Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	4.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.000000
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2513.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.003200
Tracer EFF	0.224954
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT			
CU			
TPU			
MDA			
DL			
BP MDA			
BP DL			
DL QSAS			
Gross Count Rate			
BKG Count Rate			
Net Count Rate			
Δ t 1 (t2 - t1)			
DF			
Tracer DPM			
Tracer Δt			
Tracer DF			
Tracer Recovery			
Chem Rec Factor			
Sys Err			
K			
K MDA			
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-01		
Analysis Code			
SDG	QC Sample		
Fraction	N/A QC Sample		
Client	QC Sample		
Client Profile			
Client ID	N/A QC Sample		
Instr File Name	ApexAlpha		
Instr Detector	A_Z_4A		
Instr keV			
Version/Date	2.0 -- 4/20/2006		

Reviewed by: _____ **Date:** 5-10-11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2513.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224954
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.056330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2513.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.003200
Tracer EFF	0.224954
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	5.062868	5.062868	OK
CU	0.198187	0.198187	OK
TPU	0.643195	0.643195	OK
MDA	0.018731	0.018731	OK
DL	0.006634	0.006634	OK
BP MDA	0.156031	0.156031	OK
BP DL	0.075445	0.075445	OK
DL QSAS			
Gross Count Rate	1.745139	1.745139	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	1.743750	1.743750	OK
Δ t 1 (t2 - t1)	2.742222	2.742222	OK
DF	0.999999	0.999999	OK
Tracer DPM	11.240217	11.240217	OK
Tracer At	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.689670	0.689670	OK
Chem Rec Factor	0.964574	0.964574	OK
Sys Err	0.061664	0.061664	OK
K	0.344419	0.344419	OK
K MDA	495.963985	495.963985	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-01		
Analysis Code			
SDG	QC Sample		
Fraction	N/A QC Sample		
Client	QC Sample		
Client Profile			
Client ID	N/A QC Sample		
Instr File Name	ApexAlpha		
Instr Detector	A_2_4A		
Instr keV	49.10917282		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	39.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224954
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2513.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.003200
Tracer EFF	0.224954
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.070570	0.070570	OK
CU	0.025914	0.025914	OK
TPU	0.027282	0.027282	OK
MDA	0.024227	0.024227	OK
DL	0.009381	0.009381	OK
BP MDA	0.070536	0.070536	OK
BP DL	0.032606	0.032606	OK
DL QSAS			
Gross Count Rate	0.027083	0.027083	OK
BKG Count Rate	0.002778	0.002778	OK
Net Count Rate	0.024306	0.024306	OK
Δ t 1 (t2 - t1)	2.742222	2.742222	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.240217	11.240217	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.689670	0.689670	OK
Chem Rec Factor	0.964574	0.964574	OK
Sys Err	0.061664	0.061664	OK
K	0.344420	0.344420	OK
K MDA	495.964337	495.964337	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-01
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4A
Instr keV	5.700368881
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	1.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215817
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2755.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	6.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.984500
Tracer EFF	0.215817
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	-0.001823	-0.001823	OK
CU	0.006190	0.006190	OK
TPU	0.006194	0.006194	OK
MDA	0.016938	0.016938	OK
DL	0.005998	0.005998	OK
BP MDA	0.051322	0.051322	OK
BP DL	0.023240	0.023240	OK
DL QSAS			
Gross Count Rate	0.000694	0.000694	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	-0.000694	-0.000694	OK
Δ t 1 (t2 - t1)	2.742222	2.742222	OK
DF	0.997282	0.997282	OK
Tracer DPM	11.030695	11.030695	OK
Tracer At	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.801954	0.801954	OK
Chem Rec Factor	1.121614	1.121614	OK
Sys Err	0.061664	0.061664	OK
K	0.380883	0.380883	OK
K MDA	548.472194	548.472194	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-02		
Analysis Code			
SDG	QC Sample		
Fraction	N/A QC Sample		
Client	QC Sample		
Client Profile			
Client ID	N/A QC Sample		
Instr File Name	ApexAlpha		
Instr Detector	A_2_4B		
Instr keV	4.910474777		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: _____ **Date:** 5-10-11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	3495.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224954
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2513.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.003200
Tracer EFF	0.224954
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	7.054939	7.054939	OK
CU	0.234199	0.234199	OK
TPU	0.884242	0.884242	OK
MDA	0.021756	0.021756	OK
DL	0.008141	0.008141	OK
BP MDA	0.269888	0.269888	OK
BP DL	0.132491	0.132491	OK
DL QSAS			
Gross Count Rate	2.427083	2.427083	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	2.425000	2.425000	OK
Δ t 1 (t2 - t1)	2.742222	2.742222	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.240217	11.240217	OK
Tracer Δt	226.643056	226.643056	OK
Tracer OF	0.999941	0.999941	OK
Tracer Recovery	0.689670	0.689670	OK
Chem Rec Factor	0.964574	0.964574	OK
Sys Err	0.061664	0.061664	OK
K	0.343731	0.343731	OK
K MDA	494.972374	494.972374	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-01
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4A
Instr keV	31.02458572
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5-10-11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2755.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215817
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi — UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2755.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	6.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.984500
Tracer EFF	0.215817
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.968494	4.968494	OK
CU	0.186140	0.186140	OK
TPU	0.628683	0.628683	OK
MDA	0.025497	0.025497	OK
DL	0.010299	0.010299	OK
BP MDA	0.155465	0.155465	OK
BP DL	0.075445	0.075445	OK
DL QSAS			
Gross Count Rate	1.913194	1.913194	OK
BKG Count Rate	0.004167	0.004167	OK
Net Count Rate	1.909028	1.909028	OK
Δ t 1 (t2 - t1)	2.742222	2.742222	OK
DF	0.999999	0.999999	OK
Tracer DPM	11.030695	11.030695	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.801954	0.801954	OK
Chem Rec Factor	1.121614	1.121614	OK
Sys Err	0.061664	0.061664	OK
K	0.384227	0.384227	OK
K MDA	553.286369	553.286369	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4B
Instr keV	50.41350555
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	3395.000000
Count Mins	1440.000000
BKG Counts	11.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215817
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi — UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2755.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	6.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.984500
Tracer EFF	0.215817
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**6.128435**	**6.128435**	**OK**
CU	**0.207156**	**0.207156**	**OK**
TPU	**0.769109**	**0.769109**	**OK**
MDA	**0.032854**	**0.032854**	**OK**
DL	**0.013973**	**0.013973**	**OK**
BP MDA	**0.269320**	**0.269320**	**OK**
BP DL	**0.132491**	**0.132491**	**OK**
DL QSAS			
Gross Count Rate	**2.357639**	**2.357639**	**OK**
BKG Count Rate	**0.007639**	**0.007639**	**OK**
Net Count Rate	**2.350000**	**2.350000**	**OK**
Δ t 1 (t2 - t1)	**2.742222**	**2.742222**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.030695**	**11.030695**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.801954**	**0.801954**	**OK**
Chem Rec Factor	**1.121614**	**1.121614**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.383458**	**0.383458**	**OK**
K MDA	**552.180150**	**552.180150**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4B
Instr keV	29.97737694
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	58.000000
Count Mins	1440.000000
BKG Counts	47.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215817
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2755.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	6.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.984500
Tracer EFF	0.215817
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.019881**	**0.019881**	**OK**
CU	**0.036299**	**0.036299**	**OK**
TPU	**0.036379**	**0.036379**	**OK**
MDA	**0.062549**	**0.062549**	**OK**
DL	**0.028826**	**0.028826**	**OK**
BP MDA	**0.069970**	**0.069970**	**OK**
BP DL	**0.032606**	**0.032606**	**OK**
DL QSAS			
Gross Count Rate	**0.040278**	**0.040278**	**OK**
BKG Count Rate	**0.032639**	**0.032639**	**OK**
Net Count Rate	**0.007639**	**0.007639**	**OK**
Δ t 1 (t2 - t1)	**2.742222**	**2.742222**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.030695**	**11.030695**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.801954**	**0.801954**	**OK**
Chem Rec Factor	**1.121614**	**1.121614**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.384227**	**0.384227**	**OK**
K MDA	**553.286761**	**553.286761**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4B
Instr keV	
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/07/

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	4.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.218973
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2675.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.019300
Tracer EFF	0.218973
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.007768**	**0.007768**	**OK**
CU	**0.007613**	**0.007613**	**OK**
TPU	**0.007671**	**0.007671**	**OK**
MDA	**0.005263**	**0.005263**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP MDA	**0.051644**	**0.051644**	**OK**
BP DL	**0.023240**	**0.023240**	**OK**
DL QSAS			
Gross Count Rate	**0.002778**	**0.002778**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.002778**	**0.002778**	**OK**
Δ t 1 (t2 - t1)	**2.742222**	**2.742222**	**OK**
DF	**0.997282**	**0.997282**	**OK**
Tracer DPM	**11.420607**	**11.420607**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.742027**	**0.742027**	**OK**
Chem Rec Factor	**1.037800**	**1.037800**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.357575**	**0.357575**	**OK**
K MDA	**514.908457**	**514.908457**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_5A
Instr keV	4.889849663
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2675.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.218973
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2675.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.019300
Tracer EFF	0.218973
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
0 **Variables Intact Test**	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**5.144120**	**5.144120**	**OK**
CU	**0.195270**	**0.195270**	**OK**
TPU	**0.651665**	**0.651665**	**OK**
MDA	**0.020732**	**0.020732**	**OK**
DL	**0.007757**	**0.007757**	**OK**
BP MDA	**0.155784**	**0.155784**	**OK**
BP DL	**0.075445**	**0.075445**	**OK**
DL QSAS			
Gross Count Rate	**1.857639**	**1.857639**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**1.855556**	**1.855556**	**OK**
Δ t 1 (t2 - t1)	**2.742222**	**2.742222**	**OK**
DF	**0.999999**	**0.999999**	**OK**
Tracer DPM	**11.420607**	**11.420607**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.742027**	**0.742027**	**OK**
Chem Rec Factor	**1.037800**	**1.037800**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.360714**	**0.360714**	**OK**
K MDA	**519.428029**	**519.428029**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_5A
Instr keV	42.68838501
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	44.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.218973
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2675.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.019300
Tracer EFF	0.218973
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
0 **Variables Intact Test**	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.073304**	**0.073304**	**OK**
CU	**0.026735**	**0.026735**	**OK**
TPU	**0.028165**	**0.028165**	**OK**
MDA	**0.027213**	**0.027213**	**OK**
DL	**0.010993**	**0.010993**	**OK**
BP MDA	**0.269640**	**0.269640**	**OK**
BP DL	**0.132491**	**0.132491**	**OK**
DL QSAS			
Gross Count Rate	**0.030556**	**0.030556**	**OK**
BKG Count Rate	**0.004167**	**0.004167**	**OK**
Net Count Rate	**0.026389**	**0.026389**	**OK**
Δ t 1 (t2 - t1)	**2.742222**	**2.742222**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.420607**	**11.420607**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.742027**	**0.742027**	**OK**
Chem Rec Factor	**1.037800**	**1.037800**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.359993**	**0.359993**	**OK**
K MDA	**518.389505**	**518.389505**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_5A
Instr keV	7.334774494
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

35000564

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	3.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.218973
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/2/11 10:04 AM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2675.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.019300
Tracer EFF	0.218973
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.005776	0.005776	OK
CU	0.006536	0.006536	OK
TPU	0.006573	0.006573	OK
MDA	0.005217	0.005217	OK
DL	0.000000	0.000000	OK
BP MDA	0.070289	0.070289	OK
BP DL	0.032606	0.032606	OK
DL QSAS			
Gross Count Rate	0.002083	0.002083	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.002083	0.002083	OK
Δ t 1 (t2 - t1)	2.742222	2.742222	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.420607	11.420607	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.742027	0.742027	OK
Chem Rec Factor	1.037800	1.037800	OK
Sys Err	0.061664	0.061664	OK
K	0.360714	0.360714	OK
K MDA	519.428397	519.428397	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_SA
Instr keV	4.889849663
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ Date: 5/10/11

35000565

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	233.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213046
Sample Aliquot	1.022700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2543.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.012500
Tracer EFF	0.213046
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.461649	0.461649	OK
CU	0.060436	0.060436	OK
TPU	0.082253	0.082253	OK
MDA	0.021615	0.021615	OK
DL	0.008088	0.008088	OK
BP MDA	0.051330	0.051330	OK
BP DL	0.022995	0.022995	OK
DL QSAS			
Gross Count Rate	0.161806	0.161806	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	0.159722	0.159722	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	0.985553	0.985553	OK
Tracer DPM	11.344417	11.344417	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.730151	0.730151	OK
Chem Rec Factor	1.021190	1.021190	OK
Sys Err	0.061664	0.061664	OK
K	0.345982	0.345982	OK
K MDA	498.213498	498.213498	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-04
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	001
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	PR-SED-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_2_58
Instr keV	25.94958878
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5-10-11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2543.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213046
Sample Aliquot	1.022700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2543.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.012500
Tracer EFF	0.213046
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**4.996400**	**4.996400**	**OK**
CU	**0.194425**	**0.194425**	**OK**
TPU	**0.634395**	**0.634395**	**OK**
MDA	**0.018267**	**0.018267**	**OK**
DL	**0.006469**	**0.006469**	**OK**
BP MDA	**0.152554**	**0.152554**	**OK**
BP DL	**0.073771**	**0.073771**	**OK**
DL QSAS			
Gross Count Rate	**1.765972**	**1.765972**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**1.764583**	**1.764583**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**0.999996**	**0.999996**	**OK**
Tracer DPM	**11.344417**	**11.344417**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.730151**	**0.730151**	**OK**
Chem Rec Factor	**1.021190**	**1.021190**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.353171**	**0.353171**	**OK**
K MDA	**508.566211**	**508.566211**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-04
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	001
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	PR-SED-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_2_SB
Instr keV	45.33880997
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2253.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213046
Sample Aliquot	1.022700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2543.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.012500
Tracer EFF	0.213046
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
0 **Variables Intact Test**	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**4.433054**	**4.433054**	**OK**
CU	**0.183420**	**0.183420**	**OK**
TPU	**0.566307**	**0.566307**	**OK**
MDA	**0.021217**	**0.021217**	**OK**
DL	**0.007939**	**0.007939**	**OK**
BP MDA	**0.263883**	**0.263883**	**OK**
BP DL	**0.129550**	**0.129550**	**OK**
DL QSAS			
Gross Count Rate	**1.564583**	**1.564583**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**1.562500**	**1.562500**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.344417**	**11.344417**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.730151**	**0.730151**	**OK**
Chem Rec Factor	**1.021190**	**1.021190**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.352466**	**0.352466**	**OK**
K MDA	**507.550815**	**507.550815**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-04
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	001
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	PR-SED-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_2_5B
Instr keV	26.77484131
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	278.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213046
Sample Aliquot	1.022700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2543.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.012500
Tracer EFF	0.213046
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.542700**	**0.542700**	**OK**
CU	**0.064489**	**0.064489**	**OK**
TPU	**0.091984**	**0.091984**	**OK**
MDA	**0.018267**	**0.018267**	**OK**
DL	**0.006469**	**0.006469**	**OK**
BP MDA	**0.068956**	**0.068956**	**OK**
BP DL	**0.031882**	**0.031882**	**OK**
DL QSAS			
Gross Count Rate	**0.193056**	**0.193056**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.191667**	**0.191667**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.344417**	**11.344417**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.730151**	**0.730151**	**OK**
Chem Rec Factor	**1.021190**	**1.021190**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.353172**	**0.353172**	**OK**
K MDA	**508.568139**	**508.568139**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-04
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	001
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	PR-SED-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_2_58
Instr keV	18.91488647
Version/Date	2.0 -- 4/20/2006

Reviewed by: HW **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	279.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223028
Sample Aliquot	1.109200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2379.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.011800
Tracer EFF	0.223028
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.548079**	**0.548079**	**OK**
CU	**0.065009**	**0.065009**	**OK**
TPU	**0.092812**	**0.092812**	**OK**
MDA	**0.018361**	**0.018361**	**OK**
DL	**0.006510**	**0.006510**	**OK**
BP MDA	**0.047674**	**0.047674**	**OK**
BP DL	**0.021202**	**0.021202**	**OK**
DL QSAS			
Gross Count Rate	**0.193750**	**0.193750**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.192361**	**0.192361**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**0.985553**	**0.985553**	**OK**
Tracer DPM	**11.336574**	**11.336574**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.652358**	**0.652358**	**OK**
Chem Rec Factor	**0.912389**	**0.912389**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.350973**	**0.350973**	**OK**
K MDA	**505.401353**	**505.401353**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-05
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	002
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SED-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_1A
Instr keV	24.01058388
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2379.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223028
Sample Aliquot	1.109200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.056330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2379.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.011800
Tracer EFF	0.223028
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**4.603575**	**4.603575**	**OK**
CU	**0.185460**	**0.185460**	**OK**
TPU	**0.586486**	**0.586486**	**OK**
MDA	**0.023290**	**0.023290**	**OK**
DL	**0.009019**	**0.009019**	**OK**
BP MDA	**0.140997**	**0.140997**	**OK**
BP DL	**0.068018**	**0.068018**	**OK**
DL QSAS			
Gross Count Rate	**1.652083**	**1.652083**	**OK**
BKG Count Rate	**0.002778**	**0.002778**	**OK**
Net Count Rate	**1.649306**	**1.649306**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**0.999996**	**0.999996**	**OK**
Tracer DPM	**11.336574**	**11.336574**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.652358**	**0.652358**	**OK**
Chem Rec Factor	**0.912389**	**0.912389**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.358266**	**0.358266**	**OK**
K MDA	**515.903427**	**515.903427**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-05
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	002
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SED-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_1A
Instr keV	42.74464035
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	503.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223028
Sample Aliquot	1.109200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2379.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.011800
Tracer EFF	0.223028
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.973055	0.973055	OK
CU	0.085546	0.085546	OK
TPU	0.145426	0.145426	OK
MDA	0.018043	0.018043	OK
DL	0.006390	0.006390	OK
BP MDA	0.243645	0.243645	OK
BP DL	0.119447	0.119447	OK
DL QSAS			
Gross Count Rate	0.349306	0.349306	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	0.347917	0.347917	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.336574	11.336574	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.652358	0.652358	OK
Chem Rec Factor	0.912389	0.912389	OK
Sys Err	0.061664	0.061664	OK
K	0.357551	0.357551	OK
K MDA	514.873382	514.873382	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-05
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	002
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SED-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_1A
Instr keV	14.36770821
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	239.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223028
Sample Aliquot	1.109200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2379.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.011800
Tracer EFF	0.223028
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.451633	0.451633	OK
CU	0.059466	0.059466	OK
TPU	0.080720	0.080720	OK
MDA	0.027344	0.027344	OK
DL	0.011046	0.011046	OK
BP MDA	0.063919	0.063919	OK
BP DL	0.029396	0.029396	OK
DL QSAS			
Gross Count Rate	0.165972	0.165972	OK
BKG Count Rate	0.004167	0.004167	OK
Net Count Rate	0.161806	0.161806	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.336574	11.336574	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.652358	0.652358	OK
Chem Rec Factor	0.912389	0.912389	OK
Sys Err	0.061664	0.061664	OK
K	0.358268	0.358268	OK
K MDA	515.905383	515.905383	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-05
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	002
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SED-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_1A
Instr keV	24.17536354
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	539.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209818
Sample Aliquot	1.078500
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2044.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.007600
Tracer EFF	0.209818
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**1.266315**	**1.266315**	**OK**
CU	**0.107503**	**0.107503**	**OK**
TPU	**0.187031**	**0.187031**	**OK**
MDA	**0.021907**	**0.021907**	**OK**
DL	**0.007758**	**0.007758**	**OK**
BP MDA	**0.049907**	**0.049907**	**OK**
BP DL	**0.021805**	**0.021805**	**OK**
DL QSAS			
Gross Count Rate	**0.374306**	**0.374306**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.372917**	**0.372917**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**0.985553**	**0.985553**	**OK**
Tracer DPM	**11.289516**	**11.289516**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.598394**	**0.598394**	**OK**
Chem Rec Factor	**0.836915**	**0.836915**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.294490**	**0.294490**	**OK**
K MDA	**424.065162**	**424.065162**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-06
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	003
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SED-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_1B
Instr keV	26.97288513
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2044.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209818
Sample Aliquot	1.078500
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2044.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.007600
Tracer EFF	0.209818
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**4.714964**	**4.714964**	**OK**
CU	**0.204857**	**0.204857**	**OK**
TPU	**0.605556**	**0.605556**	**OK**
MDA	**0.024877**	**0.024877**	**OK**
DL	**0.009308**	**0.009308**	**OK**
BP MDA	**0.145869**	**0.145869**	**OK**
BP DL	**0.069954**	**0.069954**	**OK**
DL QSAS			
Gross Count Rate	**1.419444**	**1.419444**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**1.417361**	**1.417361**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**0.999996**	**0.999996**	**OK**
Tracer DPM	**11.289516**	**11.289516**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.598394**	**0.598394**	**OK**
Chem Rec Factor	**0.836915**	**0.836915**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.300609**	**0.300609**	**OK**
K MDA	**432.877097**	**432.877097**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-06
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	003
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SED-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_1B
Instr keV	39.9537468
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2960.000000
Count Mins	1440.000000
BKG Counts	10.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209818
Sample Aliquot	1.078500
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2044.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.007600
Tracer EFF	0.209818
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	6.828501	6.828501	OK
CU	0.247251	0.247251	OK
TPU	0.861537	0.861537	OK
MDA	0.040331	0.040331	OK
DL	0.017029	0.017029	OK
BP MDA	0.251440	0.251440	OK
BP DL	0.122847	0.122847	OK
DL QSAS			
Gross Count Rate	2.055556	2.055556	OK
BKG Count Rate	0.006944	0.006944	OK
Net Count Rate	2.048611	2.048611	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.289516	11.289516	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.598394	0.598394	OK
Chem Rec Factor	0.836915	0.836915	OK
Sys Err	0.061664	0.061664	OK
K	0.300009	0.300009	OK
K MDA	432.012821	432.012821	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-06
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	003
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SED-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_15
Instr keV	30.49419785
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	551.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209818
Sample Aliquot	1.078500
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2044.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.007600
Tracer EFF	0.209818
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.268254	1.268254	OK
CU	0.106476	0.106476	OK
TPU	0.186635	0.186635	OK
MDA	0.021461	0.021461	OK
DL	0.007600	0.007600	OK
BP MDA	0.066596	0.066596	OK
BP DL	0.030233	0.030233	OK
DL QSAS			
Gross Count Rate	0.382639	0.382639	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	0.381250	0.381250	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.289516	11.289516	OK
Tracer At	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.598394	0.598394	OK
Chem Rec Factor	0.836915	0.836915	OK
Sys Err	0.061664	0.061664	OK
K	0.300610	0.300610	OK
K MDA	432.878738	432.878738	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-06
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	003
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SED-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_1B
Instr keV	37.24372864
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	462.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220569
Sample Aliquot	1.060700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --> UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2752.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.007000
Tracer EFF	0.220569
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.821286**	**0.821286**	**OK**
CU	**0.075135**	**0.075135**	**OK**
TPU	**0.124491**	**0.124491**	**OK**
MDA	**0.013117**	**0.013117**	**OK**
DL	**0.004145**	**0.004145**	**OK**
BP MDA	**0.049119**	**0.049119**	**OK**
BP DL	**0.022193**	**0.022193**	**OK**
DL QSAS			
Gross Count Rate	**0.320833**	**0.320833**	**OK**
BKG Count Rate	**0.000694**	**0.000694**	**OK**
Net Count Rate	**0.320139**	**0.320139**	**OK**
Δ t 1 (t2 - t1)	**15.661806**	**15.661806**	**OK**
DF	**0.984575**	**0.984575**	**OK**
Tracer DPM	**11.282793**	**11.282793**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.766864**	**0.766864**	**OK**
Chem Rec Factor	**1.072537**	**1.072537**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.389802**	**0.389802**	**OK**
K MDA	**561.314644**	**561.314644**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-07
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	004
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-SED-BG-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_2B
Instr keV	39.25505829
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2752.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220569
Sample Aliquot	1.060700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2752.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.007000
Tracer EFF	0.220569
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.791234	4.791234	OK
CU	0.179402	0.179402	OK
TPU	0.606224	0.606224	OK
MDA	0.020949	0.020949	OK
DL	0.008112	0.008112	OK
BP MDA	0.146676	0.146676	OK
BP DL	0.071128	0.071128	OK
DL QSAS			
Gross Count Rate	1.911111	1.911111	OK
BKG Count Rate	0.002778	0.002778	OK
Net Count Rate	1.908333	1.908333	OK
Δ t 1 (t2 - t1)	15.661806	15.661806	OK
DF	0.999996	0.999996	OK
Tracer DPM	11.282793	11.282793	OK
Tracer At	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.766864	0.766864	OK
Chem Rec Factor	1.072537	1.072537	OK
Sys Err	0.061664	0.061664	OK
K	0.398297	0.398297	OK
K MDA	573.547416	573.547416	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-07
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	004
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-SED-BG-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_28
Instr keV	61.57248306
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	602.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220569
Sample Aliquot	1.060700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2752.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.007000
Tracer EFF	0.220569
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
0 **Variables Intact Test**	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.044720	1.044720	OK
CU	0.084293	0.084293	OK
TPU	0.151816	0.151816	OK
MDA	0.020991	0.020991	OK
DL	0.008128	0.008128	OK
BP MDA	0.254016	0.254016	OK
BP DL	0.124909	0.124909	OK
DL QSAS			
Gross Count Rate	0.418056	0.418056	OK
BKG Count Rate	0.002778	0.002778	OK
Net Count Rate	0.415278	0.415278	OK
Δ t 1 (t2 - t1)	15.661806	15.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.282793	11.282793	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.766864	0.766864	OK
Chem Rec Factor	1.072537	1.072537	OK
Sys Err	0.061664	0.061664	OK
K	0.397502	0.397502	OK
K MDA	572.402413	572.402413	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-07
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	004
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-SED-BG-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_2B
Instr keV	41.29672241
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/1

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	472.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220569
Sample Aliquot	1.060700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2752.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.007000
Tracer EFF	0.220569
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.821202**	**0.821202**	**OK**
CU	**0.074322**	**0.074322**	**OK**
TPU	**0.123994**	**0.123994**	**OK**
MDA	**0.012837**	**0.012837**	**OK**
DL	**0.004056**	**0.004056**	**OK**
BP MDA	**0.066073**	**0.066073**	**OK**
BP DL	**0.030740**	**0.030740**	**OK**
DL QSAS			
Gross Count Rate	**0.327778**	**0.327778**	**OK**
BKG Count Rate	**0.000694**	**0.000694**	**OK**
Net Count Rate	**0.327083**	**0.327083**	**OK**
Δ t 1 (t2 - t1)	**15.661806**	**15.661806**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.282793**	**11.282793**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.766864**	**0.766864**	**OK**
Chem Rec Factor	**1.072537**	**1.072537**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.398298**	**0.398298**	**OK**
K MDA	**573.549739**	**573.549739**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-07
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	004
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-SED-BG-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_2B
Instr keV	28.52734184
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	183.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219087
Sample Aliquot	1.021700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2499.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.004900
Tracer EFF	0.219087
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.371045**	**0.371045**	**OK**
CU	**0.053760**	**0.053760**	**OK**
TPU	**0.070008**	**0.070008**	**OK**
MDA	**0.005495**	**0.005495**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP MDA	**0.051430**	**0.051430**	**OK**
BP DL	**0.023017**	**0.023017**	**OK**
DL QSAS			
Gross Count Rate	**0.127083**	**0.127083**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.127083**	**0.127083**	**OK**
Δt 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**0.985553**	**0.985553**	**OK**
Tracer DPM	**11.259264**	**11.259264**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.703561**	**0.703561**	**OK**
Chem Rec Factor	**0.984002**	**0.984002**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.342501**	**0.342501**	**OK**
K MDA	**493.201517**	**493.201517**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-08
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	005
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SED-01
Instr File Name	ApexAlpha
Instr Detector	A_3_3A
Instr keV	28.15198326
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2499.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219087
Sample Aliquot	1.021700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2499.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.004900
Tracer EFF	0.219087
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.963749	4.963749	OK
CU	0.194618	0.194618	OK
TPU	0.630699	0.630699	OK
MDA	0.005383	0.005383	OK
DL	0.000000	0.000000	OK
BP MDA	0.152752	0.152752	OK
BP DL	0.073843	0.073843	OK
DL QSAS			
Gross Count Rate	1.735417	1.735417	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	1.735417	1.735417	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	0.999996	0.999996	OK
Tracer DPM	11.259264	11.259264	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.703561	0.703561	OK
Chem Rec Factor	0.984002	0.984002	OK
Sys Err	0.061664	0.061664	OK
K	0.349618	0.349618	OK
K MDA	503.450082	503.450082	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-08		
Analysis Code	ASP-A-D09		
SDG	ARS1-11-00895		
Fraction	005		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-JM-SED-01		
Instr File Name	ApexAlpha		
Instr Detector	A_3_3A		
Instr keV	45.02334595		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: _____ **Date:** 5/10/1

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	343.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219087
Sample Aliquot	1.021700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2499.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.004900
Tracer EFF	0.219087
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.678681**	**0.678681**	**OK**
CU	**0.072456**	**0.072456**	**OK**
TPU	**0.109445**	**0.109445**	**OK**
MDA	**0.018490**	**0.018490**	**OK**
DL	**0.006548**	**0.006548**	**OK**
BP MDA	**0.264190**	**0.264190**	**OK**
BP DL	**0.129677**	**0.129677**	**OK**
DL QSAS			
Gross Count Rate	**0.238194**	**0.238194**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.236806**	**0.236806**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.259264**	**11.259264**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.703561**	**0.703561**	**OK**
Chem Rec Factor	**0.984002**	**0.984002**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.348920**	**0.348920**	**OK**
K MDA	**502.444902**	**502.444902**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-08
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	005
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SED-01
Instr File Name	ApexAlpha
Instr Detector	A_3_3A
Instr keV	35.14909363
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	214.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219087
Sample Aliquot	1.021700
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.038330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2499.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.004900
Tracer EFF	0.219087
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.419106	0.419106	OK
CU	0.057349	0.057349	OK
TPU	0.076516	0.076516	OK
MDA	0.021390	0.021390	OK
DL	0.008004	0.008004	OK
BP MDA	0.069073	0.069073	OK
BP DL	0.031913	0.031913	OK
DL QSAS			
Gross Count Rate	0.148611	0.148611	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	0.146528	0.146528	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.259264	11.259264	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.703561	0.703561	OK
Chem Rec Factor	0.984002	0.984002	OK
Sys Err	0.061664	0.061664	OK
K	0.349619	0.349619	OK
K MDA	503.451991	503.451991	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-08
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	005
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SEO-01
Instr File Name	ApexAlpha
Instr Detector	A_3_3A
Instr keV	34.75193024
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	426.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212397
Sample Aliquot	1.108200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	1977.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	8.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.004500
Tracer EFF	0.212397
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.005528	1.005528	OK
CU	0.096163	0.096163	OK
TPU	0.154972	0.154972	OK
MDA	0.022032	0.022032	OK
DL	0.007802	0.007802	OK
BP MDA	0.048777	0.048777	OK
BP DL	0.021221	0.021221	OK
DL QSAS			
Gross Count Rate	0.295833	0.295833	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	0.294444	0.294444	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	0.985553	0.985553	OK
Tracer DPM	11.254783	11.254783	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.572037	0.572037	OK
Chem Rec Factor	0.800052	0.800052	OK
Sys Err	0.061664	0.061664	OK
K	0.292826	0.292826	OK
K MDA	421.668852	421.668852	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-09
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	006
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SED-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3B
Instr keV	20.57688332
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/1

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	1977.000000
Count Mins	1440.000000
BKG Counts	8.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212397
Sample Aliquot	1.108200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	1977.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	8.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.004500
Tracer EFF	0.212397
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**4.574485**	**4.574485**	**OK**
CU	**0.202877**	**0.202877**	**OK**
TPU	**0.588922**	**0.588922**	**OK**
MDA	**0.036870**	**0.036870**	**OK**
DL	**0.015287**	**0.015287**	**OK**
BP MDA	**0.142163**	**0.142163**	**OK**
BP DL	**0.068079**	**0.068079**	**OK**
DL QSAS			
Gross Count Rate	**1.372917**	**1.372917**	**OK**
BKG Count Rate	**0.005556**	**0.005556**	**OK**
Net Count Rate	**1.367361**	**1.367361**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**0.999996**	**0.999996**	**OK**
Tracer DPM	**11.254783**	**11.254783**	**OK**
Tracer At	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.572037**	**0.572037**	**OK**
Chem Rec Factor	**0.800052**	**0.800052**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.298910**	**0.298910**	**OK**
K MDA	**430.430992**	**430.430992**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-09
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	006
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SED-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_38
Instr keV	35.814991
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	370.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212397
Sample Aliquot	1.108200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.993000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.056330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	1977.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	8.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.004500
Tracer EFF	0.212397
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.858995**	**0.858995**	**OK**
CU	**0.087884**	**0.087884**	**OK**
TPU	**0.136021**	**0.136021**	**OK**
MDA	**0.017140**	**0.017140**	**OK**
DL	**0.005416**	**0.005416**	**OK**
BP MDA	**0.244905**	**0.244905**	**OK**
BP DL	**0.119555**	**0.119555**	**OK**
DL QSAS			
Gross Count Rate	**0.256944**	**0.256944**	**OK**
BKG Count Rate	**0.000694**	**0.000694**	**OK**
Net Count Rate	**0.256250**	**0.256250**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.254783**	**11.254783**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.572037**	**0.572037**	**OK**
Chem Rec Factor	**0.800052**	**0.800052**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.298314**	**0.298314**	**OK**
K MDA	**429.571600**	**429.571600**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-09
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	006
Client	Summit Enviroomental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SED-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3B
Instr keV	25.31498146
Version/Date	2.0 -- 4/20/2006

Reviewed by: HEW **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	393.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212397
Sample Aliquot	1.108200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	1977.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	8.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.004500
Tracer EFF	0.212397
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.908388	0.908388	OK
CU	0.090500	0.090500	OK
TPU	0.142281	0.142281	OK
MDA	0.021583	0.021583	OK
DL	0.007643	0.007643	OK
BP MDA	0.065015	0.065015	OK
BP DL	0.029422	0.029422	OK
DL QSAS			
Gross Count Rate	0.272917	0.272917	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	0.271528	0.271528	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.254783	11.254783	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.572037	0.572037	OK
Chem Rec Factor	0.800052	0.800052	OK
Sys Err	0.061664	0.061664	OK
K	0.298912	0.298912	OK
K MDA	430.432624	430.432624	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-09
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	006
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SED-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3B
Instr keV	34.51046371
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/1

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	239.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215743
Sample Aliquot	1.015200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2365.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.001000
Tracer EFF	0.215743
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.512117**	**0.512117**	**OK**
CU	**0.065336**	**0.065336**	**OK**
TPU	**0.089999**	**0.089999**	**OK**
MDA	**0.015843**	**0.015843**	**OK**
DL	**0.005006**	**0.005006**	**OK**
BP MDA	**0.052107**	**0.052107**	**OK**
BP DL	**0.023188**	**0.023188**	**OK**
DL QSAS			
Gross Count Rate	**0.165972**	**0.165972**	**OK**
BKG Count Rate	**0.000694**	**0.000694**	**OK**
Net Count Rate	**0.165278**	**0.165278**	**OK**
Δ t 1 (t2 - t1)	**15.661806**	**15.661806**	**OK**
DF	**0.984575**	**0.984575**	**OK**
Tracer DPM	**11.215567**	**11.215567**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.678217**	**0.678217**	**OK**
Chem Rec Factor	**0.948555**	**0.948555**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.322734**	**0.322734**	**OK**
K MDA	**464.737587**	**464.737587**	**OK**
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-10		
Analysis Code	ASP-A-009		
SDG	ARS1-11-00895		
Fraction	007		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-SED-01-110419		
Instr File Name	ApexAlpha		
Instr Detector	A_3_4B		
Instr keV	28.25423431		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2365.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215743
Sample Aliquot	1.015200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2365.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.001000
Tracer EFF	0.215743
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.976144	4.976144	OK
CU	0.200810	0.200810	OK
TPU	0.634058	0.634058	OK
MDA	0.019503	0.019503	OK
DL	0.006928	0.006928	OK
BP MDA	0.154020	0.154020	OK
BP DL	0.074316	0.074316	OK
DL QSAS			
Gross Count Rate	1.642361	1.642361	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	1.640972	1.640972	OK
Δ t 1 (t2 - t1)	15.661806	15.661806	OK
DF	0.999996	0.999996	OK
Tracer DPM	11.215567	11.215567	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.678217	0.678217	OK
Chem Rec Factor	0.948555	0.948555	OK
Sys Err	0.061664	0.061664	OK
K	0.329768	0.329768	OK
K MDA	474.865648	474.865648	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-10
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	007
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-01-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_4B
Instr keV	41.05665207
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/1

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	279.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215743
Sample Aliquot	1.015200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2365.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.001000
Tracer EFF	0.215743
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
0 **Variables Intact Test**	OK

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.584490**	**0.584490**	**OK**
CU	**0.069328**	**0.069328**	**OK**
TPU	**0.098978**	**0.098978**	**OK**
MDA	**0.019603**	**0.019603**	**OK**
DL	**0.006942**	**0.006942**	**OK**
BP MDA	**0.266172**	**0.266172**	**OK**
BP DL	**0.130507**	**0.130507**	**OK**
DL QSAS			
Gross Count Rate	**0.193750**	**0.193750**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.192361**	**0.192361**	**OK**
Δ t 1 (t2 - t1)	**15.661806**	**15.661806**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.215567**	**11.215567**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.678217**	**0.678217**	**OK**
Chem Rec Factor	**0.948555**	**0.948555**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.329109**	**0.329109**	**OK**
K MDA	**473.917649**	**473.917649**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-10
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	007
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-01-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_4B
Instr keV	23.88544273
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	230.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215743
Sample Aliquot	1.015200
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2365.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	1.001000
Tracer EFF	0.215743
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
0 **Variables Intact Test**	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.475922**	**0.475922**	**OK**
CU	**0.063138**	**0.063138**	**OK**
TPU	**0.085411**	**0.085411**	**OK**
MDA	**0.025303**	**0.025303**	**OK**
DL	**0.009798**	**0.009798**	**OK**
BP MDA	**0.069805**	**0.069805**	**OK**
BP DL	**0.032118**	**0.032118**	**OK**
DL QSAS			
Gross Count Rate	**0.159722**	**0.159722**	**OK**
BKG Count Rate	**0.002778**	**0.002778**	**OK**
Net Count Rate	**0.156944**	**0.156944**	**OK**
Δ t 1 (t2 - t1)	**15.661806**	**15.661806**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.215567**	**11.215567**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.678217**	**0.678217**	**OK**
Chem Rec Factor	**0.948555**	**0.948555**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.329769**	**0.329769**	**OK**
K MDA	**474.867571**	**474.867571**	**OK**
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-10		
Analysis Code	ASP-A-009		
SDG	ARS1-11-00895		
Fraction	007		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-SED-01-110419		
Instr File Name	ApexAlpha		
Instr Detector	A_3_48		
Instr keV	18.78171539		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: _____ **Date:** _____

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	391.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	1.064000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2360.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	5.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.999600
Tracer EFF	0.213233
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.795329**	**0.795329**	**OK**
CU	**0.080055**	**0.080055**	**OK**
TPU	**0.125095**	**0.125095**	**OK**
MDA	**0.024693**	**0.024693**	**OK**
DL	**0.009562**	**0.009562**	**OK**
BP MDA	**0.049679**	**0.049679**	**OK**
BP DL	**0.022102**	**0.022102**	**OK**
DL QSAS			
Gross Count Rate	**0.271528**	**0.271528**	**OK**
BKG Count Rate	**0.002778**	**0.002778**	**OK**
Net Count Rate	**0.268750**	**0.268750**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**0.985553**	**0.985553**	**OK**
Tracer DPM	**11.199881**	**11.199881**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.684834**	**0.684834**	**OK**
Chem Rec Factor	**0.957810**	**0.957810**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.337910**	**0.337910**	**OK**
K MDA	**486.590799**	**486.590799**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-11
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	008
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	36.71587753
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2360.000000
Count Mins	1440.000000
BKG Counts	5.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	1.064000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2360.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	5.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.999600
Tracer EFF	0.213233
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.741273	4.741273	OK
CU	0.191900	0.191900	OK
TPU	0.604311	0.604311	OK
MDA	0.026402	0.026402	OK
DL	0.010473	0.010473	OK
BP MDA	0.146967	0.146967	OK
BP DL	0.070907	0.070907	OK
DL QSAS			
Gross Count Rate	1.638889	1.638889	OK
BKG Count Rate	0.003472	0.003472	OK
Net Count Rate	1.635417	1.635417	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	0.999996	0.999996	OK
Tracer DPM	11.199881	11.199881	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.684834	0.684834	OK
Chem Rec Factor	0.957810	0.957810	OK
Sys Err	0.061664	0.061664	OK
K	0.344932	0.344932	OK
K MDA	496.701996	496.701996	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-11
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	008
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	55.79859543
Version/Date	2.0 -- 4/20/2006

Reviewed by: GRW **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	802.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	1.064000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2360.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	5.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.999600
Tracer EFF	0.213233
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.609811	1.609811	OK
CU	0.112257	0.112252	OK
TPU	0.224622	0.224622	OK
MDA	0.024239	0.024239	OK
DL	0.009386	0.009386	OK
BP MDA	0.253975	0.253975	OK
BP DL	0.124521	0.124521	OK
DL QSAS			
Gross Count Rate	0.556944	0.556944	OK
BKG Count Rate	0.002778	0.002778	OK
Net Count Rate	0.554167	0.554167	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.199881	11.199881	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.684834	0.684834	OK
Chem Rec Factor	0.957810	0.957810	OK
Sys Err	0.061664	0.061664	OK
K	0.344243	0.344243	OK
K MDA	495.710288	495.710288	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-11
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	008
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	35.01737976
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ Date: 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	371.000000
Count Mins	1440.000000
BKG Counts	7.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	1.064000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2360.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	5.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.999600
Tracer EFF	0.213233
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.732831**	**0.732831**	**OK**
CU	**0.076719**	**0.076719**	**OK**
TPU	**0.117177**	**0.117177**	**OK**
MDA	**0.030239**	**0.030239**	**OK**
DL	**0.012392**	**0.012392**	**OK**
BP MDA	**0.066614**	**0.066614**	**OK**
BP DL	**0.030645**	**0.030645**	**OK**
DL QSAS			
Gross Count Rate	**0.257639**	**0.257639**	**OK**
BKG Count Rate	**0.004861**	**0.004861**	**OK**
Net Count Rate	**0.252778**	**0.252778**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.199881**	**11.199881**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.684834**	**0.684834**	**OK**
Chem Rec Factor	**0.957810**	**0.957810**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.344933**	**0.344933**	**OK**
K MDA	**496.703879**	**496.703879**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-11
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	008
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	34.94045258
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	553.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219040
Sample Aliquot	1.019900
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2466.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.998100
Tracer EFF	0.219040
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
0 **Variables Intact Test**	OK

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.129883	1.129883	OK
CU	0.094429	0.094429	OK
TPU	0.166027	0.166027	OK
MDA	0.015071	0.015071	OK
DL	0.004762	0.004762	OK
BP MDA	0.051564	0.051564	OK
BP DL	0.023058	0.023058	OK
DL QSAS			
Gross Count Rate	0.384028	0.384028	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.383333	0.383333	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	0.985553	0.985553	OK
Tracer DPM	11.183075	11.183075	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.698301	0.698301	OK
Chem Rec Factor	0.976645	0.976645	OK
Sys Err	0.061664	0.061664	OK
K	0.339268	0.339268	OK
K MDA	488.546098	488.546098	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-12
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	009
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-03-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_6A
Instr keV	26.07896614
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** _____

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2466.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219040
Sample Aliquot	1.019900
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2466.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.998100
Tracer EFF	0.219040
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.938862	4.938862	OK
CU	0.195290	0.195290	OK
TPU	0.628047	0.628047	OK
MDA	0.021594	0.021594	OK
DL	0.008080	0.008080	OK
BP MDA	0.153064	0.153064	OK
BP DL	0.073974	0.073974	OK
DL QSAS			
Gross Count Rate	1.712500	1.712500	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	1.710417	1.710417	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	0.999996	0.999996	OK
Tracer DPM	11.183075	11.183075	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.698301	0.698301	OK
Chem Rec Factor	0.976645	0.976645	OK
Sys Err	0.061664	0.061664	OK
K	0.346318	0.346318	OK
K MDA	498.697925	498.697925	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-12		
Analysis Code	ASP-A-009		
SDG	ARS1-11-00895		
Fraction	009		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-SED-03-110420		
Instr File Name	ApexAlpha		
Instr Detector	A_3_6A		
Instr keV	45.91628647		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	1983.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219040
Sample Aliquot	1.019900
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2466.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.998100
Tracer EFF	0.219040
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
0 **Variables Intact Test**	**OK**

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	3.982301	3.982301	OK
CU	0.175411	0.175411	OK
TPU	0.512271	0.512271	OK
MDA	0.014794	0.014794	OK
DL	0.004674	0.004674	OK
BP MDA	0.264699	0.264699	OK
BP DL	0.129906	0.129906	OK
DL QSAS			
Gross Count Rate	1.377083	1.377083	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	1.376389	1.376389	OK
Δ t 1 (t2 - t1)	14.661806	14.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.183075	11.183075	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.698301	0.698301	OK
Chem Rec Factor	0.976645	0.976645	OK
Sys Err	0.061664	0.061664	OK
K	0.345627	0.345627	OK
K MDA	497.702232	497.702232	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-12		
Analysis Code	ASP-A-009		
SDG	ARS1-11-00895		
Fraction	009		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-SED-03-110420		
Instr File Name	ApexAlpha		
Instr Detector	A_3_6A		
Instr keV	31.45694542		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: _____ **Date:** 5/10/11

35000600

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	496.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219040
Sample Aliquot	1.019900
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2466.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.998100
Tracer EFF	0.219040
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.994586**	**0.994586**	**OK**
CU	**0.087530**	**0.087530**	**OK**
TPU	**0.148698**	**0.148698**	**OK**
MDA	**0.005434**	**0.005434**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP MDA	**0.069236**	**0.069236**	**OK**
BP DL	**0.031970**	**0.031970**	**OK**
DL QSAS			
Gross Count Rate	**0.344444**	**0.344444**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.344444**	**0.344444**	**OK**
Δ t 1 (t2 - t1)	**14.661806**	**14.661806**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**11.183075**	**11.183075**	**OK**
Tracer At	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.698301**	**0.698301**	**OK**
Chem Rec Factor	**0.976645**	**0.976645**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.346319**	**0.346319**	**OK**
K MDA	**498.699815**	**498.699815**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-12
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	009
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-03-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_6A
Instr keV	29.80042267
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	242.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.217225
Sample Aliquot	1.083800
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.994000
Halflife Days 1 - Result Isotope	698.356481
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2480.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	7.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.998000
Tracer EFF	0.217225
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.022083
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-228		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.464672**	**0.464672**	**OK**
CU	**0.058546**	**0.058546**	**OK**
TPU	**0.081127**	**0.081127**	**OK**
MDA	**0.005204**	**0.005204**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP MDA	**0.048550**	**0.048550**	**OK**
BP DL	**0.021720**	**0.021720**	**OK**
DL QSAS			
Gross Count Rate	**0.168056**	**0.168056**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.168056**	**0.168056**	**OK**
Δ t 1 (t2 - t1)	**15.661806**	**15.661806**	**OK**
DF	**0.984575**	**0.984575**	**OK**
Tracer DPM	**11.181954**	**11.181954**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.707065**	**0.707065**	**OK**
Chem Rec Factor	**0.988902**	**0.988902**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.361665**	**0.361665**	**OK**
K MDA	**520.797952**	**520.797952**	**OK**
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-11		
Analysis Code	ASP-A-009		
SDG	ARS1-11-00895		
Fraction	010		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-SED-BG-041911		
Instr File Name	ApexAlpha		
Instr Detector	A_3_6B		
Instr keV	24.91238785		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: _____ **Date:** 5/10/11

35000602

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	2480.000000
Count Mins	1440.000000
BKG Counts	7.000000
BKG Mins	1440.000000
Instrument Efficiency	0.217225
Sample Aliquot	1.083800
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	2680555.555556
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2480.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	7.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.998000
Tracer EFF	0.217225
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.071883
Activity Units	pCi
Aliquot Units	g
0 **Variables Intact Test**	OK

Isotope	TH-229		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**4.647206**	**4.647206**	**OK**
CU	**0.183680**	**0.183680**	**OK**
TPU	**0.590935**	**0.590935**	**OK**
MDA	**0.028225**	**0.028225**	**OK**
DL	**0.011566**	**0.011566**	**OK**
BP MDA	**0.144018**	**0.144018**	**OK**
BP DL	**0.069612**	**0.069612**	**OK**
DL QSAS			
Gross Count Rate	**1.722222**	**1.722222**	**OK**
BKG Count Rate	**0.004861**	**0.004861**	**OK**
Net Count Rate	**1.717361**	**1.717361**	**OK**
Δ t 1 (t2 - t1)	**15.661806**	**15.661806**	**OK**
DF	**0.999996**	**0.999996**	**OK**
Tracer DPM	**11.181954**	**11.181954**	**OK**
Tracer Δt	**226.643056**	**226.643056**	**OK**
Tracer DF	**0.999941**	**0.999941**	**OK**
Tracer Recovery	**0.707065**	**0.707065**	**OK**
Chem Rec Factor	**0.988902**	**0.988902**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.369547**	**0.369547**	**OK**
K MDA	**532.147740**	**532.147740**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-13
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	010
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-BG-041911
Instr File Name	ApexAlpha
Instr Detector	A_3_68
Instr keV	45.42248535
Version/Date	2.0 -- 4/20/2006

Reviewed by: [signature] **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	251.000000
Count Mins	1440.000000
BKG Counts	10.000000
BKG Mins	1440.000000
Instrument Efficiency	0.217225
Sample Aliquot	1.083800
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	27534722.222222
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2480.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	7.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.998000
Tracer EFF	0.217225
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.126236
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	OK

Isotope	TH-230		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.453788	0.453788	OK
CU	0.059623	0.059623	OK
TPU	0.081011	0.081011	OK
MDA	0.032807	0.032807	OK
DL	0.013852	0.013852	OK
BP MDA	0.249071	0.249071	OK
BP DL	0.122246	0.122246	OK
DL QSAS			
Gross Count Rate	0.174306	0.174306	OK
BKG Count Rate	0.006944	0.006944	OK
Net Count Rate	0.167361	0.167361	OK
Δ t 1 (t2 - t1)	15.661806	15.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.181954	11.181954	OK
Tracer Δt	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.707065	0.707065	OK
Chem Rec Factor	0.988902	0.988902	OK
Sys Err	0.061664	0.061664	OK
K	0.368809	0.368809	OK
K MDA	531.085386	531.085386	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01647
Batch ID	ARS1-B11-01647-13
Analysis Code	ASP-A-009
SDG	ARS1-11-00895
Fraction	010
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SED-BG-041911
Instr File Name	ApexAlpha
Instr Detector	A_3_6B
Instr keV	19.59401321
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ **Date:** 5/10/11

Calculation Verification

Procedure	ARS-031
Variable	**Value**
Counts	265.000000
Count Mins	1440.000000
BKG Counts	7.000000
BKG Mins	1440.000000
Instrument Efficiency	0.217225
Sample Aliquot	1.083800
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/5/11 3:53 AM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	5131944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0246
Tracer Std - Isotope	Th-229
Tracer Counts	2480.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	7.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	9/20/10 12:27 PM
Tracer DPM/g	11.2044
Tracer Net Wt Added g	0.998000
Tracer EFF	0.217225
Tracer Plating Rec	0.715000
Tracer Abundance	1.000000
Tracer Halflife Days	2680555.5556
Sb	0.031067
Activity Units	pCi
Aliquot Units	g
Variables Intact Test	**OK**

Isotope	TH-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.484826	0.484826	OK
CU	0.060744	0.060744	OK
TPU	0.084400	0.084400	OK
MDA	0.028225	0.028225	OK
DL	0.011566	0.011566	OK
BP MDA	0.065133	0.065133	OK
BP DL	0.030085	0.030085	OK
DL QSAS			
Gross Count Rate	0.184028	0.184028	OK
BKG Count Rate	0.004861	0.004861	OK
Net Count Rate	0.179167	0.179167	OK
Δ t 1 (t2 - t1)	15.661806	15.661806	OK
DF	1.000000	1.000000	OK
Tracer DPM	11.181954	11.181954	OK
Tracer At	226.643056	226.643056	OK
Tracer DF	0.999941	0.999941	OK
Tracer Recovery	0.707065	0.707065	OK
Chem Rec Factor	0.988902	0.988902	OK
Sys Err	0.061664	0.061664	OK
K	0.369549	0.369549	OK
K MDA	532.149896	532.149896	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01647		
Batch ID	ARS1-B11-01647-13		
Analysis Code	ASP-A-009		
SDG	ARS1-11-00895		
Fraction	010		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-SED-BG-041911		
Instr File Name	ApexAlpha		
Instr Detector	A_3_6B		
Instr keV	30.39453316		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: HCV **Date:** 5/10/11

35000605

AMERICAN RADIATION SERVICES, INC.

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American Radiation Services Analytical Reports

for

Summit Environmental Technologies

Thorium Alpha Spectroscopy Laboratory Records

35000606

Analysis Batch Report

Analysis Batch ID **ARS1-B11-01647**

Method	ARS-031	Analysis	ASP-A-009	Matrix	SO
Description	Thorium in Solid, Waste, Biota, Sediment, Veg				

ABatch Sample ID	Type	Blind Iso1	Blind Iso2	Blind Iso3	SDG	FR	Run	Client ID	Isotope Group	Lab Deadline
ARS1-B11-01647-01	LCS	B-11682								
ARS1-B11-01647-02	LCSD	B-11683								
ARS1-B11-01647-03	MBL									
ARS1-B11-01647-04	TRG				ARS1-11-00895	001	1	PR-SED-01-110420	STD	05/03/11
ARS1-B11-01647-05	TRG				ARS1-11-00895	002	1	RM-JM-SED-02-110420	STD	05/03/11
ARS1-B11-01647-06	TRG				ARS1-11-00895	003	1	RM-JM-SED-110420	STD	05/03/11
ARS1-B11-01647-07	TRG				ARS1-11-00895	004	1	RM-SED-BG-110419	STD	05/03/11
ARS1-B11-01647-08	TRG				ARS1-11-00895	005	1	RP-JM-SED-01	STD	05/03/11
ARS1-B11-01647-09	TRG				ARS1-11-00895	006	1	RP-JM-SED-110420	STD	05/03/11
ARS1-B11-01647-10	TRG				ARS1-11-00895	007	1	RP-SED-01-110419	STD	05/03/11
ARS1-B11-01647-11	TRG				ARS1-11-00895	008	1	RP-SED-02-110420	STD	05/03/11
ARS1-B11-01647-12	TRG				ARS1-11-00895	009	1	RP-SED-03-110420	STD	05/03/11
ARS1-B11-01647-13	TRG				ARS1-11-00895	010	1	RP-SED-BG-041911	STD	05/03/11

35000607

American Radiation Services
Baton Rouge Laboratory

LCS Report
Analytical Batch: ARS1-B11-01647

BlindID	ABatch	ABatchSampleID	BlindGroup	StdID	Isotope	ExpectedAddition	ExpectedValue	EmptyWt	GrossWt	NetWt	UserID	ModDate	ExpectedValue_CT	MidPointCountDate	KnownValue
B-11682	ARS1-B11-01647	ARS1-B11-01647-01	B-Th230	S-0231	Th-230	1	5.656931968	13.1912	14.2214	1.0302	VMULLIGAN	4/28/2011	5.656930971	5/5/2011	5.827770287
B-11683	ARS1-B11-01647	ARS1-B11-01647-02	B-Th230	S-0231	Th-230	1	5.656931968	13.4853	14.5137	1.0284	VMULLIGAN	4/28/2011	5.656930971	5/5/2011	5.817587811

35000608

ARS-031

ID_31001_031	ABatch	ABatchSampleID	ClientID	Aliquot	AliquotUnits	UserID	ModDate	IC_ID
2917	ARS1-B11-01647	ARS1-B11-01647-01		1	g	JBROWN	05/02/2011 10:04:12	
2918	ARS1-B11-01647	ARS1-B11-01647-02		1	g	JBROWN	05/02/2011 10:04:12	
2919	ARS1-B11-01647	ARS1-B11-01647-03		1	g	JBROWN	05/02/2011 10:04:12	
2920	ARS1-B11-01647	ARS1-B11-01647-04	PR-SED-01-110420	1.0227	g	JBROWN	05/02/2011 10:04:12	85785
2921	ARS1-B11-01647	ARS1-B11-01647-05	RM-JM-SED-02-110420	1.1092	g	JBROWN	05/02/2011 10:04:12	85786
2922	ARS1-B11-01647	ARS1-B11-01647-06	RM-JM-SED-110420	1.0785	g	JBROWN	05/02/2011 10:04:12	85787
2923	ARS1-B11-01647	ARS1-B11-01647-07	RM-SED-BG-110419	1.0607	g	JBROWN	05/02/2011 10:04:12	85788
2924	ARS1-B11-01647	ARS1-B11-01647-08	RP-JM-SED-01	1.0217	g	JBROWN	05/02/2011 10:04:13	85789
2925	ARS1-B11-01647	ARS1-B11-01647-09	RP-JM-SED-110420	1.1082	g	JBROWN	05/02/2011 10:04:13	85790
2926	ARS1-B11-01647	ARS1-B11-01647-10	RP-SED-01-110419	1.0152	g	JBROWN	05/02/2011 10:04:13	85791
2927	ARS1-B11-01647	ARS1-B11-01647-11	RP-SED-02-110420	1.064	g	JBROWN	05/02/2011 10:04:13	85794
2928	ARS1-B11-01647	ARS1-B11-01647-12	RP-SED-03-110420	1.0199	g	JBROWN	05/02/2011 10:04:13	85792
2929	ARS1-B11-01647	ARS1-B11-01647-13	RP-SED-BG-041911	1.0838	g	JBROWN	05/02/2011 10:04:13	85793

ARS1-B11-01647

ABatch	ABatchSampleID	ClientID	SampleType	EmptyWt	FilledWt	NetWt	Exp Val	StdID	Isotope	TracerDate	UserID	ModDate	HL days	Ref Date	Cert dpm/g	Curr ACT
ARS1-B11-01647	ARS1-B11-01647-01		LCS	59.022	60.025	1.003	11.240	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-02		LCSD	66.050	67.034	0.984	11.030	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-03		MBL	82.240	83.259	1.019	11.420	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-04	PR-SED-01-110420	TRG	74.915	75.928	1.013	11.344	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-05	RM-JM-SED-02-110420	TRG	80.936	81.948	1.012	11.336	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-06	RM-JM-SED-110420	TRG	70.165	71.173	1.008	11.289	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-07	RM-SED-BG-110419	TRG	73.004	74.011	1.007	11.282	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-08	RP-JM-SED-01	TRG	75.939	76.944	1.005	11.259	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-09	RP-JM-SED-110420	TRG	81.275	82.280	1.005	11.254	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-10	RP-SED-01-110419	TRG	64.686	65.687	1.001	11.215	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-11	RP-SED-02-110420	TRG	77.849	78.849	1.000	11.199	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-12	RP-SED-03-110420	TRG	73.610	74.609	0.998	11.182	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204
ARS1-B11-01647	ARS1-B11-01647-13	RP-SED-BG-041911	TRG	72.661	73.659	0.998	11.181	S-0246	Th-229	5/2/2011	JBROWN	5/2/2011	2680555.556	9/20/2010	11.204	11.204

Technical Notes

Batch	ARS1-B11-01647
Analysis Code	ASP-A-009
Procedure No	ARS-031
Matrix	SO

#	Date	Dept.	Batch Technical Note	
1	05/03/11 16:22	CHEMISTRY	B11-01647-11 electroplated with a very light shadow and the plate seems to have white particles that plated on the disk. As a result, tracer recovery and activity may be affected.	JBROWN

5/5/2011 03:51:46

Apex-Alpha™

ASSIGNED SAMPLES REPORT

Date : 5/5/2011
Time : 03:51:46
User : countroom

SAMPLE	CHAMBER	GEOMETRY	DEVICE	CERTIFICATE
11-01657-01	A_1_1A	Shelf 2	Alpha Analyst10139	
11-01657-02	A_1_1B	Shelf 2	Alpha Analyst10139	
11-01657-03	A_1_2A	Shelf 2	Alpha Analyst10139	
11-01657-04	A_1_2B	Shelf 2	Alpha Analyst10139	
11-01657-05	A_1_3A	Shelf 2	Alpha Analyst10139	
11-01657-06	A_1_3B	Shelf 2	Alpha Analyst10139	
11-01657-07	A_1_4A	Shelf 2	Alpha Analyst10139	
11-01657-08	A_1_4B	Shelf 2	Alpha Analyst10139	
11-01657-09	A_1_5A	Shelf 2	Alpha Analyst10139	
11-01657-10	A_1_5B	Shelf 2	Alpha Analyst10139	
11-01657-11	A_1_6A	Shelf 2	Alpha Analyst10139	
11-01657-12	A_1_6B	Shelf 2	Alpha Analyst10139	
11-01657-13	A_2_1A	Shelf 2	Alpha Analyst10139	
11-01657-14	A_2_1B	Shelf 2	Alpha Analyst10139	
11-01657-15	A_2_2A	Shelf 2	Alpha Analyst10139	
11-01657-16	A_2_3B	Shelf 2	Alpha Analyst10139	
11-01647-01	A_2_4A	Shelf 2	Alpha Analyst10139	
11-01647-02	A_2_4B	Shelf 2	Alpha Analyst10139	
11-01647-03	A_2_5A	Shelf 2	Alpha Analyst10139	
11-01647-04	A_2_5B	Shelf 2	Alpha Analyst10139	
11-01647-05	A_3_1A	Shelf 2	Alpha Analyst10139	
11-01647-06	A_3_1B	Shelf 2	Alpha Analyst10139	
11-01647-07	A_3_2B	Shelf 2	Alpha Analyst10139	
11-01647-08	A_3_3A	Shelf 2	Alpha Analyst10139	
11-01647-09	A_3_3B	Shelf 2	Alpha Analyst10139	
11-01647-10	A_3_4B	Shelf 2	Alpha Analyst10139	
11-01647-11	A_3_5A	Shelf 2	Alpha Analyst10139	
11-01647-12	A_3_6A	Shelf 2	Alpha Analyst10139	
11-01647-13	A_3_6B	Shelf 2	Alpha Analyst10139	

ALPHA SPECTRUM ANALYSIS

Sample Description: LCS
Batch Identification: B11-01647
Sample Identification: 11-01647-01
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 2 4A
Chamber Serial Number: 12044982A
Detector Serial Number: 55800
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:52:39
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.9 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2250 +/- 0.0046 on 4/13/10 09:49:41
Effective Efficiency: 0.2250 +/- 0.0046

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

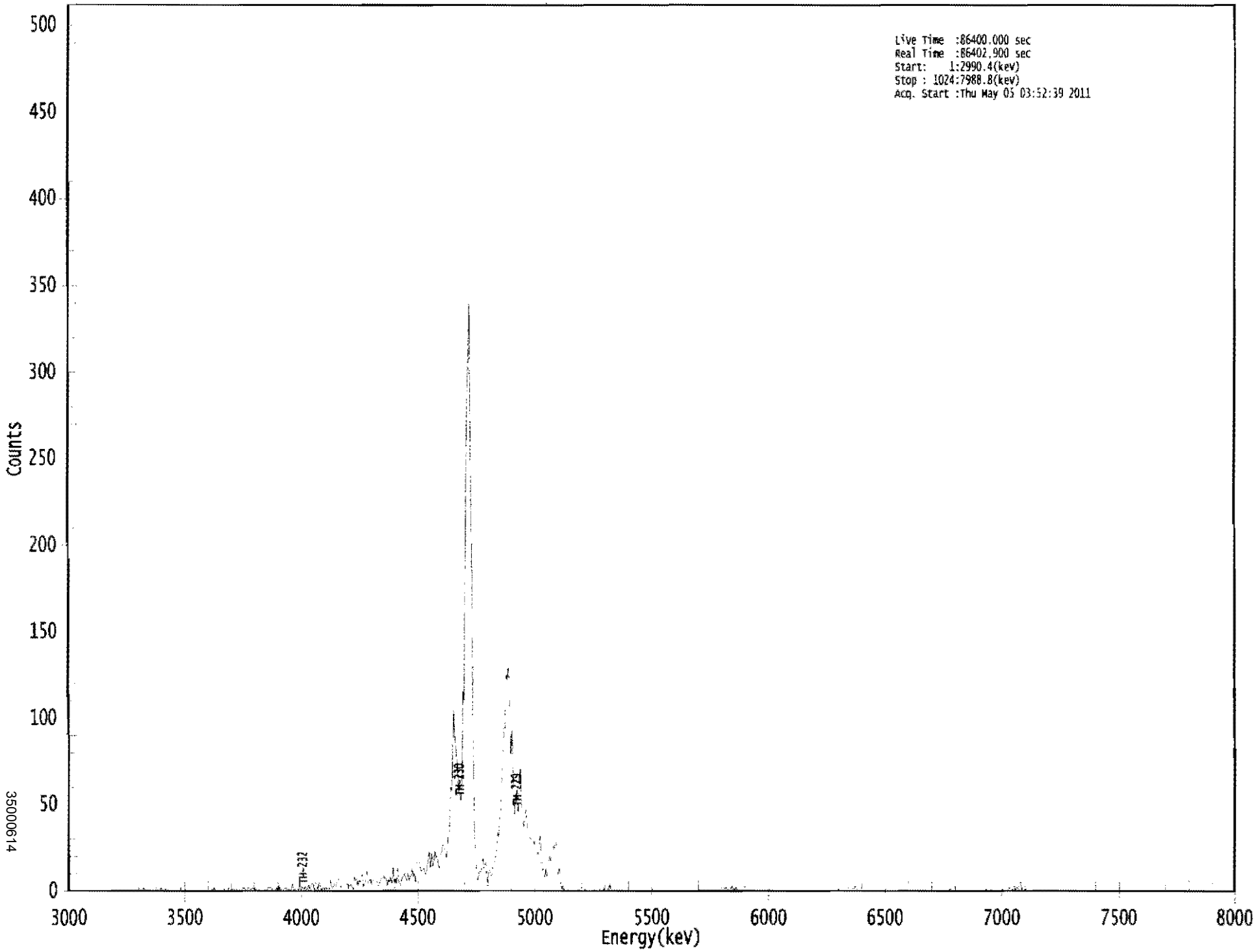
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-229	4919.829	2513.00	50.13	0.00	0.00E+000	49.1
TH-230	4674.833	3495.00	59.12	0.00	0.00E+000	31.0
TH-232	4002.684	39.00	6.24	0.00	0.00E+000	5.7
<not ID'd>	5316.149	14.00	3.74	0.00	0.00E+000	7.3

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-229	3.5113E+000	2.86	3.7811E-003	2.05
TH-230	4.8688E+000	2.66	3.7697E-003	2.05
TH-232	5.4232E-002	16.14	3.7629E-003	2.05

Errors quoted at 1.000 sigma

0000012152.CNF



35000614

ALPHA SPECTRUM ANALYSIS

Sample Description: LCSD
Batch Identification: B11-01647
Sample Identification: 11-01647-02
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 2 4B
Chamber Serial Number: 12044982B
Detector Serial Number: 55801
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:52:41
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.9 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2158 +/- 0.0044 on 4/13/10 09:50:10
Effective Efficiency: 0.2158 +/- 0.0044

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

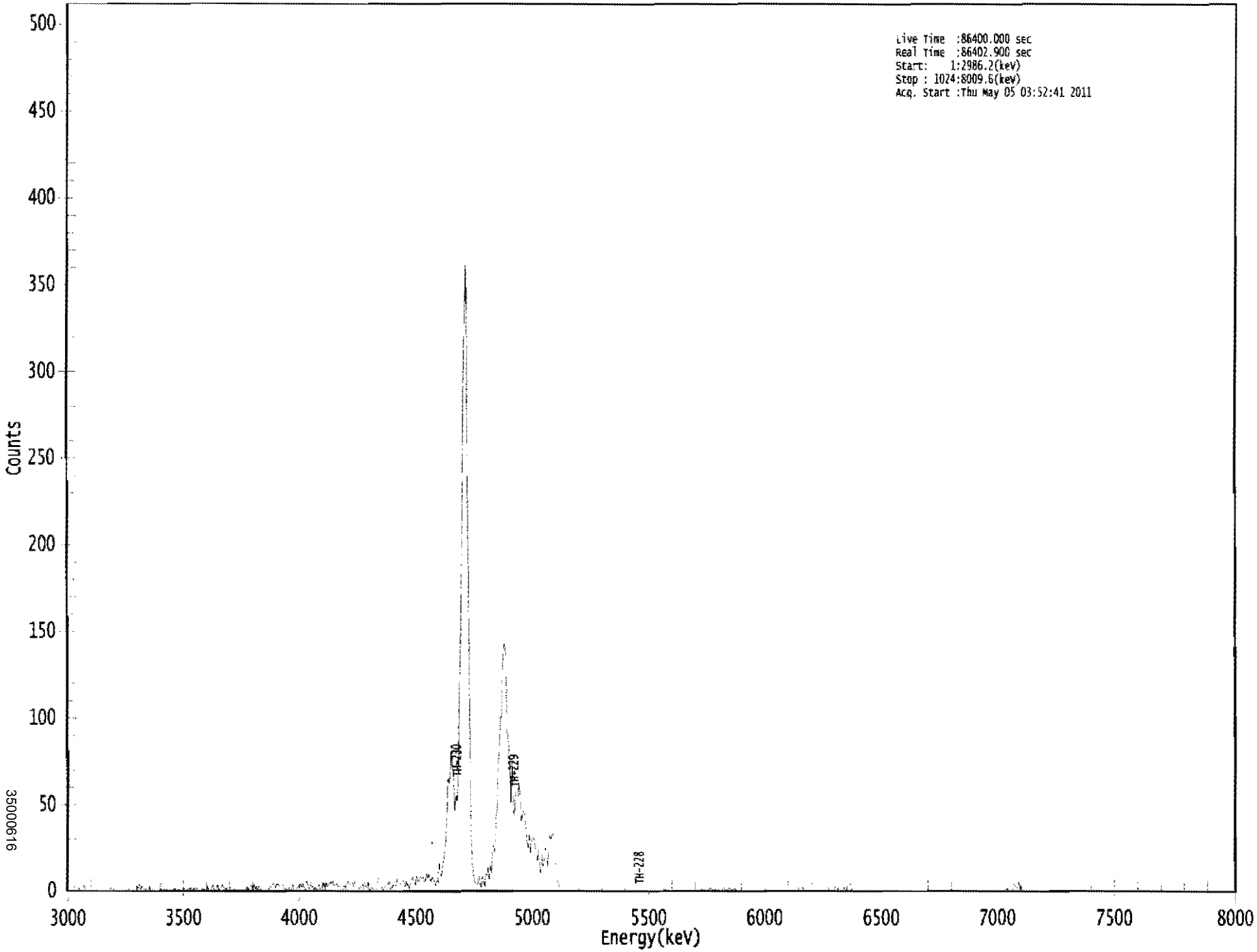
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5451.223	1.00	1.00	0.00	0.00E+000	4.9
TH-229	4915.167	2755.00	52.49	0.00	0.00E+000	50.4
TH-230	4670.242	3395.00	58.27	0.00	0.00E+000	30.0
<not ID'd>	3881.395	58.00	7.62	0.00	0.00E+000	14.7

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	1.4503E-003	100.02	3.9246E-003	2.05
TH-229	4.0125E+000	2.80	3.9411E-003	2.05
TH-230	4.9297E+000	2.68	3.9293E-003	2.05

Errors quoted at 1.000 sigma

0000012154.CNF



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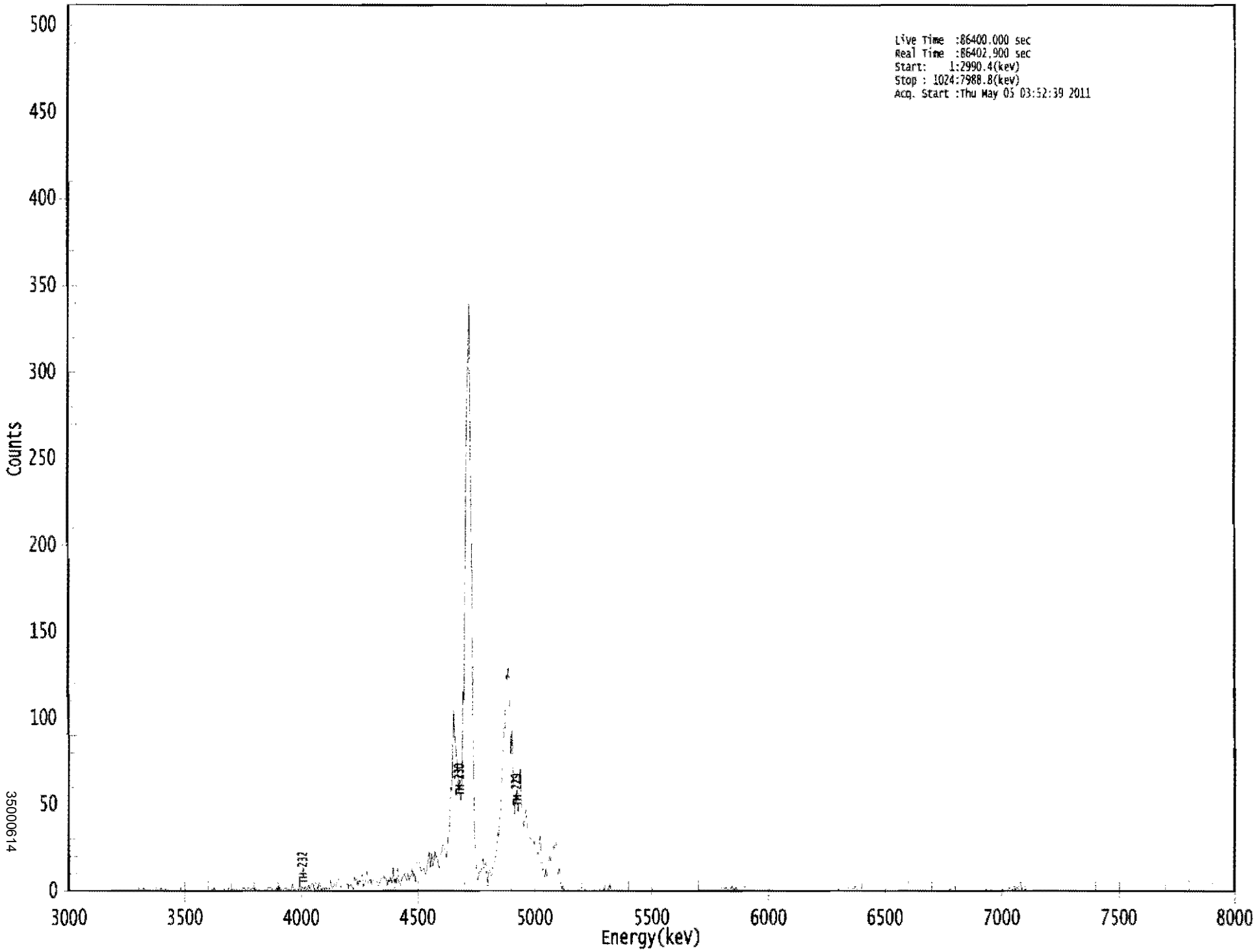

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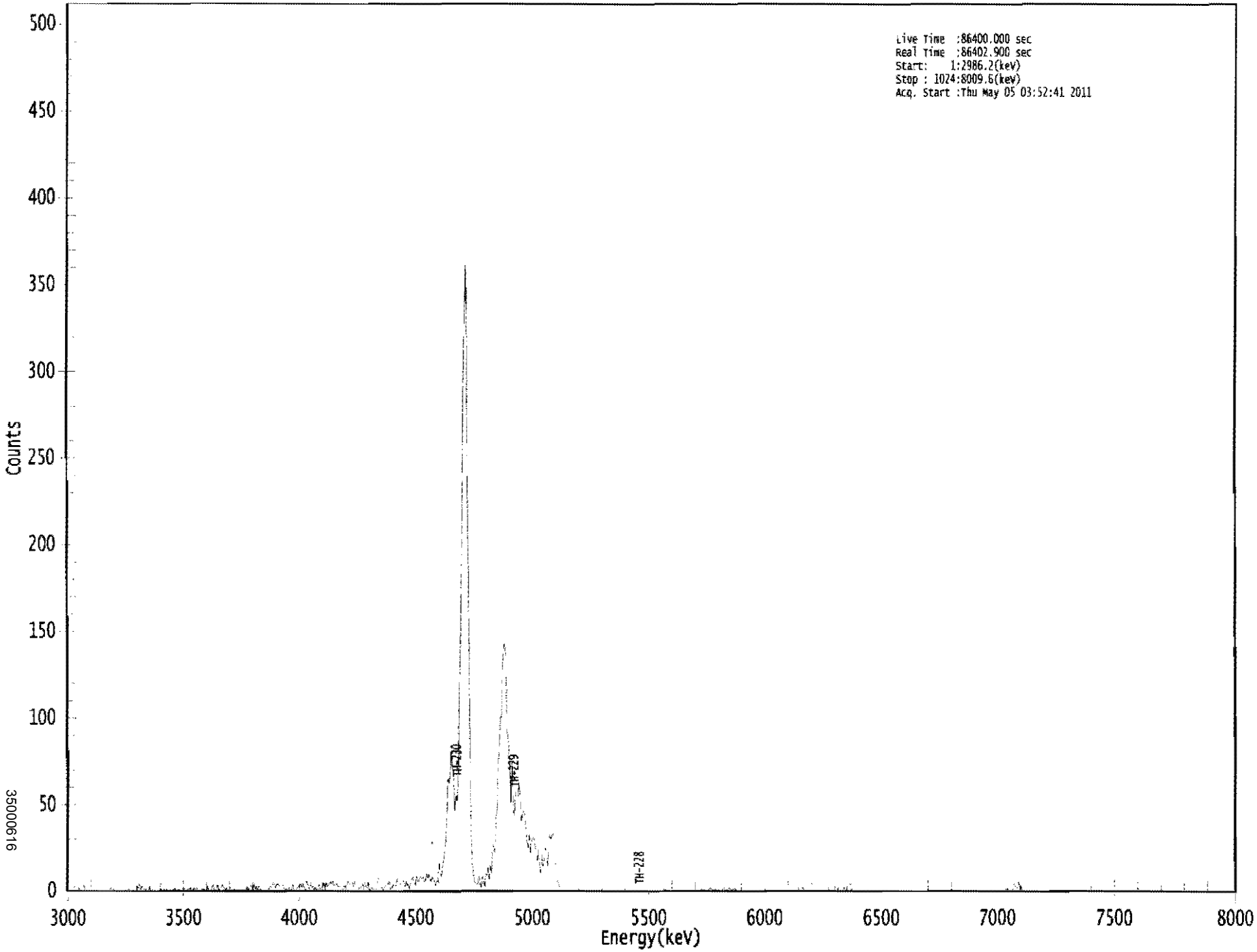

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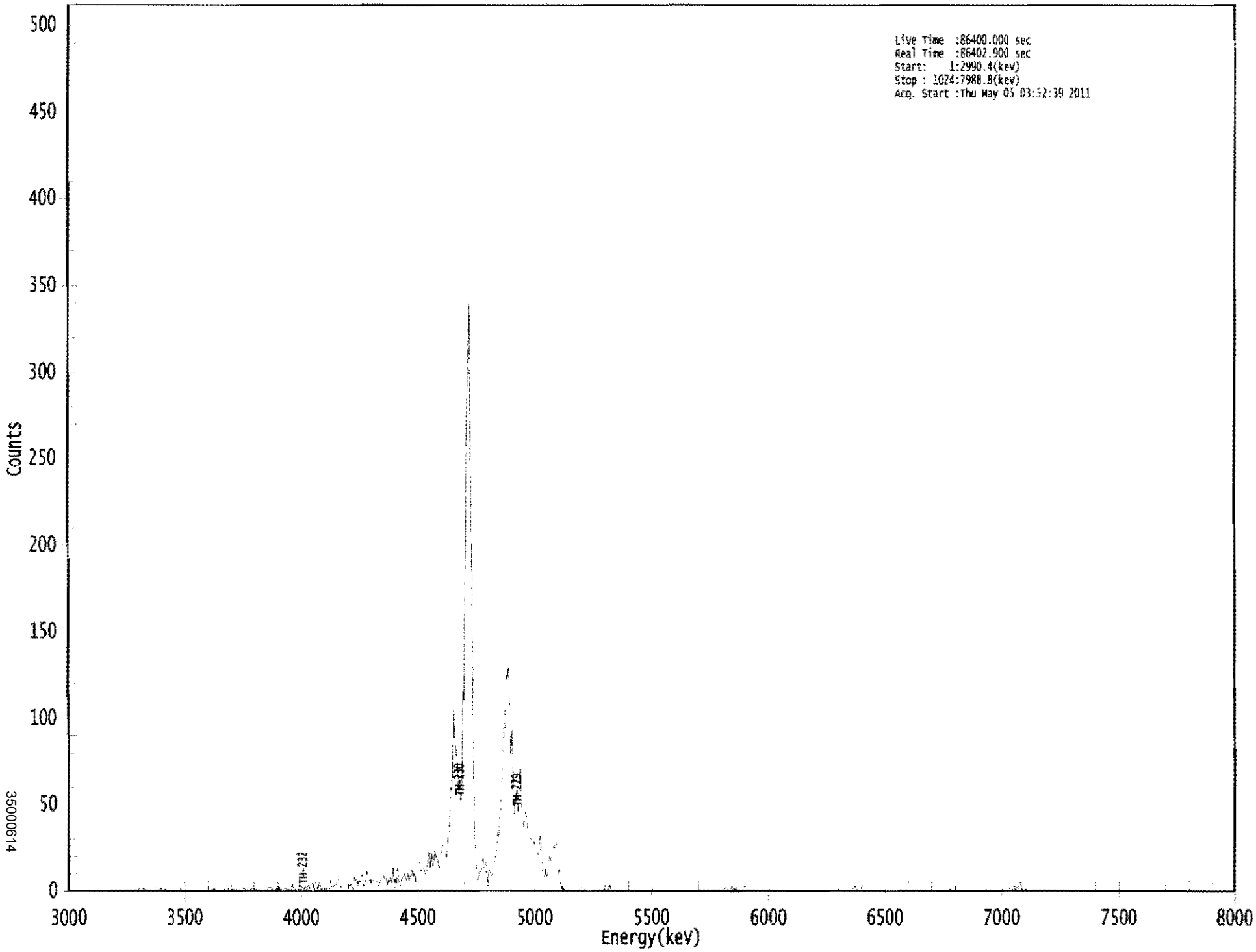

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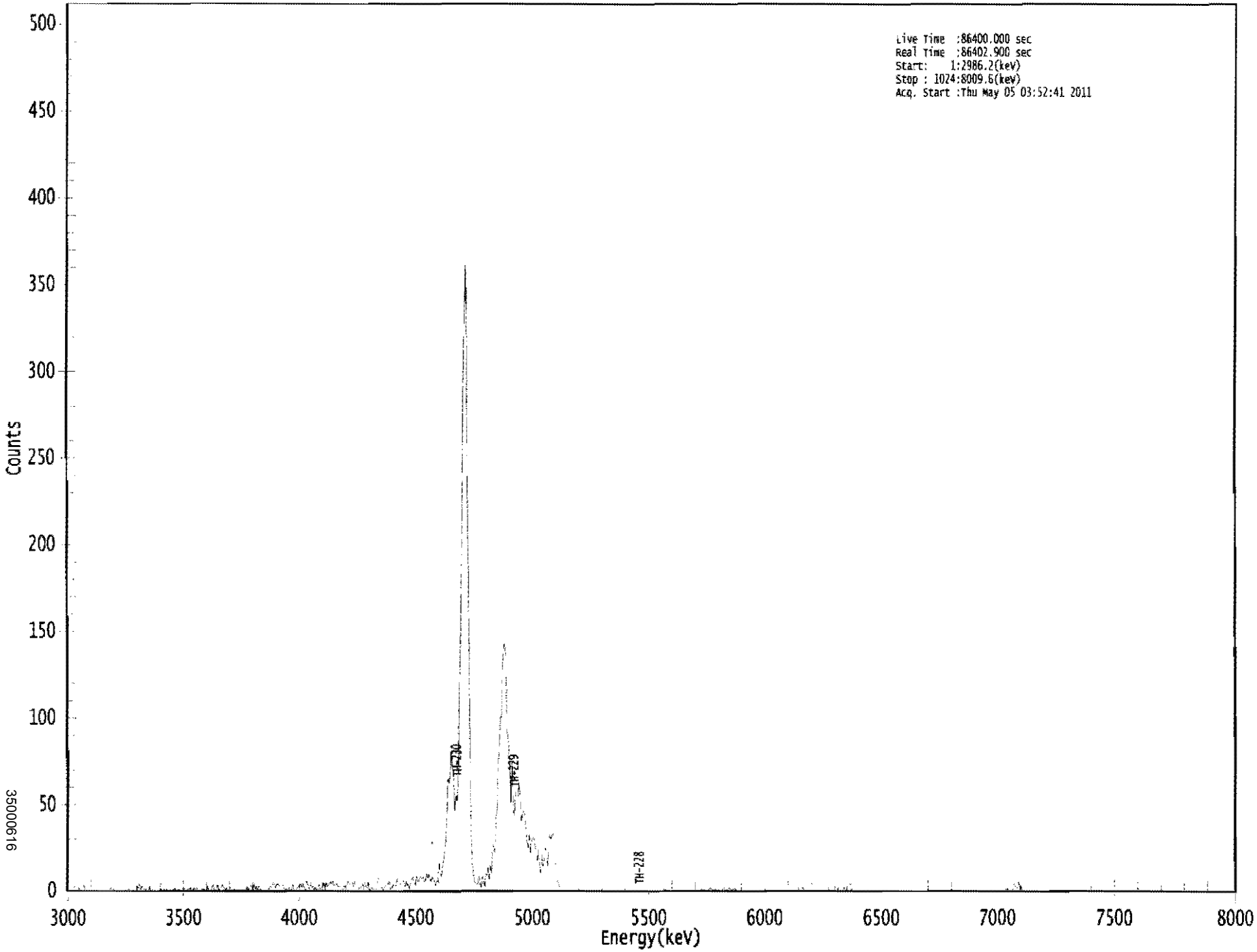

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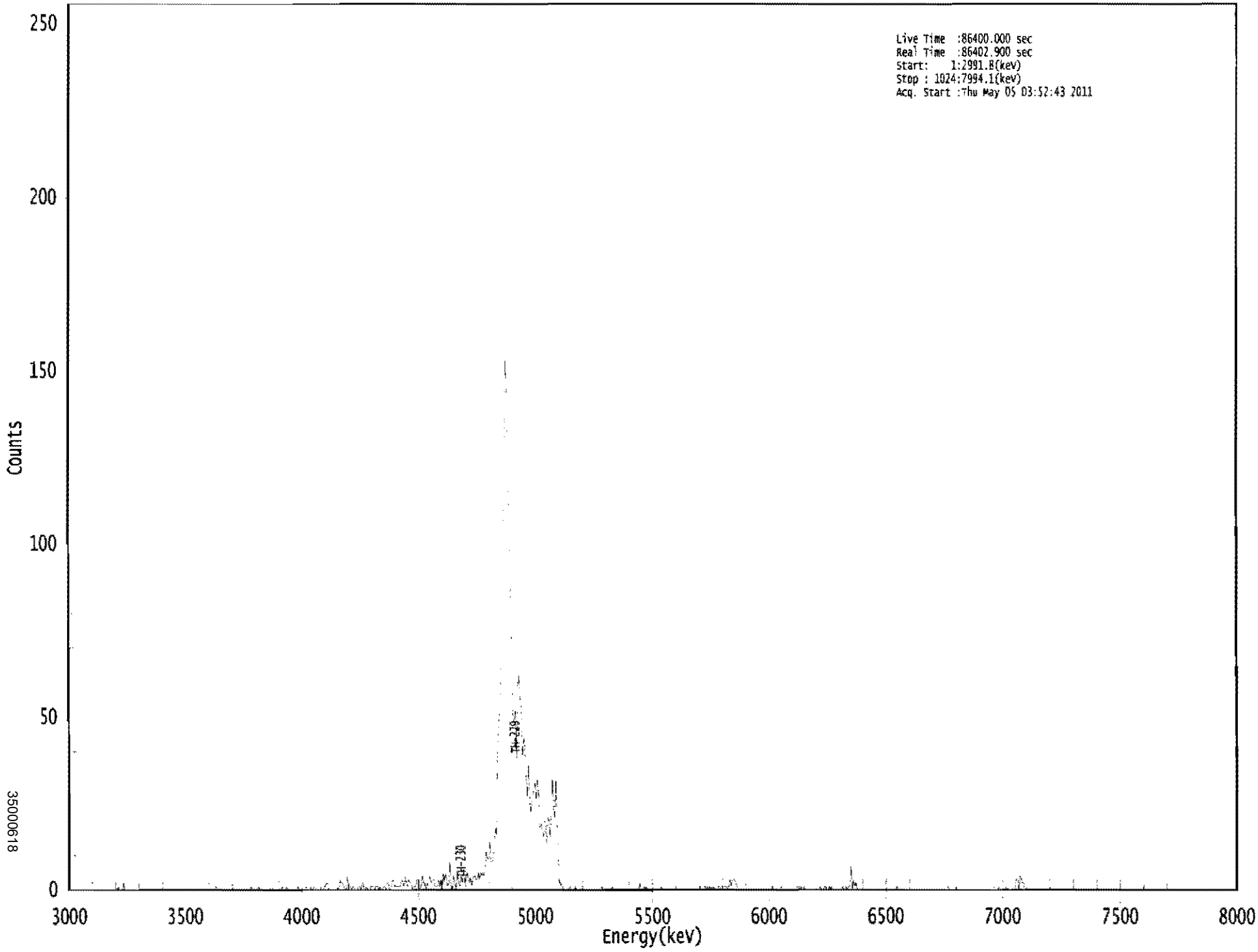

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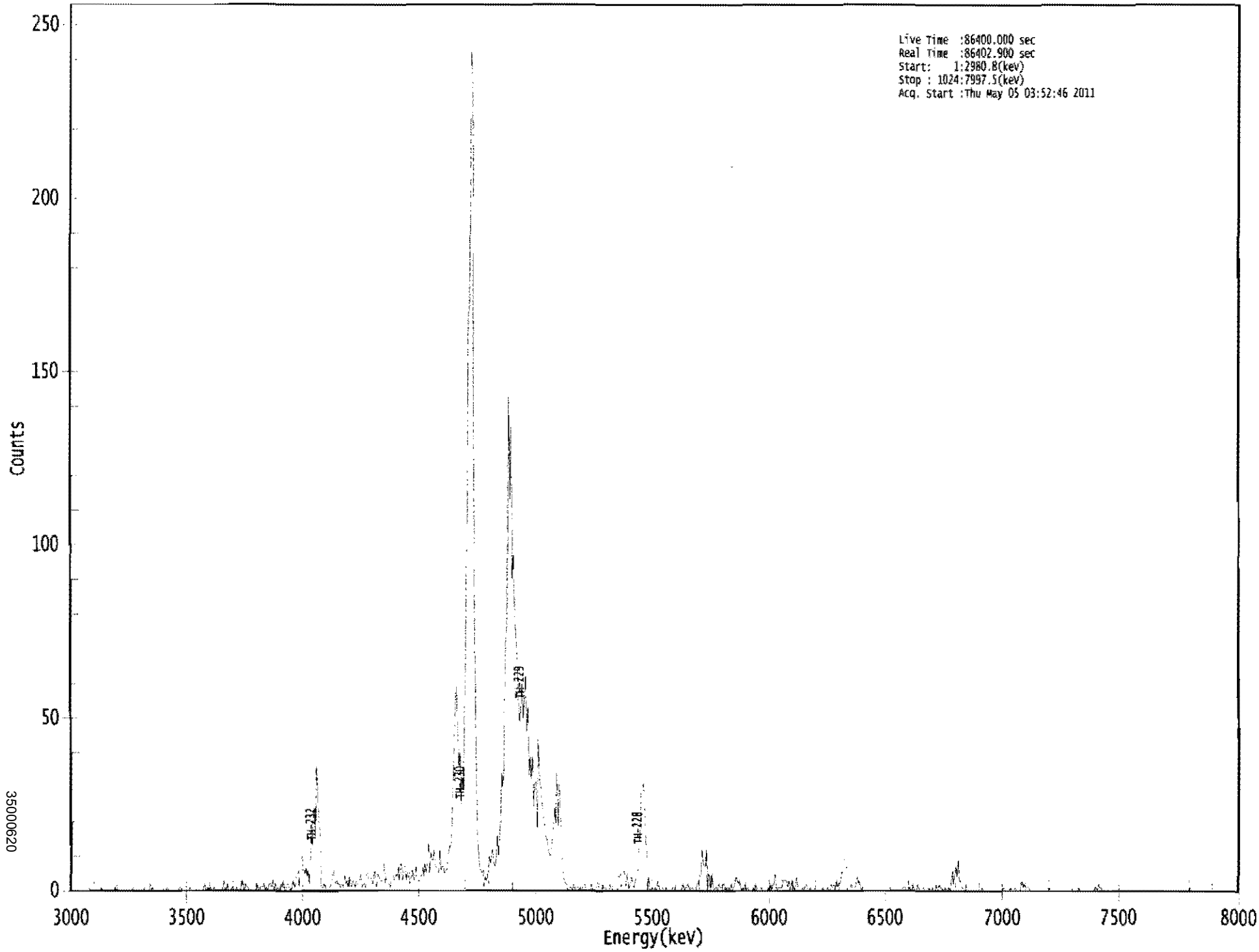

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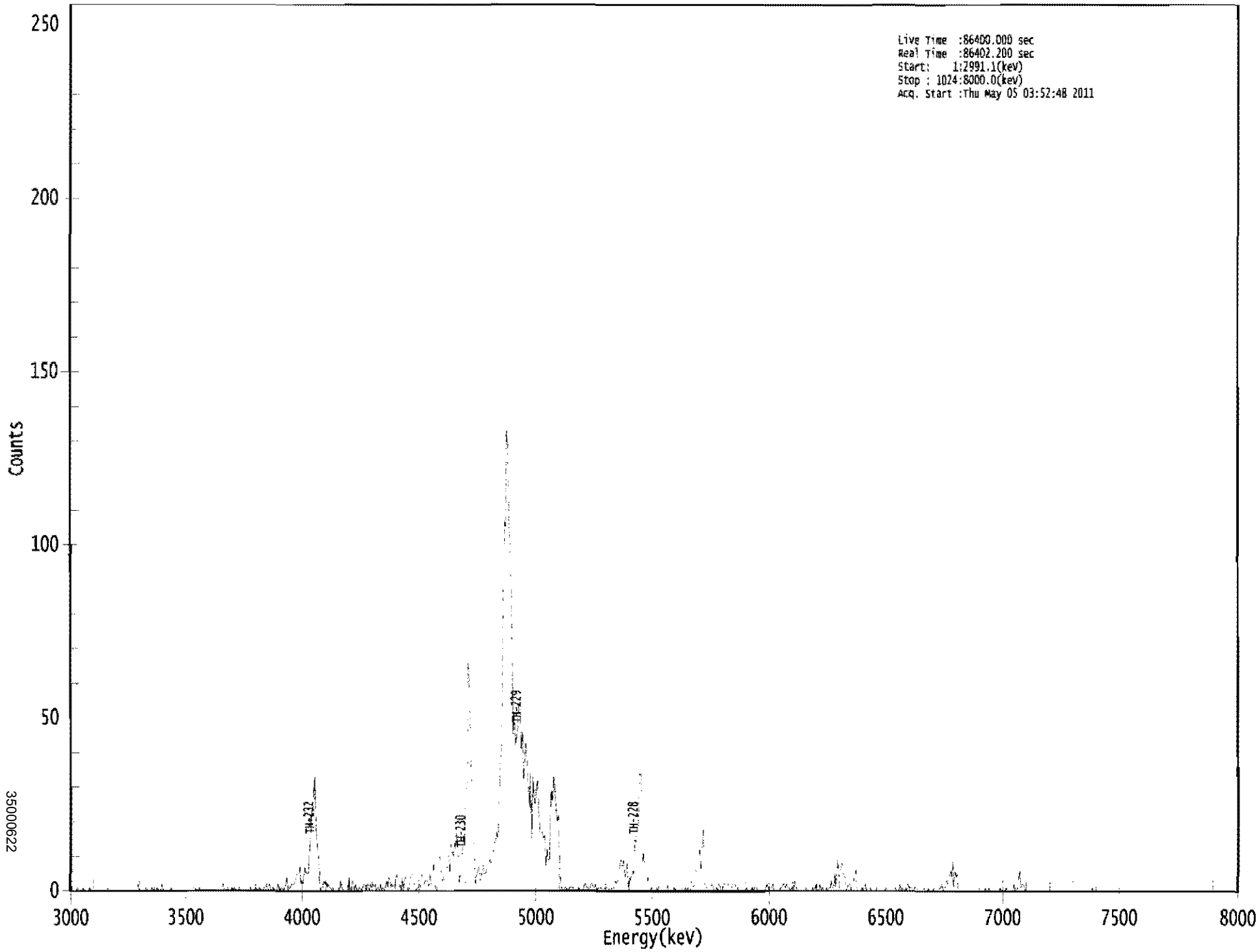

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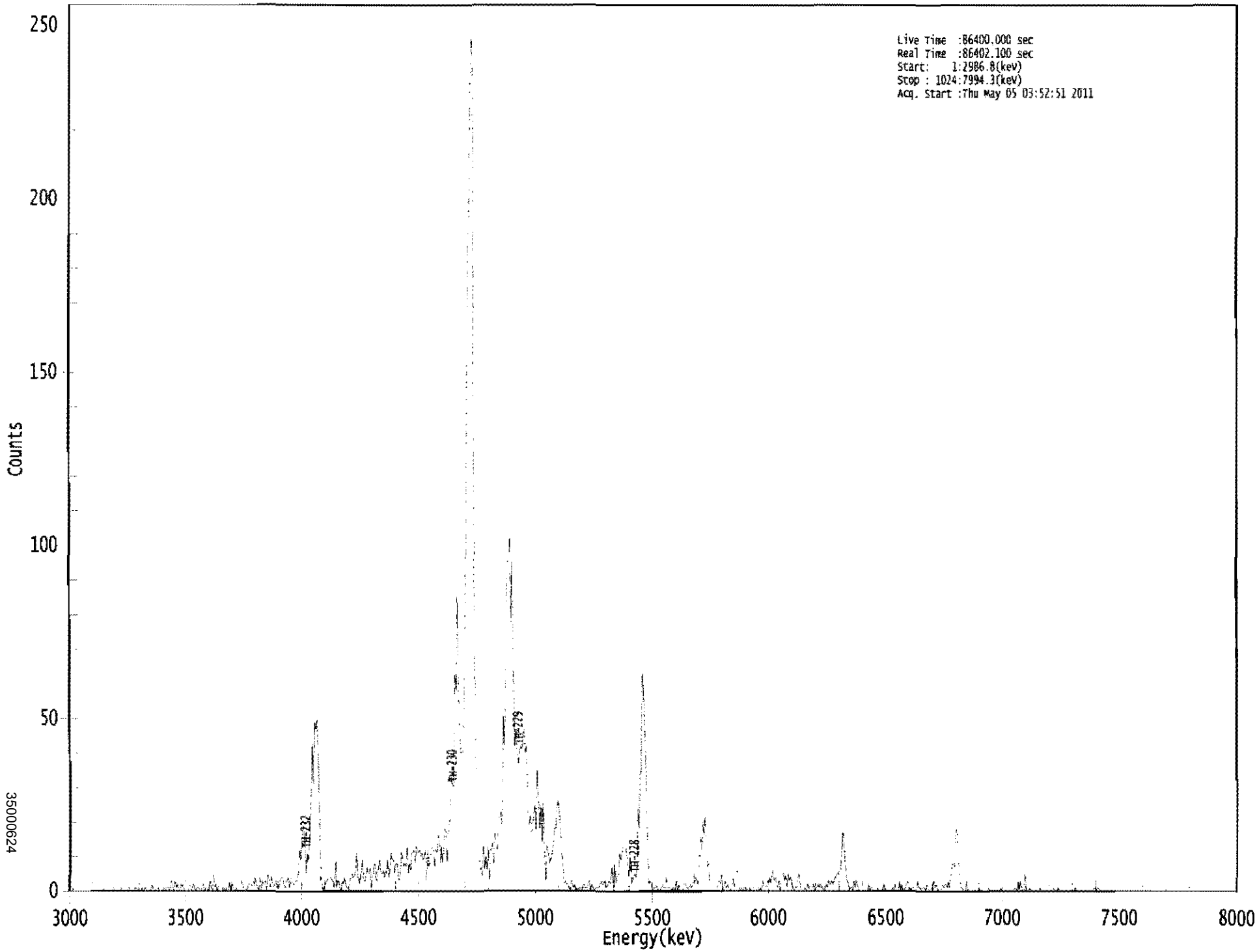

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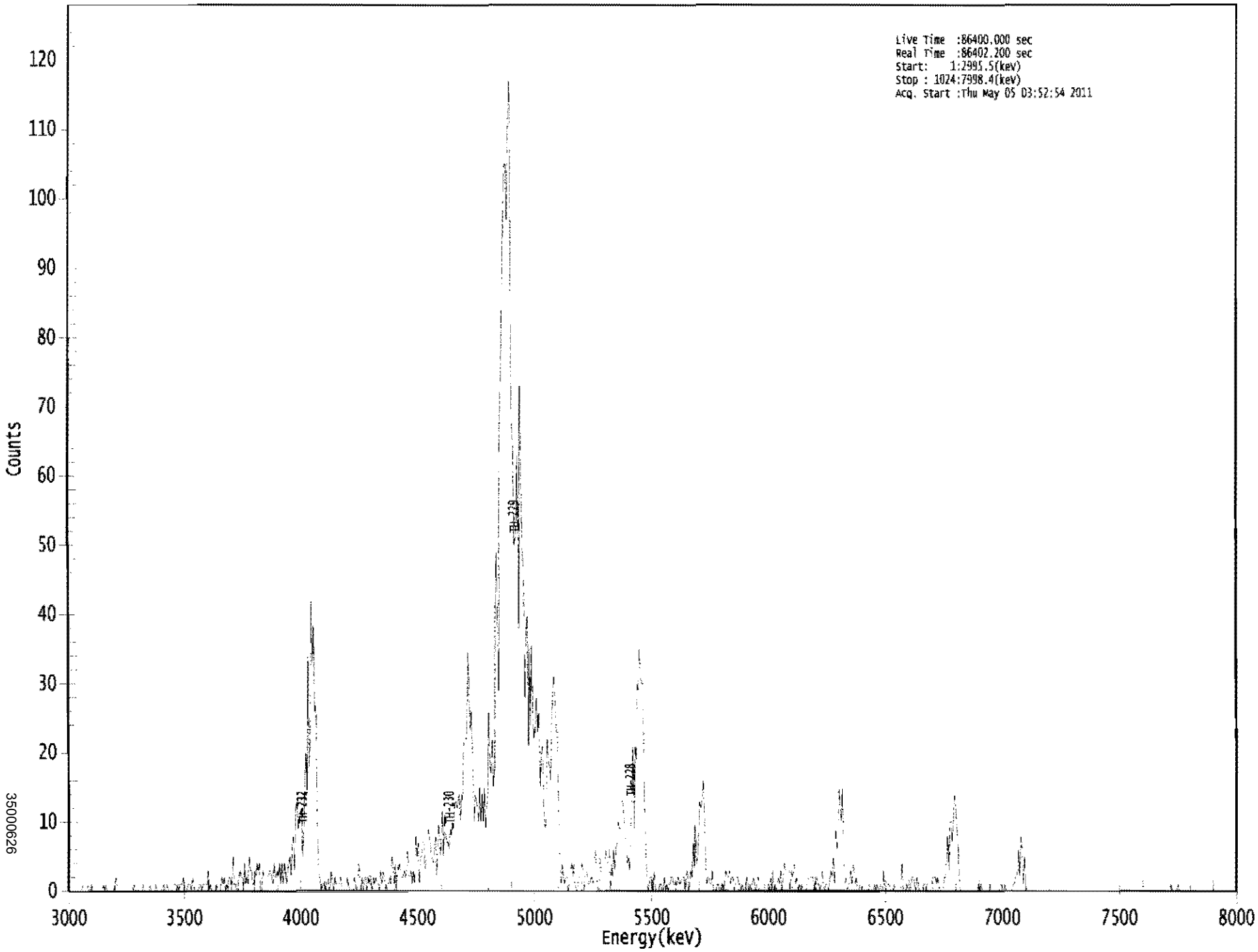

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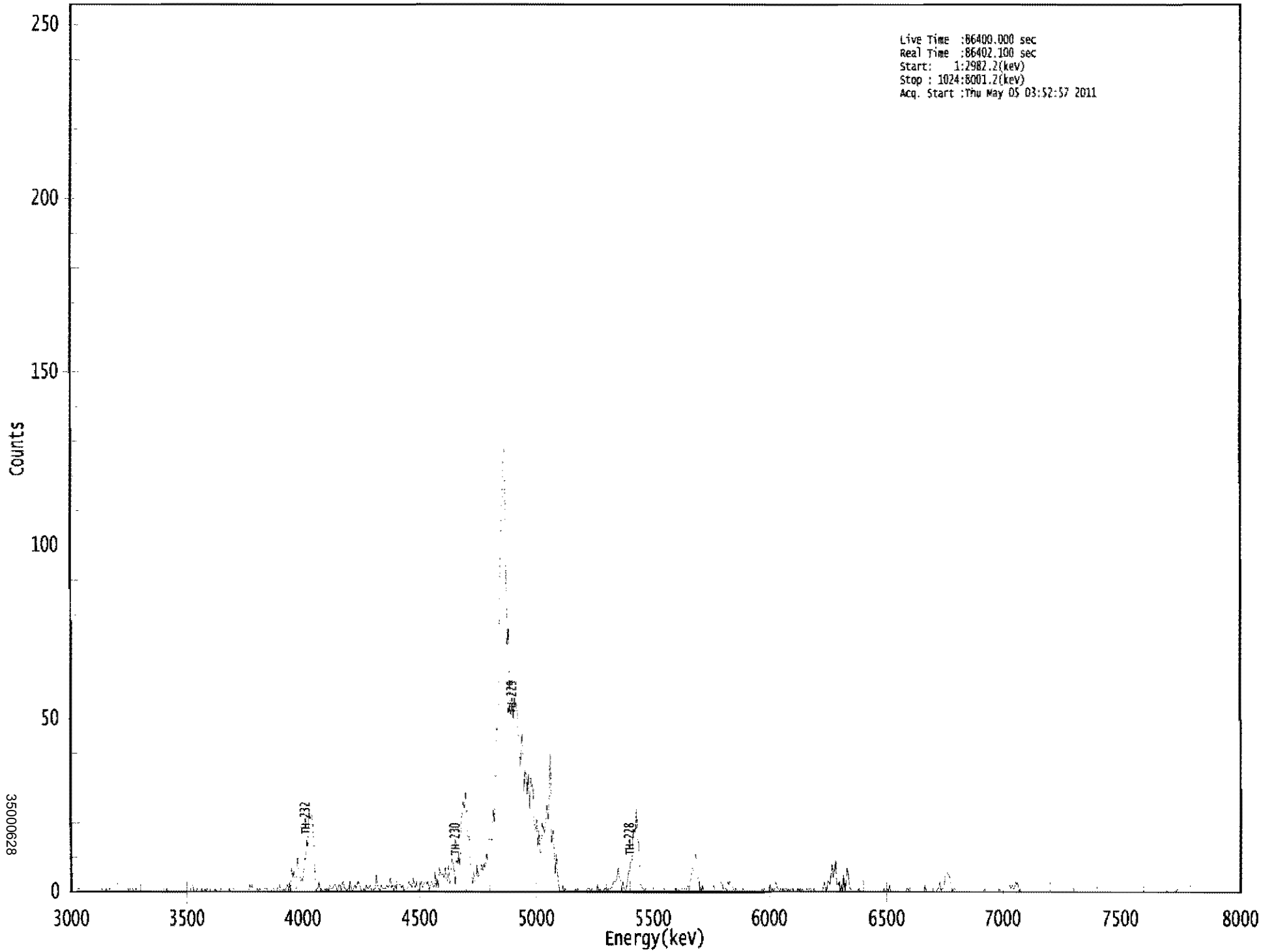

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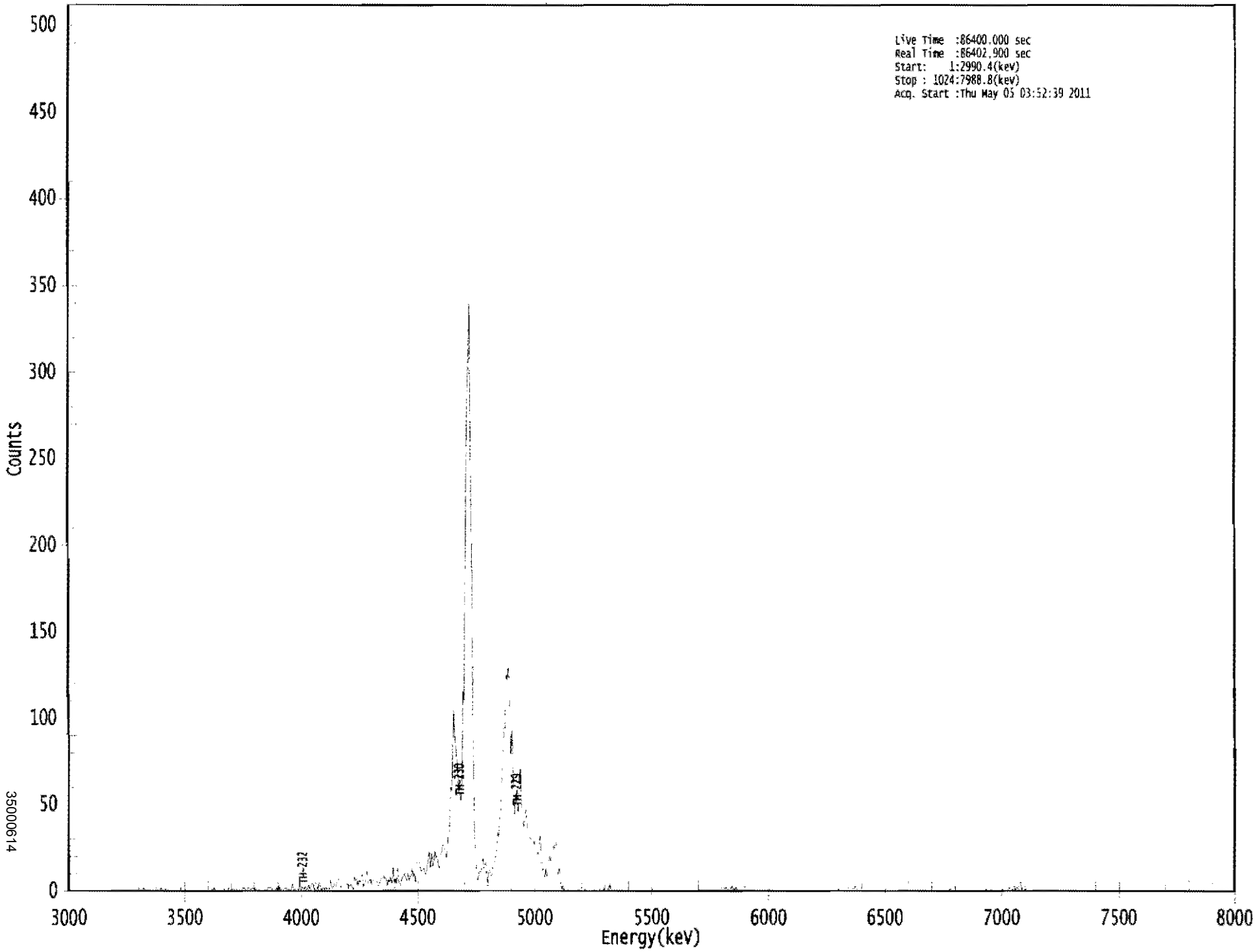


35000614

ALPHA SPECTRUM ANALYSIS

Sample Description: MBL
Batch Identification: B11-01647
Sample Identification: 11-01647-03
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 2 5A
Chamber Serial Number: 12044983A
Detector Serial Number: 55802
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:52:43
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.9 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2190 +/- 0.0045 on 4/13/10 20:11:11
Effective Efficiency: 0.2190 +/- 0.0045

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

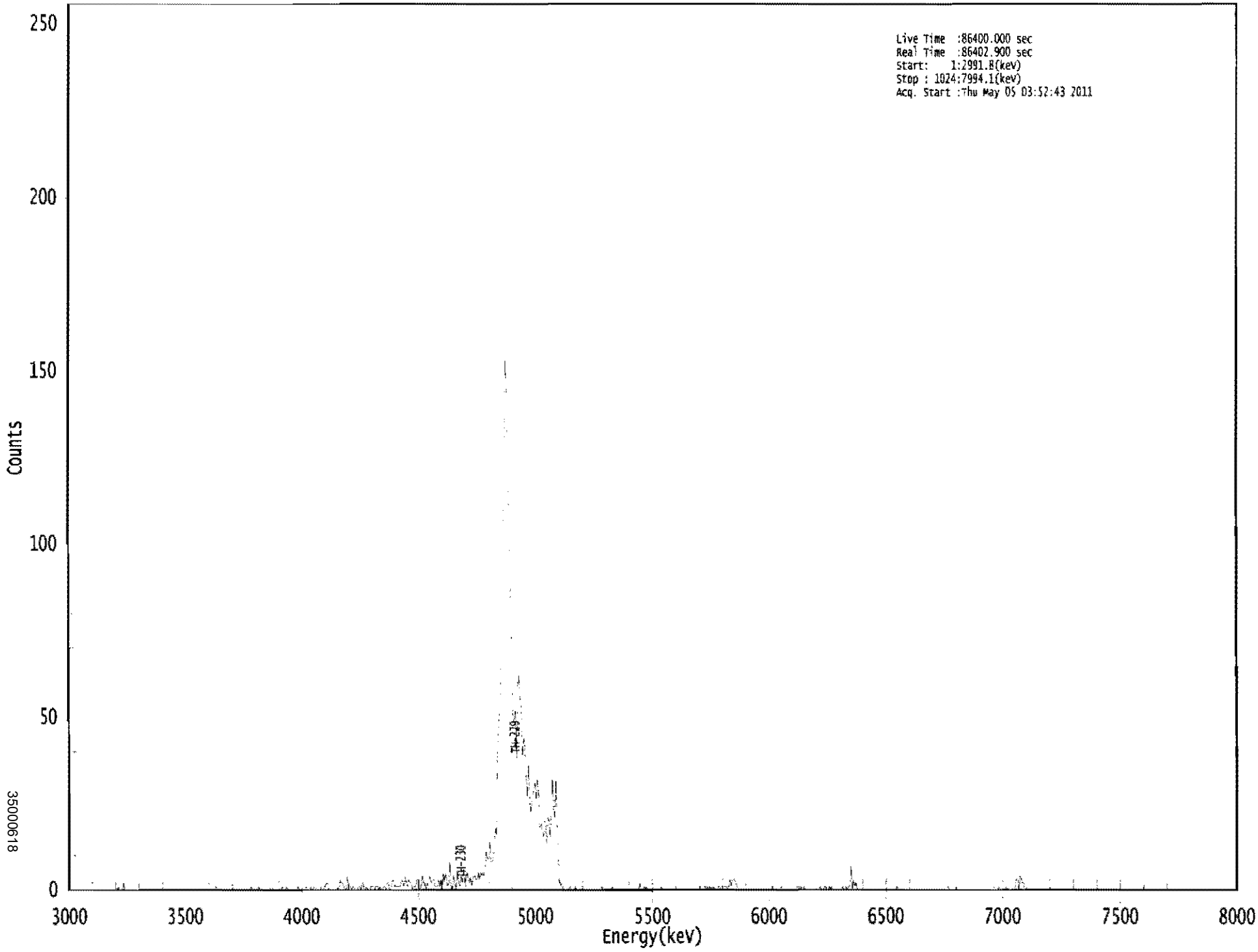
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5448.936	4.00	2.00	0.00	0.00E+000	4.9
TH-229	4911.558	2675.00	51.72	0.00	0.00E+000	42.7
TH-230	4676.339	44.00	6.63	0.00	0.00E+000	7.3
TH-232	4003.985	3.00	1.73	0.00	0.00E+000	4.9

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	5.7176E-003	50.04	3.8680E-003	2.06
TH-229	3.8398E+000	2.82	3.8843E-003	2.06
TH-230	6.2969E-002	15.22	3.8726E-003	2.06
TH-232	4.2856E-003	57.77	3.8657E-003	2.06

Errors quoted at 1.000 sigma

0000012155.CNF



35000618

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-001
Batch Identification: B11-01647
Sample Identification: 11-01647-04
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 2 5B
Chamber Serial Number: 12044983B
Detector Serial Number: 55803
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:52:46
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.9 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2130 +/- 0.0044 on 4/13/10 20:11:42
Effective Efficiency: 0.2130 +/- 0.0044

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

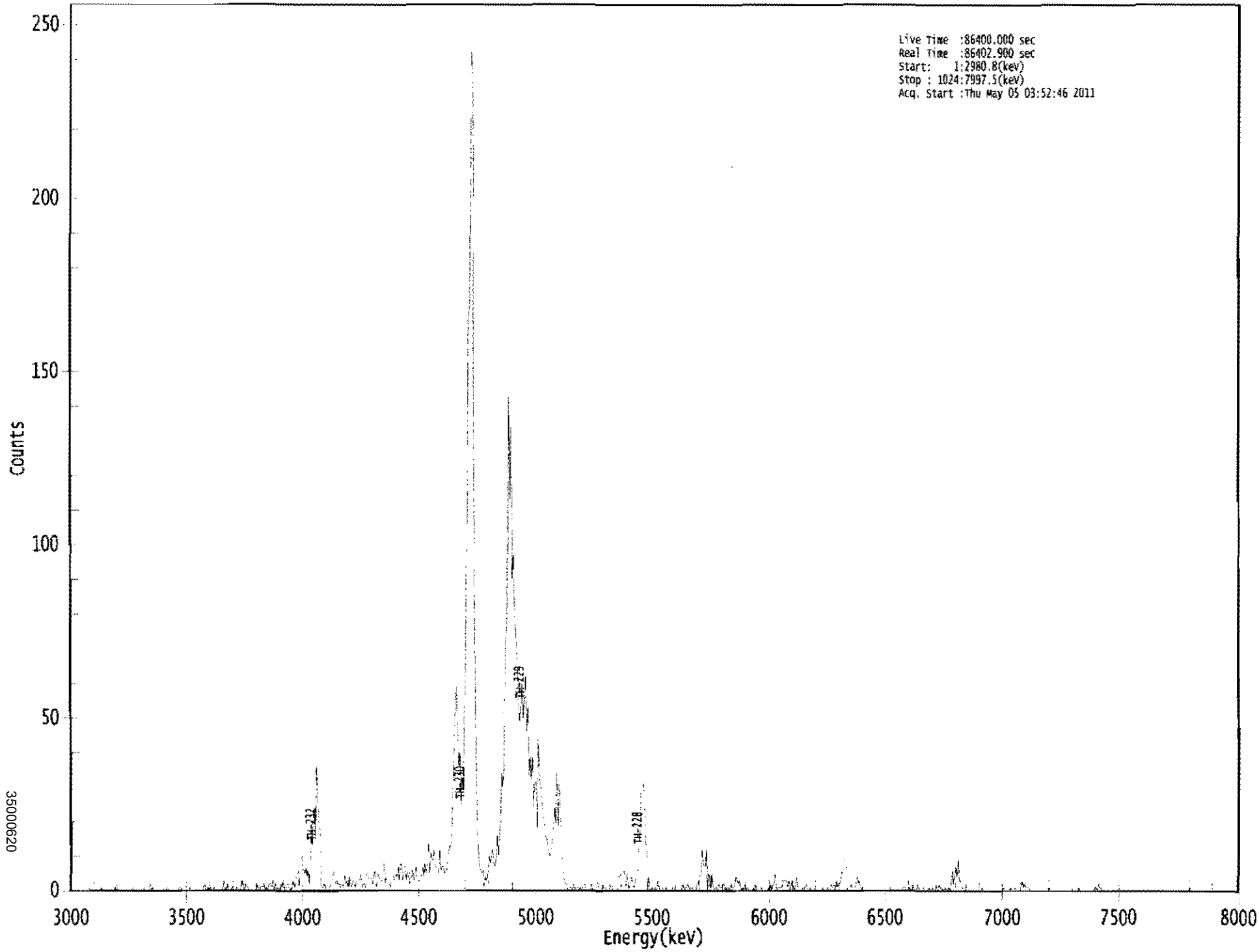
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5422.918	233.00	15.26	0.00	0.00E+000	25.9
TH-229	4919.964	2543.00	50.43	0.00	0.00E+000	45.3
TH-230	4665.310	2253.00	47.47	0.00	0.00E+000	26.8
TH-232	4018.480	278.00	16.67	0.00	0.00E+000	18.9

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	3.4232E-001	6.87	3.9756E-003	2.06
TH-229	3.7519E+000	2.86	3.9924E-003	2.06
TH-230	3.3140E+000	2.94	3.9804E-003	2.06
TH-232	4.0818E-001	6.34	3.9732E-003	2.06

Errors quoted at 1.000 sigma

0000012156.CNF



35000620

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-002
Batch Identification: B11-01647
Sample Identification: 11-01647-05
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 3 1A
Chamber Serial Number: 12044985A
Detector Serial Number: 55806
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:52:48
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.2 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2230 +/- 0.0046 on 5/28/10 09:42:00
Effective Efficiency: 0.2230 +/- 0.0046

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

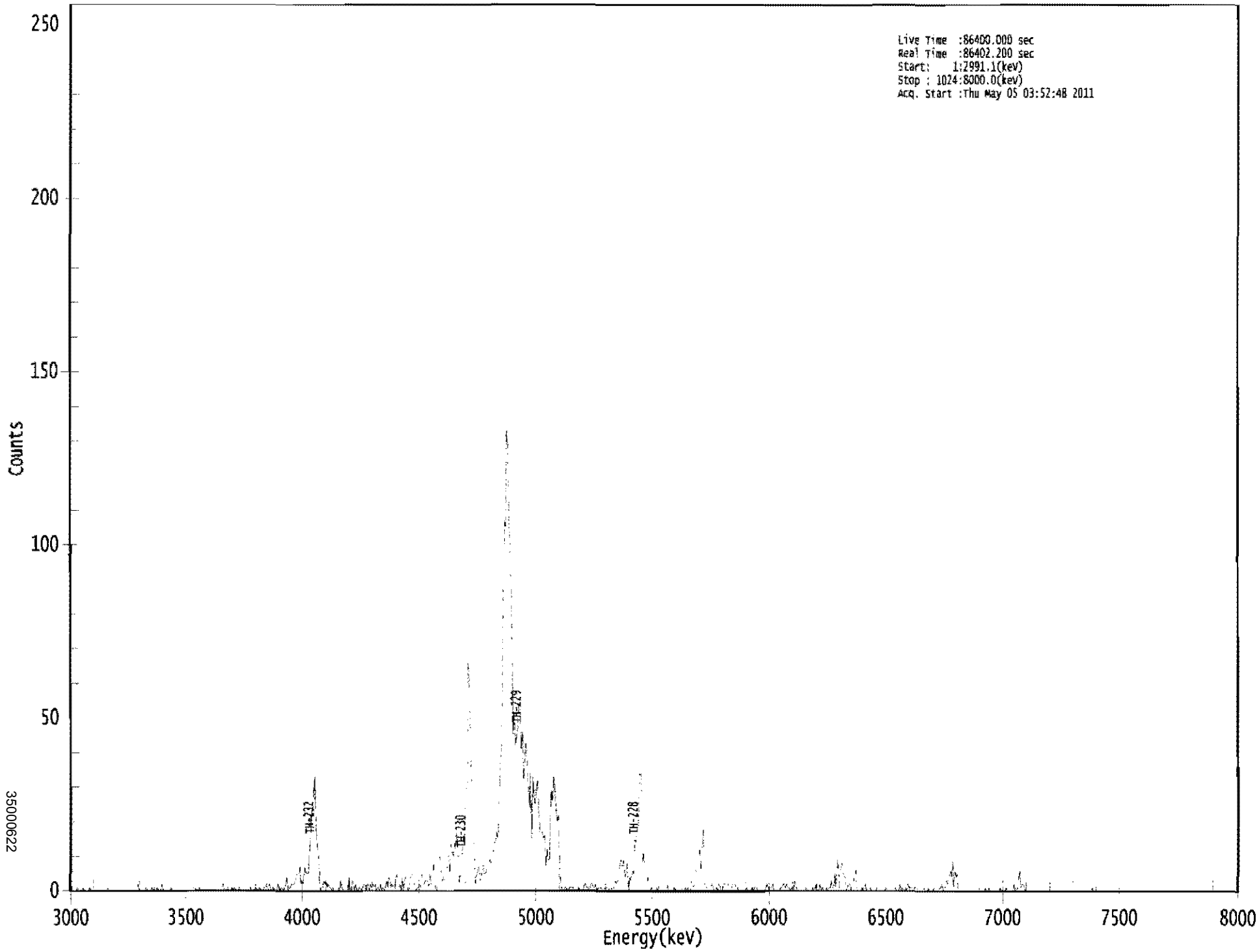
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5416.195	279.00	16.70	0.00	0.00E+000	24.0
TH-229	4916.278	2379.00	48.77	0.00	0.00E+000	42.7
TH-230	4676.820	503.00	22.43	0.00	0.00E+000	14.4
TH-232	4024.787	239.00	15.46	0.00	0.00E+000	24.2

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	3.9155E-001	6.33	3.7977E-003	2.06
TH-229	3.3528E+000	2.90	3.8137E-003	2.06
TH-230	7.0677E-001	4.91	3.8022E-003	2.06
TH-232	3.3522E-001	6.79	3.7954E-003	2.06

Errors quoted at 1.000 sigma

0000012157.CNF



35000622

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-003
Batch Identification: B11-01647
Sample Identification: 11-01647-06
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 3 1B
Chamber Serial Number: 12044985B
Detector Serial Number: 55807
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:52:51
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.1 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2098 +/- 0.0043 on 4/18/10 15:12:35
Effective Efficiency: 0.2098 +/- 0.0043

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

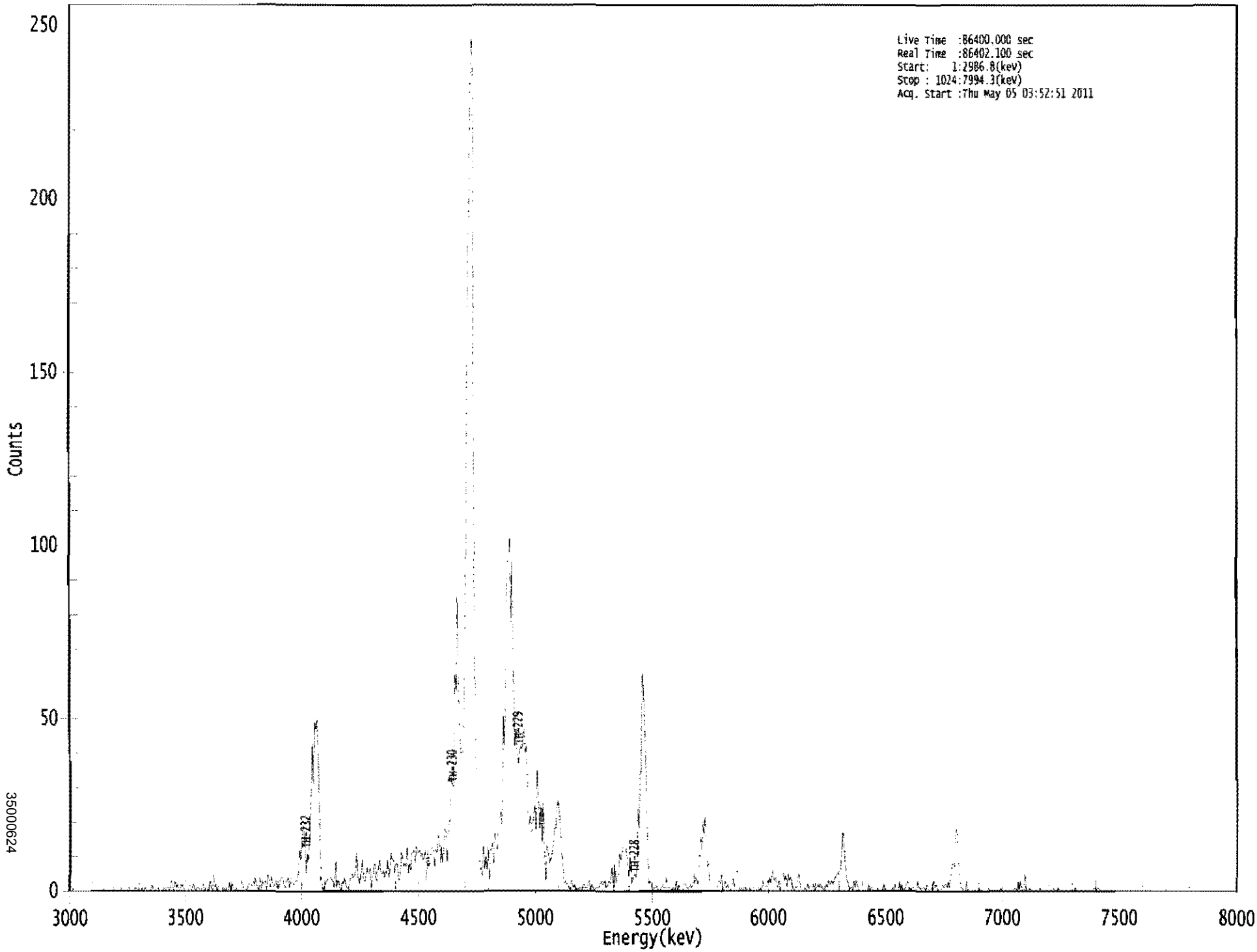
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5414.146	539.00	23.22	0.00	0.00E+000	27.0
TH-229	4920.519	2044.00	45.21	0.00	0.00E+000	40.0
TH-230	4636.126	2960.00	54.41	0.00	0.00E+000	30.5
TH-232	4010.461	551.00	23.47	0.00	0.00E+000	37.2

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	8.0406E-001	4.77	4.0368E-003	2.06
TH-229	3.0620E+000	3.02	4.0538E-003	2.06
TH-230	4.4209E+000	2.76	4.0416E-003	2.06
TH-232	8.2147E-001	4.73	4.0343E-003	2.06

Errors quoted at 1.000 sigma

0000012158.CNF



35000624

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-004
Batch Identification: B11-01647
Sample Identification: 11-01647-07
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 3 2B
Chamber Serial Number: 12045128B
Detector Serial Number: 55809
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:52:54
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.2 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2206 +/- 0.0045 on 4/18/10 15:13:08
Effective Efficiency: 0.2206 +/- 0.0045

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

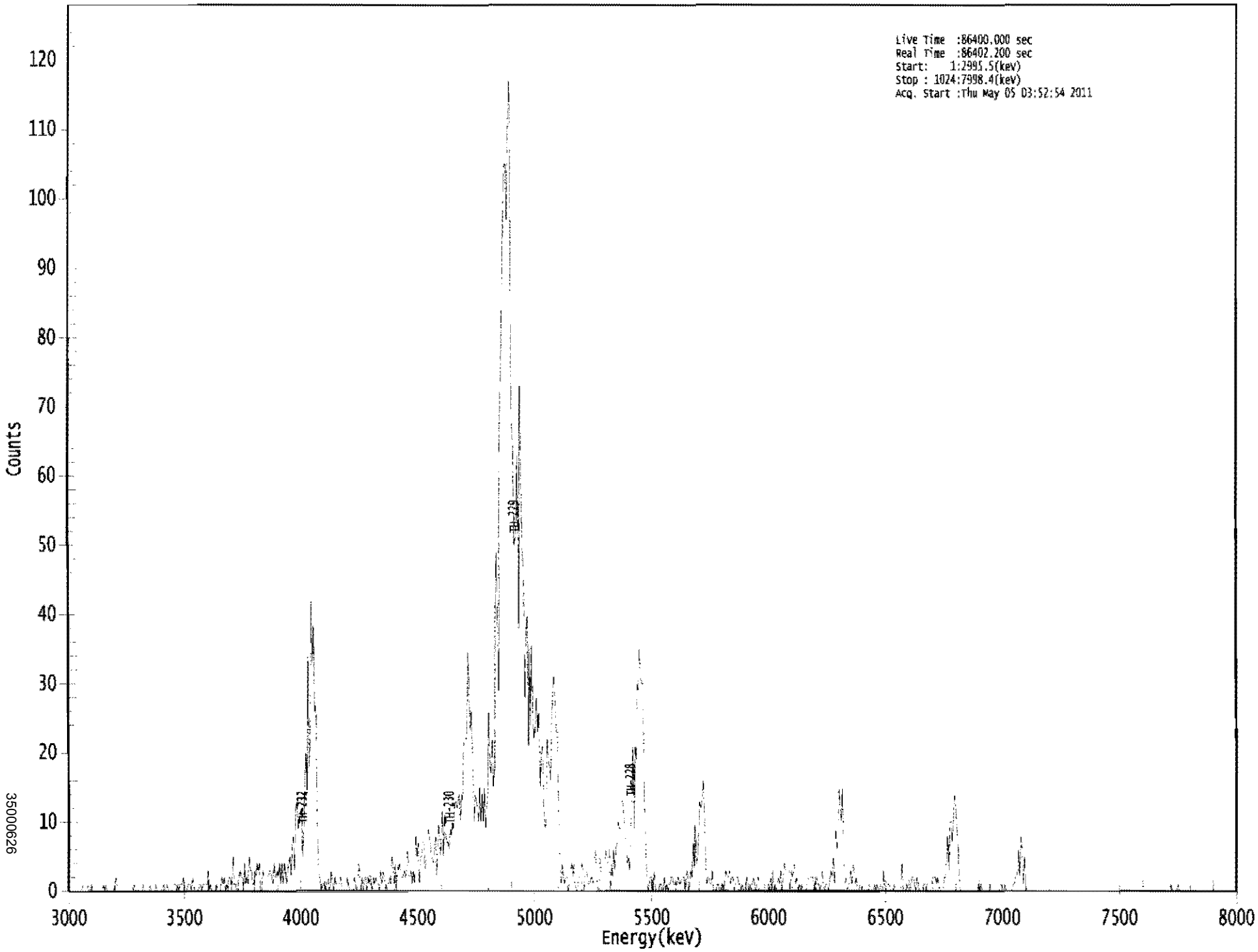
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5411.662	462.00	21.49	0.00	0.00E+000	39.3
TH-229	4916.210	2752.00	52.46	0.00	0.00E+000	61.6
TH-230	4634.459	602.00	24.54	0.00	0.00E+000	41.3
TH-232	4008.929	472.00	21.73	0.00	0.00E+000	28.5

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	6.5561E-001	5.09	3.8400E-003	2.05
TH-229	3.9217E+000	2.80	3.8562E-003	2.05
TH-230	8.5530E-001	4.56	3.8446E-003	2.05
TH-232	6.6939E-001	5.04	3.8377E-003	2.05

Errors quoted at 1.000 sigma

0000012159.CNF



35000626

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-005
Batch Identification: B11-01647
Sample Identification: 11-01647-08
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 3 3A
Chamber Serial Number: 12045129A
Detector Serial Number: 55810
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:52:57
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.1 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2191 +/- 0.0045 on 4/18/10 15:15:02
Effective Efficiency: 0.2191 +/- 0.0045

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

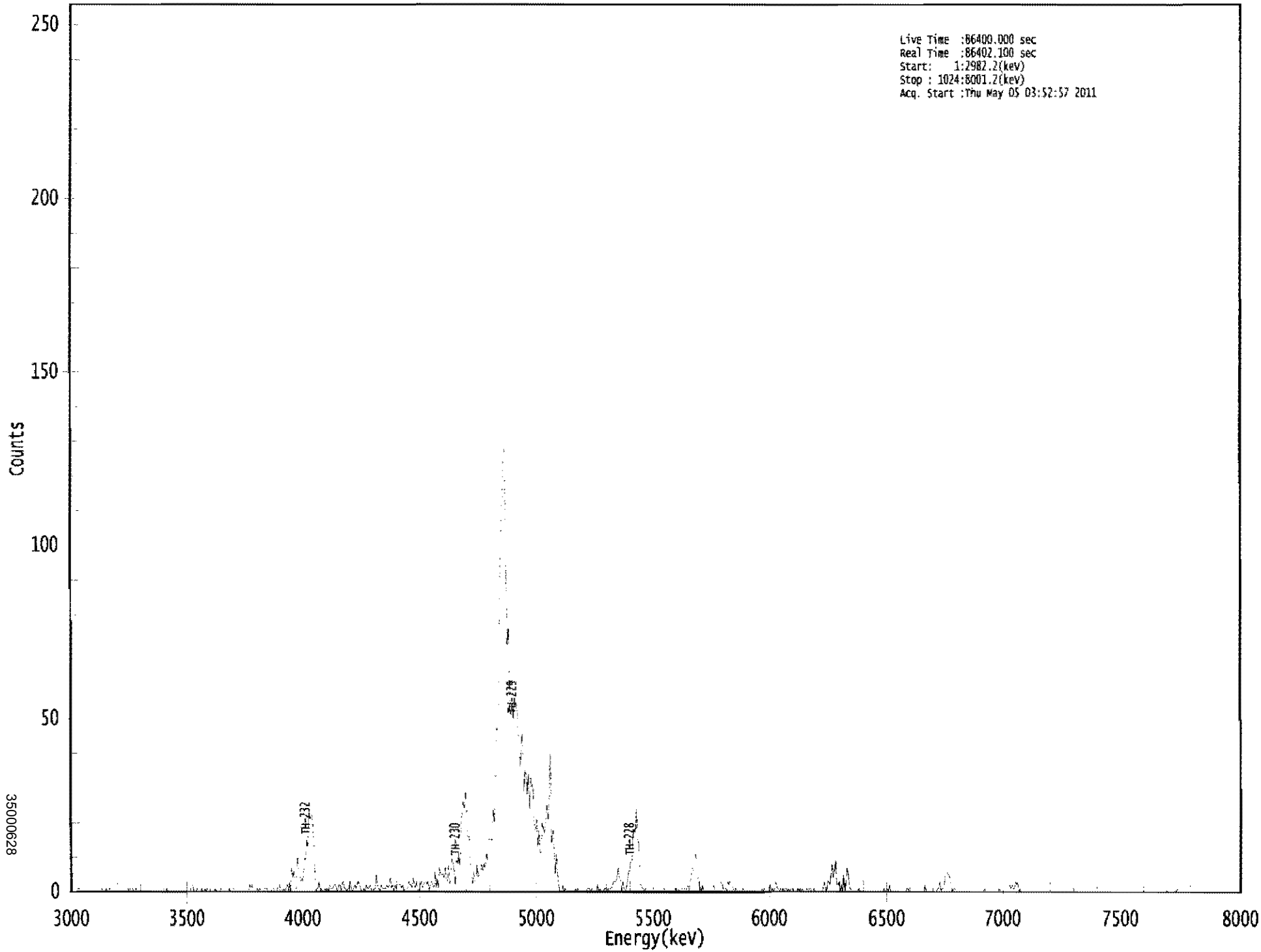
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5386.442	183.00	13.53	0.00	0.00E+000	28.2
TH-229	4888.035	2499.00	49.99	0.00	0.00E+000	45.0
TH-230	4640.022	343.00	18.52	0.00	0.00E+000	35.1
TH-232	3996.017	214.00	14.63	0.00	0.00E+000	34.8

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	2.6144E-001	7.67	3.8660E-003	2.06
TH-229	3.5853E+000	2.87	3.8823E-003	2.06
TH-230	4.9062E-001	5.78	3.8706E-003	2.06
TH-232	3.0555E-001	7.14	3.8637E-003	2.06

Errors quoted at 1.000 sigma

0000012160.CNF



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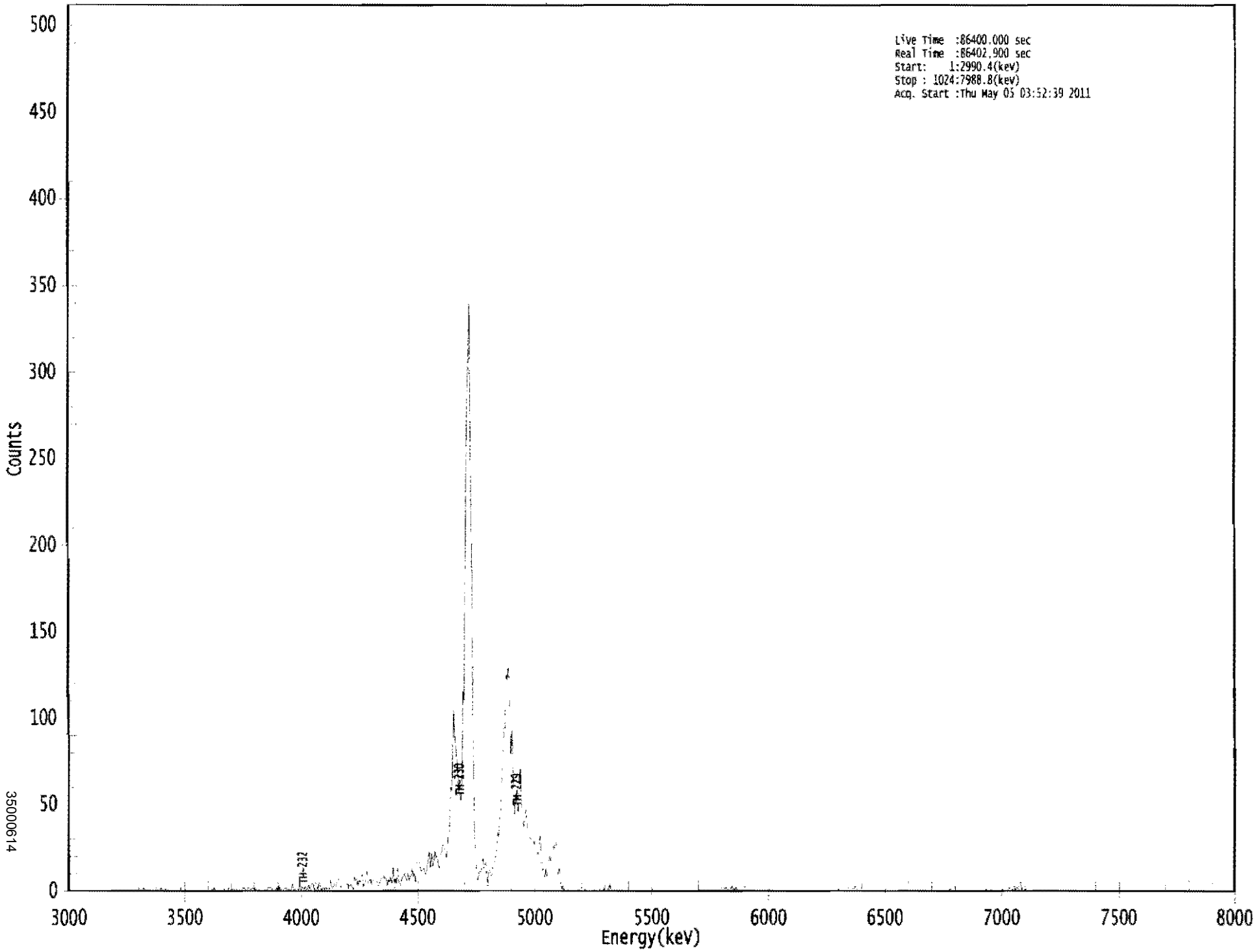

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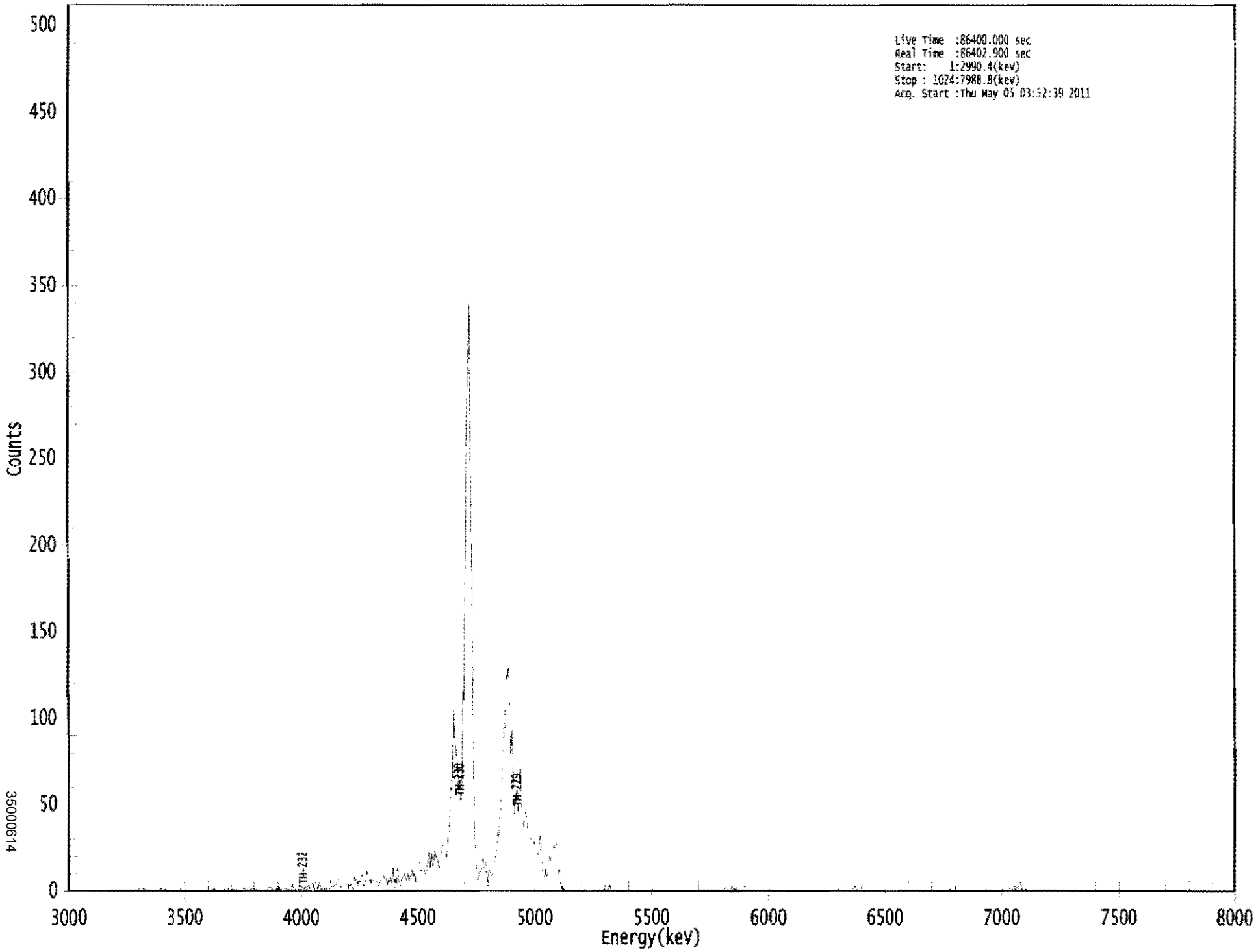
0000012152.CNF



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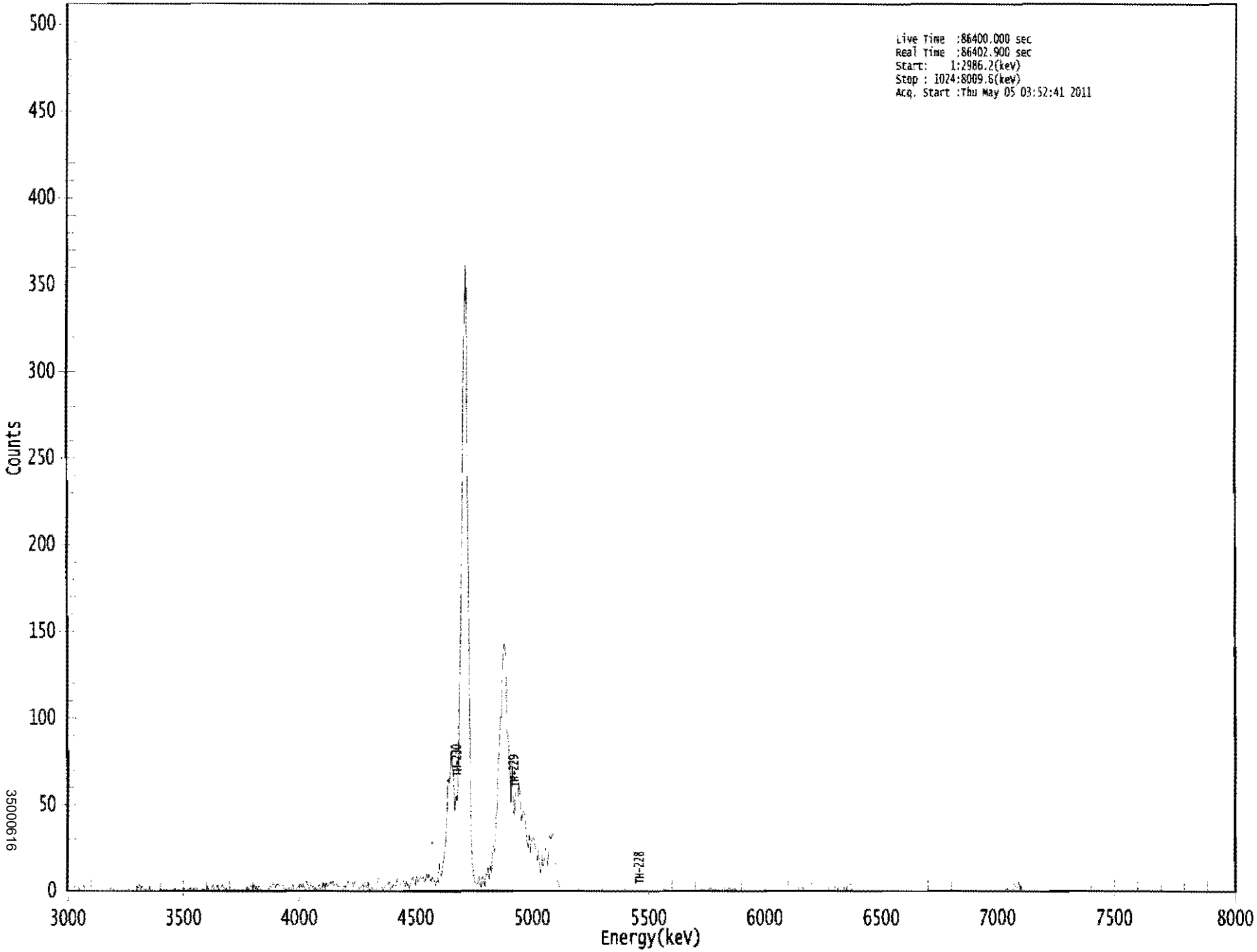

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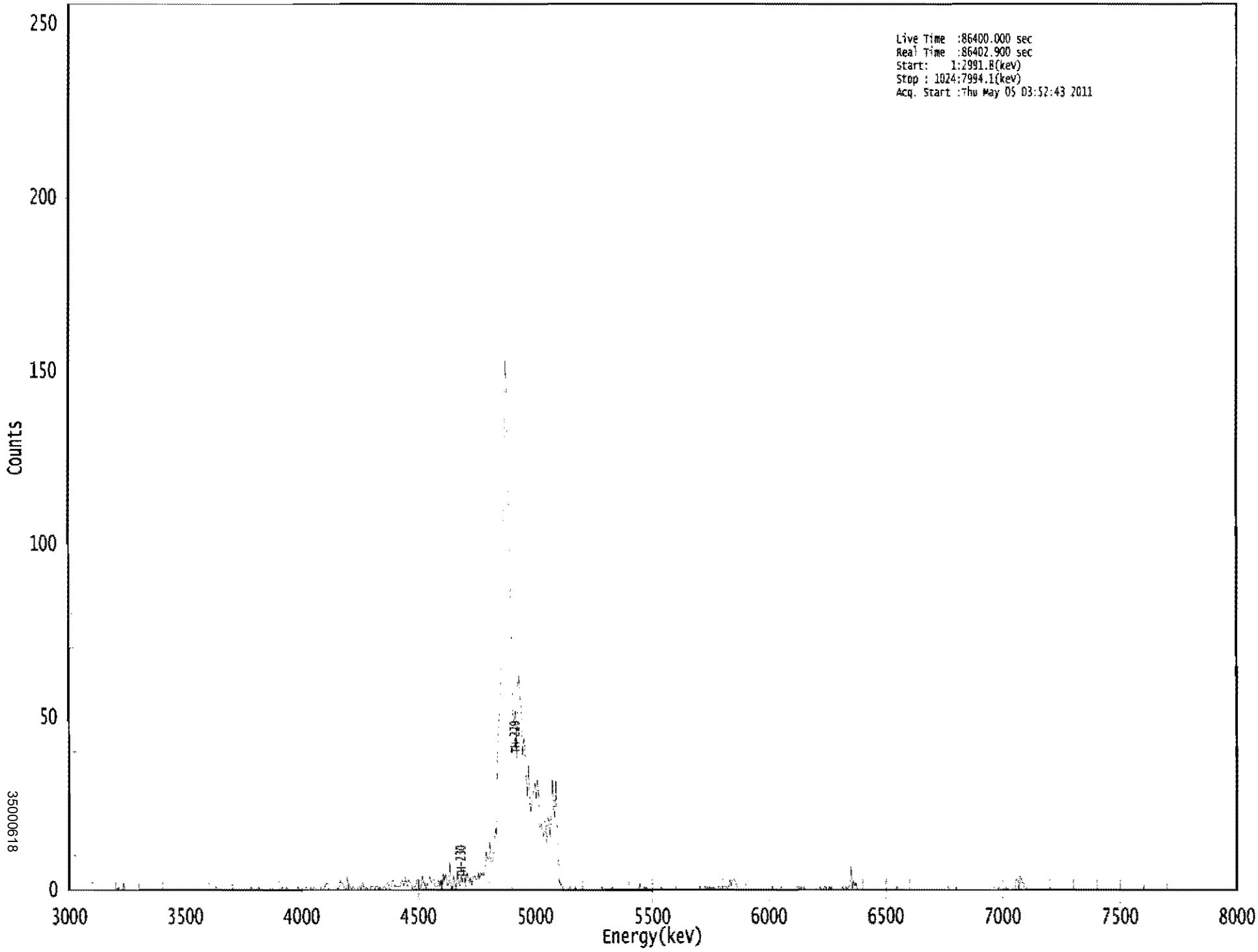

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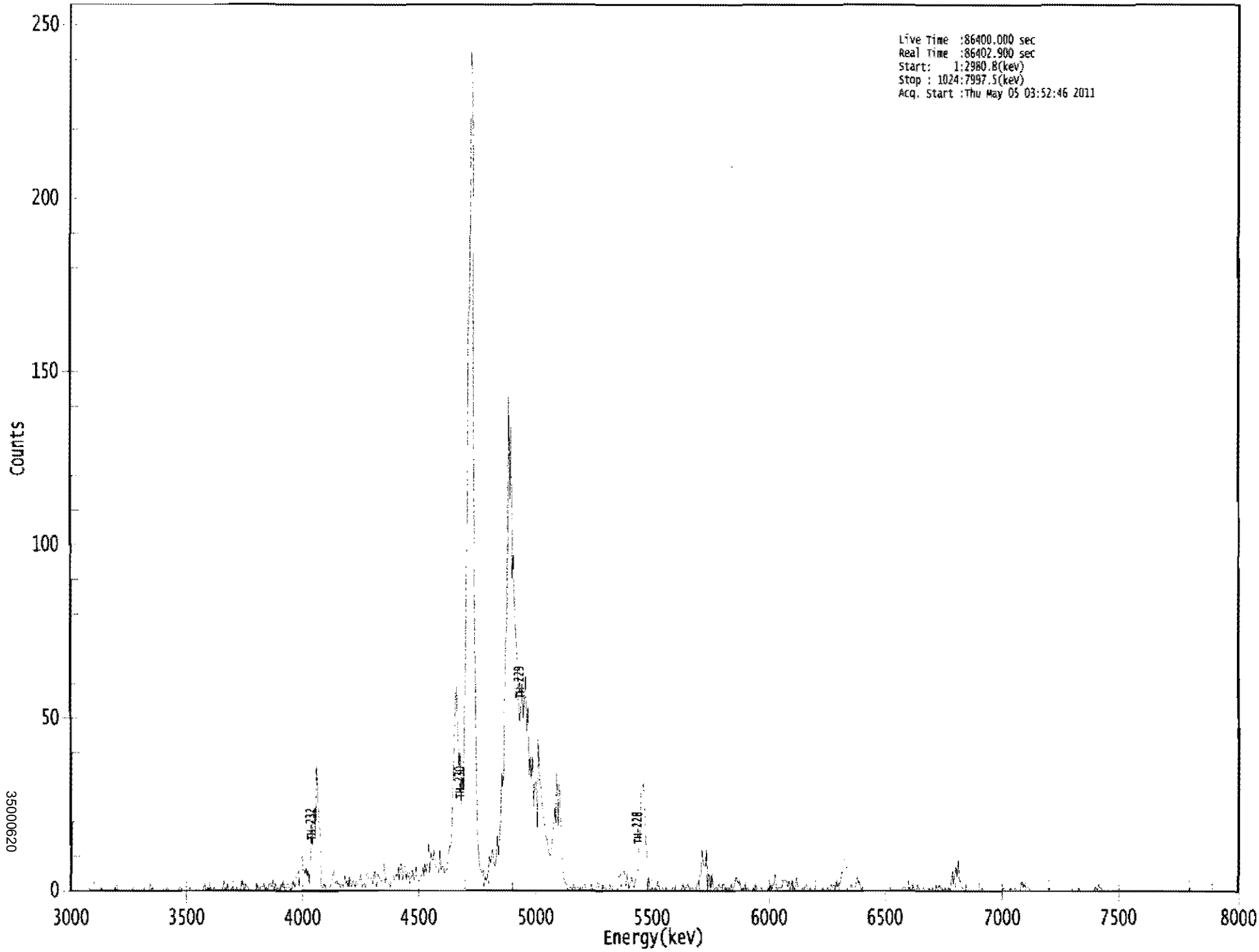

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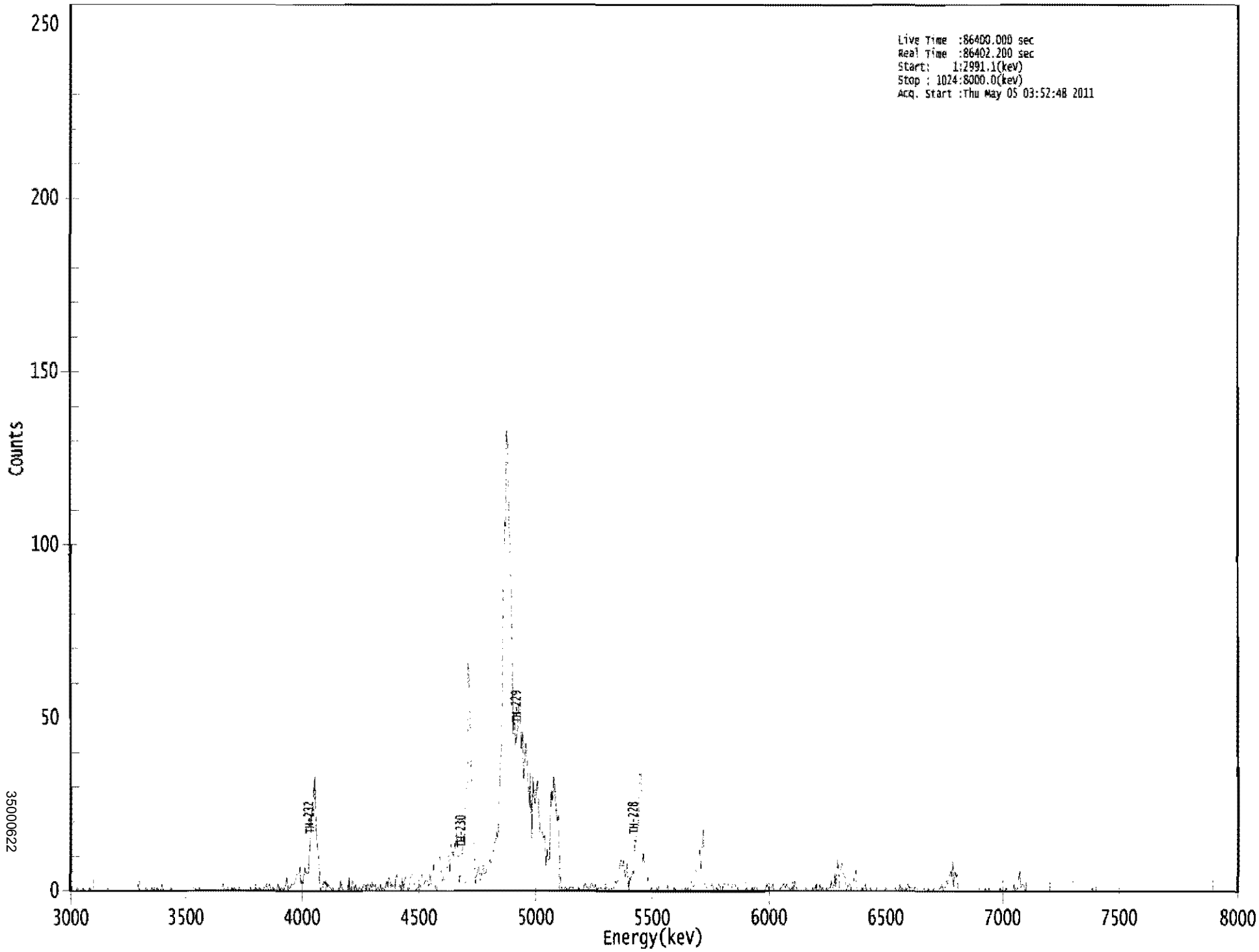

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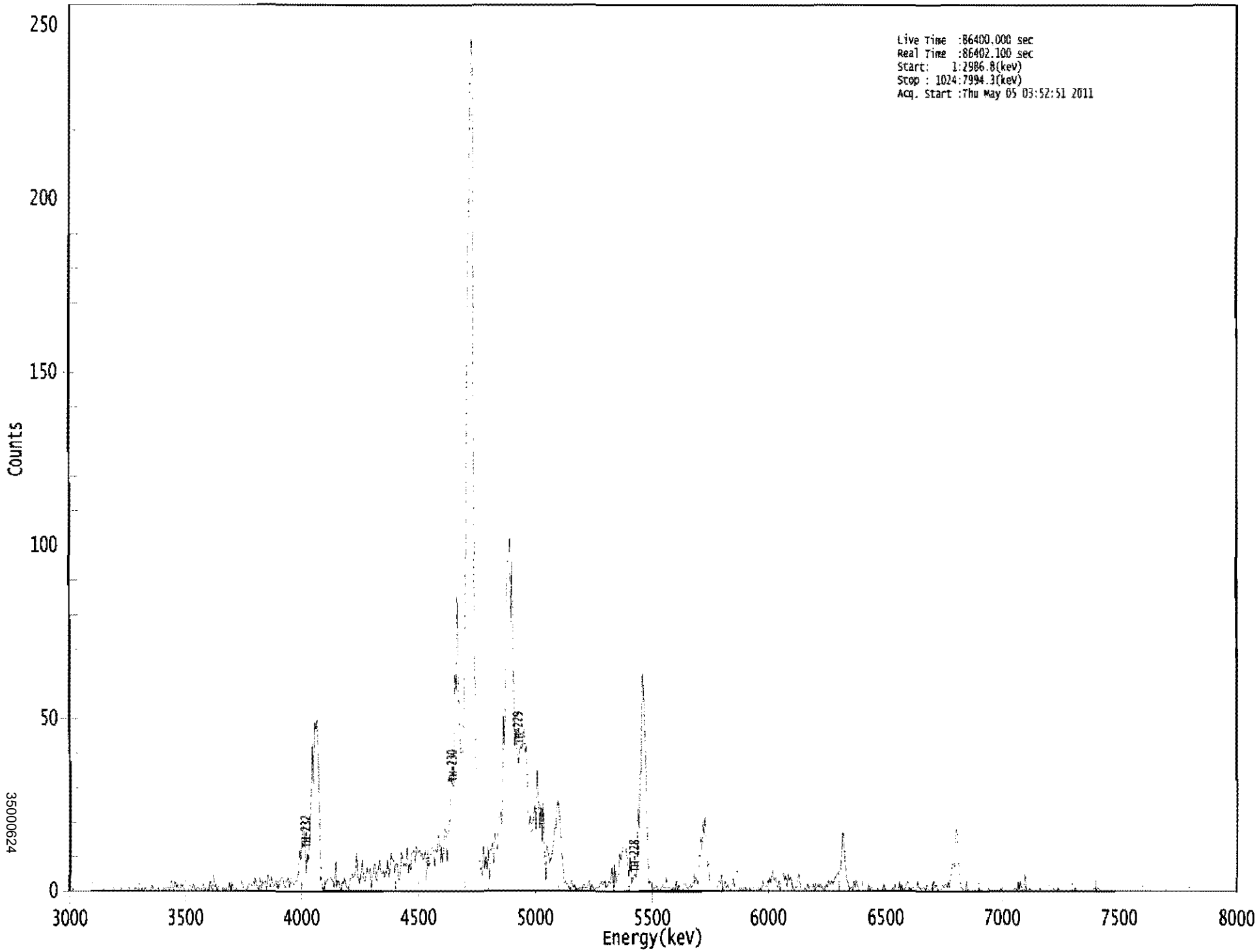

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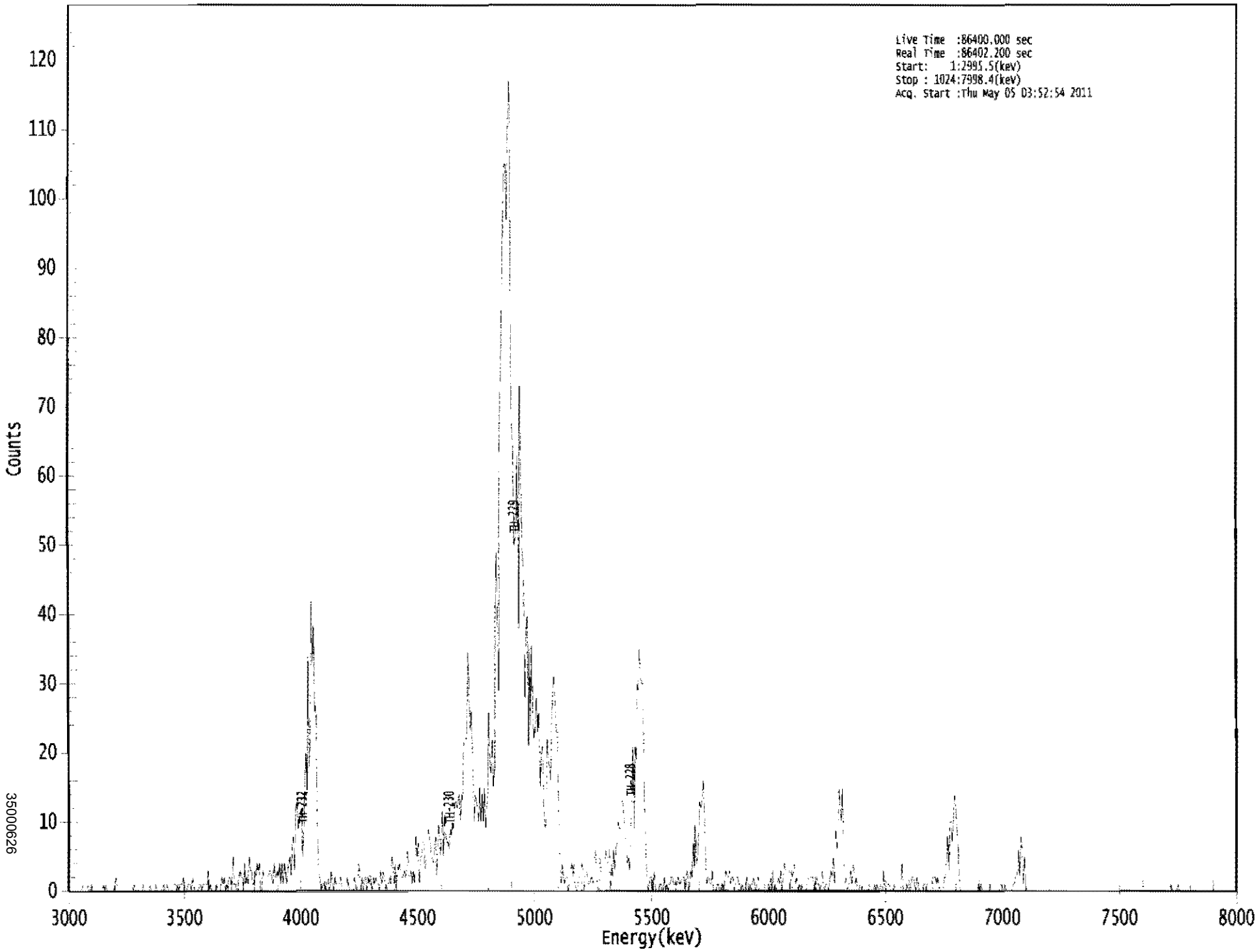
0000012159.CNF



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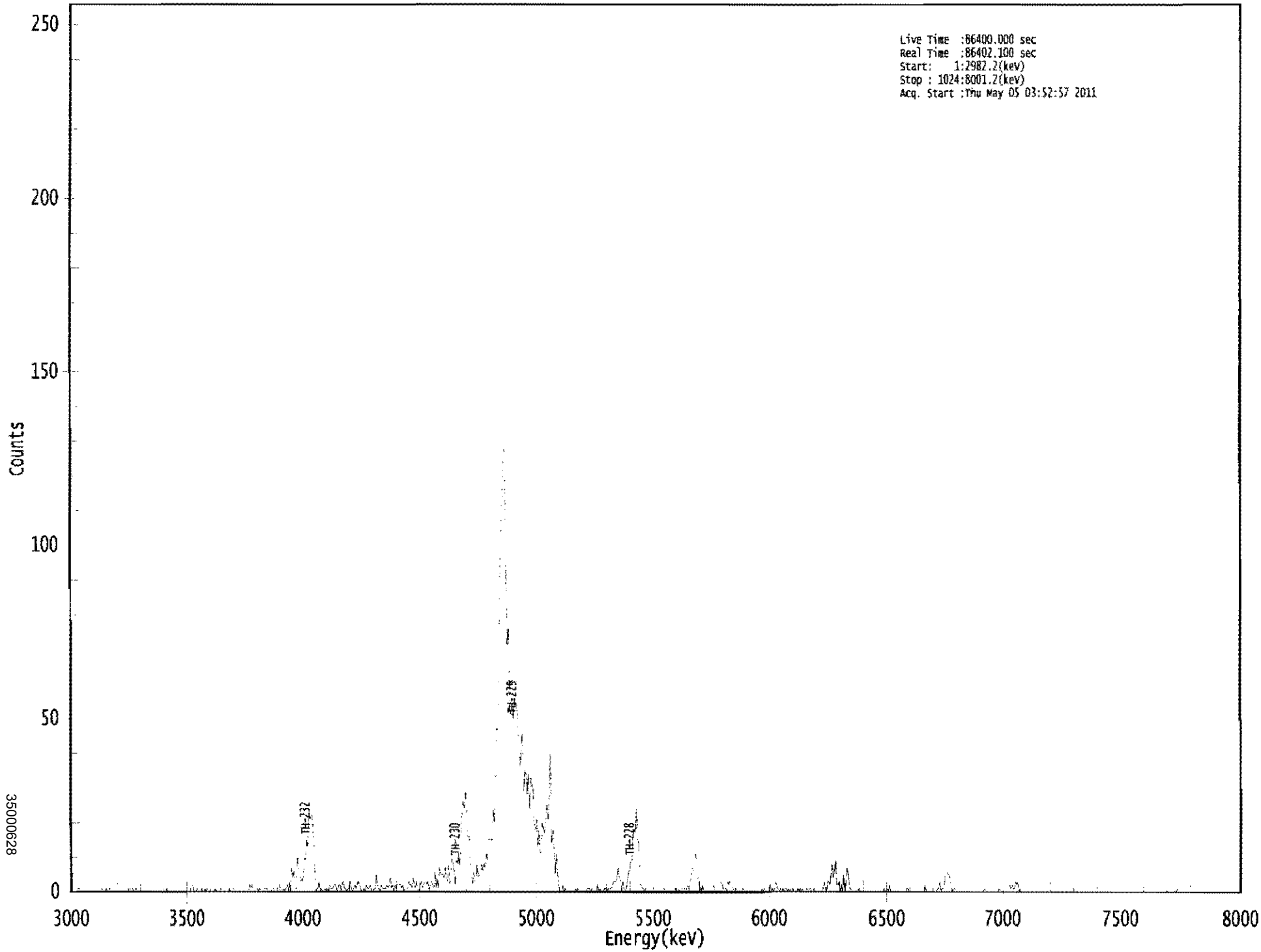

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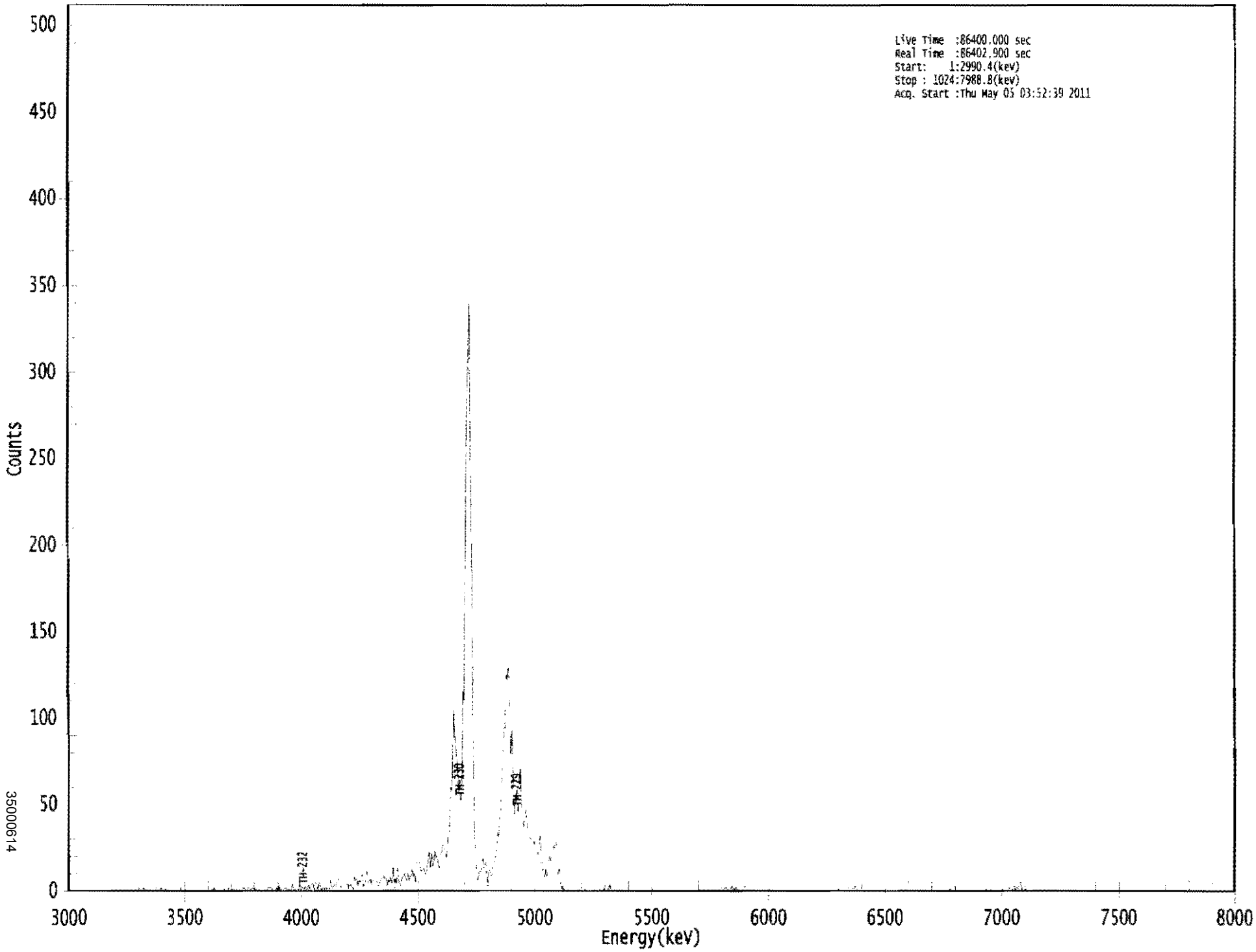

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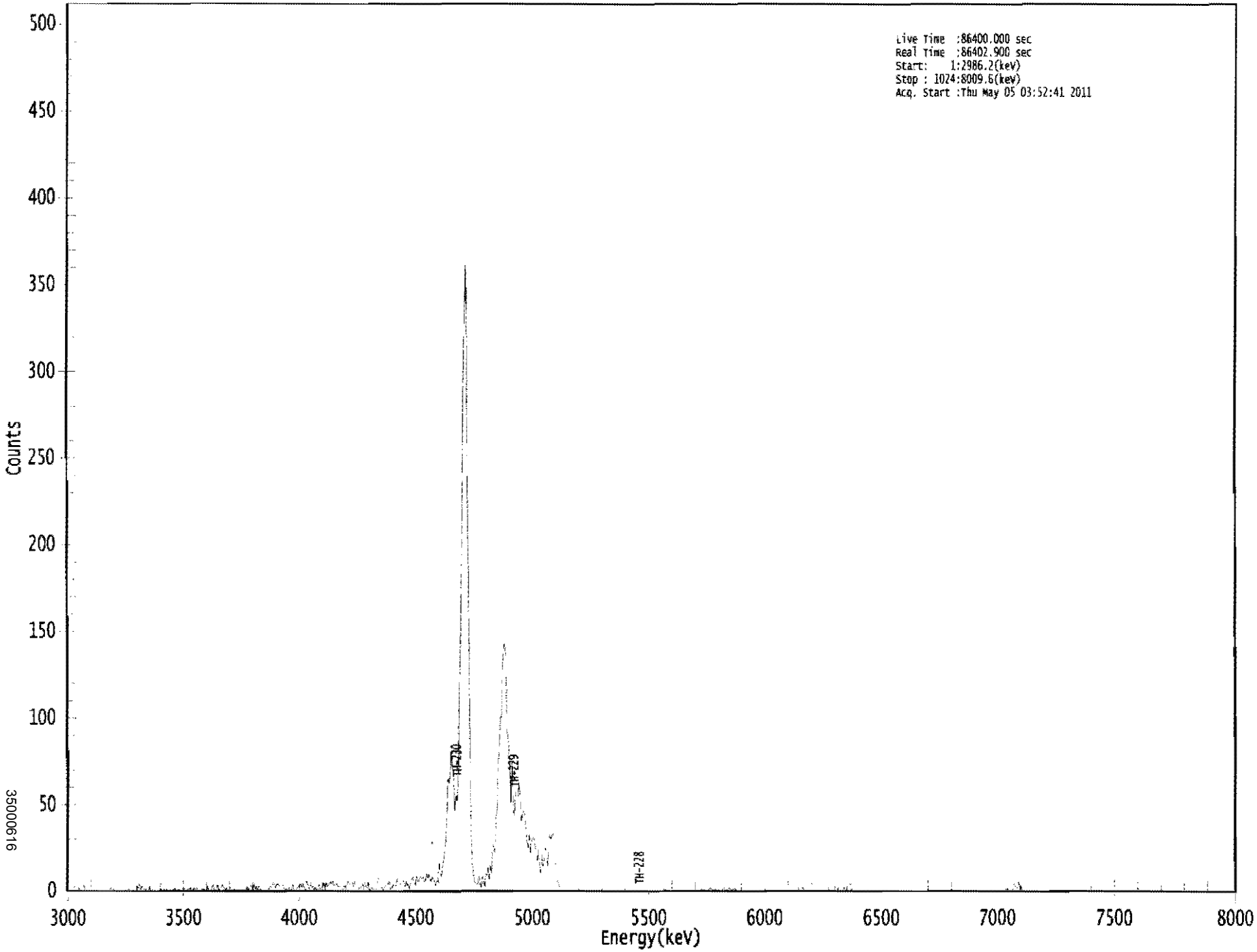

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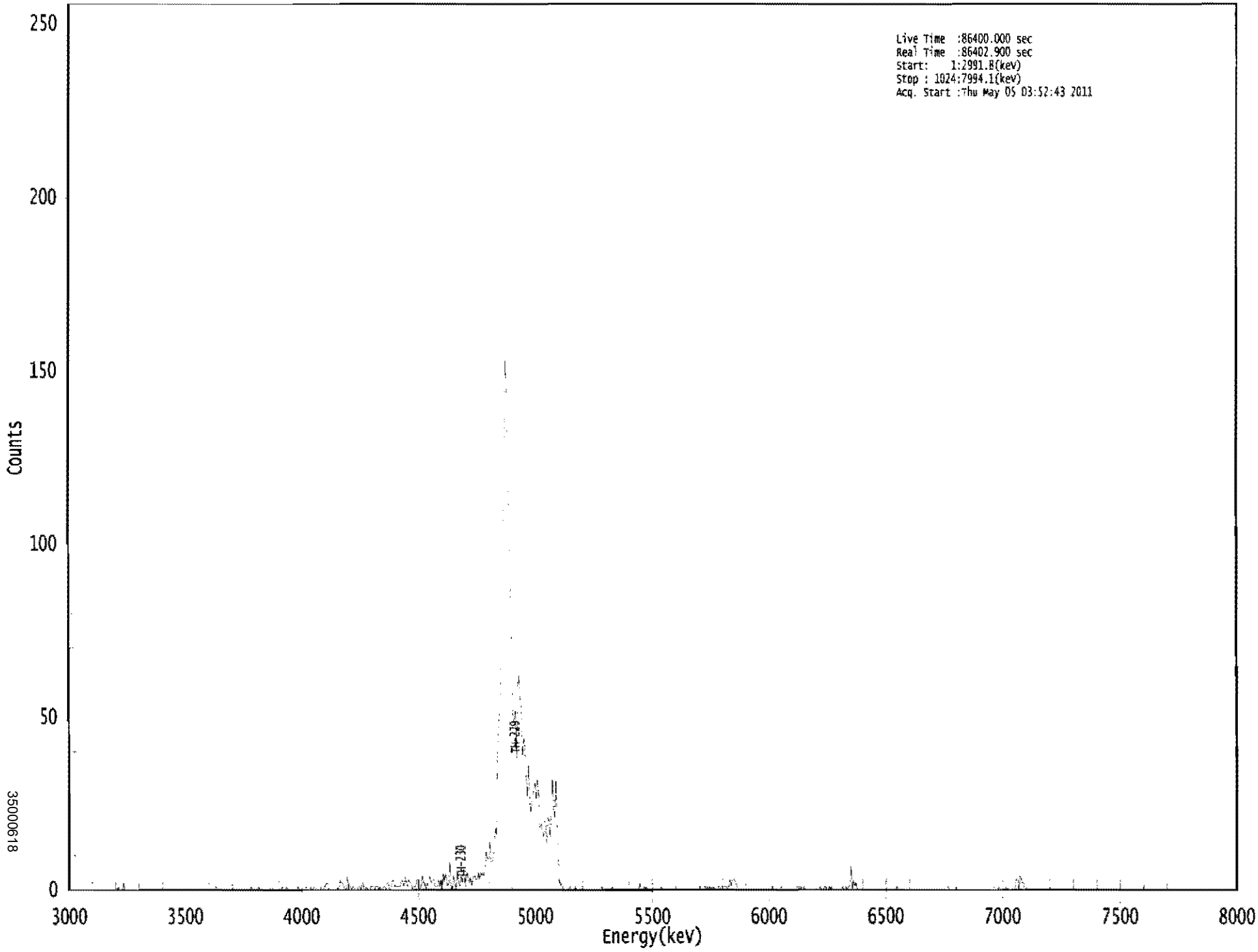

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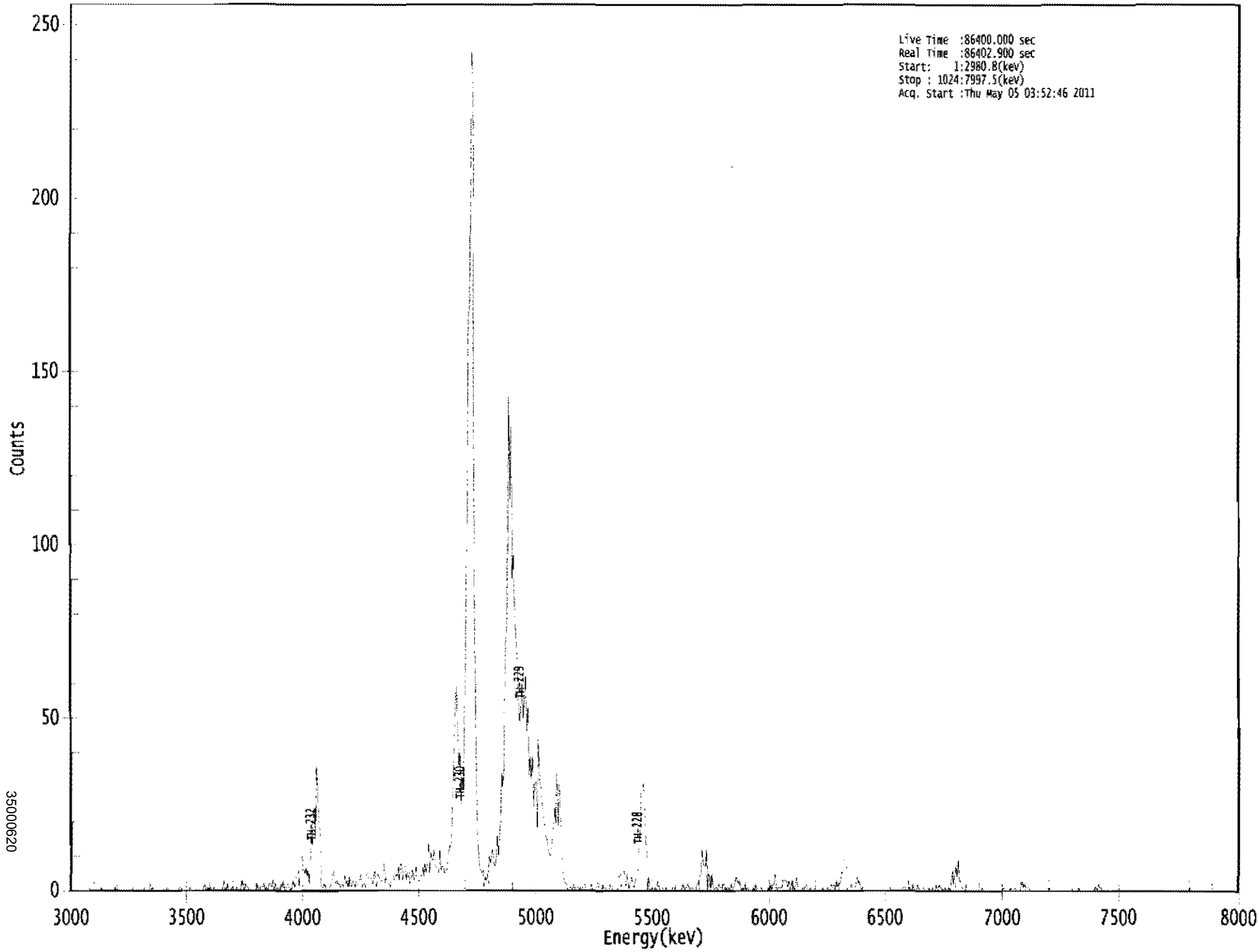

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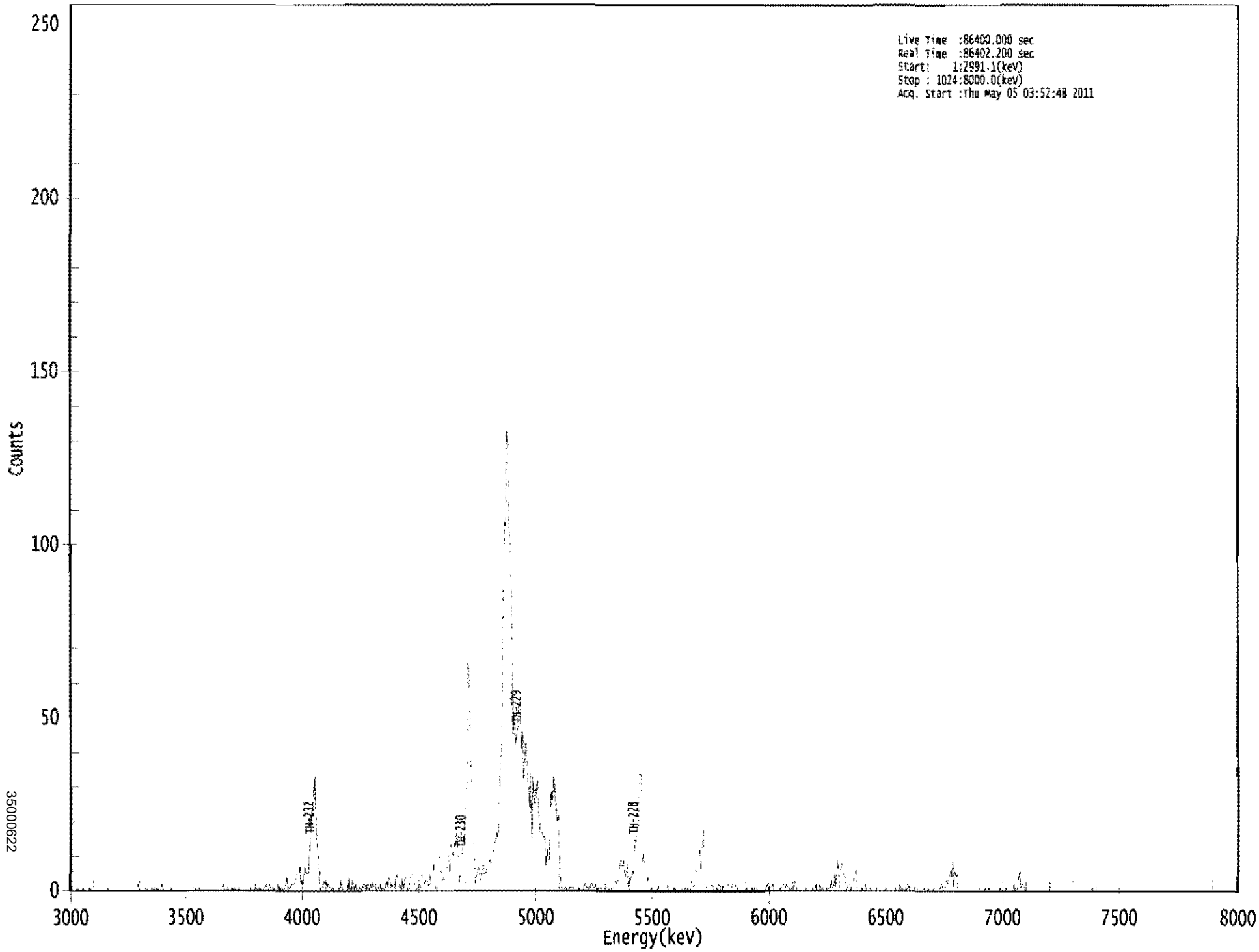

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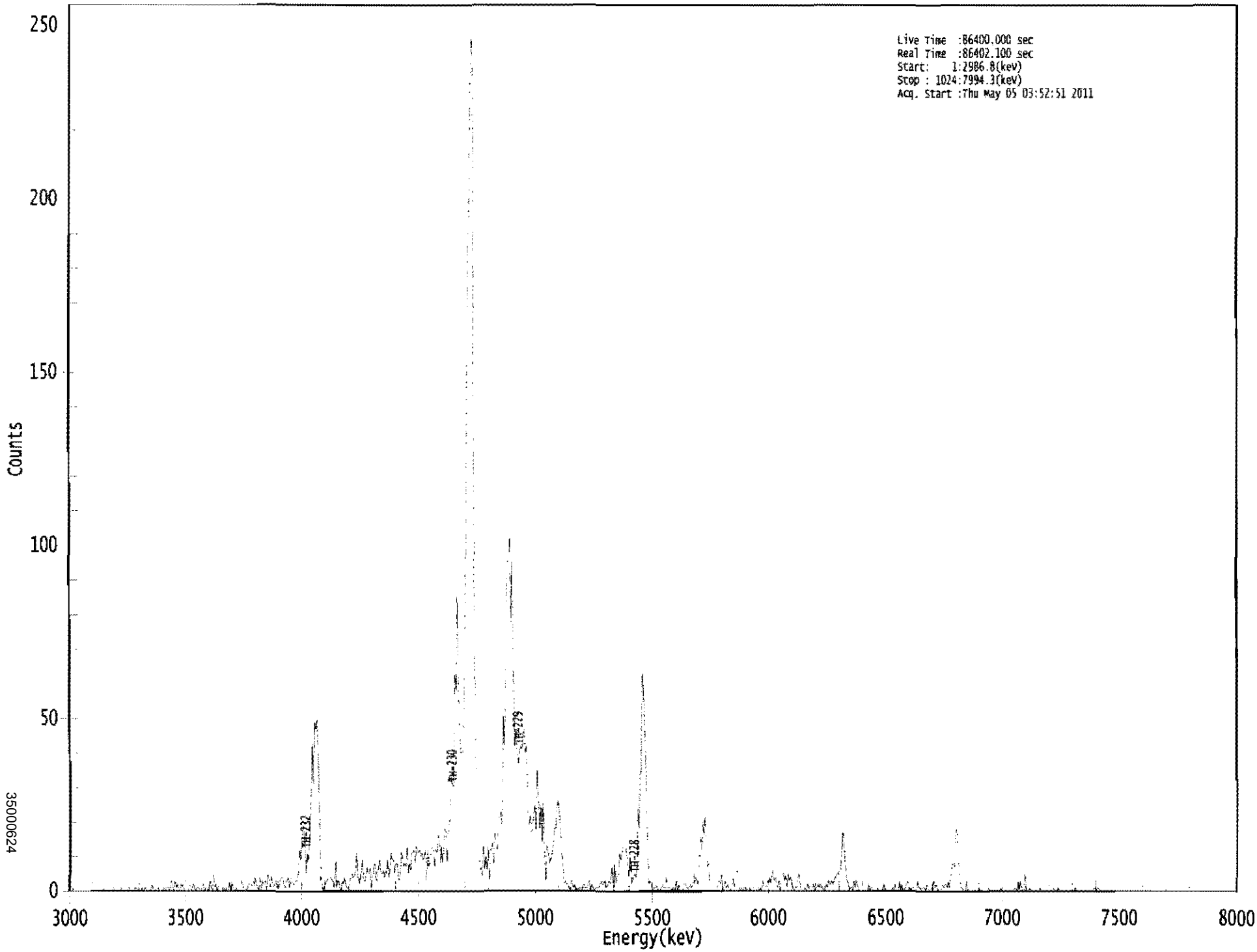

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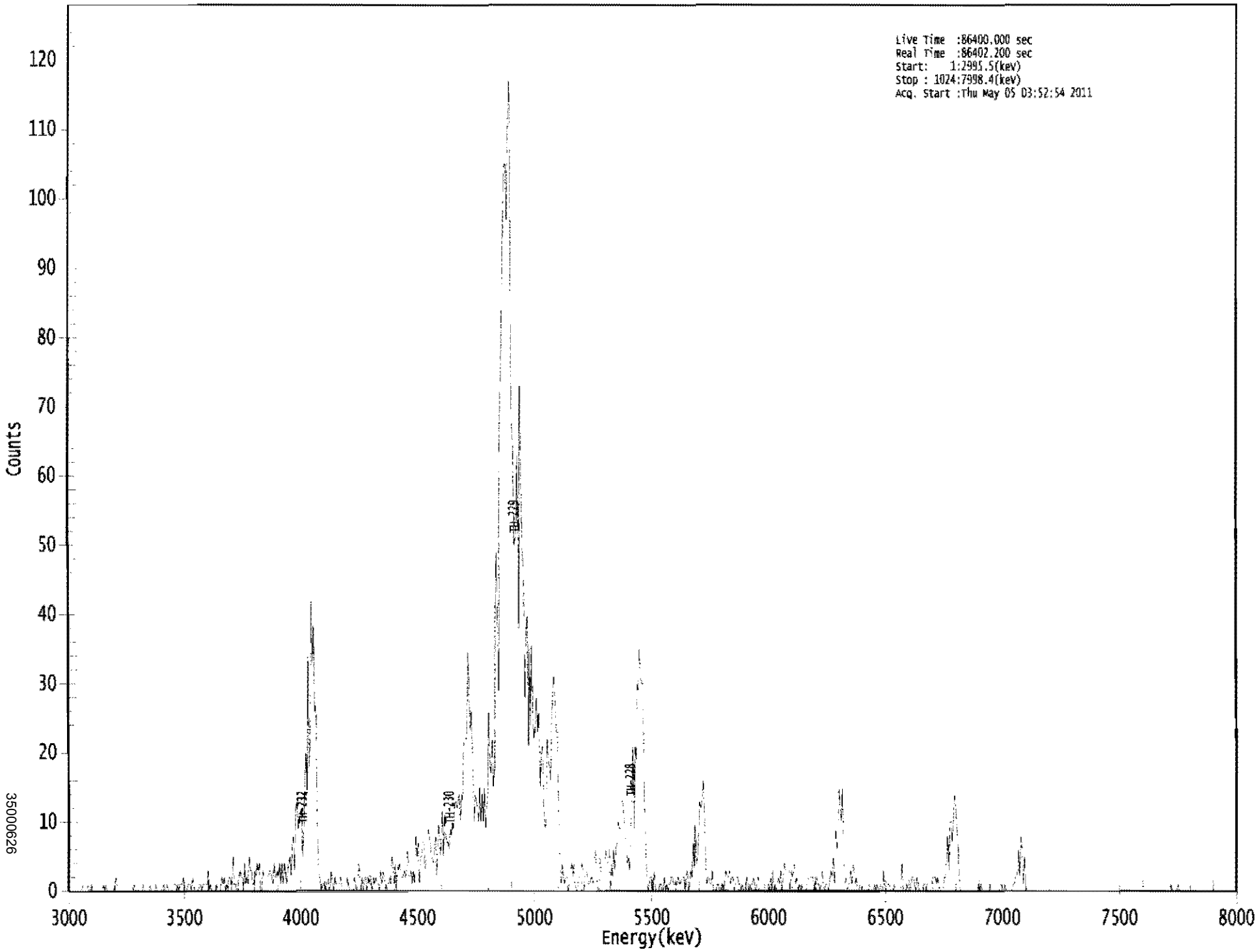

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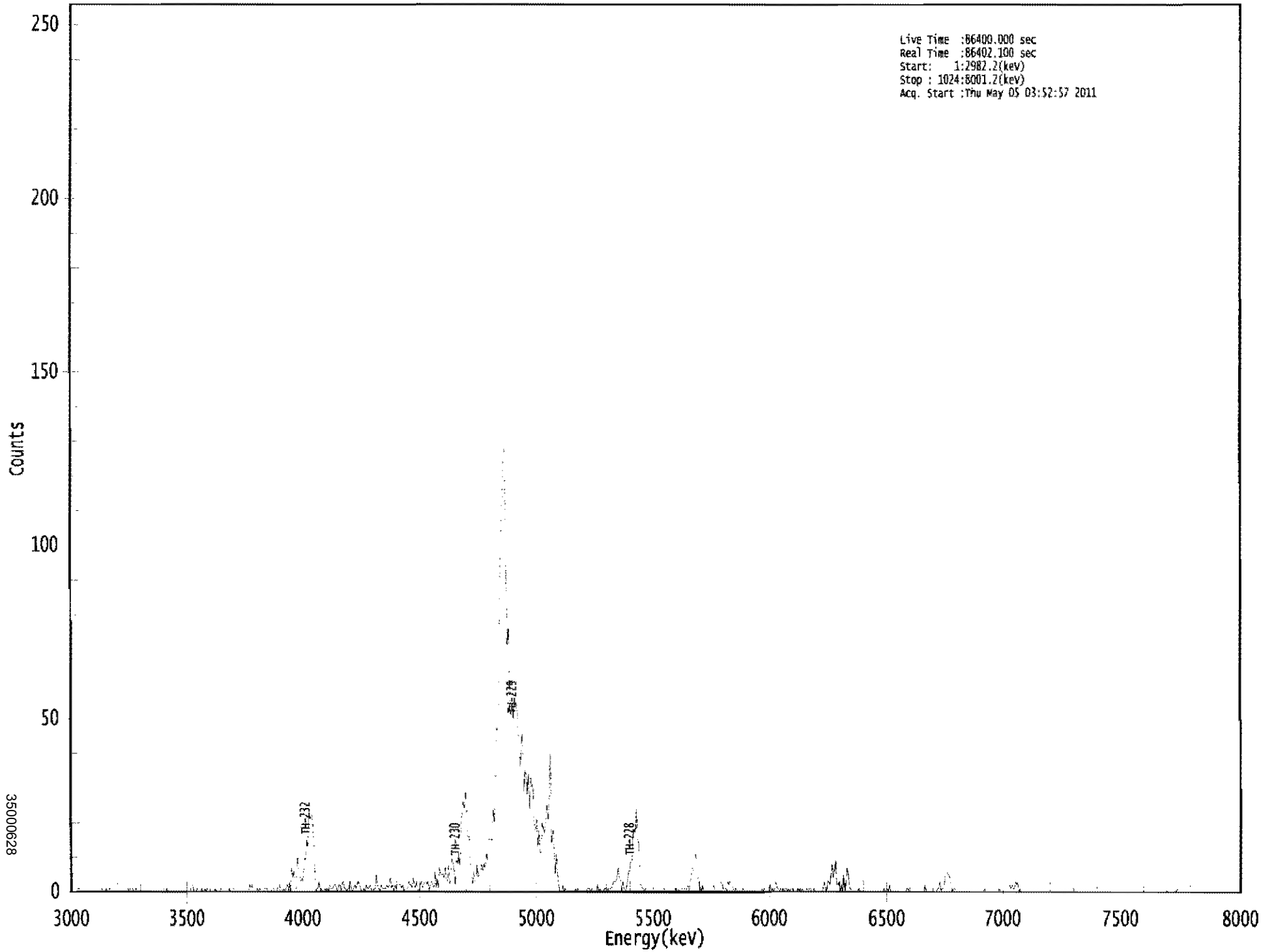


35000628

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-006
Batch Identification: B11-01647
Sample Identification: 11-01647-09
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 3 3B
Chamber Serial Number: 12045129B
Detector Serial Number: 55811
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:52:59
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.1 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2124 +/- 0.0044 on 4/18/10 15:15:32
Effective Efficiency: 0.2124 +/- 0.0044

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

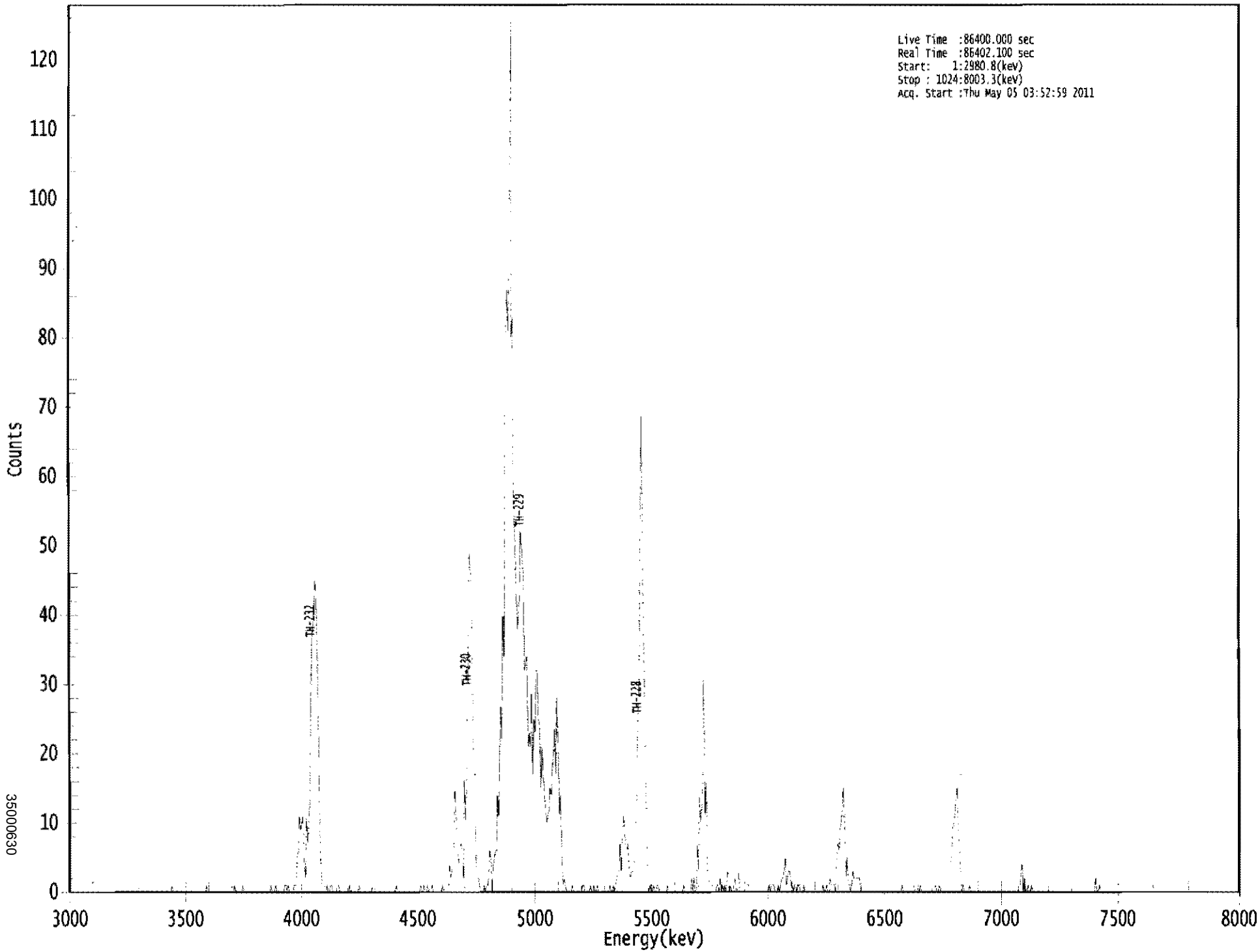
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5426.033	426.00	20.64	0.00	0.00E+000	20.6
TH-229	4924.347	1977.00	44.46	0.00	0.00E+000	35.8
TH-230	4692.439	370.00	19.24	0.00	0.00E+000	25.3
TH-232	4026.754	393.00	19.82	0.00	0.00E+000	34.5

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	6.2778E-001	5.26	3.9878E-003	2.06
TH-229	2.9257E+000	3.05	4.0046E-003	2.06
TH-230	5.4591E-001	5.59	3.9926E-003	2.06
TH-232	5.7880E-001	5.45	3.9854E-003	2.06

Errors quoted at 1.000 sigma

0000012161.CNF



35000630

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-007
Batch Identification: B11-01647
Sample Identification: 11-01647-10
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 3 4B
Chamber Serial Number: 12045130B
Detector Serial Number: 55813
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:53:01
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.1 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2157 +/- 0.0044 on 4/18/10 15:16:34
Effective Efficiency: 0.2157 +/- 0.0044

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

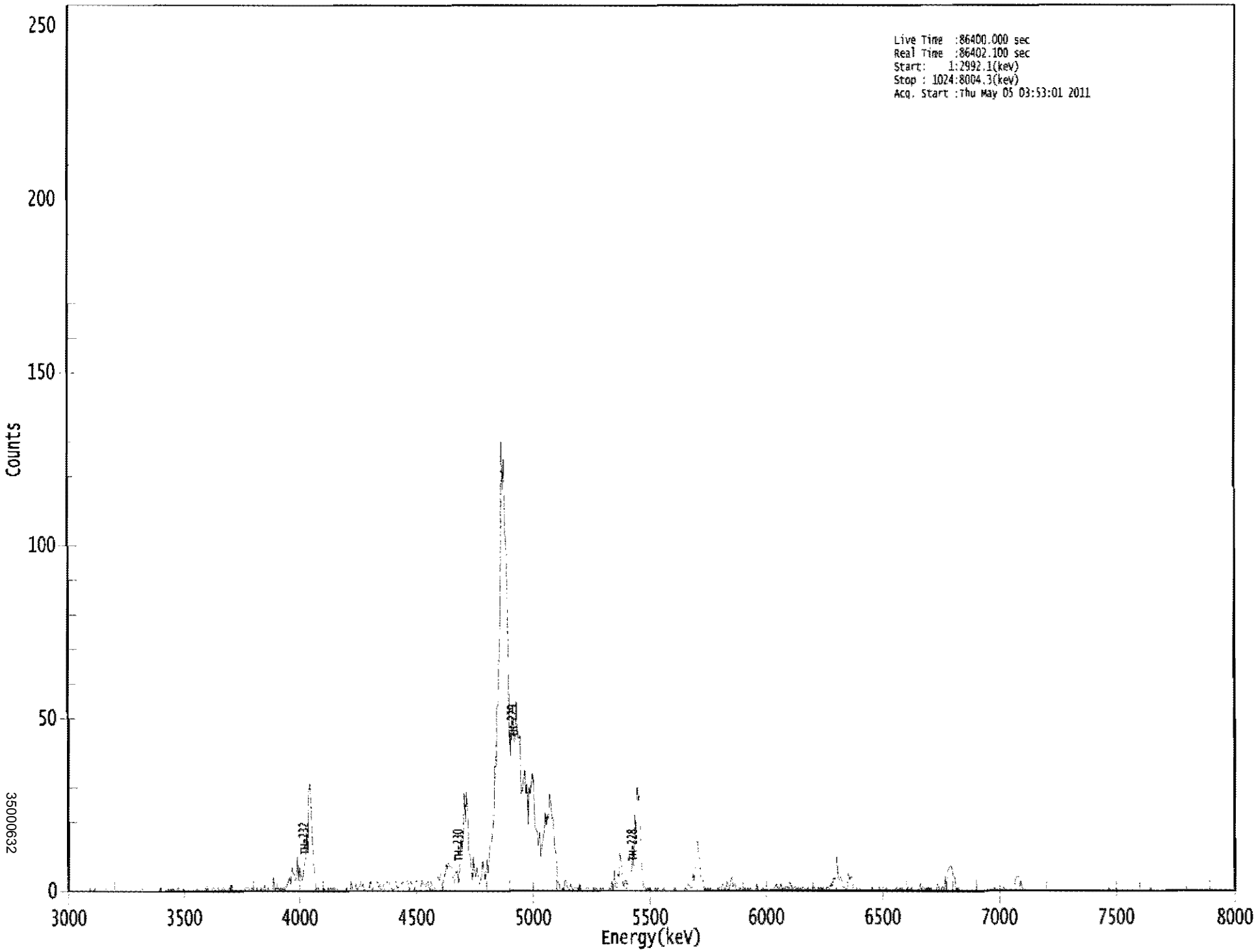
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5420.112	239.00	15.46	0.00	0.00E+000	28.3
TH-229	4914.200	2365.00	48.63	0.00	0.00E+000	41.1
TH-230	4675.208	279.00	16.70	0.00	0.00E+000	23.9
TH-232	4015.490	230.00	15.17	0.00	0.00E+000	18.8

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	3.4674E-001	6.79	3.9259E-003	2.05
TH-229	3.4456E+000	2.91	3.9425E-003	2.05
TH-230	4.0526E-001	6.33	3.9306E-003	2.05
TH-232	3.3348E-001	6.91	3.9236E-003	2.05

Errors quoted at 1.000 sigma

0000012162.CNF



35000632

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-008
Batch Identification: B11-01647
Sample Identification: 11-01647-11
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 3 5A
Chamber Serial Number: 12045131A
Detector Serial Number: 55814
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:53:02
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.2 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2132 +/- 0.0044 on 4/19/10 14:24:55
Effective Efficiency: 0.2132 +/- 0.0044

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

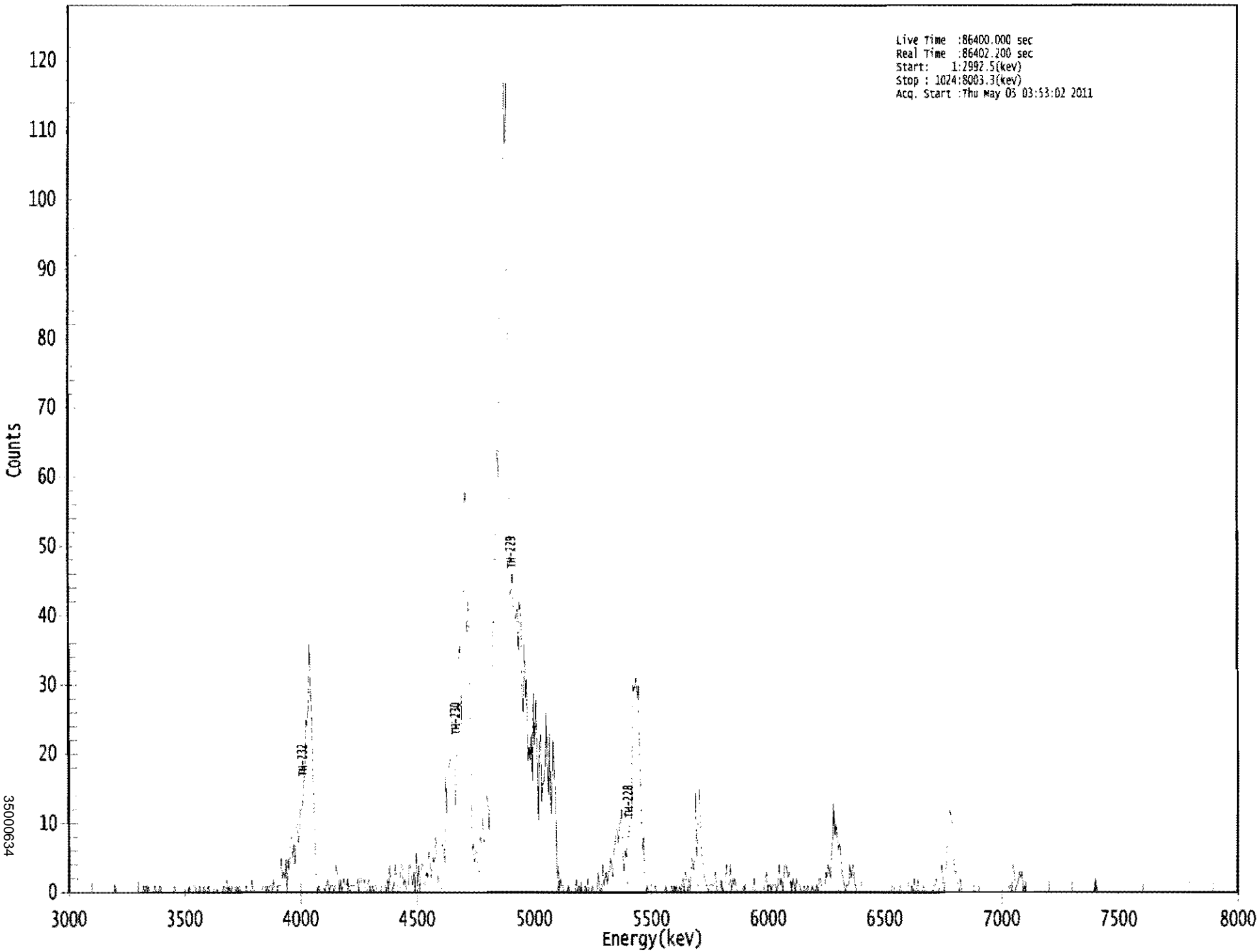
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5404.105	391.00	19.77	0.00	0.00E+000	36.7
TH-229	4903.505	2360.00	48.58	0.00	0.00E+000	55.8
TH-230	4661.461	802.00	28.32	0.00	0.00E+000	35.0
TH-232	4006.693	371.00	19.26	0.00	0.00E+000	34.9

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	5.7394E-001	5.46	3.9721E-003	2.06
TH-229	3.4788E+000	2.91	3.9889E-003	2.06
TH-230	1.1787E+000	4.09	3.9769E-003	2.06
TH-232	5.4426E-001	5.58	3.9697E-003	2.06

Errors quoted at 1.000 sigma

0000012163.CNF



35000634

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-009
Batch Identification: B11-01647
Sample Identification: 11-01647-12
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 3 6A
Chamber Serial Number: 12045132A
Detector Serial Number: 55816
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:53:04
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.2 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2190 +/- 0.0045 on 4/19/10 14:26:08
Effective Efficiency: 0.2190 +/- 0.0045

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

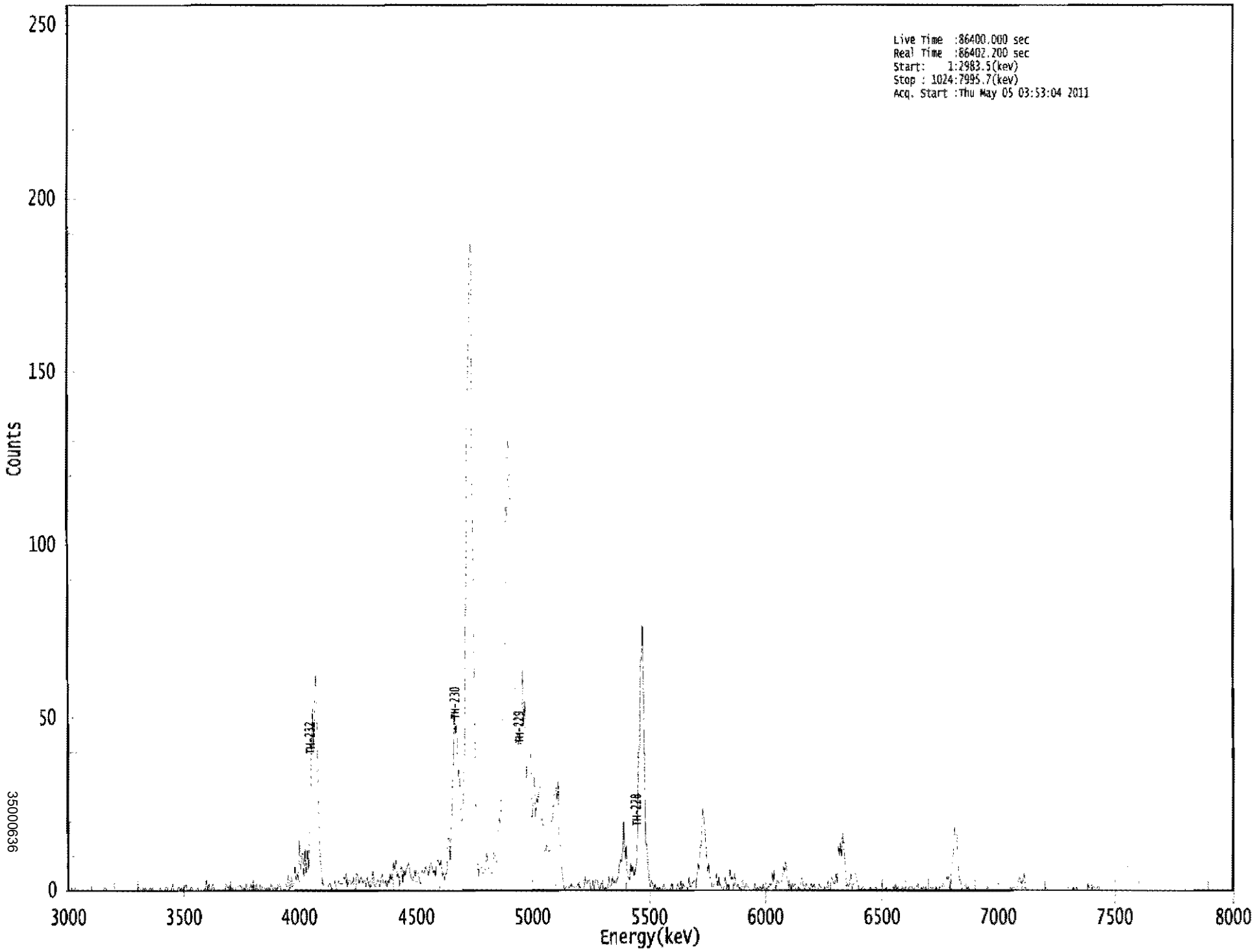
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5432.678	553.00	23.52	0.00	0.00E+000	26.1
TH-229	4931.162	2466.00	49.66	0.00	0.00E+000	45.9
TH-230	4656.996	1983.00	44.53	0.00	0.00E+000	31.5
TH-232	4035.130	496.00	22.27	0.00	0.00E+000	29.8

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	7.9022E-001	4.72	3.8668E-003	2.05
TH-229	3.5387E+000	2.88	3.8831E-003	2.05
TH-230	2.8370E+000	3.04	3.8715E-003	2.05
TH-232	7.0834E-001	4.94	3.8645E-003	2.05

Errors quoted at 1.000 sigma

0000012164.CNF



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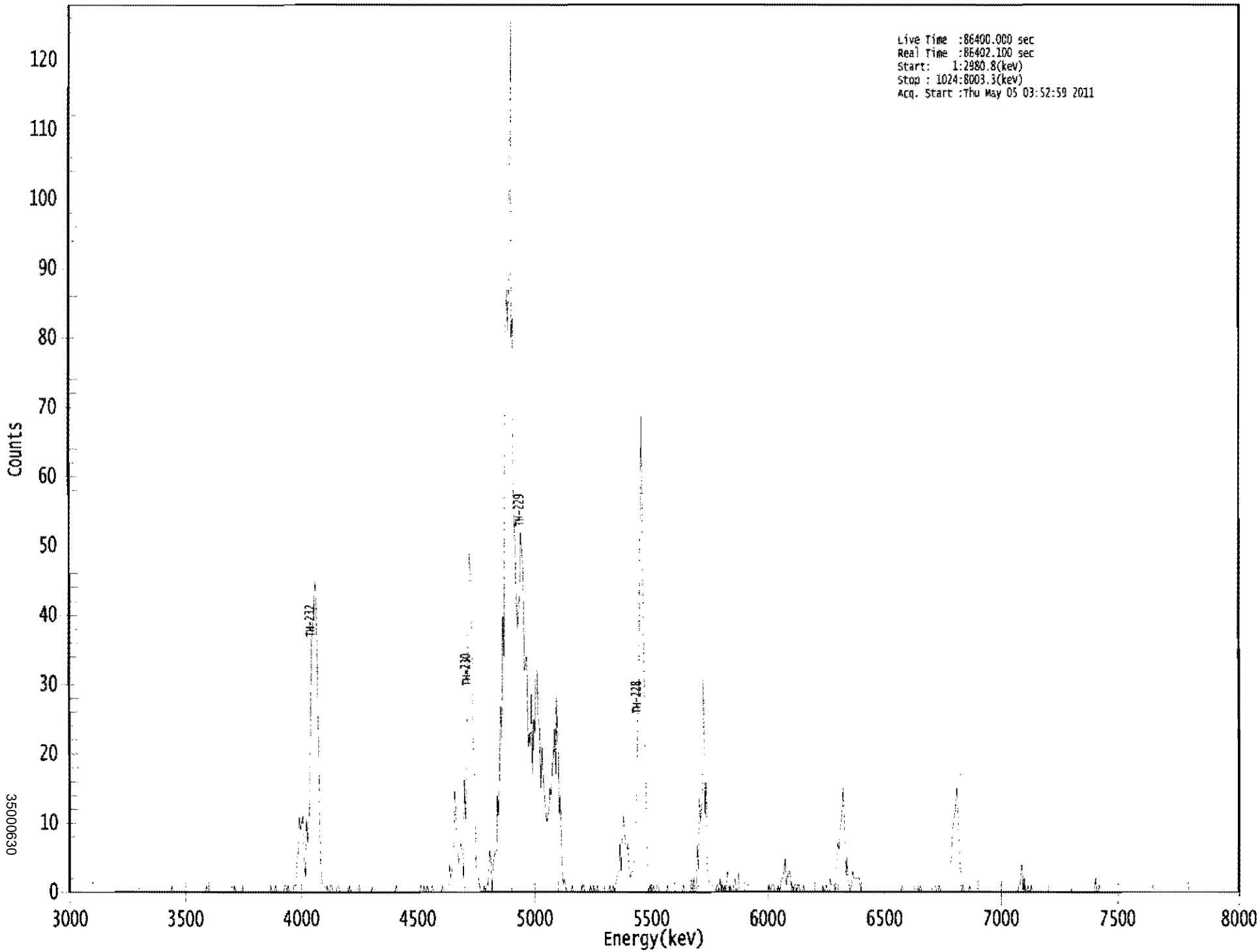

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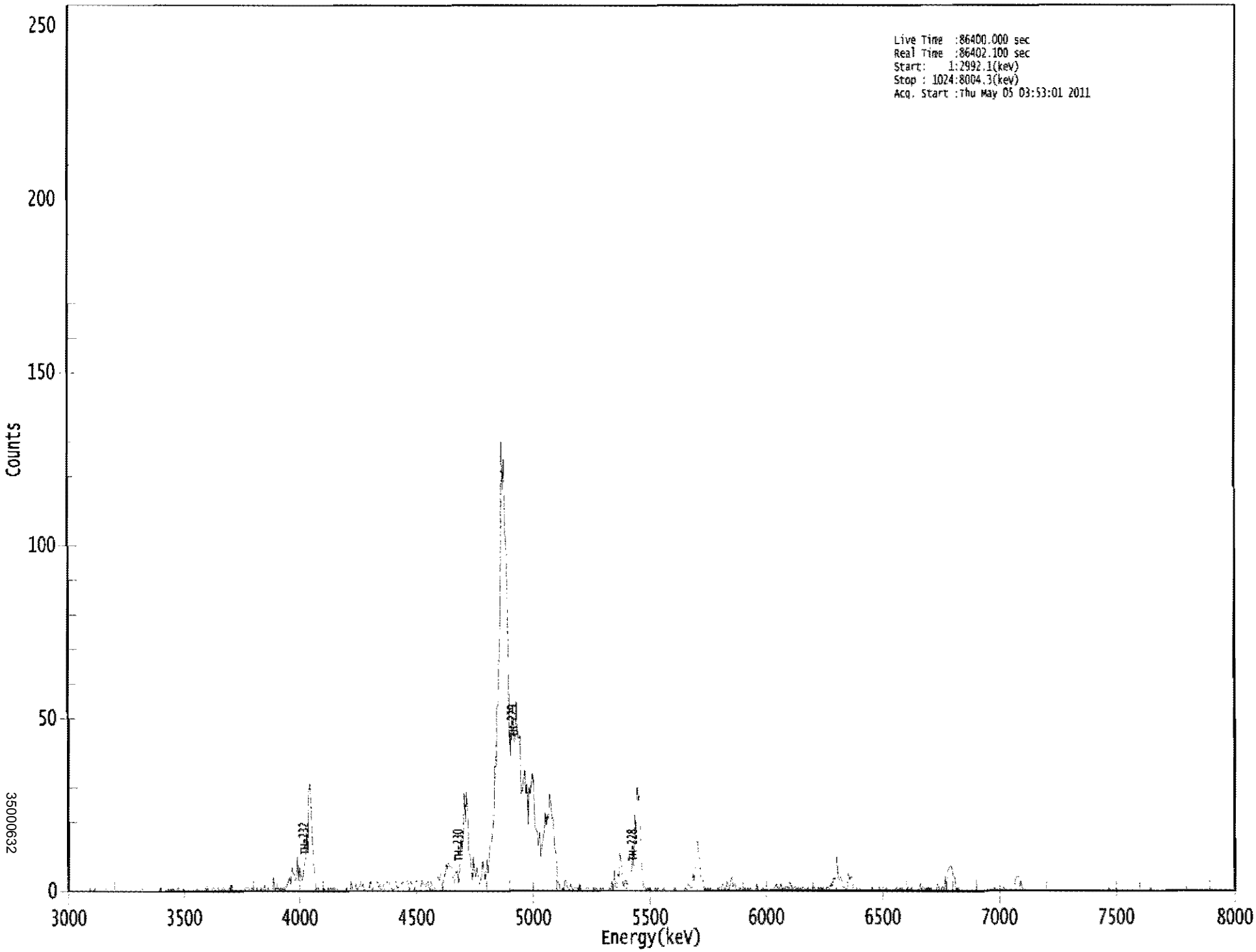

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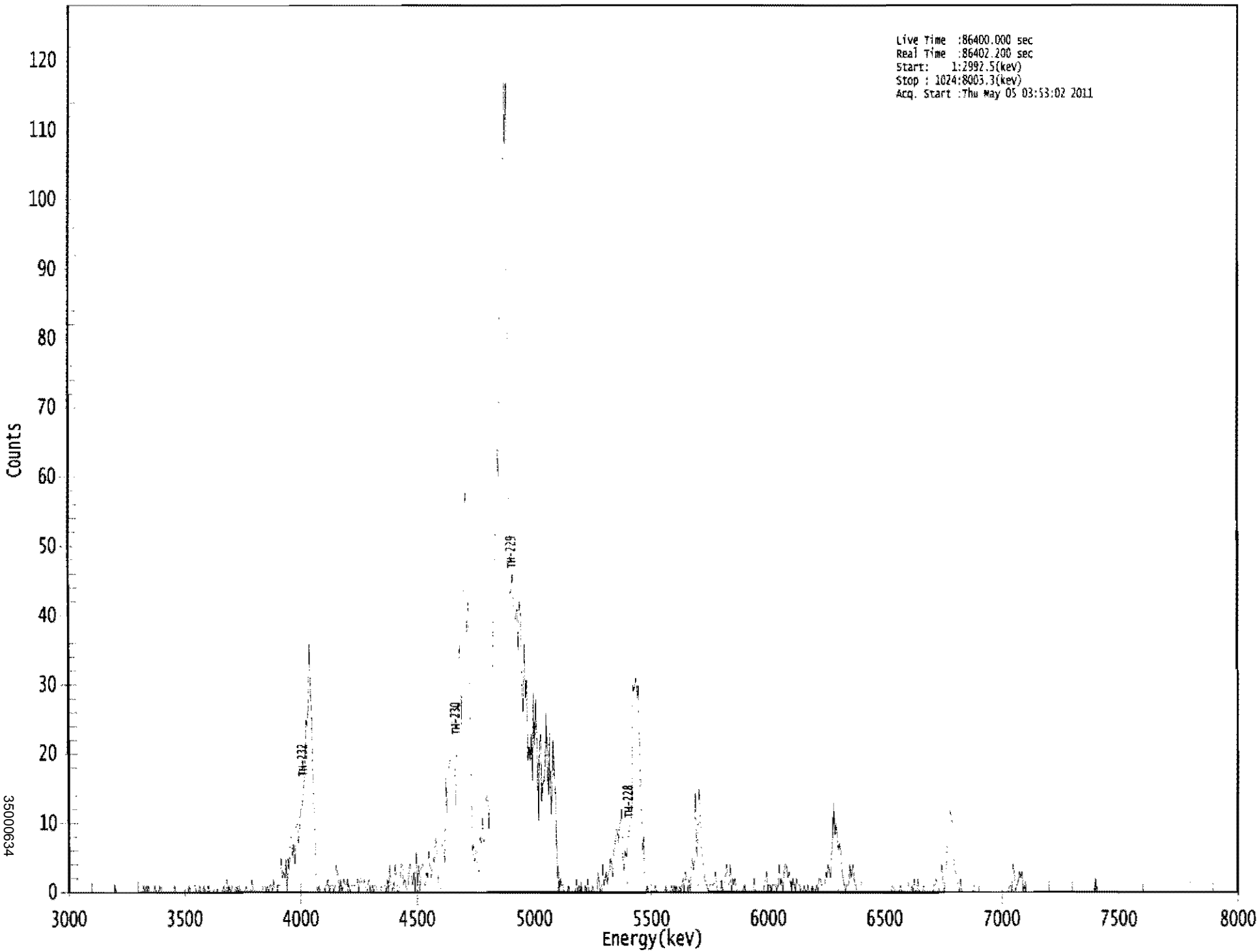

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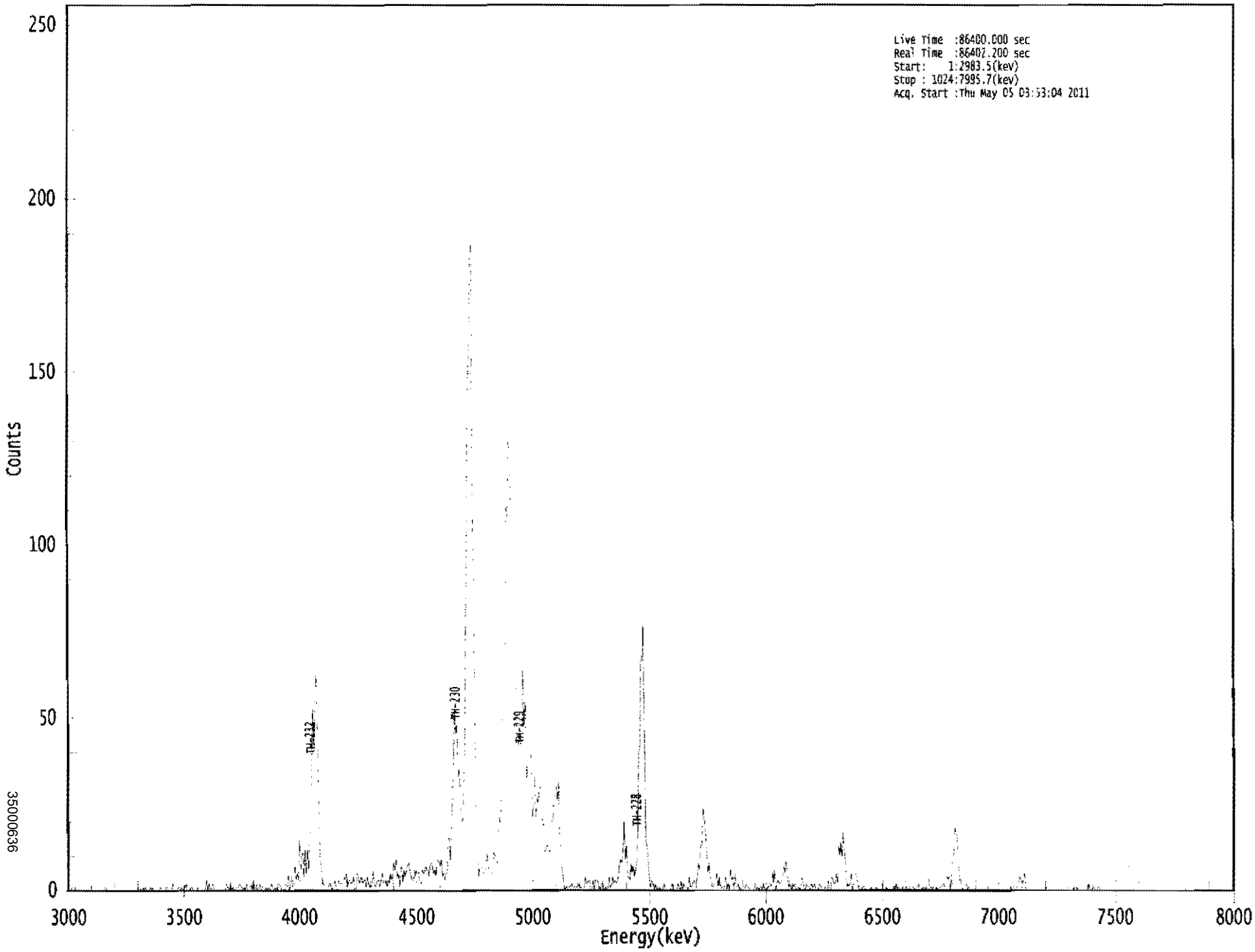


35000636

ALPHA SPECTRUM ANALYSIS

Sample Description: ARS1-11-00895-010
Batch Identification: B11-01647
Sample Identification: 11-01647-13
Sample Geometry: Shelf 2
Protocol Description: Thorium - 24 Hrs

Detector Name: A 3 6B
Chamber Serial Number: 12045132B
Detector Serial Number: 55817
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000012
Env. Background File: <not performed>
Reagent Blank File: <not performed>

Sample Size: 1.000 units
Sample Date/Time:
Acquisition Date/Time: 5/5/11 03:53:06
Acquisition Live Time: 86400.0 seconds
Acquisition Real Time: 86402.1 seconds

Chem. Recovery Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2172 +/- 0.0045 on 4/19/10 14:26:42
Effective Efficiency: 0.2172 +/- 0.0045

Peak Match Tolerance: 100.000 keV

PEAK AREA REPORT

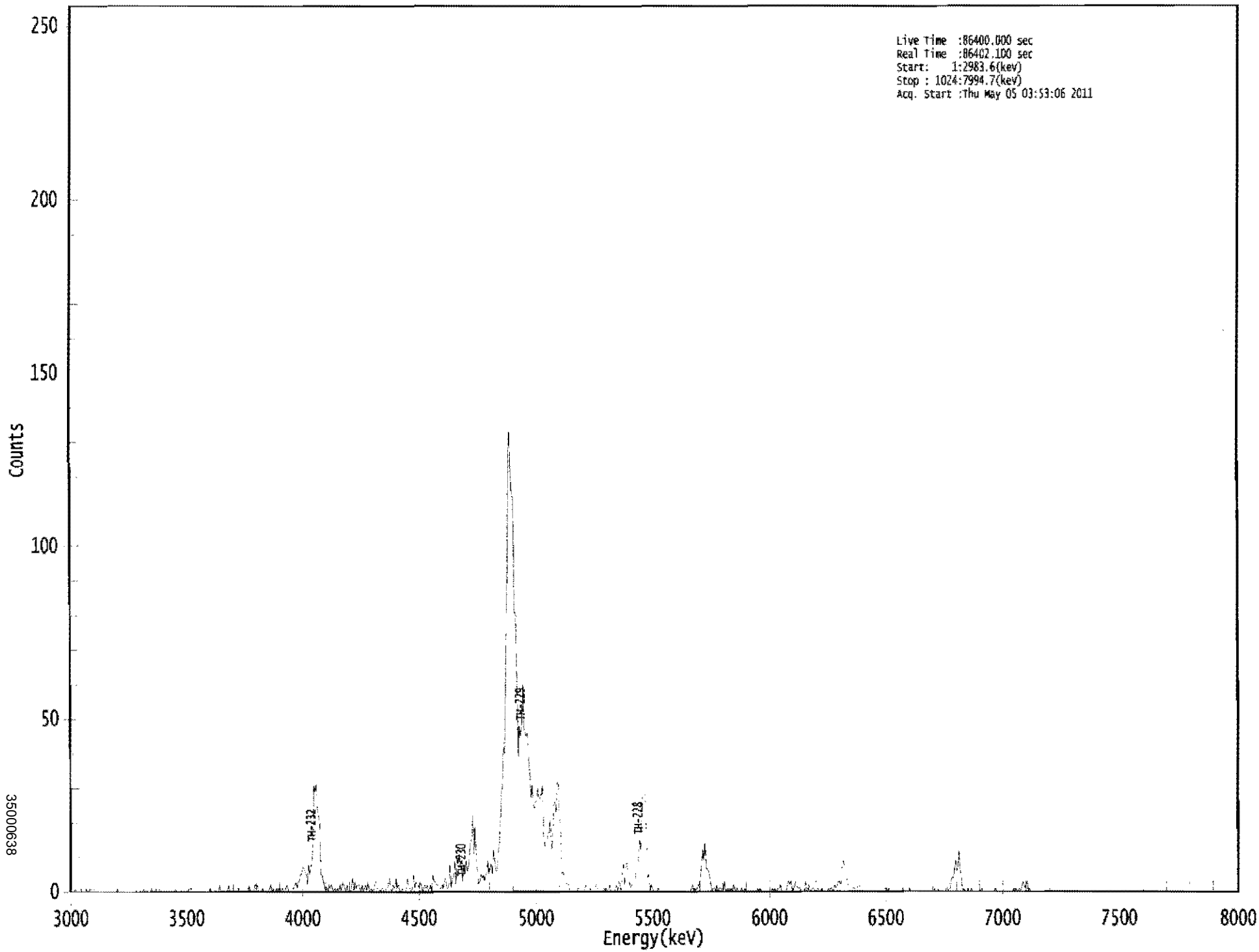
Nuclide	Energy (keV)	Gross Pk Area	Pk Area Error %	Ambient Backgnd	Reagent Backgnd	FWHM (keV)
TH-228	5425.477	242.00	15.56	0.00	0.00E+000	24.9
TH-229	4921.361	2480.00	49.80	0.00	0.00E+000	45.4
TH-230	4670.316	251.00	15.84	0.00	0.00E+000	19.6
TH-232	4028.449	265.00	16.28	0.00	0.00E+000	30.4

NUCLIDE ACTIVITY REPORT

Nuclide	Activity (pCi/units)	Activity Error %	MDA (pCi/units)	MDA Error %
TH-228	3.4870E-001	6.75	3.8991E-003	2.05
TH-229	3.5885E+000	2.87	3.9156E-003	2.05
TH-230	3.6210E-001	6.64	3.9038E-003	2.05
TH-232	3.8161E-001	6.48	3.8968E-003	2.05

Errors quoted at 1.000 sigma

0000012165.CNF



3500638

Apex Alpha Instrument Data Transfer Report

#	Report ID	Batch Sample ID	Isotope	Gross Area	Count Mins	BKG Counts	BKG Count Mins	EFF	Analysis Date	Date
1	ApexAlpha	ARS1-B11-01647-01	TH-228	4	1440	2	1440		05/05/11 03:53	A_2
2	ApexAlpha	ARS1-B11-01647-01	TH-229	2513	1440	2	1440	0.22	05/05/11 03:53	A_2
3	ApexAlpha	ARS1-B11-01647-01	TH-230	3495	1440	3	1440	0.22	05/05/11 03:53	A_2
4	ApexAlpha	ARS1-B11-01647-01	TH-232	39	1440	4	1440	0.22	05/05/11 03:53	A_2
5	ApexAlpha	ARS1-B11-01647-02	TH-228	1	1440	2	1440	0.22	05/05/11 03:53	A_2
6	ApexAlpha	ARS1-B11-01647-02	TH-229	2755	1440	6	1440	0.22	05/05/11 03:53	A_2
7	ApexAlpha	ARS1-B11-01647-02	TH-230	3395	1440	11	1440	0.22	05/05/11 03:53	A_2
8	ApexAlpha	ARS1-B11-01647-02	TH-232	58	1440	47	1440	0.22	05/05/11 03:53	A_2
9	ApexAlpha	ARS1-B11-01647-03	TH-228	4	1440	0	1440	0.22	05/05/11 03:53	A_2
10	ApexAlpha	ARS1-B11-01647-03	TH-229	2675	1440	3	1440	0.22	05/05/11 03:53	A_2
11	ApexAlpha	ARS1-B11-01647-03	TH-230	44	1440	6	1440	0.22	05/05/11 03:53	A_2
12	ApexAlpha	ARS1-B11-01647-03	TH-232	3	1440	0	1440	0.22	05/05/11 03:53	A_2
13	ApexAlpha	ARS1-B11-01647-04	TH-228	233	1440	3	1440	0.21	05/05/11 03:53	A_2
14	ApexAlpha	ARS1-B11-01647-04	TH-229	2543	1440	2	1440	0.21	05/05/11 03:53	A_2
15	ApexAlpha	ARS1-B11-01647-04	TH-230	2253	1440	3	1440	0.21	05/05/11 03:53	A_2
16	ApexAlpha	ARS1-B11-01647-04	TH-232	278	1440	2	1440	0.21	05/05/11 03:53	A_2
17	ApexAlpha	ARS1-B11-01647-05	TH-228	279	1440	2	1440	0.22	05/05/11 03:53	A_3
18	ApexAlpha	ARS1-B11-01647-05	TH-229	2379	1440	4	1440	0.22	05/05/11 03:53	A_3
19	ApexAlpha	ARS1-B11-01647-05	TH-230	503	1440	2	1440	0.22	05/05/11 03:53	A_3
20	ApexAlpha	ARS1-B11-01647-05	TH-232	239	1440	6	1440	0.22	05/05/11 03:53	A_3
21	ApexAlpha	ARS1-B11-01647-06	TH-228	539	1440	2	1440	0.21	05/05/11 03:53	A_3
22	ApexAlpha	ARS1-B11-01647-06	TH-229	2044	1440	3	1440	0.21	05/05/11 03:53	A_3
23	ApexAlpha	ARS1-B11-01647-06	TH-230	2960	1440	10	1440	0.21	05/05/11 03:53	A_3
24	ApexAlpha	ARS1-B11-01647-06	TH-232	551	1440	2	1440	0.21	05/05/11 03:53	A_3
25	ApexAlpha	ARS1-B11-01647-07	TH-228	462	1440	1	1440	0.22	05/05/11 03:53	A_3
26	ApexAlpha	ARS1-B11-01647-07	TH-229	2752	1440	4	1440	0.22	05/05/11 03:53	A_3
27	ApexAlpha	ARS1-B11-01647-07	TH-230	602	1440	4	1440	0.22	05/05/11 03:53	A_3
28	ApexAlpha	ARS1-B11-01647-07	TH-232	472	1440	1	1440	0.22	05/05/11 03:53	A_3
29	ApexAlpha	ARS1-B11-01647-08	TH-228	183	1440	0	1440	0.22	05/05/11 03:53	A_3
30	ApexAlpha	ARS1-B11-01647-08	TH-229	2499	1440	0	1440	0.22	05/05/11 03:53	A_3
31	ApexAlpha	ARS1-B11-01647-08	TH-230	343	1440	2	1440	0.22	05/05/11 03:53	A_3
32	ApexAlpha	ARS1-B11-01647-08	TH-232	214	1440	3	1440	0.22	05/05/11 03:53	A_3
33	ApexAlpha	ARS1-B11-01647-09	TH-228	426	1440	2	1440	0.21	05/05/11 03:53	A_3
34	ApexAlpha	ARS1-B11-01647-09	TH-229	1977	1440	8	1440	0.21	05/05/11 03:53	A_3
35	ApexAlpha	ARS1-B11-01647-09	TH-230	370	1440	1	1440	0.21	05/05/11 03:53	A_3
36	ApexAlpha	ARS1-B11-01647-09	TH-232	393	1440	2	1440	0.21	05/05/11 03:53	A_3
37	ApexAlpha	ARS1-B11-01647-10	TH-228	239	1440	1	1440	0.22	05/05/11 03:53	A_3
38	ApexAlpha	ARS1-B11-01647-10	TH-229	2365	1440	2	1440	0.22	05/05/11 03:53	A_3
39	ApexAlpha	ARS1-B11-01647-10	TH-230	279	1440	2	1440	0.22	05/05/11 03:53	A_3
40	ApexAlpha	ARS1-B11-01647-10	TH-232	230	1440	4	1440	0.22	05/05/11 03:53	A_3
41	ApexAlpha	ARS1-B11-01647-11	TH-228	391	1440	4	1440	0.21	05/05/11 03:53	A_3
42	ApexAlpha	ARS1-B11-01647-11	TH-229	2360	1440	5	1440	0.21	05/05/11 03:53	A_3
43	ApexAlpha	ARS1-B11-01647-11	TH-230	802	1440	4	1440	0.21	05/05/11 03:53	A_3
44	ApexAlpha	ARS1-B11-01647-11	TH-232	371	1440	7	1440	0.21	05/05/11 03:53	A_3
45	ApexAlpha	ARS1-B11-01647-12	TH-228	553	1440	1	1440	0.22	05/05/11 03:53	A_3
46	ApexAlpha	ARS1-B11-01647-12	TH-229	2466	1440	3	1440	0.22	05/05/11 03:53	A_3
47	ApexAlpha	ARS1-B11-01647-12	TH-230	1983	1440	1	1440	0.22	05/05/11 03:53	A_3
48	ApexAlpha	ARS1-B11-01647-12	TH-232	496	1440	0	1440	0.22	05/05/11 03:53	A_3
49	ApexAlpha	ARS1-B11-01647-13	TH-228	242	1440	0	1440	0.22	05/05/11 03:53	A_3
50	ApexAlpha	ARS1-B11-01647-13	TH-229	2480	1440	7	1440	0.22	05/05/11 03:53	A_3
51	ApexAlpha	ARS1-B11-01647-13	TH-230	251	1440	10	1440	0.22	05/05/11 03:53	A_3
52	ApexAlpha	ARS1-B11-01647-13	TH-232	265	1440	7	1440	0.22	05/05/11 03:53	A_3

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Batch Result Verification Report

ABatchSampleID	SDG	Fraction	ClientID	Run	Isotope	ACT	TPU	TPU1s	TPU2s	MDA	DL	CU	CU1s	CU2s	ActivityReportUnits
ARS1-B11-01647-01				1	TH-228										pCi
ARS1-B11-01647-01				1	TH-229	5.06286762	0.643195493	0.328160966	0.643195493	0.018731199	0.006633546	0.198186891	0.10111576	0.19818689	pCi
ARS1-B11-01647-01				1	TH-230	7.054939195	0.884242055	0.451143905	0.884242055	0.021756409	0.008140678	0.234198988	0.11948928	0.23419899	pCi
ARS1-B11-01647-01				1	TH-232	0.07056959	0.027281811	0.013919291	0.027281811	0.024226591	0.009381244	0.025914322	0.01322159	0.02591432	pCi
ARS1-B11-01647-02				1	TH-228	-0.001823246	0.006193514	0.003159956	0.006193514	0.01693796	0.005998481	0.006189593	0.00315796	0.00618959	pCi
ARS1-B11-01647-02				1	TH-229	4.968493991	0.628682591	0.320756424	0.628682591	0.025496551	0.010299273	0.186139826	0.0949693	0.18613983	pCi
ARS1-B11-01647-02				1	TH-230	6.128434718	0.769109086	0.392402595	0.769109086	0.032854256	0.013973219	0.207156041	0.10569186	0.20715604	pCi
ARS1-B11-01647-02				1	TH-232	0.019881191	0.036378925	0.018560676	0.036378925	0.062549361	0.028825679	0.036299483	0.01852014	0.03629948	pCi
ARS1-B11-01647-03				1	TH-228	0.007768371	0.00767068	0.003913612	0.00767068	0.005263071	0	0.007613004	0.00388419	0.007613	pCi
ARS1-B11-01647-03				1	TH-229	5.144119782	0.651664967	0.332482126	0.651664967	0.020732076	0.007757399	0.195270202	0.09962765	0.1952702	pCi
ARS1-B11-01647-03				1	TH-230	0.073303953	0.028165001	0.014369899	0.028165001	0.027212924	0.010992597	0.026735288	0.01364045	0.02673529	pCi
ARS1-B11-01647-03				1	TH-232	0.005775579	0.006572855	0.003353497	0.006572855	0.005217273	0	0.006535683	0.00333453	0.00653568	pCi
ARS1-B11-01647-04	ARS1-11-00895	001	PR-SED-01-110420	1	TH-228	0.461649475	0.082253431	0.041966036	0.082253431	0.021614873	0.008087719	0.060436121	0.03083476	0.06043612	pCi
ARS1-B11-01647-04	ARS1-11-00895	001	PR-SED-01-110420	1	TH-229	4.996399578	0.63439486	0.323670847	0.63439486	0.018267041	0.006469167	0.194425159	0.09919651	0.19442516	pCi
ARS1-B11-01647-04	ARS1-11-00895	001	PR-SED-01-110420	1	TH-230	4.433053663	0.566307432	0.288932363	0.566307432	0.021217228	0.00793893	0.183419747	0.0935815	0.18341975	pCi
ARS1-B11-01647-04	ARS1-11-00895	001	PR-SED-01-110420	1	TH-232	0.54270014	0.091983784	0.046930502	0.091983784	0.018266972	0.006469143	0.064489044	0.03290257	0.06448904	pCi
ARS1-B11-01647-05	ARS1-11-00895	002	RM-JM-SED-02-110420	1	TH-228	0.548079261	0.092811875	0.047352997	0.092811875	0.018381431	0.006509678	0.065008902	0.03316781	0.0650089	pCi
ARS1-B11-01647-05	ARS1-11-00895	002	RM-JM-SED-02-110420	1	TH-229	4.60357477	0.586485696	0.299227396	0.586485696	0.023290261	0.00901867	0.185459754	0.09462232	0.18545975	pCi
ARS1-B11-01647-05	ARS1-11-00895	002	RM-JM-SED-02-110420	1	TH-230	0.973054769	0.145426419	0.074197153	0.145426419	0.018043271	0.006389921	0.085546318	0.04364608	0.08554632	pCi
ARS1-B11-01647-05	ARS1-11-00895	002	RM-JM-SED-02-110420	1	TH-232	0.451633202	0.080719824	0.041183584	0.080719824	0.027343956	0.011045528	0.059466045	0.03033982	0.05946604	pCi
ARS1-B11-01647-06	ARS1-11-00895	003	RM-JM-SED-110420	1	TH-228	1.266314821	0.187030721	0.095423837	0.187030721	0.021907011	0.007758242	0.107503377	0.05484866	0.10750338	pCi
ARS1-B11-01647-06	ARS1-11-00895	003	RM-JM-SED-110420	1	TH-229	4.714964166	0.605556433	0.308957364	0.605556433	0.024877318	0.00930844	0.2048568	0.10451878	0.2048568	pCi
ARS1-B11-01647-06	ARS1-11-00895	003	RM-JM-SED-110420	1	TH-230	6.828501045	0.86153721	0.439559801	0.86153721	0.040330579	0.017028809	0.247250774	0.12614835	0.24725077	pCi
ARS1-B11-01647-06	ARS1-11-00895	003	RM-JM-SED-110420	1	TH-232	1.268253559	0.186634577	0.095221723	0.186634577	0.021460976	0.007600281	0.10647616	0.05432457	0.10647616	pCi
ARS1-B11-01647-07	ARS1-11-00895	004	RM-SED-BG-110419	1	TH-228	0.821286252	0.124490847	0.063515738	0.124490847	0.013116997	0.004144523	0.075134637	0.038334	0.07513464	pCi
ARS1-B11-01647-07	ARS1-11-00895	004	RM-SED-BG-110419	1	TH-229	4.791234211	0.606224417	0.309298172	0.606224417	0.020949489	0.008112255	0.179401616	0.09153144	0.17940162	pCi
ARS1-B11-01647-07	ARS1-11-00895	004	RM-SED-BG-110419	1	TH-230	1.044719564	0.151816404	0.077457349	0.151816404	0.020991395	0.008128462	0.084292887	0.04300657	0.08429289	pCi
ARS1-B11-01647-07	ARS1-11-00895	004	RM-SED-BG-110419	1	TH-232	0.821201664	0.123993713	0.063262098	0.123993713	0.012837182	0.004056111	0.074321686	0.03791923	0.07432169	pCi
ARS1-B11-01647-08	ARS1-11-00895	005	RP-JM-SED-01	1	TH-228	0.371045087	0.070008261	0.0357185	0.070008261	0.005494711	0	0.053759747	0.02742844	0.05375975	pCi
ARS1-B11-01647-08	ARS1-11-00895	005	RP-JM-SED-01	1	TH-229	4.963749312	0.630699232	0.321785323	0.630699232	0.005382857	0	0.194617901	0.09929485	0.1946179	pCi
ARS1-B11-01647-08	ARS1-11-00895	005	RP-JM-SED-01	1	TH-230	0.678681382	0.109444807	0.055839187	0.109444807	0.01848959	0.006547982	0.072456471	0.03696759	0.07245647	pCi
ARS1-B11-01647-08	ARS1-11-00895	005	RP-JM-SED-01	1	TH-232	0.419106496	0.076516057	0.039038804	0.076516057	0.021389967	0.008003565	0.057349268	0.02925983	0.05734927	pCi
ARS1-B11-01647-09	ARS1-11-00895	006	RP-JM-SED-110420	1	TH-228	1.005528386	0.154972477	0.07906759	0.154972477	0.022031506	0.007802331	0.096162653	0.04906258	0.09616265	pCi
ARS1-B11-01647-09	ARS1-11-00895	006	RP-JM-SED-110420	1	TH-229	4.574484731	0.588922092	0.300470455	0.588922092	0.036870022	0.015287003	0.20287699	0.10350867	0.20287699	pCi
ARS1-B11-01647-09	ARS1-11-00895	006	RP-JM-SED-110420	1	TH-230	0.858995334	0.136021374	0.06939866	0.136021374	0.01713978	0.005415585	0.087883524	0.04483853	0.08788352	pCi
ARS1-B11-01647-09	ARS1-11-00895	006	RP-JM-SED-110420	1	TH-232	0.908388394	0.142280516	0.0725921	0.142280516	0.021582937	0.007643473	0.090500179	0.04617356	0.09050018	pCi
ARS1-B11-01647-10	ARS1-11-00895	007	RP-SED-01-110419	1	TH-228	0.512116959	0.089998744	0.045917727	0.089998744	0.015842839	0.005005795	0.065336203	0.0333348	0.0653362	pCi
ARS1-B11-01647-10	ARS1-11-00895	007	RP-SED-01-110419	1	TH-229	4.976144324	0.634058021	0.32349899	0.634058021	0.019563428	0.006928275	0.200809589	0.10245387	0.20080959	pCi
ARS1-B11-01647-10	ARS1-11-00895	007	RP-SED-01-110419	1	TH-230	0.584489732	0.098977633	0.050498792	0.098977633	0.019602562	0.006942134	0.069327629	0.03537124	0.06932763	pCi
ARS1-B11-01647-10	ARS1-11-00895	007	RP-SED-01-110419	1	TH-232	0.475922159	0.085410718	0.043576897	0.085410718	0.025302897	0.009798021	0.063138097	0.03221331	0.0631381	pCi
ARS1-B11-01647-11	ARS1-11-00895	008	RP-SED-02-110420	1	TH-228	0.795329465	0.125094665	0.063823809	0.125094665	0.024693285	0.009561962	0.080055417	0.0408446	0.08005542	pCi
ARS1-B11-01647-11	ARS1-11-00895	008	RP-SED-02-110420	1	TH-229	4.741273481	0.60431128	0.308322081	0.60431128	0.026401934	0.010472973	0.191900338	0.09790834	0.19190034	pCi
ARS1-B11-01647-11	ARS1-11-00895	008	RP-SED-02-110420	1	TH-230	1.609811253	0.224622343	0.114603236	0.224622343	0.024239007	0.009386052	0.112252406	0.05727164	0.11225241	pCi
ARS1-B11-01647-11	ARS1-11-00895	008	RP-SED-02-110420	1	TH-232	0.732831	0.117177409	0.059784393	0.117177409	0.030239451	0.012391742	0.076719263	0.03914248	0.07671926	pCi
ARS1-B11-01647-12	ARS1-11-00895	009	RP-SED-03-110420	1	TH-228	1.129883143	0.166027064	0.084707685	0.166027064	0.015070763	0.004761846	0.094429003	0.04817806	0.094429	pCi
ARS1-B11-01647-12	ARS1-11-00895	009	RP-SED-03-110420	1	TH-229	4.938861539	0.628047288	0.32043229	0.628047288	0.021593876	0.008079862	0.195289573	0.09963754	0.19528957	pCi
ARS1-B11-01647-12	ARS1-11-00895	009	RP-SED-03-110420	1	TH-230	3.982300806	0.512270911	0.26136271	0.512270911	0.014793509	0.004674243	0.175411199	0.08949551	0.1754112	pCi
ARS1-B11-01647-12	ARS1-11-00895	009	RP-SED-03-110420	1	TH-232	0.994586291	0.148697864	0.075866257	0.148697864	0.005434131	0	0.087530156	0.04465824	0.08753016	pCi
ARS1-B11-01647-13	ARS1-11-00895	010	RP-SED-BG-041911	1	TH-228	0.464671567	0.081126968	0.04139131	0.081126968	0.005203553	0	0.05854563	0.02987022	0.05854563	pCi
ARS1-B11-01647-13	ARS1-11-00895	010	RP-SED-BG-041911	1	TH-229	4.647205677	0.590935067	0.301497483	0.590935067	0.028225344	0.011566386	0.183679945	0.09371426	0.18367995	pCi
ARS1-B11-01647-13	ARS1-11-00895	010	RP-SED-BG-041911	1	TH-230	0.45378767	0.081011392	0.041332343	0.081011392	0.032807017	0.01385213	0.059622746	0.03041977	0.05962275	pCi
ARS1-B11-01647-13	ARS1-11-00895	010	RP-SED-BG-041911	1	TH-232	0.484825802	0.084400305	0.04306138	0.084400305	0.028225229	0.01156634	0.060744441	0.03099206	0.06074444	pCi

35000640

Batch Result Verification Report

ABatchSampleID	SDG	Fraction	AliquotReportUnits	ChemRecovery	TracerRecovery	SampleCounts	SampleCountMins	BKG_Counts	BKG_CountMins	EFF	ALIQ	SampleCollDate	MidPointCountDate
ARS1-B11-01647-01			g			4	1440	2	1440	0	1	5/2/2011	5/5/2011
ARS1-B11-01647-01			g		0.689670268	2513	1440	2	1440	0.224953875	1	5/2/2011	5/5/2011
ARS1-B11-01647-01			g		0.689670268	3495	1440	3	1440	0.224953875	1	5/2/2011	5/5/2011
ARS1-B11-01647-01			g		0.689670268	39	1440	4	1440	0.224953875	1	5/2/2011	5/5/2011
ARS1-B11-01647-02			g		0.80195421	1	1440	2	1440	0.215816796	1	5/2/2011	5/5/2011
ARS1-B11-01647-02			g		0.80195421	2755	1440	6	1440	0.215816796	1	5/2/2011	5/5/2011
ARS1-B11-01647-02			g		0.80195421	3395	1440	11	1440	0.215816796	1	5/2/2011	5/5/2011
ARS1-B11-01647-02			g		0.80195421	58	1440	47	1440	0.215816796	1	5/2/2011	5/5/2011
ARS1-B11-01647-03			g		0.74202672	4	1440	0	1440	0.218973055	1	5/2/2011	5/5/2011
ARS1-B11-01647-03			g		0.74202672	2675	1440	3	1440	0.218973055	1	5/2/2011	5/5/2011
ARS1-B11-01647-03			g		0.74202672	44	1440	6	1440	0.218973055	1	5/2/2011	5/5/2011
ARS1-B11-01647-03			g		0.74202672	3	1440	0	1440	0.218973055	1	5/2/2011	5/5/2011
ARS1-B11-01647-04	ARS1-11-00895	001	g		0.730150687	233	1440	3	1440	0.213045776	1.0227	4/20/2011	5/5/2011
ARS1-B11-01647-04	ARS1-11-00895	001	g		0.730150687	2543	1440	2	1440	0.213045776	1.0227	4/20/2011	5/5/2011
ARS1-B11-01647-04	ARS1-11-00895	001	g		0.730150687	2253	1440	3	1440	0.213045776	1.0227	4/20/2011	5/5/2011
ARS1-B11-01647-04	ARS1-11-00895	001	g		0.730150687	278	1440	2	1440	0.213045776	1.0227	4/20/2011	5/5/2011
ARS1-B11-01647-05	ARS1-11-00895	002	g		0.6523581	279	1440	2	1440	0.223027632	1.1092	4/20/2011	5/5/2011
ARS1-B11-01647-05	ARS1-11-00895	002	g		0.6523581	2379	1440	4	1440	0.223027632	1.1092	4/20/2011	5/5/2011
ARS1-B11-01647-05	ARS1-11-00895	002	g		0.6523581	503	1440	2	1440	0.223027632	1.1092	4/20/2011	5/5/2011
ARS1-B11-01647-05	ARS1-11-00895	002	g		0.6523581	239	1440	6	1440	0.223027632	1.1092	4/20/2011	5/5/2011
ARS1-B11-01647-06	ARS1-11-00895	003	g		0.598394094	539	1440	2	1440	0.209818289	1.0785	4/20/2011	5/5/2011
ARS1-B11-01647-06	ARS1-11-00895	003	g		0.598394094	2044	1440	3	1440	0.209818289	1.0785	4/20/2011	5/5/2011
ARS1-B11-01647-06	ARS1-11-00895	003	g		0.598394094	2960	1440	10	1440	0.209818289	1.0785	4/20/2011	5/5/2011
ARS1-B11-01647-06	ARS1-11-00895	003	g		0.598394094	551	1440	2	1440	0.209818289	1.0785	4/20/2011	5/5/2011
ARS1-B11-01647-07	ARS1-11-00895	004	g		0.766863882	462	1440	1	1440	0.220569149	1.0607	4/19/2011	5/5/2011
ARS1-B11-01647-07	ARS1-11-00895	004	g		0.766863882	2752	1440	4	1440	0.220569149	1.0607	4/19/2011	5/5/2011
ARS1-B11-01647-07	ARS1-11-00895	004	g		0.766863882	602	1440	4	1440	0.220569149	1.0607	4/19/2011	5/5/2011
ARS1-B11-01647-07	ARS1-11-00895	004	g		0.766863882	472	1440	1	1440	0.220569149	1.0607	4/19/2011	5/5/2011
ARS1-B11-01647-08	ARS1-11-00895	005	g		0.703561096	183	1440	0	1440	0.219087392	1.0217	4/20/2011	5/5/2011
ARS1-B11-01647-08	ARS1-11-00895	005	g		0.703561096	2499	1440	0	1440	0.219087392	1.0217	4/20/2011	5/5/2011
ARS1-B11-01647-08	ARS1-11-00895	005	g		0.703561096	343	1440	2	1440	0.219087392	1.0217	4/20/2011	5/5/2011
ARS1-B11-01647-08	ARS1-11-00895	005	g		0.703561096	214	1440	3	1440	0.219087392	1.0217	4/20/2011	5/5/2011
ARS1-B11-01647-09	ARS1-11-00895	006	g		0.572036833	426	1440	2	1440	0.212396607	1.1082	4/20/2011	5/5/2011
ARS1-B11-01647-09	ARS1-11-00895	006	g		0.572036833	1977	1440	8	1440	0.212396607	1.1082	4/20/2011	5/5/2011
ARS1-B11-01647-09	ARS1-11-00895	006	g		0.572036833	370	1440	1	1440	0.212396607	1.1082	4/20/2011	5/5/2011
ARS1-B11-01647-09	ARS1-11-00895	006	g		0.572036833	393	1440	2	1440	0.212396607	1.1082	4/20/2011	5/5/2011
ARS1-B11-01647-10	ARS1-11-00895	007	g		0.678216877	239	1440	1	1440	0.215743065	1.0152	4/19/2011	5/5/2011
ARS1-B11-01647-10	ARS1-11-00895	007	g		0.678216877	2365	1440	2	1440	0.215743065	1.0152	4/19/2011	5/5/2011
ARS1-B11-01647-10	ARS1-11-00895	007	g		0.678216877	279	1440	2	1440	0.215743065	1.0152	4/19/2011	5/5/2011
ARS1-B11-01647-10	ARS1-11-00895	007	g		0.678216877	230	1440	4	1440	0.215743065	1.0152	4/19/2011	5/5/2011
ARS1-B11-01647-11	ARS1-11-00895	008	g		0.684834016	391	1440	4	1440	0.213233352	1.064	4/20/2011	5/5/2011
ARS1-B11-01647-11	ARS1-11-00895	008	g		0.684834016	2360	1440	5	1440	0.213233352	1.064	4/20/2011	5/5/2011
ARS1-B11-01647-11	ARS1-11-00895	008	g		0.684834016	802	1440	4	1440	0.213233352	1.064	4/20/2011	5/5/2011
ARS1-B11-01647-11	ARS1-11-00895	008	g		0.684834016	371	1440	7	1440	0.213233352	1.064	4/20/2011	5/5/2011
ARS1-B11-01647-12	ARS1-11-00895	009	g		0.698301305	553	1440	1	1440	0.219039932	1.0199	4/20/2011	5/5/2011
ARS1-B11-01647-12	ARS1-11-00895	009	g		0.698301305	2466	1440	3	1440	0.219039932	1.0199	4/20/2011	5/5/2011
ARS1-B11-01647-12	ARS1-11-00895	009	g		0.698301305	1983	1440	1	1440	0.219039932	1.0199	4/20/2011	5/5/2011
ARS1-B11-01647-12	ARS1-11-00895	009	g		0.698301305	496	1440	0	1440	0.219039932	1.0199	4/20/2011	5/5/2011
ARS1-B11-01647-13	ARS1-11-00895	010	g		0.707065264	242	1440	0	1440	0.21722503	1.0838	4/19/2011	5/5/2011
ARS1-B11-01647-13	ARS1-11-00895	010	g		0.707065264	2480	1440	7	1440	0.21722503	1.0838	4/19/2011	5/5/2011
ARS1-B11-01647-13	ARS1-11-00895	010	g		0.707065264	251	1440	10	1440	0.21722503	1.0838	4/19/2011	5/5/2011
ARS1-B11-01647-13	ARS1-11-00895	010	g		0.707065264	265	1440	7	1440	0.21722503	1.0838	4/19/2011	5/5/2011

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Batch Result Verification Report

ABatchSampleID	SDG	Fraction	BP_DL	BP_MDA	Sb_Val	UCF	CF	GrossCountRate	BKGCountRate	NetCountRate	PlatingRecovery	InstFileName	DetectorID	InstrumentkeV	NuclideAbd	TracerMeas.
ARS1-B11-01647-01					0.022082805	2.22	1.96				0.715	ApexAlpha	A_2_4A			
ARS1-B11-01647-01			0.075445343	0.156030993	0.071883495	2.22	1.96	1.745138889	0.001388889	1.74375	0.715	ApexAlpha	A_2_4A	49.10917282		
ARS1-B11-01647-01			0.132490624	0.269887672	0.126235693	2.22	1.96	2.427083333	0.002083333	2.425	0.715	ApexAlpha	A_2_4A	31.02458572		
ARS1-B11-01647-01			0.032605946	0.070536055	0.03106661	2.22	1.96	0.027083333	0.002777778	0.024305556	0.715	ApexAlpha	A_2_4A	5.700368881		
ARS1-B11-01647-02			0.023240167	0.051321588	0.022082805	2.22	1.96	0.000694444	0.001388889	-0.000694444	0.715	ApexAlpha	A_2_4B	4.910474777		
ARS1-B11-01647-02			0.075445343	0.155464892	0.071883495	2.22	1.96	1.913194444	0.004166667	1.909027778	0.715	ApexAlpha	A_2_4B	50.41350555		
ARS1-B11-01647-02			0.132490624	0.269320437	0.126235693	2.22	1.96	2.357638889	0.007638889	2.35	0.715	ApexAlpha	A_2_4B	29.97737694		
ARS1-B11-01647-02			0.032605946	0.069969955	0.03106661	2.22	1.96	0.040277778	0.032638889	0.007638889	0.715	ApexAlpha	A_2_4B			
ARS1-B11-01647-03			0.023240167	0.051643662	0.022082805	2.22	1.96	0.002777778	0	0.002777778	0.715	ApexAlpha	A_2_5A	4.889849663		
ARS1-B11-01647-03			0.075445343	0.155784163	0.071883495	2.22	1.96	1.857638889	0.002083333	1.855555556	0.715	ApexAlpha	A_2_5A	42.68838501		
ARS1-B11-01647-03			0.132490624	0.269640348	0.126235693	2.22	1.96	0.030555556	0.004166667	0.026388889	0.715	ApexAlpha	A_2_5A	7.334774494		
ARS1-B11-01647-03			0.032605946	0.070289226	0.03106661	2.22	1.96	0.002083333	0	0.002083333	0.715	ApexAlpha	A_2_5A	4.889849663		
ARS1-B11-01647-04	ARS1-11-00895	001	0.022994765	0.051330275	0.022082805	2.22	1.96	0.161805556	0.002083333	0.159722222	0.715	ApexAlpha	A_2_5B	25.94958878		
ARS1-B11-01647-04	ARS1-11-00895	001	0.073770974	0.152554041	0.071883495	2.22	1.96	1.765972222	0.001388889	1.764583333	0.715	ApexAlpha	A_2_5B	45.33880997		
ARS1-B11-01647-04	ARS1-11-00895	001	0.129549881	0.263883122	0.126235693	2.22	1.96	1.564583333	0.002083333	1.5625	0.715	ApexAlpha	A_2_5B	26.77484131		
ARS1-B11-01647-04	ARS1-11-00895	001	0.03188222	0.068956292	0.03106661	2.22	1.96	0.193055556	0.001388889	0.191666667	0.715	ApexAlpha	A_2_5B	18.91488647		
ARS1-B11-01647-05	ARS1-11-00895	002	0.021201538	0.047674158	0.022062805	2.22	1.96	0.19375	0.001388889	0.192361111	0.715	ApexAlpha	A_3_1A	24.01058388		
ARS1-B11-01647-05	ARS1-11-00895	002	0.068018009	0.140997016	0.071883495	2.22	1.96	1.652083333	0.002777778	1.649305556	0.715	ApexAlpha	A_3_1A	42.74464035		
ARS1-B11-01647-05	ARS1-11-00895	002	0.119447046	0.243644874	0.126235693	2.22	1.98	0.349305556	0.001388889	0.347916667	0.715	ApexAlpha	A_3_1A	14.36770821		
ARS1-B11-01647-05	ARS1-11-00895	002	0.029395913	0.063918564	0.03106661	2.22	1.98	0.165972222	0.004166667	0.161805556	0.715	ApexAlpha	A_3_1A	24.17536354		
ARS1-B11-01647-06	ARS1-11-00895	003	0.02180505	0.049907043	0.022082805	2.22	1.96	0.374305556	0.001388889	0.372916667	0.715	ApexAlpha	A_3_1B	26.97288513		
ARS1-B11-01647-06	ARS1-11-00895	003	0.069954173	0.145868551	0.071883495	2.22	1.96	1.419444444	0.002083333	1.417361111	0.715	ApexAlpha	A_3_1B	39.9537468		
ARS1-B11-01647-06	ARS1-11-00895	003	0.122847162	0.251440044	0.126235693	2.22	1.96	2.055555556	0.006944444	2.048611111	0.715	ApexAlpha	A_3_1B	30.49419785		
ARS1-B11-01647-06	ARS1-11-00895	003	0.030232681	0.066596021	0.03106661	2.22	1.96	0.382638889	0.001388889	0.38125	0.715	ApexAlpha	A_3_1B	37.24372864		
ARS1-B11-01647-07	ARS1-11-00895	004	0.022192985	0.049118673	0.022082805	2.22	1.96	0.320833333	0.000694444	0.320138889	0.715	ApexAlpha	A_3_2B	39.25505829		
ARS1-B11-01647-07	ARS1-11-00895	004	0.071128118	0.146675945	0.071883495	2.22	1.96	1.911111111	0.002777778	1.908333333	0.715	ApexAlpha	A_3_2B	61.57248306		
ARS1-B11-01647-07	ARS1-11-00895	004	0.124908709	0.25401576	0.126235693	2.22	1.96	0.418055556	0.002777778	0.415277778	0.715	ApexAlpha	A_3_2B	41.29672241		
ARS1-B11-01647-07	ARS1-11-00895	004	0.030740027	0.066073082	0.03106661	2.22	1.96	0.327777778	0.000694444	0.327083333	0.715	ApexAlpha	A_3_2B	28.52734184		
ARS1-B11-01647-08	ARS1-11-00895	005	0.023017271	0.051430468	0.022082805	2.22	1.96	0.127083333	0	0.127083333	0.715	ApexAlpha	A_3_3A	28.15198326		
ARS1-B11-01647-08	ARS1-11-00895	005	0.073843179	0.152752291	0.071883495	2.22	1.96	1.735416667	0	1.735416667	0.715	ApexAlpha	A_3_3A	45.02334595		
ARS1-B11-01647-08	ARS1-11-00895	005	0.12967668	0.264190434	0.126235693	2.22	1.96	0.238194444	0.001388889	0.236805556	0.715	ApexAlpha	A_3_3A	35.14909363		
ARS1-B11-01647-08	ARS1-11-00895	005	0.031913425	0.069072719	0.03106661	2.22	1.96	0.148611111	0.002083333	0.146527778	0.715	ApexAlpha	A_3_3A	34.75193024		
ARS1-B11-01647-09	ARS1-11-00895	006	0.02122067	0.048777108	0.022082805	2.22	1.96	0.295833333	0.001388889	0.294444444	0.715	ApexAlpha	A_3_3B	20.57688332		
ARS1-B11-01647-09	ARS1-11-00895	006	0.068079386	0.142162601	0.071883495	2.22	1.96	1.372916667	0.005555556	1.367361111	0.715	ApexAlpha	A_3_3B	35.814991		
ARS1-B11-01647-09	ARS1-11-00895	006	0.119554831	0.244905162	0.126235693	2.22	1.96	0.256944444	0.000694444	0.25625	0.715	ApexAlpha	A_3_3B	25.31498146		
ARS1-B11-01647-09	ARS1-11-00895	006	0.02942438	0.065014591	0.03106661	2.22	1.96	0.272916667	0.001388889	0.271527778	0.715	ApexAlpha	A_3_3B	34.51046371		
ARS1-B11-01647-10	ARS1-11-00895	007	0.023187647	0.052107024	0.022082805	2.22	1.96	0.165972222	0.000694444	0.165277778	0.715	ApexAlpha	A_3_4B	28.25423431		
ARS1-B11-01647-10	ARS1-11-00895	007	0.074315992	0.154019908	0.071883495	2.22	1.96	1.642361111	0.001388889	1.640972222	0.715	ApexAlpha	A_3_4B	41.05665207		
ARS1-B11-01647-10	ARS1-11-00895	007	0.130506961	0.2661721	0.126235693	2.22	1.96	0.19375	0.001388889	0.192361111	0.715	ApexAlpha	A_3_4B	23.88544273		
ARS1-B11-01647-10	ARS1-11-00895	007	0.032117756	0.069804522	0.03106661	2.22	1.96	0.159722222	0.002777778	0.156944444	0.715	ApexAlpha	A_3_4B	18.78171539		
ARS1-B11-01647-11	ARS1-11-00895	008	0.022102205	0.049678912	0.022082805	2.22	1.96	0.271527778	0.002777778	0.26875	0.715	ApexAlpha	A_3_5A	36.71587753		
ARS1-B11-01647-11	ARS1-11-00895	008	0.070907496	0.146966655	0.071883495	2.22	1.96	1.638888889	0.003472222	1.635416667	0.715	ApexAlpha	A_3_5A	55.79859543		
ARS1-B11-01647-11	ARS1-11-00895	008	0.124521301	0.253975078	0.126235693	2.22	1.96	0.556944444	0.002777778	0.554166667	0.715	ApexAlpha	A_3_5A	35.01737976		
ARS1-B11-01647-11	ARS1-11-00895	008	0.030644686	0.066613817	0.03106661	2.22	1.96	0.257638889	0.004861111	0.252777778	0.715	ApexAlpha	A_3_5A	34.94045258		
ARS1-B11-01647-12	ARS1-11-00895	009	0.023057894	0.051563899	0.022082805	2.22	1.96	0.384027778	0.000694444	0.383333333	0.715	ApexAlpha	A_3_6A	26.07896614		
ARS1-B11-01647-12	ARS1-11-00895	009	0.073973503	0.153063674	0.071883495	2.22	1.96	1.7125	0.002083333	1.710416667	0.715	ApexAlpha	A_3_6A	45.91628647		
ARS1-B11-01647-12	ARS1-11-00895	009	0.129905543	0.264698575	0.126235693	2.22	1.96	1.377083333	0.000694444	1.376388889	0.715	ApexAlpha	A_3_6A	31.45694542		
ARS1-B11-01647-12	ARS1-11-00895	009	0.031969748	0.069236418	0.03106661	2.22	1.96	0.344444444	0	0.344444444	0.715	ApexAlpha	A_3_6A	29.80042267		
ARS1-B11-01647-13	ARS1-11-00895	010	0.021719966	0.048550267	0.022082805	2.22	1.96	0.168055556	0	0.168055556	0.715	ApexAlpha	A_3_6B	24.91238785		
ARS1-B11-01647-13	ARS1-11-00895	010	0.069612101	0.144018008	0.071883495	2.22	1.96	1.722222222	0.004861111	1.717361111	0.715	ApexAlpha	A_3_6B	45.42248535		
ARS1-B11-01647-13	ARS1-11-00895	010	0.122246417	0.24907093	0.126235693	2.22	1.96	0.174305556	0.006944444	0.167361111	0.715	ApexAlpha	A_3_6B	19.59401321		
ARS1-B11-01647-13	ARS1-11-00895	010	0.030084837	0.065133104	0.03106661	2.22	1.96	0.184027778	0.004861111	0.179166667	0.715	ApexAlpha	A_3_6B	30.39453316		

35000642

Batch Result Verification Report

ABatchSampleID	SDG	Fraction	TracerKnownACT	TracerIsotope	TracerRefDate	TracerRefACT	TracerKnown	Halflife1	Halflife2	Halflife3	TPUF_1	TPUF_2	TPUF_3	TPUF_4	TPUF_5	TPUF_6	DeltaT1	Delta
ARS1-B11-01647-01				TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0		
ARS1-B11-01647-01				TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-01				TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-01				TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-02				TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-02				TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-02				TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-02				TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-03				TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-03				TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-03				TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-03				TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	2.742222222	
ARS1-B11-01647-04	ARS1-11-00895	001		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-04	ARS1-11-00895	001		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-04	ARS1-11-00895	001		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-04	ARS1-11-00895	001		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-05	ARS1-11-00895	002		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-05	ARS1-11-00895	002		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-05	ARS1-11-00895	002		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-05	ARS1-11-00895	002		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-06	ARS1-11-00895	003		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-06	ARS1-11-00895	003		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-06	ARS1-11-00895	003		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-06	ARS1-11-00895	003		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-07	ARS1-11-00895	004		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-07	ARS1-11-00895	004		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-07	ARS1-11-00895	004		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-07	ARS1-11-00895	004		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-08	ARS1-11-00895	005		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-08	ARS1-11-00895	005		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-08	ARS1-11-00895	005		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-08	ARS1-11-00895	005		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-09	ARS1-11-00895	006		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-09	ARS1-11-00895	006		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-09	ARS1-11-00895	006		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-09	ARS1-11-00895	006		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-10	ARS1-11-00895	007		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-10	ARS1-11-00895	007		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-10	ARS1-11-00895	007		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-10	ARS1-11-00895	007		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-11	ARS1-11-00895	008		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-11	ARS1-11-00895	008		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-11	ARS1-11-00895	008		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-11	ARS1-11-00895	008		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-12	ARS1-11-00895	009		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-12	ARS1-11-00895	009		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-12	ARS1-11-00895	009		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-12	ARS1-11-00895	009		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	14.66180556	
ARS1-B11-01647-13	ARS1-11-00895	010		TH-229	9/20/2010			698.3564815			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-13	ARS1-11-00895	010		TH-229	9/20/2010			2680555.556			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-13	ARS1-11-00895	010		TH-229	9/20/2010			27534722.22			0	0.02	0.05833	0	0	0	15.66180556	
ARS1-B11-01647-13	ARS1-11-00895	010		TH-229	9/20/2010			5.13194E+12			0	0.02	0.05833	0	0	0	15.66180556	

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Batch Result Verification Report

ABatchSampleID	SDG	Fraction	DeltaT3	DeltaT4	DeltaT5	DeltaT6	DF1	DF2	DF3	IF1	IF2	SysErr	K_Val	K_MDA	AnalysisCode	UserID	ModDate
ARS1-B11-01647-01																ABAILEY	5/6/2011
ARS1-B11-01647-01							0.999999291					0.061663514	0.344419434	495.9639849		ABAILEY	5/6/2011
ARS1-B11-01647-01							0.999999931					0.061663514	0.343730815	494.9723737		ABAILEY	5/6/2011
ARS1-B11-01647-01							1					0.061663514	0.344419678	495.9643366		ABAILEY	5/6/2011
ARS1-B11-01647-02							0.997281934					0.061663514	0.380883468	548.4721939		ABAILEY	5/6/2011
ARS1-B11-01647-02							0.999999291					0.061663514	0.384226645	553.286369		ABAILEY	5/6/2011
ARS1-B11-01647-02							0.999999931					0.061663514	0.383458437	552.1801497		ABAILEY	5/6/2011
ARS1-B11-01647-02							1					0.061663514	0.384226916	553.2867613		ABAILEY	5/6/2011
ARS1-B11-01647-03							0.997281934					0.061663514	0.357575318	514.9084573		ABAILEY	5/6/2011
ARS1-B11-01647-03							0.999999291					0.061663514	0.360713909	519.4280291		ABAILEY	5/6/2011
ARS1-B11-01647-03							0.999999931					0.061663514	0.359992712	518.3895049		ABAILEY	5/6/2011
ARS1-B11-01647-03							1					0.061663514	0.360714165	519.4283974		ABAILEY	5/6/2011
ARS1-B11-01647-04	ARS1-11-00895	001					0.985552937					0.061663514	0.345981596	498.213498	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-04	ARS1-11-00895	001					0.999996209					0.061663514	0.35317096	508.5662106	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-04	ARS1-11-00895	001					0.999999631					0.061663514	0.352465844	507.5508151	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-04	ARS1-11-00895	001					1					0.061663514	0.353172319	508.5681387	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-05	ARS1-11-00895	002					0.985552937					0.061663514	0.350973162	505.4013531	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-05	ARS1-11-00895	002					0.999996209					0.061663514	0.358266269	515.9034269	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-05	ARS1-11-00895	002					0.999999631					0.061663514	0.35755096	514.8733821	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-05	ARS1-11-00895	002					1					0.061663514	0.358267627	515.9053829	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-06	ARS1-11-00895	003					0.985552937					0.061663514	0.294489696	424.0651622	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-06	ARS1-11-00895	003					0.999996209					0.061663514	0.300609095	432.8770968	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-06	ARS1-11-00895	003					0.999999631					0.061663514	0.300008904	432.0128211	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-06	ARS1-11-00895	003					1					0.061663514	0.300610235	432.878738	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-07	ARS1-11-00895	004					0.984575221					0.061663514	0.389801836	561.3146436	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-07	ARS1-11-00895	004					0.99999595					0.061663514	0.398296817	573.5474158	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-07	ARS1-11-00895	004					0.999999606					0.061663514	0.397501676	572.4024134	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-07	ARS1-11-00895	004					1					0.061663514	0.39829843	573.5497386	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-08	ARS1-11-00895	005					0.985552937					0.061663514	0.342501053	493.201517	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-08	ARS1-11-00895	005					0.999996209					0.061663514	0.349618113	503.4500823	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-08	ARS1-11-00895	005					0.999999631					0.061663514	0.348920071	502.4449016	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-08	ARS1-11-00895	005					1					0.061663514	0.349619438	503.4519911	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-09	ARS1-11-00895	006					0.985552937					0.061663514	0.292825592	421.6688518	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-09	ARS1-11-00895	006					0.999996209					0.061663514	0.298910411	430.4309919	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-09	ARS1-11-00895	006					0.999999631					0.061663514	0.298313611	429.5715999	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-09	ARS1-11-00895	006					1					0.061663514	0.298911544	430.4326237	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-10	ARS1-11-00895	007					0.984575221					0.061663514	0.322734435	464.7375871	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-10	ARS1-11-00895	007					0.99999595					0.061663514	0.329767811	474.8656482	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-10	ARS1-11-00895	007					0.999999606					0.061663514	0.329109479	473.9176494	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-10	ARS1-11-00895	007					1					0.061663514	0.329769147	474.8675714	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-11	ARS1-11-00895	008					0.985552937					0.061663514	0.337910277	486.5907989	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-11	ARS1-11-00895	008					0.999996209					0.061663514	0.344931941	496.7019956	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-11	ARS1-11-00895	008					0.999999631					0.061663514	0.344243256	495.7102881	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-11	ARS1-11-00895	008					1					0.061663514	0.344933249	496.7038788	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-12	ARS1-11-00895	009					0.985552937					0.061663514	0.339268123	488.5460975	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-12	ARS1-11-00895	009					0.999996209					0.061663514	0.346318003	498.6979247	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-12	ARS1-11-00895	009					0.999999631					0.061663514	0.34562655	497.7022321	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-12	ARS1-11-00895	009					1					0.061663514	0.346319316	498.6998155	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-13	ARS1-11-00895	010					0.984575221					0.061663514	0.361665244	520.7979515	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-13	ARS1-11-00895	010					0.99999595					0.061663514	0.369547042	532.1477404	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-13	ARS1-11-00895	010					0.999999606					0.061663514	0.368809296	531.0853864	ASP-A-009	ABAILEY	5/6/2011
ARS1-B11-01647-13	ARS1-11-00895	010					1					0.061663514	0.369548539	532.1498955	ASP-A-009	ABAILEY	5/6/2011

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ARS1-B11-01647
TH-228

Data Point	Date	Value	LCL	LWL	Mean	UWL	UCL
1	06/21/10	0.02770	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
2	08/25/10	0.04561	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
3	09/01/10	0.03338	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
4	09/04/10	0.02630	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
5	09/04/10	0.00403	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
6	09/07/10	0.07760	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
7	09/14/10	0.02114	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
8	09/29/10	0.00921	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
9	10/06/10	0.00548	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
10	10/13/10	0.04427	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
11	10/19/10	0.07291	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
12	11/10/10	0.00398	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
13	12/08/10	0.06481	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
14	01/13/11	0.02716	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
15	01/24/11	0.02326	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
16	01/25/11	0.03179	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
17	01/31/11	0.01661	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
18	03/11/11	0.02413	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
19	04/26/11	0.00583	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638
20	05/05/11	0.01710	-0.037133	-0.0150502	0.0291154	0.073281	0.0953638

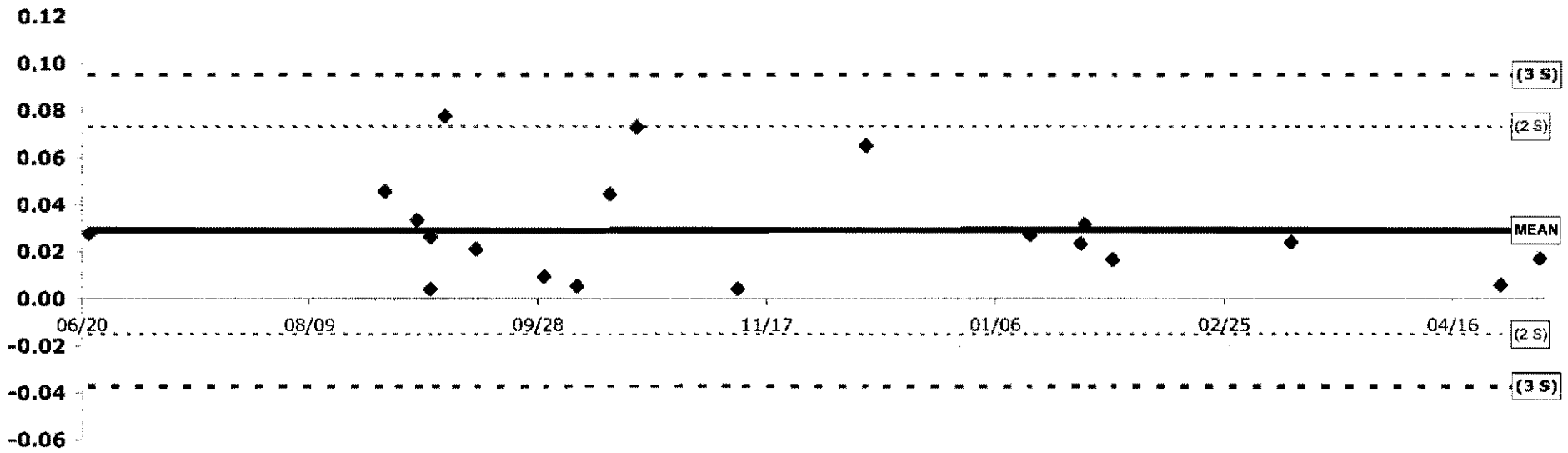
American Radiation Services
Baton Rouge Laboratory

Blank Population Analysis

		Statistical Quality Control(SQC) Rules Analysis	
Population Size	20		
Last Data Point Value	0.02	One or more points outside of the control limits.	OK
NSD	-0.5443	A run of eight points on one side of the center line	OK
Average	0.0291	2 of 3 consecutive points outside the Warning limits but still inside the Ctrl limits	OK
Upper Control Limit (UCL)	0.0954	Four of five consecutive points beyond the 1-sigma limits.	OK
Standard Deviation	0.0221	A trend of seven points in a row upward or downward.	OK
Lower Control Limit (LCL)	-0.0371	Several points near a warning or control limit.	OK

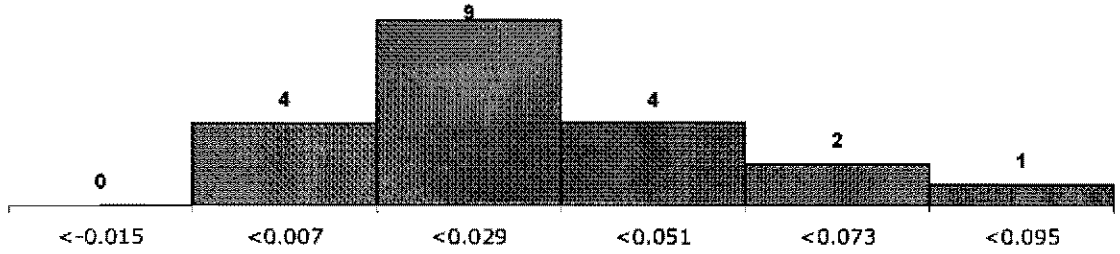
Batch ARS1-B11-01647 - BLK Population for Isotope - TH-228

Process Date Range: 06/21/10 - 05/05/11



Population Frequency Distribution (Histogram)

Bin	Frequency
<-0.015	0
<0.007	4
<0.029	9
<0.051	4
<0.073	2
<0.095	1



ARS INTERNATIONAL

Statistical Process Control

35000646

ARS1-B11-01647
TH-229

Data Point	Date	Value	LCL	LWL	Mean	UWL	UCL
1	06/21/10	11.24243	11.105837	11.1777202	11.321487	11.465254	11.537138
2	08/25/10	11.29530	11.105837	11.1777202	11.321487	11.465254	11.537138
3	09/01/10	11.23559	11.105837	11.1777202	11.321487	11.465254	11.537138
4	09/04/10	11.24995	11.105837	11.1777202	11.321487	11.465254	11.537138
5	09/04/10	11.24553	11.105837	11.1777202	11.321487	11.465254	11.537138
6	09/07/10	11.35495	11.105837	11.1777202	11.321487	11.465254	11.537138
7	09/14/10	11.22339	11.105837	11.1777202	11.321487	11.465254	11.537138
8	09/29/10	11.28856	11.105837	11.1777202	11.321487	11.465254	11.537138
9	10/06/10	11.35154	11.105837	11.1777202	11.321487	11.465254	11.537138
10	10/13/10	11.37363	11.105837	11.1777202	11.321487	11.465254	11.537138
11	10/19/10	11.29735	11.105837	11.1777202	11.321487	11.465254	11.537138
12	11/10/10	11.34149	11.105837	11.1777202	11.321487	11.465254	11.537138
13	12/08/10	11.30383	11.105837	11.1777202	11.321487	11.465254	11.537138
14	01/13/11	11.21420	11.105837	11.1777202	11.321487	11.465254	11.537138
15	01/24/11	11.39895	11.105837	11.1777202	11.321487	11.465254	11.537138
16	01/25/11	11.35413	11.105837	11.1777202	11.321487	11.465254	11.537138
17	01/31/11	11.37316	11.105837	11.1777202	11.321487	11.465254	11.537138
18	03/11/11	11.44811	11.105837	11.1777202	11.321487	11.465254	11.537138
19	04/26/11	11.41772	11.105837	11.1777202	11.321487	11.465254	11.537138
20	05/05/11	11.41994	11.105837	11.1777202	11.321487	11.465254	11.537138

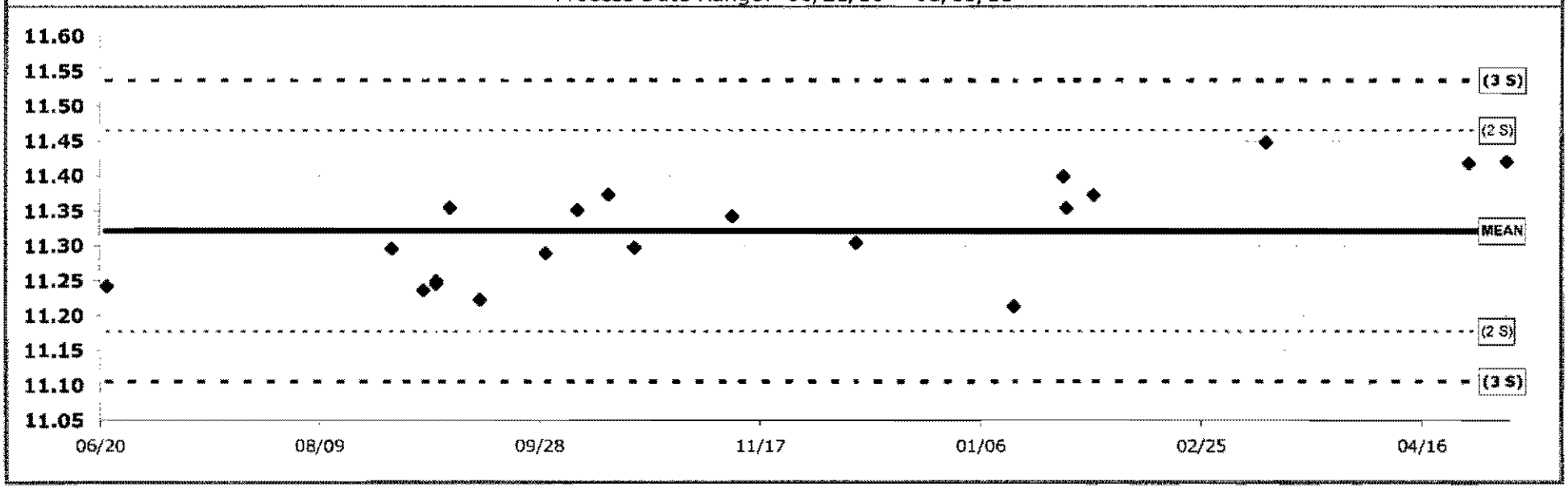
American Radiation Services
Baton Rouge Laboratory

Blank Population Analysis

		Statistical Quality Control(SQC) Rules Analysis	
Population Size	20		
Last Data Point Value	11.42	One or more points outside of the control limits.	OK
NSD	1.3696	A run of eight points on one side of the center line	OK
Average	11.3215	2 of 3 consecutive points outside the Warning limits but still inside the Ctrl limits	OK
Upper Control Limit (UCL)	11.5371	Four of five consecutive points beyond the 1-sigma limits.	OK
Standard Deviation	0.0719	A trend of seven points in a row upward or downward.	OK
Lower Control Limit (LCL)	11.1058	Several points near a warning or control limit.	OK

Batch ARS1-B11-01647 - BLK Population for Isotope - TH-229

Process Date Range: 06/21/10 - 05/05/11



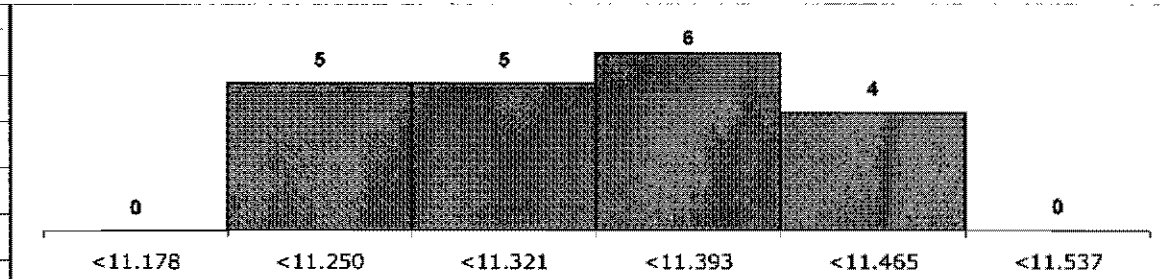
ARS INTERNATIONAL

Statistical Process Control

35000648

Bin	Frequency
<11.178	0
<11.250	5
<11.321	5
<11.393	6
<11.465	4
<11.537	0

Population Frequency Distribution (Histogram)



ARS1-B11-01647
TH-230

Data Point	Date	Value	LCL	LWL	Mean	UWL	UCL
1	06/21/10	0.07387	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
2	08/25/10	0.09121	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
3	09/01/10	0.07790	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
4	09/04/10	0.05259	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
5	09/04/10	0.08470	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
6	09/07/10	0.05888	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
7	09/14/10	0.05498	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
8	09/29/10	0.06448	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
9	10/06/10	0.08218	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
10	10/13/10	0.05634	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
11	10/19/10	0.32000	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
12	11/10/10	0.15718	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
13	12/08/10	0.04575	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
14	01/13/11	0.06337	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
15	01/24/11	0.02326	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
16	01/25/11	0.03179	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
17	01/31/11	0.07059	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
18	03/11/11	0.01034	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
19	04/26/11	0.56215	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063
20	05/05/11	0.16241	-0.271508	-0.14527212	0.1071993	0.3596706	0.4859063

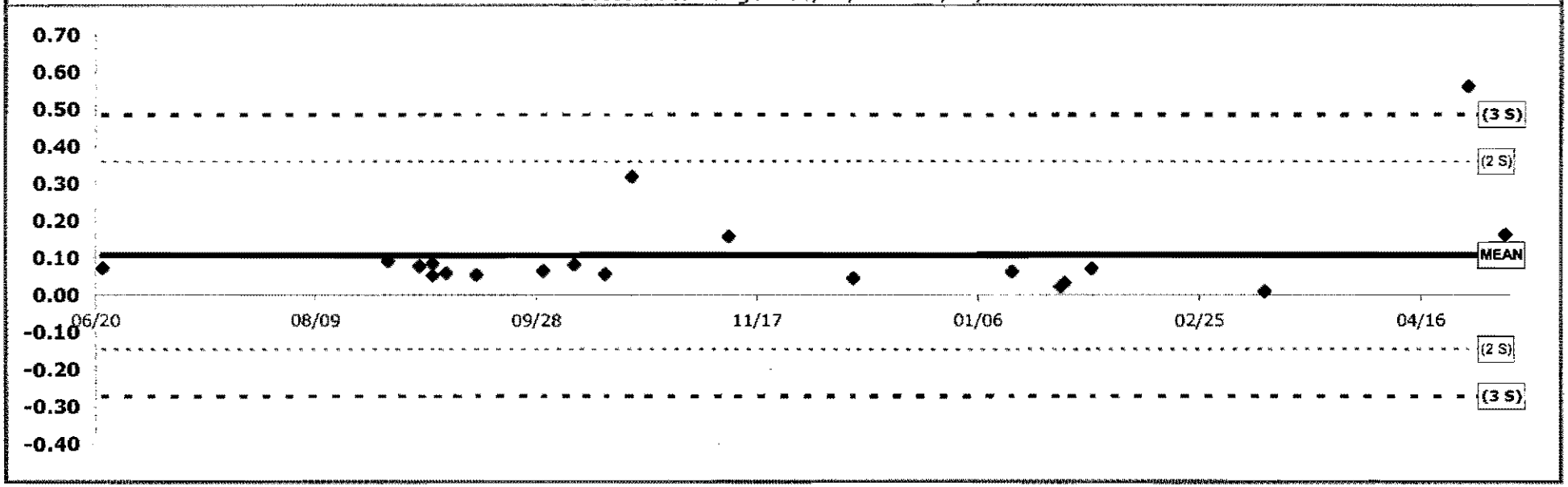
American Radiation Services
Baton Rouge Laboratory

Blank Population Analysis

		Statistical Quality Control(SQC) Rules Analysis	
Population Size	20		
Last Data Point Value	0.16	One or more points outside of the control limits.	OUT OF CONTROL
NSD	0.4374	A run of eight points on one side of the center line	INVESTIGATE
Average	0.1072	2 of 3 consecutive points outside the Warning limits but still inside the Ctrl limits	OK
Upper Control Limit (UCL)	0.4859	Four of five consecutive points beyond the 1-sigma limits.	OK
Standard Deviation	0.1262	A trend of seven points in a row upward or downward.	OK
Lower Control Limit (LCL)	-0.2715	Several points near a warning or control limit.	OK

Batch ARS1-B11-01647 - BLK Population for Isotope - TH-230

Process Date Range: 06/21/10 - 05/05/11



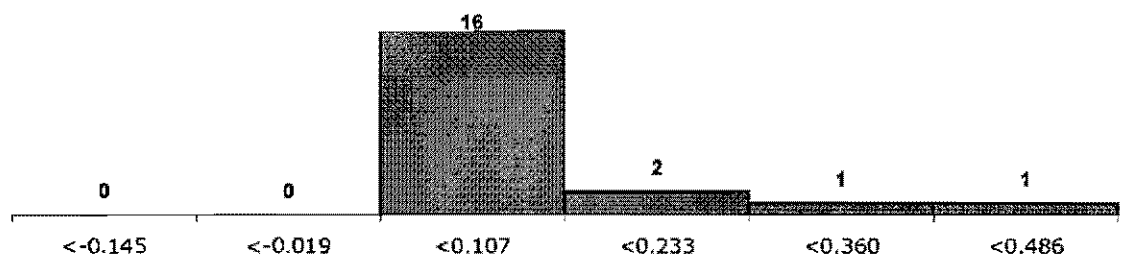
ARS INTERNATIONAL

Statistical Process Control

35000650

Population Frequency Distribution (Histogram)

Bin	Frequency
<-0.145	0
<-0.019	0
<0.107	16
<0.233	2
<0.360	1
<0.486	1



ARS1-B11-01647
TH-232

Data Point	Date	Value	LCL	LWL	Mean	UWL	UCL
1	06/21/10	0.00462	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
2	08/25/10	0.01520	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
3	09/01/10	0.02226	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
4	09/04/10	0.10518	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
5	09/04/10	0.02420	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
6	09/07/10	0.09881	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
7	09/14/10	0.01692	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
8	09/29/10	0.02303	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
9	10/06/10	0.01644	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
10	10/13/10	-0.00402	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
11	10/19/10	-0.01215	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
12	11/10/10	0.00403	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
13	12/08/10	0.00000	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
14	01/13/11	0.01132	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
15	01/24/11	-0.01861	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
16	01/25/11	0.00795	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
17	01/31/11	-0.00415	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
18	03/11/11	0.01379	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
19	04/26/11	0.01748	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545
20	05/05/11	0.01282	-0.075445	-0.04437858	0.0177546	0.0798879	0.1109545

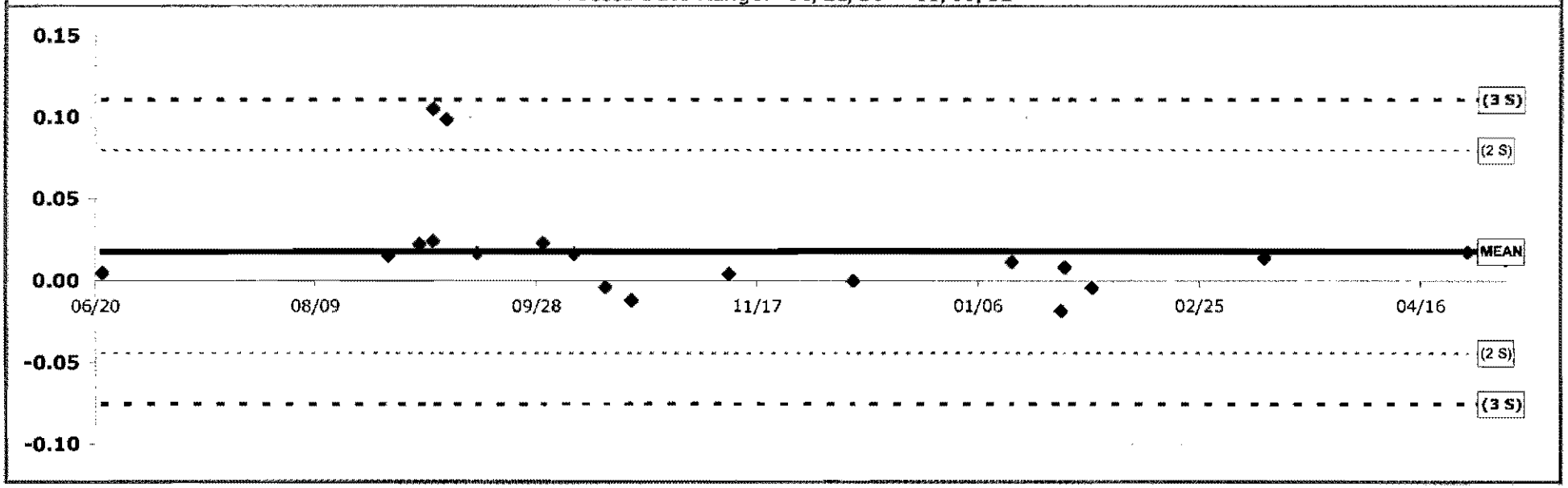
American Radiation Services
Baton Rouge Laboratory

Blank Population Analysis

		Statistical Quality Control(SQC) Rules Analysis	
Population Size	20		
Last Data Point Value	0.01	One or more points outside of the control limits.	OK
NSD	-0.1588	A run of eight points on one side of the center line	INVESTIGATE
Average	0.0178	2 of 3 consecutive points outside the Warning limits but still inside the Ctrl limits	INVESTIGATE
Upper Control Limit (UCL)	0.1110	Four of five consecutive points beyond the 1-sigma limits.	OK
Standard Deviation	0.0311	A trend of seven points in a row upward or downward.	OK
Lower Control Limit (LCL)	-0.0754	Several points near a warning or control limit.	INVESTIGATE

Batch ARS1-B11-01647 - BLK Population for Isotope - TH-232

Process Date Range: 06/21/10 - 05/05/11

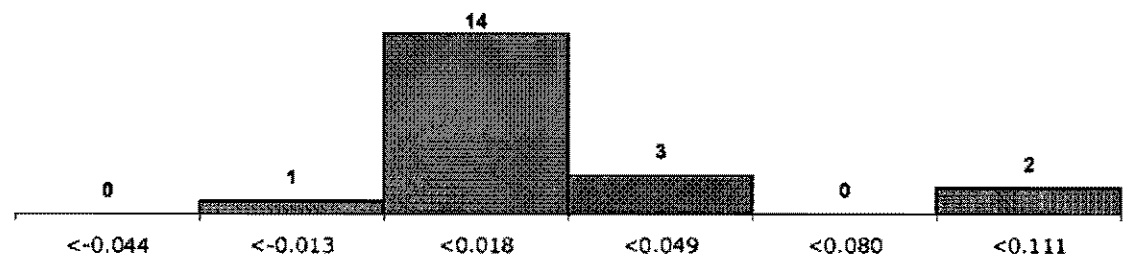


ARS INTERNATIONAL

Statistical Process Control

Bin	Frequency
<-0.044	0
<-0.013	1
<0.018	14
<0.049	3
<0.080	0
<0.111	2

Population Frequency Distribution (Histogram)



35000652

Alpha Spectroscopy Count Log Book – Canberra System

Sample Number	Batch Number	Chamber Number	Spectrum Number	Type of Analysis	Analysis Date and Time	Analyst Initials	Count Time (seconds)
11-01657-04	B11-01657	A12B	12139	Th	5-5-11 0353	[illegible]	86400
11-01657-05	↓	A13A	12140	↓	↓	[illegible]	↓
11-01657-06	↓	A13B	12141	↓	↓	[illegible]	↓
11-01657-07	↓	A14A [illegible] ~~A12~~ 5-5-11	~~12143~~ 12142 [illegible] 5-6-11	↓	↓	[illegible]	↓
11-01657-08	↓	A14B	12143	↓	↓	[illegible]	↓
11-01657-09	↓	A15A	12144	↓	↓	[illegible]	↓
11-01657-10	↓	A15B	12145	↓	↓	[illegible]	↓
11-01657-11	↓	A16A	12146	↓	↓	[illegible]	↓
11-01657-12	↓	A16B	12147	↓	↓	[illegible]	↓
11-01657-13	↓	[illegible] 5-5-11 A21A ~~A21B~~	12148	↓	↓	[illegible]	↓
11-01657-14	↓	[illegible] 5-5-11 A21B ~~A22A~~	12149	↓	↓	[illegible]	↓
11-01657-15	↓	A22A	12150	↓	↓	[illegible]	↓
11-01657-16	↓	A23B	12151	↓	↓	[illegible]	↓
11-01647-01	B11-01647	A24A	12152	↓	↓	[illegible]	↓
11-01647-02	↓	A24B	12154	↓	↓	[illegible]	↓

35000653

Reviewed By: LSW Date: 5-10-11
Initials

Alpha Spectroscopy Count Log Book – Canberra System

Sample Number	Batch Number	Chamber Number	Spectrum Number	Type of Analysis	Analysis Date and Time	Analyst Initials	Count Time (seconds)
11-01647-03	B11-01647	A25A	12155	Th	5-5-11 0553	[illegible]	86400
11-01647-04	↓	A25B	12156	↓	↓	[illegible]	↓
11-01647-05	↓	A31A	12157	↓	↓	[illegible]	↓
11-01647-06	↓	A31B	12158	↓	↓	[illegible]	↓
11-01647-07	↓	A32B	12159	↓	↓	[illegible]	↓
11-01647-08	↓	A33A	12160	↓	↓	[illegible]	↓
11-01647-09	↓	A33B	12161	↓	↓	[illegible]	↓
11-01647-10	↓	A34B	12162	↓	↓	[illegible]	↓
11-01647-11	↓	A35A	12163	↓	↓	[illegible]	↓
11-01647-12	↓	A36A	12164	↓	↓	[illegible]	↓
11-01647-13	↓	A36B	12165	↓	↓	[illegible]	↓
11-01660-01	B11-01660	A11A	12169	↓	5-6-11 1053	[illegible]	↓
11-01660-02	↓	A11B	12193	↓	↓	[illegible]	↓
11-01660-03	↓	A12A	12192	↓	↓	[illegible]	↓
11-01660-04	↓	A12B	12191	↓	↓	[illegible]	↓

35000654

Reviewed By: LSW Date: 5-10-11
Initials

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American Radiation Services Analytical Reports

for

Summit Environmental Technologies

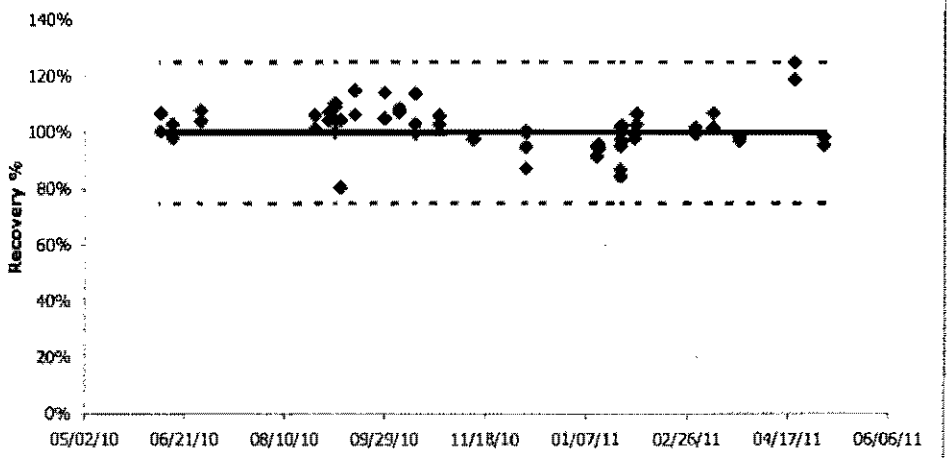
Thorium Alpha Spectroscopy Control Charts

35000655

American Radiation Services
Baton Rouge Laboratory

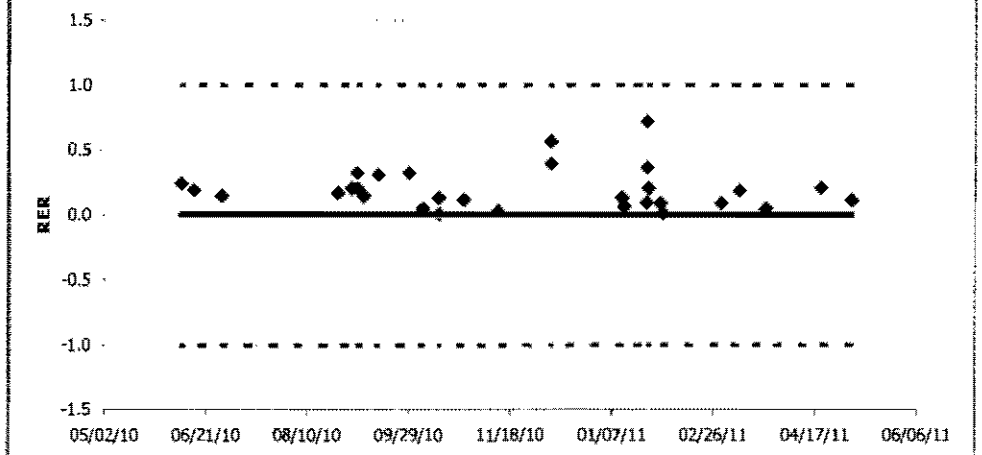
QC Chart

Th LCS



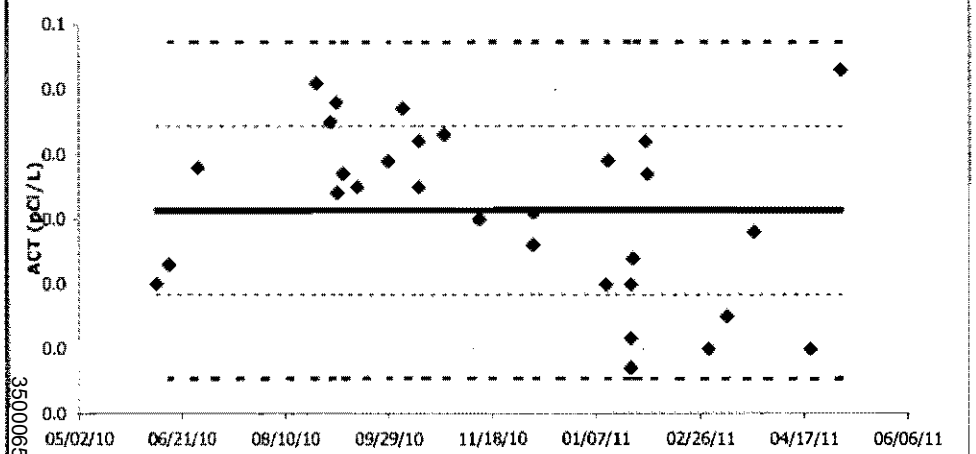
Average	STDEV	n	UCL	LCL
1.0189	0.0783	30	1.2500	0.7500

Th RER



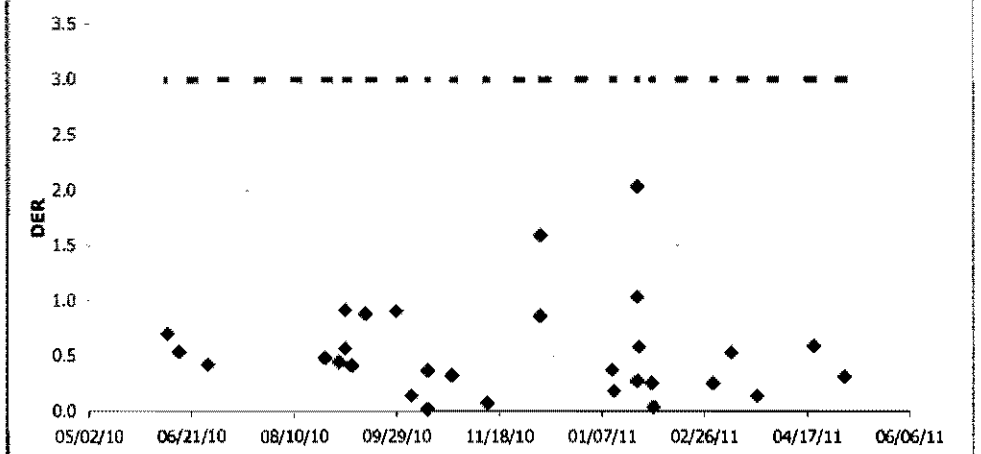
		n	UCL	LCL
		30	1.0000	-1.0000

Th Blank



Average	STDEV	n	UCL	LCL
0.0214	0.0130	30	0.0473	-0.0046

Th DER



		n	UCL	
		30	3.0000	

35000656

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American Radiation Services Analytical Reports

for

Summit Environmental Technologies

Alpha Spectroscopy Calibration Information

35000657

Alpha Calibration Report 2/24/2011 11:37:29

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008038.cn
Detector Name: A_1_1A
Chamber Serial Number: 10043743A
Detector Serial Number: 57895
Geometry Description: Shelf 2

Energy Calibration: 4/9/2010 20:07:25 by Countroom
Shape Calibration: 4/9/2010 20:07:25 by Countroom
Efficiency Calibration: 4/9/2010 20:56:03 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\62919A-526

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.994 MeV + 4.8826E-003*ch
FWHM = 5.7654E-002 MeV
Low Tail = 1.6117E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	247.40	0.1602	12.16	0.4148	3.34	0.3168
4.775	364.50	0.1651	11.24	0.4134	2.51	0.2370
5.157	442.28	0.0962	10.40	0.2462	2.72	0.1765
5.486	510.34	0.0604	12.45	0.1619	4.66	0.2048

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2125
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1281E-001	8.76E-003
4.775	2.0826E-001	8.58E-003
5.157	2.1141E-001	8.70E-003
5.486	2.1776E-001	8.96E-003

Alpha Calibration Report 2/24/2011 11:37:39

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008039.cn
Detector Name: A_1_1B
Chamber Serial Number: 10043743B
Detector Serial Number: 57896
Geometry Description: Shelf 2

Energy Calibration: 4/9/2010 20:07:23 by Countroom
Shape Calibration: 4/9/2010 20:07:23 by Countroom
Efficiency Calibration: 4/9/2010 20:56:53 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70719-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.987 MeV + 4.8833E-003*ch
FWHM = 6.0195E-002 MeV
Low Tail = 1.4244E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.48	0.2084	14.04	0.5381	3.84	0.4115
4.775	365.76	0.2480	12.68	0.6162	2.72	0.3372
5.157	443.89	0.1604	10.72	0.3957	2.27	0.2129
5.486	511.75	0.1078	12.59	0.2771	3.35	0.2043

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.1922
Uncertainty: +/- 0.0040

Energy (MeV)	Efficiency	Error
4.198	1.9170E-001	7.90E-003
4.775	1.9452E-001	8.02E-003
5.157	1.9294E-001	7.95E-003
5.486	1.8977E-001	7.82E-003

Alpha Calibration Report 2/24/2011 11:37:45

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008040.cn
Detector Name: A_1_2A
Chamber Serial Number: 10043744A
Detector Serial Number: 57897
Geometry Description: Shelf 2

Energy Calibration: 4/9/2010 20:07:21 by Countroom
Shape Calibration: 4/9/2010 20:07:21 by Countroom
Efficiency Calibration: 4/9/2010 20:57:28 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70720-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.977 MeV + 4.9125E-003*ch
FWHM = 5.6717E-002 MeV
Low Tail = 1.1572E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.85	0.2425	12.69	0.6064	2.82	0.3470
4.775	366.26	0.2711	10.35	0.6342	1.63	0.2370
5.157	443.16	0.1640	10.35	0.4064	2.17	0.2143
5.486	510.85	0.1463	12.55	0.3761	3.37	0.2785

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2164
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1893E-001	8.99E-003
4.775	2.1235E-001	8.73E-003
5.157	2.1768E-001	8.94E-003
5.486	2.1681E-001	8.91E-003

Alpha Calibration Report 2/24/2011 11:37:52

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008041.cn
Detector Name: A_1_2B
Chamber Serial Number: 10043744B
Detector Serial Number: 57898
Geometry Description: Shelf 2

Energy Calibration: 4/9/2010 20:07:19 by Countroom
Shape Calibration: 4/9/2010 20:07:19 by Countroom
Efficiency Calibration: 4/9/2010 20:58:18 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70721-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.987 MeV + 4.8889E-003*ch
FWHM = 5.9682E-002 MeV
Low Tail = 1.3980E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.38	0.2286	12.68	0.5722	2.91	0.3425
4.775	365.30	0.2707	12.25	0.6691	2.61	0.3646
5.157	443.34	0.1612	10.52	0.4021	2.30	0.2238
5.486	511.25	0.1282	13.21	0.3346	3.90	0.2863

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2196
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.2324E-001	9.16E-003
4.775	2.1019E-001	8.64E-003
5.157	2.2270E-001	9.14E-003
5.486	2.2328E-001	9.17E-003

Alpha Calibration Report 2/24/2011 11:37:58

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008046.cn
Detector Name: A_1_3A
Chamber Serial Number: 10043745A
Detector Serial Number: 57907
Geometry Description: Shelf 2

Energy Calibration: 4/10/2010 04:25:21 by Countroom
Shape Calibration: 4/10/2010 04:25:21 by Countroom
Efficiency Calibration: 4/11/2010 09:13:21 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\62919A-526

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.980 MeV + 4.9113E-003*ch
FWHM = 4.9657E-002 MeV
Low Tail = 1.0633E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.68	0.1668	9.38	0.4059	1.80	0.1915
4.775	365.32	0.2136	9.66	0.5138	1.80	0.2335
5.157	442.69	0.1250	9.10	0.3121	2.07	0.1844
5.486	510.49	0.1062	11.42	0.2816	3.77	0.2876

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2122
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1425E-001	8.81E-003
4.775	2.1233E-001	8.74E-003
5.157	2.0801E-001	8.57E-003
5.486	2.1434E-001	8.82E-003

Alpha Calibration Report 2/24/2011 11:38:04

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008047.cn
Detector Name: A_1_3B
Chamber Serial Number: 10043745B
Detector Serial Number: 57908
Geometry Description: Shelf 2

Energy Calibration: 4/10/2010 04:25:19 by Countroom
Shape Calibration: 4/10/2010 04:25:19 by Countroom
Efficiency Calibration: 4/11/2010 09:13:55 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70719-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.976 MeV + 4.9138E-003*ch
FWHM = 5.5624E-002 MeV
Low Tail = 1.1330E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.30	0.2335	10.97	0.5638	2.06	0.2590
4.775	365.46	0.2546	11.48	0.6198	2.25	0.3011
5.157	443.37	0.1808	9.78	0.4378	1.88	0.2079
5.486	510.82	0.1427	12.50	0.3680	3.42	0.2808

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2061
Uncertainty: +/- 0.0042

Energy (MeV)	Efficiency	Error
4.198	2.0722E-001	8.52E-003
4.775	2.0660E-001	8.50E-003
5.157	2.0655E-001	8.49E-003
5.486	2.0413E-001	8.40E-003

Alpha Calibration Report 2/24/2011 11:38:10

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008048.cn
Detector Name: A_1_4A
Chamber Serial Number: 10043746A
Detector Serial Number: 57909
Geometry Description: Shelf 2

Energy Calibration: 4/10/2010 04:25:18 by Countroom
Shape Calibration: 4/10/2010 04:25:18 by Countroom
Efficiency Calibration: 4/11/2010 09:14:49 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70720-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.978 MeV + 4.9105E-003*ch
FWHM = 6.1770E-002 MeV
Low Tail = 1.4252E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.64	0.2563	13.20	0.6451	3.14	0.4035
4.775	365.77	0.3055	11.78	0.7376	2.24	0.3424
5.157	443.45	0.1886	10.35	0.4610	2.09	0.2324
5.486	510.66	0.1040	13.37	0.2745	4.27	0.2665

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2259
Uncertainty: +/- 0.0046

Energy (MeV)	Efficiency	Error
4.198	2.2669E-001	9.30E-003
4.775	2.2972E-001	9.43E-003
5.157	2.2620E-001	9.28E-003
5.486	2.2142E-001	9.09E-003

Alpha Calibration Report 2/24/2011 11:38:16

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008049.cn
Detector Name: A_1_4B
Chamber Serial Number: 10043746B
Detector Serial Number: 57910
Geometry Description: Shelf 2

Energy Calibration: 4/10/2010 04:25:17 by Countroom
Shape Calibration: 4/10/2010 04:25:17 by Countroom
Efficiency Calibration: 4/11/2010 09:15:19 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70721-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.983 MeV + 4.8903E-003*ch
FWHM = 6.1459E-002 MeV
Low Tail = 1.4881E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.90	0.2617	14.07	0.6789	3.91	0.5283
4.775	366.20	0.2507	12.28	0.6192	2.63	0.3381
5.157	444.23	0.1492	10.51	0.3722	2.31	0.2086
5.486	511.79	0.1047	13.52	0.2778	4.49	0.2876

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2164
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1779E-001	8.95E-003
4.775	2.1023E-001	8.64E-003
5.157	2.1880E-001	8.98E-003
5.486	2.1948E-001	9.02E-003

Alpha Calibration Report 2/24/2011 11:38:22

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008054.cn
Detector Name: A_1_5A
Chamber Serial Number: 10043747A
Detector Serial Number: 57911
Geometry Description: Shelf 2

Energy Calibration: 4/11/2010 17:28:41 by Countroom
Shape Calibration: 4/11/2010 17:28:41 by Countroom
Efficiency Calibration: 4/11/2010 18:32:55 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\62919A-526

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.984 MeV + 4.8897E-003*ch
FWHM = 5.1623E-002 MeV
Low Tail = 1.1344E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.03	0.1877	10.55	0.4664	2.32	0.2634
4.775	366.42	0.1888	9.07	0.4492	1.54	0.1819
5.157	443.58	0.1267	9.77	0.3224	2.42	0.2140
5.486	511.89	0.0975	11.56	0.2593	3.85	0.2678

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2092
Uncertainty: +/- 0.0043

Energy (MeV)	Efficiency	Error
4.198	2.0798E-001	8.56E-003
4.775	2.0844E-001	8.59E-003
5.157	2.1016E-001	8.65E-003
5.486	2.1030E-001	8.66E-003

Alpha Calibration Report 2/24/2011 11:38:28

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008055.cn
Detector Name: A_1_5B
Chamber Serial Number: 10043747B
Detector Serial Number: 57912
Geometry Description: Shelf 2

Energy Calibration: 4/11/2010 17:28:40 by Countroom
Shape Calibration: 4/11/2010 17:28:40 by Countroom
Efficiency Calibration: 4/11/2010 18:33:27 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70719-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.983 MeV + 4.9065E-003*ch
FWHM = 5.5961E-002 MeV
Low Tail = 1.1378E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.00	0.2314	12.16	0.5731	2.64	0.3181
4.775	365.10	0.2336	10.43	0.5549	1.79	0.2285
5.157	442.90	0.1554	9.44	0.3765	1.77	0.1730
5.486	510.17	0.1051	12.51	0.2737	3.62	0.2274

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2047
Uncertainty: +/- 0.0042

Energy (MeV)	Efficiency	Error
4.198	2.0623E-001	8.48E-003
4.775	2.0457E-001	8.42E-003
5.157	2.0543E-001	8.45E-003
5.486	2.0278E-001	8.34E-003

Alpha Calibration Report 2/24/2011 11:38:34

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008056.cn
Detector Name: A_1_6A
Chamber Serial Number: 10043748A
Detector Serial Number: 57913
Geometry Description: Shelf 2

Energy Calibration: 4/11/2010 17:28:38 by Countroom
Shape Calibration: 4/11/2010 17:28:38 by Countroom
Efficiency Calibration: 4/11/2010 18:33:56 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70720-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.984 MeV + 4.8861E-003*ch
FWHM = 6.0193E-002 MeV
Low Tail = 1.5559E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.33	0.2342	13.18	0.5906	3.12	0.3682
4.775	365.93	0.2966	12.72	0.7289	2.64	0.3815
5.157	443.99	0.1659	10.60	0.4080	2.18	0.2105
5.486	511.96	0.0547	12.36	0.0752	3.28	0.0580

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2250
Uncertainty: +/- 0.0046

Energy (MeV)	Efficiency	Error
4.198	2.2625E-001	9.28E-003
4.775	2.2317E-001	9.17E-003
5.157	2.2747E-001	9.33E-003
5.486	2.2324E-001	9.16E-003

Alpha Calibration Report 2/24/2011 11:38:41

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008057.cn
Detector Name: A_1_6B
Chamber Serial Number: 10043748B
Detector Serial Number: 57914
Geometry Description: Shelf 2

Energy Calibration: 4/11/2010 17:28:37 by Countroom
Shape Calibration: 4/11/2010 17:28:37 by Countroom
Efficiency Calibration: 4/11/2010 18:34:27 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70721-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.980 MeV + 4.8993E-003*ch
FWHM = 5.9778E-002 MeV
Low Tail = 1.3391E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.58	0.2586	11.58	0.6258	2.21	0.2944
4.775	365.94	0.2326	11.57	0.5651	2.25	0.2726
5.157	443.70	0.1830	10.72	0.4510	2.27	0.2424
5.486	511.53	0.1042	13.00	0.2724	3.85	0.2333

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2243
Uncertainty: +/- 0.0046

Energy (MeV)	Efficiency	Error
4.198	2.2589E-001	9.27E-003
4.775	2.2008E-001	9.04E-003
5.157	2.2431E-001	9.20E-003
5.486	2.2718E-001	9.32E-003

Alpha Calibration Report 2/24/2011 11:38:46

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008062.cn
Detector Name: A_2_1A
Chamber Serial Number: 12044979A
Detector Serial Number: 55794
Geometry Description: Shelf 2

Energy Calibration: 4/12/2010 01:36:29 by Countroom
Shape Calibration: 4/12/2010 01:36:29 by Countroom
Efficiency Calibration: 4/12/2010 10:36:04 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\62919A-526

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.976 MeV + 4.9081E-003*ch
FWHM = 4.9742E-002 MeV
Low Tail = 1.1055E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.76	0.1868	10.25	0.4602	2.16	0.2460
4.775	366.46	0.1968	9.22	0.4711	1.63	0.2009
5.157	443.65	0.1188	8.63	0.2934	1.80	0.1541
5.486	511.43	0.0731	10.91	0.1914	3.25	0.1667

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2205
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.2008E-001	9.05E-003
4.775	2.1744E-001	8.95E-003
5.157	2.2335E-001	9.18E-003
5.486	2.2138E-001	9.10E-003

Alpha Calibration Report 2/24/2011 11:38:53

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008081.cn
Detector Name: A_2_1B
Chamber Serial Number: 12044979B
Detector Serial Number: 55795
Geometry Description: Shelf 2

Energy Calibration: 4/13/2010 02:51:58 by Countroom
Shape Calibration: 4/13/2010 02:51:58 by Countroom
Efficiency Calibration: 4/13/2010 09:49:08 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70719-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.990 MeV + 4.8791E-003*ch
FWHM = 5.7970E-002 MeV
Low Tail = 1.2280E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.13	0.2401	11.49	0.5867	2.28	0.2902
4.775	365.58	0.2491	10.98	0.5966	1.98	0.2617
5.157	443.76	0.1754	10.10	0.4278	1.99	0.2095
5.486	511.60	0.1069	12.93	0.2797	3.84	0.2418

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2148
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1391E-001	8.79E-003
4.775	2.1624E-001	8.89E-003
5.157	2.1645E-001	8.89E-003
5.486	2.1258E-001	8.74E-003

Alpha Calibration Report 2/24/2011 11:38:59

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008064.cn
Detector Name: A_2_2A
Chamber Serial Number: 12044980A
Detector Serial Number: 55796
Geometry Description: Shelf 2

Energy Calibration: 4/12/2010 02:27:31 by Countroom
Shape Calibration: 4/12/2010 02:27:31 by Countroom
Efficiency Calibration: 4/12/2010 10:37:23 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70720-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.980 MeV + 4.9030E-003*ch
FWHM = 6.3766E-002 MeV
Low Tail = 1.5838E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.81	0.2348	14.09	0.6039	3.74	0.4427
4.775	365.84	0.2834	12.45	0.6928	2.54	0.3502
5.157	443.48	0.1886	11.05	0.4709	2.43	0.2654
5.486	511.07	0.1062	13.55	0.2794	4.12	0.2494

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2232
Uncertainty: +/- 0.0046

Energy (MeV)	Efficiency	Error
4.198	2.2518E-001	9.24E-003
4.775	2.2476E-001	9.23E-003
5.157	2.2219E-001	9.12E-003
5.486	2.2075E-001	9.06E-003

Alpha Calibration Report 2/24/2011 11:39:06

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008065.cn
Detector Name: A_2_2B
Chamber Serial Number: 12044980B
Detector Serial Number: 55797
Geometry Description: Shelf 2

Energy Calibration: 4/12/2010 02:27:35 by Countroom
Shape Calibration: 4/12/2010 02:27:35 by Countroom
Efficiency Calibration: 4/12/2010 10:38:36 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70721-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 3.011 MeV + 4.8460E-003*ch
FWHM = 5.9319E-002 MeV
Low Tail = 1.3484E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	245.56	0.2490	12.77	0.6251	2.97	0.3816
4.775	363.41	0.2480	12.22	0.6095	2.48	0.3112
5.157	442.44	0.1779	10.28	0.4331	2.05	0.2150
5.486	510.65	0.1089	12.98	0.2848	3.83	0.2444

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2199
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.2099E-001	9.07E-003
4.775	2.1343E-001	8.77E-003
5.157	2.2116E-001	9.08E-003
5.486	2.2441E-001	9.21E-003

Alpha Calibration Report 2/24/2011 11:39:12

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008513.cn
Detector Name: A_2_3A
Chamber Serial Number: 12044981A
Detector Serial Number: 55798
Geometry Description: Shelf 2

Energy Calibration: 5/21/2010 18:14:32 by test
Shape Calibration: 5/21/2010 18:14:32 by test
Efficiency Calibration: 5/24/2010 08:34:35 by test
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\62919A-526

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 3.000 MeV + 4.9151E-003*ch
FWHM = 5.0565E-002 MeV
Low Tail = 1.1431E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	244.76	0.1645	10.27	0.4056	2.18	0.2184
4.775	360.70	0.1879	10.29	0.4605	2.12	0.2386
5.157	438.31	0.1171	8.95	0.2888	1.92	0.1570
5.486	506.04	0.0918	11.22	0.2412	3.48	0.2225

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2188
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.2301E-001	9.16E-003
4.775	2.1742E-001	8.95E-003
5.157	2.1724E-001	8.93E-003
5.486	2.1778E-001	8.96E-003

Alpha Calibration Report 2/24/2011 11:39:18

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008514.cn
Detector Name: A_2_3B
Chamber Serial Number: 12044981B
Detector Serial Number: 55799
Geometry Description: Shelf 2

Energy Calibration: 5/21/2010 18:14:43 by test
Shape Calibration: 5/21/2010 18:14:43 by test
Efficiency Calibration: 5/24/2010 08:35:23 by test
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70719-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.996 MeV + 4.9199E-003*ch
FWHM = 6.0350E-002 MeV
Low Tail = 1.3732E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	244.47	0.2346	12.48	0.5854	2.81	0.3415
4.775	361.87	0.2679	10.34	0.6327	1.68	0.2451
5.157	438.44	0.2013	10.93	0.5045	2.44	0.2902
5.486	506.05	0.0939	12.84	0.2457	3.82	0.2132

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2134
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1364E-001	8.78E-003
4.775	2.1437E-001	8.82E-003
5.157	2.1494E-001	8.83E-003
5.486	2.1081E-001	8.67E-003

Alpha Calibration Report 2/24/2011 11:39:24

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008082.cn
Detector Name: A_2_4A
Chamber Serial Number: 12044982A
Detector Serial Number: 55800
Geometry Description: Shelf 2

Energy Calibration: 4/12/2010 17:41:27 by Countroom
Shape Calibration: 4/12/2010 17:41:27 by Countroom
Efficiency Calibration: 4/13/2010 09:49:41 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70720-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.986 MeV + 4.8860E-003*ch
FWHM = 5.8711E-002 MeV
Low Tail = 1.3220E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.15	0.2425	13.53	0.6145	3.28	0.3958
4.775	365.66	0.2464	12.84	0.6125	2.81	0.3416
5.157	443.85	0.1716	10.82	0.4211	2.23	0.2182
5.486	511.92	0.1374	12.09	0.3502	3.00	0.2332

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2250
Uncertainty: +/- 0.0046

Energy (MeV)	Efficiency	Error
4.198	2.2869E-001	9.38E-003
4.775	2.2368E-001	9.19E-003
5.157	2.2797E-001	9.35E-003
5.486	2.1992E-001	9.03E-003

Alpha Calibration Report 2/24/2011 11:39:31

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008083.cn
Detector Name: A_2_4B
Chamber Serial Number: 12044982B
Detector Serial Number: 55801
Geometry Description: Shelf 2

Energy Calibration: 4/12/2010 18:36:12 by Countroom
Shape Calibration: 4/12/2010 18:36:12 by Countroom
Efficiency Calibration: 4/13/2010 09:50:10 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70721-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.981 MeV + 4.9105E-003*ch
FWHM = 5.8244E-002 MeV
Low Tail = 1.2717E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.52	0.2488	11.80	0.6090	2.37	0.3057
4.775	364.69	0.2607	11.99	0.6416	2.50	0.3371
5.157	442.73	0.1745	9.87	0.4254	1.94	0.2077
5.486	510.10	0.1153	12.83	0.2994	3.67	0.2441

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2158
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1617E-001	8.88E-003
4.775	2.1332E-001	8.77E-003
5.157	2.1771E-001	8.94E-003
5.486	2.1616E-001	8.88E-003

Alpha Calibration Report 2/24/2011 11:39:38

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008088.cn
Detector Name: A_2_5A
Chamber Serial Number: 12044983A
Detector Serial Number: 55802
Geometry Description: Shelf 2

Energy Calibration: 4/13/2010 16:52:15 by Countroom
Shape Calibration: 4/13/2010 16:52:15 by Countroom
Efficiency Calibration: 4/13/2010 20:11:11 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\62919A-526

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.987 MeV + 4.8898E-003*ch
FWHM = 5.1736E-002 MeV
Low Tail = 1.2152E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.63	0.1859	10.71	0.4630	2.38	0.2641
4.775	365.38	0.2055	10.17	0.4991	1.99	0.2421
5.157	443.10	0.1211	9.07	0.3014	1.98	0.1674
5.486	511.16	0.0784	11.34	0.2072	3.69	0.2066

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2190
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.1858E-001	8.99E-003
4.775	2.1889E-001	9.01E-003
5.157	2.1963E-001	9.03E-003
5.486	2.1880E-001	9.00E-003

Alpha Calibration Report 2/24/2011 11:39:44

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008089.cn
Detector Name: A_2_5B
Chamber Serial Number: 12044983B
Detector Serial Number: 55803
Geometry Description: Shelf 2

Energy Calibration: 4/13/2010 16:52:14 by Countroom
Shape Calibration: 4/13/2010 16:52:14 by Countroom
Efficiency Calibration: 4/13/2010 20:11:42 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70719-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.976 MeV + 4.9039E-003*ch
FWHM = 5.8829E-002 MeV
Low Tail = 1.3010E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.40	0.2267	12.61	0.5701	2.97	0.3535
4.775	367.36	0.2642	10.23	0.6193	1.63	0.2332
5.157	444.10	0.1664	10.91	0.4173	2.54	0.2540
5.486	511.90	0.1109	12.75	0.2902	3.77	0.2487

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2130
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1648E-001	8.89E-003
4.775	2.1009E-001	8.64E-003
5.157	2.1299E-001	8.75E-003
5.486	2.1281E-001	8.75E-003

Alpha Calibration Report 2/24/2011 11:39:51

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008090.cn
Detector Name: A_2_6A
Chamber Serial Number: 12044984A
Detector Serial Number: 55804
Geometry Description: Shelf 2

Energy Calibration: 4/13/2010 16:52:12 by Countroom
Shape Calibration: 4/13/2010 16:52:12 by Countroom
Efficiency Calibration: 4/13/2010 20:12:14 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70720-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.982 MeV + 4.8867E-003*ch
FWHM = 5.9367E-002 MeV
Low Tail = 1.3752E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.66	0.2446	13.42	0.6146	3.15	0.3794
4.775	366.64	0.2589	12.30	0.6338	2.46	0.3176
5.157	444.54	0.1646	10.92	0.4079	2.35	0.2232
5.486	512.52	0.1137	12.46	0.2921	3.28	0.2115

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2248
Uncertainty: +/- 0.0046

Energy (MeV)	Efficiency	Error
4.198	2.2815E-001	9.36E-003
4.775	2.2302E-001	9.16E-003
5.157	2.2375E-001	9.18E-003
5.486	2.2430E-001	9.21E-003

Alpha Calibration Report 2/24/2011 11:39:57

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008091.cn
Detector Name: A_2_6B
Chamber Serial Number: 12044984B
Detector Serial Number: 55805
Geometry Description: Shelf 2

Energy Calibration: 4/13/2010 16:52:11 by Countroom
Shape Calibration: 4/13/2010 16:52:11 by Countroom
Efficiency Calibration: 4/13/2010 20:12:47 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70721-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.978 MeV + 4.9004E-003*ch
FWHM = 5.9702E-002 MeV
Low Tail = 1.3766E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.50	0.2280	12.37	0.5676	2.74	0.3234
4.775	366.12	0.2513	12.00	0.6168	2.48	0.3224
5.157	444.25	0.1908	10.31	0.4656	2.04	0.2291
5.486	511.77	0.1173	12.83	0.2756	3.82	0.2345

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2190
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.1924E-001	9.00E-003
4.775	2.1227E-001	8.73E-003
5.157	2.2292E-001	9.15E-003
5.486	2.2201E-001	9.12E-003

Alpha Calibration Report 2/24/2011 11:40:03

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008606.cn
Detector Name: A_3_1A
Chamber Serial Number: 12044985A
Detector Serial Number: 55806
Geometry Description: Shelf 2

Energy Calibration: 5/27/2010 20:44:58 by Countroom
Shape Calibration: 5/27/2010 20:44:58 by Countroom
Efficiency Calibration: 5/28/2010 09:42:00 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\62919A-526

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.986 MeV + 4.8963E-003*ch
FWHM = 5.1530E-002 MeV
Low Tail = 1.1820E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.64	0.1886	10.14	0.4606	2.04	0.2318
4.775	364.96	0.1742	10.03	0.4269	1.96	0.2064
5.157	442.69	0.1168	9.14	0.2914	2.07	0.1714
5.486	510.66	0.0817	11.49	0.2153	3.55	0.1979

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2230
Uncertainty: +/- 0.0046

Energy (MeV)	Efficiency	Error
4.198	2.2559E-001	9.27E-003
4.775	2.2125E-001	9.10E-003
5.157	2.2375E-001	9.20E-003
5.486	2.2163E-001	9.11E-003

Alpha Calibration Report 2/24/2011 11:40:09

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008118.cn
Detector Name: A_3_1B
Chamber Serial Number: 12044985B
Detector Serial Number: 55807
Geometry Description: Shelf 2

Energy Calibration: 4/17/2010 21:22:33 by Countroom
Shape Calibration: 4/17/2010 21:22:33 by Countroom
Efficiency Calibration: 4/18/2010 15:12:35 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70719-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.982 MeV + 4.8949E-003*ch
FWHM = 5.7620E-002 MeV
Low Tail = 1.3849E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.74	0.2496	11.82	0.6117	2.41	0.3138
4.775	365.89	0.2311	12.04	0.5674	2.49	0.2956
5.157	443.62	0.1523	10.86	0.3836	2.52	0.2320
5.486	511.66	0.0972	12.10	0.2516	3.37	0.1967

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2098
Uncertainty: +/- 0.0043

Energy (MeV)	Efficiency	Error
4.198	2.0756E-001	8.54E-003
4.775	2.1337E-001	8.78E-003
5.157	2.1269E-001	8.74E-003
5.486	2.0603E-001	8.47E-003

Alpha Calibration Report 2/24/2011 11:40:15

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008604.cn
Detector Name: A_3_2A
Chamber Serial Number: 12045128A
Detector Serial Number: 55808
Geometry Description: Shelf 2

Energy Calibration: 1/18/2010 20:52:22 by jarmstrong
Shape Calibration: 1/18/2010 20:52:22 by jarmstrong
Efficiency Calibration: 1/19/2010 08:12:58 by jarmstrong
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70720-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 3000.0 MeV + 1.0000E+000*ch
FWHM = 2.5000E+001 MeV
Low Tail = <none>

No Calibration Peaks Available

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2190
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4198.000	2.2118E-001	9.08E-003
4774.600	2.1766E-001	8.94E-003
5156.590	2.1978E-001	9.02E-003
5485.560	2.1738E-001	8.93E-003

Alpha Calibration Report 2/24/2011 11:40:21

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008119.cn
Detector Name: A_3_2B
Chamber Serial Number: 12045128B
Detector Serial Number: 55809
Geometry Description: Shelf 2

Energy Calibration: 4/17/2010 21:22:30 by Countroom
Shape Calibration: 4/17/2010 21:22:30 by Countroom
Efficiency Calibration: 4/18/2010 15:13:08 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70721-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.991 MeV + 4.8904E-003*ch
FWHM = 6.0011E-002 MeV
Low Tail = 1.4919E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	247.97	0.2466	12.24	0.6094	2.62	0.3322
4.775	364.48	0.2355	12.21	0.5822	2.56	0.3092
5.157	442.22	0.1694	11.22	0.4266	2.66	0.2669
5.486	510.31	0.0963	12.65	0.2515	3.72	0.2148

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2206
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.2004E-001	9.04E-003
4.775	2.1576E-001	8.87E-003
5.157	2.2461E-001	9.22E-003
5.486	2.2225E-001	9.13E-003

Alpha Calibration Report 2/24/2011 11:40:27

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008120.cn
Detector Name: A_3_3A
Chamber Serial Number: 12045129A
Detector Serial Number: 55810
Geometry Description: Shelf 2

Energy Calibration: 4/14/2010 05:15:02 by Countroom
Shape Calibration: 4/14/2010 05:15:02 by Countroom
Efficiency Calibration: 4/18/2010 15:15:02 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\62919A-526

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.977 MeV + 4.9062E-003*ch
FWHM = 4.7685E-002 MeV
Low Tail = 9.7367E-003 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	250.04	0.1885	9.26	0.4499	1.65	0.1940
4.775	366.49	0.1784	8.93	0.4236	1.47	0.1648
5.157	443.27	0.1141	9.36	0.2888	2.20	0.1780
5.486	511.73	0.1045	10.52	0.2699	2.82	0.1986

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2191
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.2191E-001	9.12E-003
4.775	2.1993E-001	9.05E-003
5.157	2.1684E-001	8.92E-003
5.486	2.1781E-001	8.96E-003

Alpha Calibration Report 2/24/2011 11:40:33

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008121.cn
Detector Name: A_3_3B
Chamber Serial Number: 12045129B
Detector Serial Number: 55811
Geometry Description: Shelf 2

Energy Calibration: 4/14/2010 05:15:00 by Countroom
Shape Calibration: 4/14/2010 05:15:00 by Countroom
Efficiency Calibration: 4/18/2010 15:15:32 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70719-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.976 MeV + 4.9096E-003*ch
FWHM = 6.0051E-002 MeV
Low Tail = 1.3852E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.47	0.2276	12.49	0.5651	2.72	0.3155
4.775	366.25	0.2738	11.44	0.6610	2.12	0.2993
5.157	443.67	0.1748	10.87	0.4363	2.44	0.2529
5.486	511.33	0.1177	13.00	0.3078	3.89	0.2685

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2124
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.0994E-001	8.63E-003
4.775	2.1591E-001	8.88E-003
5.157	2.1585E-001	8.87E-003
5.486	2.0831E-001	8.57E-003

Alpha Calibration Report 2/24/2011 11:40:39

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008122.cn
Detector Name: A_3_4A
Chamber Serial Number: 12045130A
Detector Serial Number: 55812
Geometry Description: Shelf 2

Energy Calibration: 4/14/2010 05:15:06 by Countroom
Shape Calibration: 4/14/2010 05:15:06 by Countroom
Efficiency Calibration: 4/18/2010 15:16:03 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70720-526.

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.981 MeV + 4.8980E-003*ch
FWHM = 6.0307E-002 MeV
Low Tail = 1.4323E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.33	0.2520	13.47	0.6414	3.30	0.4209
4.775	365.80	0.2208	12.61	0.5526	2.81	0.3165
5.157	443.80	0.1783	10.83	0.4416	2.36	0.2462
5.486	511.51	0.1340	12.77	0.3474	3.51	0.2656

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2175
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.2013E-001	9.04E-003
4.775	2.1787E-001	8.95E-003
5.157	2.1707E-001	8.91E-003
5.486	2.1512E-001	8.84E-003

Alpha Calibration Report 2/24/2011 11:40:45

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008123.cn
Detector Name: A_3_4B
Chamber Serial Number: 12045130B
Detector Serial Number: 55813
Geometry Description: Shelf 2

Energy Calibration: 4/14/2010 05:15:04 by Countroom
Shape Calibration: 4/14/2010 05:15:04 by Countroom
Efficiency Calibration: 4/18/2010 15:16:34 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70721-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.987 MeV + 4.8996E-003*ch
FWHM = 5.6621E-002 MeV
Low Tail = 1.1136E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	247.86	0.2586	11.05	0.6231	2.02	0.2804
4.775	364.84	0.2305	10.28	0.5453	1.69	0.2133
5.157	441.99	0.1954	10.82	0.4837	2.34	0.2666
5.486	510.19	0.1447	12.78	0.3748	3.58	0.2953

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2157
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1478E-001	8.83E-003
4.775	2.1077E-001	8.67E-003
5.157	2.1735E-001	8.93E-003
5.486	2.2054E-001	9.06E-003

Alpha Calibration Report 2/24/2011 11:40:51

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008128.cn
Detector Name: A_3_5A
Chamber Serial Number: 12045131A
Detector Serial Number: 55814
Geometry Description: Shelf 2

Energy Calibration: 4/18/2010 21:27:20 by Countroom
Shape Calibration: 4/18/2010 21:27:20 by Countroom
Efficiency Calibration: 4/19/2010 14:24:55 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\62919A-526

----- ENERGY / SHAPE CALIBRATION -----

Version: Alpha Encal v1.1
Energy = 2.988 MeV + 4.8982E-003*ch
FWHM = 4.9981E-002 MeV
Low Tail = 1.1096E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	248.09	0.1948	9.77	0.4737	1.89	0.2270
4.775	364.86	0.2099	9.21	0.4985	1.58	0.2054
5.157	441.94	0.1346	9.21	0.3388	2.15	0.2077
5.486	510.20	0.0864	10.96	0.2270	3.27	0.1967

----- EFFICIENCY CALIBRATION -----

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2132
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1535E-001	8.86E-003
4.775	2.0935E-001	8.62E-003
5.157	2.1408E-001	8.81E-003
5.486	2.1435E-001	8.82E-003

Alpha Calibration Report 2/24/2011 11:40:57

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008129.cn
Detector Name: A_3_5B
Chamber Serial Number: 12045131B
Detector Serial Number: 55815
Geometry Description: Shelf 2

Energy Calibration: 4/18/2010 21:27:25 by Countroom
Shape Calibration: 4/18/2010 21:27:25 by Countroom
Efficiency Calibration: 4/19/2010 14:25:36 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70719-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.982 MeV + 4.8985E-003*ch
FWHM = 5.8445E-002 MeV
Low Tail = 1.3560E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.00	0.2268	12.27	0.5634	2.69	0.3172
4.775	365.90	0.2588	11.35	0.6258	2.14	0.2903
5.157	443.33	0.1537	10.86	0.3853	2.47	0.2265
5.486	511.30	0.1131	12.59	0.2935	3.54	0.2339

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2140
Uncertainty: +/- 0.0044

Energy (MeV)	Efficiency	Error
4.198	2.1312E-001	8.76E-003
4.775	2.1696E-001	8.92E-003
5.157	2.1443E-001	8.81E-003
5.486	2.1155E-001	8.69E-003

Alpha Calibration Report 2/24/2011 11:41:03

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008130.cn
Detector Name: A_3_6A
Chamber Serial Number: 12045132A
Detector Serial Number: 55816
Geometry Description: Shelf 2

Energy Calibration: 4/18/2010 21:27:23 by Countroom
Shape Calibration: 4/18/2010 21:27:23 by Countroom
Efficiency Calibration: 4/19/2010 14:26:08 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70720-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.979 MeV + 4.8995E-003*ch
FWHM = 6.2078E-002 MeV
Low Tail = 1.4874E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.35	0.2328	13.64	0.5925	3.36	0.3892
4.775	366.38	0.2533	12.14	0.6200	2.40	0.3050
5.157	444.09	0.1968	11.15	0.4862	2.36	0.2620
5.486	511.76	0.1039	13.04	0.2715	3.77	0.2251

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2190
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.1813E-001	8.96E-003
4.775	2.1835E-001	8.97E-003
5.157	2.2364E-001	9.18E-003
5.486	2.1629E-001	8.88E-003

Alpha Calibration Report 2/24/2011 11:41:09

Apex-Alpha™

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000008131.cn
Detector Name: A_3_6B
Chamber Serial Number: 12045132B
Detector Serial Number: 55817
Geometry Description: Shelf 2

Energy Calibration: 4/18/2010 21:27:22 by Countroom
Shape Calibration: 4/18/2010 21:27:22 by Countroom
Efficiency Calibration: 4/19/2010 14:26:42 by Countroom
Certificate: C:\Canberra\ApexAlpha\Root\Certificates\70721-526.

ENERGY / SHAPE CALIBRATION

Version: Alpha Encal v1.1
Energy = 2.979 MeV + 4.8985E-003*ch
FWHM = 6.0932E-002 MeV
Low Tail = 1.3842E-002 MeV

Energy (MeV)	Centroid Channel	Centroid error	FWHM (ch)	FWHM error	TAIL (ch)	TAIL error
4.198	249.20	0.1818	12.79	0.4608	3.09	0.2952
4.775	366.43	0.2257	11.55	0.5494	2.25	0.2646
5.157	444.34	0.1747	10.42	0.4286	2.12	0.2186
5.486	511.85	0.1064	13.40	0.2798	4.12	0.2551

EFFICIENCY CALIBRATION

Version: Alpha Efcal v1.0
Avg Efficiency: 0.2172
Uncertainty: +/- 0.0045

Energy (MeV)	Efficiency	Error
4.198	2.1581E-001	8.87E-003
4.775	2.1427E-001	8.81E-003
5.157	2.2020E-001	9.04E-003
5.486	2.1881E-001	8.99E-003

AMERICAN RADIATION SERVICES, INC.

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1 (800) 401-4277 • Fax (225) 381-2996

American Radiation Services Analytical Reports

for

Summit Environmental Technologies

Folder Duplicate

35000694

ARS INTERNATIONAL

Report Compilation Checklist

ARS SDG: 11-00895 **Client Name:** Summit Environ. **Sample Matrix:** SO

LEVEL 1 COMPONENTS	1st Reviewer	
1) Cover Page Complete and Accurate (see ARS-059)?	~~Yes~~ No N/A	
2) Technical Review Checklist(s) Complete and Accurate?	~~Yes~~ No N/A	
3) Case Narrative Complete and Accurate (see ARS-059)?	~~Yes~~ No N/A	
4) Form 1s Present for all Samples and Tests?	~~Yes~~ No N/A	
5) Client Specific Components are Present and Complete?	~~Yes~~ No N/A	

LEVEL 2 COMPONENTS	1st Reviewer	
6) Batch Quality Control Report is Present and Accurate?	~~Yes~~ No N/A	
7) DQO Report is Present and Accurate?	~~Yes~~ No N/A	
8) Client Specific Batch QC Components are Present and Complete?	~~Yes~~ No N/A	

LEVEL 3 COMPONENTS	1st Reviewer	
9) Efficiencies are Present?	~~Yes~~ No N/A	
10) Calibrations are Present?	~~Yes~~ No N/A	
11) Backgrounds are Present?	~~Yes~~ No N/A	
12) Spectrum Analysis is Present?	~~Yes~~ No N/A	
13) Spectral Plots are Present?	~~Yes~~ No N/A	
14) Plateaus are Present?	~~Yes~~ No N/A	
15) Control Charts are Present?	~~Yes~~ No N/A	
16) Other:	~~Yes~~ No N/A	

LEVEL 4 COMPONENTS	1st Reviewer	
17) Preparation Raw Data Present, Signed and Complete?	~~Yes~~ No N/A	
18) Instrument Raw Data Present and Complete?	~~Yes~~ No N/A	
19) Calibration Certificates Present?	~~Yes~~ No N/A	
20) Copies of Log Book Pages Present?	~~Yes~~ No N/A	
21) Sample Receiving Documentation Present?	~~Yes~~ No N/A	
22) LIMS Reports Present?	~~Yes~~ No N/A	
23) Applicable Correspondence Present?	~~Yes~~ No N/A	
24) Other:	~~Yes~~ No N/A	

Heather Wright 5-10-11
Report Generator Signature Date

VLM 5-11-11
Management Review Signature Date

ARS-059
07/03/2009

Alpha Spec
Technical Review Checklist

ARS SDG ARS1-11-00895

Sample Matrix: SO **Aliquot** (Circle One) : Dry As Received Filtered Other: Digested

Required QC Samples (Circle all that apply): Blank LCS LCSD Sample Dup

ARS Prep. Batch ID(s):	**Batch A:** B11-01648	**Batch B:** NA	**Batch C:** NA
Test(s):	ASP-A-025	NA	NA

A. RADIOCHEMICAL PREPARATION REVIEW

	Chemist Review			Lab Supervisor		
1) 100% of Manual Transcriptions Verified?	✓Yes	No	N/A	✓Yes	No	N/A
2) 100% of Manual Calculations Verified?	Yes	No	✓N/A	Yes	No	✓N/A
3) Tracers Added Before Muffling, Digestion, or Chem. Sep.?	✓Yes	No	N/A	✓Yes	No	N/A
4) QC and Samples are Aliquoted / Traced?	✓Yes	No	N/A	✓Yes	No	N/A
5) Deviations from procedure are documented and verified?	Yes	No	✓N/A	Yes	No	✓N/A

6) Sample Prep Anomaly? ☐ **No** ☑ **Yes** (See Tech Notes) **NCR #** (If initiated): _____

Jamaal Brown 5-3-11 — **Chemist Signature** **Date**

Jerry D Rolen 5-3-11 — **Verifier Signature** **Date**

B. ANALYSIS REVIEW

	Analyst Review			QA Officer Review		
1) Calibrations/Backgrounds Valid and Current?	✓Yes	No	N/A	✓ Yes	No	N/A
2) Source Checks Completed and Acceptable?	✓Yes	No	N/A	✓ Yes	No	N/A
3) Background Checks Complete and Acceptable?	✓Yes	No	✓N/A	Yes	No ✓	N/A

VLM 5-11-11

Quality Assurance Officer Signature **Date**

	Analyst Review			Lab Supervisor		
4) 100% of Manually entered Parameters Verified Accurate?	✓Yes	No	N/A	Yes	No	N/A
5) Appropriate QC samples initiated at required frequency?	✓Yes	No	N/A	Yes	No	N/A
6) Test/Sample Specific Parameters (See ARS-059 for details)						
a) All Centroids +/- 50 keV for each sample and QC sample?	✓Yes	No	N/A	Yes	No	N/A
b) FWHM <100 kEV for each sample and QC sample?	✓Yes	No	N/A	Yes	No	N/A
c) All specific peaks are with in the regions of interest (ROI's) ?	✓Yes	No	N/A	Yes	No	N/A
d) Spectrum shows no visual indication of interferences?	✓Yes	No	N/A	Yes	No	N/A

7) Analysis Anomaly? ☑ **No** ☐ **Yes** (See Comments) **NCR #** (If initiated): _____

5-10-11 — **Analyst Signature** **Date**

5-10-11 — **Laboratory Supervisor Signature** **Date**

35000696

Batch A: B11-01648

Alpha Spec
Technical Review Checklist

C. BATCH QC VALIDATION

	Proj. Mgr. Review	QA Officer Review
1) RDL Criteria are Met?	Yes No N/A	✓Yes No N/A
2) Activity + 3xCSU a Negative Number?	Yes No N/A	Yes ✓No N/A
3) Method Blank Criteria Met?	5/10 ~~Yes~~ No N/A	Yes ✓No N/A
4) LCS/LCD Criteria Met?	Yes No N/A	✓Yes No N/A
5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met?	Yes No N/A	✓Yes No N/A
6) Tracer yield results meet acceptance criteria?	Yes No N/A	✓Yes No N/A

7) Batch QC Anomaly? ☐ No ☑ Yes (See Comments) NCR # (If initiated): _____

[signature] 5/10/11 — Project Manager Signature / Date

VLM 5-11-11 — Quality Assurance Officer Signature / Date

GENERAL COMMENTS

see technical notes about method Blank 5/10/11 [illegible]

Technical Notes

Batch	ARS1-B11-01648
Analysis Code	ASP-A-025
Procedure No	ARS-026
Matrix	SO

#	Date	Dept	Batch Technical Notes	User ID
1	05/03/11 16:18	CHEMISTRY	B11-01648-03 seems to have electroplated with a light shadow, this may or may not affect tracer recovery.	JBROWN
2	05/03/11 16:20	CHEMISTRY	B11-01648-11 electroplated but it is cloudy and has a gray film covering the plate, this may or may not effect activity and tracer recovery.	JBROWN
3	05/10/11 16:42	REPORTING	The method blank for U-234 is elevated; however, method blank evaluation was performed per procedure and the data is being released as valid.	HWRIGHT

Alpha Spec
Technical Review Checklist

ARS SDG ARS1-11-00895

Sample Matrix: SO **Aliquot** (Circle One) : Dry As Received Filtered Other: Digested

Required QC Samples (Circle all that apply): Blank LCS LCSD Sample Dup

ARS Prep. Batch ID(s):	**Batch A:** B11-01647	**Batch B:** NA	**Batch C:** NA
Test(s):	ASP-A-009	NA	NA

A. RADIOCHEMICAL PREPARATION REVIEW

	Chemist Review			Lab Supervisor		
1) 100% of Manual Transcriptions Verified?	Yes	No	N/A	Yes	No	N/A
2) 100% of Manual Calculations Verified?	Yes	No	N/A	Yes	No	N/A
3) Tracers Added Before Muffling, Digestion, or Chem. Sep.?	Yes	No	N/A	Yes	No	N/A
4) QC and Samples are Aliquoted / Traced?	Yes	No	N/A	Yes	No	N/A
5) Deviations from procedure are documented and verified?	Yes	No	N/A	Yes	No	N/A

6) Sample Prep Anomaly? ☐ **No** ☒ **Yes** (See Tech Notes) **NCR #** (If initiated): _____

Jamaal Brown 5-3-11 — **Chemist Signature** **Date**

Jerry D. Rabe 5-3-11 — **Verifier Signature** **Date**

B. ANALYSIS REVIEW

	Analyst Review			QA Officer Review		
1) Calibrations/Backgrounds Valid and Current?	Yes	No	N/A	Yes	No	N/A
2) Source Checks Completed and Acceptable?	Yes	No	N/A	Yes	No	N/A
3) Background Checks Complete and Acceptable?	Yes	No	N/A	Yes	No	N/A

VHM 5-6-11 — **Quality Assurance Officer Signature** **Date**

	Analyst Review			Lab Supervisor		
4) 100% of Manually entered Parameters Verified Accurate?	Yes	No	N/A	Yes	No	N/A
5) Appropriate QC samples initiated at required frequency?	Yes	No	N/A	Yes	No	N/A
6) Test/Sample Specific Parameters (See ARS-059 for details)						
a) All Centroids +/- 50 keV for each sample and QC sample?	Yes	No	N/A	Yes	No	N/A
b) FWHM <100 kEV for each sample and QC sample?	Yes	No	N/A	Yes	No	N/A
c) All specific peaks are with in the regions of interest (ROI's) ?	Yes	No	N/A	Yes	No	N/A
d) Spectrum shows no visual indication of interferences?	Yes	No	N/A	Yes	No	N/A

7) Analysis Anomaly? ☐ **No** ☑ **Yes** (See Comments) **NCR #** (If initiated): _____

5-6-11 — **Analyst Signature** **Date**

5-6-11 — **Laboratory Supervisor Signature** **Date**

ARS INTERNATIONAL

Batch A: B11-01647

Alpha Spec
Technical Review Checklist

C. BATCH QC VALIDATION

	Proj. Mgr. Review	QA Officer Review
1) RDL Criteria are Met?	Yes No N/A	Yes No N/A
2) Activity + 3xCSU a Negative Number?	Yes No N/A	Yes No N/A
3) Method Blank Criteria Met?	Yes No N/A	Yes No N/A
4) LCS/LCD Criteria Met?	Yes No N/A	Yes No N/A
5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met?	Yes No N/A	Yes No N/A
6) Tracer yield results meet acceptance criteria?	Yes No N/A	Yes No N/A

7) Batch QC Anomaly? ☐ No ☑ Yes (See Comments) NCR # (If initiated): _____

Heather Wright 5-6-11 — Project Manager Signature — Date

VLM 5-6-11 — Quality Assurance Officer Signature — Date

GENERAL COMMENTS

REFER TO BATCH TECHNICAL NOTES. [illegible] 5-6-11

Technical Notes

Batch	ARS1-B11-01647
Analysis Code	ASP-A-009
Procedure No	ARS-031
Matrix	SO

#	Date	Dept	Batch Technical Notes	User ID
1	05/03/11 16:22	CHEMISTRY	B11-01647-11 electroplated with a very light shadow and the plate seems to have white particles that plated on the disk. As a result, tracer recovery and activity may be affected.	JBROWN
2	05/06/11 14:40	COUNTROOM	The following spectral anomalies were identified in the counting results for this batch. Heavy peak trailing was encountered on the Th-229 & Th-230 peaks for B11-01647-01, -02, 04 thru -08, & -10 thru -13. There was also heavy peak trailing on the Th-229 peak for B11-01647-03. This causes blending of the Th-229 and Th-230 peaks, and in the case of B11-01647-03, it likely led to a false detection of Th-230 counts. Also, Th-228 was not identified in B11-01647-01. Th-232 was not identified in B11-01647-02. In both of these cases, a small amount of unidentified isotope was used in place for calculation purposes, but the centroid energies would be low out of acceptable range. Finally, the Th-230 centroid energies for B11-01647-06 & -07 are low out of acceptable range.	ABAILEY
3	05/06/11 16:11	REPORTING	Method Blank for TH-228, TH-230, TH-232 was slightly elevated; however, method blank evaluation was performed per procedure and the data is being released as valid.	HWRIGHT

ARS INTERNATIONAL

Report Compilation Checklist

ARS SDG: 11-00895 **Client Name:** Summit **Sample Matrix:** SO

LEVEL 1 COMPONENTS	1st Reviewer	
1) Cover Page Complete and Accurate (see ARS-059)?	~~Yes~~ No N/A	
2) Technical Review Checklist(s) Complete and Accurate?	~~Yes~~ No N/A	
3) Case Narrative Complete and Accurate (see ARS-059)?	~~Yes~~ No N/A	
4) Form 1s Present for all Samples and Tests?	~~Yes~~ No N/A	
5) Client Specific Components are Present and Complete?	Yes No ~~N/A~~	

LEVEL 2 COMPONENTS	1st Reviewer	
6) Batch Quality Control Report is Present and Accurate?	~~Yes~~ No N/A	
7) DQO Report is Present and Accurate?	~~Yes~~ No N/A	
8) Client Specific Batch QC Components are Present and Complete?	Yes No ~~N/A~~	

LEVEL 3 COMPONENTS	1st Reviewer	
9) Efficiencies are Present?	Yes No N/A	
10) Calibrations are Present?	Yes No N/A	
11) Backgrounds are Present?	Yes No N/A	
12) Spectrum Analysis is Present?	Yes No N/A	
13) Spectral Plots are Present?	Yes No N/A	
14) Plateaus are Present?	Yes No N/A	
15) Control Charts are Present?	Yes No N/A	
16) Other:	Yes No N/A	

LEVEL 4 COMPONENTS	1st Reviewer	
17) Preparation Raw Data Present, Signed and Complete?	Yes No N/A	
18) Instrument Raw Data Present and Complete?	Yes No N/A	
19) Calibration Certificates Present?	Yes No N/A	
20) Copies of Log Book Pages Present?	Yes No N/A	
21) Sample Receiving Documentation Present?	Yes No N/A	
22) LIMS Reports Present?	Yes No N/A	
23) Applicable Correspondence Present?	Yes No N/A	
24) Other:	Yes No N/A	

Report Generator Signature: [signature] Date: 5/6/11

Management Review Signature: VHM Date: 5-6-11

ARS-059
07/03/2009

2609 North River Road, Port Allen, Louisiana 70767
(800) 401-4277 -- FAX (225) 381-2996

Preliminary

American Radiation Services, Inc.

Laboratory Analysis Report

ARS1-11-00895

Prepared for:

Summit Environmental Technologies

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Project Manager Review

Management Review

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

Contact Person: Questions regarding this analytical report should be addressed to:

Project Manager

ProjectManagers@amrad.com

Phone: 225.381.2991
Fax: 225.381.2996

LELAP Cert# 01949

NELAP Cert# E87558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	PR-SED-01-110420	**ARS Sample ID:**	ARS1-11-00895-001
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	0.462	0.082	0.022	0.008		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	73%
TH-230	4.433	0.566	0.021	0.008		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	73%
TH-232	0.543	0.092	0.018	0.006		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	73%

NOTES:

Project Manager Review

Notes: *American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

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ARS INTERNATIONAL

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ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	RM-JM-SED-02-110420	**ARS Sample ID:**	ARS1-11-00895-002
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	0.548	0.093	0.018	0.007		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	65%
TH-230	0.973	0.145	0.018	0.006		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	65%
TH-232	0.452	0.081	0.027	0.011		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	65%

NOTES:

Project Manager Review

Notes: *American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	RM-JM-SED-110420	**ARS Sample ID:**	ARS1-11-00895-003
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 σ	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	1.266	0.187	0.022	0.008		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	60%
TH-230	6.829	0.862	0.040	0.017		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	60%
TH-232	1.268	0.187	0.021	0.008		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	60%

NOTES:

Project Manager Review

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LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

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ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	RM-SED-BG-110419	**ARS Sample ID:**	ARS1-11-00895-004
Sample Collection Date:	04/19/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	0.821	0.124	0.013	0.004		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	77%
TH-230	1.045	0.152	0.021	0.008		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	77%
TH-232	0.821	0.124	0.013	0.004		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	77%

NOTES:

Project Manager Review

Notes: *American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	RP-JM-SED-01	**ARS Sample ID:**	ARS1-11-00895-005
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	0.371	0.070	0.005	0.000		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	70%
TH-230	0.679	0.109	0.018	0.007		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	70%
TH-232	0.419	0.077	0.021	0.008		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	70%

NOTES:

Project Manager Review

Notes: *American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL
2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	RP-JM-SED-110420	**ARS Sample ID:**	ARS1-11-00895-006
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	1.006	0.155	0.022	0.008		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	57%
TH-230	0.859	0.136	0.017	0.005		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	57%
TH-232	0.908	0.142	0.022	0.008		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	57%

NOTES:

Project Manager Review

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	RP-SED-01-110419	**ARS Sample ID:**	ARS1-11-00895-007
Sample Collection Date:	04/19/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	0.512	0.090	0.016	0.005		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	68%
TH-230	0.584	0.099	0.020	0.007		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	68%
TH-232	0.476	0.085	0.025	0.010		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	68%

NOTES:

Project Manager Review

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LELAP Certificate # 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	RP-SED-02-110420	**ARS Sample ID:**	ARS1-11-00895-008
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	0.795	0.125	0.025	0.010		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	68%
TH-230	1.610	0.225	0.024	0.009		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	68%
TH-232	0.733	0.117	0.030	0.012		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	68%

NOTES:

Project Manager Review

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ARS INTERNATIONAL

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1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	RP-SED-03-110420	**ARS Sample ID:**	ARS1-11-00895-009
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	1.130	0.166	0.015	0.005		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	70%
TH-230	3.982	0.512	0.015	0.005		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	70%
TH-232	0.995	0.149	0.005	0.000		pCi/g	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	70%

NOTES:

Project Manager Review

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ARS INTERNATIONAL

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1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00895	**Request or PO Number:**	N/A
Client Sample ID:	RP-SED-BG-041911	**ARS Sample ID:**	ARS1-11-00895-010
Sample Collection Date:	04/19/11	**Date Received:**	04/27/11
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	05/06/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
TH-228	0.465	0.081	0.005	0.000		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	71%
TH-230	0.454	0.081	0.033	0.014		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	71%
TH-232	0.485	0.084	0.028	0.012		pCi/g	ARS-031/Elchrom ACW-10	05/05/11 03:53	JB	71%

NOTES:

Project Manager Review

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LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

Notes:

Comments:

1.0) Soil and Sludge analysis are reported on a wet basis or an as received basis unless otherwise indicated.

2.0) Data in this report are within the limits of uncertainty specified in the reference method unless otherwise specified.

3.0) Modified analysis procedures are procedures that are modified to meet the certain specifications. An example may be the use of a water method to analyze a solid matrix due to the lack of an officially recognized procedure for the analysis of the solid matrix. Modified analyses are indicated by the subsequent addition of "m" to the procedure number (i.e. 900.0M).

4.0) Derived Air Concentrations and Effluent Release Concentrations are obtained from 10 CFR 20 Appendix B.

5.0) **Total activity** is actually total gamma activity and is determined utilizing the prominent gamma emitters from the naturally occurring radioactive decay chains and other prominent radioactive nuclides. Total activity may be lower than the actual total activity due to the extent of secular equilibrium achieved in the various decay chains at the time of analysis. The total activity is not representative of nuclides that emit solely alpha or beta particles.

6.0) Ra-228 is determined via secular equilibrium with its daughter, Actinium 228 (Gamma Spectroscopy only).

7.0) U-238 is determined via secular equilibrium with its daughter, Thorium 234 (Gamma Spectroscopy only).

8.0) All gamma spectroscopy was performed utilizing high purity germanium detectors (**HPGe**).

9.0) ARS makes every attempt to match sample density to calibrated density; however, in some cases, it is not practical or possible to do so and data results may be affected (Gamma Spectroscopy only).

10.0) Gamma spectroscopy results are calculated values based on the **ORTEC**® GammaVision ENV32 Analysis Engine.

Method References:

1.0) **EPA 600/4-80-032**; Prescribed Procedures for the Measurements of Radioactivity in Drinking Water. August 1980.

2.0) Standard Methods for Examination of Water and Waste Water, 18th, 1992.

3.0) **EPA SW-846**; Test Methods for Evaluating Solid Waste, Third Edition. (9/86). (Updated through 1995).

4.0) **EPA 600/4/79-020**; Methods for Chemical Analysis of Water and Waste, March 1983.

5.0) **HASL 300**

6.0) **ARS-040**; An LCSD is not reported with this process. The criteria for the LCS/LCSD analysis for reproducibility have not been established for Low Level Tritium analysis. A prepared standard for Low Level Tritium has not been developed. As a result, the standard we use is based on the dilution of a verified conventional tritium standard. The volume required for Low Level Tritium analysis, in addition to the lack of an available Low Level Tritium standard, introduce variability into the LCS/LCSD analysis that does not represent the actual sample analysis. The preferred measure for reproducibility is to run a duplicate analysis of a sample.

Definitions:

1.0)	**ND**	Not detected above the detection limit (non-detect).
2.0)	**MDC**	(Minimum Detectable Concentration) minimum concentration of the analyte that ARS can detect utilizing the specific analysis
3.0)	**MBL**	Method Blank
4.0)	**DO**	Duplicate Original
5.0)	**DUP**	Method Duplicate
6.0)	**MS/MSD**	Matrix Spike/Matrix Spike Duplicate
7.0)	**S**	Spike
8.0)	**RS**	Reference Spike
9.0)	***SC**	Subcontracted out to another qualified laboratory
10.0)	**NR**	Not Referenced
11.0)	**N/A**	Not Applicable
12.0)	**	False Positive due to interference from Bi-214
13.0)	**U**	Activity is below the MDC
14.0)	**LCS/LCSD**	Laboratory Control Standard/Laboratory Control Standard Duplicate
15.0)	**DLC**	Decision Level Concentration (ANSI N42.23) or critical level

Notes: ARS International assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

LELAP Cert# 01949 ***NELAP Cert# E87558***

Analysis Batch Report

Analysis Batch ID **ARS1-B11-01618**

Method	ARS-003	Analysis	GPC-A-003	Matrix	SO
Description	Gross Alpha/Beta (Soil, Sludge, Waste, Sediment)				

ABatch Sample ID	Type	Blind Iso1	Blind Iso2	Blind Iso3	SDG	FR	Run	Client ID	Isotope Group	Lab Deadline
ARS1-B11-01618-01	LCS									
ARS1-B11-01618-02	LCSD									
ARS1-B11-01618-03	MBL									
ARS1-B11-01618-04	TRG				ARS1-11-00895	001	1	PR-SED-01-110420	STD	05/03/11
ARS1-B11-01618-05	TRG				ARS1-11-00895	002	1	RM-JM-SED-02-110420	STD	05/03/11
ARS1-B11-01618-06	TRG				ARS1-11-00895	003	1	RM-JM-SED-110420	STD	05/03/11
ARS1-B11-01618-07	TRG				ARS1-11-00895	004	1	RM-SED-BG-110419	STD	05/03/11
ARS1-B11-01618-08	TRG				ARS1-11-00895	005	1	RP-JM-SED-01	STD	05/03/11
ARS1-B11-01618-09	TRG				ARS1-11-00895	006	1	RP-JM-SED-110420	STD	05/03/11
ARS1-B11-01618-10	TRG				ARS1-11-00895	007	1	RP-SED-01-110419	STD	05/03/11
ARS1-B11-01618-11	TRG				ARS1-11-00895	008	1	RP-SED-02-110420	STD	05/03/11
ARS1-B11-01618-12	TRG				ARS1-11-00895	009	1	RP-SED-03-110420	STD	05/03/11
ARS1-B11-01618-13	TRG				ARS1-11-00895	010	1	RP-SED-BG-041911	STD	05/03/11

GEN 256
A 35723
Screen GAGB
ACB

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
A1	11-01618-04	0	34	10	1395	4/28/11 11:42
A2	11-01618-05	0	21	10	1395	4/28/11 11:42
A3	11-01618-06	1	51	10	1395	4/28/11 11:42
A4	11-01618-07	1	32	10	1395	4/28/11 11:42
C1	11-01618-08	2	17	10	1395	4/28/11 11:42
C2	11-01618-09	4	27	10	1395	4/28/11 11:42
C3	11-01618-10	0	16	10	1395	4/28/11 11:42
C4	11-01618-11	0	29	10	1395	4/28/11 11:42
D3	11-01618-12	1	30	10	1395	4/28/11 11:42
D4	11-01618-13	0	11	10	1395	4/28/11 11:42

35000716

DQO Report for SDG
ARS1-11-00895

Analysis Code	Group	Isotope	Activity Units	Aliquot Units	ProcedureNo	RDL	LCS_LL	LCS_UL	MS_LL	MS_UL	RadY_LL	RadY_UL	GravY_LL	GravY_LL	RER	RPD	DilutionReq	RoughPrepReq	BlankCorrectionMDA	BlankCorrectionAll	CountTimeReq	AliquotRequired
ASP-A-009	STL	TH-228	pCi	g	ARS-031	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-009	STL	TH-230	pCi	g	ARS-031	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-009	STL	TH-232	pCi	g	ARS-031	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-025	STL	U-234	pCi	g	ARS-026	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-025	STL	U-235	pCi	g	ARS-026	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-025	STL	U-238	pCi	g	ARS-026	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
GPC-A-003	STL	GROSS ALPHA	pCi	g	ARS-003	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
GPC-A-003	STL	GROSS BETA	pCi	g	ARS-003	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		

35000717

SDG Report - Samples and Containers

SDG Specific Data

SDG	ARS1-11-00895			TAT Days	7	Project Type	Environmental
Sample Count	10	Rpt Level	2	Date Received	4/27/2011	COC Number	6-042211-001353-0001
Client	Summit Environmental Technologies			Client Deadline	5/6/2011	PO Number	
Client Code	493			Internal Deadline	5/5/2011	Job Number	
Profile Number	PN-00556			Lab Deadline	5/3/2011	Job Location	site 0603
Comments	LEVEL IV DELIVERABLE						

Samples and Containers (→) Checked In Thus Far

FR	ClientID	Matrix	SampleStartDate	SampleEndDate	Disp	Hold	Arch	Storage	X	Units	Y	Units	Z	Units	Comments
001	PR-SED-01-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							PR
→	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85373	1		511.00			25	16		N	N/A				
	85375	2		540.00			25	16		N	N/A				
002	RM-JM-SED-02-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RM-JM
→	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85376	1		557.00			30	16		N	N/A				
	85377	2		555.00			30	15		N	N/A				
003	RM-JM-SED-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RM-JM
→	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85378	1		553.00			30	15		N	N/A				
	85379	2		590.00			30	14		N	N/A				
004	RM-SED-BG-110419	SO	04/19/11 12:00 PM	04/19/11 12:00 PM	H	30	5	M2							RM-BG
→	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85380	1		666.00			30	16		N	N/A				
	85381	2		677.00			30	14		N	N/A				
005	RP-JM-SED-01	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RP-JM-01
→	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85382	1		559.00			35	14		N	N/A				
	85383	2		533.00			35	16		N	N/A				
006	RP-JM-SED-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RP-JM
→	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85384	1		641.00			30	16		N	N/A				
	85385	2		596.00			30	17		N	N/A				
007	RP-SED-01-110419	SO	04/19/11 12:00 PM	04/19/11 12:00 PM	H	30	5	M2							RP-01
→	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85386	1		643.00			25	16		N	N/A				
	85387	2		573.00			25	16		N	N/A				
008	RP-SED-02-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RP-02
→	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85388	1		674.00			30	15		N	N/A				
	85389	2		703.00			30	14		N	N/A				
009	RP-SED-03-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RP-03
→	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85390	1		490.00			40	17		N	N/A				
	85391	2		496.00			40	17		N	N/A				
010	RP-SED-BG-041911	SO	04/19/11 12:00 PM	04/19/11 12:00 PM	H	30	5	M2							RP-BG

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SDG Report - Samples and Containers

SDG Specific Data

SDG	ARS1-11-00895	TAT Days	7	Project Type	Environmental
Sample Count	[illegible] Rpt Level 2	Date Received	4/27/2011	COC Number	6-042211-001353-0001
Client	Summit Environmental Technologies	Client Deadline	5/6/2011	PO Number	
Client Code	493	Internal Deadline	5/5/2011	Job Number	
Profile Number	PN-00556	Lab Deadline	5/3/2011	Job Location	site 0603
Comments	LEVEL IV DELIVERABLE				

Samples and Containers (➔) Checked In Thus Far

FR	ClientID	Matrix	SampleStartDate	SampleEndDate	Disp	Hold	Arch	Storage	X	Units	Y	Units	Z	Units	Comments
➔	LC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85392	1		719.00			35	17		N	N/A				
	85393	2		710.00			35	17		N	N/A				

35000719

SDG Report - Analysis Assignments

Temp SDG	ARS1-11-00895	Sample Count	10
Client	Summit Environmental Technologies	Analysis Count	3-30

Samples Count Totals per Analysis

Analysis Code	Analysis Description	Samples Count
ASP-A-009	Thorium in (Soil, Sludge, Waste, Biota, Sediment [SO, BI, VG])	10
ASP-A-025	(233, 234U, 235U, 238U) in (Soil, Sludge, Waste, Biota, Sediment [SO,	10
GPC-A-003	Gross Alpha/Beta in (Soil, Sludge, Waste, Sediment [SO])	10

Analyses Assigned Per Fraction

Fraction	Analysis Code	X = Assigned
001	ASP-A-009	X
001	ASP-A-025	X
001	GPC-A-003	X
002	ASP-A-009	X
002	ASP-A-025	X
002	GPC-A-003	X
003	ASP-A-009	X
003	ASP-A-025	X
003	GPC-A-003	X
004	ASP-A-009	X
004	ASP-A-025	X
004	GPC-A-003	X
005	ASP-A-009	X
005	ASP-A-025	X
005	GPC-A-003	X
006	ASP-A-009	X
006	ASP-A-025	X
006	GPC-A-003	X
007	ASP-A-009	X
007	ASP-A-025	X
007	GPC-A-003	X
008	ASP-A-009	X
008	ASP-A-025	X
008	GPC-A-003	X
009	ASP-A-009	X
009	ASP-A-025	X
009	GPC-A-003	X
010	ASP-A-009	X
010	ASP-A-025	X
010	GPC-A-003	X

DQO Report for SDG

ARS1-11-00895

Analysis Code	Group	Isotope	Activity Units	Aliquot Units	ProcedureNo	RDL	LCS_LL	LCS_UL	MS_LL	MS_UL	RadY_LL	RadY_UL	GravY_LL	GravY_LL	RER	RPD	DilutionReq	RoughPrepReq	BlankCorrectionMDA	BlankCorrectionAll	CountTimeReq	AliquotRequired
ASP-A-009	STD	TH-22	pCi	g	ARS-031	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-009	STD	TH-23	pCi	g	ARS-031	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-009	STD	TH-23	pCi	g	ARS-031	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-025	STD	U-234	pCi	g	ARS-026	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-025	STD	U-235	pCi	g	ARS-026	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
ASP-A-025	STD	U-238	pCi	g	ARS-026	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		

35000721

SDG Report - Samples and Containers

SDG Specific Data

SDG	ARS1-11-00895	TAT Days	7	Project Type	Environmental
Sample Count	Rpt Level 2	Date Received	4/27/2011	COC Number	6-042211-001353-0001
Client	Summit Environmental Technologies	Client Deadline	5/6/2011	PO Number	
Client Code	493	Internal Deadline	5/5/2011	Job Number	
Profile Number	PN-00556	Lab Deadline	5/3/2011	Job Location	site 0603
Comments	LEVEL IV DELIVERABLE				

Samples and Containers (→) Checked In Thus Far

FR	ClientID	Matrix	SampleStartDate	SampleEndDate	Disp	Hold	Arch	Storage	X	Units	Y	Units	Z	Units	Comments
001	PR-SED-01-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							PR
→	TC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85373	1		511.00			25	16		N	N/A				
	85375	2		540.00			25	16		N	N/A				
002	RM-JM-SED-02-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RM-JM
→	TC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85376	1		557.00			30	16		N	N/A				
	85377	2		555.00			30	15		N	N/A				
003	RM-JM-SED-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RM-JM
→	TC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85378	1		553.00			30	15		N	N/A				
	85379	2		590.00			30	14		N	N/A				
004	RM-SED-BG-110419	SO	04/19/11 12:00 PM	04/19/11 12:00 PM	H	30	5	M2							RM-BG
→	TC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85380	1		666.00			30	16		N	N/A				
	85381	2		677.00			30	14		N	N/A				
005	RP-JM-SED-01	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RP-JM-01
→	TC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85382	1		559.00			35	14		N	N/A				
	85383	2		533.00			35	16		N	N/A				
006	RP-JM-SED-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RP-JM
→	TC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85384	1		641.00			30	16		N	N/A				
	85385	2		596.00			30	17		N	N/A				
007	RP-SED-01-110419	SO	04/19/11 12:00 PM	04/19/11 12:00 PM	H	30	5	M2							RP-01
→	TC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85386	1		643.00			25	16		N	N/A				
	85387	2		573.00			25	16		N	N/A				
008	RP-SED-02-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RP-02
→	TC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85388	1		674.00			30	15		N	N/A				
	85389	2		703.00			30	14		N	N/A				
009	RP-SED-03-110420	SO	04/20/11 12:00 PM	04/20/11 12:00 PM	H	30	5	M2							RP-03
→	TC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85390	1		490.00			40	17		N	N/A				
	85391	2		496.00			40	17		N	N/A				
010	RP-SED-BG-041911	SO	04/19/11 12:00 PM	04/19/11 12:00 PM	H	30	5	M2							RP-BG

35000722

SDG Report - Samples and Containers

SDG Specific Data

SDG	ARS1-11-00895	TAT Days	7	Project Type	Environmental
Sample Count	Rpt Level 2	Date Received	4/27/2011	COC Number	6-042211-001353-0001
Client	Summit Environmental Technologies	Client Deadline	5/6/2011	PO Number	
Client Code	493	Internal Deadline	5/5/2011	Job Number	
Profile Number	PN-00556	Lab Deadline	5/3/2011	Job Location	site 0603
Comments	LEVEL IV DELIVERABLE				

Samples and Containers (→) Checked In Thus Far

FR	ClientID	Matrix	SampleStartDate	SampleEndDate	Disp	Hold	Arch	Storage	X	Units	Y	Units	Z	Units	Comments
→	IC_ID	Cat	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Need Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	85392	1		719.00			35	17		N	N/A				
	85393	2		710.00			35	17		N	N/A				

35000723

SDG Report - Analysis Assignments

Temp SDG	ARS1-11-00895	Sample Count	
Client	Summit Environmental Technologies	Analysis Count	2-20

Samples Count Totals per Analysis

Analysis Code	Analysis Description	Samples Count
ASP-A-009	Thorium in (Soil, Sludge, Waste, Biota, Sediment [SO, BI, VG])	10
ASP-A-025	(233, 234U, 235U, 238U) in (Soil, Sludge, Waste, Biota, Sediment [SO,	10

Analyses Assigned Per Fraction

Fraction	Analysis Code	X = Assigned
001	ASP-A-009	X
001	ASP-A-025	X
002	ASP-A-009	X
002	ASP-A-025	X
003	ASP-A-009	X
003	ASP-A-025	X
004	ASP-A-009	X
004	ASP-A-025	X
005	ASP-A-009	X
005	ASP-A-025	X
006	ASP-A-009	X
006	ASP-A-025	X
007	ASP-A-009	X
007	ASP-A-025	X
008	ASP-A-009	X
008	ASP-A-025	X
009	ASP-A-009	X
009	ASP-A-025	X
010	ASP-A-009	X
010	ASP-A-025	X

Heather Wright

From: Virgene Ideker-Mulligan
Sent: Tuesday, April 26, 2011 10:08 AM
To: Project Managers
Subject: FW: Price quote please

Virgene Mulligan, **CQM, CHMM**
Vice President - Laboratory Services
Phone: 225-381-2991
Direct: 225-346-6030
Cell: 225-223-8225
FAX: 225-381-2996
ARS INTERNATIONAL

-----Original Message-----
From: Elvin Chavez [mailto:echavez@summitlabs.com]
Sent: Tuesday, April 26, 2011 9:58 AM
To: Virgene Ideker-Mulligan; Danny Coleman
Subject: RE: Price quote please

Virgene,

We shipped 3 coolers with soils and waters for analyses. On the chains I highlighted what I need you all to do. For the isotopic thorium, we are looking for 230 and 232. For the uranium, we need 234, 235, and 238. Both analyses are by alpha spec I believe???

Elvin J. Chavez
Vice President
Summit Environmental Technologies, Inc.
2709 Pan American Fwy. NE, Suite A/C
Albuquerque, NM 87107
Email: echavez@summitlabs.com
Web: http://www.settek.com/
Video Tour of Lab: http://www.settek.com/videos
Cell Phone: 505-259-9795
Office Phone: 505-345-3335
Fax Number: 505-345-3338

Corporate Headquarters:
3310 Win St.
Cuyahoga Falls, Ohio 44223
Phone: 1-800-278-0140

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From: Virgene Ideker-Mulligan
Sent: Thu 4/21/2011 3:31 PM
To: Elvin Chavez; Danny Coleman
Subject: RE: Price quote please

Elvin:

Please find attached the price quote you requested.

In addition, would you please call or e-mail Heather about the samples she has written to you for confirmation of analysis request. We need to get this completed in order to begin the analysis.

Thank you.

Virgene Mulligan, **CQM, CHMM**
Vice President - Laboratory Services
Phone: 225-381-2991
Direct: 225-346-6030
Cell: 225-223-8225
FAX: 225-381-2996
ARS INTERNATIONAL

-----Original Message-----
From: Elvin Chavez [mailto:echavez@summitlabs.com]
Sent: Thursday, April 21, 2011 3:54 PM
To: Danny Coleman
Cc: Virgene Ideker-Mulligan
Subject: Price quote please
Importance: High

Hey Guys,
You will be getting the 45 samples for the quote you gave me for the Weston project here. I am sending them on Friday (FedEx) Express. Additionally, they want pricing now for another project I am sampling for them. See below and get back to me as soon as you can.
Thanks.
For the deliverable, we need a full Level IV deliverable. For a chemical analysis I would say a CLP like. For number of samples, it really varies. I would say 10 to 20 per week through the summer. The TAT required would also vary. In some cases, we look for a 7 day TAT. The longest TAT we prefer is a 14 day TAT.
For the isotopic thorium, we are looking for 230 and 232. For the uranium, we need 234, 235, and 238. Both analyses are by alpha spec.

Elvin J. Chavez
Vice President
Summit Environmental Technologies, Inc.
2709 Pan American Fwy. NE, Suite A/C
Albuquerque, NM 87107

Email: echavez@summitlabs.com
Web: http://www.settek.com/
Video Tour of Lab: http://www.settek.com/videos
Cell Phone: 505-259-9795
Office Phone: 505-345-3335
Fax Number: 505-345-3338

Corporate Headquarters:
3310 Win St.
Cuyahoga Falls, Ohio 44223
Phone: 1-800-278-0140

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ARS FILE TRACKING SHEET

SDG: ARS1-11-00895

Task	Date / Time	Initials
Date & Time Samples Received	04-27-11/12:30	CWB
ICOC Initiated / Storage Location: M2	04-28-11/08:50	CWB
Technical Checks Performed	see batch	
Report Written / EDD Generated: ____/____ Date/Time Initials	Final 5-11-10/0842	CLW
	prelim 5-6-11/1619	CLW
Quality Assurance Checks Performed on Report	Prelim 5-6-11 16:21 FINAL	Prelim VLM FINAL
Management Check Performed on Report	5-11-11/1457	VLM
Preliminary Report Sent	5-6-11/1637	CLW
Report E-mailed		
Report Faxed	N/A	
Report Reviewed		
Report Mailed		
Invoice Completed Invoice #:_____		
Report Imaged		

SPECIAL REQUIREMENTS

Requirement	Yes	No
3 Hour Rush		✓
24 Hour Rush		✓
48 Hour Rush		✓
Special Invoicing *see notes* Mgmt. Approval:_____		✓

NOTES:

ARS-062
04/23/2010

COMPANY NAME: Summit **SDG:** ARSH1200895

SHIPPING CONTAINER

Good Condition	☑ Yes	☐ No
Radioactive	☐ Yes	☑ No
UN2910	☐ Yes	☑ No
Sec. Seals	☐ Yes	☑ No
Seals Intact	☐ Yes ☐ No	☑ N/A
Air Bill	☐ Yes	☑ No

COC PRESENT WITH SAMPLES

COC	☑ Yes	☐ No

SAMPLE CONTAINER(S)

Good Condition	☑ Yes	☐ No
Sec. Seals	☐ Yes	☑ No
Seal Intact	☐ Yes ☐ No	☑ N/A
Marked Radioactive	☐ Yes	☑ No

Samples Rcv 10

Matrix [AF , AQ , BI , FE , LT , SI , SO , UR , VG]

External and Internal Surveys

Exposure Rate Meter:	MB 242861	Serial No.:	M44-2 PR2042660	Calibration Due Date:	4-20-12
Count Rate Meter:	M2 154659	Serial No.:	M44-4 PR154559	Calibration Due Date:	4-20-12

Background Exposure Rate (µR/hr)	24	Max. Exposure Rate on Shipping Containers Externals (Plus Bkgd)	14	µR/hr
Background Count Rate (cpm)	60	Max. Removable Count Rate on Shipping Containers Externals (Plus Bkgd)	26	cpm
		Max. Removable Count Rate on Shipping Containers Internals (Plus Bkgd)	26	cpm

pH ≤ 2 is Acceptable

Sample Label/Comments/Notes	pH Orig	pH Final	Mark if Preserve	Acid Lot #	Weight(g) / Volume(mL)	Acceptance Limits <500 µR/hr µR/hr	Acceptance Limits <100 cpm/cm² cpm
PR-SED-01-110420					511	16	25
↓					540	16	25
RM-JM-SED-02-110420		Cwb 4-27-11			557	16	30
↓					555	15	30
RM-JM-SED-110420					553	15	30
↓					590	14	30
RM-SED-BG-110419					666	16	30
↓					677	14	30
RP-JM-SED-01					559	14	35
↓					533	16	35
RP-JM-SED-110420					641	16	30
↓					596	17	30
RP-SED-01-110419					643	16	25
↓		Cwb 4-27-11			573	16	25
RP-SED-02-110420					674	15	30
↓					703	14	30
RP-SED-03-110420					490	17	40
↓					496	17	40
RP-SED-BG 041911					719	17	35

Surveyors' Name: [signature] Date/Time Surveyed: 4-27-11 / 15:18

COMPANY NAME: Summit

SDG: ARS11-00895

SHIPPING CONTAINER

- Good Condition ☑ Yes ☐ No
- Radioactive ☐ Yes ☑ No
- UN2910 ☐ Yes ☑ No
- Sec. Seals ☐ Yes ☑ No
- Seals Intact ☐ Yes ☐ No ☑ N/A
- Air Bill ☐ Yes ☐ No

COC PRESENT WITH SAMPLES

- COC ☑ Yes ☐ No

SAMPLE CONTAINER(S)

- Good Condition ☑ Yes ☐ No
- Sec. Seals ☐ Yes ☑ No
- Seal Intact ☐ Yes ☐ No ☑ N/A
- Marked Radioactive ☐ Yes ☑ No
- # Samples Rcv 10
- Matrix [AF , AQ , BI , FE , LT , SI , SO , UR , VG]

External and Internal Surveys

Exposure Rate Meter:	M3 242561	Serial No.:	M44-2 PR2042606	Calibration Due Date:	4-20-12
Count Rate Meter:	M2 154859	Serial No.:	M44-4 PR154559	Calibration Due Date:	4-20-12

Background Exposure Rate (µR/hr)	24	Max. Exposure Rate on Shipping Containers Externals (Plus Bkgd)	14	µR/hr
Background Count Rate (cpm)	60	Max. Removable Count Rate on Shipping Containers Externals (Plus Bkgd)	26	cpm
		Max. Removable Count Rate on Shipping Containers Internals (Plus Bkgd)	26	cpm

Sample Label/Comments/Notes	pH Orig	pH Final (pH ≤ 2 is Acceptable)	Mark if Preserve	Acid Lot #	Weight(g) / Volume(mL)	Acceptance Limits <500 µR/hr µR/hr	Acceptance Limits <100 cpm/cm² cpm
RP-SED-BG 04191	—	CuB 4-27-11			710	17	35

Surveyors Name: [signature]

Date/Time Surveyed: 4-27-11 / 15:18

SAMPLE CHECK-IN COMMENT SHEET

SDG: ARS1-11-00895

SLUDGE cb04-28-11

ARS-062
04/23/2010

35000731

AMERICAN RADIATION SERVICES, INC.

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

American Radiation Services Analytical Reports

for

Summit Enviromental Technologies

Site Number: 0603

(Aqueous samples)

35000732

2609 North River Road, Port Allen, Louisiana 70767
(800) 401-4277 -- FAX (225) 381-2996

American Radiation Services, Inc.

Laboratory Analysis Report

ARS1-11-00897

Prepared for:

Summit Environmental Technologies

Dara Gilger
3310 Win St
Cuyahoga Falls, OH 44223

dgilger@settek.com
echavez@summitlabs.com

Phone: 330-253-8211
Fax: 330-253-4489

Heather Wright
Project Manager Review

Management Review

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

Contact Person: Questions regarding this analytical report should be addressed to:

Project Manager

ProjectManagers@amrad.com

Phone: 225.381.2991
Fax: 225.381.2996

LELAP Cert# 01949 **NELAP Cert# E87558**

AMERICAN RADIATION SERVICES, INC.

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

American Radiation Services Analytical Reports

for

Summit Enviromental Technologies

Site Number: 0603

Original COC

35000734

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	MW-1-110419	MW-1	Gamma Spec - Thorium	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	Y
	MW-1-110419	MW-1	Gross Alpha/Beta	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	Y
	MW-1-110419	MW-1	Total Dissolved Solids	Ground Water	4/19/2011	1	500 ml poly	None	
	MW-1-110419	MW-1	Total Radium (226+228)	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	Y
	MW-1-110419	MW-1	TAL Metals/Hg	Ground Water	4/19/2011	1	500 ml poly	HNO3 pH<2	Y
	MW-2-110421	MW-2	Alkalinity	Ground Water	4/21/2011	1	NA	NA	
	MW-2-110421	MW-2	Alpha Spec -Uranium isotopes	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	MW-2-110421	MW-2	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/21/2011	1	500 ml poly	None	
	MW-2-110421	MW-2	Gamma Spec - Thorium	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	MW-2-110421	MW-2	Gross Alpha/Beta	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	MW-2-110421	MW-2	Total Dissolved Solids	Ground Water	4/21/2011	1	500 ml poly	None	
	MW-2-110421	MW-2	Total Radium (226+228)	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	MW-2-110421	MW-2	TAL Metals/Hg	Ground Water	4/21/2011	1	500 ml poly	HNO3 pH<2	
	MW-2-2-110421	MW-2	Alkalinity	Ground Water	4/21/2011	1	NA	NA	
	MW-2-2-110421	MW-2	Alpha Spec -Uranium isotopes	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	MW-2-2-110421	MW-2	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/21/2011	1	500 ml poly	None	
	MW-2-2-110421	MW-2	Gamma Spec - Thorium	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	MW-2-2-110421	MW-2	Gross Alpha/Beta	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	MW-2-2-110421	MW-2	Total Dissolved Solids	Ground Water	4/21/2011	1	500 ml poly	None	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	[illegible]	04/22/11	[illegible]	4/22/11	8:45		[illegible]	4/22/11	[illegible]	4-27-11	1230

35000735

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0503
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	JPOP41S-110421	JPOP41S	Alkalinity	Ground Water	4/21/2011	1	NA	NA	
	JPOP41S-110421	JPOP41S	Alpha Spec -Uranium isotopes	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	JPOP41S-110421	JPOP41S	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/21/2011	1	500 ml poly	None	
	JPOP41S-110421	JPOP41S	Gamma Spec - Thorium	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	JPOP41S-110421	JPOP41S	Gross Alpha/Beta	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	JPOP41S-110421	JPOP41S	Total Dissolved Solids	Ground Water	4/21/2011	1	500 ml poly	None	
	JPOP41S-110421	JPOP41S	Total Radium (226+228)	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	JPOP41S-110421	JPOP41S	TAL Metals/Hg	Ground Water	4/21/2011	1	500 ml poly	HNO3 pH<2	
	MD-SW-110420	MW-MD	Alkalinity	Surface Water	4/20/2011	1	NA	NA	
	MD-SW-110420	MW-MD	Alpha Spec -Uranium isotopes	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MD-SW-110420	MW-MD	Anions (NO2,NO3,Cl,SO4)	Surface Water	4/20/2011	1	500 ml poly	None	
	MD-SW-110420	MW-MD	Gamma Spec - Thorium	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MD-SW-110420	MW-MD	Gross Alpha/Beta	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MD-SW-110420	MW-MD	Total Dissolved Solids	Surface Water	4/20/2011	1	500 ml poly	None	
	MD-SW-110420	MW-MD	Total Radium (226+228)	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MD-SW-110420	MW-MD	TAL Metals/Hg	Surface Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	MW-1-110419	MW-1	Alkalinity	Ground Water	4/19/2011	1	NA	NA	
	MW-1-110419	MW-1	Alpha Spec -Uranium isotopes	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	Y
	MW-1-110419	MW-1	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/19/2011	1	500 ml poly	None	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	[illegible]	4/22/11	[illegible]	4/22/11	8:45		[illegible]	4/22/11	[illegible]	4-27-11	12:30

35000736

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	MW-2-2-110421	MW-2	Total Radium (226+228)	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	MW-2-2-110421	MW-2	TAL Metals/Hg	Ground Water	4/21/2011	1	500 ml poly	HNO3 pH<2	
	MW-3-110420	MW-3	Alkalinity	Ground Water	4/20/2011	1	NA	NA	
	MW-3-110420	MW-3	Alpha Spec -Uranium isotopes	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-3-110420	MW-3	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-3-110420	MW-3	Gamma Spec - Thorium	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-3-110420	MW-3	Gross Alpha/Beta	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-3-110420	MW-3	Total Dissolved Solids	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-3-110420	MW-3	Total Radium (226+228)	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-3-110420	MW-3	TAL Metals/Hg	Ground Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	MW-4-110420	MW-6	Alkalinity	Ground Water	4/20/2011	1	NA	NA	
	MW-4-110420	MW-6	Alpha Spec -Uranium isotopes	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-4-110420	MW-6	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-4-110420	MW-6	Gamma Spec - Thorium	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-4-110420	MW-6	Gross Alpha/Beta	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-4-110420	MW-6	Total Dissolved Solids	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-4-110420	MW-6	Total Radium (226+228)	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-4-110420	MW-6	TAL Metals/Hg	Ground Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	MW-6-110420	MW-6	Alkalinity	Ground Water	4/20/2011	1	NA	NA	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		04/22/11	[signature]	4/22/11	9:45		[signature]	4/22/11	[signature]	4-27-11	12:30

35000737

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	MW-6-110420	MW-6	Alpha Spec -Uranium isotopes	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-6-110420	MW-6	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-6-110420	MW-6	Gamma Spec - Thorium	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-6-110420	MW-6	Gross Alpha/Beta	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-6-110420	MW-6	Total Dissolved Solids	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-6-110420	MW-6	Total Radium (226+228)	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-6-110420	MW-6	TAL Metals/Hg	Ground Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	MW-7-110419	MW-7	Alkalinity	Ground Water	4/19/2011	1	NA	NA	
	MW-7-110419	MW-7	Alpha Spec -Uranium isotopes	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	MW-7-110419	MW-7	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/19/2011	1	500 ml poly	None	
	MW-7-110419	MW-7	Gamma Spec - Thorium	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	MW-7-110419	MW-7	Gross Alpha/Beta	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	MW-7-110419	MW-7	Total Dissolved Solids	Ground Water	4/19/2011	1	500 ml poly	None	
	MW-7-110419	MW-7	Total Radium (226+228)	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	MW-7-110419	MW-7	TAL Metals/Hg	Ground Water	4/19/2011	1	500 ml poly	HNO3 pH<2	
	MW-8-110419	MW-8	Alkalinity	Ground Water	4/19/2011	1	NA	NA	
	MW-8-110419	MW-8	Alpha Spec -Uranium isotopes	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	MW-8-110419	MW-8	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/19/2011	1	500 ml poly	None	
	MW-8-110419	MW-8	Gamma Spec - Thorium	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	[illegible]	04/22/11	[signature]	4/22/11	8:45		[signature]	4/22/11	[signature]	4-27-11	12:50

35000738

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analysas	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	MW-8-110419	MW-8	Gross Alpha/Beta	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	MW-8-110419	MW-8	Total Dissolved Solids	Ground Water	4/19/2011	1	500 ml poly	None	
	MW-8-110419	MW-8	Total Radium (226+228)	Ground Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	MW-8-110419	MW-8	TAL Metals/Hg	Ground Water	4/19/2011	1	500 ml poly	HNO3 pH<2	
	MW-MD-02-110420	MW-MD	Alkalinity	Ground Water	4/20/2011	1	NA	NA	
	MW-MD-02-110420	MW-MD	**Alpha Spec -Uranium isotopes**	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-MD-02-110420	MW-MD	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-MD-02-110420	MW-MD	**Gamma Spec - Thorium**	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-MD-02-110420	MW-MD	Gross Alpha/Beta	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-MD-02-110420	MW-MD	Total Dissolved Solids	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-MD-02-110420	MW-MD	Total Radium (226+228)	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-MD-02-110420	MW-MD	TAL Metals/Hg	Ground Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	MW-MD-110420	MW-MD	Alkalinity	Ground Water	4/20/2011	1	NA	NA	
	MW-MD-110420	MW-MD	**Alpha Spec -Uranium isotopes**	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-MD-110420	MW-MD	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-MD-110420	MW-MD	**Gamma Spec - Thorium**	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-MD-110420	MW-MD	Gross Alpha/Beta	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	MW-MD-110420	MW-MD	Total Dissolved Solids	Ground Water	4/20/2011	1	500 ml poly	None	
	MW-MD-110420	MW-MD	Total Radium (226+228)	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		04/22/11		4/22/11	8:45			4/22/11		4-27-11	12:30

35000739

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	MW-MD-110420	MW-MD	TAL Metals/Hg	Ground Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	NPOP20E-110420	NPOP20E	Alkalinity	Ground Water	4/20/2011	1	NA	NA	
	NPOP20E-110420	NPOP20E	Alpha Spec -Uranium isotopes	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	NPOP20E-110420	NPOP20E	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/20/2011	1	500 ml poly	None	
	NPOP20E-110420	NPOP20E	Gamma Spec - Thorium	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	NPOP20E-110420	NPOP20E	Gross Alpha/Beta	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	NPOP20E-110420	NPOP20E	Total Dissolved Solids	Ground Water	4/20/2011	1	500 ml poly	None	
	NPOP20E-110420	NPOP20E	Total Radium (226+228)	Ground Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	NPOP20E-110420	NPOP20E	TAL Metals/Hg	Ground Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	PR-SED-01-110420	PR	Alpha Spec -Uranium isotopes	Sediment	4/20/2011	1	8 oz glass	None	
	PR-SED-01-110420	PR	Gamma Spec - Thorium	Sediment	4/20/2011	1	8 oz glass	None	
	PR-SED-01-110420	PR	Gross Alpha/Beta	Sediment	4/20/2011	1	8 oz glass	None	
	PR-SED-01-110420	PR	TAL Metals/Hg	Sediment	4/20/2011	1	8 oz glass	None	
	PR-SED-01-110420	PR	Total Radium (226+228)	Sediment	4/20/2011	1	8 oz glass	None	
	PR-SW-01-110420	PR	Alkalinity	Surface Water	4/20/2011	1	NA	NA	
	PR-SW-01-110420	PR	Alpha Spec -Uranium isotopes	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	PR-SW-01-110420	PR	Anions (NO2,NO3,Cl,SO4)	Surface Water	4/20/2011	1	500 ml poly	None	
	PR-SW-01-110420	PR	Gamma Spec - Thorium	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	PR-SW-01-110420	PR	Gross Alpha/Beta	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		04/22/11		4/22/11	8:45			4/22/11		4-27-11	12:30

35000740

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	PR-SW-01-110420	PR	Total Dissolved Solids	Surface Water	4/20/2011	1	500 ml poly	None	
	PR-SW-01-110420	PR	Total Radium (226+228)	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	PR-SW-01-110420	PR	TAL Metals/Hg	Surface Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	RB-01-110420	NA	Alkalinity	Blank	4/20/2011	1	NA	NA	
	RB-01-110420	NA	Alpha Spec -Uranium isotopes	Blank	4/20/2011	1	1 L poly	HNO3 pH<2	
	RB-01-110420	NA	Anions (NO2,NO3,Cl,SO4)	Blank	4/20/2011	1	500 ml poly	None	
	RB-01-110420	NA	Gamma Spec - Thorium	Blank	4/20/2011	1	1 L poly	HNO3 pH<2	
	RB-01-110420	NA	Gross Alpha/Beta	Blank	4/20/2011	1	1 L poly	HNO3 pH<2	
	RB-01-110420	NA	Total Dissolved Solids	Blank	4/20/2011	1	500 ml poly	None	
	RB-01-110420	NA	Total Radium (226+228)	Blank	4/20/2011	1	1 L poly	HNO3 pH<2	
	RB-01-110420	NA	TAL Metals/Hg	Blank	4/20/2011	1	500 ml poly	HNO3 pH<2	
	RB-02-110421	NA	Alkalinity	Blank	4/21/2011	1	NA	NA	
	RB-02-110421	NA	Alpha Spec -Uranium isotopes	Blank	4/21/2011	1	1 L poly	HNO3 pH<2	
	RB-02-110421	NA	Anions (NO2,NO3,Cl,SO4)	Blank	4/21/2011	1	500 ml poly	None	
	RB-02-110421	NA	Gamma Spec - Thorium	Blank	4/21/2011	1	1 L poly	HNO3 pH<2	
	RB-02-110421	NA	Gross Alpha/Beta	Blank	4/21/2011	1	1 L poly	HNO3 pH<2	
	RB-02-110421	NA	Total Dissolved Solids	Blank	4/21/2011	1	500 ml poly	None	
	RB-02-110421	NA	Total Radium (226+228)	Blank	4/21/2011	1	1 L poly	HNO3 pH<2	
	RB-02-110421	NA	TAL Metals/Hg	Blank	4/21/2011	1	500 ml poly	HNO3 pH<2	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		04/22/11		4/22/11	8:45			4/22/11		4-27-11 4-27-11	12:30

35000741

USEPA

DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD

Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001

Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	RM-JM-SED-02-110420	RM-JM	Alpha Spec -Uranium isotopes	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SED-02-110420	RM-JM	Gamma Spec - Thorium	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SED-02-110420	RM-JM	Gross Alpha/Beta	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SED-02-110420	RM-JM	TAL Metals/Hg	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SED-02-110420	RM-JM	Total Radium (226+228)	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SED-110420	RM-JM	Alphe Spec -Uranium isotopes	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SED-110420	RM-JM	Gamma Spec - Thorium	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SED-110420	RM-JM	Gross Alpha/Beta	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SED-110420	RM-JM	TAL Metals/Hg	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SED-110420	RM-JM	Total Radium (226+228)	Sediment	4/20/2011	1	8 oz glass	None	
	RM-JM-SW-02-110420	RM-JM	Alkalinity	Surface Water	4/20/2011	1	NA	NA	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	[illegible]	04/22/11	[illegible]	4/22/11	8:45		[illegible]	4/22/11	[illegible]	4-27-11	1230 [illegible] 4-27-11

35000742

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	RM-JM-SW-02-110420	RM-JM	Alpha Spec -Uranium Isotopes	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RM-JM-SW-02-110420	RM-JM	Anions (NO2,NO3,Cl,SO4)	Surface Water	4/20/2011	1	500 ml poly	None	
	RM-JM-SW-02-110420	RM-JM	Gamma Spec - Thorium	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RM-JM-SW-02-110420	RM-JM	Gross Alpha/Beta	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RM-JM-SW-02-110420	RM-JM	Total Dissolved Solids	Surface Water	4/20/2011	1	500 ml poly	None	
	RM-JM-SW-02-110420	RM-JM	Total Radium (226+228)	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RM-JM-SW-02-110420	RM-JM	TAL Metals/Hg	Surface Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	RM-JM-SW-110420	RM-JM	Alkalinity	Surface Water	4/20/2011	1	NA	NA	
	RM-JM-SW-110420	RM-JM	Alpha Spec -Uranium Isotopes	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RM-JM-SW-110420	RM-JM	Anions (NO2,NO3,Cl,SO4)	Surface Water	4/20/2011	1	500 ml poly	None	
	RM-JM-SW-110420	RM-JM	Gamma Spec - Thorium	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RM-JM-SW-110420	RM-JM	Gross Alpha/Beta	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RM-JM-SW-110420	RM-JM	Total Dissolved Solids	Surface Water	4/20/2011	1	500 ml poly	None	
	RM-JM-SW-110420	RM-JM	Total Radium (226+228)	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		4/22/11		4/22/11	8:45			4/22/11		4-27-11	12:30

35000743

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	RM-JM-SW-110420	RM-JM	TAL Metals/Hg	Surface Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	RM-SED-BG-110419	RM-BG	Alpha Spec -Uranium isotopes	Sediment	4/19/2011	1	8 oz glass	None	
	RM-SED-BG-110419	RM-BG	Gamma Spec - Thorium	Sediment	4/19/2011	1	8 oz glass	None	
	RM-SED-BG-110419	RM-BG	TAL Metals/Hg	Sediment	4/19/2011	1	8 oz glass	None	
	RM-SED-BG-110419	RM-BG	Total Radium (226+228)	Sediment	4/19/2011	1	8 oz glass	None	
	RM-SW-BG-110419	RM-BG	Alkalinity	Surface Water	4/19/2011	1	NA	NA	
	RM-SW-BG-110419	RM-BG	Alpha Spec -Uranium isotopes	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RM-SW-BG-110419	RM-BG	Anions (NO2,NO3,Cl,SO4)	Surface Water	4/19/2011	1	500 ml poly	None	
	RM-SW-BG-110419	RM-BG	Gamma Spec - Thorium	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RM-SW-BG-110419	RM-BG	Gross Alpha/Beta	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RM-SW-BG-110419	RM-BG	Total Dissolved Solids	Surface Water	4/19/2011	1	500 ml poly	None	
	RM-SW-BG-110419	RM-BG	Total Radium (226+228)	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RM-SW-BG-110419	RM-BG	TAL Metals/Hg	Surface Water	4/19/2011	1	500 ml poly	HNO3 pH<2	
	RP-JM-SED-01	RP-JM-01	Alpha Spec -Uranium isotopes	Sediment	4/20/2011	1	8 oz glass	None	
	RP-JM-SED-01	RP-JM-01	Gamma Spec - Thorium	Sediment	4/20/2011	1	8 oz glass	None	
	RP-JM-SED-01	RP-JM-01	Gross Alpha/Beta	Sediment	4/20/2011	1	8 oz glass	None	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		04/22/11	[signature]	4/22/11	8:05		[signature]	4/22/11	[signature]	4-27-11	12:30

35000744

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	RP-JM-SED-01	RP-JM-01	TAL Metals/Hg	Sediment	4/20/2011	1	8 oz glass	None	
	RP-JM-SED-01	RP-JM-01	Total Radium (226+228)	Sediment	4/20/2011	1	8 oz glass	None	
	RP-JM-SED-110420	RP-JM	**Alpha Spec -Uranium isotopes**	Sediment	4/20/2011	1	8 oz glass	None	
	RP-JM-SED-110420	RP-JM	**Gamma Spec - Thorium**	Sediment	4/20/2011	1	8 oz glass	None	
	RP-JM-SED-110420	RP-JM	Gross Alpha/Beta	Sediment	4/20/2011	1	8 oz glass	None	
	RP-JM-SED-110420	RP-JM	TAL Metals/Hg	Sediment	4/20/2011	1	8 oz glass	None	
	RP-JM-SED-110420	RP-JM	Total Radium (226+228)	Sediment	4/20/2011	1	8 oz glass	None	
	RP-JM-SW-01-110420	RP-JM-01	Alkalinity	Surface Water	4/20/2011	1	NA	NA	
	RP-JM-SW-01-110420	RP-JM-01	**Alpha Spec -Uranium isotopes**	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RP-JM-SW-01-110420	RP-JM-01	Anions (NO2,NO3,Cl,SO4)	Surface Water	4/20/2011	1	500 ml poly	None	
	RP-JM-SW-01-110420	RP-JM-01	**Gamma Spec - Thorium**	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RP-JM-SW-01-110420	RP-JM-01	Gross Alpha/Beta	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RP-JM-SW-01-110420	RP-JM-01	Total Dissolved Solids	Surface Water	4/20/2011	1	500 ml poly	None	
	RP-JM-SW-01-110420	RP-JM-01	Total Radium (226+228)	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		04/22/11		4/22/11	8:45			4/22/11		4-27-11	12:30

35000745

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	RP-JM-SW-01-110420	RP-JM-01	TAL Metals/Hg	Surface Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	RP-JM-SW-110420	RP-JM	Alkalinity	Surface Water	4/20/2011	1	NA	NA	
	RP-JM-SW-110420	RP-JM	Alpha Spec -Uranium Isotopes	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RP-JM-SW-110420	RP-JM	Anions (NO2,NO3,Cl,SO4)	Surface Water	4/20/2011	1	500 ml poly	None	
	RP-JM-SW-110420	RP-JM	Gamma Spec - Thorium	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RP-JM-SW-110420	RP-JM	Gross Alpha/Beta	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RP-JM-SW-110420	RP-JM	Total Dissolved Solids	Surface Water	4/20/2011	1	500 ml poly	None	
	RP-JM-SW-110420	RP-JM	Total Radium (226+228)	Surface Water	4/20/2011	1	1 L poly	HNO3 pH<2	
	RP-JM-SW-110420	RP-JM	TAL Metals/Hg	Surface Water	4/20/2011	1	500 ml poly	HNO3 pH<2	
	RP-SED-01-110419	RP-01	Alpha Spec -Uranium Isotopes	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SED-01-110419	RP-01	Gamma Spec - Thorium	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SED-01-110419	RP-01	Gross Alpha/Beta	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SED-01-110419	RP-01	TAL Metals/Hg	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SED-01-110419	RP-01	Total Radium (226+228)	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SED-02-110420	RP-02	Alpha Spec -Uranium Isotopes	Sediment	4/20/2011	1	8 oz glass	None	
	RP-SED-02-110420	RP-02	Gamma Spec - Thorium	Sediment	4/20/2011	1	8 oz glass	None	
	RP-SED-02-110420	RP-02	Gross Alpha/Beta	Sediment	4/20/2011	1	8 oz glass	None	
	RP-SED-02-110420	RP-02	TAL Metals/Hg	Sediment	4/20/2011	1	8 oz glass	None	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	[illegible]	04/22/11	[signature]	4/22/11	8:45		[signature]	4/22/11	[signature]	4-27-11	12:00

35000746

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	RP-SED-02-110420	RP-02	Total Radium (226+228)	Sediment	4/20/2011	1	8 oz glass	None	
	RP-SED-03-110420	RP-03	Alpha Spec -Uranium isotopes	Sediment	4/20/2011	1	8 oz glass	None	
	RP-SED-03-110420	RP-03	Gamma Spec - Thorium	Sediment	4/20/2011	1	8 oz glass	None	
	RP-SED-03-110420	RP-03	Gross Alpha/Beta	Sediment	4/20/2011	1	8 oz glass	None	
	RP-SED-03-110420	RP-03	TAL Metals/Hg	Sediment	4/20/2011	1	8 oz glass	None	
	RP-SED-03-110420	RP-03	Total Radium (226+228)	Sediment	4/20/2011	1	8 oz glass	None	
	RP-SED-BG-041911	RP-BG	Alpha Spec -Uranium isotopes	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SED-BG-041911	RP-BG	Gamma Spec - Thorium	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SED-BG-041911	RP-BG	Gross Alpha/Beta	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SED-BG-041911	RP-BG	TAL Metals/Hg	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SED-BG-041911	RP-BG	Total Radium (226+228)	Sediment	4/19/2011	1	8 oz glass	None	
	RP-SW-01-110419	RP-01	Alkalinity	Surface Water	4/19/2011	1	NA	NA	
	RP-SW-01-110419	RP-01	Alpha Spec -Uranium isotopes	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RP-SW-01-110419	RP-01	Anions (NO2,NO3,Cl,SO4)	Surface Water	4/19/2011	1	500 ml poly	None	
	RP-SW-01-110419	RP-01	Gamma Spec - Thorium	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		04/22/11	[signature]	4/22/11	8:45		[signature]	4/22/11	[signature]	4-27-11	12:30

35000747

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3335

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	RP-SW-01-110419	RP-01	Gross Alpha/Beta	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RP-SW-01-110419	RP-01	Total Dissolved Solids	Surface Water	4/19/2011	1	500 ml poly	None	
	RP-SW-01-110419	RP-01	Total Radium (226+228)	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RP-SW-01-110419	RP-01	TAL Metals/Hg	Surface Water	4/19/2011	1	500 ml poly	HNO3 pH<2	
	RP-SW-BG-041911	RP-BG	Alkalinity	Surface Water	4/19/2011	1	NA	NA	
	RP-SW-BG-041911	RP-BG	Alpha Spec -Uranium isotopes	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RP-SW-BG-041911	RP-BG	Anions (NO2,NO3,Cl,SO4)	Surface Water	4/19/2011	1	500 ml poly	None	
	RP-SW-BG-041911	RP-BG	Gamma Spec - Thorium	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RP-SW-BG-041911	RP-BG	Gross Alpha/Beta	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RP-SW-BG-041911	RP-BG	Total Dissolved Solids	Surface Water	4/19/2011	1	500 ml poly	None	
	RP-SW-BG-041911	RP-BG	Total Radium (226+228)	Surface Water	4/19/2011	1	1 L poly	HNO3 pH<2	
	RP-SW-BG-041911	RP-BG	TAL Metals/Hg	Surface Water	4/19/2011	1	500 ml poly	HNO3 pH<2	
	SPOP35-110421	SPOP35	Alkalinity	Ground Water	4/21/2011	1	NA	NA	
	SPOP35-110421	SPOP35	Alpha Spec -Uranium isotopes	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	SPOP35-110421	SPOP35	Anions (NO2,NO3,Cl,SO4)	Ground Water	4/21/2011	1	500 ml poly	None	
	SPOP35-110421	SPOP35	Gamma Spec - Thorium	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	SPOP35-110421	SPOP35	Gross Alpha/Beta	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	
	SPOP35-110421	SPOP35	Total Dissolved Solids	Ground Water	4/21/2011	1	500 ml poly	None	
	SPOP35-110421	SPOP35	Total Radium (226+228)	Ground Water	4/21/2011	1	1 L poly	HNO3 pH<2	

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	[signature]	04/22/11	[signature]	4/22/11	8:45		[signature]	4/22/11	[signature]	4-27-11	2:30

35000748

USEPA
DateShipped: 4/22/2011
CarrierName: hand delivered
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 0603
Contact Name: [redacted]
Contact Phone: [redacted]

No: 6-042211-001353-0001
Cooler #:
Lab: Summit Environmental
Lab Phone: 505-345-3336

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	SPOP35-110421	SPOP35	TAL Metals/Hg	Ground Water	4/21/2011	1	500 ml poly	HNO3 pH<2	
	RM-SED-BG-110419	RM-BG	Gross Alpha/Beta	Sediment	4/19/2011	1	8 oz glass	None	
	MW-RM-110420		Alpha spec-uranium isotopes Alpha Spec-thorium isotopes		4-20-11/0934				

Special Instructions: 5-7 day TAT
Level IV Deliverable

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		04/22/11		4/22/11	8:45			4/22/11		4-27-11	12:30

35000749

AMERICAN RADIATION SERVICES, INC.

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

American Radiation Services Analytical Reports

for

Summit Enviromental Technologies

Site Number: 0603

Case Narrative

35000750

ARS INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767
1 (800) 401-4277 • Fax (225) 381-2996

June 2, 2011

Summit Environmental
2709 Pan American Fwy. NE, Suite A/C
Albuquerque, NM 87107

Site Number: 0603
ARS SDG: ARS1-11-00897

Dear Mr. Chavez and Ms. Gilger ;

On April 27, 2011, ARS International received ten (10) solid samples and twenty five (25) aqueous samples to be analyzed for Isotopic Uranium and Isotopic Thorium via Alpha Spectroscopy. The solid samples are reported on ARS1-11-00895 and the aqueous samples are reported on ARS1-11-00897.

The samples were processed and counted using the appropriate counting equipment and QA/QC for this type of analysis. Results of the analysis and QA/QC are attached in the data package.

The client and QA/QC samples were counted with a count time sufficient to meet quality control parameters for counting equipment and were within acceptance criteria and statistical sound detection limits.

If you have any questions please do not hesitate to call at 225.381.2991 or email projectmanagers@amrad.com.

Sincerely,

Virgene Mulligan

Laboratory Management
ARS International

ARS INTERNATIONAL
2609 North River Road • Port Allen, Louisiana 70767
1 (800) 401-4277 • Fax (225) 381-2996

PROJECT SAMPLE IDENTIFICATION
CROSS-REFERENCE
TO ARS SAMPLE LABORATORY IDs

Site Number 0603

Summit Environmental SAMPLE ID NUMBER	American Radiation Services SAMPLE ID NUMBER(S)
MW-1-110419	ARS1-11-00897-001
MW-2-110421	ARS1-11-00897-002
MW-2-2-110421	ARS1-11-00897-003
JPOP41S-110421	ARS1-11-00897-004
MD-SW-110420	ARS1-11-00897-005
MW-3-110420	ARS1-11-00897-006
MW-4-110420	ARS1-11-00897-007
MW-6-110420	ARS1-11-00897-008
MW-7-1I0419	ARS1-1I-00897-009
MW-8-I10419	ARS1-11-00897-010
MW-MD-02-110420	ARS1-11-00897-011
MW-MD-110420	ARS1-11-00897-012
NPOP20E-110420	ARS1-11-00897-013
PR-SW-01-110420	ARS1-11-00897-014
RB-01-110420	ARS1-11-00897-015
RB-02-110421	ARS1-11-00897-016
RM-JM-SW-02-110420	ARS1-11-00897-017
RM-JW-SW-110420	ARS1-11-00897-018
RM-SW-BG-110419	ARS1-11-00897-019
RP-JM-SW-01-110420	ARS1-11-00897-020

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RP-JM-SW-110420	ARS1-11-00897-021
RP-SW-01-110419	ARS1-11-00897-022
RP-SW-BG-041911	ARS1-11-00897-023
SPOP35-110421	ARS1-11-00897-024
MW-RM-110420	ARS1-11-00897-025

SAMPLE RECEIPT

The samples were received in good condition. The ten solid samples were checked in on ARS1-11-00895, and the twenty five aqueous samples were checked in on ARS1-11-00897.

ANALYTICAL METHODS

A Gross Alpha/Beta screen was performed for internal use. The data for this screen in included in your report under duplicate reports.

Samples for Uranium and Thorium procedures were digested prior to analyses utilizing the MARS total digestion system followed by a sequential separation using an Eichrom Ion Exchange Resin per Eichrom procedures ACW-03-15 and ACW-10. The samples were then electroplated on stainless steel disks and analyzed using alpha spectroscopy.

ANALYTICAL RESULTS

The result data that are flagged with "U" indicate that the activity is below the MDC.

The method blank for Th-230 failed evaluation criteria for samples ARS1-B11-01657-05 and 06. However, review of the data shows that both samples have activities that are less than the MDC and are less than the value of the blank. The results can be reported.

The tracer recovery for ARS1-B11-01985-04, and 05 are biased low; however, after management review the data is being released as valid.

The method blank is biased high for ARS1-B11-01985;however, method blank evaluation was performed per procedure and results are being released as valid.

The Method Blank for ARS1-B11-01664 is elevated; however, method blank evaluation was performed per procedure and the QC is being released as valid.

Tracer recovery for ARS1-B11-01664-14 is biased low; however, after management review the results are being released as valid.

Tracer recovery for ARS1-B11-01984-17 is low. This is a rerun and the results are comparable to the first run. There is an obvious matrix interference with this sample.

ARS INTERNATIONAL

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American Radiation Services Project Manager/Laboratory Director's Comments:

"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."

"I certify that this electronic image and all hardcopies produced from this image accurately represent the data and is in compliance with the Summit Environmental specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager/Technical Director or the Manager's designee."

Signature	Title	Date
Virginia Mullegan	Laboratory Management, ARS International	6-2-11

AMERICAN RADIATION SERVICES, INC.

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

American Radiation Services Analytical Reports

for

Summit Environmental Technologies

Analysis Results

35000755

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-1-110419	**ARS Sample ID:**	ARS1-11-00897-001
Sample Collection Date:	04/19/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	3.743	0.520	0.075	0.031		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	64%
U-235	0.161	0.062	0.038	0.012		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	64%
U-238	0.826	0.156	0.041	0.015		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	64%
TH-228	0.044	0.025	0.010	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	79%
TH-230	0.122	0.046	0.033	0.012		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	79%
TH-232	0.007	0.020	0.039	0.014	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	79%

NOTES: LEVEL IV DELIVERABLE

Vmulligan

Project Manager Review

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.

LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-2-110421	**ARS Sample ID:**	ARS1-11-00897-002
Sample Collection Date:	04/21/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	63.555	7.743	0.051	0.020		pCi/L	ARS-026/Elchrom ACW-03	05/28/11 14:09	JB	75%
U-235	2.232	0.334	0.012	0.000		pCi/L	ARS-026/Elchrom ACW-03	05/28/11 14:09	JB	75%
U-238	54.374	6.633	0.042	0.016		pCi/L	ARS-026/Elchrom ACW-03	05/28/11 14:09	JB	75%
TH-228	0.013	0.015	0.012	0.000		pCi/L	ARS-031/Elchrom ACW-10	05/05/11 03:52	JB	70%
TH-230	0.004	0.027	0.055	0.022	U	pCi/L	ARS-031/Elchrom ACW-10	05/05/11 03:52	JB	70%
TH-232	-0.071	0.042	0.101	0.045	U	pCi/L	ARS-031/Elchrom ACW-10	05/05/11 03:52	JB	70%

NOTES: LEVEL IV DELIVERABLE

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Project Manager Review

Notes: *American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

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ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-2-2-110421	**ARS Sample ID:**	ARS1-11-00897-003
Sample Collection Date:	04/21/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	62.708	7.639	0.054	0.022		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	74%
U-235	2.490	0.365	0.033	0.010		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	74%
U-238	54.411	6.636	0.035	0.013		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	74%
TH-228	0.008	0.012	0.011	0.000	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	73%
TH-230	0.042	0.037	0.054	0.022	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	73%
TH-232	-0.004	0.018	0.045	0.017	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	73%

NOTES: LEVEL IV DELIVERABLE

Vmulligan

Project Manager Review

Notes: *American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL
2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-11-00897
Client Sample ID: JPOP41S-110421
Sample Collection Date: 04/21/11
Sample Matrix: Aqueous

Request or PO Number: N/A
ARS Sample ID: ARS1-11-00897-004
Date Received: 04/27/11
Report Date: 06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	63261.388	7653.729	9.051	3.850		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	1%
U-235	72121.573	8725.834	1.567	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	1%
U-238	114131.786	13801.934	1.349	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	1%
TH-228	0.247	0.150	0.164	0.058		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	80%
TH-230	1.492	0.373	0.187	0.070		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	80%
TH-232	0.087	0.090	0.127	0.040	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	80%

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LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MD-SW-110420	**ARS Sample ID:**	ARS1-11-00897-005
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	4.858	0.662	0.054	0.020		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	57%
U-235	0.306	0.090	0.016	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	57%
U-238	2.811	0.413	0.070	0.028		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	57%
TH-228	0.043	0.029	0.013	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	59%
TH-230	0.419	0.105	0.053	0.020		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	59%
TH-232	0.020	0.027	0.046	0.016	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	59%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-3-110420	**ARS Sample ID:**	ARS1-11-00897-006
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	17.713	2.201	0.046	0.018		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	75%
U-235	0.650	0.132	0.033	0.010		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	75%
U-238	15.436	1.926	0.081	0.035		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	75%
TH-228	0.008	0.022	0.043	0.016	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	77%
TH-230	0.645	0.127	0.042	0.016		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	77%
TH-232	0.031	0.027	0.036	0.013	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	77%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-4-110420	**ARS Sample ID:**	ARS1-11-00897-007
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	118.950	14.432	0.038	0.014		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	84%
U-235	4.579	0.615	0.011	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	84%
U-238	108.225	13.136	0.038	0.014		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	84%
TH-228	0.000	0.016	0.038	0.013	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	76%
TH-230	0.129	0.054	0.057	0.023		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	76%
TH-232	0.008	0.016	0.030	0.009	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	76%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-6-110420	**ARS Sample ID:**	ARS1-11-00897-008
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	73.205	8.904	0.010	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	82%
U-235	2.629	0.378	0.011	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	82%
U-238	61.798	7.525	0.050	0.020		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	82%
TH-228	0.026	0.029	0.045	0.018	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	75%
TH-230	0.674	0.129	0.044	0.017		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	75%
TH-232	0.041	0.030	0.040	0.015		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	75%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-11-00897
Client Sample ID: MW-7-110419
Sample Collection Date: 04/19/11
Sample Matrix: Aqueous

Request or PO Number: N/A
ARS Sample ID: ARS1-11-00897-009
Date Received: 04/27/11
Report Date: 06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	3.803	0.531	0.045	0.016		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	61%
U-235	0.062	0.040	0.041	0.013		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	61%
U-238	0.443	0.113	0.084	0.035		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	61%
TH-228	0.036	0.024	0.011	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	72%
TH-230	0.485	0.104	0.036	0.013		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	72%
TH-232	0.039	0.024	0.011	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:52	JB	72%

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2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-8-110419	**ARS Sample ID:**	ARS1-11-00897-010
Sample Collection Date:	04/19/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	5.210	0.706	0.054	0.020		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	57%
U-235	0.059	0.040	0.043	0.014		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	57%
U-238	1.955	0.308	0.071	0.029		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	57%
TH-228	0.004	0.018	0.037	0.013	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	72%
TH-230	0.938	0.166	0.042	0.016		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	72%
TH-232	0.012	0.020	0.037	0.013	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	72%

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1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-MD-02-110420	**ARS Sample ID:**	ARS1-11-00897-011
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	29.059	3.645	0.185	0.081		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	34%
U-235	1.066	0.241	0.091	0.032		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	34%
U-238	21.357	2.713	0.169	0.073		pCi/L	ARS-026/Eichrom ACW-03	05/28/11 14:09	JB	34%
TH-228	-0.004	0.018	0.044	0.016	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	73%
TH-230	0.693	0.133	0.029	0.009		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	73%
TH-232	0.024	0.022	0.029	0.009	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	73%

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2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-MD-110420	**ARS Sample ID:**	ARS1-11-00897-012
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	31.289	3.843	0.036	0.013		pCi/L	ARS-026/Eichrom ACW-03	05/29/11 16:05	JB	76%
U-235	1.001	0.179	0.033	0.010		pCi/L	ARS-026/Eichrom ACW-03	05/29/11 16:05	JB	76%
U-238	22.773	2.814	0.068	0.029		pCi/L	ARS-026/Eichrom ACW-03	05/29/11 16:05	JB	76%
TH-228	0.009	0.022	0.043	0.015	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	64%
TH-230	0.859	0.160	0.052	0.020		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	64%
TH-232	0.009	0.012	0.012	0.000	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	64%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	NPOP20E-110420	**ARS Sample ID:**	ARS1-11-00897-013
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	36513.126	4475.259	2.203	0.696		pCi/L	ARS-026/Eichrom ACW-03	05/29/11 16:05	JB	1%
U-235	40367.118	4947.878	2.553	0.807		pCi/L	ARS-026/Eichrom ACW-03	05/29/11 16:05	JB	1%
U-238	64338.356	7882.096	2.198	0.695		pCi/L	ARS-026/Eichrom ACW-03	05/29/11 16:05	JB	1%
TH-228	0.037	0.073	0.138	0.043	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	80%
TH-230	1.854	0.434	0.198	0.074		pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	80%
TH-232	0.110	0.161	0.275	0.113	U	pCi/L	ARS-031/Eichrom ACW-10	05/05/11 03:53	JB	80%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	PR-SW-01-110420	**ARS Sample ID:**	ARS1-11-00897-014
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	17.445	2.253	0.141	0.058		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	30%
U-235	0.565	0.168	0.029	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	30%
U-238	14.624	1.911	0.101	0.038		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	30%
TH-228	0.034	0.039	0.031	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	26%
TH-230	1.573	0.324	0.103	0.036		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	26%
TH-232	0.088	0.082	0.119	0.045	U	pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	26%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	RB-01-110420	**ARS Sample ID:**	ARS1-11-00897-015
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	05/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	0.124	0.058	0.060	0.023		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	59%
U-235	0.006	0.030	0.062	0.023	U	pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	59%
U-238	0.065	0.063	0.100	0.043	U	pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	59%
TH-228	0.079	0.059	0.030	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	26%
TH-230	1.062	0.261	0.150	0.059		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	26%
TH-232	0.080	0.157	0.274	0.121	U	pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	26%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	RB-02-110421	**ARS Sample ID:**	ARS1-11-00897-016
Sample Collection Date:	04/21/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	0.111	0.056	0.067	0.027		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	68%
U-235	0.010	0.014	0.014	0.000	U	pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	68%
U-238	0.138	0.051	0.012	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	68%
TH-228	0.053	0.060	0.048	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	18%
TH-230	0.672	0.250	0.226	0.090		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	18%
TH-232	0.086	0.112	0.185	0.069	U	pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	18%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	RM-JM-SW-02-110420	**ARS Sample ID:**	ARS1-11-00897-017
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	28.334	3.489	0.038	0.014		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	67%
U-235	0.961	0.177	0.044	0.016		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	67%
U-238	23.591	2.916	0.011	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	67%
TH-228	0.027	0.026	0.036	0.013	U	pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	73%
TH-230	0.871	0.156	0.041	0.015		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	73%
TH-232	0.111	0.044	0.028	0.009		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	73%

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1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	RM-JM-SW-110420	**ARS Sample ID:**	ARS1-11-00897-018
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	37.997	4.652	0.053	0.022		pCi/L	ARS-026/Elchrom ACW-03	05/10/11 13:21	JB	76%
U-235	1.541	0.246	0.012	0.000		pCi/L	ARS-026/Elchrom ACW-03	05/10/11 13:21	JB	76%
U-238	33.431	4.100	0.045	0.018		pCi/L	ARS-026/Elchrom ACW-03	05/10/11 13:21	JB	76%
TH-228	0.036	0.024	0.011	0.000		pCi/L	ARS-031/Elchrom ACW-10	05/06/11 10:32	JB	73%
TH-230	0.545	0.114	0.043	0.016		pCi/L	ARS-031/Elchrom ACW-10	05/06/11 10:32	JB	73%
TH-232	0.139	0.051	0.037	0.013		pCi/L	ARS-031/Elchrom ACW-10	05/06/11 10:32	JB	73%

NOTES: LEVEL IV DELIVERABLE

Vmulligan

Project Manager Review

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LELAP Certificate# 01949 NELAP Certificate # EB7558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	RM-SW-BG-110419	**ARS Sample ID:**	ARS1-11-00897-019
Sample Collection Date:	04/19/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	4.119	0.588	0.066	0.025		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	49%
U-235	0.100	0.054	0.019	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	49%
U-238	2.230	0.355	0.066	0.025		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	49%
TH-228	0.071	0.042	0.048	0.018		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	69%
TH-230	0.727	0.143	0.047	0.018		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	69%
TH-232	0.126	0.051	0.040	0.014		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	69%

NOTES: LEVEL IV DELIVERABLE

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Project Manager Review

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	RP-JM-SW-01-110420	**ARS Sample ID:**	ARS1-11-00897-020
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	32.398	3.979	0.070	0.029		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	77%
U-235	1.236	0.211	0.034	0.011		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	77%
U-238	29.257	3.599	0.052	0.021		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	77%
TH-228	0.026	0.027	0.040	0.014	U	pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	72%
TH-230	0.755	0.147	0.060	0.024		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	72%
TH-232	0.077	0.038	0.031	0.010		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	72%

NOTES: LEVEL IV DELIVERABLE

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	RP-JM-SW-110420	**ARS Sample ID:**	ARS1-11-00897-021
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	28.476	3.505	0.056	0.023		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	70%
U-235	1.071	0.190	0.043	0.015		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	70%
U-238	24.247	2.993	0.075	0.032		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	70%
TH-228	0.226	0.071	0.051	0.020		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	67%
TH-230	0.702	0.138	0.050	0.019		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	67%
TH-232	0.142	0.054	0.045	0.017		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	67%

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	RP-SW-01-110419	**ARS Sample ID:**	ARS1-11-00897-022
Sample Collection Date:	04/19/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	85.099	10.338	0.031	0.011		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	83%
U-235	3.236	0.449	0.011	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	83%
U-238	78.787	9.575	0.025	0.008		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	83%
TH-228	0.104	0.043	0.011	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	69%
TH-230	1.073	0.184	0.038	0.013		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	69%
TH-232	0.110	0.044	0.011	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	69%

NOTES: LEVEL IV DELIVERABLE

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	RP-SW-BG-041911	**ARS Sample ID:**	ARS1-11-00897-023
Sample Collection Date:	04/19/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	6.242	0.840	0.061	0.023		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	50%
U-235	0.216	0.078	0.018	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	50%
U-238	3.793	0.541	0.041	0.013		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	50%
TH-228	0.161	0.057	0.038	0.014		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	70%
TH-230	1.202	0.200	0.044	0.016		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	70%
TH-232	0.073	0.038	0.038	0.013		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	70%

NOTES: LEVEL IV DELIVERABLE

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Project Manager Review

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ARS INTERNATIONAL
2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	SPOP35-110421	**ARS Sample ID:**	ARS1-11-00897-024
Sample Collection Date:	04/21/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	3658.397	448.367	0.208	0.066		pCi/L	ARS-026/Eichrom ACW-03	05/29/11 16:05	JB	10%
U-235	4154.134	509.134	0.241	0.076		pCi/L	ARS-026/Eichrom ACW-03	05/29/11 16:05	JB	10%
U-238	5951.706	729.152	0.207	0.066		pCi/L	ARS-026/Eichrom ACW-03	05/29/11 16:05	JB	10%
TH-228	0.075	0.039	0.041	0.015		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	79%
TH-230	0.592	0.117	0.027	0.009		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	79%
TH-232	0.100	0.041	0.027	0.009		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	79%

NOTES: LEVEL IV DELIVERABLE

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ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-11-00897	**Request or PO Number:**	N/A
Client Sample ID:	MW-RM-110420	**ARS Sample ID:**	ARS1-11-00897-025
Sample Collection Date:	04/20/11	**Date Received:**	04/27/11
Sample Matrix:	Aqueous	**Report Date:**	06/02/11

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
U-234	11.645	1.471	0.011	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	68%
U-235	0.733	0.146	0.013	0.000		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	68%
U-238	30.024	3.693	0.049	0.019		pCi/L	ARS-026/Eichrom ACW-03	05/10/11 13:21	JB	68%
TH-228	0.012	0.021	0.038	0.014	U	pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	70%
TH-230	1.035	0.179	0.048	0.019		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	70%
TH-232	0.104	0.042	0.011	0.000		pCi/L	ARS-031/Eichrom ACW-10	05/06/11 10:32	JB	70%

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LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

QC Results per Analytical Batch

Analytical Batch	ARS1-B11-01664
SDG	ARS1-11-00897
Analysis	Uranium in Water
Analysis Test Method	ARS-026/Elchrom ACW-03-15
Analysis Code	ASP-A-024
Report Units	pCi/L

Acceptable QC Performance Ranges

QC Sample Type	Performance Items and Ranges		
Laboratory Control Sample	Recovery (%):	> 75	< 125
Matrix Spike	Recovery (%):	> 60	< 140
Duplicate	Replicate Error Ratio (RER):		< 1
	Duplicate Error Ratio (DER):		< 3
	Relative Percent Difference (RPD %):		≤ 25

Laboratory Control Sample

Analysis Date: 05/10/11 13:21 — Analysis Technician: JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	Expected Value	LCS Rec (%)	MDC
ARS1-B11-01664-01	LCS	U-238	20.7	2.6	16.8	123	0.064

Duplicate RER/DER/RPD

Analysis Date: 05/10/11 13:21 — Analysis Technician: JBROWN

Analyte	Result LCS	CSU LCS (2s)	Results LCSD	CSU LCSD (2s)	RER	DER	RPD
U-238	20.7	2.6	17.1	2.1	0.77	2.11	19.0

Method Blank

Analysis Date: 05/10/11 13:21, 05/10/11 13:21 — Analysis Technician: JBROWN, JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	MDC	Qual
ARS1-B11-01664-03	MBL	U-234	0.054	0.036	0.047	
ARS1-B11-01664-03	MBL	U-235	0.008	0.016	0.031	U
ARS1-B11-01664-03	MBL	U-238	0.039	0.028	0.033	

Heather Wright

Heather Wright

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ARS INTERNATIONAL

QC Results per Analytical Batch

Analytical Batch	ARS1-B11-01984
SDG	ARS1-11-00897
Analysis	Uranium in Water
Analysis Test Method	ARS-026/Eichrom ACW-03-15
Analysis Code	ASP-A-024
Report Units	pCi/L

Acceptable QC Performance Ranges

QC Sample Type	Performance Items and Ranges		
Laboratory Control Sample	Recovery (%):	> 75	< 125
Matrix Spike	Recovery (%):	> 60	< 140
Duplicate	Replicate Error Ratio (RER):		< 1
	Duplicate Error Ratio (DER):		< 3
	Relative Percent Difference (RPD %):		≤ 25

Laboratory Control Sample

Analysis Date: 05/28/11 14:08 — Analysis Technician: JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	Expected Value	LCS Rec (%)	MDC
ARS1-B11-01984-01	LCS	U-238	17.6	2.2	17.0	104	0.021

Duplicate RER/DER/RPD

Analysis Date: 05/28/11 14:09 — Analysis Technician: JBROWN

Analyte	Result LCS	CSU LCS (2s)	Results LCSD	CSU LCSD (2s)	RER	DER	RPD
U-238	17.6	2.2	17.0	2.1	0.14	0.39	3.5

Method Blank

Analysis Date: 05/28/11 14:09, 05/28/11 14:09 — Analysis Technician: JBROWN, JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	MDC	Qual
ARS1-B11-01984-03	MBL	U-234	0.174	0.047	0.037	
ARS1-B11-01984-03	MBL	U-235	0.015	0.017	0.027	U
ARS1-B11-01984-03	MBL	U-238	0.120	0.056	0.079	

Virgene Mulligan

Virgene Mulligan

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ARS INTERNATIONAL

QC Results per Analytical Batch

Analytical Batch	ARS1-B11-01657
SDG	ARS1-11-00897
Analysis	Thorium in Water
Analysis Test Method	ARS-031/Eichrom ACW-10
Analysis Code	ASP-A-008
Report Units	pCi/L

Acceptable QC Performance Ranges

QC Sample Type	Performance Items and Ranges		
Laboratory Control Sample	Recovery (%):	> 75	< 125
Matrix Spike	Recovery (%):	> 60	< 140
Duplicate	Replicate Error Ratio (RER):		< 1
	Duplicate Error Ratio (DER):		< 3
	Relative Percent Difference (RPD %):		≤ 25

Laboratory Control Sample

Analysis Date: 05/05/11 03:52 — Analysis Technician: JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	Expected Value	LCS Rec (%)	MDC
ARS1-B11-01657-01	LCS	TH-230	5.59	0.70	5.86	95	0.034

Duplicate RER/DER/RPD

Analysis Date: 05/05/11 03:52 — Analysis Technician: JBROWN

Analyte	Result LCS	CSU LCS (2s)	Results LCSD	CSU LCSD (2s)	RER	DER	RPD
TH-230	5.59	0.70	5.75	0.72	0.11	0.31	2.8

Method Blank

Analysis Date: 05/05/11 03:52 — Analysis Technician: JBROWN
05/05/11 03:52 — JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	MDC	Qual
ARS1-B11-01657-03	MBL	TH-228	0.029	0.016	0.013	
ARS1-B11-01657-03	MBL	TH-230	0.043	0.022	0.026	
ARS1-B11-01657-03	MBL	TH-232	0.023	0.015	0.017	

Heather Wright

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ARS INTERNATIONAL

QC Results per Analytical Batch

Analytical Batch	ARS1-B11-01660
SDG	ARS1-11-00897
Analysis	Thorium in Water
Analysis Test Method	ARS-031/Eichrom ACW-10
Analysis Code	ASP-A-008
Report Units	pCi/L

Acceptable QC Performance Ranges

QC Sample Type	Performance Items and Ranges		
Laboratory Control Sample	Recovery (%):	> 75	< 125
Matrix Spike	Recovery (%):	> 60	< 140
Duplicate	Replicate Error Ratio (RER):		< 1
	Duplicate Error Ratio (DER):		< 3
	Relative Percent Difference (RPD %):		≤ 25

Laboratory Control Sample

Analysis Date: 05/06/11 10:32 — Analysis Technician: JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	Expected Value	LCS Rec (%)	MDC
ARS1-B11-01660-01	LCS	TH-230	5.77	0.73	5.82	99	0.039

Duplicate RER/DER/RPD

Analysis Date: 05/06/11 10:32 — Analysis Technician: JBROWN

Analyte	Result LCS	CSU LCS (2s)	Results LCSD	CSU LCSD (2s)	RER	DER	RPD
TH-230	5.77	0.73	6.42	0.81	0.43	1.18	10.7

Method Blank

Analysis Date: 05/06/11 10:32 — Analysis Technician: JBROWN

05/06/11 10:32 — JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	MDC	Qual
ARS1-B11-01660-03	MBL	TH-228	0.0039	0.0077	0.015	U
ARS1-B11-01660-03	MBL	TH-230	0.278	0.058	0.028	
ARS1-B11-01660-03	MBL	TH-232	0.045	0.021	0.018	

Jamie Armstrong

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ARS INTERNATIONAL

QC Results per Analytical Batch

Analytical Batch	ARS1-B11-01985
SDG	ARS1-11-00897
Analysis	Thorium in Water
Analysis Test Method	ARS-031/Eichrom ACW-10
Analysis Code	ASP-A-008
Report Units	pCi/L

Acceptable QC Performance Ranges

QC Sample Type	Performance Items and Ranges		
Laboratory Control Sample	Recovery (%):	> 75	< 125
Matrix Spike	Recovery (%):	> 60	< 140
Duplicate	Replicate Error Ratio (RER):		< 1
	Duplicate Error Ratio (DER):		< 3
	Relative Percent Difference (RPD %):		≤ 25

Laboratory Control Sample

Analysis Date: 05/28/11 14:08 — Analysis Technician: JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	Expected Value	LCS Rec (%)	MDC
ARS1-B11-01985-01	LCS	TH-230	6.78	0.85	5.79	117	0.037

Duplicate RER/DER/RPD

Analysis Date: 05/28/11 14:08 — Analysis Technician: JBROWN

Analyte	Result LCS	CSU LCS (2s)	Results LCSD	CSU LCSD (2s)	RER	DER	RPD
TH-230	6.78	0.85	6.39	0.81	0.24	0.66	5.9

Method Blank

Analysis Date: 05/28/11 14:08, 05/28/11 14:08 — Analysis Technician: JBROWN, JBROWN

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	MDC	Qual
ARS1-B11-01985-03	MBL	TH-228	0.013	0.011	0.014	U
ARS1-B11-01985-03	MBL	TH-230	0.140	0.038	0.027	
ARS1-B11-01985-03	MBL	TH-232	0.017	0.014	0.018	U

Heather Wright

Heather Wright

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AMERICAN RADIATION SERVICES, INC.

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American Radiation Services Analytical Reports

for

Summit Environmental Technologies

Uranium Alpha Spectroscopy Samples

35000786

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	5109.000000
Count Mins	1440.000000
BKG Counts	14.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212453
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1237.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.031200
Tracer EFF	0.212453
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	17.331466	17.331466	OK
CU	0.477210	0.477210	OK
TPU	2.148361	2.148361	OK
MDA	0.068438	0.068438	OK
DL	0.029610	0.029610	OK
BP MDA	0.422241	0.422241	OK
BP DL	0.206955	0.206955	OK
DL QSAS			
Gross Count Rate	3.547917	3.547917	OK
BKG Count Rate	0.009722	0.009722	OK
Net Count Rate	3.538194	3.538194	OK
Δ t 1 (t2 - t1)	6.860208	6.860208	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.437523	9.437523	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.433711	0.433711	OK
Chem Rec Factor	0.442562	0.442562	OK
Sys Err	0.061664	0.061664	OK
K	0.204149	0.204149	OK
K MDA	293.973970	293.973970	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-01
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_1A
Instr keV	59.44017029
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	180.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212453
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --> UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1237.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.031200
Tracer EFF	0.212453
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.705784	0.705784	OK
CU	0.103971	0.103971	OK
TPU	0.134486	0.134486	OK
MDA	0.029031	0.029031	OK
DL	0.009173	0.009173	OK
BP MDA	0.163601	0.163601	OK
BP DL	0.076622	0.076622	OK
DL QSAS			
Gross Count Rate	0.125000	0.125000	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.124306	0.124306	OK
Δ t 1 (t2 - t1)	6.860208	6.860208	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.437523	9.437523	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.433711	0.433711	OK
Chem Rec Factor	0.442562	0.442562	OK
Sys Err	0.061664	0.061664	OK
K	0.176124	0.176124	OK
K MDA	253.618839	253.618839	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-01
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_1A
Instr keV	55.66129303
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDR **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	6118.000000
Count Mins	1440.000000
BKG Counts	12.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212453
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1237.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.031200
Tracer EFF	0.212453
Tracer Plating Rec	0.950000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	20.729004	20.729004	OK
CU	0.520964	0.520964	OK
TPU	2.558910	2.558910	OK
MDA	0.063917	0.063917	OK
DL	0.027359	0.027359	OK
BP MDA	0.351362	0.351362	OK
BP DL	0.171449	0.171449	OK
DL QSAS			
Gross Count Rate	4.248611	4.248611	OK
BKG Count Rate	0.008333	0.008333	OK
Net Count Rate	4.240278	4.240278	OK
Δ t 1 (t2 - t1)	6.860208	6.860208	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.437523	9.437523	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.433711	0.433711	OK
Chem Rec Factor	0.442562	0.442562	OK
Sys Err	0.061664	0.061664	OK
K	0.204558	0.204558	OK
K MDA	294.563112	294.563112	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-01
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_1A
Instr keV	54.32730484
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1206.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.192201
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-D241
Tracer Std - Isotope	U-232
Tracer Counts	1206.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.032000
Tracer EFF	0.192201
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.216140	4.216140	OK
CU	0.238846	0.238846	OK
TPU	0.562764	0.562764	OK
MDA	0.037741	0.037741	OK
DL	0.014122	0.014122	OK
BP MDA	0.181046	0.181046	OK
BP DL	0.085959	0.085959	OK
DL QSAS			
Gross Count Rate	0.837500	0.837500	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	0.835417	0.835417	OK
Δ t 1 (t2 - t1)	6.860208	6.860208	OK
DF	0.999811	0.999811	OK
Tracer DPM	9.444845	9.444845	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.465872	0.465872	OK
Chem Rec Factor	0.475380	0.475380	OK
Sys Err	0.061664	0.061664	OK
K	0.198147	0.198147	OK
K MDA	285.332065	285.332065	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_18
Instr keV	37.7613678
Version/Date	2.0 -- 4/20/2006

Reviewed by: SRh Date: 6-2-11

35000790

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	4548.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.192201
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1206.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.032000
Tracer EFF	0.192201
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	15.899341	15.899341	OK
CU	0.463004	0.463004	OK
TPU	1.976595	1.976595	OK
MDA	0.049381	0.049381	OK
DL	0.019948	0.019948	OK
BP MDA	0.422509	0.422509	OK
BP DL	0.206955	0.206955	OK
DL QSAS			
Gross Count Rate	3.158333	3.158333	OK
BKG Count Rate	0.004167	0.004167	OK
Net Count Rate	3.154167	3.154167	OK
Δ t 1 (t2 - t1)	6.860208	6.860208	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.444845	9.444845	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.465872	0.465872	OK
Chem Rec Factor	0.475380	0.475380	OK
Sys Err	0.061664	0.061664	OK
K	0.198383	0.198383	OK
K MDA	285.672222	285.672222	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_18
Instr keV	35.82033157
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDH **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	180.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.192201
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1206.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.032000
Tracer EFF	0.192201
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.722236**	**0.722236**	**OK**
CU	**0.107288**	**0.107288**	**OK**
TPU	**0.138312**	**0.138312**	**OK**
MDA	**0.037694**	**0.037694**	**OK**
DL	**0.013349**	**0.013349**	**OK**
BP MDA	**0.163912**	**0.163912**	**OK**
BP DL	**0.076622**	**0.076622**	**OK**
DL QSAS			
Gross Count Rate	**0.125000**	**0.125000**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.123611**	**0.123611**	**OK**
Δ t 1 (t2 - t1)	**6.860208**	**6.860208**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.444845**	**9.444845**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.465872**	**0.465872**	**OK**
Chem Rec Factor	**0.475380**	**0.475380**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.171150**	**0.171150**	**OK**
K MDA	**246.456709**	**246.456709**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_18
Instr keV	12.16941738
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	4884.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.192201
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1206.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.032000
Tracer EFF	0.192201
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	17.062323	17.062323	OK
CU	0.478527	0.478527	OK
TPU	2.116954	2.116954	OK
MDA	0.009467	0.009467	OK
DL	0.000000	0.000000	OK
BP MDA	0.351630	0.351630	OK
BP DL	0.171449	0.171449	OK
DL QSAS			
Gross Count Rate	3.391667	3.391667	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	3.391667	3.391667	OK
Δ t 1 (t2 - t1)	6.860208	6.860208	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.444845	9.444845	OK
Tracer At	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.465872	0.465872	OK
Chem Rec Factor	0.475380	0.475380	OK
Sys Err	0.061664	0.061664	OK
K	0.198781	0.198781	OK
K MDA	286.244726	286.244726	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_18
Instr keV	38.64440918
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDR **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1174.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.216391
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1174.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.033100
Tracer EFF	0.216391
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.220634	4.220634	OK
CU	0.241435	0.241435	OK
TPU	0.564359	0.564359	OK
MDA	0.009743	0.009743	OK
DL	0.000000	0.000000	OK
BP MDA	0.181291	0.181291	OK
BP DL	0.085959	0.085959	OK
DL QSAS			
Gross Count Rate	0.815278	0.815278	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.815278	0.815278	OK
Δ t 1 (t2 - t1)	6.860208	6.860208	OK
DF	0.999811	0.999811	OK
Tracer DPM	9.454912	9.454912	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.403387	0.403387	OK
Chem Rec Factor	0.411620	0.411620	OK
Sys Err	0.061664	0.061664	OK
K	0.193165	0.193165	OK
K MDA	278.157250	278.157250	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_2A
Instr keV	28.96851158
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL Date: 6-2-11

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Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	20.000000
Count Mins	1440.000000
BKG Counts	5.000000
BKG Mins	1440.000000
Instrument Efficiency	0.216391
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1174.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.033100
Tracer EFF	0.216391
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.053862	0.053862	OK
CU	0.035190	0.035190	OK
TPU	0.035787	0.035787	OK
MDA	0.047089	0.047089	OK
DL	0.018679	0.018679	OK
BP MDA	0.422754	0.422754	OK
BP DL	0.206955	0.206955	OK
DL QSAS			
Gross Count Rate	0.013889	0.013889	OK
BKG Count Rate	0.003472	0.003472	OK
Net Count Rate	0.010417	0.010417	OK
Δ t 1 (t2 - t1)	6.860208	6.860208	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.454912	9.454912	OK
Tracer At	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.403387	0.403387	OK
Chem Rec Factor	0.411620	0.411620	OK
Sys Err	0.061664	0.061664	OK
K	0.193395	0.193395	OK
K MDA	278.488854	278.488854	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_2A
Instr keV	8.187438965
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	3.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.216391
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1174.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.033100
Tracer EFF	0.216391
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	2516Z.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.008324**	**0.008324**	**OK**
CU	**0.016316**	**0.016316**	**OK**
TPU	**0.016347**	**0.016347**	**OK**
MDA	**0.030645**	**0.030645**	**OK**
DL	**0.009683**	**0.009683**	**OK**
BP MDA	**0.164195**	**0.164195**	**OK**
BP OL	**0.076622**	**0.076622**	**OK**
DL QSAS			
Gross Count Rate	**0.002083**	**0.002083**	**OK**
BKG Count Rate	**0.000694**	**0.000694**	**OK**
Net Count Rate	**0.001389**	**0.001389**	**OK**
Δ t 1 (t2 - t1)	**6.860208**	**6.860208**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.454912**	**9.454912**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.403387**	**0.403387**	**OK**
Chem Rec Factor	**0.411620**	**0.411620**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.166847**	**0.166847**	**OK**
K MDA	**240.259435**	**240.259435**	**OK**
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01664		
Batch ID	ARS1-B11-01664-03		
Analysis Code			
SDG	QC Sample		
Fraction	N/A QC Sample		
Client	QC Sample		
Client Profile			
Client ID	N/A QC Sample		
Instr File Name	ApexAlpha		
Instr Detector	A_1_2A		
Instr keV	4.912463665		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	13.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.216391
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/3/11 4:42 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1174.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.033100
Tracer EFF	0.216391
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.039420**	**0.039420**	**OK**
CU	**0.027203**	**0.027203**	**OK**
TPU	**0.027618**	**0.027618**	**OK**
MDA	**0.033292**	**0.033292**	**OK**
DL	**0.011790**	**0.011790**	**OK**
BP MDA	**0.351874**	**0.351874**	**OK**
BP DL	**0.171449**	**0.171449**	**OK**
DL QSAS			
Gross Count Rate	**0.009028**	**0.009028**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.007639**	**0.007639**	**OK**
Δ t 1 (t2 - t1)	**6.860208**	**6.860208**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.454912**	**9.454912**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.403387**	**0.403387**	**OK**
Chem Rec Factor	**0.411620**	**0.411620**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.193783**	**0.193783**	**OK**
K MDA	**279.046962**	**279.046962**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_1_2A
Instr keV	7.368695259
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

35000797

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	887.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219564
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	887.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Rct Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.016000
Tracer EFF	0.219564
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.304566	8.304566	OK
CU	0.548379	0.548379	OK
TPU	1.143731	1.143731	OK
MDA	0.087174	0.087174	OK
DL	0.030872	0.030872	OK
BP MDA	0.368651	0.368651	OK
BP DL	0.171980	0.171980	OK
DL QSAS			
Gross Count Rate	0.615972	0.615972	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	0.614583	0.614583	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	0.999448	0.999448	OK
Tracer DPM	9.298413	9.298413	OK
Tracer At	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.304737	0.304737	OK
Chem Rec Factor	0.310956	0.310956	OK
Sys Err	0.061664	0.061664	OK
K	0.074005	0.074005	OK
K MDA	106.567884	106.567884	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-04
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	014
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	PR-SW-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_2B
Instr keV	33.09716034
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

35000798

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1869.000000
Count Mins	1440.000000
BKG Counts	7.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219564
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0241
Tracer Std - Isotope	U-232
Tracer Counts	887.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.016000
Tracer EFF	0.219564
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	17.445285	17.445285	OK
CU	0.795373	0.795373	OK
TPU	2.253478	2.253478	OK
MDA	0.140725	0.140725	OK
DL	0.057667	0.057667	OK
BP MDA	0.851436	0.851436	OK
BP DL	0.413911	0.413911	OK
DL QSAS			
Gross Count Rate	1.297917	1.297917	OK
BKG Count Rate	0.004861	0.004861	OK
Net Count Rate	1.293056	1.293056	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.298413	9.298413	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.304737	0.304737	OK
Chem Rec Factor	0.310956	0.310956	OK
Sys Err	0.061664	0.061664	OK
K	0.074121	0.074121	OK
K MDA	106.733710	106.733710	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-04
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	014
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	PR-SW-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_2B
Instr keV	34.36228943
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDu **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	52.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219564
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	887.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.016000
Tracer EFF	0.219564
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.564715**	**0.564715**	**OK**
CU	**0.153491**	**0.153491**	**OK**
TPU	**0.167982**	**0.167982**	**OK**
MDA	**0.029430**	**0.029430**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP MDA	**0.335262**	**0.335262**	**OK**
BP DL	**0.153245**	**0.153245**	**OK**
DL QSAS			
Gross Count Rate	**0.036111**	**0.036111**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.036111**	**0.036111**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.298413**	**9.298413**	**OK**
Tracer At	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.304737**	**0.304737**	**OK**
Chem Rec Factor	**0.310956**	**0.310956**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.063946**	**0.063946**	**OK**
K MDA	**92.081902**	**92.081902**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-04
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	014
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	PR-SW-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_28
Instr keV	11.08153439
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1567.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219564
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	887.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.016000
Tracer EFF	0.219564
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**14.623981**	**14.623981**	**OK**
CU	**0.726164**	**0.726164**	**OK**
TPU	**1.910820**	**1.910820**	**OK**
MDA	**0.100692**	**0.100692**	**OK**
DL	**0.037676**	**0.037676**	**OK**
BP MDA	**0.709664**	**0.709664**	**OK**
BP DL	**0.342898**	**0.342898**	**OK**
DL QSAS			
Gross Count Rate	**1.088194**	**1.088194**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**1.086111**	**1.086111**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.298413**	**9.298413**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.304737**	**0.304737**	**OK**
Chem Rec Factor	**0.310956**	**0.310956**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.074269**	**0.074269**	**OK**
K MDA	**106.947622**	**106.947622**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-04
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	014
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	PR-SW-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_28
Instr keV	38.09555817
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1675.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212170
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1675.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.212170
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.337261	8.337261	OK
CU	0.399633	0.399633	OK
TPU	1.084000	1.084000	OK
MDA	0.036670	0.036670	OK
DL	0.011586	0.011586	OK
BP MDA	0.356719	0.356719	OK
BP DL	0.171980	0.171980	OK
DL QSAS			
Gross Count Rate	1.163194	1.163194	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	1.162500	1.162500	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	0.999448	0.999448	OK
Tracer DPM	9.335021	9.335021	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.594164	0.594164	OK
Chem Rec Factor	0.606290	0.606290	OK
Sys Err	0.061664	0.061664	OK
K	0.139434	0.139434	OK
K MDA	200.785369	200.785369	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-D1664
Batch ID	ARS1-B11-D1664-05
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	015
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RB-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_3A
Instr keV	27.50323486
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDR Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	29.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212170
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0241
Tracer Std - Isotope	U-232
Tracer Counts	1675.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.212170
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.124318**	**0.124318**	**OK**
CU	**0.055989**	**0.055989**	**OK**
TPU	**0.057970**	**0.057970**	**OK**
MDA	**0.059750**	**0.059750**	**OK**
DL	**0.023137**	**0.023137**	**OK**
BP MDA	**0.839522**	**0.839522**	**OK**
BP DL	**0.413911**	**0.413911**	**OK**
DL QSAS			
Gross Count Rate	**0.020139**	**0.020139**	**OK**
BKG Count Rate	**0.002778**	**0.002778**	**OK**
Net Count Rate	**0.017361**	**0.017361**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.335021**	**9.335021**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.594164**	**0.594164**	**OK**
Chem Rec Factor	**0.606290**	**0.606290**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.139651**	**0.139651**	**OK**
K MDA	**201.097802**	**201.097802**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-05
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	015
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RB-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_3A
Instr keV	13.09677887
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	4.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212170
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1675.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.212170
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.005764**	**0.005764**	**OK**
CU	**0.029890**	**0.029890**	**OK**
TPU	**0.029898**	**0.029898**	**OK**
MDA	**0.062071**	**0.062071**	**OK**
DL	**0.023225**	**0.023225**	**OK**
BP MDA	**0.321452**	**0.321452**	**OK**
BP DL	**0.153245**	**0.153245**	**OK**
DL QSAS			
Gross Count Rate	**0.002778**	**0.002778**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**0.000694**	**0.000694**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.335021**	**9.335021**	**OK**
Tracer At	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.594164**	**0.594164**	**OK**
Chem Rec Factor	**0.606290**	**0.606290**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.120481**	**0.120481**	**OK**
K MDA	**173.492219**	**173.492219**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-05
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	015
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RB-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_3A
Instr keV	4.911292076
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDK **Date:** 6-2-11

35000804

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	27.000000
Count Mins	1440.000000
BKG Counts	14.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212170
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1675.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.212170
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.064516	0.064516	OK
CU	0.062283	0.062283	OK
TPU	0.062769	0.062769	OK
MDA	0.099846	0.099846	OK
DL	0.043198	0.043198	OK
BP MDA	0.697774	0.697774	OK
BP DL	0.342898	0.342898	OK
DL QSAS			
Gross Count Rate	0.018750	0.018750	OK
BKG Count Rate	0.009722	0.009722	OK
Net Count Rate	0.009028	0.009028	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.335021	9.335021	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.594164	0.594164	OK
Chem Rec Factor	0.606290	0.606290	OK
Sys Err	0.061664	0.061664	OK
K	0.139931	0.139931	OK
K MDA	201.500835	201.500835	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-05
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	015
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	88-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_3A
Instr keV	8.185486794
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1866.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.206113
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0241
Tracer Std - Isotope	U-232
Tracer Counts	1866.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.019000
Tracer EFF	0.206113
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.328858**	**8.328858**	**OK**
CU	**0.378212**	**0.378212**	**OK**
TPU	**1.075336**	**1.075336**	**OK**
MDA	**0.032881**	**0.032881**	**OK**
DL	**0.010389**	**0.010389**	**OK**
BP MDA	**0.355315**	**0.355315**	**OK**
BP DL	**0.171975**	**0.171975**	**OK**
DL QSAS			
Gross Count Rate	**1.295833**	**1.295833**	**OK**
BKG Count Rate	**0.000694**	**0.000694**	**OK**
Net Count Rate	**1.295139**	**1.295139**	**OK**
Δ t 1 (t2 - t1)	**19.056250**	**19.056250**	**OK**
DF	**0.999475**	**0.999475**	**OK**
Tracer DPM	**9.325869**	**9.325869**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.682079**	**0.682079**	**OK**
Chem Rec Factor	**0.695999**	**0.695999**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.155500**	**0.155500**	**OK**
K MDA	**223.920263**	**223.920263**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-06
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	016
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RB-02-110421
Instr File Name	ApexAlpha
Instr Detector	A_1_3B
Instr keV	27.29480934
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	32.000000
Count Mins	1440.000000
BKG Counts	7.000000
BKG Mins	1440.000000
Instrument Efficiency	0.206113
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1866.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.019000
Tracer EFF	0.206113
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.111476**	**0.111476**	**OK**
CU	**0.054580**	**0.054580**	**OK**
TPU	**0.056218**	**0.056218**	**OK**
MDA	**0.066975**	**0.066975**	**OK**
DL	**0.027446**	**0.027446**	**OK**
BP MDA	**0.838130**	**0.838130**	**OK**
BP DL	**0.413911**	**0.413911**	**OK**
DL QSAS			
Gross Count Rate	**0.022222**	**0.022222**	**OK**
BKG Count Rate	**0.004861**	**0.004861**	**OK**
Net Count Rate	**0.017361**	**0.017361**	**OK**
Δ t 1 (t2 - t1)	**19.056250**	**19.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.325869**	**9.325869**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.682079**	**0.682079**	**OK**
Chem Rec Factor	**0.695999**	**0.695999**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.155738**	**0.155738**	**OK**
K MDA	**224.262520**	**224.262520**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-06
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	016
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RB-02-110421
Instr File Name	ApexAlpha
Instr Detector	A_1_3B
Instr keV	13.51308155
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.206113
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1866.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.019000
Tracer EFF	0.206113
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.010337	0.010337	OK
CU	0.014327	0.014327	OK
TPU	0.014381	0.014381	OK
MDA	0.014007	0.014007	OK
DL	0.000000	0.000000	OK
BP MDA	0.319839	0.319839	OK
BP DL	0.153245	0.153245	OK
DL QSAS			
Gross Count Rate	0.001389	0.001389	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.001389	0.001389	OK
Δ t 1 (t2 - t1)	19.056250	19.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.325869	9.325869	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.682079	0.682079	OK
Chem Rec Factor	0.695999	0.695999	OK
Sys Err	0.061664	0.061664	OK
K	0.134359	0.134359	OK
K MDA	193.477012	193.477012	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-06
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	016
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RB-02-110421
Instr File Name	ApexAlpha
Instr Detector	A_1_SB
Instr keV	4.913847923
Version/Date	2.0 -- 4/20/2006

Reviewed by: SOh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	31.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.206113
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1866.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.019000
Tracer EFF	0.206113
Tracer Plating Rec	0.950000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.137954	0.137954	OK
CU	0.048564	0.048564	OK
TPU	0.051346	0.051346	OK
MDA	0.012060	0.012060	OK
DL	0.000000	0.000000	OK
BP MDA	0.696385	0.696385	OK
BP DL	0.342898	0.342898	OK
DL QSAS			
Gross Count Rate	0.021528	0.021528	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.021528	0.021528	OK
Δ t 1 (t2 - t1)	19.056250	19.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.325869	9.325869	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.682079	0.682079	OK
Chem Rec Factor	0.695999	0.695999	OK
Sys Err	0.061664	0.061664	OK
K	0.156050	0.156050	OK
K MDA	224.711977	224.711977	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-06
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	016
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RB-02-110421
Instr File Name	ApexAlpha
Instr Detector	A_1_3B
Instr keV	10.23718262
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2012.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.225930
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2012.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.016000
Tracer EFF	0.225930
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.304566	8.304566	OK
CU	0.363147	0.363147	OK
TPU	1.067369	1.067369	OK
MDA	0.030405	0.030405	OK
DL	0.009607	0.009607	OK
BP MDA	0.354413	0.354413	OK
BP DL	0.171980	0.171980	OK
DL QSAS			
Gross Count Rate	1.397222	1.397222	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	1.396528	1.396528	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	0.999448	0.999448	OK
Tracer DPM	9.298413	9.298413	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.672946	0.672946	OK
Chem Rec Factor	0.686680	0.686680	OK
Sys Err	0.061664	0.061664	OK
K	0.168164	0.168164	OK
K MDA	242.155949	242.155949	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-07
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	017
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SW-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_4A
Instr keV	29.44181824
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	6874.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.225930
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2012.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.016000
Tracer EFF	0.225930
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**28.334317**	**28.334317**	**OK**
CU	**0.670122**	**0.670122**	**OK**
TPU	**3.489450**	**3.489450**	**OK**
MDA	**0.038304**	**0.038304**	**OK**
DL	**0.013565**	**0.013565**	**OK**
BP MDA	**0.837219**	**0.837219**	**OK**
BP DL	**0.413911**	**0.413911**	**OK**
DL QSAS			
Gross Count Rate	**4.773611**	**4.773611**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**4.772222**	**4.772222**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.298413**	**9.298413**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.672946**	**0.672946**	**OK**
Chem Rec Factor	**0.686680**	**0.686680**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.168426**	**0.168426**	**OK**
K MDA	**242.532758**	**242.532758**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-07
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	017
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-3M-SW-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_4A
Instr keV	36.94655609
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	203.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.225930
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0241
Tracer Std - Isotope	U-232
Tracer Counts	2012.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.016000
Tracer EFF	0.225930
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.960623**	**0.960623**	**OK**
CU	**0.134119**	**0.134119**	**OK**
TPU	**0.177391**	**0.177391**	**OK**
MDA	**0.044399**	**0.044399**	**OK**
DL	**0.015724**	**0.015724**	**OK**
BP MDA	**0.318784**	**0.318784**	**OK**
BP DL	**0.153245**	**0.153245**	**OK**
DL QSAS			
Gross Count Rate	**0.140972**	**0.140972**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.139583**	**0.139583**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.298413**	**9.298413**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.672946**	**0.672946**	**OK**
Chem Rec Factor	**0.686680**	**0.686680**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.145305**	**0.145305**	**OK**
K MDA	**209.239215**	**209.239215**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-07
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	017
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SW-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_4A
Instr keV	20.18749237
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

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Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	5733.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.225930
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2012.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.016000
Tracer EFF	0.225930
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	23.590764	23.590764	OK
CU	0.610671	0.610671	OK
TPU	2.915855	2.915855	OK
MDA	0.011151	0.011151	OK
DL	0.000000	0.000000	OK
BP MDA	0.695476	0.695476	OK
BP DL	0.342898	0.342898	OK
DL QSAS			
Gross Count Rate	3.981250	3.981250	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	3.981250	3.981250	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.298413	9.298413	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.672946	0.672946	OK
Chem Rec Factor	0.686680	0.686680	OK
Sys Err	0.061664	0.061664	OK
K	0.168763	0.168763	OK
K MDA	243.018833	243.018833	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-07
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	017
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SW-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_4A
Instr keV	42.40550995
Version/Date	2.0 -- 4/20/2006

Reviewed by: SRh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2192.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.216447
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2192.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.017000
Tracer EFF	0.216447
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.312740**	**8.312740**	**OK**
CU	**0.348001**	**0.348001**	**OK**
TPU	**1.063245**	**1.063245**	**OK**
MDA	**0.010277**	**0.010277**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP MDA	**0.353499**	**0.353499**	**OK**
BP DL	**0.171980**	**0.171980**	**OK**
DL QSAS			
Gross Count Rate	**1.522222**	**1.522222**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**1.522222**	**1.522222**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**0.999448**	**0.999448**	**OK**
Tracer DPM	**9.307565**	**9.307565**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.764898**	**0.764898**	**OK**
Chem Rec Factor	**0.780509**	**0.780509**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.183119**	**0.183119**	**OK**
K MDA	**263.691650**	**263.691650**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-08
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	018
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_48
Instr keV	30.84774017
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	10041.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.216447
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi — UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.993000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2192.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.017000
Tracer EFF	0.216447
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	37.996688	37.996688	OK
CU	0.743880	0.743880	OK
TPU	4.652156	4.652156	OK
MDA	0.053415	0.053415	OK
DL	0.021577	0.021577	OK
BP MDA	0.836307	0.836307	OK
BP DL	0.413911	0.413911	OK
DL QSAS			
Gross Count Rate	6.972917	6.972917	OK
BKG Count Rate	0.004167	0.004167	OK
Net Count Rate	6.968750	6.968750	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.307565	9.307565	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.764898	0.764898	OK
Chem Rec Factor	0.780509	0.780509	OK
Sys Err	0.061664	0.061664	OK
K	0.183404	0.183404	OK
K MDA	264.101969	264.101969	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-08
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	018
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_4B
Instr keV	39.53868103
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDR Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	351.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.216447
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2192.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.017000
Tracer EFF	0.216447
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.540504	1.540504	OK
CU	0.161163	0.161163	OK
TPU	0.246249	0.246249	OK
MDA	0.011894	0.011894	OK
DL	0.000000	0.000000	OK
BP MDA	0.317726	0.317726	OK
BP DL	0.153245	0.153245	OK
DL QSAS			
Gross Count Rate	0.243750	0.243750	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.243750	0.243750	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.307565	9.307565	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.764898	0.764898	OK
Chem Rec Factor	0.780509	0.780509	OK
Sys Err	0.061664	0.061664	OK
K	0.158227	0.158227	OK
K MDA	227.847526	227.847526	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-08
Analysis Code	ASP-A-024
SDG	ARS1-11-00307
Fraction	018
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_4B
Instr keV	42.83360672
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	8851.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.216447
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2192.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.017000
Tracer EFF	0.216447
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	33.431423	33.431423	OK
CU	0.696962	0.696962	OK
TPU	4.100208	4.100208	OK
MDA	0.045405	0.045405	OK
DL	0.017582	0.017582	OK
BP MDA	0.694565	0.694565	OK
BP DL	0.342898	0.342898	OK
DL QSAS			
Gross Count Rate	6.146528	6.146528	OK
BKG Count Rate	0.002778	0.002778	OK
Net Count Rate	6.143750	6.143750	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.307565	9.307565	OK
Tracer At	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.764898	0.764898	OK
Chem Rec Factor	0.780509	0.780509	OK
Sys Err	0.061664	0.061664	OK
K	0.183772	0.183772	OK
K MDA	264.631273	264.631273	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-08
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	018
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-JM-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_4B
Instr keV	36.84606552
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1358.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209210
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1358.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.209210
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.337491**	**8.337491**	**OK**
CU	**0.444428**	**0.444428**	**OK**
TPU	**1.101327**	**1.101327**	**OK**
MDA	**0.057120**	**0.057120**	**OK**
DL	**0.020229**	**0.020229**	**OK**
BP MDA	**0.359894**	**0.359894**	**OK**
BP DL	**0.171985**	**0.171985**	**OK**
DL QSAS			
Gross Count Rate	**0.943056**	**0.943056**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.941667**	**0.941667**	**OK**
Δ t 1 (t2 - t1)	**21.056250**	**21.056250**	**OK**
DF	**0.999420**	**0.999420**	**OK**
Tracer DPM	**9.335021**	**9.335021**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.488105**	**0.488105**	**OK**
Chem Rec Factor	**0.498066**	**0.498066**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.112944**	**0.112944**	**OK**
K MDA	**162.638865**	**162.638865**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-09
Analysis Code	ASP-A-024
SDG	ARS1-11-00097
Fraction	019
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-SW-BG-110419
Instr File Name	ApexAlpha
Instr Detector	A_1_5A
Instr keV	31.55294228
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDR **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	674.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209210
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1358.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.209210
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**4.119182**	**4.119182**	**OK**
CU	**0.313068**	**0.313068**	**OK**
TPU	**0.588101**	**0.588101**	**OK**
MDA	**0.066108**	**0.066108**	**OK**
DL	**0.024736**	**0.024736**	**OK**
BP MDA	**0.842682**	**0.842682**	**OK**
BP DL	**0.413911**	**0.413911**	**OK**
DL QSAS			
Gross Count Rate	**0.468056**	**0.468056**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**0.465972**	**0.465972**	**OK**
Δ t 1 (t2 - t1)	**21.056250**	**21.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.335021**	**9.335021**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.488105**	**0.488105**	**OK**
Chem Rec Factor	**0.498066**	**0.498066**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.113123**	**0.113123**	**OK**
K MDA	**162.896426**	**162.896426**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-09
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	019
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-SW-BG-110419
Instr File Name	ApexAlpha
Instr Detector	A_1_5A
Instr keV	24.95882797
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	14.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209210
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1358.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.209210
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.099619	0.099619	OK
CU	0.052184	0.052184	OK
TPU	0.053555	0.053555	OK
MDA	0.019283	0.019283	OK
DL	0.000000	0.000000	OK
BP MDA	0.325115	0.325115	OK
BP DL	0.153245	0.153245	OK
DL QSAS			
Gross Count Rate	0.009722	0.009722	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.009722	0.009722	OK
Δ t 1 (t2 - t1)	21.056250	21.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.335021	9.335021	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.488105	0.488105	OK
Chem Rec Factor	0.498066	0.498066	OK
Sys Err	0.061664	0.061664	OK
K	0.097594	0.097594	OK
K MDA	140.534916	140.534916	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-09
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	019
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-SW-BG-110419
Instr File Name	ApexAlpha
Instr Detector	A_1_5A
Instr keV	6.112156391
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	367.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209210
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1358.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.209210
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**2.230079**	**2.230079**	**OK**
CU	**0.230981**	**0.230981**	**OK**
TPU	**0.354962**	**0.354962**	**OK**
MDA	**0.065976**	**0.065976**	**OK**
DL	**0.024687**	**0.024687**	**OK**
BP MDA	**0.700928**	**0.700928**	**OK**
BP DL	**0.342898**	**0.342898**	**OK**
DL QSAS			
Gross Count Rate	**0.254861**	**0.254861**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**0.252778**	**0.252778**	**OK**
Δ t 1 (t2 - t1)	**21.056250**	**21.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.335021**	**9.335021**	**OK**
Tracer At	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.488105**	**0.488105**	**OK**
Chem Rec Factor	**0.498066**	**0.498066**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.113349**	**0.113349**	**OK**
K MDA	**163.222899**	**163.222899**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-09
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	019
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RM-SW-BG-110419
Instr File Name	ApexAlpha
Instr Detector	A_1_SA
Instr keV	35.00598907
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2083.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.204735
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2083.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.018000
Tracer EFF	0.204735
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.320913**	**8.320913**	**OK**
CU	**0.357856**	**0.357856**	**OK**
TPU	**1.067442**	**1.067442**	**OK**
MDA	**0.037146**	**0.037146**	**OK**
DL	**0.013155**	**0.013155**	**OK**
BP MDA	**0.354057**	**0.354057**	**OK**
BP DL	**0.171980**	**0.171980**	**OK**
DL QSAS			
Gross Count Rate	**1.446528**	**1.446528**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**1.445139**	**1.445139**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**0.999448**	**0.999448**	**OK**
Tracer DPM	**9.316717**	**9.316717**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.766952**	**0.766952**	**OK**
Chem Rec Factor	**0.782604**	**0.782604**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.173676**	**0.173676**	**OK**
K MDA	**250.092739**	**250.092739**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-10
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	020
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SW-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_SB
Instr keV	34.6806488
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

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Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	8125.000000
Count Mins	1440.000000
BKG Counts	10.000000
BKG Mins	1440.000000
Instrument Efficiency	0.204735
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2209
CF	1.9600
Nuclide Abundance	0.993000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2083.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.018000
Tracer EFF	0.204735
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	32.397551	32.397551	OK
CU	0.705762	0.705762	OK
TPU	3.978680	3.978680	OK
MDA	0.069559	0.069559	OK
DL	0.029370	0.029370	OK
BP MDA	0.836865	0.836865	OK
BP DL	0.413911	0.413911	OK
DL QSAS			
Gross Count Rate	5.642361	5.642361	OK
BKG Count Rate	0.006944	0.006944	OK
Net Count Rate	5.635417	5.635417	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.316717	9.316717	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.766952	0.766952	OK
Chem Rec Factor	0.782604	0.782604	OK
Sys Err	0.061664	0.061664	OK
K	0.173946	0.173946	OK
K MDA	250.481898	250.481898	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-10
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	020
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SW-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_58
Instr keV	35.38989639
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	268.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.204735
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2083.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.018000
Tracer EFF	0.204735
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.235555	1.235555	OK
CU	0.148759	0.148759	OK
TPU	0.210781	0.210781	OK
MDA	0.034072	0.034072	OK
DL	0.010765	0.010765	OK
BP MDA	0.318373	0.318373	OK
BP DL	0.153245	0.153245	OK
DL QSAS			
Gross Count Rate	0.186111	0.186111	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.185417	0.185417	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.316717	9.316717	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.766952	0.766952	OK
Chem Rec Factor	0.782604	0.782604	OK
Sys Err	0.061664	0.061664	OK
K	0.150067	0.150067	OK
K MDA	216.097141	216.097141	OK
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01664		
Batch ID	ARS1-B11-01664-10		
Analysis Code	ASP-A-024		
SDG	ARS1-11-00897		
Fraction	020		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-JM-SW-01-110420		
Instr File Name	ApexAlpha		
Instr Detector	A_1_5B		
Instr keV	31.37195396		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: SDR **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	7348.000000
Count Mins	1440.000000
BKG Counts	5.000000
BKG Mins	1440.000000
Instrument Efficiency	0.204735
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2083.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.018000
Tracer EFF	0.204735
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	29.256856	29.256856	OK
CU	0.669642	0.669642	OK
TPU	3.598847	3.598847	OK
MDA	0.052250	0.052250	OK
DL	0.020726	0.020726	OK
BP MDA	0.695122	0.695122	OK
BP DL	0.342898	0.342898	OK
DL QSAS			
Gross Count Rate	5.102778	5.102778	OK
BKG Count Rate	0.003472	0.003472	OK
Net Count Rate	5.099306	5.099306	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.316717	9.316717	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.766952	0.766952	OK
Chem Rec Factor	0.782604	0.782604	OK
Sys Err	0.061664	0.061664	OK
K	0.174294	0.174294	OK
K MDA	250.983904	250.983904	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-10
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	020
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SW-01-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_S8
Instr keV	34.7035675
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2076.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.225003
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.056330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2076.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.012000
Tracer EFF	0.225003
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.271871**	**8.271871**	**OK**
CU	**0.356348**	**0.356348**	**OK**
TPU	**1.061352**	**1.061352**	**OK**
MDA	**0.037052**	**0.037052**	**OK**
DL	**0.013122**	**0.013122**	**OK**
BP MDA	**0.354030**	**0.354030**	**OK**
BP DL	**0.171980**	**0.171980**	**OK**
DL QSAS			
Gross Count Rate	**1.441667**	**1.441667**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**1.440278**	**1.440278**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**0.999448**	**0.999448**	**OK**
Tracer DPM	**9.261805**	**9.261805**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.699641**	**0.699641**	**OK**
Chem Rec Factor	**0.713920**	**0.713920**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.174118**	**0.174118**	**OK**
K MDA	**250.729261**	**250.729261**	**OK**
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01664		
Batch ID	ARS1-B11-01664-11		
Analysis Code	ASP-A-024		
SDG	ARS1-11-00897		
Fraction	021		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-JM-SW-110420		
Instr File Name	ApexAlpha		
Instr Detector	A_1_6A		
Instr keV	39.60801315		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: SDR **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	7157.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.225003
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2078.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.012000
Tracer EFF	0.225003
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**28.476493**	**28.476493**	**OK**
CU	**0.660577**	**0.660577**	**OK**
TPU	**3.504503**	**3.504503**	**OK**
MDA	**0.056176**	**0.056176**	**OK**
DL	**0.022692**	**0.022692**	**OK**
BP MDA	**0.836837**	**0.836837**	**OK**
BP DL	**0.413911**	**0.413911**	**OK**
DL QSAS			
Gross Count Rate	**4.970139**	**4.970139**	**OK**
BKG Count Rate	**0.004167**	**0.004167**	**OK**
Net Count Rate	**4.965972**	**4.965972**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.261805**	**9.261805**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.699641**	**0.699641**	**OK**
Chem Rec Factor	**0.713920**	**0.713920**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.174388**	**0.174388**	**OK**
K MDA	**251.119410**	**251.119410**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-11
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	021
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_6A
Instr keV	39.67454147
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	234.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.225003
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2076.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.012000
Tracer EFF	0.225003
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**1.070866**	**1.070866**	**OK**
CU	**0.138982**	**0.138982**	**OK**
TPU	**0.189913**	**0.189913**	**OK**
MDA	**0.042881**	**0.042881**	**OK**
DL	**0.015186**	**0.015186**	**OK**
BP MDA	**0.318341**	**0.318341**	**OK**
BP DL	**0.153245**	**0.153245**	**OK**
DL QSAS			
Gross Count Rate	**0.162500**	**0.162500**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**0.161111**	**0.161111**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.261805**	**9.261805**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.699641**	**0.699641**	**OK**
Chem Rec Factor	**0.713920**	**0.713920**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.150449**	**0.150449**	**OK**
K MDA	**216.647140**	**216.647140**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-11
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	021
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-IM-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_6A
Instr keV	29.86603737
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	6113.000000
Count Mins	1440.000000
BKG Counts	12.000000
BKG Mins	1440.000000
Instrument Efficiency	0.225003
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2076.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.012000
Tracer EFF	0.225003
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**24.246621**	**24.246621**	**OK**
CU	**0.609620**	**0.609620**	**OK**
TPU	**2.993196**	**2.993196**	**OK**
MDA	**0.074825**	**0.074825**	**OK**
DL	**0.032027**	**0.032027**	**OK**
BP MDA	**0.695095**	**0.695095**	**OK**
BP DL	**0.342898**	**0.342898**	**OK**
DL QSAS			
Gross Count Rate	**4.245139**	**4.245139**	**OK**
BKG Count Rate	**0.008333**	**0.008333**	**OK**
Net Count Rate	**4.236806**	**4.236806**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.261805**	**9.261805**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.699641**	**0.699641**	**OK**
Chem Rec Factor	**0.713920**	**0.713920**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.174738**	**0.174738**	**OK**
K MDA	**251.622694**	**251.622694**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-11
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	021
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-JM-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_1_6A
Instr keV	42.12785339
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

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Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2481.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224300
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2481.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.224300
Tracer Plating Rec	0.960000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.08188S
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.337491	8.337491	OK
CU	0.328079	0.328079	OK
TPU	1.059736	1.059736	OK
MDA	0.009107	0.009107	OK
DL	0.000000	0.000000	OK
BP MDA	0.352338	0.352338	OK
BP DL	0.171985	0.171985	OK
DL QSAS			
Gross Count Rate	1.722917	1.722917	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	1.722917	1.722917	OK
Δ t 1 (t2 - t1)	21.056250	21.056250	OK
DF	0.999420	0.999420	OK
Tracer DPM	9.335021	9.335021	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.832978	0.832978	OK
Chem Rec Factor	0.849977	0.849977	OK
Sys Err	0.061664	0.061664	OK
K	0.206647	0.206647	OK
K MDA	297.571552	297.571552	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-12
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	022
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SW-01-110419
Instr File Name	ApexAlpha
Instr Detector	A_1_6B
Instr keV	64.28845215
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	25365.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224300
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.050330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2481.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.224300
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**85.098517**	**85.098517**	**OK**
CU	**1.047399**	**1.047399**	**OK**
TPU	**10.338243**	**10.338243**	**OK**
MDA	**0.031170**	**0.031170**	**OK**
DL	**0.011039**	**0.011039**	**OK**
BP MDA	**0.835138**	**0.835138**	**OK**
BP DL	**0.413911**	**0.413911**	**OK**
DL QSAS			
Gross Count Rate	**17.614583**	**17.614583**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**17.613194**	**17.613194**	**OK**
Δ t 1 (t2 - t1)	**21.056250**	**21.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.335021**	**9.335021**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.832978**	**0.832978**	**OK**
Chem Rec Factor	**0.849977**	**0.849977**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.206974**	**0.206974**	**OK**
K MDA	**298.042798**	**298.042798**	**OK**
Batch Identifiers and Other Related Information			
Batch	ARS1-B11-01664		
Batch ID	ARS1-B11-01664-12		
Analysis Code	ASP-A-024		
SDG	ARS1-11-00897		
Fraction	022		
Client	Summit Environmental Technologies		
Client Profile	Cuyahoga Falls		
Client ID	RP-SW-01-110419		
Instr File Name	ApexAlpha		
Instr Detector	A_1_6B		
Instr keV	76.40910339		
Version/Date	2.0 -- 4/20/2006		

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	832.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224300
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2481.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.224300
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**3.235728**	**3.235728**	**OK**
CU	**0.219870**	**0.219870**	**OK**
TPU	**0.448642**	**0.448642**	**OK**
MDA	**0.010539**	**0.010539**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP MDA	**0.316371**	**0.316371**	**OK**
BP DL	**0.153245**	**0.153245**	**OK**
DL QSAS			
Gross Count Rate	**0.577778**	**0.577778**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.577778**	**0.577778**	**OK**
Δ t 1 (t2 - t1)	**21.056250**	**21.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.335021**	**9.335021**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.832978**	**0.832978**	**OK**
Chem Rec Factor	**0.849977**	**0.849977**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.178562**	**0.178562**	**OK**
K MDA	**257.129149**	**257.129149**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-12
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	022
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SW-01-110419
Instr File Name	ApexAlpha
Instr Detector	A_1_6B
Instr keV	67.9863205
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	23530.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224300
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2481.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.020000
Tracer EFF	0.224300
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	78.787135	78.787135	OK
CU	1.006765	1.006765	OK
TPU	9.575325	9.575325	OK
MDA	0.024654	0.024654	OK
DL	0.007790	0.007790	OK
BP MDA	0.693399	0.693399	OK
BP DL	0.342898	0.342898	OK
DL QSAS			
Gross Count Rate	16.340278	16.340278	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	16.339583	16.339583	OK
Δ t 1 (t2 - t1)	21.056250	21.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.335021	9.335021	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.832978	0.832978	OK
Chem Rec Factor	0.849977	0.849977	OK
Sys Err	0.061664	0.061664	OK
K	0.207389	0.207389	OK
K MDA	298.640126	298.640126	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-12
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	022
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SW-01-110419
Instr File Name	ApexAlpha
Instr Detector	A_1_6B
Instr keV	76.08847046
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDR **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1473.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220520
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0241
Tracer Std - Isotope	U-232
Tracer Counts	1473.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.017000
Tracer EFF	0.220520
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.312969	8.312969	OK
CU	0.424965	0.424965	OK
TPU	1.090888	1.090888	OK
MDA	0.041580	0.041580	OK
DL	0.013138	0.013138	OK
BP MDA	0.358535	0.358535	OK
BP DL	0.171985	0.171985	OK
DL QSAS			
Gross Count Rate	1.022917	1.022917	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	1.022222	1.022222	OK
Δ t 1 (t2 - t1)	21.056250	21.056250	OK
DF	0.999420	0.999420	OK
Tracer DPM	9.307565	9.307565	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.504167	0.504167	OK
Chem Rec Factor	0.514456	0.514456	OK
Sys Err	0.061664	0.061664	OK
K	0.122967	0.122967	OK
K MDA	177.072726	177.072726	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-13
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	023
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SW-BG-041911
Instr File Name	ApexAlpha
Instr Detector	A_2_1A
Instr keV	29.11910248
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1110.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220520
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1473.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.017000
Tracer EFF	0.220520
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**6.241784**	**6.241784**	**OK**
CU	**0.368693**	**0.368693**	**OK**
TPU	**0.839661**	**0.839661**	**OK**
MDA	**0.060720**	**0.060720**	**OK**
DL	**0.022720**	**0.022720**	**OK**
BP MDA	**0.841326**	**0.841326**	**OK**
BP DL	**0.413911**	**0.413911**	**OK**
DL QSAS			
Gross Count Rate	**0.770833**	**0.770833**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**0.768750**	**0.768750**	**OK**
Δ t 1 (t2 - t1)	**21.056250**	**21.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.307565**	**9.307565**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.504167**	**0.504167**	**OK**
Chem Rec Factor	**0.514456**	**0.514456**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.123162**	**0.123162**	**OK**
K MDA	**177.353146**	**177.353146**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-13
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	023
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SW-BG-041911
Instr File Name	ApexAlpha
Instr Detector	A_2_1A
Instr keV	31.36332893
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDK **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	33.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220520
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	5-0241
Tracer Std - Isotope	U-232
Tracer Counts	1473.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.017000
Tracer EFF	0.220520
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.215676	0.215676	OK
CU	0.073587	0.073587	OK
TPU	0.078067	0.078067	OK
MDA	0.017712	0.017712	OK
DL	0.000000	0.000000	OK
BP MDA	0.323544	0.323544	OK
BP DL	0.153245	0.153245	OK
DL QSAS			
Gross Count Rate	0.022917	0.022917	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.022917	0.022917	OK
Δ t 1 (t2 - t1)	21.056250	21.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.307565	9.307565	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.504167	0.504167	OK
Chem Rec Factor	0.514456	0.514456	OK
Sys Err	0.061664	0.061664	OK
K	0.106255	0.106255	OK
K MDA	153.007098	153.007098	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-13
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	023
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SW-BG-041911
Instr File Name	ApexAlpha
Instr Detector	A_2_1A
Instr keV	11.45227432
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	675.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220520
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1473.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.017000
Tracer EFF	0.220520
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	3.792726	3.792726	OK
CU	0.286762	0.286762	OK
TPU	0.540698	0.540698	OK
MDA	0.041432	0.041432	OK
DL	0.013091	0.013091	OK
BP MDA	0.699574	0.699574	OK
BP DL	0.342898	0.342898	OK
DL QSAS			
Gross Count Rate	0.468750	0.468750	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.468056	0.468056	OK
Δ t 1 (t2 - t1)	21.056250	21.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.307565	9.307565	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.504167	0.504167	OK
Chem Rec Factor	0.514456	0.514456	OK
Sys Err	0.061664	0.061664	OK
K	0.123409	0.123409	OK
K MDA	177.708592	177.708592	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-I3
Analysis Code	ASP-A-024
SDG	ARS1-I1-00897
Fraction	023
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	RP-SW-BG-041911
Instr File Name	ApexAlpha
Instr Detector	A_2_1A
Instr keV	29.78630257
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	252.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.214772
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	252.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.019000
Tracer EFF	0.214772
Tracer Plating Rec	0.950000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.328858**	**8.328858**	**OK**
CU	**1.053197**	**1.053197**	**OK**
TPU	**1.456890**	**1.456890**	**OK**
MDA	**0.403531**	**0.403531**	**OK**
OL	**0.156259**	**0.156259**	**OK**
BP MDA	**0.434225**	**0.434225**	**OK**
BP DL	**0.171975**	**0.171975**	**OK**
DL QSAS			
Gross Count Rate	**0.175000**	**0.175000**	**OK**
BKG Count Rate	**0.002778**	**0.002778**	**OK**
Net Count Rate	**0.172222**	**0.172222**	**OK**
Δ t 1 (t2 - t1)	**19.056250**	**19.056250**	**OK**
DF	**0.999475**	**0.999475**	**OK**
Tracer DPM	**9.325869**	**9.325869**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.087044**	**0.087044**	**OK**
Chem Rec Factor	**0.088820**	**0.088820**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.020678**	**0.020678**	**OK**
K MDA	**29.775992**	**29.775992**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-14
Analysis Code	ASP-A-024
SDG	ARS1-11-00997
Fraction	024
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	SPOP35-110421
Instr File Name	ApexAlpha
Instr Detector	A_2_1B
Instr keV	10.00212955
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDR **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	124641.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.214772
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	252.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.019000
Tracer EFF	0.214772
Tracer Plating Rec	0.580000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4179.500807	4179.500807	OK
CU	23.203873	23.203873	OK
TPU	505.669165	505.669165	OK
MDA	0.311520	0.311520	OK
DL	0.110323	0.110323	OK
BP MDA	0.916920	0.916920	OK
BP DL	0.413911	0.413911	OK
DL QSAS			
Gross Count Rate	86.556250	86.556250	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	86.554861	86.554861	OK
Δ t 1 (t2 - t1)	19.056250	19.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.325869	9.325869	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.087044	0.087044	OK
Chem Rec Factor	0.088820	0.088820	OK
Sys Err	0.061664	0.061664	OK
K	0.020709	0.020709	OK
K MDA	29.821504	29.821504	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-14
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	024
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	SPOP35-110421
Instr File Name	ApexAlpha
Instr Detector	A_2_1B
Instr keV	4.879087925
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

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Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	59058.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.214772
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	252.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.019000
Tracer EFF	0.214772
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**2295.457018**	**2295.457018**	**OK**
CU	**18.513857**	**18.513857**	**OK**
TPU	**278.047112**	**278.047112**	**OK**
MDA	**0.286180**	**0.286180**	**OK**
DL	**0.090423**	**0.090423**	**OK**
BP MDA	**0.411166**	**0.411166**	**OK**
BP DL	**0.153245**	**0.153245**	**OK**
DL QSAS			
Gross Count Rate	**41.012500**	**41.012500**	**OK**
BKG Count Rate	**0.000694**	**0.000694**	**OK**
Net Count Rate	**41.011806**	**41.011806**	**OK**
Δ t 1 (t2 - t1)	**19.056250**	**19.056250**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.325869**	**9.325869**	**OK**
Tracer Δt	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.087044**	**0.087044**	**OK**
Chem Rec Factor	**0.088820**	**0.088820**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.017867**	**0.017867**	**OK**
K MDA	**25.727774**	**25.727774**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-14
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	024
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	SPOP35-110421
Instr File Name	ApexAlpha
Instr Detector	A_2_1B
Instr keV	137.4632874
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

35000840

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	119549.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.214772
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.056330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	252.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.019000
Tracer EFF	0.214772
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4000.699980	4000.699980	OK
CU	22.679602	22.679602	OK
TPU	484.058142	484.058142	OK
MDA	0.360387	0.360387	OK
DL	0.134847	0.134847	OK
BP MDA	0.775017	0.775017	OK
BP DL	0.342898	0.342898	OK
DL QSAS			
Gross Count Rate	83.020139	83.020139	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	83.018056	83.018056	OK
Δ t 1 (t2 - t1)	19.056250	19.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.325869	9.325869	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.087044	0.087044	OK
Chem Rec Factor	0.088820	0.088820	OK
Sys Err	0.061664	0.061664	OK
K	0.020751	0.020751	OK
K MDA	29.881271	29.881271	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-14
Analysis Code	ASP-A-D24
SDG	ARS1-11-00897
Fraction	024
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	SPOP35-110421
Instr File Name	ApexAlpha
Instr Detector	A_2_18
Instr keV	227.3585358
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2020.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223188
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2020.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.015000
Tracer EFF	0.223188
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.081885
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.296392**	**8.296392**	**OK**
CU	**0.362339**	**0.362339**	**OK**
TPU	**1.066165**	**1.066165**	**OK**
MDA	**0.038193**	**0.038193**	**OK**
DL	**0.013526**	**0.013526**	**OK**
BP MDA	**0.354363**	**0.354363**	**OK**
BP DL	**0.171980**	**0.171980**	**OK**
DL QSAS			
Gross Count Rate	**1.402778**	**1.402778**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**1.401389**	**1.401389**	**OK**
Δ t 1 (t2 - t1)	**20.056250**	**20.056250**	**OK**
DF	**0.999448**	**0.999448**	**OK**
Tracer DPM	**9.289261**	**9.289261**	**OK**
Tracer At	**335.087500**	**335.087500**	**OK**
Tracer DF	**0.990812**	**0.990812**	**OK**
Tracer Recovery	**0.684258**	**0.684258**	**OK**
Chem Rec Factor	**0.698222**	**0.698222**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.168915**	**0.168915**	**OK**
K MDA	**243.238267**	**243.238267**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-15
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	025
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-RM-110420
Instr File Name	ApexAlpha
Instr Detector	A_2_2A
Instr keV	32.61607742
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2837.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223188
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.993000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2020.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.015000
Tracer EFF	0.223188
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.197185
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	11.645340	11.645340	OK
CU	0.428527	0.428527	OK
TPU	1.471252	1.471252	OK
MDA	0.011124	0.011124	OK
DL	0.000000	0.000000	OK
BP MDA	0.837170	0.837170	OK
BP DL	0.413911	0.413911	OK
DL QSAS			
Gross Count Rate	1.970139	1.970139	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	1.970139	1.970139	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.289261	9.289261	OK
Tracer At	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.684258	0.684258	OK
Chem Rec Factor	0.698222	0.698222	OK
Sys Err	0.061664	0.061664	OK
K	0.169178	0.169178	OK
K MDA	243.616759	243.616759	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-15
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	025
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-RM-110420
Instr File Name	ApexAlpha
Instr Detector	A_2_2A
Instr keV	36.27605438
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDR **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	154.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223188
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2020.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.015000
Tracer EFF	0.223188
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.073005
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.732725	0.732725	OK
CU	0.115728	0.115728	OK
TPU	0.145723	0.145723	OK
MDA	0.012894	0.012894	OK
DL	0.000000	0.000000	OK
BP MDA	0.318726	0.318726	OK
BP DL	0.153245	0.153245	OK
DL QSAS			
Gross Count Rate	0.106944	0.106944	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.106944	0.106944	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.289261	9.289261	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.684258	0.684258	OK
Chem Rec Factor	0.698222	0.698222	OK
Sys Err	0.061664	0.061664	OK
K	0.145954	0.145954	OK
K MDA	210.174411	210.174411	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-15
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	025
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-RM-110420
Instr File Name	ApexAlpha
Instr Detector	A_2_2A
Instr keV	11.46146107
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDL **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	7333.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223188
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/10/11 1:21 PM
Activity Units = pCi -- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2020.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Rec Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.015000
Tracer EFF	0.223188
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.163355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	30.023964	30.023964	OK
CU	0.687763	0.687763	OK
TPU	3.693313	3.693313	OK
MDA	0.049223	0.049223	OK
DL	0.019060	0.019060	OK
BP MDA	0.695426	0.695426	OK
BP DL	0.342898	0.342898	OK
DL QSAS			
Gross Count Rate	5.092361	5.092361	OK
BKG Count Rate	0.002778	0.002778	OK
Net Count Rate	5.089583	5.089583	OK
Δ t 1 (t2 - t1)	20.056250	20.056250	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.289261	9.289261	OK
Tracer Δt	335.087500	335.087500	OK
Tracer DF	0.990812	0.990812	OK
Tracer Recovery	0.684258	0.684258	OK
Chem Rec Factor	0.698222	0.698222	OK
Sys Err	0.061664	0.061664	OK
K	0.169517	0.169517	OK
K MDA	244.105007	244.105007	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01664
Batch ID	ARS1-B11-01664-15
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	025
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-RM-110420
Instr File Name	ApexAlpha
Instr Detector	A_2_2A
Instr keV	38.88392258
Version/Date	2.0 -- 4/20/2006

Reviewed by: SDh **Date:** 6-2-11

35000845

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2423.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213413
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:08 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2423.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.044500
Tracer EFF	0.213413
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**4.264512**	**4.264512**	**OK**
TPU	**0.542662**	**0.542662**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP DL	**0.086815**	**0.086815**	**OK**
DL QSAS			
Gross Count Rate	**1.682639**	**1.682639**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**1.682639**	**1.682639**	**OK**
Δ t 1 (t2 - t1)	**1.949028**	**1.949028**	**OK**
DF	**0.999946**	**0.999946**	**OK**
Tracer DPM	**9.559244**	**9.559244**	**OK**
Tracer Δt	**353.120139**	**353.120139**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.835363**	**0.835363**	**OK**
Chem Rec Factor	**0.852411**	**0.852411**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.394568**	**0.394568**	**OK**
K MDA	**568.177604**	**568.177604**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-01
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_3B
Instr keV	39.81627655
Version/Date	2.0 -- 4/20/2006

Reviewed by: DPM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	9650.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213413
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:08 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2423.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.044500
Tracer EFF	0.213413
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**16.960923**	**16.960923**	**OK**
TPU	**2.077676**	**2.077676**	**OK**
DL	**0.007084**	**0.007084**	**OK**
BP DL	**0.136641**	**0.136641**	**OK**
DL QSAS			
Gross Count Rate	**6.701389**	**6.701389**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**6.699306**	**6.699306**	**OK**
Δ t 1 (t2 - t1)	**1.949028**	**1.949028**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.559244**	**9.559244**	**OK**
Tracer Δt	**353.120139**	**353.120139**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.835363**	**0.835363**	**OK**
Chem Rec Factor	**0.852411**	**0.852411**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.394985**	**0.394985**	**OK**
K MDA	**568.778020**	**568.778020**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-01
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_3B
Instr keV	44.50381088
Version/Date	2.0 -- 4/20/2006

Reviewed by: VJM **Date:** 6-2-11

35000847

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	348.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213413
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:08 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2423.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.044500
Tracer EFF	0.213413
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.707154	0.707154	OK
TPU	0.113458	0.113458	OK
DL	0.004741	0.004741	OK
BP DL	0.015438	0.015438	OK
DL QSAS			
Gross Count Rate	0.241667	0.241667	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.240972	0.240972	OK
Δ t 1 (t2 - t1)	1.949028	1.949028	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.559244	9.559244	OK
Tracer Δt	353.120139	353.120139	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.835363	0.835363	OK
Chem Rec Factor	0.852411	0.852411	OK
Sys Err	0.061664	0.061664	OK
K	0.340763	0.340763	OK
K MDA	490.699281	490.699281	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-01
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_3B
Instr keV	47.43571854
Version/Date	2.0 -- 4/20/2006

Reviewed by: VHM Date: 6-2-11

35000848

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	10054.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213413
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:08 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2423.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.044500
Tracer EFF	0.213413
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	OK

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**17.634120**	**17.634120**	**OK**
TPU	**2.158996**	**2.158996**	**OK**
DL	**0.008164**	**0.008164**	**OK**
BP DL	**0.158855**	**0.158855**	**OK**
DL QSAS			
Gross Count Rate	**6.981944**	**6.981944**	**OK**
BKG Count Rate	**0.002778**	**0.002778**	**OK**
Net Count Rate	**6.979167**	**6.979167**	**OK**
Δ t 1 (t2 - t1)	**1.949028**	**1.949028**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.559244**	**9.559244**	**OK**
Tracer Δt	**353.120139**	**353.120139**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.835363**	**0.835363**	**OK**
Chem Rec Factor	**0.852411**	**0.852411**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.395776**	**0.395776**	**OK**
K MDA	**569.917864**	**569.917864**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-01
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_3B
Instr keV	44.36736298
Version/Date	2.0 -- 4/20/2006

Reviewed by: VHM **Date:** 6-2-11

35000849

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2366.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224954
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2366.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.046800
Tracer EFF	0.224954
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.273902	4.273902	OK
TPU	0.544498	0.544498	OK
DL	0.000000	0.000000	OK
BP DL	0.086815	0.086815	OK
DL QSAS			
Gross Count Rate	1.643056	1.643056	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	1.643056	1.643056	OK
Δ t 1 (t2 - t1)	1.949722	1.949722	OK
DF	0.999946	0.999946	OK
Tracer DPM	9.580294	9.580294	OK
Tracer At	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.772164	0.772164	OK
Chem Rec Factor	0.787922	0.787922	OK
Sys Err	0.061664	0.061664	OK
K	0.384439	0.384439	OK
K MDA	553.592461	553.592461	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4A
Instr keV	38.41609192
Version/Date	2.0 -- 4/20/2006

Reviewed by: DHM Date: 6-2-11

35000850

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	9438.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224954
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2366.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.046800
Tracer EFF	0.224954
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	OK

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	17.028841	17.028841	OK
TPU	2.086601	2.086601	OK
DL	0.004198	0.004198	OK
BP DL	0.136641	0.136641	OK
DL QSAS			
Gross Count Rate	6.554167	6.554167	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	6.553472	6.553472	OK
Δ t 1 (t2 - t1)	1.949722	1.949722	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.580294	9.580294	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.772164	0.772164	OK
Chem Rec Factor	0.787922	0.787922	OK
Sys Err	0.061664	0.061664	OK
K	0.384845	0.384845	OK
K MDA	554.177475	554.177475	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4A
Instr keV	43.13824081
Version/Date	2.0 -- 4/20/2006

35000851

Reviewed by: VHM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	343.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224954
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2366.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.046800
Tracer EFF	0.224954
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.715327**	**0.715327**	**OK**
TPU	**0.115134**	**0.115134**	**OK**
DL	**0.004866**	**0.004866**	**OK**
BP DL	**0.015438**	**0.015438**	**OK**
DL QSAS			
Gross Count Rate	**0.238194**	**0.238194**	**OK**
BKG Count Rate	**0.000694**	**0.000694**	**OK**
Net Count Rate	**0.237500**	**0.237500**	**OK**
Δ t 1 (t2 - t1)	**1.949722**	**1.949722**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.580294**	**9.580294**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.772164**	**0.772164**	**OK**
Chem Rec Factor	**0.787922**	**0.787922**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.332016**	**0.332016**	**OK**
K MDA	**478.103019**	**478.103019**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4A
Instr keV	14.2139082
Version/Date	2.0 -- 4/20/2006

Reviewed by: DHM **Date:** 6-2-11

35000852

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	9439.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.224954
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2366.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.046800
Tracer EFF	0.224954
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**16.991181**	**16.991181**	**OK**
TPU	**2.082010**	**2.082010**	**OK**
DL	**0.008379**	**0.008379**	**OK**
BP DL	**0.158855**	**0.158855**	**OK**
DL QSAS			
Gross Count Rate	**6.554861**	**6.554861**	**OK**
BKG Count Rate	**0.002778**	**0.002778**	**OK**
Net Count Rate	**6.552083**	**6.552083**	**OK**
Δ t 1 (t2 - t1)	**1.949722**	**1.949722**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.580294**	**9.580294**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.772164**	**0.772164**	**OK**
Chem Rec Factor	**0.787922**	**0.787922**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.385617**	**0.385617**	**OK**
K MDA	**555.288060**	**555.288060**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-02
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4A
Instr keV	46.86788177
Version/Date	2.0 -- 4/20/2006

Reviewed by: VJM **Date:** 6-2-11

35000853

Procedure	ARS-026
Variable	**Value**
Counts	1986.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215817
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1986.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.046600
Tracer EFF	0.215817
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.273086	4.273086	OK
TPU	0.549676	0.549676	OK
DL	0.007086	0.007086	OK
BP DL	0.086815	0.086815	OK
DL QSAS			
Gross Count Rate	1.379167	1.379167	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	1.377778	1.377778	OK
Δ t 1 (t2 - t1)	1.949722	1.949722	OK
DF	0.999946	0.999946	OK
Tracer DPM	9.578464	9.578464	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.675037	0.675037	OK
Chem Rec Factor	0.688813	0.688813	OK
Sys Err	0.061664	0.061664	OK
K	0.322432	0.322432	OK
K MDA	464.301491	464.301491	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_Z_4B
Instr keV	40.27577209
Version/Date	2.0 -- 4/20/2006

Reviewed by: VHM Date: 6-2-11

35000854

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	91.000000
Count Mins	1440.000000
BKG Counts	10.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215817
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1986.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.046600
Tracer EFF	0.215817
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	OK

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.174271	0.174271	OK
TPU	0.047325	0.047325	OK
DL	0.015828	0.015828	OK
BP DL	0.136641	0.136641	OK
DL QSAS			
Gross Count Rate	0.063194	0.063194	OK
BKG Count Rate	0.006944	0.006944	OK
Net Count Rate	0.056250	0.056250	OK
Δ t 1 (t2 - t1)	1.949722	1.949722	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.578464	9.578464	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.675037	0.675037	OK
Chem Rec Factor	0.688813	0.688813	OK
Sys Err	0.061664	0.061664	OK
K	0.322772	0.322772	OK
K MDA	464.792146	464.792146	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4B
Instr keV	25.77999306
Version/Date	2.0 -- 4/20/2006

35000855

Reviewed by: VJM Date: 6-2-11

Procedure	ARS-026
Variable	**Value**
Counts	9.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215817
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1986.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.046600
Tracer EFF	0.215817
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.014963	0.014963	OK
TPU	0.017029	0.017029	OK
DL	0.010049	0.010049	OK
BP DL	0.015438	0.015438	OK
DL QSAS			
Gross Count Rate	0.006250	0.006250	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	0.004167	0.004167	OK
Δ t 1 (t2 - t1)	1.949722	1.949722	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.578464	9.578464	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.675037	0.675037	OK
Chem Rec Factor	0.688813	0.688813	OK
Sys Err	0.061664	0.061664	OK
K	0.278464	0.278464	OK
K MDA	400.988020	400.988020	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4B
Instr keV	6.138093472
Version/Date	2.0 -- 4/20/2006

Reviewed by: AHM Date: 6-2-11

35000856

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	109.000000
Count Mins	1440.000000
BKG Counts	53.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215817
Sample Aliquot	1.000000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	5/26/11 3:21 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1986.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.046600
Tracer EFF	0.215817
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.120243	0.120243	OK
TPU	0.055502	0.055502	OK
DL	0.036366	0.036366	OK
BP DL	0.158855	0.158855	OK
DL QSAS			
Gross Count Rate	0.075694	0.075694	OK
BKG Count Rate	0.036806	0.036806	OK
Net Count Rate	0.038889	0.038889	OK
Δ t 1 (t2 - t1)	1.949722	1.949722	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.578464	9.578464	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.675037	0.675037	OK
Chem Rec Factor	0.688813	0.688813	OK
Sys Err	0.061664	0.061664	OK
K	0.323419	0.323419	OK
K MDA	465.723600	465.723600	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-03
Analysis Code	
SDG	QC Sample
Fraction	N/A QC Sample
Client	QC Sample
Client Profile	
Client ID	N/A QC Sample
Instr File Name	ApexAlpha
Instr Detector	A_2_4B
Instr keV	8.593330383
Version/Date	2.0 -- 4/20/2006

Reviewed by: RJM Date: 6-2-11

35000857

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1910.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.218973
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1910.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.047200
Tracer EFF	0.218973
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.559824	8.559824	OK
TPU	1.103473	1.103473	OK
DL	0.000000	0.000000	OK
BP DL	0.173808	0.173808	OK
DL QSAS			
Gross Count Rate	1.326389	1.326389	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	1.326389	1.326389	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	0.998924	0.998924	OK
Tracer DPM	9.583955	9.583955	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.640125	0.640125	OK
Chem Rec Factor	0.653189	0.653189	OK
Sys Err	0.061664	0.061664	OK
K	0.154955	0.154955	OK
K MDA	223.135438	223.135438	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-04
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	001
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-1-110419
Instr File Name	ApexAlpha
Instr Detector	A_2_5A
Instr keV	29.66066933
Version/Date	2.0 -- 4/20/2006

35000858

Reviewed by: 27M Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	846.000000
Count Mins	1440.000000
BKG Counts	9.000000
BKG Mins	1440.000000
Instrument Efficiency	0.218973
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1910.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.047200
Tracer EFF	0.218973
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	3.743295	3.743295	OK
TPU	0.519977	0.519977	OK
DL	0.031213	0.031213	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	0.587500	0.587500	OK
BKG Count Rate	0.006250	0.006250	OK
Net Count Rate	0.581250	0.581250	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.583955	9.583955	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.640125	0.640125	OK
Chem Rec Factor	0.653189	0.653189	OK
Sys Err	0.061664	0.061664	OK
K	0.155278	0.155278	OK
K MDA	223.599824	223.599824	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-04
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	001
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-1-110419
Instr File Name	ApexAlpha
Instr Detector	A_2_5A
Instr keV	27.81350517
Version/Date	2.0 -- 4/20/2006

Reviewed by: VHM Date: 6-2-11

35000859

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	32.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.218973
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1910.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.047200
Tracer EFF	0.218973
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.160701	0.160701	OK
TPU	0.061514	0.061514	OK
DL	0.012060	0.012060	OK
BP DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	0.022222	0.022222	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.021528	0.021528	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.583955	9.583955	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.640125	0.640125	OK
Chem Rec Factor	0.653189	0.653189	OK
Sys Err	0.061664	0.061664	OK
K	0.133962	0.133962	OK
K MDA	192.905317	192.905317	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-04
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	001
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-1-110419
Instr File Name	ApexAlpha
Instr Detector	A_2_5A
Instr keV	4.889849663
Version/Date	2.0 -- 4/20/2006

Reviewed by: VHM Date: 6-2-11

35000860

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	187.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.218973
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1910.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.047200
Tracer EFF	0.218973
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.825716	0.825716	OK
TPU	0.156280	0.156280	OK
DL	0.014684	0.014684	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	0.129861	0.129861	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	0.128472	0.128472	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.583955	9.583955	OK
Tracer At	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.640125	0.640125	OK
Chem Rec Factor	0.653189	0.653189	OK
Sys Err	0.061664	0.061664	OK
K	0.155589	0.155589	OK
K MDA	224.047987	224.047987	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-04
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	001
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-1-110419
Instr File Name	ApexAlpha
Instr Detector	A_2_5A
Instr keV	16.5469017
Version/Date	2.0 -- 4/20/2006

35000861

Reviewed by: RJM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2184.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213046
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2184.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.042400
Tracer EFF	0.213046
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.520119	8.520119	OK
TPU	1.090226	1.090226	OK
DL	0.015741	0.015741	OK
BP DL	0.173798	0.173798	OK
DL QSAS			
Gross Count Rate	1.516667	1.516667	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	1.514583	1.514583	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	0.998979	0.998979	OK
Tracer DPM	9.540025	9.540025	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.754745	0.754745	OK
Chem Rec Factor	0.770148	0.770148	OK
Sys Err	0.061664	0.061664	OK
K	0.177766	0.177766	OK
K MDA	255.982341	255.982341	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-05
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	002
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-2-110421
Instr File Name	ApexAlpha
Instr Detector	A_2_5B
Instr keV	63.23594666
Version/Date	2.0 -- 4/20/2006

35000862

Reviewed by: JHM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	16307.000000
Count Mins	1440.000000
BKG Counts	5.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213046
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2184.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.042400
Tracer EFF	0.213046
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	63.555318	63.555318	OK
TPU	7.743076	7.743076	OK
DL	0.020280	0.020280	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	11.324306	11.324306	OK
BKG Count Rate	0.003472	0.003472	OK
Net Count Rate	11.320833	11.320833	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.540025	9.540025	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.754745	0.754745	OK
Chem Rec Factor	0.770148	0.770148	OK
Sys Err	0.061664	0.061664	OK
K	0.178126	0.178126	OK
K MDA	256.500959	256.500959	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-05
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	002
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-2-110421
Instr File Name	ApexAlpha
Instr Detector	A_2_5B
Instr keV	65.6692276
Version/Date	2.0 -- 4/20/2006

Reviewed by: VTM Date: 6-2-11

35000863

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	494.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213046
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2184.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.042400
Tracer EFF	0.213046
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	2.232365	2.232365	OK
TPU	0.333989	0.333989	OK
DL	0.000000	0.000000	OK
BP DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	0.343056	0.343056	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.343056	0.343056	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.540025	9.540025	OK
Tracer At	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.754745	0.754745	OK
Chem Rec Factor	0.770148	0.770148	OK
Sys Err	0.061664	0.061664	OK
K	0.153674	0.153674	OK
K MDA	221.289969	221.289969	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-05
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	002
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-2-110421
Instr File Name	ApexAlpha
Instr Detector	A_2_5B
Instr keV	50.82377243
Version/Date	2.0 -- 4/20/2006

Reviewed by: DFM Date: 6-2-11

35000864

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	13978.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213046
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2184.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	3.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.042400
Tracer EFF	0.213046
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	54.374245	54.374245	OK
TPU	6.633272	6.633272	OK
DL	0.015678	0.015678	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	9.706944	9.706944	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	9.704861	9.704861	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.540025	9.540025	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.754745	0.754745	OK
Chem Rec Factor	0.770148	0.770148	OK
Sys Err	0.061664	0.061664	OK
K	0.178483	0.178483	OK
K MDA	257.015062	257.015062	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-05
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	002
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-2-110421
Instr File Name	ApexAlpha
Instr Detector	A_2_5B
Instr keV	67.47711945
Version/Date	2.0 -- 4/20/2006

35000865

Reviewed by: DFM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2231.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223028
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2231.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.041200
Tracer EFF	0.223028
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.510311	8.510311	OK
TPU	1.087573	1.087573	OK
DL	0.008878	0.008878	OK
BP DL	0.173798	0.173798	OK
DL QSAS			
Gross Count Rate	1.549306	1.549306	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	1.548611	1.548611	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	0.998979	0.998979	OK
Tracer DPM	9.529043	9.529043	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.738013	0.738013	OK
Chem Rec Factor	0.753074	0.753074	OK
Sys Err	0.061664	0.061664	OK
K	0.181969	0.181969	OK
K MDA	262.035087	262.035087	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-06
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	003
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-2-2-110421
Instr File Name	ApexAlpha
Instr Detector	A_3_1A
Instr keV	48.20111465
Version/Date	2.0 -- 4/20/2006

Reviewed by: DHM Date: 6-2-11

35000866

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	16471.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223028
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2231.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.041200
Tracer EFF	0.223028
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	OK

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	62.708051	62.708051	OK
TPU	7.639258	7.639258	OK
DL	0.021703	0.021703	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	11.438194	11.438194	OK
BKG Count Rate	0.004167	0.004167	OK
Net Count Rate	11.434028	11.434028	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.529043	9.529043	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.738013	0.738013	OK
Chem Rec Factor	0.753074	0.753074	OK
Sys Err	0.061664	0.061664	OK
K	0.182337	0.182337	OK
K MDA	262.565967	262.565967	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-06
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	003
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-2-2-110421
Instr File Name	ApexAlpha
Instr Detector	A_3_1A
Instr keV	58.67838669
Version/Date	2.0 -- 4/20/2006

35000867

Reviewed by: JJM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	565.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223028
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2231.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.041200
Tracer EFF	0.223028
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	2.489820	2.489820	OK
TPU	0.364593	0.364593	OK
DL	0.010270	0.010270	OK
BP DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	0.392361	0.392361	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.391667	0.391667	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.529043	9.529043	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.738013	0.738013	OK
Chem Rec Factor	0.753074	0.753074	OK
Sys Err	0.061664	0.061664	OK
K	0.157307	0.157307	OK
K MDA	226.522407	226.522407	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-06
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	003
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-2-2-110421
Instr File Name	ApexAlpha
Instr Detector	A_3_1A
Instr keV	47.90333176
Version/Date	2.0 -- 4/20/2006

Reviewed by: YYM Date: 6-2-11

35000868

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	14317.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.223028
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2231.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.041200
Tracer EFF	0.223028
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**54.410578**	**54.410578**	**OK**
TPU	**6.636238**	**6.636238**	**OK**
DL	**0.012505**	**0.012505**	**OK**
BP DL	**0.317709**	**0.317709**	**OK**
DL QSAS			
Gross Count Rate	**9.942361**	**9.942361**	**OK**
BKG Count Rate	**0.001389**	**0.001389**	**OK**
Net Count Rate	**9.940972**	**9.940972**	**OK**
Δ t 1 (t2 - t1)	**37.089583**	**37.089583**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.529043**	**9.529043**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.738013**	**0.738013**	**OK**
Chem Rec Factor	**0.753074**	**0.753074**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.182703**	**0.182703**	**OK**
K MDA	**263.092227**	**263.092227**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-06
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	003
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-2-2-110421
Instr File Name	ApexAlpha
Instr Detector	A_3_1A
Instr keV	63.52745819
Version/Date	2.0 -- 4/20/2006

35000869

Reviewed by: YHM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	17.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209818
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	17.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039800
Tracer EFF	0.209818
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.498868**	**8.498868**	**OK**
TPU	**4.168638**	**4.168638**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP DL	**0.173798**	**0.173798**	**OK**
DL QSAS			
Gross Count Rate	**0.011806**	**0.011806**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.011806**	**0.011806**	**OK**
Δ t 1 (t2 - t1)	**37.089583**	**37.089583**	**OK**
DF	**0.998979**	**0.998979**	**OK**
Tracer DPM	**9.516230**	**9.516230**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.005988**	**0.005988**	**OK**
Chem Rec Factor	**0.006111**	**0.006111**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.001389**	**0.001389**	**OK**
K MDA	**2.000266**	**2.000266**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-07
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	004
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	JPOP41S-110421
Instr File Name	ApexAlpha
Instr Detector	A_3_1B
Instr keV	4.894890308
Version/Date	2.0 -- 4/20/2006

35000870

Reviewed by: DJM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	126807.000000
Count Mins	1440.000000
BKG Counts	11.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209818
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	17.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039800
Tracer EFF	0.209818
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	63261.387801	63261.387801	OK
TPU	7653.728603	7653.728603	OK
DL	3.849554	3.849554	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	88.060417	88.060417	OK
BKG Count Rate	0.007639	0.007639	OK
Net Count Rate	88.052778	88.052778	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.516230	9.516230	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.005988	0.005988	OK
Chem Rec Factor	0.006111	0.006111	OK
Sys Err	0.061664	0.061664	OK
K	0.001392	0.001392	OK
K MDA	2.004319	2.004319	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-07
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	004
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	JPOP41S-110421
Instr File Name	ApexAlpha
Instr Detector	A_3_1B
Instr keV	223.4042358
Version/Date	2.0 -- 4/20/2006

Reviewed by: VFM Date: 6-2-11

35000871

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	124711.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209818
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	17.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039800
Tracer EFF	0.209818
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	72121.572782	72121.572782	OK
TPU	8725.834438	8725.834438	OK
DL	0.000000	0.000000	OK
BP DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	86.604861	86.604861	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	86.604861	86.604861	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.516230	9.516230	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.005988	0.005988	OK
Chem Rec Factor	0.006111	0.006111	OK
Sys Err	0.061664	0.061664	OK
K	0.001201	0.001201	OK
K MDA	1.729177	1.729177	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-07
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	004
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	JPOP41S-110421
Instr File Name	ApexAlpha
Instr Detector	A_3_1B
Instr keV	91.45392609
Version/Date	2.0 -- 4/20/2006

35000872

Reviewed by: VPM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	229215.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.209818
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/21/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	17.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039800
Tracer EFF	0.209818
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	114131.786030	114131.786030	OK
TPU	13801.934285	13801.934285	OK
DL	0.000000	0.000000	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	159.177083	159.177083	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	159.177083	159.177083	OK
Δ t 1 (t2 - t1)	37.089583	37.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.516230	9.516230	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.005988	0.005988	OK
Chem Rec Factor	0.006111	0.006111	OK
Sys Err	0.061664	0.061664	OK
K	0.001395	0.001395	OK
K MDA	2.008336	2.008336	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-07
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	004
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	JPOP41S-110421
Instr File Name	ApexAlpha
Instr Detector	A_3_1B
Instr keV	103.445076
Version/Date	2.0 -- 4/20/2006

35000873

Reviewed by: VHM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1705.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220569
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1705.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039100
Tracer EFF	0.220569
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.493380	8.493380	OK
TPU	1.103105	1.103105	OK
DL	0.016408	0.016408	OK
BP DL	0.173803	0.173803	OK
DL QSAS			
Gross Count Rate	1.184028	1.184028	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	1.182639	1.182639	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	0.998951	0.998951	OK
Tracer DPM	9.509824	9.509824	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.571037	0.571037	OK
Chem Rec Factor	0.582691	0.582691	OK
Sys Err	0.061664	0.061664	OK
K	0.139242	0.139242	OK
K MDA	200.509098	200.509098	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-08
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	005
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MD-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_2B
Instr keV	30.2557621
Version/Date	2.0 -- 4/20/2006

35000874

Reviewed by: VFM Date: 6-2-11

Procedure	ARS-026
Variable	**Value**
Counts	979.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220569
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1705.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039100
Tracer EFF	0.220569
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.857634	4.857634	OK
TPU	0.661914	0.661914	OK
DL	0.020055	0.020055	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	0.679861	0.679861	OK
BKG Count Rate	0.002083	0.002083	OK
Net Count Rate	0.677778	0.677778	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.509824	9.509824	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.571037	0.571037	OK
Chem Rec Factor	0.582691	0.582691	OK
Sys Err	0.061664	0.061664	OK
K	0.139528	0.139528	OK
K MDA	200.920861	200.920861	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-08
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	005
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MD-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_2B
Instr keV	29.02689934
Version/Date	2.0 -- 4/20/2006

35000875

Reviewed by: DJM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	53.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220569
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1705.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039100
Tracer EFF	0.220569
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**0.305758**	**0.305758**	**OK**
TPU	**0.090232**	**0.090232**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP DL	**0.030876**	**0.030876**	**OK**
DL QSAS			
Gross Count Rate	**0.036806**	**0.036806**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.036806**	**0.036806**	**OK**
Δ t 1 (t2 - t1)	**38.089583**	**38.089583**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.509824**	**9.509824**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.571037**	**0.571037**	**OK**
Chem Rec Factor	**0.582691**	**0.582691**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.120375**	**0.120375**	**OK**
K MDA	**173.339591**	**173.339591**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-08
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	005
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MD-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_2B
Instr keV	8.558202744
Version/Date	2.0 -- 4/20/2006

35000876

Reviewed by: VHM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	572.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.220569
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1705.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	2.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039100
Tracer EFF	0.220569
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	2.811395	2.811395	OK
TPU	0.412600	0.412600	OK
DL	0.028305	0.028305	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	0.397222	0.397222	OK
BKG Count Rate	0.004167	0.004167	OK
Net Count Rate	0.393056	0.393056	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.509824	9.509824	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.571037	0.571037	OK
Chem Rec Factor	0.582691	0.582691	OK
Sys Err	0.061664	0.061664	OK
K	0.139808	0.139808	OK
K MDA	201.323567	201.323567	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-08
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	005
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MD-SW-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_2B
Instr keV	30.83281708
Version/Date	2.0 -- 4/20/2006

35000877

Reviewed by: VJM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2223.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219087
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2223.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039000
Tracer EFF	0.219087
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.492563	8.492563	OK
TPU	1.085434	1.085434	OK
DL	0.000000	0.000000	OK
BP DL	0.173803	0.173803	OK
DL QSAS			
Gross Count Rate	1.543750	1.543750	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	1.543750	1.543750	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	0.998951	0.998951	OK
Tracer DPM	9.508909	9.508909	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.750513	0.750513	OK
Chem Rec Factor	0.765830	0.765830	OK
Sys Err	0.061664	0.061664	OK
K	0.181777	0.181777	OK
K MDA	261.758441	261.758441	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-09
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	006
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-3-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3A
Instr keV	35.24778366
Version/Date	2.0 -- 4/20/2006

35000878

Reviewed by: VJM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	4650.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219087
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2223.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039000
Tracer EFF	0.219087
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	17.712814	17.712814	OK
TPU	2.200638	2.200638	OK
DL	0.017739	0.017739	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	3.229167	3.229167	OK
BKG Count Rate	0.002778	0.002778	OK
Net Count Rate	3.226389	3.226389	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.508909	9.508909	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.750513	0.750513	OK
Chem Rec Factor	0.765830	0.765830	OK
Sys Err	0.061664	0.061664	OK
K	0.182150	0.182150	OK
K MDA	262.295984	262.295984	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-09
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	006
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-3-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3A
Instr keV	34.71844101
Version/Date	2.0 -- 4/20/2006

Reviewed by: NJM Date: 6-2-11

35000879

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	148.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219087
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2223.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039000
Tracer EFF	0.219087
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.649610	0.649610	OK
TPU	0.131690	0.131690	OK
DL	0.010281	0.010281	OK
BP DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	0.102778	0.102778	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.102083	0.102083	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.508909	9.508909	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.750513	0.750513	OK
Chem Rec Factor	0.765830	0.765830	OK
Sys.Err	0.061664	0.061664	OK
K	0.157145	0.157145	OK
K MDA	226.289488	226.289488	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-09
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	006
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-3-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3A
Instr keV	33.72981262
Version/Date	2.0 -- 4/20/2006

Reviewed by: DJM Date: 6-2-11

35000880

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	4073.000000
Count Mins	1440.000000
BKG Counts	16.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219087
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2223.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.039000
Tracer EFF	0.219087
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	OK

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	15.436320	15.436320	OK
TPU	1.925623	1.925623	OK
DL	0.035406	0.035406	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	2.828472	2.828472	OK
BKG Count Rate	0.011111	0.011111	OK
Net Count Rate	2.817361	2.817361	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.508909	9.508909	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.750513	0.750513	OK
Chem Rec Factor	0.765830	0.765830	OK
Sys Err	0.061664	0.061664	OK
K	0.182515	0.182515	OK
K MDA	262.821705	262.821705	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-09
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	006
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-3-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3A
Instr keV	35.34767532
Version/Date	2.0 -- 4/20/2006

35000881

Reviewed by: DYM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2408.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212397
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2408.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.038100
Tracer EFF	0.212397
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.485206	8.485206	OK
TPU	1.080144	1.080144	OK
DL	0.008201	0.008201	OK
BP DL	0.173803	0.173803	OK
DL QSAS			
Gross Count Rate	1.672222	1.672222	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	1.671528	1.671528	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	0.998951	0.998951	OK
Tracer DPM	9.500672	9.500672	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.838960	0.838960	OK
Chem Rec Factor	0.856081	0.856081	OK
Sys Err	0.061664	0.061664	OK
K	0.196993	0.196993	OK
K MDA	283.670177	283.670177	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-10
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	007
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-4-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3B
Instr keV	67.77412415
Version/Date	2.0 -- 4/20/2006

Reviewed by: VHM Date: 6-2-11

35000882

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	33815.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212397
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2408.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.038100
Tracer EFF	0.212397
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**118.950490**	**118.950490**	**OK**
TPU	**14.432226**	**14.432226**	**OK**
DL	**0.014175**	**0.014175**	**OK**
BP DL	**0.273282**	**0.273282**	**OK**
DL QSAS			
Gross Count Rate	**23.482639**	**23.482639**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**23.480556**	**23.480556**	**OK**
Δ t 1 (t2 - t1)	**38.089583**	**38.089583**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.500672**	**9.500672**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.838960**	**0.838960**	**OK**
Chem Rec Factor	**0.856081**	**0.856081**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.197398**	**0.197398**	**OK**
K MDA	**284.252718**	**284.252718**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-10
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	007
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-4-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3B
Instr keV	82.13598633
Version/Date	2.0 -- 4/20/2006

Reviewed by: DHM **Date:** 6-2-11

35000883

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1123.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212397
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2408.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.038100
Tracer EFF	0.212397
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	OK

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	4.579335	4.579335	OK
TPU	0.614862	0.614862	OK
DL	0.000000	0.000000	OK
BP DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	0.779861	0.779861	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	0.779861	0.779861	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.500672	9.500672	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.838960	0.838960	OK
Chem Rec Factor	0.856081	0.856081	OK
Sys Err	0.061664	0.061664	OK
K	0.170300	0.170300	OK
K MDA	245.232126	245.232126	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-10
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	007
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-4-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3B
Instr keV	88.02515411
Version/Date	2.0 -- 4/20/2006

Reviewed by: DHM Date: 6-2-11

35000884

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	30828.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.212397
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2408.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.038100
Tracer EFF	0.212397
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**108.225319**	**108.225319**	**OK**
TPU	**13.135856**	**13.135856**	**OK**
DL	**0.014147**	**0.014147**	**OK**
BP DL	**0.317709**	**0.317709**	**OK**
DL QSAS			
Gross Count Rate	**21.408333**	**21.408333**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**21.406250**	**21.406250**	**OK**
Δ t 1 (t2 - t1)	**38.089583**	**38.089583**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.500672**	**9.500672**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.838960**	**0.838960**	**OK**
Chem Rec Factor	**0.856081**	**0.856081**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.197793**	**0.197793**	**OK**
K MDA	**284.822446**	**284.822446**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-10
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	007
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-4-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_3B
Instr keV	84.92006683
Version/Date	2.0 -- 4/20/2006

35000885

Reviewed by: YHM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2382.000000
Count Mins	1440.000000
BKG Counts	4.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215743
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2382.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.038000
Tracer EFF	0.215743
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/**
ACT	8.484389	8.484389	OK
TPU	1.080825	1.080825	OK
DL	0.016600	0.016600	OK
BP DL	0.173803	0.173803	OK
DL QSAS			
Gross Count Rate	1.654167	1.654167	OK
BKG Count Rate	0.002778	0.002778	OK
Net Count Rate	1.651389	1.651389	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	0.998951	0.998951	OK
Tracer DPM	9.499757	9.499757	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.816074	0.816074	OK
Chem Rec Factor	0.832728	0.832728	OK
Sys Err	0.061664	0.061664	OK
K	0.194639	0.194639	OK
K MDA	280.279463	280.279463	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-11
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	008
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-6-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_4B
Instr keV	57.33830643
Version/Date	2.0 -- 4/20/2006

Reviewed by: VJM Date: 6-2-11

35000886

Procedure	ARS-026
Variable	**Value**
Counts	20560.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215743
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2382.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.038000
Tracer EFF	0.215743
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	73.205024	73.205024	OK
TPU	8.904002	8.904002	OK
DL	0.000000	0.000000	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	14.277778	14.277778	OK
BKG Count Rate	0.000000	0.000000	OK
Net Count Rate	14.277778	14.277778	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.499757	9.499757	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.816074	0.816074	OK
Chem Rec Factor	0.832728	0.832728	OK
Sys Err	0.061664	0.061664	OK
K	0.195038	0.195038	OK
K MDA	280.855041	280.855041	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-11
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	008
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-6-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_4B
Instr keV	66.15758514
Version/Date	2.0 -- 4/20/2006

Reviewed by: UYM Date: 6-2-11

35000887

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	637.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215743
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2382.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.038000
Tracer EFF	0.215743
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**2.628963**	**2.628963**	**OK**
TPU	**0.377675**	**0.377675**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP DL	**0.030876**	**0.030876**	**OK**
DL QSAS			
Gross Count Rate	**0.442361**	**0.442361**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.442361**	**0.442361**	**OK**
Δ t 1 (t2 - t1)	**38.089583**	**38.089583**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.499757**	**9.499757**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.816074**	**0.816074**	**OK**
Chem Rec Factor	**0.832728**	**0.832728**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.168264**	**0.168264**	**OK**
K MDA	**242.300863**	**242.300863**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-11
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	008
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-6-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_4B
Instr keV	51.39112854
Version/Date	2.0 -- 4/20/2006

35000888

Reviewed by: DHM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	17397.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.215743
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2382.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	4.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.038000
Tracer EFF	0.215743
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
0 **Variables Intact Test**	OK

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	61.797762	61.797762	OK
TPU	7.525208	7.525208	OK
DL	0.020249	0.020249	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	12.081250	12.081250	OK
BKG Count Rate	0.004167	0.004167	OK
Net Count Rate	12.077083	12.077083	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.499757	9.499757	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.816074	0.816074	OK
Chem Rec Factor	0.832728	0.832728	OK
Sys Err	0.061664	0.061664	OK
K	0.195429	0.195429	OK
K MDA	281.417960	281.417960	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-11
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	008
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-6-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_4B
Instr keV	65.5785675
Version/Date	2.0 -- 4/20/2006

35000889

Reviewed by: VHM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1753.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1753.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.036700
Tracer EFF	0.213233
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.473997	8.473997	OK
TPU	1.098436	1.098436	OK
DL	0.011252	0.011252	OK
BP DL	0.173808	0.173808	OK
DL QSAS			
Gross Count Rate	1.217361	1.217361	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	1.216667	1.216667	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	0.998924	0.998924	OK
Tracer DPM	9.487859	9.487859	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.609085	0.609085	OK
Chem Rec Factor	0.621515	0.621515	OK
Sys Err	0.061664	0.061664	OK
K	0.143576	0.143576	OK
K MDA	206.750144	206.750144	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-12
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	009
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-7-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	27.4553318
Version/Date	2.0 -- 4/20/2006

Reviewed by: VHM Date: 6-2-11

35000890

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	790.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1753.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.036700
Tracer EFF	0.213233
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	3.803448	3.803448	OK
TPU	0.531220	0.531220	OK
DL	0.015880	0.015880	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	0.548611	0.548611	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	0.547222	0.547222	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.487859	9.487859	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.609085	0.609085	OK
Chem Rec Factor	0.621515	0.621515	OK
Sys Err	0.061664	0.061664	OK
K	0.143875	0.143875	OK
K MDA	207.180428	207.180428	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-12
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	009
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-7-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	26.25976372
Version/Date	2.0 -- 4/20/2006

35000891

Reviewed by: VHM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	12.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1753.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.036700
Tracer EFF	0.213233
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.061542	0.061542	OK
TPU	0.040231	0.040231	OK
DL	0.013015	0.013015	OK
8P DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	0.008333	0.008333	OK
8KG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.007639	0.007639	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.487859	9.487859	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.609085	0.609085	OK
Chem Rec Factor	0.621515	0.621515	OK
Sys Err	0.061664	0.061664	OK
K	0.124125	0.124125	OK
K MDA	178.739882	178.739882	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-12
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	009
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-7-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	4.898194313
Version/Date	2.0 -- 4/20/2006

Reviewed by: VLM Date: 6-2-11

35000892

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	102.000000
Count Mins	1440.000000
BKG Counts	10.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1753.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.036700
Tracer EFF	0.213233
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.443169	0.443169	OK
TPU	0.113369	0.113369	OK
DL	0.035437	0.035437	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	0.070833	0.070833	OK
BKG Count Rate	0.006944	0.006944	OK
Net Count Rate	0.063889	0.063889	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.487859	9.487859	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.609085	0.609085	OK
Chem Rec Factor	0.621515	0.621515	OK
Sys Err	0.061664	0.061664	OK
K	0.144164	0.144164	OK
K MDA	207.595682	207.595682	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-12
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	009
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-7-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	29.63407707
Version/Date	2.0 -- 4/20/2006

35000893

Reviewed by: UHM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1677.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219040
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1677.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.037200
Tracer EFF	0.219040
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.478084**	**8.478084**	**OK**
TPU	**1.102220**	**1.102220**	**OK**
DL	**0.011768**	**0.011768**	**OK**
BP DL	**0.173808**	**0.173808**	**OK**
DL QSAS			
Gross Count Rate	**1.164583**	**1.164583**	**OK**
BKG Count Rate	**0.000694**	**0.000694**	**OK**
Net Count Rate	**1.163889**	**1.163889**	**OK**
Δ t 1 (t2 - t1)	**39.089583**	**39.089583**	**OK**
DF	**0.998924**	**0.998924**	**OK**
Tracer DPM	**9.492435**	**9.492435**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.566944**	**0.566944**	**OK**
Chem Rec Factor	**0.578514**	**0.578514**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.137282**	**0.137282**	**OK**
K MDA	**197.686186**	**197.686186**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-13
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	010
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-8-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_6A
Instr keV	34.43494797
Version/Date	2.0 -- 4/20/2006

35000894

Reviewed by: MM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1035.000000
Count Mins	1440.000000
BKG Counts	3.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219040
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1677.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.037200
Tracer EFF	0.219040
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**5.209553**	**5.209553**	**OK**
TPU	**0.705724**	**0.705724**	**OK**
DL	**0.020341**	**0.020341**	**OK**
BP DL	**0.273282**	**0.273282**	**OK**
DL QSAS			
Gross Count Rate	**0.718750**	**0.718750**	**OK**
BKG Count Rate	**0.002083**	**0.002083**	**OK**
Net Count Rate	**0.716667**	**0.716667**	**OK**
Δ t 1 (t2 - t1)	**39.089583**	**39.089583**	**OK**
DF	**1.000000**	**1.000000**	**OK**
Tracer DPM	**9.492435**	**9.492435**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.566944**	**0.566944**	**OK**
Chem Rec Factor	**0.578514**	**0.578514**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.137568**	**0.137568**	**OK**
K MDA	**198.097607**	**198.097607**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-13
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	010
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-8-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_6A
Instr keV	29.59216309
Version/Date	2.0 -- 4/20/2006

35000895

Reviewed by: VHM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	11.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219040
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1677.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.037200
Tracer EFF	0.219040
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	0.058512	0.058512	OK
TPU	0.040352	0.040352	OK
DL	0.013612	0.013612	OK
BP DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	0.007639	0.007639	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.006944	0.006944	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.492435	9.492435	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.566944	0.566944	OK
Chem Rec Factor	0.578514	0.578514	OK
Sys Err	0.061664	0.061664	OK
K	0.118683	0.118683	OK
K MDA	170.903899	170.903899	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-13
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	010
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-8-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_6A
Instr keV	7.349233627
Version/Date	2.0 -- 4/20/2006

35000896

Reviewed by: NPM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	394.000000
Count Mins	1440.000000
BKG Counts	6.000000
BKG Mins	1440.000000
Instrument Efficiency	0.219040
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/19/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1677.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.037200
Tracer EFF	0.219040
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.954713	1.954713	OK
TPU	0.307918	0.307918	OK
DL	0.028708	0.028708	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	0.273611	0.273611	OK
BKG Count Rate	0.004167	0.004167	OK
Net Count Rate	0.269444	0.269444	OK
Δ t 1 (t2 - t1)	39.089583	39.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.492435	9.492435	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.566944	0.566944	OK
Chem Rec Factor	0.578514	0.578514	OK
Sys Err	0.061664	0.061664	OK
K	0.137844	0.137844	OK
K MDA	198.494656	198.494656	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-13
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	010
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-8-110419
Instr File Name	ApexAlpha
Instr Detector	A_3_6A
Instr keV	29.63024139
Version/Date	2.0 -- 4/20/2006

35000897

Reviewed by: VHM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	1003.000000
Count Mins	1440.000000
BKG Counts	0.000000
BKG Mins	1440.000000
Instrument Efficiency	0.217225
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1003.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.037200
Tracer EFF	0.217225
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	OK

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	**8.477850**	**8.477850**	**OK**
TPU	**1.151159**	**1.151159**	**OK**
DL	**0.000000**	**0.000000**	**OK**
BP DL	**0.173803**	**0.173803**	**OK**
DL QSAS			
Gross Count Rate	**0.696528**	**0.696528**	**OK**
BKG Count Rate	**0.000000**	**0.000000**	**OK**
Net Count Rate	**0.696528**	**0.696528**	**OK**
Δ t 1 (t2 - t1)	**38.089583**	**38.089583**	**OK**
DF	**0.998951**	**0.998951**	**OK**
Tracer DPM	**9.492435**	**9.492435**	**OK**
Tracer Δt	**353.120833**	**353.120833**	**OK**
Tracer DF	**0.990320**	**0.990320**	**OK**
Tracer Recovery	**0.342122**	**0.342122**	**OK**
Chem Rec Factor	**0.349104**	**0.349104**	**OK**
Sys Err	**0.061664**	**0.061664**	**OK**
K	**0.082159**	**0.082159**	**OK**
K MDA	**118.308298**	**118.308298**	**OK**

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-14
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	011
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-MD-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_6B
Instr keV	36.30580902
Version/Date	2.0 -- 4/20/2006

35000898

Reviewed by: MHM **Date:** 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	3462.000000
Count Mins	1440.000000
BKG Counts	17.000000
BKG Mins	1440.000000
Instrument Efficiency	0.217225
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1003.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.037200
Tracer EFF	0.217225
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	29.059161	29.059161	OK
TPU	3.644972	3.644972	OK
DL	0.080909	0.080909	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	2.404167	2.404167	OK
BKG Count Rate	0.011806	0.011806	OK
Net Count Rate	2.392361	2.392361	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.492435	9.492435	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.342122	0.342122	OK
Chem Rec Factor	0.349104	0.349104	OK
Sys Err	0.061664	0.061664	OK
K	0.082327	0.082327	OK
K MDA	118.551254	118.551254	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-14
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	011
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-MD-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_6B
Instr keV	38.73160934
Version/Date	2.0 -- 4/20/2006

35000899

Reviewed by: _____ Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	111.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.217225
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1003.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.037200
Tracer EFF	0.217225
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.065731	1.065731	OK
TPU	0.241017	0.241017	OK
DL	0.032167	0.032167	OK
BP DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	0.077083	0.077083	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	0.075694	0.075694	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.492435	9.492435	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.342122	0.342122	OK
Chem Rec Factor	0.349104	0.349104	OK
Sys Err	0.061664	0.061664	OK
K	0.071026	0.071026	OK
K MDA	102.277214	102.277214	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-14
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	011
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-MD-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_6B
Instr keV	19.59401321
Version/Date	2.0 -- 4/20/2006

35000900

Reviewed by: VHM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2551.000000
Count Mins	1440.000000
BKG Counts	14.000000
BKG Mins	1440.000000
Instrument Efficiency	0.217225
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/28/11 2:09 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	1003.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	0.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.037200
Tracer EFF	0.217225
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	21.357220	21.357220	OK
TPU	2.713140	2.713140	OK
DL	0.073277	0.073277	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	1.771528	1.771528	OK
BKG Count Rate	0.009722	0.009722	OK
Net Count Rate	1.761806	1.761806	OK
Δ t 1 (t2 - t1)	38.089583	38.089583	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.492435	9.492435	OK
Tracer Δt	353.120833	353.120833	OK
Tracer DF	0.990320	0.990320	OK
Tracer Recovery	0.342122	0.342122	OK
Chem Rec Factor	0.349104	0.349104	OK
Sys Err	0.061664	0.061664	OK
K	0.082492	0.082492	OK
K MDA	118.788866	118.788866	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-14
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	011
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-MD-02-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_6B
Instr keV	36.32271194
Version/Date	2.0 -- 4/20/2006

35000901

Reviewed by: NHM Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	2175.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/29/11 4:05 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.997000
Halflife Days 1 - Result Isotope	25162.037037
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2175.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.036600
Tracer EFF	0.213233
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.082712
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-232		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	8.472946	8.472946	OK
TPU	1.084271	1.084271	OK
DL	0.009067	0.009067	OK
BP DL	0.173808	0.173808	OK
DL QSAS			
Gross Count Rate	1.510417	1.510417	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	1.509722	1.509722	OK
Δ t 1 (t2 - t1)	39.170139	39.170139	OK
DF	0.998922	0.998922	OK
Tracer DPM	9.486944	9.486944	OK
Tracer Δt	354.201389	354.201389	OK
Tracer DF	0.990290	0.990290	OK
Tracer Recovery	0.755889	0.755889	OK
Chem Rec Factor	0.771315	0.771315	OK
Sys Err	0.061664	0.061664	OK
K	0.178182	0.178182	OK
K MDA	256.581368	256.581368	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-15
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	012
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-MD-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	29.19708061
Version/Date	2.0 -- 4/20/2006

Reviewed by: VHM Date: 6-2-11

35000902

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	8047.000000
Count Mins	1440.000000
BKG Counts	2.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/29/11 4:05 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.998000
Halflife Days 1 - Result Isotope	89745370.370370
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2175.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.036600
Tracer EFF	0.213233
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.130190
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-234		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	31.289388	31.289388	OK
TPU	3.842995	3.842995	OK
DL	0.012796	0.012796	OK
BP DL	0.273282	0.273282	OK
DL QSAS			
Gross Count Rate	5.588194	5.588194	OK
BKG Count Rate	0.001389	0.001389	OK
Net Count Rate	5.586806	5.586806	OK
Δ t 1 (t2 - t1)	39.170139	39.170139	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.486944	9.486944	OK
Tracer Δt	354.201389	354.201389	OK
Tracer DF	0.990290	0.990290	OK
Tracer Recovery	0.755889	0.755889	OK
Chem Rec Factor	0.771315	0.771315	OK
Sys Err	0.061664	0.061664	OK
K	0.178553	0.178553	OK
K MDA	257.115930	257.115930	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-15
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	012
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-MD-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	38.52608109
Version/Date	2.0 -- 4/20/2006

35000903

Reviewed by: MM Date: 6-2-11

Procedure	ARS-026
Variable	**Value**
Counts	223.000000
Count Mins	1440.000000
BKG Counts	1.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/29/11 4:05 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	0.861000
Halflife Days 1 - Result Isotope	257060185185.185000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2175.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.036600
Tracer EFF	0.213233
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.014709
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	**OK**

Isotope	U-235		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	1.000809	1.000809	OK
TPU	0.179219	0.179219	OK
DL	0.010488	0.010488	OK
BP DL	0.030876	0.030876	OK
DL QSAS			
Gross Count Rate	0.154861	0.154861	OK
BKG Count Rate	0.000694	0.000694	OK
Net Count Rate	0.154167	0.154167	OK
Δ t 1 (t2 - t1)	39.170139	39.170139	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.486944	9.486944	OK
Tracer Δt	354.201389	354.201389	OK
Tracer DF	0.990290	0.990290	OK
Tracer Recovery	0.755889	0.755889	OK
Chem Rec Factor	0.771315	0.771315	OK
Sys Err	0.061664	0.061664	OK
K	0.154042	0.154042	OK
K MDA	221.820524	221.820524	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-15
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	012
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-MD-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	45.06338501
Version/Date	2.0 -- 4/20/2006

35000904

Reviewed by: [illegible] Date: 6-2-11

Calculation Verification

Procedure	ARS-026
Variable	**Value**
Counts	5877.000000
Count Mins	1440.000000
BKG Counts	10.000000
BKG Mins	1440.000000
Instrument Efficiency	0.213233
Sample Aliquot	0.500000
Aliquot Conversion Factor	1.000000
Sample Collection Date (t1)	4/20/11 12:00 PM
Midpoint Count Date (t2)	5/29/11 4:05 PM
Activity Units = pCi --- UCF =	2.2200
CF	1.9600
Nuclide Abundance	1.000000
Halflife Days 1 - Result Isotope	1631944444444.440000
TPUF_Calibration Factor	0.000000
TPUF_Aliquoting Factor	0.020000
TPUF_Yield Factor	0.058330
TPUF_Decay Ingrowth Factor	0.000000
TPUF_Analysis Factor	0.000000
TPUF_Unassigned Factor	0.000000
Tracer ID	S-0241
Tracer Std - Isotope	U-232
Tracer Counts	2175.000000
Tracer Count Mins	1440.000000
Tracer BKG Counts	1.000000
Tracer BKG Mins	1440.000000
Tracer Ref Date	6/9/10 11:15 AM
Tracer DPM/g	9.1520
Tracer Net Wt Added g	1.036600
Tracer EFF	0.213233
Tracer Plating Rec	0.980000
Tracer Abundance	0.997000
Tracer Halflife Days	25162.0370
Sb	0.151355
Activity Units	pCi
Aliquot Units	L
Variables Intact Test	OK

Isotope	U-238		
Calculated Values	**Excel**	**VBA**	**V/V**
ACT	22.772857	22.772857	OK
TPU	2.813556	2.813556	OK
DL	0.028555	0.028555	OK
BP DL	0.317709	0.317709	OK
DL QSAS			
Gross Count Rate	4.081250	4.081250	OK
BKG Count Rate	0.006944	0.006944	OK
Net Count Rate	4.074306	4.074306	OK
Δ t 1 (t2 - t1)	39.170139	39.170139	OK
DF	1.000000	1.000000	OK
Tracer DPM	9.486944	9.486944	OK
Tracer Δt	354.201389	354.201389	OK
Tracer DF	0.990290	0.990290	OK
Tracer Recovery	0.755889	0.755889	OK
Chem Rec Factor	0.771315	0.771315	OK
Sys Err	0.061664	0.061664	OK
K	0.178911	0.178911	OK
K MDA	257.631271	257.631271	OK

Batch Identifiers and Other Related Information	
Batch	ARS1-B11-01984
Batch ID	ARS1-B11-01984-15
Analysis Code	ASP-A-024
SDG	ARS1-11-00897
Fraction	012
Client	Summit Environmental Technologies
Client Profile	Cuyahoga Falls
Client ID	MW-MD-110420
Instr File Name	ApexAlpha
Instr Detector	A_3_5A
Instr keV	38.45557404
Version/Date	2.0 -- 4/20/2006

Reviewed by: _____ Date: 6-2-11

35000905

AMERICAN RADIATION SERVICES, INC.

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American Radiation Services Analytical Reports

for

Summit Environmental Technologies

Uranium Alpha Spectroscopy Laboratory Records

35000906

Analysis Batch Report

ARS INTERNATIONAL

Analysis Batch ID **ARS1-B11-01664**

Method	ARS-026	Analysis	ASP-A-024	Matrix	AQ
Description	Uranium in Water				

ABatch Sample ID	Type	Blind Iso1	Blind Iso2	Blind Iso3	SDG	FR	Run	Client ID	Isotope Group	Lab Deadline
ARS1-B11-01664-01	LCS	B-11686								
ARS1-B11-01664-02	LCSD	B-11687								
ARS1-B11-01664-03	MBL									
ARS1-B11-01664-04	TRG				**ARS1-11-00897**	014	1	PR-SW-01-110420	STD	05/03/11
ARS1-B11-01664-05	TRG				**ARS1-11-00897**	015	1	RB-01-110420	STD	05/03/11
ARS1-B11-01664-06	TRG				**ARS1-11-00897**	016	1	RB-02-110421	STD	05/03/11
ARS1-B11-01664-07	TRG				**ARS1-11-00897**	017	1	RM-JM-SW-02-110420	STD	05/03/11
ARS1-B11-01664-08	TRG				**ARS1-11-00897**	018	1	RM-JM-SW-110420	STD	05/03/11
ARS1-B11-01664-09	TRG				**ARS1-11-00897**	019	1	RM-SW-BG-110419	STD	05/03/11
ARS1-B11-01664-10	TRG				**ARS1-11-00897**	020	1	RP-JM-SW-01-110420	STD	05/03/11
ARS1-B11-01664-11	TRG				**ARS1-11-00897**	021	1	RP-JM-SW-110420	STD	05/03/11
ARS1-B11-01664-12	TRG				**ARS1-11-00897**	022	1	RP-SW-01-110419	STD	05/03/11
ARS1-B11-01664-13	TRG				**ARS1-11-00897**	023	1	RP-SW-BG-041911	STD	05/03/11
ARS1-B11-01664-14	TRG				**ARS1-11-00897**	024	1	SPOP35-110421	STD	05/03/11
ARS1-B11-01664-15	TRG				**ARS1-11-00897**	025	1	MW-RM-110420	STD	05/03/11

35000907

Technical Notes

Batch	ARS1-B11-01664
Analysis Code	ASP-A-024
Procedure No	ARS-026
Matrix	AQ

#	Date	Dept	Batch Technical Notes	User ID
1	05/03/11 16:56	CHEMISTRY	B11-01664-14 had a black film that plated onto the disk, I am unsure what this can be attributed to. As a result tracer recovery/activity could be affected.	JBROWN
2	05/11/11 16:39	COUNTROOM	The following spectral anomalies were identified in the counting results for this batch: The identified U-235 centroid energy for B11-01664-06 (ARS1-11-00897-016) is high out of acceptable range. Also, B11-01664-14 (ARS1-11-00897-024) sample spectrum shows gross peak trailing and attenuation, so much so that individual analytes cannot be readily or confidently identified. A check recount of the sample was conducted on another detector verified to be accurate. The results confirm the original count. ARS laboratory supervision is informed and the sample must be rerun.	ABAILEY
3	05/11/11 17:03	MGMT	The Method Blank for U-234 and U-238 is elevated; however, method blank evaluation was performed per procedure and the QC is being released as valid.	HWRIGHT
4	06/02/11 16:08	REPORTING	Tracer recovery for ARS1-B11-01664-14 is biased low; however, after management review the results are being released as valid.	HWRIGHT

American Radiation Services
Baton Rouge Laboratory

LCS Report
Analytical Batch: ARS1-B11-01664

BlindID	ABatch	ABatchSampleID	BlindGroup	StdID	Isotope	ExpectedAddition	ExpectedValue	EmptyWt	GrossWt	NetWt	UserID	ModDate	ExpectedValue_CT	MidPointCountDate	KnownValue
B-11686	ARS1-B11-01664	ARS1-B11-01664-01	B-UU238	S-0028	U-238	1	15.7364287	13.4873	14.5527	1.0654	VMULLIGAN	4/28/2011	15.7364287	5/10/2011	16.75559114
B-11687	ARS1-B11-01664	ARS1-B11-01664-02	B-UU238	S-0028	U-238	1	15.7364287	13.2134	14.2803	1.0669	VMULLIGAN	4/28/2011	15.7364287	5/10/2011	16.78919578

35000909

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Baton Rouge Laboratory

ARS1-B11-01664

ABatch	ABatchSampleID	ClientID	SampleType	EmptyWt	FilledWt	NetWt	Exp Val	StdID	Isotope	TracerDate	UserID	ModDate	HL days	Ref Date	Cert dpm/g	Curr ACT
ARS1-B11-01664	ARS1-B11-01664-01		LCS	105.731	106.762	1.031	9.353	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-02		LCSD	103.202	104.234	1.032	9.360	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-03		MBL	91.595	92.628	1.033	9.370	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-04	PR-SW-01-110420	TRG	438.201	439.217	1.016	9.215	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-05	RB-01-110420	TRG	412.006	413.026	1.020	9.251	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-06	RB-02-110421	TRG	350.882	351.901	1.019	9.242	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-07	RM-JM-SW-02-110420	TRG	443.465	444.481	1.016	9.215	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-08	RM-JM-SW-110420	TRG	430.832	431.849	1.017	9.224	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-09	RM-SW-BG-110419	TRG	398.207	399.227	1.020	9.251	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-10	RP-JM-SW-01-110420	TRG	302.277	303.295	1.018	9.233	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-11	RP-JM-SW-110420	TRG	446.576	447.588	1.012	9.178	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-12	RP-SW-01-110419	TRG	449.028	450.048	1.020	9.251	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-13	RP-SW-BG-041911	TRG	377.133	378.150	1.017	9.224	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-14	SPOP35-110421	TRG	383.444	384.463	1.019	9.242	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070
ARS1-B11-01664	ARS1-B11-01664-15	MW-RM-110420	TRG	408.572	409.587	1.015	9.206	S-0241	U-232	5/3/2011	JBROWN	5/3/2011	25162.037	6/9/2010	9.152	9.070

35000910

ARS-026

ID_31001_026	ABatch	ABatchSampleID	ClientID	Aliquot	AliquotUnits	UserID	ModDate	IC_ID	BalanceSerialNumber
8831	ARS1-B11-01664	ARS1-B11-01664-01		1	L	JBROWN	05/03/2011 16:42:18		
8832	ARS1-B11-01664	ARS1-B11-01664-02		1	L	JBROWN	05/03/2011 16:42:18		
8833	ARS1-B11-01664	ARS1-B11-01664-03		1	L	JBROWN	05/03/2011 16:42:18		
8834	ARS1-B11-01664	ARS1-B11-01664-04	PR-SW-01-110420	0.5	L	JBROWN	05/03/2011 16:42:18	85950	
8835	ARS1-B11-01664	ARS1-B11-01664-05	RB-01-110420	0.5	L	JBROWN	05/03/2011 16:42:18	85951	
8836	ARS1-B11-01664	ARS1-B11-01664-06	RB-02-110421	0.5	L	JBROWN	05/03/2011 16:42:18	85952	
8837	ARS1-B11-01664	ARS1-B11-01664-07	RM-JM-SW-02-110420	0.5	L	JBROWN	05/03/2011 16:42:18	85953	
8838	ARS1-B11-01664	ARS1-B11-01664-08	RM-JM-SW-110420	0.5	L	JBROWN	05/03/2011 16:42:18	85954	
8839	ARS1-B11-01664	ARS1-B11-01664-09	RM-SW-BG-110419	0.5	L	JBROWN	05/03/2011 16:42:18	85955	
8840	ARS1-B11-01664	ARS1-B11-01664-10	RP-JM-SW-01-110420	0.5	L	JBROWN	05/03/2011 16:42:19	85956	
8841	ARS1-B11-01664	ARS1-B11-01664-11	RP-JM-SW-110420	0.5	L	JBROWN	05/03/2011 16:42:19	85957	
8842	ARS1-B11-01664	ARS1-B11-01664-12	RP-SW-01-110419	0.5	L	JBROWN	05/03/2011 16:42:19	85958	
8843	ARS1-B11-01664	ARS1-B11-01664-13	RP-SW-BG-041911	0.5	L	JBROWN	05/03/2011 16:42:19	85959	
8844	ARS1-B11-01664	ARS1-B11-01664-14	SPOP35-110421	0.5	L	JBROWN	05/03/2011 16:42:19	85960	
8845	ARS1-B11-01664	ARS1-B11-01664-15	MW-RM-110420	0.5	L	JBROWN	05/03/2011 16:42:19	85961	