	73.11	1.00	1.00
10	TRG	0.9050	914.3	393.5	95.54	2.000	0.0953	0.1481	0.0528	77.65	74.18	1.00	1.00
11	TRG	0.9057	915.1	427.3	103.67	2.000	0.0964	0.1503	0.0539	79.26	82.17	1.00	1.00
12	TRG	0.9069	916.3	390.1	94.52	2.000	0.0970	0.1491	0.0521	76.62	72.42	1.00	1.00
13	TRG	0.9059	915.3	407.4	98.82	2.000	0.0964	0.1484	0.0520	76.47	75.57	1.00	1.00
14	DO	0.9048	914.1	358.0	86.94	2.000	0.0961	0.1490	0.0529	77.79	67.63	1.00	1.00
15	TRG	0.8935	902.7	398.8	98.07	2.000	0.0969	0.1506	0.0537	78.97	77.45	1.00	1.00
16	TRG	0.9040	913.3	367.9	89.42	2.000	0.0964	0.1497	0.0533	78.38	70.09	1.00	1.00
17	TRG	0.9034	912.7	422.6	102.79	2.000	0.0962	0.1514	0.0552	81.18	83.44	1.00	1.00
18	TRG	0.9050	914.3	341.6	82.94	2.000	0.0969	0.1516	0.0547	80.44	66.72	1.00	1.00
19	TRG	0.9080	917.4	365.4	88.42	2.000	0.0965	0.1544	0.0579	85.15	75.29	1.00	1.00

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

0425

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
02	MBL			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
03	DUP			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
04	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
05	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
06	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
07	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
08	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
09	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
10	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
11	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
12	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
13	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
14	DO			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
15	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
16	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
17	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
18	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH
19	TRG			04/18/13 08:09	JBARNARD	04/19/13 09:40	TSMITH	04/30/13 05:31	TSMITH

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

0428

Preliminary Data Report & Analytical Calculations
Work Order: 13-04052-Ra228-1

	
Run	1
Analysis Code	Ra228
Eberline Services Work Order	13-04052
Client	Engineering Management Support, Inc.

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	RA-228	LCS	LCS	pCi/l	8.75E+00	8.58E-01	9.72E-01	9.05E+00	96.60	OK		OK	
02	RA-228	MBL	BLANK	pCi/l	4.91E-01	3.89E-01	7.76E-01					OK	OK
03	RA-228	DUP	PZ-203-SS TOT	pCi/l	9.08E-01	3.95E-01	7.38E-01				NA	OK	
04	RA-228	TRG	S-61 TOT	pCi/l	1.21E+00	4.26E-01	7.68E-01					OK	
05	RA-228	TRG	S-61 DIS	pCi/l	8.85E-01	5.04E-01	9.80E-01					OK	
06	RA-228	TRG	PZ-115-SS TOT	pCi/l	8.49E-01	4.73E-01	9.19E-01					OK	
07	RA-228	TRG	PZ-115-SS DIS	pCi/l	1.31E+00	4.23E-01	7.47E-01					OK	
08	RA-228	TRG	MW-104 TOT	pCi/l	1.33E+00	5.13E-01	9.48E-01					OK	
09	RA-228	TRG	MW-104 DIS	pCi/l	1.34E+00	5.32E-01	9.90E-01					OK	
10	RA-228	TRG	PZ-100-SD TOT	pCi/l	1.20E+00	5.14E-01	9.65E-01					OK	
11	RA-228	TRG	PZ-100-SD DIS	pCi/l	3.98E-01	4.44E-01	9.05E-01					OK	
12	RA-228	TRG	I-67 TOT	pCi/l	5.54E-01	4.92E-01	9.90E-01					OK	
13	RA-228	TRG	I-67 DIS	pCi/l	6.03E-01	4.49E-01	8.91E-01					OK	
14	RA-228	DO	PZ-203-SS TOT	pCi/l	1.08E+00	6.01E-01	1.17E+00					OK	
15	RA-228	TRG	PZ-203-SS DIS	pCi/l	3.65E-01	5.53E-01	1.14E+00					OK	
16	RA-228	TRG	PZ-100-SS TOT	pCi/l	1.37E+00	5.83E-01	1.10E+00					OK	
17	RA-228	TRG	PZ-100-SS DIS	pCi/l	1.08E+00	5.40E-01	1.04E+00					OK	
18	RA-228	TRG	I-66 TOT	pCi/l	2.67E-01	6.35E-01	1.33E+00					OK	
19	RA-228	TRG	I-66 DIS	pCi/l	1.42E+00	5.40E-01	9.83E-01					OK	

13-04052

Preliminary Data Report & Analytical Calculations
Work Order: 13-04052-Ra228-1

	
Run	1
Analysis Code	Ra228
Eberline Services Work Order	13-04052
Client	Engineering Management Support, Inc.

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	RA-228	LCS	04/09/13 00:00	1.00E+00	100.36	82.06	82.35	1.00	4/19/2013 9:40	4/30/2013 5:31
02	RA-228	MBL	04/09/13 00:00	1.50E+00	97.89	79.41	77.74	1.00	4/19/2013 9:40	4/30/2013 5:31
03	RA-228	DUP	04/05/13 14:58	1.50E+00	99.81	79.41	79.26	1.00	4/19/2013 9:40	4/30/2013 5:31
04	RA-228	TRG	04/05/13 11:18	1.50E+00	96.68	77.06	74.50	1.00	4/19/2013 9:40	4/30/2013 5:31
05	RA-228	TRG	04/05/13 11:18	1.50E+00	90.96	76.91	69.96	1.00	4/19/2013 9:40	4/30/2013 5:31
06	RA-228	TRG	04/05/13 12:23	1.50E+00	95.87	79.85	76.56	1.00	4/19/2013 9:40	4/30/2013 5:31
07	RA-228	TRG	04/05/13 12:23	1.50E+00	101.05	77.79	78.61	1.00	4/19/2013 9:40	4/30/2013 5:31
08	RA-228	TRG	04/05/13 12:56	1.50E+00	87.44	78.38	68.54	1.00	4/19/2013 9:40	4/30/2013 5:31
09	RA-228	TRG	04/05/13 12:56	1.50E+00	95.79	76.32	73.11	1.00	4/19/2013 9:40	4/30/2013 5:31
10	RA-228	TRG	04/05/13 14:03	1.50E+00	95.54	77.65	74.18	1.00	4/19/2013 9:40	4/30/2013 5:31
11	RA-228	TRG	04/05/13 14:03	1.50E+00	103.67	79.26	82.17	1.00	4/19/2013 9:40	4/30/2013 5:31
12	RA-228	TRG	04/05/13 14:09	1.50E+00	94.52	76.62	72.42	1.00	4/19/2013 9:40	4/30/2013 5:31
13	RA-228	TRG	04/05/13 14:09	1.50E+00	98.82	76.47	75.57	1.00	4/19/2013 9:40	4/30/2013 5:31
14	RA-228	DO	04/05/13 14:58	1.50E+00	86.94	77.79	67.63	1.00	4/19/2013 9:40	4/30/2013 5:31
15	RA-228	TRG	04/05/13 14:58	1.50E+00	98.07	78.97	77.45	1.00	4/19/2013 9:40	4/30/2013 5:31
16	RA-228	TRG	04/05/13 14:58	1.50E+00	89.42	78.38	70.09	1.00	4/19/2013 9:40	4/30/2013 5:31
17	RA-228	TRG	04/05/13 14:58	1.50E+00	102.79	81.18	83.44	1.00	4/19/2013 9:40	4/30/2013 5:31
18	RA-228	TRG	04/05/13 14:59	1.50E+00	82.94	80.44	66.72	1.00	4/19/2013 9:40	4/30/2013 5:31
19	RA-228	TRG	04/05/13 14:59	1.50E+00	88.42	85.15	75.29	1.00	4/19/2013 9:40	4/30/2013 5:31

0220

Preliminary Data Report & Analytical Calculations
Work Order: 13-04052-Ra228-1

	
Run	1
Analysis Code	Ra228
Eberline Services Work Order	13-04052
Client	Engineering Management Support, Inc.

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Half-life (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	RA-228	LCS	04/30/13 09:00		LB4110R	A1	120	654	0.866666667	0.4776
02	RA-228	MBL	04/30/13 09:00		LB4110R	A2	120	173	1.083333333	0.4699
03	RA-228	DUP	04/30/13 09:00		LB4110R	A3	120	211	1.066666667	0.4809
04	RA-228	TRG	04/30/13 09:00		LB4110R	A4	120	220	0.983333333	0.4732
05	RA-228	TRG	04/30/13 09:18		LB4110A	C1	120	223	1.3	0.4667
06	RA-228	TRG	04/30/13 09:18		LB4110A	C2	120	227	1.316666667	0.4578
07	RA-228	TRG	04/30/13 09:18		LB4110A	C4	120	226	0.95	0.4692
08	RA-228	TRG	04/30/13 09:18		LB4110A	D4	120	244	1.2	0.4741
09	RA-228	TRG	04/30/13 10:00		LB4110R	B1	120	254	1.283333333	0.4754
10	RA-228	TRG	04/30/13 10:00		LB4110R	B2	120	233	1.2	0.4658
11	RA-228	TRG	04/30/13 10:00		LB4110R	B3	120	193	1.333333333	0.4713
12	RA-228	TRG	04/30/13 10:00		LB4110R	B4	120	193	1.266666667	0.4773
13	RA-228	TRG	04/30/13 09:59		LB4110R	C1	120	176	1.083333333	0.4705
14	RA-228	DO	04/30/13 09:59		LB4110R	C2	120	253	1.5	0.4676
15	RA-228	TRG	04/30/13 09:59		LB4110R	C3	120	248	1.833333333	0.4614
16	RA-228	TRG	04/30/13 09:59		LB4110R	C4	120	271	1.45	0.4714
17	RA-228	TRG	04/30/13 11:21		LB4110A	C1	120	233	1.3	0.4667
18	RA-228	TRG	04/30/13 11:21		LB4110A	C2	120	173	1.316666667	0.4578
19	RA-228	TRG	04/30/13 11:21		LB4110A	C4	120	206	0.95	0.4692

5275

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	04/09/13 00:00	1.0000	0.9198	929.2988	420.1000	100.36	1.00	1.00
02	MBL	BLANK	04/09/13 00:00	1.5000	0.9111	920.5089	405.9000	97.89	1.00	1.00
03	DUP	PZ-203-SS TOT	04/05/13 14:58	1.5000	0.9116	921.0141	414.1000	99.81	1.00	1.00
04	TRG	S-61 TOT	04/05/13 11:18	1.5000	0.9107	920.1048	400.7000	96.68	1.00	1.00
05	TRG	S-61 DIS	04/05/13 11:18	1.5000	0.9076	916.9728	375.7000	90.96	1.00	1.00
06	TRG	PZ-115-SS TOT	04/05/13 12:23	1.5000	0.9108	920.2058	397.4000	95.87	1.00	1.00
07	TRG	PZ-115-SS DIS	04/05/13 12:23	1.5000	0.9085	917.8821	417.8000	101.05	1.00	1.00
08	TRG	MW-104 TOT	04/05/13 12:56	1.5000	0.9074	916.7707	361.1000	87.44	1.00	1.00
09	TRG	MW-104 DIS	04/05/13 12:56	1.5000	0.9056	914.9521	394.8000	95.79	1.00	1.00
10	TRG	PZ-100-SD TOT	04/05/13 14:03	1.5000	0.9050	914.3459	393.5000	95.54	1.00	1.00
11	TRG	PZ-100-SD DIS	04/05/13 14:03	1.5000	0.9057	915.0532	427.3000	103.67	1.00	1.00
12	TRG	I-67 TOT	04/05/13 14:09	1.5000	0.9069	916.2656	390.1000	94.52	1.00	1.00
13	TRG	I-67 DIS	04/05/13 14:09	1.5000	0.9059	915.2552	407.4000	98.82	1.00	1.00
14	DO	PZ-203-SS TOT	04/05/13 14:58	1.5000	0.9048	914.1439	358.0000	86.94	1.00	1.00
15	TRG	PZ-203-SS DIS	04/05/13 14:58	1.5000	0.8935	902.7272	398.8000	98.07	1.00	1.00
16	TRG	PZ-100-SS TOT	04/05/13 14:58	1.5000	0.9040	913.3356	367.9000	89.42	1.00	1.00
17	TRG	PZ-100-SS DIS	04/05/13 14:58	1.5000	0.9034	912.7294	422.6000	102.79	1.00	1.00
18	TRG	I-66 TOT	04/05/13 14:59	1.5000	0.9050	914.3459	341.6000	82.94	1.00	1.00
19	TRG	I-66 DIS	04/05/13 14:59	1.5000	0.9080	917.3769	365.4000	88.42	1.00	1.00


Aliquot Worksheet

Work Order	Run	Analysis Code	Rpt Units	Lab Deadline	Technician
13-04052	1	Ra228	liters	4/30/2013	JBARNARD

Lab Fraction	Engineering Management Support, Inc. Client ID	Sample Type	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
			Ratio Post/Pre	No of Dils	Dil Factor	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.5000E+00	1.5000E+00				
03	PZ-203-SS TOT	DUP					1.5000E+00	1.5000E+00				
04	S-61 TOT	TRG					1.5000E+00	1.5000E+00				
05	S-61 DIS	TRG					1.5000E+00	1.5000E+00				
06	PZ-115-SS TOT	TRG					1.5000E+00	1.5000E+00				
07	PZ-115-SS DIS	TRG					1.5000E+00	1.5000E+00				
08	MW-104 TOT	TRG					1.5000E+00	1.5000E+00				
09	MW-104 DIS	TRG					1.5000E+00	1.5000E+00				
10	PZ-100-SD TOT	TRG					1.5000E+00	1.5000E+00				
11	PZ-100-SD DIS	TRG					1.5000E+00	1.5000E+00				
12	I-67 TOT	TRG					1.5000E+00	1.5000E+00				
13	I-67 DIS	TRG					1.5000E+00	1.5000E+00				
14	PZ-203-SS TOT	DO					1.5000E+00	1.5000E+00				
15	PZ-203-SS DIS	TRG					1.5000E+00	1.5000E+00				
16	PZ-100-SS TOT	TRG					1.5000E+00	1.5000E+00				
17	PZ-100-SS DIS	TRG					1.5000E+00	1.5000E+00				
18	I-66 TOT	TRG					1.5000E+00	1.5000E+00				
19	I-66 DIS	TRG					1.5000E+00	1.5000E+00				

Comments	
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Technician: _____

 Date: 4/18/13

Gravimetric Worksheet

Work Order	Run	Analysis Code	Gravimetric Carrier	Carrier Conc (mg/ml)	Technician
13-04052	1	Ra228	Yttirum	34.0000	TSMITH

TRetec Fraction	Engineering Management Support, Inc. Client ID	Sample Type	Carrier Data		Filter Data		Gravimetric % Recovery
			Carrier Added (ml)	Filter Tare (g)	Filter Final (g)	Filter Net (g)	
01	LCS	LCS	2.0000	0.0952	0.1510	0.0558	82.06
02	BLANK	MBL	2.0000	0.0950	0.1490	0.0540	79.41
03	DUP	DUP	2.0000	0.0952	0.1492	0.0540	79.41
04	S-61 TOT	TRG	2.0000	0.0948	0.1472	0.0524	77.06
05	S-61 DIS	TRG	2.0000	0.0952	0.1475	0.0523	76.91
06	PZ-115-SS TOT	TRG	2.0000	0.0952	0.1495	0.0543	79.85
07	PZ-115-SS DIS	TRG	2.0000	0.0950	0.1479	0.0529	77.79
08	MW-104 TOT	TRG	2.0000	0.0955	0.1488	0.0533	78.38
09	MW-104 DIS	TRG	2.0000	0.0953	0.1472	0.0519	76.32
10	PZ-100-SD TOT	TRG	2.0000	0.0953	0.1481	0.0528	77.65
11	PZ-100-SD DIS	TRG	2.0000	0.0964	0.1503	0.0539	79.26
12	I-67 TOT	TRG	2.0000	0.0970	0.1491	0.0521	76.62
13	I-67 DIS	TRG	2.0000	0.0964	0.1484	0.0520	76.47
14	PZ-203-SS TOT	DO	2.0000	0.0961	0.1490	0.0529	77.79
15	PZ-203-SS DIS	TRG	2.0000	0.0969	0.1506	0.0537	78.97
16	PZ-100-SS TOT	TRG	2.0000	0.0964	0.1497	0.0533	78.38
17	PZ-100-SS DIS	TRG	2.0000	0.0962	0.1514	0.0552	81.18
18	I-66 TOT	TRG	2.0000	0.0969	0.1516	0.0547	80.44
19	I-66 DIS	TRG	2.0000	0.0965	0.1544	0.0579	85.15

Technician: _____

TSMITH

Date: _____

4/30/13

0433

(R)
4/30/13
KB

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
A1	1304052-01	16	654	120	1400	4/30/13 11:00
A2	1304052-02	17	173	120	1400	4/30/13 11:00
A3	1304052-03	24	211	120	1400	4/30/13 11:00
A4	1304052-04	12	220	120	1400	4/30/13 11:00

0154

C
4/17/17
A

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
C1	1304052-05	15	223	120	1400	4/30/13 11:18
C2	1304052-06	14	227	120	1400	4/30/13 11:18
C4	1304052-07	16	226	120	1400	4/30/13 11:18
D4	1304052-08	17	244	120	1400	4/30/13 11:18

(R)
4/30/13
K13

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
C1	1304052-13	15	176	120	1400	4/30/13 11:59
C2	1304052-14	12	253	120	1400	4/30/13 11:59
C3	1304052-15	12	248	120	1400	4/30/13 11:59
C4	1304052-16	25	271	120	1400	4/30/13 11:59
B1	1304052-09	17	254	120	1400	4/30/13 12:00
B2	1304052-10	12	233	120	1400	4/30/13 12:00
B3	1304052-11	9	193	120	1400	4/30/13 12:00
B4	1304052-12	8	193	120	1400	4/30/13 12:00

C
4/17/11
A

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
C1	1304052-17	18	233	120	1400	4/30/13 13:21
C2	1304052-18	12	173	120	1400	4/30/13 13:21
C4	1304052-19	13	206	120	1400	4/30/13 13:21

GPC Detector Report
(ALL Backgrounds)

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4129117

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	4/29/2013	5.00E-02	P	-2.19E+01	2.94E-01	2.24E+01
LB4110A - A2	Alpha	11/18/2007	4/29/2013	5.00E-02	P	-1.86E+01	2.63E-01	1.91E+01
LB4110A - A3	Alpha	11/18/2007	4/29/2013	6.67E-02	P	-1.81E+01	2.25E-01	1.85E+01
LB4110A - A4	Alpha	11/18/2007	4/29/2013	6.67E-02	P	-1.92E+01	2.46E-01	1.97E+01
LB4110A - B1	Alpha	11/18/2007	4/29/2013	6.67E-02	P	-9.90E-02	7.51E-02	2.49E-01
LB4110A - B2	Alpha	11/18/2007	4/29/2013	1.67E-02	P	-7.96E-02	7.27E-02	2.25E-01
LB4110A - B3	Alpha	11/18/2007	4/29/2013	1.50E-01	W	-6.40E-02	5.32E-02	1.70E-01
LB4110A - B4	Alpha	11/18/2007	4/29/2013	3.33E-02	P	-1.44E-01	7.91E-02	3.02E-01
LB4110A - C1	Alpha	11/18/2007	4/29/2013	5.00E-02	P	-1.53E-01	8.92E-02	3.31E-01
LB4110A - C2	Alpha	11/18/2007	4/29/2013	5.00E-02	P	-1.80E-01	8.84E-02	3.57E-01
LB4110A - C3	Alpha	11/18/2007	4/29/2013	5.00E-02	P	-1.76E-01	1.01E-01	3.79E-01
LB4110A - C4	Alpha	11/18/2007	4/29/2013	3.33E-02	P	-6.28E-02	6.89E-02	2.01E-01
LB4110A - D1	Alpha	11/18/2007	4/29/2013	3.33E-02	P	-5.35E-02	8.43E-02	2.22E-01
LB4110A - D2	Alpha	11/18/2007	4/29/2013	0.00E+00	P	-7.05E-02	6.03E-02	1.91E-01
LB4110A - D3	Alpha	11/18/2007	4/29/2013	8.33E-02	P	-4.75E-02	7.21E-02	1.92E-01
LB4110A - D4	Alpha	11/18/2007	4/29/2013	5.00E-02	P	-5.75E-02	7.09E-02	1.99E-01
LB4110R - A1	Alpha	11/24/2006	4/29/2013	1.00E-01	P	-1.01E-01	1.01E-01	3.03E-01
LB4110R - A2	Alpha	11/24/2006	4/29/2013	6.67E-02	P	-9.05E-02	7.74E-02	2.45E-01
LB4110R - A3	Alpha	11/24/2006	4/29/2013	6.67E-02	P	-7.39E-02	7.68E-02	2.27E-01
LB4110R - A4	Alpha	11/24/2006	4/29/2013	6.67E-02	P	-5.31E-02	7.18E-02	1.97E-01
LB4110R - B1	Alpha	11/24/2006	4/26/2013	5.00E-02	P	-9.60E-02	6.21E-02	2.20E-01
LB4110R - B2	Alpha	11/24/2006	4/26/2013	6.67E-02	P	-6.95E-02	6.44E-02	1.98E-01
LB4110R - B3	Alpha	11/24/2006	4/26/2013	1.17E-01	P	-6.55E-02	7.00E-02	2.05E-01
LB4110R - B4	Alpha	11/24/2006	4/26/2013	3.33E-02	P	-6.47E-02	7.08E-02	2.06E-01
LB4110R - C1	Alpha	11/24/2006	4/29/2013	1.67E-02	P	-7.81E-02	7.44E-02	2.27E-01
LB4110R - C2	Alpha	11/24/2006	4/29/2013	1.67E-02	P	-7.53E-02	7.23E-02	2.20E-01
LB4110R - C3	Alpha	11/24/2006	4/29/2013	1.67E-02	P	-8.93E-02	8.48E-02	2.59E-01
LB4110R - C4	Alpha	11/24/2006	4/29/2013	1.67E-02	P	-6.23E-02	8.22E-02	2.27E-01
LB4110R - D1	Alpha	11/24/2006	4/29/2013	0.00E+00	P	-9.89E-02	7.34E-02	2.46E-01
LB4110R - D2	Alpha	11/24/2006	4/29/2013	0.00E+00	P	-7.29E-02	7.28E-02	2.18E-01
LB4110R - D3	Alpha	11/24/2006	4/29/2013	0.00E+00	P	-7.82E-02	7.25E-02	2.23E-01
LB4110R - D4	Alpha	11/24/2006	4/29/2013	0.00E+00	P	-6.95E-02	7.75E-02	2.24E-01
LB5100 - 1	Alpha	7/10/2006	10/26/2007	5.00E-02	P	-1.56E-02	9.58E-02	2.07E-01

GPC Detector Report
(ALL Backgrounds)

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/18/2007	4/29/2013	1.97E+01	P	-2.97E+02	7.63E+00	3.12E+02
LB4110A - A2	Beta	11/18/2007	4/29/2013	1.44E+01	P	-3.12E+01	2.54E+00	3.63E+01
LB4110A - A3	Beta	11/18/2007	4/29/2013	3.06E+01	P	-5.14E+01	2.68E+00	5.68E+01
LB4110A - A4	Beta	11/18/2007	4/29/2013	1.83E+01	P	-3.35E+01	3.01E+00	3.95E+01
LB4110A - B1	Beta	11/18/2007	4/29/2013	8.17E+01	F	-1.05E+01	3.26E+00	1.70E+01
LB4110A - B2	Beta	11/18/2007	4/29/2013	1.02E+01	W	-7.57E+00	1.99E+00	1.16E+01
LB4110A - B3	Beta	11/18/2007	4/29/2013	8.10E+00	F	1.04E-01	1.36E+00	2.62E+00
LB4110A - B4	Beta	11/18/2007	4/29/2013	8.13E+00	P	-7.63E+00	1.97E+00	1.16E+01
LB4110A - C1	Beta	11/18/2007	4/29/2013	2.63E+00	P	-5.52E+00	2.16E+00	9.84E+00
LB4110A - C2	Beta	11/18/2007	4/29/2013	2.15E+00	W	3.79E-01	1.27E+00	2.17E+00
LB4110A - C3	Beta	11/18/2007	4/29/2013	1.87E+00	P	4.69E-01	1.47E+00	2.47E+00
LB4110A - C4	Beta	11/18/2007	4/29/2013	1.87E+00	P	-1.77E+00	2.14E+00	6.06E+00
LB4110A - D1	Beta	11/18/2007	4/29/2013	8.28E+00	F	-2.39E+00	2.59E+00	7.57E+00
LB4110A - D2	Beta	11/18/2007	4/29/2013	7.87E+00	F	-6.85E-01	1.57E+00	3.82E+00
LB4110A - D3	Beta	11/18/2007	4/29/2013	7.73E+00	F	1.22E+00	4.47E+00	7.73E+00
LB4110A - D4	Beta	11/18/2007	4/29/2013	6.22E+00	F	-4.55E-01	1.38E+00	3.21E+00
LB4110R - A1	Beta	11/24/2006	4/29/2013	8.83E-01	P	-6.21E+01	3.79E+00	6.97E+01
LB4110R - A2	Beta	11/24/2006	4/29/2013	1.15E+00	P	-4.94E+01	2.06E+00	5.35E+01
LB4110R - A3	Beta	11/24/2006	4/29/2013	9.17E-01	P	-4.57E+01	2.80E+00	5.13E+01
LB4110R - A4	Beta	11/24/2006	4/29/2013	9.33E-01	P	-4.56E+01	2.03E+00	4.96E+01
LB4110R - B1	Beta	11/24/2006	4/26/2013	1.28E+00	P	-4.80E+01	2.05E+00	5.21E+01
LB4110R - B2	Beta	11/24/2006	4/26/2013	1.08E+00	P	-4.80E+01	2.08E+00	5.21E+01
LB4110R - B3	Beta	11/24/2006	4/26/2013	1.00E+00	P	-4.77E+01	2.71E+00	5.32E+01
LB4110R - B4	Beta	11/24/2006	4/26/2013	1.03E+00	P	-4.81E+01	1.95E+00	5.20E+01
LB4110R - C1	Beta	11/24/2006	4/29/2013	1.15E+00	P	-4.78E+01	3.04E+00	5.39E+01
LB4110R - C2	Beta	11/24/2006	4/29/2013	1.28E+00	P	-4.78E+01	2.76E+00	5.34E+01
LB4110R - C3	Beta	11/24/2006	4/29/2013	1.57E+00	P	-4.83E+01	2.56E+00	5.35E+01
LB4110R - C4	Beta	11/24/2006	4/29/2013	1.35E+00	P	-5.45E+01	2.99E+00	6.05E+01
LB4110R - D1	Beta	11/24/2006	4/29/2013	0.00E+00	P	-4.52E+01	5.81E+00	5.68E+01
LB4110R - D2	Beta	11/24/2006	4/29/2013	0.00E+00	P	-4.88E+01	1.96E+00	5.27E+01
LB4110R - D3	Beta	11/24/2006	4/29/2013	0.00E+00	P	-5.21E+01	5.78E+00	6.36E+01
LB4110R - D4	Beta	11/24/2006	4/29/2013	0.00E+00	P	-4.84E+01	2.33E+00	5.31E+01
LB5100 - 1	Beta	7/10/2006	10/26/2007	4.52E+00	F	-3.19E-01	1.58E+00	3.48E+00

C
4/29/13

GPC Detector Report
(ALL Efficiencies)

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	4/29/2013	0.2423	P	-0.0195	0.2145	0.4486
LB4110A - A2	Alpha	11/18/2007	4/29/2013	0.2051	P	-0.0569	0.1724	0.4017
LB4110A - A3	Alpha	11/18/2007	4/29/2013	0.2042	P	-0.0806	0.1612	0.4029
LB4110A - A4	Alpha	11/18/2007	4/29/2013	0.2166	P	-0.0590	0.1801	0.4193
LB4110A - B1	Alpha	11/18/2007	4/29/2013	0.2069	P	0.1943	0.2247	0.2551
LB4110A - B2	Alpha	11/18/2007	4/29/2013	0.2013	P	0.1930	0.2218	0.2507
LB4110A - B3	Alpha	11/18/2007	4/29/2013	0.2344	P	0.1290	0.2326	0.3362
LB4110A - B4	Alpha	11/18/2007	4/29/2013	0.2334	P	0.2090	0.2368	0.2645
LB4110A - C1	Alpha	11/18/2007	4/29/2013	0.2175	P	0.1973	0.2208	0.2444
LB4110A - C2	Alpha	11/18/2007	4/29/2013	0.2319	P	0.1966	0.2252	0.2539
LB4110A - C3	Alpha	11/18/2007	4/29/2013	0.2493	P	0.2227	0.2494	0.2760
LB4110A - C4	Alpha	11/18/2007	4/29/2013	0.2229	P	0.1965	0.2258	0.2551
LB4110A - D1	Alpha	11/18/2007	4/29/2013	0.2178	P	0.2037	0.2335	0.2633
LB4110A - D2	Alpha	11/18/2007	4/29/2013	0.2538	P	0.2279	0.2585	0.2891
LB4110A - D3	Alpha	11/18/2007	4/29/2013	0.2537	P	0.2315	0.2640	0.2964
LB4110A - D4	Alpha	11/18/2007	4/29/2013	0.1809	P	0.1652	0.2000	0.2347
LB4110R - A1	Alpha	11/24/2006	4/29/2013	0.2376	P	0.2030	0.2389	0.2748
LB4110R - A2	Alpha	11/24/2006	4/29/2013	0.2138	P	0.1899	0.2207	0.2515
LB4110R - A3	Alpha	11/24/2006	4/29/2013	0.2221	P	0.1963	0.2249	0.2535
LB4110R - A4	Alpha	11/24/2006	4/29/2013	0.2443	P	0.2159	0.2457	0.2756
LB4110R - B1	Alpha	11/24/2006	4/26/2013	0.2185	P	0.1877	0.2261	0.2646
LB4110R - B2	Alpha	11/24/2006	4/26/2013	0.2091	P	0.1801	0.2176	0.2551
LB4110R - B3	Alpha	11/24/2006	4/26/2013	0.2456	P	0.2066	0.2440	0.2814
LB4110R - B4	Alpha	11/24/2006	4/26/2013	0.2187	P	0.1938	0.2321	0.2703
LB4110R - C1	Alpha	11/24/2006	4/29/2013	0.2077	P	0.1861	0.2153	0.2446
LB4110R - C2	Alpha	11/24/2006	4/29/2013	0.2188	P	0.1963	0.2249	0.2534
LB4110R - C3	Alpha	11/24/2006	4/29/2013	0.2354	P	0.2063	0.2398	0.2732
LB4110R - C4	Alpha	11/24/2006	4/29/2013	0.2094	P	0.1860	0.2230	0.2601
LB4110R - D1	Alpha	11/24/2006	4/29/2013	0.0000	F	0.0429	0.2083	0.3737
LB4110R - D2	Alpha	11/24/2006	4/29/2013	0.0000	F	0.0496	0.2369	0.4242
LB4110R - D3	Alpha	11/24/2006	4/29/2013	0.0000	F	0.0488	0.2327	0.4167
LB4110R - D4	Alpha	11/24/2006	4/29/2013	0.0000	F	0.0376	0.1876	0.3376
LB5100 - 1	Alpha	7/10/2006	10/26/2007	0.3368	P	0.3332	0.3455	0.3578

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4/25/13

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GPC Detector Report
(ALL Efficiencies)

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/18/2007	4/29/2013	0.5367	P	0.2025	0.5629	0.9232
LB4110A - A2	Beta	11/18/2007	4/29/2013	0.4760	P	0.1532	0.4632	0.7731
LB4110A - A3	Beta	11/18/2007	4/29/2013	0.4408	P	0.0804	0.4570	0.8335
LB4110A - A4	Beta	11/18/2007	4/29/2013	0.4993	P	0.1328	0.4875	0.8423
LB4110A - B1	Beta	11/18/2007	4/29/2013	0.4136	F	0.4638	0.5307	0.5976
LB4110A - B2	Beta	11/18/2007	4/29/2013	0.4854	P	0.4638	0.5277	0.5916
LB4110A - B3	Beta	11/18/2007	4/29/2013	0.5285	P	0.3184	0.5321	0.7457
LB4110A - B4	Beta	11/18/2007	4/29/2013	0.5294	P	0.4922	0.5547	0.6172
LB4110A - C1	Beta	11/18/2007	4/29/2013	0.5059	P	0.4500	0.5027	0.5554
LB4110A - C2	Beta	11/18/2007	4/29/2013	0.4971	P	0.4278	0.5012	0.5746
LB4110A - C3	Beta	11/18/2007	4/29/2013	0.6076	P	0.5275	0.5901	0.6527
LB4110A - C4	Beta	11/18/2007	4/29/2013	0.5183	P	0.4567	0.5251	0.5936
LB4110A - D1	Beta	11/18/2007	4/29/2013	0.5164	P	0.4800	0.5544	0.6289
LB4110A - D2	Beta	11/18/2007	4/29/2013	0.5519	P	0.4908	0.5890	0.6873
LB4110A - D3	Beta	11/18/2007	4/29/2013	0.6062	P	0.5367	0.6156	0.6945
LB4110A - D4	Beta	11/18/2007	4/29/2013	0.4351	P	0.3867	0.4737	0.5607
LB4110R - A1	Beta	11/24/2006	4/29/2013	0.5621	P	0.4812	0.5680	0.6548
LB4110R - A2	Beta	11/24/2006	4/29/2013	0.5087	P	0.4207	0.5089	0.5971
LB4110R - A3	Beta	11/24/2006	4/29/2013	0.5195	P	0.4579	0.5398	0.6218
LB4110R - A4	Beta	11/24/2006	4/29/2013	0.6000	P	0.5098	0.5917	0.6737
LB4110R - B1	Beta	11/24/2006	4/26/2013	0.5287	P	0.4533	0.5428	0.6323
LB4110R - B2	Beta	11/24/2006	4/26/2013	0.5094	P	0.4311	0.5203	0.6095
LB4110R - B3	Beta	11/24/2006	4/26/2013	0.6093	P	0.5013	0.5912	0.6811
LB4110R - B4	Beta	11/24/2006	4/26/2013	0.5199	P	0.4624	0.5501	0.6379
LB4110R - C1	Beta	11/24/2006	4/29/2013	0.4629	P	0.4245	0.5035	0.5825
LB4110R - C2	Beta	11/24/2006	4/29/2013	0.5101	P	0.4503	0.5293	0.6084
LB4110R - C3	Beta	11/24/2006	4/29/2013	0.5573	P	0.4812	0.5714	0.6615
LB4110R - C4	Beta	11/24/2006	4/29/2013	0.5005	P	0.4326	0.5267	0.6208
LB4110R - D1	Beta	11/24/2006	4/29/2013	0.0000	F	0.1017	0.4982	0.8947
LB4110R - D2	Beta	11/24/2006	4/29/2013	0.0000	F	0.1150	0.5598	1.0046
LB4110R - D3	Beta	11/24/2006	4/29/2013	0.0000	F	0.1117	0.5437	0.9757
LB4110R - D4	Beta	11/24/2006	4/29/2013	0.0000	F	0.0883	0.4475	0.8068
LB5100 - 1	Beta	7/10/2006	10/26/2007	0.4428	F	0.4555	0.4731	0.4906

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4/29/13

0421

GPC Detector Report
(ALL Backgrounds)

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4/17/11

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	4/30/2013	8.33E-02	P	-2.19E+01	2.94E-01	2.24E+01
LB4110A - A2	Alpha	11/18/2007	4/30/2013	1.17E-01	P	-1.86E+01	2.63E-01	1.91E+01
LB4110A - A3	Alpha	11/18/2007	4/30/2013	5.00E-02	P	-1.81E+01	2.24E-01	1.85E+01
LB4110A - A4	Alpha	11/18/2007	4/30/2013	5.00E-02	P	-1.92E+01	2.45E-01	1.97E+01
LB4110A - B1	Alpha	11/18/2007	4/30/2013	5.00E-02	P	-9.89E-02	7.51E-02	2.49E-01
LB4110A - B2	Alpha	11/18/2007	4/30/2013	1.67E-01	P	-7.96E-02	7.27E-02	2.25E-01
LB4110A - B3	Alpha	11/18/2007	4/30/2013	8.33E-02	P	-6.40E-02	5.32E-02	1.70E-01
LB4110A - B4	Alpha	11/18/2007	4/30/2013	8.33E-02	P	-1.44E-01	7.91E-02	3.02E-01
LB4110A - C1	Alpha	11/18/2007	4/30/2013	1.67E-02	P	-1.53E-01	8.91E-02	3.31E-01
LB4110A - C2	Alpha	11/18/2007	4/30/2013	8.33E-02	P	-1.80E-01	8.84E-02	3.57E-01
LB4110A - C3	Alpha	11/18/2007	4/30/2013	1.50E-01	P	-1.76E-01	1.01E-01	3.79E-01
LB4110A - C4	Alpha	11/18/2007	4/30/2013	8.33E-02	P	-6.28E-02	6.89E-02	2.01E-01
LB4110A - D1	Alpha	11/18/2007	4/30/2013	1.67E-02	P	-5.36E-02	8.42E-02	2.22E-01
LB4110A - D2	Alpha	11/18/2007	4/30/2013	5.00E-02	P	-7.04E-02	6.03E-02	1.91E-01
LB4110A - D3	Alpha	11/18/2007	4/30/2013	3.33E-02	P	-4.75E-02	7.20E-02	1.92E-01
LB4110A - D4	Alpha	11/18/2007	4/30/2013	1.67E-02	P	-5.75E-02	7.08E-02	1.99E-01
LB4110R - A1	Alpha	11/24/2006	4/30/2013	5.00E-02	P	-1.01E-01	1.01E-01	3.03E-01
LB4110R - A2	Alpha	11/24/2006	4/30/2013	1.00E-01	P	-9.04E-02	7.74E-02	2.45E-01
LB4110R - A3	Alpha	11/24/2006	4/30/2013	1.33E-01	P	-7.38E-02	7.68E-02	2.27E-01
LB4110R - A4	Alpha	11/24/2006	4/30/2013	6.67E-02	P	-5.30E-02	7.18E-02	1.97E-01
LB4110R - B1	Alpha	11/24/2006	4/30/2013	1.17E-01	P	-9.60E-02	6.21E-02	2.20E-01
LB4110R - B2	Alpha	11/24/2006	4/30/2013	3.33E-02	P	-6.95E-02	6.44E-02	1.98E-01
LB4110R - B3	Alpha	11/24/2006	4/30/2013	5.00E-02	P	-6.54E-02	7.00E-02	2.05E-01
LB4110R - B4	Alpha	11/24/2006	4/30/2013	5.00E-02	P	-6.47E-02	7.08E-02	2.06E-01
LB4110R - C1	Alpha	11/24/2006	4/30/2013	5.00E-02	P	-7.81E-02	7.44E-02	2.27E-01
LB4110R - C2	Alpha	11/24/2006	4/30/2013	1.67E-02	P	-7.54E-02	7.23E-02	2.20E-01
LB4110R - C3	Alpha	11/24/2006	4/30/2013	6.67E-02	P	-8.93E-02	8.48E-02	2.59E-01
LB4110R - C4	Alpha	11/24/2006	4/30/2013	5.00E-02	P	-6.23E-02	8.21E-02	2.27E-01
LB4110R - D1	Alpha	11/24/2006	4/30/2013	0.00E+00	P	-9.89E-02	7.33E-02	2.46E-01
LB4110R - D2	Alpha	11/24/2006	4/30/2013	0.00E+00	P	-7.29E-02	7.27E-02	2.18E-01
LB4110R - D3	Alpha	11/24/2006	4/30/2013	0.00E+00	P	-7.83E-02	7.25E-02	2.23E-01
LB4110R - D4	Alpha	11/24/2006	4/30/2013	0.00E+00	P	-6.95E-02	7.74E-02	2.24E-01
LB5100 - 1	Alpha	7/10/2006	10/26/2007	5.00E-02	P	-1.56E-02	9.58E-02	2.07E-01

0042

GPC Detector Report
(ALL Backgrounds)

C
4/17/0112

Detector	Alpha/Beta	Calibration Date	Count Date	Bkg CPM	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/18/2007	4/30/2013	8.12E+00	P	-2.97E+02	7.63E+00	3.12E+02
LB4110A - A2	Beta	11/18/2007	4/30/2013	4.50E+00	P	-3.12E+01	2.54E+00	3.63E+01
LB4110A - A3	Beta	11/18/2007	4/30/2013	1.45E+00	P	-5.14E+01	2.68E+00	5.68E+01
LB4110A - A4	Beta	11/18/2007	4/30/2013	7.98E+00	P	-3.34E+01	3.01E+00	3.95E+01
LB4110A - B1	Beta	11/18/2007	4/30/2013	1.57E+00	P	-1.05E+01	3.26E+00	1.70E+01
LB4110A - B2	Beta	11/18/2007	4/30/2013	2.23E+00	P	-7.57E+00	1.99E+00	1.15E+01
LB4110A - B3	Beta	11/18/2007	4/30/2013	1.88E+00	P	1.05E-01	1.36E+00	2.62E+00
LB4110A - B4	Beta	11/18/2007	4/30/2013	1.33E+00	P	-7.63E+00	1.97E+00	1.16E+01
LB4110A - C1	Beta	11/18/2007	4/30/2013	1.30E+00	P	-5.52E+00	2.16E+00	9.83E+00
LB4110A - C2	Beta	11/18/2007	4/30/2013	1.32E+00	P	3.79E-01	1.27E+00	2.17E+00
LB4110A - C3	Beta	11/18/2007	4/30/2013	2.05E+00	P	4.69E-01	1.47E+00	2.47E+00
LB4110A - C4	Beta	11/18/2007	4/30/2013	9.50E-01	P	-1.78E+00	2.14E+00	6.06E+00
LB4110A - D1	Beta	11/18/2007	4/30/2013	2.02E+00	P	-2.39E+00	2.59E+00	7.57E+00
LB4110A - D2	Beta	11/18/2007	4/30/2013	2.18E+00	P	-6.84E-01	1.57E+00	3.82E+00
LB4110A - D3	Beta	11/18/2007	4/30/2013	6.37E+00	P	1.22E+00	4.47E+00	7.73E+00
LB4110A - D4	Beta	11/18/2007	4/30/2013	1.20E+00	P	-4.54E-01	1.38E+00	3.21E+00
LB4110R - A1	Beta	11/24/2006	4/30/2013	8.67E-01	P	-6.21E+01	3.78E+00	6.97E+01
LB4110R - A2	Beta	11/24/2006	4/30/2013	1.08E+00	P	-4.94E+01	2.06E+00	5.35E+01
LB4110R - A3	Beta	11/24/2006	4/30/2013	1.07E+00	P	-4.57E+01	2.80E+00	5.13E+01
LB4110R - A4	Beta	11/24/2006	4/30/2013	9.83E-01	P	-4.56E+01	2.02E+00	4.96E+01
LB4110R - B1	Beta	11/24/2006	4/30/2013	1.28E+00	P	-4.80E+01	2.05E+00	5.21E+01
LB4110R - B2	Beta	11/24/2006	4/30/2013	1.20E+00	P	-4.79E+01	2.08E+00	5.21E+01
LB4110R - B3	Beta	11/24/2006	4/30/2013	1.33E+00	P	-4.77E+01	2.71E+00	5.31E+01
LB4110R - B4	Beta	11/24/2006	4/30/2013	1.27E+00	P	-4.81E+01	1.95E+00	5.20E+01
LB4110R - C1	Beta	11/24/2006	4/30/2013	1.08E+00	P	-4.78E+01	3.04E+00	5.39E+01
LB4110R - C2	Beta	11/24/2006	4/30/2013	1.50E+00	P	-4.78E+01	2.76E+00	5.33E+01
LB4110R - C3	Beta	11/24/2006	4/30/2013	1.83E+00	P	-4.83E+01	2.56E+00	5.34E+01
LB4110R - C4	Beta	11/24/2006	4/30/2013	1.45E+00	P	-5.45E+01	2.99E+00	6.05E+01
LB4110R - D1	Beta	11/24/2006	4/30/2013	0.00E+00	P	-4.52E+01	5.80E+00	5.68E+01
LB4110R - D2	Beta	11/24/2006	4/30/2013	0.00E+00	P	-4.88E+01	1.96E+00	5.27E+01
LB4110R - D3	Beta	11/24/2006	4/30/2013	0.00E+00	P	-5.21E+01	5.77E+00	6.36E+01
LB4110R - D4	Beta	11/24/2006	4/30/2013	0.00E+00	P	-4.84E+01	2.33E+00	5.31E+01
LB5100 - 1	Beta	7/10/2006	10/26/2007	4.52E+00	F	-3.19E-01	1.58E+00	3.48E+00

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GPC Detector Report
(ALL Efficiencies)

C
4/70112

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Alpha	11/18/2007	4/30/2013	0.2457	P	-0.0195	0.2145	0.4485
LB4110A - A2	Alpha	11/18/2007	4/30/2013	0.2091	P	-0.0569	0.1724	0.4016
LB4110A - A3	Alpha	11/18/2007	4/30/2013	0.2107	P	-0.0805	0.1612	0.4029
LB4110A - A4	Alpha	11/18/2007	4/30/2013	0.2212	P	-0.0589	0.1802	0.4192
LB4110A - B1	Alpha	11/18/2007	4/30/2013	0.2163	P	0.1943	0.2247	0.2550
LB4110A - B2	Alpha	11/18/2007	4/30/2013	0.2086	P	0.1930	0.2218	0.2507
LB4110A - B3	Alpha	11/18/2007	4/30/2013	0.2424	P	0.1291	0.2326	0.3361
LB4110A - B4	Alpha	11/18/2007	4/30/2013	0.2324	P	0.2091	0.2367	0.2644
LB4110A - C1	Alpha	11/18/2007	4/30/2013	0.2162	P	0.1973	0.2208	0.2444
LB4110A - C2	Alpha	11/18/2007	4/30/2013	0.2268	P	0.1966	0.2252	0.2539
LB4110A - C3	Alpha	11/18/2007	4/30/2013	0.2521	P	0.2228	0.2494	0.2760
LB4110A - C4	Alpha	11/18/2007	4/30/2013	0.2252	P	0.1965	0.2258	0.2551
LB4110A - D1	Alpha	11/18/2007	4/30/2013	0.2223	P	0.2037	0.2335	0.2632
LB4110A - D2	Alpha	11/18/2007	4/30/2013	0.2466	P	0.2279	0.2585	0.2891
LB4110A - D3	Alpha	11/18/2007	4/30/2013	0.2554	P	0.2315	0.2639	0.2964
LB4110A - D4	Alpha	11/18/2007	4/30/2013	0.1860	P	0.1652	0.2000	0.2347
LB4110R - A1	Alpha	11/24/2006	4/30/2013	0.2375	P	0.2030	0.2389	0.2748
LB4110R - A2	Alpha	11/24/2006	4/30/2013	0.2158	P	0.1899	0.2207	0.2515
LB4110R - A3	Alpha	11/24/2006	4/30/2013	0.2221	P	0.1963	0.2249	0.2535
LB4110R - A4	Alpha	11/24/2006	4/30/2013	0.2463	P	0.2159	0.2457	0.2755
LB4110R - B1	Alpha	11/24/2006	4/30/2013	0.2218	P	0.1877	0.2261	0.2646
LB4110R - B2	Alpha	11/24/2006	4/30/2013	0.2070	P	0.1801	0.2176	0.2551
LB4110R - B3	Alpha	11/24/2006	4/30/2013	0.2448	P	0.2067	0.2440	0.2814
LB4110R - B4	Alpha	11/24/2006	4/30/2013	0.2207	P	0.1938	0.2321	0.2703
LB4110R - C1	Alpha	11/24/2006	4/30/2013	0.2104	P	0.1861	0.2153	0.2445
LB4110R - C2	Alpha	11/24/2006	4/30/2013	0.2218	P	0.1963	0.2249	0.2534
LB4110R - C3	Alpha	11/24/2006	4/30/2013	0.2319	P	0.2064	0.2398	0.2732
LB4110R - C4	Alpha	11/24/2006	4/30/2013	0.2080	P	0.1860	0.2230	0.2600
LB4110R - D1	Alpha	11/24/2006	4/30/2013	0.0000	F	0.0424	0.2082	0.3741
LB4110R - D2	Alpha	11/24/2006	4/30/2013	0.0000	F	0.0489	0.2368	0.4246
LB4110R - D3	Alpha	11/24/2006	4/30/2013	0.0000	F	0.0481	0.2326	0.4170
LB4110R - D4	Alpha	11/24/2006	4/30/2013	0.0000	F	0.0370	0.1875	0.3379
LB5100 - 1	Alpha	7/10/2006	10/26/2007	0.3368	P	0.3332	0.3455	0.3578

0242

GPC Detector Report
(ALL Efficiencies)

C
4/7/2013

Detector	Alpha/Beta	Calibration Date	Count Date	Eff	PFW	LCL	Mean	UCL
LB4110A - A1	Beta	11/18/2007	4/30/2013	0.5576	P	0.2026	0.5628	0.9231
LB4110A - A2	Beta	11/18/2007	4/30/2013	0.4958	P	0.1534	0.4632	0.7730
LB4110A - A3	Beta	11/18/2007	4/30/2013	0.4668	P	0.0806	0.4570	0.8334
LB4110A - A4	Beta	11/18/2007	4/30/2013	0.5216	P	0.1329	0.4876	0.8422
LB4110A - B1	Beta	11/18/2007	4/30/2013	0.5056	P	0.4637	0.5307	0.5976
LB4110A - B2	Beta	11/18/2007	4/30/2013	0.5159	P	0.4638	0.5277	0.5916
LB4110A - B3	Beta	11/18/2007	4/30/2013	0.5404	P	0.3185	0.5321	0.7456
LB4110A - B4	Beta	11/18/2007	4/30/2013	0.5443	P	0.4922	0.5547	0.6172
LB4110A - C1	Beta	11/18/2007	4/30/2013	0.5002	P	0.4500	0.5027	0.5553
LB4110A - C2	Beta	11/18/2007	4/30/2013	0.5064	P	0.4278	0.5012	0.5745
LB4110A - C3	Beta	11/18/2007	4/30/2013	0.6009	P	0.5275	0.5901	0.6527
LB4110A - C4	Beta	11/18/2007	4/30/2013	0.5232	P	0.4567	0.5251	0.5935
LB4110A - D1	Beta	11/18/2007	4/30/2013	0.5278	P	0.4800	0.5544	0.6288
LB4110A - D2	Beta	11/18/2007	4/30/2013	0.5485	P	0.4908	0.5890	0.6873
LB4110A - D3	Beta	11/18/2007	4/30/2013	0.6012	P	0.5367	0.6156	0.6945
LB4110A - D4	Beta	11/18/2007	4/30/2013	0.4246	P	0.3866	0.4737	0.5607
LB4110R - A1	Beta	11/24/2006	4/30/2013	0.5667	P	0.4812	0.5680	0.6548
LB4110R - A2	Beta	11/24/2006	4/30/2013	0.5162	P	0.4207	0.5089	0.5971
LB4110R - A3	Beta	11/24/2006	4/30/2013	0.5222	P	0.4579	0.5398	0.6218
LB4110R - A4	Beta	11/24/2006	4/30/2013	0.5954	P	0.5098	0.5917	0.6736
LB4110R - B1	Beta	11/24/2006	4/30/2013	0.5287	P	0.4533	0.5428	0.6323
LB4110R - B2	Beta	11/24/2006	4/30/2013	0.5187	P	0.4311	0.5203	0.6095
LB4110R - B3	Beta	11/24/2006	4/30/2013	0.6052	P	0.5014	0.5912	0.6811
LB4110R - B4	Beta	11/24/2006	4/30/2013	0.5264	P	0.4624	0.5501	0.6379
LB4110R - C1	Beta	11/24/2006	4/30/2013	0.4638	P	0.4244	0.5035	0.5825
LB4110R - C2	Beta	11/24/2006	4/30/2013	0.5086	P	0.4503	0.5293	0.6084
LB4110R - C3	Beta	11/24/2006	4/30/2013	0.5638	P	0.4812	0.5714	0.6615
LB4110R - C4	Beta	11/24/2006	4/30/2013	0.4881	P	0.4326	0.5267	0.6208
LB4110R - D1	Beta	11/24/2006	4/30/2013	0.0000	F	0.1003	0.4979	0.8955
LB4110R - D2	Beta	11/24/2006	4/30/2013	0.0000	F	0.1134	0.5595	1.0055
LB4110R - D3	Beta	11/24/2006	4/30/2013	0.0000	F	0.1101	0.5434	0.9766
LB4110R - D4	Beta	11/24/2006	4/30/2013	0.0000	F	0.0871	0.4473	0.8075
LB5100 - 1	Beta	7/10/2006	10/26/2007	0.4428	F	0.4555	0.4731	0.4906

SECTION XII
BARIUM-133 ANALYTICAL TRACER DATA

Handwritten signature

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405201_GE3_BAFIL_190754.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : SPIKE
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 08:13:07
 Sample ID : 1304052-01 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE3 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.47 0.4%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	30.58	2113	93	1.35	30.90	26	14	2.35E+00	2.3	4.12E+00
2	3	34.77	509	86	1.56	35.09	26	14	5.65E-01	5.3	
3	0	53.03	65	139	2.15	53.35	50	8	7.25E-02	33.7	
4	0	61.25	269	197	1.64	61.57	58	7	2.99E-01	10.6	
5	0	65.73	101	135	1.30	66.05	65	5	1.12E-01	20.5	
6	0	80.77	877	221	1.25	81.09	77	8	9.74E-01	4.5	
7	0	92.48	31	72	1.68	92.79	91	5	3.42E-02	45.4	
8	1	111.70	272	73	1.59	112.02	107	13	3.02E-01	7.6	2.57E+00
9	1	115.69	65	63	1.60	116.01	107	13	7.20E-02	23.3	
10	0	161.00	23	107	1.41	161.31	158	9	2.53E-02	84.2	
11	0	238.97	46	69	1.66	239.28	234	10	5.06E-02	37.4	
12	0	276.51	53	32	1.90	276.82	273	7	5.83E-02	22.5	
13	3	302.68	148	18	1.42	302.99	300	11	1.65E-01	8.9	4.13E+00
14	3	307.05	28	32	2.19	307.35	300	11	3.10E-02	39.3	
15	0	319.41	7	24	2.92	319.71	315	8	7.78E-03	127.0	
16	1	333.62	85	15	1.78	333.93	328	15	9.47E-02	13.2	6.29E-01
17	1	337.71	17	15	1.83	338.02	328	15	1.94E-02	49.8	
18	3	352.09	22	5	2.23	352.40	350	13	2.49E-02	28.1	1.73E+00
19	3	355.93	542	8	1.56	356.23	350	13	6.02E-01	4.4	
20	2	383.56	138	20	1.90	383.86	381	9	1.54E-01	10.8	7.48E+00
21	2	386.78	231	26	1.42	387.08	381	9	2.57E-01	7.5	
22	1	414.53	51	22	1.89	414.83	411	11	5.67E-02	19.5	3.88E+00
23	1	417.87	24	23	1.90	418.17	411	11	2.63E-02	44.9	
24	0	423.04	14	8	2.55	423.34	421	5	1.58E-02	40.4	
25	0	437.05	101	20	1.55	437.35	433	9	1.12E-01	12.8	
26	1	467.73	28	4	1.93	468.02	465	13	3.17E-02	21.5	1.05E+00
27	1	472.82	11	1	1.94	473.12	465	13	1.21E-02	38.3	
28	0	510.65	18	9	1.45	510.94	506	9	2.04E-02	37.5	
29	0	609.22	9	5	1.76	609.51	607	6	1.02E-02	49.8	
30	0	910.15	7	0	1.77	910.43	907	6	7.78E-03	37.8	

Total number of lines in spectrum 30
 Number of unidentified lines 26
 Number of lines tentatively identified by NID 4 13.33%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter			
BA-133	10.50Y	1.00	4.201E+02	4.201E+02	0.763E+02	18.17	
Total Activity :			4.201E+02	4.201E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter			
AM-241	432.20Y	1.00	7.769E+01	7.769E+01	1.723E+01	22.18	
Total Activity :			7.769E+01	7.769E+01			

Grand Total Activity : 4.978E+02 4.978E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.899E+01	4.201E+02	4.201E+02	18.17	OK
	302.84	17.80	6.222E+00	4.023E+02	4.024E+02	27.28	OK
	356.01	60.00	5.860E+00	4.627E+02	4.627E+02	16.19	OK

Final Mean for 3 Valid Peaks = 4.201E+02 +/- 7.634E+01 (18.17%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
AM-241	59.54	35.90*	2.893E+01	7.769E+01	7.769E+01	22.18	OK

Final Mean for 1 Valid Peaks = 7.769E+01 +/- 1.723E+01 (22.18%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	4.201E+02	7.634E+01	2.187E+01	3.345E+00	19.212
AM-241	7.769E+01	1.723E+01	1.557E+01	7.655E-01	4.990

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/filter) Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	7.445E+00	7.047E+00	1.244E+01	1.421E+00	0.598
CD-109	7.703E+01	1.467E+02	2.190E+02	1.806E+01	0.352
PA-231	1.523E+00	1.677E+00	3.195E+00	4.545E-02	0.477
PA-234	3.411E+00	1.542E+00	2.864E+00	4.074E-02	1.191
TH-234	5.042E+02	1.592E+02	2.624E+02	1.409E+01	1.922
NP-237	-1.867E+01	4.642E+01	6.164E+01	4.983E+00	-0.303

C
4/22/13

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405202_GE3_BAFIL_190757.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : BLANK
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 08:33:35
 Sample ID : 1304052-02 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE3 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.38 0.4%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	27.81	34	119	1.43	28.13	26	24	3.77E-02	45.3	3.94E+00
2	1	30.60	2072	99	1.37	30.92	26	24	2.30E+00	2.3	
3	1	34.70	475	78	1.45	35.02	26	24	5.27E-01	5.5	
4	0	52.33	85	140	1.70	52.65	49	8	9.47E-02	26.3	
5	2	61.50	283	95	1.66	61.82	58	11	3.15E-01	7.9	1.09E+00
6	2	65.73	146	79	1.67	66.05	58	11	1.62E-01	12.6	
7	0	80.69	847	186	1.23	81.00	77	8	9.41E-01	4.4	
8	0	92.09	48	145	1.62	92.41	88	9	5.33E-02	47.6	
9	1	111.54	218	78	1.59	111.86	99	21	2.43E-01	9.3	3.45E+00
10	1	115.80	41	87	1.60	116.11	99	21	4.51E-02	36.7	
11	0	160.56	26	57	1.11	160.88	158	7	2.93E-02	51.0	
12	0	184.96	32	95	3.23	185.27	182	10	3.59E-02	58.5	
13	0	276.50	52	37	1.86	276.81	272	7	5.76E-02	23.9	
14	0	294.99	15	36	1.23	295.30	292	7	1.72E-02	68.5	
15	0	302.96	127	61	1.46	303.27	299	8	1.41E-01	14.0	
16	2	333.71	76	14	2.01	334.02	329	12	8.40E-02	14.3	8.41E-01
17	2	337.62	24	8	2.02	337.92	329	12	2.67E-02	35.6	
18	2	351.63	26	8	2.03	351.94	350	12	2.89E-02	24.3	2.33E+00
19	2	355.93	515	13	1.54	356.23	350	12	5.72E-01	4.5	
20	1	383.56	109	30	1.87	383.86	381	9	1.21E-01	13.7	5.80E+00
21	1	386.67	205	30	1.54	386.97	381	9	2.27E-01	8.3	
22	0	390.93	63	9	1.34	391.23	390	5	6.96E-02	15.5	
23	0	415.33	48	27	1.27	415.63	413	7	5.37E-02	22.5	
24	0	437.22	112	11	1.83	437.52	433	11	1.24E-01	11.1	
25	0	467.15	21	4	1.36	467.45	463	8	2.33E-02	27.4	
26	0	510.85	23	2	2.96	511.15	507	8	2.56E-02	23.4	

Summary of Nuclide Activity

Sample ID : 1304052-02

Acquisition date : 22-APR-2013 08:33:35

Total number of lines in spectrum 26
 Number of unidentified lines 22
 Number of lines tentatively identified by NID 4 15.38%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean		Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter			
BA-133	10.50Y	1.00	4.059E+02	4.059E+02	0.735E+02	18.12	
Total Activity :			4.059E+02	4.059E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean		Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter			
TH-234	4.47E+09Y	1.00	8.448E+02	8.448E+02	1.449E+02	17.15	
AM-241	432.20Y	1.00	8.185E+01	8.185E+01	1.393E+01	17.02	
Total Activity :			9.266E+02	9.266E+02			

Grand Total Activity : 1.332E+03 1.333E+03

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.899E+01	4.059E+02	4.059E+02	18.12	OK
	302.84	17.80	6.222E+00	3.452E+02	3.453E+02	34.70	OK
	356.01	60.00	5.860E+00	4.394E+02	4.395E+02	16.39	OK

Final Mean for 3 Valid Peaks = 4.059E+02 +/- 7.354E+01 (18.12%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.648E+01	8.448E+02	8.448E+02	17.15	OK

Final Mean for 1 Valid Peaks = 8.448E+02 +/- 1.449E+02 (17.15%)

AM-241	59.54	35.90*	2.893E+01	8.185E+01	8.185E+01	17.02	OK
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Final Mean for 1 Valid Peaks = 8.185E+01 +/- 1.393E+01 (17.02%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	4.059E+02	7.354E+01	2.122E+01	3.246E+00	19.125
TH-234	8.448E+02	1.449E+02	1.319E+02	7.086E+00	6.403
AM-241	8.185E+01	1.393E+01	1.275E+01	6.271E-01	6.418

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	6.637E+00		7.403E+00	1.280E+01	1.463E+00	0.518
CD-109	-4.009E+01		1.491E+02	2.017E+02	1.663E+01	-0.199
PA-231	2.446E+00		1.615E+00	3.211E+00	4.567E-02	0.762
PA-234	2.885E+00		1.492E+00	2.744E+00	3.903E-02	1.051
NP-237	-6.148E+00		4.333E+01	5.966E+01	4.823E+00	-0.103

C
4/22/13

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405203_GE3_BAFIL_190760.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : PZ-203-SS TOT
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 08:50:55
 Sample ID : 1304052-03 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE3 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.46 0.4%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	27.81	55	99	1.43	28.13	26	15	6.16E-02	29.4	8.07E+00
2	1	30.59	1864	89	1.43	30.91	26	15	2.07E+00	2.4	
3	1	34.74	443	77	1.45	35.06	26	15	4.93E-01	5.7	
4	0	52.81	77	156	1.40	53.13	49	9	8.53E-02	31.4	
5	1	61.54	231	104	1.51	61.86	58	12	2.57E-01	9.6	4.53E+00
6	1	65.64	111	115	1.52	65.95	58	12	1.24E-01	16.7	
7	1	76.82	21	65	1.54	77.14	76	11	2.29E-02	51.9	3.65E+01
8	1	80.73	864	81	1.54	81.05	76	11	9.60E-01	3.7	
9	1	83.54	30	62	1.55	83.86	76	11	3.35E-02	63.2	
10	0	92.47	31	90	2.11	92.79	89	7	3.47E-02	53.3	
11	0	111.57	240	119	1.35	111.88	108	7	2.67E-01	9.9	
12	0	161.40	52	60	2.95	161.71	159	8	5.83E-02	29.3	
13	0	276.50	57	18	1.83	276.80	275	6	6.34E-02	17.5	
14	0	302.67	139	24	1.39	302.98	301	5	1.54E-01	10.0	
15	3	333.52	67	37	1.84	333.82	330	13	7.44E-02	18.1	8.73E+00
16	3	338.02	28	40	2.22	338.33	330	13	3.12E-02	39.8	
17	1	351.57	17	14	1.84	351.87	350	10	1.87E-02	35.2	5.93E+00
18	1	355.86	469	15	1.57	356.17	350	10	5.21E-01	4.8	
19	1	383.54	125	33	1.87	383.85	381	10	1.39E-01	12.4	1.76E+01
20	1	386.87	190	52	1.78	387.17	381	10	2.11E-01	10.1	
21	1	411.70	10	8	1.72	412.00	410	11	1.09E-02	41.8	6.35E+00
22	1	417.75	12	20	1.90	418.05	410	11	1.33E-02	70.8	
23	0	436.94	101	13	1.57	437.24	432	10	1.12E-01	12.0	
24	2	467.84	20	4	2.13	468.14	465	10	2.18E-02	27.3	2.67E-01
25	2	471.87	7	1	2.13	472.17	465	10	7.99E-03	61.4	
26	0	511.02	19	9	1.98	511.32	506	9	2.11E-02	36.6	

Total number of lines in spectrum 26
 Number of unidentified lines 22
 Number of lines tentatively identified by NID 4 15.38%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected	Decay Corr				
BA-133	10.50Y	1.00	4.140E+02	4.141E+02	0.723E+02	17.47		
Total Activity :			4.140E+02	4.141E+02				

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected	Decay Corr				
TH-234	4.47E+09Y	1.00	6.892E+02	6.892E+02	1.398E+02	20.28		
Total Activity :			6.892E+02	6.892E+02				

Grand Total Activity : 1.103E+03 1.103E+03

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.899E+01	4.140E+02	4.141E+02	17.47	OK
	302.84	17.80	6.222E+00	3.757E+02	3.757E+02	28.68	OK
	356.01	60.00	5.860E+00	4.008E+02	4.008E+02	16.66	OK

Final Mean for 3 Valid Peaks = 4.141E+02+/- 7.235E+01 (17.47%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.648E+01	6.892E+02	6.892E+02	20.28	OK

Final Mean for 1 Valid Peaks = 6.892E+02+/- 1.398E+02 (20.28%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	4.141E+02	7.235E+01	2.056E+01	3.144E+00	20.141
TH-234	6.892E+02	1.398E+02	1.535E+02	8.246E+00	4.489

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/filter) Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	-1.484E+00	5.785E+00	9.815E+00	1.121E+00	-0.151
CD-109	-2.243E+01	1.220E+02	1.684E+02	1.389E+01	-0.133
PA-231	9.752E+00	3.169E+00	6.105E+00	8.683E-02	1.597
PA-234	2.994E+00	1.802E+00	3.181E+00	4.525E-02	0.941
NP-237	3.406E+00	3.595E+01	5.174E+01	4.183E+00	0.066
AM-241	2.981E+01	1.116E+01	2.038E+01	1.002E+00	1.463

C
4/22/13

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130405204_GE3_BAFIL_190764.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : S-61 TOT
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 09:11:24
 Sample ID : 1304052-04 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE3 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.61 0.4%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	30.57	2023	87	1.36	30.89	26	18	2.25E+00	2.3	2.96E+00
2	1	34.81	517	67	1.45	35.13	26	18	5.74E-01	5.0	
3	0	52.68	65	117	1.68	53.00	50	7	7.21E-02	30.2	
4	2	61.53	253	92	1.66	61.85	57	13	2.81E-01	8.7	2.83E+00
5	2	65.55	137	91	1.67	65.86	57	13	1.52E-01	14.1	
6	0	80.74	836	184	1.21	81.06	77	8	9.29E-01	4.5	
7	1	111.54	223	59	1.59	111.86	108	13	2.47E-01	8.6	1.37E+00
8	1	115.77	40	54	1.60	116.09	108	13	4.44E-02	33.6	
9	1	160.54	24	43	1.66	160.85	158	10	2.71E-02	46.0	4.88E-01
10	1	163.84	14	41	1.66	164.15	158	10	1.54E-02	76.9	
11	0	276.16	83	23	1.90	276.47	273	9	9.18E-02	15.2	
12	1	302.76	137	21	1.59	303.07	298	14	1.52E-01	9.9	1.74E+00
13	1	306.78	26	20	1.81	307.09	298	14	2.86E-02	40.6	
14	0	334.06	50	60	1.25	334.36	330	8	5.57E-02	30.0	
15	0	338.26	18	18	1.91	338.57	337	5	2.01E-02	43.1	
16	0	355.85	502	38	1.37	356.15	352	8	5.58E-01	4.9	
17	1	383.59	107	37	1.87	383.90	381	10	1.19E-01	15.1	2.52E+01
18	1	386.80	207	55	1.81	387.10	381	10	2.30E-01	9.5	
19	0	391.48	53	12	1.89	391.78	390	6	5.88E-02	18.3	
20	0	416.03	47	47	4.38	416.34	410	13	5.28E-02	32.8	
21	0	436.79	112	7	1.64	437.09	432	9	1.24E-01	10.4	
22	0	467.65	17	15	3.79	467.95	464	8	1.89E-02	45.5	
23	0	510.73	20	4	3.48	511.02	507	8	2.26E-02	27.8	
24	0	609.71	9	0	1.96	610.00	607	7	1.00E-02	33.3	

Total number of lines in spectrum 24
 Number of unidentified lines 20
 Number of lines tentatively identified by NID 4 16.67%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter			
BA-133	10.50Y	1.00	4.007E+02	4.007E+02	0.727E+02	18.15	
Total Activity :			4.007E+02	4.007E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter			
TH-234	4.47E+09Y	1.00	7.560E+02	7.560E+02	1.406E+02	18.60	
AM-241	432.20Y	1.00	7.326E+01	7.326E+01	1.353E+01	18.47	
Total Activity :			8.293E+02	8.293E+02			

Grand Total Activity : 1.230E+03 1.230E+03

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.899E+01	4.007E+02	4.007E+02	18.15	OK
	302.84	17.80	6.222E+00	3.710E+02	3.711E+02	28.61	OK
	356.01	60.00	5.860E+00	4.287E+02	4.287E+02	16.85	OK

Final Mean for 3 Valid Peaks = 4.007E+02 +/- 7.272E+01 (18.15%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.648E+01	7.560E+02	7.560E+02	18.60	OK

Final Mean for 1 Valid Peaks = 7.560E+02 +/- 1.406E+02 (18.60%)

AM-241	59.54	35.90*	2.893E+01	7.326E+01	7.326E+01	18.47	OK
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Final Mean for 1 Valid Peaks = 7.326E+01 +/- 1.353E+01 (18.47%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	4.007E+02	7.272E+01	2.042E+01	3.123E+00	19.624
TH-234	7.560E+02	1.406E+02	1.451E+02	7.794E+00	5.210
AM-241	7.326E+01	1.353E+01	1.403E+01	6.897E-01	5.222

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/filter) Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	2.713E+00	5.989E+00	1.022E+01	1.168E+00	0.265
CD-109	5.283E+01	1.148E+02	1.933E+02	1.594E+01	0.273
PA-231	3.012E+00	1.741E+00	3.464E+00	4.927E-02	0.869
PA-234	3.086E+00	1.488E+00	2.760E+00	3.925E-02	1.118
NP-237	1.675E+00	3.532E+01	5.684E+01	4.595E+00	0.029

*C
y/rw*

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405205_GE3_BAFIL_190767.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : S-61 DIS
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 09:33:36
 Sample ID : 1304052-05 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE3 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.50 0.4%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	30.57	1958	92	1.33	30.89	26	18	2.18E+00	2.4	2.66E+00
2	1	34.81	428	59	1.45	35.13	26	18	4.76E-01	5.8	
3	0	52.48	47	99	1.83	52.80	50	6	5.27E-02	36.1	
4	1	61.59	235	93	1.51	61.91	57	13	2.61E-01	9.3	2.60E+00
5	1	65.54	103	86	1.52	65.86	57	13	1.14E-01	17.1	
6	0	80.74	784	129	1.29	81.06	77	7	8.71E-01	4.3	
7	0	91.72	14	99	1.36	92.03	90	6	1.56E-02	115.4	
8	3	111.56	256	67	1.69	111.88	107	14	2.85E-01	7.6	2.59E+00
9	3	115.91	72	59	1.93	116.23	107	14	7.97E-02	23.4	
10	0	160.19	38	65	3.63	160.50	156	7	4.22E-02	38.7	
11	0	184.93	33	64	2.49	185.24	182	8	3.67E-02	45.5	
12	0	276.43	56	27	1.58	276.74	272	7	6.28E-02	20.1	
13	5	302.82	137	15	1.63	303.13	298	23	1.52E-01	9.5	1.45E+00
14	5	307.51	29	19	2.65	307.82	298	23	3.25E-02	41.0	
15	5	311.35	12	13	1.99	311.65	298	23	1.29E-02	67.1	
16	5	314.77	13	17	2.65	315.08	298	23	1.46E-02	73.1	
17	2	333.54	77	9	1.84	333.85	330	13	8.60E-02	13.4	1.02E+00
18	2	337.73	34	9	2.02	338.04	330	13	3.81E-02	24.0	
19	0	355.89	488	30	1.40	356.20	352	8	5.42E-01	4.9	
20	2	383.80	101	13	1.54	384.10	382	8	1.12E-01	12.8	1.78E+00
21	2	386.75	198	27	1.51	387.05	382	8	2.20E-01	8.4	
22	0	391.29	43	18	1.91	391.59	390	6	4.81E-02	23.0	
23	3	414.54	27	11	2.29	414.84	409	15	2.96E-02	31.4	1.20E+00
24	3	417.83	26	11	2.29	418.14	409	15	2.86E-02	35.1	
25	0	436.92	100	12	1.43	437.22	432	10	1.11E-01	12.0	
26	0	446.35	10	5	2.00	446.65	443	7	1.07E-02	51.2	
27	1	467.83	16	2	1.93	468.13	465	12	1.76E-02	29.9	3.96E-01
28	1	471.88	6	4	1.94	472.18	465	12	6.57E-03	76.6	
29	0	511.70	16	9	2.91	512.00	508	8	1.79E-02	41.6	

Total number of lines in spectrum 29
 Number of unidentified lines 25
 Number of lines tentatively identified by NID 4 13.79%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter				
BA-133	10.50Y	1.00	3.757E+02	3.757E+02	0.676E+02	18.00		
Total Activity :			3.757E+02	3.757E+02				

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter				
TH-234	4.47E+09Y	1.00	7.012E+02	7.012E+02	1.392E+02	19.85		
Total Activity :			7.012E+02	7.012E+02				

Grand Total Activity : 1.077E+03 1.077E+03

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.899E+01	3.757E+02	3.757E+02	18.00	OK
	302.84	17.80	6.222E+00	3.715E+02	3.715E+02	27.98	OK
	356.01	60.00	5.860E+00	4.167E+02	4.168E+02	16.83	OK

Final Mean for 3 Valid Peaks = 3.757E+02 +/- 6.762E+01 (18.00%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.648E+01	7.012E+02	7.012E+02	19.85	OK

Final Mean for 1 Valid Peaks = 7.012E+02 +/- 1.392E+02 (19.85%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.757E+02	6.762E+01	2.069E+01	3.165E+00	18.157
TH-234	7.012E+02	1.392E+02	1.392E+02	7.476E+00	5.038

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	-8.197E-01		5.840E+00	9.272E+00	1.059E+00	-0.088
CD-109	-3.227E+01		1.304E+02	2.029E+02	1.673E+01	-0.159
PA-231	5.283E+00		2.029E+00	4.110E+00	5.845E-02	1.285
PA-234	3.441E+00		1.661E+00	3.027E+00	4.306E-02	1.137
NP-237	-2.505E+01		4.333E+01	5.609E+01	4.534E+00	-0.447
AM-241	3.773E+01		1.094E+01	2.070E+01	1.018E+00	1.823

Ypru

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405206_GE1_BAFIL_190765.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : PZ-115-SS TOT
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 09:31:54
 Sample ID : 1304052-06 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE1 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.27 0.0%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	27.90	38	52	1.51	28.14	27	13	4.21E-02	30.1	3.64E+01
2	1	30.85	1874	64	1.32	31.08	27	13	2.08E+00	2.4	
3	1	34.90	489	70	1.53	35.13	27	13	5.43E-01	5.4	
4	0	52.56	55	101	2.02	52.80	50	8	6.14E-02	34.1	
5	2	61.76	309	69	1.63	61.99	58	11	3.43E-01	7.0	2.44E+00
6	2	65.96	111	74	1.74	66.19	58	11	1.23E-01	15.2	
7	0	81.11	857	163	1.81	81.34	76	11	9.52E-01	4.5	
8	0	92.93	36	89	1.44	93.16	90	7	4.01E-02	47.2	
9	4	111.88	200	53	1.48	112.11	108	13	2.22E-01	8.7	1.40E+00
10	4	116.16	49	86	2.20	116.39	108	13	5.41E-02	38.3	
11	0	192.40	15	59	1.34	192.62	190	7	1.67E-02	88.0	
12	0	276.52	63	30	1.13	276.74	273	8	6.98E-02	19.7	
13	0	303.53	131	48	1.71	303.75	299	8	1.46E-01	12.7	
14	0	334.12	64	36	1.39	334.34	330	8	7.12E-02	20.5	
15	4	352.79	10	3	1.69	353.00	352	10	1.09E-02	19.6	2.97E+01
16	4	356.30	611	14	1.71	356.51	352	10	6.79E-01	4.0	
17	0	365.92	11	28	1.63	366.13	362	9	1.18E-02	93.9	
18	1	376.96	14	12	1.87	377.17	374	24	1.59E-02	45.5	9.23E+00
19	1	383.96	144	11	1.88	384.17	374	24	1.59E-01	9.2	
20	1	386.96	251	7	1.67	387.17	374	24	2.79E-01	6.9	
21	1	390.91	50	7	1.88	391.12	374	24	5.56E-02	25.9	
22	0	415.99	81	20	1.99	416.20	411	10	9.05E-02	15.1	
23	0	437.21	95	1	2.03	437.42	435	7	1.05E-01	10.5	
24	0	446.17	9	1	3.05	446.37	444	6	9.89E-03	39.3	
25	1	467.97	24	7	1.93	468.18	464	11	2.67E-02	26.4	1.21E+00
26	1	471.94	11	1	1.93	472.14	464	11	1.21E-02	49.5	
27	0	512.04	19	7	3.03	512.24	507	10	2.07E-02	35.8	
28	0	539.05	8	7	2.93	539.24	534	10	8.81E-03	73.2	
29	0	609.65	14	5	1.92	609.85	607	8	1.60E-02	36.2	
30	0	794.44	6	2	1.08	794.62	791	6	7.15E-03	49.7	

Summary of Nuclide Activity

Sample ID : 1304052-06

Acquisition date : 22-APR-2013 09:31:54

Total number of lines in spectrum 30
 Number of unidentified lines 26
 Number of lines tentatively identified by NID 4 13.33%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected	Decay Corr				
BA-133	10.50Y	1.00	3.974E+02	3.974E+02	0.760E+02	19.11		
Total Activity :			3.974E+02	3.974E+02				

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected	Decay Corr				
TH-234	4.47E+09Y	1.00	4.158E+02	4.158E+02	0.618E+02	14.86		
Total Activity :			4.158E+02	4.158E+02				

Grand Total Activity : 8.132E+02 8.132E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.963E+01	3.974E+02	3.974E+02	19.11	OK
	302.84	17.80	4.915E+00	4.497E+02	4.497E+02	38.68	OK
	356.01	60.00	6.963E+00	4.390E+02	4.391E+02	17.14	OK

Final Mean for 3 Valid Peaks = 3.974E+02 +/- 7.596E+01 (19.11%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	5.865E+01	4.158E+02	4.158E+02	14.86	OK

Final Mean for 1 Valid Peaks = 4.158E+02 +/- 6.181E+01 (14.86%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.974E+02	7.596E+01	1.858E+01	3.050E+00	21.392
TH-234	4.158E+02	6.181E+01	5.564E+01	1.783E+00	7.474

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	-3.901E+00		1.369E+01	2.090E+01	6.525E+00	-0.187
CD-109	5.283E+01		1.696E+02	2.451E+02	3.171E+01	0.216
PA-231	0.000E+00		0.000E+00	1.933E-01	3.632E-03	0.000
PA-234	1.044E+01		1.843E+00	3.839E+00	7.215E-02	2.720
NP-237	2.705E+01		4.641E+01	6.935E+01	8.444E+00	0.390
AM-241	1.383E+01		3.668E+00	7.167E+00	1.681E-01	1.929

U12117

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130405207_GE1_BAFIL_190768.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : PZ-115-SS DIS
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 09:52:07
 Sample ID : 1304052-07 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE1 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.29 0.0%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	28.05	57	52	1.66	28.29	27	12	6.32E-02	21.3	3.02E+01
2	2	30.83	2142	55	1.36	31.06	27	12	2.38E+00	2.2	
3	2	35.00	510	47	1.68	35.24	27	12	5.66E-01	5.1	
4	0	52.91	55	115	1.45	53.14	50	8	6.06E-02	36.9	
5	2	61.90	288	64	1.73	62.13	58	12	3.20E-01	7.4	4.70E+00
6	2	65.69	137	63	1.74	65.92	58	12	1.52E-01	13.9	
7	0	81.13	901	137	1.85	81.36	76	11	1.00E+00	4.2	
8	0	92.38	30	117	1.21	92.61	89	8	3.30E-02	65.5	
9	2	112.02	220	53	1.75	112.25	109	10	2.44E-01	8.3	4.32E+00
10	2	115.70	47	51	1.81	115.93	109	10	5.18E-02	33.0	
11	0	161.54	19	67	1.96	161.76	158	6	2.07E-02	73.9	
12	0	276.56	39	35	1.18	276.77	273	8	4.38E-02	30.3	
13	2	302.93	167	23	1.51	303.14	298	13	1.85E-01	8.8	2.61E+00
14	2	307.46	30	32	2.01	307.67	298	13	3.36E-02	33.9	
15	0	315.01	29	19	11.16	315.22	311	12	3.17E-02	42.5	
16	3	333.93	78	14	1.92	334.14	328	14	8.64E-02	13.9	1.78E+00
17	3	338.34	32	10	1.96	338.55	328	14	3.59E-02	25.5	
18	0	356.28	583	25	1.93	356.49	352	9	6.48E-01	4.4	
19	0	364.95	15	11	1.38	365.16	362	6	1.62E-02	45.5	
20	0	369.78	15	23	2.19	369.99	368	6	1.64E-02	56.4	
21	4	383.91	122	30	1.52	384.12	382	9	1.36E-01	12.0	2.59E+01
22	4	387.09	222	57	1.75	387.30	382	9	2.47E-01	8.3	
23	0	391.85	42	28	2.70	392.06	391	6	4.71E-02	28.5	
24	2	414.84	53	7	2.08	415.05	412	14	5.90E-02	17.0	2.94E+00
25	2	417.81	23	11	2.09	418.02	412	14	2.59E-02	43.0	
26	0	437.63	99	19	1.81	437.83	434	7	1.10E-01	12.4	
27	0	468.18	23	15	1.94	468.38	463	9	2.52E-02	37.8	
28	0	511.62	32	3	2.48	511.82	507	11	3.55E-02	20.4	
29	0	859.07	8	0	2.75	859.25	856	7	8.89E-03	35.4	

Summary of Nuclide Activity

Sample ID : 1304052-07

Acquisition date : 22-APR-2013 09:52:07

Total number of lines in spectrum 29
 Number of unidentified lines 25
 Number of lines tentatively identified by NID 4 13.79%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
BA-133	10.50Y	1.00	4.177E+02	4.178E+02	0.787E+02	18.85	
Total Activity :			4.177E+02	4.178E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
TH-234	4.47E+09Y	1.00	3.875E+02	3.875E+02	0.604E+02	15.58	
Total Activity :			3.875E+02	3.875E+02			

Grand Total Activity : 8.052E+02 8.052E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected		Decay Corr	2-Sigma	Status
				pCi/filter	pCi/filter	pCi/filter	%Error	
BA-133	81.00	33.00*	1.963E+01	4.177E+02	4.178E+02	4.178E+02	18.85	OK
	302.84	17.80	4.915E+00	5.717E+02	5.718E+02	5.718E+02	34.12	OK
	356.01	60.00	6.963E+00	4.194E+02	4.194E+02	4.194E+02	17.54	OK

Final Mean for 3 Valid Peaks = 4.178E+02+/- 7.874E+01 (18.85%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected		Decay Corr	2-Sigma	Status
				pCi/filter	pCi/filter	pCi/filter	%Error	
TH-234	63.29	3.80*	5.865E+01	3.875E+02	3.875E+02	3.875E+02	15.58	OK

Final Mean for 1 Valid Peaks = 3.875E+02+/- 6.038E+01 (15.58%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	4.178E+02	7.874E+01	1.638E+01	2.689E+00	25.500
TH-234	3.875E+02	6.038E+01	5.509E+01	1.765E+00	7.033

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	3.020E+00		1.302E+01	2.136E+01	6.669E+00	0.141
CD-109	1.078E+01		1.468E+02	2.083E+02	2.694E+01	0.052
PA-231	0.000E+00		0.000E+00	1.933E-01	3.632E-03	0.000
PA-234	1.085E+01		1.868E+00	3.894E+00	7.318E-02	2.787
NP-237	7.517E+00		4.100E+01	5.909E+01	7.194E+00	0.127
AM-241	1.176E+01		3.511E+00	6.793E+00	1.594E-01	1.731

C
Ymru

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130405208_GE1_BAFIL_190771.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : MW-104 TOT
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 10:12:17
 Sample ID : 1304052-08 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE1 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.27 0.0%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	30.79	1981	60	1.41	31.02	27	13	2.20E+00	2.3	9.97E+00
2	1	34.91	470	50	1.53	35.14	27	13	5.22E-01	5.4	
3	5	52.56	62	72	2.28	52.79	49	25	6.84E-02	26.2	5.92E+00
4	5	61.89	273	56	1.88	62.12	49	25	3.03E-01	7.6	
5	5	65.86	174	59	2.32	66.09	49	25	1.93E-01	11.3	
6	5	70.28	18	57	2.33	70.51	49	25	2.05E-02	85.2	
7	0	81.20	779	126	1.82	81.43	76	11	8.65E-01	4.5	
8	0	93.53	33	81	1.04	93.76	91	6	3.70E-02	46.2	
9	0	101.15	31	74	2.17	101.38	98	7	3.47E-02	49.3	
10	2	111.96	196	53	1.81	112.19	106	14	2.17E-01	9.3	1.62E+00
11	2	116.01	31	51	1.81	116.24	106	14	3.47E-02	40.6	
12	0	159.82	51	80	1.50	160.04	156	9	5.68E-02	34.3	
13	1	181.93	16	33	1.72	182.16	181	13	1.81E-02	49.1	5.35E+00
14	1	185.93	44	52	1.72	186.16	181	13	4.90E-02	27.2	
15	0	276.86	66	40	1.82	277.08	273	10	7.33E-02	21.7	
16	3	303.07	172	16	1.72	303.28	298	18	1.91E-01	8.3	2.51E+00
17	3	307.56	28	12	2.21	307.77	298	18	3.14E-02	41.6	
18	3	311.95	15	8	2.21	312.17	298	18	1.68E-02	53.6	
19	2	333.89	69	18	1.86	334.10	328	14	7.67E-02	15.6	1.04E+00
20	2	338.14	37	14	2.03	338.35	328	14	4.07E-02	26.9	
21	0	356.27	550	32	1.91	356.48	352	10	6.11E-01	4.7	
22	0	365.33	12	21	1.29	365.54	362	7	1.28E-02	72.4	
23	2	380.79	11	3	1.70	381.00	380	17	1.21E-02	17.1	5.35E+00
24	2	384.15	134	16	2.06	384.36	380	17	1.49E-01	10.2	
25	2	387.12	197	9	1.71	387.33	380	17	2.19E-01	8.2	
26	2	390.96	45	7	1.88	391.17	380	17	4.96E-02	28.6	
27	1	414.77	45	8	1.89	414.97	411	16	4.96E-02	18.9	1.36E+00
28	1	418.87	25	7	1.90	419.07	411	16	2.81E-02	31.4	
29	1	422.89	11	6	1.90	423.09	411	16	1.20E-02	57.2	
30	0	437.34	98	14	1.93	437.54	434	8	1.09E-01	12.0	
31	0	468.74	10	18	1.35	468.94	467	8	1.09E-02	84.0	
32	0	512.90	42	0	3.48	513.10	508	15	4.67E-02	15.4	
33	0	583.85	8	2	2.85	584.05	580	7	9.11E-03	44.1	
34	0	610.08	16	3	2.72	610.28	607	9	1.81E-02	30.1	

Total number of lines in spectrum 34
 Number of unidentified lines 30
 Number of lines tentatively identified by NID 4 11.76%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
BA-133	10.50Y	1.00	3.610E+02	3.611E+02	0.693E+02	19.19	
Total Activity :			3.610E+02	3.611E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
TH-234	4.47E+09Y	1.00	3.679E+02	3.679E+02	0.587E+02	15.95	
Total Activity :			3.679E+02	3.679E+02			

Grand Total Activity : 7.289E+02 7.290E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected Decay Corr		2-Sigma	Status
				pCi/filter	pCi/filter	%Error	
BA-133	81.00	33.00*	1.963E+01	3.610E+02	3.611E+02	19.19	OK
	302.84	17.80	4.915E+00	5.916E+02	5.916E+02	33.64	OK
	356.01	60.00	6.963E+00	3.956E+02	3.956E+02	17.81	OK

Final Mean for 3 Valid Peaks = 3.611E+02+/- 6.928E+01 (19.19%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected Decay Corr		2-Sigma	Status
				pCi/filter	pCi/filter	%Error	
TH-234	63.29	3.80*	5.865E+01	3.679E+02	3.679E+02	15.95	OK

Final Mean for 1 Valid Peaks = 3.679E+02+/- 5.868E+01 (15.95%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.611E+02	6.928E+01	1.736E+01	2.850E+00	20.798
TH-234	3.679E+02	5.868E+01	4.867E+01	1.559E+00	7.559

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	3.764E+00		1.354E+01	2.222E+01	6.938E+00	0.169
CD-109	8.528E+01		1.557E+02	2.339E+02	3.025E+01	0.365
PA-231	0.000E+00		0.000E+00	1.933E-01	3.632E-03	0.000
PA-234	1.027E+01		1.764E+00	3.725E+00	7.000E-02	2.756
NP-237	-4.789E+00		4.635E+01	6.352E+01	7.734E+00	-0.075
AM-241	1.214E+01		3.168E+00	6.571E+00	1.542E-01	1.848

KBS
4/22/13

VAX/VMS Peak Search Report Generated 22-APR-2013 10:47:00.12

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405209_GE1_BAFIL_190775.CN
Analyses by : PEAK V16.9 PEAKEFF V2.2
Client ID : MW-104 DIS
Deposition Date :
Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 10:31:44
Sample ID : 1304052-09 Sample Quantity : 1.00000E+00 filter
Sample type : FILTER Sample Geometry : 0
Detector name : GE1 Detector Geometry: BAFIL
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.28 0.0%
Start channel : 25 End channel : 4096
Sensitivity : 3.00000 Gaussian : 10.00000
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	28.05	55	58	1.66	28.29	27	14	6.14E-02	23.0	1.53E+01
2	2	30.83	1982	66	1.36	31.07	27	14	2.20E+00	2.3	
3	2	34.96	508	64	1.68	35.19	27	14	5.64E-01	5.1	
4	0	54.03	31	151	1.87	54.26	48	9	3.48E-02	72.9	
5	1	58.87	19	81	1.57	59.10	57	17	2.14E-02	77.5	4.11E+00
6	1	61.91	200	76	1.58	62.14	57	17	2.22E-01	9.9	
7	1	65.80	97	69	1.58	66.03	57	17	1.07E-01	18.4	
8	0	81.19	851	149	1.82	81.42	76	11	9.46E-01	4.4	
9	0	93.02	44	74	1.43	93.24	89	7	4.83E-02	36.5	
10	1	111.91	200	50	1.64	112.14	107	19	2.23E-01	9.1	3.65E+00
11	1	115.62	39	43	1.65	115.85	107	19	4.33E-02	38.6	
12	0	160.24	32	85	1.04	160.46	157	7	3.60E-02	50.1	
13	0	185.39	30	74	1.84	185.61	182	7	3.34E-02	51.1	
14	0	276.35	65	41	1.30	276.57	273	8	7.23E-02	21.0	
15	0	303.16	125	41	1.41	303.37	300	6	1.39E-01	12.0	
16	0	307.75	25	27	1.11	307.97	307	5	2.75E-02	40.2	
17	0	334.21	57	56	1.41	334.42	329	9	6.28E-02	27.4	
18	0	356.19	583	17	1.82	356.40	351	11	6.47E-01	4.4	
19	0	376.96	16	16	1.47	377.16	374	7	1.82E-02	45.9	
20	3	384.01	106	26	1.65	384.22	382	8	1.18E-01	12.6	6.56E+00
21	3	386.97	188	29	1.69	387.17	382	8	2.09E-01	8.9	
22	0	391.45	56	12	1.98	391.66	390	6	6.27E-02	17.5	
23	3	414.88	49	2	2.29	415.08	410	20	5.45E-02	16.3	4.06E+00
24	3	418.36	33	1	2.26	418.57	410	20	3.69E-02	26.3	
25	3	421.81	9	1	2.09	422.02	410	20	9.83E-03	59.0	
26	3	426.90	11	0	2.30	427.10	410	20	1.18E-02	34.6	
27	0	437.37	104	16	1.94	437.58	432	12	1.16E-01	12.3	
28	3	468.38	24	6	2.33	468.58	465	10	2.71E-02	26.6	6.99E-01
29	3	471.93	6	3	1.93	472.13	465	10	7.11E-03	83.8	
30	0	511.89	23	4	1.62	512.09	509	8	2.56E-02	25.7	
31	0	707.26	5	4	1.02	707.44	703	7	5.00E-03	83.5	

Summary of Nuclide Activity

Sample ID : 1304052-09

Acquisition date : 22-APR-2013 10:31:44

Total number of lines in spectrum 31
 Number of unidentified lines 26
 Number of lines tentatively identified by NID 5 16.13%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
BA-133	10.50Y	1.00	3.948E+02	3.948E+02	0.753E+02	19.07	
Total Activity :			3.948E+02	3.948E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
TH-234	4.47E+09Y	1.00	2.695E+02	2.695E+02	0.552E+02	20.48	
AM-241	432.20Y	1.00	2.009E+00	2.009E+00	3.115E+00	155.00	
Total Activity :			2.715E+02	2.715E+02			

Grand Total Activity : 6.663E+02 6.663E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.963E+01	3.948E+02	3.948E+02	19.07	OK
	302.84	17.80	4.915E+00	4.306E+02	4.307E+02	37.83	OK
	356.01	60.00	6.963E+00	4.187E+02	4.187E+02	17.48	OK

Final Mean for 3 Valid Peaks = 3.948E+02+/- 7.528E+01 (19.07%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	5.865E+01	2.695E+02	2.695E+02	20.48	OK

Final Mean for 1 Valid Peaks = 2.695E+02+/- 5.519E+01 (20.48%)

AM-241	59.54	35.90*	8.010E+01	2.009E+00	2.009E+00	155.00	OK
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Final Mean for 1 Valid Peaks = 2.009E+00+/- 3.115E+00 (155.00%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.948E+02	7.528E+01	1.872E+01	3.074E+00	21.085
TH-234	2.695E+02	5.519E+01	5.776E+01	1.851E+00	4.666
AM-241	2.009E+00	3.115E+00	4.468E+00	1.048E-01	0.450

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	7.814E-01		1.375E+01	2.369E+01	7.397E+00	0.033
CD-109	2.466E+00		1.521E+02	2.134E+02	2.760E+01	0.012
PA-231	0.000E+00		0.000E+00	1.933E-01	3.632E-03	0.000
PA-234	1.060E+01		1.862E+00	3.874E+00	7.280E-02	2.738
NP-237	1.063E+01		4.286E+01	6.206E+01	7.556E+00	0.171

KB
4/22/13

VAX/VMS Peak Search Report Generated 22-APR-2013 11:06:14.17

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130405210_GE1_BAFIL_190779.CN
Analyses by : PEAK V16.9 PEAKEFF V2.2
Client ID : PZ-100-SD TOT
Deposition Date :
Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 10:50:51
Sample ID : 1304052-10 Sample Quantity : 1.00000E+00 filter
Sample type : FILTER Sample Geometry : 0
Detector name : GE1 Detector Geometry: BAFIL
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.28 0.0%
Start channel : 25 End channel : 4096
Sensitivity : 3.00000 Gaussian : 10.00000
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	30.79	2148	67	1.50	31.03	27	17	2.39E+00	2.2	2.17E+01
2	1	34.91	516	50	1.53	35.14	27	17	5.73E-01	5.1	
3	0	52.71	55	114	1.81	52.94	50	8	6.14E-02	35.9	
4	1	61.91	222	77	1.58	62.14	57	13	2.47E-01	9.1	9.50E-01
5	1	65.70	103	74	1.58	65.93	57	13	1.14E-01	16.4	
6	0	81.08	849	124	1.85	81.31	77	9	9.43E-01	4.2	
7	0	92.28	54	111	1.90	92.51	89	10	5.95E-02	39.1	
8	1	111.83	213	66	1.64	112.06	108	13	2.36E-01	8.9	2.86E+00
9	1	115.92	28	60	1.65	116.15	108	13	3.15E-02	46.8	
10	1	143.62	27	35	1.68	143.85	139	28	3.01E-02	39.6	1.91E+00
11	1	160.93	35	37	1.70	161.15	139	28	3.89E-02	32.1	
12	0	276.87	64	22	1.36	277.09	274	7	7.14E-02	17.7	
13	3	303.15	154	20	1.69	303.37	300	11	1.71E-01	9.0	3.95E+00
14	3	307.40	25	36	2.21	307.61	300	11	2.76E-02	52.6	
15	3	333.89	67	15	1.78	334.10	330	14	7.46E-02	14.9	8.01E-01
16	3	338.34	20	16	2.23	338.55	330	14	2.24E-02	49.7	
17	0	356.17	612	14	1.82	356.38	351	11	6.80E-01	4.2	
18	0	366.83	46	8	1.84	367.04	362	11	5.12E-02	19.0	
19	0	377.47	11	17	1.61	377.68	374	6	1.26E-02	64.3	
20	2	383.97	133	16	2.06	384.18	381	15	1.48E-01	9.8	1.03E+01
21	2	387.07	248	9	1.75	387.28	381	15	2.76E-01	7.0	
22	2	391.15	45	7	2.07	391.36	381	15	4.98E-02	28.9	
23	2	414.81	45	9	2.08	415.02	410	15	4.99E-02	18.0	3.70E+00
24	2	418.14	25	6	2.09	418.35	410	15	2.79E-02	37.3	
25	2	421.43	13	4	2.09	421.64	410	15	1.48E-02	52.1	
26	0	437.45	96	14	1.89	437.66	432	9	1.06E-01	12.4	
27	0	467.13	36	0	1.73	467.33	463	8	4.00E-02	16.7	
28	0	510.54	20	9	2.54	510.74	505	12	2.22E-02	37.5	
29	0	651.68	8	2	2.46	651.87	648	7	9.22E-03	43.5	
30	0	796.45	8	0	2.50	796.62	793	7	8.89E-03	35.4	
31	0	911.83	8	0	2.00	912.00	909	6	8.89E-03	35.4	

Total number of lines in spectrum 31
 Number of unidentified lines 27
 Number of lines tentatively identified by NID 4 12.90%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected	Decay Corr				
BA-133	10.50Y	1.00	3.935E+02	3.935E+02	0.741E+02	18.84		
Total Activity :			3.935E+02	3.935E+02				

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected	Decay Corr				
TH-234	4.47E+09Y	1.00	2.994E+02	2.994E+02	0.566E+02	18.92		
Total Activity :			2.994E+02	2.994E+02				

Grand Total Activity : 6.928E+02 6.929E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.963E+01	3.935E+02	3.935E+02	18.84	OK
	302.84	17.80	4.915E+00	5.290E+02	5.291E+02	34.36	OK
	356.01	60.00	6.963E+00	4.401E+02	4.402E+02	17.33	OK

Final Mean for 3 Valid Peaks = 3.935E+02+/- 7.414E+01 (18.84%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	5.865E+01	2.994E+02	2.994E+02	18.92	OK

Final Mean for 1 Valid Peaks = 2.994E+02+/- 5.664E+01 (18.92%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.935E+02	7.414E+01	1.813E+01	2.976E+00	21.702
TH-234	2.994E+02	5.664E+01	5.980E+01	1.916E+00	5.006

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	3.575E+00		1.352E+01	2.216E+01	6.920E+00	0.161
CD-109	3.017E+01		1.391E+02	2.027E+02	2.622E+01	0.149
PA-231	0.000E+00		0.000E+00	1.933E-01	3.632E-03	0.000
PA-234	9.317E+00		1.778E+00	3.691E+00	6.936E-02	2.524
NP-237	1.113E+01		3.960E+01	5.810E+01	7.073E+00	0.192
AM-241	8.481E+00		3.490E+00	6.448E+00	1.513E-01	1.315

C
4/12/13

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405211_GE3_BAFIL_190770.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : PZ-100-SD DIS
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 09:53:39
 Sample ID : 1304052-11 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE3 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.64 0.4%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	30.56	2092	94	1.38	30.88	26	15	2.32E+00	2.3	5.32E+00
2	2	34.79	551	89	1.50	35.11	26	15	6.13E-01	5.1	
3	0	52.30	53	132	2.01	52.62	50	7	5.94E-02	37.8	
4	3	61.50	244	101	1.62	61.82	57	12	2.71E-01	8.9	5.28E-01
5	3	65.63	137	77	1.60	65.95	57	12	1.52E-01	13.3	
6	1	80.71	892	71	1.54	81.03	76	15	9.91E-01	3.6	6.60E+00
7	1	83.82	26	66	1.55	84.14	76	15	2.92E-02	72.5	
8	1	107.83	18	34	1.59	108.14	107	15	1.96E-02	49.9	8.60E+00
9	1	111.59	230	56	1.59	111.91	107	15	2.56E-01	8.3	
10	1	115.67	43	55	1.60	115.99	107	15	4.74E-02	31.8	
11	1	118.68	14	44	1.46	119.00	107	15	1.54E-02	79.0	
12	1	157.54	13	52	1.65	157.85	155	12	1.42E-02	88.4	3.26E+00
13	1	160.84	39	43	1.66	161.15	155	12	4.34E-02	30.0	
14	0	190.23	29	52	3.33	190.54	188	7	3.21E-02	45.2	
15	0	210.47	19	59	4.51	210.79	206	8	2.11E-02	74.0	
16	0	238.02	24	41	5.26	238.33	234	8	2.70E-02	50.9	
17	0	276.36	59	28	1.91	276.67	273	7	6.57E-02	19.7	
18	1	302.67	149	19	1.47	302.98	297	14	1.66E-01	9.0	2.55E+00
19	1	306.79	24	21	1.81	307.09	297	14	2.66E-02	41.6	
20	0	333.68	70	41	1.66	333.99	330	8	7.76E-02	19.8	
21	0	355.94	497	25	1.79	356.25	351	10	5.52E-01	4.9	
22	0	377.67	11	11	1.98	377.97	375	6	1.20E-02	56.8	
23	1	383.73	116	24	1.87	384.03	381	9	1.28E-01	13.0	5.37E+00
24	1	386.66	192	32	1.58	386.97	381	9	2.14E-01	8.8	
25	0	391.14	55	19	1.35	391.44	390	5	6.08E-02	18.8	
26	2	414.34	42	20	2.08	414.64	410	12	4.62E-02	24.2	4.09E+00
27	2	417.82	12	25	2.09	418.12	410	12	1.33E-02	80.3	
28	0	436.91	94	18	1.92	437.21	431	12	1.04E-01	13.7	
29	1	464.88	6	0	1.93	465.18	464	7	6.13E-03	31.4	2.90E-01
30	1	467.70	20	0	1.93	468.00	464	7	2.25E-02	24.7	
31	0	473.29	16	2	2.18	473.59	471	7	1.76E-02	29.0	
32	0	510.95	9	6	1.39	511.24	508	7	1.05E-02	52.0	
33	0	569.37	4	6	2.40	569.67	564	8	4.67E-03	111.7	

Total number of lines in spectrum 33
 Number of unidentified lines 29
 Number of lines tentatively identified by NID 4 12.12%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
BA-133	10.50Y	1.00	4.273E+02	4.273E+02	0.743E+02	17.39	
Total Activity :			4.273E+02	4.273E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
TH-234	4.47E+09Y	1.00	7.292E+02	7.292E+02	1.380E+02	18.93	
AM-241	432.20Y	1.00	7.066E+01	7.066E+01	1.329E+01	18.80	
Total Activity :			7.999E+02	7.999E+02			

Grand Total Activity : 1.227E+03 1.227E+03

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.899E+01	4.273E+02	4.273E+02	17.39	OK
	302.84	17.80	6.222E+00	4.049E+02	4.049E+02	27.30	OK
	356.01	60.00	5.860E+00	4.245E+02	4.245E+02	16.76	OK

Final Mean for 3 Valid Peaks = 4.273E+02+/- 7.429E+01 (17.39%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.648E+01	7.292E+02	7.292E+02	18.93	OK

Final Mean for 1 Valid Peaks = 7.292E+02+/- 1.380E+02 (18.93%)

AM-241	59.54	35.90*	2.893E+01	7.066E+01	7.066E+01	18.80	OK
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Final Mean for 1 Valid Peaks = 7.066E+01+/- 1.329E+01 (18.80%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	4.273E+02	7.429E+01	1.958E+01	2.995E+00	21.821
TH-234	7.292E+02	1.380E+02	1.402E+02	7.530E+00	5.202
AM-241	7.066E+01	1.329E+01	1.355E+01	6.663E-01	5.214

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/filter) Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	-5.526E+00	7.002E+00	1.006E+01	1.149E+00	-0.549
CD-109	-4.427E+01	1.078E+02	1.805E+02	1.488E+01	-0.245
PA-231	2.202E+00	1.682E+00	3.284E+00	4.670E-02	0.671
PA-234	2.625E+00	1.533E+00	2.774E+00	3.945E-02	0.947
NP-237	-2.748E+00	3.195E+01	5.505E+01	4.450E+00	-0.050

C
Ymzu

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405212_GE3_BAFIL_190773.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : I-67 TOT
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 10:13:37
 Sample ID : 1304052-12 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE3 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.15 0.3%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	27.91	49	134	1.57	28.23	26	15	5.48E-02	53.0	6.77E+00
2	2	30.62	2060	90	1.38	30.94	26	15	2.29E+00	2.3	
3	2	34.81	454	86	1.59	35.13	26	15	5.05E-01	5.8	
4	0	46.05	23	68	1.42	46.37	44	5	2.53E-02	58.1	
5	1	52.57	60	63	1.49	52.89	50	20	6.63E-02	23.7	3.32E+00
6	1	61.68	265	85	1.51	62.00	50	20	2.94E-01	8.4	
7	1	65.54	112	89	1.52	65.86	50	20	1.24E-01	16.0	
8	0	80.71	814	158	1.29	81.03	77	8	9.04E-01	4.4	
9	0	92.74	49	91	1.97	93.05	89	7	5.41E-02	36.1	
10	0	111.59	224	137	1.34	111.90	108	7	2.49E-01	10.9	
11	0	161.33	20	93	1.61	161.65	157	8	2.17E-02	89.5	
12	0	196.26	59	107	8.38	196.57	191	14	6.58E-02	39.0	
13	0	206.53	23	38	2.88	206.84	204	6	2.56E-02	47.4	
14	0	221.67	25	53	1.25	221.98	219	7	2.72E-02	53.0	
15	0	275.99	52	28	1.80	276.30	272	7	5.76E-02	21.9	
16	2	302.68	169	15	1.66	302.98	297	18	1.88E-01	8.2	1.18E+00
17	2	307.35	20	18	1.99	307.66	297	18	2.28E-02	43.1	
18	2	310.95	12	18	1.99	311.26	297	18	1.33E-02	71.4	
19	2	333.50	74	2	2.01	333.81	329	16	8.21E-02	12.9	2.88E+00
20	2	337.92	33	1	2.02	338.23	329	16	3.64E-02	22.1	
21	0	356.00	503	43	1.54	356.31	352	8	5.59E-01	5.0	
22	0	363.64	19	16	3.51	363.95	361	7	2.10E-02	41.8	
23	5	383.66	137	17	1.96	383.96	380	15	1.52E-01	10.5	4.67E+00
24	5	386.68	190	11	1.47	386.98	380	15	2.11E-01	8.2	
25	5	390.99	29	18	2.45	391.30	380	15	3.21E-02	36.9	
26	1	414.53	48	2	1.89	414.83	410	17	5.34E-02	16.7	2.87E+00
27	1	417.87	35	4	1.90	418.17	410	17	3.89E-02	26.0	
28	1	421.53	20	5	1.90	421.83	410	17	2.23E-02	32.9	
29	0	436.77	99	2	1.91	437.07	433	8	1.10E-01	10.4	
30	1	467.64	22	8	1.93	467.94	464	13	2.41E-02	27.8	5.84E-01
31	1	471.52	9	7	1.94	471.82	464	13	1.01E-02	60.3	
32	0	511.31	19	4	1.36	511.61	508	8	2.11E-02	29.3	

Summary of Nuclide Activity

Sample ID : 1304052-12

Acquisition date : 22-APR-2013 10:13:37

Total number of lines in spectrum 32
 Number of unidentified lines 28
 Number of lines tentatively identified by NID 4 12.50%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
BA-133	10.50Y	1.00	3.901E+02	3.901E+02	0.706E+02	18.10	
Total Activity :			3.901E+02	3.901E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
TH-234	4.47E+09Y	1.00	7.900E+02	7.900E+02	1.424E+02	18.03	
Total Activity :			7.900E+02	7.900E+02			

Grand Total Activity : 1.180E+03 1.180E+03

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected Decay Corr		2-Sigma	Status
				pCi/filter	pCi/filter	%Error	
BA-133	81.00	33.00*	1.899E+01	3.901E+02	3.901E+02	18.10	OK
	302.84	17.80	6.222E+00	4.595E+02	4.596E+02	26.35	OK
	356.01	60.00	5.860E+00	4.297E+02	4.298E+02	16.90	OK

Final Mean for 3 Valid Peaks = 3.901E+02+/- 7.061E+01 (18.10%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected Decay Corr		2-Sigma	Status
				pCi/filter	pCi/filter	%Error	
TH-234	63.29	3.80*	2.648E+01	7.900E+02	7.900E+02	18.03	OK

Final Mean for 1 Valid Peaks = 7.900E+02+/- 1.424E+02 (18.03%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.901E+02	7.061E+01	1.915E+01	2.929E+00	20.371
TH-234	7.900E+02	1.424E+02	1.330E+02	7.143E+00	5.941

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/filter) Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	-1.242E+00	6.337E+00	1.077E+01	1.230E+00	-0.115
CD-109	3.171E+00	1.396E+02	1.971E+02	1.625E+01	0.016
PA-231	2.843E+00	1.560E+00	3.177E+00	4.518E-02	0.895
PA-234	1.972E+00	1.508E+00	2.671E+00	3.798E-02	0.739
NP-237	-2.935E+01	4.420E+01	5.650E+01	4.567E+00	-0.519
AM-241	4.159E+01	1.090E+01	2.093E+01	1.029E+00	1.987

KCB
4/22/13

VAX/VMS Peak Search Report Generated 22-APR-2013 10:48:16.81

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405213_GE3_BAFIL_190777.CN
Analyses by : PEAK V16.9 PEAKEFF V2.2
Client ID : I-67 DIS
Deposition Date :
Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 10:33:01
Sample ID : 1304052-13 Sample Quantity : 1.00000E+00 filter
Sample type : FILTER Sample Geometry : 0
Detector name : GE3 Detector Geometry: BAFIL
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.20 0.4%
Start channel : 25 End channel : 4096
Sensitivity : 3.00000 Gaussian : 10.00000
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	30.59	2122	76	1.44	30.91	27	14	2.36E+00	2.3	8.94E+00
2	1	34.79	464	74	1.45	35.11	27	14	5.16E-01	5.5	
3	0	52.53	71	146	2.49	52.85	49	9	7.93E-02	32.6	
4	1	61.64	256	99	1.51	61.96	57	16	2.84E-01	8.4	6.03E+00
5	1	65.64	99	91	1.52	65.96	57	16	1.10E-01	18.6	
6	1	68.68	18	70	1.38	69.00	57	16	2.05E-02	76.4	
7	1	80.74	850	76	1.54	81.06	76	11	9.44E-01	3.7	1.03E+01
8	1	83.74	19	84	1.55	84.06	76	11	2.16E-02	99.3	
9	1	111.76	204	79	1.59	112.08	108	13	2.27E-01	9.6	2.75E+00
10	1	115.54	58	62	1.60	115.85	108	13	6.48E-02	28.0	
11	0	161.16	30	60	2.44	161.47	158	7	3.28E-02	47.1	
12	0	239.53	22	25	1.47	239.84	238	6	2.43E-02	42.8	
13	0	277.22	38	66	1.78	277.53	272	11	4.22E-02	44.5	
14	0	303.30	116	60	1.41	303.61	299	8	1.29E-01	15.2	
15	0	307.20	32	9	1.68	307.51	306	4	3.50E-02	22.6	
16	1	333.71	62	12	1.83	334.02	331	11	6.93E-02	15.3	1.31E+00
17	1	337.86	31	16	1.83	338.17	331	11	3.44E-02	27.3	
18	2	355.89	494	12	1.56	356.20	350	18	5.49E-01	4.6	2.14E+00
19	2	364.70	18	9	2.04	365.00	350	18	2.04E-02	38.7	
20	1	383.53	118	26	1.87	383.84	381	9	1.31E-01	12.3	4.20E+00
21	1	386.80	201	32	1.54	387.10	381	9	2.24E-01	8.3	
22	0	391.25	52	16	1.70	391.55	390	6	5.81E-02	19.7	
23	1	414.53	47	14	1.89	414.83	412	9	5.27E-02	18.7	4.84E+00
24	1	417.87	28	20	1.90	418.17	412	9	3.09E-02	35.3	
25	0	436.84	110	8	1.65	437.14	432	10	1.23E-01	10.6	
26	0	449.13	8	4	1.22	449.43	445	7	9.35E-03	50.6	
27	0	468.16	18	7	1.26	468.46	465	6	1.95E-02	34.2	
28	0	510.75	16	2	2.45	511.05	507	9	1.79E-02	29.8	
29	0	609.58	7	4	1.81	609.87	606	6	7.27E-03	64.4	

Summary of Nuclide Activity

Sample ID : 1304052-13

Acquisition date : 22-APR-2013 10:33:01

Total number of lines in spectrum 29
 Number of unidentified lines 25
 Number of lines tentatively identified by NID 4 13.79%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/filter	Wtd Mean Decay Corr pCi/filter	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
BA-133	10.50Y	1.00	4.074E+02	4.074E+02	0.712E+02	17.49	
Total Activity :			4.074E+02	4.074E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/filter	Wtd Mean Decay Corr pCi/filter	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
TH-234	4.47E+09Y	1.00	7.631E+02	7.631E+02	1.385E+02	18.15	
Total Activity :			7.631E+02	7.631E+02			

Grand Total Activity : 1.170E+03 1.170E+03

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.899E+01	4.074E+02	4.074E+02	17.49	OK
	302.84	17.80	6.222E+00	3.152E+02	3.152E+02	36.71	OK
	356.01	60.00	5.860E+00	4.222E+02	4.223E+02	16.49	OK

Final Mean for 3 Valid Peaks = 4.074E+02+/- 7.124E+01 (17.49%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.648E+01	7.631E+02	7.631E+02	18.15	OK

Final Mean for 1 Valid Peaks = 7.631E+02+/- 1.385E+02 (18.15%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	4.074E+02	7.124E+01	2.083E+01	3.185E+00	19.562
TH-234	7.631E+02	1.385E+02	1.412E+02	7.583E+00	5.405

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/filter) Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	-1.086E+00	6.230E+00	9.806E+00	1.120E+00	-0.111
CD-109	1.918E+01	1.259E+02	2.042E+02	1.684E+01	0.094
PA-231	2.978E+00	1.607E+00	3.262E+00	4.640E-02	0.913
PA-234	3.703E+00	1.431E+00	2.845E+00	4.046E-02	1.302
NP-237	1.382E+01	3.520E+01	5.858E+01	4.735E+00	0.236
AM-241	3.340E+01	1.075E+01	2.013E+01	9.898E-01	1.659

VMS
4/22/13

VAX/VMS Peak Search Report Generated 22-APR-2013 11:07:23.72

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405214_GE3_BAFIL_190781.CN
Analyses by : PEAK V16.9 PEAKEFF V2.2
Client ID : PZ-203-SS TOT
Deposition Date :
Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 10:52:04
Sample ID : 1304052-14 Sample Quantity : 1.00000E+00 filter
Sample type : FILTER Sample Geometry : 0
Detector name : GE3 Detector Geometry: BAFIL
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.17 0.4%
Start channel : 25 End channel : 4096
Sensitivity : 3.00000 Gaussian : 10.00000
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	27.81	43	108	1.43	28.13	26	13	4.83E-02	37.9	1.25E+01
2	1	30.63	2130	104	1.38	30.95	26	13	2.37E+00	2.3	
3	1	34.74	432	99	1.45	35.06	26	13	4.80E-01	6.0	
4	0	52.45	80	171	2.50	52.77	49	9	8.89E-02	31.4	
5	2	61.56	246	96	1.66	61.88	58	15	2.73E-01	8.8	1.23E+00
6	2	65.69	124	77	1.67	66.01	58	15	1.38E-01	14.6	
7	2	69.58	23	71	1.68	69.90	58	15	2.59E-02	67.0	
8	0	80.82	747	140	1.38	81.14	77	8	8.30E-01	4.6	
9	4	111.63	235	58	1.71	111.95	107	16	2.62E-01	8.0	1.77E+00
10	4	115.76	61	51	2.13	116.07	107	16	6.83E-02	26.1	
11	4	119.75	19	45	2.13	120.07	107	16	2.09E-02	72.3	
12	0	160.49	26	120	7.59	160.81	152	12	2.89E-02	86.5	
13	0	276.48	64	38	1.53	276.79	272	9	7.16E-02	21.3	
14	1	302.69	145	25	1.49	303.00	299	16	1.62E-01	9.4	3.29E+00
15	1	306.81	28	16	1.81	307.12	299	16	3.08E-02	36.6	
16	1	310.86	17	11	1.81	311.16	299	16	1.94E-02	49.0	
17	3	333.25	66	10	2.08	333.56	330	16	7.31E-02	14.4	3.23E+00
18	3	337.82	32	16	2.22	338.13	330	16	3.57E-02	27.4	
19	7	355.86	478	8	1.64	356.17	351	21	5.31E-01	4.6	3.10E+00
20	7	364.69	18	10	3.29	364.99	351	21	2.03E-02	47.9	
21	1	376.87	17	9	1.86	377.17	373	27	1.89E-02	38.6	1.65E+00
22	1	383.87	123	7	1.87	384.17	373	27	1.36E-01	11.0	
23	1	386.71	202	5	1.81	387.01	373	27	2.24E-01	8.7	
24	1	390.87	42	4	1.88	391.17	373	27	4.66E-02	25.0	
25	1	409.87	7	2	1.89	410.17	409	18	7.96E-03	37.6	1.80E+00
26	1	414.65	34	7	1.89	414.95	409	18	3.77E-02	22.9	
27	1	417.86	26	8	1.90	418.16	409	18	2.94E-02	32.6	
28	1	421.61	10	9	1.90	421.91	409	18	1.11E-02	60.2	
29	0	436.98	96	11	1.84	437.29	431	11	1.06E-01	12.3	
30	0	467.85	22	16	1.13	468.15	464	8	2.39E-02	38.9	
31	0	511.28	12	8	1.20	511.58	509	7	1.34E-02	46.9	

Summary of Nuclide Activity

Sample ID : 1304052-14

Acquisition date : 22-APR-2013 10:52:04

Total number of lines in spectrum 31
 Number of unidentified lines 27
 Number of lines tentatively identified by NID 4 12.90%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
BA-133	10.50Y	1.00	3.580E+02	3.580E+02	0.654E+02	18.26	
Total Activity :			3.580E+02	3.580E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
TH-234	4.47E+09Y	1.00	7.331E+02	7.331E+02	1.375E+02	18.76	
Total Activity :			7.331E+02	7.331E+02			

Grand Total Activity : 1.091E+03 1.091E+03

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.899E+01	3.580E+02	3.580E+02	18.26	OK
	302.84	17.80	6.222E+00	3.942E+02	3.942E+02	27.86	OK
	356.01	60.00	5.860E+00	4.082E+02	4.082E+02	16.50	OK

Final Mean for 3 Valid Peaks = 3.580E+02+/- 6.539E+01 (18.26%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.648E+01	7.331E+02	7.331E+02	18.76	OK

Final Mean for 1 Valid Peaks = 7.331E+02+/- 1.375E+02 (18.76%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.580E+02	6.539E+01	2.122E+01	3.246E+00	16.868
TH-234	7.331E+02	1.375E+02	1.276E+02	6.852E+00	5.746

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/filter) Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	5.045E+00	6.033E+00	1.071E+01	1.224E+00	0.471
CD-109	-7.963E+01	1.283E+02	1.917E+02	1.580E+01	-0.415
PA-231	3.365E+00	1.750E+00	3.516E+00	5.001E-02	0.957
PA-234	4.682E+00	1.494E+00	2.923E+00	4.157E-02	1.602
NP-237	2.210E+01	3.443E+01	5.873E+01	4.748E+00	0.376
AM-241	4.248E+01	1.071E+01	2.076E+01	1.021E+00	2.046

*C
yrru*

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405215_GE2_BAFIL_190772.CN
 Analyses by : PEAK V16.9 PEAKEFF V2.2
 Client ID : PZ-203-SS DIS
 Deposition Date :
 Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 10:12:53
 Sample ID : 1304052-15 Sample Quantity : 1.00000E+00 filter
 Sample type : FILTER Sample Geometry : 0
 Detector name : GE2 Detector Geometry: BAFIL
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.29 0.0%
 Start channel : 25 End channel : 4096
 Sensitivity : 3.00000 Gaussian : 10.00000
 Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	28.01	37	135	1.37	28.12	26	14	4.13E-02	46.5	1.24E+01
2	1	30.84	1934	125	1.38	30.95	26	14	2.15E+00	2.4	
3	1	34.89	443	114	1.39	35.01	26	14	4.92E-01	6.1	
4	0	52.72	72	96	1.78	52.83	50	8	8.00E-02	26.4	
5	2	61.66	205	61	1.60	61.78	58	11	2.28E-01	9.2	1.87E+00
6	2	65.83	89	62	1.61	65.95	58	11	9.87E-02	16.7	
7	0	80.88	788	120	1.26	81.00	77	8	8.76E-01	4.3	
8	0	94.15	23	106	2.04	94.27	88	9	2.51E-02	85.4	
9	0	111.56	166	84	1.43	111.68	108	7	1.84E-01	12.0	
10	0	187.18	21	68	1.11	187.29	183	7	2.29E-02	70.6	
11	3	192.41	18	46	2.01	192.52	190	18	1.97E-02	64.2	2.31E+00
12	3	198.39	19	44	2.02	198.50	190	18	2.10E-02	62.2	
13	0	276.69	67	38	1.65	276.80	272	9	7.46E-02	20.6	
14	1	302.73	139	20	1.59	302.84	300	12	1.55E-01	9.7	8.10E+00
15	1	307.01	26	28	1.79	307.12	300	12	2.90E-02	35.6	
16	0	333.43	57	34	1.96	333.54	329	8	6.34E-02	22.1	
17	1	352.06	12	3	1.83	352.17	351	12	1.37E-02	12.9	2.48E+00
18	1	355.83	557	8	1.50	355.94	351	12	6.18E-01	4.2	
19	1	383.74	98	9	1.86	383.85	380	19	1.09E-01	13.4	1.81E+00
20	1	386.79	139	9	1.86	386.89	380	19	1.55E-01	10.9	
21	1	391.00	49	9	1.86	391.11	380	19	5.43E-02	19.2	
22	4	414.36	34	4	2.38	414.47	409	16	3.76E-02	20.3	2.05E+00
23	4	418.69	26	4	2.51	418.80	409	16	2.94E-02	30.9	
24	5	429.84	7	8	2.78	429.94	426	16	7.27E-03	80.9	2.67E-01
25	5	436.87	83	4	1.70	436.98	426	16	9.28E-02	11.5	
26	0	511.93	10	15	0.95	512.03	508	8	1.08E-02	77.4	
27	0	583.15	8	2	1.54	583.25	579	8	9.06E-03	45.9	
28	0	609.56	12	2	1.91	609.66	605	8	1.36E-02	34.6	
29	0	1461.72	6	1	1.41	1461.80	1457	7	6.35E-03	55.5	

Summary of Nuclide Activity

Sample ID : 1304052-15

Acquisition date : 22-APR-2013 10:12:53

Total number of lines in spectrum 29
 Number of unidentified lines 25
 Number of lines tentatively identified by NID 4 13.79%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean		Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter			
BA-133	10.50Y	1.00	3.988E+02	3.988E+02	0.777E+02	19.49	
Total Activity :			3.988E+02	3.988E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean		Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter			
TH-234	4.47E+09Y	1.00	7.045E+02	7.045E+02	1.443E+02	20.48	
Total Activity :			7.045E+02	7.045E+02			

Grand Total Activity : 1.103E+03 1.103E+03

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.799E+01	3.988E+02	3.988E+02	19.49	OK
	302.84	17.80	7.560E+00	3.109E+02	3.109E+02	35.60	OK
	356.01	60.00	7.170E+00	3.885E+02	3.886E+02	17.32	OK

Final Mean for 3 Valid Peaks = 3.988E+02+/- 7.773E+01 (19.49%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.305E+01	7.045E+02	7.045E+02	20.48	OK

Final Mean for 1 Valid Peaks = 7.045E+02+/- 1.443E+02 (20.48%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.988E+02	7.773E+01	1.800E+01	3.065E+00	22.153
TH-234	7.045E+02	1.443E+02	1.392E+02	1.150E+01	5.062

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	4.472E-01		5.209E+00	9.255E+00	1.421E+00	0.048
CD-109	-2.315E+01		1.248E+02	1.740E+02	1.998E+01	-0.133
PA-231	3.612E+01		5.824E+00	1.098E+01	2.090E-01	3.291
PA-234	2.108E+00		1.871E+00	3.256E+00	6.716E-02	0.647
NP-237	-2.981E+01		3.986E+01	5.049E+01	5.701E+00	-0.590
AM-241	2.396E+01		1.038E+01	1.939E+01	1.500E+00	1.236

KP
1/22/13

VAX/VMS Peak Search Report Generated 22-APR-2013 10:47:35.73

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130405216_GE2_BAFIL_190776.CN
Analyses by : PEAK V16.9 PEAKEFF V2.2
Client ID : PZ-100-SS TOT
Deposition Date :
Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 10:32:21
Sample ID : 1304052-16 Sample Quantity : 1.00000E+00 filter
Sample type : FILTER Sample Geometry : 0
Detector name : GE2 Detector Geometry: BAFIL
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.30 0.0%
Start channel : 25 End channel : 4096
Sensitivity : 3.00000 Gaussian : 10.00000
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	28.15	33	174	1.51	28.26	26	14	3.67E-02	80.4	9.52E+00
2	2	30.87	1958	125	1.39	30.98	26	14	2.18E+00	2.4	
3	2	35.01	465	133	1.53	35.12	26	14	5.17E-01	6.1	
4	0	52.54	66	57	1.51	52.65	50	7	7.29E-02	22.8	
5	4	61.81	265	54	1.94	61.93	57	17	2.95E-01	7.7	2.96E+00
6	4	65.80	115	61	1.95	65.92	57	17	1.28E-01	15.6	
7	0	80.95	727	144	1.27	81.06	77	8	8.08E-01	4.7	
8	1	111.75	177	44	1.55	111.86	107	13	1.97E-01	9.6	1.86E+00
9	1	115.86	38	41	1.56	115.97	107	13	4.27E-02	30.2	
10	0	184.83	24	110	1.40	184.94	181	9	2.61E-02	83.1	
11	1	276.02	54	22	1.76	276.13	273	11	5.96E-02	18.7	2.05E+00
12	1	280.00	10	17	1.76	280.11	273	11	1.08E-02	88.8	
13	3	302.71	140	11	1.63	302.82	297	18	1.55E-01	8.9	5.59E+00
14	3	307.18	36	18	2.16	307.28	297	18	3.95E-02	25.2	
15	0	332.56	56	57	1.91	332.66	330	8	6.20E-02	26.6	
16	2	351.73	10	3	1.83	351.83	351	10	1.17E-02	18.3	3.71E+00
17	2	355.94	495	11	1.47	356.05	351	10	5.50E-01	4.6	
18	1	384.06	138	10	1.86	384.17	380	16	1.53E-01	10.3	2.15E+01
19	1	390.75	49	4	1.86	390.85	380	16	5.42E-02	19.7	
20	2	414.20	30	13	2.07	414.31	410	12	3.29E-02	30.3	1.27E+00
21	2	417.53	19	24	2.08	417.64	410	12	2.09E-02	48.5	
22	2	433.97	7	4	2.09	434.07	432	11	8.01E-03	50.0	3.56E+00
23	2	436.84	91	4	2.09	436.94	432	11	1.01E-01	11.1	
24	0	472.19	9	4	1.71	472.29	470	5	9.62E-03	50.7	
25	0	510.59	24	12	2.12	510.69	507	7	2.65E-02	31.8	
26	0	601.79	9	0	2.32	601.89	600	5	1.00E-02	33.3	
27	0	608.61	13	5	1.21	608.71	606	5	1.45E-02	37.7	

Total number of lines in spectrum 27
 Number of unidentified lines 23
 Number of lines tentatively identified by NID 4 14.81%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
BA-133	10.50Y	1.00	3.678E+02	3.679E+02	0.730E+02	19.84	
Total Activity :			3.678E+02	3.679E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
TH-234	4.47E+09Y	1.00	9.096E+02	9.096E+02	1.636E+02	17.98	
Total Activity :			9.096E+02	9.096E+02			

Grand Total Activity : 1.277E+03 1.277E+03

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.799E+01	3.678E+02	3.679E+02	19.84	OK
	302.84	17.80	7.560E+00	3.115E+02	3.115E+02	34.75	OK
	356.01	60.00	7.170E+00	3.456E+02	3.456E+02	17.69	OK

Final Mean for 3 Valid Peaks = 3.679E+02+/- 7.298E+01 (19.84%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.305E+01	9.096E+02	9.096E+02	17.98	OK

Final Mean for 1 Valid Peaks = 9.096E+02+/- 1.636E+02 (17.98%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.679E+02	7.298E+01	2.276E+01	3.875E+00	16.166
TH-234	9.096E+02	1.636E+02	1.269E+02	1.049E+01	7.168

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/filter) Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	2.277E+00	5.318E+00	9.167E+00	1.408E+00	0.248
CD-109	-3.486E+01	1.173E+02	1.840E+02	2.112E+01	-0.189
PA-231	3.728E+01	5.890E+00	1.109E+01	2.113E-01	3.361
PA-234	1.476E+00	1.865E+00	3.188E+00	6.576E-02	0.463
NP-237	2.568E+01	3.405E+01	5.927E+01	6.692E+00	0.433
AM-241	2.902E+01	1.019E+01	1.959E+01	1.516E+00	1.482

KD
4/22/13

VAX/VMS Peak Search Report Generated 22-APR-2013 11:06:44.32

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405217_GE2_BAFIL_190780.CN
Analyses by : PEAK V16.9 PEAKEFF V2.2
Client ID : PZ-100-SS DIS
Deposition Date :
Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 10:51:28
Sample ID : 1304052-17 Sample Quantity : 1.00000E+00 filter
Sample type : FILTER Sample Geometry : 0
Detector name : GE2 Detector Geometry: BAFIL
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.29 0.0%
Start channel : 25 End channel : 4096
Sensitivity : 3.00000 Gaussian : 10.00000
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	30.84	1990	106	1.39	30.95	26	14	2.21E+00	2.4	7.12E+00
2	2	35.13	444	133	1.53	35.24	26	14	4.94E-01	6.1	
3	0	52.94	28	85	1.19	53.06	51	6	3.11E-02	54.9	
4	2	61.72	245	56	1.49	61.83	58	17	2.72E-01	7.6	1.82E+00
5	2	65.94	123	61	1.61	66.05	58	17	1.37E-01	13.3	
6	1	80.94	835	46	1.39	81.05	76	22	9.28E-01	3.6	2.72E+00
7	1	85.02	15	54	1.50	85.14	76	22	1.64E-02	82.3	
8	1	93.02	34	53	1.52	93.14	76	22	3.77E-02	36.7	
9	0	111.80	158	100	1.30	111.92	108	7	1.76E-01	13.1	
10	0	116.01	45	56	1.88	116.12	115	5	5.04E-02	29.0	
11	0	134.35	58	57	6.06	134.46	130	10	6.50E-02	27.5	
12	0	143.51	22	66	1.66	143.62	139	8	2.46E-02	67.0	
13	0	160.79	23	63	1.19	160.90	158	7	2.60E-02	59.4	
14	0	186.43	24	47	0.96	186.54	185	5	2.69E-02	46.3	
15	0	239.61	12	64	6.27	239.72	233	11	1.37E-02	128.2	
16	0	276.83	54	37	1.78	276.93	273	9	6.04E-02	24.1	
17	1	302.75	141	19	1.50	302.86	299	15	1.56E-01	9.4	3.15E+00
18	1	306.93	37	18	1.79	307.04	299	15	4.06E-02	24.7	
19	0	333.31	54	30	1.45	333.42	330	7	5.98E-02	21.7	
20	0	338.11	21	12	1.72	338.22	337	4	2.32E-02	33.2	
21	0	355.87	512	16	1.34	355.98	352	8	5.69E-01	4.6	
22	1	384.06	157	22	1.86	384.17	380	15	1.75E-01	9.3	2.86E+01
23	1	391.01	51	16	1.86	391.12	380	15	5.62E-02	20.2	
24	3	414.44	25	1	2.28	414.55	409	19	2.73E-02	25.7	1.66E+00
25	3	418.33	19	2	2.28	418.43	409	19	2.10E-02	35.9	
26	0	436.91	101	17	1.47	437.01	432	10	1.12E-01	12.6	
27	0	445.47	13	1	1.34	445.57	443	6	1.42E-02	31.5	
28	0	467.95	15	9	1.46	468.05	465	6	1.62E-02	42.0	
29	0	511.33	23	9	1.90	511.43	507	9	2.56E-02	31.4	
30	0	568.98	5	6	1.72	569.08	565	8	5.51E-03	96.8	
31	0	656.28	9	2	1.57	656.38	652	8	1.01E-02	42.8	

Total number of lines in spectrum 31
 Number of unidentified lines 26
 Number of lines tentatively identified by NID 5 16.13%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected	Decay Corr				
BA-133	10.50Y	1.00	4.226E+02	4.226E+02		0.801E+02	18.94	
NP-237	2.14E+06Y	1.00	2.078E+01	2.078E+01		3.430E+01	165.09	
Total Activity :			4.434E+02	4.434E+02				

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected	Decay Corr				
TH-234	4.47E+09Y	1.00	8.403E+02	8.403E+02		1.499E+02	17.83	
Total Activity :			8.403E+02	8.403E+02				

Grand Total Activity : 1.284E+03 1.284E+03

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.799E+01	4.226E+02	4.226E+02	18.94	OK
	302.84	17.80	7.560E+00	3.141E+02	3.141E+02	35.36	OK
	356.01	60.00	7.170E+00	3.575E+02	3.576E+02	17.74	OK

Final Mean for 3 Valid Peaks = 4.226E+02+/- 8.006E+01 (18.94%)

NP-237	86.50	12.60*	1.691E+01	2.078E+01	2.078E+01	165.09	OK
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Final Mean for 1 Valid Peaks = 2.078E+01+/- 3.430E+01 (165.09%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.305E+01	8.403E+02	8.403E+02	17.83	OK

Final Mean for 1 Valid Peaks = 8.403E+02+/- 1.499E+02 (17.83%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	4.226E+02	8.006E+01	1.894E+01	3.225E+00	22.315
TH-234	8.403E+02	1.499E+02	1.405E+02	1.161E+01	5.982
NP-237	2.078E+01	3.430E+01	5.291E+01	5.974E+00	0.393

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/filter) Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	5.333E+00	5.189E+00	9.543E+00	1.466E+00	0.559
CD-109	-3.928E+01	1.088E+02	1.698E+02	1.949E+01	-0.231
PA-231	3.333E+01	5.719E+00	1.077E+01	2.051E-01	3.095
PA-234	2.813E+00	1.910E+00	3.376E+00	6.963E-02	0.833
AM-241	2.897E+01	1.177E+01	2.044E+01	1.582E+00	1.417

V/S
4/22/13

VAX/VMS Peak Search Report Generated 22-APR-2013 11:23:41.90

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405218_GE1_BAFIL_190782.CN
Analyses by : PEAK V16.9 PEAKEFF V2.2
Client ID : I-66 TOT
Deposition Date :
Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 11:08:26
Sample ID : 1304052-18 Sample Quantity : 1.00000E+00 filter
Sample type : FILTER Sample Geometry : 0
Detector name : GE1 Detector Geometry: BAFIL
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.26 0.0%
Start channel : 25 End channel : 4096
Sensitivity : 3.00000 Gaussian : 10.00000
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	28.05	55	56	1.66	28.29	27	13	6.12E-02	21.6	1.60E+01
2	2	30.86	1955	64	1.33	31.09	27	13	2.17E+00	2.3	
3	2	34.97	425	61	1.68	35.20	27	13	4.72E-01	5.7	
4	0	52.11	70	76	2.10	52.34	49	7	7.77E-02	23.8	
5	1	61.91	262	62	1.58	62.14	58	12	2.91E-01	7.8	5.34E+00
6	1	65.72	107	64	1.58	65.95	58	12	1.18E-01	15.9	
7	0	81.15	737	112	1.72	81.38	78	8	8.18E-01	4.5	
8	0	93.64	45	70	1.14	93.87	91	7	5.03E-02	33.8	
9	1	111.82	201	45	1.64	112.05	107	15	2.24E-01	8.7	2.95E+00
10	1	116.62	43	45	1.65	116.85	107	15	4.77E-02	30.2	
11	0	222.63	27	35	3.03	222.85	220	7	2.98E-02	40.9	
12	0	276.27	53	29	1.58	276.49	273	8	5.93E-02	22.0	
13	2	303.05	172	16	1.65	303.26	297	19	1.91E-01	8.2	2.15E+00
14	2	307.52	48	14	2.01	307.74	297	19	5.36E-02	20.9	
15	0	334.26	60	46	1.34	334.47	331	7	6.65E-02	22.6	
16	0	338.71	22	16	1.94	338.92	337	5	2.46E-02	34.5	
17	0	356.22	502	19	1.93	356.43	352	8	5.58E-01	4.7	
18	2	383.90	147	11	2.06	384.11	381	15	1.63E-01	9.3	6.97E+00
19	2	387.09	238	7	1.78	387.30	381	15	2.65E-01	7.3	
20	2	391.15	53	6	1.87	391.36	381	15	5.89E-02	17.6	
21	1	414.62	48	15	1.89	414.83	409	18	5.32E-02	17.8	2.70E+00
22	1	417.97	28	15	1.90	418.17	409	18	3.12E-02	34.7	
23	0	437.21	106	3	1.94	437.41	434	9	1.18E-01	10.1	
24	4	464.79	7	4	2.56	464.99	463	8	7.70E-03	50.0	3.93E+00
25	4	468.26	17	7	1.64	468.46	463	8	1.93E-02	31.4	
26	0	484.53	9	4	1.60	484.73	481	6	9.49E-03	52.0	
27	0	512.21	9	14	1.49	512.41	508	9	9.44E-03	85.1	
28	0	709.90	12	0	2.79	710.08	706	8	1.33E-02	28.9	

Total number of lines in spectrum 28
 Number of unidentified lines 24
 Number of lines tentatively identified by NID 4 14.29%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter				
BA-133	10.50Y	1.00	3.415E+02	3.416E+02	0.652E+02	19.10		
Total Activity :			3.415E+02	3.416E+02				

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected pCi/filter	Decay Corr pCi/filter				
TH-234	4.47E+09Y	1.00	3.535E+02	3.535E+02	0.579E+02	16.39		
Total Activity :			3.535E+02	3.535E+02				

Grand Total Activity : 6.950E+02 6.950E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.963E+01	3.415E+02	3.416E+02	19.10	OK
	302.84	17.80	4.915E+00	5.908E+02	5.909E+02	33.56	OK
	356.01	60.00	6.963E+00	3.611E+02	3.612E+02	17.83	OK

Final Mean for 3 Valid Peaks = 3.416E+02+/- 6.524E+01 (19.10%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	5.865E+01	3.535E+02	3.535E+02	16.39	OK

Final Mean for 1 Valid Peaks = 3.535E+02+/- 5.794E+01 (16.39%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.416E+02	6.524E+01	1.828E+01	3.001E+00	18.683
TH-234	3.535E+02	5.794E+01	5.604E+01	1.796E+00	6.307

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	-9.230E-02		1.291E+01	2.061E+01	6.434E+00	-0.004
CD-109	-2.363E+01		1.442E+02	1.972E+02	2.550E+01	-0.120
PA-231	0.000E+00		0.000E+00	1.933E-01	3.632E-03	0.000
PA-234	8.903E+00		1.787E+00	3.679E+00	6.914E-02	2.420
NP-237	2.248E+01		3.706E+01	5.736E+01	6.984E+00	0.392
AM-241	9.252E+00		3.216E+00	6.391E+00	1.499E-01	1.448

KCB
4/22/13

VAX/VMS Peak Search Report Generated 22-APR-2013 11:24:23.68

Configuration : DKA100: [GAMMA.SCUSR.ARCHIVE] SMP_130405219_GE2_BAFIL_190783.CN
Analyses by : PEAK V16.9 PEAKEFF V2.2
Client ID : I-66 DIS
Deposition Date :
Sample Date : 22-APR-2013 00:00:00 Acquisition date : 22-APR-2013 11:08:51
Sample ID : 1304052-19 Sample Quantity : 1.00000E+00 filter
Sample type : FILTER Sample Geometry : 0
Detector name : GE2 Detector Geometry: BAFIL
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:00.29 0.0%
Start channel : 25 End channel : 4096
Sensitivity : 3.00000 Gaussian : 10.00000
Critical level : No

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	30.82	1928	128	1.39	30.94	26	14	2.14E+00	2.4	4.11E+00
2	3	35.11	485	130	1.52	35.23	26	14	5.39E-01	5.9	
3	0	53.04	40	93	1.55	53.16	49	7	4.46E-02	42.8	
4	1	61.86	171	57	1.46	61.98	57	12	1.90E-01	10.5	4.99E+00
5	1	65.75	108	52	1.47	65.87	57	12	1.20E-01	13.9	
6	1	80.90	722	46	1.50	81.02	77	11	8.02E-01	4.0	6.19E+00
7	1	84.02	18	62	1.50	84.14	77	11	2.00E-02	94.7	
8	1	108.89	13	48	1.40	109.00	107	8	1.44E-02	81.6	7.26E+00
9	1	111.82	137	73	1.55	111.93	107	8	1.53E-01	12.1	
10	0	116.19	34	58	1.24	116.31	115	5	3.78E-02	38.5	
11	0	153.94	39	44	4.30	154.05	151	7	4.30E-02	33.0	
12	0	161.02	40	49	2.35	161.13	158	8	4.48E-02	33.8	
13	0	276.66	64	51	1.85	276.77	271	12	7.09E-02	25.7	
14	2	302.82	160	22	1.44	302.92	299	12	1.78E-01	8.7	3.01E+00
15	2	307.07	12	35	1.97	307.18	299	12	1.33E-02	87.1	
16	0	333.49	66	31	1.82	333.60	330	7	7.38E-02	18.6	
17	0	338.22	20	17	1.08	338.32	337	5	2.25E-02	37.3	
18	0	355.88	522	34	1.36	355.99	352	8	5.80E-01	4.8	
19	0	377.03	15	14	2.02	377.13	373	7	1.67E-02	48.8	
20	1	383.78	124	26	1.86	383.89	380	11	1.37E-01	12.9	1.24E+01
21	1	386.85	164	49	1.86	386.96	380	11	1.82E-01	11.2	
22	4	414.11	28	14	2.20	414.21	409	18	3.06E-02	31.3	2.17E+00
23	4	418.43	31	16	2.51	418.54	409	18	3.49E-02	31.9	
24	0	436.75	88	11	1.31	436.86	433	7	9.82E-02	12.3	
25	0	458.74	9	6	2.77	458.85	454	8	1.00E-02	57.5	
26	0	467.78	16	3	1.19	467.88	464	6	1.73E-02	31.1	
27	0	472.58	13	2	2.65	472.69	471	6	1.41E-02	36.7	
28	0	510.91	30	6	2.15	511.01	508	9	3.38E-02	22.3	
29	0	545.24	6	3	1.45	545.34	542	6	6.11E-03	64.3	
30	0	609.67	5	5	1.69	609.77	608	7	5.78E-03	77.2	

Summary of Nuclide Activity

Sample ID : 1304052-19

Acquisition date : 22-APR-2013 11:08:51

Total number of lines in spectrum 30
 Number of unidentified lines 26
 Number of lines tentatively identified by NID 4 13.33%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
BA-133	10.50Y	1.00	3.654E+02	3.654E+02	0.702E+02	19.20	
Total Activity :			3.654E+02	3.654E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr			
TH-234	4.47E+09Y	1.00	5.872E+02	5.872E+02	1.347E+02	22.94	
Total Activity :			5.872E+02	5.872E+02			

Grand Total Activity : 9.526E+02 9.526E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
BA-133	81.00	33.00*	1.799E+01	3.654E+02	3.654E+02	19.20	OK
	302.84	17.80	7.560E+00	3.569E+02	3.570E+02	34.63	OK
	356.01	60.00	7.170E+00	3.644E+02	3.644E+02	17.92	OK

Final Mean for 3 Valid Peaks = 3.654E+02+/- 7.016E+01 (19.20%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/filter	Decay Corr pCi/filter	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.305E+01	5.872E+02	5.872E+02	22.94	OK

Final Mean for 1 Valid Peaks = 5.872E+02+/- 1.347E+02 (22.94%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/filter)	Act error	MDA (pCi/filter)	MDA error	Act/MDA
BA-133	3.654E+02	7.016E+01	1.978E+01	3.367E+00	18.477
TH-234	5.872E+02	1.347E+02	1.430E+02	1.182E+01	4.106

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/filter)	K.L. Ided	Act error	MDA (pCi/filter)	MDA error	Act/MDA
CO-57	-3.075E+00		5.936E+00	8.950E+00	1.374E+00	-0.344
CD-109	-6.258E+01		1.178E+02	1.795E+02	2.061E+01	-0.349
PA-231	3.317E+01		5.581E+00	1.055E+01	2.010E-01	3.144
PA-234	1.929E+00		1.824E+00	3.170E+00	6.539E-02	0.608
NP-237	3.580E+00		3.162E+01	5.222E+01	5.896E+00	0.069
AM-241	2.360E+01		1.055E+01	1.958E+01	1.515E+00	1.205