Tuesday, August 19, 2014

Mr. Clif Gray
Tidewater, Inc.
1820 Tribute Road, Suite L
Sacramento, CA 95815

Re: ALS Workorder: 1407417
Project Name: Great Kills Park
Project Number: N303-540

Dear Mr. Gray:

Fourty soil samples were received from Tidewater, Inc., on 7/21/2014. The samples were scheduled for the following analysis:

Gamma Spectroscopy	pages 1-809

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Lance R. Steere
Project Manager

LRS/jml
Enclosure(s): CD

ALS is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Laboratory Certifications	
Accreditation Body	License or Certification Number
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Maryland (MD)	285
Missouri	175
Nebraska	NE-OS-24-13
Nevada (NV)	CO000782008A
New Jersey (NJ)	CO003
North Dakota (ND)	R-057
Oklahoma	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington	C1280

Revised 8/15/2013

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1407417
Client Name: Tidewater, Inc.
Client Project Name: Great Kills Park
Client Project Number: N303-540
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
GKP-SR-IDW1	1407417-1		SOIL	16-Jul-14	10:00
GKP-SR-IDW2	1407417-2		SOIL	16-Jul-14	10:30
GKP-SR-IDW2	1407417-3		SOIL	16-Jul-14	11:00
GKP-SR-IDW4	1407417-4		SOIL	16-Jul-14	11:30
GKP-SR-IDW5	1407417-5		SOIL	16-Jul-14	12:00
GKP-SR-CF1	1407417-6		SOIL	16-Jul-14	12:30
GKP-CS-J16-38	1407417-7		SOIL	17-Jul-14	11:48
GKP-CS-J18-04	1407417-8		SOIL	17-Jul-14	14:55
GKP-CS-E09-09	1407417-9		SOIL	17-Jul-14	9:05
GKP-CS-I31-21	1407417-10		SOIL	17-Jul-14	10:55
GKP-CS-H11-16	1407417-11		SOIL	17-Jul-14	9:55
GKP-CS-C07-06	1407417-12		SOIL	16-Jul-14	11:25
GKP-CS-K15-37	1407417-13		SOIL	17-Jul-14	11:24
GKP-CS-I13-22	1407417-14		SOIL	17-Jul-14	11:00
GKP-CS-G11-14	1407417-15		SOIL	17-Jul-14	10:00
GKP-CS-J17-24	1407417-16		SOIL	17-Jul-14	14:30
GKP-CS-H12-18	1407417-17		SOIL	17-Jul-14	10:10
GKP-CS-J17-23	1407417-18		SOIL	17-Jul-14	12:10
GKP-CS-H11-17	1407417-19		SOIL	17-Jul-14	10:05
GKP-CS-D08-07	1407417-20		SOIL	17-Jul-14	8:45
GKP-CS-G09-13	1407417-21		SOIL	17-Jul-14	9:30
GKP-CS-D05-04	1407417-22		SOIL	16-Jul-14	17:10
GKP-CS-I13-20	1407417-23		SOIL	17-Jul-14	10:50
GKP-CS-J17-03	1407417-24		SOIL	17-Jul-14	15:10
GKP-CS-E08-08	1407417-25		SOIL	17-Jul-14	
GKP-CS-I13-19	1407417-26		SOIL	17-Jul-14	10:45
GKP-CS-C07-30	1407417-27		SOIL	16-Jul-14	17:15
GKP-CS-G11-15	1407417-28		SOIL	17-Jul-14	9:50
GKP-CS-K08-02	1407417-29		SOIL	16-Jul-14	16:30
GKP-CS-E12-10	1407417-30		SOIL	17-Jul-14	16:30
GKP-CS-E19-05	1407417-31		SOIL	18-Jul-14	9:14
GKP-CS-C17-30	1407417-32		SOIL	18-Jul-14	9:20

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1407417
Client Name: Tidewater, Inc.
Client Project Name: Great Kills Park
Client Project Number: N303-540
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
GKP-CS-D13-11	1407417-33		SOIL	18-Jul-14	9:25
GKP-CS-M18-39	1407417-34		SOIL	18-Jul-14	9:50
GKP-CS-M18-26	1407417-35		SOIL	18-Jul-14	9:55
GKP-CS-N20-36	1407417-36		SOIL	18-Jul-14	10:05
GKP-CS-N20-29	1407417-37		SOIL	18-Jul-14	10:00
GKP-CS-O23-40	1407417-38		SOIL	18-Jul-14	10:10
GKP-CS-K16-37	1407417-39		SOIL	18-Jul-14	9:45
GKP-CS-J17-24(DUP)	1407417-40		SOIL	18-Jul-14	9:40
GKP-SR-IDW1	1407417-41		LEACHAT	16-Jul-14	10:00
GKP-SR-IDW2	1407417-42		LEACHAT	16-Jul-14	10:30
GKP-SR-IDW3	1407417-43		LEACHAT	16-Jul-14	11:00
GKP-SR-IDW4	1407417-44		LEACHAT	16-Jul-14	11:30
GKP-SR-IDW5	1407417-45		LEACHAT	16-Jul-14	12:00
GKP-SR-CF1	1407417-46		LEACHAT	16-Jul-14	12:30

ALS Laboratory Group

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

Chain-of-Custody

Form 202r8

WORKORDER # 1407417

PAGE 1 of 3

DISPOSAL By Lab or Return to Client

PROJECT NAME	Green Hills Park	SAMPLER	KB, GG, BC
PROJECT No.	N303-540	SITE ID	
		EDD FORMAT	Excel
		PURCHASE ORDER	
COMPANY NAME	Tidewater, Inc.	BILL TO COMPANY	Tidewater, Inc.
SEND REPORT TO	Clif Gray	INVOICE ATTN TO	Same
ADDRESS	1820 Tribute Rd	ADDRESS	
CITY / STATE / ZIP	Sacramento, CA 95815	CITY / STATE / ZIP	
PHONE	916 833 2945	PHONE	
FAX		FAX	
E-MAIL	clif.gray@tidewaterinc.net	E-MAIL	

DATE 7/16/14

TURNAROUND STD

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	VOC 8260C TLP	SVOC 8270 TLP	Pest TLP 8081A	PCB TLP 8082	Metals 6020	TLP Prep 1311	Ignit. 1010	pH 9045	React SW846 7.3	Cyanide Spec 901.1	
1	GKP-SR-IDW1	S	7/16/14	1000	5	Cool	Y	X	X	X	X	X	14	X	X	X	X	
2	GKP-SR-IDW2			1030	5	Cool	Y	X	X	X	X	X	42	X	X	X	X	
3	GKP-SR-IDW3			1100	5	Cool	Y	X	X	X	X	X	43	X	X	X	X	
4	GKP-SR-IDW4			1130	5	Cool	Y	X	X	X	X	X	44	X	X	X	X	
5	GKP-SR-IDW5			1200	5	Cool	Y	X	X	X	X	X	45	X	X	X	X	
6	GKP-SR-CF1			1230	4	Cool	Y	X	X	X	X	X	46	X	X	X	X	
7	GKP-CS-J16-38	S	7/17/14	1148	1		N										X	
8	GKP-CS-J18-04		7/17/14	0955	1		N										X	
9	GKP-CS-E09-09		7/17/14	0905	1		N										X	
10	GKP-CS-I13-21		7/17/14	1055	1		N										X	

All stable
Chem cancelled
This per Clif
Gray request
for new bottles
7/24/14

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments:

Contact Clif Gray about QC Package & Analyses per previous emails. per Clif Gray 7/24/14

QC PACKAGE (check below)
- LEVEL II (Standard QC)
- LEVEL III (Std QC + forms)
- LEVEL IV (Std QC + forms + raw data)

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Michael Pawli	7/18/14	1400
RECEIVED BY	Fed EX	Fed EX	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	[signature]	Jacob Roddy	7-21-14	0933
RELINQUISHED BY				
RECEIVED BY				

ALS Laboratory Group

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Chain-of-Custody

Form 202r8

WORKORDER #	1407417				
SAMPLER	KE, CG, BC	DATE	7/16/14	PAGE	2 of 5
SITE ID		TURNAROUND	STD	DISPOSAL	By Lab or Return to Client
EDD FORMAT	Excel				
PURCHASE ORDER					
BILL TO COMPANY	Tidewater, Inc.				
INVOICE ATTN TO	Same				
ADDRESS					
CITY / STATE / ZIP					
PHONE					
FAX					
E-MAIL					

PROJECT NAME	Great Kills Park
PROJECT No.	N303-540
COMPANY NAME	Tidewater, Inc.
SEND REPORT TO	Clif Gray
ADDRESS	1820 Tributte Rd
CITY / STATE / ZIP	Sacramento, CA 95815
PHONE	(916)-833-2945
FAX	
E-MAIL	clif.gray@tidch2o.net

Gamma Spec 901.1

per Clif Gray 7/21/14

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	Gamma Spec 901.1
11	GKP-CS-H11-16	S	7/17/14	0955	1	/	N	X
12	GKP-CS-C07-06		7/16/14	1125	1	/	N	
13	GKP-CS-K15-37		7/17/14	1124	1	/	N	
14	GKP-CS-I13-22		7/17/14	1100	1	/	N	
15	GKP-CS-G11-14		7/17/14	1000	1	/	N	
16	GKP-CS-J17-24		7/17/14	1430	1	/	N	
17	GKP-CS-H12-18		7/17/14	1010	1	/	N	
18	GKP-CS-J17-23		7/17/14	1210	1	/	N	
19	GKP-CS-H11-17		7/17/14	1005	1	/	N	
20	GKP-CS-D08-07		7/17/14	0845	1	/	N	

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments: Contact Clif Gray about QC Package

QC PACKAGE (check below)	
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Michael Rado	7/18/14	1400
RECEIVED BY	FEDEX	FED EX	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	[signature]	Jacob Roddy	7-21-14	0925
RELINQUISHED BY				
RECEIVED BY				

ALS Laboratory Group

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Chain-of-Custody

Form 202r8

WORKORDER # 1407417

PAGE 3 of 5

PROJECT NAME	Green Hills Park	SAMPLER	KE, CB, BC
PROJECT No.	N303-540	SITE ID	
		EDD FORMAT	Excel
		PURCHASE ORDER	
COMPANY NAME	Tidewater, Inc.	BILL TO COMPANY	Tidewater, Inc.
SEND REPORT TO	Clif Gray	INVOICE ATTN TO	Same
ADDRESS	1820 Tribute Rd.	ADDRESS	
CITY / STATE / ZIP	Sacramento, CA 95815	CITY / STATE / ZIP	
PHONE	(916)-833-2945	PHONE	
FAX		FAX	
E-MAIL	clif.gray@tidh2o.net	E-MAIL	

DATE 7/16/14
TURNAROUND STD
DISPOSAL By Lab or Return to Client

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	Common Spec. 901.1
21	GKP-CS-G09-13	Soil	7/17/14	0930	1	N	N	X
22	GKP-CS-D05-04		7/16/14	1710	1			X
23	GKP-CS-I13-20		7/17/14	1050	1			X
24	GKP-CS-J17-03		7/17/14	1510	1			X
25	GKP-CS-E08-08		7/17/14		1			X
26	GKP-CS-I13-19		7/17/14	1045	1			X
27	GKP-CS-C07-30		7/16/14	1715	1			X
28	GKP-CS-G11-15		7/17/14	0950	1			X
29	GKP-CS-K08-02		7/16/14	1630	1			X
30	GKP-CS-E12-10		7/17/14	1630	1			X

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments: Contact Clif Gray about QC Package

QC PACKAGE (check below)	
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Michael Paulo	7/18/14	1400
RECEIVED BY	FED EX	FED EX	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	[signature]	Jacob Reddy	7-21-14	0935
RELINQUISHED BY				
RECEIVED BY				

ALS Laboratory Group

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Chain-of-Custody

Form 202r8

WORKORDER #	1407417				
PAGE	4 of 5				
DISPOSAL	By Lab or Return to Client				

		SAMPLER	KE, CG, BC	DATE	7/16/14
PROJECT NAME	Great Kills Park	SITE ID		TURNAROUND	STD
PROJECT No.	N303-540	EDD FORMAT	Excel		
		PURCHASE ORDER			
COMPANY NAME	Tidewater, Inc.	BILL TO COMPANY	Tidewater, Inc.		
SEND REPORT TO	Clif Gray	INVOICE ATTN TO	Same		
ADDRESS	1820 Tributte Rd	ADDRESS			
CITY / STATE / ZIP	Sacramento, CA 95815	CITY / STATE / ZIP			
PHONE	(916)-833-2945	PHONE			
FAX		FAX			
E-MAIL	clif.gray@tidch2o.net	E-MAIL			

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC
	PAB	BLANK					MX SAMPLE

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments:

Contact Clif Gray about QC Package

QC PACKAGE (check below)	
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Michael Park	7/16/14	1400
RECEIVED BY	FED EX	FED EX	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	[signature]	Jacob Reddy	7-21-14	0935
RELINQUISHED BY				
RECEIVED BY				

Preservative Key: 2 HNO3 3 H2SO4 4 NaOH 5 NaHSO4 7 Other 8 4 degrees C 9 5035

ALS Laboratory Group

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

Chain-of-Custody

Form 202rB

WORKORDER # 1407417

PAGE 5 of 5

PROJECT NAME	Great Kills Park	SAMPLER	KE, CG, BC
PROJECT No.	N303-540	SITE ID	
		EDD FORMAT	Excel
		PURCHASE ORDER	
COMPANY NAME	Tidewater, Inc.	BILL TO COMPANY	Tidewater, Inc.
SEND REPORT TO	Clif Gray	INVOICE ATTN TO	Same
ADDRESS	1820 Tributte Rd	ADDRESS	
CITY / STATE / ZIP	Sacramento, CA 95815	CITY / STATE / ZIP	
PHONE	(916)-833-2945	PHONE	
FAX		FAX	
E-MAIL	clif.gray@tidch2o.net	E-MAIL	

DATE 7/16/14
TURNAROUND STD
DISPOSAL By Lab or Return to Client

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	Gamma Spec 901.1
31	GKP-CS-E19-05	Soil	7/18/14	0914	1	N	N	X
32	GKP-CS-C17-30		7/18/14	0920				X
33	GKP-CS-D13-11		7/18/14	0925				X
34	GKP-CS-M18-39		7/18/14	0950				X
35	GKP-CS-M18-26		7/18/14	0955				X
36	GKP-CS-N20-36		7/18/14	1005				X
37	GKP-CS-N20-29		7/18/14	1000				X
38	GKP-CS-O23-40		7/18/14	1010				X
39	GKP-CS-K16-37		7/18/14	0945				X
40	GKP-CS-J17-24(a)		7/18/14	0940				X

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments: Contact Clif Gray about QC Package

QC PACKAGE (check below)	
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Michael Pardo	7/18/14	1400
RECEIVED BY	FedEx	FedEx	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	[signature]	Jacob Roddy	7-21-14	0935
RELINQUISHED BY				
RECEIVED BY				

Preservative Key: 1 - None 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Tidewater Workorder No: 1407417

Project Manager: LRS Initials: JCR Date: 7-21-14

1. Does this project require any special handling in addition to standard ALS procedures?			YES	(NO)
2. Are custody seals on shipping containers intact?	NONE		(YES)	NO
3. Are Custody seals on sample containers intact?	(NONE)		YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?			(YES)	NO
* 5. Are the COC and bottle labels complete and legible?			~~YES~~	(NO) *
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		7-21-14	(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF		(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	(N/A)		YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)		YES	NO
10. Is there sufficient sample for the requested analyses?			(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?			(YES)	NO
12. Are all samples within holding times for the requested analyses?			(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)			(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)		YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	(N/A)		YES	NO
16. Were the samples shipped on ice?			(YES)	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 (#4)	RAD ONLY		YES	(NO)

Cooler #:	1	2						
Temperature (°C):	20.8°	AMB(22.2°)						
No. of custody seals on cooler:	2	2						
DOT Survey/ Acceptance Information — External µR/hr reading:	60	40						
Background µR/hr reading:	13							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / (NO) / NA (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

*5 → page 2 of COC had no markings to show which tests the samples were asking for (samples -11 through -20)

Gamma is listed in header, but boxes are not checked

Cliff Gray: yes -- these are γ's.

If applicable, was the client contacted? (YES) / NO / NA Contact: Cliff Gray Date/Time: 7/21

Project Manager Signature / Date: 7/21/14

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

FedEx Express **NEW** Package US Airbill

FedEx Tracking Number 8044 6005 5710

Form ID No. 0200

Recipient's Copy

1 From

Date 7/18/2014 [redacted]

Sender's Name Michael Pawlo Phone [redacted] 797-6750

Company Tidewater, Inc.

Address 8450-D Tyco Rd Dept/Floor/Suite/Room

City Vienna State VA ZIP 22182

#2

46

2 Your Internal Billing Reference

3 To

Recipient's Name Lance Steere Phone 970 490-1511

Company ALS Labs

Address 225 Commerce Drive Dept/Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City Fort Collins State CO ZIP 80524

17 lm

HOLD Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

HOLD Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

8044 6005 5710

4 Express Package Service * To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs.
For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day

- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [x] FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

- [ ] FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
- [ ] FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.

- [ ] FedEx Envelope*
- [ ] FedEx Pak*
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling and Delivery Signature Options

- [ ] SATURDAY Delivery — NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.
- [ ] No Signature Required — Package may be left without obtaining a signature for delivery.
- [ ] Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.
- [ ] Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods?

One box must be checked.

- [ ] No
- [ ] Yes — As per attached Shipper's Declaration.
- [ ] Yes — Shipper's Declaration not required.
- [ ] Dry Ice — Dry ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

- [ ] Cargo Aircraft Only

7 Payment *Bill to:*

Enter FedEx Acct. No. or Credit Card No. below.

Obtain recip. Acct. No. [ ]

- [x] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [ ] Third Party
- [ ] Credit Card
- [ ] Cash/Check

[redacted]

Total Packages 1 Total Weight ____ lbs. [redacted] Credit Card Auth.

*Our liability is limited to US$100 unless you declare a higher value. See the current FedEx Service Guide for details.

644

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Temp-222

1140741

FedEx Express NEW Package US Airbill

FedEx Tracking Number 8044 6005 5721

0200 — Recipient's Copy

1 From

Date 7/18/2014 [redacted]

Sender's Name Michael Pawlo Phone [redacted]-6750

Company Tidewater Inc.

Address 8450-D Tyco Rd. Dept./Floor/Suite/Room

City Vienna State VA ZIP 22182

#1

2 Your Internal Billing Reference

3 To

Recipient's Name Lance Steere Phone 970-491-1511

Company ALS Labs

Address 225 Commerce Drive Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City Fort Collins State CO ZIP 80524

HOLD Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

HOLD [redacted] FedEx Priority Overnight and FedEx 2Day at select locations.

8044 6005 5721

4 Express Package Service * To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day	2 or 3 Business Days
☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.	☐ FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
☒ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.	☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.	☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.

☐ FedEx Envelope* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube ☒ Other

6 Special Handling and Delivery Signature Options

☐ SATURDAY Delivery — NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

☐ No Signature Required — Package may be left without obtaining a signature for delivery.

☐ Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.

☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods? One box must be checked.

☐ No ☐ Yes As per attached Shipper's Declaration. ☐ Yes Shipper's Declaration not required. ☐ Dry Ice Dry ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box. ☐ Cargo Aircraft Only

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐

☒ Sender Acct. No. in Section 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

[redacted]

Total Packages 1 Total Weight ____ lbs. [redacted] Credit Card Auth.

†Our liability is limited to US$100 unless you declare a higher value. See the current FedEx Service Guide for details.

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20.80c

140717

ALS Environmental

Gamma Spectroscopy

Case Narrative

Tidewater, Inc.

Great Kills Park -- N303-540

Work Order Number: 1407417

1. The following report consists of analytical results and supporting documentation for 40 soil samples received by ALS on 07/21/14.

2. Analysis for ^{226}Ra is requested for the samples in this work order. Typically, samples analyzed for ^{226}Ra are hermetically sealed in steel cans to allow for in-growth and entrapment of the gaseous progeny (^{222}Rn). Samples are allowed to in-grow for a long enough period (typically > 21 days) to ensure establishment of secular equilibrium between the ^{226}Ra and the ^{214}Pb/^{214}Bi progeny. The emissions from the ^{214}Pb/^{214}Bi progeny are used to determine the ^{226}Ra activity concentration. These samples were prepared by placing the analysis aliquot into a 16 ounce PP MRP jar and using vinyl tape to secure the lid to the body of the sample container. Due to the nature of the configuration of this geometry, and the uncertainty in the progeny emanation rate, there may be a potential low bias to the analytical results for these samples. At the request of the client, the samples were allowed to in-grow for at least 21 days prior to analysis.

3. The samples were analyzed for the presence of gamma emitting radionuclides according to the current revision of SOP 713. The analyses were completed on 08/17/14.

4. The results for these samples are reported on a "Dry Weight" basis in units of pCi/gram.

5. Sample volumes were insufficient to allow preparation of duplicates. A duplicate analysis of samples 1407417-1 and -21 was performed in lieu of prepared duplicates.

6. The library used for calibration and analysis employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium.

7. Bismuth-214, Lead-214, and Radium-226 activity is reported in method blank GS140724-1MB above the achieved minimum detectable concentration value, as indicated with a "B3" qualifier on the final reports. The measured blank activity is below the requested MDC. Results are acceptable according to the current revision of SOP 715, and are submitted without further qualification.

8. ALS has found there to be a significant low bias to ^{214}Pb and ^{214}Bi results when using a mixed nuclide gamma source for efficiency calibrations. The magnitude of this bias has been determined to be approximately 32% for ^{214}Bi, and 23% for ^{214}Pb. Therefore, any reported results for ^{214}Pb and ^{214}Bi are flagged with a "J" qualifier, indicating the activity values to be an estimated value.

9. The gamma emission energy of ^{210}Pb falls below the minimum calibrated value of 59.54 keV at 46.5 keV. Therefore, any reported results for ^{210}Pb are flagged with a "J" qualifier, indicating the activity values to be an estimated value. Results are reported without further qualification.

10. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.

11. Upon review of the raw data for samples 1407417-1, -1DUP, -7, and -24, it was noted that ^{152}Eu was quantified at a level greater than the achieved detection limit. Closer inspection of the acquired spectra for the samples indicated that presence of high levels of ^{214}Bi resulted in the presence of low-abundance emissions of ^{214}Bi. Consequently, it is believed that the calculated activity for ^{152}Eu should be considered a false-positive due to interference from the 1408.08 keV (0.02477 abundance) ^{214}Bi emission. Thus, where this is believed to be occurring the results for these nuclides have been flagged with an 'SI' qualifier. Results are submitted without further qualification.

12. The requested MDC for several analytes for several samples was not met. The reported activity for these samples is greater than the achieved MDC. These samples are identified with an "M3" qualifier on the final reports.

13. Due to elevated activity and subsequent elevated background from the Compton Continuum in samples 1407417-2, -3, -4, -7, and -33, the requested MDC for ^{40}K was not met for samples 1407417-2, -4, and -33 and for ^{234}Th for samples 1407417-2, -3, -4, -7, and -33. The results have been flagged with an "M" qualifier on the final reports. As there is significant activity in these samples, results are reported without further qualification.

14. Technical considerations made in the creation of the gamma spectroscopy library used in this analysis are detailed in the document "Technical Comments Regarding Gamma Spectroscopy Libraries" found in Section 5.

15. There are cases where the magnitude of negative activity is greater than the 2σ TPU. Under typical conditions, where background data is normally distributed and analyzed by paired observations, this event is likely to occur at least 2.5% of the time. Review of the data does not indicate a problem with the instrument or reporting systems and results are reported without further qualification.

16. There are cases where the magnitude of negative activity is greater than the 3σ TPU. ALS is currently investigating the possible cause and frequency of this occurrence. Review of the data does not indicate a problem with the instrument or reporting systems and results are reported without further qualification.

17. ALS uses the following convention for reporting significant digits in the TPU and MDC results. The TPU value is rounded to two significant digits. The MDC value is rounded to the same decimal place as the TPU value. In practice, this could result in an MDC reported value of zero for samples with significant activity, including the batch laboratory control sample.

18. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Linda Arend — 8/19/14
Radiochemistry Primary Data Reviewer — Date

Radiochemistry Final Data Reviewer — 08/19/14
Date

Section 1

CHAIN OF CUSTODY

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1407417
Client Name: Tidewater, Inc.
Client Project Name: Great Kills Park
Client Project Number: N303-540
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
GKP-SR-IDW1	1407417-1		SOIL	16-Jul-14	10:00
GKP-SR-IDW2	1407417-2		SOIL	16-Jul-14	10:30
GKP-SR-IDW2	1407417-3		SOIL	16-Jul-14	11:00
GKP-SR-IDW4	1407417-4		SOIL	16-Jul-14	11:30
GKP-SR-IDW5	1407417-5		SOIL	16-Jul-14	12:00
GKP-SR-CF1	1407417-6		SOIL	16-Jul-14	12:30
GKP-CS-J16-38	1407417-7		SOIL	17-Jul-14	11:48
GKP-CS-J18-04	1407417-8		SOIL	17-Jul-14	14:55
GKP-CS-E09-09	1407417-9		SOIL	17-Jul-14	9:05
GKP-CS-I31-21	1407417-10		SOIL	17-Jul-14	10:55
GKP-CS-H11-16	1407417-11		SOIL	17-Jul-14	9:55
GKP-CS-C07-06	1407417-12		SOIL	16-Jul-14	11:25
GKP-CS-K15-37	1407417-13		SOIL	17-Jul-14	11:24
GKP-CS-I13-22	1407417-14		SOIL	17-Jul-14	11:00
GKP-CS-G11-14	1407417-15		SOIL	17-Jul-14	10:00
GKP-CS-J17-24	1407417-16		SOIL	17-Jul-14	14:30
GKP-CS-H12-18	1407417-17		SOIL	17-Jul-14	10:10
GKP-CS-J17-23	1407417-18		SOIL	17-Jul-14	12:10
GKP-CS-H11-17	1407417-19		SOIL	17-Jul-14	10:05
GKP-CS-D08-07	1407417-20		SOIL	17-Jul-14	8:45
GKP-CS-G09-13	1407417-21		SOIL	17-Jul-14	9:30
GKP-CS-D05-04	1407417-22		SOIL	16-Jul-14	17:10
GKP-CS-I13-20	1407417-23		SOIL	17-Jul-14	10:50
GKP-CS-J17-03	1407417-24		SOIL	17-Jul-14	15:10
GKP-CS-E08-08	1407417-25		SOIL	17-Jul-14	
GKP-CS-I13-19	1407417-26		SOIL	17-Jul-14	10:45
GKP-CS-C07-30	1407417-27		SOIL	16-Jul-14	17:15
GKP-CS-G11-15	1407417-28		SOIL	17-Jul-14	9:50
GKP-CS-K08-02	1407417-29		SOIL	16-Jul-14	16:30
GKP-CS-E12-10	1407417-30		SOIL	17-Jul-14	16:30

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1407417
Client Name: Tidewater, Inc.
Client Project Name: Great Kills Park
Client Project Number: N303-540
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
GKP-CS-E19-05	1407417-31		SOIL	18-Jul-14	9:14
GKP-CS-C17-30	1407417-32		SOIL	18-Jul-14	9:20
GKP-CS-D13-11	1407417-33		SOIL	18-Jul-14	9:25
GKP-CS-M18-39	1407417-34		SOIL	18-Jul-14	9:50
GKP-CS-M18-26	1407417-35		SOIL	18-Jul-14	9:55
GKP-CS-N20-36	1407417-36		SOIL	18-Jul-14	10:05
GKP-CS-N20-29	1407417-37		SOIL	18-Jul-14	10:00
GKP-CS-O23-40	1407417-38		SOIL	18-Jul-14	10:10
GKP-CS-K16-37	1407417-39		SOIL	18-Jul-14	9:45
GKP-CS-J17-24(DUP)	1407417-40		SOIL	18-Jul-14	9:40
GKP-SR-IDW1	1407417-41		LEACHAT	16-Jul-14	10:00
GKP-SR-IDW2	1407417-42		LEACHAT	16-Jul-14	10:30
GKP-SR-IDW3	1407417-43		LEACHAT	16-Jul-14	11:00
GKP-SR-IDW4	1407417-44		LEACHAT	16-Jul-14	11:30
GKP-SR-IDW5	1407417-45		LEACHAT	16-Jul-14	12:00
GKP-SR-CF1	1407417-46		LEACHAT	16-Jul-14	12:30

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Chain-of-Custody

Form 202r8

WORKORDER # 1407417

PAGE 1 of 3

DISPOSAL By Lab or Return to Client

PROJECT NAME	Green Hills Park	SAMPLER	KE, GG, BC
PROJECT No.	N303-540	SITE ID	
		EDD FORMAT	Excel
		PURCHASE ORDER	
COMPANY NAME	Tidewater, Inc.	BILL TO COMPANY	Tidewater, Inc.
SEND REPORT TO	Cliff Gray	INVOICE ATTN TO	Same
ADDRESS	1820 Tribute Rd	ADDRESS	
CITY / STATE / ZIP	Sacramento, CA 95815	CITY / STATE / ZIP	
PHONE	916 833 2945	PHONE	
FAX		FAX	
E-MAIL	cliff.gray@tidewater.net	E-MAIL	

DATE 7/16/14

TURNAROUND STD

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	VOC 8260C TCLP	SVOC 8270 TCLP	Pest TCLP 8081A	PCB TCLP 8082	Metals 6020	TCLP Prep 1311	Ignit. 1010	pH 9045	React SW8467.3	Corrosivity Spec 9041										
1	GKP-SR-IDW1	S	7/16/14	1000	5	Cool	Y	X	X	X	X	X	X (44)	X	X	X	X										
2	GKP-SR-IDW2			1030	5	Cool	Y	X	X	X	X	X	X (42)	X	X	X	X										
3	GKP-SR-IDW3			1100	5	Cool	Y	X	X	X	X	X	X (43)	X	X	X	X										
4	GKP-SR-IDW4			1130	5	Cool	Y	X	X	X	X	X	X (44)	X	X	X	X										
5	GKP-SR-IDW5			1200	5	Cool	Y	X	X	X	X	X	X (45)	X	X	X	X										
6	GKP-SR-CF1			1230	4	Cool	Y	X	X	X	X	X	X (46)	X	X	X	X										
7	GKP-CS-J16-38	S	7/17/14	1148	1		N										X										
8	GKP-CS-J18-04		7/17/14	1155	1		N										X										
9	GKP-CS-E09-09		7/17/14	0905	1		N										X										
10	GKP-CS-I13-21		7/17/14	1055	1		N										X										

All stable
Client cancelled
this per Cliff
Gray request
for new bottles
7/24/14

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments:

Contact Cliff Gray about QC Package
Analyses per previous emails.
per Cliff Gray 7/21/14

QC PACKAGE (check below)	
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	Michael Pawlo	Michael Pawlo	7/18/14	1400
RECEIVED BY	Fed EX	Fed EX	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	Jacob Roddy	Jacob Roddy	7-21-14	0935
RELINQUISHED BY				
RECEIVED BY				

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Form 202r8

WORKORDER #	1407417				
PAGE	2 of 5				
DISPOSAL	By Lab or Return to Client				

PROJECT NAME	Great Kills Park	SAMPLER	KE, CG, BC	DATE	7/16/14
PROJECT No.	N303-540	SITE ID		TURNAROUND	STD
		EDD FORMAT	Excel		
		PURCHASE ORDER			
COMPANY NAME	Tidewater, Inc.	BILL TO COMPANY	Tidewater, Inc.		
SEND REPORT TO	Clif Gray	INVOICE ATTN TO	Same		
ADDRESS	1820 Tribute Rd	ADDRESS			
CITY / STATE / ZIP	Sacramento, CA 95815	CITY / STATE / ZIP			
PHONE	(916)-833-2945	PHONE			
FAX		FAX			
E-MAIL	clif.gray@tidch2o.net	E-MAIL			

Comm. Spec 90/.1

per Clif Gray 7/21/14

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC
11	GKP-CS-H11-16	S	7/17/14	0955	1	/	N
12	GKP-CS-C07-06		7/16/14	1125	1	/	N
13	GKP-CS-K15-37		7/17/14	1124	1	/	N
14	GKP-CS-I13-22		7/17/14	1100	1	/	N
15	GKP-CS-G11-14		7/17/14	1000	1	/	N
16	GKP-CS-J17-24		7/17/14	1430	1	/	N
17	GKP-CS-H12-18		7/17/14	1010	1	/	N
18	GKP-CS-J17-23		7/17/14	1210	1	/	N
19	GKP-CS-H11-17		7/17/14	1005	1	/	N
20	GKP-CS-D08-07		7/17/14	0845	1	/	N

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments: Contact Clif Gray about QC Package

QC PACKAGE (check below)	
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Michael Rado	7/18/14	1400
RECEIVED BY	FEDEX	FED EX	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	[signature]	Jacob Rodd	7-21-14	0975
RELINQUISHED BY				
RECEIVED BY				

ALS Laboratory Group

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Chain-of-Custody

Form 202r8

WORKORDER # 1407417

PAGE 3 of 5

PROJECT NAME	Green Hills Park	SAMPLER	KE, CB, BC
PROJECT No.	N303-540	SITE ID	
		EDD FORMAT	Excel
		PURCHASE ORDER	
COMPANY NAME	Tidewater, Inc.	BILL TO COMPANY	Tidewater, Inc.
SEND REPORT TO	Clif Gray	INVOICE ATTN TO	Same
ADDRESS	1820 Tributte Rd.	ADDRESS	
CITY / STATE / ZIP	Sacramento, CA 95815	CITY / STATE / ZIP	
PHONE	(916)-833-2945	PHONE	
FAX		FAX	
E-MAIL	clif.gray@tidh2o.net	E-MAIL	

DATE 7/16/14
TURNAROUND STD
DISPOSAL By Lab or Return to Client

Common Spec 901.1

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	
21	GKP-CS-G09-13	Soil	7/17/14	0930	1	N	N	X
22	GKP-CS-D05-04	↓	7/16/14	1710	1	↓	↓	X
23	GKP-CS-I13-20		7/17/14	1050	1			X
24	GKP-CS-J17-03		7/17/14	1510	1			X
25	GKP-CS-E08-08		7/17/14		1			X
26	GKP-CS-I13-19		7/17/14	1045	1			X
27	GKP-CS-C07-30		7/16/14	1715	1			X
28	GKP-CS-G11-15		7/17/14	0950	1			X
29	GKP-CS-K08-02		7/16/14	1630	1			X
30	GKP-CS-E12-10	↓	7/17/14	1630	1	↓	↓	X

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments: Contact Clif Gray about QC Package

QC PACKAGE (check below)	
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Michael Paulo	7/18/14	1400
RECEIVED BY	FED EX	FED EX	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	[signature]	Jacob Roddy	7-21-14	0935
RELINQUISHED BY				
RECEIVED BY				

ALS Laboratory Group

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Chain-of-Custody

Form 202r8

		SAMPLER	KE, CG, BC	DATE	7/16/14
PROJECT NAME	Great Hills Park	SITE ID		TURNAROUND	STD
PROJECT No.	N303-540	EDD FORMAT	Excel		
		PURCHASE ORDER			
COMPANY NAME	Tidewater, Inc.	BILL TO COMPANY	Tidewater, Inc.		
SEND REPORT TO	Clif Gray	INVOICE ATTN TO	Same		
ADDRESS	1820 Tributate Rd	ADDRESS			
CITY / STATE / ZIP	Sacramento, CA 95815	CITY / STATE / ZIP			
PHONE	(916)-833-2945	PHONE			
FAX		FAX			
E-MAIL	clif.gray@tidch2o.net	E-MAIL			

WORKORDER # 1407417

PAGE 4 of 5

DISPOSAL: By Lab or Return to Client

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC
	PAGE 5	BLANK					NO SAMPLES

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments: Contact Clif Gray about QC Package

QC PACKAGE (check below)

- LEVEL II (Standard QC)
- LEVEL III (Std QC + forms)
- LEVEL IV (Std QC + forms + raw data)

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Michael Park	7/16/14	1400
RECEIVED BY	FED EX	FED EX	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	[signature]	Jacob Reddy	7-21-14	0935
RELINQUISHED BY				

Preservative Key: 2 HNO3 3 H2SO4 4 NaOH 5 NaHSO4 7 Other 8 4 degrees C 9 5035

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Chain-of-Custody

Form 202r8

WORKORDER #: 1407417

PAGE: 5 of 5

PROJECT NAME	Great Kills Park	SAMPLER	KE, CG, BC
PROJECT No.	N303-540	SITE ID	
		EDD FORMAT	Excel
		PURCHASE ORDER	
COMPANY NAME	Tidewater, Inc.	BILL TO COMPANY	Tidewater, Inc.
SEND REPORT TO	Clif Gray	INVOICE ATTN TO	Same
ADDRESS	1820 Tribute Rd	ADDRESS	
CITY / STATE / ZIP	Sacramento, CA 95815	CITY / STATE / ZIP	
PHONE	(916)-833-2945	PHONE	
FAX		FAX	
E-MAIL	clif.gray@tidch2o.net	E-MAIL	

DATE: 7/16/14

TURNAROUND: STD

DISPOSAL: By Lab or Return to Client

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	Gamma Spec 901.1
31	GKP-CS-E19-05	Soil	7/18/14	0914	1	N	N	X
32	GKP-CS-C17-30		7/18/14	0920				X
33	GKP-CS-D13-11		7/18/14	0925				X
34	GKP-CS-M18-39		7/18/14	0950				X
35	GKP-CS-M18-26		7/18/14	0955				X
36	GKP-CS-N20-36		7/18/14	1005				X
37	GKP-CS-N20-29		7/18/14	1000				X
38	GKP-CS-O23-40		7/18/14	1010				X
39	GKP-CS-K16-37		7/18/14	0945				X
40	GKP-CS-J17-24(Dup)		7/18/14	0940			Y	X

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments: Contact Clif Gray about QC Package

QC PACKAGE (check below)	
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Michael Pardo	7/18/14	1400
RECEIVED BY	FedEx	FedEx	7/18/14	1400
RELINQUISHED BY				
RECEIVED BY	[signature]	Jacob Roddy	7-21-14	0935
RELINQUISHED BY				
RECEIVED BY				

Preservative Key: 1. None 2. HNO3 3. H2SO4 4. NaOH 5. NaHSO4 7. Other 8. 4 degrees C 9. 5035

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Tidewater Workorder No: 1407417

Project Manager: LRS Initials: JCR Date: 7-21-14

1. Does this project require any special handling in addition to standard ALS procedures?			YES	(NO)
2. Are custody seals on shipping containers intact?	NONE		(YES)	NO
3. Are Custody seals on sample containers intact?	(NONE)		YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?			(YES)	NO
★ 5. Are the COC and bottle labels complete and legible?			~~YES~~	(NO) ★
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		7-21-14	(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF		(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	(N/A)		YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)		YES	NO
10. Is there sufficient sample for the requested analyses?			(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?			(YES)	NO
12. Are all samples within holding times for the requested analyses?			(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)			(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)		YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	(N/A)		YES	NO
16. Were the samples shipped on ice?			(YES)	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 (#4)	RAD ONLY		YES	(NO)

Cooler #:	1	2
Temperature (°C):	20.8°	AMB(22.2°)
No. of custody seals on cooler:	2	2
DOT Survey/ Acceptance Information — External µR/hr reading:	60	40
Background µR/hr reading:	13	

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / (NO) / NA (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

★5→ page 2 of COC had no markings to show which tests the samples were asking for (samples -11 through -20)

Gamma is listed in header, but boxes are not checked

Cliff Gray: yes -- these are γ's.

If applicable, was the client contacted? (YES) / NO / NA Contact: Cliff Gray Date/Time: 7/21

Project Manager Signature / Date: 7/21/14

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

FedEx Express NEW Package US Airbill

FedEx Tracking Number: 8044 6005 5710

0200 Recipient's Copy

1 From

Date 7/18/2014 [redacted]

Sender's Name Michael Pawlo Phone [redacted]97-6750

Company Tidewater, Inc.

Address 8450-D Tyco Rd Dept./Floor/Suite/Room

City Vienna State VA ZIP 22182

#2

46

2

2 Your Internal Billing Reference

3 To

Recipient's Name Lance Steere Phone 970 [redacted]-1511

Company ALS Labs

Address 225 Commerce Drive Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

17em

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City Fort Collins State CO ZIP 80524

HOLD Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

HOLD Saturday FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

8044 6005 5710

4 Express Package Service * To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day

- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [x] FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

- [ ] FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
- [ ] FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.

- [ ] FedEx Envelope*
- [ ] FedEx Pak*
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling and Delivery Signature Options

- [ ] SATURDAY Delivery — NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.
- [ ] No Signature Required — Package may be left without obtaining a signature for delivery.
- [ ] Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.
- [ ] Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods? One box must be checked.

- [ ] No
- [ ] Yes — As per attached Shipper's Declaration.
- [ ] Yes — Shipper's Declaration not required.
- [ ] Dry Ice — Dry ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

- [ ] Cargo Aircraft Only

7 Payment Bill to:

Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. [ ]

- [x] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [ ] Third Party
- [ ] Credit Card
- [ ] Cash/Check

[redacted]

Total Packages 1 Total Weight ____ lbs. [redacted] Credit Card Auth.

†Our liability is limited to US$100 unless you declare a higher value. See the current FedEx Service Guide for details.

644

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Temp-222c

1470417

FedEx Express NEW Package US Airbill

FedEx Tracking Number 8044 6005 5721

0200 Recipient's Copy

1 From

Date 7/18/2014 [redacted]

Sender's Name Michael Pawlo Phone [redacted]-697-6750

Company Tidewater Inc.

Address 8450-D Tyco Rd

Dept./Floor/Suite/Room

City Vienna State VA ZIP 22182

#1

2 Your Internal Billing Reference

3 To

Recipient's Name Lance Steere Phone 970 49[redacted]-1511

Company ALS Labs

Address 225 Commerce Drive

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

HOLD Weekday FedEx location address REQUIRED. NOT available for FedEx First Overnight.

HOLD Saturday FedEx location address REQUIRED. AVAILABLE ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City Fort Collins State CO ZIP 80524

8044 6005 5721

4 Express Package Service *To most locations.

NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs. For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day

- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [x] FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

- [ ] FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
- [ ] FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging *Declared value limit $500.

- [ ] FedEx Envelope*
- [ ] FedEx Pak*
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

6 Special Handling and Delivery Signature Options

- [ ] SATURDAY Delivery — NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.
- [ ] No Signature Required — Package may be left without obtaining a signature for delivery.
- [ ] Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.
- [ ] Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods? One box must be checked.

- [ ] No
- [ ] Yes — As per attached Shipper's Declaration.
- [ ] Yes — Shipper's Declaration not required.
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

- [ ] Cargo Aircraft Only

7 Payment Bill to:

Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. [ ]

- [x] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [ ] Third Party
- [ ] Credit Card
- [ ] Cash/Check

[redacted]

Total Packages ____ Total Weight ____ lbs. [redacted] Credit Card Auth.

†Our liability is limited to US$100 unless you declare a higher value. See the current FedEx Service Guide for details.

644

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20 Clm

-2

20.80

140417

Section 2

2

SAMPLE RESULTS SUMMARY

Due to the nature of gamma spectroscopy data, a summary report is not provided.

Please refer to the individual sample results in Section 4.

Section 3

QC RESULTS SUMMARY

3

Gamma Spectroscopy Results

PAI 713 Rev 13

Method Blank Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Lab ID: GS140724-1MB
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 26-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 75 minutes

Final Aliquot: 500 g
Result Units: pCi/g
File Name: 141331d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.025 +/- 0.042	0.070	0.5	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Method Blank Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Lab ID: GS140724-1MB
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 26-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 75 minutes

Final Aliquot: 500 g
Result Units: pCi/g
File Name: 141331d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.07 +/- 0.11	0.18		U
14596-10-2	Am-241	-0.04 +/- 0.13	0.23		U
14913-49-6	Bi-212	0.19 +/- 0.31	0.53		U
14733-03-0	Bi-214	0.038 +/- 0.065	0.108	0.5	U,J
10198-40-0	Co-60	0.001 +/- 0.029	0.054		U
10045-97-3	Cs-137	0.008 +/- 0.023	0.041		U
14683-23-9	Eu-152	-0.05 +/- 0.12	0.26		U
15585-10-1	Eu-154	0.09 +/- 0.12	0.20		U
13966-00-2	K-40	0.19 +/- 0.40	0.70	1	U
15100-28-4	Pa-234m	-0.7 +/- 3.7	7.4		U
15092-94-1	Pb-212	-0.008 +/- 0.030	0.055		U
15067-28-4	Pb-214	0 +/- 0.047	0.083	0.5	U,J
15065-10-8	Th-234	-0.09 +/- 0.34	0.60	5	U
14913-50-9	Tl-208	0.012 +/- 0.024	0.041		U
15117-96-1	U-235	0.11 +/- 0.11	0.17		U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Method Blank Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Lab ID: GS140724-1MB
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 26-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 75 minutes

Final Aliquot: 500 g
Result Units: pCi/g
File Name: 141331d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	0.7 +/- 5.2	9.1		U,J
7440-29-1	Th-232	0.07 +/- 0.11	0.18		U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Method Blank Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Lab ID: GS140724-2MB
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 27-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 45 minutes

Final Aliquot: 500 g
Result Units: pCi/g
File Name: 140928d01A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.295 +/- 0.071	0.114	0.5	B3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Method Blank Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Lab ID: GS140724-2MB
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 27-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 45 minutes

Final Aliquot: 500 g
Result Units: pCi/g
File Name: 140928d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.05 +/- 0.11	0.19		U
14596-10-2	Am-241	0.30 +/- 0.41	0.68		U
14913-49-6	Bi-212	-0.23 +/- 0.41	0.86		U
14733-03-0	Bi-214	0.39 +/- 0.12	0.13	0.5	B3,J
10198-40-0	Co-60	0.003 +/- 0.031	0.061		U
10045-97-3	Cs-137	0.032 +/- 0.032	0.049		U
14683-23-9	Eu-152	0.06 +/- 0.11	0.20		U
15585-10-1	Eu-154	-0.06 +/- 0.14	0.30		U
13966-00-2	K-40	0.84 +/- 0.52	0.67	1	NQ
15100-28-4	Pa-234m	-1.2 +/- 5.2	10.6		U
15092-94-1	Pb-212	0 +/- 0.044	0.080		U
15067-28-4	Pb-214	0.253 +/- 0.079	0.114	0.5	B3,J
15065-10-8	Th-234	0.02 +/- 0.48	0.87	5	U
14913-50-9	Tl-208	-0.008 +/- 0.029	0.057		U
15117-96-1	U-235	0.01 +/- 0.16	0.28		U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Method Blank Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Lab ID: GS140724-2MB
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 27-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 45 minutes

Final Aliquot: 500 g
Result Units: pCi/g
File Name: 140928d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	15 +/- 31	52		U,J
7440-29-1	Th-232	0.05 +/- 0.11	0.19		U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Lab ID: GS140724-1LCS
Library: ANALYTICAL.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 26-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes

Final Aliquot: 500 g
Result Units: pCi/g
File Name: 140967d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	189 +/- 23	6	189.0	100	85 - 115	P
10198-40-0	Co-60	86 +/- 10	0	87.21	99.1	85 - 115	P
10045-97-3	Cs-137	76.2 +/- 9.0	0.6	75.15	101	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS Recovery within control limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Laboratory Control Sample(s)

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Lab ID: GS140724-2LCS
Library: ANALYTICAL.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 27-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes

Final Aliquot: 500 g
Result Units: pCi/g
File Name: 141006d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	211 +/- 26	11	189.0	112	85 - 115	P
10198-40-0	Co-60	86 +/- 10	0	87.18	98.9	85 - 115	P
10045-97-3	Cs-137	76.8 +/- 9.0	0.5	75.15	102	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS Recovery within control limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Duplicate Sample Results (DER)

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW1
Lab ID: 1407417-1DUP
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140998d02A

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13982-63-3	Ra-226	17.2 +/- 2.1	0.5	M3,G	17.5 +/- 2.1	0.4	G	0.0936	2.13

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Duplicate Sample Results (DER)

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G09-13
Lab ID: 1407417-21DUP
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 237 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141004d02A

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13982-63-3	Ra-226	2.03 +/- 0.34	0.38	G	1.89 +/- 0.31	0.34	G	0.301	2.13

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Duplicate Sample Results (DER)

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW1
Lab ID: 1407417-1DUP
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140998d02

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
14331-83-0	Ac-228	0.84 +/- 0.63	1.20	U,G	1.36 +/- 0.56	0.87	G,TI	0.624	2.13
14596-10-2	Am-241	-1.3 +/- 2.4	4.2	U,G	-1.3 +/- 3.3	5.7	U,G	0.0158	2.13
14913-49-6	Bi-212	2.4 +/- 2.0	3.1	U,G	1.9 +/- 1.7	2.6	U,G	0.191	2.13
14733-03-0	Bi-214	17.4 +/- 2.2	0.5	G,J	15.9 +/- 2.6	1.4	M3,G,J	0.437	2.13
10198-40-0	Co-60	0.11 +/- 0.14	0.23	U,G	-0.02 +/- 0.12	0.22	U,G	0.749	2.13
10045-97-3	Cs-137	0.18 +/- 0.16	0.25	U,G	0.02 +/- 0.15	0.26	U,G	0.733	2.13
14683-23-9	Eu-152	2.7 +/- 1.0	1.2	G,SI	1.35 +/- 0.71	0.97	G,SI	1.05	2.13
15585-10-1	Eu-154	-0.24 +/- 0.79	1.47	U,G	-0.12 +/- 0.70	1.27	U,G	0.115	2.13
13966-00-2	K-40	7.0 +/- 2.3	2.5	M3,G	7.4 +/- 2.1	2.2	M3,G	0.123	2.13
15100-28-4	Pa-234m	19 +/- 24	39	U,G	23 +/- 21	33	U,G	0.134	2.13
15092-94-1	Pb-212	1.64 +/- 0.40	0.47	G	1.30 +/- 0.33	0.41	G	0.66	2.13
15067-28-4	Pb-214	17.2 +/- 2.1	0.5	M3,G,J	17.8 +/- 2.2	0.5	G,J	0.207	2.13
15065-10-8	Th-234	-0.1 +/- 2.8	4.7	U,G	1.9 +/- 2.8	4.7	U,G	0.493	2.13
14913-50-9	Tl-208	0.28 +/- 0.16	0.24	G	0.35 +/- 0.16	0.23	G	0.276	2.13
15117-96-1	U-235	-0.8 +/- 1.0	1.8	U,G	0.79 +/- 0.93	1.51	U,G	1.16	2.13
14255-04-0	Pb-210	-200 +/- 150	270	U,G,J	-220 +/- 300	530	U,G,J	0.0577	2.13
7440-29-1	Th-232	0.84 +/- 0.63	1.20	U,G	1.36 +/- 0.56	0.87	G,TI	0.624	2.13

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Duplicate Sample Results (DER)

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G09-13
Lab ID: 1407417-21DUP
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 237 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141004d02

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
14331-83-0	Ac-228	1.59 +/- 0.52	0.64	G,TI	1.65 +/- 0.44	0.50	G	0.102	2.13
14596-10-2	Am-241	0 +/- 1.6	2.9	U,G	-1.1 +/- 2.2	4.1	U,G	0.418	2.13
14913-49-6	Bi-212	2.3 +/- 1.6	2.1	G,NQ	1.2 +/- 1.4	2.3	U,G	0.489	2.13
14733-03-0	Bi-214	1.80 +/- 0.44	0.42	G,J	2.00 +/- 0.42	0.34	G,J	0.334	2.13
10198-40-0	Co-60	-0.074 +/- 0.082	0.207	U,G	-0.042 +/- 0.097	0.202	U,G	0.252	2.13
10045-97-3	Cs-137	0.12 +/- 0.12	0.19	U,G	0.02 +/- 0.11	0.19	U,G	0.598	2.13
14683-23-9	Eu-152	0.48 +/- 0.49	0.73	U,G	0.27 +/- 0.50	0.85	U,G	0.292	2.13
15585-10-1	Eu-154	-0.12 +/- 0.57	1.15	U,G	-0.07 +/- 0.55	1.05	U,G	0.0601	2.13
13966-00-2	K-40	7.7 +/- 2.5	2.3	M3,G	7.4 +/- 2.2	1.9	M3,G	0.0834	2.13
15100-28-4	Pa-234m	7 +/- 14	24	U,G	-2 +/- 14	27	U,G	0.456	2.13
15092-94-1	Pb-212	1.52 +/- 0.38	0.42	G	1.87 +/- 0.35	0.25	G	0.671	2.13
15067-28-4	Pb-214	2.19 +/- 0.42	0.38	G,J	1.81 +/- 0.35	0.34	G,J	0.702	2.13
15065-10-8	Th-234	0 +/- 2.0	3.6	U,G	0.1 +/- 2.2	3.8	U,G	0.012	2.13
14913-50-9	Tl-208	0.51 +/- 0.19	0.22	G	0.75 +/- 0.19	0.18	G	0.874	2.13
15117-96-1	U-235	0.61 +/- 0.57	0.91	U,G	-0.05 +/- 0.57	1.00	U,G	0.812	2.13
14255-04-0	Pb-210	-30 +/- 110	190	U,G,J	10 +/- 220	380	U,G,J	0.18	2.13
7440-29-1	Th-232	1.59 +/- 0.52	0.64	G,TI	1.65 +/- 0.44	0.50	G	0.102	2.13

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: *GSS1407417-1*

Section 4

INDIVIDUAL SAMPLE RESULTS

4

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW1
Lab ID: 1407417-1
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140919d01A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	17.2 +/- 2.1	0.5	0.5	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW1
Lab ID: 1407417-1
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140919d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.84 +/- 0.63	1.20		U,G
14596-10-2	Am-241	-1.3 +/- 2.4	4.2		U,G
14913-49-6	Bi-212	2.4 +/- 2.0	3.1		U,G
14733-03-0	Bi-214	17.4 +/- 2.2	0.5	0.5	G,J
10198-40-0	Co-60	0.11 +/- 0.14	0.23		U,G
10045-97-3	Cs-137	0.18 +/- 0.16	0.25		U,G
14683-23-9	Eu-152	2.7 +/- 1.0	1.2		G,SI
15585-10-1	Eu-154	-0.24 +/- 0.79	1.47		U,G
13966-00-2	K-40	7.0 +/- 2.3	2.5	1	M3,G
15100-28-4	Pa-234m	19 +/- 24	39		U,G
15092-94-1	Pb-212	1.64 +/- 0.40	0.47		G
15067-28-4	Pb-214	17.2 +/- 2.1	0.5	0.5	M3,G,J
15065-10-8	Th-234	-0.1 +/- 2.8	4.7	5	U,G
14913-50-9	Tl-208	0.28 +/- 0.16	0.24		G
15117-96-1	U-235	-0.8 +/- 1.0	1.8		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW1
Lab ID: 1407417-1
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140919d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-200 +/- 150	270		U,G,J
7440-29-1	Th-232	0.84 +/- 0.63	1.20		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Duplicate Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW1
Lab ID: 1407417-1DUP
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140998d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	17.5 +/- 2.1	0.4	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Duplicate Results

Lab Name: ALS Environmental – FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW1
Lab ID: 1407417-1DUP
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140998d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.36 +/- 0.56	0.87		G,TI
14596-10-2	Am-241	-1.3 +/- 3.3	5.7		U,G
14913-49-6	Bi-212	1.9 +/- 1.7	2.6		U,G
14733-03-0	Bi-214	15.9 +/- 2.6	1.4	0.5	M3,G,J
10198-40-0	Co-60	-0.02 +/- 0.12	0.22		U,G
10045-97-3	Cs-137	0.02 +/- 0.15	0.26		U,G
14683-23-9	Eu-152	1.35 +/- 0.71	0.97		G,SI
15585-10-1	Eu-154	-0.12 +/- 0.70	1.27		U,G
13966-00-2	K-40	7.4 +/- 2.1	2.2	1	M3,G
15100-28-4	Pa-234m	23 +/- 21	33		U,G
15092-94-1	Pb-212	1.30 +/- 0.33	0.41		G
15067-28-4	Pb-214	17.8 +/- 2.2	0.5	0.5	G,J
15065-10-8	Th-234	1.9 +/- 2.8	4.7	5	U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Duplicate Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW1
Lab ID: 1407417-1DUP
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140998d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14913-50-9	Tl-208	0.35 +/- 0.16	0.23		G
15117-96-1	U-235	0.79 +/- 0.93	1.51		U,G
14255-04-0	Pb-210	-220 +/- 300	530		U,G,J
7440-29-1	Th-232	1.36 +/- 0.56	0.87		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW2
Lab ID: 1407417-2
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 246 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140997d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	970 +/- 110	0	0.5	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW2
Lab ID: 1407417-2
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 246 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140997d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	-0.3 +/- 3.4	5.7		U,G
14596-10-2	Am-241	3 +/- 24	40		U,G
14913-49-6	Bi-212	2 +/- 11	18		U,G
14733-03-0	Bi-214	940 +/- 110	0	0.5	M3,G,J
10198-40-0	Co-60	-0.19 +/- 0.89	1.50		U,G
10045-97-3	Cs-137	-0.4 +/- 1.3	2.1		U,G
14683-23-9	Eu-152	41 +/- 14	20		G,NQ
15585-10-1	Eu-154	2.6 +/- 4.9	8.2		U,G
13966-00-2	K-40	5.9 +/- 9.1	15.0	1	U,M,G
15100-28-4	Pa-234m	-40 +/- 150	250		U,G
15092-94-1	Pb-212	2.0 +/- 1.7	2.8		U,G
15067-28-4	Pb-214	990 +/- 120	0	0.5	M3,G,J
15065-10-8	Th-234	4 +/- 20	33	5	U,M,G
14913-50-9	Tl-208	0.08 +/- 0.86	2.03		U,G
15117-96-1	U-235	-0.1 +/- 6.5	10.8		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW2
Lab ID: 1407417-2
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 246 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140997d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	1500 +/- 2100	3500		U,G,J
7440-29-1	Th-232	-0.3 +/- 3.4	5.7		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW2
Lab ID: 1407417-3
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 241 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141328d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	44.4 +/- 5.3	0.9	0.5	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW2
Lab ID: 1407417-3
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 241 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141328d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.3 +/- 1.2	1.9		U,G
14596-10-2	Am-241	0.1 +/- 1.9	3.2		U,G
14913-49-6	Bi-212	3.7 +/- 3.7	6.0		U,G
14733-03-0	Bi-214	40.7 +/- 6.2	3.8	0.5	M3,G,J
10198-40-0	Co-60	0.25 +/- 0.35	0.58		U,G
10045-97-3	Cs-137	-0.03 +/- 0.42	0.73		U,G
14683-23-9	Eu-152	3.3 +/- 2.2	3.4		U,G
15585-10-1	Eu-154	-0.1 +/- 1.6	2.8		U,G
13966-00-2	K-40	9.7 +/- 5.0	7.3	1	M3,G
15100-28-4	Pa-234m	4 +/- 49	85		U,G
15092-94-1	Pb-212	2.28 +/- 0.58	0.75		G
15067-28-4	Pb-214	44.8 +/- 5.4	0.9	0.5	M3,G,J
15065-10-8	Th-234	3.9 +/- 3.8	6.1	5	U,M,G
14913-50-9	Tl-208	0.68 +/- 0.32	0.48		G
15117-96-1	U-235	-0.2 +/- 1.4	2.5		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW2
Lab ID: 1407417-3
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 241 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141328d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	42 +/- 48	78		U,G,J
7440-29-1	Th-232	1.3 +/- 1.2	1.9		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW4
Lab ID: 1407417-4
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 234 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140887d05A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1010 +/- 120	0	0.5	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW4
Lab ID: 1407417-4
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 234 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140887d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	3.7 +/- 4.4	7.2		U,G
14596-10-2	Am-241	-3 +/- 20	32		U,G
14913-49-6	Bi-212	-4 +/- 10	17		U,G
14733-03-0	Bi-214	970 +/- 110	0	0.5	M3,G,J
10198-40-0	Co-60	-0.16 +/- 0.81	1.37		U,G
10045-97-3	Cs-137	1.0 +/- 1.1	1.7		U,G
14683-23-9	Eu-152	-20 +/- 12	20		U,G
15585-10-1	Eu-154	1.3 +/- 4.5	7.5		U,G
13966-00-2	K-40	8.4 +/- 7.0	11.3	1	U,M,G
15100-28-4	Pa-234m	-50 +/- 140	230		U,G
15092-94-1	Pb-212	3.8 +/- 2.0	3.1		G
15067-28-4	Pb-214	1040 +/- 120	0	0.5	M3,G,J
15065-10-8	Th-234	-8 +/- 18	30	5	U,M,G
14913-50-9	Tl-208	0.92 +/- 0.94	1.53		U,G
15117-96-1	U-235	-3.7 +/- 5.8	9.7		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW4
Lab ID: 1407417-4
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 234 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140887d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-1400 +/- 1500	2500		U,G,J
7440-29-1	Th-232	3.7 +/- 4.4	7.2		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW5
Lab ID: 1407417-5
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 252 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140898d07A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	7.49 +/- 0.96	0.44	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW5
Lab ID: 1407417-5
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 252 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140898d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	8.6 +/- 1.3	1.0		G
14596-10-2	Am-241	0.3 +/- 1.4	2.3		U,G
14913-49-6	Bi-212	9.8 +/- 3.3	4.1		G
14733-03-0	Bi-214	7.1 +/- 1.0	0.4	0.5	G,J
10198-40-0	Co-60	0.07 +/- 0.13	0.23		U,G
10045-97-3	Cs-137	0.04 +/- 0.16	0.28		U,G
14683-23-9	Eu-152	0.41 +/- 0.78	1.34		U,G
15585-10-1	Eu-154	-0.86 +/- 0.66	1.38		U,G
13966-00-2	K-40	8.3 +/- 2.5	2.5	1	M3,G
15100-28-4	Pa-234m	16 +/- 19	32		U,G
15092-94-1	Pb-212	9.5 +/- 1.2	0.4		G
15067-28-4	Pb-214	7.8 +/- 1.0	0.5	0.5	G,J
15065-10-8	Th-234	8.2 +/- 3.9	5.9	5	M3,G,TI
14913-50-9	Tl-208	2.97 +/- 0.47	0.27		G
15117-96-1	U-235	-0.32 +/- 0.91	1.58		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-IDW5
Lab ID: 1407417-5
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 252 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140898d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	15 +/- 30	50		U,G,J
7440-29-1	Th-232	8.6 +/- 1.3	1.0		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-CF1
Lab ID: 1407417-6
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 75 minutes
Report Basis: Dry Weight

Final Aliquot: 95.6 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140838d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.47 +/- 0.20	0.46	0.5	LT,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-CF1
Lab ID: 1407417-6
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 75 minutes
Report Basis: Dry Weight

Final Aliquot: 95.6 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140838d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.30 +/- 0.52	0.88		U,G
14596-10-2	Am-241	0.03 +/- 0.13	0.23		U,G
14913-49-6	Bi-212	0.5 +/- 1.4	2.5		U,G
14733-03-0	Bi-214	0.43 +/- 0.31	0.47	0.5	U,G,J
10198-40-0	Co-60	0.06 +/- 0.11	0.19		U,G
10045-97-3	Cs-137	0.10 +/- 0.13	0.21		U,G
14683-23-9	Eu-152	-0.43 +/- 0.44	1.07		U,G
15585-10-1	Eu-154	0.22 +/- 0.54	0.95		U,G
13966-00-2	K-40	4.5 +/- 2.2	2.9	1	M3,G
15100-28-4	Pa-234m	7 +/- 16	28		U,G
15092-94-1	Pb-212	0.17 +/- 0.18	0.28		U,G
15067-28-4	Pb-214	0.49 +/- 0.25	0.46	0.5	LT,G,J
15065-10-8	Th-234	-0.4 +/- 1.3	2.2	5	U,G
14913-50-9	Tl-208	0.15 +/- 0.16	0.25		U,G
15117-96-1	U-235	-0.02 +/- 0.47	0.84		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-SR-CF1
Lab ID: 1407417-6
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 75 minutes
Report Basis: Dry Weight

Final Aliquot: 95.6 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140838d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	0.9 +/- 2.0	3.3		U,G,J
7440-29-1	Th-232	0.30 +/- 0.52	0.88		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J16-38
Lab ID: 1407417-7
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 188 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140920d01A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	38.4 +/- 4.6	0.8	0.5	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J16-38
Lab ID: 1407417-7
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 188 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140920d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	2.4 +/- 1.4	2.1		G,TI
14596-10-2	Am-241	-3.6 +/- 4.2	7.4		U,G
14913-49-6	Bi-212	-0.4 +/- 3.3	5.9		U,G
14733-03-0	Bi-214	37.4 +/- 4.7	0.8	0.5	M3,G,J
10198-40-0	Co-60	-0.23 +/- 0.24	0.49		U,G
10045-97-3	Cs-137	0.05 +/- 0.21	0.38		U,G
14683-23-9	Eu-152	3.5 +/- 1.7	2.4		G,SI
15585-10-1	Eu-154	-1.2 +/- 1.5	2.8		U,G
13966-00-2	K-40	7.3 +/- 3.7	5.1	1	M3,G
15100-28-4	Pa-234m	30 +/- 46	77		U,G
15092-94-1	Pb-212	1.96 +/- 0.64	0.89		G
15067-28-4	Pb-214	39.1 +/- 4.8	1.0	0.5	M3,G,J
15065-10-8	Th-234	0 +/- 4.4	7.6	5	U,M,G
14913-50-9	Tl-208	0.43 +/- 0.24	0.33		G
15117-96-1	U-235	1.2 +/- 1.7	2.8		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J16-38
Lab ID: 1407417-7
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 188 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140920d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	290 +/- 270	440		U,G,J
7440-29-1	Th-232	2.4 +/- 1.4	2.1		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J18-04
Lab ID: 1407417-8
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 227 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140965d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.91 +/- 0.44	0.42	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J18-04
Lab ID: 1407417-8
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 227 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140965d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.88 +/- 0.52	0.70		G,TI
14596-10-2	Am-241	-0.3 +/- 1.1	2.0		U,G
14913-49-6	Bi-212	2.2 +/- 1.6	2.3		U,G
14733-03-0	Bi-214	2.75 +/- 0.54	0.42	0.5	G,J
10198-40-0	Co-60	0.06 +/- 0.10	0.18		U,G
10045-97-3	Cs-137	0.56 +/- 0.19	0.21		G
14683-23-9	Eu-152	-0.11 +/- 0.65	1.29		U,G
15585-10-1	Eu-154	-0.24 +/- 0.59	1.20		U,G
13966-00-2	K-40	7.5 +/- 2.5	2.5	1	M3,G
15100-28-4	Pa-234m	-7 +/- 18	36		U,G
15092-94-1	Pb-212	1.07 +/- 0.29	0.31		G
15067-28-4	Pb-214	3.02 +/- 0.51	0.42	0.5	G,J
15065-10-8	Th-234	2.0 +/- 2.3	3.7	5	U,G
14913-50-9	Tl-208	0.35 +/- 0.17	0.22		G
15117-96-1	U-235	-0.16 +/- 0.61	1.10		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative.Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J18-04
Lab ID: 1407417-8
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 227 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140965d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	24 +/- 53	89		U,G,J
7440-29-1	Th-232	0.88 +/- 0.52	0.70		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E09-09
Lab ID: 1407417-9
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 225 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141329d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.25 +/- 0.27	0.36	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E09-09
Lab ID: 1407417-9
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 225 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141329d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.54 +/- 0.53	0.84		G,TI
14596-10-2	Am-241	-0.22 +/- 0.73	1.33		U,G
14913-49-6	Bi-212	2.0 +/- 1.8	2.6		U,G
14733-03-0	Bi-214	0.92 +/- 0.38	0.48	0.5	G,J
10198-40-0	Co-60	-0.15 +/- 0.16	0.35		U,G
10045-97-3	Cs-137	0.08 +/- 0.15	0.25		U,G
14683-23-9	Eu-152	0.61 +/- 0.53	0.68		U,G
15585-10-1	Eu-154	0.51 +/- 0.66	1.08		U,G
13966-00-2	K-40	4.6 +/- 2.1	2.2	1	M3,G
15100-28-4	Pa-234m	9 +/- 19	33		U,G
15092-94-1	Pb-212	1.28 +/- 0.33	0.36		G
15067-28-4	Pb-214	1.46 +/- 0.33	0.36	0.5	G,J
15065-10-8	Th-234	1.7 +/- 1.9	3.1	5	U,G
14913-50-9	Tl-208	0.42 +/- 0.19	0.25		G
15117-96-1	U-235	-0.11 +/- 0.51	0.92		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E09-09
Lab ID: 1407417-9
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 225 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141329d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	0 +/- 25	45		U,G,J
7440-29-1	Th-232	1.54 +/- 0.53	0.84		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I31-21
Lab ID: 1407417-10
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 281 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140888d05A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	7.37 +/- 0.92	0.32	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I31-21
Lab ID: 1407417-10
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 281 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140888d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.59 +/- 0.44	0.72		G
14596-10-2	Am-241	-1.2 +/- 2.1	3.8		U,G
14913-49-6	Bi-212	1.8 +/- 1.4	2.2		U,G
14733-03-0	Bi-214	7.12 +/- 0.98	0.32	0.5	G,J
10198-40-0	Co-60	0.001 +/- 0.082	0.157		U,G
10045-97-3	Cs-137	0.08 +/- 0.11	0.18		U,G
14683-23-9	Eu-152	0.63 +/- 0.47	0.67		U,G
15585-10-1	Eu-154	-0.22 +/- 0.49	0.96		U,G
13966-00-2	K-40	7.4 +/- 2.1	2.2	1	M3,G
15100-28-4	Pa-234m	9 +/- 15	26		U,G
15092-94-1	Pb-212	1.81 +/- 0.33	0.27		G
15067-28-4	Pb-214	7.54 +/- 0.98	0.34	0.5	G,J
15065-10-8	Th-234	2.8 +/- 1.9	2.8	5	U,G
14913-50-9	Tl-208	0.45 +/- 0.14	0.16		G
15117-96-1	U-235	0.06 +/- 0.61	1.05		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I31-21
Lab ID: 1407417-10
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 281 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140888d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	50 +/- 160	280		U,G,J
7440-29-1	Th-232	1.59 +/- 0.44	0.72		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-H11-16
Lab ID: 1407417-11
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 227 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140899d07A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.49 +/- 0.28	0.38	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-H11-16
Lab ID: 1407417-11
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 227 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140899d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	4.04 +/- 0.75	0.73		G
14596-10-2	Am-241	-0.23 +/- 0.98	1.76		U,G
14913-49-6	Bi-212	4.9 +/- 1.9	1.9		G
14733-03-0	Bi-214	1.52 +/- 0.40	0.39	0.5	G,J
10198-40-0	Co-60	0.014 +/- 0.088	0.170		U,G
10045-97-3	Cs-137	0.15 +/- 0.14	0.21		U,G
14683-23-9	Eu-152	0.26 +/- 0.54	0.94		U,G
15585-10-1	Eu-154	-0.64 +/- 0.66	1.37		U,G
13966-00-2	K-40	6.4 +/- 2.1	2.1	1	M3,G
15100-28-4	Pa-234m	14 +/- 18	29		U,G
15092-94-1	Pb-212	4.21 +/- 0.65	0.38		G
15067-28-4	Pb-214	1.48 +/- 0.32	0.38	0.5	G,J
15065-10-8	Th-234	2.9 +/- 3.0	4.9	5	U,G
14913-50-9	Tl-208	1.52 +/- 0.31	0.27		G
15117-96-1	U-235	0.60 +/- 0.61	0.98		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-H11-16
Lab ID: 1407417-11
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 227 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140899d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	31 +/- 22	34		U,G,J
7440-29-1	Th-232	4.04 +/- 0.75	0.73		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-C07-06
Lab ID: 1407417-12
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 271 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140839d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	6.02 +/- 0.78	0.34	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental – FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-C07-06
Lab ID: 1407417-12
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 271 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140839d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.85 +/- 0.33	0.50		G
14596-10-2	Am-241	-0.02 +/- 0.18	0.31		U,G
14913-49-6	Bi-212	1.4 +/- 1.4	2.2		U,G
14733-03-0	Bi-214	5.30 +/- 0.80	0.34	0.5	G,J
10198-40-0	Co-60	-0.013 +/- 0.088	0.180		U,G
10045-97-3	Cs-137	0.49 +/- 0.17	0.19		G
14683-23-9	Eu-152	0.59 +/- 0.56	0.86		U,G
15585-10-1	Eu-154	-0.05 +/- 0.55	1.05		U,G
13966-00-2	K-40	8.5 +/- 2.3	1.8	1	M3,G
15100-28-4	Pa-234m	3 +/- 17	31		U,G
15092-94-1	Pb-212	1.16 +/- 0.27	0.28		G
15067-28-4	Pb-214	6.58 +/- 0.89	0.36	0.5	G,J
15065-10-8	Th-234	1.0 +/- 1.2	2.0	5	U,G
14913-50-9	Tl-208	0.26 +/- 0.13	0.18		G
15117-96-1	U-235	0.37 +/- 0.48	0.80		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-C07-06
Lab ID: 1407417-12
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 271 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140839d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	10.1 +/- 2.6	2.9		G,J
7440-29-1	Th-232	0.85 +/- 0.33	0.50		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-K15-37
Lab ID: 1407417-13
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 207 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140921d01A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.68 +/- 0.43	0.41	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-K15-37
Lab ID: 1407417-13
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 207 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140921d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	2.19 +/- 0.61	0.87		G
14596-10-2	Am-241	0.2 +/- 2.0	3.5		U,G
14913-49-6	Bi-212	3.3 +/- 2.2	3.1		G,NQ
14733-03-0	Bi-214	2.34 +/- 0.52	0.44	0.5	G,J
10198-40-0	Co-60	0.02 +/- 0.11	0.21		U,G
10045-97-3	Cs-137	0.04 +/- 0.12	0.21		U,G
14683-23-9	Eu-152	0.55 +/- 0.57	0.84		U,G
15585-10-1	Eu-154	0.07 +/- 0.61	1.17		U,G
13966-00-2	K-40	9.5 +/- 3.0	2.6	1	M3,G
15100-28-4	Pa-234m	-6 +/- 19	40		U,G
15092-94-1	Pb-212	2.39 +/- 0.47	0.38		G
15067-28-4	Pb-214	2.94 +/- 0.52	0.41	0.5	G,J
15065-10-8	Th-234	2.1 +/- 2.5	4.1	5	U,G
14913-50-9	Tl-208	0.60 +/- 0.21	0.22		G
15117-96-1	U-235	-0.23 +/- 0.75	1.35		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-K15-37
Lab ID: 1407417-13
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 207 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140921d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	50 +/- 130	220		U,G,J
7440-29-1	Th-232	2.19 +/- 0.61	0.87		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I13-22
Lab ID: 1407417-14
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 262 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140999d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.83 +/- 0.17	0.26	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I13-22
Lab ID: 1407417-14
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 262 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140999d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.51 +/- 0.28	0.44		G,TI
14596-10-2	Am-241	0.3 +/- 1.6	2.9		U,G
14913-49-6	Bi-212	1.1 +/- 1.2	1.8		U,G
14733-03-0	Bi-214	0.89 +/- 0.25	0.26	0.5	G,J
10198-40-0	Co-60	0.009 +/- 0.056	0.112		U,G
10045-97-3	Cs-137	0.069 +/- 0.079	0.126		U,G
14683-23-9	Eu-152	-0.22 +/- 0.34	0.77		U,G
15585-10-1	Eu-154	-0.09 +/- 0.41	0.81		U,G
13966-00-2	K-40	8.0 +/- 2.1	1.7	1	M3,G
15100-28-4	Pa-234m	-9 +/- 12	25		U,G
15092-94-1	Pb-212	1.12 +/- 0.25	0.21		G
15067-28-4	Pb-214	0.79 +/- 0.21	0.29	0.5	G,J
15065-10-8	Th-234	2.2 +/- 2.1	3.3	5	U,G
14913-50-9	Tl-208	0.35 +/- 0.13	0.15		G
15117-96-1	U-235	0.18 +/- 0.44	0.75		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I13-22
Lab ID: 1407417-14
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 262 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140999d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	100 +/- 170	280		U,G,J
7440-29-1	Th-232	0.51 +/- 0.28	0.44		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G11-14
Lab ID: 1407417-15
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 211 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140966d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.01 +/- 0.38	0.52	0.5	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G11-14
Lab ID: 1407417-15
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 211 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140966d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	8.1 +/- 1.3	1.1		G
14596-10-2	Am-241	0.9 +/- 1.8	3.0		U,G
14913-49-6	Bi-212	9.5 +/- 3.1	3.2		G
14733-03-0	Bi-214	1.73 +/- 0.51	0.58	0.5	M3,G,J
10198-40-0	Co-60	0.02 +/- 0.15	0.28		U,G
10045-97-3	Cs-137	-0.12 +/- 0.18	0.34		U,G
14683-23-9	Eu-152	-0.37 +/- 0.76	1.56		U,G
15585-10-1	Eu-154	-0.26 +/- 0.73	1.44		U,G
13966-00-2	K-40	7.8 +/- 2.8	3.0	1	M3,G
15100-28-4	Pa-234m	8 +/- 23	40		U,G
15092-94-1	Pb-212	10.3 +/- 1.4	0.4		G
15067-28-4	Pb-214	2.18 +/- 0.46	0.52	0.5	M3,G,J
15065-10-8	Th-234	7.7 +/- 3.3	4.8	5	G,TI
14913-50-9	Tl-208	2.97 +/- 0.50	0.32		G
15117-96-1	U-235	0.20 +/- 0.91	1.55		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G11-14
Lab ID: 1407417-15
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 211 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140966d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-41 +/- 77	137		U,G,J
7440-29-1	Th-232	8.1 +/- 1.3	1.1		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-24
Lab ID: 1407417-16
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 279 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141330d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.84 +/- 0.20	0.28	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-24
Lab ID: 1407417-16
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 279 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141330d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.95 +/- 0.51	0.65		G,NQ
14596-10-2	Am-241	-0.25 +/- 0.50	0.96		U,G
14913-49-6	Bi-212	0.7 +/- 1.3	2.3		U,G
14733-03-0	Bi-214	0.69 +/- 0.30	0.40	0.5	G,J
10198-40-0	Co-60	0.009 +/- 0.093	0.184		U,G
10045-97-3	Cs-137	0.47 +/- 0.16	0.17		G
14683-23-9	Eu-152	-0.30 +/- 0.58	1.22		U,G
15585-10-1	Eu-154	-0.06 +/- 0.56	1.09		U,G
13966-00-2	K-40	7.1 +/- 2.4	2.4	1	M3,G
15100-28-4	Pa-234m	5 +/- 17	31		U,G
15092-94-1	Pb-212	0.80 +/- 0.22	0.23		G
15067-28-4	Pb-214	0.91 +/- 0.24	0.28	0.5	G,J
15065-10-8	Th-234	0.9 +/- 1.1	1.8	5	U,G
14913-50-9	Tl-208	0.23 +/- 0.15	0.22		G
15117-96-1	U-235	0.11 +/- 0.42	0.72		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-24
Lab ID: 1407417-16
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 279 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141330d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-6 +/- 20	37		U,G,J
7440-29-1	Th-232	0.95 +/- 0.51	0.65		G,NQ

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-H12-18
Lab ID: 1407417-17
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 220 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140889d05A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.73 +/- 0.29	0.35	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-H12-18
Lab ID: 1407417-17
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 220 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140889d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	6.7 +/- 1.0	0.7		G
14596-10-2	Am-241	-1.2 +/- 2.4	4.3		U,G
14913-49-6	Bi-212	7.1 +/- 2.2	2.2		G
14733-03-0	Bi-214	1.69 +/- 0.38	0.35	0.5	G,J
10198-40-0	Co-60	0.077 +/- 0.081	0.121		U,G
10045-97-3	Cs-137	0.24 +/- 0.15	0.21		G
14683-23-9	Eu-152	0.31 +/- 0.57	0.98		U,G
15585-10-1	Eu-154	-0.14 +/- 0.43	0.89		U,G
13966-00-2	K-40	8.6 +/- 2.4	2.2	1	M3,G
15100-28-4	Pa-234m	-1 +/- 12	25		U,G
15092-94-1	Pb-212	7.6 +/- 1.0	0.3		G
15067-28-4	Pb-214	1.76 +/- 0.35	0.39	0.5	G,J
15065-10-8	Th-234	5.1 +/- 2.9	4.4	5	G,TI
14913-50-9	Tl-208	2.15 +/- 0.36	0.22		G
15117-96-1	U-235	0.21 +/- 0.63	1.07		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-H12-18
Lab ID: 1407417-17
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 220 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140889d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-30 +/- 180	310		U,G,J
7440-29-1	Th-232	6.7 +/- 1.0	0.7		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-23
Lab ID: 1407417-18
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 260 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140900d07A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.89 +/- 0.31	0.32	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-23
Lab ID: 1407417-18
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 260 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140900d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.58 +/- 0.46	0.53		G,TI
14596-10-2	Am-241	0.52 +/- 0.76	1.26		U,G
14913-49-6	Bi-212	2.0 +/- 1.3	1.8		G,NQ
14733-03-0	Bi-214	1.68 +/- 0.39	0.41	0.5	G,J
10198-40-0	Co-60	-0.01 +/- 0.11	0.21		U,G
10045-97-3	Cs-137	0.137 +/- 0.090	0.125		G
14683-23-9	Eu-152	0.06 +/- 0.47	0.88		U,G
15585-10-1	Eu-154	-0.14 +/- 0.53	1.04		U,G
13966-00-2	K-40	8.0 +/- 2.3	2.0	1	M3,G
15100-28-4	Pa-234m	1 +/- 16	30		U,G
15092-94-1	Pb-212	1.88 +/- 0.34	0.25		G
15067-28-4	Pb-214	2.03 +/- 0.37	0.32	0.5	G,J
15065-10-8	Th-234	0.9 +/- 1.9	3.2	5	U,G
14913-50-9	Tl-208	0.56 +/- 0.17	0.19		G
15117-96-1	U-235	0.31 +/- 0.54	0.90		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-23
Lab ID: 1407417-18
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 260 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140900d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-12 +/- 18	33		U,G,J
7440-29-1	Th-232	1.58 +/- 0.46	0.53		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-H11-17
Lab ID: 1407417-19
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 232 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140922d01A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.51 +/- 0.30	0.44	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-H11-17
Lab ID: 1407417-19
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 232 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140922d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	3.90 +/- 0.75	0.72		G
14596-10-2	Am-241	0.2 +/- 2.0	3.5		U,G
14913-49-6	Bi-212	4.6 +/- 2.4	3.2		G
14733-03-0	Bi-214	1.72 +/- 0.46	0.45	0.5	G,J
10198-40-0	Co-60	0.02 +/- 0.11	0.21		U,G
10045-97-3	Cs-137	0.27 +/- 0.16	0.22		G
14683-23-9	Eu-152	0.14 +/- 0.52	0.98		U,G
15585-10-1	Eu-154	-0.25 +/- 0.53	1.13		U,G
13966-00-2	K-40	6.1 +/- 2.3	2.4	1	M3,G
15100-28-4	Pa-234m	21 +/- 17	23		U,G
15092-94-1	Pb-212	5.17 +/- 0.79	0.43		G
15067-28-4	Pb-214	1.40 +/- 0.34	0.44	0.5	G,J
15065-10-8	Th-234	2.6 +/- 2.8	4.6	5	U,G
14913-50-9	Tl-208	1.85 +/- 0.35	0.24		G
15117-96-1	U-235	0.94 +/- 0.79	1.24		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-H11-17
Lab ID: 1407417-19
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 232 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140922d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-20 +/- 130	230		U,G,J
7440-29-1	Th-232	3.90 +/- 0.75	0.72		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-D08-07
Lab ID: 1407417-20
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 273 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141000d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.20 +/- 0.22	0.26	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-D08-07
Lab ID: 1407417-20
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 273 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141000d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.40 +/- 0.41	0.58		G,TI
14596-10-2	Am-241	0.5 +/- 1.9	3.3		U,G
14913-49-6	Bi-212	1.4 +/- 1.3	2.0		U,G
14733-03-0	Bi-214	1.00 +/- 0.28	0.29	0.5	G,J
10198-40-0	Co-60	-0.009 +/- 0.082	0.163		U,G
10045-97-3	Cs-137	0.27 +/- 0.13	0.17		G
14683-23-9	Eu-152	0.11 +/- 0.38	0.70		U,G
15585-10-1	Eu-154	-0.25 +/- 0.36	0.78		U,G
13966-00-2	K-40	10.1 +/- 2.3	1.5	1	M3,G
15100-28-4	Pa-234m	11 +/- 12	18		U,G
15092-94-1	Pb-212	1.58 +/- 0.31	0.26		G
15067-28-4	Pb-214	1.36 +/- 0.28	0.26	0.5	G,J
15065-10-8	Th-234	2.1 +/- 1.8	2.8	5	U,G
14913-50-9	Tl-208	0.41 +/- 0.14	0.16		G
15117-96-1	U-235	-0.04 +/- 0.47	0.83		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-D08-07
Lab ID: 1407417-20
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 26-Jul-14
Date Analyzed: 16-Aug-14

Prep Batch: GS140724-1
QCBatchID: GS140724-1-1
Run ID: GS140724-1A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 273 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141000d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-40 +/- 180	320		U,G,J
7440-29-1	Th-232	1.40 +/- 0.41	0.58		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G09-13
Lab ID: 1407417-21
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 237 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140925d01a

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.03 +/- 0.34	0.38	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G09-13
Lab ID: 1407417-21
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 237 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140925d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.59 +/- 0.52	0.64		G,TI
14596-10-2	Am-241	0 +/- 1.6	2.9		U,G
14913-49-6	Bi-212	2.3 +/- 1.6	2.1		G,NQ
14733-03-0	Bi-214	1.80 +/- 0.44	0.42	0.5	G,J
10198-40-0	Co-60	-0.074 +/- 0.082	0.207		U,G
10045-97-3	Cs-137	0.12 +/- 0.12	0.19		U,G
14683-23-9	Eu-152	0.48 +/- 0.49	0.73		U,G
15585-10-1	Eu-154	-0.12 +/- 0.57	1.15		U,G
13966-00-2	K-40	7.7 +/- 2.5	2.3	1	M3,G
15100-28-4	Pa-234m	7 +/- 14	24		U,G
15092-94-1	Pb-212	1.52 +/- 0.38	0.42		G
15067-28-4	Pb-214	2.19 +/- 0.42	0.38	0.5	G,J
15065-10-8	Th-234	0 +/- 2.0	3.6	5	U,G
14913-50-9	Tl-208	0.51 +/- 0.19	0.22		G
15117-96-1	U-235	0.61 +/- 0.57	0.91		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G09-13
Lab ID: 1407417-21
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 237 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140925d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-30 +/- 110	190		U,G,J
7440-29-1	Th-232	1.59 +/- 0.52	0.64		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Duplicate Results

Lab Name: ALS Environmental – FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G09-13
Lab ID: 1407417-21DUP
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 237 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141004d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.89 +/- 0.31	0.34	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Duplicate Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G09-13
Lab ID: 1407417-21DUP
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 237 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141004d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.65 +/- 0.44	0.50		G
14596-10-2	Am-241	-1.1 +/- 2.2	4.1		U,G
14913-49-6	Bi-212	1.2 +/- 1.4	2.3		U,G
14733-03-0	Bi-214	2.00 +/- 0.42	0.34	0.5	G,J
10198-40-0	Co-60	-0.042 +/- 0.097	0.202		U,G
10045-97-3	Cs-137	0.02 +/- 0.11	0.19		U,G
14683-23-9	Eu-152	0.27 +/- 0.50	0.85		U,G
15585-10-1	Eu-154	-0.07 +/- 0.55	1.05		U,G
13966-00-2	K-40	7.4 +/- 2.2	1.9	1	M3,G
15100-28-4	Pa-234m	-2 +/- 14	27		U,G
15092-94-1	Pb-212	1.87 +/- 0.35	0.25		G
15067-28-4	Pb-214	1.81 +/- 0.35	0.34	0.5	G,J
15065-10-8	Th-234	0.1 +/- 2.2	3.8	5	U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Duplicate Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G09-13
Lab ID: 1407417-21DUP
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 237 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141004d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14913-50-9	Tl-208	0.75 +/- 0.19	0.18		G
15117-96-1	U-235	-0.05 +/- 0.57	1.00		U,G
14255-04-0	Pb-210	10 +/- 220	380		U,G,J
7440-29-1	Th-232	1.65 +/- 0.44	0.50		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-D05-04
Lab ID: 1407417-22
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 321 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141003d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.79 +/- 0.15	0.20	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-D05-04
Lab ID: 1407417-22
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 321 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141003d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.46 +/- 0.28	0.38		G,TI
14596-10-2	Am-241	-0.3 +/- 1.5	2.8		U,G
14913-49-6	Bi-212	1.4 +/- 1.1	1.6		U,G
14733-03-0	Bi-214	0.89 +/- 0.22	0.21	0.5	G,J
10198-40-0	Co-60	0.031 +/- 0.049	0.082		U,G
10045-97-3	Cs-137	0.098 +/- 0.085	0.131		U,G
14683-23-9	Eu-152	0.55 +/- 0.37	0.47		G,NQ
15585-10-1	Eu-154	-0.18 +/- 0.34	0.71		U,G
13966-00-2	K-40	8.5 +/- 2.1	1.7	1	M3,G
15100-28-4	Pa-234m	11 +/- 11	16		U,G
15092-94-1	Pb-212	0.75 +/- 0.21	0.23		G
15067-28-4	Pb-214	0.72 +/- 0.18	0.20	0.5	G,J
15065-10-8	Th-234	1.0 +/- 1.4	2.3	5	U,G
14913-50-9	Tl-208	0.152 +/- 0.086	0.118		G
15117-96-1	U-235	-0.09 +/- 0.38	0.68		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-D05-04
Lab ID: 1407417-22
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 321 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141003d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	40 +/- 150	260		U,G,J
7440-29-1	Th-232	0.46 +/- 0.28	0.38		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I13-20
Lab ID: 1407417-23
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 295 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141334d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	10.1 +/- 1.3	0.5	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I13-20
Lab ID: 1407417-23
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 295 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141334d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.06 +/- 0.74	1.13		U,G
14596-10-2	Am-241	0.4 +/- 1.0	1.7		U,G
14913-49-6	Bi-212	2.5 +/- 1.9	2.8		U,G
14733-03-0	Bi-214	8.4 +/- 2.0	2.1	0.5	M3,G,J
10198-40-0	Co-60	0.13 +/- 0.16	0.26		U,G
10045-97-3	Cs-137	-0.02 +/- 0.25	0.43		U,G
14683-23-9	Eu-152	0.9 +/- 1.1	1.7		U,G
15585-10-1	Eu-154	-0.1 +/- 1.0	1.8		U,G
13966-00-2	K-40	10.0 +/- 2.9	2.9	1	M3,G
15100-28-4	Pa-234m	36 +/- 29	44		U,G
15092-94-1	Pb-212	1.59 +/- 0.35	0.38		G
15067-28-4	Pb-214	10.2 +/- 1.3	0.5	0.5	G,J
15065-10-8	Th-234	7.2 +/- 2.7	3.8	5	G
14913-50-9	Tl-208	0.36 +/- 0.16	0.22		G
15117-96-1	U-235	0.90 +/- 0.76	1.21		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I13-20
Lab ID: 1407417-23
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 295 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141334d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	17 +/- 36	59		U,G,J
7440-29-1	Th-232	1.06 +/- 0.74	1.13		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-03
Lab ID: 1407417-24
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140892d05A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	9.4 +/- 1.2	0.3	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-03
Lab ID: 1407417-24
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140892d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.91 +/- 0.31	0.43		G
14596-10-2	Am-241	-1.6 +/- 2.0	3.7		U,G
14913-49-6	Bi-212	-0.1 +/- 1.2	2.2		U,G
14733-03-0	Bi-214	9.1 +/- 1.2	0.4	0.5	G,J
10198-40-0	Co-60	0.003 +/- 0.084	0.158		U,G
10045-97-3	Cs-137	0.35 +/- 0.13	0.17		G
14683-23-9	Eu-152	0.83 +/- 0.49	0.64		G,SI
15585-10-1	Eu-154	-0.41 +/- 0.53	1.04		U,G
13966-00-2	K-40	8.4 +/- 2.2	2.0	1	M3,G
15100-28-4	Pa-234m	7 +/- 16	27		U,G
15092-94-1	Pb-212	0.76 +/- 0.21	0.25		G
15067-28-4	Pb-214	9.6 +/- 1.2	0.3	0.5	G,J
15065-10-8	Th-234	1.1 +/- 1.6	2.6	5	U,G
14913-50-9	Tl-208	0.16 +/- 0.12	0.18		U,G
15117-96-1	U-235	0.50 +/- 0.62	1.01		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-03
Lab ID: 1407417-24
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 305 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140892d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-160 +/- 160	290		U,G,J
7440-29-1	Th-232	0.91 +/- 0.31	0.43		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E08-08
Lab ID: 1407417-25
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 319 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140903d07A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.04 +/- 0.42	0.29	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E08-08
Lab ID: 1407417-25
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 319 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140903d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.08 +/- 0.33	0.61		G
14596-10-2	Am-241	-0.26 +/- 0.69	1.25		U,G
14913-49-6	Bi-212	1.5 +/- 1.1	1.5		G
14733-03-0	Bi-214	3.00 +/- 0.50	0.29	0.5	G,J
10198-40-0	Co-60	0.014 +/- 0.079	0.147		U,G
10045-97-3	Cs-137	-0.054 +/- 0.086	0.168		U,G
14683-23-9	Eu-152	-0.27 +/- 0.48	0.97		U,G
15585-10-1	Eu-154	-0.08 +/- 0.46	0.88		U,G
13966-00-2	K-40	15.4 +/- 3.0	1.7	1	M3,G
15100-28-4	Pa-234m	10 +/- 14	24		U,G
15092-94-1	Pb-212	0.99 +/- 0.23	0.23		G
15067-28-4	Pb-214	3.07 +/- 0.47	0.31	0.5	G,J
15065-10-8	Th-234	1.8 +/- 1.8	2.9	5	U,G
14913-50-9	Tl-208	0.38 +/- 0.14	0.17		G
15117-96-1	U-235	-0.02 +/- 0.45	0.79		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E08-08
Lab ID: 1407417-25
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 319 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140903d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-6 +/- 15	28		U,G,J
7440-29-1	Th-232	1.08 +/- 0.33	0.61		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I13-19
Lab ID: 1407417-26
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 267 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140842d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	13.8 +/- 1.7	0.5	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I13-19
Lab ID: 1407417-26
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 267 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140842d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.63 +/- 0.47	0.68		G
14596-10-2	Am-241	0.08 +/- 0.24	0.40		U,G
14913-49-6	Bi-212	2.1 +/- 1.3	1.7		G
14733-03-0	Bi-214	12.5 +/- 2.3	1.4	0.5	M3,G,J
10198-40-0	Co-60	0 +/- 0.11	0.22		U,G
10045-97-3	Cs-137	0.16 +/- 0.13	0.19		U,G
14683-23-9	Eu-152	0.99 +/- 0.78	1.17		U,G
15585-10-1	Eu-154	-0.25 +/- 0.71	1.36		U,G
13966-00-2	K-40	9.0 +/- 2.5	2.0	1	M3,G
15100-28-4	Pa-234m	10 +/- 23	40		U,G
15092-94-1	Pb-212	2.19 +/- 0.41	0.36		G
15067-28-4	Pb-214	13.9 +/- 1.8	0.5	0.5	G,J
15065-10-8	Th-234	8.3 +/- 1.9	2.8	5	G
14913-50-9	Tl-208	0.68 +/- 0.21	0.24		G
15117-96-1	U-235	0.52 +/- 0.63	1.04		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-I13-19
Lab ID: 1407417-26
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 267 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140842d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	9.2 +/- 2.5	2.7		G,J
7440-29-1	Th-232	1.63 +/- 0.47	0.68		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-C07-30
Lab ID: 1407417-27
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 240 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140971d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.83 +/- 0.43	0.42	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-C07-30
Lab ID: 1407417-27
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 240 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140971d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	2.08 +/- 0.56	0.71		G
14596-10-2	Am-241	1.0 +/- 1.2	2.0		U,G
14913-49-6	Bi-212	2.9 +/- 2.4	3.8		U,G
14733-03-0	Bi-214	2.61 +/- 0.52	0.42	0.5	G,J
10198-40-0	Co-60	0.02 +/- 0.11	0.21		U,G
10045-97-3	Cs-137	0.03 +/- 0.13	0.23		U,G
14683-23-9	Eu-152	0.32 +/- 0.76	1.33		U,G
15585-10-1	Eu-154	-0.06 +/- 0.59	1.14		U,G
13966-00-2	K-40	10.8 +/- 2.9	2.2	1	M3,G
15100-28-4	Pa-234m	-15 +/- 20	41		U,G
15092-94-1	Pb-212	3.00 +/- 0.50	0.31		G
15067-28-4	Pb-214	3.00 +/- 0.50	0.45	0.5	G,J
15065-10-8	Th-234	2.2 +/- 2.3	3.6	5	U,G
14913-50-9	Tl-208	0.61 +/- 0.20	0.22		G
15117-96-1	U-235	0.26 +/- 0.66	1.12		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-C07-30
Lab ID: 1407417-27
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 240 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140971d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-11 +/- 60	105		U,G,J
7440-29-1	Th-232	2.08 +/- 0.56	0.71		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G11-15
Lab ID: 1407417-28
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 244 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140926d01A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.20 +/- 0.26	0.38	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G11-15
Lab ID: 1407417-28
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 244 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140926d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	2.58 +/- 0.59	0.63		G
14596-10-2	Am-241	-0.9 +/- 1.7	3.2		U,G
14913-49-6	Bi-212	2.4 +/- 1.9	2.8		U,G
14733-03-0	Bi-214	1.06 +/- 0.38	0.45	0.5	G,J
10198-40-0	Co-60	0.01 +/- 0.12	0.22		U,G
10045-97-3	Cs-137	0.08 +/- 0.11	0.18		U,G
14683-23-9	Eu-152	0.13 +/- 0.46	0.87		U,G
15585-10-1	Eu-154	0.30 +/- 0.59	1.03		U,G
13966-00-2	K-40	11.4 +/- 3.2	3.1	1	M3,G
15100-28-4	Pa-234m	-2 +/- 18	35		U,G
15092-94-1	Pb-212	2.99 +/- 0.53	0.42		G
15067-28-4	Pb-214	1.29 +/- 0.32	0.38	0.5	G,J
15065-10-8	Th-234	3.3 +/- 3.1	4.9	5	U,G
14913-50-9	Tl-208	0.85 +/- 0.22	0.20		G
15117-96-1	U-235	0.51 +/- 0.67	1.10		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental – FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-G11-15
Lab ID: 1407417-28
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 244 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140926d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	30 +/- 110	190		U,G,J
7440-29-1	Th-232	2.58 +/- 0.59	0.63		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-K08-02
Lab ID: 1407417-29
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 283 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140972d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.86 +/- 0.20	0.32	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-K08-02
Lab ID: 1407417-29
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 283 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140972d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.76 +/- 0.35	0.54		G,NQ
14596-10-2	Am-241	0.85 +/- 0.84	1.33		U,G
14913-49-6	Bi-212	1.2 +/- 1.3	2.1		U,G
14733-03-0	Bi-214	0.86 +/- 0.30	0.35	0.5	G,J
10198-40-0	Co-60	-0.007 +/- 0.067	0.144		U,G
10045-97-3	Cs-137	0.12 +/- 0.10	0.15		U,G
14683-23-9	Eu-152	0.16 +/- 0.46	0.84		U,G
15585-10-1	Eu-154	0 +/- 0.41	0.80		U,G
13966-00-2	K-40	7.1 +/- 2.2	2.0	1	M3,G
15100-28-4	Pa-234m	-1 +/- 13	25		U,G
15092-94-1	Pb-212	0.75 +/- 0.22	0.24		G
15067-28-4	Pb-214	0.86 +/- 0.23	0.32	0.5	G,J
15065-10-8	Th-234	1.2 +/- 1.5	2.5	5	U,G
14913-50-9	Tl-208	0.30 +/- 0.13	0.16		G
15117-96-1	U-235	0.20 +/- 0.43	0.74		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-K08-02
Lab ID: 1407417-29
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 16-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 283 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140972d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-5 +/- 36	65		U,G,J
7440-29-1	Th-232	0.76 +/- 0.35	0.54		G,NQ

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E12-10
Lab ID: 1407417-30
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 205 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141336d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	11.7 +/- 1.4	0.5	0.5	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E12-10
Lab ID: 1407417-30
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 205 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141336d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	2.26 +/- 0.69	1.05		G,TI
14596-10-2	Am-241	0.1 +/- 1.0	1.7		U,G
14913-49-6	Bi-212	2.7 +/- 2.4	3.7		U,G
14733-03-0	Bi-214	11.5 +/- 1.5	0.6	0.5	M3,G,J
10198-40-0	Co-60	-0.06 +/- 0.18	0.34		U,G
10045-97-3	Cs-137	0.47 +/- 0.20	0.27		G
14683-23-9	Eu-152	0.7 +/- 1.1	1.8		U,G
15585-10-1	Eu-154	-0.19 +/- 0.84	1.56		U,G
13966-00-2	K-40	12.3 +/- 3.4	3.6	1	M3,G
15100-28-4	Pa-234m	10 +/- 26	44		U,G
15092-94-1	Pb-212	2.62 +/- 0.47	0.44		G
15067-28-4	Pb-214	11.8 +/- 1.5	0.5	0.5	M3,G,J
15065-10-8	Th-234	3.2 +/- 2.6	4.1	5	U,G
14913-50-9	Tl-208	0.88 +/- 0.25	0.29		G
15117-96-1	U-235	0.38 +/- 0.75	1.25		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E12-10
Lab ID: 1407417-30
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 17-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 205 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141336d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	9 +/- 35	59		U,G,J
7440-29-1	Th-232	2.26 +/- 0.69	1.05		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E19-05
Lab ID: 1407417-31
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 217 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140894d05A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	24.1 +/- 2.9	0.4	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E19-05
Lab ID: 1407417-31
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 217 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140894d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.39 +/- 0.48	1.04		G
14596-10-2	Am-241	0.4 +/- 2.8	4.8		U,G
14913-49-6	Bi-212	2.0 +/- 1.4	2.1		U,G
14733-03-0	Bi-214	22.5 +/- 2.8	0.4	0.5	G,J
10198-40-0	Co-60	-0.11 +/- 0.11	0.23		U,G
10045-97-3	Cs-137	0.15 +/- 0.13	0.21		U,G
14683-23-9	Eu-152	1.4 +/- 1.5	2.3		U,G
15585-10-1	Eu-154	-0.48 +/- 0.69	1.29		U,G
13966-00-2	K-40	7.4 +/- 2.2	2.5	1	M3,G
15100-28-4	Pa-234m	7 +/- 22	38		U,G
15092-94-1	Pb-212	2.16 +/- 0.40	0.39		G
15067-28-4	Pb-214	25.3 +/- 3.0	0.5	0.5	G,J
15065-10-8	Th-234	2.1 +/- 2.9	4.7	5	U,G
14913-50-9	Tl-208	0.54 +/- 0.18	0.24		G
15117-96-1	U-235	-0.28 +/- 0.83	1.43		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental – FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-E19-05
Lab ID: 1407417-31
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 217 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140894d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	210 +/- 260	420		U,G,J
7440-29-1	Th-232	1.39 +/- 0.48	1.04		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-C17-30
Lab ID: 1407417-32
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 274 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140904d07A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.23 +/- 0.69	0.39	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-C17-30
Lab ID: 1407417-32
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 274 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140904d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.50 +/- 0.43	0.73		G
14596-10-2	Am-241	0.83 +/- 0.93	1.52		U,G
14913-49-6	Bi-212	2.2 +/- 1.9	2.9		U,G
14733-03-0	Bi-214	4.95 +/- 0.75	0.39	0.5	G,J
10198-40-0	Co-60	-0.05 +/- 0.10	0.21		U,G
10045-97-3	Cs-137	0.13 +/- 0.12	0.18		U,G
14683-23-9	Eu-152	0.30 +/- 0.67	1.16		U,G
15585-10-1	Eu-154	0.13 +/- 0.49	0.88		U,G
13966-00-2	K-40	7.8 +/- 2.2	1.9	1	M3,G
15100-28-4	Pa-234m	0 +/- 15	29		U,G
15092-94-1	Pb-212	1.74 +/- 0.34	0.29		G
15067-28-4	Pb-214	5.44 +/- 0.76	0.42	0.5	G,J
15065-10-8	Th-234	0.5 +/- 1.8	3.0	5	U,G
14913-50-9	Tl-208	0.55 +/- 0.17	0.19		G
15117-96-1	U-235	-0.50 +/- 0.58	1.06		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-C17-30
Lab ID: 1407417-32
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 274 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140904d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-2 +/- 20	35		U,G,J
7440-29-1	Th-232	1.50 +/- 0.43	0.73		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-D13-11
Lab ID: 1407417-33
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 256 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140843d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1030 +/- 120	0	0.5	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-D13-11
Lab ID: 1407417-33
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 256 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140843d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.7 +/- 3.3	5.6		U,G
14596-10-2	Am-241	2.1 +/- 1.7	2.8		U,G
14913-49-6	Bi-212	-1 +/- 10	17		U,G
14733-03-0	Bi-214	970 +/- 110	0	0.5	M3,G,J
10198-40-0	Co-60	-0.49 +/- 0.87	1.48		U,G
10045-97-3	Cs-137	0.54 +/- 0.76	1.25		U,G
14683-23-9	Eu-152	-31 +/- 11	18		U,G
15585-10-1	Eu-154	-2.0 +/- 4.9	8.2		U,G
13966-00-2	K-40	-7.2 +/- 9.5	16.1	1	U,M,G
15100-28-4	Pa-234m	20 +/- 150	250		U,G
15092-94-1	Pb-212	3.3 +/- 1.5	2.4		G
15067-28-4	Pb-214	1080 +/- 130	0	0.5	M3,G,J
15065-10-8	Th-234	5.2 +/- 6.1	10.1	5	U,M,G
14913-50-9	Tl-208	-0.22 +/- 0.84	1.99		U,G
15117-96-1	U-235	0 +/- 4.9	8.2		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-D13-11
Lab ID: 1407417-33
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 256 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140843d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	791 +/- 95	25		G,J
7440-29-1	Th-232	0.7 +/- 3.3	5.6		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-M18-39
Lab ID: 1407417-34
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 325 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140927d01A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.48 +/- 0.14	0.24	0.5	LT,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-M18-39
Lab ID: 1407417-34
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 325 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140927d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.65 +/- 0.30	0.43		G,TI
14596-10-2	Am-241	-0.7 +/- 1.1	2.1		U,G
14913-49-6	Bi-212	1.1 +/- 1.2	1.9		U,G
14733-03-0	Bi-214	0.39 +/- 0.19	0.24	0.5	LT,G,J
10198-40-0	Co-60	0.011 +/- 0.034	0.071		U,G
10045-97-3	Cs-137	0.014 +/- 0.066	0.123		U,G
14683-23-9	Eu-152	-0.35 +/- 0.36	0.87		U,G
15585-10-1	Eu-154	-0.22 +/- 0.37	0.81		U,G
13966-00-2	K-40	8.1 +/- 2.2	1.8	1	M3,G
15100-28-4	Pa-234m	1 +/- 12	23		U,G
15092-94-1	Pb-212	0.62 +/- 0.19	0.23		G
15067-28-4	Pb-214	0.58 +/- 0.19	0.28	0.5	G,J
15065-10-8	Th-234	0.4 +/- 1.3	2.2	5	U,G
14913-50-9	Tl-208	0.22 +/- 0.11	0.14		G
15117-96-1	U-235	0.08 +/- 0.42	0.73		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental – FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-M18-39
Lab ID: 1407417-34
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 325 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140927d01

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-19 +/- 69	127		U,G,J
7440-29-1	Th-232	0.65 +/- 0.30	0.43		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-M18-26
Lab ID: 1407417-35
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 291 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141005d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.82 +/- 0.17	0.24	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-M18-26
Lab ID: 1407417-35
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 291 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141005d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.57 +/- 0.25	0.48		G
14596-10-2	Am-241	-0.6 +/- 1.5	2.9		U,G
14913-49-6	Bi-212	-0.1 +/- 1.1	2.1		U,G
14733-03-0	Bi-214	0.77 +/- 0.24	0.24	0.5	G,J
10198-40-0	Co-60	0 +/- 0.079	0.153		U,G
10045-97-3	Cs-137	0.097 +/- 0.093	0.145		U,G
14683-23-9	Eu-152	0.24 +/- 0.32	0.52		U,G
15585-10-1	Eu-154	0.11 +/- 0.39	0.70		U,G
13966-00-2	K-40	9.0 +/- 2.1	1.4	1	M3,G
15100-28-4	Pa-234m	0 +/- 11	21		U,G
15092-94-1	Pb-212	0.66 +/- 0.21	0.26		G
15067-28-4	Pb-214	0.85 +/- 0.21	0.24	0.5	G,J
15065-10-8	Th-234	0.3 +/- 1.6	2.8	5	U,G
14913-50-9	Tl-208	0.19 +/- 0.10	0.14		G
15117-96-1	U-235	0.32 +/- 0.42	0.69		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-M18-26
Lab ID: 1407417-35
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 291 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141005d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	20 +/- 140	250		U,G,J
7440-29-1	Th-232	0.57 +/- 0.25	0.48		G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-N20-36
Lab ID: 1407417-36
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 276 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140973d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.91 +/- 0.19	0.29	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-N20-36
Lab ID: 1407417-36
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 276 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140973d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.80 +/- 0.47	0.64		G,TI
14596-10-2	Am-241	-0.25 +/- 0.73	1.37		U,G
14913-49-6	Bi-212	0.3 +/- 1.2	2.2		U,G
14733-03-0	Bi-214	0.91 +/- 0.29	0.30	0.5	G,J
10198-40-0	Co-60	-0.002 +/- 0.094	0.185		U,G
10045-97-3	Cs-137	0.044 +/- 0.081	0.140		U,G
14683-23-9	Eu-152	0.34 +/- 0.48	0.80		U,G
15585-10-1	Eu-154	-0.34 +/- 0.38	0.89		U,G
13966-00-2	K-40	8.5 +/- 2.4	2.0	1	M3,G
15100-28-4	Pa-234m	-6 +/- 11	25		U,G
15092-94-1	Pb-212	0.51 +/- 0.19	0.24		G
15067-28-4	Pb-214	0.90 +/- 0.23	0.29	0.5	G,J
15065-10-8	Th-234	0.7 +/- 1.4	2.3	5	U,G
14913-50-9	Tl-208	0.133 +/- 0.094	0.135		U,G
15117-96-1	U-235	0.07 +/- 0.39	0.68		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-N20-36
Lab ID: 1407417-36
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 276 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140973d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	18 +/- 37	62		U,G,J
7440-29-1	Th-232	0.80 +/- 0.47	0.64		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-N20-29
Lab ID: 1407417-37
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 325 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140905d07A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.30 +/- 0.21	0.20	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-N20-29
Lab ID: 1407417-37
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 325 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140905d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.52 +/- 0.35	0.49		G,TI
14596-10-2	Am-241	0.20 +/- 0.55	0.95		U,G
14913-49-6	Bi-212	0.4 +/- 1.1	2.0		U,G
14733-03-0	Bi-214	1.27 +/- 0.28	0.21	0.5	G,J
10198-40-0	Co-60	-0.008 +/- 0.062	0.128		U,G
10045-97-3	Cs-137	0.001 +/- 0.068	0.128		U,G
14683-23-9	Eu-152	-0.15 +/- 0.42	0.85		U,G
15585-10-1	Eu-154	-0.11 +/- 0.37	0.74		U,G
13966-00-2	K-40	8.0 +/- 2.0	1.4	1	M3,G
15100-28-4	Pa-234m	-1 +/- 11	21		U,G
15092-94-1	Pb-212	0.81 +/- 0.19	0.19		G
15067-28-4	Pb-214	1.33 +/- 0.25	0.20	0.5	G,J
15065-10-8	Th-234	0.3 +/- 1.1	1.9	5	U,G
14913-50-9	Tl-208	0.176 +/- 0.094	0.128		G
15117-96-1	U-235	-0.05 +/- 0.37	0.65		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-N20-29
Lab ID: 1407417-37
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 325 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140905d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-15 +/- 13	25		U,G,J
7440-29-1	Th-232	0.52 +/- 0.35	0.49		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-O23-40
Lab ID: 1407417-38
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 210 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140844d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.51 +/- 0.29	0.34	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-O23-40
Lab ID: 1407417-38
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 210 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140844d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.04 +/- 0.50	0.81		G,TI
14596-10-2	Am-241	0.05 +/- 0.14	0.24		U,G
14913-49-6	Bi-212	2.0 +/- 1.5	2.0		U,G
14733-03-0	Bi-214	1.45 +/- 0.41	0.41	0.5	G,J
10198-40-0	Co-60	-0.06 +/- 0.10	0.23		U,G
10045-97-3	Cs-137	0.11 +/- 0.12	0.19		U,G
14683-23-9	Eu-152	0.21 +/- 0.42	0.75		U,G
15585-10-1	Eu-154	-0.19 +/- 0.57	1.17		U,G
13966-00-2	K-40	9.2 +/- 2.9	2.7	1	M3,G
15100-28-4	Pa-234m	-6 +/- 18	37		U,G
15092-94-1	Pb-212	1.37 +/- 0.32	0.29		G
15067-28-4	Pb-214	1.55 +/- 0.34	0.34	0.5	G,J
15065-10-8	Th-234	2.0 +/- 1.2	2.3	5	U,G
14913-50-9	Tl-208	0.37 +/- 0.15	0.18		G
15117-96-1	U-235	0.20 +/- 0.44	0.76		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-O23-40
Lab ID: 1407417-38
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 210 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140844d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	4.0 +/- 2.5	3.8		G,J
7440-29-1	Th-232	1.04 +/- 0.50	0.81		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-K16-37
Lab ID: 1407417-39
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 238 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141337d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.33 +/- 0.38	0.39	0.5	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-K16-37
Lab ID: 1407417-39
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 238 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141337d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	1.28 +/- 0.54	1.08		G,TI
14596-10-2	Am-241	-0.15 +/- 0.72	1.30		U,G
14913-49-6	Bi-212	2.0 +/- 1.6	2.4		U,G
14733-03-0	Bi-214	2.45 +/- 0.55	0.46	0.5	G,J
10198-40-0	Co-60	-0.05 +/- 0.13	0.27		U,G
10045-97-3	Cs-137	0.09 +/- 0.14	0.23		U,G
14683-23-9	Eu-152	0.58 +/- 0.68	1.08		U,G
15585-10-1	Eu-154	-0.47 +/- 0.67	1.42		U,G
13966-00-2	K-40	7.4 +/- 2.9	3.4	1	M3,G
15100-28-4	Pa-234m	2 +/- 20	37		U,G
15092-94-1	Pb-212	1.74 +/- 0.34	0.26		G
15067-28-4	Pb-214	2.27 +/- 0.41	0.39	0.5	G,J
15065-10-8	Th-234	1.2 +/- 2.0	3.3	5	U,G
14913-50-9	Tl-208	0.55 +/- 0.18	0.19		G
15117-96-1	U-235	-0.04 +/- 0.53	0.95		U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-K16-37
Lab ID: 1407417-39
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 238 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 141337d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	-12 +/- 25	47		U,G,J
7440-29-1	Th-232	1.28 +/- 0.54	1.08		G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-24(DUP)
Lab ID: 1407417-40
Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-1
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 292 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140895d05A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.77 +/- 0.16	0.19	0.5	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-24(DUP)
Lab ID: 1407417-40
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-2
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 292 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140895d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.80 +/- 0.28	0.51		
14596-10-2	Am-241	0 +/- 1.2	2.2		U
14913-49-6	Bi-212	0.55 +/- 0.90	1.52		U
14733-03-0	Bi-214	0.68 +/- 0.23	0.25	0.5	J
10198-40-0	Co-60	0.027 +/- 0.051	0.091		U
10045-97-3	Cs-137	0.70 +/- 0.16	0.11		
14683-23-9	Eu-152	0.24 +/- 0.32	0.52		U
15585-10-1	Eu-154	-0.04 +/- 0.38	0.74		U
13966-00-2	K-40	8.6 +/- 2.1	1.5	1	M3
15100-28-4	Pa-234m	4 +/- 11	19		U
15092-94-1	Pb-212	0.71 +/- 0.20	0.22		
15067-28-4	Pb-214	0.82 +/- 0.19	0.19	0.5	J
15065-10-8	Th-234	0.3 +/- 1.3	2.3	5	U
14913-50-9	Tl-208	0.199 +/- 0.089	0.109		
15117-96-1	U-235	-0.11 +/- 0.33	0.61		U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Gamma Spectroscopy Results

PAI 713 Rev 13

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1407417
Client Name: Tidewater, Inc.
ClientProject ID: Great Kills Park N303-540

Field ID: GKP-CS-J17-24(DUP)
Lab ID: 1407417-40
Library: HUNTERS_POIN

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 11
Date Collected: 18-Jul-14
Date Prepared: 27-Jul-14
Date Analyzed: 17-Aug-14

Prep Batch: GS140724-2
QCBatchID: GS140724-2-2
Run ID: GS140724-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 292 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 140895d05

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14255-04-0	Pb-210	40 +/- 100	170		U,J
7440-29-1	Th-232	0.80 +/- 0.28	0.51		

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *GSS1407417-1*

Section 5

RAW DATA

5

140919D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-1 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:26:44
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.05E+002 g	Real Time	1903 Sec
Collection Efficiency	1.0000	Spc. File	.140919D01.SPC

Detector #: 1 (Detector 1)

Energy(keV) = -2.00 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.68	153.14	177	44	29	190	0.74	a
2	77.03	157.84	358	56	34	238	0.77	b
3	83.81	171.38	36	35	27	164	0.71	a
4	87.00	177.75	153	51	36	246	0.94	b
5	89.83	183.41	66	37	27	164	0.66	c
6	186.15	375.76	358	60	38	246	1.11	a
7	238.58	480.49	235	49	31	169	1.16	a
8	241.99	487.29	502	56	28	145	1.04	b
9	258.97	521.21	30	31	24	117	0.79	a
10	295.15	593.47	979	70	26	124	0.97	a
11	338.71	680.46	33	35	27	116	1.27	a
12	351.82	706.65	1749	89	26	112	1.13	a
13	510.74	1024.03	74	36	26	96	2.13	a Wide Pk
14	583.15	1168.66	45	23	16	48	1.18	a
15	609.27	1220.81	1391	77	17	55	1.24	a
16	665.68	1333.48	26	23	17	54	1.24	a
17	727.61	1457.16	23	19	13	36	1.19	a
18	768.40	1538.63	136	28	13	32	1.51	a
19	785.95	1573.68	22	18	13	29	1.31	a
20	806.19	1614.11	20	16	11	26	1.00	a
21	911.34	1824.11	27	24	18	55	2.01	a
22	933.98	1869.32	65	22	12	30	1.55	a
23	1120.39	2241.63	298	37	12	25	1.85	a
24	1155.70	2312.13	25	20	15	37	1.76	a

140919D01.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1238.27	2477.03	99	26	14	35	1.77	a
26	1281.25	2562.89	19	11	6	9	0.92	a
27	1377.52	2755.15	72	22	11	22	2.09	a
28	1401.30	2802.64	28	16	10	17	2.08	a
29	1408.34	2816.70	50	19	10	17	2.15	b
30	1460.91	2921.70	81	21	9	13	2.05	a
31	1509.26	3018.25	35	15	8	13	1.65	a
32	1729.31	3457.75	52	16	5	4	2.19	a
33	1764.46	3527.94	200	30	8	11	1.81	a
34	1847.28	3693.35	27	13	6	7	2.05	a

140919D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	83.81	36	35	27	35	35	28	
4	87.00	153	51	36	153	51	37	
6	186.15	358	60	38	353	60	38	
7	238.58	235	49	31	230	49	32	
10	295.15	979	70	26	976	70	26	
11	338.71	33	35	27	31	35	27	
12	351.82	1749	89	26	1746	89	26	
13	510.74	74	36	26	35	37	29	
14	583.15	45	23	16	42	23	16	
15	609.27	1391	77	17	1389	78	18	
21	911.34	27	24	18	25	24	18	
23	1120.39	298	37	12	296	38	12	
30	1460.91	81	21	9	68	21	11	
33	1764.46	200	30	8	199	30	8	

140919D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-1 GS140724-1

Sampling Start: 07/16/2014 12:00:00	Counting Start: 08/16/2014 09:26:44
Sampling Stop: 07/16/2014 12:00:00	Decay Time. . . . . 7.41e+002 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 3.05e+002 g	Real Time . . . . . 1903 Sec
Collection Efficiency 1.0000	Spectrum File 140919D01.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)			MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	-8.08E-01	+-	1.02E+00	1.79E+00	8.64E-01	6.17E+12
	185.72		I.D.		. . . .	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.64E+00	+-	3.51E-01	4.75E-01	2.28E-01	1.67E+04
Pb-214	Average:x		1.72E+01	+-	7.16E-01	. . . .	. . . .	1.40E+07
	295.22		1.65E+01	+-	1.19E+00	9.35E-01	4.45E-01	1.40E+07
	351.99		1.75E+01	+-	8.97E-01	5.48E-01	2.60E-01	1.40E+07
Ac-228	Average:x		8.36E-01	+-	6.21E-01	. . . .	. . . .	1.23E+14
	338.40		9.93E-01	+-	1.12E+00	1.83E+00	8.72E-01	1.23E+14
	911.07		7.66E-01	+-	7.47E-01	1.20E+00	5.61E-01	1.23E+14
Tl-208	583.14		2.85E-01	+-	1.58E-01	2.35E-01	1.09E-01	1.67E+04
Bi-214	Average:x		1.74E+01	+-	8.90E-01	. . . .	. . . .	1.40E+07
	609.32		1.73E+01	+-	9.65E-01	4.73E-01	2.20E-01	1.40E+07
	1120.28		1.82E+01	+-	2.30E+00	1.68E+00	7.58E-01	1.40E+07
Bi-212	727.17		2.41E+00	+-	1.96E+00	3.07E+00	1.39E+00	1.67E+04
Eu-152	1408.08		2.66E+00	+-	9.82E-01	1.19E+00	5.24E-01	1.17E+05
K-40	1460.75		7.01E+00	+-	2.17E+00	2.51E+00	1.12E+00	1.12E+13
Pb-210	46.50	N	-1.99E+02	+-	1.48E+02	2.73E+02	1.31E+02	1.95E+05
Am-241	59.54	N	-1.33E+00	+-	2.36E+00	4.20E+00	2.01E+00	3.80E+06
Th-234	92.50	N	-6.85E-02	+-	2.76E+00	4.73E+00b	2.27E+00	3.92E+13
Cs-137	661.62	N	1.80E-01	+-	1.56E-01	2.47E-01B	1.14E-01	2.64E+05
Pa-234m	1001.03	N	1.87E+01	+-	2.39E+01	3.93E+01	1.77E+01	3.92E+13
Eu-154	1004.80	N	-2.38E-01	+-	7.90E-01	1.47E+00	6.72E-01	7.45E+04
Co-60	1332.51	N	1.13E-01	+-	1.39E-01	2.28E-01	9.93E-02	4.62E+04

140919D01.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 6.84E+01 +- 3.20E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.68	153.14	177	44	29	190	0.74	Unknown
2	77.03	157.84	359	56	34	238	0.77	Unknown
3	83.81	171.38	35	35	28	164	0.71	Unknown
4	87.00	177.75	153	51	37	246	0.94	Unknown
5	89.83	183.41	66	37	27	164	0.66	Unknown
8	241.99	487.29	502	56	28	145	1.04	Unknown
9	258.97	521.21	30	31	24	117	0.79	Unknown
13	510.74	1024.03	35	37	29	96	2.13	Unknown
16	665.68	1333.48	26	23	17	54	1.24	Unknown
18	768.40	1538.63	136	28	13	32	1.51	Unknown
19	785.95	1573.68	22	18	13	29	1.31	Unknown
20	806.19	1614.11	20	16	11	26	1.00	Unknown
22	933.98	1869.32	65	22	12	30	1.55	Unknown
24	1155.70	2312.13	25	20	15	37	1.76	Unknown
25	1238.27	2477.03	99	26	14	35	1.77	Unknown
26	1281.25	2562.89	19	11	6	9	0.92	Unknown
27	1377.52	2755.15	72	22	11	22	2.09	Unknown
28	1401.30	2802.64	28	16	10	17	2.08	Unknown
31	1509.26	3018.25	35	15	8	13	1.65	Unknown
32	1729.31	3457.75	52	16	5	4	2.19	Unknown
33	1764.46	3527.94	199	30	8	11	1.81	Unknown
34	1847.28	3693.35	27	13	6	7	2.05	Unknown

c:\SEEKER\BIN\140919d01.res Analysis Results Saved.

140919D01.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-1 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:26:44
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.05E+002 g	Real Time	1903 Sec
Collection Efficiency	1.0000	Spc. File	.140919D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.00 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.68	153.14	177	44	29	190	0.74 a	
2	77.03	157.84	358	56	34	238	0.77 b	
3	83.81	171.38	36	35	27	164	0.71 a	
4	87.00	177.75	153	51	36	246	0.94 b	
5	89.83	183.41	66	37	27	164	0.66 c	
6	186.15	375.76	358	60	38	246	1.11 a	
7	238.58	480.49	235	49	31	169	1.16 a	
8	241.99	487.29	502	56	28	145	1.04 b	
9	258.97	521.21	30	31	24	117	0.79 a	
10	295.15	593.47	979	70	26	124	0.97 a	
11	338.71	680.46	33	35	27	116	1.27 a	
12	351.82	706.65	1749	89	26	112	1.13 a	
13	510.74	1024.03	74	36	26	96	2.13 a	Wide Pk
14	583.15	1168.66	45	23	16	48	1.18 a	
15	609.27	1220.81	1391	77	17	55	1.24 a	
16	665.68	1333.48	26	23	17	54	1.24 a	
17	727.61	1457.16	23	19	13	36	1.19 a	
18	768.40	1538.63	136	28	13	32	1.51 a	
19	785.95	1573.68	22	18	13	29	1.31 a	
20	806.19	1614.11	20	16	11	26	1.00 a	
21	911.34	1824.11	27	24	18	55	2.01 a	
22	933.98	1869.32	65	22	12	30	1.55 a	
23	1120.39	2241.63	298	37	12	25	1.85 a	
24	1155.70	2312.13	25	20	15	37	1.76 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1238.27	2477.03	99	26	14	35	1.77	a
26	1281.25	2562.89	19	11	6	9	0.92	a
27	1377.52	2755.15	72	22	11	22	2.09	a
28	1401.30	2802.64	28	16	10	17	2.08	a
29	1408.34	2816.70	50	19	10	17	2.15	b
30	1460.91	2921.70	81	21	9	13	2.05	a
31	1509.26	3018.25	35	15	8	13	1.65	a
32	1729.31	3457.75	52	16	5	4	2.19	a
33	1764.46	3527.94	200	30	8	11	1.81	a
34	1847.28	3693.35	27	13	6	7	2.05	a

140919D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	83.81	36	35	27	35	35	28	
4	87.00	153	51	36	153	51	37	
6	186.15	358	60	38	353	60	38	
7	238.58	235	49	31	230	49	32	
10	295.15	979	70	26	976	70	26	
11	338.71	33	35	27	31	35	27	
12	351.82	1749	89	26	1746	89	26	
13	510.74	74	36	26	35	37	29	
14	583.15	45	23	16	42	23	16	
15	609.27	1391	77	17	1389	78	18	
21	911.34	27	24	18	25	24	18	
23	1120.39	298	37	12	296	38	12	
30	1460.91	81	21	9	68	21	11	
33	1764.46	200	30	8	199	30	8	

140919D01.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-1 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:26:44
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.05e+002 g	Real Time	1903 Sec
Collection Efficiency	1.0000	Spectrum File	.140919D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013
Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.72E+01 +- 6.67E-01	. . . .	. . . .	1.40E+07
	295.21		1.65E+01 +- 1.19E+00	9.35E-01	4.45E-01	1.40E+07
	351.92		1.75E+01 +- 8.97E-01	5.48E-01	2.60E-01	1.40E+07
	609.31		1.72E+01 +- 3.05E+00	4.24E+00	2.10E+00	1.40E+07
	1120.29		1.82E+01 +- 2.30E+00	1.68E+00	7.58E-01	1.40E+07

MEASURED TOTAL: 1.72E+01 +- 6.67E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.68	153.14	177	44	29	190	0.74	Unknown
2	77.03	157.84	359	56	34	238	0.77	Unknown
3	83.81	171.38	35	35	28	164	0.71	Unknown
4	87.00	177.75	153	51	37	246	0.94	Unknown
5	89.83	183.41	66	37	27	164	0.66	Unknown
6	186.15	375.76	353	60	38	246	1.11	Unknown
7	238.58	480.49	230	49	32	169	1.16	Unknown
8	241.99	487.29	502	56	28	145	1.04	Unknown
9	258.97	521.21	30	31	24	117	0.79	Unknown
11	338.71	680.46	31	35	27	116	1.27	Unknown

140919D01.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	510.74	1024.03	35	37	29	96	2.13	Unknown
14	583.15	1168.66	42	23	16	48	1.18	Unknown
15	609.27	1220.81	1389	78	18	55	1.24	SPLIT
16	665.68	1333.48	26	23	17	54	1.24	Unknown
17	727.61	1457.16	23	19	13	36	1.19	Unknown
18	768.40	1538.63	136	28	13	32	1.51	Unknown
19	785.95	1573.68	22	18	13	29	1.31	Unknown
20	806.19	1614.11	20	16	11	26	1.00	Unknown
21	911.34	1824.11	25	24	18	55	2.01	Unknown
22	933.98	1869.32	65	22	12	30	1.55	Unknown
24	1155.70	2312.13	25	20	15	37	1.76	Unknown
25	1238.27	2477.03	99	26	14	35	1.77	Unknown
26	1281.25	2562.89	19	11	6	9	0.92	Unknown
27	1377.52	2755.15	72	22	11	22	2.09	Unknown
28	1401.30	2802.64	28	16	10	17	2.08	Unknown
29	1408.34	2816.70	50	19	10	17	2.15	Unknown
30	1460.91	2921.70	68	21	11	13	2.05	Unknown
31	1509.26	3018.25	35	15	8	13	1.65	Unknown
32	1729.31	3457.75	52	16	5	4	2.19	Unknown
33	1764.46	3527.94	199	30	8	11	1.81	Unknown
34	1847.28	3693.35	27	13	6	7	2.05	Unknown
36	609.27	1220.81	3	514	18	55	1.24	1120SEsc

c:\SEEKER\BIN\140919d01A.res Analysis Results Saved.

140998D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-1D GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 10:14:16
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.42E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.05E+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spc. File	.140998D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.44 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.79	152.21	178	56	41	307	0.94 a	
2	77.01	156.63	296	55	36	256	0.81 b	
3	79.35	161.31	25	32	25	154	0.44 c	NET< CL
4	83.62	169.83	33	39	30	205	0.72 d	
5	87.10	176.78	160	56	41	307	0.98 e	
6	89.83	182.24	43	39	30	205	0.68 f	
7	92.80	188.15	38	45	36	256	0.80 g	
8	107.73	217.97	30	39	31	193	0.79 a	NET< CL
9	186.06	374.39	422	63	39	278	1.05 a	
10	238.64	479.37	225	50	33	199	1.02 a	
11	241.90	485.88	592	66	37	232	1.14 b	
12	259.13	520.28	27	30	23	116	0.60 a	
13	295.21	592.32	1331	83	33	182	1.12 a	
14	338.48	678.70	64	46	36	189	1.54 a	
15	351.85	705.42	2281	101	28	143	1.24 a	
16	511.03	1023.24	68	31	21	79	1.41 a	
17	583.30	1167.55	70	29	20	76	1.15 a	
18	609.30	1219.45	1810	89	21	74	1.45 a	
19	665.48	1331.63	19	29	23	89	1.48 a	NET< CL
20	768.42	1537.17	154	32	17	52	1.71 a	
21	785.74	1571.76	31	21	14	41	1.41 a	
22	795.02	1590.28	19	16	11	26	0.98 a	
23	910.90	1821.67	58	26	17	49	2.01 a	
24	934.20	1868.18	84	24	13	30	1.59 a	

140998D02.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1120.29	2239.75	344	41	14	36	1.98	a
26	1238.38	2475.53	133	28	13	32	1.71	a
27	1281.13	2560.91	26	16	10	23	1.46	a
28	1377.56	2753.45	116	26	12	27	2.14	a
29	1385.15	2768.60	19	14	9	19	1.53	b
30	1408.08	2814.38	34	17	11	26	1.34	a
31	1460.90	2919.85	107	25	11	23	1.94	a
32	1509.69	3017.27	40	21	13	33	1.92	a
33	1661.40	3320.19	24	14	8	11	2.18	a
34	1729.86	3456.89	40	20	13	21	3.39	a
35	1764.47	3525.99	267	34	8	12	2.32	a
36	1847.44	3691.65	23	13	7	11	1.47	a

140998D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
4	83.62	33	39	30	32	39	31	
5	87.10	160	56	41	159	56	41	
7	92.80	38	45	36	30	45	36	NET<CL
9	186.06	422	63	39	413	63	39	
10	238.64	225	50	33	218	50	33	
13	295.21	1331	83	33	1329	83	33	
14	338.48	64	46	36	62	47	36	
15	351.85	2281	101	28	2276	101	28	
16	511.03	68	31	21	22	32	25	NET<CL
17	583.30	70	29	20	66	29	20	
18	609.30	1810	89	21	1803	89	21	
23	910.90	58	26	17	56	26	17	
25	1120.29	345	41	14	343	41	14	
31	1460.90	107	25	11	95	25	13	
35	1764.47	267	34	8	265	34	9	

140998D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-1D GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 10:14:16
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.42e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.05e+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spectrum File	.140998D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013
Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50	N	1.88E+00 +- 2.84E+00	4.70E+00	2.27E+00	3.92E+13
U-235	143.76	N	7.94E-01 +- 9.21E-01	1.51E+00	7.30E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.30E+00 +- 2.98E-01	4.12E-01	1.98E-01	1.67E+04
Pb-214	Average:x		1.78E+01 +- 6.46E-01	. . . .	. . . .	1.40E+07
	295.22		1.72E+01 +- 1.08E+00	8.88E-01	4.27E-01	1.40E+07
	351.99		1.81E+01 +- 8.07E-01	4.71E-01	2.25E-01	1.40E+07
Ac-228	Average:x		1.36E+00 +- 5.38E-01	. . . .	. . . .	1.23E+14
	338.40		1.57E+00 +- 1.19E+00	1.92E+00	9.24E-01	1.23E+14
	911.07		1.31E+00 +- 6.02E-01	8.72E-01	4.04E-01	1.23E+14
Tl-208	583.14		3.48E-01 +- 1.55E-01	2.26E-01	1.06E-01	1.67E+04
Bi-214	Average:x		1.59E+01 +- 1.75E+00	. . . .	. . . .	1.40E+07
	1120.28		1.59E+01 +- 1.90E+00	1.44E+00	6.58E-01	1.40E+07
	609.32		1.59E+01 +- 4.50E+00	7.02E+00	3.50E+00	1.40E+07
Eu-152	1408.08		1.35E+00 +- 6.95E-01	9.69E-01	4.31E-01	1.17E+05
K-40	1460.75		7.39E+00 +- 1.93E+00	2.19E+00	9.91E-01	1.12E+13
Pb-210	46.50	N	-2.18E+02 +- 3.00E+02	5.30E+02	2.55E+02	1.95E+05
Am-241	59.54	N	-1.27E+00 +- 3.29E+00	5.73E+00	2.76E+00	3.80E+06
Cs-137	661.62	N	2.09E-02 +- 1.50E-01	2.59E-01	1.22E-01	2.64E+05
Bi-212	727.17	N	1.91E+00 +- 1.67E+00	2.64E+00	1.21E+00	1.67E+04
Pa-234m	1001.03	N	2.29E+01 +- 2.08E+01	3.29E+01	1.50E+01	3.92E+13
Eu-154	1004.80	N	-1.16E-01 +- 7.00E-01	1.27E+00	5.86E-01	7.45E+04
Co-60	1332.51	N	-2.42E-02 +- 1.18E-01	2.21E-01	9.94E-02	4.62E+04

140998D02.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 7.30E+01 +- 3.24E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.79	152.21	178	56	41	307	0.94	Unknown
2	77.01	156.63	296	55	36	256	0.81	Unknown
3	79.35	161.31	25	32	25	154	0.44	Deleted
4	83.62	169.83	32	39	31	205	0.72	Unknown
5	87.10	176.78	159	56	41	307	0.98	Unknown
6	89.83	182.24	43	39	30	205	0.68	Unknown
8	107.73	217.97	30	39	31	193	0.79	Deleted
11	241.90	485.88	592	66	37	232	1.14	Unknown
12	259.13	520.28	27	30	23	116	0.60	Unknown
16	511.03	1023.24	22	32	25	79	1.41	Deleted
18	609.30	1219.45	1803	89	21	74	1.45	SPLIT
19	665.48	1331.63	19	29	23	89	1.48	Deleted
20	768.42	1537.17	154	32	17	52	1.71	Unknown
21	785.74	1571.76	31	21	14	41	1.41	Unknown
22	795.02	1590.28	19	16	11	26	0.98	Unknown
24	934.20	1868.18	84	24	13	30	1.59	Unknown
26	1238.38	2475.53	133	28	13	32	1.71	Unknown
27	1281.13	2560.91	26	16	10	23	1.46	Unknown
28	1377.56	2753.45	116	26	12	27	2.14	Unknown
29	1385.15	2768.60	20	14	9	19	1.53	Unknown
32	1509.69	3017.27	40	21	13	33	1.92	Unknown
33	1661.40	3320.19	24	14	8	11	2.18	Unknown
34	1729.86	3456.89	40	20	13	21	3.39	Unknown
35	1764.47	3525.99	265	34	9	12	2.32	Unknown
36	1847.44	3691.65	23	13	7	11	1.47	Unknown
38	609.30	1219.45	152	949	21	74	1.45	1120SEsc

c:\SEEKER\BIN\140998d02.res Analysis Results Saved.

140998D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-1D GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 10:14:16
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.42E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.05E+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spc. File	.140998D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.44 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.79	152.21	178	56	41	307	0.94 a	
2	77.01	156.63	296	55	36	256	0.81 b	
3	79.35	161.31	25	32	25	154	0.44 c	NET< CL
4	83.62	169.83	33	39	30	205	0.72 d	
5	87.10	176.78	160	56	41	307	0.98 e	
6	89.83	182.24	43	39	30	205	0.68 f	
7	92.80	188.15	38	45	36	256	0.80 g	
8	107.73	217.97	30	39	31	193	0.79 a	NET< CL
9	186.06	374.39	422	63	39	278	1.05 a	
10	238.64	479.37	225	50	33	199	1.02 a	
11	241.90	485.88	592	66	37	232	1.14 b	
12	259.13	520.28	27	30	23	116	0.60 a	
13	295.21	592.32	1331	83	33	182	1.12 a	
14	338.48	678.70	64	46	36	189	1.54 a	
15	351.85	705.42	2281	101	28	143	1.24 a	
16	511.03	1023.24	68	31	21	79	1.41 a	
17	583.30	1167.55	70	29	20	76	1.15 a	
18	609.30	1219.45	1810	89	21	74	1.45 a	
19	665.48	1331.63	19	29	23	89	1.48 a	NET< CL
20	768.42	1537.17	154	32	17	52	1.71 a	
21	785.74	1571.76	31	21	14	41	1.41 a	
22	795.02	1590.28	19	16	11	26	0.98 a	
23	910.90	1821.67	58	26	17	49	2.01 a	
24	934.20	1868.18	84	24	13	30	1.59 a	

140998D02.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1120.29	2239.75	344	41	14	36	1.98	a
26	1238.38	2475.53	133	28	13	32	1.71	a
27	1281.13	2560.91	26	16	10	23	1.46	a
28	1377.56	2753.45	116	26	12	27	2.14	a
29	1385.15	2768.60	19	14	9	19	1.53	b
30	1408.08	2814.38	34	17	11	26	1.34	a
31	1460.90	2919.85	107	25	11	23	1.94	a
32	1509.69	3017.27	40	21	13	33	1.92	a
33	1661.40	3320.19	24	14	8	11	2.18	a
34	1729.86	3456.89	40	20	13	21	3.39	a
35	1764.47	3525.99	267	34	8	12	2.32	a
36	1847.44	3691.65	23	13	7	11	1.47	a

140998D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
4	83.62	33	39	30	32	39	31	
5	87.10	160	56	41	159	56	41	
7	92.80	38	45	36	30	45	36	NET<CL
9	186.06	422	63	39	413	63	39	
10	238.64	225	50	33	218	50	33	
13	295.21	1331	83	33	1329	83	33	
14	338.48	64	46	36	62	47	36	
15	351.85	2281	101	28	2276	101	28	
16	511.03	68	31	21	22	32	25	NET<CL
17	583.30	70	29	20	66	29	20	
18	609.30	1810	89	21	1803	89	21	
23	910.90	58	26	17	56	26	17	
25	1120.29	345	41	14	343	41	14	
31	1460.90	107	25	11	95	25	13	
35	1764.47	267	34	8	265	34	9	

140998D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-1D GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 10:14:16
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.42e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.05e+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spectrum File	.140998D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.75E+01 +- 4.98E-01	. . . .	. . . .	1.40E+07
	295.21		1.72E+01 +- 1.08E+00	8.88E-01	4.27E-01	1.40E+07
	351.92		1.81E+01 +- 8.07E-01	4.71E-01	2.25E-01	1.40E+07
	609.31		1.74E+01 +- 8.57E-01	4.38E-01	2.06E-01	1.40E+07
	1120.29		1.59E+01 +- 1.90E+00	1.44E+00	6.58E-01	1.40E+07

MEASURED TOTAL: 1.75E+01 +- 4.98E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.79	152.21	178	56	41	307	0.94	Unknown
2	77.01	156.63	296	55	36	256	0.81	Unknown
3	83.62	169.83	32	39	31	205	0.72	Unknown
4	87.10	176.78	159	56	41	307	0.98	Unknown
5	89.83	182.24	43	39	30	205	0.68	Unknown
6	186.06	374.39	413	63	39	278	1.05	Unknown
7	238.64	479.37	218	50	33	199	1.02	Unknown
8	241.90	485.88	592	66	37	232	1.14	Unknown
9	259.13	520.28	27	30	23	116	0.60	Unknown
11	338.48	678.70	62	47	36	189	1.54	Unknown

140998D02.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	583.30	1167.55	66	29	20	76	1.15	Unknown
15	609.30	1219.45	1651	466	362	74	1.45	1120SEsc
16	609.30	1219.45	152	949	21	74	1.45	Unknown
17	768.42	1537.17	154	32	17	52	1.71	Unknown
18	785.74	1571.76	31	21	14	41	1.41	Unknown
19	795.02	1590.28	19	16	11	26	0.98	Unknown
20	910.90	1821.67	56	26	17	49	2.01	Unknown
21	934.20	1868.18	84	24	13	30	1.59	Unknown
23	1238.38	2475.53	133	28	13	32	1.71	Unknown
24	1281.13	2560.91	26	16	10	23	1.46	Unknown
25	1377.56	2753.45	116	26	12	27	2.14	Unknown
26	1385.15	2768.60	20	14	9	19	1.53	Unknown
27	1408.08	2814.38	34	17	11	26	1.34	Unknown
28	1460.90	2919.85	95	25	13	23	1.94	Unknown
29	1509.69	3017.27	40	21	13	33	1.92	Unknown
30	1661.40	3320.19	24	14	8	11	2.18	Unknown
31	1729.86	3456.89	40	20	13	21	3.39	Unknown
32	1764.47	3525.99	265	34	9	12	2.32	Unknown
33	1847.44	3691.65	23	13	7	11	1.47	Unknown

c:\SEEKER\BIN\140998d02A.res Analysis Results Saved.

140997D02.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-2 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:26:52
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.47E+002 g	Real Time	1903 Sec
Collection Efficiency	1.0000	Spc. File	.140997D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.44 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	53.29	109.28	123	165	135	4458	0.43	a	NET< CL
2	74.77	152.17	8147	366	262	11692	1.12	a	
3	77.03	156.67	14621	372	233	10022	0.96	b	
4	79.21	161.02	969	220	174	6681	0.73	c	
5	83.90	170.40	397	268	218	8747	0.93	a	
6	87.09	176.76	7332	343	245	10205	1.17	b	
7	89.75	182.08	2792	285	218	8747	1.02	c	
8	147.21	296.81	123	175	143	5009	0.48	a	NET< CL
9	186.16	374.58	16954	380	227	9548	1.05	a	
10	196.14	394.50	286	236	192	7450	0.82	a	
11	241.98	486.04	27042	417	210	7540	1.13	a	
12	258.93	519.88	1703	229	175	5680	1.04	a	
13	274.70	551.35	1286	221	172	5438	1.05	a	
14	281.01	563.96	209	185	150	4532	0.82	b	
15	295.22	592.33	60704	541	184	5761	1.17	a	
16	320.34	642.49	128	162	132	3517	0.89	a	NET< CL
17	324.31	650.42	157	185	151	4220	0.94	b	
18	333.29	668.35	188	139	112	2772	0.69	a	
19	351.87	705.44	102485	674	173	5526	1.23	a	
20	386.92	775.44	614	176	139	3784	1.13	a	
21	389.01	779.60	917	179	139	3784	1.13	b	
22	405.79	813.12	384	144	114	2934	0.80	a	
23	454.61	910.58	647	178	140	3417	1.48	a	
24	461.79	924.92	627	214	171	4317	1.89	a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	469.79	940.91	403	152	121	2692	1.32 a	
26	474.34	949.98	311	138	109	2356	1.19 b	
27	480.43	962.15	728	143	109	2356	1.12 c	
28	487.11	975.48	886	184	143	3365	1.58 d	
29	510.92	1023.02	780	213	169	4037	2.10 a	Wide Pk
30	533.72	1068.55	456	154	122	2588	1.44 a	
31	572.71	1146.39	109	84	67	1101	0.71 a	
32	580.14	1161.24	474	128	99	1926	1.13 a	
33	609.32	1219.51	78409	576	112	2172	1.46 a	Wide Pk
34	615.14	1231.13	65	90	73	1207	0.88 b	NET< CL
35	617.14	1235.10	0	260	214	4828	3.30 c	NET< CL
36	640.12	1280.99	115	159	129	2358	2.08 a	NET< CL
37	649.07	1298.86	124	109	88	1424	1.29 a	
38	665.58	1331.83	2270	152	97	1650	1.45 a	
39	683.26	1367.13	104	79	63	907	0.83 a	
40	703.24	1407.04	776	149	114	2006	1.75 a	
41	719.94	1440.37	489	119	91	1601	1.42 a	
42	727.62	1455.70	67	92	75	1207	1.07 a	NET< CL
43	740.85	1482.12	44	73	59	852	0.83 a	NET< CL
44	742.46	1485.34	304	147	117	2214	2.21 b	
45	752.48	1505.35	143	118	95	1660	1.59 a	
46	768.50	1537.33	7161	205	95	1682	1.63 a	
47	786.02	1572.33	1688	140	94	1618	1.63 a	
48	806.32	1612.84	1598	133	88	1499	1.52 a	
49	821.20	1642.55	218	103	81	1350	1.28 a	
50	826.46	1653.07	143	75	59	844	0.81 b	
51	838.91	1677.93	799	112	80	1307	1.37 a	
52	934.18	1868.14	4024	173	97	1664	1.80 a	
53	963.98	1927.64	363	114	88	1434	1.70 a	
54	1033.11	2065.69	49	100	81	1218	1.59 a	NET< CL
55	1052.04	2103.48	362	119	92	1434	1.90 a	
56	1070.09	2139.51	266	93	72	995	1.55 a	
57	1120.35	2239.87	16506	277	86	1358	1.93 a	
58	1133.85	2266.82	243	101	79	1196	1.76 a	
59	1155.35	2309.75	1880	129	78	1187	1.87 a	
60	1181.79	2362.54	103	88	71	1009	1.58 a	
61	1207.83	2414.54	419	92	67	917	1.65 a	
62	1238.21	2475.21	6077	184	80	1136	2.05 a	
63	1253.57	2505.88	418	130	102	1524	2.97 a	
64	1281.18	2561.01	1396	117	74	1005	1.96 a	
65	1303.84	2606.24	90	85	68	893	1.72 a	
66	1377.69	2753.70	4200	156	71	941	2.00 a	
67	1385.41	2769.12	772	103	71	941	1.90 b	
68	1401.75	2801.75	1206	113	73	992	1.97 a	
69	1408.12	2814.46	2231	134	78	1075	2.07 b	
70	1509.15	3016.19	1660	123	75	1052	2.00 a	HiResid
71	1538.80	3075.39	280	79	59	743	1.55 a	
72	1543.49	3084.75	364	102	78	1073	2.19 b	
73	1583.36	3164.36	546	94	67	794	2.06 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
74	1594.68	3186.96	202	77	59	672	1.85	b
75	1599.31	3196.20	217	82	63	733	1.94	c
76	1661.43	3320.24	837	87	54	491	2.25	a
77	1684.17	3365.65	172	61	45	374	1.90	a
78	1693.43	3384.14	262	75	56	499	2.66	b
79	1729.65	3456.46	2811	122	50	410	2.48	a
80	1764.55	3526.14	13137	236	47	370	2.49	a
81	1838.43	3673.66	222	58	41	286	2.30	a
82	1847.39	3691.56	1801	100	43	306	2.54	b
83	1873.02	3742.73	173	53	38	246	2.24	a
84	1889.97	3776.57	60	52	41	314	1.99	a
85	1935.96	3868.40	124	60	46	332	2.58	a

140997D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	53.29	123	165	135	121	165	135	NET<CL
5	83.90	397	268	218	396	268	218	
6	87.09	7332	343	245	7331	343	245	
9	186.16	16954	380	227	16945	380	227	
10	196.14	286	236	192	281	236	192	
15	295.22	60704	541	184	60701	541	184	
19	351.87	102485	674	173	102481	674	173	
24	461.79	627	214	171	626	214	171	
29	510.92	780	213	169	733	213	170	
33	609.32	78409	576	112	78402	576	112	
37	649.07	124	109	88	123	109	88	
57	1120.35	16506	277	86	16504	277	86	
80	1764.55	13137	236	47	13135	236	48	

140997D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-2 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:26:52
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.47e+002 g	Real Time	1903 Sec
Collection Efficiency	1.0000	Spectrum File	.140997D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)		MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	-1.17E-01	+- 6.54E+00	1.08E+01	5.38E+00	6.17E+12
	185.72		I.D.	. . . .	. . . .	. . . .	6.17E+12
Pb-214	Average:x		9.94E+02	+- 5.26E+00	. . . .	. . . .	1.40E+07
	295.22		9.70E+02	+- 8.65E+00	5.92E+00	2.94E+00	1.40E+07
	351.99		1.01E+03	+- 6.63E+00	3.43E+00	1.70E+00	1.40E+07
Bi-214	Average:x		9.37E+02	+- 6.31E+00	. . . .	. . . .	1.40E+07
	609.32		9.36E+02	+- 6.88E+00	2.70E+00	1.34E+00	1.40E+07
	1120.28		9.47E+02	+- 1.59E+01	1.00E+01	4.92E+00	1.40E+07
Pb-210	46.50	N	1.48E+03	+- 2.12E+03	3.49E+03	1.73E+03	1.95E+05
Am-241	59.54	N	2.71E+00	+- 2.40E+01	3.98E+01	1.97E+01	3.80E+06
Th-234	92.50	N	4.03E+00	+- 1.99E+01	3.28E+01b	1.63E+01	3.92E+13
Pb-212	238.63	N	1.97E+00	+- 1.70E+00	2.79E+00B	1.39E+00	1.67E+04
Tl-208	583.14	N	7.67E-02	+- 8.64E-01	2.02E+00r	1.00E+00	1.67E+04
Cs-137	661.62	N	-3.87E-01	+- 1.26E+00	2.11E+00R	1.04E+00	2.64E+05
Bi-212	727.17	N	2.15E+00	+- 1.08E+01	1.79E+01	8.82E+00	1.67E+04
Ac-228	911.07	N	-3.16E-01	+- 3.40E+00	5.69E+00	2.80E+00	1.23E+14
Pa-234m	1001.03	N	-3.88E+01	+- 1.50E+02	2.51E+02	1.24E+02	3.92E+13
Eu-154	1004.80	N	2.56E+00	+- 4.94E+00	8.16E+00	4.02E+00	7.45E+04
Co-60	1332.51	N	-1.90E-01	+- 8.89E-01	1.50E+00	7.35E-01	4.62E+04
Eu-152	1408.08	N	4.09E+01	+- 1.27E+01	2.00E+01r	9.94E+00	1.17E+05
K-40	1460.75	N	5.89E+00	+- 9.09E+00	1.50E+01	7.37E+00	1.12E+13

MEASURED TOTAL: 3.47E+03 +- 2.21E+03 pCi/g

140997D02.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.29	109.28	121	165	135	4458	0.43	Deleted
2	74.77	152.17	8147	366	262	11692	1.12	Unknown
3	77.03	156.67	14621	372	233	10022	0.96	Unknown
4	79.21	161.02	969	220	174	6681	0.73	Unknown
5	83.90	170.40	396	268	218	8747	0.93	Unknown
6	87.09	176.76	7331	343	245	10205	1.17	Unknown
7	89.75	182.08	2792	285	218	8747	1.02	Unknown
8	147.21	296.81	123	175	143	5009	0.48	Deleted
10	196.14	394.50	281	236	192	7450	0.82	Unknown
11	241.98	486.04	27042	417	210	7540	1.13	Unknown
12	258.93	519.88	1703	229	175	5680	1.04	1281DEsc
13	274.70	551.35	1286	221	172	5438	1.05	Unknown
14	281.01	563.96	209	185	150	4532	0.82	Unknown
16	320.34	642.49	128	162	132	3517	0.89	Deleted
17	324.31	650.42	157	185	151	4220	0.94	Unknown
18	333.29	668.35	188	139	112	2772	0.69	Unknown
20	386.92	775.44	614	176	139	3784	1.13	1408DEsc
21	389.01	779.60	917	179	139	3784	1.13	Unknown
22	405.79	813.12	384	144	114	2934	0.80	Unknown
23	454.61	910.58	647	178	140	3417	1.48	Unknown
24	461.79	924.92	626	214	171	4317	1.89	Unknown
25	469.79	940.91	403	152	121	2692	1.32	Unknown
26	474.34	949.98	311	138	109	2356	1.19	Unknown
27	480.43	962.15	728	143	109	2356	1.12	Unknown
28	487.11	975.48	886	184	143	3365	1.58	1509DEsc
29	510.92	1023.02	733	213	170	4037	2.10	Unknown
30	533.72	1068.55	456	154	122	2588	1.44	Unknown
31	572.71	1146.39	109	84	67	1101	0.71	1595DEsc
32	580.14	1161.24	474	128	99	1926	1.13	Unknown
34	615.14	1231.13	65	90	73	1207	0.88	Deleted
35	617.14	1235.10	0	260	214	4828	3.30	Deleted
36	640.12	1280.99	115	159	129	2358	2.08	Deleted
37	649.07	1298.86	123	109	88	1424	1.29	Unknown
38	665.58	1331.83	2270	152	97	1650	1.45	Unknown
39	683.26	1367.13	104	79	63	907	0.83	Unknown
40	703.24	1407.04	776	149	114	2006	1.75	Unknown
41	719.94	1440.37	489	119	91	1601	1.42	Unknown
42	727.62	1455.70	67	92	75	1207	1.07	Deleted
43	740.85	1482.12	44	73	59	852	0.83	Deleted
44	742.46	1485.34	304	147	117	2214	2.21	1765DEsc
45	752.48	1505.35	143	118	95	1660	1.59	Unknown
46	768.50	1537.33	7161	205	95	1682	1.63	1281SEsc
47	786.02	1572.33	1688	140	94	1618	1.63	Unknown
48	806.32	1612.84	1598	133	88	1499	1.52	Unknown
49	821.20	1642.55	218	103	81	1350	1.28	Unknown
50	826.46	1653.07	143	75	59	844	0.81	1847DEsc
51	838.91	1677.93	799	112	80	1307	1.37	Unknown
52	934.18	1868.14	4024	173	97	1664	1.80	Unknown
53	963.98	1927.64	363	114	88	1434	1.70	Unknown

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
54	1033.11	2065.69	49	100	81	1218	1.59	Deleted
55	1052.04	2103.48	362	119	92	1434	1.90	Unknown
56	1070.09	2139.51	266	93	72	995	1.55	Unknown
58	1133.85	2266.82	243	101	79	1196	1.76	Unknown
59	1155.35	2309.75	1880	129	78	1187	1.87	Unknown
60	1181.79	2362.54	103	88	71	1009	1.58	1693SEsc
61	1207.83	2414.54	419	92	67	917	1.65	Unknown
62	1238.21	2475.21	6077	184	80	1136	2.05	Unknown
63	1253.57	2505.88	418	130	102	1524	2.97	1765SEsc
64	1281.18	2561.01	1396	117	74	1005	1.96	Unknown
65	1303.84	2606.24	90	85	68	893	1.72	Unknown
66	1377.69	2753.70	4200	156	71	941	2.00	Unknown
67	1385.41	2769.12	772	103	71	941	1.90	Unknown
68	1401.75	2801.75	1206	113	73	992	1.97	Unknown
69	1408.12	2814.46	2231	134	78	1075	2.07	Unknown
70	1509.15	3016.19	1660	123	75	1052	2.00	Unknown
71	1538.80	3075.39	280	79	59	743	1.55	Unknown
72	1543.49	3084.75	364	102	78	1073	2.19	Unknown
73	1583.36	3164.36	546	94	67	794	2.06	Unknown
74	1594.68	3186.96	202	77	59	672	1.85	Unknown
75	1599.31	3196.20	217	82	63	733	1.94	Unknown
76	1661.43	3320.24	837	87	54	491	2.25	Unknown
77	1684.17	3365.65	172	61	45	374	1.90	Unknown
78	1693.43	3384.14	262	76	56	499	2.66	Unknown
79	1729.65	3456.46	2811	122	50	410	2.48	Unknown
80	1764.55	3526.14	13135	236	48	370	2.49	Unknown
81	1838.43	3673.66	222	58	41	286	2.30	Unknown
82	1847.39	3691.56	1801	100	43	306	2.54	Unknown
83	1873.02	3742.73	173	53	38	246	2.24	Unknown
84	1889.97	3776.57	60	52	41	314	1.99	Unknown
85	1935.96	3868.40	124	60	46	332	2.58	Unknown

c:\SEEKER\BIN\140997d02.res Analysis Results Saved.

140997D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-2 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:26:52
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.47E+002 g	Real Time	1903 Sec
Collection Efficiency	1.0000	Spc. File	.140997D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.44 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.29	109.28	123	165	135	4458	0.43 a	NET< CL
2	74.77	152.17	8147	366	262	11692	1.12 a	
3	77.03	156.67	14621	372	233	10022	0.96 b	
4	79.21	161.02	969	220	174	6681	0.73 c	
5	83.90	170.40	397	268	218	8747	0.93 a	
6	87.09	176.76	7332	343	245	10205	1.17 b	
7	89.75	182.08	2792	285	218	8747	1.02 c	
8	147.21	296.81	123	175	143	5009	0.48 a	NET< CL
9	186.16	374.58	16954	380	227	9548	1.05 a	
10	196.14	394.50	286	236	192	7450	0.82 a	
11	241.98	486.04	27042	417	210	7540	1.13 a	
12	258.93	519.88	1703	229	175	5680	1.04 a	
13	274.70	551.35	1286	221	172	5438	1.05 a	
14	281.01	563.96	209	185	150	4532	0.82 b	
15	295.22	592.33	60704	541	184	5761	1.17 a	
16	320.34	642.49	128	162	132	3517	0.89 a	NET< CL
17	324.31	650.42	157	185	151	4220	0.94 b	
18	333.29	668.35	188	139	112	2772	0.69 a	
19	351.87	705.44	102485	674	173	5526	1.23 a	
20	386.92	775.44	614	176	139	3784	1.13 a	
21	389.01	779.60	917	179	139	3784	1.13 b	
22	405.79	813.12	384	144	114	2934	0.80 a	
23	454.61	910.58	647	178	140	3417	1.48 a	
24	461.79	924.92	627	214	171	4317	1.89 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	469.79	940.91	403	152	121	2692	1.32 a	
26	474.34	949.98	311	138	109	2356	1.19 b	
27	480.43	962.15	728	143	109	2356	1.12 c	
28	487.11	975.48	886	184	143	3365	1.58 d	
29	510.92	1023.02	780	213	169	4037	2.10 a	Wide Pk
30	533.72	1068.55	456	154	122	2588	1.44 a	
31	572.71	1146.39	109	84	67	1101	0.71 a	
32	580.14	1161.24	474	128	99	1926	1.13 a	
33	609.32	1219.51	78409	576	112	2172	1.46 a	Wide Pk
34	615.14	1231.13	65	90	73	1207	0.88 b	NET< CL
35	617.14	1235.10	0	260	214	4828	3.30 c	NET< CL
36	640.12	1280.99	115	159	129	2358	2.08 a	NET< CL
37	649.07	1298.86	124	109	88	1424	1.29 a	
38	665.58	1331.83	2270	152	97	1650	1.45 a	
39	683.26	1367.13	104	79	63	907	0.83 a	
40	703.24	1407.04	776	149	114	2006	1.75 a	
41	719.94	1440.37	489	119	91	1601	1.42 a	
42	727.62	1455.70	67	92	75	1207	1.07 a	NET< CL
43	740.85	1482.12	44	73	59	852	0.83 a	NET< CL
44	742.46	1485.34	304	147	117	2214	2.21 b	
45	752.48	1505.35	143	118	95	1660	1.59 a	
46	768.50	1537.33	7161	205	95	1682	1.63 a	
47	786.02	1572.33	1688	140	94	1618	1.63 a	
48	806.32	1612.84	1598	133	88	1499	1.52 a	
49	821.20	1642.55	218	103	81	1350	1.28 a	
50	826.46	1653.07	143	75	59	844	0.81 b	
51	838.91	1677.93	799	112	80	1307	1.37 a	
52	934.18	1868.14	4024	173	97	1664	1.80 a	
53	963.98	1927.64	363	114	88	1434	1.70 a	
54	1033.11	2065.69	49	100	81	1218	1.59 a	NET< CL
55	1052.04	2103.48	362	119	92	1434	1.90 a	
56	1070.09	2139.51	266	93	72	995	1.55 a	
57	1120.35	2239.87	16506	277	86	1358	1.93 a	
58	1133.85	2266.82	243	101	79	1196	1.76 a	
59	1155.35	2309.75	1880	129	78	1187	1.87 a	
60	1181.79	2362.54	103	88	71	1009	1.58 a	
61	1207.83	2414.54	419	92	67	917	1.65 a	
62	1238.21	2475.21	6077	184	80	1136	2.05 a	
63	1253.57	2505.88	418	130	102	1524	2.97 a	
64	1281.18	2561.01	1396	117	74	1005	1.96 a	
65	1303.84	2606.24	90	85	68	893	1.72 a	
66	1377.69	2753.70	4200	156	71	941	2.00 a	
67	1385.41	2769.12	772	103	71	941	1.90 b	
68	1401.75	2801.75	1206	113	73	992	1.97 a	
69	1408.12	2814.46	2231	134	78	1075	2.07 b	
70	1509.15	3016.19	1660	123	75	1052	2.00 a	HiResid
71	1538.80	3075.39	280	79	59	743	1.55 a	
72	1543.49	3084.75	364	102	78	1073	2.19 b	
73	1583.36	3164.36	546	94	67	794	2.06 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
74	1594.68	3186.96	202	77	59	672	1.85	b
75	1599.31	3196.20	217	82	63	733	1.94	c
76	1661.43	3320.24	837	87	54	491	2.25	a
77	1684.17	3365.65	172	61	45	374	1.90	a
78	1693.43	3384.14	262	75	56	499	2.66	b
79	1729.65	3456.46	2811	122	50	410	2.48	a
80	1764.55	3526.14	13137	236	47	370	2.49	a
81	1838.43	3673.66	222	58	41	286	2.30	a
82	1847.39	3691.56	1801	100	43	306	2.54	b
83	1873.02	3742.73	173	53	38	246	2.24	a
84	1889.97	3776.57	60	52	41	314	1.99	a
85	1935.96	3868.40	124	60	46	332	2.58	a

140997D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	53.29	123	165	135	121	165	135	NET<CL
5	83.90	397	268	218	396	268	218	
6	87.09	7332	343	245	7331	343	245	
9	186.16	16954	380	227	16945	380	227	
10	196.14	286	236	192	281	236	192	
15	295.22	60704	541	184	60701	541	184	
19	351.87	102485	674	173	102481	674	173	
24	461.79	627	214	171	626	214	171	
29	510.92	780	213	169	733	213	170	
33	609.32	78409	576	112	78402	576	112	
37	649.07	124	109	88	123	109	88	
57	1120.35	16506	277	86	16504	277	86	
80	1764.55	13137	236	47	13135	236	48	

140997D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-2 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:26:52
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.47e+002 g	Real Time	1903 Sec
Collection Efficiency	1.0000	Spectrum File	.140997D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	9.71E+02 +- 4.04E+00	. . . .	. . . .	1.40E+07
	295.21		9.70E+02 +- 8.65E+00	5.92E+00	2.94E+00	1.40E+07
	351.92		1.01E+03 +- 6.63E+00	3.43E+00	1.70E+00	1.40E+07
	609.31		9.36E+02 +- 6.88E+00	2.70E+00	1.34E+00	1.40E+07
	1120.29		9.47E+02 +- 1.59E+01	1.00E+01	4.92E+00	1.40E+07

MEASURED TOTAL: 9.71E+02 +- 4.04E+00 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.77	152.17	8147	366	262	11692	1.12	Unknown
2	77.03	156.67	14621	372	233	10022	0.96	Unknown
3	79.21	161.02	969	220	174	6681	0.73	Unknown
4	83.90	170.40	396	268	218	8747	0.93	Unknown
5	87.09	176.76	7331	343	245	10205	1.17	Unknown
6	89.75	182.08	2792	285	218	8747	1.02	Unknown
7	186.16	374.58	16945	380	227	9548	1.05	1208DEsc
8	196.14	394.50	281	236	192	7450	0.82	Unknown
9	241.98	486.04	27042	417	210	7540	1.13	Unknown
10	258.93	519.88	1703	229	175	5680	1.04	1281DEsc

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
11	274.70	551.35	1286	221	172	5438	1.05	Unknown
12	281.01	563.96	209	185	150	4532	0.82	Unknown
14	324.31	650.42	157	185	151	4220	0.94	Unknown
15	333.29	668.35	188	139	112	2772	0.69	Unknown
17	386.92	775.44	614	176	139	3784	1.13	1408DEsc
18	389.01	779.60	917	179	139	3784	1.13	Unknown
19	405.79	813.12	384	144	114	2934	0.80	Unknown
20	454.61	910.58	647	178	140	3417	1.48	Unknown
21	461.79	924.92	626	214	171	4317	1.89	Unknown
22	469.79	940.91	403	152	121	2692	1.32	Unknown
23	474.34	949.98	311	138	109	2356	1.19	Unknown
24	480.43	962.15	728	143	109	2356	1.12	Unknown
25	487.11	975.48	886	184	143	3365	1.58	1509DEsc
26	510.92	1023.02	733	213	170	4037	2.10	Unknown
27	533.72	1068.55	456	154	122	2588	1.44	Unknown
28	572.71	1146.39	109	84	67	1101	0.71	1595DEsc
29	580.14	1161.24	474	128	99	1926	1.13	Unknown
31	649.07	1298.86	123	109	88	1424	1.29	Unknown
32	665.58	1331.83	2270	152	97	1650	1.45	Unknown
33	683.26	1367.13	104	79	63	907	0.83	Unknown
34	703.24	1407.04	776	149	114	2006	1.75	Unknown
35	719.94	1440.37	489	119	91	1601	1.42	Unknown
36	742.46	1485.34	304	147	117	2214	2.21	1765DEsc
37	752.48	1505.35	143	118	95	1660	1.59	Unknown
38	768.50	1537.33	7161	205	95	1682	1.63	1281SEsc
39	786.02	1572.33	1688	140	94	1618	1.63	Unknown
40	806.32	1612.84	1598	133	88	1499	1.52	Unknown
41	821.20	1642.55	218	103	81	1350	1.28	Unknown
42	826.46	1653.07	143	75	59	844	0.81	1847DEsc
43	838.91	1677.93	799	112	80	1307	1.37	Unknown
44	934.18	1868.14	4024	173	97	1664	1.80	Unknown
45	963.98	1927.64	363	114	88	1434	1.70	Unknown
46	1052.04	2103.48	362	119	92	1434	1.90	Unknown
47	1070.09	2139.51	266	93	72	995	1.55	Unknown
49	1133.85	2266.82	243	101	79	1196	1.76	Unknown
50	1155.35	2309.75	1880	129	78	1187	1.87	Unknown
51	1181.79	2362.54	103	88	71	1009	1.58	1693SEsc
52	1207.83	2414.54	419	92	67	917	1.65	Unknown
53	1238.21	2475.21	6077	184	80	1136	2.05	Unknown
54	1253.57	2505.88	418	130	102	1524	2.97	1765SEsc
55	1281.18	2561.01	1396	117	74	1005	1.96	Unknown
56	1303.84	2606.24	90	85	68	893	1.72	Unknown
57	1377.69	2753.70	4200	156	71	941	2.00	Unknown
58	1385.41	2769.12	772	103	71	941	1.90	Unknown
59	1401.75	2801.75	1206	113	73	992	1.97	Unknown
60	1408.12	2814.46	2231	134	78	1075	2.07	Unknown
61	1509.15	3016.19	1660	123	75	1052	2.00	Unknown
62	1538.80	3075.39	280	79	59	743	1.55	Unknown
63	1543.49	3084.75	364	102	78	1073	2.19	Unknown

140997D02.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
64	1583.36	3164.36	546	94	67	794	2.06	Unknown
65	1594.68	3186.96	202	77	59	672	1.85	Unknown
66	1599.31	3196.20	217	82	63	733	1.94	Unknown
67	1661.43	3320.24	837	87	54	491	2.25	Unknown
68	1684.17	3365.65	172	61	45	374	1.90	Unknown
69	1693.43	3384.14	262	76	56	499	2.66	Unknown
70	1729.65	3456.46	2811	122	50	410	2.48	Unknown
71	1764.55	3526.14	13135	236	48	370	2.49	Unknown
72	1838.43	3673.66	222	58	41	286	2.30	Unknown
73	1847.39	3691.56	1801	100	43	306	2.54	Unknown
74	1873.02	3742.73	173	53	38	246	2.24	Unknown
75	1889.97	3776.57	60	52	41	314	1.99	Unknown
76	1935.96	3868.40	124	60	46	332	2.58	Unknown

c:\SEEKER\BIN\140997d02A.res Analysis Results Saved.

141328D04.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-3 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:00
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.41E+002 g	Real Time	1902 Sec
Collection Efficiency	1.0000	Spc. File	.141328D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.50 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.73	96.37	37	39	30	226	0.42	a
2	53.31	109.53	36	40	31	238	0.45	a
3	74.75	152.36	696	85	55	552	0.99	a
4	77.01	156.87	1179	96	55	552	0.99	b
5	79.12	161.09	22	42	33	276	0.45	c NET< CL
6	83.80	170.45	50	76	61	644	1.14	d NET< CL
7	87.10	177.04	487	87	61	644	1.11	e
8	89.67	182.16	122	70	55	552	0.91	f
9	92.23	187.29	28	67	55	552	0.93	g NET< CL
10	154.58	311.87	21	38	31	233	0.53	a NET< CL
11	186.12	374.89	778	86	54	498	1.12	a
12	238.59	479.73	295	65	46	384	1.25	a
13	241.96	486.47	1060	82	41	336	1.16	b
14	258.12	518.76	29	52	42	325	1.26	a NET< CL
15	295.19	592.82	2359	109	40	293	1.30	a HiResid
16	337.46	677.30	11	29	23	133	0.68	a NET< CL
17	338.64	679.65	26	39	31	199	0.91	b NET< CL
18	351.83	706.00	3767	130	36	241	1.37	a HiResid
19	388.97	780.21	39	31	23	124	0.89	a
20	487.02	976.12	27	31	24	115	1.36	a
21	511.00	1024.05	61	39	30	149	1.94	a
22	582.93	1167.77	81	37	26	123	1.73	a
23	609.25	1220.36	2743	109	25	108	1.81	a HiResid
24	665.38	1332.52	59	31	22	91	1.66	a

141328D04.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	768.28	1538.12	246	43	24	100	2.05	a
26	786.11	1573.75	66	26	16	56	1.54	a
27	806.20	1613.89	51	24	16	56	1.35	a
28	911.19	1823.68	33	29	22	88	2.04	a
29	934.11	1869.47	152	37	23	89	2.28	a
30	1120.24	2241.37	487	51	22	79	2.29	a
31	1155.63	2312.10	32	27	20	73	2.14	a
32	1237.96	2476.60	163	34	19	60	2.51	a
33	1281.47	2563.53	39	19	12	31	1.43	a
34	1377.78	2755.97	95	31	20	64	2.45	a
35	1408.32	2817.00	44	30	22	82	2.25	a
36	1460.25	2920.76	73	33	23	74	3.42	a
37	1509.24	3018.66	39	29	21	68	2.77	a
38	1582.77	3165.58	20	16	11	24	1.56	a
39	1729.95	3459.65	40	18	11	19	2.64	a
40	1764.46	3528.60	389	45	19	48	3.27	a
41	1847.66	3694.86	46	21	13	26	3.01	a

141328D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.73	37	39	30	35	39	31	
3	74.75	696	85	55	693	85	55	
4	77.01	1179	96	55	1177	96	55	
6	83.80	50	76	61	48	76	62	NET<CL
9	92.23	28	67	55	12	67	55	NET<CL
11	186.12	778	86	54	765	86	55	
12	238.59	295	65	46	289	65	46	
13	241.96	1060	82	41	1058	82	41	
15	295.19	2360	109	40	2357	109	40	
18	351.83	3767	130	36	3763	130	36	
21	511.00	61	39	30	23	40	32	NET<CL
22	582.93	81	37	26	79	37	27	
23	609.25	2743	109	25	2739	109	25	
28	911.19	33	29	22	32	29	22	
36	1460.25	73	33	23	66	33	24	

141328D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-3 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:00
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.41e+002 g	Real Time	1902 Sec
Collection Efficiency	1.0000	Spectrum File	.141328D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-210	46.50		4.24E+01 +- 4.75E+01	7.79E+01	3.73E+01	1.95E+05
U-235	143.76	N	-2.49E-01 +- 1.44E+00	2.45E+00	1.19E+00	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		2.28E+00 +- 5.16E-01	7.46E-01	3.62E-01	1.67E+04
Pb-214	Average:x		4.47E+01 +- 1.24E+00	. . . .	. . . .	1.40E+07
	295.22		4.43E+01 +- 2.04E+00	1.56E+00	7.52E-01	1.40E+07
	351.99		4.50E+01 +- 1.56E+00	9.03E-01	4.35E-01	1.40E+07
Tl-208	583.14		6.76E-01 +- 3.15E-01	4.77E-01	2.27E-01	1.67E+04
Ac-228	911.07		1.29E+00 +- 1.17E+00	1.89E+00	8.92E-01	1.23E+14
Bi-214	Average:x		4.07E+01 +- 3.93E+00	. . . .	. . . .	1.40E+07
	1120.28		4.07E+01 +- 4.29E+00	3.83E+00	1.80E+00	1.40E+07
	609.32		4.07E+01 +- 9.86E+00	1.55E+01	7.73E+00	1.40E+07
Eu-152	1408.08		3.28E+00 +- 2.20E+00	3.45E+00	1.62E+00	1.17E+05
K-40	1460.75		9.68E+00 +- 4.84E+00	7.34E+00	3.47E+00	1.12E+13
Am-241	59.54	N	1.44E-01 +- 1.89E+00	3.20E+00	1.55E+00	3.80E+06
Th-234	92.50	N	3.88E+00 +- 3.74E+00	6.10E+00b	2.97E+00	3.92E+13
Cs-137	661.62	N	-2.95E-02 +- 4.24E-01	7.26E-01R	3.51E-01	2.64E+05
Bi-212	727.17	N	3.71E+00 +- 3.70E+00	5.99E+00	2.81E+00	1.67E+04
Pa-234m	1001.03	N	4.35E+00 +- 4.86E+01	8.45E+01	3.97E+01	3.92E+13
Eu-154	1004.80	N	-5.33E-02 +- 1.60E+00	2.82E+00	1.32E+00	7.45E+04
Co-60	1332.51	N	2.54E-01 +- 3.51E-01	5.81E-01	2.70E-01	4.62E+04

MEASURED TOTAL: 1.57E+02 +- 1.20E+02 pCi/g

141328D04.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	53.31	109.53	36	40	31	238	0.45	Unknown
3	74.75	152.36	693	85	55	552	0.99	Unknown
4	77.01	156.87	1177	96	55	552	0.99	Unknown
5	79.12	161.09	22	42	33	276	0.45	Deleted
6	83.80	170.45	48	76	62	644	1.14	Deleted
7	87.10	177.04	487	87	61	644	1.11	Unknown
8	89.67	182.16	122	70	55	552	0.91	Unknown
9	92.23	187.29	12	67	55	552	0.93	Deleted
10	154.58	311.87	21	38	31	233	0.53	Deleted
13	241.96	486.47	1058	82	41	336	1.16	Unknown
14	258.12	518.76	29	52	42	325	1.26	Deleted
16	337.46	677.30	11	29	23	133	0.68	Deleted
17	338.64	679.65	26	39	31	199	0.91	Deleted
19	388.97	780.21	39	31	23	124	0.89	Unknown
20	487.02	976.12	27	31	24	115	1.36	Unknown
21	511.00	1024.05	23	40	32	149	1.94	Deleted
23	609.25	1220.36	2739	109	25	108	1.81	SPLIT
24	665.38	1332.52	59	31	22	91	1.66	Unknown
25	768.28	1538.12	246	43	24	100	2.05	Unknown
26	786.11	1573.75	66	26	16	56	1.54	Unknown
27	806.20	1613.89	51	24	16	56	1.35	Unknown
29	934.11	1869.47	152	37	23	89	2.28	Unknown
31	1155.63	2312.10	32	27	20	73	2.14	Unknown
32	1237.96	2476.60	163	34	19	60	2.51	Unknown
33	1281.47	2563.53	39	19	12	31	1.43	Unknown
34	1377.78	2755.97	95	31	20	64	2.45	Unknown
37	1509.24	3018.66	39	29	21	68	2.77	Unknown
38	1582.77	3165.58	20	16	11	24	1.56	Unknown
39	1729.95	3459.65	40	18	11	19	2.64	Unknown
40	1764.46	3528.60	389	45	19	48	3.27	Unknown
41	1847.66	3694.86	46	21	13	26	3.01	Unknown
43	609.25	1220.36	164	1268	25	108	1.81	1120SEsc

c:\SEEKER\BIN\141328d04.res Analysis Results Saved.

141328D04.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-3 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:00
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.41E+002 g	Real Time	1902 Sec
Collection Efficiency	1.0000	Spc. File	.141328D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.50 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.73	96.37	37	39	30	226	0.42 a	
2	53.31	109.53	36	40	31	238	0.45 a	
3	74.75	152.36	696	85	55	552	0.99 a	
4	77.01	156.87	1179	96	55	552	0.99 b	
5	79.12	161.09	22	42	33	276	0.45 c	NET< CL
6	83.80	170.45	50	76	61	644	1.14 d	NET< CL
7	87.10	177.04	487	87	61	644	1.11 e	
8	89.67	182.16	122	70	55	552	0.91 f	
9	92.23	187.29	28	67	55	552	0.93 g	NET< CL
10	154.58	311.87	21	38	31	233	0.53 a	NET< CL
11	186.12	374.89	778	86	54	498	1.12 a	
12	238.59	479.73	295	65	46	384	1.25 a	
13	241.96	486.47	1060	82	41	336	1.16 b	
14	258.12	518.76	29	52	42	325	1.26 a	NET< CL
15	295.19	592.82	2359	109	40	293	1.30 a	HiResid
16	337.46	677.30	11	29	23	133	0.68 a	NET< CL
17	338.64	679.65	26	39	31	199	0.91 b	NET< CL
18	351.83	706.00	3767	130	36	241	1.37 a	HiResid
19	388.97	780.21	39	31	23	124	0.89 a	
20	487.02	976.12	27	31	24	115	1.36 a	
21	511.00	1024.05	61	39	30	149	1.94 a	
22	582.93	1167.77	81	37	26	123	1.73 a	
23	609.25	1220.36	2743	109	25	108	1.81 a	HiResid
24	665.38	1332.52	59	31	22	91	1.66 a	

141328D04.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	768.28	1538.12	246	43	24	100	2.05	a
26	786.11	1573.75	66	26	16	56	1.54	a
27	806.20	1613.89	51	24	16	56	1.35	a
28	911.19	1823.68	33	29	22	88	2.04	a
29	934.11	1869.47	152	37	23	89	2.28	a
30	1120.24	2241.37	487	51	22	79	2.29	a
31	1155.63	2312.10	32	27	20	73	2.14	a
32	1237.96	2476.60	163	34	19	60	2.51	a
33	1281.47	2563.53	39	19	12	31	1.43	a
34	1377.78	2755.97	95	31	20	64	2.45	a
35	1408.32	2817.00	44	30	22	82	2.25	a
36	1460.25	2920.76	73	33	23	74	3.42	a
37	1509.24	3018.66	39	29	21	68	2.77	a
38	1582.77	3165.58	20	16	11	24	1.56	a
39	1729.95	3459.65	40	18	11	19	2.64	a
40	1764.46	3528.60	389	45	19	48	3.27	a
41	1847.66	3694.86	46	21	13	26	3.01	a

141328D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.73	37	39	30	35	39	31	
3	74.75	696	85	55	693	85	55	
4	77.01	1179	96	55	1177	96	55	
6	83.80	50	76	61	48	76	62	NET<CL
9	92.23	28	67	55	12	67	55	NET<CL
11	186.12	778	86	54	765	86	55	
12	238.59	295	65	46	289	65	46	
13	241.96	1060	82	41	1058	82	41	
15	295.19	2360	109	40	2357	109	40	
18	351.83	3767	130	36	3763	130	36	
21	511.00	61	39	30	23	40	32	NET<CL
22	582.93	81	37	26	79	37	27	
23	609.25	2743	109	25	2739	109	25	
28	911.19	33	29	22	32	29	22	
36	1460.25	73	33	23	66	33	24	

141328D04.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-3 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:00
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.41e+002 g	Real Time	1902 Sec
Collection Efficiency	1.0000	Spectrum File	.141328D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	4.44E+01 +- 1.18E+00	. . . .	. . . .	1.40E+07
	295.21		4.43E+01 +- 2.04E+00	1.56E+00	7.52E-01	1.40E+07
	351.92		4.50E+01 +- 1.56E+00	9.03E-01	4.35E-01	1.40E+07
	609.31		4.07E+01 +- 9.86E+00	1.55E+01	7.73E+00	1.40E+07
	1120.29		4.07E+01 +- 4.29E+00	3.83E+00	1.80E+00	1.40E+07

MEASURED TOTAL: 4.44E+01 +- 1.18E+00 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.73	96.37	35	39	31	226	0.42	Unknown
2	53.31	109.53	36	40	31	238	0.45	Unknown
3	74.75	152.36	693	85	55	552	0.99	Unknown
4	77.01	156.87	1177	96	55	552	0.99	Unknown
5	87.10	177.04	487	87	61	644	1.11	Unknown
6	89.67	182.16	122	70	55	552	0.91	Unknown
7	186.12	374.89	765	86	55	498	1.12	Unknown
8	238.59	479.73	289	65	46	384	1.25	Unknown
9	241.96	486.47	1058	82	41	336	1.16	Unknown
12	388.97	780.21	39	31	23	124	0.89	Unknown

141328D04.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	487.02	976.12	27	31	24	115	1.36	Unknown
14	582.93	1167.77	79	37	27	123	1.73	Unknown
15	609.25	1220.36	2739	109	25	108	1.81	1120SEsc
17	609.25	1220.36	164	1268	25	108	1.81	Unknown
18	665.38	1332.52	59	31	22	91	1.66	Unknown
19	768.28	1538.12	246	43	24	100	2.05	Unknown
20	786.11	1573.75	66	26	16	56	1.54	Unknown
21	806.20	1613.89	51	24	16	56	1.35	Unknown
22	911.19	1823.68	32	29	22	88	2.04	Unknown
23	934.11	1869.47	152	37	23	89	2.28	Unknown
25	1155.63	2312.10	32	27	20	73	2.14	Unknown
26	1237.96	2476.60	163	34	19	60	2.51	Unknown
27	1281.47	2563.53	39	19	12	31	1.43	Unknown
28	1377.78	2755.97	95	31	20	64	2.45	Unknown
29	1408.32	2817.00	44	30	22	82	2.25	Unknown
30	1460.25	2920.76	66	33	24	74	3.42	Unknown
31	1509.24	3018.66	39	29	21	68	2.77	Unknown
32	1582.77	3165.58	20	16	11	24	1.56	Unknown
33	1729.95	3459.65	40	18	11	19	2.64	Unknown
34	1764.46	3528.60	389	45	19	48	3.27	Unknown
35	1847.66	3694.86	46	21	13	26	3.01	Unknown

c:\SEEKER\BIN\141328d04A.res Analysis Results Saved.

140887D05.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-4 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:09
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.34E+002 g	Real Time	1904 Sec
Collection Efficiency	1.0000	Spc. File	.140887D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.70 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	150.94	8900	346	238	10496	0.94 a	HiResid Wide Pk
2	77.09	155.46	16020	358	208	8747	0.78 b	HiResid
3	79.51	160.31	14	397	326	15744	1.46 c	NET< CL HiResid
4	81.13	163.53	-0	537	441	22741	2.18 d	NET< CL HiResid
5	83.86	169.00	268	180	146	5248	0.49 e	HiResid
6	87.18	175.64	8169	342	238	10496	1.04 f	HiResid
7	89.87	181.02	3300	312	238	10496	0.98 g	HiResid
8	186.18	373.51	17254	387	234	10142	0.91 a	
9	196.41	393.94	177	244	200	8034	0.87 a	NET< CL
10	238.51	478.09	547	268	217	8030	1.14 a	
11	241.95	484.96	29045	414	193	6883	0.97 b	
12	258.76	518.57	1807	210	158	5049	0.90 a	
13	274.62	550.26	1332	252	198	6712	1.22 a	HiResid
14	295.17	591.34	64118	547	170	5345	1.02 a	
15	333.70	668.35	239	262	214	6765	1.53 a	
16	350.14	701.20	1228	467	380	12809	3.10 a	Wide Pk
17	351.89	704.71	108556	689	166	4719	1.08 b	
18	386.74	774.35	675	212	169	4539	1.23 a	
19	388.86	778.60	970	196	153	3971	1.10 b	
20	405.67	812.20	462	212	171	4635	1.26 a	
21	454.91	910.61	507	130	100	2020	0.88 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
22	461.73	924.25	552	191	153	3445	1.51 a	
23	469.72	940.21	243	182	148	3225	1.42 a	
24	474.53	949.83	281	151	121	2508	1.15 b	
25	480.44	961.63	979	190	148	3225	1.41 c	
26	487.12	974.98	959	170	130	2957	1.54 a	
27	509.63	1019.98	209	104	82	1547	0.78 a	
28	511.23	1023.18	659	187	148	3403	1.82 b	
29	513.62	1027.96	53	87	71	1238	0.70 c	NET< CL
30	533.59	1067.87	233	105	83	1568	0.90 a	
31	543.66	1087.98	140	102	81	1506	0.87 a	
32	572.73	1146.09	109	96	77	1353	0.84 a	
33	576.26	1153.16	86	108	88	1624	1.05 b	NET< CL
34	580.27	1161.17	711	131	98	1894	1.22 c	
35	583.49	1167.60	147	146	118	2436	1.42 d	
36	609.32	1219.22	82638	589	107	2103	1.33 a	HiResid
37	615.99	1232.54	57	106	87	1477	1.16 a	NET< CL
38	649.09	1298.70	102	118	96	1598	1.48 a	
39	665.47	1331.44	2419	145	88	1435	1.39 a	
40	683.48	1367.44	147	119	96	1605	1.45 a	
41	703.16	1406.78	732	120	88	1439	1.38 a	
42	719.93	1440.29	605	123	92	1487	1.48 a	
43	742.25	1484.90	272	155	124	2173	2.19 a	
44	742.56	1485.52	27	64	52	669	0.70 b	NET< CL
45	752.96	1506.30	93	97	78	1213	1.21 a	
46	768.37	1537.12	7470	207	94	1537	1.52 a	
47	785.96	1572.26	1883	148	98	1591	1.69 a	
48	806.19	1612.70	1774	139	91	1443	1.52 a	
49	821.26	1642.83	159	107	86	1363	1.24 a	
50	826.52	1653.34	186	117	94	1533	1.41 b	
51	839.06	1678.41	944	135	99	1618	1.62 a	
52	910.90	1821.98	133	155	126	2442	2.24 a	
53	934.11	1868.36	3878	163	87	1458	1.49 a	
54	964.11	1928.34	479	109	82	1309	1.53 a	
55	1051.87	2103.73	406	98	73	1043	1.54 a	
56	1070.07	2140.11	234	88	68	948	1.38 a	
57	1104.31	2208.54	177	132	106	1665	2.47 a	
58	1120.33	2240.57	17390	282	83	1216	1.76 a	
59	1133.67	2267.22	224	98	77	1088	1.70 a	
60	1155.26	2310.38	1834	125	75	1049	1.64 a	
61	1181.72	2363.26	93	78	62	793	1.28 a	
62	1207.80	2415.38	387	89	65	833	1.52 a	
63	1238.18	2476.11	6126	180	74	955	1.84 a	
64	1253.39	2506.51	283	112	88	1197	2.24 a	
65	1281.04	2561.77	1527	123	78	1013	1.92 a	
66	1304.02	2607.70	105	84	67	869	1.80 a	
67	1377.72	2755.00	4390	159	72	952	1.95 a	
68	1385.31	2770.18	780	95	63	793	1.68 b	
69	1401.54	2802.62	1296	112	71	925	1.98 a	
70	1408.07	2815.67	2326	129	71	925	1.88 b	

140887D05.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
71	1461.16	2921.78	101	73	58	699	1.40	a	
72	1479.35	2958.14	40	56	44	487	0.98	a	NET< CL
73	1509.27	3017.92	2011	128	75	1033	1.89	a	
74	1538.56	3076.47	384	95	72	945	2.03	a	
75	1543.44	3086.23	388	86	63	788	1.65	b	
76	1583.20	3165.69	616	89	61	686	1.89	a	
77	1594.61	3188.51	275	85	64	726	2.05	a	
78	1599.71	3198.69	193	74	56	614	1.79	b	
79	1661.31	3321.81	972	88	51	481	1.98	a	
80	1684.18	3367.52	173	60	44	357	2.02	a	
81	1693.33	3385.81	254	77	58	506	2.81	b	
82	1729.65	3458.40	2967	122	46	367	2.16	a	
83	1764.58	3528.22	13687	240	43	313	2.24	a	HiResid
84	1838.47	3675.89	254	52	34	219	1.87	a	
85	1847.45	3693.83	1887	100	40	279	2.25	b	
86	1872.97	3744.85	162	58	43	301	2.50	a	
87	1890.51	3779.90	79	50	39	264	2.10	a	
88	1896.12	3791.12	77	48	36	244	1.92	b	
89	1935.79	3870.40	70	47	37	247	1.98	a	

140887D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
8	186.18	17254	387	234	17247	388	234	
9	196.41	177	244	200	170	244	200	NET<CL
10	238.51	547	268	217	540	268	217	
11	241.95	29045	414	193	29043	414	193	
12	258.76	1807	210	158	1806	210	158	
14	295.17	64118	547	170	64116	547	170	
15	333.70	239	262	214	238	262	214	
16	350.14	1228	467	380	1222	467	380	
27	509.63	209	104	82	160	105	83	
35	583.49	147	146	118	144	146	118	
36	609.32	82638	589	107	82634	589	107	
52	910.90	133	155	126	131	155	126	
71	1461.16	101	73	58	88	73	58	
83	1764.58	13687	240	43	13686	240	43	

140887D05.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-4 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:09
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.34e+002 g	Real Time	1904 Sec
Collection Efficiency	1.0000	Spectrum File	.140887D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014

Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)		MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	-3.70E+00	+- 5.81E+00	9.66E+00	4.80E+00	6.17E+12
	185.72		I.D.	. . . .	. . . .	. . . .	6.17E+12
Pb-212	238.63		3.84E+00	+- 1.91E+00	3.11E+00	1.54E+00	1.67E+04
Pb-214	Average:x		1.04E+03	+- 5.30E+00	. . . .	. . . .	1.40E+07
	295.22		1.03E+03	+- 8.83E+00	5.54E+00	2.75E+00	1.40E+07
	351.99		1.04E+03	+- 6.63E+00	3.23E+00	1.60E+00	1.40E+07
Tl-208	583.14		9.22E-01	+- 9.32E-01	1.53E+00	7.56E-01	1.67E+04
Bi-214	Average:x		9.73E+02	+- 6.36E+00	. . . .	. . . .	1.40E+07
	609.32		9.70E+02	+- 6.92E+00	2.54E+00	1.25E+00	1.40E+07
	1120.28		9.90E+02	+- 1.61E+01	9.61E+00	4.73E+00	1.40E+07
Ac-228	911.07		3.73E+00	+- 4.41E+00	7.25E+00	3.59E+00	1.23E+14
K-40	1460.75		8.38E+00	+- 6.97E+00	1.13E+01	5.54E+00	1.12E+13
Pb-210	46.50	N	-1.42E+03	+- 1.47E+03	2.46E+03	1.22E+03	1.95E+05
Am-241	59.54	N	-3.41E+00	+- 1.95E+01	3.25E+01	1.61E+01	3.80E+06
Th-234	92.50	N	-8.11E+00	+- 1.81E+01	3.01E+01b	1.49E+01	3.92E+13
Cs-137	661.62	N	1.03E+00	+- 1.06E+00	1.73E+00R	8.54E-01	2.64E+05
Bi-212	727.17	N	-4.36E+00	+- 1.01E+01	1.70E+01	8.36E+00	1.67E+04
Pa-234m	1001.03	N	-5.21E+01	+- 1.38E+02	2.32E+02	1.14E+02	3.92E+13
Eu-154	1004.80	N	1.28E+00	+- 4.53E+00	7.54E+00	3.71E+00	7.45E+04
Co-60	1332.51	N	-1.57E-01	+- 8.11E-01	1.37E+00	6.71E-01	4.62E+04
Eu-152	1408.08	N	-2.05E+01	+- 1.18E+01	2.01E+01r	9.99E+00	1.17E+05

MEASURED TOTAL: 2.03E+03 +- 3.15E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	150.94	8900	346	238	10496	0.94	Unknown
2	77.09	155.46	16020	358	208	8747	0.78	Unknown
3	79.51	160.31	14	397	326	15744	1.46	Deleted
4	81.13	163.53	0	537	441	22741	2.18	Deleted
5	83.86	169.00	268	180	146	5248	0.49	1104DEsc
6	87.18	175.64	8169	342	238	10496	1.04	Unknown
7	89.87	181.02	3300	312	238	10496	0.98	Unknown
9	196.41	393.94	170	244	200	8034	0.87	Deleted
11	241.95	484.96	29043	414	193	6883	0.97	Unknown
12	258.76	518.57	1806	210	158	5049	0.90	1281DEsc
13	274.62	550.26	1332	252	198	6712	1.22	Unknown
15	333.70	668.35	238	262	214	6765	1.53	Unknown
16	350.14	701.20	1222	467	380	12809	3.10	Unknown
18	386.74	774.35	675	212	169	4539	1.23	1408DEsc
19	388.86	778.60	970	196	153	3971	1.10	Unknown
20	405.67	812.20	462	212	171	4635	1.26	Unknown
21	454.91	910.61	507	130	100	2020	0.88	Unknown
22	461.73	924.25	552	191	153	3446	1.51	Unknown
23	469.72	940.21	243	182	148	3225	1.42	Unknown
24	474.53	949.83	281	151	121	2508	1.15	Unknown
25	480.44	961.63	979	190	148	3225	1.41	Unknown
26	487.12	974.98	959	170	130	2957	1.54	1509DEsc
27	509.63	1019.98	160	105	83	1547	0.78	Unknown
28	511.23	1023.18	659	187	148	3403	1.82	Unknown
29	513.62	1027.96	53	87	71	1238	0.70	Deleted
30	533.59	1067.87	233	105	83	1568	0.90	Unknown
31	543.66	1087.98	140	102	81	1506	0.87	Unknown
32	572.73	1146.09	109	96	77	1353	0.84	1595DEsc
33	576.26	1153.16	86	108	88	1624	1.05	Deleted
34	580.27	1161.17	711	131	98	1894	1.22	Unknown
37	615.99	1232.54	57	106	87	1477	1.16	Deleted
38	649.09	1298.70	102	118	96	1598	1.48	Unknown
39	665.47	1331.44	2419	145	88	1435	1.39	Unknown
40	683.48	1367.44	147	119	96	1605	1.45	Unknown
41	703.16	1406.78	732	120	88	1439	1.38	Unknown
42	719.93	1440.29	605	123	92	1487	1.48	Unknown
43	742.25	1484.90	272	155	124	2173	2.19	1765DEsc
44	742.56	1485.52	27	64	52	669	0.70	Deleted
45	752.96	1506.30	93	97	78	1213	1.21	Unknown
46	768.37	1537.12	7470	207	94	1537	1.52	1281SEsc
47	785.96	1572.26	1883	148	98	1591	1.69	Unknown
48	806.19	1612.70	1774	139	91	1443	1.52	Unknown
49	821.26	1642.83	159	107	86	1363	1.24	Unknown
50	826.52	1653.34	186	117	94	1533	1.41	1847DEsc
51	839.06	1678.41	944	135	99	1618	1.62	Unknown
53	934.11	1868.36	3878	163	87	1458	1.49	Unknown
54	964.11	1928.34	479	109	82	1309	1.53	Unknown
55	1051.87	2103.73	406	98	73	1043	1.54	Unknown
56	1070.07	2140.11	234	88	68	948	1.38	Unknown

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
57	1104.31	2208.54	177	132	106	1665	2.47	Unknown
59	1133.67	2267.22	224	98	77	1088	1.70	Unknown
60	1155.26	2310.38	1834	125	75	1049	1.64	Unknown
61	1181.72	2363.26	93	78	62	793	1.28	1693SEsc
62	1207.80	2415.38	387	89	65	833	1.52	Unknown
63	1238.18	2476.11	6126	180	74	955	1.84	Unknown
64	1253.39	2506.51	283	112	88	1197	2.24	1765SEsc
65	1281.04	2561.77	1527	123	78	1013	1.92	Unknown
66	1304.02	2607.70	105	84	67	869	1.80	Unknown
67	1377.72	2755.00	4390	159	72	952	1.95	Unknown
68	1385.31	2770.18	780	95	63	793	1.68	Unknown
69	1401.54	2802.62	1296	112	71	925	1.98	Unknown
70	1408.07	2815.67	2326	129	71	925	1.88	Unknown
72	1479.35	2958.14	40	56	44	487	0.98	Deleted
73	1509.27	3017.92	2011	128	75	1033	1.89	Unknown
74	1538.56	3076.47	384	95	72	945	2.03	Unknown
75	1543.44	3086.23	388	86	63	788	1.65	Unknown
76	1583.20	3165.69	616	89	61	686	1.89	Unknown
77	1594.61	3188.51	275	85	64	726	2.05	Unknown
78	1599.71	3198.69	193	74	56	614	1.79	Unknown
79	1661.31	3321.81	972	88	51	481	1.98	Unknown
80	1684.18	3367.52	173	60	44	357	2.02	Unknown
81	1693.33	3385.81	254	77	58	506	2.81	Unknown
82	1729.65	3458.40	2967	122	46	367	2.16	Unknown
83	1764.58	3528.22	13686	240	43	313	2.24	Unknown
84	1838.47	3675.89	254	52	34	219	1.87	Unknown
85	1847.45	3693.83	1887	100	40	279	2.25	Unknown
86	1872.97	3744.85	162	58	43	301	2.50	Unknown
87	1890.51	3779.90	79	50	39	264	2.10	Unknown
88	1896.12	3791.12	77	48	36	244	1.92	Unknown
89	1935.79	3870.40	70	48	37	247	1.98	Unknown

c:\SEEKER\BIN\140887d05.res Analysis Results Saved.

140887D05.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-4 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:09
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.34E+002 g	Real Time	1904 Sec
Collection Efficiency	1.0000	Spc. File	.140887D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.70 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	150.94	8900	346	238	10496	0.94 a	HiResid Wide Pk
2	77.09	155.46	16020	358	208	8747	0.78 b	HiResid
3	79.51	160.31	14	397	326	15744	1.46 c	NET< CL HiResid
4	81.13	163.53	-0	537	441	22741	2.18 d	NET< CL HiResid
5	83.86	169.00	268	180	146	5248	0.49 e	HiResid
6	87.18	175.64	8169	342	238	10496	1.04 f	HiResid
7	89.87	181.02	3300	312	238	10496	0.98 g	HiResid
8	186.18	373.51	17254	387	234	10142	0.91 a	
9	196.41	393.94	177	244	200	8034	0.87 a	NET< CL
10	238.51	478.09	547	268	217	8030	1.14 a	
11	241.95	484.96	29045	414	193	6883	0.97 b	
12	258.76	518.57	1807	210	158	5049	0.90 a	
13	274.62	550.26	1332	252	198	6712	1.22 a	HiResid
14	295.17	591.34	64118	547	170	5345	1.02 a	
15	333.70	668.35	239	262	214	6765	1.53 a	
16	350.14	701.20	1228	467	380	12809	3.10 a	Wide Pk
17	351.89	704.71	108556	689	166	4719	1.08 b	
18	386.74	774.35	675	212	169	4539	1.23 a	
19	388.86	778.60	970	196	153	3971	1.10 b	
20	405.67	812.20	462	212	171	4635	1.26 a	
21	454.91	910.61	507	130	100	2020	0.88 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
22	461.73	924.25	552	191	153	3445	1.51 a	
23	469.72	940.21	243	182	148	3225	1.42 a	
24	474.53	949.83	281	151	121	2508	1.15 b	
25	480.44	961.63	979	190	148	3225	1.41 c	
26	487.12	974.98	959	170	130	2957	1.54 a	
27	509.63	1019.98	209	104	82	1547	0.78 a	
28	511.23	1023.18	659	187	148	3403	1.82 b	
29	513.62	1027.96	53	87	71	1238	0.70 c	NET< CL
30	533.59	1067.87	233	105	83	1568	0.90 a	
31	543.66	1087.98	140	102	81	1506	0.87 a	
32	572.73	1146.09	109	96	77	1353	0.84 a	
33	576.26	1153.16	86	108	88	1624	1.05 b	NET< CL
34	580.27	1161.17	711	131	98	1894	1.22 c	
35	583.49	1167.60	147	146	118	2436	1.42 d	
36	609.32	1219.22	82638	589	107	2103	1.33 a	HiResid
37	615.99	1232.54	57	106	87	1477	1.16 a	NET< CL
38	649.09	1298.70	102	118	96	1598	1.48 a	
39	665.47	1331.44	2419	145	88	1435	1.39 a	
40	683.48	1367.44	147	119	96	1605	1.45 a	
41	703.16	1406.78	732	120	88	1439	1.38 a	
42	719.93	1440.29	605	123	92	1487	1.48 a	
43	742.25	1484.90	272	155	124	2173	2.19 a	
44	742.56	1485.52	27	64	52	669	0.70 b	NET< CL
45	752.96	1506.30	93	97	78	1213	1.21 a	
46	768.37	1537.12	7470	207	94	1537	1.52 a	
47	785.96	1572.26	1883	148	98	1591	1.69 a	
48	806.19	1612.70	1774	139	91	1443	1.52 a	
49	821.26	1642.83	159	107	86	1363	1.24 a	
50	826.52	1653.34	186	117	94	1533	1.41 b	
51	839.06	1678.41	944	135	99	1618	1.62 a	
52	910.90	1821.98	133	155	126	2442	2.24 a	
53	934.11	1868.36	3878	163	87	1458	1.49 a	
54	964.11	1928.34	479	109	82	1309	1.53 a	
55	1051.87	2103.73	406	98	73	1043	1.54 a	
56	1070.07	2140.11	234	88	68	948	1.38 a	
57	1104.31	2208.54	177	132	106	1665	2.47 a	
58	1120.33	2240.57	17390	282	83	1216	1.76 a	
59	1133.67	2267.22	224	98	77	1088	1.70 a	
60	1155.26	2310.38	1834	125	75	1049	1.64 a	
61	1181.72	2363.26	93	78	62	793	1.28 a	
62	1207.80	2415.38	387	89	65	833	1.52 a	
63	1238.18	2476.11	6126	180	74	955	1.84 a	
64	1253.39	2506.51	283	112	88	1197	2.24 a	
65	1281.04	2561.77	1527	123	78	1013	1.92 a	
66	1304.02	2607.70	105	84	67	869	1.80 a	
67	1377.72	2755.00	4390	159	72	952	1.95 a	
68	1385.31	2770.18	780	95	63	793	1.68 b	
69	1401.54	2802.62	1296	112	71	925	1.98 a	
70	1408.07	2815.67	2326	129	71	925	1.88 b	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
71	1461.16	2921.78	101	73	58	699	1.40	a	
72	1479.35	2958.14	40	56	44	487	0.98	a	NET< CL
73	1509.27	3017.92	2011	128	75	1033	1.89	a	
74	1538.56	3076.47	384	95	72	945	2.03	a	
75	1543.44	3086.23	388	86	63	788	1.65	b	
76	1583.20	3165.69	616	89	61	686	1.89	a	
77	1594.61	3188.51	275	85	64	726	2.05	a	
78	1599.71	3198.69	193	74	56	614	1.79	b	
79	1661.31	3321.81	972	88	51	481	1.98	a	
80	1684.18	3367.52	173	60	44	357	2.02	a	
81	1693.33	3385.81	254	77	58	506	2.81	b	
82	1729.65	3458.40	2967	122	46	367	2.16	a	
83	1764.58	3528.22	13687	240	43	313	2.24	a	HiResid
84	1838.47	3675.89	254	52	34	219	1.87	a	
85	1847.45	3693.83	1887	100	40	279	2.25	b	
86	1872.97	3744.85	162	58	43	301	2.50	a	
87	1890.51	3779.90	79	50	39	264	2.10	a	
88	1896.12	3791.12	77	48	36	244	1.92	b	
89	1935.79	3870.40	70	47	37	247	1.98	a	

140887D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
8	186.18	17254	387	234	17247	388	234	
9	196.41	177	244	200	170	244	200	NET<CL
10	238.51	547	268	217	540	268	217	
11	241.95	29045	414	193	29043	414	193	
12	258.76	1807	210	158	1806	210	158	
14	295.17	64118	547	170	64116	547	170	
15	333.70	239	262	214	238	262	214	
16	350.14	1228	467	380	1222	467	380	
27	509.63	209	104	82	160	105	83	
35	583.49	147	146	118	144	146	118	
36	609.32	82638	589	107	82634	589	107	
52	910.90	133	155	126	131	155	126	
71	1461.16	101	73	58	88	73	58	
83	1764.58	13687	240	43	13686	240	43	

140887D05.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-4 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:09
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.34e+002 g	Real Time	1904 Sec
Collection Efficiency	1.0000	Spectrum File	.140887D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014

Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.01E+03 +- 4.07E+00	. . . .	. . . .	1.40E+07
	295.21		1.04E+03 +- 8.83E+00	5.54E+00	2.75E+00	1.40E+07
	351.92		1.04E+03 +- 6.63E+00	3.23E+00	1.60E+00	1.40E+07
	609.31		9.70E+02 +- 6.92E+00	2.54E+00	1.25E+00	1.40E+07
	1120.29		9.90E+02 +- 1.61E+01	9.61E+00	4.73E+00	1.40E+07

MEASURED TOTAL: 1.01E+03 +- 4.07E+00 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	150.94	8900	346	238	10496	0.94	Unknown
2	77.09	155.46	16020	358	208	8747	0.78	Unknown
3	83.86	169.00	268	180	146	5248	0.49	1104DEsc
4	87.18	175.64	8169	342	238	10496	1.04	Unknown
5	89.87	181.02	3300	312	238	10496	0.98	Unknown
6	186.18	373.51	17247	388	234	10142	0.91	1208DEsc
7	238.51	478.09	540	268	217	8030	1.14	Unknown
8	241.95	484.96	29043	414	193	6883	0.97	Unknown
9	258.76	518.57	1806	210	158	5049	0.90	1281DEsc
10	274.62	550.26	1332	252	198	6712	1.22	Unknown

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	333.70	668.35	238	262	214	6765	1.53	Unknown
13	350.14	701.20	1222	467	380	12809	3.10	Unknown
15	386.74	774.35	675	212	169	4539	1.23	1408DEsc
16	388.86	778.60	970	196	153	3971	1.10	Unknown
17	405.67	812.20	462	212	171	4635	1.26	Unknown
18	454.91	910.61	507	130	100	2020	0.88	Unknown
19	461.73	924.25	552	191	153	3446	1.51	Unknown
20	469.72	940.21	243	182	148	3225	1.42	Unknown
21	474.53	949.83	281	151	121	2508	1.15	Unknown
22	480.44	961.63	979	190	148	3225	1.41	Unknown
23	487.12	974.98	959	170	130	2957	1.54	1509DEsc
24	509.63	1019.98	160	105	84	1547	0.78	Unknown
25	511.23	1023.18	659	187	148	3403	1.82	Unknown
26	533.59	1067.87	233	105	83	1568	0.90	Unknown
27	543.66	1087.98	140	102	81	1506	0.87	Unknown
28	572.73	1146.09	109	96	77	1353	0.84	1595DEsc
29	580.27	1161.17	711	131	98	1894	1.22	Unknown
30	583.49	1167.60	144	146	118	2436	1.42	Unknown
32	649.09	1298.70	102	118	96	1598	1.48	Unknown
33	665.47	1331.44	2419	145	88	1435	1.39	Unknown
34	683.48	1367.44	147	119	96	1605	1.45	Unknown
35	703.16	1406.78	732	120	88	1439	1.38	Unknown
36	719.93	1440.29	605	123	92	1487	1.48	Unknown
37	742.25	1484.90	272	155	124	2173	2.19	1765DEsc
38	752.96	1506.30	93	97	78	1213	1.21	Unknown
39	768.37	1537.12	7470	207	94	1537	1.52	1281SEsc
40	785.96	1572.26	1883	148	98	1591	1.69	Unknown
41	806.19	1612.70	1774	139	91	1443	1.52	Unknown
42	821.26	1642.83	159	107	86	1363	1.24	Unknown
43	826.52	1653.34	186	117	94	1533	1.41	1847DEsc
44	839.06	1678.41	944	135	99	1618	1.62	Unknown
45	910.90	1821.98	131	155	126	2442	2.24	Unknown
46	934.11	1868.36	3878	163	87	1458	1.49	Unknown
47	964.11	1928.34	479	109	82	1309	1.53	Unknown
48	1051.87	2103.73	406	98	73	1043	1.54	Unknown
49	1070.07	2140.11	234	88	68	948	1.38	Unknown
50	1104.31	2208.54	177	132	106	1665	2.47	Unknown
52	1133.67	2267.22	224	98	77	1088	1.70	Unknown
53	1155.26	2310.38	1834	125	75	1049	1.64	Unknown
54	1181.72	2363.26	93	78	62	793	1.28	1693SEsc
55	1207.80	2415.38	387	89	65	833	1.52	Unknown
56	1238.18	2476.11	6126	180	74	955	1.84	Unknown
57	1253.39	2506.51	283	112	88	1197	2.24	1765SEsc
58	1281.04	2561.77	1527	123	78	1013	1.92	Unknown
59	1304.02	2607.70	105	84	67	869	1.80	Unknown
60	1377.72	2755.00	4390	159	72	952	1.95	Unknown
61	1385.31	2770.18	780	95	63	793	1.68	Unknown
62	1401.54	2802.62	1296	112	71	925	1.98	Unknown
63	1408.07	2815.67	2326	129	71	925	1.88	Unknown

140887D05.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
64	1461.16	2921.78	88	73	58	699	1.40	Unknown
65	1509.27	3017.92	2011	128	75	1033	1.89	Unknown
66	1538.56	3076.47	384	95	72	945	2.03	Unknown
67	1543.44	3086.23	388	86	63	788	1.65	Unknown
68	1583.20	3165.69	616	89	61	686	1.89	Unknown
69	1594.61	3188.51	275	85	64	726	2.05	Unknown
70	1599.71	3198.69	193	74	56	614	1.79	Unknown
71	1661.31	3321.81	972	88	51	481	1.98	Unknown
72	1684.18	3367.52	173	60	44	357	2.02	Unknown
73	1693.33	3385.81	254	77	58	506	2.81	Unknown
74	1729.65	3458.40	2967	122	46	367	2.16	Unknown
75	1764.58	3528.22	13686	240	43	313	2.24	Unknown
76	1838.47	3675.89	254	52	34	219	1.87	Unknown
77	1847.45	3693.83	1887	100	40	279	2.25	Unknown
78	1872.97	3744.85	162	58	43	301	2.50	Unknown
79	1890.51	3779.90	79	50	39	264	2.10	Unknown
80	1896.12	3791.12	77	48	36	244	1.92	Unknown
81	1935.79	3870.40	70	48	37	247	1.98	Unknown

c:\SEEKER\BIN\140887d05A.res Analysis Results Saved.

140898D07.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-5 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:18
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.52E+002 g	Real Time	1802 Sec
Collection Efficiency	1.0000	Spc. File	.140898D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.23 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.74	153.72	286	53	33	224	0.75 a	
2	76.94	158.11	482	60	33	224	0.75 b	
3	84.16	172.53	60	45	35	225	0.99 a	
4	87.14	178.49	172	50	35	225	1.01 b	
5	89.75	183.70	100	37	26	150	0.71 c	
6	92.89	189.97	139	58	44	300	1.24 d	
7	105.06	214.26	34	48	39	254	1.08 a	NET< CL
8	129.01	262.10	61	38	28	161	0.85 a	
9	186.01	375.94	164	42	27	152	0.90 a	
10	199.49	402.86	-4	48	40	251	0.10	NET< CL
11	209.19	422.23	130	42	29	158	0.94 a	
12	238.55	480.88	1360	81	27	136	1.00 a	
13	241.57	486.90	273	53	34	181	1.36 b	
14	270.04	543.77	123	36	23	99	1.06 a	
15	277.32	558.30	33	28	21	88	0.78 a	
16	295.19	593.99	425	51	24	102	1.13 a	
17	300.03	603.66	74	31	22	87	1.03 b	
18	328.23	659.99	61	32	23	100	0.93 a	
19	338.43	680.35	276	45	25	97	1.33 a	
20	351.96	707.37	753	60	21	85	1.14 a	
21	409.50	822.28	50	31	22	93	1.25 a	
22	463.16	929.45	106	32	20	68	1.61 a	
23	510.99	1024.98	170	38	23	78	2.01 a	
24	583.39	1169.57	437	47	18	54	1.49 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	609.53	1221.79	580	51	15	38	1.53	a
26	727.70	1457.78	93	29	18	56	1.92	a
27	768.57	1539.42	35	19	13	38	1.05	a
28	785.66	1573.54	30	22	16	44	2.04	a
29	795.30	1592.80	37	21	15	39	1.59	a
30	860.63	1723.26	52	21	12	28	1.65	a
31	911.23	1824.33	287	39	15	41	2.06	a
32	933.91	1869.61	27	16	10	22	1.48	a
33	964.81	1931.33	62	21	12	26	1.85	a
34	968.93	1939.57	148	30	14	33	2.21	b
35	1120.56	2242.40	97	24	12	25	2.08	a
36	1238.01	2476.97	41	19	12	25	2.24	a
37	1460.62	2921.54	87	22	10	15	2.67	a
38	1728.40	3456.35	22	13	8	11	2.17	a
39	1764.13	3527.71	75	21	10	15	3.01	a

140898D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

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GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.74	286	53	33	283	53	34	
2	76.94	482	60	33	479	60	34	
3	84.16	60	45	35	58	45	35	
6	92.89	139	58	44	127	58	44	
9	186.01	164	42	27	156	42	28	
10	199.49	-4	48	40	-8	48	40	NET<CL
12	238.55	1360	81	27	1353	81	28	
13	241.57	273	53	34	271	53	34	
14	270.04	123	36	23	123	36	23	
16	295.19	425	51	24	421	51	25	
19	338.43	276	45	25	275	45	25	
20	351.96	753	60	21	747	60	21	
23	510.99	170	38	23	126	39	26	
24	583.39	437	47	18	432	47	18	
25	609.53	580	51	15	574	52	16	
31	911.23	287	39	15	285	39	16	
34	968.93	148	30	14	147	30	14	
37	1460.62	87	22	10	81	22	11	
39	1764.13	75	21	10	73	21	10	

140898D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-5 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:18
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.52e+002 g	Real Time	1802 Sec
Collection Efficiency	1.0000	Spectrum File	.140898D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)		MDA	Critical Level	Halflife (hrs)
Th-234	92.50		8.20E+00	+- 3.77E+00	5.90E+00	2.86E+00	3.92E+13
U-235	143.76	N	-3.25E-01	+- 9.11E-01	1.58E+00	7.62E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	. . . .	6.17E+12
Pb-212	Average:x		9.53E+00	+- 5.65E-01	. . . .	. . . .	1.67E+04
	238.63		9.57E+00	+- 5.72E-01	4.11E-01	1.96E-01	1.67E+04
	300.09		8.19E+00	+- 3.46E+00	5.07E+00	2.39E+00	1.67E+04
Tl-208	Average:x		2.97E+00	+- 3.11E-01	. . . .	. . . .	1.67E+04
	277.36		1.79E+00	+- 1.50E+00	2.39E+00	1.12E+00	1.67E+04
	583.14		3.00E+00	+- 3.28E-01	2.73E-01	1.27E-01	1.67E+04
	860.47		3.28E+00	+- 1.31E+00	1.73E+00	7.77E-01	1.67E+04
Pb-214	Average:x		7.78E+00	+- 5.23E-01	. . . .	. . . .	1.40E+07
	295.22		7.57E+00	+- 9.14E-01	9.39E-01	4.45E-01	1.40E+07
	351.99		7.88E+00	+- 6.38E-01	4.79E-01	2.25E-01	1.40E+07
Ac-228	Average:x		8.63E+00	+- 8.02E-01	. . . .	. . . .	1.23E+14
	338.40		9.28E+00	+- 1.52E+00	1.78E+00	8.43E-01	1.23E+14
	911.07		8.77E+00	+- 1.19E+00	1.04E+00	4.77E-01	1.23E+14
	968.90		7.71E+00	+- 1.56E+00	1.62E+00	7.41E-01	1.23E+14
Bi-214	Average:x		7.10E+00	+- 6.02E-01	. . . .	. . . .	1.40E+07
	609.32		7.33E+00	+- 6.58E-01	4.35E-01	2.00E-01	1.40E+07
	1120.28		5.93E+00	+- 1.49E+00	1.62E+00	7.26E-01	1.40E+07
Bi-212	727.17		9.76E+00	+- 3.09E+00	4.14E+00	1.93E+00	1.67E+04
K-40	1460.75		8.30E+00	+- 2.27E+00	2.47E+00	1.10E+00	1.12E+13
Pb-210	46.50	N	1.51E+01	+- 3.00E+01	5.02E+01	2.39E+01	1.95E+05
Am-241	59.54	N	3.09E-01	+- 1.36E+00	2.31E+00	1.10E+00	3.80E+06
Cs-137	661.62	N	4.12E-02	+- 1.60E-01	2.77E-01	1.29E-01	2.64E+05

140898D07.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pa-234m	1001.03	N	1.59E+01 +- 1.94E+01	3.16E+01	1.38E+01	3.92E+13
Eu-154	1004.80	N	-8.59E-01 +- 6.47E-01	1.39E+00	6.28E-01	7.45E+04
Co-60	1332.51	N	7.28E-02 +- 1.34E-01	2.30E-01	1.00E-01	4.62E+04
Eu-152	1408.08	N	4.07E-01 +- 7.83E-01	1.34E+00	5.97E-01	1.17E+05

MEASURED TOTAL: 9.40E+01 +- 6.37E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.74	153.72	283	53	34	224	0.75	Unknown
2	76.94	158.11	479	60	34	224	0.75	Unknown
3	84.16	172.53	58	45	35	225	0.99	Unknown
4	87.14	178.49	172	50	35	225	1.01	Unknown
5	89.75	183.70	100	37	26	150	0.71	Unknown
7	105.06	214.26	34	48	39	254	1.08	Deleted
8	129.01	262.10	61	38	28	161	0.85	Unknown
10	199.49	402.86	-8	48	40	251	0.10	Deleted
11	209.19	422.23	130	42	29	158	0.94	Unknown
13	241.57	486.90	271	53	34	181	1.36	Unknown
14	270.04	543.77	123	36	23	99	1.06	Unknown
18	328.23	659.99	61	32	23	100	0.93	Unknown
21	409.50	822.28	50	31	22	93	1.25	Unknown
22	463.16	929.45	106	32	20	68	1.61	Unknown
23	510.99	1024.98	126	39	26	78	2.01	Unknown
27	768.57	1539.42	35	19	13	38	1.05	Unknown
28	785.66	1573.54	30	22	16	44	2.04	Unknown
29	795.30	1592.80	37	21	15	39	1.59	Unknown
32	933.91	1869.61	27	16	10	22	1.48	Unknown
33	964.81	1931.33	62	21	12	26	1.85	Unknown
36	1238.01	2476.97	41	19	12	25	2.24	Unknown
38	1728.40	3456.35	22	13	8	11	2.17	Unknown
39	1764.13	3527.71	73	21	10	15	3.01	Unknown

c:\SEEKER\BIN\140898d07.res Analysis Results Saved.

140898D07.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-5 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:18
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.52E+002 g	Real Time	1802 Sec
Collection Efficiency	1.0000	Spc. File	.140898D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.23 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.74	153.72	286	53	33	224	0.75 a	
2	76.94	158.11	482	60	33	224	0.75 b	
3	84.16	172.53	60	45	35	225	0.99 a	
4	87.14	178.49	172	50	35	225	1.01 b	
5	89.75	183.70	100	37	26	150	0.71 c	
6	92.89	189.97	139	58	44	300	1.24 d	
7	105.06	214.26	34	48	39	254	1.08 a	NET< CL
8	129.01	262.10	61	38	28	161	0.85 a	
9	186.01	375.94	164	42	27	152	0.90 a	
10	199.49	402.86	-4	48	40	251	0.10	NET< CL
11	209.19	422.23	130	42	29	158	0.94 a	
12	238.55	480.88	1360	81	27	136	1.00 a	
13	241.57	486.90	273	53	34	181	1.36 b	
14	270.04	543.77	123	36	23	99	1.06 a	
15	277.32	558.30	33	28	21	88	0.78 a	
16	295.19	593.99	425	51	24	102	1.13 a	
17	300.03	603.66	74	31	22	87	1.03 b	
18	328.23	659.99	61	32	23	100	0.93 a	
19	338.43	680.35	276	45	25	97	1.33 a	
20	351.96	707.37	753	60	21	85	1.14 a	
21	409.50	822.28	50	31	22	93	1.25 a	
22	463.16	929.45	106	32	20	68	1.61 a	
23	510.99	1024.98	170	38	23	78	2.01 a	
24	583.39	1169.57	437	47	18	54	1.49 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	609.53	1221.79	580	51	15	38	1.53	a
26	727.70	1457.78	93	29	18	56	1.92	a
27	768.57	1539.42	35	19	13	38	1.05	a
28	785.66	1573.54	30	22	16	44	2.04	a
29	795.30	1592.80	37	21	15	39	1.59	a
30	860.63	1723.26	52	21	12	28	1.65	a
31	911.23	1824.33	287	39	15	41	2.06	a
32	933.91	1869.61	27	16	10	22	1.48	a
33	964.81	1931.33	62	21	12	26	1.85	a
34	968.93	1939.57	148	30	14	33	2.21	b
35	1120.56	2242.40	97	24	12	25	2.08	a
36	1238.01	2476.97	41	19	12	25	2.24	a
37	1460.62	2921.54	87	22	10	15	2.67	a
38	1728.40	3456.35	22	13	8	11	2.17	a
39	1764.13	3527.71	75	21	10	15	3.01	a

140898D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.74	286	53	33	283	53	34	
2	76.94	482	60	33	479	60	34	
3	84.16	60	45	35	58	45	35	
6	92.89	139	58	44	127	58	44	
9	186.01	164	42	27	156	42	28	
10	199.49	-4	48	40	-8	48	40	NET<CL
12	238.55	1360	81	27	1353	81	28	
13	241.57	273	53	34	271	53	34	
14	270.04	123	36	23	123	36	23	
16	295.19	425	51	24	421	51	25	
19	338.43	276	45	25	275	45	25	
20	351.96	753	60	21	747	60	21	
23	510.99	170	38	23	126	39	26	
24	583.39	437	47	18	432	47	18	
25	609.53	580	51	15	574	52	16	
31	911.23	287	39	15	285	39	16	
34	968.93	148	30	14	147	30	14	
37	1460.62	87	22	10	81	22	11	
39	1764.13	75	21	10	73	21	10	

140898D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-5 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:18
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.52e+002 g	Real Time	1802 Sec
Collection Efficiency	1.0000	Spectrum File	.140898D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	7.49E+00 +- 3.95E-01	. . . .	. . . .	1.40E+07
	295.21		7.57E+00 +- 9.14E-01	9.39E-01	4.45E-01	1.40E+07
	351.92		7.88E+00 +- 6.38E-01	4.79E-01	2.25E-01	1.40E+07
	609.31		7.33E+00 +- 6.58E-01	4.35E-01	2.00E-01	1.40E+07
	1120.29		5.93E+00 +- 1.49E+00	1.62E+00	7.26E-01	1.40E+07

MEASURED TOTAL: 7.49E+00 +- 3.95E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.74	153.72	283	53	34	224	0.75	Unknown
2	76.94	158.11	479	60	34	224	0.75	Unknown
3	84.16	172.53	58	45	35	225	0.99	Unknown
4	87.14	178.49	172	50	35	225	1.01	Unknown
5	89.75	183.70	100	37	26	150	0.71	Unknown
6	92.89	189.97	127	58	44	300	1.24	Unknown
7	129.01	262.10	61	38	28	161	0.85	Unknown
8	186.01	375.94	156	42	28	152	0.90	Unknown
9	209.19	422.23	130	42	29	158	0.94	Unknown
10	238.55	480.88	1353	81	28	136	1.00	Unknown
11	241.57	486.90	271	53	34	181	1.36	Unknown

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	270.04	543.77	123	36	23	99	1.06	Unknown
13	277.32	558.30	33	28	21	88	0.78	Unknown
15	300.03	603.66	74	32	22	87	1.03	Unknown
16	328.23	659.99	61	32	23	100	0.93	Unknown
17	338.43	680.35	275	45	25	97	1.33	Unknown
19	409.50	822.28	50	31	22	93	1.25	Unknown
20	463.16	929.45	106	32	20	68	1.61	Unknown
21	510.99	1024.98	126	39	26	78	2.01	Unknown
22	583.39	1169.57	432	47	18	54	1.49	Unknown
24	727.70	1457.78	93	29	18	56	1.92	Unknown
25	768.57	1539.42	35	19	13	38	1.05	Unknown
26	785.66	1573.54	30	22	16	44	2.04	Unknown
27	795.30	1592.80	37	21	15	39	1.59	Unknown
28	860.63	1723.26	52	21	12	28	1.65	Unknown
29	911.23	1824.33	285	39	16	41	2.06	Unknown
30	933.91	1869.61	27	16	10	22	1.48	Unknown
31	964.81	1931.33	62	21	12	26	1.85	Unknown
32	968.93	1939.57	147	30	14	33	2.21	Unknown
34	1238.01	2476.97	41	19	12	25	2.24	Unknown
35	1460.62	2921.54	81	22	11	15	2.67	Unknown
36	1728.40	3456.35	22	13	8	11	2.17	Unknown
37	1764.13	3527.71	73	21	10	15	3.01	Unknown

c:\SEEKER\BIN\140898d07A.res Analysis Results Saved.

140838D08.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-6 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:28
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	4500 Sec
Sample Size	9.56E+001 g	Real Time	4504 Sec
Collection Efficiency	1.0000	Spc. File	.140838D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.44	96.76	40	21	14	45	0.47	a
2	63.26	130.33	48	18	10	26	0.38	a
3	74.71	153.18	71	28	18	68	0.78	a
4	77.02	157.79	69	25	16	54	0.64	b
5	83.81	171.35	22	18	13	42	0.47	a
6	92.52	188.73	52	27	19	74	0.82	a
7	185.80	374.93	29	26	19	70	0.93	a
8	238.57	480.24	45	20	13	35	0.58	a
9	295.01	592.90	35	19	12	31	0.90	a
10	352.09	706.83	52	23	15	39	1.12	a
11	511.30	1024.63	116	33	20	56	2.24	a Wide Pk
12	583.39	1168.52	30	18	12	28	1.38	a
13	609.82	1221.27	41	19	12	26	1.17	a
14	1460.62	2919.50	57	17	6	7	1.90	a

140838D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.44	40	21	14	11	24	19	NET<CL
2	63.26	48	18	10	-1	22	18	NET<CL
3	74.71	71	28	18	55	29	21	
4	77.02	69	25	16	48	26	19	
5	83.81	22	18	13	9	22	18	NET<CL
6	92.52	52	27	19	-9	31	26	NET<CL
7	185.80	29	26	19	-1	29	24	NET<CL
8	238.57	45	20	13	22	22	17	
9	295.01	35	19	12	29	21	15	
10	352.09	52	23	15	39	25	18	
11	511.30	116	33	20	-2	38	31	NET<CL
12	583.39	30	18	12	19	20	15	
13	609.82	41	19	12	30	21	15	
14	1460.62	57	17	6	38	18	11	

140838D08.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-6 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:28
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	4500 Sec
Sample Size	9.56e+001 g	Real Time	4504 Sec
Collection Efficiency	1.0000	Spectrum File	.140838D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-210	46.50	N	9.17E-01 +- 1.97E+00	3.34E+00	1.56E+00	1.95E+05
Th-234	92.50	N	-3.80E-01 +- 1.26E+00	2.22E+00	1.06E+00	3.92E+13
Pb-212	238.63		1.71E-01 +- 1.74E-01	2.82E-01	1.30E-01	1.67E+04
Pb-214	Average:	x	4.93E-01 +- 2.40E-01	. . . .	. . . .	1.40E+07
	295.22		5.72E-01 +- 4.12E-01	6.35E-01	2.91E-01	1.40E+07
	351.99		4.53E-01 +- 2.96E-01	4.57E-01	2.13E-01	1.40E+07
Tl-208	583.14		1.46E-01 +- 1.55E-01	2.52E-01	1.15E-01	1.67E+04
Bi-214	609.32		4.27E-01 +- 3.03E-01	4.67E-01	2.14E-01	1.40E+07
K-40	1460.75		4.53E+00 +- 2.14E+00	2.91E+00	1.29E+00	1.12E+13
Am-241	59.54	N	2.72E-02 +- 1.29E-01	2.28E-01	1.04E-01	3.80E+06
U-235	143.76	N	-2.04E-02 +- 4.69E-01	8.36E-01	3.88E-01	6.17E+12
Cs-137	661.62	N	9.93E-02 +- 1.26E-01	2.07E-01	9.23E-02	2.64E+05
Bi-212	727.17	N	4.75E-01 +- 1.42E+00	2.53E+00	1.10E+00	1.67E+04
Ac-228	911.07	N	3.05E-01 +- 5.22E-01	8.83E-01	3.94E-01	1.23E+14
Pa-234m	1001.03	N	6.63E+00 +- 1.55E+01	2.76E+01	1.16E+01	3.92E+13
Eu-154	1004.80	N	2.19E-01 +- 5.36E-01	9.53E-01	4.03E-01	7.45E+04
Co-60	1332.51	N	5.78E-02 +- 1.07E-01	1.86E-01	7.64E-02	4.62E+04
Eu-152	1408.08	N	-4.29E-01 +- 4.42E-01	1.07E+00	4.51E-01	1.17E+05

MEASURED TOTAL: 1.45E+01 +- 2.34E+01 pCi/g

140838D08.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	63.26	130.33	-1	22	18	26	0.38	Deleted
3	74.71	153.18	55	29	21	68	0.78	Unknown
4	77.02	157.79	48	26	19	54	0.64	Unknown
5	83.81	171.35	9	22	18	42	0.47	Deleted
7	185.80	374.93	-1	29	24	70	0.93	Deleted
11	511.30	1024.63	-2	38	31	56	2.24	Deleted

c:\SEEKER\BIN\140838d08.res Analysis Results Saved.

140838D08.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-6 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:28
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	4500 Sec
Sample Size	9.56E+001 g	Real Time	4504 Sec
Collection Efficiency	1.0000	Spc. File	.140838D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.44	96.76	40	21	14	45	0.47 a	
2	63.26	130.33	48	18	10	26	0.38 a	
3	74.71	153.18	71	28	18	68	0.78 a	
4	77.02	157.79	69	25	16	54	0.64 b	
5	83.81	171.35	22	18	13	42	0.47 a	
6	92.52	188.73	52	27	19	74	0.82 a	
7	185.80	374.93	29	26	19	70	0.93 a	
8	238.57	480.24	45	20	13	35	0.58 a	
9	295.01	592.90	35	19	12	31	0.90 a	
10	352.09	706.83	52	23	15	39	1.12 a	
11	511.30	1024.63	116	33	20	56	2.24 a	Wide Pk
12	583.39	1168.52	30	18	12	28	1.38 a	
13	609.82	1221.27	41	19	12	26	1.17 a	
14	1460.62	2919.50	57	17	6	7	1.90 a	

140838D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.44	40	21	14	11	24	19	NET<CL
2	63.26	48	18	10	-1	22	18	NET<CL
3	74.71	71	28	18	55	29	21	
4	77.02	69	25	16	48	26	19	
5	83.81	22	18	13	9	22	18	NET<CL
6	92.52	52	27	19	-9	31	26	NET<CL
7	185.80	29	26	19	-1	29	24	NET<CL
8	238.57	45	20	13	22	22	17	
9	295.01	35	19	12	29	21	15	
10	352.09	52	23	15	39	25	18	
11	511.30	116	33	20	-2	38	31	NET<CL
12	583.39	30	18	12	19	20	15	
13	609.82	41	19	12	30	21	15	
14	1460.62	57	17	6	38	18	11	

140838D08.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-6 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 09:27:28
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.41e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	4500 Sec
Sample Size	9.56e+001 g	Real Time	4504 Sec
Collection Efficiency	1.0000	Spectrum File	.140838D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)
Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)
Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	4.68E-01 +- 1.88E-01	. . . .	. . . .	1.40E+07
	295.21		5.72E-01 +- 4.12E-01	6.35E-01	2.91E-01	1.40E+07
	351.92		4.53E-01 +- 2.96E-01	4.57E-01	2.13E-01	1.40E+07
	609.31		4.27E-01 +- 3.03E-01	4.67E-01	2.14E-01	1.40E+07

MEASURED TOTAL: 4.68E-01 +- 1.88E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.71	153.18	55	29	21	68	0.78	Unknown
2	77.02	157.79	48	26	19	54	0.64	Unknown
3	238.57	480.24	22	22	17	35	0.58	Unknown
6	583.39	1168.52	19	20	15	28	1.38	Unknown
8	1460.62	2919.50	38	18	11	7	1.90	Unknown

c:\SEEKER\BIN\140838d08A.res Analysis Results Saved.

140920D01.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-7 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:22
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	1.88E+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spc. File	.140920D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.00 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.73	153.25	228	52	35	252	0.79 a	
2	77.02	157.81	506	62	35	252	0.87 b	
3	79.28	162.34	42	33	25	151	0.41 c	
4	87.08	177.92	186	50	34	238	0.81 a	
5	89.73	183.21	71	39	29	190	0.65 b	
6	186.13	375.73	397	58	34	238	0.83 a	
7	238.50	480.33	174	52	37	229	1.07 a	
8	241.97	487.26	692	66	33	196	0.99 b	
9	258.96	521.18	47	37	28	146	0.96 a	
10	274.61	552.44	47	44	34	187	1.37 a	
11	295.18	593.52	1467	84	29	142	1.07 a	
12	313.46	630.03	21	32	25	116	0.92 a	NET< CL
13	351.84	706.68	2365	103	29	140	1.19 a	
14	487.14	976.90	42	29	21	74	1.58 a	
15	510.83	1024.22	37	34	26	102	1.95 a	
16	583.17	1168.69	42	21	13	44	0.72 a	
17	609.24	1220.75	1853	89	19	69	1.33 a	
18	665.56	1333.24	59	23	14	38	1.29 a	
19	768.40	1538.64	169	33	16	46	1.43 a	
20	785.91	1573.60	36	24	17	55	1.23 a	
21	806.31	1614.33	35	20	13	36	1.16 a	
22	839.09	1679.80	26	20	14	41	1.33 a	
23	911.22	1823.86	50	27	19	60	2.11 a	
24	933.91	1869.18	85	26	15	44	1.48 a	

140920D01.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1120.16	2241.15	379	42	13	32	1.76	a
26	1155.00	2310.73	48	24	16	38	2.46	a
27	1238.05	2476.60	148	28	12	22	2.26	a
28	1281.31	2563.00	20	15	10	21	1.29	a
29	1377.63	2755.38	90	25	14	34	1.99	a
30	1407.99	2816.00	40	20	13	33	1.45	a
31	1460.94	2921.76	57	21	12	28	1.83	a
32	1509.00	3017.74	42	19	11	23	1.93	a
33	1729.41	3457.93	62	18	6	7	2.25	a
34	1764.43	3527.87	234	31	6	7	2.15	a
35	1847.67	3694.12	32	14	7	9	1.61	a

140920D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
4	87.08	186	50	34	185	50	34	
6	186.13	397	58	34	392	58	35	
7	238.50	174	52	37	170	52	37	
11	295.18	1467	84	29	1465	84	29	
13	351.84	2365	103	29	2362	103	29	
15	510.83	37	34	26	-2	35	29	NET<CL
16	583.17	42	21	13	39	21	14	
17	609.24	1853	89	19	1851	89	20	
23	911.22	50	27	19	48	27	20	
25	1120.16	379	42	13	378	42	14	
31	1460.94	57	21	12	44	21	14	
34	1764.43	234	31	6	233	31	6	

140920D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-7 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:22
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	1.88e+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spectrum File	.140920D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	1.24E+00 +- 1.70E+00	2.80E+00	1.35E+00	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.96E+00 +- 6.01E-01	8.87E-01	4.28E-01	1.67E+04
Pb-214	Average:x		3.91E+01 +- 1.36E+00	. . . .	. . . .	1.40E+07
	295.22		4.02E+01 +- 2.32E+00	1.68E+00	8.03E-01	1.40E+07
	351.99		3.85E+01 +- 1.69E+00	9.87E-01	4.72E-01	1.40E+07
Tl-208	583.14		4.32E-01 +- 2.30E-01	3.34E-01	1.52E-01	1.67E+04
Bi-214	Average:x		3.74E+01 +- 1.66E+00	. . . .	. . . .	1.40E+07
	609.32		3.74E+01 +- 1.80E+00	8.50E-01	3.97E-01	1.40E+07
	1120.28		3.76E+01 +- 4.21E+00	3.02E+00	1.37E+00	1.40E+07
Ac-228	911.07		2.40E+00 +- 1.36E+00	2.07E+00	9.67E-01	1.23E+14
Eu-152	1408.08		3.45E+00 +- 1.70E+00	2.38E+00	1.08E+00	1.17E+05
K-40	1460.75		7.34E+00 +- 3.59E+00	5.10E+00	2.32E+00	1.12E+13
Pb-210	46.50	N	2.88E+02 +- 2.71E+02	4.40E+02	2.11E+02	1.95E+05
Am-241	59.54	N	-3.61E+00 +- 4.14E+00	7.41E+00	3.56E+00	3.80E+06
Th-234	92.50	N	2.47E-03 +- 4.43E+00	7.60E+00b	3.64E+00	3.92E+13
Cs-137	661.62	N	4.68E-02 +- 2.14E-01	3.76E-01B	1.72E-01	2.64E+05
Bi-212	727.17	N	-3.56E-01 +- 3.28E+00	5.91E+00	2.73E+00	1.67E+04
Pa-234m	1001.03	N	3.03E+01 +- 4.59E+01	7.66E+01	3.52E+01	3.92E+13
Eu-154	1004.80	N	-1.16E+00 +- 1.49E+00	2.85E+00	1.32E+00	7.45E+04
Co-60	1332.51	N	-2.29E-01 +- 2.38E-01	4.90E-01	2.21E-01	4.62E+04

MEASURED TOTAL: 4.12E+02 +- 3.34E+02 pCi/g

140920D01.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.73	153.25	228	52	35	252	0.79	Unknown
2	77.02	157.81	506	62	35	252	0.87	Unknown
3	79.28	162.34	42	33	25	151	0.41	Unknown
4	87.08	177.92	185	50	34	238	0.81	Unknown
5	89.73	183.21	71	39	29	190	0.65	Unknown
8	241.97	487.26	692	66	33	196	0.99	Unknown
9	258.96	521.18	47	37	28	146	0.96	Unknown
10	274.61	552.44	47	44	34	187	1.37	Unknown
12	313.46	630.03	21	32	25	116	0.92	Deleted
14	487.14	976.90	42	29	21	74	1.58	Unknown
15	510.83	1024.22	-2	35	29	102	1.95	Deleted
18	665.56	1333.24	59	23	14	38	1.29	Unknown
19	768.40	1538.64	169	33	16	46	1.43	Unknown
20	785.91	1573.60	36	24	17	55	1.23	Unknown
21	806.31	1614.33	35	20	13	36	1.16	Unknown
22	839.09	1679.80	26	20	14	41	1.33	Unknown
24	933.91	1869.18	85	26	15	44	1.48	Unknown
26	1155.00	2310.73	48	24	16	38	2.46	Unknown
27	1238.05	2476.60	148	28	12	22	2.26	Unknown
28	1281.31	2563.00	20	15	10	21	1.29	Unknown
29	1377.63	2755.38	90	25	14	34	1.99	Unknown
32	1509.00	3017.74	42	19	11	23	1.93	Unknown
33	1729.41	3457.93	63	18	6	7	2.25	Unknown
34	1764.43	3527.87	233	31	6	7	2.15	Unknown
35	1847.67	3694.12	32	14	7	9	1.61	Unknown

c:\SEEKER\BIN\140920d01.res Analysis Results Saved.

140920D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-7 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:22
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	1.88E+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spc. File	.140920D01.SPC

Detector #: 1 (Detector 1)

Energy(keV) = -2.00 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.73	153.25	228	52	35	252	0.79 a	
2	77.02	157.81	506	62	35	252	0.87 b	
3	79.28	162.34	42	33	25	151	0.41 c	
4	87.08	177.92	186	50	34	238	0.81 a	
5	89.73	183.21	71	39	29	190	0.65 b	
6	186.13	375.73	397	58	34	238	0.83 a	
7	238.50	480.33	174	52	37	229	1.07 a	
8	241.97	487.26	692	66	33	196	0.99 b	
9	258.96	521.18	47	37	28	146	0.96 a	
10	274.61	552.44	47	44	34	187	1.37 a	
11	295.18	593.52	1467	84	29	142	1.07 a	
12	313.46	630.03	21	32	25	116	0.92 a	NET< CL
13	351.84	706.68	2365	103	29	140	1.19 a	
14	487.14	976.90	42	29	21	74	1.58 a	
15	510.83	1024.22	37	34	26	102	1.95 a	
16	583.17	1168.69	42	21	13	44	0.72 a	
17	609.24	1220.75	1853	89	19	69	1.33 a	
18	665.56	1333.24	59	23	14	38	1.29 a	
19	768.40	1538.64	169	33	16	46	1.43 a	
20	785.91	1573.60	36	24	17	55	1.23 a	
21	806.31	1614.33	35	20	13	36	1.16 a	
22	839.09	1679.80	26	20	14	41	1.33 a	
23	911.22	1823.86	50	27	19	60	2.11 a	
24	933.91	1869.18	85	26	15	44	1.48 a	

140920D01.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1120.16	2241.15	379	42	13	32	1.76	a
26	1155.00	2310.73	48	24	16	38	2.46	a
27	1238.05	2476.60	148	28	12	22	2.26	a
28	1281.31	2563.00	20	15	10	21	1.29	a
29	1377.63	2755.38	90	25	14	34	1.99	a
30	1407.99	2816.00	40	20	13	33	1.45	a
31	1460.94	2921.76	57	21	12	28	1.83	a
32	1509.00	3017.74	42	19	11	23	1.93	a
33	1729.41	3457.93	62	18	6	7	2.25	a
34	1764.43	3527.87	234	31	6	7	2.15	a
35	1847.67	3694.12	32	14	7	9	1.61	a

140920D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
4	87.08	186	50	34	185	50	34	
6	186.13	397	58	34	392	58	35	
7	238.50	174	52	37	170	52	37	
11	295.18	1467	84	29	1465	84	29	
13	351.84	2365	103	29	2362	103	29	
15	510.83	37	34	26	-2	35	29	NET<CL
16	583.17	42	21	13	39	21	14	
17	609.24	1853	89	19	1851	89	20	
23	911.22	50	27	19	48	27	20	
25	1120.16	379	42	13	378	42	14	
31	1460.94	57	21	12	44	21	14	
34	1764.43	234	31	6	233	31	6	

140920D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-7 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:22
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	1.88e+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spectrum File	.140920D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	3.84E+01 +- 1.05E+00	. . . .	. . . .	1.40E+07
	295.21		4.02E+01 +- 2.32E+00	1.68E+00	8.03E-01	1.40E+07
	351.92		3.85E+01 +- 1.69E+00	9.87E-01	4.72E-01	1.40E+07
	609.31		3.74E+01 +- 1.80E+00	8.50E-01	3.98E-01	1.40E+07
	1120.29		3.76E+01 +- 4.21E+00	3.02E+00	1.37E+00	1.40E+07

MEASURED TOTAL: 3.84E+01 +- 1.05E+00 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.73	153.25	228	52	35	252	0.79	Unknown
2	77.02	157.81	506	62	35	252	0.87	Unknown
3	79.28	162.34	42	33	25	151	0.41	Unknown
4	87.08	177.92	185	50	34	238	0.81	Unknown
5	89.73	183.21	71	39	29	190	0.65	Unknown
6	186.13	375.73	392	58	35	238	0.83	Unknown
7	238.50	480.33	170	52	37	229	1.07	Unknown
8	241.97	487.26	692	66	33	196	0.99	Unknown
9	258.96	521.18	47	37	28	146	0.96	Unknown
10	274.61	552.44	47	44	34	187	1.37	Unknown

140920D01.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	487.14	976.90	42	29	21	74	1.58	Unknown
14	583.17	1168.69	39	21	14	44	0.72	Unknown
16	665.56	1333.24	59	23	14	38	1.29	Unknown
17	768.40	1538.64	169	33	16	46	1.43	Unknown
18	785.91	1573.60	36	24	17	55	1.23	Unknown
19	806.31	1614.33	35	20	13	36	1.16	Unknown
20	839.09	1679.80	26	20	14	41	1.33	Unknown
21	911.22	1823.86	48	27	20	60	2.11	Unknown
22	933.91	1869.18	85	26	15	44	1.48	Unknown
24	1155.00	2310.73	48	24	16	38	2.46	Unknown
25	1238.05	2476.60	148	28	12	22	2.26	Unknown
26	1281.31	2563.00	20	15	10	21	1.29	Unknown
27	1377.63	2755.38	90	25	14	34	1.99	Unknown
28	1407.99	2816.00	40	20	13	33	1.45	Unknown
29	1460.94	2921.76	44	21	14	28	1.83	Unknown
30	1509.00	3017.74	42	19	11	23	1.93	Unknown
31	1729.41	3457.93	63	18	6	7	2.25	Unknown
32	1764.43	3527.87	233	31	6	7	2.15	Unknown
33	1847.67	3694.12	32	14	7	9	1.61	Unknown

c:\SEEKER\BIN\140920d01A.res Analysis Results Saved.

140965D03.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-8 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:36
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.27E+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spc. File	.140965D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	42.47	88.17	20	19	14	42	0.65	a
2	74.39	151.84	102	44	33	124	2.14	a Wide Pk
3	76.90	156.83	102	29	18	57	0.97	b
4	87.17	177.33	27	23	17	63	0.60	a
5	92.90	188.74	37	30	23	90	1.19	a
6	185.90	374.21	40	32	24	86	1.46	a
7	238.60	479.32	125	29	16	51	1.05	a
8	241.75	485.60	54	26	17	60	1.18	b
9	295.09	591.97	138	29	14	37	1.10	a
10	351.85	705.16	255	37	15	43	1.15	a
11	511.06	1022.67	62	23	14	26	2.31	a
12	583.29	1166.72	45	19	11	23	1.41	a
13	609.09	1218.17	193	31	11	24	1.62	a
14	661.78	1323.25	62	20	10	20	1.66	a
15	911.68	1821.62	25	13	7	12	1.28	a
16	1120.68	2238.41	26	12	6	8	1.39	a
17	1460.99	2917.08	63	18	7	8	2.25	a
18	1765.00	3523.37	22	11	5	4	1.68	a

140965D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	76.90	102	29	18	100	29	18	
5	92.90	37	30	23	27	31	24	
6	185.90	40	32	24	32	32	25	
7	238.60	125	29	16	120	30	16	
9	295.09	138	29	14	136	29	14	
10	351.85	255	37	15	249	37	16	
11	511.06	62	23	14	21	24	18	
12	583.29	45	19	11	42	19	12	
13	609.09	193	31	11	190	31	12	
15	911.68	25	13	7	23	13	8	
17	1460.99	63	18	7	57	18	8	
18	1765.00	22	11	5	20	11	5	

140965D03.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-8 GS140724-1

Sampling Start: 07/17/2014 12:00:00	Counting Start: 08/16/2014 10:14:36
Sampling Stop: 07/17/2014 12:00:00	Decay Time. . . . . 7.18e+002 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.27e+002 g	Real Time . . . . . 1807 Sec
Collection Efficiency 1.0000	Spectrum File 140965D03.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 3 (Detector 3)
Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013
Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		1.98E+00 +- 2.28E+00	3.73E+00	1.77E+00	3.92E+13
U-235	143.76	N	-1.62E-01 +- 6.11E-01	1.10E+00	5.14E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.07E+00 +- 2.62E-01	3.14E-01	1.45E-01	1.67E+04
Pb-214	Average:x		3.02E+00 +- 3.67E-01	. . . .	. . . . .	1.40E+07
	295.22		2.86E+00 +- 6.09E-01	6.53E-01	2.98E-01	1.40E+07
	351.99		3.11E+00 +- 4.60E-01	4.25E-01	1.95E-01	1.40E+07
Tl-208	583.14		3.51E-01 +- 1.61E-01	2.18E-01	9.77E-02	1.67E+04
Bi-214	Average:x		2.75E+00 +- 4.33E-01	. . . .	. . . .	1.40E+07
	609.32		2.95E+00 +- 4.85E-01	4.21E-01	1.89E-01	1.40E+07
	1120.28		1.99E+00 +- 9.55E-01	1.14E+00	4.64E-01	1.40E+07
Cs-137	661.62		5.56E-01 +- 1.81E-01	2.11E-01	9.35E-02	2.64E+05
Ac-228	911.07		8.85E-01 +- 5.14E-01	7.04E-01	3.00E-01	1.23E+14
K-40	1460.75		7.47E+00 +- 2.37E+00	2.52E+00	1.08E+00	1.12E+13
Pb-210	46.50	N	2.44E+01 +- 5.28E+01	8.94E+01	4.17E+01	1.95E+05
Am-241	59.54	N	-3.02E-01 +- 1.13E+00	2.04E+00	9.53E-01	3.80E+06
Bi-212	727.17	N	2.19E+00 +- 1.61E+00	2.34E+00	9.95E-01	1.67E+04
Pa-234m	1001.03	N	-7.21E+00 +- 1.77E+01	3.63E+01	1.57E+01	3.92E+13
Eu-154	1004.80	N	-2.39E-01 +- 5.85E-01	1.20E+00	5.19E-01	7.45E+04
Co-60	1332.51	N	5.87E-02 +- 1.03E-01	1.78E-01	7.09E-02	4.62E+04
Eu-152	1408.08	N	-1.12E-01 +- 6.52E-01	1.29E+00	5.55E-01	1.17E+05

MEASURED TOTAL: 4.48E+01 +- 6.11E+01 pCi/g

140965D03.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	42.47	88.17	20	19	14	42	0.65	Unknown
2	74.39	151.84	102	44	33	124	2.14	Unknown
3	76.90	156.83	100	29	18	57	0.97	Unknown
4	87.17	177.33	27	23	17	63	0.60	Unknown
8	241.75	485.60	54	26	17	60	1.18	Unknown
11	511.06	1022.67	21	24	18	26	2.31	Unknown
18	1765.00	3523.37	20	11	5	4	1.68	Unknown

c:\SEEKER\BIN\140965d03.res Analysis Results Saved.

140965D03.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-8 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:36
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.27E+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spc. File	.140965D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	42.47	88.17	20	19	14	42	0.65	a
2	74.39	151.84	102	44	33	124	2.14	a Wide Pk
3	76.90	156.83	102	29	18	57	0.97	b
4	87.17	177.33	27	23	17	63	0.60	a
5	92.90	188.74	37	30	23	90	1.19	a
6	185.90	374.21	40	32	24	86	1.46	a
7	238.60	479.32	125	29	16	51	1.05	a
8	241.75	485.60	54	26	17	60	1.18	b
9	295.09	591.97	138	29	14	37	1.10	a
10	351.85	705.16	255	37	15	43	1.15	a
11	511.06	1022.67	62	23	14	26	2.31	a
12	583.29	1166.72	45	19	11	23	1.41	a
13	609.09	1218.17	193	31	11	24	1.62	a
14	661.78	1323.25	62	20	10	20	1.66	a
15	911.68	1821.62	25	13	7	12	1.28	a
16	1120.68	2238.41	26	12	6	8	1.39	a
17	1460.99	2917.08	63	18	7	8	2.25	a
18	1765.00	3523.37	22	11	5	4	1.68	a

140965D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	76.90	102	29	18	100	29	18	
5	92.90	37	30	23	27	31	24	
6	185.90	40	32	24	32	32	25	
7	238.60	125	29	16	120	30	16	
9	295.09	138	29	14	136	29	14	
10	351.85	255	37	15	249	37	16	
11	511.06	62	23	14	21	24	18	
12	583.29	45	19	11	42	19	12	
13	609.09	193	31	11	190	31	12	
15	911.68	25	13	7	23	13	8	
17	1460.99	63	18	7	57	18	8	
18	1765.00	22	11	5	20	11	5	

140965D03.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-8 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:36
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.27e+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spectrum File	.140965D03.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	2.91E+00 +- 2.80E-01	. . . .	. . . .	1.40E+07
	295.21		2.86E+00 +- 6.10E-01	6.53E-01	2.98E-01	1.40E+07
	351.92		3.11E+00 +- 4.60E-01	4.24E-01	1.95E-01	1.40E+07
	609.31		2.95E+00 +- 4.85E-01	4.21E-01	1.89E-01	1.40E+07
	1120.29		1.99E+00 +- 9.55E-01	1.14E+00	4.64E-01	1.40E+07

MEASURED TOTAL: 2.91E+00 +- 2.80E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	42.47	88.17	20	19	14	42	0.65	Unknown
2	74.39	151.84	102	44	33	124	2.14	Unknown
3	76.90	156.83	100	29	18	57	0.97	Unknown
4	87.17	177.33	27	23	17	63	0.60	Unknown
5	92.90	188.74	27	31	24	90	1.19	Unknown
6	185.90	374.21	32	32	25	86	1.46	Unknown
7	238.60	479.32	120	30	16	51	1.05	Unknown
8	241.75	485.60	54	26	17	60	1.18	Unknown
11	511.06	1022.67	21	24	18	26	2.31	Unknown
12	583.29	1166.72	42	19	12	23	1.41	Unknown

140965D03.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	661.78	1323.25	62	20	10	20	1.66	Unknown
15	911.68	1821.62	23	13	8	12	1.28	Unknown
17	1460.99	2917.08	57	18	8	8	2.25	Unknown
18	1765.00	3523.37	20	11	5	4	1.68	Unknown

c:\SEEKER\BIN\140965d03A.res Analysis Results Saved.

141329D04.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-9 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:41
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.25E+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spc. File	.141329D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.50 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.75	152.37	61	28	19	60	1.15	a
2	77.07	157.01	121	28	15	43	0.84	b
3	87.23	177.29	37	28	21	74	1.19	a
4	90.11	183.05	22	19	14	42	0.64	b
5	92.94	188.71	42	28	21	74	1.16	c
6	99.47	201.76	17	19	14	42	0.77	a
7	185.84	374.34	46	26	18	51	1.36	a
8	238.55	479.65	158	34	19	78	1.03	a
9	270.42	543.34	19	15	11	26	0.80	a
10	295.14	592.74	60	25	17	48	1.49	a
11	338.44	679.25	41	18	11	23	1.08	a
12	351.74	705.82	128	27	12	26	1.35	a
13	510.49	1023.03	59	24	15	32	2.85	a Wide Pk
14	583.23	1168.38	47	20	12	25	1.96	a
15	609.27	1220.40	58	21	12	26	1.67	a
16	911.23	1823.74	35	15	8	11	2.08	a
17	1460.86	2921.99	36	13	3	2	2.08	a

141329D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.75	61	28	19	59	28	19	
2	77.07	121	28	15	119	29	15	
5	92.94	42	28	21	25	29	22	
7	185.84	46	26	18	32	26	19	
8	238.55	158	34	19	152	35	20	
10	295.14	60	25	17	58	26	17	
12	351.74	128	27	12	124	27	13	
13	510.49	59	24	15	21	25	19	
14	583.23	47	20	12	46	20	13	
15	609.27	58	21	12	54	21	13	
16	911.23	35	15	8	34	15	8	
17	1460.86	36	13	3	30	13	6	

141329D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-9 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:41
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.25e+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spectrum File	.141329D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		1.68E+00 +- 1.90E+00	3.11E+00	1.46E+00	3.92E+13
U-235	143.76	N	-1.15E-01 +- 5.07E-01	9.21E-01	4.26E-01	6.17E+12
	185.72		I.D. -	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.28E+00 +- 2.92E-01	3.59E-01	1.68E-01	1.67E+04
Pb-214	Average:x		1.46E+00 +- 2.88E-01	. . . .	. . . .	1.40E+07
	295.22		1.16E+00 +- 5.18E-01	7.43E-01	3.44E-01	1.40E+07
	351.99		1.59E+00 +- 3.47E-01	3.61E-01	1.63E-01	1.40E+07
Ac-228	Average:x		1.54E+00 +- 4.94E-01	. . . .	. . . .	1.23E+14
	338.40		1.65E+00 +- 7.41E-01	9.84E-01	4.37E-01	1.23E+14
	911.07		1.46E+00 +- 6.63E-01	8.36E-01	3.59E-01	1.23E+14
Tl-208	583.14		4.19E-01 +- 1.86E-01	2.53E-01	1.14E-01	1.67E+04
Bi-214	609.32		9.20E-01 +- 3.62E-01	4.78E-01	2.16E-01	1.40E+07
K-40	1460.75		4.63E+00 +- 2.02E+00	2.22E+00	9.00E-01	1.12E+13
Pb-210	46.50	N	-4.26E-01 +- 2.53E+01	4.53E+01	2.09E+01	1.95E+05
Am-241	59.54	N	-2.16E-01 +- 7.27E-01	1.33E+00	6.16E-01	3.80E+06
Cs-137	661.62	N	7.91E-02 +- 1.45E-01	2.48E-01	1.10E-01	2.64E+05
Bi-212	727.17	N	2.02E+00 +- 1.74E+00	2.64E+00	1.13E+00	1.67E+04
Pa-234m	1001.03	N	9.13E+00 +- 1.86E+01	3.26E+01	1.35E+01	3.92E+13
Eu-154	1004.80	N	5.08E-01 +- 6.59E-01	1.08E+00	4.47E-01	7.45E+04
Co-60	1332.51	N	-1.54E-01 +- 1.58E-01	3.51E-01	1.54E-01	4.62E+04
Eu-152	1408.08	N	6.09E-01 +- 5.21E-01	6.76E-01	2.30E-01	1.17E+05

MEASURED TOTAL: 2.43E+01 +- 2.72E+01 pCi/g

141329D04.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.75	152.37	59	28	19	60	1.15	Unknown
2	77.07	157.01	119	29	15	43	0.84	Unknown
3	87.23	177.29	37	28	21	74	1.19	Unknown
4	90.11	183.05	22	19	14	42	0.64	Unknown
6	99.47	201.76	17	19	14	42	0.77	Unknown
9	270.42	543.34	19	15	11	26	0.80	Unknown
13	510.49	1023.03	21	25	19	32	2.85	Unknown

c:\SEEKER\BIN\141329d04.res Analysis Results Saved.

141329D04.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-9 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:41
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.25E+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spc. File	.141329D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.50 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG	
1	74.75	152.37	61	28	19	60	1.15	a	
2	77.07	157.01	121	28	15	43	0.84	b	
3	87.23	177.29	37	28	21	74	1.19	a	
4	90.11	183.05	22	19	14	42	0.64	b	
5	92.94	188.71	42	28	21	74	1.16	c	
6	99.47	201.76	17	19	14	42	0.77	a	
7	185.84	374.34	46	26	18	51	1.36	a	
8	238.55	479.65	158	34	19	78	1.03	a	
9	270.42	543.34	19	15	11	26	0.80	a	
10	295.14	592.74	60	25	17	48	1.49	a	
11	338.44	679.25	41	18	11	23	1.08	a	
12	351.74	705.82	128	27	12	26	1.35	a	
13	510.49	1023.03	59	24	15	32	2.85	a	Wide Pk
14	583.23	1168.38	47	20	12	25	1.96	a	
15	609.27	1220.40	58	21	12	26	1.67	a	
16	911.23	1823.74	35	15	8	11	2.08	a	
17	1460.86	2921.99	36	13	3	2	2.08	a	

141329D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.75	61	28	19	59	28	19	
2	77.07	121	28	15	119	29	15	
5	92.94	42	28	21	25	29	22	
7	185.84	46	26	18	32	26	19	
8	238.55	158	34	19	152	35	20	
10	295.14	60	25	17	58	26	17	
12	351.74	128	27	12	124	27	13	
13	510.49	59	24	15	21	25	19	
14	583.23	47	20	12	46	20	13	
15	609.27	58	21	12	54	21	13	
16	911.23	35	15	8	34	15	8	
17	1460.86	36	13	3	30	13	6	

141329D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-9 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:41
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.25e+002 g	Real Time	1807 Sec
Collection Efficiency	1.0000	Spectrum File	.141329D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.25E+00 +- 2.25E-01	. . . .	. . . .	1.40E+07
	295.21		1.16E+00 +- 5.18E-01	7.43E-01	3.44E-01	1.40E+07
	351.92		1.59E+00 +- 3.47E-01	3.61E-01	1.63E-01	1.40E+07
	609.31		9.20E-01 +- 3.62E-01	4.78E-01	2.16E-01	1.40E+07

MEASURED TOTAL: 1.25E+00 +- 2.25E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.75	152.37	59	28	19	60	1.15	Unknown
2	77.07	157.01	119	29	15	43	0.84	Unknown
3	87.23	177.29	37	28	21	74	1.19	Unknown
4	90.11	183.05	22	19	14	42	0.64	Unknown
5	92.94	188.71	25	29	22	74	1.16	Unknown
6	99.47	201.76	17	19	14	42	0.77	Unknown
7	185.84	374.34	32	26	19	51	1.36	Unknown
8	238.55	479.65	152	35	20	78	1.03	Unknown
9	270.42	543.34	19	15	11	26	0.80	Unknown
11	338.44	679.25	41	18	11	23	1.08	Unknown
13	510.49	1023.03	21	25	19	32	2.85	Unknown

141329D04.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	583.23	1168.38	46	20	13	25	1.96	Unknown
16	911.23	1823.74	34	15	8	11	2.08	Unknown
17	1460.86	2921.99	30	13	6	2	2.08	Unknown

c:\SEEKER\BIN\141329d04A.res Analysis Results Saved.

140888D05.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-10 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:48
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.81E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140888D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.70 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.82	150.93	104	36	25	133	0.74 a	
2	77.08	155.46	160	39	25	133	0.69 b	
3	87.13	175.53	39	32	24	126	0.71 a	
4	90.04	181.36	21	30	24	126	0.69 b	NET< CL
5	92.56	186.38	50	28	20	95	0.47 c	
6	129.12	259.45	41	25	17	74	0.57 a	
7	186.00	373.15	238	48	31	160	1.21 a	
8	238.57	478.22	312	43	21	86	0.83 a	
9	241.89	484.85	292	45	24	103	0.98 b	
10	295.15	591.29	580	54	20	76	1.00 a	
11	338.25	677.45	65	30	21	76	1.13 a	
12	351.87	704.66	930	65	19	63	1.12 a	
13	511.31	1023.32	52	31	23	75	2.03 a	Wide Pk
14	583.35	1167.32	88	25	13	38	1.04 a	
15	609.27	1219.12	726	57	14	37	1.28 a	
16	768.44	1537.25	52	22	14	36	1.33 a	
17	786.07	1572.48	18	15	11	22	1.10 a	
18	911.01	1822.20	81	24	13	35	1.40 a	
19	934.01	1868.17	27	17	11	23	1.55 a	
20	968.74	1937.58	25	20	14	37	1.69 a	
21	1120.42	2240.73	156	27	9	14	1.85 a	
22	1237.61	2474.97	35	19	13	26	2.12 a	
23	1377.43	2754.43	30	16	9	17	1.74 a	
24	1408.12	2815.77	15	11	7	12	0.95 a	

140888D05.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1460.84	2921.14	106	24	10	18	2.08	a
26	1508.95	3017.29	26	15	9	14	2.28	a
27	1764.41	3527.88	121	24	7	10	2.18	a

140888D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
5	92.56	50	28	20	43	28	21	
7	186.00	238	48	31	231	48	31	
8	238.57	312	43	21	305	44	21	
9	241.89	292	45	24	290	45	24	
10	295.15	580	54	20	578	54	21	
11	338.25	65	30	21	63	30	21	
12	351.87	930	65	19	924	65	20	
13	511.31	52	31	23	4	32	26	NET<CL
14	583.35	88	25	13	85	25	14	
15	609.27	726	57	14	721	57	15	
18	911.01	81	24	13	79	24	14	
20	968.74	25	20	14	24	20	14	
25	1460.84	106	24	10	92	24	12	
27	1764.41	121	24	7	120	24	8	

140888D05.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-10 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:48
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.81e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140888D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)
Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014
Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		2.77E+00 +- 1.82E+00	2.83E+00	1.33E+00	3.92E+13
U-235	143.76	N	6.14E-02 +- 6.14E-01	1.05E+00	5.02E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.81E+00 +- 2.58E-01	2.70E-01	1.27E-01	1.67E+04
Pb-214	Average:x		7.54E+00 +- 4.27E-01	. . . .	. . . .	1.40E+07
	295.22		7.78E+00 +- 7.31E-01	5.94E-01	2.79E-01	1.40E+07
	351.99		7.42E+00 +- 5.25E-01	3.42E-01	1.60E-01	1.40E+07
Ac-228	Average:x		1.59E+00 +- 4.04E-01	. . . .	. . . .	1.23E+14
	338.40		1.62E+00 +- 7.82E-01	1.17E+00	5.50E-01	1.23E+14
	911.07		1.88E+00 +- 5.79E-01	7.17E-01	3.26E-01	1.23E+14
	968.90		9.89E-01 +- 8.14E-01	1.28E+00	5.84E-01	1.23E+14
Tl-208	583.14		4.54E-01 +- 1.33E-01	1.62E-01	7.40E-02	1.67E+04
Bi-214	Average:x		7.12E+00 +- 5.10E-01	. . . .	. . . .	1.40E+07
	609.32		7.07E+00 +- 5.55E-01	3.20E-01	1.47E-01	1.40E+07
	1120.28		7.43E+00 +- 1.30E+00	9.85E-01	4.28E-01	1.40E+07
Eu-152	1408.08		6.29E-01 +- 4.60E-01	6.68E-01	2.79E-01	1.17E+05
K-40	1460.75		7.36E+00 +- 1.93E+00	2.15E+00	9.69E-01	1.12E+13
Pb-210	46.50	N	4.91E+01 +- 1.62E+02	2.76E+02	1.30E+02	1.95E+05
Am-241	59.54	N	-1.23E+00 +- 2.09E+00	3.78E+00	1.79E+00	3.80E+06
Cs-137	661.62	N	7.92E-02 +- 1.06E-01	1.76E-01	8.01E-02	2.64E+05
Bi-212	727.17	N	1.78E+00 +- 1.41E+00	2.17E+00	9.78E-01	1.67E+04
Pa-234m	1001.03	N	8.93E+00 +- 1.51E+01	2.57E+01	1.13E+01	3.92E+13
Eu-154	1004.80	N	-2.21E-01 +- 4.90E-01	9.59E-01	4.29E-01	7.45E+04
Co-60	1332.51	N	1.38E-03 +- 8.24E-02	1.57E-01	6.75E-02	4.62E+04

140888D05.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 8.93E+01 +- 1.85E+02 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.82	150.93	104	36	25	133	0.74	Unknown
2	77.08	155.46	160	39	25	133	0.69	Unknown
3	87.13	175.53	39	32	24	126	0.71	Unknown
4	90.04	181.36	21	30	24	126	0.69	Deleted
6	129.12	259.45	41	25	17	74	0.57	Unknown
9	241.89	484.85	290	45	24	103	0.98	Unknown
13	511.31	1023.32	4	32	26	75	2.03	Deleted
16	768.44	1537.25	52	22	14	36	1.33	Unknown
17	786.07	1572.48	18	15	11	22	1.10	Unknown
19	934.01	1868.17	27	17	11	23	1.55	Unknown
22	1237.61	2474.97	35	19	13	26	2.12	Unknown
23	1377.43	2754.43	30	16	9	17	1.74	Unknown
26	1508.95	3017.29	26	15	9	14	2.28	Unknown
27	1764.41	3527.88	120	24	8	10	2.18	Unknown

c:\SEEKER\BIN\140888d05.res Analysis Results Saved.

140888D05.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-10 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:48
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.81E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140888D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.70 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.82	150.93	104	36	25	133	0.74 a	
2	77.08	155.46	160	39	25	133	0.69 b	
3	87.13	175.53	39	32	24	126	0.71 a	
4	90.04	181.36	21	30	24	126	0.69 b	NET< CL
5	92.56	186.38	50	28	20	95	0.47 c	
6	129.12	259.45	41	25	17	74	0.57 a	
7	186.00	373.15	238	48	31	160	1.21 a	
8	238.57	478.22	312	43	21	86	0.83 a	
9	241.89	484.85	292	45	24	103	0.98 b	
10	295.15	591.29	580	54	20	76	1.00 a	
11	338.25	677.45	65	30	21	76	1.13 a	
12	351.87	704.66	930	65	19	63	1.12 a	
13	511.31	1023.32	52	31	23	75	2.03 a	Wide Pk
14	583.35	1167.32	88	25	13	38	1.04 a	
15	609.27	1219.12	726	57	14	37	1.28 a	
16	768.44	1537.25	52	22	14	36	1.33 a	
17	786.07	1572.48	18	15	11	22	1.10 a	
18	911.01	1822.20	81	24	13	35	1.40 a	
19	934.01	1868.17	27	17	11	23	1.55 a	
20	968.74	1937.58	25	20	14	37	1.69 a	
21	1120.42	2240.73	156	27	9	14	1.85 a	
22	1237.61	2474.97	35	19	13	26	2.12 a	
23	1377.43	2754.43	30	16	9	17	1.74 a	
24	1408.12	2815.77	15	11	7	12	0.95 a	

140888D05.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1460.84	2921.14	106	24	10	18	2.08	a
26	1508.95	3017.29	26	15	9	14	2.28	a
27	1764.41	3527.88	121	24	7	10	2.18	a

140888D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
5	92.56	50	28	20	43	28	21	
7	186.00	238	48	31	231	48	31	
8	238.57	312	43	21	305	44	21	
9	241.89	292	45	24	290	45	24	
10	295.15	580	54	20	578	54	21	
11	338.25	65	30	21	63	30	21	
12	351.87	930	65	19	924	65	20	
13	511.31	52	31	23	4	32	26	NET<CL
14	583.35	88	25	13	85	25	14	
15	609.27	726	57	14	721	57	15	
18	911.01	81	24	13	79	24	14	
20	968.74	25	20	14	24	20	14	
25	1460.84	106	24	10	92	24	12	
27	1764.41	121	24	7	120	24	8	

140888D05.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-10 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:48
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.81e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140888D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014
Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	7.37E+00 +- 3.27E-01	. . . .	. . . .	1.40E+07
	295.21		7.78E+00 +- 7.31E-01	5.94E-01	2.79E-01	1.40E+07
	351.92		7.42E+00 +- 5.25E-01	3.42E-01	1.60E-01	1.40E+07
	609.31		7.07E+00 +- 5.55E-01	3.20E-01	1.47E-01	1.40E+07
	1120.29		7.43E+00 +- 1.30E+00	9.85E-01	4.28E-01	1.40E+07

MEASURED TOTAL: 7.37E+00 +- 3.27E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.82	150.93	104	36	25	133	0.74	Unknown
2	77.08	155.46	160	39	25	133	0.69	Unknown
3	87.13	175.53	39	32	24	126	0.71	Unknown
4	92.56	186.38	43	28	21	95	0.47	Unknown
5	129.12	259.45	41	25	17	74	0.57	Unknown
6	186.00	373.15	231	48	31	160	1.21	Unknown
7	238.57	478.22	305	44	21	86	0.83	Unknown
8	241.89	484.85	290	45	24	103	0.98	Unknown
10	338.25	677.45	63	30	21	76	1.13	Unknown
12	583.35	1167.32	85	25	14	38	1.04	Unknown

140888D05.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	768.44	1537.25	52	22	14	36	1.33	Unknown
15	786.07	1572.48	18	15	11	22	1.10	Unknown
16	911.01	1822.20	79	24	14	35	1.40	Unknown
17	934.01	1868.17	27	17	11	23	1.55	Unknown
18	968.74	1937.58	24	20	14	37	1.69	Unknown
20	1237.61	2474.97	35	19	13	26	2.12	Unknown
21	1377.43	2754.43	30	16	9	17	1.74	Unknown
22	1408.12	2815.77	15	11	7	12	0.95	Unknown
23	1460.84	2921.14	92	24	12	18	2.08	Unknown
24	1508.95	3017.29	26	15	9	14	2.28	Unknown
25	1764.41	3527.88	120	24	8	10	2.18	Unknown

c:\SEEKER\BIN\140888d05A.res Analysis Results Saved.

140899D07.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-11 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:55
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.27E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140899D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.23 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.78	153.79	85	33	23	104	0.78 a	
2	76.98	158.19	161	37	23	104	0.75 b	
3	87.17	178.55	54	24	16	60	0.43 a	
4	89.92	184.03	43	30	22	99	0.79 b	
5	93.06	190.29	53	41	32	159	1.34 c	
6	105.52	215.18	27	25	18	68	0.79 a	
7	128.87	261.83	16	18	14	47	0.52 a	
8	185.86	375.64	56	32	23	92	1.14 a	
9	209.10	422.05	53	26	17	55	0.94 a	
10	238.54	480.85	544	54	22	91	1.02 a	Wide Pk
11	239.51	482.79	6	69	57	288	3.12 b	NET< CL
12	270.14	543.95	49	21	13	35	0.80 a	
13	295.15	593.92	84	23	12	29	0.80 a	
14	300.22	604.04	34	20	14	35	1.06 b	
15	338.35	680.19	135	29	15	36	1.14 a	
16	352.03	707.52	127	28	14	39	1.08 a	
17	510.94	1024.87	93	28	17	38	2.39 a	Wide Pk
18	583.42	1169.63	201	34	15	38	1.62 a	
19	609.68	1222.08	113	25	11	24	1.33 a	
20	727.70	1457.79	42	15	7	9	1.41 a	
21	860.69	1723.39	26	15	10	16	1.98 a	
22	911.19	1824.24	118	24	9	14	2.19 a	
23	969.23	1940.17	54	20	12	29	1.50 a	
24	1460.93	2922.17	62	17	6	6	2.38 a	

140899D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.78	85	33	23	82	33	23	
2	76.98	161	37	23	158	38	23	
5	93.06	53	41	32	40	41	32	
8	185.86	56	32	23	48	32	24	
10	238.54	544	54	22	536	54	23	
12	270.14	49	21	13	48	21	13	
13	295.15	84	23	12	80	24	13	
15	338.35	135	29	15	133	29	15	
16	352.03	127	28	14	121	28	15	
17	510.94	93	28	17	50	29	21	
18	583.42	201	34	15	196	34	16	
19	609.68	113	25	11	107	26	13	
22	911.19	118	24	9	116	24	9	
23	969.23	54	20	12	53	20	12	
24	1460.93	62	17	6	56	18	8	

140899D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-11 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:55
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.27e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140899D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		2.89E+00 +- 2.98E+00	4.87E+00	2.34E+00	3.92E+13
U-235	143.76	N	6.00E-01 +- 6.05E-01	9.79E-01	4.57E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	Average:x		4.21E+00 +- 4.18E-01	. . . .	. . . .	1.67E+04
	238.63		4.21E+00 +- 4.24E-01	3.80E-01	1.80E-01	1.67E+04
	300.09		4.18E+00 +- 2.49E+00	3.68E+00	1.68E+00	1.67E+04
Pb-214	Average:x		1.48E+00 +- 2.72E-01	. . . .	. . . .	1.40E+07
	295.22		1.60E+00 +- 4.72E-01	5.65E-01	2.56E-01	1.40E+07
	351.99		1.42E+00 +- 3.33E-01	3.79E-01	1.73E-01	1.40E+07
Ac-228	Average:x		4.04E+00 +- 5.79E-01	. . . .	. . . .	1.23E+14
	338.40		5.00E+00 +- 1.10E+00	1.21E+00	5.56E-01	1.23E+14
	911.07		3.94E+00 +- 8.29E-01	7.33E-01	3.21E-01	1.23E+14
	968.90		3.11E+00 +- 1.19E+00	1.55E+00	6.95E-01	1.23E+14
Tl-208	Average:x		1.52E+00 +- 2.55E-01	. . . .	. . . .	1.67E+04
	583.14		1.51E+00 +- 2.62E-01	2.66E-01	1.23E-01	1.67E+04
	860.47		1.79E+00 +- 1.08E+00	1.54E+00	6.74E-01	1.67E+04
Bi-214	609.32		1.52E+00 +- 3.63E-01	3.93E-01	1.77E-01	1.40E+07
Bi-212	727.17		4.88E+00 +- 1.78E+00	1.90E+00	7.92E-01	1.67E+04
K-40	1460.75		6.37E+00 +- 2.00E+00	2.06E+00	8.78E-01	1.12E+13
Pb-210	46.50	N	3.15E+01 +- 2.18E+01	3.36E+01	1.55E+01	1.95E+05
Am-241	59.54	N	-2.31E-01 +- 9.83E-01	1.76E+00	8.24E-01	3.80E+06
Cs-137	661.62	N	1.46E-01 +- 1.34E-01	2.11E-01	9.46E-02	2.64E+05
Pa-234m	1001.03	N	1.44E+01 +- 1.78E+01	2.90E+01	1.23E+01	3.92E+13
Eu-154	1004.80	N	-6.35E-01 +- 6.53E-01	1.37E+00	6.16E-01	7.45E+04
Co-60	1332.51	N	1.38E-02 +- 8.78E-02	1.70E-01	6.91E-02	4.62E+04

140899D07.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Eu-152	1408.08	N	2.62E-01 +- 5.38E-01	9.44E-01	3.93E-01	1.17E+05

MEASURED TOTAL: 7.38E+01 +- 4.97E+01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.78	153.79	82	33	23	104	0.78	Unknown
2	76.98	158.19	158	38	23	104	0.75	Unknown
3	87.17	178.55	54	24	16	60	0.43	Unknown
4	89.92	184.03	43	30	22	99	0.79	Unknown
6	105.52	215.18	27	25	18	68	0.79	Unknown
7	128.87	261.83	16	18	14	47	0.52	Unknown
9	209.10	422.05	53	26	17	55	0.94	Unknown
11	239.51	482.79	6	69	57	288	3.12	Deleted
12	270.14	543.95	48	21	13	35	0.80	Unknown
17	510.94	1024.87	50	29	21	38	2.39	Unknown

c:\SEEKER\BIN\140899d07.res Analysis Results Saved.

140899D07.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-11 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:55
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.27E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140899D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.23 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG	
1	74.78	153.79	85	33	23	104	0.78	a	
2	76.98	158.19	161	37	23	104	0.75	b	
3	87.17	178.55	54	24	16	60	0.43	a	
4	89.92	184.03	43	30	22	99	0.79	b	
5	93.06	190.29	53	41	32	159	1.34	c	
6	105.52	215.18	27	25	18	68	0.79	a	
7	128.87	261.83	16	18	14	47	0.52	a	
8	185.86	375.64	56	32	23	92	1.14	a	
9	209.10	422.05	53	26	17	55	0.94	a	
10	238.54	480.85	544	54	22	91	1.02	a	Wide Pk
11	239.51	482.79	6	69	57	288	3.12	b	NET< CL
12	270.14	543.95	49	21	13	35	0.80	a	
13	295.15	593.92	84	23	12	29	0.80	a	
14	300.22	604.04	34	20	14	35	1.06	b	
15	338.35	680.19	135	29	15	36	1.14	a	
16	352.03	707.52	127	28	14	39	1.08	a	
17	510.94	1024.87	93	28	17	38	2.39	a	Wide Pk
18	583.42	1169.63	201	34	15	38	1.62	a	
19	609.68	1222.08	113	25	11	24	1.33	a	
20	727.70	1457.79	42	15	7	9	1.41	a	
21	860.69	1723.39	26	15	10	16	1.98	a	
22	911.19	1824.24	118	24	9	14	2.19	a	
23	969.23	1940.17	54	20	12	29	1.50	a	
24	1460.93	2922.17	62	17	6	6	2.38	a	

140899D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.78	85	33	23	82	33	23	
2	76.98	161	37	23	158	38	23	
5	93.06	53	41	32	40	41	32	
8	185.86	56	32	23	48	32	24	
10	238.54	544	54	22	536	54	23	
12	270.14	49	21	13	48	21	13	
13	295.15	84	23	12	80	24	13	
15	338.35	135	29	15	133	29	15	
16	352.03	127	28	14	121	28	15	
17	510.94	93	28	17	50	29	21	
18	583.42	201	34	15	196	34	16	
19	609.68	113	25	11	107	26	13	
22	911.19	118	24	9	116	24	9	
23	969.23	54	20	12	53	20	12	
24	1460.93	62	17	6	56	18	8	

140899D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-11 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:14:55
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.18e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.27e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140899D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.49E+00 +- 2.18E-01	. . . .	. . . .	1.40E+07
	295.21		1.60E+00 +- 4.72E-01	5.65E-01	2.56E-01	1.40E+07
	351.92		1.42E+00 +- 3.33E-01	3.79E-01	1.73E-01	1.40E+07
	609.31		1.52E+00 +- 3.63E-01	3.93E-01	1.77E-01	1.40E+07

MEASURED TOTAL: 1.49E+00 +- 2.18E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.78	153.79	82	33	23	104	0.78	Unknown
2	76.98	158.19	158	38	23	104	0.75	Unknown
3	87.17	178.55	54	24	16	60	0.43	Unknown
4	89.92	184.03	43	30	22	99	0.79	Unknown
5	93.06	190.29	40	41	32	159	1.34	Unknown
6	105.52	215.18	27	25	18	68	0.79	Unknown
7	128.87	261.83	16	18	14	47	0.52	Unknown
8	185.86	375.64	48	32	24	92	1.14	Unknown
9	209.10	422.05	53	26	17	55	0.94	Unknown
10	238.54	480.85	536	54	23	91	1.02	Unknown
11	270.14	543.95	48	21	13	35	0.80	Unknown
13	300.22	604.04	34	20	14	35	1.06	Unknown

140899D07.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	338.35	680.19	133	29	15	36	1.14	Unknown
16	510.94	1024.87	50	29	21	38	2.39	Unknown
17	583.42	1169.63	196	34	16	38	1.62	Unknown
19	727.70	1457.79	42	15	7	9	1.41	Unknown
20	860.69	1723.39	26	15	10	16	1.98	Unknown
21	911.19	1824.24	116	24	9	14	2.19	Unknown
22	969.23	1940.17	53	20	12	29	1.50	Unknown
23	1460.93	2922.17	56	18	8	6	2.38	Unknown

c:\SEEKER\BIN\140899d07A.res Analysis Results Saved.

140839D08.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-12 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 11:08:46
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.43E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.71E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140839D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.38	96.65	151	32	17	67	0.72 a	
2	63.20	130.21	37	29	22	106	0.59 a	
3	74.69	153.15	233	45	28	153	0.77 a	
4	77.04	157.83	362	48	24	123	0.70 b	
5	83.85	171.42	23	19	13	48	0.35 a	
6	87.07	177.86	110	36	24	119	0.76 b	
7	89.76	183.23	72	34	24	119	0.77 c	
8	92.50	188.70	51	33	24	119	0.78 d	
9	185.96	375.23	135	36	22	92	0.98 a	
10	238.53	480.18	174	34	18	61	0.94 a	
11	241.98	487.05	152	31	16	51	0.81 b	
12	295.20	593.28	400	44	15	43	0.90 a	
13	300.29	603.44	24	15	9	21	0.55 a	
14	338.32	679.35	41	21	14	36	0.96 a	
15	352.01	706.67	632	54	15	44	0.97 a	
16	511.18	1024.38	63	26	17	44	2.02 a	Wide Pk
17	583.53	1168.80	43	18	11	24	1.02 a	
18	609.57	1220.78	425	43	11	25	1.16 a	
19	661.82	1325.07	68	22	12	27	1.09 a	
20	768.54	1538.09	33	16	9	19	0.98 a	
21	911.33	1823.09	25	12	6	8	1.12 a	
22	969.14	1938.48	17	14	9	18	1.32 a	
23	1120.45	2240.50	86	20	7	10	1.34 a	
24	1238.15	2475.44	32	15	8	12	1.49 a	

140839D08.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1377.61	2753.80	15	10	5	6	0.95	a
26	1460.71	2919.67	88	20	5	6	1.62	a
27	1763.89	3524.83	79	18	3	1	2.53	a

140839D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.38	151	32	17	139	33	19	
2	63.20	37	29	22	17	30	23	NET<CL
3	74.69	233	45	28	227	45	28	
4	77.04	362	48	24	353	48	24	
5	83.85	23	19	13	18	19	14	
6	87.07	110	36	24	106	36	25	
8	92.50	51	33	24	27	33	26	
9	185.96	135	36	22	123	36	23	
10	238.53	174	34	18	165	35	19	
12	295.20	400	44	15	398	44	16	
13	300.29	24	15	9	23	15	10	
14	338.32	41	21	14	40	21	14	
15	352.01	632	54	15	627	54	16	
16	511.18	63	26	17	16	27	21	NET<CL
17	583.53	43	18	11	38	19	11	
18	609.57	425	43	11	421	44	12	
21	911.33	25	12	6	23	13	7	
22	969.14	17	14	9	16	14	10	
26	1460.71	88	20	5	80	20	7	

140839D08.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-12 GS140724-1

Sampling Start: 07/16/2014 12:00:00	Counting Start: 08/16/2014 11:08:46
Sampling Stop: 07/16/2014 12:00:00	Decay Time. . . . . 7.43e+002 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.71e+002 g	Real Time . . . . . 1801 Sec
Collection Efficiency 1.0000	Spectrum File 140839D08.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8)
Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)
Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NOTE	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-210	46.50		1.01E+01 +- 2.37E+00	2.91E+00	1.36E+00	1.95E+05
Th-234	92.50		9.53E-01 +- 1.19E+00	1.96E+00	9.31E-01	3.92E+13
U-235	143.76	N	3.73E-01 +- 4.83E-01	7.95E-01	3.71E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	Average:x		1.16E+00 +- 2.34E-01	. . . .	. . . .	1.67E+04
	238.63		1.13E+00 +- 2.37E-01	2.80E-01	1.31E-01	1.67E+04
	300.09		2.41E+00 +- 1.59E+00	2.33E+00	1.02E+00	1.67E+04
Pb-214	Average:x		6.58E+00 +- 4.48E-01	. . . .	. . . .	1.40E+07
	295.22		6.91E+00 +- 7.67E-01	5.93E-01	2.73E-01	1.40E+07
	351.99		6.41E+00 +- 5.51E-01	3.60E-01	1.66E-01	1.40E+07
Ac-228	Average:x		8.51E-01 +- 3.10E-01	. . . .	. . . .	1.23E+14
	338.40		1.31E+00 +- 6.96E-01	1.01E+00	4.63E-01	1.23E+14
	911.07		7.07E-01 +- 3.90E-01	5.03E-01	2.10E-01	1.23E+14
	968.90		8.51E-01 +- 7.54E-01	1.17E+00	5.15E-01	1.23E+14
Tl-208	583.14		2.62E-01 +- 1.27E-01	1.76E-01	7.85E-02	1.67E+04
Bi-214	Average:x		5.31E+00 +- 5.04E-01	. . . .	. . . .	1.40E+07
	609.32		5.30E+00 +- 5.49E-01	3.43E-01	1.54E-01	1.40E+07
	1120.28		5.34E+00 +- 1.26E+00	1.02E+00	4.26E-01	1.40E+07
Cs-137	661.62		4.92E-01 +- 1.58E-01	1.91E-01	8.55E-02	2.64E+05
K-40	1460.75		8.51E+00 +- 2.11E+00	1.84E+00	7.76E-01	1.12E+13
Am-241	59.54	N	-1.74E-02 +- 1.76E-01	3.10E-01	1.46E-01	3.80E+06
Bi-212	727.17	N	1.36E+00 +- 1.37E+00	2.17E+00	9.42E-01	1.67E+04
Pa-234m	1001.03	N	2.91E+00 +- 1.70E+01	3.11E+01	1.36E+01	3.92E+13
Eu-154	1004.80	N	-4.82E-02 +- 5.54E-01	1.05E+00	4.62E-01	7.45E+04
Co-60	1332.51	N	-1.27E-02 +- 8.84E-02	1.80E-01	7.53E-02	4.62E+04

140839D08.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Eu-152	1408.08	N	5.93E-01 +- 5.61E-01	8.56E-01	3.55E-01	1.17E+05

MEASURED TOTAL: 3.94E+01 +- 2.68E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	63.20	130.21	17	30	23	106	0.59	Deleted
3	74.69	153.15	227	45	28	153	0.77	Unknown
4	77.04	157.83	353	48	24	123	0.70	Unknown
5	83.85	171.42	18	19	14	48	0.35	Unknown
6	87.07	177.86	106	36	25	119	0.76	Unknown
7	89.76	183.23	72	34	24	119	0.77	Unknown
11	241.98	487.05	152	31	16	51	0.81	Unknown
16	511.18	1024.38	16	27	21	44	2.02	Deleted
20	768.54	1538.09	33	16	9	19	0.98	Unknown
24	1238.15	2475.44	32	15	8	12	1.49	Unknown
25	1377.61	2753.80	15	10	5	6	0.95	Unknown
27	1763.89	3524.83	79	18	3	1	2.53	Unknown

c:\SEEKER\BIN\140839d08.res Analysis Results Saved.

140839D08.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-12 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 11:08:46
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.43E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.71E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140839D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.38	96.65	151	32	17	67	0.72	a
2	63.20	130.21	37	29	22	106	0.59	a
3	74.69	153.15	233	45	28	153	0.77	a
4	77.04	157.83	362	48	24	123	0.70	b
5	83.85	171.42	23	19	13	48	0.35	a
6	87.07	177.86	110	36	24	119	0.76	b
7	89.76	183.23	72	34	24	119	0.77	c
8	92.50	188.70	51	33	24	119	0.78	d
9	185.96	375.23	135	36	22	92	0.98	a
10	238.53	480.18	174	34	18	61	0.94	a
11	241.98	487.05	152	31	16	51	0.81	b
12	295.20	593.28	400	44	15	43	0.90	a
13	300.29	603.44	24	15	9	21	0.55	a
14	338.32	679.35	41	21	14	36	0.96	a
15	352.01	706.67	632	54	15	44	0.97	a
16	511.18	1024.38	63	26	17	44	2.02	a Wide Pk
17	583.53	1168.80	43	18	11	24	1.02	a
18	609.57	1220.78	425	43	11	25	1.16	a
19	661.82	1325.07	68	22	12	27	1.09	a
20	768.54	1538.09	33	16	9	19	0.98	a
21	911.33	1823.09	25	12	6	8	1.12	a
22	969.14	1938.48	17	14	9	18	1.32	a
23	1120.45	2240.50	86	20	7	10	1.34	a
24	1238.15	2475.44	32	15	8	12	1.49	a

140839D08.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1377.61	2753.80	15	10	5	6	0.95	a
26	1460.71	2919.67	88	20	5	6	1.62	a
27	1763.89	3524.83	79	18	3	1	2.53	a

140839D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.38	151	32	17	139	33	19	
2	63.20	37	29	22	17	30	23	NET<CL
3	74.69	233	45	28	227	45	28	
4	77.04	362	48	24	353	48	24	
5	83.85	23	19	13	18	19	14	
6	87.07	110	36	24	106	36	25	
8	92.50	51	33	24	27	33	26	
9	185.96	135	36	22	123	36	23	
10	238.53	174	34	18	165	35	19	
12	295.20	400	44	15	398	44	16	
13	300.29	24	15	9	23	15	10	
14	338.32	41	21	14	40	21	14	
15	352.01	632	54	15	627	54	16	
16	511.18	63	26	17	16	27	21	NET<CL
17	583.53	43	18	11	38	19	11	
18	609.57	425	43	11	421	44	12	
21	911.33	25	12	6	23	13	7	
22	969.14	17	14	9	16	14	10	
26	1460.71	88	20	5	80	20	7	

140839D08.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-12 GS140724-1

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/16/2014 11:08:46
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.43e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.71e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140839D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	6.02E+00 +- 3.34E-01	. . . .	. . . .	1.40E+07
	295.21		6.91E+00 +- 7.67E-01	5.93E-01	2.73E-01	1.40E+07
	351.92		6.41E+00 +- 5.51E-01	3.60E-01	1.66E-01	1.40E+07
	609.31		5.30E+00 +- 5.49E-01	3.43E-01	1.54E-01	1.40E+07
	1120.29		5.34E+00 +- 1.26E+00	1.02E+00	4.26E-01	1.40E+07

MEASURED TOTAL: 6.02E+00 +- 3.34E-01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.38	96.65	139	33	19	67	0.72	Unknown
2	74.69	153.15	227	45	28	153	0.77	Unknown
3	77.04	157.83	353	48	24	123	0.70	Unknown
4	83.85	171.42	18	19	14	48	0.35	Unknown
5	87.07	177.86	106	37	25	119	0.76	Unknown
6	89.76	183.23	72	34	24	119	0.77	Unknown
7	92.50	188.70	27	33	26	119	0.78	Unknown
8	185.96	375.23	123	36	23	92	0.98	Unknown
9	238.53	480.18	165	35	19	61	0.94	Unknown
10	241.98	487.05	152	31	16	51	0.81	Unknown
12	300.29	603.44	23	15	10	21	0.55	Unknown

140839D08.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	338.32	679.35	40	21	14	36	0.96	Unknown
15	583.53	1168.80	38	19	11	24	1.02	Unknown
17	661.82	1325.07	68	22	12	27	1.09	Unknown
18	768.54	1538.09	33	16	9	19	0.98	Unknown
19	911.33	1823.09	23	13	7	8	1.12	Unknown
20	969.14	1938.48	16	14	10	18	1.32	Unknown
22	1238.15	2475.44	32	15	8	12	1.49	Unknown
23	1377.61	2753.80	15	10	5	6	0.95	Unknown
24	1460.71	2919.67	80	20	7	6	1.62	Unknown
25	1763.89	3524.83	79	18	3	1	2.53	Unknown

c:\SEEKER\BIN\140839d08A.res Analysis Results Saved.

140921D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-13 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:59:57
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.07E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140921D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.00 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.65	153.09	38	29	22	90	0.91 a	
2	77.01	157.81	81	27	16	60	0.72 b	
3	87.12	178.00	7	18	14	49	0.41 a	NET< CL
4	93.25	190.24	25	24	18	65	0.85 a	
5	185.86	375.19	49	27	19	61	1.09 a	
6	238.58	480.49	233	36	16	47	0.94 a	
7	241.61	486.54	74	32	22	71	1.49 b	
8	295.25	593.67	139	29	13	33	1.06 a	
9	338.40	679.85	58	22	13	33	0.96 a	
10	351.77	706.53	189	31	12	23	1.10 a	
11	511.17	1024.90	43	23	15	39	1.67 a	
12	583.21	1168.76	63	19	9	15	1.24 a	
13	609.23	1220.73	127	26	10	19	1.36 a	
14	911.26	1823.94	50	17	8	12	1.39 a	
15	968.99	1939.24	21	16	11	23	1.58 a	
16	1120.32	2241.47	31	14	7	7	2.04 a	
17	1460.89	2921.65	75	18	3	2	1.69 a	
18	1764.71	3528.43	25	12	5	4	3.68 a	Wide Pk

140921D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	87.12	7	18	14	6	18	14	NET<CL
4	93.25	25	24	18	21	24	19	
5	185.86	49	27	19	44	27	19	
6	238.58	233	36	16	228	36	17	
8	295.25	139	29	13	136	29	14	
9	338.40	58	22	13	56	22	14	
10	351.77	189	31	12	187	31	12	
11	511.17	43	23	15	4	24	19	NET<CL
12	583.21	63	19	9	61	20	10	
13	609.23	127	26	10	125	26	11	
14	911.26	50	17	8	48	17	8	
16	1120.32	31	14	7	29	14	7	
17	1460.89	75	18	3	62	18	7	
18	1764.71	25	12	5	24	12	6	

140921D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-13 GS140724-1

Sampling Start: 07/17/2014 12:00:00	Counting Start: 08/16/2014 10:59:57
Sampling Stop: 07/17/2014 12:00:00	Decay Time. . . . . 7.19e+002 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.07e+002 g	Real Time . . . . . 1804 Sec
Collection Efficiency 1.0000	Spectrum File 140921D01.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		2.12E+00 +- 2.51E+00	4.13E+00	1.93E+00	3.92E+13
U-235	143.76	N	-2.32E-01 +- 7.45E-01	1.35E+00	6.30E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		2.40E+00 +- 3.82E-01	3.81E-01	1.76E-01	1.67E+04
Pb-214	Average:x		2.94E+00 +- 3.88E-01	. . . .	. . . .	1.40E+07
	295.22		3.40E+00 +- 7.21E-01	7.72E-01	3.52E-01	1.40E+07
	351.99		2.76E+00 +- 4.60E-01	4.05E-01	1.82E-01	1.40E+07
Ac-228	Average:x		2.19E+00 +- 5.57E-01	. . . .	. . . .	1.23E+14
	338.40		2.67E+00 +- 1.06E+00	1.42E+00	6.46E-01	1.23E+14
	911.07		2.16E+00 +- 7.69E-01	8.69E-01	3.74E-01	1.23E+14
	968.90		1.60E+00 +- 1.25E+00	1.93E+00	8.59E-01	1.23E+14
Tl-208	583.14		6.03E-01 +- 1.95E-01	2.21E-01	9.69E-02	1.67E+04
Bi-214	Average:x		2.34E+00 +- 4.44E-01	. . . .	. . . .	1.40E+07
	609.32		2.29E+00 +- 4.75E-01	4.45E-01	1.98E-01	1.40E+07
	1120.28		2.63E+00 +- 1.25E+00	1.55E+00	6.50E-01	1.40E+07
K-40	1460.75		9.46E+00 +- 2.74E+00	2.59E+00	1.09E+00	1.12E+13
Pb-210	46.50	N	5.36E+01 +- 1.26E+02	2.15E+02	9.94E+01	1.95E+05
Am-241	59.54	N	2.33E-01 +- 1.97E+00	3.47E+00	1.60E+00	3.80E+06
Cs-137	661.62	N	4.24E-02 +- 1.20E-01	2.13E-01	9.24E-02	2.64E+05
Bi-212	727.17	N	3.27E+00 +- 2.15E+00	3.09E+00	1.34E+00	1.67E+04
Pa-234m	1001.03	N	-6.35E+00 +- 1.94E+01	3.98E+01	1.71E+01	3.92E+13
Eu-154	1004.80	N	7.00E-02 +- 6.10E-01	1.17E+00	4.88E-01	7.45E+04
Co-60	1332.51	N	2.37E-02 +- 1.10E-01	2.12E-01	8.44E-02	4.62E+04
Eu-152	1408.08	N	5.46E-01 +- 5.63E-01	8.40E-01	3.15E-01	1.17E+05

140921D01.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 7.98E+01 +- 1.39E+02 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.65	153.09	38	29	22	90	0.91	Unknown
2	77.01	157.81	81	27	16	60	0.72	Unknown
3	87.12	178.00	6	18	14	49	0.41	Deleted
7	241.61	486.54	74	32	22	71	1.49	Unknown
11	511.17	1024.90	4	24	19	39	1.67	Deleted
18	1764.71	3528.43	24	12	6	4	3.68	Unknown

c:\SEEKER\BIN\140921d01.res Analysis Results Saved.

140921D01.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-13 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:59:57
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.07E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140921D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.00 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.65	153.09	38	29	22	90	0.91	a
2	77.01	157.81	81	27	16	60	0.72	b
3	87.12	178.00	7	18	14	49	0.41	a NET< CL
4	93.25	190.24	25	24	18	65	0.85	a
5	185.86	375.19	49	27	19	61	1.09	a
6	238.58	480.49	233	36	16	47	0.94	a
7	241.61	486.54	74	32	22	71	1.49	b
8	295.25	593.67	139	29	13	33	1.06	a
9	338.40	679.85	58	22	13	33	0.96	a
10	351.77	706.53	189	31	12	23	1.10	a
11	511.17	1024.90	43	23	15	39	1.67	a
12	583.21	1168.76	63	19	9	15	1.24	a
13	609.23	1220.73	127	26	10	19	1.36	a
14	911.26	1823.94	50	17	8	12	1.39	a
15	968.99	1939.24	21	16	11	23	1.58	a
16	1120.32	2241.47	31	14	7	7	2.04	a
17	1460.89	2921.65	75	18	3	2	1.69	a
18	1764.71	3528.43	25	12	5	4	3.68	a Wide Pk

140921D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	87.12	7	18	14	6	18	14	NET<CL
4	93.25	25	24	18	21	24	19	
5	185.86	49	27	19	44	27	19	
6	238.58	233	36	16	228	36	17	
8	295.25	139	29	13	136	29	14	
9	338.40	58	22	13	56	22	14	
10	351.77	189	31	12	187	31	12	
11	511.17	43	23	15	4	24	19	NET<CL
12	583.21	63	19	9	61	20	10	
13	609.23	127	26	10	125	26	11	
14	911.26	50	17	8	48	17	8	
16	1120.32	31	14	7	29	14	7	
17	1460.89	75	18	3	62	18	7	
18	1764.71	25	12	5	24	12	6	

140921D01.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-13 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 10:59:57
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.07e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140921D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)
Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013
Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	2.68E+00 +- 2.92E-01	. . . .	. . . .	1.40E+07
	295.21		3.39E+00 +- 7.21E-01	7.72E-01	3.52E-01	1.40E+07
	351.92		2.76E+00 +- 4.60E-01	4.05E-01	1.83E-01	1.40E+07
	609.31		2.29E+00 +- 4.75E-01	4.45E-01	1.98E-01	1.40E+07
	1120.29		2.63E+00 +- 1.25E+00	1.55E+00	6.50E-01	1.40E+07

MEASURED TOTAL: 2.68E+00 +- 2.92E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.65	153.09	38	29	22	90	0.91	Unknown
2	77.01	157.81	81	27	16	60	0.72	Unknown
3	93.25	190.24	21	24	19	65	0.85	Unknown
4	185.86	375.19	44	27	20	61	1.09	Unknown
5	238.58	480.49	228	36	17	47	0.94	Unknown
6	241.61	486.54	74	32	22	71	1.49	Unknown
8	338.40	679.85	56	22	14	33	0.96	Unknown
10	583.21	1168.76	61	20	10	15	1.24	Unknown
12	911.26	1823.94	48	17	8	12	1.39	Unknown
13	968.99	1939.24	21	16	11	23	1.58	Unknown

140921D01.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	1460.89	2921.65	62	18	7	2	1.69	Unknown
16	1764.71	3528.43	24	12	6	4	3.68	Unknown

c:\SEEKER\BIN\140921d01A.res Analysis Results Saved.

140999D02.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-14 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:03
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.63E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140999D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.44 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014

FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.10	156.81	43	25	18	63	0.75	a
2	92.92	188.40	39	28	20	65	1.30	a
3	185.78	373.82	40	24	16	46	1.12	a
4	238.54	479.16	169	30	13	29	1.04	a
5	241.69	485.46	36	22	16	39	1.24	b
6	295.13	592.15	52	19	10	22	0.68	a
7	338.33	678.42	32	18	12	23	1.08	a
8	351.85	705.40	93	25	13	36	1.07	a
9	510.76	1022.71	44	24	17	41	2.09	a Wide Pk
10	583.21	1167.36	61	20	10	18	1.11	a
11	609.17	1219.19	84	21	9	14	1.34	a
12	911.66	1823.19	17	11	6	10	0.84	a
13	1120.65	2240.48	22	14	9	13	2.17	a
14	1460.87	2919.78	101	21	5	5	2.22	a
15	1764.21	3525.47	13	10	5	4	3.63	a

140999D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	92.92	39	28	20	31	28	21	
3	185.78	40	24	16	32	24	18	
4	238.54	169	30	13	163	30	14	
6	295.13	52	19	10	49	19	11	
7	338.33	32	18	12	29	19	13	
8	351.85	93	25	13	89	26	14	
9	510.76	44	25	17	-2	26	21	NET<CL
10	583.21	61	20	10	57	20	11	
11	609.17	84	21	9	78	22	10	
12	911.66	17	11	6	15	11	7	
13	1120.65	22	14	9	20	14	9	
14	1460.87	101	21	5	89	21	8	
15	1764.21	13	10	5	11	10	6	

140999D02.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-14 GS140724-1

Sampling Start: 07/17/2014 12:00:00	Counting Start: 08/16/2014 11:00:03
Sampling Stop: 07/17/2014 12:00:00	Decay Time. . . . . 7.19e+002 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.63e+002 g	Real Time . . . . . 1804 Sec
Collection Efficiency 1.0000	Spectrum File 140999D02.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 2 (Detector 2)
Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013
Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		2.24E+00 +- 2.04E+00	3.29E+00	1.55E+00	3.92E+13
U-235	143.76	N	1.75E-01 +- 4.39E-01	7.51E-01	3.46E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.12E+00 +- 2.10E-01	2.07E-01	9.41E-02	1.67E+04
Pb-214	Average:x		7.88E-01 +- 1.83E-01	. . . .	. . . .	1.40E+07
	295.22		7.38E-01 +- 2.91E-01	3.70E-01	1.65E-01	1.40E+07
	351.99		8.21E-01 +- 2.37E-01	2.88E-01	1.32E-01	1.40E+07
Ac-228	Average:x		5.06E-01 +- 2.69E-01	. . . .	. . . .	1.23E+14
	338.40		8.59E-01 +- 5.71E-01	8.65E-01	3.92E-01	1.23E+14
	911.07		4.04E-01 +- 3.05E-01	4.44E-01	1.85E-01	1.23E+14
Tl-208	583.14		3.45E-01 +- 1.21E-01	1.47E-01	6.51E-02	1.67E+04
Bi-214	Average:x		8.95E-01 +- 2.30E-01	. . . .	. . . .	1.40E+07
	609.32		8.74E-01 +- 2.41E-01	2.59E-01	1.14E-01	1.40E+07
	1120.28		1.10E+00 +- 7.54E-01	1.10E+00	4.79E-01	1.40E+07
K-40	1460.75		8.02E+00 +- 1.91E+00	1.70E+00	7.28E-01	1.12E+13
Pb-210	46.50	N	9.75E+01 +- 1.67E+02	2.81E+02	1.29E+02	1.95E+05
Am-241	59.54	N	3.20E-01 +- 1.61E+00	2.85E+00	1.30E+00	3.80E+06
Cs-137	661.62	N	6.87E-02 +- 7.86E-02	1.27E-01	5.45E-02	2.64E+05
Bi-212	727.17	N	1.07E+00 +- 1.15E+00	1.84E+00	7.94E-01	1.67E+04
Pa-234m	1001.03	N	-9.13E+00 +- 1.15E+01	2.54E+01	1.10E+01	3.92E+13
Eu-154	1004.80	N	-8.81E-02 +- 4.05E-01	8.09E-01	3.48E-01	7.45E+04
Co-60	1332.51	N	9.36E-03 +- 5.62E-02	1.12E-01	4.36E-02	4.62E+04
Eu-152	1408.08	N	-2.15E-01 +- 3.38E-01	7.70E-01	3.23E-01	1.17E+05

140999D02.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 1.13E+02 +- 1.76E+02 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.10	156.81	43	25	18	63	0.75	Unknown
5	241.69	485.46	36	22	16	39	1.24	Unknown
9	510.76	1022.71	-2	26	21	41	2.09	Deleted
15	1764.21	3525.47	11	10	6	4	3.63	Unknown

c:\SEEKER\BIN\140999d02.res Analysis Results Saved.

140999D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-14 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:03
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.63E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140999D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.44 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG	
1	77.10	156.81	43	25	18	63	0.75	a	
2	92.92	188.40	39	28	20	65	1.30	a	
3	185.78	373.82	40	24	16	46	1.12	a	
4	238.54	479.16	169	30	13	29	1.04	a	
5	241.69	485.46	36	22	16	39	1.24	b	
6	295.13	592.15	52	19	10	22	0.68	a	
7	338.33	678.42	32	18	12	23	1.08	a	
8	351.85	705.40	93	25	13	36	1.07	a	
9	510.76	1022.71	44	24	17	41	2.09	a	Wide Pk
10	583.21	1167.36	61	20	10	18	1.11	a	
11	609.17	1219.19	84	21	9	14	1.34	a	
12	911.66	1823.19	17	11	6	10	0.84	a	
13	1120.65	2240.48	22	14	9	13	2.17	a	
14	1460.87	2919.78	101	21	5	5	2.22	a	
15	1764.21	3525.47	13	10	5	4	3.63	a	

140999D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	92.92	39	28	20	31	28	21	
3	185.78	40	24	16	32	24	18	
4	238.54	169	30	13	163	30	14	
6	295.13	52	19	10	49	19	11	
7	338.33	32	18	12	29	19	13	
8	351.85	93	25	13	89	26	14	
9	510.76	44	25	17	-2	26	21	NET<CL
10	583.21	61	20	10	57	20	11	
11	609.17	84	21	9	78	22	10	
12	911.66	17	11	6	15	11	7	
13	1120.65	22	14	9	20	14	9	
14	1460.87	101	21	5	89	21	8	
15	1764.21	13	10	5	11	10	6	

140999D02.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-14 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:03
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.63e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140999D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013
Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	8.29E-01 +- 1.43E-01	. . . .	. . . .	1.40E+07
	295.21		7.38E-01 +- 2.91E-01	3.70E-01	1.65E-01	1.40E+07
	351.92		8.21E-01 +- 2.37E-01	2.88E-01	1.32E-01	1.40E+07
	609.31		8.74E-01 +- 2.41E-01	2.59E-01	1.14E-01	1.40E+07
	1120.29		1.10E+00 +- 7.54E-01	1.10E+00	4.79E-01	1.40E+07

MEASURED TOTAL: 8.29E-01 +- 1.43E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.10	156.81	43	25	18	63	0.75	Unknown
2	92.92	188.40	31	28	21	65	1.30	Unknown
3	185.78	373.82	32	24	18	46	1.12	Unknown
4	238.54	479.16	163	30	14	29	1.04	Unknown
5	241.69	485.46	36	22	16	39	1.24	Unknown
7	338.33	678.42	29	19	13	23	1.08	Unknown
9	583.21	1167.36	57	20	11	18	1.11	Unknown
11	911.66	1823.19	15	11	7	10	0.84	Unknown
13	1460.87	2919.78	89	21	8	5	2.22	Unknown
14	1764.21	3525.47	11	10	6	4	3.63	Unknown

140999D02.SPC Analyzed by

c:\SEEKER\BIN\140999d02A.res Analysis Results Saved.

140966D03.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-15 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:09
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.11E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140966D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.72	152.50	148	47	33	190	1.07	a
2	76.93	156.90	272	52	33	190	1.21	b
3	87.08	177.14	102	36	24	120	0.87	a
4	89.74	182.44	71	38	28	144	0.95	b
5	93.00	188.94	108	40	28	144	1.04	c
6	105.07	213.02	46	44	34	174	1.48	a
7	109.11	221.07	19	24	19	77	0.65	b
8	129.23	261.20	53	35	26	127	0.93	a
9	154.01	310.61	46	37	29	131	1.29	a
10	185.86	374.13	54	28	20	80	0.86	a
11	209.19	420.67	87	35	25	104	1.10	a
12	238.54	479.20	1090	71	21	85	1.15	a
13	241.15	484.39	110	39	27	121	1.68	b
14	270.26	542.44	80	30	19	74	1.17	a
15	277.53	556.95	47	24	16	56	1.04	a
16	295.11	592.01	85	29	19	70	1.11	a
17	300.11	601.98	58	32	23	90	1.47	b
18	327.94	657.49	50	29	21	74	1.43	a
19	338.20	677.94	189	38	22	78	1.58	a
20	351.89	705.24	179	34	17	52	1.52	a
21	409.96	821.06	47	26	19	51	1.90	a
22	463.09	927.00	56	24	15	42	1.31	a
23	510.83	1022.22	144	32	18	48	2.02	a
24	583.11	1166.36	326	41	16	41	1.89	a

140966D03.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	609.18	1218.34	107	28	15	46	1.48	a
26	727.31	1453.93	68	21	10	21	1.38	a
27	794.87	1588.66	38	20	12	24	2.31	a
28	860.23	1719.02	42	19	12	22	2.16	a
29	911.30	1820.86	198	31	11	23	2.16	a
30	964.73	1927.41	35	15	7	12	1.35	a
31	969.13	1936.19	116	25	11	21	2.23	b
32	1460.97	2917.04	61	19	8	12	2.27	a

140966D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	76.93	272	52	33	270	52	34	
4	89.74	71	38	28	69	38	28	
5	93.00	108	40	28	97	40	29	
10	185.86	54	28	20	47	29	21	
12	238.54	1090	71	21	1085	71	21	
16	295.11	85	29	19	83	30	19	
19	338.20	189	38	22	185	38	22	
20	351.89	179	34	17	173	34	18	
23	510.83	144	32	18	103	33	22	
24	583.11	326	41	16	323	41	16	
25	609.18	107	28	15	104	28	16	
29	911.30	198	31	11	196	31	12	
31	969.13	116	25	11	115	25	11	
32	1460.97	61	19	8	55	19	9	

140966D03.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-15 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:09
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.11e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140966D03.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		7.70E+00 +- 3.18E+00	4.77E+00	2.28E+00	3.92E+13
U-235	143.76	N	2.04E-01 +- 9.07E-01	1.55E+00	7.35E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	Average:x		1.03E+01 +- 6.69E-01	. . . .	. . . .	1.67E+04
	238.63		1.04E+01 +- 6.77E-01	4.34E-01	2.04E-01	1.67E+04
	300.09		8.03E+00 +- 4.37E+00	6.68E+00	3.15E+00	1.67E+04
Tl-208	Average:x		2.97E+00 +- 3.53E-01	. . . .	. . . .	1.67E+04
	277.36		3.24E+00 +- 1.66E+00	2.44E+00	1.13E+00	1.67E+04
	583.14		2.93E+00 +- 3.70E-01	3.15E-01	1.45E-01	1.67E+04
	860.47		3.57E+00 +- 1.62E+00	2.20E+00	9.87E-01	1.67E+04
Pb-214	Average:x		2.18E+00 +- 3.79E-01	. . . .	. . . .	1.40E+07
	295.22		1.88E+00 +- 6.70E-01	9.31E-01	4.35E-01	1.40E+07
	351.99		2.33E+00 +- 4.60E-01	5.21E-01	2.42E-01	1.40E+07
Ac-228	Average:x		8.05E+00 +- 8.85E-01	. . . .	. . . .	1.23E+14
	338.40		7.93E+00 +- 1.65E+00	2.04E+00	9.60E-01	1.23E+14
	911.07		8.09E+00 +- 1.29E+00	1.07E+00	4.80E-01	1.23E+14
	968.90		8.13E+00 +- 1.80E+00	1.80E+00	8.06E-01	1.23E+14
Bi-214	609.32		1.73E+00 +- 4.70E-01	5.79E-01	2.67E-01	1.40E+07
Bi-212	727.17		9.48E+00 +- 2.85E+00	3.17E+00	1.40E+00	1.67E+04
K-40	1460.75		7.81E+00 +- 2.64E+00	3.04E+00	1.33E+00	1.12E+13
Pb-210	46.50	N	-4.07E+01 +- 7.70E+01	1.37E+02	6.54E+01	1.95E+05
Am-241	59.54	N	9.23E-01 +- 1.77E+00	2.97E+00	1.41E+00	3.80E+06
Cs-137	661.62	N	-1.16E-01 +- 1.77E-01	3.38E-01	1.56E-01	2.64E+05
Pa-234m	1001.03	N	7.77E+00 +- 2.26E+01	4.03E+01	1.75E+01	3.92E+13

140966D03.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Eu-154	1004.80	N	-2.57E-01 +- 7.27E-01	1.44E+00	6.34E-01	7.45E+04
Co-60	1332.51	N	1.95E-02 +- 1.51E-01	2.81E-01	1.21E-01	4.62E+04
Eu-152	1408.08	N	-3.73E-01 +- 7.60E-01	1.56E+00	6.81E-01	1.17E+05

MEASURED TOTAL: 5.92E+01 +- 3.69E+01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.72	152.50	148	47	33	190	1.07	Unknown
2	76.93	156.90	270	52	34	190	1.21	Unknown
3	87.08	177.14	102	36	24	120	0.87	Unknown
4	89.74	182.44	69	38	28	144	0.95	Unknown
6	105.07	213.02	46	44	34	174	1.48	Unknown
7	109.11	221.07	19	24	19	77	0.65	Unknown
8	129.23	261.20	53	35	26	127	0.93	Unknown
9	154.01	310.61	46	37	29	131	1.29	Unknown
11	209.19	420.67	87	35	25	104	1.10	Unknown
13	241.15	484.39	110	39	27	121	1.68	Unknown
14	270.26	542.44	80	30	19	74	1.17	Unknown
18	327.94	657.49	50	29	21	74	1.43	Unknown
21	409.96	821.06	47	26	19	51	1.90	Unknown
22	463.09	927.00	56	24	15	42	1.31	Unknown
23	510.83	1022.22	103	33	22	48	2.02	Unknown
27	794.87	1588.66	38	20	12	24	2.31	Unknown
30	964.73	1927.41	35	15	7	12	1.35	Unknown

c:\SEEKER\BIN\140966d03.res Analysis Results Saved.

140966D03.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-15 GS140724-1

Sampling Start: 07/17/2014 12:00:00	Counting Start: 08/16/2014 11:00:09
Sampling Stop: 07/17/2014 12:00:00	Decay Time. . . . . 7.19E+002 Hrs
Buildup Time. . . . . 0.00E+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.11E+002 g	Real Time . . . . . 1804 Sec
Collection Efficiency 1.0000	Spc. File 140966D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.72	152.50	148	47	33	190	1.07	a
2	76.93	156.90	272	52	33	190	1.21	b
3	87.08	177.14	102	36	24	120	0.87	a
4	89.74	182.44	71	38	28	144	0.95	b
5	93.00	188.94	108	40	28	144	1.04	c
6	105.07	213.02	46	44	34	174	1.48	a
7	109.11	221.07	19	24	19	77	0.65	b
8	129.23	261.20	53	35	26	127	0.93	a
9	154.01	310.61	46	37	29	131	1.29	a
10	185.86	374.13	54	28	20	80	0.86	a
11	209.19	420.67	87	35	25	104	1.10	a
12	238.54	479.20	1090	71	21	85	1.15	a
13	241.15	484.39	110	39	27	121	1.68	b
14	270.26	542.44	80	30	19	74	1.17	a
15	277.53	556.95	47	24	16	56	1.04	a
16	295.11	592.01	85	29	19	70	1.11	a
17	300.11	601.98	58	32	23	90	1.47	b
18	327.94	657.49	50	29	21	74	1.43	a
19	338.20	677.94	189	38	22	78	1.58	a
20	351.89	705.24	179	34	17	52	1.52	a
21	409.96	821.06	47	26	19	51	1.90	a
22	463.09	927.00	56	24	15	42	1.31	a
23	510.83	1022.22	144	32	18	48	2.02	a
24	583.11	1166.36	326	41	16	41	1.89	a

140966D03.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	609.18	1218.34	107	28	15	46	1.48	a
26	727.31	1453.93	68	21	10	21	1.38	a
27	794.87	1588.66	38	20	12	24	2.31	a
28	860.23	1719.02	42	19	12	22	2.16	a
29	911.30	1820.86	198	31	11	23	2.16	a
30	964.73	1927.41	35	15	7	12	1.35	a
31	969.13	1936.19	116	25	11	21	2.23	b
32	1460.97	2917.04	61	19	8	12	2.27	a

140966D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	76.93	272	52	33	270	52	34	
4	89.74	71	38	28	69	38	28	
5	93.00	108	40	28	97	40	29	
10	185.86	54	28	20	47	29	21	
12	238.54	1090	71	21	1085	71	21	
16	295.11	85	29	19	83	30	19	
19	338.20	189	38	22	185	38	22	
20	351.89	179	34	17	173	34	18	
23	510.83	144	32	18	103	33	22	
24	583.11	326	41	16	323	41	16	
25	609.18	107	28	15	104	28	16	
29	911.30	198	31	11	196	31	12	
31	969.13	116	25	11	115	25	11	
32	1460.97	61	19	8	55	19	9	

140966D03.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-15 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:09
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.11e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140966D03.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	2.01E+00 +- 2.95E-01	. . . .	. . . .	1.40E+07
	295.21		1.88E+00 +- 6.70E-01	9.31E-01	4.35E-01	1.40E+07
	351.92		2.33E+00 +- 4.60E-01	5.21E-01	2.42E-01	1.40E+07
	609.31		1.73E+00 +- 4.70E-01	5.79E-01	2.67E-01	1.40E+07

MEASURED TOTAL: 2.01E+00 +- 2.95E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.72	152.50	148	47	33	190	1.07	Unknown
2	76.93	156.90	270	52	34	190	1.21	Unknown
3	87.08	177.14	102	36	24	120	0.87	Unknown
4	89.74	182.44	69	38	28	144	0.95	Unknown
5	93.00	188.94	97	40	29	144	1.04	Unknown
6	105.07	213.02	46	44	34	174	1.48	Unknown
7	109.11	221.07	19	24	19	77	0.65	Unknown
8	129.23	261.20	53	35	26	127	0.93	Unknown
9	154.01	310.61	46	37	29	131	1.29	Unknown
10	185.86	374.13	47	29	21	80	0.86	Unknown
11	209.19	420.67	87	35	25	104	1.10	Unknown

140966D03.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	238.54	479.20	1085	71	21	85	1.15	Unknown
13	241.15	484.39	110	39	27	121	1.68	Unknown
14	270.26	542.44	80	30	19	74	1.17	Unknown
15	277.53	556.95	47	24	16	56	1.04	Unknown
17	300.11	601.98	58	32	23	90	1.47	Unknown
18	327.94	657.49	50	29	21	74	1.43	Unknown
19	338.20	677.94	185	38	22	78	1.58	Unknown
21	409.96	821.06	47	26	19	51	1.90	Unknown
22	463.09	927.00	56	24	15	42	1.31	Unknown
23	510.83	1022.22	103	33	22	48	2.02	Unknown
24	583.11	1166.36	323	41	16	41	1.89	Unknown
26	727.31	1453.93	68	21	10	21	1.38	Unknown
27	794.87	1588.66	38	20	12	24	2.31	Unknown
28	860.23	1719.02	42	19	12	22	2.16	Unknown
29	911.30	1820.86	196	31	12	23	2.16	Unknown
30	964.73	1927.41	35	15	7	12	1.35	Unknown
31	969.13	1936.19	115	25	11	21	2.23	Unknown
32	1460.97	2917.04	55	19	9	12	2.27	Unknown

c:\SEEKER\BIN\140966d03A.res Analysis Results Saved.

141330D04.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-16 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:14
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.79E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.141330D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.50 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.87	156.59	34	20	13	43	0.45 a	
2	87.40	177.65	12	16	12	37	0.54 a	NET< CL
3	92.55	187.93	32	19	13	37	0.72 a	
4	185.93	374.52	37	28	20	61	1.43 a	
5	238.63	479.82	124	29	15	47	0.98 a	
6	295.16	592.77	59	25	16	45	1.42 a	
7	351.77	705.89	93	24	11	23	1.41 a	
8	510.81	1023.66	35	17	10	20	1.53 a	
9	583.12	1168.16	33	20	13	27	2.30 a	
10	609.25	1220.35	54	21	13	26	1.91 a	
11	661.89	1325.55	60	19	9	18	1.32 a	
12	1461.22	2922.70	62	18	7	7	2.85 a	

141330D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

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GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	76.87	34	20	13	33	20	14	
3	92.55	32	19	13	16	20	15	
4	185.93	37	28	20	24	28	22	
5	238.63	124	29	15	118	29	16	
6	295.16	59	25	16	56	25	17	
7	351.77	93	24	11	89	24	12	
8	510.81	35	17	10	-3	18	15	NET<CL
9	583.12	33	20	13	31	20	13	
10	609.25	54	21	13	50	22	13	
12	1461.22	62	18	7	56	18	8	

141330D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-16 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:14
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.79e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.141330D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)		MDA	Critical Level	Halflife (hrs)
Th-234	92.50		8.55E-01	+- 1.07E+00	1.76E+00	8.07E-01	3.92E+13
U-235	143.76	N	1.13E-01	+- 4.17E-01	7.23E-01	3.34E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	. . . .	6.17E+12
Pb-212	238.63		8.04E-01	+- 1.97E-01	2.33E-01	1.07E-01	1.67E+04
Pb-214	Average:x		9.15E-01	+- 2.12E-01	. . . .	. . . .	1.40E+07
	295.22		9.17E-01	+- 4.07E-01	5.81E-01	2.69E-01	1.40E+07
	351.99		9.14E-01	+- 2.48E-01	2.82E-01	1.27E-01	1.40E+07
Tl-208	583.14		2.31E-01	+- 1.45E-01	2.17E-01	9.87E-02	1.67E+04
Bi-214	609.32		6.88E-01	+- 2.94E-01	4.03E-01	1.83E-01	1.40E+07
Cs-137	661.62		4.75E-01	+- 1.52E-01	1.69E-01	7.38E-02	2.64E+05
K-40	1460.75		7.06E+00	+- 2.26E+00	2.40E+00	1.03E+00	1.12E+13
Pb-210	46.50	N	-6.32E+00	+- 2.01E+01	3.71E+01	1.71E+01	1.95E+05
Am-241	59.54	N	-2.49E-01	+- 5.04E-01	9.57E-01	4.38E-01	3.80E+06
Bi-212	727.17	N	7.22E-01	+- 1.32E+00	2.26E+00	9.75E-01	1.67E+04
Ac-228	911.07	N	9.48E-01	+- 4.96E-01	6.48E-01	2.76E-01	1.23E+14
Pa-234m	1001.03	N	5.28E+00	+- 1.69E+01	3.06E+01	1.30E+01	3.92E+13
Eu-154	1004.80	N	-5.52E-02	+- 5.64E-01	1.09E+00	4.73E-01	7.45E+04
Co-60	1332.51	N	8.59E-03	+- 9.33E-02	1.84E-01	7.48E-02	4.62E+04
Eu-152	1408.08	N	-2.99E-01	+- 5.76E-01	1.22E+00	5.26E-01	1.17E+05

MEASURED TOTAL: 1.81E+01 +- 2.36E+01 pCi/g

141330D04.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.87	156.59	33	20	14	43	0.45	Unknown
2	87.40	177.65	12	16	12	37	0.54	Deleted
8	510.81	1023.66	-3	18	15	20	1.53	Deleted

c:\SEEKER\BIN\141330d04.res Analysis Results Saved.

141330D04.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-16 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:14
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.79E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	141330D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.50 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.87	156.59	34	20	13	43	0.45 a	
2	87.40	177.65	12	16	12	37	0.54 a	NET< CL
3	92.55	187.93	32	19	13	37	0.72 a	
4	185.93	374.52	37	28	20	61	1.43 a	
5	238.63	479.82	124	29	15	47	0.98 a	
6	295.16	592.77	59	25	16	45	1.42 a	
7	351.77	705.89	93	24	11	23	1.41 a	
8	510.81	1023.66	35	17	10	20	1.53 a	
9	583.12	1168.16	33	20	13	27	2.30 a	
10	609.25	1220.35	54	21	13	26	1.91 a	
11	661.89	1325.55	60	19	9	18	1.32 a	
12	1461.22	2922.70	62	18	7	7	2.85 a	

141330D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	76.87	34	20	13	33	20	14	
3	92.55	32	19	13	16	20	15	
4	185.93	37	28	20	24	28	22	
5	238.63	124	29	15	118	29	16	
6	295.16	59	25	16	56	25	17	
7	351.77	93	24	11	89	24	12	
8	510.81	35	17	10	-3	18	15	NET<CL
9	583.12	33	20	13	31	20	13	
10	609.25	54	21	13	50	22	13	
12	1461.22	62	18	7	56	18	8	

141330D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-16 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:14
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.79e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.141330D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	8.37E-01 +- 1.72E-01	. . . .	. . . .	1.40E+07
	295.21		9.17E-01 +- 4.07E-01	5.81E-01	2.69E-01	1.40E+07
	351.92		9.14E-01 +- 2.48E-01	2.82E-01	1.27E-01	1.40E+07
	609.31		6.88E-01 +- 2.94E-01	4.03E-01	1.83E-01	1.40E+07

MEASURED TOTAL: 8.37E-01 +- 1.72E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.87	156.59	33	20	14	43	0.45	Unknown
2	92.55	187.93	16	20	15	37	0.72	Unknown
3	185.93	374.52	24	28	22	62	1.43	Unknown
4	238.63	479.82	118	29	16	47	0.98	Unknown
7	583.12	1168.16	31	20	13	27	2.30	Unknown
9	661.89	1325.55	60	19	9	18	1.32	Unknown
10	1461.22	2922.70	56	18	8	7	2.85	Unknown

c:\SEEKER\BIN\141330d04A.res Analysis Results Saved.

140889D05.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-17 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:20
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.20E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140889D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.70 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014

FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	150.96	73	31	22	104	0.67 a	
2	77.14	155.57	153	40	25	130	0.85 b	
3	87.24	175.75	72	31	21	97	0.74 a	
4	89.93	181.13	51	33	25	122	0.74 b	
5	93.07	187.40	69	34	25	122	0.82 c	
6	105.92	213.08	17	30	24	115	0.79 a	NET< CL
7	129.00	259.23	49	24	16	63	0.56 a	
8	185.82	372.79	45	33	25	117	0.95 a	
9	209.13	419.37	108	33	21	87	0.85 a	
10	238.58	478.23	1000	68	19	76	0.90 a	
11	241.27	483.61	106	37	25	106	1.21 b	
12	270.15	541.34	64	27	18	63	0.85 a	
13	277.42	555.86	37	25	18	62	0.94 a	
14	295.11	591.22	109	28	15	42	1.01 a	
15	299.65	600.29	92	30	19	56	1.36 b	
16	327.97	656.89	48	25	17	55	0.99 a	
17	338.29	677.51	218	35	15	48	0.89 a	
18	351.89	704.71	174	33	17	53	0.96 a	
19	409.67	820.19	30	26	19	60	1.27 a	
20	463.12	927.01	55	22	13	29	1.11 a	
21	510.59	1021.90	156	34	19	56	1.76 a	
22	583.20	1167.02	319	40	14	40	1.16 a	
23	609.30	1219.18	139	28	12	27	1.19 a	
24	661.70	1323.91	33	20	13	30	1.47 a	

140889D05.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	727.38	1455.19	68	20	9	16	1.23	a
26	795.05	1590.44	31	20	14	30	1.85	a
27	860.46	1721.17	37	17	10	16	1.43	a
28	911.22	1822.61	212	31	10	20	1.37	a
29	964.74	1929.60	55	17	8	11	1.64	a
30	969.07	1938.25	132	25	7	10	1.45	b
31	1120.24	2240.38	28	15	8	13	1.57	a
32	1460.74	2920.93	98	21	7	8	2.33	a
33	1588.00	3175.28	16	13	8	13	1.58	a
34	1764.60	3528.24	32	14	7	8	2.57	a

140889D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
5	93.07	69	34	25	62	35	25	
8	185.82	45	33	25	38	34	26	
10	238.58	1000	68	19	993	68	20	
11	241.27	106	37	25	104	37	25	
14	295.11	109	28	15	107	28	16	
17	338.29	218	35	15	216	35	16	
18	351.89	174	33	17	168	34	18	
21	510.59	156	34	19	108	35	23	
22	583.20	320	40	14	317	40	15	
23	609.30	139	28	12	135	28	13	
27	860.46	37	17	10	35	17	10	
28	911.22	212	31	10	210	31	10	
30	969.07	132	25	7	131	25	8	
32	1460.74	98	22	7	85	22	10	
34	1764.60	32	14	7	31	14	7	

140889D05.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-17 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:20
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.20e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140889D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014

Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		5.12E+00 +- 2.86E+00	4.41E+00	2.09E+00	3.92E+13
U-235	143.76	N	2.09E-01 +- 6.27E-01	1.07E+00	5.02E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	Average:x		7.58E+00 +- 5.06E-01	. . . .	. . . .	1.67E+04
	238.63		7.52E+00 +- 5.12E-01	3.26E-01	1.53E-01	1.67E+04
	300.09		9.79E+00 +- 3.17E+00	4.28E+00	2.00E+00	1.67E+04
Tl-208	Average:x		2.15E+00 +- 2.58E-01	. . . .	. . . .	1.67E+04
	277.36		1.99E+00 +- 1.37E+00	2.12E+00	9.89E-01	1.67E+04
	583.14		2.15E+00 +- 2.71E-01	2.20E-01	1.01E-01	1.67E+04
	860.47		2.20E+00 +- 1.05E+00	1.39E+00	6.12E-01	1.67E+04
Pb-214	Average:x		1.76E+00 +- 2.81E-01	. . . .	. . . .	1.40E+07
	295.22		1.84E+00 +- 4.83E-01	5.84E-01	2.69E-01	1.40E+07
	351.99		1.73E+00 +- 3.46E-01	3.92E-01	1.82E-01	1.40E+07
Ac-228	Average:x		6.69E+00 +- 6.38E-01	. . . .	. . . .	1.23E+14
	338.40		7.09E+00 +- 1.15E+00	1.13E+00	5.22E-01	1.23E+14
	911.07		6.36E+00 +- 9.55E-01	7.06E-01	3.12E-01	1.23E+14
	968.90		6.80E+00 +- 1.28E+00	9.25E-01	3.92E-01	1.23E+14
Bi-214	Average:x		1.69E+00 +- 3.24E-01	. . . .	. . . .	1.40E+07
	609.32		1.68E+00 +- 3.48E-01	3.51E-01	1.59E-01	1.40E+07
	1120.28		1.71E+00 +- 8.91E-01	1.18E+00	5.09E-01	1.40E+07
Cs-137	661.62		2.38E-01 +- 1.42E-01	2.11E-01	9.55E-02	2.64E+05
Bi-212	727.17		7.06E+00 +- 2.06E+00	2.20E+00	9.61E-01	1.67E+04
K-40	1460.75		8.62E+00 +- 2.21E+00	2.22E+00	9.73E-01	1.12E+13
Pb-210	46.50	N	-3.38E+01 +- 1.75E+02	3.12E+02	1.46E+02	1.95E+05

140889D05.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54	N	-1.18E+00 +- 2.39E+00	4.35E+00	2.04E+00	3.80E+06
Pa-234m	1001.03	N	-1.42E+00 +- 1.24E+01	2.48E+01	1.05E+01	3.92E+13
Eu-154	1004.80	N	-1.41E-01 +- 4.32E-01	8.87E-01	3.80E-01	7.45E+04
Co-60	1332.51	N	7.74E-02 +- 8.00E-02	1.21E-01	4.61E-02	4.62E+04
Eu-152	1408.08	N	3.13E-01 +- 5.71E-01	9.81E-01	4.20E-01	1.17E+05

MEASURED TOTAL: 4.15E+01 +- 1.06E+01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	150.96	73	31	22	104	0.67	Unknown
2	77.14	155.57	153	40	25	130	0.85	Unknown
3	87.24	175.75	72	31	21	97	0.74	Unknown
4	89.93	181.13	51	33	25	122	0.74	Unknown
6	105.92	213.08	17	30	24	115	0.79	Deleted
7	129.00	259.23	49	24	16	63	0.56	Unknown
9	209.13	419.37	108	33	21	87	0.85	Unknown
11	241.27	483.61	104	37	25	106	1.21	Unknown
12	270.15	541.34	64	27	18	63	0.85	Unknown
16	327.97	656.89	48	25	17	55	0.99	Unknown
19	409.67	820.19	30	26	19	60	1.27	Unknown
20	463.12	927.01	55	22	13	29	1.11	Unknown
21	510.59	1021.90	108	35	23	56	1.76	Unknown
26	795.05	1590.44	31	20	14	30	1.85	Unknown
29	964.74	1929.60	55	17	8	11	1.64	Unknown
33	1588.00	3175.28	16	13	8	13	1.58	Unknown
34	1764.60	3528.24	31	14	7	8	2.57	Unknown

c:\SEEKER\BIN\140889d05.res Analysis Results Saved.

140889D05.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-17 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:20
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.20E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140889D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.70 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014

FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	150.96	73	31	22	104	0.67 a	
2	77.14	155.57	153	40	25	130	0.85 b	
3	87.24	175.75	72	31	21	97	0.74 a	
4	89.93	181.13	51	33	25	122	0.74 b	
5	93.07	187.40	69	34	25	122	0.82 c	
6	105.92	213.08	17	30	24	115	0.79 a	NET< CL
7	129.00	259.23	49	24	16	63	0.56 a	
8	185.82	372.79	45	33	25	117	0.95 a	
9	209.13	419.37	108	33	21	87	0.85 a	
10	238.58	478.23	1000	68	19	76	0.90 a	
11	241.27	483.61	106	37	25	106	1.21 b	
12	270.15	541.34	64	27	18	63	0.85 a	
13	277.42	555.86	37	25	18	62	0.94 a	
14	295.11	591.22	109	28	15	42	1.01 a	
15	299.65	600.29	92	30	19	56	1.36 b	
16	327.97	656.89	48	25	17	55	0.99 a	
17	338.29	677.51	218	35	15	48	0.89 a	
18	351.89	704.71	174	33	17	53	0.96 a	
19	409.67	820.19	30	26	19	60	1.27 a	
20	463.12	927.01	55	22	13	29	1.11 a	
21	510.59	1021.90	156	34	19	56	1.76 a	
22	583.20	1167.02	319	40	14	40	1.16 a	
23	609.30	1219.18	139	28	12	27	1.19 a	
24	661.70	1323.91	33	20	13	30	1.47 a	

140889D05.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	727.38	1455.19	68	20	9	16	1.23	a
26	795.05	1590.44	31	20	14	30	1.85	a
27	860.46	1721.17	37	17	10	16	1.43	a
28	911.22	1822.61	212	31	10	20	1.37	a
29	964.74	1929.60	55	17	8	11	1.64	a
30	969.07	1938.25	132	25	7	10	1.45	b
31	1120.24	2240.38	28	15	8	13	1.57	a
32	1460.74	2920.93	98	21	7	8	2.33	a
33	1588.00	3175.28	16	13	8	13	1.58	a
34	1764.60	3528.24	32	14	7	8	2.57	a

140889D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
5	93.07	69	34	25	62	35	25	
8	185.82	45	33	25	38	34	26	
10	238.58	1000	68	19	993	68	20	
11	241.27	106	37	25	104	37	25	
14	295.11	109	28	15	107	28	16	
17	338.29	218	35	15	216	35	16	
18	351.89	174	33	17	168	34	18	
21	510.59	156	34	19	108	35	23	
22	583.20	320	40	14	317	40	15	
23	609.30	139	28	12	135	28	13	
27	860.46	37	17	10	35	17	10	
28	911.22	212	31	10	210	31	10	
30	969.07	132	25	7	131	25	8	
32	1460.74	98	22	7	85	22	10	
34	1764.60	32	14	7	31	14	7	

140889D05.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-17 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:20
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.20e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140889D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014

Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.73E+00 +- 2.12E-01	. . . .	. . . .	1.40E+07
	295.21		1.84E+00 +- 4.83E-01	5.84E-01	2.69E-01	1.40E+07
	351.92		1.73E+00 +- 3.46E-01	3.92E-01	1.82E-01	1.40E+07
	609.31		1.68E+00 +- 3.48E-01	3.51E-01	1.59E-01	1.40E+07
	1120.29		1.71E+00 +- 8.91E-01	1.18E+00	5.09E-01	1.40E+07

MEASURED TOTAL: 1.73E+00 +- 2.12E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.83	150.96	73	31	22	104	0.67	Unknown
2	77.14	155.57	153	40	25	130	0.85	Unknown
3	87.24	175.75	72	31	21	97	0.74	Unknown
4	89.93	181.13	51	33	25	122	0.74	Unknown
5	93.07	187.40	62	35	25	122	0.82	Unknown
6	129.00	259.23	49	24	16	63	0.56	Unknown
7	185.82	372.79	38	34	26	117	0.95	Unknown
8	209.13	419.37	108	33	21	87	0.85	Unknown
9	238.58	478.23	993	68	20	76	0.90	Unknown
10	241.27	483.61	104	37	25	106	1.21	Unknown

140889D05.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
11	270.15	541.34	64	27	18	63	0.85	Unknown
12	277.42	555.86	37	25	18	62	0.94	Unknown
14	299.65	600.29	92	30	19	56	1.36	Unknown
15	327.97	656.89	48	25	17	55	0.99	Unknown
16	338.29	677.51	216	35	16	48	0.89	Unknown
18	409.67	820.19	30	26	19	60	1.27	Unknown
19	463.12	927.01	55	22	13	29	1.11	Unknown
20	510.59	1021.90	108	35	23	56	1.76	Unknown
21	583.20	1167.02	317	40	15	40	1.16	Unknown
23	661.70	1323.91	33	20	13	30	1.47	Unknown
24	727.38	1455.19	68	20	9	16	1.23	Unknown
25	795.05	1590.44	31	20	14	30	1.85	Unknown
26	860.46	1721.17	35	17	10	16	1.43	Unknown
27	911.22	1822.61	210	32	10	20	1.37	Unknown
28	964.74	1929.60	55	17	8	11	1.64	Unknown
29	969.07	1938.25	131	25	8	10	1.45	Unknown
31	1460.74	2920.93	85	22	10	8	2.33	Unknown
32	1588.00	3175.28	16	13	8	13	1.58	Unknown
33	1764.60	3528.24	31	14	7	8	2.57	Unknown

c:\SEEKER\BIN\140889d05A.res Analysis Results Saved.

140900D07.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-18 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:26
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.60E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140900D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.23 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.08	130.43	25	28	21	83	1.00 a	
2	74.82	153.87	50	25	17	64	0.63 a	
3	77.01	158.24	84	30	20	80	0.77 b	
4	87.11	178.42	52	22	14	49	0.44 a	
5	89.73	183.65	13	18	14	49	0.42 b	NET< CL
6	92.91	190.00	28	30	23	97	1.03 c	
7	128.81	261.71	42	29	22	75	1.36 a	
8	185.86	375.64	39	23	15	48	0.83 a	
9	209.20	422.26	26	16	10	27	0.50 a	
10	238.61	480.98	281	39	16	44	1.08 a	
11	241.78	487.32	79	30	20	57	1.54 b	
12	295.24	594.10	147	31	16	39	1.35 a	
13	299.92	603.45	22	16	11	24	0.85 b	
14	338.52	680.53	47	22	15	39	1.01 a	
15	351.92	707.30	188	32	14	37	1.10 a	
16	510.99	1024.99	61	24	15	33	1.83 a	
17	583.48	1169.76	88	23	11	24	1.32 a	
18	609.50	1221.72	143	30	14	36	1.42 a	
19	662.09	1326.75	19	12	7	14	0.82 a	
20	911.33	1824.53	57	17	7	9	1.72 a	
21	1120.52	2242.31	26	14	8	11	2.02 a	
22	1460.93	2922.18	86	21	7	9	2.31 a	

140900D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	63.08	25	28	21	21	28	22	NET<CL
2	74.82	50	25	17	47	25	18	
3	77.01	84	30	20	81	31	20	
6	92.91	28	30	23	15	30	24	NET<CL
8	185.86	39	23	15	31	23	17	
10	238.61	281	39	16	273	39	17	
11	241.78	79	30	20	78	30	20	
12	295.24	147	31	16	142	31	16	
14	338.52	47	22	15	46	23	15	
15	351.92	188	32	14	182	32	15	
16	510.99	61	24	15	18	25	19	NET<CL
17	583.48	88	23	11	83	24	12	
18	609.50	143	30	14	138	30	15	
20	911.33	57	17	7	55	17	8	
22	1460.93	86	21	7	80	21	9	

140900D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-18 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:26
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.60e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140900D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50	N	9.17E-01 +- 1.89E+00	3.19E+00	1.51E+00	3.92E+13
U-235	143.76	N	3.14E-01 +- 5.35E-01	8.95E-01	4.19E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	Average:	x	1.88E+00 +- 2.64E-01	. . . .	. . . .	1.67E+04
	238.63		1.87E+00 +- 2.67E-01	2.52E-01	1.17E-01	1.67E+04
	300.09		2.31E+00 +- 1.72E+00	2.62E+00	1.17E+00	1.67E+04
Pb-214	Average:	x	2.03E+00 +- 2.81E-01	. . . .	. . . .	1.40E+07
	295.22		2.48E+00 +- 5.39E-01	6.12E-01	2.83E-01	1.40E+07
	351.99		1.87E+00 +- 3.30E-01	3.24E-01	1.48E-01	1.40E+07
Ac-228	Average:	x	1.58E+00 +- 4.22E-01	. . . .	. . . .	1.23E+14
	338.40		1.49E+00 +- 7.36E-01	1.06E+00	4.85E-01	1.23E+14
	911.07		1.63E+00 +- 5.15E-01	5.28E-01	2.24E-01	1.23E+14
Tl-208	583.14		5.60E-01 +- 1.59E-01	1.86E-01	8.38E-02	1.67E+04
Bi-214	Average:	x	1.68E+00 +- 3.38E-01	. . . .	. . . .	1.40E+07
	609.32		1.71E+00 +- 3.70E-01	4.12E-01	1.89E-01	1.40E+07
	1120.28		1.56E+00 +- 8.23E-01	1.08E+00	4.58E-01	1.40E+07
Cs-137	661.62		1.37E-01 +- 8.88E-02	1.25E-01	5.28E-02	2.64E+05
K-40	1460.75		7.97E+00 +- 2.06E+00	2.00E+00	8.68E-01	1.12E+13
Pb-210	46.50	N	-1.18E+01 +- 1.75E+01	3.28E+01	1.53E+01	1.95E+05
Am-241	59.54	N	5.20E-01 +- 7.61E-01	1.27E+00B	5.83E-01	3.80E+06
Bi-212	727.17	N	2.03E+00 +- 1.29E+00	1.77E+00	7.48E-01	1.67E+04
Pa-234m	1001.03	N	1.40E+00 +- 1.61E+01	2.98E+01	1.30E+01	3.92E+13
Eu-154	1004.80	N	-1.39E-01 +- 5.31E-01	1.04E+00	4.56E-01	7.45E+04
Co-60	1332.51	N	-8.60E-03 +- 1.07E-01	2.07E-01	8.95E-02	4.62E+04
Eu-152	1408.08	N	6.36E-02 +- 4.65E-01	8.80E-01	3.71E-01	1.17E+05

140900D07.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 2.11E+01 +- 2.46E+01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.08	130.43	21	28	22	83	1.00	Deleted
2	74.82	153.87	47	25	18	64	0.63	Unknown
3	77.01	158.24	81	31	20	80	0.77	Unknown
4	87.11	178.42	52	22	14	49	0.44	Unknown
5	89.73	183.65	13	18	14	49	0.42	Deleted
7	128.81	261.71	42	29	22	75	1.36	Unknown
9	209.20	422.26	26	16	10	27	0.50	Unknown
11	241.78	487.32	78	30	20	57	1.54	Unknown
16	510.99	1024.99	18	25	19	33	1.83	Deleted

c:\SEEKER\BIN\140900d07.res Analysis Results Saved.

140900D07.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-18 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:26
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.60E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140900D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.23 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.08	130.43	25	28	21	83	1.00 a	
2	74.82	153.87	50	25	17	64	0.63 a	
3	77.01	158.24	84	30	20	80	0.77 b	
4	87.11	178.42	52	22	14	49	0.44 a	
5	89.73	183.65	13	18	14	49	0.42 b	NET< CL
6	92.91	190.00	28	30	23	97	1.03 c	
7	128.81	261.71	42	29	22	75	1.36 a	
8	185.86	375.64	39	23	15	48	0.83 a	
9	209.20	422.26	26	16	10	27	0.50 a	
10	238.61	480.98	281	39	16	44	1.08 a	
11	241.78	487.32	79	30	20	57	1.54 b	
12	295.24	594.10	147	31	16	39	1.35 a	
13	299.92	603.45	22	16	11	24	0.85 b	
14	338.52	680.53	47	22	15	39	1.01 a	
15	351.92	707.30	188	32	14	37	1.10 a	
16	510.99	1024.99	61	24	15	33	1.83 a	
17	583.48	1169.76	88	23	11	24	1.32 a	
18	609.50	1221.72	143	30	14	36	1.42 a	
19	662.09	1326.75	19	12	7	14	0.82 a	
20	911.33	1824.53	57	17	7	9	1.72 a	
21	1120.52	2242.31	26	14	8	11	2.02 a	
22	1460.93	2922.18	86	21	7	9	2.31 a	

140900D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	63.08	25	28	21	21	28	22	NET<CL
2	74.82	50	25	17	47	25	18	
3	77.01	84	30	20	81	31	20	
6	92.91	28	30	23	15	30	24	NET<CL
8	185.86	39	23	15	31	23	17	
10	238.61	281	39	16	273	39	17	
11	241.78	79	30	20	78	30	20	
12	295.24	147	31	16	142	31	16	
14	338.52	47	22	15	46	23	15	
15	351.92	188	32	14	182	32	15	
16	510.99	61	24	15	18	25	19	NET<CL
17	583.48	88	23	11	83	24	12	
18	609.50	143	30	14	138	30	15	
20	911.33	57	17	7	55	17	8	
22	1460.93	86	21	7	80	21	9	

140900D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-18 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:00:26
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.19e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.60e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140900D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.89E+00 +- 2.16E-01	. . . .	. . . .	1.40E+07
	295.21		2.48E+00 +- 5.39E-01	6.12E-01	2.83E-01	1.40E+07
	351.92		1.87E+00 +- 3.30E-01	3.24E-01	1.48E-01	1.40E+07
	609.31		1.71E+00 +- 3.70E-01	4.11E-01	1.89E-01	1.40E+07
	1120.29		1.56E+00 +- 8.23E-01	1.08E+00	4.58E-01	1.40E+07

MEASURED TOTAL: 1.89E+00 +- 2.16E-01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.82	153.87	47	25	18	64	0.63	Unknown
2	77.01	158.24	81	31	20	80	0.77	Unknown
3	87.11	178.42	52	22	14	49	0.44	Unknown
4	128.81	261.71	42	29	22	75	1.36	Unknown
5	185.86	375.64	31	23	17	48	0.83	Unknown
6	209.20	422.26	26	16	10	27	0.50	Unknown
7	238.61	480.98	273	39	17	44	1.08	Unknown
8	241.78	487.32	78	30	20	57	1.54	Unknown
10	299.92	603.45	22	16	11	24	0.85	Unknown
11	338.52	680.53	46	23	15	39	1.01	Unknown
13	583.48	1169.76	83	24	12	24	1.32	Unknown

140900D07.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	662.09	1326.75	19	12	7	14	0.82	Unknown
16	911.33	1824.53	55	17	8	9	1.72	Unknown
18	1460.93	2922.18	80	21	9	9	2.31	Unknown

c:\SEEKER\BIN\140900d07A.res Analysis Results Saved.

140922D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-19 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:37:04
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.20E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.32E+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spc. File	.140922D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.00 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.85	153.48	83	25	15	53	0.41	a
2	77.02	157.81	115	33	21	88	0.87	b
3	84.30	172.35	20	20	15	55	0.47	a
4	87.29	178.33	34	21	15	55	0.43	b
5	93.08	189.89	33	30	23	99	0.98	a
6	129.10	261.84	36	25	18	64	0.86	a
7	185.81	375.09	48	32	24	89	1.31	a
8	209.14	421.69	55	30	21	77	1.13	a
9	238.57	480.47	557	54	21	81	0.95	a
10	241.55	486.42	42	34	26	108	1.30	b
11	295.24	593.65	71	23	13	36	0.89	a
12	328.07	659.21	19	21	16	43	1.21	a
13	338.26	679.57	107	25	12	29	0.85	a
14	351.84	706.68	104	27	15	41	0.99	a
15	462.98	928.66	23	18	13	33	1.22	a
16	510.71	1023.98	96	23	11	21	1.29	a
17	583.17	1168.69	207	32	12	25	1.34	a
18	609.37	1221.03	107	25	12	26	1.26	a
19	661.51	1325.16	28	16	10	20	1.09	a
20	727.04	1456.02	34	17	10	18	1.63	a
21	860.57	1722.71	30	15	8	14	1.51	a
22	911.18	1823.79	96	21	7	9	1.57	a
23	969.07	1939.40	49	20	11	29	1.15	a
24	1460.99	2921.86	58	16	4	3	1.64	a

140922D01.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1764.58	3528.18	19	10	4	4	1.31	a

140922D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	84.30	20	20	15	19	21	15	
4	87.29	34	21	15	33	22	15	
5	93.08	33	30	23	29	31	24	
7	185.81	48	32	24	43	32	24	
9	238.57	557	54	21	552	54	22	
11	295.24	71	23	13	69	24	14	
12	328.07	19	21	16	18	21	16	
13	338.26	107	25	12	105	25	12	
14	351.84	104	27	15	101	27	15	
16	510.71	96	23	11	57	25	16	
17	583.17	207	32	12	204	32	12	
18	609.37	107	25	12	105	25	12	
22	911.18	96	21	7	94	21	8	
24	1460.99	58	16	4	45	16	7	
25	1764.58	19	10	4	18	10	5	

140922D01.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-19 GS140724-1

Sampling Start: 07/17/2014 12:00:00	Counting Start: 08/16/2014 11:37:04
Sampling Stop: 07/17/2014 12:00:00	Decay Time. . . . . 7.20e+002 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.32e+002 g	Real Time . . . . . 1825 Sec
Collection Efficiency 1.0000	Spectrum File 140922D01.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 1 (Detector 1)
Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013
Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		2.63E+00 +- 2.82E+00	4.61E+00	2.18E+00	3.92E+13
U-235	143.76	N	9.44E-01 +- 7.83E-01	1.24E+00	5.82E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		5.17E+00 +- 5.04E-01	4.30E-01	2.02E-01	1.67E+04
Pb-214	Average:x		1.40E+00 +- 2.99E-01	. . . .	. . . .	1.40E+07
	295.22		1.53E+00 +- 5.30E-01	6.87E-01	3.14E-01	1.40E+07
	351.99		1.34E+00 +- 3.63E-01	4.42E-01	2.03E-01	1.40E+07
Ac-228	Average:x		3.90E+00 +- 6.00E-01	. . . .	. . . .	1.23E+14
	338.40		4.44E+00 +- 1.07E+00	1.16E+00	5.21E-01	1.23E+14
	911.07		3.77E+00 +- 8.58E-01	7.18E-01	3.05E-01	1.23E+14
	968.90		3.37E+00 +- 1.35E+00	1.76E+00	7.89E-01	1.23E+14
Tl-208	Average:x		1.85E+00 +- 2.78E-01	. . . .	. . . .	1.67E+04
	583.14		1.82E+00 +- 2.86E-01	2.41E-01	1.08E-01	1.67E+04
	860.47		2.47E+00 +- 1.22E+00	1.59E+00	6.83E-01	1.67E+04
Bi-214	609.32		1.72E+00 +- 4.16E-01	4.50E-01	2.03E-01	1.40E+07
Cs-137	661.62		2.68E-01 +- 1.53E-01	2.17E-01	9.56E-02	2.64E+05
Bi-212	727.17		4.57E+00 +- 2.32E+00	3.17E+00	1.40E+00	1.67E+04
K-40	1460.75		6.13E+00 +- 2.19E+00	2.39E+00	1.01E+00	1.12E+13
Pb-210	46.50	N	-1.80E+01 +- 1.28E+02	2.28E+02	1.07E+02	1.95E+05
Am-241	59.54	N	1.93E-01 +- 1.97E+00	3.46E+00	1.61E+00	3.80E+06
Pa-234m	1001.03	N	2.08E+01 +- 1.65E+01	2.27E+01	8.78E+00	3.92E+13
Eu-154	1004.80	N	-2.50E-01 +- 5.30E-01	1.13E+00	4.82E-01	7.45E+04
Co-60	1332.51	N	2.35E-02 +- 1.12E-01	2.12E-01	8.70E-02	4.62E+04
Eu-152	1408.08	N	1.39E-01 +- 5.21E-01	9.82E-01	3.97E-01	1.17E+05

140922D01.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 4.97E+01 +- 2.94E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.85	153.48	83	25	15	53	0.41	Unknown
2	77.02	157.81	115	33	21	88	0.87	Unknown
3	84.30	172.35	19	21	15	55	0.47	Unknown
4	87.29	178.33	33	22	15	55	0.43	Unknown
6	129.10	261.84	36	25	18	64	0.86	Unknown
8	209.14	421.69	55	30	21	77	1.13	Unknown
10	241.55	486.42	42	34	26	108	1.30	Unknown
12	328.07	659.21	18	21	16	43	1.21	Unknown
15	462.98	928.66	23	18	13	33	1.22	Unknown
16	510.71	1023.98	57	25	16	21	1.29	Unknown
25	1764.58	3528.18	18	10	5	4	1.31	Unknown

c:\SEEKER\BIN\140922d01.res Analysis Results Saved.

140922D01.SPC Analyzed by JB

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-19 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:37:04
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.20E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.32E+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spc. File	.140922D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.00 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.85	153.48	83	25	15	53	0.41	a
2	77.02	157.81	115	33	21	88	0.87	b
3	84.30	172.35	20	20	15	55	0.47	a
4	87.29	178.33	34	21	15	55	0.43	b
5	93.08	189.89	33	30	23	99	0.98	a
6	129.10	261.84	36	25	18	64	0.86	a
7	185.81	375.09	48	32	24	89	1.31	a
8	209.14	421.69	55	30	21	77	1.13	a
9	238.57	480.47	557	54	21	81	0.95	a
10	241.55	486.42	42	34	26	108	1.30	b
11	295.24	593.65	71	23	13	36	0.89	a
12	328.07	659.21	19	21	16	43	1.21	a
13	338.26	679.57	107	25	12	29	0.85	a
14	351.84	706.68	104	27	15	41	0.99	a
15	462.98	928.66	23	18	13	33	1.22	a
16	510.71	1023.98	96	23	11	21	1.29	a
17	583.17	1168.69	207	32	12	25	1.34	a
18	609.37	1221.03	107	25	12	26	1.26	a
19	661.51	1325.16	28	16	10	20	1.09	a
20	727.04	1456.02	34	17	10	18	1.63	a
21	860.57	1722.71	30	15	8	14	1.51	a
22	911.18	1823.79	96	21	7	9	1.57	a
23	969.07	1939.40	49	20	11	29	1.15	a
24	1460.99	2921.86	58	16	4	3	1.64	a

140922D01.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1764.58	3528.18	19	10	4	4	1.31	a

140922D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	84.30	20	20	15	19	21	15	
4	87.29	34	21	15	33	22	15	
5	93.08	33	30	23	29	31	24	
7	185.81	48	32	24	43	32	24	
9	238.57	557	54	21	552	54	22	
11	295.24	71	23	13	69	24	14	
12	328.07	19	21	16	18	21	16	
13	338.26	107	25	12	105	25	12	
14	351.84	104	27	15	101	27	15	
16	510.71	96	23	11	57	25	16	
17	583.17	207	32	12	204	32	12	
18	609.37	107	25	12	105	25	12	
22	911.18	96	21	7	94	21	8	
24	1460.99	58	16	4	45	16	7	
25	1764.58	19	10	4	18	10	5	

140922D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-19 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:37:04
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.20e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.32e+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spectrum File	.140922D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.51E+00 +- 2.43E-01	. . . .	. . . .	1.40E+07
	295.21		1.53E+00 +- 5.30E-01	6.87E-01	3.14E-01	1.40E+07
	351.92		1.34E+00 +- 3.63E-01	4.42E-01	2.03E-01	1.40E+07
	609.31		1.72E+00 +- 4.16E-01	4.50E-01	2.03E-01	1.40E+07

MEASURED TOTAL: 1.51E+00 +- 2.43E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.85	153.48	83	25	15	53	0.41	Unknown
2	77.02	157.81	115	33	21	88	0.87	Unknown
3	84.30	172.35	19	21	15	55	0.47	Unknown
4	87.29	178.33	33	22	15	55	0.43	Unknown
5	93.08	189.89	29	31	24	99	0.98	Unknown
6	129.10	261.84	36	25	18	64	0.86	Unknown
7	185.81	375.09	43	32	24	89	1.31	Unknown
8	209.14	421.69	55	30	21	77	1.13	Unknown
9	238.57	480.47	552	54	22	81	0.95	Unknown
10	241.55	486.42	42	34	26	108	1.30	Unknown
12	328.07	659.21	18	21	16	43	1.21	Unknown

140922D01.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	338.26	679.57	105	25	12	29	0.85	Unknown
15	462.98	928.66	23	18	13	33	1.22	Unknown
16	510.71	1023.98	57	25	16	21	1.29	Unknown
17	583.17	1168.69	204	32	12	25	1.34	Unknown
19	661.51	1325.16	28	16	10	20	1.09	Unknown
20	727.04	1456.02	34	17	10	18	1.63	Unknown
21	860.57	1722.71	30	15	8	14	1.51	Unknown
22	911.18	1823.79	94	21	8	9	1.57	Unknown
23	969.07	1939.40	49	20	11	29	1.15	Unknown
24	1460.99	2921.86	45	16	7	3	1.64	Unknown
25	1764.58	3528.18	18	10	5	4	1.31	Unknown

c:\SEEKER\BIN\140922d01A.res Analysis Results Saved.

141000D02.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-20 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:37:11
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.20E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.73E+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spc. File	.141000D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.44 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.03	156.68	37	27	20	83	0.85	a
2	87.03	176.65	31	19	13	39	0.56	a
3	89.91	182.39	26	18	13	39	0.45	b
4	92.63	187.82	38	25	18	64	0.82	c
5	185.85	373.96	46	27	19	67	0.91	a
6	238.59	479.26	244	38	18	54	1.11	a
7	241.73	485.53	78	34	24	77	1.60	b
8	294.97	591.83	82	30	20	55	1.61	a
9	338.25	678.25	56	20	11	26	0.78	a
10	351.83	705.38	166	30	12	30	1.16	a
11	511.10	1023.38	82	25	15	32	1.96	a
12	583.33	1167.60	74	22	11	23	1.29	a
13	609.12	1219.09	99	24	11	21	1.33	a
14	661.51	1323.71	44	20	13	25	1.81	a
15	727.23	1454.93	16	15	10	21	1.25	a
16	911.09	1822.05	53	18	9	16	1.61	a
17	1460.71	2919.47	128	23	3	2	2.14	a

141000D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	87.03	31	19	13	30	19	13	
4	92.63	38	25	18	30	25	19	
5	185.85	46	27	19	37	27	20	
6	238.59	244	38	18	238	38	19	
8	294.97	82	30	20	79	31	20	
9	338.25	56	20	11	54	22	13	
10	351.83	166	30	12	162	30	13	
11	511.10	82	25	15	36	26	19	
12	583.33	74	22	11	69	22	12	
13	609.12	99	24	11	93	24	12	
16	911.09	53	18	9	51	18	10	
17	1460.71	128	23	3	116	23	7	

141000D02.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-20 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:37:11
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.20e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.73e+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spectrum File	.141000D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013
Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point).

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		2.11E+00 +- 1.78E+00	2.83E+00	1.32E+00	3.92E+13
U-235	143.76	N	-4.22E-02 +- 4.66E-01	8.29E-01	3.86E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.58E+00 +- 2.53E-01	2.64E-01	1.23E-01	1.67E+04
Pb-214	Average:x		1.36E+00 +- 2.28E-01	. . . .	. . . .	1.40E+07
	295.22		1.14E+00 +- 4.41E-01	6.29E-01	2.95E-01	1.40E+07
	351.99		1.44E+00 +- 2.66E-01	2.57E-01	1.17E-01	1.40E+07
Ac-228	Average:x		1.40E+00 +- 3.77E-01	. . . .	. . . .	1.23E+14
	338.40		1.53E+00 +- 6.11E-01	8.12E-01	3.68E-01	1.23E+14
	911.07		1.31E+00 +- 4.79E-01	5.77E-01	2.53E-01	1.23E+14
Tl-208	583.14		4.06E-01 +- 1.30E-01	1.57E-01	7.06E-02	1.67E+04
Bi-214	609.32		1.00E+00 +- 2.59E-01	2.86E-01	1.28E-01	1.40E+07
Cs-137	661.62		2.73E-01 +- 1.26E-01	1.74E-01	7.83E-02	2.64E+05
Bi-212	727.17		1.44E+00 +- 1.30E+00	2.03E+00	8.93E-01	1.67E+04
K-40	1460.75		1.01E+01 +- 2.01E+00	1.46E+00	6.13E-01	1.12E+13
Pb-210	46.50	N	-3.75E+01 +- 1.81E+02	3.25E+02	1.51E+02	1.95E+05
Am-241	59.54	N	5.23E-01 +- 1.88E+00	3.25E+00	1.50E+00	3.80E+06
Pa-234m	1001.03	N	1.15E+01 +- 1.18E+01	1.82E+01	7.46E+00	3.92E+13
Eu-154	1004.80	N	-2.46E-01 +- 3.54E-01	7.78E-01	3.34E-01	7.45E+04
Co-60	1332.51	N	-9.00E-03 +- 8.25E-02	1.63E-01	6.94E-02	4.62E+04
Eu-152	1408.08	N	1.07E-01 +- 3.79E-01	7.00E-01	2.90E-01	1.17E+05

MEASURED TOTAL: 3.17E+01 +- 2.05E+01 pCi/g

141000D02.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.03	156.68	37	27	20	83	0.85	Unknown
2	87.03	176.65	30	19	13	39	0.56	Unknown
3	89.91	182.39	26	18	13	39	0.45	Unknown
7	241.73	485.53	78	34	24	77	1.60	Unknown
11	511.10	1023.38	36	26	19	32	1.96	Unknown

c:\SEEKER\BIN\141000d02.res Analysis Results Saved.

141000D02.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-20 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:37:11
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.20E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.73E+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spc. File	.141000D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.44 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.03	156.68	37	27	20	83	0.85	a
2	87.03	176.65	31	19	13	39	0.56	a
3	89.91	182.39	26	18	13	39	0.45	b
4	92.63	187.82	38	25	18	64	0.82	c
5	185.85	373.96	46	27	19	67	0.91	a
6	238.59	479.26	244	38	18	54	1.11	a
7	241.73	485.53	78	34	24	77	1.60	b
8	294.97	591.83	82	30	20	55	1.61	a
9	338.25	678.25	56	20	11	26	0.78	a
10	351.83	705.38	166	30	12	30	1.16	a
11	511.10	1023.38	82	25	15	32	1.96	a
12	583.33	1167.60	74	22	11	23	1.29	a
13	609.12	1219.09	99	24	11	21	1.33	a
14	661.51	1323.71	44	20	13	25	1.81	a
15	727.23	1454.93	16	15	10	21	1.25	a
16	911.09	1822.05	53	18	9	16	1.61	a
17	1460.71	2919.47	128	23	3	2	2.14	a

141000D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	87.03	31	19	13	30	19	13	
4	92.63	38	25	18	30	25	19	
5	185.85	46	27	19	37	27	20	
6	238.59	244	38	18	238	38	19	
8	294.97	82	30	20	79	31	20	
9	338.25	56	20	11	54	22	13	
10	351.83	166	30	12	162	30	13	
11	511.10	82	25	15	36	26	19	
12	583.33	74	22	11	69	22	12	
13	609.12	99	24	11	93	24	12	
16	911.09	53	18	9	51	18	10	
17	1460.71	128	23	3	116	23	7	

141000D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-20 GS140724-1

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/16/2014 11:37:11
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.20e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.73e+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spectrum File	.141000D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.20E+00 +- 1.71E-01	. . . .	. . . .	1.40E+07
	295.21		1.14E+00 +- 4.41E-01	6.29E-01	2.95E-01	1.40E+07
	351.92		1.44E+00 +- 2.66E-01	2.57E-01	1.17E-01	1.40E+07
	609.31		1.00E+00 +- 2.59E-01	2.86E-01	1.28E-01	1.40E+07

MEASURED TOTAL: 1.20E+00 +- 1.71E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.03	156.68	37	27	20	83	0.85	Unknown
2	87.03	176.65	30	19	13	39	0.56	Unknown
3	89.91	182.39	26	18	13	39	0.45	Unknown
4	92.63	187.82	30	25	19	64	0.82	Unknown
5	185.85	373.96	37	27	20	67	0.91	Unknown
6	238.59	479.26	238	38	19	54	1.11	Unknown
7	241.73	485.53	78	34	24	77	1.60	Unknown
9	338.25	678.25	54	22	13	26	0.78	Unknown
11	511.10	1023.38	36	27	19	32	1.96	Unknown
12	583.33	1167.60	69	22	12	23	1.29	Unknown
14	661.51	1323.71	44	20	13	25	1.81	Unknown

141000D02.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	727.23	1454.93	16	15	10	21	1.25	Unknown
16	911.09	1822.05	51	18	10	16	1.61	Unknown
17	1460.71	2919.47	116	23	7	2	2.14	Unknown

c:\SEEKER\BIN\141000d02A.res Analysis Results Saved.

140925D01.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-21 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:24:42
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.37E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140925D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.04 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.06	157.97	48	26	18	73	0.70	a
2	128.95	261.61	17	16	12	33	0.45	a
3	185.92	375.40	30	21	15	46	0.87	a
4	238.53	480.48	170	36	21	81	1.01	a
5	295.08	593.42	92	27	15	42	0.98	a
6	338.25	679.63	38	20	13	33	0.78	a
7	351.78	706.66	182	31	13	25	1.31	a
8	510.65	1023.97	59	27	18	48	1.90	a
9	583.22	1168.90	61	20	11	21	1.38	a
10	609.17	1220.73	123	26	11	21	1.43	a
11	911.12	1823.80	44	15	6	7	1.46	a
12	1120.01	2241.00	16	11	7	10	1.18	a
13	1460.74	2921.52	71	17	3	2	1.69	a

140925D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	185.92	30	21	15	25	22	16	
4	238.53	170	36	21	166	37	22	
5	295.08	92	27	15	90	27	16	
6	338.25	38	20	13	36	20	13	
7	351.78	182	31	13	179	31	13	
8	510.65	59	27	18	20	28	22	NET<CL
9	583.22	61	20	11	59	21	11	
10	609.17	123	26	11	120	26	12	
11	911.12	44	15	6	42	15	7	
12	1120.01	16	11	7	15	12	7	
13	1460.74	71	17	3	58	17	7	

140925D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-21 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:24:42
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.37e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140925D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	6.06E-01 +- 5.68E-01	9.06E-01	4.14E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.52E+00 +- 3.37E-01	4.21E-01	1.98E-01	1.67E+04
Pb-214	Average:x		2.19E+00 +- 3.32E-01	. . . .	. . . .	1.40E+07
	295.22		1.95E+00 +- 5.85E-01	7.44E-01	3.43E-01	1.40E+07
	351.99		2.31E+00 +- 4.03E-01	3.77E-01	1.71E-01	1.40E+07
Ac-228	Average:x		1.59E+00 +- 4.82E-01	. . . .	. . . .	1.23E+14
	338.40		1.48E+00 +- 8.17E-01	1.18E+00	5.37E-01	1.23E+14
	911.07		1.64E+00 +- 5.98E-01	6.38E-01	2.66E-01	1.23E+14
Tl-208	583.14		5.13E-01 +- 1.79E-01	2.20E-01	9.81E-02	1.67E+04
Bi-214	Average:x		1.80E+00 +- 3.81E-01	. . . .	. . . .	1.40E+07
	609.32		1.93E+00 +- 4.18E-01	4.17E-01	1.87E-01	1.40E+07
	1120.28		1.18E+00 +- 9.29E-01	1.37E+00	5.79E-01	1.40E+07
K-40	1460.75		7.71E+00 +- 2.32E+00	2.26E+00	9.51E-01	1.12E+13
Pb-210	46.50	N	-3.44E+01 +- 1.05E+02	1.93E+02	8.94E+01	1.95E+05
Am-241	59.54	N	4.35E-02 +- 1.63E+00	2.91E+00	1.34E+00	3.80E+06
Th-234	92.50	N	4.70E-02 +- 2.04E+00	3.59E+00	1.67E+00	3.92E+13
Cs-137	661.62	N	1.20E-01 +- 1.21E-01	1.92E-01	8.34E-02	2.64E+05
Bi-212	727.17	N	2.27E+00 +- 1.54E+00	2.15E+00	8.93E-01	1.67E+04
Pa-234m	1001.03	N	7.38E+00 +- 1.38E+01	2.42E+01	9.60E+00	3.92E+13
Eu-154	1004.80	N	-1.22E-01 +- 5.73E-01	1.15E+00	4.92E-01	7.45E+04
Co-60	1332.51	N	-7.36E-02 +- 8.15E-02	2.07E-01	8.51E-02	4.62E+04
Eu-152	1408.08	N	4.77E-01 +- 4.91E-01	7.33E-01	2.75E-01	1.17E+05

140925D01.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 2.63E+01 +- 2.42E+01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.06	157.97	48	26	18	73	0.70	Unknown
2	128.95	261.61	17	16	12	33	0.45	Unknown
8	510.65	1023.97	20	28	22	48	1.90	Deleted

c:\SEEKER\BIN\140925d01.res Analysis Results Saved.

140925D01.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-21 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:24:42
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.37E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140925D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.04 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.06	157.97	48	26	18	73	0.70	a
2	128.95	261.61	17	16	12	33	0.45	a
3	185.92	375.40	30	21	15	46	0.87	a
4	238.53	480.48	170	36	21	81	1.01	a
5	295.08	593.42	92	27	15	42	0.98	a
6	338.25	679.63	38	20	13	33	0.78	a
7	351.78	706.66	182	31	13	25	1.31	a
8	510.65	1023.97	59	27	18	48	1.90	a
9	583.22	1168.90	61	20	11	21	1.38	a
10	609.17	1220.73	123	26	11	21	1.43	a
11	911.12	1823.80	44	15	6	7	1.46	a
12	1120.01	2241.00	16	11	7	10	1.18	a
13	1460.74	2921.52	71	17	3	2	1.69	a

140925D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	185.92	30	21	15	25	22	16	
4	238.53	170	36	21	166	37	22	
5	295.08	92	27	15	90	27	16	
6	338.25	38	20	13	36	20	13	
7	351.78	182	31	13	179	31	13	
8	510.65	59	27	18	20	28	22	NET<CL
9	583.22	61	20	11	59	21	11	
10	609.17	123	26	11	120	26	12	
11	911.12	44	15	6	42	15	7	
12	1120.01	16	11	7	15	12	7	
13	1460.74	71	17	3	58	17	7	

140925D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-21 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:24:42
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.37e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140925D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	2.02E+00 +- 2.50E-01	. . . .	. . . .	1.40E+07
	295.21		1.95E+00 +- 5.85E-01	7.44E-01	3.43E-01	1.40E+07
	351.92		2.31E+00 +- 4.03E-01	3.77E-01	1.71E-01	1.40E+07
	609.31		1.93E+00 +- 4.18E-01	4.17E-01	1.87E-01	1.40E+07
	1120.29		1.18E+00 +- 9.29E-01	1.37E+00	5.79E-01	1.40E+07

MEASURED TOTAL: 2.02E+00 +- 2.50E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.06	157.97	48	26	18	73	0.70	Unknown
2	128.95	261.61	17	16	12	33	0.45	Unknown
3	185.92	375.40	25	22	16	46	0.87	Unknown
4	238.53	480.48	166	37	22	81	1.01	Unknown
6	338.25	679.63	36	20	13	33	0.78	Unknown
8	510.65	1023.97	20	28	22	48	1.90	Deleted
9	583.22	1168.90	59	21	11	21	1.38	Unknown
11	911.12	1823.80	42	15	7	7	1.46	Unknown
13	1460.74	2921.52	58	17	7	2	1.69	Unknown

140925D01.SPC Analyzed by
c:\SEEKER\BIN\140925d01a.res Analysis Results Saved.

141004D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-21D GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:21
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.37E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.141004D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.47 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.70	152.10	46	29	21	80	0.99	a
2	76.87	156.43	66	33	23	93	1.06	b
3	87.21	177.09	22	18	13	41	0.56	a
4	185.83	374.03	50	27	19	66	0.95	a
5	238.47	479.15	251	36	14	35	0.93	a Wide Pk
6	241.61	485.42	88	33	22	64	1.84	b
7	295.05	592.13	107	28	16	43	1.23	a
8	338.03	677.96	41	20	13	30	1.06	a
9	351.64	705.13	186	32	15	42	1.21	a
10	510.60	1022.56	58	25	17	44	1.87	a
11	583.15	1167.44	115	25	11	21	1.51	a
12	609.16	1219.39	174	30	11	18	1.98	a
13	911.05	1822.24	73	19	6	8	1.49	a
14	968.87	1937.72	25	17	11	24	1.52	a
15	1120.09	2239.69	27	15	10	16	2.14	a
16	1460.81	2920.10	86	20	5	6	1.53	a
17	1764.57	3526.67	28	11	3	1	2.47	a

141004D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	87.21	22	18	13	21	19	14	
4	185.83	50	27	19	42	28	20	
5	238.47	251	36	14	244	36	15	
7	295.05	107	28	16	104	29	17	
8	338.03	41	20	13	38	21	14	
9	351.64	186	32	15	181	33	15	
10	510.60	58	25	17	11	27	21	NET<CL
11	583.15	115	25	11	111	26	12	
12	609.16	174	30	11	167	30	12	
13	911.05	73	19	6	71	19	7	
14	968.87	25	17	11	23	17	12	
15	1120.09	27	15	10	25	16	10	
16	1460.81	86	20	5	74	20	8	
17	1764.57	28	11	3	26	11	4	

141004D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-21D GS140724-2

Sampling Start: 07/17/2014 12:00:00	Counting Start: 08/17/2014 08:08:21
Sampling Stop: 07/17/2014 12:00:00	Decay Time. . . . . 7.40e+002 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.37e+002 g	Real Time . . . . . 1804 Sec
Collection Efficiency 1.0000	Spectrum File 141004D02.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)		MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	-4.86E-02	+- 5.67E-01	1.00E+00	4.69E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.87E+00	+- 2.75E-01	2.47E-01	1.13E-01	1.67E+04
Pb-214	Average:x		1.81E+00	+- 2.74E-01	. . . .	. . . .	1.40E+07
	295.22		1.72E+00	+- 4.75E-01	5.96E-01	2.75E-01	1.40E+07
	351.99		1.86E+00	+- 3.35E-01	3.41E-01	1.57E-01	1.40E+07
Ac-228	Average:x		1.65E+00	+- 3.90E-01	. . . .	. . . .	1.23E+14
	338.40		1.25E+00	+- 6.93E-01	1.02E+00	4.65E-01	1.23E+14
	911.07		2.12E+00	+- 5.63E-01	5.05E-01	2.12E-01	1.23E+14
	968.90		1.20E+00	+- 8.67E-01	1.32E+00	5.89E-01	1.23E+14
Tl-208	583.14		7.49E-01	+- 1.73E-01	1.80E-01	8.10E-02	1.67E+04
Bi-214	Average:x		2.00E+00	+- 3.44E-01	. . . .	. . . .	1.40E+07
	609.32		2.08E+00	+- 3.70E-01	3.38E-01	1.52E-01	1.40E+07
	1120.28		1.52E+00	+- 9.28E-01	1.34E+00	5.89E-01	1.40E+07
K-40	1460.75		7.43E+00	+- 1.98E+00	1.89E+00	8.12E-01	1.12E+13
Pb-210	46.50	N	9.25E+00	+- 2.18E+02	3.82E+02	1.78E+02	1.95E+05
Am-241	59.54	N	-1.10E+00	+- 2.19E+00	4.06E+00	1.89E+00	3.80E+06
Th-234	92.50	N	8.27E-02	+- 2.17E+00	3.78E+00	1.78E+00	3.92E+13
Cs-137	661.62	N	2.33E-02	+- 1.07E-01	1.90E-01	8.54E-02	2.64E+05
Bi-212	727.17	N	1.24E+00	+- 1.42E+00	2.29E+00	1.01E+00	1.67E+04
Pa-234m	1001.03	N	-1.54E+00	+- 1.38E+01	2.71E+01	1.16E+01	3.92E+13
Eu-154	1004.80	N	-7.43E-02	+- 5.52E-01	1.05E+00	4.65E-01	7.45E+04
Co-60	1332.51	N	-4.15E-02	+- 9.73E-02	2.02E-01	8.70E-02	4.62E+04
Eu-152	1408.08	N	2.73E-01	+- 4.95E-01	8.53E-01	3.57E-01	1.17E+05

141004D02.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 2.64E+01 +- 2.25E+02 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.70	152.10	46	29	21	80	0.99	Unknown
2	76.87	156.43	66	33	23	93	1.06	Unknown
3	87.21	177.09	21	19	14	41	0.56	Unknown
6	241.61	485.42	88	33	22	64	1.84	Unknown
10	510.60	1022.56	11	27	21	44	1.87	Deleted
17	1764.57	3526.67	26	11	4	1	2.47	Unknown

c:\SEEKER\BIN\141004d02.res Analysis Results Saved.

141004D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-21D GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:21
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.37E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.141004D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.47 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG	
1	74.70	152.10	46	29	21	80	0.99	a	
2	76.87	156.43	66	33	23	93	1.06	b	
3	87.21	177.09	22	18	13	41	0.56	a	
4	185.83	374.03	50	27	19	66	0.95	a	
5	238.47	479.15	251	36	14	35	0.93	a	Wide Pk
6	241.61	485.42	88	33	22	64	1.84	b	
7	295.05	592.13	107	28	16	43	1.23	a	
8	338.03	677.96	41	20	13	30	1.06	a	
9	351.64	705.13	186	32	15	42	1.21	a	
10	510.60	1022.56	58	25	17	44	1.87	a	
11	583.15	1167.44	115	25	11	21	1.51	a	
12	609.16	1219.39	174	30	11	18	1.98	a	
13	911.05	1822.24	73	19	6	8	1.49	a	
14	968.87	1937.72	25	17	11	24	1.52	a	
15	1120.09	2239.69	27	15	10	16	2.14	a	
16	1460.81	2920.10	86	20	5	6	1.53	a	
17	1764.57	3526.67	28	11	3	1	2.47	a	

141004D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	87.21	22	18	13	21	19	14	
4	185.83	50	27	19	42	28	20	
5	238.47	251	36	14	244	36	15	
7	295.05	107	28	16	104	29	17	
8	338.03	41	20	13	38	21	14	
9	351.64	186	32	15	181	33	15	
10	510.60	58	25	17	11	27	21	NET<CL
11	583.15	115	25	11	111	26	12	
12	609.16	174	30	11	167	30	12	
13	911.05	73	19	6	71	19	7	
14	968.87	25	17	11	23	17	12	
15	1120.09	27	15	10	25	16	10	
16	1460.81	86	20	5	74	20	8	
17	1764.57	28	11	3	26	11	4	

141004D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-21D GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:21
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.37e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.141004D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.89E+00 +- 2.14E-01	. . . .	. . . .	1.40E+07
	295.21		1.72E+00 +- 4.75E-01	5.96E-01	2.75E-01	1.40E+07
	351.92		1.86E+00 +- 3.35E-01	3.41E-01	1.57E-01	1.40E+07
	609.31		2.08E+00 +- 3.70E-01	3.38E-01	1.52E-01	1.40E+07
	1120.29		1.52E+00 +- 9.29E-01	1.34E+00	5.89E-01	1.40E+07

MEASURED TOTAL: 1.89E+00 +- 2.14E-01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.70	152.10	46	29	21	80	0.99	Unknown
2	76.87	156.43	66	33	23	93	1.06	Unknown
3	87.21	177.09	21	19	14	41	0.56	Unknown
4	185.83	374.03	42	28	20	66	0.95	Unknown
5	238.47	479.15	244	36	15	35	0.93	Unknown
6	241.61	485.42	88	33	22	64	1.84	Unknown
8	338.03	677.96	38	21	14	30	1.06	Unknown
10	583.15	1167.44	111	26	12	21	1.51	Unknown
12	911.05	1822.24	71	19	7	8	1.49	Unknown
13	968.87	1937.72	23	17	12	24	1.52	Unknown

141004D02.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	1460.81	2920.10	74	20	8	6	1.53	Unknown
16	1764.57	3526.67	26	11	4	1	2.47	Unknown

c:\SEEKER\BIN\141004d02A.res Analysis Results Saved.

141003D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-22 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 07:24:53
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.63E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.21E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.141003D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.47 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.99	156.66	31	29	22	88	0.95	a
2	185.82	374.00	26	23	17	55	1.04	a
3	238.54	479.28	139	33	19	55	1.33	a
4	242.02	486.22	37	18	11	27	0.63	b
5	295.16	592.34	54	25	17	48	1.17	a
6	351.76	705.38	104	24	11	25	1.04	a
7	510.92	1023.21	50	19	11	20	1.56	a
8	582.81	1166.77	35	16	9	14	1.81	a
9	609.02	1219.12	108	23	9	14	1.36	a
10	911.33	1822.81	23	12	7	10	1.08	a
11	1119.93	2239.36	17	11	6	9	0.95	a
12	1460.77	2920.01	128	25	8	11	2.24	a

141003D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	185.82	26	23	17	17	24	18	NET<CL
3	238.54	139	33	19	133	33	19	
5	295.16	54	25	17	51	25	17	
6	351.76	104	24	11	100	24	12	
7	510.92	50	19	11	4	21	17	NET<CL
8	582.81	35	16	9	30	17	10	
9	609.02	108	23	9	102	24	10	
10	911.33	23	12	7	21	13	7	
11	1119.93	17	11	6	16	11	6	
12	1460.77	128	25	8	116	25	10	

141003D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-22 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 07:24:53
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.63e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.21e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.141003D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NOTE	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-212	238.63		7.50E-01 +- 1.86E-01	2.34E-01	1.09E-01	1.67E+04
Pb-214	Average:x		7.19E-01 +- 1.59E-01	. . . .	. . . .	1.40E+07
	295.22		6.26E-01 +- 3.12E-01	4.59E-01	2.13E-01	1.40E+07
	351.99		7.52E-01 +- 1.85E-01	1.98E-01	8.88E-02	1.40E+07
Tl-208	583.14		1.51E-01 +- 8.37E-02	1.18E-01	5.21E-02	1.67E+04
Bi-214	Average:x		8.93E-01 +- 1.98E-01	. . . .	. . . .	1.40E+07
	609.32		9.34E-01 +- 2.17E-01	2.12E-01	9.34E-02	1.40E+07
	1120.28		6.91E-01 +- 4.83E-01	6.77E-01	2.79E-01	1.40E+07
Ac-228	911.07		4.62E-01 +- 2.79E-01	3.83E-01	1.62E-01	1.23E+14
K-40	1460.75		8.53E+00 +- 1.82E+00	1.67E+00	7.34E-01	1.12E+13
Pb-210	46.50	N	3.64E+01 +- 1.48E+02	2.57E+02	1.19E+02	1.95E+05
Am-241	59.54	N	-3.27E-01 +- 1.53E+00	2.78E+00	1.29E+00	3.80E+06
Th-234	92.50	N	9.51E-01 +- 1.41E+00	2.34E+00	1.09E+00	3.92E+13
U-235	143.76	N	-8.96E-02 +- 3.77E-01	6.83E-01	3.17E-01	6.17E+12
Cs-137	661.62	N	9.83E-02 +- 8.45E-02	1.31E-01	5.85E-02	2.64E+05
Bi-212	727.17	N	1.43E+00 +- 1.08E+00	1.62E+00	7.08E-01	1.67E+04
Pa-234m	1001.03	N	1.07E+01 +- 1.07E+01	1.65E+01	6.85E+00	3.92E+13
Eu-154	1004.80	N	-1.82E-01 +- 3.41E-01	7.10E-01	3.09E-01	7.45E+04
Co-60	1332.51	N	3.06E-02 +- 4.84E-02	8.24E-02	3.08E-02	4.62E+04
Eu-152	1408.08	N	5.53E-01 +- 3.67E-01	4.75E-01	1.86E-01	1.17E+05

MEASURED TOTAL: 6.16E+01 +- 1.65E+02 pCi/g

141003D02.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.99	156.66	31	29	22	88	0.95	Unknown
2	185.82	374.00	17	24	18	55	1.04	Deleted
4	242.02	486.22	37	18	11	27	0.63	Unknown
7	510.92	1023.21	4	21	17	20	1.56	Deleted

c:\SEEKER\BIN\141003d02.res Analysis Results Saved.

141003D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-22 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 07:24:53
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.63E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.21E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.141003D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.47 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.99	156.66	31	29	22	88	0.95	a
2	185.82	374.00	26	23	17	55	1.04	a
3	238.54	479.28	139	33	19	55	1.33	a
4	242.02	486.22	37	18	11	27	0.63	b
5	295.16	592.34	54	25	17	48	1.17	a
6	351.76	705.38	104	24	11	25	1.04	a
7	510.92	1023.21	50	19	11	20	1.56	a
8	582.81	1166.77	35	16	9	14	1.81	a
9	609.02	1219.12	108	23	9	14	1.36	a
10	911.33	1822.81	23	12	7	10	1.08	a
11	1119.93	2239.36	17	11	6	9	0.95	a
12	1460.77	2920.01	128	25	8	11	2.24	a

141003D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	185.82	26	23	17	17	24	18	NET<CL
3	238.54	139	33	19	133	33	19	
5	295.16	54	25	17	51	25	17	
6	351.76	104	24	11	100	24	12	
7	510.92	50	19	11	4	21	17	NET<CL
8	582.81	35	16	9	30	17	10	
9	609.02	108	23	9	102	24	10	
10	911.33	23	12	7	21	13	7	
11	1119.93	17	11	6	16	11	6	
12	1460.77	128	25	8	116	25	10	

141003D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-22 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 07:24:53
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.63e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.21e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.141003D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	7.88E-01 +- 1.24E-01	. . . .	. . . .	1.40E+07
	295.21		6.26E-01 +- 3.12E-01	4.59E-01	2.13E-01	1.40E+07
	351.92		7.52E-01 +- 1.85E-01	1.98E-01	8.87E-02	1.40E+07
	609.31		9.34E-01 +- 2.17E-01	2.12E-01	9.34E-02	1.40E+07
	1120.29		6.91E-01 +- 4.83E-01	6.76E-01	2.79E-01	1.40E+07

MEASURED TOTAL: 7.88E-01 +- 1.24E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.99	156.66	31	29	22	88	0.95	Unknown
2	238.54	479.28	133	33	19	55	1.33	Unknown
3	242.02	486.22	37	18	11	27	0.63	Unknown
6	582.81	1166.77	30	17	10	14	1.81	Unknown
8	911.33	1822.81	21	13	7	10	1.08	Unknown
10	1460.77	2920.01	116	25	10	11	2.24	Unknown

c:\SEEKER\BIN\141003d02A.res Analysis Results Saved.

141334D04.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-23 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:04
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.95E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.141334D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.58 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	74.75	152.55	189	53	37	259	1.01	a	
2	76.92	156.89	300	53	33	216	0.84	b	
3	86.28	175.59	15	33	27	159	0.58	a	NET< CL
4	87.09	177.22	102	38	27	159	0.68	b	
5	92.59	188.21	159	50	36	238	0.98	c	
6	150.09	303.14	20	75	61	411	2.25	a	NET< CL Wide Pk
7	185.80	374.51	318	57	36	209	1.34	a	
8	238.46	479.76	253	46	28	143	1.25	a	
9	241.74	486.33	345	50	28	143	1.33	b	
10	295.01	592.78	609	56	22	87	1.28	a	
11	351.69	706.07	1114	72	23	96	1.37	a	
12	510.32	1023.12	39	25	18	58	1.76	a	
13	583.12	1168.63	54	22	14	43	1.13	a	
14	609.04	1220.45	754	59	17	53	1.79	a	
15	665.33	1332.95	25	23	17	53	1.80	a	
16	768.39	1538.94	75	26	16	47	1.98	a	
17	910.99	1823.96	33	22	15	46	1.72	a	
18	933.76	1869.47	39	24	17	42	2.97	a	
19	1120.06	2241.83	123	28	14	34	2.20	a	
20	1154.61	2310.89	24	13	7	10	1.92	a	
21	1238.40	2478.35	43	20	12	26	2.12	a	
22	1376.74	2754.84	25	21	16	28	4.29	a	Wide Pk
23	1460.75	2922.77	90	22	10	15	2.56	a	

141334D04.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	1764.36	3529.59	101	22	7	8	2.88	a
25	1846.48	3693.72	16	12	7	7	3.58	a

141334D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.75	189	53	37	187	53	38	
2	76.92	300	53	33	298	53	33	
3	86.28	15	33	27	14	34	27	NET<CL
5	92.59	159	50	36	142	51	37	
7	185.80	318	57	36	305	57	37	
8	238.46	253	46	28	247	47	28	
9	241.74	345	50	28	343	50	28	
10	295.01	609	56	22	606	56	22	
11	351.69	1114	72	23	1109	72	23	
12	510.32	39	25	18	1	26	22	NET<CL
13	583.12	54	22	14	52	23	14	
14	609.04	754	59	17	750	59	18	
17	910.99	33	22	15	32	22	16	
23	1460.75	90	22	10	84	22	11	

141334D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-23 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:04
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.95e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.141334D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		7.17E+00 +- 2.55E+00	3.83E+00	1.85E+00	3.92E+13
U-235	143.76	N	9.02E-01 +- 7.53E-01	1.21E+00	5.80E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.59E+00 +- 3.00E-01	3.82E-01	1.83E-01	1.67E+04
Pb-214	Average:x		1.02E+01 +- 5.46E-01	. . . .	. . . .	1.40E+07
	295.22		9.31E+00 +- 8.60E-01	7.18E-01	3.38E-01	1.40E+07
	351.99		1.08E+01 +- 7.06E-01	4.81E-01	2.27E-01	1.40E+07
Tl-208	583.14		3.64E-01 +- 1.57E-01	2.19E-01	1.00E-01	1.67E+04
Ac-228	911.07		1.06E+00 +- 7.30E-01	1.13E+00	5.19E-01	1.23E+14
Bi-214	Average:x		8.39E+00 +- 1.74E+00	. . . .	. . . .	1.40E+07
	1120.28		8.39E+00 +- 1.89E+00	2.06E+00	9.39E-01	1.40E+07
	609.32		8.39E+00 +- 4.35E+00	6.86E+00	3.41E+00	1.40E+07
K-40	1460.75		9.98E+00 +- 2.66E+00	2.86E+00	1.27E+00	1.12E+13
Pb-210	46.50	N	1.70E+01 +- 3.55E+01	5.94E+01	2.84E+01	1.95E+05
Am-241	59.54	N	3.91E-01 +- 1.00E+00	1.69E+00	8.06E-01	3.80E+06
Cs-137	661.62	N	-1.81E-02 +- 2.48E-01	4.31E-01R	2.05E-01	2.64E+05
Bi-212	727.17	N	2.54E+00 +- 1.84E+00	2.77E+00	1.24E+00	1.67E+04
Pa-234m	1001.03	N	3.60E+01 +- 2.85E+01	4.40E+01	1.99E+01	3.92E+13
Eu-154	1004.80	N	-7.40E-02 +- 9.97E-01	1.79E+00	8.26E-01	7.45E+04
Co-60	1332.51	N	1.30E-01 +- 1.57E-01	2.57E-01	1.12E-01	4.62E+04
Eu-152	1408.08	N	8.68E-01 +- 1.06E+00	1.74E+00	7.86E-01	1.17E+05

MEASURED TOTAL: 9.66E+01 +- 7.74E+01 pCi/g

141334D04.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.75	152.55	187	53	38	259	1.01	Unknown
2	76.92	156.89	298	53	33	216	0.84	Unknown
3	86.28	175.59	14	34	27	159	0.58	Deleted
4	87.09	177.22	102	38	27	159	0.68	Unknown
6	150.09	303.14	20	75	61	411	2.25	Deleted
9	241.74	486.33	343	50	28	143	1.33	Unknown
12	510.32	1023.12	1	26	22	58	1.76	Deleted
14	609.04	1220.45	750	59	18	53	1.79	SPLIT
15	665.33	1332.95	25	23	17	53	1.80	Unknown
16	768.39	1538.94	75	26	16	47	1.98	Unknown
18	933.76	1869.47	39	24	17	42	2.97	Unknown
20	1154.61	2310.89	24	13	7	10	1.92	Unknown
21	1238.40	2478.35	43	20	12	26	2.12	Unknown
22	1376.74	2754.84	25	21	16	28	4.29	Unknown
24	1764.36	3529.59	101	22	7	8	2.88	Unknown
25	1846.48	3693.72	16	12	8	7	3.58	Unknown
27	609.04	1220.45	100	685	18	53	1.79	1120SEsc

c:\SEEKER\BIN\141334d04.res Analysis Results Saved.

141334D04.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-23 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:04
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.95E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.141334D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.58 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.75	152.55	189	53	37	259	1.01 a	
2	76.92	156.89	300	53	33	216	0.84 b	
3	86.28	175.59	15	33	27	159	0.58 a	NET< CL
4	87.09	177.22	102	38	27	159	0.68 b	
5	92.59	188.21	159	50	36	238	0.98 c	
6	150.09	303.14	20	75	61	411	2.25 a	NET< CL Wide Pk
7	185.80	374.51	318	57	36	209	1.34 a	
8	238.46	479.76	253	46	28	143	1.25 a	
9	241.74	486.33	345	50	28	143	1.33 b	
10	295.01	592.78	609	56	22	87	1.28 a	
11	351.69	706.07	1114	72	23	96	1.37 a	
12	510.32	1023.12	39	25	18	58	1.76 a	
13	583.12	1168.63	54	22	14	43	1.13 a	
14	609.04	1220.45	754	59	17	53	1.79 a	
15	665.33	1332.95	25	23	17	53	1.80 a	
16	768.39	1538.94	75	26	16	47	1.98 a	
17	910.99	1823.96	33	22	15	46	1.72 a	
18	933.76	1869.47	39	24	17	42	2.97 a	
19	1120.06	2241.83	123	28	14	34	2.20 a	
20	1154.61	2310.89	24	13	7	10	1.92 a	
21	1238.40	2478.35	43	20	12	26	2.12 a	
22	1376.74	2754.84	25	21	16	28	4.29 a	Wide Pk
23	1460.75	2922.77	90	22	10	15	2.56 a	

141334D04.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	1764.36	3529.59	101	22	7	8	2.88	a
25	1846.48	3693.72	16	12	7	7	3.58	a

141334D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.75	189	53	37	187	53	38	
2	76.92	300	53	33	298	53	33	
3	86.28	15	33	27	14	34	27	NET<CL
5	92.59	159	50	36	142	51	37	
7	185.80	318	57	36	305	57	37	
8	238.46	253	46	28	247	47	28	
9	241.74	345	50	28	343	50	28	
10	295.01	609	56	22	606	56	22	
11	351.69	1114	72	23	1109	72	23	
12	510.32	39	25	18	1	26	22	NET<CL
13	583.12	54	22	14	52	23	14	
14	609.04	754	59	17	750	59	18	
17	910.99	33	22	15	32	22	16	
23	1460.75	90	22	10	84	22	11	

141334D04.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-23 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:04
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.95e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.141334D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.00E+01 +- 5.24E-01	. . . . .	. . . . .	1.40E+07
	295.21		9.31E+00 +- 8.60E-01	7.18E-01	3.38E-01	1.40E+07
	351.92		1.08E+01 +- 7.06E-01	4.81E-01	2.27E-01	1.40E+07
	609.31		1.29E+00 +- 8.84E+00	4.98E-01	2.32E-01	1.40E+07
	1120.29		8.39E+00 +- 1.89E+00	2.06E+00	9.39E-01	1.40E+07

MEASURED TOTAL: 1.00E+01 +- 5.24E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.75	152.55	187	53	38	259	1.01	Unknown
2	76.92	156.89	298	53	33	216	0.84	Unknown
3	87.09	177.22	102	38	27	159	0.68	Unknown
4	92.59	188.21	143	51	37	238	0.98	Unknown
5	185.80	374.51	305	57	37	209	1.34	Unknown
6	238.46	479.76	247	47	28	143	1.25	Unknown
7	241.74	486.33	343	50	28	143	1.33	Unknown
10	583.12	1168.63	52	23	14	43	1.13	Unknown
11	609.04	1220.45	750	59	18	53	1.79	1120SEsc
12	609.04	1220.45	651	338	265	53	1.79	1120SEsc

141334D04.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	665.33	1332.95	25	23	17	53	1.80	Unknown
15	768.39	1538.94	75	26	16	47	1.98	Unknown
16	910.99	1823.96	32	22	16	46	1.72	Unknown
17	933.76	1869.47	39	24	17	42	2.97	Unknown
19	1154.61	2310.89	24	13	7	10	1.92	Unknown
20	1238.40	2478.35	43	20	12	26	2.12	Unknown
21	1376.74	2754.84	25	21	16	28	4.29	Unknown
22	1460.75	2922.77	84	22	11	15	2.56	Unknown
23	1764.36	3529.59	101	22	7	8	2.88	Unknown
24	1846.48	3693.72	16	12	8	7	3.58	Unknown

c:\SEEKER\BIN\141334d04A.res Analysis Results Saved.

140892D05.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-24 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:14
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.05E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140892D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.76 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.76	150.94	126	40	27	162	0.69 a	
2	77.06	155.53	257	38	17	81	0.37 b	
3	87.12	175.64	113	39	27	150	0.85 a	
4	89.98	181.34	68	46	35	210	1.08 b	
5	92.46	186.32	26	25	19	90	0.43 c	
6	186.11	373.47	213	44	27	143	0.87 a	
7	208.96	419.14	12	24	19	87	0.45 a	NET< CL
8	238.59	478.36	146	35	21	98	0.73 a	
9	241.87	484.92	348	51	28	147	0.96 b	
10	295.11	591.32	746	62	25	111	0.97 a	
11	337.93	676.91	46	40	31	132	1.59 a	
12	351.83	704.69	1330	77	20	69	1.07 a	
13	510.81	1022.42	86	35	24	75	2.51 a	Wide Pk
14	583.09	1166.89	35	23	16	53	1.18 a	
15	609.27	1219.22	1011	67	18	61	1.26 a	
16	661.52	1323.63	67	24	15	44	1.11 a	
17	768.36	1537.16	67	24	15	41	1.32 a	
18	786.04	1572.51	24	21	16	39	1.80 a	
19	806.39	1613.18	23	15	10	20	1.06 a	
20	911.54	1823.33	46	17	8	14	1.22 a	
21	934.02	1868.27	48	19	11	24	1.25 a	
22	969.05	1938.26	21	15	9	22	0.89 a	
23	1120.26	2240.48	210	32	11	23	1.84 a	
24	1155.14	2310.20	21	15	10	18	1.50 a	

140892D05.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1238.09	2475.98	75	23	13	28	1.87	a
26	1377.61	2754.83	49	16	7	8	1.94	a
27	1407.67	2814.90	22	13	7	13	0.95	a
28	1460.83	2921.14	128	26	11	21	1.99	a
29	1729.83	3458.77	20	11	5	6	1.27	a
30	1764.49	3528.05	145	25	6	7	2.35	a
31	1847.43	3693.80	24	13	7	8	2.04	a

140892D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
5	92.46	26	25	19	19	26	20	NET<CL
6	186.11	213	44	27	206	44	27	
8	238.59	146	35	21	139	35	22	
9	241.87	348	51	28	346	51	29	
10	295.11	746	62	25	744	62	25	
11	337.93	46	40	31	44	40	31	
12	351.83	1330	77	20	1324	77	21	
13	510.81	86	35	24	38	36	27	
14	583.09	35	23	16	32	23	17	
15	609.27	1011	67	18	1006	67	19	
20	911.54	46	17	8	44	17	9	
22	969.05	21	15	9	20	15	10	
28	1460.83	128	26	11	115	26	13	
30	1764.49	145	25	6	144	25	7	

140892D05.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-24 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:14
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.05e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140892D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014

Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50	N	1.12E+00 +- 1.55E+00	2.56E+00	1.20E+00	3.92E+13
U-235	143.76	N	5.00E-01 +- 6.13E-01	1.01E+00	4.80E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		7.60E-01 +- 1.94E-01	2.53E-01	1.19E-01	1.67E+04
Pb-214	Average:x		9.60E+00 +- 4.59E-01	. . . .	. . . .	1.40E+07
	295.22		9.24E+00 +- 7.74E-01	6.51E-01	3.09E-01	1.40E+07
	351.99		9.80E+00 +- 5.70E-01	3.28E-01	1.54E-01	1.40E+07
Ac-228	Average:x		9.12E-01 +- 2.92E-01	. . . .	. . . .	1.23E+14
	338.40		1.05E+00 +- 9.46E-01	1.53E+00	7.34E-01	1.23E+14
	911.07		9.64E-01 +- 3.69E-01	4.33E-01	1.87E-01	1.23E+14
	968.90		7.49E-01 +- 5.52E-01	8.34E-01	3.66E-01	1.23E+14
Tl-208	583.14		1.57E-01 +- 1.15E-01	1.78E-01	8.25E-02	1.67E+04
Bi-214	Average:x		9.11E+00 +- 5.59E-01	. . . .	. . . .	1.40E+07
	609.32		9.09E+00 +- 6.09E-01	3.64E-01	1.70E-01	1.40E+07
	1120.28		9.22E+00 +- 1.41E+00	1.12E+00	5.02E-01	1.40E+07
Cs-137	661.62		3.47E-01 +- 1.27E-01	1.70E-01	7.77E-02	2.64E+05
Eu-152	1408.08		8.28E-01 +- 4.77E-01	6.37E-01	2.68E-01	1.17E+05
K-40	1460.75		8.43E+00 +- 1.93E+00	2.04E+00	9.20E-01	1.12E+13
Pb-210	46.50	N	-1.64E+02 +- 1.58E+02	2.91E+02	1.38E+02	1.95E+05
Am-241	59.54	N	-1.61E+00 +- 2.00E+00	3.66E+00	1.73E+00	3.80E+06
Bi-212	727.17	N	-1.49E-01 +- 1.19E+00	2.20E+00	9.97E-01	1.67E+04
Pa-234m	1001.03	N	7.20E+00 +- 1.55E+01	2.67E+01	1.20E+01	3.92E+13
Eu-154	1004.80	N	-4.08E-01 +- 5.27E-01	1.04E+00	4.75E-01	7.45E+04
Co-60	1332.51	N	3.18E-03 +- 8.40E-02	1.58E-01	6.86E-02	4.62E+04

140892D05.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 3.90E+01 +- 2.19E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.76	150.94	126	40	27	162	0.69	Unknown
2	77.06	155.53	257	38	17	81	0.37	Unknown
3	87.12	175.64	113	39	27	150	0.85	Unknown
4	89.98	181.34	68	46	35	210	1.08	Unknown
7	208.96	419.14	12	24	19	87	0.45	Deleted
9	241.87	484.92	346	51	29	147	0.96	Unknown
13	510.81	1022.42	38	36	27	75	2.51	Unknown
17	768.36	1537.16	67	24	15	41	1.32	Unknown
18	786.04	1572.51	24	21	16	39	1.80	Unknown
19	806.39	1613.18	23	15	10	20	1.06	Unknown
21	934.02	1868.27	48	19	11	24	1.25	Unknown
24	1155.14	2310.20	21	15	10	18	1.50	Unknown
25	1238.09	2475.98	75	23	13	28	1.87	Unknown
26	1377.61	2754.83	49	16	7	8	1.94	Unknown
29	1729.83	3458.77	20	11	5	6	1.27	Unknown
30	1764.49	3528.05	144	25	7	7	2.35	Unknown
31	1847.43	3693.80	24	13	7	8	2.04	Unknown

c:\SEEKER\BIN\140892d05.res Analysis Results Saved.

140892D05.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-24 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:14
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.05E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140892D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.76 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.76	150.94	126	40	27	162	0.69 a	
2	77.06	155.53	257	38	17	81	0.37 b	
3	87.12	175.64	113	39	27	150	0.85 a	
4	89.98	181.34	68	46	35	210	1.08 b	
5	92.46	186.32	26	25	19	90	0.43 c	
6	186.11	373.47	213	44	27	143	0.87 a	
7	208.96	419.14	12	24	19	87	0.45 a	NET< CL
8	238.59	478.36	146	35	21	98	0.73 a	
9	241.87	484.92	348	51	28	147	0.96 b	
10	295.11	591.32	746	62	25	111	0.97 a	
11	337.93	676.91	46	40	31	132	1.59 a	
12	351.83	704.69	1330	77	20	69	1.07 a	
13	510.81	1022.42	86	35	24	75	2.51 a	Wide Pk
14	583.09	1166.89	35	23	16	53	1.18 a	
15	609.27	1219.22	1011	67	18	61	1.26 a	
16	661.52	1323.63	67	24	15	44	1.11 a	
17	768.36	1537.16	67	24	15	41	1.32 a	
18	786.04	1572.51	24	21	16	39	1.80 a	
19	806.39	1613.18	23	15	10	20	1.06 a	
20	911.54	1823.33	46	17	8	14	1.22 a	
21	934.02	1868.27	48	19	11	24	1.25 a	
22	969.05	1938.26	21	15	9	22	0.89 a	
23	1120.26	2240.48	210	32	11	23	1.84 a	
24	1155.14	2310.20	21	15	10	18	1.50 a	

140892D05.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1238.09	2475.98	75	23	13	28	1.87	a
26	1377.61	2754.83	49	16	7	8	1.94	a
27	1407.67	2814.90	22	13	7	13	0.95	a
28	1460.83	2921.14	128	26	11	21	1.99	a
29	1729.83	3458.77	20	11	5	6	1.27	a
30	1764.49	3528.05	145	25	6	7	2.35	a
31	1847.43	3693.80	24	13	7	8	2.04	a

140892D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
5	92.46	26	25	19	19	26	20	NET<CL
6	186.11	213	44	27	206	44	27	
8	238.59	146	35	21	139	35	22	
9	241.87	348	51	28	346	51	29	
10	295.11	746	62	25	744	62	25	
11	337.93	46	40	31	44	40	31	
12	351.83	1330	77	20	1324	77	21	
13	510.81	86	35	24	38	36	27	
14	583.09	35	23	16	32	23	17	
15	609.27	1011	67	18	1006	67	19	
20	911.54	46	17	8	44	17	9	
22	969.05	21	15	9	20	15	10	
28	1460.83	128	26	11	115	26	13	
30	1764.49	145	25	6	144	25	7	

140892D05.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-24 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:14
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.05e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140892D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014

Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	9.40E+00 +- 3.55E-01	. . . .	. . . .	1.40E+07
	295.21		9.24E+00 +- 7.74E-01	6.51E-01	3.09E-01	1.40E+07
	351.92		9.80E+00 +- 5.70E-01	3.28E-01	1.54E-01	1.40E+07
	609.31		9.09E+00 +- 6.09E-01	3.64E-01	1.70E-01	1.40E+07
	1120.29		9.22E+00 +- 1.41E+00	1.12E+00	5.02E-01	1.40E+07

MEASURED TOTAL: 9.40E+00 +- 3.55E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.76	150.94	126	40	27	162	0.69	Unknown
2	77.06	155.53	257	38	17	81	0.37	Unknown
3	87.12	175.64	113	39	27	150	0.85	Unknown
4	89.98	181.34	68	46	35	210	1.08	Unknown
5	186.11	373.47	206	44	27	143	0.87	Unknown
6	238.59	478.36	139	35	22	98	0.73	Unknown
7	241.87	484.92	346	51	29	147	0.96	Unknown
9	337.93	676.91	44	40	31	132	1.59	Unknown
11	510.81	1022.42	38	36	27	75	2.51	Unknown
12	583.09	1166.89	32	23	17	53	1.18	Unknown

140892D05.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	661.52	1323.63	67	24	15	44	1.11	Unknown
15	768.36	1537.16	67	24	15	41	1.32	Unknown
16	786.04	1572.51	24	21	16	39	1.80	Unknown
17	806.39	1613.18	23	15	10	20	1.06	Unknown
18	911.54	1823.33	44	17	9	14	1.22	Unknown
19	934.02	1868.27	48	19	11	24	1.25	Unknown
20	969.05	1938.26	20	15	10	22	0.89	Unknown
22	1155.14	2310.20	21	15	10	18	1.50	Unknown
23	1238.09	2475.98	75	23	13	28	1.87	Unknown
24	1377.61	2754.83	49	16	7	8	1.94	Unknown
25	1407.67	2814.90	22	13	7	13	0.96	Unknown
26	1460.83	2921.14	115	26	13	21	1.99	Unknown
27	1729.83	3458.77	20	11	5	6	1.27	Unknown
28	1764.49	3528.05	144	25	7	7	2.35	Unknown
29	1847.43	3693.80	24	13	7	8	2.04	Unknown

c:\SEEKER\BIN\140892d05A.res Analysis Results Saved.

140903D07.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-25 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:25
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.19E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.140903D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.28 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.66	153.68	79	32	21	93	0.87 a	
2	76.94	158.23	134	32	18	74	0.73 b	
3	83.49	171.31	16	19	14	51	0.42 a	
4	87.00	178.32	44	28	21	85	0.83 b	
5	89.83	183.97	25	24	18	68	0.69 c	
6	92.93	190.16	49	35	26	119	1.07 d	
7	185.91	375.86	74	31	21	85	0.97 a	
8	238.56	481.02	185	35	18	61	0.90 a	HiResid
9	241.70	487.30	125	35	23	81	1.26 b	HiResid
10	295.12	593.99	210	35	16	41	1.30 a	
11	338.21	680.04	40	22	15	40	0.99 a	
12	351.95	707.48	384	44	17	52	1.29 a	
13	510.94	1025.03	64	28	19	53	1.95 a	
14	583.35	1169.64	74	24	14	33	1.55 a	
15	609.53	1221.93	294	37	12	26	1.49 a	
16	727.61	1457.78	18	13	8	13	1.19 a	
17	911.31	1824.67	46	19	11	22	1.97 a	
18	969.28	1940.44	29	14	7	13	0.97 a	
19	1120.40	2242.28	75	20	9	13	2.15 a	
20	1238.27	2477.68	26	14	8	13	1.40 a	
21	1460.39	2921.32	197	29	8	9	2.54 a	
22	1763.90	3527.49	44	14	5	3	2.98 a	

140903D07.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.66	79	32	21	76	32	22	
2	76.94	134	32	18	131	32	19	
3	83.49	16	19	14	14	20	15	NET<CL
6	92.93	49	35	26	36	35	27	
7	185.91	74	31	21	66	31	22	
8	238.56	185	35	18	177	35	19	
9	241.70	125	35	23	123	36	23	
10	295.12	210	35	16	206	35	17	
11	338.21	40	22	15	39	22	15	
12	351.95	384	44	17	378	44	17	
13	510.94	64	28	19	21	29	23	NET<CL
14	583.35	74	24	14	70	24	15	
15	609.53	294	37	12	289	38	13	
17	911.31	46	19	11	44	19	11	
18	969.28	29	14	7	28	14	8	
21	1460.39	197	29	8	190	30	9	
22	1763.90	44	14	5	43	15	5	

140903D07.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-25 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:25
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.19e+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spectrum File	.140903D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)
Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)		MDA	Critical Level	Halflife (hrs)
Th-234	92.50		1.84E+00	+- 1.81E+00	2.94E+00	1.40E+00	3.92E+13
U-235	143.76	N	-1.70E-02	+- 4.53E-01	7.94E-01	3.74E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	. . . .	6.17E+12
Pb-212	238.63		9.88E-01	+- 1.96E-01	2.27E-01	1.06E-01	1.67E+04
Pb-214	Average:x		3.07E+00	+- 2.96E-01	. . . .	. . . .	1.40E+07
	295.22		2.92E+00	+- 4.98E-01	5.13E-01	2.37E-01	1.40E+07
	351.99		3.15E+00	+- 3.69E-01	3.14E-01	1.46E-01	1.40E+07
Ac-228	Average:x		1.08E+00	+- 3.08E-01	. . . .	. . . .	1.23E+14
	338.40		1.03E+00	+- 5.85E-01	8.71E-01	3.99E-01	1.23E+14
	911.07		1.06E+00	+- 4.61E-01	6.14E-01	2.74E-01	1.23E+14
	968.90		1.17E+00	+- 5.87E-01	7.53E-01	3.21E-01	1.23E+14
Tl-208	583.14		3.81E-01	+- 1.33E-01	1.75E-01	8.00E-02	1.67E+04
Bi-214	Average:x		3.00E+00	+- 3.52E-01	. . . .	. . . .	1.40E+07
	609.32		2.90E+00	+- 3.78E-01	2.94E-01	1.33E-01	1.40E+07
	1120.28		3.65E+00	+- 9.77E-01	9.58E-01	4.14E-01	1.40E+07
Bi-212	727.17		1.53E+00	+- 1.05E+00	1.49E+00	6.31E-01	1.67E+04
K-40	1460.75		1.54E+01	+- 2.39E+00	1.67E+00	7.24E-01	1.12E+13
Pb-210	46.50	N	-5.54E+00	+- 1.52E+01	2.76E+01	1.29E+01	1.95E+05
Am-241	59.54	N	-2.59E-01	+- 6.86E-01	1.25E+00	5.83E-01	3.80E+06
Cs-137	661.62	N	-5.40E-02	+- 8.53E-02	1.68E-01	7.59E-02	2.64E+05
Pa-234m	1001.03	N	1.02E+01	+- 1.42E+01	2.36E+01	1.03E+01	3.92E+13
Eu-154	1004.80	N	-7.53E-02	+- 4.64E-01	8.85E-01	3.92E-01	7.45E+04
Co-60	1332.51	N	1.40E-02	+- 7.86E-02	1.47E-01	6.21E-02	4.62E+04
Eu-152	1408.08	N	-2.69E-01	+- 4.75E-01	9.67E-01	4.27E-01	1.17E+05

140903D07.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 3.75E+01 +- 2.08E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.66	153.68	76	32	22	93	0.87	Unknown
2	76.94	158.23	131	32	19	74	0.73	Unknown
3	83.49	171.31	14	20	15	51	0.42	Deleted
4	87.00	178.32	44	28	21	85	0.83	Unknown
5	89.83	183.97	25	24	18	68	0.69	Unknown
9	241.70	487.30	123	36	23	81	1.26	Unknown
13	510.94	1025.03	21	29	23	53	1.95	Deleted
20	1238.27	2477.68	26	14	8	13	1.40	Unknown
22	1763.90	3527.49	43	15	5	3	2.98	Unknown

c:\SEEKER\BIN\140903d07.res Analysis Results Saved.

140903D07.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-25 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:25
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.19E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.140903D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.28 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.66	153.68	79	32	21	93	0.87 a	
2	76.94	158.23	134	32	18	74	0.73 b	
3	83.49	171.31	16	19	14	51	0.42 a	
4	87.00	178.32	44	28	21	85	0.83 b	
5	89.83	183.97	25	24	18	68	0.69 c	
6	92.93	190.16	49	35	26	119	1.07 d	
7	185.91	375.86	74	31	21	85	0.97 a	
8	238.56	481.02	185	35	18	61	0.90 a	HiResid
9	241.70	487.30	125	35	23	81	1.26 b	HiResid
10	295.12	593.99	210	35	16	41	1.30 a	
11	338.21	680.04	40	22	15	40	0.99 a	
12	351.95	707.48	384	44	17	52	1.29 a	
13	510.94	1025.03	64	28	19	53	1.95 a	
14	583.35	1169.64	74	24	14	33	1.55 a	
15	609.53	1221.93	294	37	12	26	1.49 a	
16	727.61	1457.78	18	13	8	13	1.19 a	
17	911.31	1824.67	46	19	11	22	1.97 a	
18	969.28	1940.44	29	14	7	13	0.97 a	
19	1120.40	2242.28	75	20	9	13	2.15 a	
20	1238.27	2477.68	26	14	8	13	1.40 a	
21	1460.39	2921.32	197	29	8	9	2.54 a	
22	1763.90	3527.49	44	14	5	3	2.98 a	

140903D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.66	79	32	21	76	32	22	
2	76.94	134	32	18	131	32	19	
3	83.49	16	19	14	14	20	15	NET<CL
6	92.93	49	35	26	36	35	27	
7	185.91	74	31	21	66	31	22	
8	238.56	185	35	18	177	35	19	
9	241.70	125	35	23	123	36	23	
10	295.12	210	35	16	206	35	17	
11	338.21	40	22	15	39	22	15	
12	351.95	384	44	17	378	44	17	
13	510.94	64	28	19	21	29	23	NET<CL
14	583.35	74	24	14	70	24	15	
15	609.53	294	37	12	289	38	13	
17	911.31	46	19	11	44	19	11	
18	969.28	29	14	7	28	14	8	
21	1460.39	197	29	8	190	30	9	
22	1763.90	44	14	5	43	15	5	

140903D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-25 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:25
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.19e+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spectrum File	.140903D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	3.04E+00 +- 2.27E-01	. . . .	. . . .	1.40E+07
	295.21		2.92E+00 +- 4.98E-01	5.13E-01	2.37E-01	1.40E+07
	351.92		3.15E+00 +- 3.68E-01	3.14E-01	1.46E-01	1.40E+07
	609.31		2.90E+00 +- 3.78E-01	2.94E-01	1.33E-01	1.40E+07
	1120.29		3.65E+00 +- 9.77E-01	9.58E-01	4.14E-01	1.40E+07

MEASURED TOTAL: 3.04E+00 +- 2.27E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.66	153.68	76	32	22	93	0.87	Unknown
2	76.94	158.23	131	32	19	74	0.73	Unknown
3	87.00	178.32	44	28	21	85	0.83	Unknown
4	89.83	183.97	25	24	18	68	0.69	Unknown
5	92.93	190.16	36	35	27	119	1.07	Unknown
6	185.91	375.86	66	31	22	85	0.97	Unknown
7	238.56	481.02	177	35	19	61	0.90	Unknown
8	241.70	487.30	123	36	23	81	1.26	Unknown
10	338.21	680.04	39	22	15	40	0.99	Unknown
12	583.35	1169.64	70	24	15	33	1.55	Unknown
14	727.61	1457.78	18	13	8	13	1.19	Unknown

140903D07.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	911.31	1824.67	44	19	11	22	1.97	Unknown
16	969.28	1940.44	28	14	8	13	0.97	Unknown
18	1238.27	2477.68	26	14	8	13	1.40	Unknown
19	1460.39	2921.32	190	30	9	9	2.54	Unknown
20	1763.90	3527.49	43	15	5	3	2.98	Unknown

c:\SEEKER\BIN\140903d07A.res Analysis Results Saved.

140842D08.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-26 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:36
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.67E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.140842D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.31	96.52	136	30	16	70	0.37 a	
2	53.09	110.05	63	38	29	166	0.79 a	
3	63.12	130.08	163	46	32	224	0.64 a	
4	72.94	149.69	48	43	33	244	0.65 a	
5	74.66	153.12	490	65	39	305	0.79 b	
6	76.93	157.66	765	68	33	244	0.73 c	
7	84.04	171.85	86	43	32	206	0.88 a	
8	87.13	178.02	272	51	32	206	0.79 b	
9	89.72	183.19	104	44	32	206	0.83 c	
10	92.48	188.71	250	55	37	247	0.93 d	
11	98.37	200.48	34	27	20	97	0.41 a	
12	143.51	290.60	29	31	24	130	0.71 a	
13	185.91	375.28	356	51	29	154	1.04 a	
14	238.59	480.46	324	46	23	111	0.89 a	
15	241.81	486.90	350	50	27	133	0.92 b	
16	295.17	593.44	791	61	19	70	0.94 a	
17	328.50	659.99	21	26	20	77	0.95 a	
18	338.27	679.52	44	25	18	63	0.87 a	
19	351.92	706.77	1345	77	20	74	1.04 a	
20	510.72	1023.86	92	37	26	82	2.59 a	Wide Pk
21	583.26	1168.70	101	27	15	39	1.43 a	
22	609.49	1221.07	986	65	15	43	1.17 a	
23	661.65	1325.24	22	17	11	30	0.88 a	
24	727.77	1457.26	19	12	7	11	0.77 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	768.45	1538.50	63	25	16	43	1.63	a
26	911.35	1823.83	62	19	9	19	0.93	a
27	934.24	1869.54	37	18	11	26	1.10	a
28	968.97	1938.89	24	16	11	26	1.05	a
29	1120.33	2241.14	197	31	10	20	1.48	a
30	1237.83	2475.76	54	20	11	23	1.71	a
31	1377.36	2754.38	47	17	9	13	2.42	a
32	1460.33	2920.04	92	21	6	7	1.79	a
33	1508.76	3016.76	26	15	9	15	1.88	a
34	1728.86	3456.25	34	13	5	5	2.02	a
35	1763.74	3525.90	162	26	5	4	1.93	a
36	1846.32	3690.80	32	13	5	4	2.22	a

140842D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.31	136	30	16	125	31	17	
3	63.12	163	46	32	144	47	33	
4	72.94	48	43	33	42	43	34	
6	76.93	766	68	33	757	69	34	
7	84.04	86	43	32	81	43	32	
8	87.13	272	51	32	268	51	32	
10	92.48	250	55	37	225	55	38	
12	143.51	29	31	24	26	32	25	
13	185.91	356	52	29	344	52	30	
14	238.59	324	46	23	314	46	24	
16	295.17	791	61	19	789	61	20	
18	338.27	44	25	18	43	25	18	
19	351.92	1345	77	20	1340	77	21	
20	510.72	92	37	26	45	38	29	
21	583.26	101	27	15	97	27	16	
22	609.49	986	65	15	982	65	15	
26	911.35	62	19	9	60	19	10	
28	968.97	24	16	11	23	16	11	
32	1460.33	92	21	6	84	21	8	

140842D08.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-26 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:36
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.67e+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spectrum File	.140842D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NOTE	Concentration (pCi/g)			MDA	Critical Level	Halflife (hrs)
Pb-210	46.50		9.19E+00	+-	2.25E+00	2.74E+00	1.27E+00	1.95E+05
Th-234	Average:x		8.28E+00	+-	1.61E+00	. . . .	. . . .	3.92E+13
	63.29		8.46E+00	+-	2.74E+00	4.02E+00	1.93E+00	3.92E+13
	92.50		8.19E+00	+-	1.99E+00	2.84E+00	1.37E+00	3.92E+13
U-235	143.76		5.18E-01	+-	6.30E-01	1.04E+00	4.91E-01	6.17E+12
	185.72		I.D.		. . . .	. . . .	. . . .	6.17E+12
Pb-212	238.63		2.19E+00	+-	3.20E-01	3.55E-01	1.68E-01	1.67E+04
Pb-214	Average:x		1.39E+01	+-	6.46E-01	. . . .	. . . .	1.40E+07
	295.22		1.39E+01	+-	1.08E+00	7.48E-01	3.50E-01	1.40E+07
	351.99		1.39E+01	+-	8.06E-01	4.58E-01	2.15E-01	1.40E+07
Ac-228	Average:x		1.63E+00	+-	4.30E-01	. . . .	. . . .	1.23E+14
	338.40		1.44E+00	+-	8.45E-01	1.28E+00	5.95E-01	1.23E+14
	911.07		1.90E+00	+-	6.08E-01	6.84E-01	2.99E-01	1.23E+14
	968.90		1.26E+00	+-	8.78E-01	1.31E+00	5.82E-01	1.23E+14
Tl-208	583.14		6.75E-01	+-	1.90E-01	2.36E-01	1.09E-01	1.67E+04
Cs-137	661.62		1.62E-01	+-	1.24E-01	1.90E-01	8.52E-02	2.64E+05
Bi-212	727.17		2.06E+00	+-	1.29E+00	1.74E+00	7.27E-01	1.67E+04
Bi-214	Average:x		1.25E+01	+-	1.78E+00	. . . .	. . . .	1.40E+07
	1120.28		1.25E+01	+-	1.94E+00	1.45E+00	6.39E-01	1.40E+07
	609.32		1.25E+01	+-	4.54E+00	7.11E+00	3.54E+00	1.40E+07
K-40	1460.75		9.03E+00	+-	2.22E+00	1.99E+00	8.51E-01	1.12E+13
Am-241	59.54	N	7.54E-02	+-	2.38E-01	4.02E-01	1.92E-01	3.80E+06
Pa-234m	1001.03	N	1.04E+01	+-	2.31E+01	3.98E+01	1.79E+01	3.92E+13
Eu-154	1004.80	N	-2.45E-01	+-	7.14E-01	1.36E+00	6.14E-01	7.45E+04
Co-60	1332.51	N	2.78E-03	+-	1.15E-01	2.18E-01	9.38E-02	4.62E+04

140842D08.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Eu-152	1408.08	N	9.88E-01 +- 7.76E-01	1.17E+00	5.11E-01	1.17E+05

MEASURED TOTAL: 7.16E+01 +- 3.58E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	53.09	110.05	63	38	29	166	0.79	Unknown
4	72.94	149.69	42	43	34	244	0.65	Unknown
5	74.66	153.12	490	65	39	305	0.79	Unknown
6	76.93	157.66	757	69	34	244	0.73	Unknown
7	84.04	171.85	81	43	32	206	0.88	Unknown
8	87.13	178.02	268	51	32	206	0.79	Unknown
9	89.72	183.19	104	44	32	206	0.83	Unknown
11	98.37	200.48	34	27	20	97	0.41	1120DEsc
15	241.81	486.90	350	50	27	133	0.92	Unknown
17	328.50	659.99	21	26	20	77	0.95	Unknown
20	510.72	1023.86	45	38	29	82	2.59	Unknown
22	609.49	1221.07	982	65	15	43	1.17	SPLIT
25	768.45	1538.50	63	25	16	43	1.63	Unknown
27	934.24	1869.54	37	18	11	26	1.10	Unknown
30	1237.83	2475.76	54	20	11	23	1.71	Unknown
31	1377.36	2754.38	47	17	9	13	2.42	Unknown
33	1508.76	3016.76	26	15	9	15	1.88	Unknown
34	1728.86	3456.25	34	13	5	5	2.02	Unknown
35	1763.74	3525.90	162	26	5	4	1.93	Unknown
36	1846.32	3690.80	32	13	5	4	2.22	Unknown
38	609.49	1221.07	7	721	15	43	1.17	1120SEsc

c:\SEEKER\BIN\140842d08.res Analysis Results Saved.

140842D08.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-26 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:36
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.67E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.140842D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.31	96.52	136	30	16	70	0.37 a	
2	53.09	110.05	63	38	29	166	0.79 a	
3	63.12	130.08	163	46	32	224	0.64 a	
4	72.94	149.69	48	43	33	244	0.65 a	
5	74.66	153.12	490	65	39	305	0.79 b	
6	76.93	157.66	765	68	33	244	0.73 c	
7	84.04	171.85	86	43	32	206	0.88 a	
8	87.13	178.02	272	51	32	206	0.79 b	
9	89.72	183.19	104	44	32	206	0.83 c	
10	92.48	188.71	250	55	37	247	0.93 d	
11	98.37	200.48	34	27	20	97	0.41 a	
12	143.51	290.60	29	31	24	130	0.71 a	
13	185.91	375.28	356	51	29	154	1.04 a	
14	238.59	480.46	324	46	23	111	0.89 a	
15	241.81	486.90	350	50	27	133	0.92 b	
16	295.17	593.44	791	61	19	70	0.94 a	
17	328.50	659.99	21	26	20	77	0.95 a	
18	338.27	679.52	44	25	18	63	0.87 a	
19	351.92	706.77	1345	77	20	74	1.04 a	
20	510.72	1023.86	92	37	26	82	2.59 a	Wide Pk
21	583.26	1168.70	101	27	15	39	1.43 a	
22	609.49	1221.07	986	65	15	43	1.17 a	
23	661.65	1325.24	22	17	11	30	0.88 a	
24	727.77	1457.26	19	12	7	11	0.77 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	768.45	1538.50	63	25	16	43	1.63	a
26	911.35	1823.83	62	19	9	19	0.93	a
27	934.24	1869.54	37	18	11	26	1.10	a
28	968.97	1938.89	24	16	11	26	1.05	a
29	1120.33	2241.14	197	31	10	20	1.48	a
30	1237.83	2475.76	54	20	11	23	1.71	a
31	1377.36	2754.38	47	17	9	13	2.42	a
32	1460.33	2920.04	92	21	6	7	1.79	a
33	1508.76	3016.76	26	15	9	15	1.88	a
34	1728.86	3456.25	34	13	5	5	2.02	a
35	1763.74	3525.90	162	26	5	4	1.93	a
36	1846.32	3690.80	32	13	5	4	2.22	a

140842D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.31	136	30	16	125	31	17	
3	63.12	163	46	32	144	47	33	
4	72.94	48	43	33	42	43	34	
6	76.93	766	68	33	757	69	34	
7	84.04	86	43	32	81	43	32	
8	87.13	272	51	32	268	51	32	
10	92.48	250	55	37	225	55	38	
12	143.51	29	31	24	26	32	25	
13	185.91	356	52	29	344	52	30	
14	238.59	324	46	23	314	46	24	
16	295.17	791	61	19	789	61	20	
18	338.27	44	25	18	43	25	18	
19	351.92	1345	77	20	1340	77	21	
20	510.72	92	37	26	45	38	29	
21	583.26	101	27	15	97	27	16	
22	609.49	986	65	15	982	65	15	
26	911.35	62	19	9	60	19	10	
28	968.97	24	16	11	23	16	11	
32	1460.33	92	21	6	84	21	8	

140842D08.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-26 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 07:25:36
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.39e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.67e+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spectrum File	.140842D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.38E+01 +- 6.07E-01	. . . .	. . . .	1.40E+07
	295.21		1.39E+01 +- 1.08E+00	7.48E-01	3.50E-01	1.40E+07
	351.92		1.39E+01 +- 8.06E-01	4.58E-01	2.15E-01	1.40E+07
	609.31		1.25E+01 +- 4.54E+00	7.11E+00	3.54E+00	1.40E+07
	1120.29		1.25E+01 +- 1.94E+00	1.45E+00	6.39E-01	1.40E+07

MEASURED TOTAL: 1.38E+01 +- 6.07E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.31	96.52	125	31	17	70	0.37	Unknown
2	53.09	110.05	63	38	29	166	0.79	Unknown
3	63.12	130.08	144	47	33	224	0.64	Unknown
4	72.94	149.69	42	43	34	244	0.65	Unknown
5	74.66	153.12	490	65	39	305	0.79	Unknown
6	76.93	157.66	757	69	34	244	0.73	Unknown
7	84.04	171.85	81	43	32	206	0.88	Unknown
8	87.13	178.02	268	51	32	206	0.79	Unknown
9	89.72	183.19	104	44	32	206	0.83	Unknown
10	92.48	188.71	225	55	38	247	0.93	Unknown
11	98.37	200.48	34	27	20	97	0.41	1120DEsc

140842D08.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	143.51	290.60	26	32	25	130	0.71	Unknown
13	185.91	375.28	344	52	30	154	1.04	Unknown
14	238.59	480.46	314	46	24	111	0.89	Unknown
15	241.81	486.90	350	50	27	133	0.92	Unknown
17	328.50	659.99	21	26	20	77	0.95	Unknown
18	338.27	679.52	43	25	18	63	0.87	Unknown
20	510.72	1023.86	45	38	29	82	2.59	Unknown
21	583.26	1168.70	97	27	16	39	1.43	Unknown
22	609.49	1221.07	982	65	15	43	1.17	1120SEsc
24	609.49	1221.07	7	721	15	43	1.17	Deleted
25	661.65	1325.24	22	17	11	30	0.88	Unknown
26	727.77	1457.26	19	12	7	11	0.77	Unknown
27	768.45	1538.50	63	25	16	43	1.63	Unknown
28	911.35	1823.83	60	19	10	19	0.93	Unknown
29	934.24	1869.54	37	18	11	26	1.10	Unknown
30	968.97	1938.89	23	16	11	26	1.05	Unknown
32	1237.83	2475.76	54	20	11	23	1.71	Unknown
33	1377.36	2754.38	47	17	9	13	2.42	Unknown
34	1460.33	2920.04	84	21	8	7	1.79	Unknown
35	1508.76	3016.76	26	15	9	15	1.88	Unknown
36	1728.86	3456.25	34	13	5	5	2.02	Unknown
37	1763.74	3525.90	162	26	5	4	1.93	Unknown
38	1846.32	3690.80	32	13	5	4	2.22	Unknown

c:\SEEKER\BIN\140842d08A.res Analysis Results Saved.

140971D03.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-27 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 07:28:39
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.63E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.40E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140971D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.73	152.54	58	25	17	68	0.49	a
2	76.99	157.04	120	36	24	113	0.82	b
3	93.00	188.98	42	32	24	104	0.97	a
4	185.79	374.06	46	28	20	77	0.95	a
5	238.56	479.32	358	42	16	54	1.05	a
6	241.59	485.36	106	33	22	81	1.46	b
7	270.23	542.49	34	22	15	42	1.29	a
8	295.19	592.28	178	32	15	39	1.24	a
9	299.69	601.25	32	18	12	29	0.97	b
10	338.10	677.88	50	26	18	56	1.42	a
11	351.71	705.02	238	37	17	51	1.26	a
12	510.69	1022.12	66	26	17	37	2.31	a
13	582.86	1166.07	80	23	12	25	1.58	a
14	609.11	1218.44	192	31	12	27	1.68	a
15	726.95	1453.50	24	20	14	31	2.24	a
16	911.22	1821.05	62	18	8	14	1.38	a
17	968.79	1935.89	37	18	11	22	2.18	a
18	1120.50	2238.50	25	14	8	13	1.95	a
19	1460.64	2916.97	92	20	6	7	2.16	a
20	1764.34	3522.73	22	11	4	2	3.92	a

140971D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	76.99	120	36	24	118	36	24	
3	93.00	42	32	24	32	32	25	
4	185.79	46	28	20	38	29	21	
5	238.56	358	43	16	353	43	17	
8	295.19	178	32	15	176	32	15	
10	338.10	50	26	18	46	27	19	
11	351.71	238	37	17	232	37	17	
12	510.69	66	26	17	25	27	20	
13	582.86	80	23	12	77	23	12	
14	609.11	192	31	12	188	32	13	
16	911.22	62	18	8	60	19	8	
17	968.79	37	18	11	36	18	11	
19	1460.64	92	21	6	86	21	8	
20	1764.34	22	11	4	20	11	5	

140971D03.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-27 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 07:28:39
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.63e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.40e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140971D03.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		2.23E+00 +- 2.24E+00	3.64E+00	1.73E+00	3.92E+13
U-235	143.76	N	2.57E-01 +- 6.61E-01	1.12E+00	5.27E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	Average:x		3.00E+00 +- 3.56E-01	. . . .	. . . .	1.67E+04
	238.63		2.98E+00 +- 3.61E-01	3.06E-01	1.42E-01	1.67E+04
	300.09		3.89E+00 +- 2.23E+00	3.22E+00	1.44E+00	1.67E+04
Pb-214	Average:x		3.00E+00 +- 3.63E-01	. . . .	. . . .	1.40E+07
	295.22		3.51E+00 +- 6.42E-01	6.53E-01	3.00E-01	1.40E+07
	351.99		2.75E+00 +- 4.39E-01	4.45E-01	2.06E-01	1.40E+07
Ac-228	Average:x		2.08E+00 +- 5.01E-01	. . . .	. . . .	1.23E+14
	338.40		1.74E+00 +- 1.00E+00	1.52E+00	7.10E-01	1.23E+14
	911.07		2.18E+00 +- 6.72E-01	7.08E-01	3.05E-01	1.23E+14
	968.90		2.23E+00 +- 1.14E+00	1.58E+00	7.08E-01	1.23E+14
Tl-208	583.14		6.13E-01 +- 1.84E-01	2.18E-01	9.80E-02	1.67E+04
Bi-214	Average:x		2.61E+00 +- 4.24E-01	. . . .	. . . .	1.40E+07
	609.32		2.77E+00 +- 4.64E-01	4.19E-01	1.89E-01	1.40E+07
	1120.28		1.83E+00 +- 1.04E+00	1.43E+00	6.15E-01	1.40E+07
Bi-212	727.17		2.92E+00 +- 2.42E+00	3.80E+00	1.73E+00	1.67E+04
K-40	1460.75		1.08E+01 +- 2.57E+00	2.21E+00	9.39E-01	1.12E+13
Pb-210	46.50	N	-1.06E+01 +- 5.98E+01	1.05E+02	4.98E+01	1.95E+05
Am-241	59.54	N	1.01E+00 +- 1.21E+00	1.99E+00	9.32E-01	3.80E+06
Cs-137	661.62	N	3.41E-02 +- 1.28E-01	2.26E-01	1.01E-01	2.64E+05
Pa-234m	1001.03	N	-1.54E+01 +- 1.97E+01	4.11E+01	1.83E+01	3.92E+13
Eu-154	1004.80	N	-5.67E-02 +- 5.89E-01	1.14E+00	4.93E-01	7.45E+04

140971D03.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Co-60	1332.51	N	2.36E-02 +- 1.14E-01	2.13E-01	8.91E-02	4.62E+04
Eu-152	1408.08	N	3.18E-01 +- 7.57E-01	1.33E+00	5.77E-01	1.17E+05

MEASURED TOTAL: 2.88E+01 +- 1.19E+01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.73	152.54	58	25	17	68	0.49	Unknown
2	76.99	157.04	118	36	24	113	0.82	Unknown
6	241.59	485.36	106	33	22	81	1.46	Unknown
7	270.23	542.49	34	22	15	42	1.29	Unknown
12	510.69	1022.12	25	27	20	37	2.31	Unknown
20	1764.34	3522.73	20	11	5	2	3.92	Unknown

c:\SEEKER\BIN\140971d03.res Analysis Results Saved.

140971D03.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-27 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 07:28:39
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.63E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.40E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140971D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.73	152.54	58	25	17	68	0.49	a
2	76.99	157.04	120	36	24	113	0.82	b
3	93.00	188.98	42	32	24	104	0.97	a
4	185.79	374.06	46	28	20	77	0.95	a
5	238.56	479.32	358	42	16	54	1.05	a
6	241.59	485.36	106	33	22	81	1.46	b
7	270.23	542.49	34	22	15	42	1.29	a
8	295.19	592.28	178	32	15	39	1.24	a
9	299.69	601.25	32	18	12	29	0.97	b
10	338.10	677.88	50	26	18	56	1.42	a
11	351.71	705.02	238	37	17	51	1.26	a
12	510.69	1022.12	66	26	17	37	2.31	a
13	582.86	1166.07	80	23	12	25	1.58	a
14	609.11	1218.44	192	31	12	27	1.68	a
15	726.95	1453.50	24	20	14	31	2.24	a
16	911.22	1821.05	62	18	8	14	1.38	a
17	968.79	1935.89	37	18	11	22	2.18	a
18	1120.50	2238.50	25	14	8	13	1.95	a
19	1460.64	2916.97	92	20	6	7	2.16	a
20	1764.34	3522.73	22	11	4	2	3.92	a

140971D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	76.99	120	36	24	118	36	24	
3	93.00	42	32	24	32	32	25	
4	185.79	46	28	20	38	29	21	
5	238.56	358	43	16	353	43	17	
8	295.19	178	32	15	176	32	15	
10	338.10	50	26	18	46	27	19	
11	351.71	238	37	17	232	37	17	
12	510.69	66	26	17	25	27	20	
13	582.86	80	23	12	77	23	12	
14	609.11	192	31	12	188	32	13	
16	911.22	62	18	8	60	19	8	
17	968.79	37	18	11	36	18	11	
19	1460.64	92	21	6	86	21	8	
20	1764.34	22	11	4	20	11	5	

140971D03.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-27 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 07:28:39
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.63e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.40e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140971D03.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	2.83E+00 +- 2.76E-01	. . . .	. . . .	1.40E+07
	295.21		3.51E+00 +- 6.42E-01	6.53E-01	3.00E-01	1.40E+07
	351.92		2.75E+00 +- 4.39E-01	4.45E-01	2.06E-01	1.40E+07
	609.31		2.77E+00 +- 4.64E-01	4.19E-01	1.89E-01	1.40E+07
	1120.29		1.83E+00 +- 1.04E+00	1.43E+00	6.15E-01	1.40E+07

MEASURED TOTAL: 2.83E+00 +- 2.76E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.73	152.54	58	25	17	68	0.49	Unknown
2	76.99	157.04	118	36	24	113	0.82	Unknown
3	93.00	188.98	32	32	25	104	0.97	Unknown
4	185.79	374.06	38	29	21	77	0.95	Unknown
5	238.56	479.32	353	43	17	54	1.05	Unknown
6	241.59	485.36	106	33	22	81	1.46	Unknown
7	270.23	542.49	34	22	15	42	1.29	Unknown
9	299.69	601.25	32	18	12	29	0.97	Unknown
10	338.10	677.88	46	27	19	56	1.42	Unknown
12	510.69	1022.12	25	27	20	37	2.31	Unknown

140971D03.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	582.86	1166.07	77	23	12	25	1.58	Unknown
15	726.95	1453.50	24	20	14	31	2.24	Unknown
16	911.22	1821.05	60	19	8	14	1.38	Unknown
17	968.79	1935.89	36	18	11	22	2.18	Unknown
19	1460.64	2916.97	86	21	8	7	2.16	Unknown
20	1764.34	3522.73	20	11	5	2	3.92	Unknown

c:\SEEKER\BIN\140971d03A.res Analysis Results Saved.

140926D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-28 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:27
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.44E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140926D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.04 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.62	153.11	61	27	18	68	0.77 a	
2	77.02	157.91	83	29	18	68	0.83 b	
3	86.92	177.66	24	21	16	55	0.58 a	
4	89.78	183.38	30	22	16	55	0.60 b	
5	93.16	190.14	42	34	26	109	1.38 c	
6	185.85	375.26	25	22	16	53	0.74 a	
7	208.99	421.48	28	22	15	48	0.86 a	
8	238.48	480.37	338	45	22	86	0.90 a	
9	270.27	543.87	24	23	17	49	1.08 a	
10	277.28	557.87	20	25	19	56	1.52 a	
11	295.19	593.63	56	23	15	37	1.07 a	
12	299.75	602.75	32	26	20	53	1.57 b	
13	328.07	659.30	23	21	15	39	1.22 a	
14	338.11	679.36	84	26	15	40	1.21 a	
15	351.72	706.54	111	27	13	30	1.07 a	
16	463.07	928.93	23	16	10	23	1.04 a	
17	510.74	1024.13	82	26	15	28	2.60 a	Wide Pk
18	583.24	1168.93	102	23	10	18	1.37 a	
19	609.25	1220.89	70	23	13	29	1.29 a	
20	911.18	1823.91	65	18	6	8	1.32 a	
21	968.92	1939.23	35	16	9	19	1.18 a	
22	1460.79	2921.62	102	23	8	12	2.27 a	

140926D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	86.92	24	21	16	23	22	16	
5	93.16	42	34	26	37	35	27	
6	185.85	25	22	16	21	22	17	
8	238.48	338	45	22	333	45	22	
11	295.19	56	23	15	53	24	16	
13	328.07	24	21	15	22	21	15	
14	338.11	84	26	15	82	26	16	
15	351.72	111	27	13	108	27	14	
17	510.74	82	26	15	43	27	19	
18	583.24	102	23	10	100	24	11	
19	609.25	70	23	13	68	23	13	
20	911.18	65	18	6	63	18	7	
22	1460.79	102	23	8	88	23	11	

140926D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-28 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:27
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.44e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140926D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		3.28E+00 +- 3.04E+00	4.92E+00	2.34E+00	3.92E+13
U-235	143.76	N	5.05E-01 +- 6.64E-01	1.10E+00	5.10E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	Average:x		2.99E+00 +- 4.02E-01	. . . .	. . . .	1.67E+04
	238.63		2.97E+00 +- 4.04E-01	4.20E-01	1.98E-01	1.67E+04
	300.09		4.15E+00 +- 3.41E+00	5.43E+00	2.54E+00	1.67E+04
Tl-208	Average:x		8.48E-01 +- 1.99E-01	. . . .	. . . .	1.67E+04
	277.36		1.30E+00 +- 1.61E+00	2.65E+00	1.24E+00	1.67E+04
	583.14		8.41E-01 +- 2.00E-01	2.01E-01	8.91E-02	1.67E+04
Pb-214	Average:x		1.29E+00 +- 2.79E-01	. . . .	. . . .	1.40E+07
	295.22		1.12E+00 +- 5.02E-01	7.12E-01	3.27E-01	1.40E+07
	351.99		1.36E+00 +- 3.36E-01	3.83E-01	1.74E-01	1.40E+07
Ac-228	Average:x		2.58E+00 +- 5.03E-01	. . . .	. . . .	1.23E+14
	338.40		3.30E+00 +- 1.05E+00	1.35E+00	6.22E-01	1.23E+14
	911.07		2.41E+00 +- 6.82E-01	6.31E-01	2.64E-01	1.23E+14
	968.90		2.26E+00 +- 1.06E+00	1.39E+00	6.09E-01	1.23E+14
Bi-214	609.32		1.06E+00 +- 3.56E-01	4.48E-01	2.03E-01	1.40E+07
K-40	1460.75		1.14E+01 +- 2.94E+00	3.08E+00	1.36E+00	1.12E+13
Pb-210	46.50	N	2.66E+01 +- 1.07E+02	1.85E+02	8.56E+01	1.95E+05
Am-241	59.54	N	-9.17E-01 +- 1.70E+00	3.17E+00	1.47E+00	3.80E+06
Cs-137	661.62	N	8.10E-02 +- 1.06E-01	1.75E-01	7.55E-02	2.64E+05
Bi-212	727.17	N	2.36E+00 +- 1.86E+00	2.81E+00	1.23E+00	1.67E+04
Pa-234m	1001.03	N	-1.79E+00 +- 1.79E+01	3.50E+01	1.51E+01	3.92E+13
Eu-154	1004.80	N	2.97E-01 +- 5.94E-01	1.03E+00	4.37E-01	7.45E+04

140926D01.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Co-60	1332.51	N	1.12E-02 +- 1.15E-01	2.21E-01	9.25E-02	4.62E+04
Eu-152	1408.08	N	1.32E-01 +- 4.59E-01	8.68E-01	3.44E-01	1.17E+05

MEASURED TOTAL: 5.34E+01 +- 1.18E+02 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.62	153.11	61	27	18	68	0.77	Unknown
2	77.02	157.91	83	29	18	68	0.83	Unknown
3	86.92	177.66	23	22	16	55	0.58	Unknown
4	89.78	183.38	30	22	16	55	0.60	Unknown
7	208.99	421.48	28	22	15	48	0.86	Unknown
9	270.27	543.87	24	23	17	49	1.08	Unknown
13	328.07	659.30	22	21	15	39	1.22	Unknown
16	463.07	928.93	23	16	10	23	1.04	Unknown
17	510.74	1024.13	43	27	19	28	2.60	Unknown

c:\SEEKER\BIN\140926d01.res Analysis Results Saved.

140926D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-28 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:27
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.44E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140926D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.04 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014

FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.62	153.11	61	27	18	68	0.77	a
2	77.02	157.91	83	29	18	68	0.83	b
3	86.92	177.66	24	21	16	55	0.58	a
4	89.78	183.38	30	22	16	55	0.60	b
5	93.16	190.14	42	34	26	109	1.38	c
6	185.85	375.26	25	22	16	53	0.74	a
7	208.99	421.48	28	22	15	48	0.86	a
8	238.48	480.37	338	45	22	86	0.90	a
9	270.27	543.87	24	23	17	49	1.08	a
10	277.28	557.87	20	25	19	56	1.52	a
11	295.19	593.63	56	23	15	37	1.07	a
12	299.75	602.75	32	26	20	53	1.57	b
13	328.07	659.30	23	21	15	39	1.22	a
14	338.11	679.36	84	26	15	40	1.21	a
15	351.72	706.54	111	27	13	30	1.07	a
16	463.07	928.93	23	16	10	23	1.04	a
17	510.74	1024.13	82	26	15	28	2.60	a Wide Pk
18	583.24	1168.93	102	23	10	18	1.37	a
19	609.25	1220.89	70	23	13	29	1.29	a
20	911.18	1823.91	65	18	6	8	1.32	a
21	968.92	1939.23	35	16	9	19	1.18	a
22	1460.79	2921.62	102	23	8	12	2.27	a

140926D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	86.92	24	21	16	23	22	16	
5	93.16	42	34	26	37	35	27	
6	185.85	25	22	16	21	22	17	
8	238.48	338	45	22	333	45	22	
11	295.19	56	23	15	53	24	16	
13	328.07	24	21	15	22	21	15	
14	338.11	84	26	15	82	26	16	
15	351.72	111	27	13	108	27	14	
17	510.74	82	26	15	43	27	19	
18	583.24	102	23	10	100	24	11	
19	609.25	70	23	13	68	23	13	
20	911.18	65	18	6	63	18	7	
22	1460.79	102	23	8	88	23	11	

140926D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-28 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:27
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.44e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140926D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.20E+00 +- 2.20E-01	. . . .	. . . .	1.40E+07
	295.21		1.12E+00 +- 5.02E-01	7.12E-01	3.27E-01	1.40E+07
	351.92		1.36E+00 +- 3.36E-01	3.83E-01	1.74E-01	1.40E+07
	609.31		1.06E+00 +- 3.56E-01	4.48E-01	2.03E-01	1.40E+07

MEASURED TOTAL: 1.20E+00 +- 2.20E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.62	153.11	61	27	18	68	0.77	Unknown
2	77.02	157.91	83	29	18	68	0.83	Unknown
3	86.92	177.66	23	22	16	55	0.58	Unknown
4	89.78	183.38	30	22	16	55	0.60	Unknown
5	93.16	190.14	37	35	27	109	1.38	Unknown
6	185.85	375.26	21	22	17	53	0.74	Unknown
7	208.99	421.48	28	22	15	48	0.86	Unknown
8	238.48	480.37	333	45	22	86	0.90	Unknown
9	270.27	543.87	24	23	17	49	1.08	Unknown
10	277.28	557.87	20	25	19	56	1.52	Unknown
12	299.75	602.75	32	26	20	53	1.57	Unknown

140926D01.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	328.07	659.30	22	21	15	39	1.22	Unknown
14	338.11	679.36	82	26	16	40	1.21	Unknown
16	463.07	928.93	23	16	10	23	1.04	Unknown
17	510.74	1024.13	43	27	19	28	2.60	Unknown
18	583.24	1168.93	100	24	11	18	1.37	Unknown
20	911.18	1823.91	63	18	7	8	1.32	Unknown
21	968.92	1939.23	35	16	9	19	1.18	Unknown
22	1460.79	2921.62	88	23	11	12	2.27	Unknown

c:\SEEKER\BIN\140926d01A.res Analysis Results Saved.

140972D03.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-29 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 08:08:34
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.64E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.83E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140972D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.89	156.84	40	23	16	56	0.70	a
2	92.52	188.01	31	25	19	66	0.95	a
3	186.17	374.82	37	22	15	40	0.99	a
4	238.47	479.14	110	28	15	51	0.76	a
5	294.96	591.82	56	22	14	37	1.16	a
6	337.96	677.58	28	19	13	30	1.24	a
7	351.60	704.80	90	25	13	32	1.45	a
8	511.03	1022.81	36	19	13	28	1.54	a
9	582.85	1166.06	47	18	9	17	1.53	a
10	608.99	1218.21	72	22	12	28	1.49	a
11	1460.35	2916.39	74	19	6	7	2.59	a

140972D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	76.89	40	23	16	38	23	16	
2	92.52	31	25	19	21	26	20	
3	186.17	37	22	15	30	22	16	
4	238.47	110	28	15	105	28	16	
5	294.96	56	22	14	53	23	14	
6	337.96	28	19	13	24	19	14	
7	351.60	90	25	13	84	25	14	
8	511.03	36	19	13	-5	21	17	NET<CL
9	582.85	47	18	9	44	18	10	
10	608.99	72	22	12	69	23	13	
11	1460.35	74	19	6	68	19	8	

140972D03.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-29 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 08:08:34
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.64e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.83e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140972D03.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		1.21E+00 +- 1.54E+00	2.55E+00	1.19E+00	3.92E+13
U-235	143.76	N	1.95E-01 +- 4.32E-01	7.37E-01	3.39E-01	6.17E+12
	185.72		I.D.	. . . .	. . . . .	6.17E+12
Pb-212	238.63		7.52E-01 +- 2.00E-01	2.44E-01	1.13E-01	1.67E+04
Pb-214	Average:x		8.62E-01 +- 2.12E-01	. . . .	. . . . .	1.40E+07
	295.22		9.00E-01 +- 3.81E-01	5.25E-01	2.39E-01	1.40E+07
	351.99		8.45E-01 +- 2.55E-01	3.17E-01	1.45E-01	1.40E+07
Ac-228	Average:x		7.58E-01 +- 3.43E-01	. . . .	. . . . .	1.23E+14
	338.40		7.81E-01 +- 6.22E-01	9.72E-01	4.42E-01	1.23E+14
	911.07	N	7.48E-01 +- 4.11E-01	5.39E-01	2.28E-01	1.23E+14
Tl-208	583.14		2.97E-01 +- 1.22E-01	1.55E-01	6.86E-02	1.67E+04
Bi-214	609.32		8.55E-01 +- 2.83E-01	3.52E-01	1.59E-01	1.40E+07
K-40	1460.75		7.14E+00 +- 2.01E+00	1.95E+00	8.32E-01	1.12E+13
Pb-210	46.50	N	-5.36E+00 +- 3.59E+01	6.48E+01	3.00E+01	1.95E+05
Am-241	59.54	N	8.51E-01 +- 8.30E-01	1.33E+00	6.11E-01	3.80E+06
Cs-137	661.62	N	1.16E-01 +- 1.00E-01	1.54E-01	6.72E-02	2.64E+05
Bi-212	727.17	N	1.25E+00 +- 1.31E+00	2.09E+00	9.04E-01	1.67E+04
Pa-234m	1001.03	N	-1.45E+00 +- 1.26E+01	2.53E+01	1.07E+01	3.92E+13
Eu-154	1004.80	N	0.00E+00 +- 4.07E-01	8.00E-01	3.35E-01	7.45E+04
Co-60	1332.51	N	-7.27E-03 +- 6.70E-02	1.44E-01	5.70E-02	4.62E+04
Eu-152	1408.08	N	1.62E-01 +- 4.60E-01	8.37E-01	3.45E-01	1.17E+05

MEASURED TOTAL: 1.44E+01 +- 7.84E+00 pCi/g

140972D03.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.89	156.84	38	23	16	56	0.70	Unknown
8	511.03	1022.81	-5	21	17	28	1.54	Deleted

c:\SEEKER\BIN\140972d03.res Analysis Results Saved.

140972D03.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-29 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 08:08:34
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.64E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.83E+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spc. File	.140972D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.89	156.84	40	23	16	56	0.70	a
2	92.52	188.01	31	25	19	66	0.95	a
3	186.17	374.82	37	22	15	40	0.99	a
4	238.47	479.14	110	28	15	51	0.76	a
5	294.96	591.82	56	22	14	37	1.16	a
6	337.96	677.58	28	19	13	30	1.24	a
7	351.60	704.80	90	25	13	32	1.45	a
8	511.03	1022.81	36	19	13	28	1.54	a
9	582.85	1166.06	47	18	9	17	1.53	a
10	608.99	1218.21	72	22	12	28	1.49	a
11	1460.35	2916.39	74	19	6	7	2.59	a

140972D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	76.89	40	23	16	38	23	16	
2	92.52	31	25	19	21	26	20	
3	186.17	37	22	15	30	22	16	
4	238.47	110	28	15	105	28	16	
5	294.96	56	22	14	53	23	14	
6	337.96	28	19	13	24	19	14	
7	351.60	90	25	13	84	25	14	
8	511.03	36	19	13	-5	21	17	NET<CL
9	582.85	47	18	9	44	18	10	
10	608.99	72	22	12	69	23	13	
11	1460.35	74	19	6	68	19	8	

140972D03.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-29 GS140724-2

Sampling Start:	07/16/2014 12:00:00	Counting Start:	08/17/2014 08:08:34
Sampling Stop:	07/16/2014 12:00:00	Decay Time.	7.64e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.83e+002 g	Real Time	1804 Sec
Collection Efficiency	1.0000	Spectrum File	.140972D03.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	8.59E-01 +- 1.69E-01	. . . .	. . . .	1.40E+07
	295.21		9.00E-01 +- 3.81E-01	5.25E-01	2.39E-01	1.40E+07
	351.92		8.45E-01 +- 2.55E-01	3.17E-01	1.45E-01	1.40E+07
	609.31		8.55E-01 +- 2.83E-01	3.52E-01	1.59E-01	1.40E+07

MEASURED TOTAL: 8.59E-01 +- 1.69E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.89	156.84	38	23	16	56	0.70	Unknown
2	92.52	188.01	21	26	20	66	0.95	Unknown
3	186.17	374.82	30	22	16	40	0.99	Unknown
4	238.47	479.14	105	28	16	51	0.76	Unknown
6	337.96	677.58	24	19	14	30	1.24	Unknown
8	582.85	1166.06	44	18	10	17	1.53	Unknown
10	1460.35	2916.39	68	19	8	7	2.59	Unknown

c:\SEEKER\BIN\140972d03A.res Analysis Results Saved.

141336D04.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-30 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:39
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	2700 Sec
Sample Size	2.05E+002 g	Real Time	2706 Sec
Collection Efficiency	1.0000	Spc. File	.141336D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.58 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.57	152.19	286	57	38	263	0.98 a	
2	76.86	156.77	508	64	38	263	0.96 b	
3	79.06	161.17	25	30	23	132	0.46 c	
4	84.13	171.29	31	28	22	115	0.47 a	
5	87.04	177.11	162	54	40	267	1.21 b	
6	89.62	182.27	87	42	31	191	0.77 c	
7	92.73	188.49	92	52	40	267	1.12 d	
8	112.55	228.11	16	25	19	94	0.49 a	NET< CL
9	128.98	260.94	34	37	29	164	0.80 a	
10	185.83	374.57	342	60	39	222	1.47 a	
11	238.39	479.62	431	58	33	194	1.39 a	
12	241.57	485.97	421	55	31	172	1.31 b	
13	269.70	542.20	58	38	29	144	1.51 a	
14	295.02	592.81	760	64	27	130	1.32 a	
15	299.74	602.25	35	37	29	146	1.48 b	
16	337.75	678.21	69	35	25	116	1.39 a	
17	351.62	705.93	1314	78	25	112	1.36 a	
18	510.80	1024.09	101	34	23	81	2.28 a	
19	582.90	1168.19	134	33	20	65	2.01 a	
20	608.99	1220.34	919	66	21	78	1.74 a	
21	661.36	1325.02	65	27	17	59	1.51 a	
22	726.61	1455.44	25	22	16	50	1.91 a	
23	768.14	1538.44	82	27	16	52	1.59 a	
24	911.19	1824.35	77	25	15	43	1.61 a	

141336D04.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	933.67	1869.28	33	20	13	36	1.66	a
26	1119.61	2240.93	193	33	14	29	3.11	a
27	1238.06	2477.67	42	21	14	33	2.37	a
28	1279.75	2561.00	22	17	12	23	2.42	a
29	1377.26	2755.89	36	17	10	18	2.24	a
30	1460.18	2921.62	117	27	13	26	2.75	a
31	1764.09	3529.05	136	25	8	10	3.13	a

141336D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.57	286	57	38	282	57	38	
2	76.86	508	64	38	505	65	38	
4	84.13	31	28	22	29	29	22	
7	92.73	92	52	40	67	52	41	
10	185.83	342	60	39	322	61	40	
11	238.39	431	58	33	422	58	34	
12	241.57	421	55	31	419	56	31	
14	295.02	760	64	27	756	64	27	
17	351.62	1314	78	25	1307	79	25	
18	510.80	101	34	23	44	36	27	
19	582.90	134	33	20	132	33	20	
20	608.99	919	66	21	914	66	22	
24	911.19	77	25	15	75	25	15	
30	1460.18	117	27	13	107	27	14	

141336D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-30 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:39
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	2700 Sec
Sample Size	2.05e+002 g	Real Time	2706 Sec
Collection Efficiency	1.0000	Spectrum File	.141336D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50		3.24E+00 +- 2.52E+00	4.07E+00	1.97E+00	3.92E+13
U-235	143.76	N	3.77E-01 +- 7.46E-01	1.25E+00	5.98E-01	6.17E+12
	185.72		I.D.	. . . . .	. . . . .	6.17E+12
Pb-212	Average:x		2.62E+00 +- 3.59E-01	. . . .	. . . .	1.67E+04
	238.63		2.61E+00 +- 3.61E-01	4.39E-01	2.11E-01	1.67E+04
	300.09		3.30E+00 +- 3.52E+00	5.76E+00	2.75E+00	1.67E+04
Pb-214	Average:x		1.18E+01 +- 5.81E-01	. . . .	. . . .	1.40E+07
	295.22		1.11E+01 +- 9.44E-01	8.38E-01	3.99E-01	1.40E+07
	351.99		1.23E+01 +- 7.37E-01	5.02E-01	2.38E-01	1.40E+07
Ac-228	Average:x		2.26E+00 +- 6.33E-01	. . . .	. . . .	1.23E+14
	338.40		2.06E+00 +- 1.03E+00	1.57E+00	7.46E-01	1.23E+14
	911.07		2.38E+00 +- 8.01E-01	1.05E+00	4.81E-01	1.23E+14
Tl-208	583.14		8.84E-01 +- 2.23E-01	2.85E-01	1.34E-01	1.67E+04
Bi-214	Average:x		1.15E+01 +- 7.65E-01	. . . .	. . . .	1.40E+07
	609.32		1.13E+01 +- 8.19E-01	5.80E-01	2.73E-01	1.40E+07
	1120.28		1.27E+01 +- 2.14E+00	2.03E+00	9.24E-01	1.40E+07
Cs-137	661.62		4.69E-01 +- 1.92E-01	2.71E-01	1.25E-01	2.64E+05
Bi-212	727.17		2.66E+00 +- 2.35E+00	3.74E+00	1.73E+00	1.67E+04
K-40	1460.75		1.23E+01 +- 3.08E+00	3.55E+00	1.62E+00	1.12E+13
Pb-210	46.50	N	8.64E+00 +- 3.49E+01	5.92E+01	2.83E+01	1.95E+05
Am-241	59.54	N	1.17E-01 +- 1.01E+00	1.72E+00	8.25E-01	3.80E+06
Pa-234m	1001.03	N	9.95E+00 +- 2.57E+01	4.43E+01	2.01E+01	3.92E+13
Eu-154	1004.80	N	-1.88E-01 +- 8.43E-01	1.56E+00	7.12E-01	7.45E+04
Co-60	1332.51	N	-5.85E-02 +- 1.82E-01	3.43E-01	1.56E-01	4.62E+04

141336D04.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Eu-152	1408.08	N	6.59E-01 +- 1.06E+00	1.78E+00	8.09E-01	1.17E+05

MEASURED TOTAL: 6.75E+01 +- 7.41E+01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.57	152.19	282	57	38	263	0.98	Unknown
2	76.86	156.77	505	65	38	263	0.96	Unknown
3	79.06	161.17	25	30	23	132	0.46	Unknown
4	84.13	171.29	29	29	22	115	0.47	Unknown
5	87.04	177.11	162	54	40	267	1.21	Unknown
6	89.62	182.27	87	42	31	191	0.77	Unknown
8	112.55	228.10	16	25	19	94	0.49	Deleted
9	128.98	260.94	34	37	29	164	0.80	Unknown
12	241.57	485.97	419	56	31	172	1.31	Unknown
13	269.70	542.20	58	38	29	144	1.51	Unknown
18	510.80	1024.09	44	36	27	81	2.28	Unknown
23	768.14	1538.44	82	27	16	52	1.59	Unknown
25	933.67	1869.28	33	20	13	36	1.66	Unknown
27	1238.06	2477.67	42	21	14	33	2.37	Unknown
28	1279.75	2561.00	22	17	12	23	2.42	Unknown
29	1377.26	2755.89	36	17	10	18	2.24	Unknown
31	1764.09	3529.05	136	25	8	10	3.13	Unknown

c:\SEEKER\BIN\141336d04.res Analysis Results Saved.

141336D04.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-30 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:39
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	2700 Sec
Sample Size	2.05E+002 g	Real Time	2706 Sec
Collection Efficiency	1.0000	Spc. File	.141336D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.58 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.57	152.19	286	57	38	263	0.98 a	
2	76.86	156.77	508	64	38	263	0.96 b	
3	79.06	161.17	25	30	23	132	0.46 c	
4	84.13	171.29	31	28	22	115	0.47 a	
5	87.04	177.11	162	54	40	267	1.21 b	
6	89.62	182.27	87	42	31	191	0.77 c	
7	92.73	188.49	92	52	40	267	1.12 d	
8	112.55	228.11	16	25	19	94	0.49 a	NET< CL
9	128.98	260.94	34	37	29	164	0.80 a	
10	185.83	374.57	342	60	39	222	1.47 a	
11	238.39	479.62	431	58	33	194	1.39 a	
12	241.57	485.97	421	55	31	172	1.31 b	
13	269.70	542.20	58	38	29	144	1.51 a	
14	295.02	592.81	760	64	27	130	1.32 a	
15	299.74	602.25	35	37	29	146	1.48 b	
16	337.75	678.21	69	35	25	116	1.39 a	
17	351.62	705.93	1314	78	25	112	1.36 a	
18	510.80	1024.09	101	34	23	81	2.28 a	
19	582.90	1168.19	134	33	20	65	2.01 a	
20	608.99	1220.34	919	66	21	78	1.74 a	
21	661.36	1325.02	65	27	17	59	1.51 a	
22	726.61	1455.44	25	22	16	50	1.91 a	
23	768.14	1538.44	82	27	16	52	1.59 a	
24	911.19	1824.35	77	25	15	43	1.61 a	

141336D04.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	933.67	1869.28	33	20	13	36	1.66	a
26	1119.61	2240.93	193	33	14	29	3.11	a
27	1238.06	2477.67	42	21	14	33	2.37	a
28	1279.75	2561.00	22	17	12	23	2.42	a
29	1377.26	2755.89	36	17	10	18	2.24	a
30	1460.18	2921.62	117	27	13	26	2.75	a
31	1764.09	3529.05	136	25	8	10	3.13	a

141336D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.57	286	57	38	282	57	38	
2	76.86	508	64	38	505	65	38	
4	84.13	31	28	22	29	29	22	
7	92.73	92	52	40	67	52	41	
10	185.83	342	60	39	322	61	40	
11	238.39	431	58	33	422	58	34	
12	241.57	421	55	31	419	56	31	
14	295.02	760	64	27	756	64	27	
17	351.62	1314	78	25	1307	79	25	
18	510.80	101	34	23	44	36	27	
19	582.90	134	33	20	132	33	20	
20	608.99	919	66	21	914	66	22	
24	911.19	77	25	15	75	25	15	
30	1460.18	117	27	13	107	27	14	

141336D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-30 GS140724-2

Sampling Start:	07/17/2014 12:00:00	Counting Start:	08/17/2014 08:08:39
Sampling Stop:	07/17/2014 12:00:00	Decay Time.	7.40e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	2700 Sec
Sample Size	2.05e+002 g	Real Time	2706 Sec
Collection Efficiency	1.0000	Spectrum File	.141336D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.17E+01 +- 4.63E-01	. . . .	. . . .	1.40E+07
	295.21		1.11E+01 +- 9.44E-01	8.38E-01	3.99E-01	1.40E+07
	351.92		1.23E+01 +- 7.37E-01	5.02E-01	2.38E-01	1.40E+07
	609.31		1.13E+01 +- 8.19E-01	5.80E-01	2.73E-01	1.40E+07
	1120.29		1.27E+01 +- 2.14E+00	2.03E+00	9.24E-01	1.40E+07

MEASURED TOTAL: 1.17E+01 +- 4.63E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.57	152.19	282	57	38	263	0.98	Unknown
2	76.86	156.77	505	65	38	263	0.96	Unknown
3	79.06	161.17	25	30	23	132	0.46	Unknown
4	84.13	171.29	29	29	22	115	0.47	Unknown
5	87.04	177.11	162	54	40	267	1.21	Unknown
6	89.62	182.27	87	42	31	191	0.77	Unknown
7	92.73	188.49	67	52	41	267	1.12	Unknown
8	128.98	260.94	34	37	29	164	0.80	Unknown
9	185.83	374.57	322	61	40	222	1.47	Unknown
10	238.39	479.62	422	58	34	194	1.39	Unknown

141336D04.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
11	241.57	485.97	419	56	31	172	1.31	Unknown
12	269.70	542.20	58	38	29	144	1.51	Unknown
14	299.74	602.25	35	37	29	146	1.48	Unknown
15	337.75	678.21	69	35	25	116	1.39	Unknown
17	510.80	1024.09	44	36	27	81	2.28	Unknown
18	582.90	1168.19	132	33	20	65	2.01	Unknown
20	661.36	1325.02	65	27	17	59	1.51	Unknown
21	726.61	1455.44	25	22	16	50	1.91	Unknown
22	768.14	1538.44	82	27	16	52	1.59	Unknown
23	911.19	1824.35	75	25	15	43	1.61	Unknown
24	933.67	1869.28	33	20	13	36	1.66	Unknown
26	1238.06	2477.67	42	21	14	33	2.37	Unknown
27	1279.75	2561.00	22	17	12	23	2.42	Unknown
28	1377.26	2755.89	36	17	10	18	2.24	Unknown
29	1460.18	2921.62	107	27	14	26	2.75	Unknown
30	1764.09	3529.05	136	25	8	10	3.13	Unknown

c:\SEEKER\BIN\141336d04A.res Analysis Results Saved.

140894D05.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-31 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:45
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	2700 Sec
Sample Size	2.17E+002 g	Real Time	2704 Sec
Collection Efficiency	1.0000	Spc. File	.140894D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.76 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.19	93.83	44	52	41	346	0.81 a	
2	74.79	151.00	297	65	45	412	0.80 a	
3	77.02	155.46	634	75	45	412	0.78 b	
4	84.54	170.48	70	65	52	459	1.17 a	
5	87.15	175.69	298	66	46	393	0.90 b	
6	89.78	180.96	111	53	40	328	0.84 c	
7	92.71	186.81	49	51	40	328	0.83 d	
8	105.82	213.00	11	27	21	125	0.39 a	NET< CL
9	149.97	301.25	27	36	28	199	0.41 a	NET< CL
10	158.97	319.24	7	44	36	284	0.65 a	NET< CL
11	161.35	324.00	9	36	29	213	0.42 b	NET< CL
12	172.86	347.00	9	35	28	194	0.43 a	NET< CL
13	186.08	373.42	716	73	41	332	0.88 a	
14	192.77	386.79	35	55	44	360	1.00 a	NET< CL
15	238.54	478.26	433	61	36	243	0.96 a	
16	241.81	484.81	1100	80	36	243	0.98 b	
17	258.63	518.42	59	30	21	112	0.52 a	
18	270.16	541.45	38	49	39	260	1.18 a	NET< CL
19	295.07	591.25	2187	103	35	226	0.96 a	
20	338.23	677.50	76	47	36	225	1.13 a	
21	351.81	704.65	3661	127	32	191	1.06 a	
22	454.99	910.87	25	23	17	67	0.72 a	
23	486.84	974.53	41	33	25	114	1.29 a	
24	510.78	1022.38	181	50	35	154	2.49 a	Wide Pk

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	583.13	1166.97	122	36	24	113	1.16	a
26	609.26	1219.19	2636	106	22	91	1.30	a
27	665.48	1331.56	62	27	18	71	1.06	a
28	727.25	1455.01	28	20	14	43	0.90	a
29	768.26	1536.96	217	39	21	78	1.37	a
30	786.00	1572.42	57	26	18	60	1.10	a
31	806.07	1612.54	49	26	18	58	1.28	a
32	838.53	1677.42	41	35	27	100	2.35	a
33	911.00	1822.25	82	34	24	90	2.15	a
34	933.95	1868.13	84	29	19	67	1.40	a
35	969.13	1938.42	32	20	14	43	0.90	a
36	1120.27	2240.51	587	52	15	40	1.70	a
37	1155.09	2310.08	51	24	16	48	1.49	a
38	1207.77	2415.38	16	15	10	24	1.04	a
39	1238.14	2476.08	225	35	15	40	1.78	a
40	1281.10	2561.93	36	24	17	46	2.11	a
41	1377.62	2754.84	153	30	15	39	1.91	a
42	1401.14	2801.86	40	26	19	54	2.76	a
43	1407.92	2815.39	108	28	15	41	2.15	b
44	1461.05	2921.59	127	29	15	41	1.78	a
45	1509.31	3018.03	54	23	14	41	1.59	a
46	1661.01	3321.23	29	18	12	26	2.29	a
47	1729.69	3458.49	99	23	9	17	1.83	a
48	1764.53	3528.13	447	44	10	18	2.17	a
49	1847.31	3693.58	60	19	10	16	2.29	a

140894D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
7	92.71	49	51	40	38	52	41	NET<CL
13	186.08	716	73	41	706	73	41	
15	238.54	433	61	36	421	61	37	
16	241.81	1100	80	36	1098	80	37	
17	258.63	59	30	21	56	31	22	
19	295.07	2187	103	35	2184	103	35	
20	338.23	76	47	36	73	48	37	
21	351.81	3661	127	32	3653	127	33	
24	510.78	181	50	35	109	51	38	
25	583.13	122	36	24	118	37	25	
26	609.26	2636	106	22	2629	106	23	
33	911.00	82	34	24	79	34	24	
35	969.13	32	20	14	30	20	14	
44	1461.05	127	29	15	107	29	17	
48	1764.53	447	44	10	446	44	11	

140894D05.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-31 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:45
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	2700 Sec
Sample Size	2.17e+002 g	Real Time	2704 Sec
Collection Efficiency	1.0000	Spectrum File	.140894D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014

Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-210	46.50		2.14E+02 +- 2.54E+02	4.18E+02	2.02E+02	1.95E+05
Th-234	92.50	N	2.12E+00 +- 2.87E+00	4.74E+00	2.29E+00	3.92E+13
U-235	143.76	N	-2.81E-01 +- 8.33E-01	1.43E+00	6.94E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		2.16E+00 +- 3.12E-01	3.93E-01	1.89E-01	1.67E+04
Pb-214	Average:x		2.53E+01 +- 7.10E-01	. . . .	. . . .	1.40E+07
	295.22		2.54E+01 +- 1.20E+00	8.55E-01	4.12E-01	1.40E+07
	351.99		2.53E+01 +- 8.82E-01	4.76E-01	2.28E-01	1.40E+07
Ac-228	Average:x		1.39E+00 +- 4.51E-01	. . . .	. . . .	1.23E+14
	338.40		1.62E+00 +- 1.06E+00	1.68E+00	8.12E-01	1.23E+14
	911.07		1.61E+00 +- 6.98E-01	1.04E+00	4.90E-01	1.23E+14
	968.90		1.06E+00 +- 7.14E-01	1.08E+00	4.95E-01	1.23E+14
Tl-208	583.14		5.41E-01 +- 1.69E-01	2.38E-01	1.13E-01	1.67E+04
Bi-214	Average:x		2.25E+01 +- 8.27E-01	. . . .	. . . .	1.40E+07
	609.32		2.22E+01 +- 8.99E-01	4.14E-01	1.96E-01	1.40E+07
	1120.28		2.40E+01 +- 2.12E+00	1.32E+00	6.03E-01	1.40E+07
Bi-212	727.17		1.98E+00 +- 1.37E+00	2.10E+00	9.53E-01	1.67E+04
K-40	1460.75		7.35E+00 +- 2.00E+00	2.50E+00	1.16E+00	1.12E+13
Am-241	59.54	N	3.98E-01 +- 2.81E+00	4.77E+00	2.30E+00	3.80E+06
Cs-137	661.62	N	1.51E-01 +- 1.29E-01	2.06E-01B	9.63E-02	2.64E+05
Pa-234m	1001.03	N	6.72E+00 +- 2.20E+01	3.78E+01	1.76E+01	3.92E+13
Eu-154	1004.80	N	-4.77E-01 +- 6.89E-01	1.29E+00	6.02E-01	7.45E+04
Co-60	1332.51	N	-1.09E-01 +- 1.14E-01	2.28E-01	1.04E-01	4.62E+04
Eu-152	1408.08	N	1.44E+00 +- 1.50E+00	2.33E+00r	1.12E+00	1.17E+05

140894D05.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 2.86E+02 +- 2.89E+02 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	74.79	151.00	297	65	45	412	0.80	Unknown
3	77.02	155.46	634	75	45	412	0.78	Unknown
4	84.54	170.48	70	65	52	459	1.17	Unknown
5	87.15	175.69	298	66	46	393	0.90	Unknown
6	89.78	180.96	111	53	40	328	0.84	Unknown
8	105.82	213.00	11	27	21	125	0.39	Deleted
9	149.97	301.25	27	36	28	199	0.41	Deleted
10	158.97	319.24	7	44	36	284	0.65	Deleted
11	161.35	324.00	9	36	29	213	0.42	Deleted
12	172.86	347.00	9	35	28	194	0.43	Deleted
14	192.77	386.79	35	55	44	360	1.00	Deleted
16	241.81	484.81	1098	80	37	243	0.98	Unknown
17	258.63	518.42	56	31	22	112	0.52	Unknown
18	270.16	541.45	38	49	39	260	1.18	Deleted
22	454.99	910.87	25	23	17	67	0.72	Unknown
23	486.84	974.53	41	33	25	114	1.29	Unknown
24	510.78	1022.38	109	51	38	154	2.49	Unknown
27	665.48	1331.56	62	27	18	71	1.06	Unknown
29	768.26	1536.96	217	39	21	78	1.37	Unknown
30	786.00	1572.42	57	26	18	60	1.10	Unknown
31	806.07	1612.54	49	26	18	58	1.28	Unknown
32	838.53	1677.42	41	35	27	100	2.35	Unknown
34	933.95	1868.13	84	29	19	67	1.40	Unknown
37	1155.09	2310.08	51	24	16	48	1.49	Unknown
38	1207.77	2415.38	16	15	10	24	1.04	Unknown
39	1238.14	2476.08	225	35	15	40	1.78	Unknown
40	1281.10	2561.93	36	24	17	46	2.11	Unknown
41	1377.62	2754.84	153	30	15	39	1.91	Unknown
42	1401.14	2801.86	40	26	19	54	2.76	Unknown
43	1407.92	2815.39	108	28	15	41	2.15	Unknown
45	1509.31	3018.03	54	23	14	41	1.59	Unknown
46	1661.01	3321.23	29	18	12	26	2.29	Unknown
47	1729.69	3458.49	99	23	9	17	1.83	Unknown
48	1764.53	3528.13	446	44	11	18	2.17	Unknown
49	1847.31	3693.58	60	20	10	16	2.29	Unknown

c:\SEEKER\BIN\140894d05.res Analysis Results Saved.

140894D05.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-31 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:45
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	2700 Sec
Sample Size	2.17E+002 g	Real Time	2704 Sec
Collection Efficiency	1.0000	Spc. File	.140894D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.76 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.19	93.83	44	52	41	346	0.81 a	
2	74.79	151.00	297	65	45	412	0.80 a	
3	77.02	155.46	634	75	45	412	0.78 b	
4	84.54	170.48	70	65	52	459	1.17 a	
5	87.15	175.69	298	66	46	393	0.90 b	
6	89.78	180.96	111	53	40	328	0.84 c	
7	92.71	186.81	49	51	40	328	0.83 d	
8	105.82	213.00	11	27	21	125	0.39 a	NET< CL
9	149.97	301.25	27	36	28	199	0.41 a	NET< CL
10	158.97	319.24	7	44	36	284	0.65 a	NET< CL
11	161.35	324.00	9	36	29	213	0.42 b	NET< CL
12	172.86	347.00	9	35	28	194	0.43 a	NET< CL
13	186.08	373.42	716	73	41	332	0.88 a	
14	192.77	386.79	35	55	44	360	1.00 a	NET< CL
15	238.54	478.26	433	61	36	243	0.96 a	
16	241.81	484.81	1100	80	36	243	0.98 b	
17	258.63	518.42	59	30	21	112	0.52 a	
18	270.16	541.45	38	49	39	260	1.18 a	NET< CL
19	295.07	591.25	2187	103	35	226	0.96 a	
20	338.23	677.50	76	47	36	225	1.13 a	
21	351.81	704.65	3661	127	32	191	1.06 a	
22	454.99	910.87	25	23	17	67	0.72 a	
23	486.84	974.53	41	33	25	114	1.29 a	
24	510.78	1022.38	181	50	35	154	2.49 a	Wide Pk

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	583.13	1166.97	122	36	24	113	1.16	a
26	609.26	1219.19	2636	106	22	91	1.30	a
27	665.48	1331.56	62	27	18	71	1.06	a
28	727.25	1455.01	28	20	14	43	0.90	a
29	768.26	1536.96	217	39	21	78	1.37	a
30	786.00	1572.42	57	26	18	60	1.10	a
31	806.07	1612.54	49	26	18	58	1.28	a
32	838.53	1677.42	41	35	27	100	2.35	a
33	911.00	1822.25	82	34	24	90	2.15	a
34	933.95	1868.13	84	29	19	67	1.40	a
35	969.13	1938.42	32	20	14	43	0.90	a
36	1120.27	2240.51	587	52	15	40	1.70	a
37	1155.09	2310.08	51	24	16	48	1.49	a
38	1207.77	2415.38	16	15	10	24	1.04	a
39	1238.14	2476.08	225	35	15	40	1.78	a
40	1281.10	2561.93	36	24	17	46	2.11	a
41	1377.62	2754.84	153	30	15	39	1.91	a
42	1401.14	2801.86	40	26	19	54	2.76	a
43	1407.92	2815.39	108	28	15	41	2.15	b
44	1461.05	2921.59	127	29	15	41	1.78	a
45	1509.31	3018.03	54	23	14	41	1.59	a
46	1661.01	3321.23	29	18	12	26	2.29	a
47	1729.69	3458.49	99	23	9	17	1.83	a
48	1764.53	3528.13	447	44	10	18	2.17	a
49	1847.31	3693.58	60	19	10	16	2.29	a

140894D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
7	92.71	49	51	40	38	52	41	NET<CL
13	186.08	716	73	41	706	73	41	
15	238.54	433	61	36	421	61	37	
16	241.81	1100	80	36	1098	80	37	
17	258.63	59	30	21	56	31	22	
19	295.07	2187	103	35	2184	103	35	
20	338.23	76	47	36	73	48	37	
21	351.81	3661	127	32	3653	127	33	
24	510.78	181	50	35	109	51	38	
25	583.13	122	36	24	118	37	25	
26	609.26	2636	106	22	2629	106	23	
33	911.00	82	34	24	79	34	24	
35	969.13	32	20	14	30	20	14	
44	1461.05	127	29	15	107	29	17	
48	1764.53	447	44	10	446	44	11	

140894D05.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-31 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:45
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	2700 Sec
Sample Size	2.17e+002 g	Real Time	2704 Sec
Collection Efficiency	1.0000	Spectrum File	.140894D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014
Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	2.41E+01 +- 5.39E-01	. . . .	. . . .	1.40E+07
	295.21		2.54E+01 +- 1.20E+00	8.55E-01	4.12E-01	1.40E+07
	351.92		2.53E+01 +- 8.82E-01	4.75E-01	2.28E-01	1.40E+07
	609.31		2.22E+01 +- 8.99E-01	4.14E-01	1.96E-01	1.40E+07
	1120.29		2.40E+01 +- 2.12E+00	1.32E+00	6.03E-01	1.40E+07

MEASURED TOTAL: 2.41E+01 +- 5.39E-01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.19	93.83	44	52	41	346	0.81	Unknown
2	74.79	151.00	297	65	45	412	0.80	Unknown
3	77.02	155.46	634	75	45	412	0.78	Unknown
4	84.54	170.48	70	65	52	459	1.17	Unknown
5	87.15	175.69	298	66	46	393	0.90	Unknown
6	89.78	180.96	111	53	40	328	0.84	Unknown
7	186.08	373.42	706	73	41	332	0.88	Unknown
8	238.54	478.26	421	61	37	243	0.96	Unknown
9	241.81	484.81	1098	80	37	243	0.98	Unknown
10	258.63	518.42	56	31	22	112	0.52	Unknown

140894D05.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	338.23	677.50	73	48	37	225	1.13	Unknown
14	454.99	910.87	25	23	17	67	0.72	Unknown
15	486.84	974.53	41	33	25	114	1.29	Unknown
16	510.78	1022.38	109	51	38	154	2.49	Unknown
17	583.13	1166.97	118	37	25	113	1.16	Unknown
19	665.48	1331.56	62	27	18	71	1.06	Unknown
20	727.25	1455.01	28	20	14	43	0.90	1238SEsc
21	768.26	1536.96	217	39	21	78	1.37	Unknown
22	786.00	1572.42	57	26	18	60	1.10	Unknown
23	806.07	1612.54	49	26	18	58	1.28	Unknown
24	838.53	1677.42	41	35	27	100	2.35	Unknown
25	911.00	1822.25	79	34	24	90	2.15	Unknown
26	933.95	1868.13	84	29	19	67	1.40	Unknown
27	969.13	1938.42	30	20	14	43	0.90	Unknown
29	1155.09	2310.08	51	24	16	48	1.49	Unknown
30	1207.77	2415.38	16	15	10	24	1.04	Unknown
31	1238.14	2476.08	225	35	15	40	1.78	Unknown
32	1281.10	2561.93	36	24	17	46	2.11	Unknown
33	1377.62	2754.84	153	30	15	39	1.91	Unknown
34	1401.14	2801.86	40	26	19	54	2.76	Unknown
35	1407.92	2815.39	108	28	15	41	2.15	Unknown
36	1461.05	2921.59	107	29	17	41	1.78	Unknown
37	1509.31	3018.03	54	23	14	41	1.59	Unknown
38	1661.01	3321.23	29	18	12	26	2.29	Unknown
39	1729.69	3458.49	99	23	9	17	1.83	Unknown
40	1764.53	3528.13	446	44	11	18	2.17	Unknown
41	1847.31	3693.58	60	20	10	16	2.29	Unknown

c:\SEEKER\BIN\140894d05A.res Analysis Results Saved.

140904D07.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-32 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:51
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.74E+002 g	Real Time	1888 Sec
Collection Efficiency	1.0000	Spc. File	.140904D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.28 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	74.60	153.55	120	33	20	92	0.70	a	
2	76.87	158.09	172	39	24	115	0.83	b	
3	87.04	178.39	66	27	18	81	0.46	a	
4	89.73	183.77	9	23	18	81	0.43	b	NET< CL
5	185.85	375.74	121	34	22	88	0.90	a	
6	209.01	422.00	25	25	19	72	0.85	a	
7	238.48	480.87	275	41	20	74	0.99	a	
8	241.72	487.33	211	44	27	111	1.46	b	
9	295.11	593.96	317	42	18	58	0.98	a	
10	338.28	680.19	56	23	15	39	0.97	a	
11	351.92	707.42	583	54	20	71	1.23	a	
12	510.74	1024.63	52	30	21	68	2.00	a	
13	583.34	1169.63	91	24	13	30	1.39	a	
14	609.49	1221.86	415	44	14	34	1.59	a	
15	661.64	1326.02	19	17	12	30	1.23	a	
16	727.26	1457.07	23	19	14	31	1.92	a	
17	768.39	1539.21	32	17	10	22	1.24	a	
18	911.30	1824.65	55	20	11	23	1.92	a	
19	933.99	1869.97	21	14	9	17	1.52	a	
20	969.34	1940.56	26	17	11	23	1.69	a	
21	1120.22	2241.90	103	23	10	16	2.07	a	
22	1238.51	2478.16	26	14	8	13	1.29	a	
23	1377.42	2755.60	23	15	10	14	2.80	a	
24	1460.49	2921.52	89	21	8	9	2.57	a	

140904D07.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1763.90	3527.50	80	20	7	8	3.04	a

140904D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.60	120	33	20	117	33	21	
2	76.87	172	39	24	169	39	24	
5	185.85	121	34	22	113	35	23	
7	238.48	275	41	20	267	41	21	
8	241.72	211	44	27	210	44	28	
9	295.11	317	42	18	313	42	18	
10	338.28	56	23	15	55	23	15	
11	351.92	583	54	20	577	54	20	
12	510.74	52	30	21	9	31	25	NET<CL
13	583.34	91	24	13	86	25	14	
14	609.49	415	44	14	410	45	15	
18	911.30	55	20	11	53	20	12	
20	969.34	26	17	11	25	17	11	
24	1460.49	89	21	8	82	21	9	
25	1763.90	80	20	7	78	20	8	

140904D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-32 GS140724-2

Sampling Start: 07/18/2014 12:00:00	Counting Start: 08/17/2014 08:08:51
Sampling Stop: 07/18/2014 12:00:00	Decay Time. . . . . 7.16e+002 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.74e+002 g	Real Time . . . . . 1888 Sec
Collection Efficiency 1.0000	Spectrum File 140904D07.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g	)	MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	-4.96E-01 +-	5.77E-01	1.06E+00	5.02E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.74E+00 +-	2.69E-01	2.88E-01	1.35E-01	1.67E+04
Pb-214	Average:x		5.44E+00 +-	4.17E-01	. . . .	. . . .	1.40E+07
	295.22		5.17E+00 +-	6.89E-01	6.48E-01	3.02E-01	1.40E+07
	351.99		5.60E+00 +-	5.23E-01	4.18E-01	1.96E-01	1.40E+07
Ac-228	Average:x		1.50E+00 +-	3.92E-01	. . . .	. . . .	1.23E+14
	338.40		1.70E+00 +-	7.23E-01	1.00E+00	4.60E-01	1.23E+14
	911.07		1.51E+00 +-	5.72E-01	7.29E-01	3.26E-01	1.23E+14
	968.90		1.21E+00 +-	8.09E-01	1.20E+00	5.35E-01	1.23E+14
Tl-208	583.14		5.48E-01 +-	1.59E-01	1.92E-01	8.74E-02	1.67E+04
Bi-214	Average:x		4.95E+00 +-	4.86E-01	. . . .	. . . .	1.40E+07
	609.32		4.81E+00 +-	5.22E-01	3.89E-01	1.79E-01	1.40E+07
	1120.28		5.81E+00 +-	1.32E+00	1.23E+00	5.39E-01	1.40E+07
Cs-137	661.62		1.31E-01 +-	1.16E-01	1.83E-01	8.23E-02	2.64E+05
Bi-212	727.17		2.18E+00 +-	1.84E+00	2.89E+00	1.32E+00	1.67E+04
K-40	1460.75		7.77E+00 +-	1.99E+00	1.94E+00	8.44E-01	1.12E+13
Pb-210	46.50	N	-2.11E+00 +-	1.96E+01	3.46E+01	1.62E+01	1.95E+05
Am-241	59.54	N	8.30E-01 +-	9.30E-01	1.52E+00	7.12E-01	3.80E+06
Th-234	92.50	N	4.60E-01 +-	1.75E+00	2.99E+00	1.42E+00	3.92E+13
Pa-234m	1001.03	N	0.00E+00 +-	1.55E+01	2.90E+01	1.27E+01	3.92E+13
Eu-154	1004.80	N	1.32E-01 +-	4.88E-01	8.82E-01	3.82E-01	7.45E+04
Co-60	1332.51	N	-5.06E-02 +-	1.03E-01	2.11E-01	9.23E-02	4.62E+04
Eu-152	1408.08	N	3.02E-01 +-	6.72E-01	1.16E+00	5.15E-01	1.17E+05

140904D07.SPC Analyzed by

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)

MEASURED TOTAL: 2.60E+01 +- 9.51E+00 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.60	153.55	117	33	21	92	0.70	Unknown
2	76.87	158.09	169	39	24	115	0.83	Unknown
3	87.04	178.39	66	27	18	81	0.46	Unknown
4	89.73	183.77	9	23	18	81	0.43	Deleted
6	209.01	422.00	25	25	19	72	0.85	Unknown
8	241.72	487.33	210	44	28	111	1.46	Unknown
12	510.74	1024.63	9	31	25	68	2.00	Deleted
17	768.39	1539.21	32	17	10	22	1.24	Unknown
19	933.99	1869.97	21	14	9	17	1.52	Unknown
22	1238.51	2478.16	26	14	8	13	1.29	Unknown
23	1377.42	2755.60	23	15	10	14	2.80	Unknown
25	1763.90	3527.50	78	20	8	8	3.04	Unknown

c:\SEEKER\BIN\140904d07.res Analysis Results Saved.

140904D07.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-32 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:51
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.74E+002 g	Real Time	1888 Sec
Collection Efficiency	1.0000	Spc. File	.140904D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.28 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	74.60	153.55	120	33	20	92	0.70	a	
2	76.87	158.09	172	39	24	115	0.83	b	
3	87.04	178.39	66	27	18	81	0.46	a	
4	89.73	183.77	9	23	18	81	0.43	b	NET< CL
5	185.85	375.74	121	34	22	88	0.90	a	
6	209.01	422.00	25	25	19	72	0.85	a	
7	238.48	480.87	275	41	20	74	0.99	a	
8	241.72	487.33	211	44	27	111	1.46	b	
9	295.11	593.96	317	42	18	58	0.98	a	
10	338.28	680.19	56	23	15	39	0.97	a	
11	351.92	707.42	583	54	20	71	1.23	a	
12	510.74	1024.63	52	30	21	68	2.00	a	
13	583.34	1169.63	91	24	13	30	1.39	a	
14	609.49	1221.86	415	44	14	34	1.59	a	
15	661.64	1326.02	19	17	12	30	1.23	a	
16	727.26	1457.07	23	19	14	31	1.92	a	
17	768.39	1539.21	32	17	10	22	1.24	a	
18	911.30	1824.65	55	20	11	23	1.92	a	
19	933.99	1869.97	21	14	9	17	1.52	a	
20	969.34	1940.56	26	17	11	23	1.69	a	
21	1120.22	2241.90	103	23	10	16	2.07	a	
22	1238.51	2478.16	26	14	8	13	1.29	a	
23	1377.42	2755.60	23	15	10	14	2.80	a	
24	1460.49	2921.52	89	21	8	9	2.57	a	

140904D07.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1763.90	3527.50	80	20	7	8	3.04	a

140904D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.60	120	33	20	117	33	21	
2	76.87	172	39	24	169	39	24	
5	185.85	121	34	22	113	35	23	
7	238.48	275	41	20	267	41	21	
8	241.72	211	44	27	210	44	28	
9	295.11	317	42	18	313	42	18	
10	338.28	56	23	15	55	23	15	
11	351.92	583	54	20	577	54	20	
12	510.74	52	30	21	9	31	25	NET<CL
13	583.34	91	24	13	86	25	14	
14	609.49	415	44	14	410	45	15	
18	911.30	55	20	11	53	20	12	
20	969.34	26	17	11	25	17	11	
24	1460.49	89	21	8	82	21	9	
25	1763.90	80	20	7	78	20	8	

140904D07.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-32 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:51
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.74e+002 g	Real Time	1888 Sec
Collection Efficiency	1.0000	Spectrum File	.140904D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)
Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)
Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	5.23E+00 +- 3.16E-01	. . . .	. . . .	1.40E+07
	295.21		5.17E+00 +- 6.89E-01	6.48E-01	3.01E-01	1.40E+07
	351.92		5.60E+00 +- 5.23E-01	4.18E-01	1.96E-01	1.40E+07
	609.31		4.81E+00 +- 5.22E-01	3.89E-01	1.79E-01	1.40E+07
	1120.29		5.81E+00 +- 1.32E+00	1.23E+00	5.39E-01	1.40E+07

MEASURED TOTAL: 5.23E+00 +- 3.16E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.60	153.55	117	33	21	92	0.70	Unknown
2	76.87	158.09	169	39	24	115	0.83	Unknown
3	87.04	178.39	66	27	18	81	0.46	Unknown
4	185.85	375.74	113	35	23	88	0.90	Unknown
5	209.01	422.00	25	25	19	72	0.85	Unknown
6	238.48	480.87	267	41	21	74	0.99	Unknown
7	241.72	487.33	210	44	28	111	1.46	Unknown
9	338.28	680.19	55	23	15	39	0.97	Unknown
11	583.34	1169.63	86	25	14	30	1.39	Unknown
13	661.64	1326.02	19	17	12	30	1.23	Unknown
14	727.26	1457.07	23	19	14	31	1.92	Unknown

140904D07.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	768.39	1539.21	32	17	10	22	1.24	Unknown
16	911.30	1824.65	53	20	12	23	1.92	Unknown
17	933.99	1869.97	21	14	9	17	1.52	Unknown
18	969.34	1940.56	25	17	11	23	1.69	Unknown
20	1238.51	2478.16	26	14	8	13	1.29	Unknown
21	1377.42	2755.60	23	15	10	14	2.80	Unknown
22	1460.49	2921.52	82	21	9	9	2.57	Unknown
23	1763.90	3527.50	78	20	8	8	3.04	Unknown

c:\SEEKER\BIN\140904d07A.res Analysis Results Saved.

140843D08.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-33 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:57
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.56E+002 g	Real Time	1888 Sec
Collection Efficiency	1.0000	Spc. File	.140843D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	46.30	96.51	10322	285	164	5988	0.70	a	
2	53.00	109.88	4366	245	170	6377	0.69	a	
3	74.68	153.16	33827	496	274	15082	0.80	a	HiResid
4	76.89	157.58	55398	560	250	12604	0.78	b	HiResid
5	79.17	162.12	3673	267	196	8479	0.62	c	HiResid
6	81.11	166.00	77	148	121	4051	0.34	d	NET< CL HiResid
7	83.78	171.34	592	192	153	5774	0.53	e	HiResid
8	87.08	177.93	18214	394	236	10293	1.00	f	HiResid
9	89.69	183.14	7191	319	222	9138	0.91	g	HiResid
10	92.30	188.36	162	161	131	4236	0.56	h	HiResid
11	94.61	192.96	231	256	209	8109	0.92	i	HiResid
12	97.42	198.57	108	186	152	5100	0.61	j	NET< CL HiResid
13	167.08	337.68	209	194	158	5508	0.71	a	
14	186.06	375.58	20565	365	185	6923	0.89	a	
15	196.16	395.73	223	190	154	5280	0.62	a	
16	238.75	480.79	464	207	167	5137	1.01	a	
17	241.84	486.96	27588	389	167	5137	0.93	b	
18	258.73	520.68	1711	184	136	3702	0.84	a	
19	274.44	552.05	1616	261	204	6156	1.42	a	
20	280.85	564.84	161	160	130	3420	0.87	b	
21	295.10	593.30	59361	520	149	4095	0.99	a	
22	314.36	631.76	238	147	118	2825	0.83	a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
23	332.91	668.81	150	167	136	3397	1.01	a	
24	349.19	701.32	973	315	254	7161	2.32	a	HiResid Wide Pk
25	351.86	706.65	98664	647	129	3069	1.05	b	HiResid
26	386.70	776.21	649	141	108	2372	0.85	a	
27	388.73	780.27	1018	199	155	3795	1.38	b	
28	405.62	813.99	385	179	144	3513	1.17	a	
29	423.24	849.17	31	292	240	6708	2.05	a	NET< CL Wide Pk
30	438.45	879.55	125	150	122	2545	1.12	a	
31	454.82	912.23	466	118	91	1656	0.86	a	
32	461.80	926.18	478	158	125	2467	1.33	a	
33	469.71	941.98	207	110	87	1528	0.80	a	
34	474.46	951.45	182	124	100	1834	1.00	b	
35	480.38	963.27	734	142	108	1974	1.07	a	
36	487.07	976.64	822	152	115	2111	1.32	a	
37	501.53	1005.50	125	147	119	2345	1.56	a	
38	510.77	1023.96	629	191	151	3218	2.08	a	Wide Pk
39	533.60	1069.55	332	104	80	1345	1.00	a	
40	543.40	1089.12	175	134	108	2022	1.40	a	
41	572.42	1147.06	114	118	96	1695	1.37	a	
42	580.18	1162.55	553	116	87	1496	1.16	a	
43	599.03	1200.20	110	113	92	1550	1.39	a	
44	609.36	1220.81	72612	551	94	1626	1.28	a	
45	665.46	1332.85	2102	134	81	1198	1.31	a	
46	683.05	1367.96	113	81	64	874	0.96	a	
47	703.11	1408.03	631	113	83	1268	1.29	a	
48	719.88	1441.52	566	116	87	1328	1.42	a	
49	722.97	1447.68	111	99	80	1180	1.29	b	
50	742.44	1486.57	340	128	101	1579	1.82	a	
51	752.63	1506.91	117	81	64	870	0.98	a	
52	768.31	1538.21	6608	192	84	1221	1.47	a	
53	785.83	1573.19	1455	129	85	1269	1.49	a	
54	806.13	1613.74	1439	129	86	1277	1.39	a	
55	821.01	1643.44	163	91	72	1025	1.07	a	
56	826.18	1653.78	118	117	94	1464	1.59	b	
57	838.98	1679.33	905	118	83	1209	1.54	a	
58	904.68	1810.53	86	80	64	940	0.96	a	
59	933.92	1868.91	3321	151	80	1254	1.50	a	
60	963.90	1928.77	448	99	74	1063	1.53	a	
61	1051.81	2104.32	334	90	68	892	1.39	a	
62	1069.83	2140.29	211	74	56	686	1.11	a	
63	1104.01	2208.55	161	109	87	1212	2.06	a	
64	1120.14	2240.76	14771	259	73	995	1.67	a	
65	1133.53	2267.49	233	91	71	921	1.72	a	
66	1154.96	2310.29	1731	119	70	893	1.68	a	
67	1181.57	2363.43	146	86	68	861	1.60	a	
68	1203.63	2407.47	19	48	38	365	0.89	a	NET< CL
69	1207.37	2414.93	457	87	63	729	1.66	b	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
70	1237.83	2475.77	5307	169	71	879	1.79 a	
71	1253.37	2506.79	389	125	97	1246	2.87 a	Wide Pk
72	1280.53	2561.02	1234	110	69	843	1.79 a	
73	1303.31	2606.51	65	68	54	624	1.53 a	
74	1377.21	2754.08	3678	144	63	739	1.89 a	
75	1384.86	2769.35	690	93	63	739	1.96 b	
76	1400.90	2801.39	1166	103	64	746	1.96 a	
77	1407.39	2814.34	2004	118	64	746	1.96 b	
78	1508.56	3016.36	1609	115	67	875	1.83 a	
79	1537.97	3075.08	335	84	62	746	1.85 a	
80	1542.69	3084.52	269	73	54	611	1.41 b	
81	1582.39	3163.79	488	79	54	566	1.88 a	
82	1593.84	3186.65	153	61	46	453	1.40 a	
83	1598.79	3196.52	201	75	57	604	1.96 b	
84	1660.45	3319.66	733	77	45	363	2.07 a	
85	1683.16	3365.01	105	42	30	199	1.37 a	
86	1692.24	3383.13	226	73	55	447	2.99 b	
87	1728.67	3455.87	2300	107	38	259	2.05 a	
88	1763.55	3525.53	11273	217	36	226	2.20 a	
89	1837.16	3672.51	262	55	36	216	2.39 a	
90	1846.23	3690.63	1577	90	34	202	2.23 b	
91	1872.11	3742.31	123	48	35	213	2.20 a	
92	1895.08	3788.16	59	36	27	159	1.24 a	
93	1935.13	3868.13	71	55	43	303	2.46 a	

140843D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.30	10322	285	164	10311	285	164	
3	74.68	33827	496	274	33821	496	274	
4	76.89	55398	560	250	55389	560	250	
7	83.78	592	192	153	587	192	153	
8	87.08	18214	394	236	18210	394	236	
10	92.30	162	161	131	137	162	131	
14	186.06	20565	365	185	20553	365	185	
15	196.16	223	190	154	217	190	154	
16	238.75	464	207	167	454	207	167	
21	295.10	59361	520	149	59358	520	149	
25	351.86	98664	647	129	98658	647	129	
38	510.77	630	191	151	582	191	152	
44	609.36	72612	551	94	72607	551	94	

140843D08.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-33 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:57
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.56e+002 g	Real Time	1888 Sec
Collection Efficiency	1.0000	Spectrum File	.140843D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-210	46.50		7.91E+02 +- 2.19E+01	2.55E+01	1.26E+01	1.95E+05
Th-234	92.50		5.20E+00 +- 6.11E+00	1.01E+01	4.98E+00	3.92E+13
U-235	143.76	N	-4.23E-02 +- 4.93E+00	8.16E+00	4.05E+00	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		3.29E+00 +- 1.50E+00	2.44E+00	1.21E+00	1.67E+04
Pb-214	Average:x		1.08E+03 +- 5.66E+00	. . . .	. . . .	1.40E+07
	295.22		1.09E+03 +- 9.57E+00	5.53E+00	2.74E+00	1.40E+07
	351.99		1.07E+03 +- 7.03E+00	2.83E+00	1.40E+00	1.40E+07
Bi-214	Average:x		9.70E+02 +- 6.75E+00	. . . .	. . . .	1.40E+07
	609.32		9.69E+02 +- 7.35E+00	2.54E+00	1.25E+00	1.40E+07
	1120.28		9.75E+02 +- 1.71E+01	9.86E+00	4.84E+00	1.40E+07
Am-241	59.54	N	2.12E+00 +- 1.70E+00	2.79E+00	1.39E+00	3.80E+06
Tl-208	583.14	N	-2.20E-01 +- 8.43E-01	1.99E+00r	9.85E-01	1.67E+04
Cs-137	661.62	N	5.41E-01 +- 7.58E-01	1.25E+00B	6.14E-01	2.64E+05
Bi-212	727.17	N	-1.33E+00 +- 1.04E+01	1.74E+01b	8.55E+00	1.67E+04
Ac-228	911.07	N	7.28E-01 +- 3.35E+00	5.57E+00	2.74E+00	1.23E+14
Pa-234m	1001.03	N	1.70E+01 +- 1.47E+02	2.45E+02	1.20E+02	3.92E+13
Eu-154	1004.80	N	-1.99E+00 +- 4.87E+00	8.23E+00	4.04E+00	7.45E+04
Co-60	1332.51	N	-4.92E-01 +- 8.66E-01	1.48E+00	7.23E-01	4.62E+04
Eu-152	1408.08	N	-3.14E+01 +- 1.02E+01	1.80E+01r	8.94E+00	1.17E+05
K-40	1460.75	N	-7.23E+00 +- 9.43E+00	1.61E+01	7.89E+00	1.12E+13

MEASURED TOTAL: 2.87E+03 +- 1.95E+02 pCi/g

140843D08.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	53.00	109.88	4366	245	170	6377	0.69	Unknown
3	74.68	153.16	33821	496	274	15082	0.80	Unknown
4	76.89	157.58	55389	560	250	12604	0.78	Unknown
5	79.17	162.12	3673	267	196	8479	0.62	Unknown
6	81.11	166.00	77	148	121	4051	0.34	Deleted
7	83.78	171.34	587	192	153	5774	0.53	1104DEsc
8	87.08	177.93	18210	394	236	10293	1.00	Unknown
9	89.69	183.14	7191	319	222	9138	0.91	Unknown
11	94.61	192.96	231	257	209	8109	0.92	Unknown
12	97.42	198.57	108	186	152	5100	0.61	Deleted
13	167.08	337.68	209	194	158	5508	0.71	Unknown
15	196.16	395.73	217	190	154	5280	0.62	Unknown
17	241.84	486.96	27588	389	167	5137	0.93	Unknown
18	258.73	520.68	1711	184	136	3702	0.84	1281DEsc
19	274.44	552.05	1616	261	204	6156	1.42	Unknown
20	280.85	564.84	161	160	130	3420	0.87	Unknown
22	314.36	631.76	238	147	118	2825	0.83	Unknown
23	332.91	668.81	150	167	136	3397	1.01	Unknown
24	349.19	701.32	973	315	254	7161	2.32	Unknown
26	386.70	776.21	649	141	108	2372	0.85	1407DEsc
27	388.73	780.27	1018	199	155	3795	1.38	Unknown
28	405.62	813.99	385	179	144	3513	1.17	Unknown
29	423.24	849.17	31	292	240	6708	2.05	Deleted
30	438.45	879.55	125	150	122	2545	1.12	Unknown
31	454.82	912.23	466	118	91	1656	0.86	Unknown
32	461.80	926.18	478	158	125	2467	1.33	Unknown
33	469.71	941.98	207	110	87	1528	0.80	Unknown
34	474.46	951.45	182	124	100	1834	1.00	Unknown
35	480.38	963.27	734	142	108	1974	1.07	Unknown
36	487.07	976.64	822	152	115	2111	1.32	1509DEsc
37	501.53	1005.50	125	147	119	2345	1.56	Unknown
38	510.77	1023.96	582	191	152	3218	2.08	Unknown
39	533.60	1069.55	332	104	80	1345	1.00	Unknown
40	543.40	1089.12	175	134	108	2022	1.40	Unknown
41	572.42	1147.06	114	118	96	1695	1.37	1594DEsc
42	580.18	1162.55	553	116	87	1496	1.16	Unknown
43	599.03	1200.20	110	113	92	1550	1.39	Unknown
45	665.46	1332.85	2102	134	81	1198	1.31	Unknown
46	683.05	1367.96	113	81	64	874	0.96	Unknown
47	703.11	1408.03	631	113	83	1268	1.29	Unknown
48	719.88	1441.52	566	116	87	1328	1.42	Unknown
49	722.97	1447.68	111	99	80	1180	1.29	Unknown
50	742.44	1486.57	340	128	101	1579	1.82	1764DEsc
51	752.63	1506.91	117	81	64	870	0.98	Unknown
52	768.31	1538.21	6608	192	84	1221	1.47	1281SEsc
53	785.83	1573.19	1455	129	85	1269	1.49	Unknown
54	806.13	1613.74	1439	129	86	1277	1.39	Unknown
55	821.01	1643.44	163	91	72	1025	1.07	Unknown
56	826.18	1653.78	118	117	94	1464	1.59	1846DEsc

140843D08.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
57	838.98	1679.33	905	118	83	1209	1.54	Unknown
58	904.68	1810.53	86	80	64	940	0.96	Unknown
59	933.92	1868.91	3321	151	80	1254	1.50	Unknown
60	963.90	1928.77	448	99	74	1063	1.53	Unknown
61	1051.81	2104.32	334	90	68	892	1.39	Unknown
62	1069.83	2140.29	211	74	56	686	1.11	1582SEsc
63	1104.01	2208.55	161	109	87	1212	2.06	Unknown
65	1133.53	2267.49	233	91	71	921	1.72	Unknown
66	1154.96	2310.29	1731	119	70	893	1.68	Unknown
67	1181.57	2363.43	146	86	68	861	1.60	1692SEsc
68	1203.63	2407.47	19	48	38	365	0.89	Deleted
69	1207.37	2414.93	457	88	63	729	1.66	Unknown
70	1237.83	2475.77	5307	169	71	879	1.79	Unknown
71	1253.37	2506.79	389	125	97	1246	2.87	1764SEsc
72	1280.53	2561.02	1234	110	69	843	1.79	Unknown
73	1303.31	2606.51	65	68	54	624	1.53	Unknown
74	1377.21	2754.08	3678	144	63	739	1.89	Unknown
75	1384.86	2769.35	690	93	63	739	1.96	Unknown
76	1400.90	2801.39	1166	103	64	746	1.96	Unknown
77	1407.39	2814.34	2004	118	64	746	1.96	Unknown
78	1508.56	3016.36	1609	115	67	875	1.83	Unknown
79	1537.97	3075.08	335	84	62	746	1.85	Unknown
80	1542.69	3084.52	269	73	54	611	1.41	Unknown
81	1582.39	3163.79	488	79	54	566	1.88	Unknown
82	1593.84	3186.65	153	61	46	453	1.40	Unknown
83	1598.79	3196.52	201	75	57	604	1.96	Unknown
84	1660.45	3319.66	733	77	45	363	2.07	Unknown
85	1683.16	3365.01	105	42	30	199	1.37	Unknown
86	1692.24	3383.13	226	73	55	447	2.99	Unknown
87	1728.67	3455.87	2300	107	38	259	2.05	Unknown
88	1763.55	3525.53	11273	217	36	226	2.20	Unknown
89	1837.16	3672.51	262	55	36	216	2.39	Unknown
90	1846.23	3690.63	1577	90	34	202	2.23	Unknown
91	1872.11	3742.31	123	48	35	213	2.20	Unknown
92	1895.08	3788.16	59	36	27	159	1.24	Unknown
93	1935.13	3868.13	71	55	43	303	2.46	Unknown

c:\SEEKER\BIN\140843d08.res Analysis Results Saved.

140843D08.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-33 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:57
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.56E+002 g	Real Time	1888 Sec
Collection Efficiency	1.0000	Spc. File	.140843D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.30	96.51	10322	285	164	5988	0.70 a	
2	53.00	109.88	4366	245	170	6377	0.69 a	
3	74.68	153.16	33827	496	274	15082	0.80 a	HiResid
4	76.89	157.58	55398	560	250	12604	0.78 b	HiResid
5	79.17	162.12	3673	267	196	8479	0.62 c	HiResid
6	81.11	166.00	77	148	121	4051	0.34 d	NET< CL HiResid
7	83.78	171.34	592	192	153	5774	0.53 e	HiResid
8	87.08	177.93	18214	394	236	10293	1.00 f	HiResid
9	89.69	183.14	7191	319	222	9138	0.91 g	HiResid
10	92.30	188.36	162	161	131	4236	0.56 h	HiResid
11	94.61	192.96	231	256	209	8109	0.92 i	HiResid
12	97.42	198.57	108	186	152	5100	0.61 j	NET< CL HiResid
13	167.08	337.68	209	194	158	5508	0.71 a	
14	186.06	375.58	20565	365	185	6923	0.89 a	
15	196.16	395.73	223	190	154	5280	0.62 a	
16	238.75	480.79	464	207	167	5137	1.01 a	
17	241.84	486.96	27588	389	167	5137	0.93 b	
18	258.73	520.68	1711	184	136	3702	0.84 a	
19	274.44	552.05	1616	261	204	6156	1.42 a	
20	280.85	564.84	161	160	130	3420	0.87 b	
21	295.10	593.30	59361	520	149	4095	0.99 a	
22	314.36	631.76	238	147	118	2825	0.83 a	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
23	332.91	668.81	150	167	136	3397	1.01	a	
24	349.19	701.32	973	315	254	7161	2.32	a	HiResid Wide Pk
25	351.86	706.65	98664	647	129	3069	1.05	b	HiResid
26	386.70	776.21	649	141	108	2372	0.85	a	
27	388.73	780.27	1018	199	155	3795	1.38	b	
28	405.62	813.99	385	179	144	3513	1.17	a	
29	423.24	849.17	31	292	240	6708	2.05	a	NET< CL Wide Pk
30	438.45	879.55	125	150	122	2545	1.12	a	
31	454.82	912.23	466	118	91	1656	0.86	a	
32	461.80	926.18	478	158	125	2467	1.33	a	
33	469.71	941.98	207	110	87	1528	0.80	a	
34	474.46	951.45	182	124	100	1834	1.00	b	
35	480.38	963.27	734	142	108	1974	1.07	a	
36	487.07	976.64	822	152	115	2111	1.32	a	
37	501.53	1005.50	125	147	119	2345	1.56	a	
38	510.77	1023.96	629	191	151	3218	2.08	a	Wide Pk
39	533.60	1069.55	332	104	80	1345	1.00	a	
40	543.40	1089.12	175	134	108	2022	1.40	a	
41	572.42	1147.06	114	118	96	1695	1.37	a	
42	580.18	1162.55	553	116	87	1496	1.16	a	
43	599.03	1200.20	110	113	92	1550	1.39	a	
44	609.36	1220.81	72612	551	94	1626	1.28	a	
45	665.46	1332.85	2102	134	81	1198	1.31	a	
46	683.05	1367.96	113	81	64	874	0.96	a	
47	703.11	1408.03	631	113	83	1268	1.29	a	
48	719.88	1441.52	566	116	87	1328	1.42	a	
49	722.97	1447.68	111	99	80	1180	1.29	b	
50	742.44	1486.57	340	128	101	1579	1.82	a	
51	752.63	1506.91	117	81	64	870	0.98	a	
52	768.31	1538.21	6608	192	84	1221	1.47	a	
53	785.83	1573.19	1455	129	85	1269	1.49	a	
54	806.13	1613.74	1439	129	86	1277	1.39	a	
55	821.01	1643.44	163	91	72	1025	1.07	a	
56	826.18	1653.78	118	117	94	1464	1.59	b	
57	838.98	1679.33	905	118	83	1209	1.54	a	
58	904.68	1810.53	86	80	64	940	0.96	a	
59	933.92	1868.91	3321	151	80	1254	1.50	a	
60	963.90	1928.77	448	99	74	1063	1.53	a	
61	1051.81	2104.32	334	90	68	892	1.39	a	
62	1069.83	2140.29	211	74	56	686	1.11	a	
63	1104.01	2208.55	161	109	87	1212	2.06	a	
64	1120.14	2240.76	14771	259	73	995	1.67	a	
65	1133.53	2267.49	233	91	71	921	1.72	a	
66	1154.96	2310.29	1731	119	70	893	1.68	a	
67	1181.57	2363.43	146	86	68	861	1.60	a	
68	1203.63	2407.47	19	48	38	365	0.89	a	NET< CL
69	1207.37	2414.93	457	87	63	729	1.66	b	

140843D08.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
70	1237.83	2475.77	5307	169	71	879	1.79	a
71	1253.37	2506.79	389	125	97	1246	2.87	a Wide Pk
72	1280.53	2561.02	1234	110	69	843	1.79	a
73	1303.31	2606.51	65	68	54	624	1.53	a
74	1377.21	2754.08	3678	144	63	739	1.89	a
75	1384.86	2769.35	690	93	63	739	1.96	b
76	1400.90	2801.39	1166	103	64	746	1.96	a
77	1407.39	2814.34	2004	118	64	746	1.96	b
78	1508.56	3016.36	1609	115	67	875	1.83	a
79	1537.97	3075.08	335	84	62	746	1.85	a
80	1542.69	3084.52	269	73	54	611	1.41	b
81	1582.39	3163.79	488	79	54	566	1.88	a
82	1593.84	3186.65	153	61	46	453	1.40	a
83	1598.79	3196.52	201	75	57	604	1.96	b
84	1660.45	3319.66	733	77	45	363	2.07	a
85	1683.16	3365.01	105	42	30	199	1.37	a
86	1692.24	3383.13	226	73	55	447	2.99	b
87	1728.67	3455.87	2300	107	38	259	2.05	a
88	1763.55	3525.53	11273	217	36	226	2.20	a
89	1837.16	3672.51	262	55	36	216	2.39	a
90	1846.23	3690.63	1577	90	34	202	2.23	b
91	1872.11	3742.31	123	48	35	213	2.20	a
92	1895.08	3788.16	59	36	27	159	1.24	a
93	1935.13	3868.13	71	55	43	303	2.46	a

140843D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.30	10322	285	164	10311	285	164	
3	74.68	33827	496	274	33821	496	274	
4	76.89	55398	560	250	55389	560	250	
7	83.78	592	192	153	587	192	153	
8	87.08	18214	394	236	18210	394	236	
10	92.30	162	161	131	137	162	131	
14	186.06	20565	365	185	20553	365	185	
15	196.16	223	190	154	217	190	154	
16	238.75	464	207	167	454	207	167	
21	295.10	59361	520	149	59358	520	149	
25	351.86	98664	647	129	98658	647	129	
38	510.77	630	191	151	582	191	152	
44	609.36	72612	551	94	72607	551	94	

140843D08.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-33 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:08:57
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.16e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.56e+002 g	Real Time	1888 Sec
Collection Efficiency	1.0000	Spectrum File	.140843D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.03E+03 +- 4.34E+00	. . . .	. . . .	1.40E+07
	295.21		1.09E+03 +- 9.57E+00	5.53E+00	2.74E+00	1.40E+07
	351.92		1.07E+03 +- 7.02E+00	2.83E+00	1.40E+00	1.40E+07
	609.31		9.69E+02 +- 7.35E+00	2.54E+00	1.25E+00	1.40E+07
	1120.29		9.75E+02 +- 1.71E+01	9.86E+00	4.84E+00	1.40E+07

MEASURED TOTAL: 1.03E+03 +- 4.34E+00 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.30	96.51	10311	285	164	5988	0.70	1070DEsc
2	53.00	109.88	4366	245	170	6377	0.69	Unknown
3	74.68	153.16	33821	496	274	15082	0.80	Unknown
4	76.89	157.58	55389	560	250	12604	0.78	Unknown
5	79.17	162.12	3673	267	196	8479	0.62	Unknown
6	83.78	171.34	587	192	153	5774	0.53	1104DEsc
7	87.08	177.93	18210	394	236	10293	1.00	Unknown
8	89.69	183.14	7191	319	222	9138	0.91	Unknown
9	92.30	188.36	137	162	131	4236	0.56	Unknown
10	94.61	192.96	231	257	209	8109	0.92	Unknown
11	167.08	337.68	209	194	158	5508	0.71	Unknown

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	186.06	375.58	20553	365	185	6923	0.89	1207DEsc
13	196.16	395.73	217	190	154	5280	0.62	Unknown
14	238.75	480.79	454	207	167	5137	1.01	Unknown
15	241.84	486.96	27588	389	167	5137	0.93	Unknown
16	258.73	520.68	1711	184	136	3702	0.84	1281DEsc
17	274.44	552.05	1616	261	204	6156	1.42	Unknown
18	280.85	564.84	161	160	130	3420	0.87	Unknown
20	314.36	631.76	238	147	118	2825	0.83	Unknown
21	332.91	668.81	150	167	136	3397	1.01	Unknown
22	349.19	701.32	973	315	254	7161	2.32	Unknown
24	386.70	776.21	649	141	108	2372	0.85	1407DEsc
25	388.73	780.27	1018	199	155	3795	1.38	Unknown
26	405.62	813.99	385	179	144	3513	1.17	Unknown
27	438.45	879.55	125	150	122	2545	1.12	Unknown
28	454.82	912.23	466	118	91	1656	0.86	Unknown
29	461.80	926.18	478	158	125	2467	1.33	Unknown
30	469.71	941.98	207	110	87	1528	0.80	Unknown
31	474.46	951.45	182	124	100	1834	1.00	Unknown
32	480.38	963.27	734	142	108	1974	1.07	Unknown
33	487.07	976.64	822	152	115	2111	1.32	1509DEsc
34	501.53	1005.50	125	147	119	2345	1.56	Unknown
35	510.77	1023.96	582	191	152	3218	2.08	Unknown
36	533.60	1069.55	332	104	80	1345	1.00	Unknown
37	543.40	1089.12	175	134	108	2022	1.40	Unknown
38	572.42	1147.06	114	118	96	1695	1.37	1594DEsc
39	580.18	1162.55	553	116	87	1496	1.16	Unknown
40	599.03	1200.20	110	113	92	1550	1.39	Unknown
42	665.46	1332.85	2102	134	81	1198	1.31	Unknown
43	683.05	1367.96	113	81	64	874	0.96	Unknown
44	703.11	1408.03	631	113	83	1268	1.29	Unknown
45	719.88	1441.52	566	116	87	1328	1.42	Unknown
46	722.97	1447.68	111	99	80	1180	1.29	Unknown
47	742.44	1486.57	340	128	101	1579	1.82	1764DEsc
48	752.63	1506.91	117	81	64	870	0.98	Unknown
49	768.31	1538.21	6608	192	84	1221	1.47	1281SEsc
50	785.83	1573.19	1455	129	85	1269	1.49	Unknown
51	806.13	1613.74	1439	129	86	1277	1.39	Unknown
52	821.01	1643.44	163	91	72	1025	1.07	Unknown
53	826.18	1653.78	118	117	94	1464	1.59	1846DEsc
54	838.98	1679.33	905	118	83	1209	1.54	Unknown
55	904.68	1810.53	86	80	64	940	0.96	Unknown
56	933.92	1868.91	3321	151	80	1254	1.50	Unknown
57	963.90	1928.77	448	99	74	1063	1.53	Unknown
58	1051.81	2104.32	334	90	68	892	1.39	Unknown
59	1069.83	2140.29	211	74	56	686	1.11	1582SEsc
60	1104.01	2208.55	161	109	87	1212	2.06	Unknown
62	1133.53	2267.49	233	91	71	921	1.72	Unknown
63	1154.96	2310.29	1731	119	70	893	1.68	Unknown
64	1181.57	2363.43	146	86	68	861	1.60	1692SEsc

140843D08.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
65	1207.37	2414.93	457	88	63	729	1.66	Unknown
66	1237.83	2475.77	5307	169	71	879	1.79	Unknown
67	1253.37	2506.79	389	125	97	1246	2.87	1764SEsc
68	1280.53	2561.02	1234	110	69	843	1.79	Unknown
69	1303.31	2606.51	65	68	54	624	1.53	Unknown
70	1377.21	2754.08	3678	144	63	739	1.89	Unknown
71	1384.86	2769.35	690	93	63	739	1.96	Unknown
72	1400.90	2801.39	1166	103	64	746	1.96	Unknown
73	1407.39	2814.34	2004	118	64	746	1.96	Unknown
74	1508.56	3016.36	1609	115	67	875	1.83	Unknown
75	1537.97	3075.08	335	84	62	746	1.85	Unknown
76	1542.69	3084.52	269	73	54	611	1.41	Unknown
77	1582.39	3163.79	488	79	54	566	1.88	Unknown
78	1593.84	3186.65	153	61	46	453	1.40	Unknown
79	1598.79	3196.52	201	75	57	604	1.96	Unknown
80	1660.45	3319.66	733	77	45	363	2.07	Unknown
81	1683.16	3365.01	105	42	30	199	1.37	Unknown
82	1692.24	3383.13	226	73	55	447	2.99	Unknown
83	1728.67	3455.87	2300	107	38	259	2.05	Unknown
84	1763.55	3525.53	11273	217	36	226	2.20	Unknown
85	1837.16	3672.51	262	55	36	216	2.39	Unknown
86	1846.23	3690.63	1577	90	34	202	2.23	Unknown
87	1872.11	3742.31	123	48	35	213	2.20	Unknown
88	1895.08	3788.16	59	36	27	159	1.24	Unknown
89	1935.13	3868.13	71	55	43	303	2.46	Unknown

c:\SEEKER\BIN\140843d08A.res Analysis Results Saved.

140927D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-34 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:34
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.25E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.140927D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.04 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.76	157.38	38	25	18	58	0.91	a
2	238.55	480.52	97	27	15	43	0.79	a
3	294.82	592.89	37	21	14	28	1.43	a
4	338.55	680.23	28	19	13	30	1.21	a
5	351.73	706.57	65	23	13	29	1.08	a
6	510.98	1024.62	44	22	15	26	2.65	a Wide Pk
7	583.18	1168.82	37	16	9	15	1.21	a
8	609.27	1220.93	35	15	8	14	1.02	a
9	911.16	1823.87	23	12	5	6	1.16	a
10	1460.82	2921.66	97	21	5	5	1.75	a

140927D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	238.55	97	27	15	93	27	16	
3	294.82	37	21	14	34	21	15	
4	338.55	28	19	13	26	19	14	
5	351.73	65	23	13	63	23	14	
6	510.98	44	22	15	5	23	19	NET<CL
7	583.18	37	16	9	34	16	9	
8	609.27	35	15	8	33	16	9	
9	911.16	23	12	5	21	12	6	
10	1460.82	97	21	5	84	21	8	

140927D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-34 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:34
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.25e+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spectrum File	.140927D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-212	238.63		6.20E-01 +- 1.80E-01	2.26E-01	1.04E-01	1.67E+04
Pb-214	Average:x		5.77E-01 +- 1.82E-01	. . . .	. . . .	1.40E+07
	295.22		5.44E-01 +- 3.38E-01	5.07E-01	2.32E-01	1.40E+07
	351.99		5.91E-01 +- 2.16E-01	2.83E-01	1.29E-01	1.40E+07
Ac-228	Average:x		6.53E-01 +- 2.93E-01	. . . . .	. . . .	1.23E+14
	338.40		7.83E-01 +- 5.85E-01	9.02E-01	4.10E-01	1.23E+14
	911.07		6.10E-01 +- 3.39E-01	4.31E-01	1.77E-01	1.23E+14
Tl-208	583.14		2.16E-01 +- 1.03E-01	1.37E-01	5.99E-02	1.67E+04
Bi-214	609.32		3.89E-01 +- 1.85E-01	2.42E-01	1.05E-01	1.40E+07
K-40	1460.75		8.13E+00 +- 2.02E+00	1.85E+00	7.92E-01	1.12E+13
Pb-210	46.50	N	-1.87E+01 +- 6.87E+01	1.27E+02	5.82E+01	1.95E+05
Am-241	59.54	N	-7.31E-01 +- 1.11E+00	2.12E+00	9.76E-01	3.80E+06
Th-234	92.50	N	3.63E-01 +- 1.29E+00	2.24E+00	1.03E+00	3.92E+13
U-235	143.76	N	8.42E-02 +- 4.17E-01	7.29E-01	3.36E-01	6.17E+12
Cs-137	661.62	N	1.35E-02 +- 6.62E-02	1.23E-01	5.22E-02	2.64E+05
Bi-212	727.17	N	1.13E+00 +- 1.19E+00	1.90E+00	8.17E-01	1.67E+04
Pa-234m	1001.03	N	1.35E+00 +- 1.24E+01	2.35E+01	9.92E+00	3.92E+13
Eu-154	1004.80	N	-2.23E-01 +- 3.68E-01	8.09E-01	3.44E-01	7.45E+04
Co-60	1332.51	N	1.09E-02 +- 3.39E-02	7.11E-02	2.20E-02	4.62E+04
Eu-152	1408.08	N	-3.48E-01 +- 3.59E-01	8.66E-01	3.66E-01	1.17E+05

MEASURED TOTAL: 1.35E+01 +- 1.83E+01 pCi/g

140927D01.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.76	157.38	38	25	18	58	0.91	Unknown
6	510.98	1024.62	5	23	19	26	2.65	Deleted

c:\SEEKER\BIN\140927d01.res Analysis Results Saved.

140927D01.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-34 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:34
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.25E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.140927D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.04 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.76	157.38	38	25	18	58	0.91 a	
2	238.55	480.52	97	27	15	43	0.79 a	
3	294.82	592.89	37	21	14	28	1.43 a	
4	338.55	680.23	28	19	13	30	1.21 a	
5	351.73	706.57	65	23	13	29	1.08 a	
6	510.98	1024.62	44	22	15	26	2.65 a	Wide Pk
7	583.18	1168.82	37	16	9	15	1.21 a	
8	609.27	1220.93	35	15	8	14	1.02 a	
9	911.16	1823.87	23	12	5	6	1.16 a	
10	1460.82	2921.66	97	21	5	5	1.75 a	

140927D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	238.55	97	27	15	93	27	16	
3	294.82	37	21	14	34	21	15	
4	338.55	28	19	13	26	19	14	
5	351.73	65	23	13	63	23	14	
6	510.98	44	22	15	5	23	19	NET<CL
7	583.18	37	16	9	34	16	9	
8	609.27	35	15	8	33	16	9	
9	911.16	23	12	5	21	12	6	
10	1460.82	97	21	5	84	21	8	

140927D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-34 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:34
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.25e+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spectrum File	.140927D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	4.84E-01 +- 1.30E-01	. . . .	. . . .	1.40E+07
	295.21		5.44E-01 +- 3.38E-01	5.07E-01	2.32E-01	1.40E+07
	351.92		5.90E-01 +- 2.16E-01	2.83E-01	1.29E-01	1.40E+07
	609.31		3.89E-01 +- 1.85E-01	2.42E-01	1.05E-01	1.40E+07

MEASURED TOTAL: 4.84E-01 +- 1.30E-01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.76	157.38	38	25	18	58	0.91	Unknown
2	238.55	480.52	93	27	16	43	0.79	Unknown
4	338.55	680.23	26	19	14	30	1.21	Unknown
6	583.18	1168.82	34	16	9	15	1.21	Unknown
8	911.16	1823.87	21	12	6	6	1.16	Unknown
9	1460.82	2921.66	84	21	8	5	1.75	Unknown

c:\SEEKER\BIN\140927d01A.res Analysis Results Saved.

141005D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-35 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:40
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.91E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.141005D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.47 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.65	152.00	7	17	13	43	0.44 a	NET< CL
2	87.04	176.74	18	20	15	43	0.90 a	
3	185.45	373.26	46	33	25	83	1.75 a	Wide Pk
4	238.40	479.00	113	31	19	65	0.93 a	
5	295.03	592.09	61	24	15	35	1.39 a	
6	338.20	678.30	20	15	10	19	0.91 a	
7	351.70	705.25	110	26	12	26	1.41 a	
8	511.02	1023.41	64	24	15	32	1.92 a	
9	582.97	1167.10	38	18	11	21	1.39 a	
10	609.25	1219.56	83	21	9	16	1.30 a	
11	910.72	1821.59	23	14	8	13	1.37 a	
12	968.70	1937.37	23	14	9	15	1.40 a	
13	1460.57	2919.62	123	23	4	3	2.42 a	

141005D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	87.04	18	20	15	16	20	15	
3	185.45	46	33	25	37	34	26	
4	238.40	113	31	19	106	31	20	
5	295.03	61	24	15	58	25	16	
6	338.20	20	15	10	18	17	12	
7	351.70	110	26	12	106	26	13	
8	511.02	64	24	15	17	25	19	NET<CL
9	582.97	38	18	11	34	18	12	
10	609.25	83	21	9	76	22	11	
11	910.72	23	14	8	21	14	8	
12	968.70	23	14	9	22	15	9	
13	1460.57	123	23	4	111	23	7	

141005D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-35 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:40
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.91e+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spectrum File	.141005D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	3.17E-01 +- 4.19E-01	6.92E-01	3.19E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		6.63E-01 +- 1.96E-01	2.60E-01	1.22E-01	1.67E+04
Pb-214	Average:x		8.54E-01 +- 1.82E-01	. . . .	. . . .	1.40E+07
	295.22		7.84E-01 +- 3.34E-01	4.70E-01	2.16E-01	1.40E+07
	351.99		8.84E-01 +- 2.17E-01	2.40E-01	1.09E-01	1.40E+07
Ac-228	Average:x		5.69E-01 +- 2.46E-01	. . . .	. . . .	1.23E+14
	338.40		4.67E-01 +- 4.47E-01	7.09E-01	3.18E-01	1.23E+14
	911.07		5.25E-01 +- 3.36E-01	4.77E-01	2.05E-01	1.23E+14
	968.90		9.01E-01 +- 6.06E-01	8.88E-01	3.88E-01	1.23E+14
Tl-208	583.14		1.87E-01 +- 1.01E-01	1.43E-01	6.38E-02	1.67E+04
Bi-214	609.32		7.72E-01 +- 2.20E-01	2.44E-01	1.09E-01	1.40E+07
K-40	1460.75		9.03E+00 +- 1.86E+00	1.41E+00	5.93E-01	1.12E+13
Pb-210	46.50	N	1.51E+01 +- 1.39E+02	2.46E+02	1.13E+02	1.95E+05
Am-241	59.54	N	-5.78E-01 +- 1.54E+00	2.87E+00	1.32E+00	3.80E+06
Th-234	92.50	N	3.30E-01 +- 1.62E+00	2.79E+00	1.31E+00	3.92E+13
Cs-137	661.62	N	9.71E-02 +- 9.20E-02	1.45E-01	6.47E-02	2.64E+05
Bi-212	727.17	N	-1.17E-01 +- 1.09E+00	2.05E+00	9.14E-01	1.67E+04
Pa-234m	1001.03	N	0.00E+00 +- 1.10E+01	2.12E+01	9.06E+00	3.92E+13
Eu-154	1004.80	N	1.14E-01 +- 3.87E-01	7.01E-01	2.99E-01	7.45E+04
Co-60	1332.51	N	0.00E+00 +- 7.93E-02	1.53E-01	6.53E-02	4.62E+04
Eu-152	1408.08	N	2.36E-01 +- 3.20E-01	5.25E-01	2.06E-01	1.17E+05

MEASURED TOTAL: 2.83E+01 +- 1.44E+02 pCi/g

141005D02.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.65	152.00	7	17	13	43	0.44	Deleted
2	87.04	176.74	16	20	15	43	0.90	Unknown
8	511.02	1023.41	17	25	19	32	1.92	Deleted

c:\SEEKER\BIN\141005d02.res Analysis Results Saved.

141005D02.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-35 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:40
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.91E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.141005D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.47 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	74.65	152.00	7	17	13	43	0.44	a	NET< CL
2	87.04	176.74	18	20	15	43	0.90	a	
3	185.45	373.26	46	33	25	83	1.75	a	Wide Pk
4	238.40	479.00	113	31	19	65	0.93	a	
5	295.03	592.09	61	24	15	35	1.39	a	
6	338.20	678.30	20	15	10	19	0.91	a	
7	351.70	705.25	110	26	12	26	1.41	a	
8	511.02	1023.41	64	24	15	32	1.92	a	
9	582.97	1167.10	38	18	11	21	1.39	a	
10	609.25	1219.56	83	21	9	16	1.30	a	
11	910.72	1821.59	23	14	8	13	1.37	a	
12	968.70	1937.37	23	14	9	15	1.40	a	
13	1460.57	2919.62	123	23	4	3	2.42	a	

141005D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	87.04	18	20	15	16	20	15	
3	185.45	46	33	25	37	34	26	
4	238.40	113	31	19	106	31	20	
5	295.03	61	24	15	58	25	16	
6	338.20	20	15	10	18	17	12	
7	351.70	110	26	12	106	26	13	
8	511.02	64	24	15	17	25	19	NET<CL
9	582.97	38	18	11	34	18	12	
10	609.25	83	21	9	76	22	11	
11	910.72	23	14	8	21	14	8	
12	968.70	23	14	9	22	15	9	
13	1460.57	123	23	4	111	23	7	

141005D02.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-35 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:40
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.91e+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spectrum File	.141005D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013
Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	8.21E-01 +- 1.40E-01	. . . .	. . . .	1.40E+07
	295.21		7.84E-01 +- 3.34E-01	4.70E-01	2.17E-01	1.40E+07
	351.92		8.84E-01 +- 2.17E-01	2.40E-01	1.09E-01	1.40E+07
	609.31		7.72E-01 +- 2.20E-01	2.44E-01	1.09E-01	1.40E+07

MEASURED TOTAL: 8.21E-01 +- 1.40E-01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	87.04	176.74	16	20	15	43	0.90	Unknown
2	185.45	373.26	37	34	26	83	1.75	Unknown
3	238.40	479.00	106	31	20	65	0.93	Unknown
5	338.20	678.30	18	17	12	19	0.91	Unknown
7	582.97	1167.10	34	18	12	21	1.39	Unknown
9	910.72	1821.59	21	14	8	13	1.37	Unknown
10	968.70	1937.37	22	15	9	15	1.40	Unknown
11	1460.57	2919.62	111	23	7	3	2.42	Unknown

c:\SEEKER\BIN\141005d02A.res Analysis Results Saved.

140973D03.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-36 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:46
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.76E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.140973D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014

FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	185.76	374.01	32	21	15	41	0.92	a
2	238.49	479.17	75	24	14	46	0.81	a
3	295.01	591.91	53	20	11	24	1.14	a
4	351.69	704.97	95	24	11	24	1.34	a
5	510.96	1022.67	29	15	8	13	1.37	a
6	608.92	1218.07	75	21	9	16	1.69	a
7	911.17	1820.95	27	15	8	14	1.61	a
8	1460.94	2917.55	85	20	6	7	2.67	a

140973D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	185.76	32	21	15	24	22	16	
2	238.49	75	24	14	70	25	15	
3	295.01	53	20	11	50	20	12	
4	351.69	95	24	11	89	24	13	
5	510.96	29	15	8	-12	16	15	NET<CL
6	608.92	75	21	9	71	21	10	
7	911.17	27	15	8	25	15	9	
8	1460.94	85	20	6	79	20	8	

140973D03.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-36 GS140724-2

Sampling Start: 07/18/2014 12:00:00	Counting Start: 08/17/2014 08:50:46
Sampling Stop: 07/18/2014 12:00:00	Decay Time. . . . . 7.17e+002 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.76e+002 g	Real Time . . . . . 1803 Sec
Collection Efficiency 1.0000	Spectrum File 140973D03.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 3 (Detector 3)
Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013
Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	6.68E-02 +- 3.86E-01	6.82E-01	3.11E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		5.10E-01 +- 1.82E-01	2.41E-01	1.11E-01	1.67E+04
Pb-214	Average:x		9.05E-01 +- 2.02E-01	. . . .	. . . .	1.40E+07
	295.22		8.74E-01 +- 3.46E-01	4.49E-01	2.01E-01	1.40E+07
	351.99		9.20E-01 +- 2.49E-01	2.86E-01	1.29E-01	1.40E+07
Bi-214	609.32		9.08E-01 +- 2.68E-01	2.98E-01	1.32E-01	1.40E+07
Ac-228	911.07		8.04E-01 +- 4.64E-01	6.41E-01	2.78E-01	1.23E+14
K-40	1460.75		8.51E+00 +- 2.18E+00	2.00E+00	8.53E-01	1.12E+13
Pb-210	46.50	N	1.83E+01 +- 3.67E+01	6.22E+01	2.86E+01	1.95E+05
Am-241	59.54	N	-2.49E-01 +- 7.34E-01	1.37E+00	6.27E-01	3.80E+06
Th-234	92.50	N	7.01E-01 +- 1.36E+00	2.30E+00	1.07E+00	3.92E+13
Tl-208	583.14	N	1.33E-01 +- 9.31E-02	1.35E-01	5.80E-02	1.67E+04
Cs-137	661.62	N	4.45E-02 +- 8.12E-02	1.40E-01	5.97E-02	2.64E+05
Bi-212	727.17	N	3.19E-01 +- 1.22E+00	2.20E+00	9.58E-01	1.67E+04
Pa-234m	1001.03	N	-5.95E+00 +- 1.11E+01	2.48E+01	1.04E+01	3.92E+13
Eu-154	1004.80	N	-3.44E-01 +- 3.81E-01	8.93E-01	3.80E-01	7.45E+04
Co-60	1332.51	N	-1.86E-03 +- 9.36E-02	1.85E-01	7.74E-02	4.62E+04
Eu-152	1408.08	N	3.41E-01 +- 4.80E-01	7.96E-01	3.23E-01	1.17E+05

MEASURED TOTAL: 3.16E+01 +- 4.36E+01 pCi/g

140973D03.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
5	510.96	1022.67	-12	16	15	13	1.37	Deleted

c:\SEEKER\BIN\140973d03.res Analysis Results Saved.

140973D03.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-36 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:46
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.76E+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spc. File	.140973D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	185.76	374.01	32	21	15	41	0.92	a
2	238.49	479.17	75	24	14	46	0.81	a
3	295.01	591.91	53	20	11	24	1.14	a
4	351.69	704.97	95	24	11	24	1.34	a
5	510.96	1022.67	29	15	8	13	1.37	a
6	608.92	1218.07	75	21	9	16	1.69	a
7	911.17	1820.95	27	15	8	14	1.61	a
8	1460.94	2917.55	85	20	6	7	2.67	a

140973D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	185.76	32	21	15	24	22	16	
2	238.49	75	24	14	70	25	15	
3	295.01	53	20	11	50	20	12	
4	351.69	95	24	11	89	24	13	
5	510.96	29	15	8	-12	16	15	NET<CL
6	608.92	75	21	9	71	21	10	
7	911.17	27	15	8	25	15	9	
8	1460.94	85	20	6	79	20	8	

140973D03.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-36 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:46
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.76e+002 g	Real Time	1803 Sec
Collection Efficiency	1.0000	Spectrum File	.140973D03.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	9.06E-01 +- 1.61E-01	. . . .	. . . .	1.40E+07
	295.21		8.74E-01 +- 3.46E-01	4.49E-01	2.01E-01	1.40E+07
	351.92		9.20E-01 +- 2.49E-01	2.86E-01	1.29E-01	1.40E+07
	609.31		9.08E-01 +- 2.68E-01	2.98E-01	1.32E-01	1.40E+07

MEASURED TOTAL: 9.06E-01 +- 1.61E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	185.76	374.01	24	22	16	41	0.92	Unknown
2	238.49	479.17	70	25	15	46	0.81	Unknown
6	911.17	1820.95	26	15	9	14	1.61	Unknown
7	1460.94	2917.55	79	20	8	7	2.67	Unknown

c:\SEEKER\BIN\140973d03A.res Analysis Results Saved.

140905D07.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-37 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:52
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.25E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140905D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.28 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	41.28	87.00	10	12	8	20	0.39	a
2	74.74	153.83	31	22	16	57	0.68	a
3	76.77	157.89	59	25	16	57	0.70	b
4	87.12	178.56	43	33	25	96	1.25	a
5	185.90	375.84	32	24	18	57	0.99	a
6	238.45	480.81	156	31	15	36	1.16	a
7	241.74	487.37	81	24	13	31	1.03	b
8	295.10	593.95	101	27	15	39	1.13	a
9	351.93	707.44	168	29	10	21	1.04	a
10	511.01	1025.17	64	25	16	32	2.44	a Wide Pk
11	583.28	1169.51	38	17	9	16	1.31	a
12	609.47	1221.83	131	25	8	12	1.17	a
13	911.39	1824.83	24	14	8	13	2.03	a
14	1120.47	2242.40	31	14	7	11	1.34	a
15	1238.15	2477.45	24	14	9	14	1.96	a
16	1460.44	2921.42	108	22	6	5	3.01	a

140905D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	74.74	31	22	16	28	23	17	
3	76.77	59	25	16	56	25	17	
5	185.90	32	24	18	25	25	19	
6	238.45	156	31	15	148	31	16	
7	241.74	81	24	13	79	24	13	
8	295.10	101	27	15	97	27	16	
9	351.93	168	29	10	162	29	11	
10	511.01	64	25	16	21	26	20	
11	583.28	38	17	9	33	17	11	
12	609.47	131	25	8	126	25	9	
13	911.39	24	14	8	22	14	9	
16	1460.44	108	22	6	101	22	7	

140905D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-37 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:52
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.25e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140905D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)		MDA	Critical Level	Halflife (hrs)
U-235	143.76	N	-5.02E-02	+- 3.65E-01	6.53E-01	3.04E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	. . . .	6.17E+12
Pb-212	238.63		8.12E-01	+- 1.69E-01	1.86E-01	8.54E-02	1.67E+04
Pb-214	Average:x		1.33E+00	+- 2.00E-01	. . . .	. . . .	1.40E+07
	295.22		1.35E+00	+- 3.80E-01	4.73E-01	2.18E-01	1.40E+07
	351.99		1.32E+00	+- 2.35E-01	2.04E-01	9.08E-02	1.40E+07
Tl-208	583.14		1.76E-01	+- 9.21E-02	1.28E-01	5.69E-02	1.67E+04
Bi-214	Average:x		1.27E+00	+- 2.32E-01	. . . .	. . . .	1.40E+07
	609.32		1.24E+00	+- 2.48E-01	2.13E-01	9.31E-02	1.40E+07
	1120.28		1.46E+00	+- 6.58E-01	7.86E-01	3.29E-01	1.40E+07
Ac-228	911.07		5.25E-01	+- 3.41E-01	4.88E-01	2.12E-01	1.23E+14
K-40	1460.75		8.05E+00	+- 1.74E+00	1.36E+00	5.72E-01	1.12E+13
Pb-210	46.50	N	-1.54E+01	+- 1.27E+01	2.52E+01	1.17E+01	1.95E+05
Am-241	59.54	N	2.00E-01	+- 5.49E-01	9.47E-01	4.34E-01	3.80E+06
Th-234	92.50	N	3.28E-01	+- 1.11E+00	1.91E+00	8.87E-01	3.92E+13
Cs-137	661.62	N	5.69E-04	+- 6.83E-02	1.28E-01	5.61E-02	2.64E+05
Bi-212	727.17	N	4.06E-01	+- 1.14E+00	1.99E+00	8.86E-01	1.67E+04
Pa-234m	1001.03	N	-1.12E+00	+- 1.07E+01	2.10E+01	8.99E+00	3.92E+13
Eu-154	1004.80	N	-1.11E-01	+- 3.69E-01	7.42E-01	3.21E-01	7.45E+04
Co-60	1332.51	N	-8.24E-03	+- 6.20E-02	1.28E-01	5.28E-02	4.62E+04
Eu-152	1408.08	N	-1.52E-01	+- 4.23E-01	8.53E-01	3.71E-01	1.17E+05

MEASURED TOTAL: 1.31E+01 +- 5.64E+00 pCi/g

140905D07.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	41.28	87.00	10	12	8	20	0.39	Unknown
2	74.74	153.83	28	23	17	57	0.68	Unknown
3	76.77	157.89	56	25	17	57	0.70	Unknown
4	87.12	178.56	43	33	25	96	1.25	Unknown
7	241.74	487.37	79	24	13	31	1.03	Unknown
10	511.01	1025.17	21	26	20	32	2.44	Unknown
15	1238.15	2477.45	24	14	9	14	1.96	Unknown

c:\SEEKER\BIN\140905d07.res Analysis Results Saved.

140905D07.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-37 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:52
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	3.25E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140905D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.28 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014

FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	41.28	87.00	10	12	8	20	0.39	a
2	74.74	153.83	31	22	16	57	0.68	a
3	76.77	157.89	59	25	16	57	0.70	b
4	87.12	178.56	43	33	25	96	1.25	a
5	185.90	375.84	32	24	18	57	0.99	a
6	238.45	480.81	156	31	15	36	1.16	a
7	241.74	487.37	81	24	13	31	1.03	b
8	295.10	593.95	101	27	15	39	1.13	a
9	351.93	707.44	168	29	10	21	1.04	a
10	511.01	1025.17	64	25	16	32	2.44	a Wide Pk
11	583.28	1169.51	38	17	9	16	1.31	a
12	609.47	1221.83	131	25	8	12	1.17	a
13	911.39	1824.83	24	14	8	13	2.03	a
14	1120.47	2242.40	31	14	7	11	1.34	a
15	1238.15	2477.45	24	14	9	14	1.96	a
16	1460.44	2921.42	108	22	6	5	3.01	a

140905D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET070813.BKG (081314-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	74.74	31	22	16	28	23	17	
3	76.77	59	25	16	56	25	17	
5	185.90	32	24	18	25	25	19	
6	238.45	156	31	15	148	31	16	
7	241.74	81	24	13	79	24	13	
8	295.10	101	27	15	97	27	16	
9	351.93	168	29	10	162	29	11	
10	511.01	64	25	16	21	26	20	
11	583.28	38	17	9	33	17	11	
12	609.47	131	25	8	126	25	9	
13	911.39	24	14	8	22	14	9	
16	1460.44	108	22	6	101	22	7	

140905D07.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-37 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:52
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	3.25e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140905D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.30E+00 +- 1.51E-01	. . . .	. . . .	1.40E+07
	295.21		1.35E+00 +- 3.80E-01	4.73E-01	2.18E-01	1.40E+07
	351.92		1.32E+00 +- 2.35E-01	2.04E-01	9.07E-02	1.40E+07
	609.31		1.24E+00 +- 2.48E-01	2.13E-01	9.32E-02	1.40E+07
	1120.29		1.46E+00 +- 6.58E-01	7.87E-01	3.29E-01	1.40E+07

MEASURED TOTAL: 1.30E+00 +- 1.51E-01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	41.28	87.00	10	12	8	20	0.39	Unknown
2	74.74	153.83	28	23	17	57	0.68	Unknown
3	76.77	157.89	56	25	17	57	0.70	Unknown
4	87.12	178.56	43	33	25	96	1.25	Unknown
5	185.90	375.84	25	25	19	57	0.99	Unknown
6	238.45	480.81	148	31	16	36	1.16	Unknown
7	241.74	487.37	79	24	13	31	1.03	Unknown
10	511.01	1025.17	21	26	20	32	2.44	Unknown
11	583.28	1169.51	33	17	11	16	1.31	Unknown
13	911.39	1824.83	22	14	9	13	2.03	Unknown
15	1238.15	2477.45	24	14	9	14	1.96	Unknown

140905D07.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
16	1460.44	2921.42	101	22	7	5	3.01	Unknown

c:\SEEKER\BIN\140905d07A.res Analysis Results Saved.

140844D08.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-38 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:57
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.10E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140844D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.23	96.35	54	26	18	58	0.93	a
2	52.91	109.69	22	14	8	19	0.38	a
3	62.99	129.83	43	25	17	61	0.83	a
4	74.70	153.21	127	29	15	53	0.69	a
5	76.91	157.62	153	33	18	66	0.74	b
6	84.00	171.77	34	26	19	64	1.10	a Wide Pk
7	86.95	177.67	48	27	19	64	1.14	b
8	89.81	183.38	30	17	11	27	0.57	c
9	92.60	188.94	72	31	22	73	1.38	d
10	185.90	375.26	45	23	15	41	1.00	a
11	238.46	480.20	164	31	14	38	0.75	a
12	241.57	486.41	28	24	18	54	1.07	b
13	295.01	593.12	70	22	12	29	0.82	a
14	338.13	679.22	29	21	15	32	1.61	a Wide Pk
15	351.88	706.68	124	26	10	20	0.94	a
16	510.69	1023.79	70	23	13	24	2.07	a Wide Pk
17	583.25	1168.70	46	16	8	11	1.13	a
18	609.23	1220.56	93	23	10	19	1.30	a
19	661.51	1324.95	11	12	9	15	1.23	a
20	911.11	1823.36	26	14	8	14	1.47	a
21	1460.18	2919.76	75	19	7	9	2.08	a

140844D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8.

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.23	54	26	18	42	26	19	
3	62.99	43	25	17	24	25	19	
4	74.70	127	29	15	121	30	16	
5	76.91	153	33	18	144	33	19	
6	84.00	34	26	19	29	27	20	
7	86.95	48	27	19	43	28	20	
9	92.60	72	31	22	47	32	23	
10	185.90	45	23	15	34	23	16	
11	238.46	164	31	14	155	31	15	
13	295.01	70	22	12	67	22	13	
14	338.13	29	21	15	28	21	15	
15	351.88	124	26	10	119	26	12	
16	510.69	70	23	13	22	24	18	
17	583.25	46	16	8	42	17	9	
18	609.23	93	23	10	89	23	11	
20	911.11	26	14	8	24	14	9	
21	1460.18	75	19	7	67	19	9	

140844D08.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 1407417-38 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:57
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.10e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140844D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)
Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-210	46.50		3.97E+00 +- 2.47E+00	3.81E+00	1.78E+00	1.95E+05
Th-234	Average:	x	2.04E+00 +- 1.16E+00	. . . .	. . . .	3.92E+13
	63.29		1.80E+00 +- 1.90E+00	3.08E+00	1.44E+00	3.92E+13
	92.50		2.18E+00 +- 1.46E+00	2.29E+00	1.08E+00	3.92E+13
U-235	143.76	N	2.02E-01 +- 4.42E-01	7.56E-01	3.44E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.37E+00 +- 2.72E-01	2.89E-01	1.32E-01	1.67E+04
Pb-214	Average:	x	1.55E+00 +- 2.83E-01	. . . .	. . . .	1.40E+07
	295.22		1.51E+00 +- 5.02E-01	6.26E-01	2.83E-01	1.40E+07
	351.99		1.57E+00 +- 3.43E-01	3.42E-01	1.53E-01	1.40E+07
Ac-228	Average:	x	1.04E+00 +- 4.86E-01	. . . .	. . . .	1.23E+14
	338.40		1.20E+00 +- 9.03E-01	1.41E+00	6.47E-01	1.23E+14
	911.07		9.72E-01 +- 5.77E-01	8.09E-01	3.50E-01	1.23E+14
Tl-208	583.14		3.68E-01 +- 1.47E-01	1.78E-01	7.69E-02	1.67E+04
Bi-214	609.32		1.45E+00 +- 3.78E-01	4.07E-01	1.81E-01	1.40E+07
Cs-137	661.62		1.07E-01 +- 1.18E-01	1.89E-01	8.18E-02	2.64E+05
K-40	1460.75		9.21E+00 +- 2.65E+00	2.72E+00	1.17E+00	1.12E+13
Am-241	59.54	N	4.51E-02 +- 1.38E-01	2.40E-01B	1.09E-01	3.80E+06
Bi-212	727.17	N	2.02E+00 +- 1.45E+00	2.03E+00	8.31E-01	1.67E+04
Pa-234m	1001.03	N	-5.65E+00 +- 1.81E+01	3.67E+01	1.58E+01	3.92E+13
Eu-154	1004.80	N	-1.87E-01 +- 5.71E-01	1.17E+00	5.02E-01	7.45E+04
Co-60	1332.51	N	-5.88E-02 +- 1.03E-01	2.33E-01	9.72E-02	4.62E+04
Eu-152	1408.08	N	2.09E-01 +- 4.18E-01	7.50E-01	2.81E-01	1.17E+05

MEASURED TOTAL: 2.36E+01 +- 1.04E+01 pCi/g

140844D08.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	52.91	109.69	22	14	8	19	0.38	Unknown
4	74.70	153.21	121	30	16	53	0.69	Unknown
5	76.91	157.62	144	33	19	66	0.74	Unknown
6	84.00	171.77	29	27	20	64	1.10	Unknown
7	86.95	177.67	43	28	20	64	1.14	Unknown
8	89.81	183.38	30	17	11	28	0.57	Unknown
12	241.57	486.41	28	24	18	54	1.07	Unknown
16	510.69	1023.79	22	24	18	24	2.07	Unknown

c:\SEEKER\BIN\140844d08.res Analysis Results Saved.

140844D08.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-38 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:57
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.10E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140844D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.03 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.23	96.35	54	26	18	58	0.93	a
2	52.91	109.69	22	14	8	19	0.38	a
3	62.99	129.83	43	25	17	61	0.83	a
4	74.70	153.21	127	29	15	53	0.69	a
5	76.91	157.62	153	33	18	66	0.74	b
6	84.00	171.77	34	26	19	64	1.10	a Wide Pk
7	86.95	177.67	48	27	19	64	1.14	b
8	89.81	183.38	30	17	11	27	0.57	c
9	92.60	188.94	72	31	22	73	1.38	d
10	185.90	375.26	45	23	15	41	1.00	a
11	238.46	480.20	164	31	14	38	0.75	a
12	241.57	486.41	28	24	18	54	1.07	b
13	295.01	593.12	70	22	12	29	0.82	a
14	338.13	679.22	29	21	15	32	1.61	a Wide Pk
15	351.88	706.68	124	26	10	20	0.94	a
16	510.69	1023.79	70	23	13	24	2.07	a Wide Pk
17	583.25	1168.70	46	16	8	11	1.13	a
18	609.23	1220.56	93	23	10	19	1.30	a
19	661.51	1324.95	11	12	9	15	1.23	a
20	911.11	1823.36	26	14	8	14	1.47	a
21	1460.18	2919.76	75	19	7	9	2.08	a

140844D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET080813.BKG (081314-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.23	54	26	18	42	26	19	
3	62.99	43	25	17	24	25	19	
4	74.70	127	29	15	121	30	16	
5	76.91	153	33	18	144	33	19	
6	84.00	34	26	19	29	27	20	
7	86.95	48	27	19	43	28	20	
9	92.60	72	31	22	47	32	23	
10	185.90	45	23	15	34	23	16	
11	238.46	164	31	14	155	31	15	
13	295.01	70	22	12	67	22	13	
14	338.13	29	21	15	28	21	15	
15	351.88	124	26	10	119	26	12	
16	510.69	70	23	13	22	24	18	
17	583.25	46	16	8	42	17	9	
18	609.23	93	23	10	89	23	11	
20	911.11	26	14	8	24	14	9	
21	1460.18	75	19	7	67	19	9	

140844D08.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-38 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 08:50:57
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.10e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140844D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	1.51E+00 +- 2.27E-01	. . . .	. . . .	1.40E+07
	295.21		1.51E+00 +- 5.02E-01	6.26E-01	2.83E-01	1.40E+07
	351.92		1.57E+00 +- 3.43E-01	3.42E-01	1.53E-01	1.40E+07
	609.31		1.45E+00 +- 3.78E-01	4.07E-01	1.81E-01	1.40E+07

MEASURED TOTAL: 1.51E+00 +- 2.27E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.23	96.35	42	26	19	58	0.93	Unknown
2	52.91	109.69	22	14	8	19	0.38	Unknown
3	62.99	129.83	24	25	19	61	0.83	Unknown
4	74.70	153.21	121	30	16	53	0.69	Unknown
5	76.91	157.62	144	33	19	66	0.74	Unknown
6	84.00	171.77	29	27	20	64	1.10	Unknown
7	86.95	177.67	43	28	20	64	1.14	Unknown
8	89.81	183.38	30	17	11	28	0.57	Unknown
9	92.60	188.94	47	32	24	73	1.38	Unknown
10	185.90	375.26	34	23	16	41	1.00	Unknown
11	238.46	480.20	155	31	15	38	0.75	Unknown
12	241.57	486.41	28	24	18	54	1.07	Unknown

140844D08.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	338.13	679.22	28	21	15	32	1.61	Unknown
16	510.69	1023.79	22	24	18	24	2.07	Unknown
17	583.25	1168.70	42	17	9	11	1.13	Unknown
19	661.51	1324.95	11	12	9	15	1.23	Unknown
20	911.11	1823.36	24	14	9	14	1.47	Unknown
21	1460.18	2919.76	67	19	9	9	2.08	Unknown

c:\SEEKER\BIN\140844d08A.res Analysis Results Saved.

141337D04.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-39 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 09:04:04
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.38E+002 g	Real Time	1806 Sec
Collection Efficiency	1.0000	Spc. File	.141337D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.58 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.72	152.49	70	24	14	51	0.45	a
2	76.86	156.76	91	31	20	84	0.79	b
3	83.96	170.97	17	20	15	52	0.58	a
4	87.11	177.26	46	28	21	78	0.90	b
5	92.76	188.54	36	32	24	98	1.12	a
6	186.11	375.13	61	29	20	63	1.23	a
7	208.96	420.80	23	19	14	35	0.92	a
8	238.36	479.56	223	34	14	39	1.22	a
9	241.66	486.16	80	30	20	61	1.84	b
10	294.98	592.72	99	26	14	37	1.13	a
11	338.07	678.86	41	20	13	34	1.02	a
12	351.79	706.28	216	34	14	35	1.43	a
13	510.09	1022.66	58	25	16	36	2.75	a Wide Pk
14	582.92	1168.23	65	20	9	15	1.84	a
15	609.00	1220.35	157	29	12	27	1.59	a
16	910.62	1823.22	26	17	11	22	2.30	a
17	1460.62	2922.51	56	19	9	13	2.64	a

141337D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.72	70	24	14	67	24	15	
2	76.86	91	31	20	90	32	21	
3	83.96	17	20	15	16	21	16	NET<CL
5	92.76	36	32	24	20	32	25	NET<CL
6	186.11	61	29	20	48	29	21	
8	238.36	223	34	14	217	35	15	
9	241.66	80	30	20	78	30	20	
10	294.98	99	26	14	97	26	14	
12	351.79	216	34	14	211	34	15	
13	510.09	58	25	16	21	26	20	
14	582.92	65	20	9	64	20	10	
15	609.00	157	29	12	153	29	13	
16	910.62	26	17	11	25	17	12	
17	1460.62	56	19	9	50	19	10	

141337D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-39 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 09:04:04
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.38e+002 g	Real Time	1806 Sec
Collection Efficiency	1.0000	Spectrum File	.141337D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Th-234	92.50	N	1.24E+00 +- 2.00E+00	3.32E+00	1.58E+00	3.92E+13
U-235	143.76	N	-3.62E-02 +- 5.33E-01	9.47E-01	4.41E-01	6.17E+12
	185.72		I.D.	. . . .	. . . .	6.17E+12
Pb-212	238.63		1.74E+00 +- 2.77E-01	2.61E-01	1.20E-01	1.67E+04
Pb-214	Average:x		2.27E+00 +- 3.19E-01	. . . .	. . . .	1.40E+07
	295.22		1.85E+00 +- 4.98E-01	5.93E-01	2.70E-01	1.40E+07
	351.99		2.56E+00 +- 4.15E-01	3.94E-01	1.81E-01	1.40E+07
Ac-228	Average:x		1.28E+00 +- 5.23E-01	. . . .	. . . .	1.23E+14
	338.40		1.57E+00 +- 7.68E-01	1.08E+00	4.87E-01	1.23E+14
	911.07		1.02E+00 +- 7.14E-01	1.08E+00	4.82E-01	1.23E+14
Tl-208	583.14		5.50E-01 +- 1.71E-01	1.91E-01	8.40E-02	1.67E+04
Bi-214	609.32		2.45E+00 +- 4.69E-01	4.60E-01	2.08E-01	1.40E+07
K-40	1460.75		7.41E+00 +- 2.78E+00	3.43E+00	1.52E+00	1.12E+13
Pb-210	46.50	N	-1.24E+01 +- 2.54E+01	4.72E+01	2.19E+01	1.95E+05
Am-241	59.54	N	-1.46E-01 +- 7.16E-01	1.30E+00	6.01E-01	3.80E+06
Cs-137	661.62	N	9.46E-02 +- 1.38E-01	2.29E-01	1.02E-01	2.64E+05
Bi-212	727.17	N	2.03E+00 +- 1.63E+00	2.42E+00	1.02E+00	1.67E+04
Pa-234m	1001.03	N	2.12E+00 +- 1.99E+01	3.74E+01	1.61E+01	3.92E+13
Eu-154	1004.80	N	-4.70E-01 +- 6.69E-01	1.42E+00	6.21E-01	7.45E+04
Co-60	1332.51	N	-5.04E-02 +- 1.30E-01	2.73E-01	1.16E-01	4.62E+04
Eu-152	1408.08	N	5.77E-01 +- 6.75E-01	1.08E+00	4.36E-01	1.17E+05

MEASURED TOTAL: 2.18E+01 +- 2.89E+01 pCi/g

141337D04.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.72	152.49	67	24	15	51	0.45	Unknown
2	76.86	156.76	90	32	21	84	0.79	Unknown
3	83.96	170.97	16	21	16	52	0.58	Deleted
4	87.11	177.26	46	28	21	78	0.90	Unknown
7	208.96	420.80	23	19	14	35	0.92	Unknown
9	241.66	486.16	78	30	20	61	1.84	Unknown
13	510.09	1022.66	21	26	20	36	2.75	Unknown

c:\SEEKER\BIN\141337d04.res Analysis Results Saved.

141337D04.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-39 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 09:04:04
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.38E+002 g	Real Time	1806 Sec
Collection Efficiency	1.0000	Spc. File	.141337D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.58 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.72	152.49	70	24	14	51	0.45 a	
2	76.86	156.76	91	31	20	84	0.79 b	
3	83.96	170.97	17	20	15	52	0.58 a	
4	87.11	177.26	46	28	21	78	0.90 b	
5	92.76	188.54	36	32	24	98	1.12 a	
6	186.11	375.13	61	29	20	63	1.23 a	
7	208.96	420.80	23	19	14	35	0.92 a	
8	238.36	479.56	223	34	14	39	1.22 a	
9	241.66	486.16	80	30	20	61	1.84 b	
10	294.98	592.72	99	26	14	37	1.13 a	
11	338.07	678.86	41	20	13	34	1.02 a	
12	351.79	706.28	216	34	14	35	1.43 a	
13	510.09	1022.66	58	25	16	36	2.75 a	Wide Pk
14	582.92	1168.23	65	20	9	15	1.84 a	
15	609.00	1220.35	157	29	12	27	1.59 a	
16	910.62	1823.22	26	17	11	22	2.30 a	
17	1460.62	2922.51	56	19	9	13	2.64 a	

141337D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	74.72	70	24	14	67	24	15	
2	76.86	91	31	20	90	32	21	
3	83.96	17	20	15	16	21	16	NET<CL
5	92.76	36	32	24	20	32	25	NET<CL
6	186.11	61	29	20	48	29	21	
8	238.36	223	34	14	217	35	15	
9	241.66	80	30	20	78	30	20	
10	294.98	99	26	14	97	26	14	
12	351.79	216	34	14	211	34	15	
13	510.09	58	25	16	21	26	20	
14	582.92	65	20	9	64	20	10	
15	609.00	157	29	12	153	29	13	
16	910.62	26	17	11	25	17	12	
17	1460.62	56	19	9	50	19	10	

141337D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-39 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 09:04:04
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.38e+002 g	Real Time	1806 Sec
Collection Efficiency	1.0000	Spectrum File	.141337D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	2.33E+00 +- 2.64E-01	. . . .	. . . .	1.40E+07
	295.21		1.85E+00 +- 4.98E-01	5.92E-01	2.70E-01	1.40E+07
	351.92		2.56E+00 +- 4.15E-01	3.94E-01	1.81E-01	1.40E+07
	609.31		2.45E+00 +- 4.69E-01	4.60E-01	2.08E-01	1.40E+07

MEASURED TOTAL: 2.33E+00 +- 2.64E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.72	152.49	67	25	15	51	0.45	Unknown
2	76.86	156.76	90	32	21	84	0.79	Unknown
3	87.11	177.26	46	28	21	78	0.90	Unknown
4	186.11	375.13	48	29	21	63	1.23	Unknown
5	208.96	420.80	23	19	14	35	0.92	Unknown
6	238.36	479.56	217	35	15	39	1.22	Unknown
7	241.66	486.16	78	30	20	61	1.84	Unknown
9	338.07	678.86	41	20	13	34	1.02	Unknown
11	510.09	1022.66	21	26	20	36	2.75	Unknown
12	582.92	1168.23	64	20	10	15	1.84	Unknown
14	910.62	1823.22	25	17	12	22	2.30	Unknown

141337D04.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	1460.62	2922.51	50	19	10	13	2.64	Unknown

c:\SEEKER\BIN\141337d04A.res Analysis Results Saved.

140895D05.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-40 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 09:04:12
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.92E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140895D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.76 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014

FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.77	150.94	27	20	14	46	0.61	a
2	76.89	155.19	44	24	17	58	0.85	b
3	238.52	478.23	131	31	17	60	0.88	a
4	295.08	591.26	45	19	11	26	0.74	a
5	327.71	656.49	17	14	9	19	0.60	a
6	338.30	677.65	36	18	11	23	0.78	a
7	351.78	704.59	134	26	10	16	1.18	a
8	583.36	1167.42	42	16	8	13	1.27	a
9	609.25	1219.17	77	22	11	24	1.15	a
10	661.51	1323.62	129	25	9	14	1.47	a
11	911.11	1822.47	39	17	9	15	1.76	a
12	968.97	1938.12	17	14	9	16	1.58	a
13	1460.68	2920.86	126	23	6	6	1.91	a
14	1764.51	3528.09	14	8	3	2	1.58	a

140895D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	238.52	131	31	17	124	31	18	
4	295.08	45	19	11	43	20	12	
6	338.30	36	18	11	35	18	11	
7	351.78	134	26	10	128	26	11	
8	583.36	42	16	8	39	17	9	
9	609.25	77	22	11	73	22	12	
11	911.11	39	17	9	37	17	10	
12	968.97	17	14	9	16	14	10	
13	1460.68	126	23	6	112	24	9	
14	1764.51	14	8	3	13	8	3	

140895D05.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-40 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 09:04:12
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.92e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140895D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014

Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-212	238.63		7.08E-01 +- 1.79E-01	2.23E-01	1.04E-01	1.67E+04
Pb-214	Average:x		8.21E-01 +- 1.59E-01	. . . .	. . . . .	1.40E+07
	295.22		5.59E-01 +- 2.55E-01	3.47E-01	1.56E-01	1.40E+07
	351.99		9.88E-01 +- 2.04E-01	1.94E-01	8.65E-02	1.40E+07
Ac-228	Average:x		8.00E-01 +- 2.59E-01	. . . .	. . . . .	1.23E+14
	338.40		8.53E-01 +- 4.47E-01	6.30E-01	2.82E-01	1.23E+14
	911.07		8.38E-01 +- 3.88E-01	5.10E-01	2.24E-01	1.23E+14
	968.90		6.40E-01 +- 5.55E-01	8.60E-01	3.77E-01	1.23E+14
Tl-208	583.14		1.99E-01 +- 8.57E-02	1.09E-01	4.75E-02	1.67E+04
Bi-214	609.32		6.84E-01 +- 2.11E-01	2.52E-01	1.13E-01	1.40E+07
Cs-137	661.62		7.01E-01 +- 1.37E-01	1.11E-01	4.80E-02	2.64E+05
K-40	1460.75		8.61E+00 +- 1.82E+00	1.55E+00	6.69E-01	1.12E+13
Pb-210	46.50	N	4.00E+01 +- 1.01E+02	1.73E+02	7.92E+01	1.95E+05
Am-241	59.54	N	-2.47E-02 +- 1.23E+00	2.22E+00	1.01E+00	3.80E+06
Th-234	92.50	N	2.82E-01 +- 1.31E+00	2.28E+00	1.06E+00	3.92E+13
U-235	143.76	N	-1.13E-01 +- 3.29E-01	6.12E-01	2.81E-01	6.17E+12
Bi-212	727.17	N	5.45E-01 +- 8.95E-01	1.52E+00	6.53E-01	1.67E+04
Pa-234m	1001.03	N	4.30E+00 +- 1.05E+01	1.87E+01	7.91E+00	3.92E+13
Eu-154	1004.80	N	-3.55E-02 +- 3.83E-01	7.37E-01	3.20E-01	7.45E+04
Co-60	1332.51	N	2.66E-02 +- 5.13E-02	9.11E-02	3.47E-02	4.62E+04
Eu-152	1408.08	N	2.36E-01 +- 3.14E-01	5.15E-01	2.04E-01	1.17E+05

MEASURED TOTAL: 5.79E+01 +- 1.17E+02 pCi/g

140895D05.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.77	150.94	27	20	14	46	0.61	Unknown
2	76.89	155.19	44	24	17	58	0.85	Unknown
5	327.71	656.49	17	14	9	19	0.60	Unknown
14	1764.51	3528.09	13	8	3	2	1.58	Unknown

c:\SEEKER\BIN\140895d05.res Analysis Results Saved.

140895D05.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-40 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 09:04:12
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17E+002 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	2.92E+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spc. File	.140895D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.76 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014

FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.77	150.94	27	20	14	46	0.61	a
2	76.89	155.19	44	24	17	58	0.85	b
3	238.52	478.23	131	31	17	60	0.88	a
4	295.08	591.26	45	19	11	26	0.74	a
5	327.71	656.49	17	14	9	19	0.60	a
6	338.30	677.65	36	18	11	23	0.78	a
7	351.78	704.59	134	26	10	16	1.18	a
8	583.36	1167.42	42	16	8	13	1.27	a
9	609.25	1219.17	77	22	11	24	1.15	a
10	661.51	1323.62	129	25	9	14	1.47	a
11	911.11	1822.47	39	17	9	15	1.76	a
12	968.97	1938.12	17	14	9	16	1.58	a
13	1460.68	2920.86	126	23	6	6	1.91	a
14	1764.51	3528.09	14	8	3	2	1.58	a

140895D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050813.BKG (081314-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	238.52	131	31	17	124	31	18	
4	295.08	45	19	11	43	20	12	
6	338.30	36	18	11	35	18	11	
7	351.78	134	26	10	128	26	11	
8	583.36	42	16	8	39	17	9	
9	609.25	77	22	11	73	22	12	
11	911.11	39	17	9	37	17	10	
12	968.97	17	14	9	16	14	10	
13	1460.68	126	23	6	112	24	9	
14	1764.51	14	8	3	13	8	3	

140895D05.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 1407417-40 GS140724-2

Sampling Start:	07/18/2014 12:00:00	Counting Start:	08/17/2014 09:04:12
Sampling Stop:	07/18/2014 12:00:00	Decay Time.	7.17e+002 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	2.92e+002 g	Real Time	1801 Sec
Collection Efficiency	1.0000	Spectrum File	.140895D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014

Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	7.71E-01 +- 1.27E-01	. . . .	. . . .	1.40E+07
	295.21		5.59E-01 +- 2.55E-01	3.47E-01	1.56E-01	1.40E+07
	351.92		9.88E-01 +- 2.04E-01	1.94E-01	8.65E-02	1.40E+07
	609.31		6.84E-01 +- 2.11E-01	2.51E-01	1.13E-01	1.40E+07

MEASURED TOTAL: 7.71E-01 +- 1.27E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.77	150.94	27	20	14	46	0.61	Unknown
2	76.89	155.19	44	24	17	58	0.85	Unknown
3	238.52	478.23	124	31	18	60	0.88	Unknown
5	327.71	656.49	17	14	9	19	0.60	Unknown
6	338.30	677.65	35	18	11	23	0.78	Unknown
8	583.36	1167.42	39	17	9	13	1.27	Unknown
10	661.51	1323.62	129	25	9	14	1.47	Unknown
11	911.11	1822.47	37	17	10	15	1.76	Unknown
12	968.97	1938.12	16	14	10	16	1.58	Unknown
13	1460.68	2920.86	112	24	9	6	1.91	Unknown
14	1764.51	3528.09	13	8	3	2	1.58	Unknown

140895D05.SPC Analyzed by

c:\SEEKER\BIN\140895d05A.res Analysis Results Saved.

141331D04.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: GS140724-1MB GS140724-1

Sampling Start:	08/16/2014 11:00:00	Counting Start:	08/16/2014 11:37:29
Sampling Stop:	08/16/2014 11:00:00	Decay Time.	6.25E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	4500 Sec
Sample Size	5.00E+002 g	Real Time	4526 Sec
Collection Efficiency	1.0000	Spc. File	.141331D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.50 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	63.18	129.24	13	17	13	39	0.44	a	
2	92.78	188.40	33	26	19	61	1.22	a	
3	185.80	374.25	31	24	17	50	1.17	a	
4	332.65	667.67	14	27	22	58	2.56	a	NET< CL Wide Pk
5	511.24	1024.52	90	30	20	50	2.88	a	Wide Pk
6	1461.53	2923.32	22	13	7	9	2.39	a	

141331D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	63.18	13	17	13	-0	20	17	NET<CL
2	92.78	33	26	19	-7	29	24	NET<CL
3	185.80	31	24	17	-1	28	23	NET<CL
5	511.24	90	30	20	-5	35	29	NET<CL
6	1461.53	22	13	7	7	14	11	NET<CL

141331D04.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: GS140724-1MB GS140724-1

Sampling Start:	08/16/2014 11:00:00	Counting Start:	08/16/2014 11:37:29
Sampling Stop:	08/16/2014 11:00:00	Decay Time.	6.25e-001 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	4500 Sec
Sample Size	5.00e+002 g	Real Time	4526 Sec
Collection Efficiency	1.0000	Spectrum File	.141331D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)
Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014
Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)		MDA	Critical Level	Halflife (hrs)
Th-234	92.50	N	-8.83E-02	+- 3.41E-01	6.04E-01	2.86E-01	3.92E+13
K-40	1460.75	N	1.89E-01	+- 4.04E-01	6.96E-01	3.10E-01	1.12E+13
Pb-210	46.50	N	7.50E-01	+- 5.20E+00	9.08E+00	4.22E+00	1.95E+05
Am-241	59.54	N	-3.78E-02	+- 1.26E-01	2.32E-01	1.07E-01	3.80E+06
U-235	143.76	N	1.09E-01	+- 1.06E-01	1.71E-01	7.94E-02	6.17E+12
Pb-212	238.63	N	-8.16E-03	+- 3.00E-02	5.46E-02	2.53E-02	1.67E+04
Pb-214	351.99	N	2.35E-04	+- 4.70E-02	8.35E-02	3.86E-02	1.40E+07
Tl-208	583.14	N	1.23E-02	+- 2.40E-02	4.10E-02	1.83E-02	1.67E+04
Bi-214	609.32	N	3.78E-02	+- 6.46E-02	1.09E-01	5.01E-02	1.40E+07
Cs-137	661.62	N	7.64E-03	+- 2.35E-02	4.15E-02	1.83E-02	2.64E+05
Bi-212	727.17	N	1.88E-01	+- 3.13E-01	5.31E-01	2.32E-01	1.67E+04
Ac-228	911.07	N	7.10E-02	+- 1.06E-01	1.78E-01	7.85E-02	1.23E+14
Pa-234m	1001.03	N	-7.47E-01	+- 3.74E+00	7.40E+00	3.20E+00	3.92E+13
Eu-154	1004.80	N	8.98E-02	+- 1.23E-01	2.04E-01	8.56E-02	7.45E+04
Co-60	1332.51	N	9.49E-04	+- 2.86E-02	5.44E-02	2.34E-02	4.62E+04
Eu-152	1408.08	N	-4.75E-02	+- 1.22E-01	2.57E-01	1.09E-01	1.17E+05

MEASURED TOTAL: 1.46E+00 +- 6.44E+00 pCi/g

141331D04.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.18	129.24	-0	20	17	39	0.44	Deleted
3	185.80	374.25	-1	28	23	50	1.17	Deleted
4	332.65	667.67	14	27	22	58	2.56	Deleted
5	511.24	1024.52	-5	35	29	50	2.88	Deleted

c:\SEEKER\BIN\141331d04.res Analysis Results Saved.

141331D04.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: GS140724-1MB GS140724-1

Sampling Start:	08/16/2014 11:00:00	Counting Start:	08/16/2014 11:37:29
Sampling Stop:	08/16/2014 11:00:00	Decay Time.	6.25E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	4500 Sec
Sample Size	5.00E+002 g	Real Time	4526 Sec
Collection Efficiency	1.0000	Spc. File	.141331D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.50 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	63.18	129.24	13	17	13	39	0.44	a	
2	92.78	188.40	33	26	19	61	1.22	a	
3	185.80	374.25	31	24	17	50	1.17	a	
4	332.65	667.67	14	27	22	58	2.56	a	NET< CL Wide Pk
5	511.24	1024.52	90	30	20	50	2.88	a	Wide Pk
6	1461.53	2923.32	22	13	7	9	2.39	a	

141331D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET040813.BKG (081314-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	63.18	13	17	13	-0	20	17	NET<CL
2	92.78	33	26	19	-7	29	24	NET<CL
3	185.80	31	24	17	-1	28	23	NET<CL
5	511.24	90	30	20	-5	35	29	NET<CL
6	1461.53	22	13	7	7	14	11	NET<CL

141331D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: GS140724-1MB GS140724-1

Sampling Start:	08/16/2014 11:00:00	Counting Start:	08/16/2014 11:37:29
Sampling Stop:	08/16/2014 11:00:00	Decay Time.	6.25e-001 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	4500 Sec
Sample Size	5.00e+002 g	Real Time	4526 Sec
Collection Efficiency	1.0000	Spectrum File	.141331D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	351.92	N	2.54E-02 +- 4.15E-02	6.97E-02	3.17E-02	1.40E+07

MEASURED TOTAL: 2.54E-02 +- 4.15E-02 pCi/g

c:\SEEKER\BIN\141331d04A.res Analysis Results Saved.

140967D03.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Geo 13 / Solid

Sample ID: GS140724-1LCS GS140724-1

Sampling Start:	08/16/2014 11:00:00	Counting Start:	08/16/2014 11:37:35
Sampling Stop:	08/16/2014 11:00:00	Decay Time.	6.26E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	5.00E+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spc. File	.140967D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.74 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/16/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.44	122.03	8246	240	128	3048	0.95 a	
2	85.99	174.96	451	202	163	3920	1.51 a	
3	87.90	178.78	10821	246	108	2145	1.01 b	
4	121.99	246.77	2817	169	108	1989	1.11 a	
5	136.44	275.57	293	138	110	2076	1.09 a	
6	165.82	334.16	216	118	94	1633	0.90 a	
7	303.39	608.51	50	69	56	759	0.63 a	NET< CL
8	346.52	694.54	61	88	71	1069	1.05 a	NET< CL
9	391.47	784.19	135	104	84	1292	1.29 a	
10	517.19	1034.89	39	71	58	708	0.96 a	NET< CL
11	661.70	1323.08	18690	286	69	877	1.65 a	HiResid
12	897.69	1793.72	86	69	55	706	1.12 a	
13	1002.26	2002.26	50	106	87	1230	2.54 a	NET< CL
14	1173.35	2343.46	15771	261	57	558	2.36 a	HiResid
15	1332.57	2660.99	14119	240	30	148	2.44 a	HiResid
16	1836.64	3666.23	18	19	14	29	2.66 a	

140967D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET030813.BKG (081314-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG

140967D03.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: GS140724-1LCS GS140724-1

Sampling Start:	08/16/2014 11:00:00	Counting Start:	08/16/2014 11:37:35
Sampling Stop:	08/16/2014 11:00:00	Decay Time.	6.26e-001 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	5.00e+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spectrum File	.140967D03.SPC
Cr. Level Confidencc Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . . .ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54		1.89E+02 +- 5.49E+00	5.95E+00	2.94E+00	3.79E+06
Cd-109	88.02		5.92E+02 +- 1.35E+01	1.19E+01	5.90E+00	1.11E+04
Co-57	122.07		4.53E+00 +- 2.72E-01	3.52E-01	1.74E-01	6.50E+03
Ce-139	165.85		3.77E-01 +- 2.06E-01	3.33E-01	1.64E-01	3.30E+03
Sn-113	391.68		4.76E-01 +- 3.68E-01	6.00E-01	2.95E-01	2.76E+03
Cs-137	661.62		7.62E+01 +- 1.17E+00	5.73E-01	2.81E-01	2.64E+05
Y-88	Average:x		1.86E-01 +- 1.35E-01	. . . .	. . . . .	2.56E+03
	898.02		4.11E-01 +- 3.30E-01	5.36E-01	2.61E-01	2.56E+03
	1836.01		1.41E-01 +- 1.48E-01	2.38E-01	1.08E-01	2.56E+03
Co-60	Average:x		8.65E+01 +- 1.03E+00	. . . .	. . . .	4.62E+04
	1173.21		8.68E+01 +- 1.43E+00	6.44E-01	3.15E-01	4.62E+04
	1332.48		8.61E+01 +- 1.47E+00	3.82E-01	1.83E-01	4.62E+04
Hg-203	279.18		MDA	4.07E-01	2.01E-01	1.12E+03

MEASURED TOTAL: 9.49E+02 +- 2.21E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	85.99	174.96	451	202	163	3920	1.51	Unknown
5	136.44	275.57	293	138	110	2076	1.09	Unknown

140967D03.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	303.39	608.51	50	69	56	759	0.63	Deleted
8	346.52	694.54	61	88	71	1069	1.05	Deleted
10	517.19	1034.89	39	72	58	708	0.96	Deleted
13	1002.26	2002.26	50	106	87	1230	2.54	Deleted

c:\SEEKER\BIN\140967d03.res Analysis Results Saved.

140928D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: GS140724-2MB GS140724-2

Sampling Start:	08/17/2014 09:00:00	Counting Start:	08/17/2014 09:29:32
Sampling Stop:	08/17/2014 09:00:00	Decay Time.	4.92E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	2700 Sec
Sample Size	5.00E+002 g	Real Time	2727 Sec
Collection Efficiency	1.0000	Spc. File	.140928D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.04 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	241.62	486.65	18	15	10	19	0.80	a
2	295.11	593.48	53	19	10	20	0.96	a
3	351.71	706.52	58	21	11	24	0.95	a
4	510.83	1024.32	30	24	18	46	2.07	a Wide Pk
5	609.25	1220.89	81	22	10	19	1.32	a

140928D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	295.11	53	19	10	49	20	12	
3	351.71	58	21	11	54	21	13	
4	510.83	30	24	18	-28	27	24	NET<CL
5	609.25	81	22	10	78	22	11	

140928D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: GS140724-2MB GS140724-2

Sampling Start:	08/17/2014 09:00:00	Counting Start:	08/17/2014 09:29:32
Sampling Stop:	08/17/2014 09:00:00	Decay Time.	4.92e-001 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	2700 Sec
Sample Size	5.00e+002 g	Real Time	2727 Sec
Collection Efficiency	1.0000	Spectrum File	.140928D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . HUNTERS_POINT.LIB (TES Hunter's Point)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Pb-214	Average:	x	2.53E-01 +- 7.37E-02	. . . .	. . . . .	1.40E+07
	295.22		3.37E-01 +- 1.40E-01	1.88E-01	8.46E-02	1.40E+07
	351.99		2.21E-01 +- 8.66E-02	1.14E-01	5.14E-02	1.40E+07
Bi-214	609.32		3.94E-01 +- 1.13E-01	1.28E-01	5.73E-02	1.40E+07
Pb-210	46.50	N	1.53E+01 +- 3.06E+01	5.20E+01	2.37E+01	1.95E+05
Am-241	59.54	N	2.98E-01 +- 4.09E-01	6.77E-01	3.01E-01	3.80E+06
Th-234	92.50	N	2.37E-02 +- 4.84E-01	8.68E-01	3.96E-01	3.92E+13
U-235	143.76	N	9.12E-03 +- 1.58E-01	2.83E-01	1.29E-01	6.17E+12
Pb-212	238.63	N	0.00E+00 +- 4.43E-02	8.04E-02B	3.64E-02	1.67E+04
Tl-208	583.14	N	-7.99E-03 +- 2.87E-02	5.68E-02	2.48E-02	1.67E+04
Cs-137	661.62	N	3.21E-02 +- 3.14E-02	4.87E-02	2.04E-02	2.64E+05
Bi-212	727.17	N	-2.29E-01 +- 4.11E-01	8.56E-01	3.73E-01	1.67E+04
Ac-228	911.07	N	4.96E-02 +- 1.05E-01	1.86E-01	7.63E-02	1.23E+14
Pa-234m	1001.03	N	-1.16E+00 +- 5.21E+00	1.06E+01	4.49E+00	3.92E+13
Eu-154	1004.80	N	-5.75E-02 +- 1.38E-01	3.04E-01	1.26E-01	7.45E+04
Co-60	1332.51	N	2.51E-03 +- 3.09E-02	6.14E-02	2.49E-02	4.62E+04
Eu-152	1408.08	N	6.43E-02 +- 1.13E-01	1.99E-01	7.05E-02	1.17E+05
K-40	1460.75	N	8.43E-01 +- 5.06E-01	6.69E-01	2.77E-01	1.12E+13

MEASURED TOTAL: 1.73E+01 +- 3.26E+01 pCi/g

140928D01.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	241.62	486.65	18	15	10	19	0.80	Unknown

c:\SEEKER\BIN\140928d01.res Analysis Results Saved.

140928D01.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: GS140724-2MB GS140724-2

Sampling Start:	08/17/2014 09:00:00	Counting Start:	08/17/2014 09:29:32
Sampling Stop:	08/17/2014 09:00:00	Decay Time.	4.92E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	2700 Sec
Sample Size	5.00E+002 g	Real Time	2727 Sec
Collection Efficiency	1.0000	Spc. File	.140928D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.04 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	241.62	486.65	18	15	10	19	0.80	a
2	295.11	593.48	53	19	10	20	0.96	a
3	351.71	706.52	58	21	11	24	0.95	a
4	510.83	1024.32	30	24	18	46	2.07	a Wide Pk
5	609.25	1220.89	81	22	10	19	1.32	a

140928D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET010813.BKG (081314-1 WEEKLY BKG)

Bkg.File Detector #: 1

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	295.11	53	19	10	49	20	12	
3	351.71	58	21	11	54	21	13	
4	510.83	30	24	18	-28	27	24	NET<CL
5	609.25	81	22	10	78	22	11	

140928D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: GS140724-2MB GS140724-2

Sampling Start:	08/17/2014 09:00:00	Counting Start:	08/17/2014 09:29:32
Sampling Stop:	08/17/2014 09:00:00	Decay Time.	4.92e-001 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	2700 Sec
Sample Size	5.00e+002 g	Real Time	2727 Sec
Collection Efficiency	1.0000	Spectrum File	.140928D01.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . . . . RA226.LIB (Ra-226 (215g steel can))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	2.95E-01 +- 6.17E-02	. . . .	. . . .	1.40E+07
	295.21		3.37E-01 +- 1.40E-01	1.88E-01	8.46E-02	1.40E+07
	351.92		2.21E-01 +- 8.65E-02	1.14E-01	5.14E-02	1.40E+07
	609.31		3.94E-01 +- 1.13E-01	1.28E-01	5.73E-02	1.40E+07

MEASURED TOTAL: 2.95E-01 +- 6.17E-02 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	241.62	486.65	18	15	10	19	0.80	Unknown

c:\SEEKER\BIN\140928d01A.res Analysis Results Saved.

141006D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Geo 13 / Solid

Sample ID: GS140724-2LCS GS140724-2

Sampling Start:	08/17/2014 09:00:00	Counting Start:	08/17/2014 09:29:39
Sampling Stop:	08/17/2014 09:00:00	Decay Time.	4.94E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	5.00E+002 g	Real Time	1827 Sec
Collection Efficiency	1.0000	Spc. File	.141006D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.47 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/17/2014

FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.40	121.55	4183	186	110	2239	1.00 a	
2	87.88	178.41	9016	236	115	2440	0.96 a	
3	91.78	186.21	44	75	60	896	0.45 b	NET< CL
4	113.54	229.65	84	142	116	2281	1.10 a	NET< CL
5	122.01	246.57	2668	163	104	1982	1.00 a	
6	136.42	275.36	335	115	90	1626	0.88 a	
7	165.68	333.78	253	109	86	1491	0.89 a	
8	173.54	349.49	88	134	109	2025	1.16 a	NET< CL
9	200.99	404.29	87	92	74	1205	0.70 a	
10	310.00	621.99	73	102	83	1262	0.95 a	NET< CL
11	333.47	668.84	87	100	81	1211	0.91 a	
12	601.18	1203.45	58	60	48	526	0.90 a	
13	661.59	1324.08	22697	314	72	907	1.51 a	
14	905.47	1811.10	59	168	137	2249	3.40 a	NET< CL Wide Pk
15	1173.12	2345.59	19487	287	53	525	1.99 a	
16	1332.30	2663.46	17742	270	34	204	2.13 a	
17	1835.69	3668.71	38	19	12	30	1.57 a	

141006D02.SPC Analyzed by .

****

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

****

Background File:. . . . . DET020813.BKG (081314-2 WEEKLY BKG)

Bkg.File Detector #: 2

==========

BACKGROUND SUBTRACT RESULTS

==========

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	87.88	9016	236	115	9014	236	115	
3	91.78	44	75	60	36	75	61	NET<CL

141006D02.SPC Analyzed by

****

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

****

Geo 13 / Solid

Sample ID: GS140724-2LCS GS140724-2

Sampling Start:	08/17/2014 09:00:00	Counting Start:	08/17/2014 09:29:39
Sampling Stop:	08/17/2014 09:00:00	Decay Time.	4.94e-001 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	5.00e+002 g	Real Time	1827 Sec
Collection Efficiency	1.0000	Spectrum File	.141006D02.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . .ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54		2.11E+02 +- 9.38E+00	1.12E+01	5.55E+00	3.79E+06
Cd-109	88.02		5.89E+02 +- 1.54E+01	1.52E+01	7.52E+00	1.11E+04
Co-57	122.07		4.18E+00 +- 2.55E-01	3.29E-01	1.62E-01	6.50E+03
Ce-139	165.85		4.08E-01 +- 1.76E-01	2.81E-01	1.39E-01	3.30E+03
Cs-137	661.62		7.68E+01 +- 1.06E+00	4.98E-01	2.44E-01	2.64E+05
Co-60	Average:x		8.62E+01 +- 9.11E-01	. . . .	. . . .	4.62E+04
	1173.21		8.62E+01 +- 1.27E+00	4.83E-01	2.36E-01	4.62E+04
	1332.48		8.63E+01 +- 1.31E+00	3.43E-01	1.65E-01	4.62E+04
Y-88	1836.01		2.37E-01 +- 1.20E-01	1.69E-01	7.58E-02	2.56E+03
Hg-203	279.18		MDA	4.02E-01	1.98E-01	1.12E+03
Sn-113	391.68		MDA	5.00E-01	2.46E-01	2.76E+03
Y-88	898.02		MDA	5.96E-01	2.93E-01	2.56E+03

MEASURED TOTAL: 9.68E+02 +- 2.73E+01 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
3	91.78	186.21	36	75	61	896	0.45	Deleted
4	113.54	229.65	84	142	116	2281	1.10	Deleted
6	136.42	275.36	335	115	90	1626	0.88	Unknown

141006D02.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
8	173.54	349.49	88	134	109	2025	1.16	Deleted
9	200.99	404.29	87	92	74	1205	0.70	Unknown
10	310.00	621.99	73	102	83	1262	0.95	Deleted
11	333.47	668.84	87	100	81	1211	0.91	Unknown
12	601.18	1203.45	58	60	48	526	0.90	Unknown
14	905.47	1811.10	59	168	137	2249	3.40	Deleted

c:\SEEKER\BIN\141006d02.res Analysis Results Saved.

Gamma Spectrometer Run Log

Date: 8/15/14 | 8/16/14 Reviewed By/Date: JP 8/15/14

Sample ID	Ver[1]	Det. No.	Geo[2]	Count Dur. (min.)[3]	Start Time	Analyst	File ID.SPC	Saved?	
1408188-6	JP	4	NA	2	14:02	JP	141320D04	JP	8/15/14
-6D	JP				14:11	JP	141321D04	JP	
-7	JP				14:14	JP	141322D04	JP	
-8	JP				14:18	JP	141323D04	JP	
TC140813-1MB	JP				14:22	JP	141324D04	JP	
LCS	JP				14:29	JP	141325D04	JP	
1407417-1	JP	1	13	30	9:26	JP	140919D01	JP	8/16/14
-2		2					140997D02	JP	
-3		4			9:27		141328D04	JP	
-4		5					140887D05	JP	
-5		7					140898D07	JP	
-6		8		15			140838D08	JP 8/16	
-1D	JP	2		30	10:14	JP	140998D02	JP	
-7		1					140920D01	JP	
-8		3					140965D03	JP	
-9		4					141329D04	JP	
-10		5					140885D05	JP	
-11		7					140899D07	JP	
-12	JP	8		30	11:08	JP	140839D08	JP	
-13	JP	1		30	10:59	JP	140921D01	JP	
-14		2			11:00		140999D02	JP	
-15		3					140966D03	JP	
-16		4					141330D04	JP	
-17		5					140889D05	JP	

[1] Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

[2] Calibration geometry.

[3] Count duration.

KEY:
* sample was counted on a puck
↑ sample was counted with air flow arrow pointing up

444985 **B**

Form 754r15b.doc (10/27/11)

Gamma Spectrometer Run Log

Date: 8/16/14 / 8/17/14 Reviewed By/Date: JP 8/17/14

Sample ID	Ver[1]	Det. No.	Geo[2]	Count Dur. (min.)[3]	Start Time	Analyst	File ID.SPC	Saved?
1407417-18	JP	7	13	30	11:00	JP	140900D07	JP
-19	JP	1			11:37	JP	140922D01	JP
-20		2					141000D02	JP
GS140724-1MB	JP	4		75			141331D04	JP
LCS	JP	3		30			140967D03	JP
1407424-1	JP	1		1000	12:55	JP	140923D01	JP
-2		2					141001D02	JP
-3		3					140968D03	JP
-4		4					141332D04	JP
-5		5			12:56		140890D05	JP
-6		7					140901D07	JP
-7		8					140840D08	JP
1407417-22	JP	1	13	30	7:24	JP	140925D01	JP
22		2					141003D02	JP
23		4			7:25		141334D04	JP
24		5					140892D05	JP
25		7					140903D07	JP
26		8					140842D08	JP
27		3			7:28	JP	140971D03	JP
-21D	JP	2		30	8:08	JP	141004D02	JP
-28		1					140926D01	JP
-29		3					140972D03	JP
-30		4		45			141336D04	JP
-31		5					140894D05	JP

8/16/14

JP 8/17/14

8/17/14

[1] Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

[2] Calibration geometry.

[3] Count duration.

KEY: * sample was counted on a puck
↑ sample was counted with air flow arrow pointing up

444986 **B**

Form 754r15b.doc (10/27/11)

ALS

Gamma Spectrometer Run Log

Date: 8/17/14

Reviewed By/Date: JP 8/18/14

Sample ID	Ver[1]	Det. No.	Geo[2]	Count Dur. (min.)[3]	Start Time	Analyst	File ID.SPC	Saved?
1407417-32	JP	7	13	30	8:08	JP	140904D07	JP
-33		8					140843D08	JP
-34	JP	1	13	30	8:50	JP	140927D01	JP
-35		2					141005D02	JP
-36		3					140973D03	JP
-37		7					140905D07	JP
-38		8					140844D08	JP
-39	JP	4	13	30	9:04	JP	141337D04	JP
-40		5					140895D05	JP
GS140724-2MB	JP	1	13	45	9:29	JP	140928D01	JP
LCS		2		30			141006D02	JP
1407424-5D	JP	1		1000	10:21	JP	140929D01	JP
-8		2					141007D02	JP
-9		3					140974D03	JP
-10		4					141338D04	JP
-11		5			10:22		140896D05	JP
-12		6					140699D06	JP
-13		7					140906D07	JP
-14		8					140845D08	JP
							JP 8/18/14	

[1] Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

[2] Calibration geometry.

[3] Count duration.

KEY: * sample was counted on a puck
↑ sample was counted with air flow arrow pointing up

444987 B

Form 754r15b.doc (10/27/11)

Technical Comments Regarding Analysis using the HUNTERS POINT Gamma Spectroscopy Library

Analysis using the **HUNTERS_POINT** library is limited to the list of gamma emitting radionuclides specified by ALS Laboratory Group. ALS Laboratory Group specifies all values assigned to the nuclides in this library. In cases where multiple gamma emissions are used to quantify activity, the most abundant emission is used for quantification in the absence of any supporting gamma emissions. It should be noted that the current software program used for gamma spectroscopic analysis is limited to a +/- 2.0 keV photo-peak resolution tolerance. Thus, any gamma emissions occurring within the same +/- 2.0 keV range will suffer interference, consequently preventing accurate quantification. Nuclide specific information regarding analysis using the **HUNTERS_POINT** library is as follows:

Nuclide: ^{228}Ac Energy: various Photon Abundance: various

All activity values for ^{228}Ac are calculated using the half-life, $t_{1/2}$=1.405E+10 years, of the long-lived ^{232}Th parent. It is assumed that secular equilibrium is achieved between the ^{232}Th parent and the ^{228}Ac progeny. If the requested analysis involves the quantification of both ^{228}Ac and ^{232}Th, the reported results for each nuclide will be identical.

Nuclide: ^{212}Bi, ^{212}Pb, ^{208}Tl Energy: various Photon Abundance: various

All activity values for ^{212}Bi, ^{212}Pb, and ^{208}Tl are calculated using the half-life, $t_{1/2}$=1.91 years, of the long-lived ^{228}Th parent. It is assumed that secular equilibrium is achieved between the ^{228}Th parent and the ^{212}Bi, ^{212}Pb, and ^{208}Tl progeny.

Nuclide: ^{214}Bi, ^{214}Pb Energy: various Photon Abundance: various

All activity values for ^{214}Bi and ^{214}Pb are calculated using the half-life, $t_{1/2}$=1600 years, of the long-lived ^{226}Ra parent. It is assumed that secular equilibrium is achieved between the ^{226}Ra parent and the ^{214}Bi and ^{214}Pb progeny.

Nuclide: ^{137}Cs Energy: 661.62 keV Photon Abundance: 0.8512 γ/dis

Cesium-137 does not emit any gamma photons useful for quantification. However, it can be assumed to be in secular equilibrium with the short-lived ^{137m}Ba daughter product. Therefore, the activity for ^{137}Cs is determined from the 661.62 keV gamma emission of the ^{137m}Ba daughter product. The calculated gamma photon abundance used in the library is the product of the 0.8998 abundance of the 661.62 keV ^{137m}Ba photon and the 0.946 branching ratio between ^{137}Ba and ^{137m}Ba.

Nuclide: ^{40}K Energy: 1460.75 Photon Abundance: 0.1100

The only gamma emission useful for quantification of this nuclide suffers from possible resolution interference due to the ^{228}Ac gamma emission occurring at 1459.2 keV (0.0104, abundance). Therefore, a possibility of a high bias to the ^{40}K results may occur in the presence of elevated ^{228}Ac activity

Nuclide: ^{234m}Pa Energy: 1001.03 Photon Abundance: 0.0059

All activity values for ^{234m}Pa are calculated using the half-life, $t_{1/2}$=4.468E+09 yrs, of the long-lived ^{238}U parent. It is assumed that secular equilibrium is achieved between the ^{238}U parent and the ^{234m}Pa progeny.

Nuclide: ^{210}Pb Energy: 46.50 Photon Abundance: 0.0405

Activity calculations for ^{210}Pb should be considered to be estimated values, as the 46.50 keV photo-peak of ^{210}Pb falls below the minimum calibration energy for standard counting geometries. Laboratory experience has shown that extrapolation of the efficiency calibration curve to encompass the ^{210}Pb emission energy may result in a significant low bias in the reported results. This bias may be as great as 100-1000 X in some large solid geometries. Consequently, the results for this nuclide will be given a "J" flag for all samples in this work order. This flag indicates that these results should be considered unreliable and should not be used as accurate quantification of the ^{210}Pb activity concentration in the sample.

Nuclide: ^{232}Th Energy: 59.00 Photon Abundance: 0.0019

The only gamma emission useful for quantification of this nuclide has an extremely low abundance and suffers from possible resolution interference due to the ^{241}Am gamma emission occurring at 59.54 keV. The quantification for ^{232}Th will therefore be obtained from the measurement of the observed ^{228}Ac photo-peaks with energies of 338.40, 911.07, and 968.90 keV. It is assumed that secular equilibrium is achieved between the ^{232}Th parent and the ^{228}Ac progeny.

Nuclide: ^{234}Th Energy: 92.50 Photon Abundance: 0.0553

The 92.50 keV photo-peak used in this library for Th-234 quantification is actually two separate photo-peaks, occurring at 92.4 keV and 92.8 keV. The current software used for gamma spectroscopic analysis cannot resolve two photo-peaks that occur within the 2-keV resolution tolerance. Therefore, these two photopeaks are observed as a single photo-peak. Therefore, the average of the two photo-peak energies is used in this library. Also, the sum of the two photo-peak abundances, 0.0553, is used in the activity calculations for this observed 'single' photo-peak.

All activity values for ^{234}Th are calculated using the half-life, $t_{1/2}$=4.468E+09 yrs, of the long-lived ^{238}U parent. It is assumed that secular equilibrium is achieved between the ^{238}U parent and the ^{234}Th progeny.

Nuclide: ^{235}U Energy: 185.70 Photon Abundance: 0.5720

Quantifying ^{235}U activity using the 185.70 keV photo-peak is vulnerable to a significant high bias due to interference from gamma emissions from ^{226}Ra occurring at 186.21 keV (0.0328, abundance). Therefore, this emission will be used as an identifier only and not in the activity calculations for this nuclide.

Kellary Beachenbritter 02/22/12
Gamma Spectroscopist Date
Radiochemistry Instrumentation Laboratory

02/22/12
Radiochemistry Manager Date

Library File: HUNTERS_POINT.lib
File I.D.: TES Hunter's Point

Pk. #	Energy (keV)	Isotope Name	2ndary Pk #	Type	Gamma Fraction	Halflife
15	338.40	Ac-228	26	QUANT	0.1127	1.4050E+10 yrs
26	911.07	Ac-228	27	NET	0.2580	1.4050E+10 yrs
27	968.90	Ac-228	15	QUANT	0.1580	1.4050E+10 yrs
2	59.54	Am-241	0	NET	0.3590	4.3310E+02 yrs
22	727.17	Bi-212	0	NET	0.0658	1.9100E+00 yrs
20	609.32	Bi-214	33	NET	0.4609	1.6000E+03 yrs
33	1120.28	Bi-214	20	QUANT	0.1510	1.6000E+03 yrs
34	1173.23	Co-60	35	QUANT	0.9997	5.2721E+00 yrs
35	1332.51	Co-60	34	NET	0.9998	5.2721E+00 yrs
21	661.62	Cs-137	0	NET	0.8512	3.0104E+01 yrs
16	344.30	Eu-152	23	QUANT	0.2650	1.3330E+01 yrs
23	778.90	Eu-152	31	QUANT	0.1294	1.3330E+01 yrs
31	1085.80	Eu-152	32	QUANT	0.1021	1.3330E+01 yrs
32	1112.07	Eu-152	36	QUANT	0.1364	1.3330E+01 yrs
36	1408.08	Eu-152	16	NET	0.2100	1.3330E+01 yrs
11	248.04	Eu-154	19	QUANT	0.0660	8.5019E+00 yrs
19	591.70	Eu-154	25	QUANT	0.0460	8.5019E+00 yrs
25	873.20	Eu-154	28	QUANT	0.1227	8.5019E+00 yrs
28	996.30	Eu-154	30	QUANT	0.1030	8.5019E+00 yrs
30	1004.80	Eu-154	11	NET	0.1801	8.5019E+00 yrs
37	1460.75	K-40	0	NET	0.1100	1.2800E+09 yrs
29	1001.03	Pa-234m	0	NET	0.0059	4.4680E+09 yrs
1	46.50	Pb-210	0	NET	0.0405	2.2260E+01 yrs
5	115.18	Pb-212	10	QUANT	0.0059	1.9100E+00 yrs
10	238.63	Pb-212	14	NET	0.4330	1.9100E+00 yrs
14	300.09	Pb-212	5	QUANT	0.0327	1.9100E+00 yrs
13	295.22	Pb-214	17	QUANT	0.1920	1.6000E+03 yrs
17	351.99	Pb-214	13	NET	0.3710	1.6000E+03 yrs
3	63.29	Th-234	4	QUANT	0.0390	4.4680E+09 yrs
4	92.50	Th-234	3	NET	0.0553	4.4680E+09 yrs
12	277.36	Tl-208	18	QUANT	0.0631	1.9100E+00 yrs
18	583.14	Tl-208	24	NET	0.8450	1.9100E+00 yrs
24	860.47	Tl-208	12	QUANT	0.1242	1.9100E+00 yrs
6	143.76	U-235	7	NET	0.1096	7.0379E+08 yrs
7	163.35	U-235	8	QUANT	0.0508	7.0379E+08 yrs
8	185.72	U-235	9	ID	0.5720	7.0379E+08 yrs
9	205.31	U-235	6	QUANT	0.0501	7.0379E+08 yrs

Technical Comments Regarding Gamma Spectroscopy Libraries

Library File: **Ra-226.LIB**

Nuclide: **Ra-226** Energy: various Photon Abundance: various

Samples analyzed by this library are sealed in a steel can and allowed to ingrow for a 21-day period to ensure the capture and full ingrowth of the Rn-222 gas and associated progeny. The Bi-214 and Pb-214 daughters are assumed to be in secular equilibrium with their parent, Ra-226. Ra-226 is then quantified from the ingrown Pb-214 and Bi-214 daughters using the 1600 year half-life of the Ra-226 parent.

Gamma Spectroscopist
Radiochemistry Instrumentation Laboratory

4-13-04
Date

OK
JB
4/14/04

OK
SH 4/3/02

Library File: Ra226.lib
File I.D.: Ra-226 (215g steel can)

	Energy (keV)	Isotope Name	2ndary Pk #	Type	Gamma Fraction	Halflife
1	295.21	Ra-226	2	QUANT	0.1920	1.6000E+03 yrs
2	351.92	Ra-226	3	NET	0.3710	1.6000E+03 yrs
3	609.31	Ra-226	4	QUANT	0.4609	1.6000E+03 yrs
4	1120.29	Ra-226	1	QUANT	0.1510	1.6000E+03 yrs

TECHNICAL BULLETIN ADDENDUM

The library used for analysis defines the gamma emission(s) to be used for analysis of each nuclide. If multiple gamma emissions are used for quantification, then a 'NET' quantification emission (or peak) must be defined in the library. This designation provides for the calculation of nuclide activity concentrations and detection limits in the case of non-presence of the nuclide. When the nuclide is not present, or the software is unable to resolve a peak at the library defined 'NET' energy, the software evaluates the 'NET' region of interest ('NET' peak energy +/- 2 keV) by performing a summation of the net counts above the background level. This 'NET' quantification can result in net negative, zero, or positive activity results, and is highly dependent on the spectral distribution in the region of interest of the 'NET' peak. In cases where only the 'NET' peak is found, and the software performs a net quantification, the nuclide result will be flagged with an 'NQ' qualifier on the final reports. This indicates that the nuclide is not detected or supported at any level above the reported MDC. Results are submitted without further qualification.

All nuclides specified in the library of analysis for gamma spectroscopy are evaluated for positive OR tentative identification on the following criteria:

- The individual abundances for the gamma emissions specified for each nuclide are summed to obtain a total nuclide abundance.
- From the total nuclide abundance, a positive identification criterion is set as 75% of this total nuclide abundance.
- For all nuclide peaks that are not net quantified, those peak abundances are summed. The total non-net quantified peak sum is compared to the calculated 75% abundance criterion. If this sum is greater than the 75% criterion, the nuclide is considered to be positively identified at the reported concentration. If the sum is less than the 75% criterion, the nuclide is tentatively identified at the reported concentration. These results will be flagged with a 'TI' qualifier on the final reports to indicate that the 75% abundance criterion was not met.

Section 6

QUALITY ASSURANCE SUMMARY REPORTS

6

No *NON-CONFORMANCE REPORTS* or *QUALITY ASSURANCE SUMMARY SHEETS* are included in this data package.

Section 7

LABORATORY BENCH SHEETS

7

Cnt 8/16

ALS Environmental -- FC

Radiochemistry Instrument Worksheet

Prep Batch: GS140724-1

Prep Procedure: GAMMASCAN

Analytical QASS / NCR? Y / N N/A

Prep Num	Lab ID Collection Date	QC Type	Init Alq	Fin Alq	Units Geo.	Report Units	Cnt 1 File Cnt Dur (min)	Cnt 1 Inst/Det	Cnt 1 Count Date	Cnt 2 File Cnt Dur (min)	Cnt 2 Inst/Det	Cnt 2 Count Date	Cnt 3 File Cnt Dur (min)	Cnt 3 Inst/Det	Cnt 3 Count Date	Notes
3/19 1	1407417-1 07/16/14 10:00	SMP	304.6	304.6	g 13	pCi/g	30	1	8/16/14							
1	1407417-1 07/16/14 10:00	DUP	304.6	304.6	g 13	pCi/g		2								Count Duplicate
1	1407417-2 07/16/14 10:30	SMP	246.5	246.5	g 13	pCi/g		4								
1	1407417-3 07/16/14 11:00	SMP	241.2	241.2	g 13	pCi/g		5								
1	1407417-4 07/16/14 11:30	SMP	234.4	234.4	g 13	pCi/g		7								
1	1407417-5 07/16/14 12:00	SMP	251.5	251.5	g 13	pCi/g		8								
1	1407417-6 07/16/14 12:30	SMP	95.6	95.6	g 13	pCi/g	75	8								
1	1407417-7 07/17/14 11:48	SMP	187.6	187.6	g 13	pCi/g	30	1								
1	1407417-8 07/17/14 14:55	SMP	227.4	227.4	g 13	pCi/g		3								
1	1407417-9 07/17/14 09:05	SMP	225.3	225.3	g 13	pCi/g		4								
1	1407417-10 07/17/14 10:55	SMP	280.8	280.8	g 13	pCi/g		5								
1	1407417-11 07/17/14 09:55	SMP	226.7	226.7	g 13	pCi/g		7								
1	1407417-12 07/16/14 11:25	SMP	271.4	271.4	g 13	pCi/g		8								
1	1407417-13 07/17/14 11:24	SMP	206.8	206.8	g 13	pCi/g		1								
1	1407417-14 07/17/14 11:00	SMP	262.5	262.5	g 13	pCi/g		2								
1	1407417-15 07/17/14 10:00	SMP	211.2	211.2	g 13	pCi/g		3								
1	1407417-16 07/17/14 14:30	SMP	279.3	279.3	g 13	pCi/g		4								
1	1407417-17 07/17/14 10:10	SMP	220	220	g 13	pCi/g		5								
1	1407417-18 07/17/14 12:10	SMP	259.6	259.6	g 13	pCi/g		7								
1	1407417-19 07/17/14 10:05	SMP	231.8	231.8	g 13	pCi/g	30	1								
1	1407417-20 07/17/14 08:45	SMP	273.1	273.1	g 13	pCi/g		2								
1	GS140724-1 07/26/14 10:23	MB	500	500	g 13	pCi/g	75	4								
1	GS140724-1 07/26/14 10:23	LCS	500	500	g 13	pCi/g	30	3								

JP 8/18/14

JP 8/18/14

Hunters Point LIB Bi214(0.5) Th234(5) Pb214(0.5) K40(1)

Ra226 LIB Ra226(1)

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Am-241	951	419.677	DPM/g	07/26/14	500	g	N/A
S1	Co-60	951	195.081	DPM/g	07/26/14	500	g	N/A
S1	Cs-137	951	167.063	DPM/g	07/26/14	500	g	N/A

571-018809

Supersedes: N/A

Radiochemistry Instrument Worksheet

ALS Environmental -- FC

Prep Batch: GS140724-1

Prep Procedure: GAMMASCAN

Analytical QASS / NCR? Y (N) NA

Prep Num	Lab ID Collection Date	QC Type	Init Alq	Fin Alq	Units Geo.	Report Units	Cnt 1 File Cnt Dur (min)	Cnt 1 Inst/Det	Cnt 1 Count Date	Cnt 2 File Cnt Dur (min)	Cnt 2 Inst/Det	Cnt 2 Count Date	Cnt 3 File Cnt Dur (min)	Cnt 3 Inst/Det	Cnt 3 Count Date	Notes

Sample Barcodes

1407417-1 GS140724-1PS1	1407417-1DUP GS140724-1PS2	1407417-2 GS140724-1PS3
1407417-3 GS140724-1PS4	1407417-4 GS140724-1PS5	1407417-5 GS140724-1PS6
1407417-6 GS140724-1PS7	1407417-7 GS140724-1PS8	1407417-8 GS140724-1PS9
1407417-9 GS140724-1PS10	1407417-10 GS140724-1PS11	1407417-11 GS140724-1PS12
1407417-12 GS140724-1PS13	1407417-13 GS140724-1PS14	1407417-14 GS140724-1PS15
1407417-15 GS140724-1PS16	1407417-16 GS140724-1PS17	1407417-17 GS140724-1PS18
1407417-18 GS140724-1PS19	1407417-19 GS140724-1PS20	1407417-20 GS140724-1PS21
GS140724-1MB GS140724-1PS22	GS140724-1LCS GS140724-1PS23	

Reporting Units

LabID:	TstGrpName:	RptUnits:
1407417-1	Gamma_TideGreatKills_226	pCi/g
1407417-1	Gamma_TidewaterGreatKills	pCi/g
1407417-2	Gamma_TidewaterGreatKills	pCi/g
1407417-2	Gamma_TideGreatKills_226	pCi/g
1407417-3	Gamma_TidewaterGreatKills	pCi/g
1407417-3	Gamma_TideGreatKills_226	pCi/g
1407417-4	Gamma_TidewaterGreatKills	pCi/g
1407417-4	Gamma_TideGreatKills_226	pCi/g
1407417-5	Gamma_TidewaterGreatKills	pCi/g
1407417-5	Gamma_TideGreatKills_226	pCi/g
1407417-6	Gamma_TidewaterGreatKills	pCi/g
1407417-6	Gamma_TideGreatKills_226	pCi/g
1407417-7	Gamma_TideGreatKills_226	pCi/g
1407417-7	Gamma_TidewaterGreatKills	pCi/g
1407417-8	Gamma_TideGreatKills_226	pCi/g
1407417-8	Gamma_TidewaterGreatKills	pCi/g
1407417-9	Gamma_TidewaterGreatKills	pCi/g
1407417-9	Gamma_TideGreatKills_226	pCi/g
1407417-10	Gamma_TidewaterGreatKills	pCi/g
1407417-10	Gamma_TideGreatKills_226	pCi/g
1407417-11	Gamma_TidewaterGreatKills	pCi/g
1407417-11	Gamma_TideGreatKills_226	pCi/g
1407417-12	Gamma_TidewaterGreatKills	pCi/g
1407417-12	Gamma_TideGreatKills_226	pCi/g
1407417-13	Gamma_TidewaterGreatKills	pCi/g
1407417-13	Gamma_TideGreatKills_226	pCi/g
1407417-14	Gamma_TidewaterGreatKills	pCi/g
1407417-14	Gamma_TideGreatKills_226	pCi/g
1407417-15	Gamma_TidewaterGreatKills	pCi/g
1407417-15	Gamma_TideGreatKills_226	pCi/g
1407417-16	Gamma_TidewaterGreatKills	pCi/g
1407417-16	Gamma_TideGreatKills_226	pCi/g
1407417-17	Gamma_TidewaterGreatKills	pCi/g
1407417-17	Gamma_TideGreatKills_226	pCi/g
1407417-18	Gamma_TidewaterGreatKills	pCi/g
1407417-18	Gamma_TideGreatKills_226	pCi/g
1407417-19	Gamma_TidewaterGreatKills	pCi/g

1407417-19	Gamma_TideGreatKills_226	pCi/g
1407417-20	Gamma_TideGreatKills_226	pCi/g
1407417-20	Gamma_TidewaterGreatKills	pCi/g

Radiochemistry Prep Worksheet

ALS Environmental -- FC

Prep Batch: GS140724-1

Prep Procedure: GAMMASCAN

Reviewed By: SAM SM **Review Date:** 7/26/2014

Non-Routine Pre-Treatment? Y / (N) **Batch:** N/A **Re-Prep?** Y / (N) **Batch:** N/A **Prep QASS / NCR?** Y / (N) N/A

Prep SOP: PAI 739 **Rev:** 11
Prep SOP: NONE
Matrix Class: solid

Prep Analyst: Stacy A. Martin
Prep Date: 7/26/2014
Prep Dept: GM

Balance: 20
Balance:

OvenNum: 19
Oven In Date: 7/24/2014 3:10:00 PM
Oven Out Date: 7/26/2014 11:30:00 AM

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Geometry	Dish Weight (g)	Dry Weight + Dish Weight (g)	Standards	Prep Notes
1	1	1407417-1	SMP		304.6	304.6	Dry Weight	13	48.6	353.2		
2	1	1407417-1	DUP		304.6	304.6	Dry Weight	13	48.6	353.2		
3	1	1407417-2	SMP		246.5	246.5	Dry Weight	13	48.4	294.9		
4	1	1407417-3	SMP		241.2	241.2	Dry Weight	13	48.3	289.5		
5	1	1407417-4	SMP		234.4	234.4	Dry Weight	13	47.7	282.1		
6	1	1407417-5	SMP		251.5	251.5	Dry Weight	13	48.5	300		
7	1	1407417-6	SMP		95.6	95.6	Dry Weight	13	47.5	143.1		
8	1	1407417-7	SMP		187.6	187.6	Dry Weight	13	48.6	236.2		
9	1	1407417-8	SMP		227.4	227.4	Dry Weight	13	48.8	276.2		
10	1	1407417-9	SMP		225.3	225.3	Dry Weight	13	47.9	273.2		
11	1	1407417-10	SMP		280.8	280.8	Dry Weight	13	48.7	329.5		
12	1	1407417-11	SMP		226.7	226.7	Dry Weight	13	48.7	275.4		
13	1	1407417-12	SMP		271.4	271.4	Dry Weight	13	48.1	319.5		
14	1	1407417-13	SMP		206.8	206.8	Dry Weight	13	47.8	254.6		
15	1	1407417-14	SMP		262.5	262.5	Dry Weight	13	48.9	311.4		
16	1	1407417-14	SMP		262.5	262.5	Dry Weight	13	48.9	311.4		Count DUP, Insufficient volume.
17	1	1407417-15	SMP		211.2	211.2	Dry Weight	13	48.2	259.4		
18	1	1407417-16	SMP		279.3	279.3	Dry Weight	13	48.2	327.5		
19	1	1407417-17	SMP		220	220	Dry Weight	13	48.4	268.4		
20	1	1407417-18	SMP		259.6	259.6	Dry Weight	13	48.4	308		
21	1	1407417-19	SMP		231.8	231.8	Dry Weight	13	48.7	280.5		
22	1	1407417-20	SMP		273.1	273.1	Dry Weight	13	48.4	321.5		
23	1	GS140724-1	MB		500	500	Dry Weight	13				
24	1	GS140724-1	LCS		500	500	Dry Weight	13			S1	

ALS Environmental -- FC

Radiochemistry Prep Worksheet

Prep Batch: GS140724-1

Prep Procedure: GAMMASCAN

Reviewed By: SAM SM Review Date: 7/26/2014

Non-Routine Pre-Treatment? Y / (N) Batch: N/A Re-Prep? Y / (N) Batch: N/A Prep QASS / NCR? Y / (N) N/A

Prep SOP: PAI 739 Rev: 11
Prep SOP: NONE
Matrix Class: solid

Prep Analyst: Stacy A. Martin SM
Prep Date: 7/26/2014
Prep Dept: GM

Balance: 20
Balance:

OvenNum: 19
Oven In Date: 7/24/2014 3:10:00 PM
Oven Out Date: 7/26/2014 11:30:00 AM

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Geometry	Dish Weight (g)	Dry Weight + Dish Weight (g)	Standards	Prep Notes

Comments
Samples were dried, sieved, packed as geometry 13 and sealed with vinyl tape for 21d ingrowth.

Spiked By: N/A Date: N/A

Witnessed By: Date:

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Am-241	951	419.677	DPM/g	07/26/14	500	g	N/A
S1	Co-60	951	195.081	DPM/g	07/26/14	500	g	N/A
S1	Cs-137	951	167.063	DPM/g	07/26/14	500	g	N/A

576 of 809

Sample Condition Form (Solids)

Analyst: SM

Analysis Date: 7/26/14 Method: Prep

		Sample Condition (Visual Appearance of Analysis Aliquot at Time of Prep)		
Work Order	Sample ID	Dry/Wet/ Moist	Texture	Remarks
1407417	1	Dry	rough	soil
	2			
	3			
	4			
	5			
	6			mulch
	7			soil
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
	18			
	19			
	20.			

Cnts 8/17

ALS Environmental -- FC

Radiochemistry Instrument Worksheet

Prep Batch: GS140724-2

Prep Procedure: GAMMASCAN

Analytical QASS / NCR? Y / (N) NA

Prep Num	Lab ID Collection Date	QC Type	Init Alq	Fin Alq	Units Geo.	Report Units	Cnt 1 File Cnt Dur (min)	Cnt 1 Inst/Det	Cnt 1 Count Date	Cnt 2 File Cnt Dur (min)	Cnt 2 Inst/Det	Cnt 2 Count Date	Cnt 3 File Cnt Dur (min)	Cnt 3 Inst/Det	Cnt 3 Count Date	Notes
1	1407417-21 07/17/14 09:30	SMP	237	237	g 13	pCi/g	30	1	8/17/14							JP 8/18/14
1	1407417-21 07/17/14 09:30	DUP	237	*237	g 13	pCi/g		2								Count Duplicate
1	1407417-22 07/16/14 17:10	SMP	321.4	321.4	g 13	pCi/g		2								
1	1407417-23 07/17/14 10:50	SMP	295.4	295.4	g 13	pCi/g		4								
1	1407417-24 07/17/14 15:10	SMP	304.7	304.7	g 13	pCi/g		5								
1	1407417-25 07/17/14	SMP	318.9	318.9	g 13	pCi/g		7								
1	1407417-26 07/17/14 10:45	SMP	266.8	266.8	g 13	pCi/g		8								
1	1407417-27 07/16/14 17:15	SMP	239.5	239.5	g 13	pCi/g		3								
1	1407417-28 07/17/14 09:50	SMP	243.8	243.8	g 13	pCi/g		1								
1	1407417-29 07/16/14 16:30	SMP	282.9	282.9	g 13	pCi/g		3								
1	1407417-30 07/17/14 16:30	SMP	205.1	205.1	g 13	pCi/g	45	4								
1	1407417-31 07/18/14 09:14	SMP	217.1	217.1	g 13	pCi/g		5								
1	1407417-32 07/18/14 09:20	SMP	273.6	273.6	g 13	pCi/g	30	7								
1	1407417-33 07/18/14 09:25	SMP	256	256	g 13	pCi/g		8								
1	1407417-34 07/18/14 09:50	SMP	324.6	324.6	g 13	pCi/g	30	1								
1	1407417-35 07/18/14 09:55	SMP	290.6	290.6	g 13	pCi/g		2								
1	1407417-36 07/18/14 10:05	SMP	275.7	275.7	g 13	pCi/g		3								
1	1407417-37 07/18/14 10:00	SMP	325.1	325.1	g 13	pCi/g		7								
1	1407417-38 07/18/14 10:10	SMP	210	210	g 13	pCi/g		8								
1	1407417-39 07/18/14 09:45	SMP	237.8	237.8	g 13	pCi/g		4								
1	1407417-40 07/18/14 09:40	SMP	291.6	291.6	g 13	pCi/g		5								
1	GS140724-2 07/27/14 10:31	MB	500	500	g 13	pCi/g	45	1								JP 8/18/14
1	GS140724-2 07/27/14 10:31	LCS	500	500	g 13	pCi/g	30	2								

5/19

Hunters Point LIB Bi214(0.5) Pb214(0.5) Th234(5) K40(1)

Ra226 LIB Ra226 (0.5)

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Am-241	951	419.675	DPM/g	07/27/14	500	g	N/A
S1	Co-60	951	195.010	DPM/g	07/27/14	500	g	N/A
S1	Cs-137	951	167.053	DPM/g	07/27/14	500	g	N/A

Supersedes: N/A

Radiochemistry Instrument Worksheet

ALS Environmental -- FC

Prep Batch: GS140724-2

Prep Procedure: GAMMASCAN

Analytical QASS / NCR? Y (N) NA

Prep Num	Lab ID Collection Date	QC Type	Init Alq	Fin Alq	Units Geo.	Report Units	Cnt 1 File Cnt Dur (min)	Cnt 1 Inst/Det	Cnt 1 Count Date	Cnt 2 File Cnt Dur (min)	Cnt 2 Inst/Det	Cnt 2 Count Date	Cnt 3 File Cnt Dur (min)	Cnt 3 Inst/Det	Cnt 3 Count Date	Notes

Sample Barcodes

1407417-21 GS140724-2PS1	1407417-21DUP GS140724-2PS2	1407417-22 GS140724-2PS3
1407417-23 GS140724-2PS4	1407417-24 GS140724-2PS5	1407417-25 GS140724-2PS6
1407417-26 GS140724-2PS7	1407417-27 GS140724-2PS8	1407417-28 GS140724-2PS9
1407417-29 GS140724-2PS10	1407417-30 GS140724-2PS11	1407417-31 GS140724-2PS12
1407417-32 GS140724-2PS13	1407417-33 GS140724-2PS14	1407417-34 GS140724-2PS15
1407417-35 GS140724-2PS16	1407417-36 GS140724-2PS17	1407417-37 GS140724-2PS18
1407417-38 GS140724-2PS19	1407417-39 GS140724-2PS20	1407417-40 GS140724-2PS21
GS140724-2MB GS140724-2PS22	GS140724-2LCS GS140724-2PS23	

Reporting Units

LabID:	TstGrpName:	RptUnits:
1407417-21	Gamma_TidewaterGreatKills	pCi/g
1407417-21	Gamma_TideGreatKills_226	pCi/g
1407417-22	Gamma_TideGreatKills_226	pCi/g
1407417-22	Gamma_TidewaterGreatKills	pCi/g
1407417-23	Gamma_TideGreatKills_226	pCi/g
1407417-23	Gamma_TidewaterGreatKills	pCi/g
1407417-24	Gamma_TideGreatKills_226	pCi/g
1407417-24	Gamma_TidewaterGreatKills	pCi/g
1407417-25	Gamma_TidewaterGreatKills	pCi/g
1407417-25	Gamma_TideGreatKills_226	pCi/g
1407417-26	Gamma_TideGreatKills_226	pCi/g
1407417-26	Gamma_TidewaterGreatKills	pCi/g
1407417-27	Gamma_TideGreatKills_226	pCi/g
1407417-27	Gamma_TidewaterGreatKills	pCi/g
1407417-28	Gamma_TideGreatKills_226	pCi/g
1407417-28	Gamma_TidewaterGreatKills	pCi/g
1407417-29	Gamma_TideGreatKills_226	pCi/g
1407417-29	Gamma_TidewaterGreatKills	pCi/g
1407417-30	Gamma_TideGreatKills_226	pCi/g
1407417-30	Gamma_TidewaterGreatKills	pCi/g
1407417-31	Gamma_TidewaterGreatKills	pCi/g
1407417-31	Gamma_TideGreatKills_226	pCi/g
1407417-32	Gamma_TideGreatKills_226	pCi/g
1407417-32	Gamma_TidewaterGreatKills	pCi/g
1407417-33	Gamma_TideGreatKills_226	pCi/g
1407417-33	Gamma_TidewaterGreatKills	pCi/g
1407417-34	Gamma_TideGreatKills_226	pCi/g
1407417-34	Gamma_TidewaterGreatKills	pCi/g
1407417-35	Gamma_TidewaterGreatKills	pCi/g
1407417-35	Gamma_TideGreatKills_226	pCi/g
1407417-36	Gamma_TideGreatKills_226	pCi/g
1407417-36	Gamma_TidewaterGreatKills	pCi/g
1407417-37	Gamma_TideGreatKills_226	pCi/g
1407417-37	Gamma_TidewaterGreatKills	pCi/g
1407417-38	Gamma_TideGreatKills_226	pCi/g
1407417-38	Gamma_TidewaterGreatKills	pCi/g
1407417-39	Gamma_TideGreatKills_226	pCi/g

1407417-39	Gamma_TidewaterGreatKills	pCi/g
1407417-40	Gamma_TidewaterGreatKills	pCi/g
1407417-40	Gamma_TideGreatKills_226	pCi/g

Radiochemistry Prep Worksheet

ALS Environmental -- FC

Prep Batch: GS140724-2

Prep Procedure: GAMMASCAN

Reviewed By: SAM SM Review Date: 7/27/2014

Non-Routine Pre-Treatment? Y / (N) Batch: N/A Re-Prep? Y / (N) Batch: N/A Prep QASS / NCR? Y / (N) N/A

Prep SOP: PAI 739 Rev: 11
Prep SOP: NONE
Matrix Class: solid

Prep Analyst: Stacy A. Martin
Prep Date: 7/27/2014 SM
Prep Dept: GM

Balance: 20
Balance:

OvenNum: 19
Oven In Date: 7/25/2014 9:30:00 AM
Oven Out Date: 7/27/2014 2:10:00 PM

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Geometry	Dish Weight (g)	Dry Weight + Dish Weight (g)	Standards	Prep Notes
1	1	1407417-21	SMP		237	237	Dry Weight	13	48.6	285.6		SM 7/27/14
2	1	1407417-21	DUP		237	237	Dry Weight	13	48.6	285.6		Count DUP, Insufficient volume.
3	1	1407417-22	SMP		321.4	321.4	Dry Weight	13	48.3	369.7		
4	1	1407417-23	SMP		295.4	295.4	Dry Weight	13	48.7	344.1		
5	1	1407417-24	SMP		304.7	304.7	Dry Weight	13	48.7	353.4		
6	1	1407417-25	SMP		318.9	318.9	Dry Weight	13	48.5	367.4		
7	1	1407417-26	SMP		266.8	266.8	Dry Weight	13	48.3	315.1		
8	1	1407417-27	SMP		239.5	239.5	Dry Weight	13	48.4	287.9		
9	1	1407417-28	SMP		243.8	243.8	Dry Weight	13	48.1	291.9	SM 7/27/14	
10	1	1407417-29	SMP		282.9	282.9	Dry Weight	13	48	330.9		SM 7/27/14
11	1	1407417-30	SMP		205.1	205.1	Dry Weight	13	48.2	253.3		
12	1	1407417-31	SMP		217.1	217.1	Dry Weight	13	49	266.1		
13	1	1407417-32	SMP		273.6	273.6	Dry Weight	13	48.6	322.2		
14	1	1407417-33	SMP		256	256	Dry Weight	13	48.8	304.8		
15	1	1407417-34	SMP		324.6	324.6	Dry Weight	13	48.4	373		
16	1	1407417-35	SMP		290.6	290.6	Dry Weight	13	48.7	339.3		
17	1	1407417-36	SMP		275.7	275.7	Dry Weight	13	48	323.7		
18	1	1407417-37	SMP		325.1	325.1	Dry Weight	13	48.6	373.7		
19	1	1407417-38	SMP		210	210	Dry Weight	13	48.3	258.3		
20	1	1407417-39	SMP		237.8	237.8	Dry Weight	13	48.7	286.5		
21	1	1407417-40	SMP		291.6	291.6	Dry Weight	13	48.2	339.8		
22	1	GS140724-2	MB		500	500	Dry Weight	13				
23	1	GS140724-2	LCS		500	500	Dry Weight	13	SM 7/27/14		S1	

Radiochemistry Prep Worksheet

ALS Environmental -- FC

Prep Batch: GS140724-2

Prep Procedure: GAMMASCAN

Reviewed By: SAM **Review Date:** 7/27/2014

Non-Routine Pre-Treatment? Y / (N) **Batch:** N/A **Re-Prep?** Y / (N) **Batch:** N/A **Prep QASS / NCR?** Y / (N) N/A

Prep SOP: PAI 739 **Rev:** 11
Prep SOP: NONE
Matrix Class: solid

Prep Analyst: Stacy A. Martin
Prep Date: 7/27/2014
Prep Dept: GM

Balance: 20
Balance:

OvenNum: 19
Oven In Date: 7/25/2014 9:30:00 AM
Oven Out Date: 7/27/2014 2:10:00 PM

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Geometry	Dish Weight (g)	Dry Weight + Dish Weight (g)	Standards	Prep Notes

Comments
Samples were dried, sieved, packed as geometry 13 and sealed with vinyl tape for 21d ingrowth.

Spiked By: N/A **Date:** N/A

Witnessed By: N/A **Date:** N/A

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Am-241	951	419.675	DPM/g	07/27/14	500	g	N/A
S1	Co-60	951	195.010	DPM/g	07/27/14	500	g	N/A
S1	Cs-137	951	167.053	DPM/g	07/27/14	500	g	N/A

583 of 809

Sample Condition Form (Solids)

Analyst: SM

Analysis Date: 7/27/14 Method: Prep

		Sample Condition (Visual Appearance of Analysis Aliquot at Time of Prep)		
Work Order	Sample ID	Dry/Wet/ Moist	Texture	Remarks
1407417	21	Dry	rough	soil
	22			
	23			
	24			
	25			
	26			
	27			
	28			
	29			
	30			
	31			
	32			
	33			
	34			
	35			
	36			
	37			
	38			
	39			
	40			

Section 8

STANDARDS TRACEABILITY DOCUMENTS

8

Eckert & Ziegler
Analytics

Rec 10-25-11
RSO #951

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

85860-307

500 Grams of Sand in 16 Ounce PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: 73625, Item 1
Reference Date: 01-Oct-2011 12:00 PM EST **Grams of Master Source:** 0.011319

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.261E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.679E+05	1.900E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.972E+04	1.016E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.255E+05	1.421E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.751E+05	3.114E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.750E+05	1.981E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.117E+05	1.264E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.205E+05	4.760E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.081E+05	2.355E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.081E+05	2.355E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.451E+05	5.038E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Std Re-Verified
9/3/2013
New Exp Date
=> 09/03/2014
JP 10/1/13

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1958

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

ANA Form006 Rev. --

Comments:
~290 mL of customer supplied sand.

This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 24 OCT 11
J. D. McCorvey, QA Manager Alternate

Section 9

ADDITIONAL SUPPORTING DOCUMENTATION

Gamma Spectroscopy

Initial Calibration Standards Traceability

130925D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 1 / Water

Sample ID: 082313-1 FWHM CAL (990)

Sampling Start:	01/01/2013 10:00:00	Counting Start:	08/23/2013 08:45:08
Sampling Stop:	01/01/2013 10:00:00	Decay Time.	5.61E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	4500 Sec
Sample Size	1.00E+000 L	Real Time	4638 Sec
Collection Efficiency	1.0000	Spc. File	130925D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -1.89 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/23/2013

FWHM(keV) = 0.59 + 0.016*En + 5.06E-04*En^2 + 0.00E+00*En^3 08/23/2012

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	59.46	122.58	19859	397	230	10707	0.77	a	HiResid
2	87.95	179.51	88985	672	254	13030	0.85	a	
3	122.07	247.68	57175	547	218	9600	0.88	a	
4	136.49	276.49	7588	327	228	9574	0.93	a	
5	165.85	335.15	48228	513	218	8816	0.93	a	
6	255.15	513.59	1393	239	187	6451	0.93	a	
7	272.47	548.20	4	493	406	15875	2.77	a	NET< CL Wide Pk
8	279.20	561.64 *	7401	273	174	5603	1.04	b	
9	356.20	715.49	230	202	164	4592	1.08	a	
10	391.75	786.53	29946	398	162	4460	1.15	a	
11	474.35	951.56	165	140	113	2910	0.88	a	
12	510.98	1024.74	692	232	186	5389	1.80	a	
13	650.17	1302.86	36	150	123	2968	1.16	a	NET< CL
14	661.74	1325.97	52593	488	136	3416	1.38	a	
15	813.96	1630.13	520	178	141	3284	1.59	a	
16	889.55	1781.15	63	106	86	1836	0.89	a	NET< CL
17	898.16	1798.37	32506	399	141	3668	1.57	a	
18	1173.36	2348.23	55318	486	100	1763	1.77	a	
19	1325.16	2651.54	865	150	113	1586	3.87	a	HiResid Wide Pk
20	1332.54	2666.27	50535	457	66	793	1.88	b	HiResid
21	1624.34	3249.31	85	90	73	864	2.40	a	
22	1836.02	3672.26	19267	281	34	198	2.21	a	HiResid

*< 10,000 counts achieved due to greater Than 5½ lives expired JP 8/23/17

130925D01.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

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Sample ID: 082313-1 FWHM CAL (990)
Stds. Match Tolerance: 2.00 keV

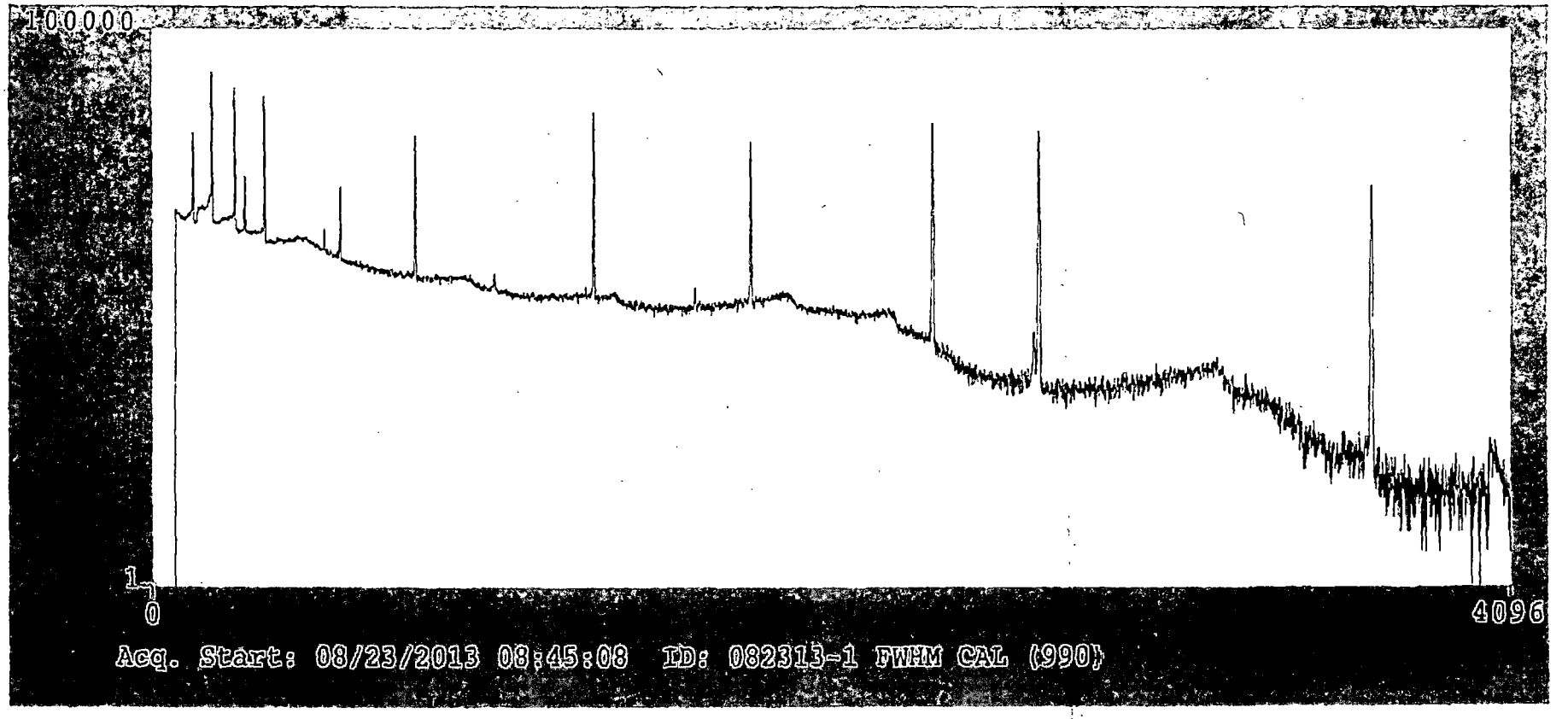
Detector Number: 01 Calibration Date. . . 08/23/2013 08:45:08

FWHM(keV) = 0.62 + 0.018*En + 4.43e-04*En^2 + 0.00e+00*En^3
(Where En = SQR(Energy in keV))

Pk. #	Energy (kev)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(kev)
1	59.50	0.770	2.21	0.787	-5.11	0.749
2	88.04	0.852	-2.62	0.831	-5.03	0.791
3	122.06	0.884	-0.86	0.876	-4.91	0.835
4	165.85	0.926	0.36	0.929	-4.73	0.887
5	279.00	1.043	0.56	1.049	-4.22	1.007
6	391.68	1.151	0.44	1.156	-3.73	1.114
7	661.64	1.375	0.62	1.384	-2.71	1.347
8	898.02	1.575	-0.53	1.566	-1.96	1.536
9	1173.21	1.768	-0.09	1.767	-1.23	1.745
10	1332.48	1.885	-0.35	1.878	-0.86	1.862
11	1836.01	2.212	0.24	2.218	0.13	2.221

Calibration Results Saved.

Ok JR 8/23/13


100000
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0
4096
Acq. Start: 08/23/2013 08:45:08 ID: 082313-1 FWHM CAL (990)

Eckert & Ziegler
Analytics

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

Rec Jan 24, 2013
RSO #990

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

92616

1.0 Liter Solid in 138G GA-MA Beaker

Customer: ALS Laboratory Group
P.O. No.: 73625, Item 1 Product Code: 8401-EG-SD
Reference Date: 01-Jan-2013 12:00 PM EST **Grams of Master Source:** 0.011441

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Am-241	59.5	1.580E+05	———	1.315E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.640E+05	1.877E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.890E+04	1.017E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.244E+05	1.423E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.525E+05	2.889E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.733E+05	1.982E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.150E+05	1.316E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.238E+05	4.849E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.138E+05	2.446E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.139E+05	2.447E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.487E+05	5.133E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1958

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 10 JAN 13
J.D. McCorvey, Counting Room Manager

140928D02.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 1 / Water

Sample ID: 080514-2 FWHM CAL (999)

Sampling Start:	01/01/2014 10:00:00	Counting Start:	08/05/2014 06:46:34
Sampling Stop:	01/01/2014 10:00:00	Decay Time.	5.18E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	4500 Sec
Sample Size	1.00E+000 L	Real Time	4667 Sec
Collection Efficiency	1.0000	Spc. File	.140928D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.50 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/05/2014

FWHM(keV) = 0.63 + 0.021*En + 4.40E-04*En^2 + 0.00E+00*En^3 08/05/2013

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.38	121.57	10143	364	250	12581	0.82 a	HiResid
2	87.87	178.46	77643	676	315	18311	0.92 a	
3	121.99	246.58	61059	596	274	13830	0.98 a	
4	136.43	275.41	8263	358	254	11908	0.99 a	
5	165.75	333.95	56359	559	243	10925	0.95 a	HiResid
6	255.05	512.26	1801	268	209	8072	1.03 a	
7	279.13	560.34	12034	348	223	8454	1.13 a	
8	391.68	785.05	42109	461	172	5855	1.21 a	
9	511.07	1023.44	1029	336	271	9450	2.48 a	Wide Pk
10	661.68	1324.16	65632	553	172	5154	1.44 a	
11	813.80	1627.89	608	164	128	3378	1.30 a	
12	821.21	1642.67	246	213	174	5068	1.99 b	
13	898.12	1796.25	47491	478	161	4803	1.65 a	
14	1173.33	2345.74	72758	557	114	2523	1.87 a	HiResid
15	1325.15	2648.88	1228	180	137	2435	3.59 a	HiResid Wide Pk
16	1332.52	2663.60	65809	523	85	1328	2.03 b	HiResid
17	1356.81	2712.09	51	57	46	513	1.03 a	
18	1836.03	3668.93	29279	348	51	428	2.42 a	HiResid

140928D02.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

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Sample ID: 080514-2 FWHM CAL (999)
Stds. Match Tolerance: 2.00 keV

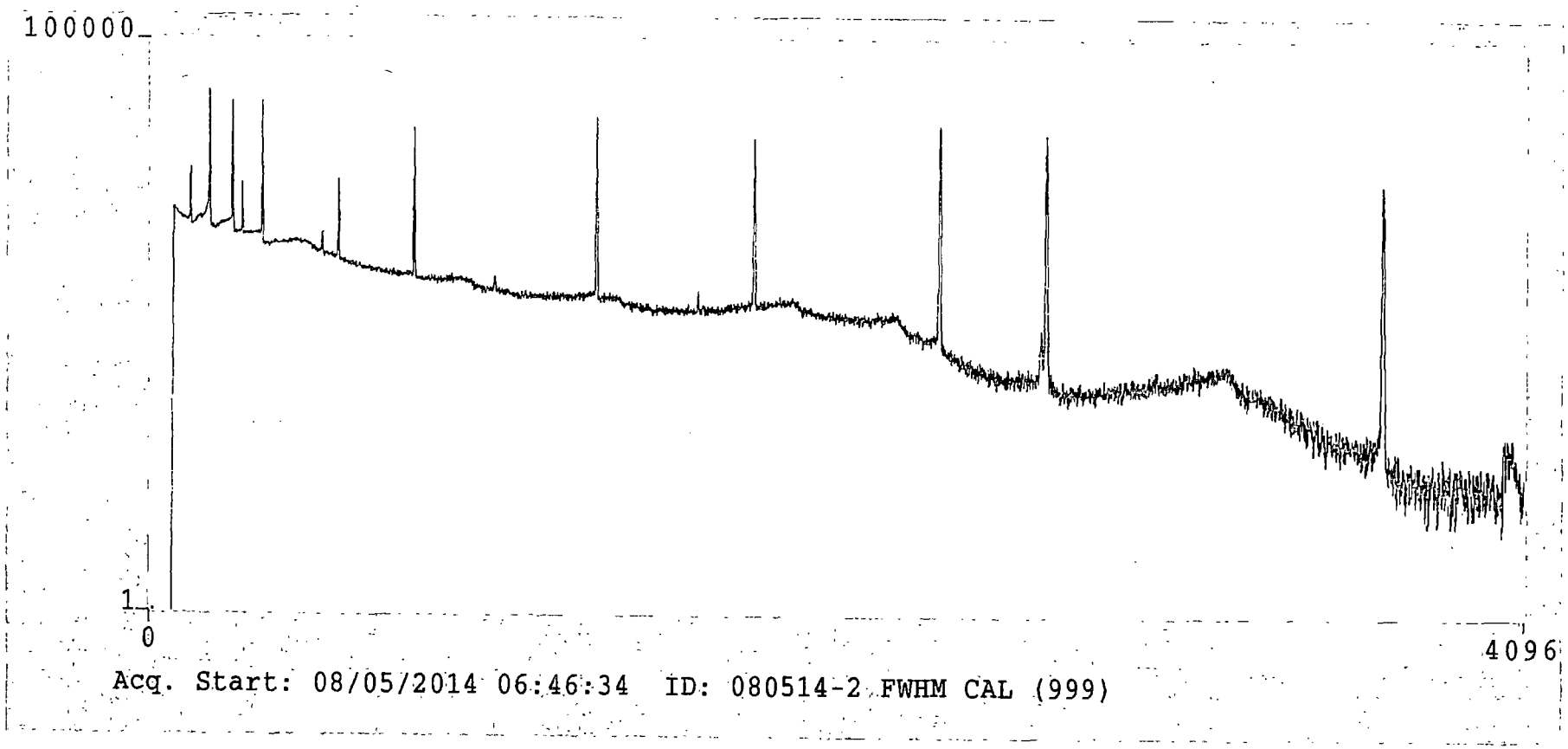
Detector Number: 02 Calibration Date. . . 08/05/2014 06:46:34

FWHM(keV) = 0.73 + 0.011*En + 6.51e-04*En^2 + 0.00e+00*En^3
(Where En = SQR(Energy in keV))

Pk. #	Energy (kev)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(kev)
1	59.50	0.815	5.03	0.859	-5.61	0.813
2	88.04	0.923	-2.97	0.896	-4.20	0.860
3	122.06	0.982	-4.77	0.937	-3.06	0.909
4	165.85	0.949	3.85	0.987	-2.08	0.967
5	279.00	1.133	-2.59	1.104	-0.76	1.096
6	391.68	1.210	0.24	1.213	-0.28	1.209
7	661.64	1.442	0.97	1.456	-0.36	1.451
8	898.02	1.651	0.46	1.658	-0.95	1.643
9	1173.21	1.875	0.61	1.886	-1.82	1.853
10	1332.48	2.032	-0.79	2.016	-2.35	1.969
11	1836.01	2.417	-0.06	2.416	-4.02	2.322

Calibration Results Saved.

OK JP 8/5/14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RSO # 999

Received 2/26/2014 JP

Eckert & Ziegler Analytics

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

95848

1.0 Liter Solid in 138G GA-MA Beaker

Customer: ALS Laboratory Group
P.O. No.: FC000236, Item 1 **Product Code** 8401-EG-SD
Reference Date: 01-Jan-2014 12:00 PM EST **Grams of Master Source:** 0.011697

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Am-241	59.5	1.580E+05	———	1.330E+03	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.627E+05	1.903E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.915E+04	1.043E+03	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.228E+05	1.436E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.636E+05	3.082E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	2.031E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.100E+05	1.287E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.166E+05	4.873E+03	0.5	1.7	3.5	HPGe
Co-60	1173.2	1.925E+03	2.055E+05	2.404E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.057E+05	2.406E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.410E+05	5.158E+03	0.7	1.7	3.7	HPGe

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

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

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts · Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

This standard will expire one year after the reference date.

Source Prepared by: _____
K. Eardley, Radiochemist

QA Approved: _____ Date: 24 Feb 14
J.D. McCorvey, Counting Room Manager

131091D03.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 110613-3 FWHM Cal (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	11/06/2013 07:05:45
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	3.07E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	3600 Sec
Sample Size	5.00E+002 g	Real Time	3725 Sec
Collection Efficiency	1.0000	Spc. File	.131091D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.65 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 11/06/2013
FWHM(keV) = 0.80 + 0.012*En + 7.23E-04*En^2 + 0.00E+00*En^3 11/07/2012
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.42	95.93	1855	258	200	8032	0.77 a	HiResid
2	59.44	121.91	10508	350	233	10061	0.93 a	
3	70.77	144.52	450	191	153	5772	0.48 a	
4	72.80	148.57	888	384	312	15391	1.29 b	
5	87.68	178.26	53495	571	275	13945	1.04 a	HiResid
6	122.03	246.80	34611	463	227	9548	1.00 a	HiResid
7	136.49	275.66	4673	318	236	9484	1.13 a	
8	165.80	334.13	36925	467	218	8121	1.07 a	
9	255.08	512.28	1130	191	147	4577	1.03 a	
10	279.15	560.30	17091	320	152	4562	1.22 a	
11	290.88	583.71	108	119	96	2287	0.73 a	
12	391.67	784.82	27004	369	138	3537	1.34 a	HiResid
13	510.90	1022.71	687	207	165	4010	1.94 a	
14	512.62	1026.15	193	189	154	3675	1.75 b	
15	661.66	1323.53	25088	355	131	3180	1.62 a	HiResid
16	813.80	1627.11	577	167	131	2768	2.09 a	
17	898.05	1795.21	30801	380	119	2512	1.84 a	HiResid
18	1173.22	2344.28	27293	348	89	1393	2.19 a	HiResid
19	1325.05	2647.22	765	116	84	1085	2.86 a	HiResid
20	1332.40	2661.90	25442	330	68	830	2.14 b	HiResid
21	1835.88	3666.50	18353	276	45	305	2.71 a	HiResid

131091D03.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

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Sample ID: 110613-3 FWHM Cal (996)
Stds. Match Tolerance: 2.00 keV

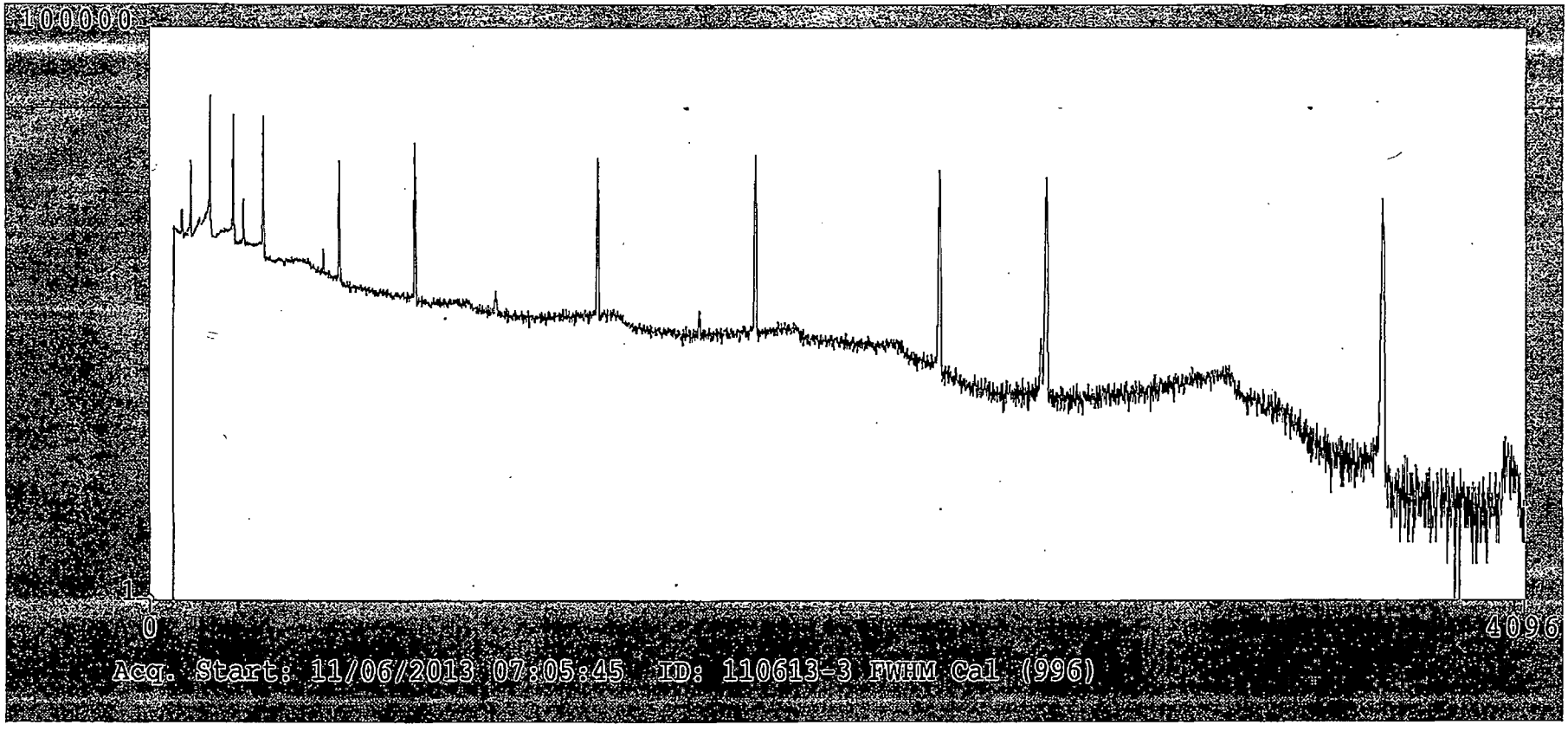
Detector Number: 03 Calibration Date. . . 11/06/2013 07:05:45

FWHM(keV) = 0.80 + 0.013*En + 7.29e-04*En^2 + 0.00e+00*En^3
(Where En = SQR(Energy in keV))

Pk. #	Energy (kev)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(kev)
1	59.50	0.929	1.54	0.943	-1.05	0.933
2	88.04	1.042	-5.75	0.986	-1.17	0.974
3	122.06	0.997	3.42	1.032	-1.27	1.019
4	165.85	1.074	1.25	1.088	-1.37	1.073
5	279.00	1.218	0.14	1.220	-1.54	1.201
6	391.68	1.343	-0.05	1.342	-1.64	1.320
7	661.64	1.617	-0.08	1.616	-1.77	1.587
8	898.02	1.844	-0.09	1.843	-1.82	1.810
9	1173.21	2.189	-4.28	2.099	-1.84	2.061
10	1332.48	2.143	4.50	2.244	-1.85	2.203
11	1836.01	2.710	-0.60	2.693	-1.84	2.645

Calibration Results Saved.

OK JP 11/6/13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#996

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

94409

Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070368

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	——	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	——	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.238E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia 30318

Comments:
~290 mL / 500 g customer supplied sand

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager

140034D04.SPC Analyzed by JP

****

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 011314-4 FWHM CAL (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	01/13/2014 11:01:43
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	4.71E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	4500 Sec
Sample Size	5.00E+002 g	Real Time	4585 Sec
Collection Efficiency	1.0000	Spc. File	.140034D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.46 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/13/2014

FWHM(keV) = 0.23 + 0.088*En +-2.36E-03*En^2 + 4.21E-05*En^3 01/11/2013

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.47	95.70	4571	325	243	10951	1.00	a
2	59.50	121.73	17541	374	217	9501	0.84	a HiResid
3	88.02	178.67	66976	615	272	13715	0.97	a
4	122.13	246.78	39925	486	227	9538	1.01	a HiResid
5	136.59	275.65	5119	318	234	9310	1.07	a
6	165.93	334.23	34331	455	217	8005	1.10	a HiResid
7	255.30	512.68	964	168	128	3744	0.90	a
8	279.31	560.63	7594	254	152	4526	1.17	a HiResid
9	391.92	785.47	21947	351	154	4131	1.44	a HiResid
10	511.15	1023.53	660	219	175	4705	2.36	a
11	662.00	1324.73	29321	384	143	3607	1.79	a HiResid
12	814.06	1628.36	338	171	137	3030	2.14	a
13	898.50	1796.96	22621	345	139	3446	2.05	a HiResid
14	1173.87	2346.79	28900	373	126	2692	2.36	a HiResid
15	1333.14	2664.81	26009	355	121	2335	2.59	a HiResid
16	1836.77	3670.40	12645	237	61	527	3.07	a HiResid

140034D04.SPC Analyzed by

****

SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

****

Sample ID: 011314-4 FWHM CAL (996)
Stds. Match Tolerance: 2.00 keV

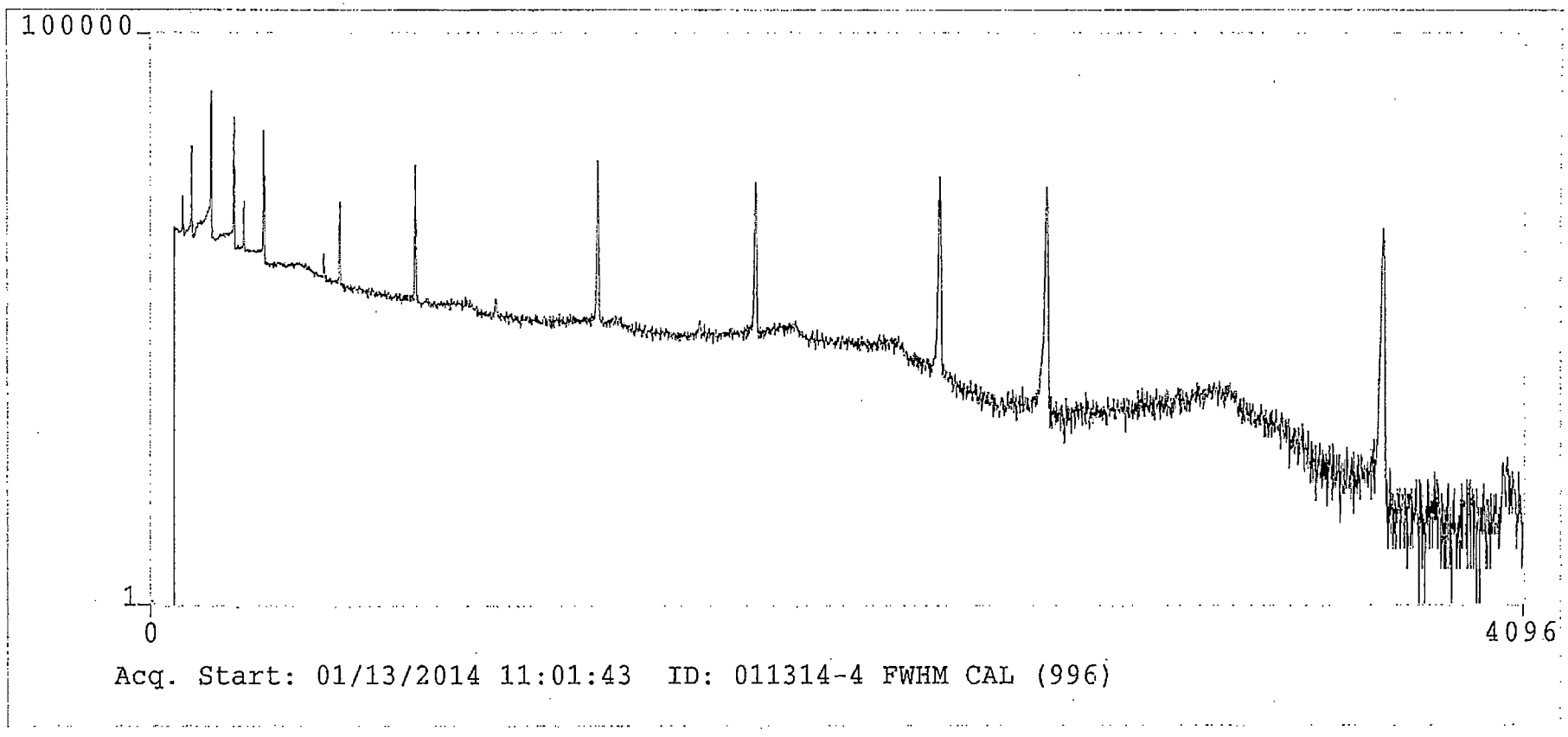
Detector Number: 04 Calibration Date. . . 01/13/2014 11:01:43

FWHM(keV) = 0.63 + 0.025*En + 7.58e-04*En^2 + 0.00e+00*En^3
(Where En = SQR(Energy in keV))

Pk. #	Energy (kev)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(kev)
1	59.50	0.844	2.49	0.865	-9.17	0.793
2	88.04	0.965	-3.95	0.929	-4.59	0.888
3	122.06	1.006	-0.98	0.996	-2.01	0.977
4	165.85	1.097	-2.04	1.075	-0.69	1.068
5	279.00	1.167	7.10	1.257	-0.97	1.245
6	391.68	1.442	-1.59	1.419	-2.75	1.381
7	661.64	1.790	-0.99	1.773	-6.90	1.658
8	898.02	2.052	0.30	2.058	-8.80	1.892
9	1173.21	2.365	0.38	2.374	-8.92	2.179
10	1332.48	2.587	-1.43	2.551	-8.16	2.358
11	1836.01	3.073	0.61	3.092	-3.21	2.995

Calibration Results Saved.

OK JP 1/14/2014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#996

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

94409

Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070368

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.238E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia 30318

608 61 809

Comments:
~290 mL / 500 g customer supplied sand

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager

140408D05.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 17/26

Sample ID: 042614-5 FWHM CAL (1000)

Sampling Start:	01/01/2014 10:00:00	Counting Start:	04/26/2014 10:24:32
Sampling Stop:	01/01/2014 10:00:00	Decay Time.	2.76E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	3600 Sec
Sample Size	2.15E+002 g	Real Time	3775 Sec
Collection Efficiency	1.0000	Spc. File	.140408D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.76 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 04/26/2014
FWHM(keV) = 0.53 + 0.018*En + 4.11E-04*En^2 + 0.00E+00*En^3 04/26/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.49	120.46	11600	383	261	13715	0.75 a	
2	70.73	142.94	543	284	231	11807	0.70 a	
3	72.83	147.12	1097	288	231	11807	0.66 b	
4	88.00	177.46	93329	710	298	17842	0.74 a	
5	121.99	245.41	77039	643	267	14358	0.77 a	
6	136.40	274.21	10470	363	247	12283	0.84 a	
7	165.79	332.96	86709	654	235	11104	0.85 a	
8	255.06	511.44	2843	259	194	7606	0.83 a	
9	279.09	559.47	48591	507	205	7787	0.96 a	
10	351.43	704.09	135	195	159	5113	0.85 a	NET< CL
11	391.61	784.43	68953	577	196	6552	1.09 a	
12	414.38	829.95	163	178	145	4213	0.88 a	
13	510.93	1022.97	1628	375	301	10038	2.25 a	Wide Pk
14	557.78	1116.62	170	164	133	3749	1.06 a	
15	661.61	1324.19	60085	533	172	5482	1.33 a	
16	674.97	1350.90	162	149	120	3296	0.89 a	
17	813.92	1628.69	956	195	152	4031	1.45 a	
18	898.02	1796.81	78952	594	159	4422	1.52 a	HiResid
19	1146.18	2292.94	107	114	92	1848	1.08 a	
20	1173.19	2346.93	65498	534	125	2743	1.75 a	HiResid
21	1325.10	2650.62	1709	193	144	2722	3.02 a	HiResid Wide Pk
22	1332.46	2665.33	60386	505	97	1663	1.85 b	HiResid
23	1711.16	3422.41	44	64	51	584	1.25 a	NET< CL

140408D05.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	1836.00	3671.98	48915	450	69	853	2.17	a HiResid

140408D05.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

****

Sample ID: 042614-5 FWHM CAL (1000)
Stds. Match Tolerance: 2.00 keV

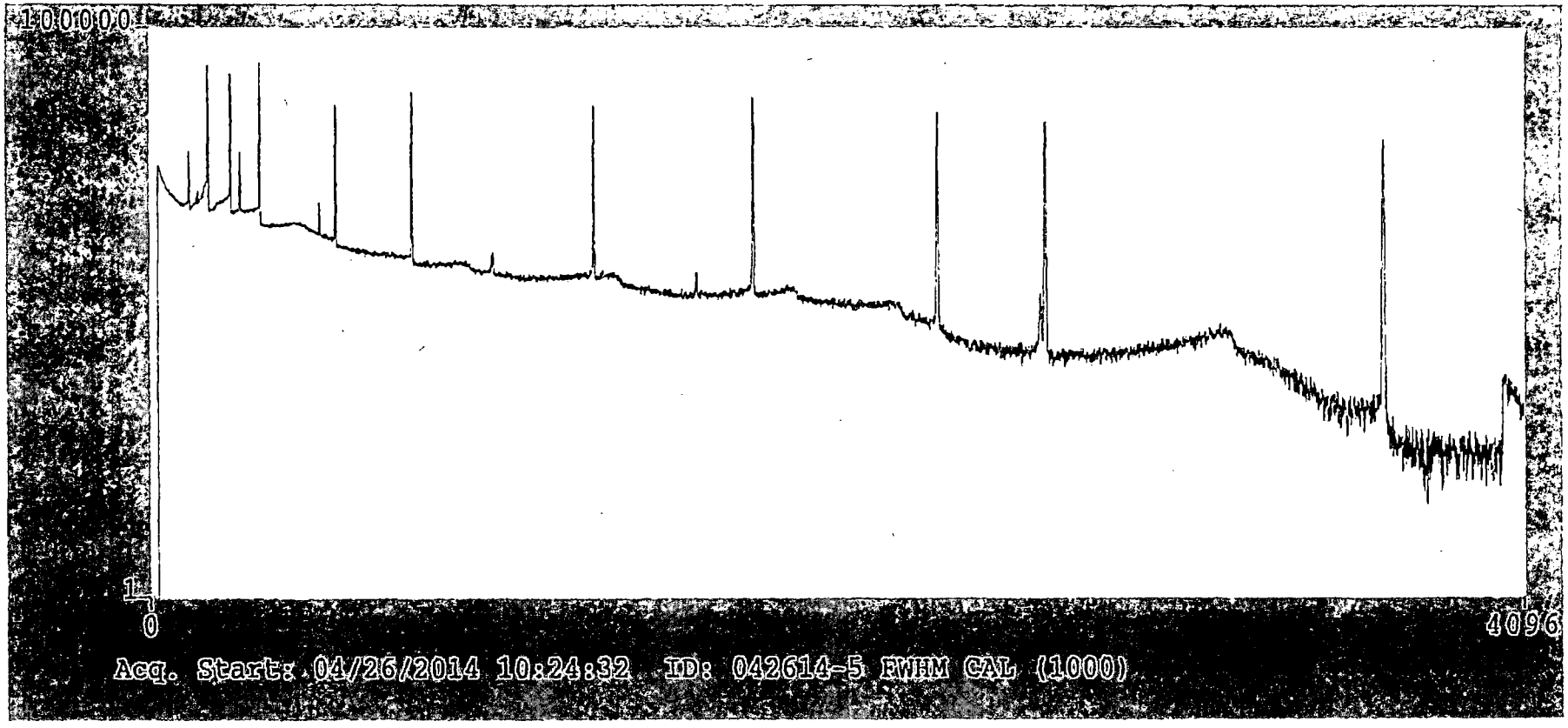
Detector Number: 05 Calibration Date. . . 04/26/2014 10:24:32

FWHM(keV) = 0.67 + -0.004*En + 1.51e-03*En^2 +-1.40e-05*En^3
(Where En = SQR(Energy in keV))

Pk. #	Energy (kev)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(kev)
1	59.50	0.746	-2.82	0.726	-4.53	0.694
2	88.04	0.742	1.98	0.757	-2.87	0.736
3	122.06	0.773	2.78	0.795	-1.88	0.780
4	165.85	0.851	-1.03	0.842	-1.40	0.831
5	279.00	0.961	0.13	0.962	-1.76	0.946
6	391.68	1.092	-1.43	1.077	-2.81	1.047
7	661.64	1.332	-0.08	1.330	-5.22	1.264
8	898.02	1.519	0.79	1.532	-6.53	1.438
9	1173.21	1.751	-0.40	1.744	-7.13	1.628
10	1332.48	1.853	0.18	1.856	-7.11	1.733
11	1836.01	2.171	-0.06	2.170	-5.66	2.054

Calibration Results Saved.

OK JP
4/26/14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Eckert & Ziegler Analytics

RSO # 1000

Received 2/26/2014 JP

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

95549

Sand in Metal Can

Customer: ALS Laboratory Group
P.O. No.: FC000236, Item 2 Product Code: 8401-EG-SAN
Reference Date: 01-Jan-2014 12:00 PM EST **Grams of Master Source:** 0.011679

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Am-241	59.5	1.580E+05	———	1.328E+03	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.627E+05	1.900E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.915E+04	1.041E+03	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.228E+05	1.434E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.636E+05	3.079E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	2.027E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.100E+05	1.285E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.166E+05	4.865E+03	0.5	1.7	3.5	HPGe
Co-60	1173.2	1.925E+03	2.055E+05	2.400E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.057E+05	2.402E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.410E+05	5.150E+03	0.7	1.7	3.7	HPGe

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

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

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

Comments:
~ 120 mL / 215 g of customer supplied sand.

This standard will expire one year after the reference date.

Source Prepared by: _____
K. Eardley, Radiochemist

QA Approved: _____ Date: 24 Feb 14
J.D. McCorvey, Counting Room Manager

131174D07.SPC Analyzed by JP

****

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Geo.9 / CHARC. FLTR

~~Sample ID: 111513-7 FWHM CAL (997)~~

Sampling Start: 07/01/2013 10:00:00	Counting Start: 11/15/2013 07:38:19
~~Sampling Stop: 07/01/2013 10:00:00~~	~~Decay Time. . . . . 3.29E+003 Hrs~~
Buildup Time. . . . . 0.00E+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00E+000 SAMPLE	Real Time . . . . . 1950 Sec
Collection Efficiency 1.0000	Spc. File 131174D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.22 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 11/15/2013

FWHM(keV) = 0.57 + 0.014*En + 7.89E-04*En^2 + 0.00E+00*En^3 11/16/2012

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	59.45	123.12	31244	424	193	7483	0.79	a	
2	70.75	145.67	769	206	163	5916	0.63	a	
3	72.85	149.88	1460	213	163	5916	0.68	b	
4	82.49	169.13	2124	384	306	13010	1.57	a	HiResid Wide Pk
5	85.08	174.29	3996	509	405	18214	2.29	b	HiResid
6	88.00	180.13	128146	749	180	6505	0.89	c	HiResid
7	121.97	247.95	76802	589	164	5443	0.87	a	
8	136.40	276.75	9714	269	150	4558	0.87	a	
9	165.81	335.48	74793	583	165	5051	0.94	a	
10	255.13	513.81	2147	192	138	3517	0.97	a	
11	279.22	561.91	28598	382	146	3625	1.09	a	
12	391.80	786.68	45781	457	133	3005	1.22	a	
13	511.13	1024.93	538	222	179	4501	2.15	a	Wide Pk
14	661.94	1326.03	41490	446	148	3620	1.56	a	
15	786.06	1573.86	52	85	69	1158	0.79	a	NET< CL
16	814.07	1629.78	603	157	122	2637	1.78	a	
17	898.27	1797.88	45105	453	130	2977	1.84	a	
18	1173.40	2347.22	39858	417	99	1755	2.13	a	HiResid
19	1325.08	2650.04	917	140	104	1536	3.11	a	HiResid
20	1332.53	2664.92	36287	394	81	1132	2.36	b	HiResid
21	1835.53	3669.21	24735	322	56	464	2.90	a	HiResid

131174D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.2

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET071113.BKG (111313-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	59.45	31244	424	193	31243	424	193	
3	72.85	1460	213	163	1456	213	163	
4	82.49	2124	384	306	2123	384	306	
8	136.40	9714	269	150	9713	269	150	
13	511.13	538	222	179	492	222	179	

131174D07.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

****

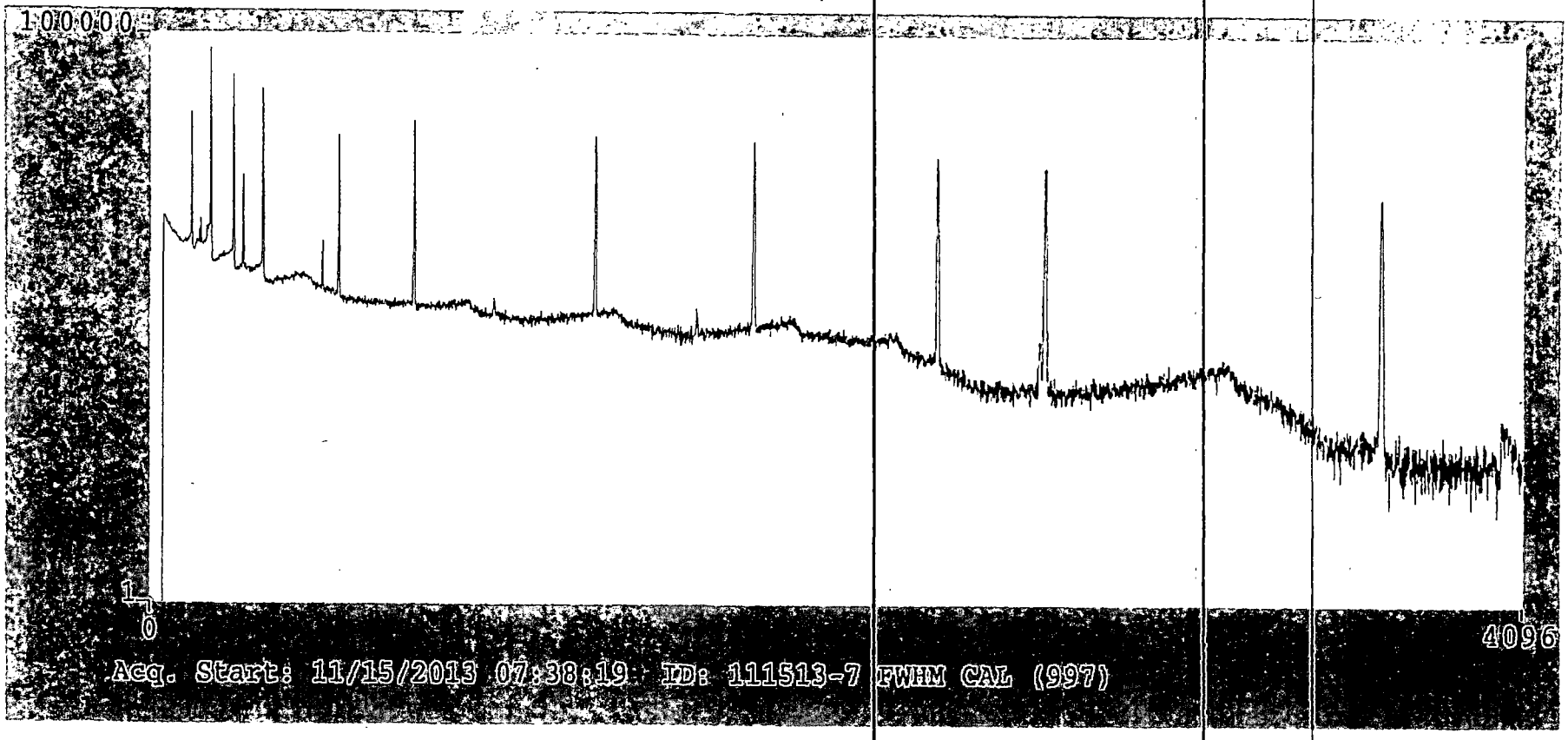
Sample ID: 111513-7 FWHM CAL (997)
Stds. Match Tolerance: 2.00 keV

Detector Number: 07 Calibration Date. . . 11/15/2013 07:38:19

FWHM(keV) = 0.69 + 0.006*En + 1.07e-03*En^2 + 0.00e+00*En^3
(Where En = SQR(Energy in keV))

Pk. #	Energy (kev)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(kev)
1	59.50	0.787	1.99	0.803	0.00	0.803
2	88.04	0.889	-5.45	0.843	0.00	0.843
3	122.06	0.870	2.20	0.890	0.00	0.890
4	165.85	0.935	1.23	0.947	0.00	0.947
5	279.00	1.092	-0.17	1.090	0.00	1.090
6	391.68	1.220	0.73	1.229	0.00	1.229
7	661.64	1.556	-0.24	1.552	0.00	1.552
8	898.02	1.839	-0.51	1.829	0.00	1.829
9	1173.21	2.128	0.96	2.149	0.00	2.149
10	1332.48	2.355	-1.00	2.332	0.00	2.332
11	1836.01	2.900	0.25	2.908	0.00	2.908

Calibration Results Saved.


100000
1
0
4096
Acq. Start: 11/15/2013 07:38:19 ID: 111513-7 FWHM CAL (997)

#997

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

94410

Face Loaded Yellow Plastic Hi-Q Charcoal Cartridge

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 2 Product Code: 8401-EG-CH
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0069120

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Am-241	59.5	1.580E+05	———	6.881E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	9.700E+02	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	5.241E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	7.346E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.553E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.027E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	6.622E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.481E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.226E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.226E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	2.627E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1954

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia

Comments:
Active material deposited on first 5 mm.

This standard will expire one year after the reference date.

Source Prepared by: A. Herron, Radiochemist

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

Date: 29 AUG 13

140106D08.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 020514-8 FWHM CAL (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	02/06/2014 09:41:10
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	5.28E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	3600 Sec
Sample Size	5.00E+002 g	Real Time	3697 Sec
Collection Efficiency	1.0000	Spc. File	.140106D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.21 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 02/06/2014
FWHM(keV) = 0.46 + 0.021*En + 5.59E-04*En^2 + 0.00E+00*En^3 02/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	44.97	94.11	5105	446	348	22351	0.91	a	HiResid Wide Pk
2	46.28	96.72	81355	652	259	14901	0.71	b	HiResid
3	48.20	100.53	-0	527	434	29801	1.32	c	NET< CL HiResid
4	49.35	102.83	0	370	304	18626	0.75	d	NET< CL HiResid
5	59.39	122.86	68401	590	224	11144	0.65	a	HiResid
6	65.97	135.99	1218	457	371	20391	1.53	a	Wide Pk
7	67.38	138.78	896	376	305	15860	1.21	b	
8	72.77	149.55	457	220	178	7783	0.41	a	
9	87.94	179.79	81128	618	198	8675	0.67	a	HiResid
10	121.96	247.64	35188	414	145	4637	0.74	a	HiResid
11	136.40	276.44	4367	226	151	4595	0.78	a	
12	165.82	335.12	25525	360	136	3711	0.85	a	
13	199.26	401.82	296	183	148	4034	0.95	a	
14	255.09	513.15	572	145	113	2553	0.78	a	
15	275.44	553.74	89	91	73	1331	0.49	a	
16	279.26	561.37	4504	198	120	2661	0.91	b	
17	298.64	600.00	16	86	70	1219	0.50	a	NET< CL
18	391.89	785.98	15798	280	101	1900	1.06	a	
19	495.62	992.85	48	79	64	1005	0.60	a	NET< CL
20	511.06	1023.66	379	176	141	2955	1.97	a	Wide Pk
21	662.12	1324.93	25373	339	96	1686	1.33	a	

140106D08.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
22	787.33	1574.64	117	147	119	2002	2.11 a	NET< CL
23	814.62	1629.07	184	75	57	807	0.84 a	
24	898.55	1796.45	17547	287	91	1595	1.53 a	
25	1173.78	2345.37	27242	341	71	881	1.75 a	HiResid
26	1325.53	2648.02	443	105	79	795	3.79 a	HiResid Wide Pk
27	1332.97	2662.85	24816	320	44	380	1.86 b	HiResid
28	1836.16	3666.39	10670	209	26	117	2.24 a	

140106D08.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

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Sample ID: 020514-8 FWHM CAL (996)
Stds. Match Tolerance: 2.00 keV

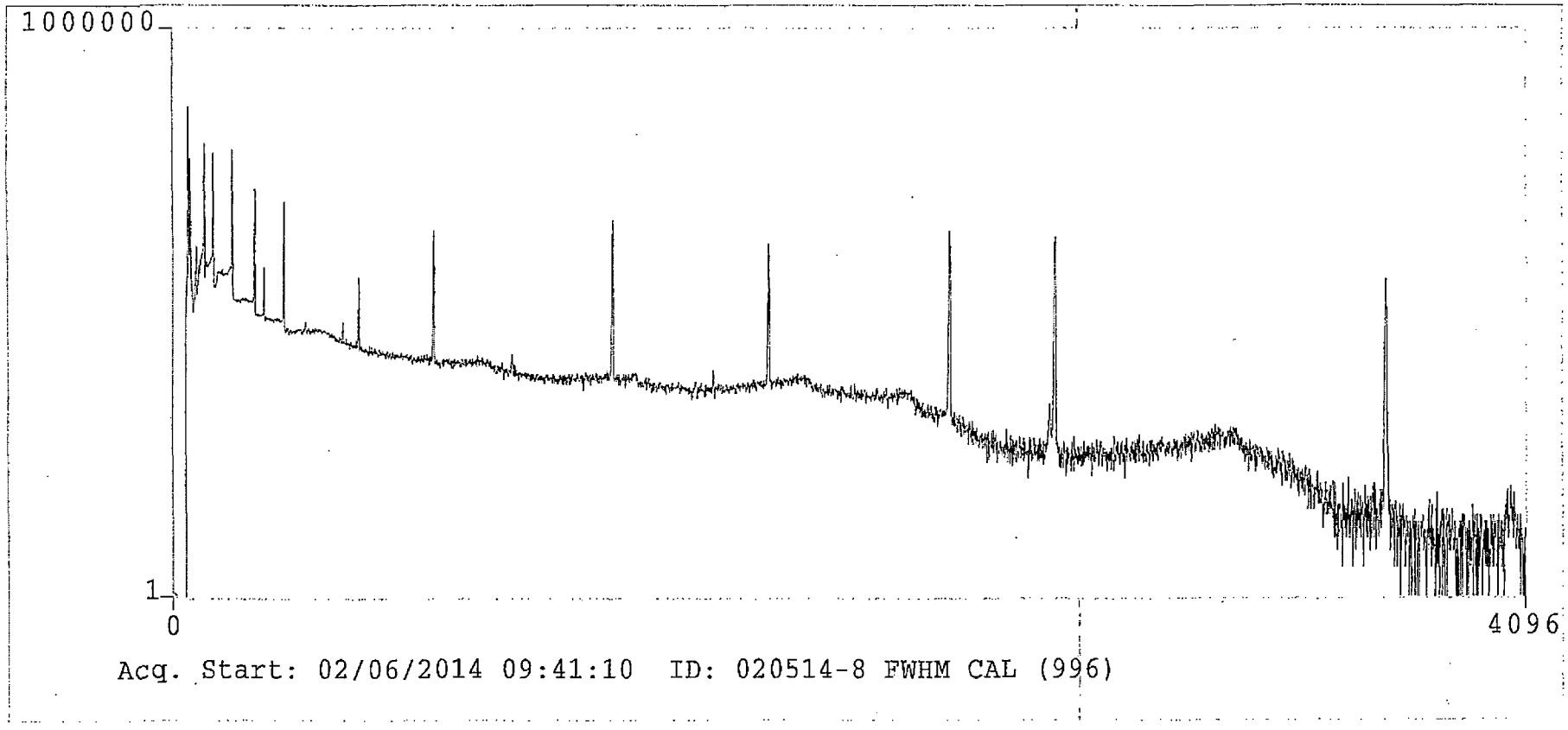
Detector Number: 08 Calibration Date. . . 02/06/2014 09:41:10

FWHM(keV) = 0.44 + 0.023*En + 4.49e-04*En^2 + 0.00e+00*En^3
(Where En = SQR(Energy in keV))

Pk. #	Energy (kev)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(kev)
1	59.50	0.652	-1.85	0.641	2.56	0.657
2	88.04	0.673	2.73	0.691	2.36	0.708
3	122.06	0.736	1.20	0.745	2.25	0.762
4	165.85	0.847	-5.06	0.806	2.23	0.824
5	279.00	0.909	3.71	0.944	2.41	0.967
6	391.68	1.064	0.10	1.065	2.71	1.095
7	661.64	1.329	-0.59	1.321	3.49	1.369
8	898.02	1.531	-0.44	1.524	4.12	1.589
9	1173.21	1.748	-0.15	1.745	4.77	1.832
10	1332.48	1.864	0.21	1.868	5.11	1.968
11	1836.01	2.236	0.09	2.238	6.03	2.382

Calibration Results Saved.

OK JP 2/6/14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4096
Acq. Start: 02/06/2014 09:41:10 ID: 020514-8 FWHM CAL (996)

#996

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

94409
Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070368

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.238E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia 30318

Comments:
~290 mL / 500 g customer supplied sand

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager

131392D01.SPC Analyzed by JP

****

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 120313-1 Geo 13 Eff Cal (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	12/03/2013 08:35:14
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	3.72E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	7200 Sec
Sample Size	5.00E+002 g	Real Time	7343 Sec
Collection Efficiency	1.0000	Spc. File	.131392D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -1.94 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 12/03/2013
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.42	96.55	1446	286	227	10377	0.86 a	
2	59.46	122.60	11837	358	234	11047	0.76 a	
3	72.77	149.17	541	275	223	11007	0.71 a	
4	87.94	179.45	75749	647	279	15728	0.81 a	
5	122.06	247.56	55399	560	250	12566	0.85 a	
6	136.49	276.36	7350	330	232	10868	0.88 a	
7	165.82	334.94	57618	549	219	9651	0.89 a	
8	255.15	513.26	1831	230	176	6247	0.83 a	HiResid
9	279.17	561.22	20841	367	187	6450	1.02 a	
10	310.45	623.66	157	212	173	5548	1.06 a	NET< CL
11	391.71	785.90	41748	462	177	5317	1.13 a	
12	511.13	1024.31	1243	304	244	7975	2.33 a	Wide Pk
13	661.68	1324.86	46286	468	151	4237	1.35 a	
14	813.95	1628.87	818	177	138	3318	1.52 a	
15	898.08	1796.81	48528	475	145	3897	1.56 a	HiResid
16	1021.24	2042.69	66	124	101	2205	1.08 a	NET< CL
17	1173.25	2346.16	50728	469	106	1992	1.77 a	HiResid
18	1325.12	2649.37	1030	143	105	1690	2.76 a	HiResid
19	1332.42	2663.94	46578	441	75	1094	1.88 b	HiResid
20	1835.86	3669.01	29598	347	40	271	2.25 a	HiResid

131392D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.8.2

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET011127.BKG (112713-1 WEEKLY BKG)

Bkg.File Detector #: 1

==========

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
4	87.94	75749	647	279	75744	647	280	
12	511.13	1243	304	244	1096	306	245	

131392D01.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

****

Sample ID: 120313-1 Geo 13 Eff Cal (996)
Stds. Match Tolerance: 2.00 keV

Detector Number: 01 Calibration Date. . . 12/03/2013 08:35:14
Geometry File (D01)(Sh13).EFF ID. Geo 13 Eff Cal
Amount of Std. in Calib. Source: 500.000000 gm

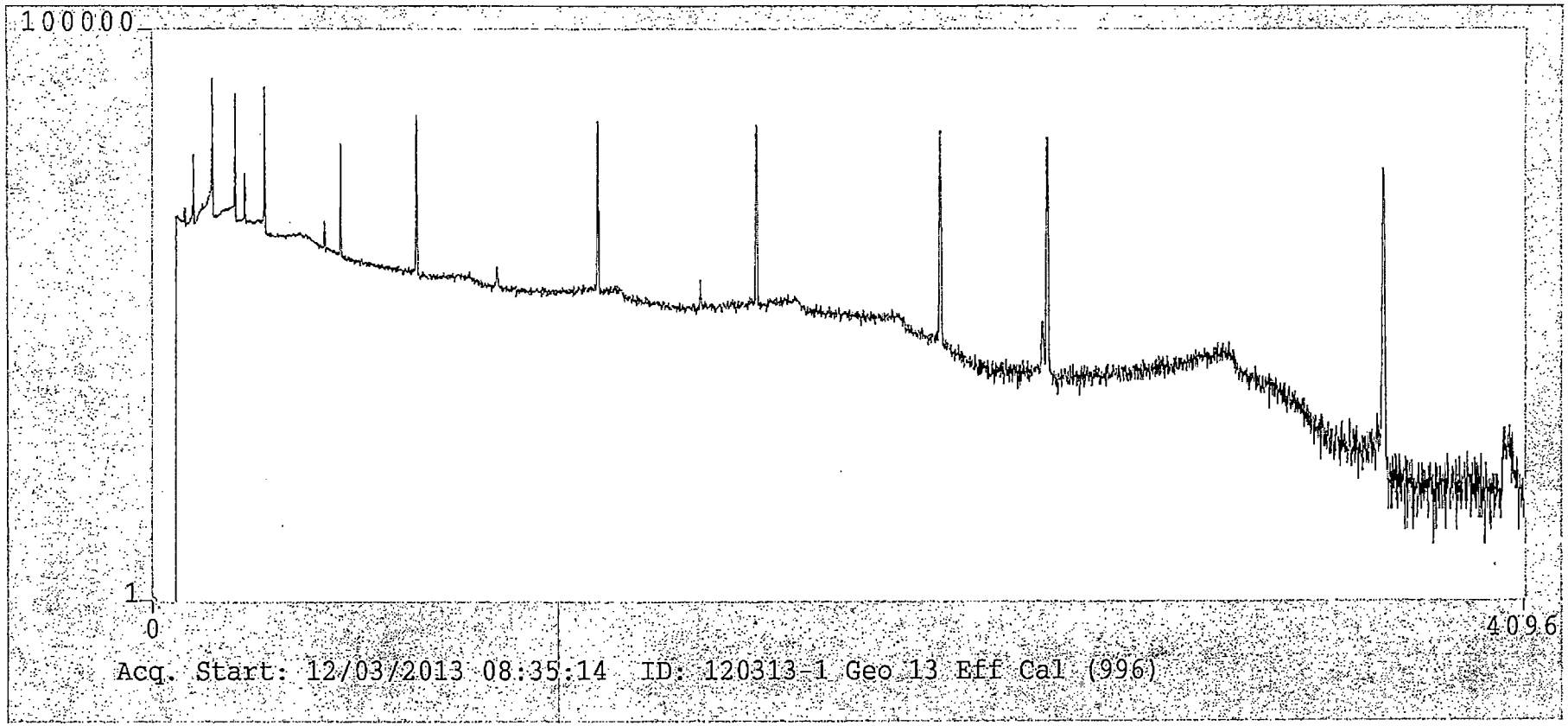
Crossover: 295.00 keV

Below Crossover Efficiency Fit:
Eff = 10 ^ [-9.82e+01 + 1.26e+02*En +-5.48e+01*En^2 + 7.89e+00*En^3]
(Where En = LOG(Energy in keV)) (Polynomial)
Above Knee Efficiency Fit:
Eff = exp ^ [2.85e-01 +-7.86e-01*En + 0.00e+00*En^2]
(Where En = Energy in keV) (Linear/Quad)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	2.01e-03	0.46	2.02e-03	1.21	2.04e-03
2	88.04	1.15e-02	-2.22	1.12e-02	-1.40	1.11e-02
3	122.06	1.83e-02	3.38	1.90e-02	-1.07	1.88e-02
4	165.85	2.00e-02	-2.00	1.96e-02	-0.39	1.95e-02
5	279.00	1.57e-02	0.26	1.57e-02	-2.67	1.53e-02
6	391.68	1.21e-02	0.85	1.22e-02	-2.40	1.19e-02
7	661.64	8.24e-03	-2.25	8.05e-03	-2.10	7.89e-03
8	898.02	6.25e-03	1.37	6.33e-03	-1.93	6.22e-03
9	1173.21	5.11e-03	0.56	5.13e-03	-1.77	5.04e-03
10	1332.48	4.69e-03	-0.87	4.65e-03	-1.70	4.57e-03
11	1836.01	3.60e-03	0.30	3.61e-03	-1.52	3.56e-03

Calibration Results Saved.

OK JP
12/3/13


100000
1
0
4096
Acq. Start: 12/03/2013 08:35:14 ID: 120313-1 Geo 13 Eff Cal (996)

Gamma Efficiency Calibration - Crossover energy efficiency difference

Calibration date: 12/03/2013
Detector 1
Geometry 13
Crossover energy=295 keV

	EFF @ CROSSOVER	% DIFF*	MEETS ALS ACCEPTANCE CRITERIA?
LOWER EFFICIENCY CURVE	0.015698	3.28%	OK
UPPER EFFICIENCY CURVE	0.015200	-3.17%	OK

*When a single calibration curve does not meet ALS acceptance criteria, a split-fit efficiency calibration may be employed. This entails the use of two separate energy range calibrations, a low energy efficiency curve and a high energy efficiency curve. A crossover energy must be specified that marks where the software will use either the low energy efficiency curve or the high energy efficiency curve. It should be noted that if a nuclide is specified that has a gamma photon energy that is equal to **OR** within 15 keV of the crossover energy, the potential exists for the calculated efficiencies at the crossover energy to be significantly different than the true detection efficiency of the detector. At times by as much as 20%. This is an artifact of the non-equivalency of the calibration equations specified for each energy range. This may result in an effective high or low bias to the analytical results. This bias is reflected in the above calculated % difference. ALS Environmental will not accept any calibration with an effective % difference of greater than 5% without supervisory approval. Results are submitted without further qualification.

Efficiency equations

Polynomial 10^(A+B*(LOG(En))+C*(LOG(En))^2+D*(LOG(En))^3)

A	-9.815693E+01		
B	1.261250E+02		
C	-5.476828E+01	Calculated efficiency	0.015698
D	7.894224E+00		

En is energy in keV
Crossover energy 295

Linear e^(A+(B*(ln(En)))+(C*(ln(En))^2))

A	2.846057E-01		
B	-7.861984E-01		
C	0.000000E+00	Calculated efficiency	0.015200

En is energy in keV
Crossover energy 295

Ok JP
12/3/13

Standards File. Gsstd13.std
Assay Date 07/01/2013 10:00
ID.: Geo 13 Std#996 500-g. mixed gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.320E+02 yrs	0.35900	4.56
2	Cd-109	88.04	4.626E+02 dys	0.03610	63.93
3	Co-57	122.06	2.718E+02 dys	0.85510	1.46
4	Ce-139	165.85	1.376E+02 dys	0.80350	2.18
5	Hg-203	279.00	4.661E+01 dys	0.77300	4.78
6	Sn-113	391.68	1.151E+02 dys	0.64900	3.77
7	Cs-137	661.64	3.007E+01 yrs	0.85120	1.85
8	Y-88	898.02	1.066E+02 dys	0.93400	6.32
9	Co-60	1173.21	5.271E+00 yrs	0.99980	2.92
10	Co-60	1332.48	5.271E+00 yrs	0.99990	2.92
11	Y-88	1836.01	1.066E+02 dys	0.99380	6.29

#996

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

94409

Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070388

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.238E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.738E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia 30318

Comments:
~~290 mL / 500 g customer supplied sand~~

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager

Geometry 13 Calibration Verification: Gamma Mixed Nuclide Source; Geometry 13
500-gram soil/solid geometry
Detector 1

VERIF. SOURCE : 951 REF DATE : 10/1/2011 Count Date: 12/3/2013

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY						
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard		DPS	pCi/g	Activity	Recovery	Pass/Fail	# of Half Lives Expired
Am-241	59.5	432.0000	1261	0.3590	500 g	Am-241	3512.5	189.9	191	101%	Pass	0.01
Cd-109	88	1.2666	1900	0.0372		Cd-109	51075.3	2760.8	2790	101%	Pass	1.72
Co-57	122	0.7441	1016	0.8551		Co-57	1188.2	64.2	61.4	96%	Pass	2.92
Ce-139	166	0.3768	1421	0.8035		Ce-139	1768.5	95.6	86.8	91%	Pass	5.77
Hg-203	279	0.1276	3114	0.7730		Hg-203	4028.5	217.8	NC	>5 h-lives	>5 h-lives	17.04
Sn-113	392	0.3151	1981	0.6490		Sn-113	3052.4	165.0	155	>5 h-lives	>5 h-lives	6.90
Cs-137	662	30.0000	1264	0.8512		Cs-137	1485.0	80.3	79.6	99%	Pass	0.07
Y-88	898	0.2919	4760	0.9340		Y-88	5096.4	275.5	227	>5 h-lives	>5 h-lives	7.45
Co-60	1173	5.2714	2355	0.9998		Co-60	2355.5	127.3	123	97%	Pass	0.41
Co-60	1332	5.2714	2355	0.9999		Co-60	2355.2	127.3	125	98%	Pass	0.41
Y-88	1836	0.2919	5038	0.9938		Y-88	5069.4	274.0	285	>5 h-lives	>5 h-lives	7.45

NC = NOT CALCULATED DUE TO THE ACTIVITY BEING LESS THAN THE MDCa

Ok JP 12/3/13

131393D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 120313-1A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	12/03/2013 11:27:31
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	1.91E+004 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	5.00E+002 g	Real Time	1861 Sec
Collection Efficiency	1.0000	Spc. File	.131393D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -1.94 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 12/03/2013
FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	58.04	119.76	622	226	182	4066	1.93	a Wide Pk
2	59.49	122.65	4622	166	78	1355	0.72	b
3	87.96	179.49	11875	250	100	2019	0.80	a
4	122.08	247.61	4349	169	87	1511	0.84	a
5	136.51	276.41	604	113	84	1418	0.75	a
6	165.81	334.90	835	115	82	1344	0.76	a
7	236.47	475.96	55	112	91	1528	0.98	a NET< CL
8	270.42	543.74	52	62	50	617	0.52	a
9	391.71	785.90	342	105	81	1107	1.08	a
10	661.68	1324.86	17311	274	62	699	1.32	a
11	898.06	1796.77	269	102	80	1122	1.73	a
12	1173.25	2346.18	15830	259	49	429	1.76	a
13	1332.43	2663.96	14506	243	26	121	1.89	a HiResid
14	1835.92	3669.13	141	27	11	23	1.94	a

131393D01.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET011127.BKG (112713-1 WEEKLY BKG)

Bkg.File Detector #: 1

==========

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	87.96	11875	250	100	11874	250	100	

131393D01.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 120313-1A Geo 13 Cal Ver (951)

Sampling Start: 10/01/2011 10:00:00	Counting Start: 12/03/2013 11:27:31
Sampling Stop: 10/01/2011 10:00:00	Decay Time. . . . . 1.91e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 5.00e+002 g	Real Time . . . . . 1861 Sec
Collection Efficiency 1.0000	Spectrum File 131393D01.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 1 (Detector 1)

Efficiency File: (D01)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-9.82E+01 +1.26E+02*L +-5.48E+01*L^2 +7.89E+00*L^3] 12/03/2013

Eff.= EXP[2.85E-01 + -7.86E-01 * En + 0.00E+00 * En^2] Above 295.00 keV

Library File: . . . .ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54		1.91E+02 +- 6.87E+00	6.59E+00	3.24E+00	3.79E+06
Cd-109	88.02		2.79E+03 +- 5.87E+01	4.77E+01	2.35E+01	1.11E+04
Co-57	122.07		6.14E+01 +- 2.38E+00	2.48E+00	1.22E+00	6.50E+03
Ce-139	165.85		8.68E+01 +- 1.19E+01	1.73E+01	8.49E+00	3.30E+03
Sn-113	391.68		1.55E+02 +- 4.75E+01	7.43E+01	3.65E+01	2.76E+03
Cs-137	661.62		7.96E+01 +- 1.26E+00	5.78E-01	2.83E-01	2.64E+05
Y-88	Average:x		2.11E+02 +- 3.65E+01	. . . .	. . . .	2.56E+03
	898.02		2.38E+02 +- 9.08E+01	1.44E+02	7.07E+01	2.56E+03
	1836.01		2.06E+02 +- 3.99E+01	3.66E+01	1.63E+01	2.56E+03
Co-60	Average:x		1.24E+02 +- 1.45E+00	. . . .	. . . .	4.62E+04
	1173.21		1.23E+02 +- 2.01E+00	7.90E-01	3.84E-01	4.62E+04
	1332.48		1.25E+02 +- 2.09E+00	4.64E-01	2.20E-01	4.62E+04
Hg-203	279.18		MDA	5.59E+04	2.75E+04	1.12E+03

MEASURED TOTAL: 3.70E+03 +- 1.67E+02 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	58.04	119.76	622	226	182	4066	1.93	Unknown
5	136.51	276.41	604	113	84	1418	0.75	Unknown

131393D01.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	236.47	475.96	55	112	91	1528	0.98	Deleted
8	270.42	543.74	52	62	50	617	0.52	Unknown

c:\SEEKER\BIN\131393d01.res Analysis Results Saved.

131392D01.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

****

Sample ID: 120313-1 Geo 13 Eff Cal (996)
Stds. Match Tolerance: 2.00 keV

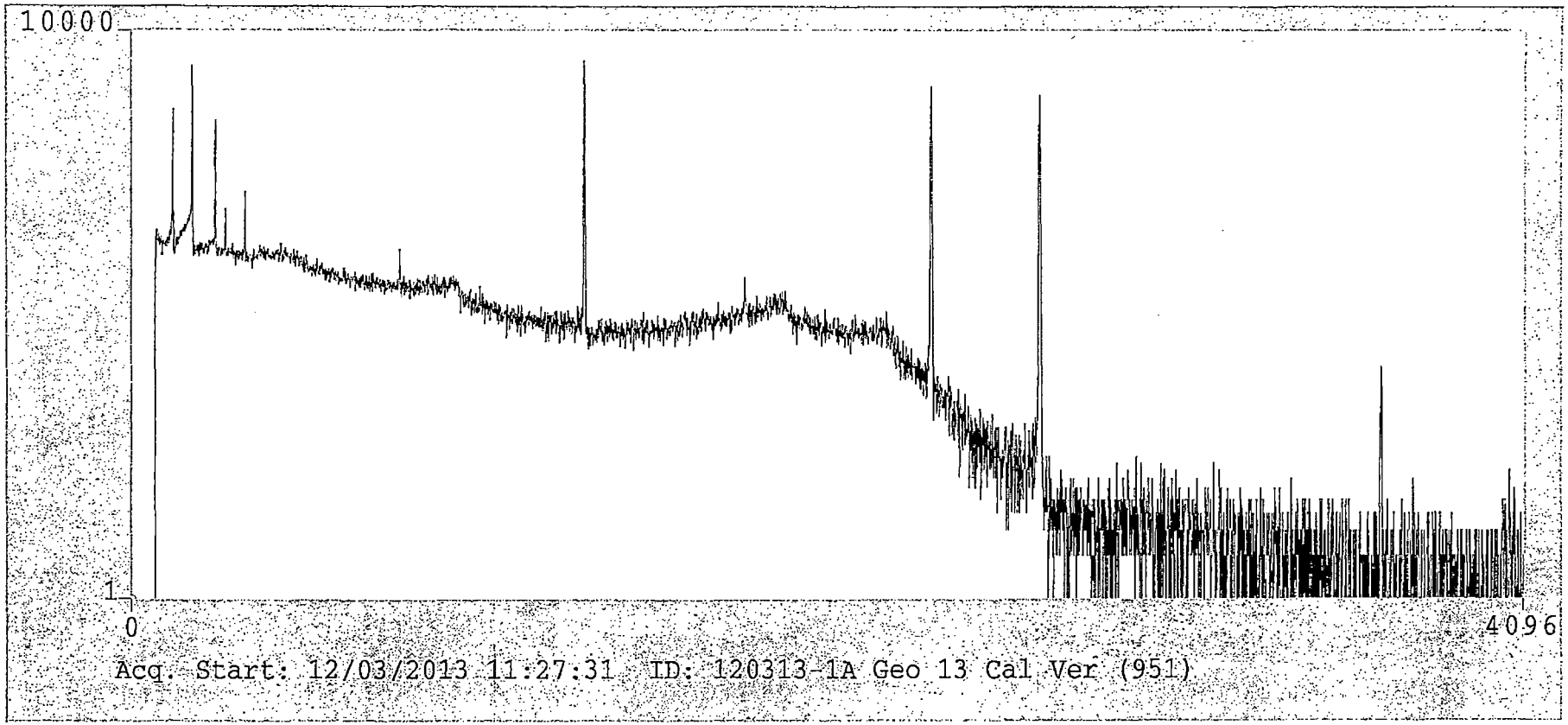
Detector Number: 01 Calibration Date. . . 12/03/2013 08:35:14
Geometry File (D01)(Sh13).EFF ID. Geo 13 Eff Cal
Amount of Std. in Calib. Source: 500.000000 gm

Crossover: 295.00 keV

Below Crossover Efficiency Fit:
Eff = 10 ^ [-9.82e+01 + 1.26e+02*En +-5.48e+01*En^2 + 7.89e+00*En^3]
(Where En = LOG(Energy in keV)) (Polynomial)
Above Knee Efficiency Fit:
Eff = exp ^ [2.85e-01 +-7.86e-01*En + 0.00e+00*En^2]
(Where En = Energy in keV) (Linear/Quad)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	2.01e-03	0.46	2.02e-03	1.21	2.04e-03
2	88.04	1.15e-02	-2.22	1.12e-02	-1.40	1.11e-02
3	122.06	1.83e-02	3.38	1.90e-02	-1.07	1.88e-02
4	165.85	2.00e-02	-2.00	1.96e-02	-0.39	1.95e-02
5	279.00	1.57e-02	0.26	1.57e-02	-2.67	1.53e-02
6	391.68	1.21e-02	0.85	1.22e-02	-2.40	1.19e-02
7	661.64	8.24e-03	-2.25	8.05e-03	-2.10	7.89e-03
8	898.02	6.25e-03	1.37	6.33e-03	-1.93	6.22e-03
9	1173.21	5.11e-03	0.56	5.13e-03	-1.77	5.04e-03
10	1332.48	4.69e-03	-0.87	4.65e-03	-1.70	4.57e-03
11	1836.01	3.60e-03	0.30	3.61e-03	-1.52	3.56e-03

Calibration Results Saved.


10000
1
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4096
Acq. Start: 12/03/2013 11:27:31 ID: 120313-1A Geo 13 Cal Ver (951)

Eckert & Ziegler
Analytics

Rec 10-25-11
RSO #951

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

~~85860-307~~

500 Grams of Sand in 16 Ounce PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: 73625, Item 1
Reference Date: 01-Oct-2011 12:00 PM EST **Grams of Master Source:** 0.011319

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_r	u_s	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.261E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.679E+05	1.900E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.972E+04	1.016E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.255E+05	1.421E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.751E+05	3.114E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.750E+05	1.981E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.117E+05	1.264E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.205E+05	4.760E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.081E+05	2.355E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.081E+05	2.355E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.451E+05	5.038E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Std Re-Verified
9/3/2013
New Exp Date
⇒ 09/03/2014
JP 10/1/13

ANA Form005 Rev. --

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1958

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Comments:

~290 mL of customer supplied sand.

This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____
J. D. McCorvey, QA Manager Alternate

Date: 24 OCT 11

130993D02.SPC Analyzed by JP

****

SEEKER | G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 110613-2 Geo 13 Eff Cal (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	11/06/2013 10:23:06
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	3.07E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	8100 Sec
Sample Size	5.00E+002 g	Real Time	8326 Sec
Collection Efficiency	1.0000	Spc. File	.130993D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.40 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 11/06/2013
FWHM(keV) = 0.63 + 0.021*En + 4.40E-04*En^2 + 0.00E+00*En^3 08/05/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	46.54	95.70	729	354	288	16663	0.81	a	
2	59.45	121.48	10894	403	283	16160	0.84	a	
3	70.68	143.89	550	320	260	15039	0.66	a	
4	72.77	148.06	826	322	260	15039	0.73	b	
5	87.95	178.37	97620	779	383	27139	0.95	a	
6	122.07	246.48	78718	702	347	22277	0.98	a	
7	136.48	275.24	10701	448	327	19720	1.03	a	
8	165.83	333.84	88147	701	306	17283	0.97	a	HiResid
9	255.15	512.13	3035	359	281	13510	1.07	a	
10	279.19	560.13	43419	523	260	11512	1.15	a	
11	391.75	784.81	70173	594	221	9019	1.25	a	
12	510.84	1022.55	2208	413	331	13490	2.67	a	Wide Pk
13	661.74	1323.77	67599	575	202	7099	1.48	a	
14	813.84	1627.39	1143	201	156	4716	1.48	a	
15	898.16	1795.71	84265	619	177	5759	1.66	a	
16	1173.37	2345.07	76282	577	136	3405	1.92	a	
17	1231.88	2461.87	98	92	74	1280	1.20	a	
18	1325.17	2648.11	2122	211	156	3264	3.40	a	HiResid Wide Pk
19	1332.56	2662.85	70347	546	107	2020	2.05	b	HiResid
20	1575.72	3148.26	111	99	80	1490	1.07	a	
21	1836.03	3667.88	53641	469	61	605	2.44	a	

130993D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.8.2

ALS Laboratory Group - Fort Collins
GammaScan

****

Background File:. . . . . DET021031.BKG (103113-2 WEEKLY BKG)

Bkg.File Detector #: 2

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
7	136.48	10701	448	327	10694	448	327	
12	510.84	2208	413	331	2001	415	333	
15	898.16	84265	619	177	84259	619	177	

130993D02.SPC Analyzed by

****

SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

****

Sample ID: 110613-2 Geo 13 Eff Cal (996)
Stds. Match Tolerance: 2.00 keV

Detector Number: 02 Calibration Date. . . 11/06/2013 10:23:06
Geometry File (D02)(Sh13).EFF ID. Geo 13 Eff Cal
Amount of Std. in Calib. Source: 500.000000 gm

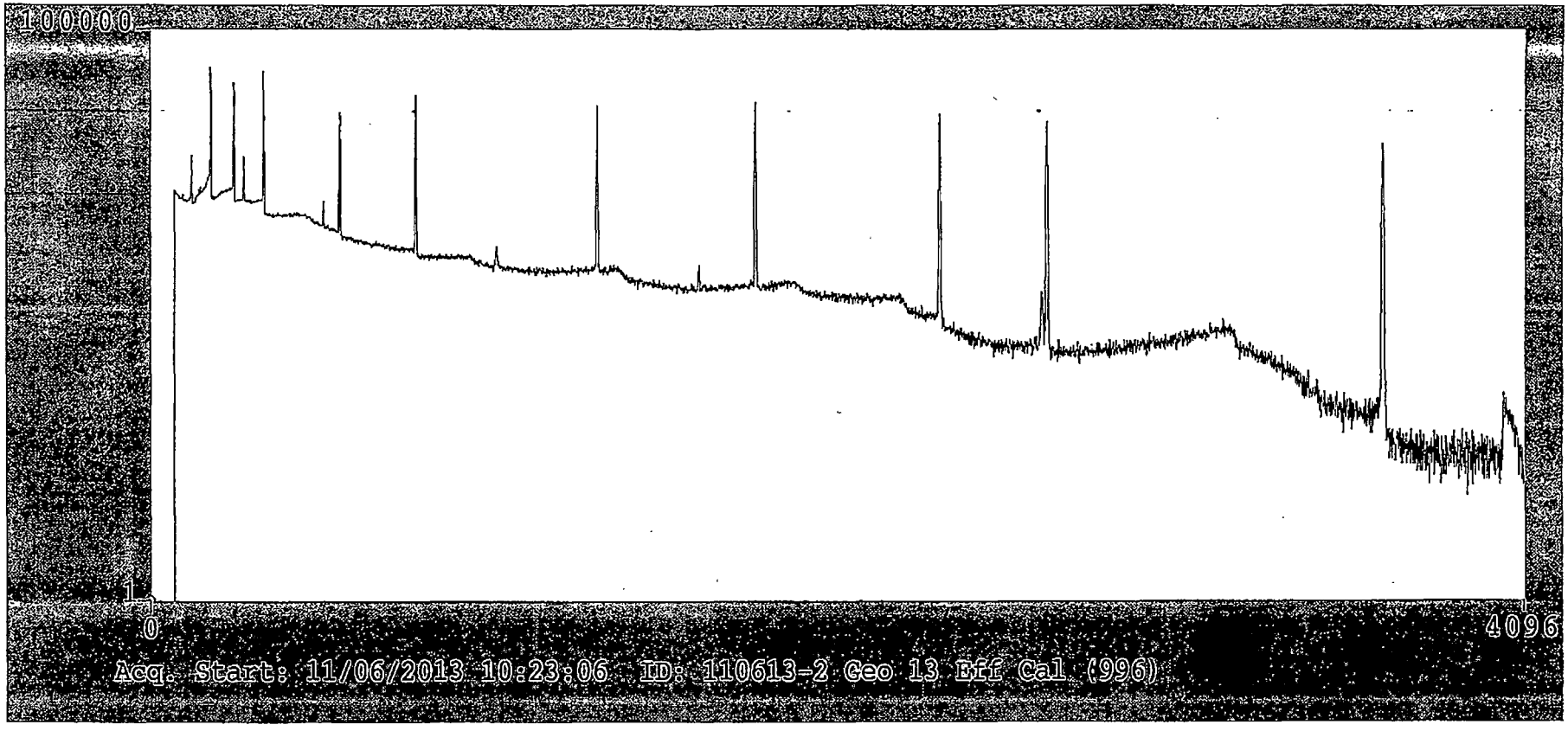
Crossover: 300.00 keV

Below Crossover Efficiency Fit:
Eff = 10 ^ [-1.20e+02 + 1.56e+02*En +-6.82e+01*En^2 + 9.91e+00*En^3]
(Where En = LOG(Energy in keV)) (Polynomial)
Above Knee Efficiency Fit:
Eff = exp ^ [2.84e-01 +-7.47e-01*En + 0.00e+00*En^2]
(Where En = Energy in keV) (Linear/Quad)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	1.64e-03	0.50	1.65e-03	12.57	1.89e-03
2	88.04	1.27e-02	-2.39	1.24e-02	0.83	1.25e-02
3	122.06	2.16e-02	3.65	2.24e-02	2.12	2.29e-02
4	165.85	2.37e-02	-2.15	2.32e-02	-1.06	2.30e-02
5	279.00	1.95e-02	0.29	1.95e-02	-5.93	1.84e-02
6	391.68	1.53e-02	0.54	1.54e-02	0.09	1.54e-02
7	661.64	1.07e-02	-2.48	1.04e-02	0.09	1.04e-02
8	898.02	8.09e-03	2.38	8.29e-03	0.09	8.30e-03
9	1173.21	6.76e-03	0.49	6.79e-03	0.09	6.80e-03
10	1332.48	6.23e-03	-0.87	6.18e-03	0.09	6.18e-03
11	1836.01	4.87e-03	-0.13	4.86e-03	0.10	4.87e-03

Calibration Results Saved.

OK JP 11/6/13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0
4096
Acq. Start: 11/06/2013 10:23:06 ID: 110613-2 Geo 13 Eff Cal (996)

Gamma Efficiency Calibration - Crossover energy efficiency difference

Calibration date: 11/06/13
Detector 2
Geometry 13
Crossover energy=300 keV

	EFF @ CROSSOVER	% DIFF*	MEETS ALS ACCEPTANCE CRITERIA?
LOWER EFFICIENCY CURVE	0.019638	4.40%	OK
UPPER EFFICIENCY CURVE	0.018810	-4.21%	OK

*When a single calibration curve does not meet ALS acceptance criteria, a split-fit efficiency calibration may be employed. This entails the use of two separate energy range calibrations, a low energy efficiency curve and a high energy efficiency curve. A crossover energy must be specified that marks where the software will use either the low energy efficiency curve or the high energy efficiency curve. It should be noted that if a nuclide is specified that has a gamma photon energy that is equal to **OR** within 15 keV of the crossover energy, the potential exists for the calculated efficiencies at the crossover energy to be significantly different than the true detection efficiency of the detector. At times by as much as 20%. This is an artifact of the non-equivalency of the calibration equations specified for each energy range. This may result in an effective high or low bias to the analytical results. This bias is reflected in the above calculated % difference. ALS Environmental will not accept any calibration with an effective % difference of greater than 5% without supervisory approval. Results are submitted without further qualification.

Efficiency equations

Polynomial 10^(A+B*(LOG(En))+C*(LOG(En))^2+D*(LOG(En))^3)

A	-1.199078E+02		
B	1.557410E+02		
C	-6.815598E+01	Calculated efficiency	0.019638
D	9.909612E+00		

En is energy in keV
Crossover energy 300

Linear e^(A+(B*(ln(En)))+(C*(ln(En))^2))

A	2.843039E-01		
B	-7.464600E-01		
C		Calculated efficiency	0.018810

En is energy in keV
Crossover energy 300

OK JP 11/6/13

Standards File. Gsstd13.std
Assay Date 07/01/2013 10:00
ID.: Geo 13 Std#996 500-g. mixed gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.320E+02 yrs	0.35900	4.56
2	Cd-109	88.04	4.626E+02 dys	0.03610	63.93
3	Co-57	122.06	2.718E+02 dys	0.85510	1.46
4	Ce-139	165.85	1.376E+02 dys	0.80350	2.18
5	Hg-203	279.00	4.661E+01 dys	0.77300	4.78
6	Sn-113	391.68	1.151E+02 dys	0.64900	3.77
7	Cs-137	661.64	3.007E+01 yrs	0.85120	1.85
8	Y-88	898.02	1.066E+02 dys	0.93400	6.32
9	Co-60	1173.21	5.271E+00 yrs	0.99980	2.92
10	Co-60	1332.48	5.271E+00 yrs	0.99990	2.92
11	Y-88	1836.01	1.066E+02 dys	0.99380	6.29

#996

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

94409

Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070368

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.238E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1958

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia 30318

Comments:
~290 mL / 500 g customer supplied sand

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager

Geometry 13 Calibration Verification: Gamma Mixed Nuclide Source; Geometry 13
500-gram soil/solid geometry
Detector 2

VERIF. SOURCE : 951 REF DATE : 10/1/2011 Count Date: 11/6/2013

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY						
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard		DPS	pCi/g	Activity	Recovery	Pass/Fail	# of Half Lives Expired
Am-241	59.5	432.0000	1261	0.3590	500 g	Am-241	3512.5	189.9	201	106%	Pass	0.00
Cd-109	88	1.2666	1900	0.0372		Cd-109	51075.3	2760.8	2840	103%	Pass	1.66
Co-57	122	0.7441	1016	0.8551		Co-57	1188.2	64.2	62.5	97%	Pass	2.82
Ce-139	166	0.3768	1421	0.8035		Ce-139	1768.5	95.6	98.7	103%	Pass	5.57
Hg-203	279	0.1276	3114	0.7730		Hg-203	4028.5	217.8	NC	>5 h-lives	>5 h-lives	16.46
Sn-113	392	0.3151	1981	0.6490		Sn-113	3052.4	165.0	174	>5 h-lives	>5 h-lives	6.66
Cs-137	662	30.0000	1264	0.8512		Cs-137	1485.0	80.3	82.1	102%	Pass	0.07
Y-88	898	0.2919	4760	0.9340		Y-88	5096.4	275.5	227	>5 h-lives	>5 h-lives	7.19
Co-60	1173	5.2714	2355	0.9998		Co-60	2355.5	127.3	127	100%	Pass	0.40
Co-60	1332	5.2714	2355	0.9999		Co-60	2355.2	127.3	128	101%	Pass	0.40
Y-88	1836	0.2919	5038	0.9938		Y-88	5069.4	274.0	285	>5 h-lives	>5 h-lives	7.19

NC = NOT CALCULATED DUE TO THE ACTIVITY BEING LESS THAN THE MDCa

Ok JP 11/6/13

130994D02.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 110613-2A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	11/06/2013 13:05:42
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	1.84E+004 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	5.00E+002 g	Real Time	1868 Sec
Collection Efficiency	1.0000	Spc. File	.130994D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.40 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 11/06/2013
FWHM(keV) = 0.63 + 0.021*En + 4.40E-04*En^2 + 0.00E+00*En^3 08/05/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	59.49	121.56	3980	192	119	2625	0.94	a	
2	87.98	178.43	13824	284	131	3192	0.97	a	
3	122.07	246.49	5601	202	112	2316	0.98	a	
4	136.59	275.46	771	154	118	2388	1.12	a	
5	165.89	333.94	1288	144	102	1941	1.04	a	
6	179.85	361.82	32	110	90	1620	0.78	a	NET< CL
7	183.95	370.00	19	77	63	972	0.49	b	NET< CL
8	310.58	622.78	61	94	76	1166	0.82	a	NET< CL
9	391.83	784.97	571	113	84	1405	1.20	a	
10	511.65	1024.16	81	71	57	733	0.84	a	
11	542.07	1084.89	61	65	52	620	0.76	a	
12	661.78	1323.85	23132	318	76	1004	1.47	a	
13	749.12	1498.19	46	55	44	483	0.78	a	
14	898.22	1795.83	401	101	76	1134	1.39	a	
15	1110.83	2220.23	58	62	50	571	1.05	a	
16	1173.43	2345.20	21794	303	56	606	1.87	a	
17	1332.61	2662.95	19995	285	31	182	2.03	a	
18	1836.10	3668.02	313	40	16	41	2.54	a	

130994D02.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET021031.BKG (103113-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
4	136.59	771	154	118	770	154	118	
7	183.95	19	77	63	9	77	63	NET<CL
10	511.65	81	71	57	35	72	58	NET<CL
14	898.22	401	101	76	399	101	76	

130994D02.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

****

Geo 13 / Solid

Sample ID: 110613-2A Geo 13 Cal Ver (951)

Sampling Start: 10/01/2011 10:00:00	Counting Start: 11/06/2013 13:05:42
Sampling Stop: 10/01/2011 10:00:00	Decay Time. . . . . 1.84e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs	Live Time . . . . . 1800 Sec
Sample Size . . . . . 5.00e+002 g	Real Time . . . . . 1868 Sec
Collection Efficiency 1.0000	Spectrum File 130994D02.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-1.20E+02 +1.56E+02*L +-6.82E+01*L^2 +9.91E+00*L^3] 11/06/2013

Eff.= EXP[2.84E-01 + -7.47E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . .ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54		2.01E+02 +- 9.72E+00	1.22E+01	6.03E+00	3.79E+06
Cd-109	88.02		2.84E+03 +- 5.85E+01	5.46E+01	2.70E+01	1.11E+04
Co-57	122.07		6.25E+01 +- 2.26E+00	2.53E+00	1.25E+00	6.50E+03
Ce-139	165.85		9.87E+01 +- 1.10E+01	1.59E+01	7.85E+00	3.30E+03
Sn-113	391.68		1.74E+02 +- 3.45E+01	5.22E+01	2.57E+01	2.76E+03
Cs-137	661.62		8.21E+01 +- 1.13E+00	5.49E-01	2.70E-01	2.64E+05
Y-88	Average:x		2.68E+02 +- 3.10E+01	. . . .	. . . .	2.56E+03
	898.02		2.27E+02 +- 5.74E+01	8.84E+01	4.34E+01	2.56E+03
	1836.01		2.85E+02 +- 3.68E+01	3.19E+01	1.47E+01	2.56E+03
Co-60	Average:x		1.28E+02 +- 1.27E+00	. . . .	. . . .	4.62E+04
	1173.21		1.27E+02 +- 1.77E+00	6.69E-01	3.27E-01	4.62E+04
	1332.48		1.28E+02 +- 1.83E+00	4.20E-01	2.01E-01	4.62E+04
Hg-203	279.18		MDA	3.72E+04	1.84E+04	1.12E+03

MEASURED TOTAL: 3.86E+03 +- 1.49E+02 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
4	136.59	275.46	770	154	118	2388	1.12	Unknown
6	179.85	361.82	32	110	90	1620	0.78	Deleted

130994D02.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	183.95	370.00	9	77	63	972	0.49	Deleted
8	310.58	622.78	61	94	76	1166	0.82	Deleted
10	511.65	1024.16	35	72	58	733	0.84	Deleted
11	542.07	1084.89	61	65	52	620	0.76	Unknown
13	749.12	1498.19	46	55	44	483	0.78	Unknown
15	1110.83	2220.23	58	62	50	571	1.05	Unknown

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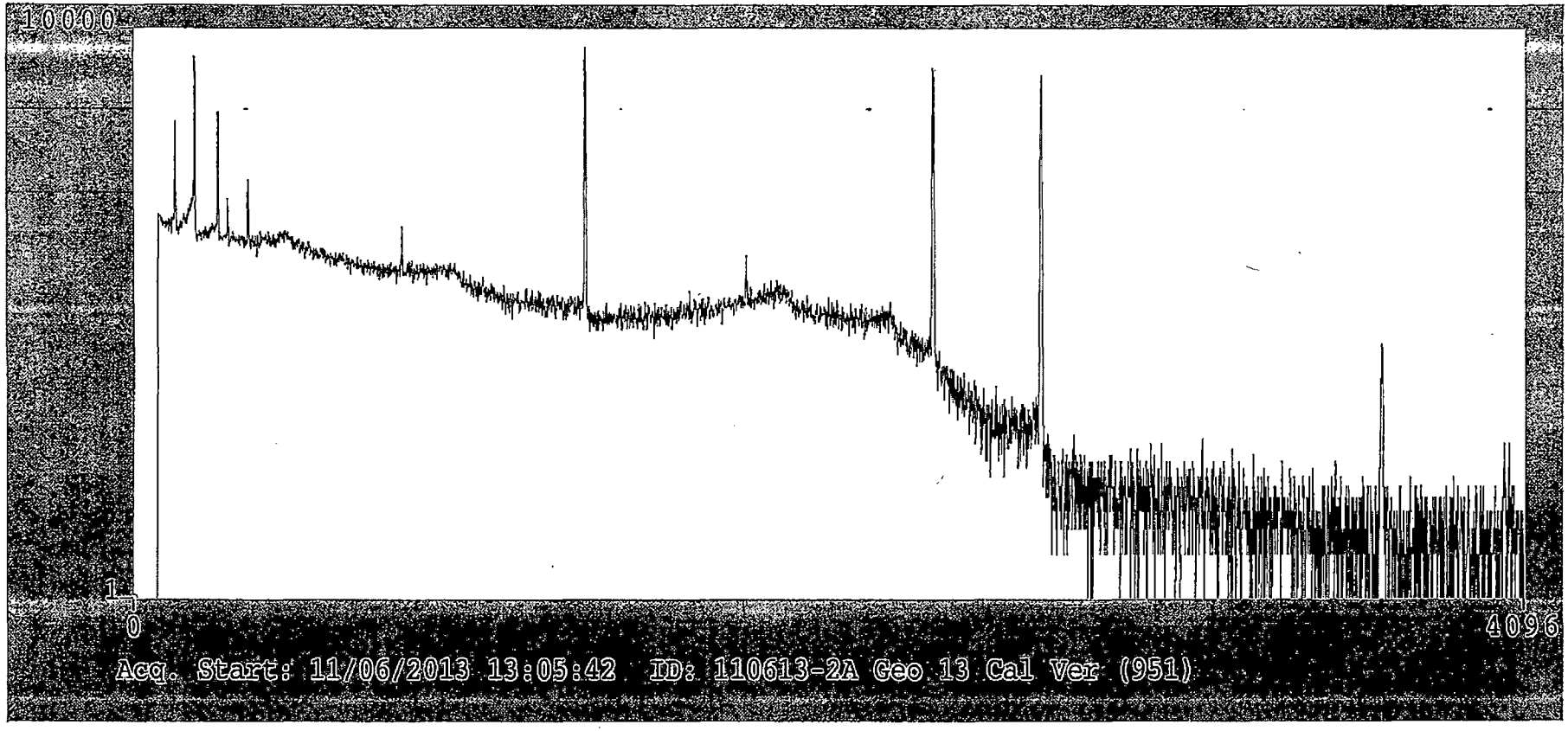
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Acq. Start: 11/06/2013 13:05:42 ID: 110613-2A Geo 13 Cal Ver (951)

Eckert & Ziegler
Analytics

Rec 10-25-11
RSO #951

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

85860-307

500 Grams of Sand in 16 Ounce PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: 73625, Item 1
Reference Date: 01-Oct-2011 12:00 PM EST **Grams of Master Source:** 0.011319

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.261E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.679E+05	1.900E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.972E+04	1.016E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.255E+05	1.421E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.751E+05	3.114E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.750E+05	1.981E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.117E+05	1.264E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.205E+05	4.760E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.081E+05	2.355E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.081E+05	2.355E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.451E+05	5.038E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Std Re-Verified
9/3/2013
New Exp Date
⇒ 09/03/2014
JP 10/1/13

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1964

ANA Form005 Rev. —

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Comments:
~290 mL of customer supplied sand.

This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____
J. D. McCorvey, QA Manager Alternate

Date: 24 OCT 11

131199D03.SPC Analyzed by JP

****

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 120313-3 Geo 13 Eff Cal (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	12/03/2013 11:27:12
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	3.72E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	7200 Sec
Sample Size	5.00E+002 g	Real Time	7379 Sec
Collection Efficiency	1.0000	Spc. File	.131199D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.66 + 0.502*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 12/03/2013
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.45	95.93	4423	399	309	17678	0.94 a	
2	57.83	118.61	2889	701	570	37873	2.08 a	Wide Pk
3	59.48	121.89	21384	475	308	17480	0.94 b	
4	70.81	144.49	556	257	208	10655	0.49 a	
5	72.79	148.43	860	417	340	21310	0.94 b	
6	87.94	178.64	98204	758	351	22809	0.98 a	
7	122.05	246.64	64933	629	303	16940	1.01 a	
8	136.49	275.42	8595	425	314	16864	1.08 a	
9	165.81	333.88	62355	591	260	12515	0.98 a	HiResid
10	255.18	512.06	1736	252	195	8054	1.02 a	
11	279.19	559.92	22247	387	203	8126	1.19 a	
12	310.54	622.43	131	156	127	3993	0.63 a	
13	391.74	784.31	45247	483	188	6508	1.34 a	HiResid
14	509.50	1019.08	263	287	235	7764	2.18 a	Wide Pk
15	511.37	1022.81	1466	364	293	10153	2.85 b	
16	661.75	1322.62	49047	492	175	5683	1.61 a	HiResid
17	742.35	1483.29	149	252	206	6269	2.43 a	NET< CL
18	813.74	1625.63	982	224	177	5035	2.21 a	
19	898.20	1794.01	52097	499	167	5131	1.91 a	HiResid
20	922.52	1842.50	117	191	156	4722	1.75 a	NET< CL
21	1012.48	2021.84	125	138	112	2797	1.36 a	
22	1173.42	2342.72	53348	485	120	2572	2.20 a	HiResid
23	1325.34	2645.58	1438	185	139	2434	3.73 a	HiResid Wide Pk

131199D03.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	1332.64	2660.14	50012	461	93	1482	2.37	b HiResid
25	1836.19	3664.04	31071	359	54	445	2.84	a HiResid

131199D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.8.2

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET031127.BKG (112713-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	57.83	2889	701	570	2885	701	570	
11	279.19	22247	387	203	22242	387	203	
14	509.50	263	287	235	105	289	237	NET<CL
19	898.20	52097	499	167	52091	499	167	

131199D03.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

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Sample ID: 120313-3 Geo 13 Eff Cal (996)
Stds. Match Tolerance: 2.00 keV

Detector Number: 03 Calibration Date. . . 12/03/2013 11:27:12
Geometry File (D03)(Sh13).EFF ID. Geo 13 Eff Cal
Amount of Std. in Calib. Source: 500.000000 gm

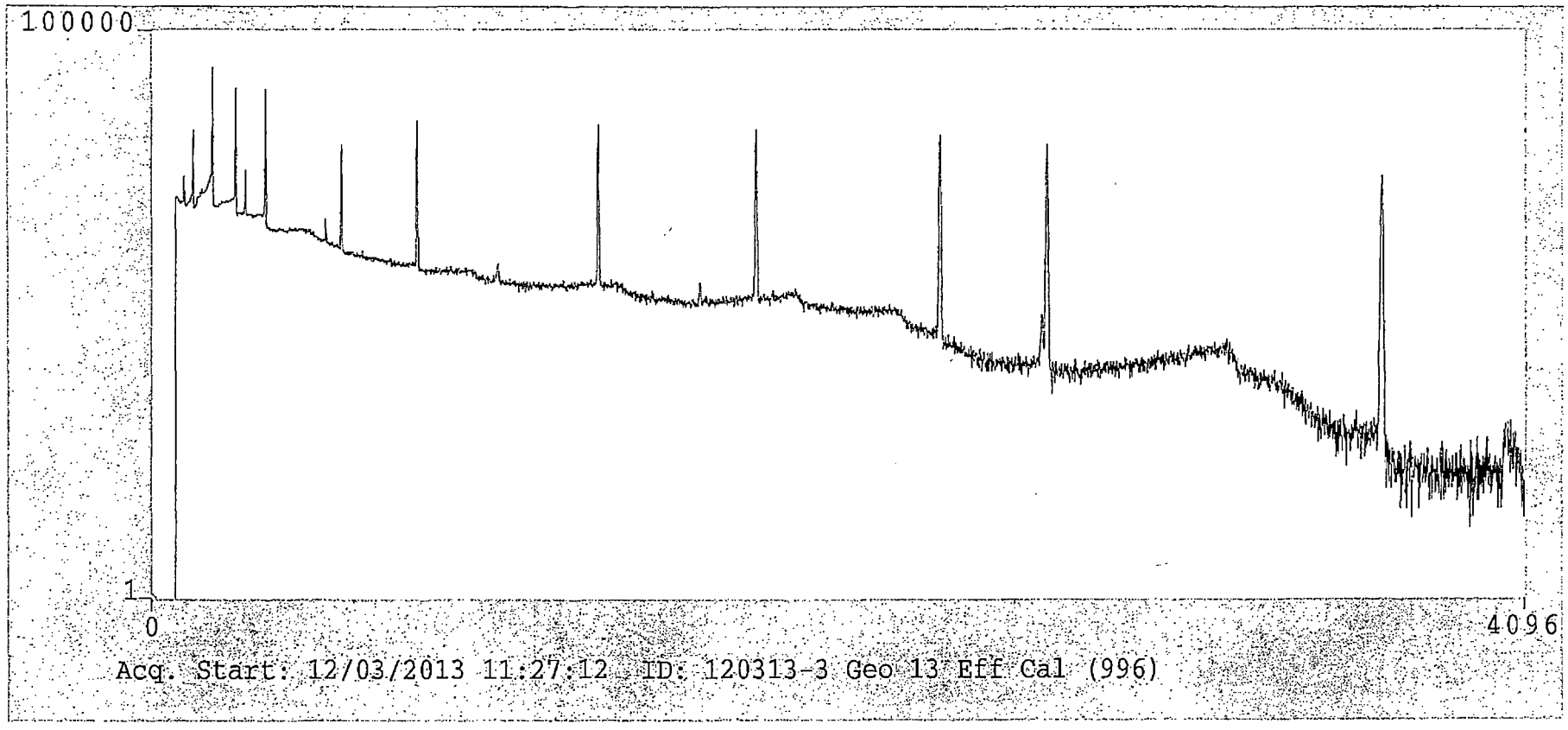
Crossover: 295.00 keV

Below Crossover Efficiency Fit:
Eff = 10 ^ [-8.44e+01 + 1.09e+02*En +-4.74e+01*En^2 + 6.85e+00*En^3]
(Where En = LOG(Energy in keV)) (Polynomial)
Above Knee Efficiency Fit:
Eff = exp ^ [5.28e-02 +-6.82e-01*En +-8.94e-03*En^2]
(Where En = Energy in keV) (Linear/Quad)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	3.63e-03	0.22	3.64e-03	-6.23	3.42e-03
2	88.04	1.49e-02	-1.04	1.48e-02	-7.44	1.37e-02
3	122.06	2.15e-02	1.61	2.18e-02	-5.33	2.07e-02
4	165.85	2.16e-02	-0.94	2.14e-02	-3.10	2.08e-02
5	279.00	1.68e-02	0.13	1.68e-02	-4.26	1.61e-02
6	391.68	1.31e-02	0.17	1.31e-02	-6.75	1.23e-02
7	661.64	8.73e-03	-0.94	8.65e-03	-6.29	8.13e-03
8	898.02	6.71e-03	0.87	6.77e-03	-5.78	6.40e-03
9	1173.21	5.37e-03	1.65	5.46e-03	-5.20	5.19e-03
10	1332.48	5.03e-03	-2.15	4.93e-03	-4.87	4.70e-03
11	1836.01	3.78e-03	0.35	3.80e-03	-3.92	3.65e-03

Calibration Results Saved.

OK JP
12/3/13


100000
1
0
4096
Acq. Start: 12/03/2013 11:27:12 ID: 120313-3 Geo 13 Eff Cal (996)

Gamma Efficiency Calibration - Crossover energy efficiency difference

Calibration date: 12/03/2013
Detector 3
Geometry 13
Crossover energy=295 keV

	EFF @ CROSSOVER	% DIFF*	MEETS ALS ACCEPTANCE CRITERIA?
LOWER EFFICIENCY CURVE	0.016696	1.98%	OK
UPPER EFFICIENCY CURVE	0.016372	-1.94%	OK

*When a single calibration curve does not meet ALS acceptance criteria, a split-fit efficiency calibration may be employed. This entails the use of two separate energy range calibrations, a low energy efficiency curve and a high energy efficiency curve. A crossover energy must be specified that marks where the software will use either the low energy efficiency curve or the high energy efficiency curve. It should be noted that if a nuclide is specified that has a gamma photon energy that is equal to **OR** within 15 keV of the crossover energy, the potential exists for the calculated efficiencies at the crossover energy to be significantly different than the true detection efficiency of the detector. At times by as much as 20%. This is an artifact of the non-equivalency of the calibration equations specified for each energy range. This may result in an effective high or low bias to the analytical results. This bias is reflected in the above calculated % difference. ALS Environmental will not accept any calibration with an effective % difference of greater than 5% without supervisory approval. Results are submitted without further qualification.

Efficiency equations

Polynomial 10^(A+B*(LOG(En))+C*(LOG(En))^2+D*(LOG(En))^3)

A	-8.441222E+01		
B	1.087276E+02		
C	-4.739719E+01	Calculated efficiency	0.016696
D	6.851260E+00		

En is energy in keV
Crossover energy 295

Linear e^(A+(B*(ln(En)))+(C*(ln(En))^2))

A	5.275521E-02		
B	-6.815307E-01		
C	-8.938585E-03	Calculated efficiency	0.016372

En is energy in keV
Crossover energy 295

OK JP 12/3/13

Standards File. Gsstd13.std
Assay Date 07/01/2013 10:00
ID.: Geo 13 Std#996 500-g. mixed gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.320E+02 yrs	0.35900	4.56
2	Cd-109	88.04	4.626E+02 dys	0.03610	63.93
3	Co-57	122.06	2.718E+02 dys	0.85510	1.46
4	Ce-139	165.85	1.376E+02 dys	0.80350	2.18
5	Hg-203	279.00	4.661E+01 dys	0.77300	4.78
6	Sn-113	391.68	1.151E+02 dys	0.64900	3.77
7	Cs-137	661.64	3.007E+01 yrs	0.85120	1.85
8	Y-88	898.02	1.066E+02 dys	0.93400	6.32
9	Co-60	1173.21	5.271E+00 yrs	0.99980	2.92
10	Co-60	1332.48	5.271E+00 yrs	0.99990	2.92
11	Y-88	1836.01	1.066E+02 dys	0.99380	6.29

#996

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

94409

Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070368

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.238E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia

Comments:

~~~290 mL / 500 g customer supplied sand~~

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager
~~~

Geometry 13 Calibration Verification: Gamma Mixed Nuclide Source; Geometry 13
500-gram soil/solid geometry
Detector 3

VERIF. SOURCE: 951 REF DATE : 10/1/2011 Count Date: 12/3/2013

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY						
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard		DPS	pCi/g	Activity	Recovery	Pass/Fail	# of Half Lives Expired
Am-241	59.5	432.0000	1261	0.3590	500 g	Am-241	3512.5	189.9	193	102%	Pass	0.01
Cd-109	88	1.2666	1900	0.0372		Cd-109	51075.3	2760.8	2800	101%	Pass	1.72
Co-57	122	0.7441	1016	0.8551		Co-57	1188.2	64.2	62.7	98%	Pass	2.92
Ce-139	166	0.3768	1421	0.8035		Ce-139	1768.5	95.6	89.6	94%	Pass	5.77
Hg-203	279	0.1276	3114	0.7730		Hg-203	4028.5	217.8	NC	>5 h-lives	>5 h-lives	17.04
Sn-113	392	0.3151	1981	0.6490		Sn-113	3052.4	165.0	166	>5 h-lives	>5 h-lives	6.90
Cs-137	662	30.0000	1264	0.8512		Cs-137	1485.0	80.3	80.4	100%	Pass	0.07
Y-88	898	0.2919	4760	0.9340		Y-88	5096.4	275.5	247	>5 h-lives	>5 h-lives	7.45
Co-60	1173	5.2714	2355	0.9998		Co-60	2355.5	127.3	121	95%	Pass	0.41
Co-60	1332	5.2714	2355	0.9999		Co-60	2355.2	127.3	128	101%	Pass	0.41
Y-88	1836	0.2919	5038	0.9938		Y-88	5069.4	274.0	213	>5 h-lives	>5 h-lives	7.45

NC = NOT CALCULATED DUE TO THE ACTIVITY BEING LESS THAN THE MDCa

OK JP 12/3/13

131200D03.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 120313-3A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	12/03/2013 13:37:47
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	1.91E+004 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	5.00E+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spc. File	.131200D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.66 + 0.502*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 12/03/2013
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.45	121.84	8411	244	133	3252	0.94 a	
2	87.92	178.60	15610	293	126	2954	0.98 a	
3	122.04	246.61	5108	192	106	2060	1.01 a	
4	136.47	275.39	637	117	87	1527	0.90 a	
5	165.84	333.94	942	132	96	1697	1.04 a	
6	303.86	609.11	81	125	101	1787	1.48 a	NET< CL
7	391.75	784.32	394	104	79	1230	1.18 a	
8	661.71	1322.54	18767	287	70	916	1.64 a	HiResid
9	898.27	1794.16	300	96	73	1086	1.72 a	
10	985.81	1968.68	56	61	48	578	1.04 a	
11	1001.34	1999.64	111	98	79	1099	2.17 a	
12	1173.34	2342.56	16481	272	73	949	2.08 a	HiResid
13	1332.57	2659.99	15716	254	33	175	2.38 a	HiResid
14	1836.06	3663.79	153	34	19	57	2.76 a	

131200D03.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET031127.BKG (112713-3 WEEKLY BKG)

Bkg.File Detector #: 3

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	59.45	8411	244	133	8410	244	133	
9	898.27	300	96	73	298	96	73	

131200D03.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 120313-3A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	12/03/2013 13:37:47
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	1.91e+004 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	5.00e+002 g	Real Time	1825 Sec
Collection Efficiency	1.0000	Spectrum File	.131200D03.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh13).EFF (Geo 13 Eff Cal)

Eff=10^[-8.44E+01 +1.09E+02*L +-4.74E+01*L^2 +6.85E+00*L^3] 12/03/2013

Eff.= EXP[5.28E-02 + -6.82E-01 * En + -8.94E-03 * En^2] Above 295.00 keV

Library File: . . . .ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	N E T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54		1.93E+02 +- 5.62E+00	6.17E+00	3.05E+00	3.79E+06
Cd-109	88.02		2.80E+03 +- 5.26E+01	4.58E+01	2.27E+01	1.11E+04
Co-57	122.07		6.27E+01 +- 2.36E+00	2.63E+00	1.30E+00	6.50E+03
Ce-139	165.85		8.96E+01 +- 1.25E+01	1.85E+01	9.11E+00	3.30E+03
Sn-113	391.68		1.66E+02 +- 4.38E+01	6.77E+01	3.33E+01	2.76E+03
Cs-137	661.62		8.04E+01 +- 1.23E+00	6.15E-01	3.02E-01	2.64E+05
Y-88	Average:x		2.22E+02 +- 4.06E+01	. . . .	. . . .	2.56E+03
	898.02		2.47E+02 +- 7.94E+01	1.24E+02	6.09E+01	2.56E+03
	1836.01		2.13E+02 +- 4.73E+01	5.73E+01	2.68E+01	2.56E+03
Co-60	Average:x		1.24E+02 +- 1.43E+00	. . . .	. . . .	4.62E+04
	1173.21		1.21E+02 +- 1.99E+00	1.09E+00	5.36E-01	4.62E+04
	1332.48		1.28E+02 +- 2.06E+00	5.52E-01	2.65E-01	4.62E+04
Hg-203	279.18		MDA	5.59E+04	2.75E+04	1.12E+03

MEASURED TOTAL: 3.74E+03 +- 1.60E+02 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

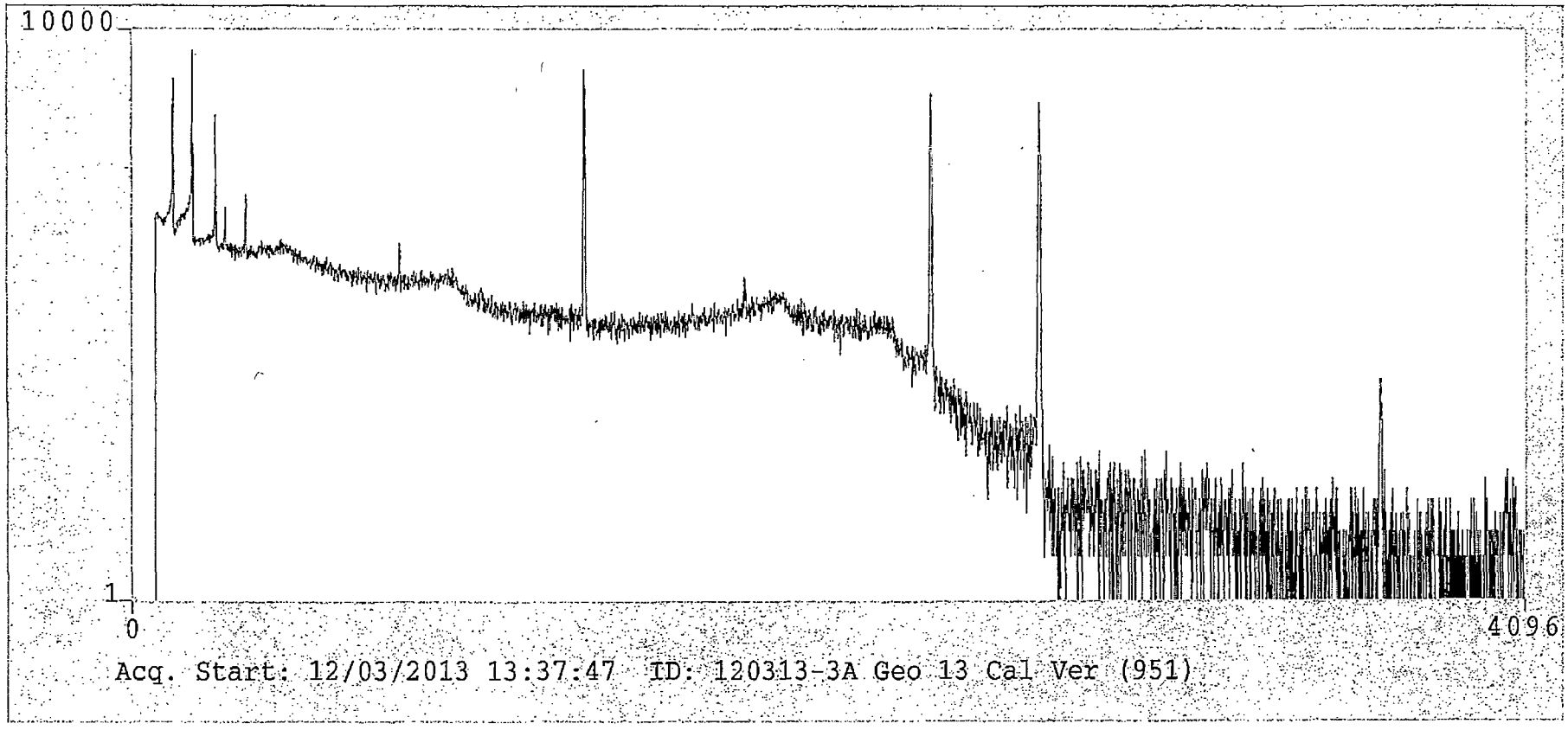
PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
4	136.47	275.39	637	117	87	1527	0.90	Unknown
6	303.86	609.11	81	125	101	1787	1.48	Deleted

131200D03.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
10	985.81	1968.68	56	61	48	578	1.04	Unknown
11	1001.34	1999.64	111	98	79	1099	2.17	Unknown

c:\SEEKER\BIN\131200d03.res Analysis Results Saved.


10000
1
0
4096
Acq. Start: 12/03/2013 13:37:47 ID: 120313-3A Geo 13 Cal Ver (951)

Eckert & Ziegler
Analytics

Rec 10-25-11
RSO #951

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

~~85860-307~~

500 Grams of Sand in 16 Ounce PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: 73625, Item 1
Reference Date: 01-Oct-2011 12:00 PM EST **Grams of Master Source:** 0.011319

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.261E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.679E+05	1.900E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.972E+04	1.016E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.255E+05	1.421E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.751E+05	3.114E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.750E+05	1.981E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.117E+05	1.264E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.205E+05	4.760E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.081E+05	2.355E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.081E+05	2.355E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.451E+05	5.038E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Std Re-Verified
9/3/2013
New Exp Date
⇒ 09/03/2014
JP 10/1/13

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

ANA Form005 Rev. ---

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Comments:
290 mL of customer supplied sand.

This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 24 OCT 11
J. D. McCorvey, QA Manager Alternate

140042D04.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 011414-4 Geo 13 Eff Cal (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	01/14/2014 10:58:36
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	4.73E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	6300 Sec
Sample Size	5.00E+002 g	Real Time	6420 Sec
Collection Efficiency	1.0000	Spc. File	.140042D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.53 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/14/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	46.33	95.60	5897	341	250	12603	0.84	a	HiResid
2	57.76	118.45	2637	701	570	36059	2.24	a	Wide Pk
3	59.44	121.81	25664	476	289	15454	0.94	b	
4	66.39	135.67	528	499	408	24645	1.54	a	Wide Pk
5	72.75	148.39	420	241	195	9403	0.46	a	
6	87.90	178.66	92860	725	323	19221	0.97	a	
7	122.01	246.79	54172	570	270	13505	0.99	a	HiResid
8	136.44	275.61	7284	372	272	12644	1.11	a	
9	165.79	334.24	47743	535	254	10996	1.10	a	HiResid
10	255.06	512.56	1192	219	171	6197	0.95	a	
11	279.15	560.68	10863	316	196	7073	1.32	a	
12	391.68	785.49	29325	398	167	5133	1.37	a	HiResid
13	511.04	1023.91	815	286	231	7558	2.58	a	Wide Pk
14	661.67	1324.80	40058	449	168	4949	1.72	a	HiResid
15	813.95	1628.99	429	170	136	3544	1.84	a	
16	898.08	1797.06	31428	405	161	4575	2.13	a	HiResid
17	1173.34	2346.90	40916	446	154	3912	2.43	a	HiResid
18	1332.54	2664.92	35378	412	138	3149	2.48	a	HiResid
19	1836.02	3670.67	17217	277	73	773	3.05	a	HiResid

140042D04.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.8.2

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET040109.BKG (010914-4 WEEKLY BKG)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.33	5897	341	250	5888	341	250	
4	66.39	528	499	408	518	499	408	
13	511.04	815	286	231	688	287	232	
16	898.08	31428	405	161	31424	405	161	

140042D04.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

****

Sample ID: 011414-4 Geo 13 Eff Cal (996)
Stds. Match Tolerance: 2.00 keV

Detector Number: 04 Calibration Date. . . 01/14/2014 10:58:36
Geometry File (D04)(Sh13).EFF ID. Geo. 13
Amount of Std. in Calib. Source: 500.000000 gm

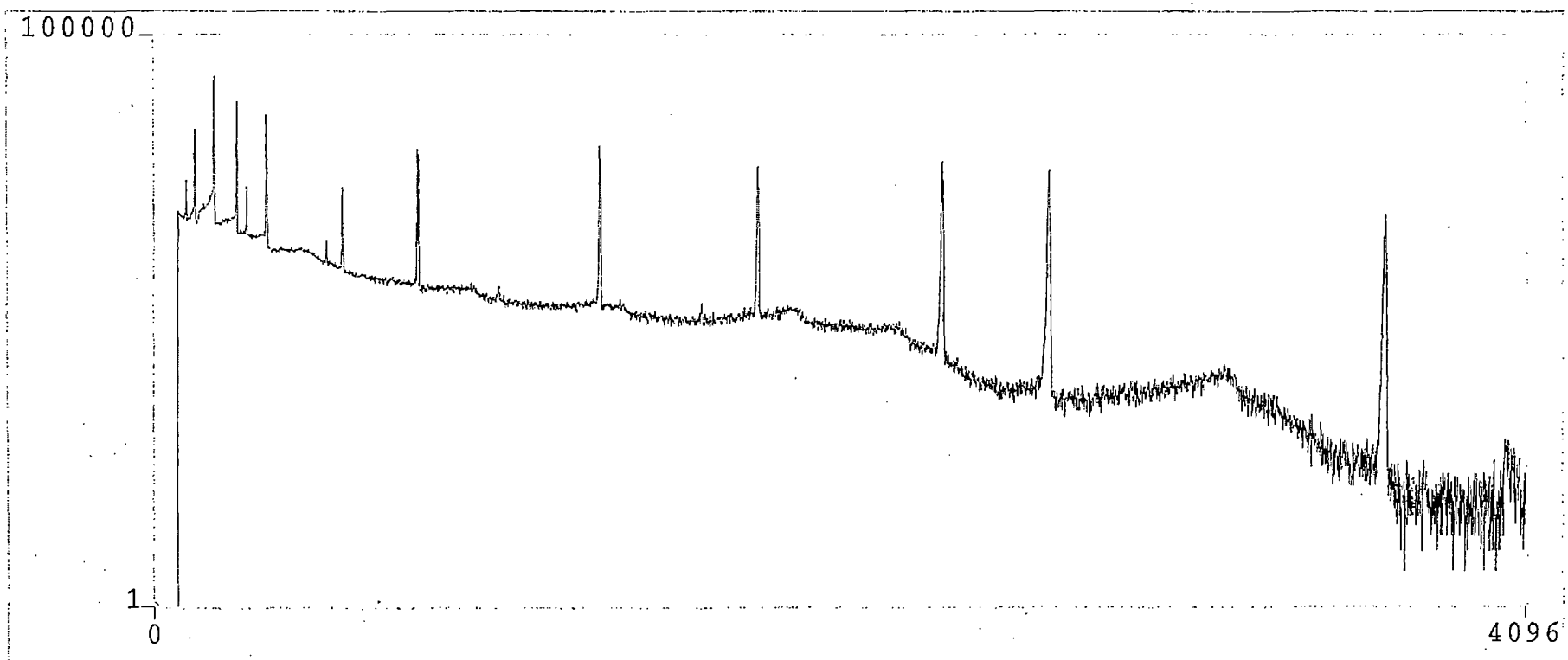
Crossover: 300.00 keV

Below Crossover Efficiency Fit:
Eff = 10 ^ [-7.17e+01 + 9.16e+01*En +-3.97e+01*En^2 + 5.71e+00*En^3]
(Where En = LOG(Energy in keV)) (Polynomial)
Above Knee Efficiency Fit:
Eff = exp ^ [1.03e+00 +-9.03e-01*En + 0.00e+00*En^2]
(Where En = Energy in keV) (Linear/Quad)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	4.98e-03	0.44	5.00e-03	-9.26	4.58e-03
2	88.04	1.72e-02	-2.12	1.68e-02	-3.16	1.63e-02
3	122.06	2.28e-02	3.24	2.35e-02	-2.11	2.31e-02
4	165.85	2.34e-02	-1.91	2.29e-02	-3.71	2.21e-02
5	279.00	1.75e-02	0.25	1.75e-02	-10.85	1.58e-02
6	391.68	1.25e-02	2.10	1.27e-02	-2.25	1.25e-02
7	661.64	8.17e-03	-2.89	7.94e-03	-2.24	7.76e-03
8	898.02	6.08e-03	-0.90	6.02e-03	-2.24	5.89e-03
9	1173.21	4.78e-03	-0.94	4.73e-03	-2.23	4.63e-03
10	1332.48	4.13e-03	2.13	4.22e-03	-2.23	4.13e-03
11	1836.01	3.15e-03	0.41	3.16e-03	-2.22	3.09e-03

Calibration Results Saved.

OK JP 1/15/14



Acq. Start: 01/14/2014 10:58:36 ID: 011414-4 Geo 13 Eff Cal (996)

Gamma Efficiency Calibration - Crossover energy efficiency difference

Calibration date: 01/14/14
Detector 4
Geometry 13
Crossover energy=300 keV

	EFF @ CROSSOVER	% DIFF*	MEETS ALS ACCEPTANCE CRITERIA?
LOWER EFFICIENCY CURVE	0.016893	4.14%	OK
UPPER EFFICIENCY CURVE	0.016221	-3.97%	OK

*When a single calibration curve does not meet ALS acceptance criteria, a split-fit efficiency calibration may be employed. This entails the use of two separate energy range calibrations, a low energy efficiency curve and a high energy efficiency curve. A crossover energy must be specified that marks where the software will use either the low energy efficiency curve or the high energy efficiency curve. It should be noted that if a nuclide is specified that has a gamma photon energy that is equal to **OR** within 15 keV of the crossover energy, the potential exists for the calculated efficiencies at the crossover energy to be significantly different than the true detection efficiency of the detector. At times by as much as 20%. This is an artifact of the non-equivalency of the calibration equations specified for each energy range. This may result in an effective high or low bias to the analytical results. This bias is reflected in the above calculated % difference. ALS Environmental will not accept any calibration with an effective % difference of greater than 5% without supervisory approval. Results are submitted without further qualification.

Efficiency equations

Polynomial 10^(A+B*(LOG(En))+C*(LOG(En))^2+D*(LOG(En))^3)

A	-7.166962E+01		
B	9.162975E+01		
C	-3.973227E+01	Calculated efficiency	0.016893
D	5.705397E+00		

En is energy in keV
Crossover energy 300

Linear e^(A+(B*(ln(En)))+(C*(ln(En))^2))

A	1.026872E+00		
B	-9.026121E-01		
C	0.000000E+00	Calculated efficiency	0.016221

En is energy in keV
Crossover energy 300

OK JP 1/15/14

I:\Oprtns\RAD\INST\GAMMA\Calibration\Efficiency crossover fit % diff calculations\Efficiency crossover calculation_geo 13-det 4_01.14.14

Standards File. Gsstd13.std
Assay Date 07/01/2013 10:00
ID.: Geo 13 Std#996 500-g. mixed gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.320E+02 yrs	0.35900	4.56
2	Cd-109	88.04	4.626E+02 dys	0.03610	63.93
3	Co-57	122.06	2.718E+02 dys	0.85510	1.46
4	Ce-139	165.85	1.376E+02 dys	0.80350	2.18
5	Hg-203	279.00	4.661E+01 dys	0.77300	4.78
6	Sn-113	391.68	1.151E+02 dys	0.64900	3.77
7	Cs-137	661.64	3.007E+01 yrs	0.85120	1.85
8	Y-88	898.02	1.066E+02 dys	0.93400	6.32
9	Co-60	1173.21	5.271E+00 yrs	0.99980	2.92
10	Co-60	1332.48	5.271E+00 yrs	0.99990	2.92
11	Y-88	1836.01	1.066E+02 dys	0.99380	6.29

#996

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

94409
Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070368

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.238E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia 30318

Comments:
~290 mL / 500 g customer supplied sand

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager

Geometry 13 Calibration Verification: Gamma Mixed Nuclide Source; Geometry 13
500-gram soil/solid geometry
Detector 4

VERIF. SOURCE : 951 REF DATE : 10/1/2011 Count Date: 1/14/2014

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY						
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard		DPS	pCi/g	Activity	Recovery	Pass/Fail	# of Half Lives Expired
Am-241	59.5	432.0000	1261	0.3590	500 g	Am-241	3512.5	189.9	191	101%	Pass	0.01
Cd-109	88	1.2666	1900	0.0372		Cd-109	51075.3	2760.8	2900	105%	Pass	1.81
Co-57	122	0.7441	1016	0.8551		Co-57	1188.2	64.2	62.1	97%	Pass	3.08
Ce-139	166	0.3768	1421	0.8035		Ce-139	1768.5	95.6	104.0	109%	Pass	6.07
Hg-203	279	0.1276	3114	0.7730		Hg-203	4028.5	217.8	NC	>5 h-lives	>5 h-lives	17.94
Sn-113	392	0.3151	1981	0.6490		Sn-113	3052.4	165.0	153	>5 h-lives	>5 h-lives	7.26
Cs-137	662	30.0000	1264	0.8512		Cs-137	1485.0	80.3	81.9	102%	Pass	0.08
Y-88	898	0.2919	4760	0.9340		Y-88	5096.4	275.5	218	>5 h-lives	>5 h-lives	7.84
Co-60	1173	5.2714	2355	0.9998		Co-60	2355.5	127.3	123	97%	Pass	0.43
Co-60	1332	5.2714	2355	0.9999		Co-60	2355.2	127.3	124	97%	Pass	0.43
Y-88	1836	0.2919	5038	0.9938		Y-88	5069.4	274.0	256	>5 h-lives	>5 h-lives	7.84

NC = NOT CALCULATED DUE TO THE ACTIVITY BEING LESS THAN THE MDCa

OK JP 1/15/14

140064D04.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Geo 13 / Solid

Sample ID: 011414-4A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	01/14/2014 14:08:51
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	2.01E+004 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	5.00E+002 g	Real Time	1824 Sec
Collection Efficiency	1.0000	Spc. File	.140064D04.SPC

Detector #: 4 (Detector 4)

Energy(keV)= -1.53 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/14/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	49.07	101.08	87	124	101	2245	0.70	a	NET< CL
2	59.50	121.91	11418	274	142	3701	0.93	a	
3	87.95	178.74	17308	304	126	2933	0.99	a	
4	122.09	246.96	4906	192	108	2148	0.99	a	
5	136.46	275.65	578	120	90	1645	0.89	a	
6	165.88	334.42	946	132	96	1720	0.98	a	
7	213.53	429.60	50	92	74	1230	0.58	a	NET< CL
8	391.75	785.61	274	120	95	1567	1.46	a	
9	661.75	1324.96	17499	290	98	1699	1.80	a	HiResid
10	898.04	1796.97	179	110	88	1360	2.07	a	
11	1173.38	2346.98	14359	260	82	1150	2.25	a	HiResid
12	1332.51	2664.87	12892	236	53	449	2.55	a	HiResid
13	1836.22	3671.07	116	31	18	45	3.47	a	

140064D04.SPC Analyzed by

****

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

****

Background File:. . . . . DET040109.BKG (010914-4 WEEKLY BKG)

Bkg.File Detector #: 4

==========

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
10	898.04	179	110	88	178	110	88	

140064D04.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 011414-4A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	01/14/2014 14:08:51
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	2.01e+004 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	5.00e+002 g	Real Time	1824 Sec
Collection Efficiency	1.0000	Spectrum File	.140064D04.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04)(Sh13).EFF (Geo. 13)

Eff=10^[-7.17E+01 +9.16E+01*L +-3.97E+01*L^2 +5.71E+00*L^3] 01/14/2014

Eff.= EXP[1.03E+00 + -9.03E-01 * En + 0.00E+00 * En^2] Above 300.00 keV

Library File: . . . .ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54		1.91E+02 +- 4.59E+00	4.78E+00	2.37E+00	3.79E+06
Cd-109	88.02		2.90E+03 +- 5.10E+01	4.27E+01	2.11E+01	1.11E+04
Co-57	122.07		6.21E+01 +- 2.43E+00	2.77E+00	1.37E+00	6.50E+03
Ce-139	165.85		1.04E+02 +- 1.45E+01	2.15E+01	1.06E+01	3.30E+03
Sn-113	391.68		1.53E+02 +- 6.70E+01	1.07E+02	5.30E+01	2.76E+03
Cs-137	661.62		8.19E+01 +- 1.36E+00	9.32E-01	4.60E-01	2.64E+05
Y-88	Average:x		2.48E+02 +- 6.07E+01	. . . .	. . . .	2.56E+03
	898.02		2.18E+02 +- 1.34E+02	2.18E+02	1.07E+02	2.56E+03
	1836.01		2.56E+02 +- 6.81E+01	8.67E+01	4.04E+01	2.56E+03
Co-60	Average:x		1.24E+02 +- 1.59E+00	. . . .	. . . .	4.62E+04
	1173.21		1.23E+02 +- 2.23E+00	1.43E+00	7.04E-01	4.62E+04
	1332.48		1.24E+02 +- 2.27E+00	1.05E+00	5.12E-01	4.62E+04
Hg-203	279.18		MDA	1.11E+05	5.46E+04	1.12E+03

MEASURED TOTAL: 3.86E+03 +- 2.03E+02 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

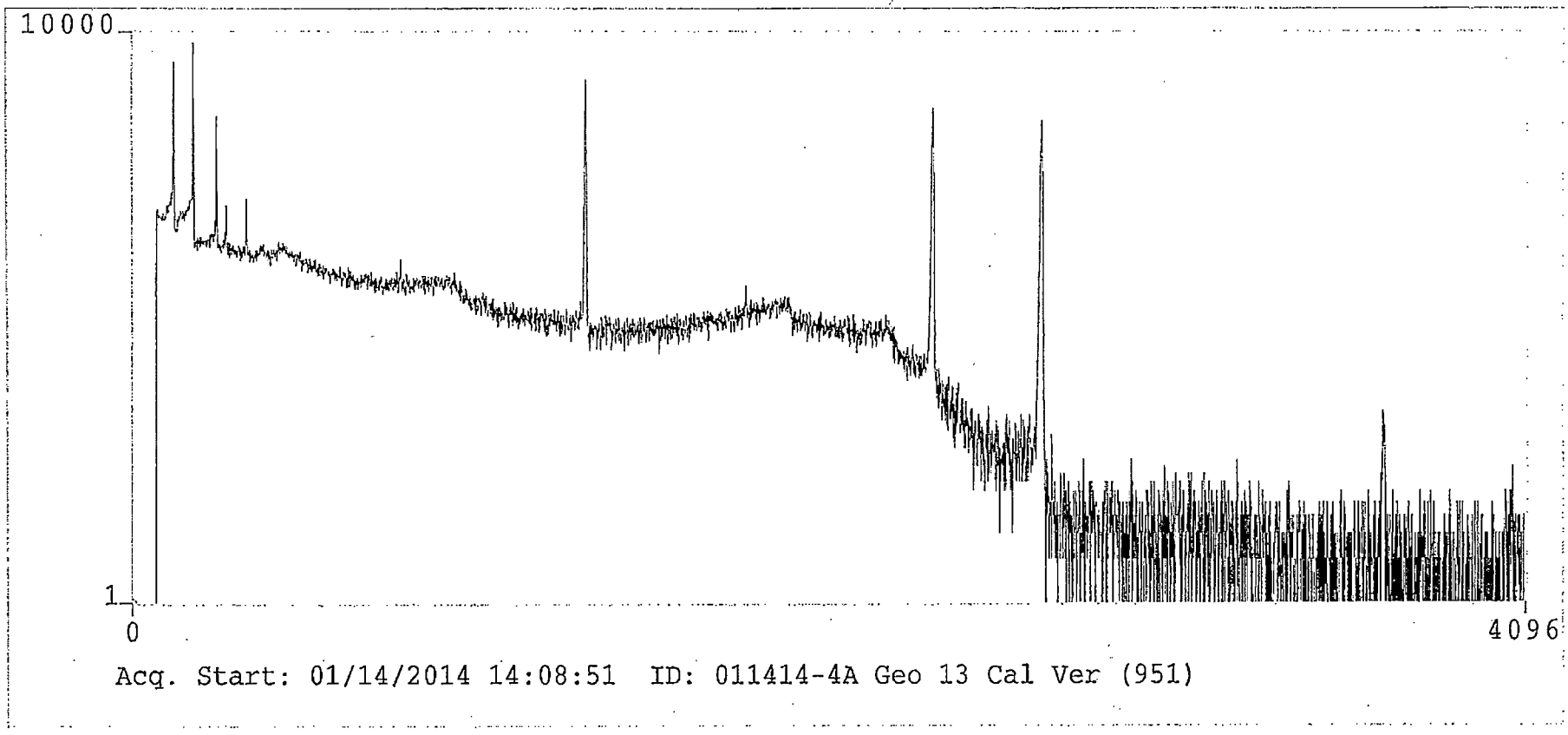
PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	49.07	101.08	87	124	101	2245	0.70	Deleted
5	136.46	275.65	578	120	90	1645	0.89	Unknown

140064D04.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	213.53	429.60	50	92	74	1230	0.58	Deleted

c:\SEEKER\BIN\140064d04.res Analysis Results Saved.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1
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4096
Acq. Start: 01/14/2014 14:08:51 ID: 011414-4A Geo 13 Cal Ver (951)

Eckert & Ziegler
Analytics

Rec 10-25-11
RSO #951

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

85860-307

500 Grams of Sand in 16 Ounce PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: 73625, Item 1
Reference Date: 01-Oct-2011 12:00 PM EST **Grams of Master Source:** 0.011319

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.261E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.679E+05	1.900E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.972E+04	1.016E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.255E+05	1.421E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.751E+05	3.114E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.750E+05	1.981E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.117E+05	1.264E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.205E+05	4.760E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.081E+05	2.355E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.081E+05	2.355E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.451E+05	5.038E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Std Re-Verified
9/3/2013
New Exp Date
⇒ 09/03/2014
JP 10/1/13

ANA Form005 Rev. —

MGS Certificate, Rev 2 09-28-2009

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Comments:
~290 mL of customer supplied sand.

This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____ Date: 24 OCT 11
J. D. McCorvey, QA Manager Alternate

140609D05.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 061614-5 Geo 13 Eff Cal (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	06/16/2014 08:05:12
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	8.40E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	9000 Sec
Sample Size	5.00E+002 g	Real Time	9149 Sec
Collection Efficiency	1.0000	Spc. File	.140609D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.77 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 06/16/2014

FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	46.51	94.52	1582	230	177	7736	0.44	a	
2	59.47	120.44	14126	354	216	10297	0.71	a	
3	87.98	177.45	81961	669	285	16377	0.74	a	
4	121.97	245.40	52377	546	245	12073	0.77	a	
5	136.40	274.24	6864	321	226	10291	0.81	a	
6	165.78	332.97	34790	452	210	8898	0.85	a	
7	255.04	511.43	1008	228	180	6528	0.79	a	
8	279.09	559.52 Δ	1882	254	196	7114	0.91	a	
9	391.62	784.49	21993	374	188	6004	1.08	a	
10	510.77	1022.71	932	353	286	10092	2.68	a	Wide Pk
11	513.27	1027.70	-16	123	101	2523	0.60	b	NET< CL
12	599.79	1200.68	35	113	92	2099	0.64	a	NET< CL
13	661.63	1324.31	79447	593	150	4162	1.34	a	HiResid
14	813.83	1628.60	352	186	150	3921	1.45	a	
15	844.81	1690.54	150	153	124	3026	1.09	a	
16	898.05	1796.96	23447	358	153	4545	1.52	a	HiResid
17	1173.24	2347.14	82824	594	120	2531	1.73	a	HiResid
18	1326.37	2653.28	876	215	170	2777	5.53	a	HiResid Wide Pk
19	1332.52	2665.59	76451	560	73	980	1.89	b	HiResid
20	1836.10	3672.36	14839	248	39	260	2.26	a	HiResid

Δ < 10,000 counts achieved due to greater Than 5 ½-lives elapsed.
JP 6/16/14

140609D05.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.8.2

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050611.BKG (061114-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
10	510.77	932	353	286	703	356	289	
16	898.05	23447	358	153	23439	358	153	

140609D05.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

****

Sample ID: 061614-5 Geo 13 Eff Cal (996)
Stds. Match Tolerance: 2.00 keV

Detector Number: 05 Calibration Date. . . 06/16/2014 08:05:12
Geometry File (D05)(Sh13).EFF ID. Geo 13 Eff Cal
Amount of Std. in Calib. Source: 500.000000 gm

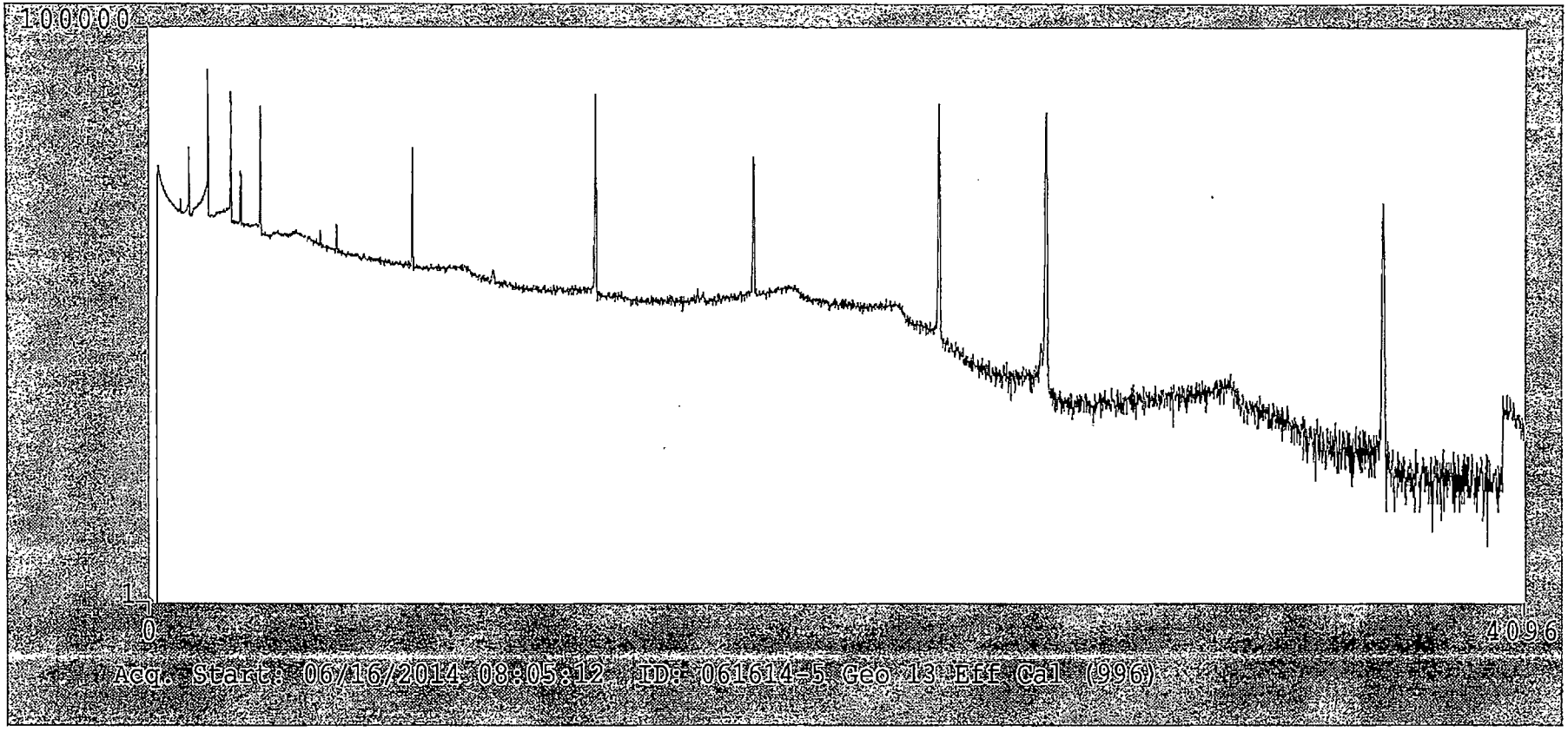
Crossover: 300.00 keV

Below Crossover Efficiency Fit:
Eff = 10 ^ [-1.07e+02 + 1.37e+02*En +-5.95e+01*En^2 + 8.57e+00*En^3]
(Where En = LOG(Energy in keV)) (Polynomial)
Above Knee Efficiency Fit:
Eff = exp ^ [4.01e-01 +-7.50e-01*En +-6.96e-04*En^2]
(Where En = Energy in keV) (Linear/Quad)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	1.92e-03	0.51	1.93e-03	0.89	1.95e-03
2	88.04	1.33e-02	-2.49	1.30e-02	-3.00	1.26e-02
3	122.06	2.28e-02	3.79	2.37e-02	-4.26	2.27e-02
4	165.85	2.57e-02	-2.24	2.52e-02	-3.99	2.42e-02
5	279.00	2.06e-02	0.30	2.06e-02	-0.97	2.04e-02
6	391.68	1.64e-02	0.67	1.66e-02	-4.22	1.59e-02
7	661.64	1.14e-02	-2.96	1.11e-02	-3.79	1.07e-02
8	898.02	8.58e-03	2.75	8.82e-03	-3.77	8.50e-03
9	1173.21	7.15e-03	0.62	7.20e-03	-3.89	6.93e-03
10	1332.48	6.60e-03	-1.01	6.53e-03	-4.00	6.28e-03
11	1836.01	5.13e-03	-0.15	5.12e-03	-4.39	4.91e-03

Calibration Results Saved.

OK JP 6/16/14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4096
Acq. Start: 06/16/2014 08:05:12 ID: 061614-5 Geo 13 Eff Cal (996)

Gamma Efficiency Calibration - Crossover energy efficiency difference

Calibration 6/16/2014
Detector 5
Geometry 13
Crossover energy=300 keV

	EFF @ CROSSOVER	% DIFF*	MEETS ALS ACCEPTANCE CRITERIA?
LOWER EFFICIENCY CURVE	0.020719	2.26%	OK
UPPER EFFICIENCY CURVE	0.020260	-2.21%	OK

*When a single calibration curve does not meet ALS acceptance criteria, a split-fit efficiency calibration may be employed. This entails the use of two separate energy range calibrations, a low energy efficiency curve and a high energy efficiency curve. A crossover energy must be specified that marks where the software will use either the low energy efficiency curve or the high energy efficiency curve. It should be noted that if a nuclide is specified that has a gamma photon energy that is equal to **OR** within 15 keV of the crossover energy, the potential exists for the calculated efficiencies at the crossover energy to be significantly different than the true detection efficiency of the detector. At times by as much as 20%. This is an artifact of the non-equivalency of the calibration equations specified for each energy range. This may result in an effective high or low bias to the analytical results. This bias is reflected in the above calculated % difference. ALS Environmental will not accept any calibration with an effective % difference of greater than 5% without supervisory approval. Results are submitted without further qualification.

Efficiency equations

Polynomial 10^(A+B*(LOG(En))+C*(LOG(En))^2+D*(LOG(En))^3)

A	-1.066323E+02		
B	1.371116E+02		
C	-5.946521E+01	Calculated efficiency	0.020719
D	8.565354E+00		

En is energy in keV
Crossover energy 300

Linear e^(A+(B*(ln(En)))+(C*(ln(En))^2))

A	4.014375E-01		
B	-7.500086E-01		
C	-6.963900E-04	Calculated efficiency	0.020260

En is energy in keV
Crossover energy 300

On JP 6/16/14

I:\Oprtns\RAD\INST\GAMMA\Calibration\Efficiency crossover fit % diff calculations\Efficiency crossover calculation_Geo13_Det5_06_16_14

Standards File. Gsstd13.std
Assay Date 07/01/2013 10:00
ID.: Geo 13 Std#996 500-g. mixed gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.320E+02 yrs	0.35900	4.56
2	Cd-109	88.04	4.626E+02 dys	0.03610	63.93
3	Co-57	122.06	2.718E+02 dys	0.85510	1.46
4	Ce-139	165.85	1.376E+02 dys	0.80350	2.18
5	Hg-203	279.00	4.661E+01 dys	0.77300	4.78
6	Sn-113	391.68	1.151E+02 dys	0.64900	3.77
7	Cs-137	661.64	3.007E+01 yrs	0.85120	1.85
8	Y-88	898.02	1.066E+02 dys	0.93400	6.32
9	Co-60	1173.21	5.271E+00 yrs	0.99980	2.92
10	Co-60	1332.48	5.271E+00 yrs	0.99990	2.92
11	Y-88	1836.01	1.066E+02 dys	0.99380	6.29

#996

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

94409
Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070368

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.238E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia 30318

Comments:
~290 mL / 500 g customer supplied sand

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager

Geometry 13 Calibration Verification: Gamma Mixed Nuclide Source; Geometry 13
500-gram soil/solid geometry
Detector 5

VERIF. SOURCE : 951 REF DATE : 10/1/2011 Count Date: 6/16/2014

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY						
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard		DPS	pCi/g	Activity	Recovery	Pass/Fail	# of Half Lives Expired
Am-241	59.5	432.0000	1261	0.3590	500 g	Am-241	3512.5	189.9	198	104%	Pass	0.01
Cd-109	88	1.2666	1900	0.0372		Cd-109	51075.3	2760.8	2880	104%	Pass	2.14
Co-57	122	0.7441	1016	0.8551		Co-57	1188.2	64.2	63.3	99%	Pass	3.64
Ce-139	166	0.3768	1421	0.8035		Ce-139	1768.5	95.6	95.6	100%	Pass	7.19
Hg-203	279	0.1276	3114	0.7730		Hg-203	4028.5	217.8	NC	>5 h-lives	>5 h-lives	21.22
Sn-113	392	0.3151	1981	0.6490		Sn-113	3052.4	165.0	NC	>5 h-lives	>5 h-lives	8.59
Cs-137	662	30.0000	1264	0.8512		Cs-137	1485.0	80.3	83.2	104%	Pass	0.09
Y-88	898	0.2919	4760	0.9340		Y-88	5096.4	275.5	NC	>5 h-lives	>5 h-lives	9.28
Co-60	1173	5.2714	2355	0.9998		Co-60	2355.5	127.3	127	100%	Pass	0.51
Co-60	1332	5.2714	2355	0.9999		Co-60	2355.2	127.3	128	101%	Pass	0.51
Y-88	1836	0.2919	5038	0.9938		Y-88	5069.4	274.0	NC	>5 h-lives	>5 h-lives	9.28

NC = NOT CALCULATED DUE TO THE ACTIVITY BEING LESS THAN THE MDCa

OK JP 6/16/14

140610D05.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Geo 13 / Solid

Sample ID: 061614-5A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	06/16/2014 10:43:30
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	2.37E+004 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	5.00E+002 g	Real Time	1828 Sec
Collection Efficiency	1.0000	Spc. File	.140610D05.SPC

Detector #: 5 (Detector 5)

Energy(keV)= -0.77 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 06/16/2014

FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.47	120.43	4564	174	91	1825	0.69 a	
2	87.97	177.43	10586	243	106	2272	0.75 a	
3	121.97	245.40	3398	164	95	1821	0.79 a	
4	132.32	266.08	79	114	93	1743	0.87 a	NET< CL
5	136.37	274.18	398	135	106	2091	0.94 b	
6	165.78	332.97	443	131	102	1930	0.93 a	
7	172.71	346.83	74	94	76	1280	0.66 a	NET< CL
8	252.49	506.34	68	74	59	869	0.47 a	
9	317.55	636.42	65	68	54	717	0.50 a	
10	363.86	729.00	11	61	50	620	0.53 a	NET< CL
11	391.64	784.52	118	102	82	1243	1.04 a	
12	435.58	872.39	107	148	120	2010	1.67 a	NET< CL
13	586.69	1174.48	35	54	43	460	0.63 a	NET< CL
14	661.64	1324.33	24680	325	67	830	1.34 a	
15	796.52	1593.99	44	65	53	584	1.04 a	NET< CL
16	898.24	1797.34	73	63	50	612	0.77 a	
17	1089.41	2179.54	20	53	43	462	0.84 a	NET< CL
18	1173.29	2347.23	21377	301	59	605	1.75 a	HiResid
19	1332.56	2665.66	19464	282	32	189	1.89 a	HiResid
20	1835.96	3672.08	70	25	15	36	2.42 a	

140610D05.SPC Analyzed by

****

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET050611.BKG (061114-5 WEEKLY BKG)

Bkg.File Detector #: 5

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
16	898.24	73	63	50	72	63	50	

140610D05.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

Geo 13 / Solid

Sample ID: 061614-5A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	06/16/2014 10:43:30
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	2.37e+004 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	5.00e+002 g	Real Time	1828 Sec
Collection Efficiency	1.0000	Spectrum File	.140610D05.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 5 (Detector 5)

Efficiency File: (D05)(Sh13).EFF (Geo 13 Eff Cal)
Eff=10^[-1.07E+02 +1.37E+02*L +-5.95E+01*L^2 +8.57E+00*L^3] 06/16/2014
Eff.= EXP[4.01E-01 + -7.50E-01 * En + -6.96E-04 * En^2] Above 300.00 keV

Library File: . . . .ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54		1.98E+02 +- 7.56E+00	7.98E+00	3.93E+00	3.79E+06
Cd-109	88.02		2.88E+03 +- 6.61E+01	5.85E+01	2.89E+01	1.11E+04
Co-57	122.07		6.33E+01 +- 3.06E+00	3.59E+00	1.77E+00	6.50E+03
Ce-139	165.85		9.56E+01 +- 2.83E+01	4.47E+01	2.20E+01	3.30E+03
Cs-137	661.62		8.32E+01 +- 1.09E+00	4.61E-01	2.26E-01	2.64E+05
Co-60	Average:x		1.28E+02 +- 1.29E+00	. . . . .	. . . . .	4.62E+04
	1173.21		1.27E+02 +- 1.79E+00	7.15E-01	3.49E-01	4.62E+04
	1332.48		1.28E+02 +- 1.85E+00	4.38E-01	2.10E-01	4.62E+04
Hg-203	279.18		MDA	8.42E+05	4.15E+05	1.12E+03
Sn-113	391.68		MDA	1.34E+02r	6.56E+01	2.76E+03
Y-88	898.02		MDA	2.31E+02r	1.12E+02	2.56E+03

MEASURED TOTAL: 3.45E+03 +- 1.07E+02 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

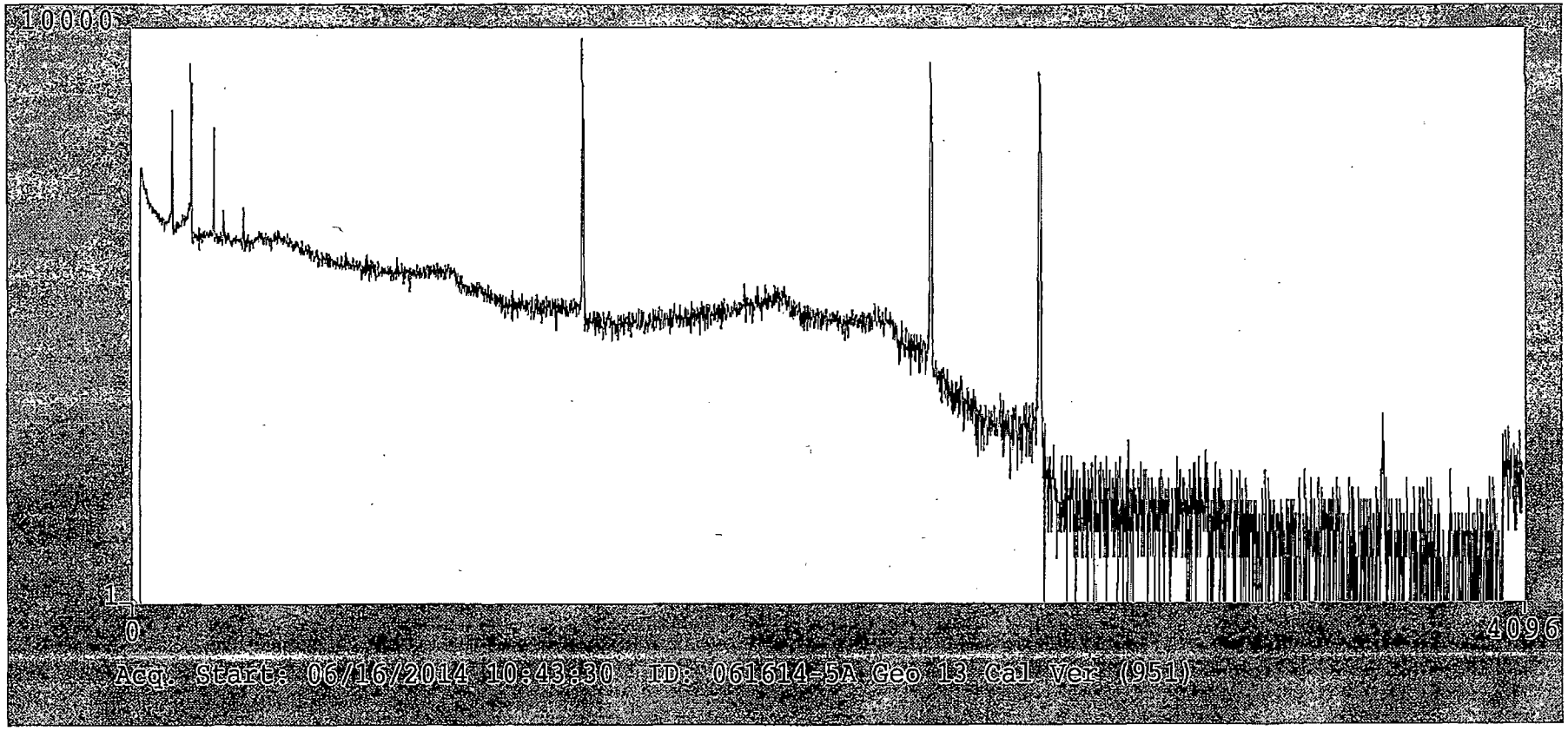
PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
4	132.32	266.08	79	114	93	1743	0.87	Deleted
5	136.37	274.18	398	135	106	2091	0.94	Unknown
7	172.71	346.83	74	94	76	1280	0.66	Deleted
8	252.49	506.34	68	74	59	869	0.47	Unknown

140610D05.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
9	317.55	636.42	65	68	54	717	0.50	Unknown
10	363.86	729.00	11	61	50	620	0.53	Deleted
11	391.64	784.52	118	102	82	1243	1.04	Unknown
12	435.58	872.39	107	148	120	2010	1.67	Deleted
13	586.69	1174.48	35	54	43	460	0.63	Deleted
15	796.52	1593.99	44	65	53	584	1.04	Deleted
16	898.24	1797.34	72	63	50	612	0.77	Unknown
17	1089.41	2179.54	20	53	43	462	0.84	Deleted
20	1835.96	3672.08	70	25	15	36	2.42	Unknown

c:\SEEKER\BIN\140610d05.res Analysis Results Saved.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4096
Acq. Start: 06/16/2014 10:43:30 ID: 061614-5A Geo 13 Cal Ver (951)

Eckert & Ziegler
Analytics

Rec 10-25-11
RSO #951

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

85860-307

500 Grams of Sand in 16 Ounce PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: 73625, Item 1
Reference Date: 01-Oct-2011 12:00 PM EST **Grams of Master Source:** 0.011319

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.261E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.679E+05	1.900E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.972E+04	1.016E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.255E+05	1.421E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.751E+05	3.114E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.750E+05	1.981E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.117E+05	1.264E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.205E+05	4.760E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.081E+05	2.355E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.081E+05	2.355E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.451E+05	5.038E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Std Re-Verified
9/3/2013
New Exp Date
=> 09/03/2014
JP 10/1/13

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

ANA Form006 Rev. —

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355
Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Comments:
~290 mL of customer supplied sand.

This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____
J. D. McCorvey, QA Manager Alternate

Date: 24 OCT 11

131248D07.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 120413-7 Geo 13 Eff Cal (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	12/04/2013 10:04:17
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	3.74E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	4500 Sec
Sample Size	5.00E+002 g	Real Time	4636 Sec
Collection Efficiency	1.0000	Spc. File	.131248D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.36 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 12/04/2013

FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.32	97.19	3422	276	206	8518	0.74 a	
2	59.36	123.22	15338	360	215	9333	0.74 a	HiResid
3	70.75	145.96	100	203	166	6786	0.41 a	NET< CL
4	72.78	150.01	480	249	202	9048	0.70 b	
5	87.91	180.22	67689	602	249	12502	0.79 a	
6	121.89	248.07	44174	495	215	9283	0.83 a	
7	136.32	276.86	5819	284	197	7843	0.85 a	
8	165.74	335.60	43208	471	182	6700	0.90 a	
9	255.08	513.96	1313	217	168	5238	1.02 a	
10	279.15	562.03	15134	311	156	4524	0.99 a	
11	338.27	680.05	84	170	139	3584	0.94 a	NET< CL
12	391.71	786.76	31304	391	136	3660	1.18 a	
13	511.38	1025.66	1039	308	248	6993	2.92 a	Wide Pk
14	661.83	1326.04	34648	404	130	3269	1.51 a	
15	676.55	1355.42	158	183	149	3906	1.73 a	
16	813.95	1629.74	585	150	117	2531	1.57 a	
17	898.14	1797.82	35529	410	133	3136	1.73 a	HiResid
18	1052.33	2105.66	101	125	101	2064	1.57 a	NET< CL
19	1173.29	2347.15	38194	408	96	1636	2.16 a	HiResid
20	1324.88	2649.80	897	132	97	1307	3.28 a	HiResid
21	1332.41	2664.83	34762	383	73	915	2.35 b	HiResid
22	1835.38	3668.99	22060	301	41	254	2.90 a	HiResid

131248D07.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.8.2

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET071127.BKG (112713-7 WEEKLY BKG)

Bkg.File Detector #: 7

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
3	70.75	100	203	166	98	203	166	NET<CL
4	72.78	480	249	202	472	250	202	
5	87.91	67689	602	249	67686	602	249	
9	255.08	1313	217	168	1311	217	169	
11	338.27	84	170	139	81	170	139	NET<CL
13	511.38	1039	308	248	931	309	249	

131248D07.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

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Sample ID: 120413-7 Geo 13 Eff Cal (996)
Stds. Match Tolerance: 2.00 keV

Detector Number: 07 Calibration Date. . . 12/04/2013 10:04:17
Geometry File (D07)(Sh13).EFF ID. Geo 13 Eff Cal
Amount of Std. in Calib. Source: 500.000000 gm

Eff = 1 / [2.54e-03*En^-4.01e+00 + 1.42e+02*En^ 7.45e-01]
(Where En = Energy in MeV)) (Exponential)

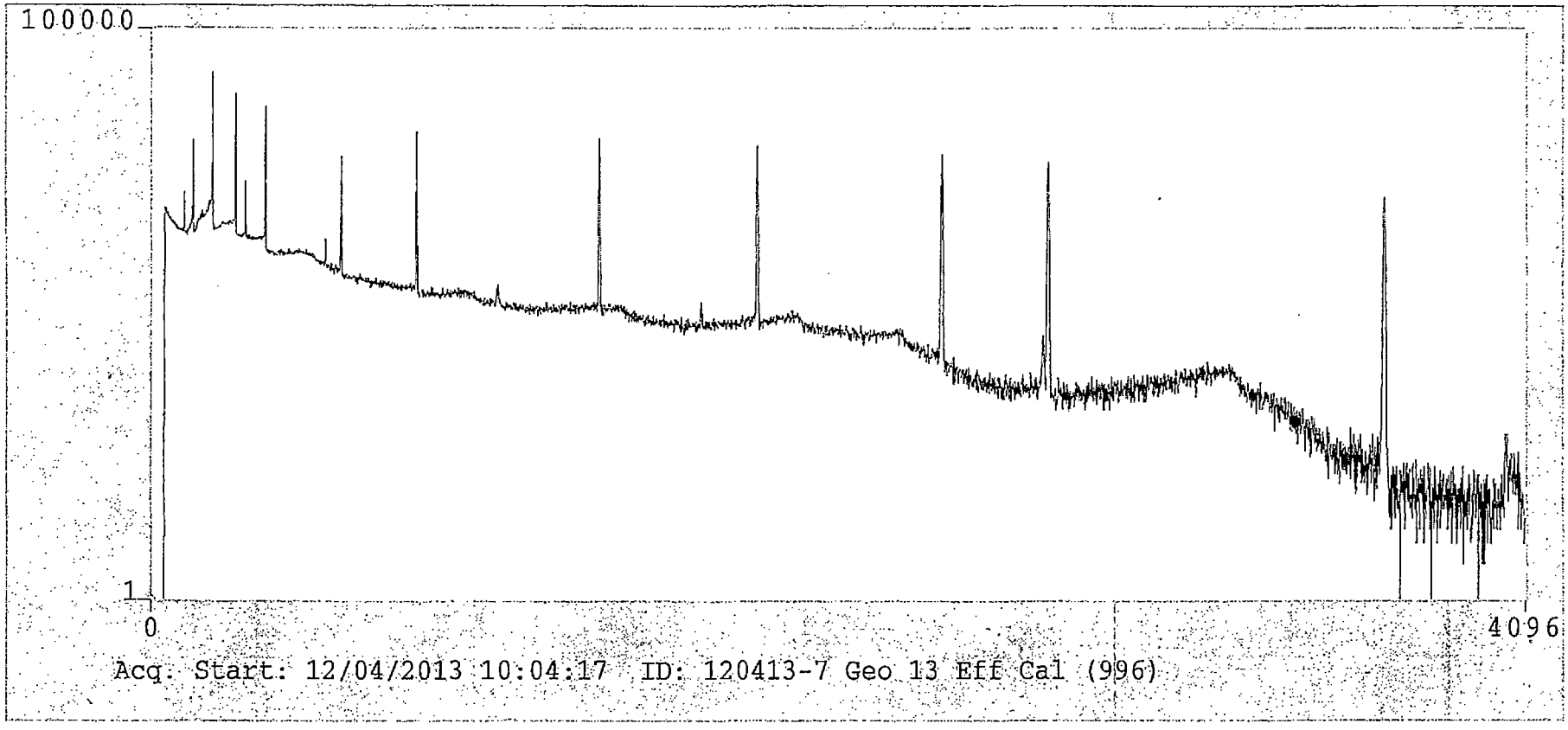
Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	4.16e-03	4.89	4.38e-03	-14.45	3.83e-03
2	88.04	1.56e-02 Δ	-4.64	1.49e-02	6.39	1.59e-02
3	122.06	2.34e-02	2.76	2.41e-02	-0.23	2.40e-02
4	165.85	2.41e-02	1.75	2.45e-02	-2.79	2.38e-02
5	279.00	1.85e-02	-2.64	1.80e-02	1.71	1.83e-02
6	391.68	1.46e-02	-3.33	1.41e-02	0.71	1.42e-02
7	661.64	9.86e-03	-3.31	9.55e-03	-0.77	9.48e-03
8	898.02	7.37e-03	3.11	7.61e-03	-1.57	7.49e-03
9	1173.21	6.15e-03	1.28	6.23e-03	-2.26	6.09e-03
10	1332.48	5.60e-03	1.26	5.67e-03	-2.60	5.53e-03
11	1836.01	4.32e-03	3.18	4.46e-03	-3.44	4.32e-03

Calibration Results Saved.

Δ Manually Adjusted from original efficiency of 1.65e-02. % Difference of Adjustment:

$$\left| \frac{1.49e\text{-}02}{1.65e\text{-}02} - 1 \right| \times 100 \Rightarrow 9.70\%$$

Change OK per SOP 713. JP 12/4/13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Acq. Start: 12/04/2013 10:04:17 ID: 120413-7 Geo 13 Eff Cal (996)

Standards File. Gsstd13.std
Assay Date 07/01/2013 10:00
ID.: Geo 13 Std#996 500-g. mixed gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.320E+02 yrs	0.35900	4.56
2	Cd-109	88.04	4.626E+02 dys	0.03610	63.93
3	Co-57	122.06	2.718E+02 dys	0.85510	1.46
4	Ce-139	165.85	1.376E+02 dys	0.80350	2.18
5	Hg-203	279.00	4.661E+01 dys	0.77300	4.78
6	Sn-113	391.68	1.151E+02 dys	0.64900	3.77
7	Cs-137	661.64	3.007E+01 yrs	0.85120	1.85
8	Y-88	898.02	1.066E+02 dys	0.93400	6.32
9	Co-60	1173.21	5.271E+00 yrs	0.99980	2.92
10	Co-60	1332.48	5.271E+00 yrs	0.99990	2.92
11	Y-88	1836.01	1.066E+02 dys	0.99380	6.29

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

94409

Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070368

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1998, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.236E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia 30318

Comments:
~290 mL / 800 g customer supplied sand

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager

Geometry 13 Calibration Verification: Gamma Mixed Nuclide Source; Geometry 13
500-gram soil/solid geometry
Detector 7

VERIF. SOURCE: 951 **REF DATE : 10/1/2011** **Count Date: 12/4/2013**

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY						
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard		DPS	pCi/g	Activity	Recovery	Pass/Fail	# of Half Lives Expired
Am-241	59.5	432.0000	1261	0.3590	500 g	Am-241	3512.5	189.9	188	99%	Pass	0.01
Cd-109	88	1.2666	1900	0.0372		Cd-109	51075.3	2760.8	3040	110%	Pass	1.72
Co-57	122	0.7441	1016	0.8551		Co-57	1188.2	64.2	63.2	98%	Pass	2.93
Ce-139	166	0.3768	1421	0.8035		Ce-139	1768.5	95.6	99.4	104%	Pass	5.78
Hg-203	279	0.1276	3114	0.7730		Hg-203	4028.5	217.8	NC	>5 h-lives	>5 h-lives	17.06
Sn-113	392	0.3151	1981	0.6490		Sn-113	3052.4	165.0	165	>5 h-lives	>5 h-lives	6.91
Cs-137	662	30.0000	1264	0.8512		Cs-137	1485.0	80.3	82.0	102%	Pass	0.07
Y-88	898	0.2919	4760	0.9340		Y-88	5096.4	275.5	279	>5 h-lives	>5 h-lives	7.46
Co-60	1173	5.2714	2355	0.9998		Co-60	2355.5	127.3	122	96%	Pass	0.41
Co-60	1332	5.2714	2355	0.9999		Co-60	2355.2	127.3	123	97%	Pass	0.41
Y-88	1836	0.2919	5038	0.9938		Y-88	5069.4	274.0	242	>5 h-lives	>5 h-lives	7.46

NC = NOT CALCULATED DUE TO THE ACTIVITY BEING LESS THAN THE MDCa

OK JP 12/4/13

131249D07.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 120413-7A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	12/04/2013 11:27:44
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	1.91E+004 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	5.00E+002 g	Real Time	1871 Sec
Collection Efficiency	1.0000	Spc. File	.131249D07.SPC

Detector #: 7 (Detector 7)

Energy(keV)= -2.36 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 12/04/2013

FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.39	123.28	9852	240	111	2473	0.76 a	
2	87.91	180.22	17101	296	113	2596	0.77 a	
3	103.21	210.76	86	81	65	1038	0.56 a	
4	121.91	248.10	5675	188	93	1734	0.83 a	
5	136.33	276.88	759	120	88	1544	0.83 a	
6	165.72	335.56	1192	125	85	1468	0.88 a	
7	186.03	376.11	84	107	87	1513	0.80 a	NET< CL
8	224.05	452.03	64	124	101	1888	0.95 a	NET< CL
9	310.69	625.00	8	62	50	628	0.57 a	NET< CL
10	391.78	786.88	419	105	79	1243	1.16 a	
11	475.96	954.95	54	86	69	1016	0.94 a	NET< CL
12	661.84	1326.05	21131	302	66	852	1.52 a	
13	898.25	1798.04	376	115	89	1331	1.92 a	
14	1173.27	2347.12	19015	284	54	527	2.10 a	
15	1332.41	2664.82	17460	267	30	154	2.32 a	HiResid
16	1835.48	3669.18	204	35	16	39	2.91 a	

131249D07.SPC Analyzed by .

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET071127.BKG (112713-7 WEEKLY BKG)

Bkg.File Detector #: 7

BACKGROUND SUBTRACT RESULTS

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
2	87.91	17101	296	113	17100	296	114	
7	186.03	84	107	87	75	107	87	NET<CL

131249D07.SPC Analyzed by

****

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

****

Geo 13 / Solid

Sample ID: 120413-7A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	12/04/2013 11:27:44
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	1.91e+004 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	5.00e+002 g	Real Time	1871 Sec
Collection Efficiency	1.0000	Spectrum File	.131249D07.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 7 (Detector 7)

Efficiency File: (D07)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.54E-03*En^-4.01E+00 + 1.42E+02*En^7.45E-01] 12/04/2013

Library File: . . . .ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54		1.88E+02 +- 4.59E+00	4.29E+00	2.12E+00	3.79E+06
Cd-109	88.02		3.04E+03 +- 5.25E+01	4.08E+01	2.02E+01	1.11E+04
Co-57	122.07		6.32E+01 +- 2.10E+00	2.10E+00	1.03E+00	6.50E+03
Ce-139	165.85		9.94E+01 +- 1.04E+01	1.45E+01	7.12E+00	3.30E+03
Sn-113	391.68		1.65E+02 +- 4.13E+01	6.36E+01	3.13E+01	2.76E+03
Cs-137	661.62		8.20E+01 +- 1.17E+00	5.24E-01	2.57E-01	2.64E+05
Y-88	Average:x		2.49E+02 +- 3.71E+01	. . . .	. . . .	2.56E+03
	898.02		2.79E+02 +- 8.54E+01	1.34E+02	6.61E+01	2.56E+03
	1836.01		2.42E+02 +- 4.12E+01	4.18E+01	1.93E+01	2.56E+03
Co-60	Average:x		1.23E+02 +- 1.31E+00	. . . .	. . . .	4.62E+04
	1173.21		1.22E+02 +- 1.82E+00	7.17E-01	3.50E-01	4.62E+04
	1332.48		1.23E+02 +- 1.88E+00	4.43E-01	2.12E-01	4.62E+04
Hg-203	279.18		MDA	5.82E+04	2.87E+04	1.12E+03

MEASURED TOTAL: 4.01E+03 +- 1.51E+02 pCi/g

UNKNOWN,SUM or ESCAPE PEAKS

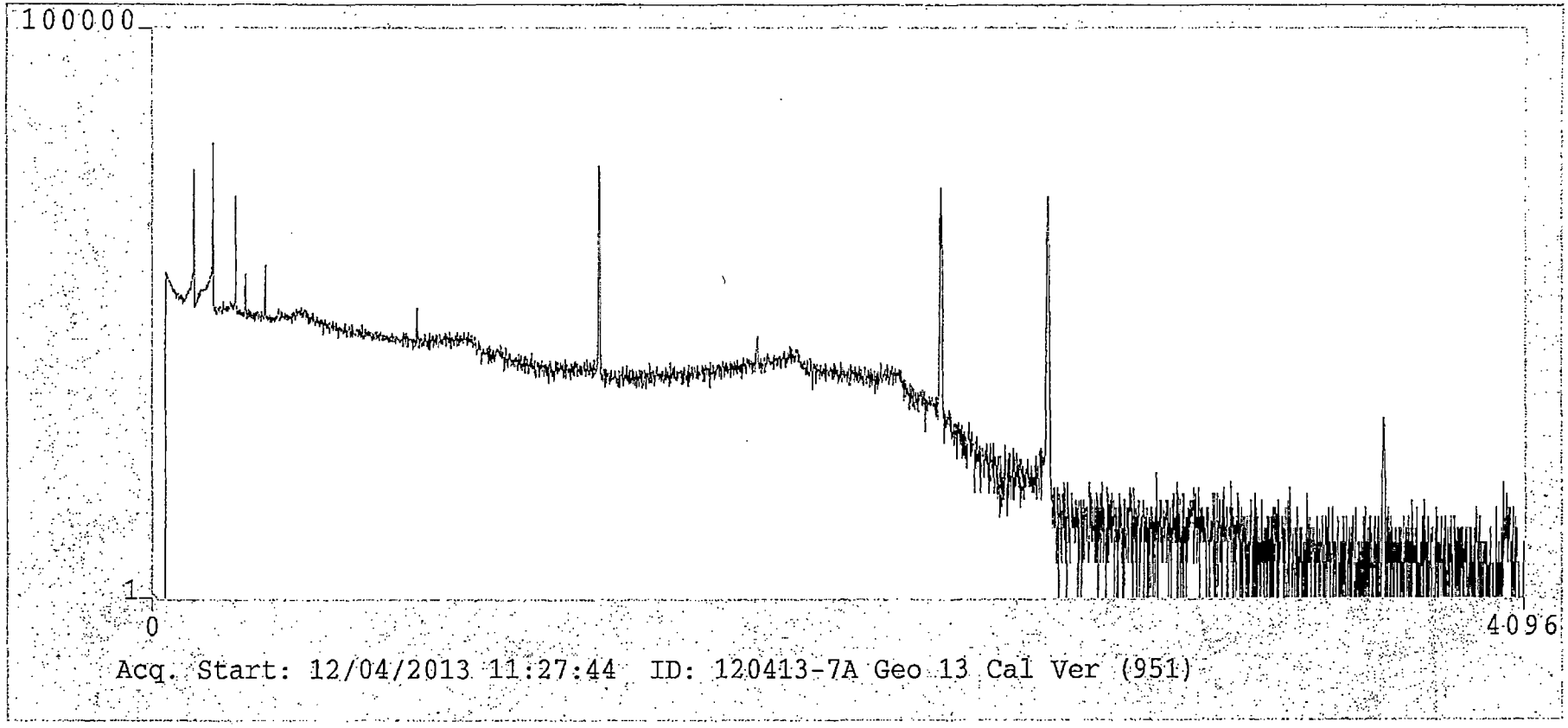
PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
3	103.21	210.76	86	81	65	1038	0.56	Unknown
5	136.33	276.88	759	120	88	1544	0.83	Unknown
7	186.03	376.11	75	107	87	1513	0.80	Deleted

131249D07.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
8	224.05	452.03	64	124	101	1888	0.95	Deleted
9	310.69	625.00	8	62	50	628	0.57	Deleted
11	475.96	954.95	54	86	69	1016	0.94	Deleted

c:\SEEKER\BIN\131249d07.res Analysis Results Saved.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4096
Acq. Start: 12/04/2013 11:27:44 ID: 120413-7A Geo 13 Cal Ver (951)

Eckert & Ziegler
Analytics

Rec 10-25-11
RSO #951

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

35860-307

500 Grams of Sand in 16 Ounce PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: 73625, Item 1
Reference Date: 01-Oct-2011 12:00 PM EST **Grams of Master Source:** 0.011319

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.261E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.628E+02	1.879E+05	1.900E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.972E+04	1.016E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.255E+05	1.421E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.751E+05	3.114E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.750E+05	1.981E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.117E+05	1.264E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.205E+05	4.760E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.081E+05	2.355E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.081E+05	2.355E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.451E+05	5.038E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Std Re-Verified
9/3/2013
New Exp Date
⇒ 09/03/2014
JP 10/1/13

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

ANA Form/RS Rev. ---

Comments:
~290 mL of customer supplied sand.

This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____
J. D. McCorvey, QA Manager Alternate

Date: 24 OCT 11

140195D08.SPC Analyzed by JP

****

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 030614-8 Geo 13 Eff Cal (996)

Sampling Start:	07/01/2013 10:00:00	Counting Start:	03/06/2014 10:09:34
Sampling Stop:	07/01/2013 10:00:00	Decay Time.	5.95E+003 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	4500 Sec
Sample Size	5.00E+002 g	Real Time	4618 Sec
Collection Efficiency	1.0000	Spc. File	.140195D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.11 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 03/06/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.32	96.68	107665	754	306	20731	0.72 a	HiResid
2	49.48	103.00	120	208	171	8060	0.31 b	NET< CL HiResid
3	59.39	122.78	87326	661	244	13174	0.67 a	HiResid
4	72.65	149.24	290	183	148	6093	0.34 a	
5	87.92	179.74	97795	678	215	10223	0.68 a	HiResid
6	121.92	247.63	41062	447	154	5275	0.73 a	HiResid
7	136.37	276.47	5163	245	163	5342	0.80 a	
8	165.77	335.17	27842	379	147	4353	0.86 a	
9	199.17	401.86	267	147	118	3086	0.65 a	
10	247.58	498.50	143	109	88	1895	0.46 a	
11	255.09	513.49	843	157	120	2913	0.86 a	
12	279.15	561.53 Δ	3426	182	115	2652	0.88 a	HiResid
13	310.23	623.59	141	130	105	2233	0.77 a	
14	391.74	786.31	16898	301	125	2681	1.10 a	
15	454.18	910.99	102	117	94	1796	0.79 a	
16	472.89	948.33	131	149	121	2490	1.22 a	
17	510.98	1024.40	671	214	171	3917	2.22 a	Wide Pk
18	661.85	1325.60	31505	376	102	1904	1.33 a	HiResid
19	692.81	1387.41	131	181	147	3053	2.18 a	NET< CL
20	754.28	1510.13	74	92	74	1167	1.03 a	NET< CL
21	814.29	1629.94	278	133	106	1841	1.56 a	
22	898.16	1797.39	18290	297	100	1946	1.52 a	
23	1109.77	2219.88	90	107	86	1447	1.47 a	

Δ < 10,000 counts achieved due to greater than 5 ½-lives elapsed. JP 3/6/14

140195D08.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	1173.30	2346.71	34308	382	77	1048	1.75	a
25	1324.53	2648.64	347	86	63	636	2.68	a HiResid
26	1332.41	2664.39	31283	359	51	477	1.89	b HiResid
27	1541.73	3082.29	51	62	49	468	1.81	a
28	1835.36	3668.54	11143	213	25	106	2.25	a

140195D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Version 1.8.2

ALS Laboratory Group - Fort Collins

GammaScan

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Background File:. . . . . DET080305.BKG (030514-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	46.32	107665	754	306	107638	754	306	
4	72.65	290	183	148	281	184	149	
9	199.17	267	147	118	251	147	118	
11	255.09	843	157	120	841	157	120	
17	510.98	671	214	171	547	215	172	
22	898.16	18290	297	100	18286	297	100	

140195D08.SPC Analyzed by

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SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

****

Sample ID: 030614-8 Geo 13 Eff Cal (996)
Stds. Match Tolerance: 2.00 keV

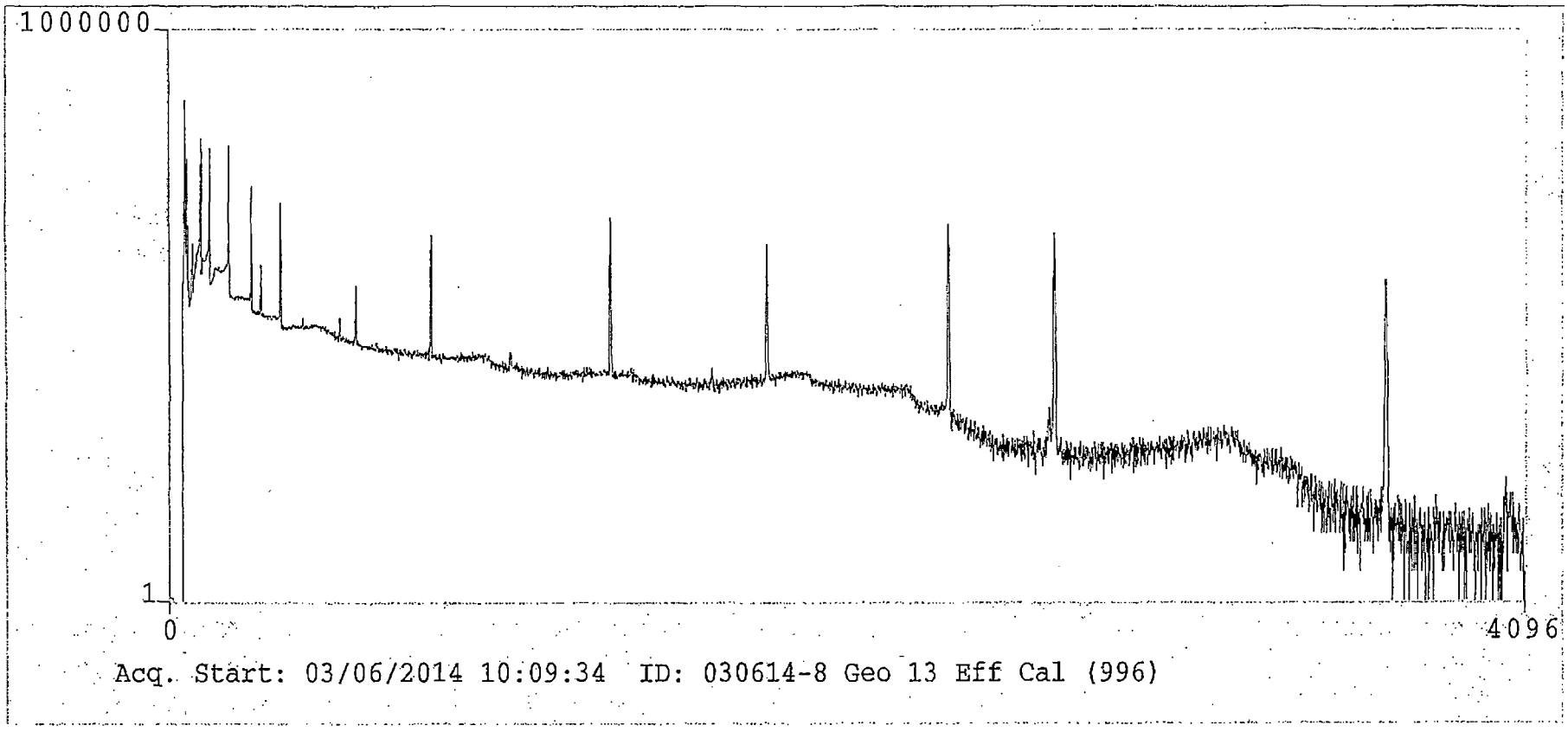
Detector Number: 08 Calibration Date. . . 03/06/2014 10:09:34
Geometry File (D08)(Sh13).EFF ID. Geo 13 Eff Cal
Amount of Std. in Calib. Source: 500.000000 gm

Eff = 1 / [2.39e-01*En^-1.67e+00 + 1.55e+02*En^ 7.99e-01]
(Where En = Energy in MeV)) (Exponential)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	2.37e-02	-0.71	2.36e-02	1.76	2.40e-02
2	88.04	2.73e-02	2.04	2.79e-02	-1.41	2.75e-02
3	122.06	2.75e-02	-1.25	2.72e-02	-0.68	2.70e-02
4	165.85	2.47e-02	-2.67	2.40e-02	0.82	2.42e-02
5	279.00	1.65e-02	4.76	1.73e-02	2.19	1.77e-02
6	391.68	1.37e-02	-1.77	1.34e-02	2.00	1.37e-02
7	661.64	9.02e-03	-0.94	8.94e-03	0.58	8.99e-03
8	898.02	6.90e-03	1.71	7.02e-03	-0.60	6.98e-03
9	1173.21	5.71e-03	-0.69	5.67e-03	-1.76	5.58e-03
10	1332.48	5.21e-03	-1.57	5.13e-03	-2.34	5.01e-03
11	1836.01	3.97e-03	-0.04	3.97e-03	-3.86	3.82e-03

Calibration Results Saved.

OK JP 3/6/14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Acq. Start: 03/06/2014 10:09:34 ID: 030614-8 Geo 13 Eff Cal (996)

Standards File. Gsstd13.std
Assay Date 07/01/2013 10:00
ID.: Geo 13 Std#996 500-g. mixed gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.320E+02 yrs	0.35900	4.56
2	Cd-109	88.04	4.626E+02 dys	0.03610	63.93
3	Co-57	122.06	2.718E+02 dys	0.85510	1.46
4	Ce-139	165.85	1.376E+02 dys	0.80350	2.18
5	Hg-203	279.00	4.661E+01 dys	0.77300	4.78
6	Sn-113	391.68	1.151E+02 dys	0.64900	3.77
7	Cs-137	661.64	3.007E+01 yrs	0.85120	1.85
8	Y-88	898.02	1.066E+02 dys	0.93400	6.32
9	Co-60	1173.21	5.271E+00 yrs	0.99980	2.92
10	Co-60	1332.48	5.271E+00 yrs	0.99990	2.92
11	Y-88	1836.01	1.066E+02 dys	0.99380	6.29

#996

Eckert & Ziegler
Analytics

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

94409

Sand in PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: FC000043, Item 1 Product Code: 8403-EG-SAN
Reference Date: 01-Jul-2013 12:00 PM EST **Grams of Master Source:** 0.0070368

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.234E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	8.190E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.641E+05	1.154E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.865E+04	6.238E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.243E+05	8.744E+02	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.627E+05	1.848E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.222E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.120E+05	7.882E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.197E+05	2.954E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.074E+05	1.459E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.074E+05	1.460E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.444E+05	3.127E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia California 91355

Laboratory
1380 Seaboard Industrial Blvd Atlanta Georgia 30318

Comments:
~290 mL / 500 g customer supplied sand

This standard will expire one year after the reference date.

Source Prepared by: _____
A. Herron, Radiochemist

QA Approved: _____ Date: 29 AUG 13
J.D. McCorvey, Counting Room Manager

Geometry 13 Calibration Verification: Gamma Mixed Nuclide Source; Geometry 13
500-gram soil/solid geometry
Detector 8

VERIF. SOURCE: 951 REF DATE : 10/1/2011 Count Date: 3/6/2014

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY						
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard		DPS	pCi/g	Activity	Recovery	Pass/Fail	# of Half Lives Expired
Am-241	59.5	432.0000	1261	0.3590	500 g	Am-241	3512.5	189.9	192	101%	Pass	0.01
Cd-109	88	1.2666	1900	0.0372		Cd-109	51075.3	2760.8	2800	101%	Pass	1.92
Co-57	122	0.7441	1016	0.8551		Co-57	1188.2	64.2	64.2	100%	Pass	3.26
Ce-139	166	0.3768	1421	0.8035		Ce-139	1768.5	95.6	89.4	94%	Pass	6.45
Hg-203	279	0.1276	3114	0.7730		Hg-203	4028.5	217.8	NC	>5 h-lives	>5 h-lives	19.03
Sn-113	392	0.3151	1981	0.6490		Sn-113	3052.4	165.0	137	>5 h-lives	>5 h-lives	7.71
Cs-137	662	30.0000	1264	0.8512		Cs-137	1485.0	80.3	79.5	99%	Pass	0.08
Y-88	898	0.2919	4760	0.9340		Y-88	5096.4	275.5	NC	>5 h-lives	>5 h-lives	8.32
Co-60	1173	5.2714	2355	0.9998		Co-60	2355.5	127.3	125	98%	Pass	0.46
Co-60	1332	5.2714	2355	0.9999		Co-60	2355.2	127.3	126	99%	Pass	0.46
Y-88	1836	0.2919	5038	0.9938		Y-88	5069.4	274.0	NC	>5 h-lives	>5 h-lives	8.32

NC = NOT CALCULATED DUE TO THE ACTIVITY BEING LESS THAN THE MDCa

OK JP 3/6/14

140196D08.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 030614-8A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	03/06/2014 11:42:09
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	2.13E+004 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	5.00E+002 g	Real Time	1836 Sec
Collection Efficiency	1.0000	Spc. File	.140196D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -2.11 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 03/06/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	48.28	100.59	421	151	119	3507	0.42 a	Wide Pk
2	49.55	103.13	1506	362	291	12496	1.43 b	
3	59.38	122.76	53748	496	145	4680	0.68 a	HiResid
4	65.25	134.47	98	83	67	1231	0.37 a	Wide Pk
5	66.44	136.85	310	259	211	6155	1.66 b	
6	71.52	147.00	39	87	71	1394	0.33 a	NET< CL
7	85.37	174.65	525	308	251	7738	2.02 a	HiResid Wide Pk
8	87.91	179.72	25704	340	94	1951	0.71 b	HiResid
9	98.40	200.67	41	60	48	645	0.36 a	NET< CL
10	119.26	242.31	153	123	99	1820	1.06 a	
11	121.93	247.63	5142	178	87	1517	0.82 b	
12	136.34	276.41	629	112	82	1371	0.85 a	
13	154.54	312.75	36	54	43	513	0.40 a	NET< CL
14	157.35	318.35	70	70	56	770	0.43 b	
15	159.96	323.56	58	70	56	770	0.46 c	
16	165.80	335.23	661	107	77	1197	0.83 a	
17	211.10	425.67	68	71	57	801	0.44 a	
18	214.32	432.09	64	86	69	1067	0.58 b	NET< CL
19	391.75	786.34	191	70	53	625	0.67 a	
20	503.16	1008.76	35	63	51	587	0.80 a	NET< CL
21	511.54	1025.50	118	115	93	1286	2.04 a	Wide Pk
22	661.83	1325.56	19059	286	60	667	1.32 a	
23	865.76	1732.70	52	83	67	788	1.40 a	NET< CL

140196D08.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	898.09	1797.26	121	87	69	924	1.49	a
25	1173.26	2346.65	17210	269	48	403	1.72	a
26	1332.39	2664.33	15669	252	22	95	1.84	a HiResid
27	1835.40	3668.62	105	24	10	20	1.75	a

140196D08.SPC Analyzed by

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SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Background File:. . . . . DET080305.BKG (030514-8 WEEKLY BKG)

Bkg.File Detector #: 8

==========

BACKGROUND SUBTRACT RESULTS

==========

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN-CERTAINTY	NEW CR.LEVEL	FLAG
1	48.28	421	151	119	410	151	119	
4	65.25	98	83	67	91	84	67	
6	71.52	39	87	71	35	87	71	NET<CL
7	85.37	525	308	251	523	308	251	
10	119.26	153	123	99	151	123	99	
21	511.54	118	115	93	69	116	94	NET<CL
24	898.09	121	87	69	119	87	69	

140196D08.SPC Analyzed by

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SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

ALS Laboratory Group - Fort Collins
GammaScan

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Geo 13 / Solid

Sample ID: 030614-8A Geo 13 Cal Ver (951)

Sampling Start:	10/01/2011 10:00:00	Counting Start:	03/06/2014 11:42:09
Sampling Stop:	10/01/2011 10:00:00	Decay Time.	2.13e+004 Hrs
Buildup Time.	0.00e+000 Hrs	Live Time	1800 Sec
Sample Size	5.00e+002 g	Real Time	1836 Sec
Collection Efficiency	1.0000	Spectrum File	.140196D08.SPC
Cr. Level Confidence Interval:	95 %	Det. Limit Confidence Interval:	95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh13).EFF (Geo 13 Eff Cal)

Eff.=1/[2.39E-01*En^-1.67E+00 + 1.55E+02*En^7.99E-01] 03/06/2014

Library File: . . . .ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY (keV)	NET	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54		1.92E+02 +- 1.77E+00	1.05E+00	5.18E-01	3.79E+06
Cd-109	88.02		2.80E+03 +- 3.71E+01	2.07E+01	1.02E+01	1.11E+04
Co-57	122.07		6.42E+01 +- 2.22E+00	2.20E+00	1.08E+00	6.50E+03
Ce-139	165.85		8.94E+01 +- 1.45E+01	2.12E+01	1.04E+01	3.30E+03
Sn-113	391.68		1.37E+02 +- 5.05E+01	7.83E+01	3.82E+01	2.76E+03
Cs-137	661.62		7.95E+01 +- 1.19E+00	5.12E-01	2.50E-01	2.64E+05
Co-60	Average:x		1.26E+02 +- 1.41E+00	. . . .	. . . .	4.62E+04
	1173.21		1.25E+02 +- 1.96E+00	7.17E-01	3.49E-01	4.62E+04
	1332.48		1.26E+02 +- 2.03E+00	3.80E-01	1.79E-01	4.62E+04
Hg-203	279.18		MDA	1.95E+05	9.57E+04	1.12E+03
Y-88	898.02		MDA	1.41E+02r	6.87E+01	2.56E+03

MEASURED TOTAL: 3.49E+03 +- 1.09E+02 pCi/g

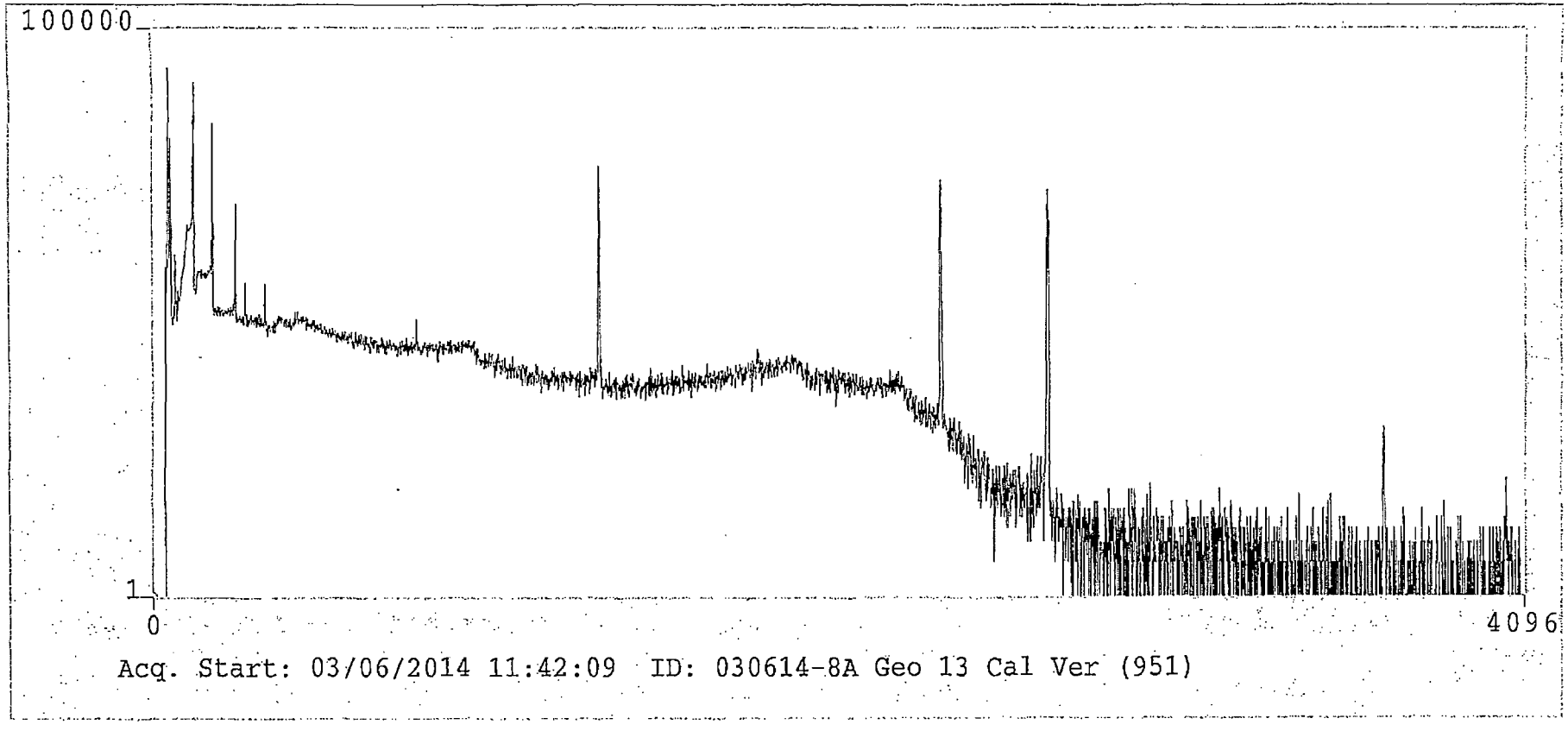
UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	48.28	100.59	410	151	119	3507	0.42	Unknown
2	49.55	103.13	1506	362	291	12496	1.43	Unknown
4	65.25	134.47	91	84	67	1231	0.37	Unknown
5	66.44	136.85	310	259	211	6155	1.66	Unknown
6	71.52	147.00	35	87	71	1394	0.33	Deleted

140196D08.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	85.37	174.65	523	308	251	7738	2.02	Unknown
9	98.40	200.67	41	60	48	645	0.36	Deleted
10	119.26	242.31	151	123	99	1820	1.06	Unknown
12	136.34	276.41	629	112	82	1371	0.85	Unknown
13	154.54	312.75	36	54	43	513	0.40	Deleted
14	157.35	318.35	70	70	56	770	0.43	Unknown
15	159.96	323.56	58	70	56	770	0.46	Unknown
17	211.10	425.67	68	71	57	801	0.44	Unknown
18	214.32	432.09	64	86	69	1067	0.58	Deleted
20	503.16	1008.76	35	63	51	587	0.80	Deleted
21	511.54	1025.50	69	116	94	1286	2.04	Deleted
23	865.76	1732.70	52	83	67	788	1.40	Deleted
24	898.09	1797.26	119	87	69	924	1.49	Unknown
27	1835.40	3668.62	105	24	10	20	1.75	Unknown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4096
Acq. Start: 03/06/2014 11:42:09 ID: 030614-8A Geo 13 Cal Ver (951)

Eckert & Ziegler
Analytics

Rec 10-25-11
RSO #951

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

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

85860-307

500 Grams of Sand in 16 Ounce PP MRP Jar

Customer: ALS Laboratory Group
P.O. No.: 73625, Item 1
Reference Date: 01-Oct-2011 12:00 PM EST **Grams of Master Source:** 0.011319

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

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	1.261E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.679E+05	1.900E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.972E+04	1.016E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.255E+05	1.421E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.751E+05	3.114E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.750E+05	1.981E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.117E+05	1.264E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.205E+05	4.760E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.081E+05	2.355E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.081E+05	2.355E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.461E+05	5.038E+03	0.7	1.9	4.0	HPGe

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

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

(Certificate continued on reverse side)

Std Re-Verified
9/3/2013
New Exp Date
=> 09/03/2014
JP 10/1/13

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

ANA Form006 Rev. —

MGS Certificate, Rev 2 09-28-2009

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Comments:
~290 mL of customer supplied sand.

This standard will expire one year after the reference date.

Source Prepared by: _____
Z. Dimitrova, Radiochemist

QA Approved: _____
J. D. McCorvey, QA Manager Alternate

Date: 24 OCT 11

Gamma Spectroscopy

Quality Control Data

Weekly Background Calibrations

ALS

Gamma Spectrometer Calibration Log

Date: 8/13/14 Reviewed By/Date: JP 8/14/14

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.		JP	JP	JP	JP					
2.					JP					
3.					JP					
4.					JP					
5.					JP					
6.					/	1332 FWHM	/	1332 FWHM		JP
7.					JP					
8.					JP					
9.	JP	/	/	/	/					
10.	JP	/	/	/	/					

.** **Corrective Action:**

*** Due to detector____ failing two different QC parameters on the first and second daily check, a third daily check was performed. All QC parameters passed for the third daily check. Detector ____ is online for the date of _____

444980 A

Form 754r15a.doc (10/27/11)

140905D01.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Weekly Background Check

Sample ID: 081314-1 WEEKLY BKG

Sampling Start:	08/13/2014 14:00:00	Counting Start:	08/13/2014 14:28:50
Sampling Stop:	08/13/2014 14:00:00	Decay Time.	4.81E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	60000 Sec
Sample Size	1.00E+000 L	Real Time	60079 Sec
Collection Efficiency	1.0000	Spc. File	.140905D01.SPC

Detector #: 1 (Detector 1)

Energy(keV)= -2.00 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/13/2014

FWHM(keV) = 0.62 + 0.018*En + 4.43E-04*En^2 + 0.00E+00*En^3 08/23/2013

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	66.32	136.46	104	66	52	599	0.60 a	
2	69.60	143.00	10	40	33	299	0.40 b	NET< CL
3	84.62	173.00	50	77	62	710	0.96 a	NET< CL
4	87.13	178.02	24	47	38	355	0.41 b	NET< CL
5	92.69	189.11	144	77	60	662	0.94 a	
6	106.37	216.43	37	45	36	319	0.53 a	
7	139.95	283.50	97	75	60	658	1.00 a	
8	177.09	357.67	39	63	51	523	0.79 a	NET< CL
9	185.72	374.90	161	69	52	554	0.82 a	
10	198.46	400.35	103	84	67	761	1.15 a	
11	211.19	425.77	42	44	35	295	0.49 a	
12	238.57	480.45	153	78	61	639	1.07 a	
13	295.42	593.98	79	79	63	632	1.30 a	
14	328.29	659.64	41	37	29	207	0.55 a	
15	338.30	679.62	59	38	29	203	0.55 a	
16	351.92	706.82	91	57	44	362	1.02 a	
17	511.01	1024.54	1303	122	81	769	2.71 a	Wide Pk
18	558.42	1119.23	150	50	36	253	1.16 a	
19	569.59	1141.54	75	50	38	289	1.10 a	
20	583.28	1168.88	82	54	42	300	1.47 a	
21	609.24	1220.73	73	55	43	369	1.16 a	
22	693.67	1389.34	62	63	50	395	1.82 a	
23	803.07	1607.84	52	40	30	183	1.09 a	
24	911.49	1824.35	57	43	33	188	1.79 a	

140905D01.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	961.93	1925.09	50	41	32	179	1.74	a
26	1120.62	2242.01	48	46	36	208	2.08	a
27	1460.88	2921.54	448	51	23	100	1.93	a
28	1764.52	3527.95	34	24	18	63	1.59	a

140905D01.SPC Analyzed by

****

SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

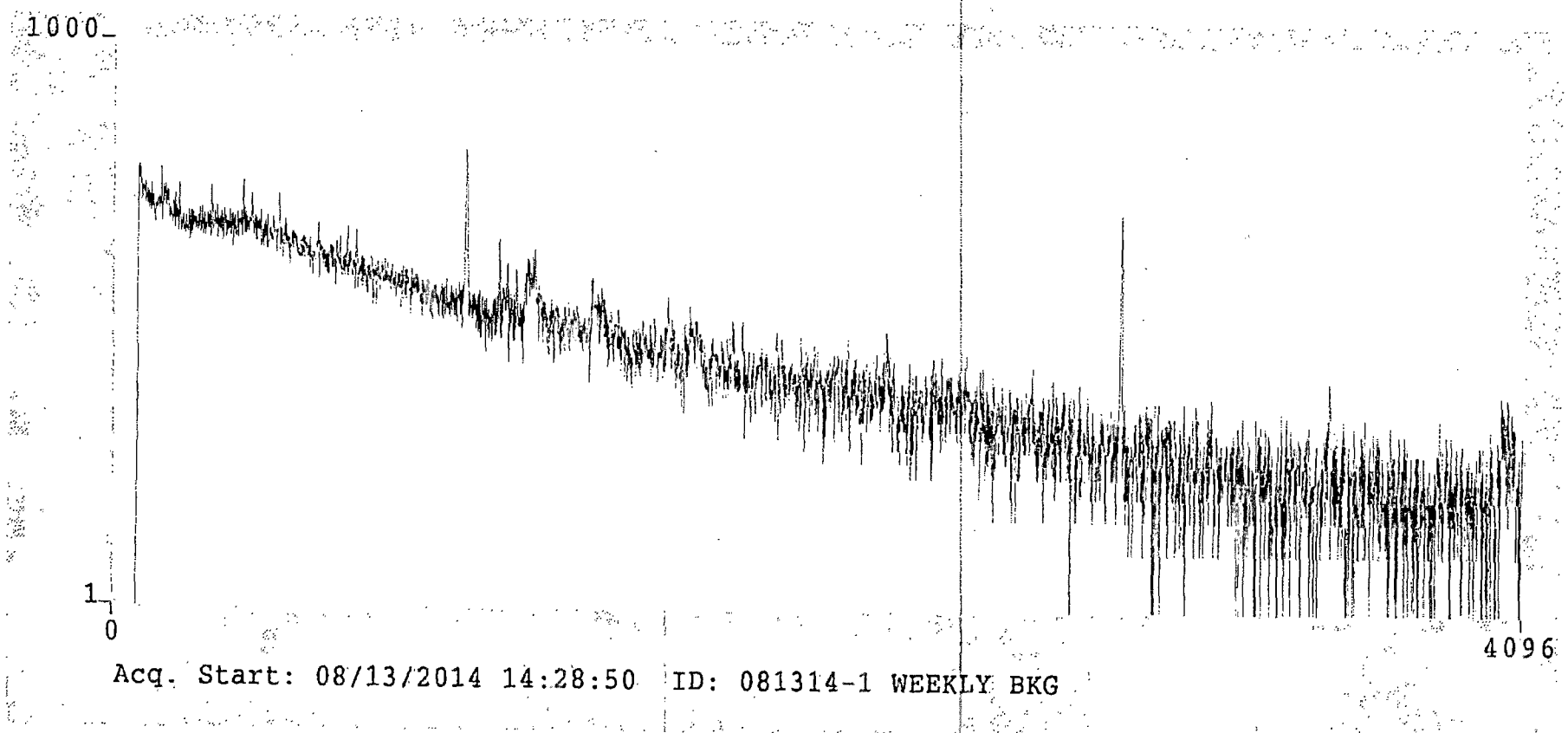
****

ID: 081314-1 WEEKLY BKG

Detector # 1 Background Q.C. Analysis for 08/13/2014 14:28:50

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
10	40-> 50 keV Bkg	3.263	N.A.	Pass	N.A.
11	50-> 150 keV Bkg	24.338	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	30.785	N.A.	Pass	N.A.
13	500->1000 keV Bkg	30.221	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	16.824	N.A.	Pass	N.A.
15	150-> 250 keV Bkg	21.012	N.A.	Pass	N.A.

Q.C. Results Saved.


1000
1
0
4096
Acq. Start: 08/13/2014 14:28:50 ID: 081314-1 WEEKLY BKG

140982D02.SPC Analyzed by JP

****

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Weekly Background Check

Sample ID: 081314-2 WEEKLY BKG

Sampling Start:	08/13/2014 14:00:00	Counting Start:	08/13/2014 14:29:01
Sampling Stop:	08/13/2014 14:00:00	Decay Time.	4.84E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	60000 Sec
Sample Size	1.00E+000 L	Real Time	60079 Sec
Collection Efficiency	1.0000	Spc. File	.140982D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -1.44 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/13/2014
FWHM(keV) = 0.73 + 0.011*En + 6.51E-04*En^2 + 0.00E+00*En^3 08/05/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	53.72	110.14	60	70	56	705	0.59	a	
2	66.27	135.20	190	87	68	939	0.80	a	
3	69.68	142.00	23	59	48	564	0.44	b	NET< CL
4	84.62	171.83	35	53	42	437	0.55	a	NET< CL
5	87.36	177.30	49	85	69	873	1.06	b	NET< CL
6	92.44	187.44	266	88	67	835	0.94	a	
7	139.75	281.90	98	73	58	680	0.83	a	
8	185.68	373.61	287	93	72	876	1.08	a	
9	198.02	398.25	142	72	56	627	0.87	a	
10	238.43	478.93	207	71	54	578	0.83	a	
11	295.28	592.44	95	75	60	608	1.09	a	
12	306.99	615.82	33	49	39	341	0.69	a	NET< CL
13	337.16	676.05	83	116	94	1040	2.19	a	NET< CL Wide Pk
14	351.69	705.07	148	61	46	453	0.99	a	
15	462.03	925.38	36	61	49	444	1.28	a	NET< CL
16	510.91	1022.98	1545	130	85	900	2.59	a	Wide Pk
17	537.65	1076.37	60	54	43	337	1.27	a	
18	558.37	1117.73	178	55	40	312	1.19	a	
19	570.10	1141.16	114	68	53	466	1.58	a	
20	583.15	1167.21	140	62	48	393	1.46	a	
21	596.58	1194.03	145	88	69	713	1.94	a	
22	609.24	1219.30	213	67	50	462	1.34	a	
23	650.65	1301.99	46	38	29	191	0.77	a	

140982D02.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	669.54	1339.70	38	59	47	368	1.59 a	NET< CL
25	693.67	1387.88	96	108	87	829	3.08 a	Wide Pk
26	802.74	1605.65	120	52	39	281	1.64 a	
27	911.27	1822.36	67	35	26	146	1.15 a	
28	961.91	1923.47	105	60	47	309	2.60 a	
29	969.16	1937.94	64	32	22	116	0.95 b	
30	1120.43	2239.98	39	32	24	132	1.16 a	
31	1460.67	2919.32	390	50	25	115	2.17 a	
32	1764.17	3525.30	57	31	22	85	2.31 a	

140982D02.SPC Analyzed by

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SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

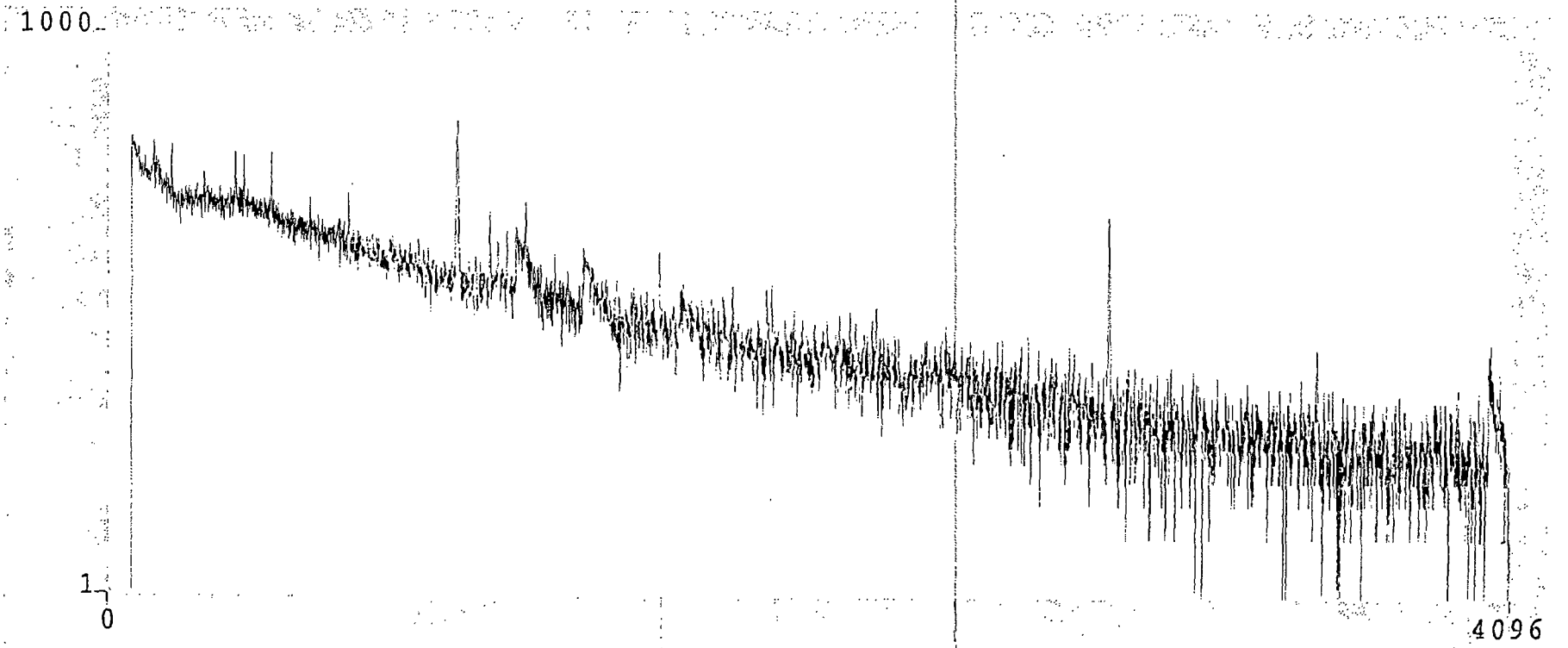
****

ID: 081314-2 WEEKLY BKG

Detector # 2 Background Q.C. Analysis for 08/13/2014 14:29:01

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
10	50-> 150 keV Bkg	29.984	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	24.603	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	36.248	N.A.	Pass	N.A.
13	500->1000 keV Bkg	37.240	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	21.304	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	4.369	N.A.	Pass	N.A.

Q.C. Results Saved.



Acq. Start: 08/13/2014 14:29:01 ID: 081314-2 WEEKLY BKG

140943D03.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Weekly Background Check

Sample ID: 081314-3 WEEKLY BKG

Sampling Start:	08/13/2014 14:00:00	Counting Start:	08/13/2014 14:29:10
Sampling Stop:	08/13/2014 14:00:00	Decay Time.	4.86E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	60000 Sec
Sample Size	1.00E+000 L	Real Time	60079 Sec
Collection Efficiency	1.0000	Spc. File	.140943D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.68 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/13/2014
FWHM(keV) = 0.80 + 0.013*En + 7.29E-04*En^2 + 0.00E+00*En^3 11/06/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.76	110.56	51	49	39	373	0.56 a	
2	63.06	129.11	98	81	65	778	0.97 a	
3	66.31	135.60	174	83	65	778	0.92 b	
4	69.58	142.12	66	61	48	519	0.64 c	
5	77.27	157.46	61	50	39	379	0.49 a	
6	90.13	183.11	74	73	59	638	0.99 a	
7	92.61	188.04	348	97	73	851	1.27 b	
8	139.63	281.82	116	94	75	833	1.48 a	
9	185.67	373.62	257	82	62	660	1.19 a	
10	198.32	398.86	120	71	55	563	0.91 a	
11	238.67	479.32	175	66	49	515	1.04 a	
12	295.41	592.47	75	58	46	443	1.02 a	
13	338.30	678.01	136	84	67	656	1.95 a	
14	351.92	705.17	186	71	54	498	1.43 a	
15	472.86	946.36	52	57	45	354	1.40 a	
16	511.13	1022.68	1368	116	73	660	2.66 a	Wide Pk
17	558.56	1117.25	115	42	30	209	1.05 a	
18	569.84	1139.76	93	46	35	262	1.19 a	
19	583.39	1166.79	101	50	38	275	1.46 a	
20	596.85	1193.62	30	42	34	263	0.99 a	NET< CL
21	609.27	1218.40	123	61	47	423	1.48 a	
22	803.49	1605.70	99	43	32	194	1.51 a	
23	911.52	1821.14	50	37	28	163	1.65 a	
24	968.79	1935.37	26	45	36	230	2.19 a	NET< CL

140943D03.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1461.28	2917.50	199	41	24	102	2.16	a
26	1764.23	3521.65	57	39	30	111	3.82	a

140943D03.SPC Analyzed by

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SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

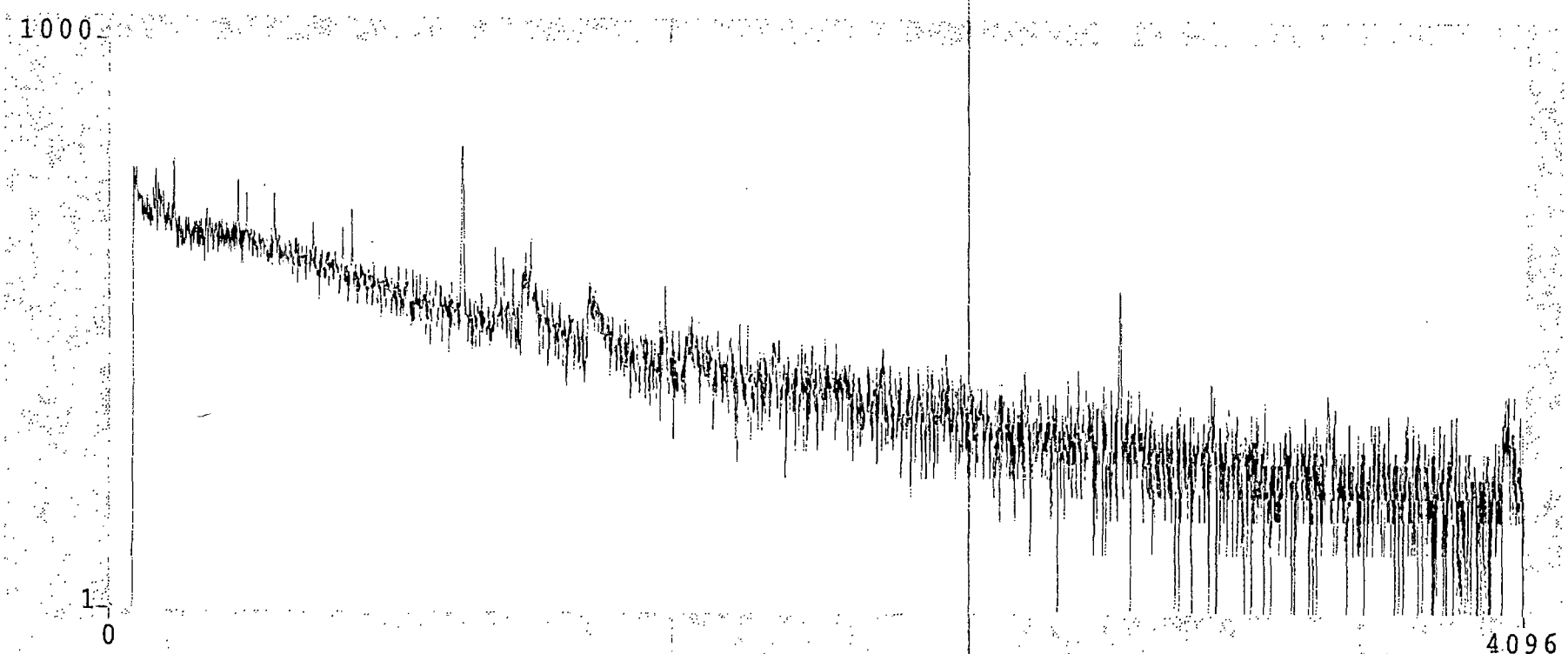
****

ID: 081314-3 WEEKLY BKG

Detector # 3 Background Q.C. Analysis for 08/13/2014 14:29:10

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
10	50-> 150 keV Bkg	22.483	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	18.415	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	27.687	N.A.	Pass	N.A.
13	500->1000 keV Bkg	28.224	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	16.153	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	2.960	N.A.	Pass	N.A.

Q.C. Results Saved.



Acq. Start: 08/13/2014 14:29:10 ID: 081314-3 WEEKLY BKG

141282D04.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Weekly Background Check

Sample ID: 081314-4 WEEKLY BKG

Sampling Start:	08/13/2014 14:00:00	Counting Start:	08/13/2014 14:29:21
Sampling Stop:	08/13/2014 14:00:00	Decay Time.	4.89E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	60000 Sec
Sample Size	1.00E+000 L	Real Time	60079 Sec
Collection Efficiency	1.0000	Spc. File	.141282D04.SPC

Detector #: 4 (Detector 4)

Energy(keV) = -1.51 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/13/2014
FWHM(keV) = 0.63 + 0.025*En + 7.58E-04*En^2 + 0.00E+00*En^3 01/13/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.59	96.12	66	61	48	518	0.63 a	
2	63.13	129.17	177	74	57	658	0.75 a	
3	66.33	135.55	121	73	57	658	0.79 b	
4	70.25	143.39	29	70	57	658	0.81 c	NET< CL
5	74.93	152.74	86	73	58	674	0.78 a	
6	77.39	157.66	55	82	66	809	0.95 b	NET< CL
7	84.47	171.80	48	57	46	467	0.72 a	
8	92.52	187.89	540	86	59	645	1.02 a	
9	139.92	282.61	106	53	41	364	0.66 a	
10	143.69	290.13	83	61	48	455	0.81 b	
11	185.71	374.09	437	99	73	797	1.48 a	
12	198.32	399.29	178	69	52	503	1.05 a	
13	238.60	479.79	194	71	54	565	1.13 a	
14	241.72	486.02	57	53	42	404	0.90 b	
15	295.36	593.20	74	60	47	439	1.08 a	
16	351.83	706.03	145	63	48	430	1.38 a	
17	418.56	839.37	19	32	26	164	0.73 a	NET< CL
18	510.93	1023.95	1261	116	75	718	3.03 a	Wide Pk
19	558.50	1118.99	110	49	36	267	1.28 a	
20	583.27	1168.49	44	36	28	177	1.06 a	
21	609.18	1220.26	128	71	55	516	1.92 a	
22	682.27	1366.29	24	42	34	222	1.54 a	NET< CL
23	694.90	1391.53	47	47	37	279	1.32 a	
24	803.14	1607.82	119	42	29	179	1.39 a	

141282D04.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	911.41	1824.17	40	41	32	195	1.76	a
26	1460.85	2922.03	207	41	25	99	2.42	a

141282D04.SPC Analyzed by

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SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

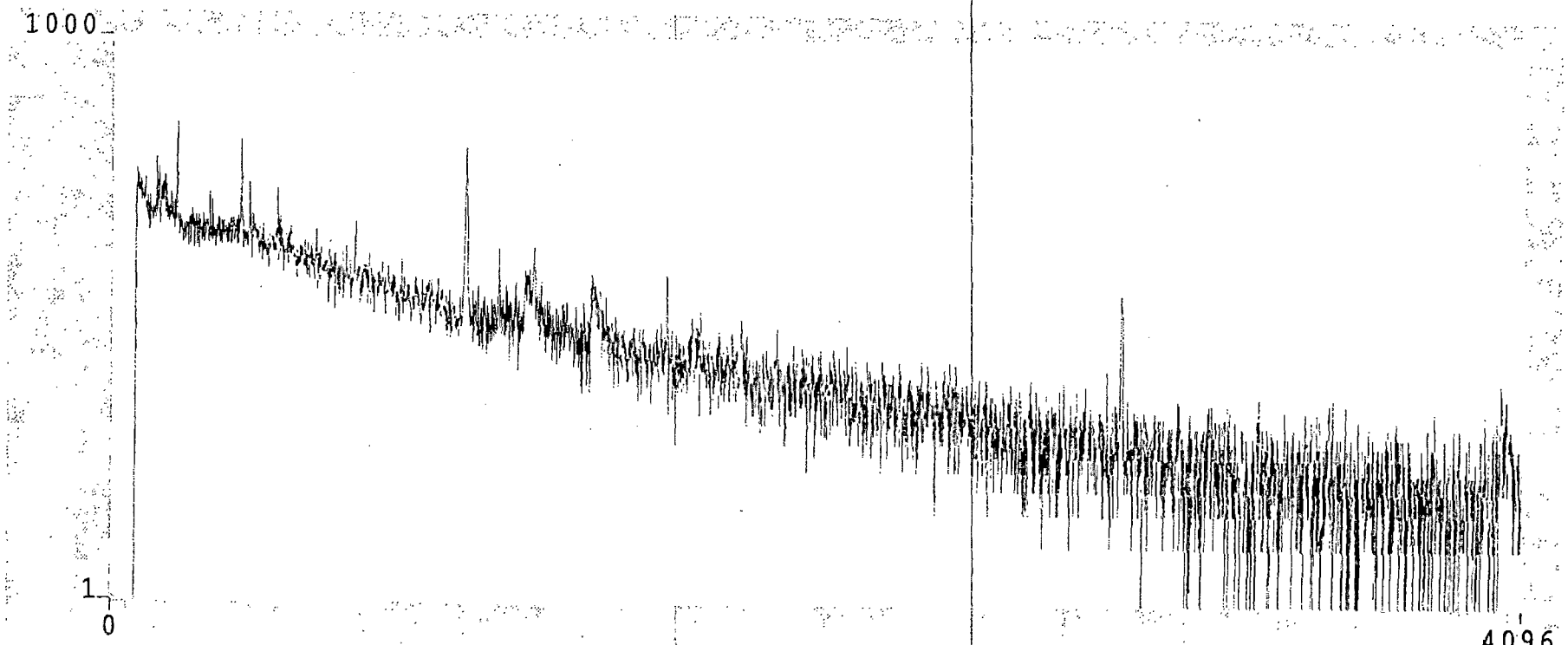
****

ID: 081314-4 WEEKLY BKG

Detector # 4 Background Q.C. Analysis for 08/13/2014 14:29:21

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
10	50-> 150 keV Bkg	22.405	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	18.048	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	25.619	N.A.	Pass	N.A.
13	500->1000 keV Bkg	26.505	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	15.041	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	2.941	N.A.	Pass	N.A.

Q.C. Results Saved.



Acq. Start: 08/13/2014 14:29:21 ID: 081314-4 WEEKLY BKG

140871D05.SPC Analyzed by

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Weekly Background Check

Sample ID: 081314-5 WEEKLY BKG

Sampling Start:	08/13/2014 14:00:00	Counting Start:	08/13/2014 14:29:32
Sampling Stop:	08/13/2014 14:00:00	Decay Time.	4.92E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	60000 Sec
Sample Size	1.00E+000 L	Real Time	60047 Sec
Collection Efficiency	1.0000	Spc. File	.140871D05.SPC

Detector #: 5 (Detector 5)

Energy(keV) = -0.72 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/13/2014
FWHM(keV) = 0.67 + -0.004*En + 1.51E-03*En^2 +-1.40E-05*En^3 04/26/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.37	128.09	68	80	64	836	0.83 a	
2	66.26	133.88	236	84	64	836	0.90 b	
3	92.65	186.60	249	87	67	827	1.04 a	
4	98.17	197.64	33	39	31	260	0.40 a	
5	139.63	280.50	130	54	40	396	0.57 a	
6	143.26	287.77	38	50	40	396	0.51 b	NET< CL
7	185.69	372.55	220	55	38	357	0.53 a	
8	198.26	397.69	246	81	61	697	0.92 a	
9	205.26	411.67	34	48	38	356	0.44 a	NET< CL
10	238.48	478.07	246	71	52	545	0.80 a	
11	241.32	483.74	61	83	67	763	1.12 b	NET< CL
12	258.37	517.81	48	64	51	527	0.81 a	NET< CL
13	264.64	530.34	16	69	56	582	1.04 a	NET< CL
14	295.05	591.12	74	66	52	506	0.91 a	
15	309.66	620.32	58	72	58	573	1.13 a	
16	331.71	664.41	44	40	31	236	0.52 a	
17	338.51	678.00	58	62	50	456	0.94 a	
18	351.82	704.59	197	74	57	546	1.08 a	
19	510.89	1022.51	1603	127	81	851	2.51 a	Wide Pk
20	558.37	1117.41	142	45	31	221	0.90 a	
21	569.71	1140.08	88	44	32	240	0.90 a	
22	583.25	1167.12	96	56	43	346	1.31 a	
23	595.54	1191.69	105	68	53	465	1.58 a	
24	609.32	1219.23	157	66	51	472	1.25 a	

140871D05.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	692.33	1385.13	60	48	37	292	0.98	a
26	802.90	1606.12	110	45	33	216	1.10	a
27	860.55	1721.34	42	35	27	154	0.91	a
28	898.88	1797.95	68	44	34	208	1.65	a
29	910.93	1822.04	68	34	24	136	1.05	a
30	962.03	1924.16	35	29	22	118	0.79	a
31	968.72	1937.53	33	38	30	182	1.34	a
32	1063.49	2126.95	29	29	22	112	0.97	a
33	1460.70	2920.81	455	51	23	91	2.18	a
34	1764.79	3528.58	29	25	19	70	1.70	a

140871D05.SPC Analyzed by

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SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

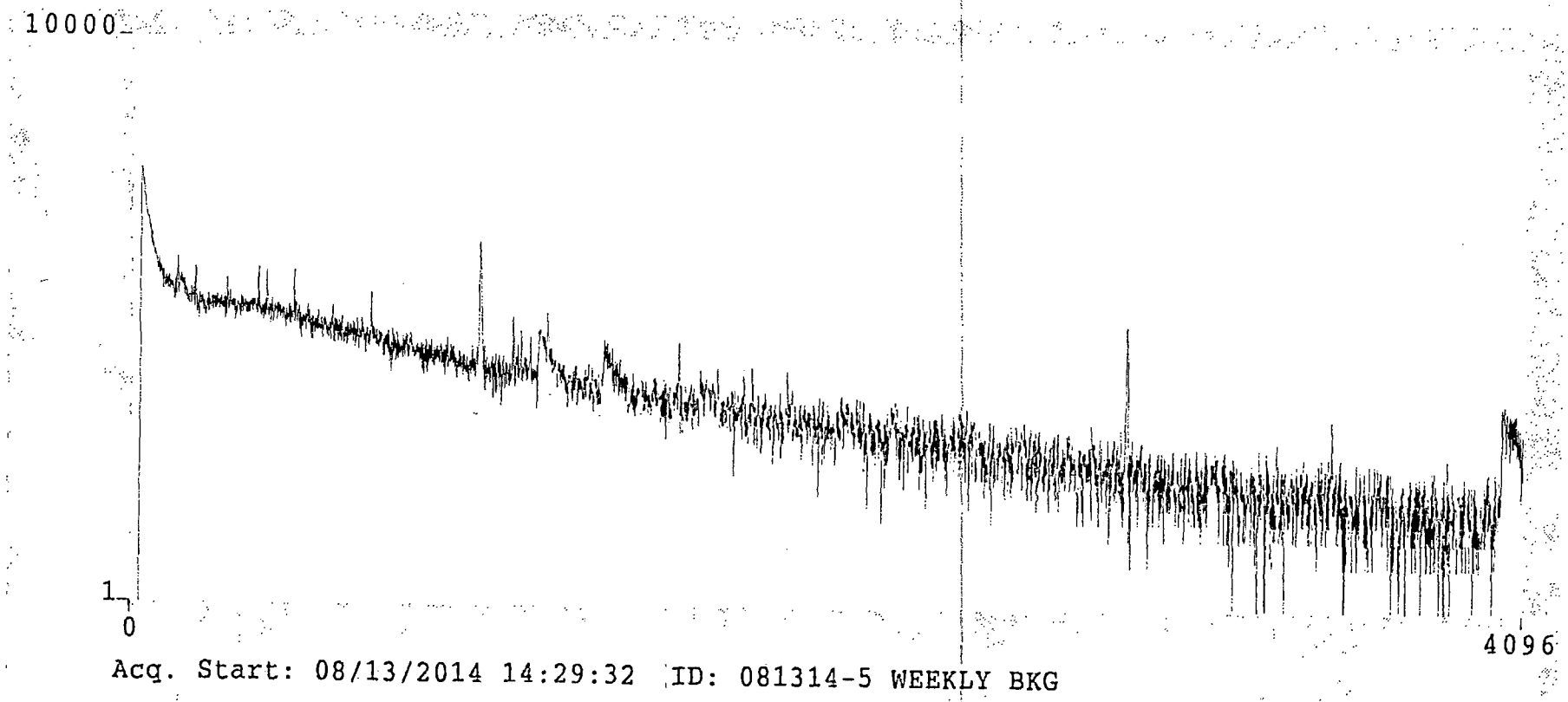
****

ID: 081314-5 WEEKLY BKG

Detector # 5 Background Q.C. Analysis for 08/13/2014 14:29:32

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
10	50-> 150 keV Bkg	29.946	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	24.041	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	35.954	N.A.	Pass	N.A.
13	500->1000 keV Bkg	36.652	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	20.519	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	4.319	N.A.	Pass	N.A.

Q.C. Results Saved.


10000
1
0
4096
Acq. Start: 08/13/2014 14:29:32 ID: 081314-5 WEEKLY BKG

140883D07.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

****

Weekly Background Check

Sample ID: 081314-7 WEEKLY BKG

Sampling Start:	08/13/2014 14:00:00	Counting Start:	08/13/2014 14:29:54
Sampling Stop:	08/13/2014 14:00:00	Decay Time.	4.98E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	60000 Sec
Sample Size	1.00E+000 L	Real Time	60033 Sec
Collection Efficiency	1.0000	Spc. File	.140883D07.SPC

Detector #: 7 (Detector 7)

Energy(keV) = -2.21 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/13/2014
FWHM(keV) = 0.69 + 0.006*En + 1.07E-03*En^2 + 0.00E+00*En^3 11/15/2013
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.39	97.05	61	80	65	779	0.92 a	NET< CL
2	63.19	130.59	135	73	57	663	0.83 a	
3	66.19	136.59	151	83	66	795	1.02 b	
4	74.69	153.55	104	63	49	534	0.60 a	
5	77.13	158.43	106	53	40	401	0.50 b	
6	84.41	172.96	60	85	69	803	1.21 a	NET< CL
7	92.61	189.34	432	84	60	659	0.93 a	
8	120.31	244.66	58	52	41	368	0.62 a	
9	139.48	282.94	108	73	57	607	0.97 a	
10	163.29	330.48	46	45	35	309	0.48 a	
11	185.72	375.26	264	73	54	533	0.94 a	
12	198.45	400.70	158	55	41	366	0.73 a	
13	238.76	481.19	261	65	46	434	0.84 a	
14	242.29	488.23	55	58	46	434	0.79 b	
15	270.21	544.00	10	36	29	210	0.54 a	NET< CL
16	295.13	593.75	135	61	46	399	0.99 a	
17	338.34	680.04	47	44	34	261	0.66 a	
18	352.03	707.37	198	57	41	353	0.98 a	
19	489.61	982.11	37	40	32	213	0.91 a	
20	508.33	1019.49	23	35	28	188	0.69 a	NET< CL Wide Pk
21	511.30	1025.42	1447	122	78	750	2.58 b	
22	536.99	1076.73	22	68	55	426	2.18 a	NET< CL
23	558.73	1120.14	197	53	37	257	1.35 a	

140883D07.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	570.23	1143.10	77	53	41	318	1.31	a
25	583.44	1169.48	161	72	55	431	2.15	a
26	609.58	1221.69	177	72	55	491	1.60	a
27	670.09	1342.52	28	31	24	139	0.78	a
28	693.86	1389.97	46	39	30	214	0.97	a
29	803.13	1608.18	151	51	37	229	1.98	a
30	911.94	1825.46	69	37	27	155	1.55	a
31	969.12	1939.66	35	41	33	204	1.82	a
32	1460.89	2921.66	210	42	26	108	2.38	a
33	1763.98	3526.91	55	34	26	101	2.86	a

140883D07.SPC Analyzed by

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SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

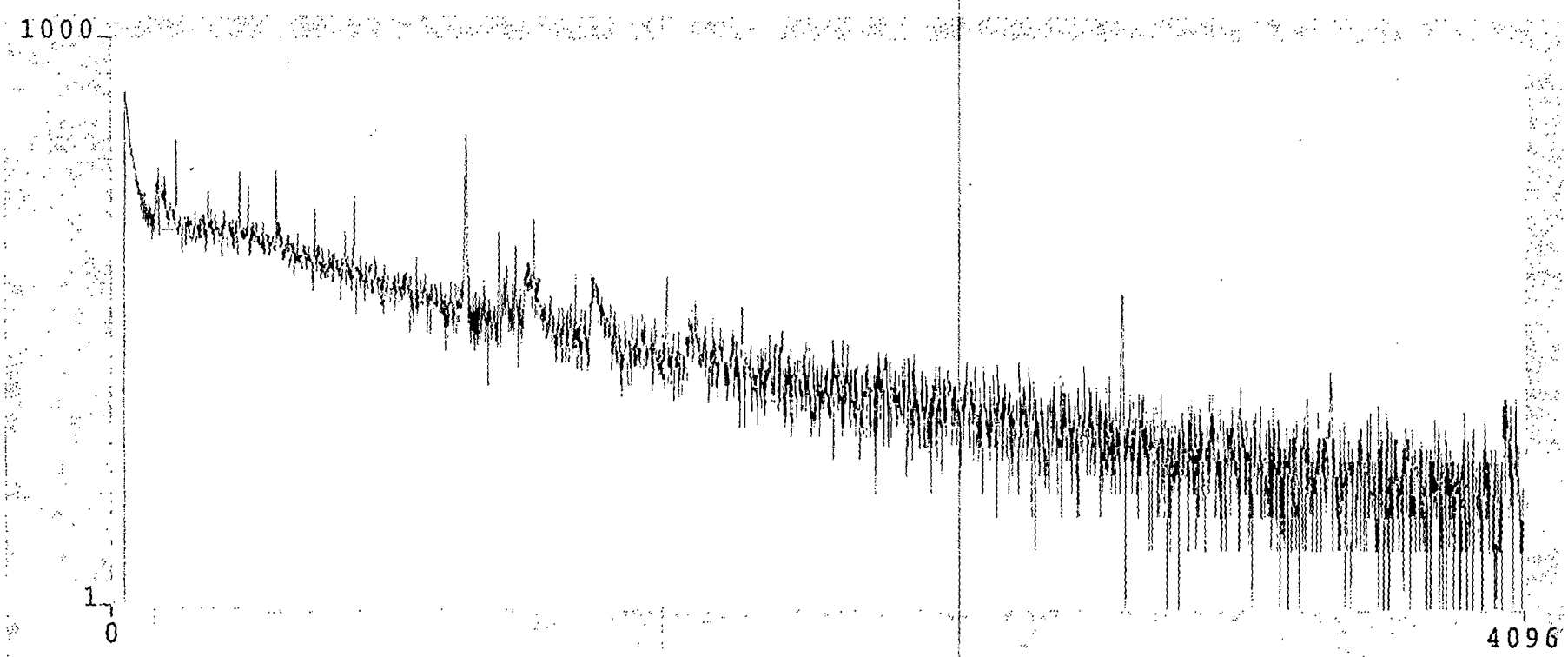
****

ID: 081314-7 WEEKLY BKG

Detector # 7 Background Q.C. Analysis for 08/13/2014 14:29:54

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
10	50-> 150 keV Bkg	23.250	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	19.193	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	28.299	N.A.	Pass	N.A.
13	500->1000 keV Bkg	29.782	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	16.753	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	2.848	N.A.	Pass	N.A.

Q.C. Results Saved.



Acq. Start: 08/13/2014 14:29:54 ID: 081314-7 WEEKLY BKG

140821D08.SPC Analyzed by JP

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SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

ALS Laboratory Group - Fort Collins
GammaScan

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Weekly Background Check

Sample ID: 081314-8 WEEKLY BKG

Sampling Start:	08/13/2014 14:00:00	Counting Start:	08/13/2014 14:30:06
Sampling Stop:	08/13/2014 14:00:00	Decay Time.	5.02E-001 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	60000 Sec
Sample Size	1.00E+000 L	Real Time	60033 Sec
Collection Efficiency	1.0000	Spc. File	.140821D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -1.99 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 08/13/2014
FWHM(keV) = 0.44 + 0.023*En + 4.49E-04*En^2 + 0.00E+00*En^3 02/06/2014
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)		FLAG
1	46.32	96.46	382	81	59	690	0.82	a	
2	63.15	130.08	648	86	58	667	0.78	a	HiResid Wide Pk
3	65.51	134.78	169	132	106	1467	1.75	b	HiResid
4	74.85	153.44	213	61	44	470	0.50	a	
5	76.90	157.53	283	53	34	313	0.36	b	
6	84.34	172.39	171	82	64	765	0.99	a	
7	87.05	177.81	148	73	56	638	0.80	b	
8	92.54	188.77	819	96	64	747	0.93	a	
9	112.08	227.79	54	74	60	655	1.02	a	NET< CL
10	139.63	282.80	122	58	44	425	0.59	a	
11	143.75	291.02	90	65	51	531	0.86	b	
12	162.94	329.34	55	71	57	608	0.97	a	NET< CL
13	185.75	374.89	392	82	59	638	0.93	a	
14	198.13	399.62	208	75	57	593	1.04	a	
15	238.53	480.29	305	63	43	418	0.73	a	
16	295.05	593.16	74	57	45	405	0.88	a	
17	298.71	600.47	34	40	31	243	0.48	b	
18	338.59	680.10	25	37	29	212	0.50	a	NET< CL
19	351.79	706.45	178	69	52	468	1.18	a	
20	511.11	1024.60	1584	125	79	799	2.45	a	Wide Pk
21	558.58	1119.40	191	48	33	226	1.00	a	
22	569.94	1142.07	80	59	47	377	1.44	a	
23	583.37	1168.90	145	51	37	274	1.14	a	

140821D08.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	609.52	1221.12	142	64	49	442	1.29 a	
25	794.89	1591.28	23	31	25	138	0.86 a	NET< CL
26	803.06	1607.59	126	41	28	167	1.06 a	
27	871.30	1743.87	30	33	26	143	0.93 a	
28	898.28	1797.73	25	45	36	240	1.65 a	NET< CL
29	911.29	1823.71	59	33	24	137	1.00 a	
30	961.73	1924.44	58	49	38	242	1.98 a	
31	968.95	1938.85	31	31	24	132	1.06 a	
32	1413.06	2825.69	22	24	18	75	1.13 a	
33	1460.20	2919.82	254	42	23	94	1.93 a	

140821D08.SPC Analyzed by

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SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

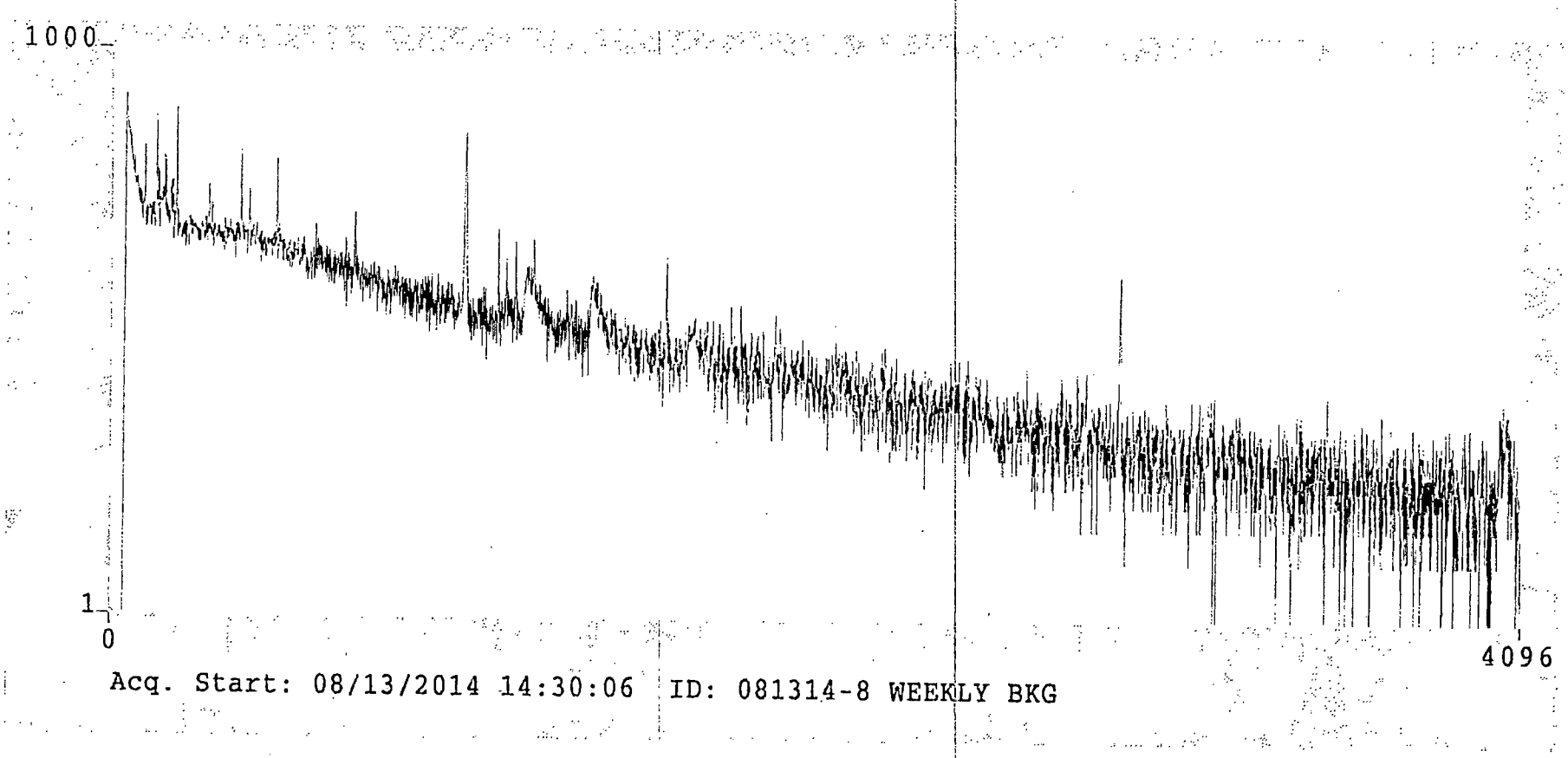
****

ID: 081314-8 WEEKLY BKG

Detector # 8 Background Q.C. Analysis for 08/13/2014 14:30:06

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
10	50-> 150 keV Bkg	27.114	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	21.180	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	31.593	N.A.	Pass	N.A.
13	500->1000 keV Bkg	34.354	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	19.661	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	3.368	N.A.	Pass	N.A.

Q.C. Results Saved.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1
0
4096
Acq. Start: 08/13/2014 14:30:06 ID: 081314-8 WEEKLY BKG

Gamma Spectroscopy

Quality Control Data

Daily Instrument Performance Checks

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source PAI I 0 0720

66354A-307

215 Grams of Sand in Metal Can

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2003 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432	y	1316	3.0
Cd-109	88	462.6	d	1879	3.3
Co-57	122	271.79	d	1042	2.8
Ce-139	166	137.6	d	1432	2.8
Hg-203	279	46.61	d	3223	2.7
Sn-113	392	115.1	d	1978	2.6
Cs-137	662	30.07	y	1272	3.0
Y-88	898	106.6	d	5106	2.6
Co-60	1173	5.2714	y	2424	2.7
Co-60	1332	5.2714	y	2449	2.6
Y-88	1836	106.6	d	5335	2.6

Approximately 126.5 mL of customer supplied sand.
P O NUMBER EW060303, Item 4

SOURCE PREPARED BY: M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED: W. M. Mutz 8-1-03

This standard will expire one year after the calibration date.

ANALYTICS

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Phone (404) 352-8677
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RSO #767
Rec'd 8/13/04
JJB

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

68681-307

215 Grams of Sand in Metal Can

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2004 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432	y	1355	3.0
Cd-109	88	462.6	d	1900	3.3
Co-57	122	271.79	d	995.1	3.0
Ce-139	166	137.6	d	1411	2.8
Hg-203	279	46.61	d	3241	2.7
Sn-113	392	115.1	d	1939	2.6
Cs-137	662	30.07	y	1247	3.0
Y-88	898	106.6	d	4853	2.6
Co-60	1173	5.2714	y	2457	2.7
Co-60	1332	5.2714	y	2474	2.6
Y-88	1836	106.6	d	5064	2.6

140 mL of customer supplied sand.
P O NUMBER 70564, Item 4

SOURCE PREPARED BY: M Tarazaera for
M. D. Currie, Radiochemist

Q A APPROVED: M Rutz 8-4-04

This standard will expire one year after the calibration date.

≈ 203 μCi

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

PAI ID 0636
rec'd 8-02-02

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

64122-307

215 Grams of Sand in Metal Can

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2002 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432	y	1301	5.0
Cd-109	88	462.6	d	1882	5.0
Co-57	122	271.79	d	994.2	4.7
Ce-139	166	137.6	d	1420	4.3
Hg-203	279	46.61	d	3085	4.1
Sn-113	392	115.1	d	2094	4.1
Cs-137	662	30.07	y	1320	4.8
Y-88	898	106.6	d	4847	4.2
Co-60	1173	5.2714	y	2354	4.1
Co-60	1332	5.2714	y	2382	4.2
Y-88	1836	106.6	d	5068	4.0

Approximately 140 mL customer supplied sand.
P O NUMBER EW060602, Item 4

SOURCE PREPARED BY: MTaskaeva
M. Taskaeva Radiochemist

Q A APPROVED: [illegible] 7/31/02

This standard will expire one year after the calibration date.

RSO #720 was opened and split into multiple LSC vials, as shown

720.3020.47	-1	35.8071 g	(Bal 12)
	-2	36.1586	
	-3	36.1325	
	-4	36.0040	
	-5	36.4197	
	-6	34.5663	

These will be used as γ daily check sources

10/30/06

Continued on Page

Read and Understood By

Signed 10/30/06 Date Signed

RSO #767 was opened and split into multiple LSC vials, to be used a γ check sources, as shown

767.3020.48-	7	36.6640 g	(Bal 12)
	8	36.1856 g	
	9	36.3390 g	
	10	35.9937 g	
	11	36.7952 g	
	12	33.1100 g	

10/30/06

Continued on Page

Read and Understood By

Signed 10/30/06 Date Signed Date

RSO # 636 was opened and split into multiple LSC vials, to be used as daily check sources, as shown

636.3020.49	- 13	34.2237 g	(Bal 12)
	14	33.7917	
	15	34.6628	
	16	34.1622	
	17	34.2401	
	18	34.6838	

The remaining 9.1386 g was transferred to a 200 ml plastic beaker and marked for disposal.

10/30/06

Continued on Page

Read and Understood By

10/30/06

Signed | Date | Signed

ALS

Gamma Spectrometer Calibration Log

Date: 8/16/14 Reviewed By/Date: JP 8/16/14

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.				JP	JP					
2.						1332 FWHM	JP			
3.						1332 FWHM				
4.						1332 FWHM	JP			
5.					JP					
~~***~~ 6.						1462 FWHM	~~***~~	1332 FWHM		
7.						1332 FWHM	JP			
8.					JP					
9.	JP									
10.	JP									

.** **Corrective Action:**

*** Due to detector 6 failing two different QC parameters on the first and second daily check, a third daily check was performed. All QC parameters passed for the third daily check. Detector 6 is online for the date of 8/16/14

444985 **A**

Form 754r15a.doc (10/27/11)

140918D01.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 1 Detector Q.C. Analysis for 08/16/2014 08:44:58
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.808	N.A.	Pass	N.A.
2	60 keV FWHM	9.311E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.715E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1325.448	N.A.	Pass	N.A.
5	662 keV FWHM	1.476	N.A.	Pass	N.A.
6	662 keV Efficiency	1.550E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.180	N.A.	Pass	N.A.
8	1332 keV FWHM	1.947	N.A.	Pass	N.A.
9	1332 keV Efficiency	6.964E-03	N.A.	Pass	N.A.

140995D02.SPC Analyzed by JP

****

SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 2 Detector Q.C. Analysis for 08/16/2014 08:45:11
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	121.633	N.A.	Pass	N.A.
2	60 keV FWHM	1.016	N.A.	<FAIL>	N.A.
3	60 keV Efficiency	4.464E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1324.026	N.A.	Pass	N.A.
5	662 keV FWHM	1.426	N.A.	Pass	N.A.
6	662 keV Efficiency	1.900E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.468	N.A.	Pass	N.A.
8	1332 keV FWHM	2.342	N.A.	<FAIL>	N.A.
9	1332 keV Efficiency	9.336E-03	N.A.	Pass	N.A.

140996D02.SPC Analyzed by JP

****

SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 2 Detector Q.C. Analysis for 08/16/2014 09:05:54
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	121.598	N.A.	Pass	N.A.
2	60 keV FWHM	9.651E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	4.129E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1324.109	N.A.	Pass	N.A.
5	662 keV FWHM	1.508	N.A.	Pass	N.A.
6	662 keV Efficiency	2.000E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.365	N.A.	Pass	N.A.
8	1332 keV FWHM	2.137	N.A.	Pass	N.A.
9	1332 keV Efficiency	9.105E-03	N.A.	Pass	N.A.

140962D03.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 3 Detector Q.C. Analysis for 08/16/2014 08:45:19
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.013	N.A.	Pass	N.A.
2	60 keV FWHM	9.888E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.052E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1322.960	N.A.	Pass	N.A.
5	662 keV FWHM	1.740	N.A.	Pass	N.A.
6	662 keV Efficiency	1.689E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2660.677	N.A.	Pass	N.A.
8	1332 keV FWHM	2.581	N.A.	<FAIL>	N.A.
9	1332 keV Efficiency	8.157E-03	N.A.	Pass	N.A.

140964D03.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 3 Detector Q.C. Analysis for 08/16/2014 09:22:11
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.081	N.A.	Pass	N.A.
2	60 keV FWHM	9.800E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.090E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.075	N.A.	Pass	N.A.
5	662 keV FWHM	1.663	N.A.	Pass	N.A.
6	662 keV Efficiency	1.630E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2660.753	N.A.	Pass	N.A.
8	1332 keV FWHM	2.457	N.A.	Pass	N.A.
9	1332 keV Efficiency	8.586E-03	N.A.	Pass	N.A.

141326D04.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 4 Detector Q.C. Analysis for 08/16/2014 08:45:29
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	121.937	N.A.	Pass	N.A.
2	60 keV FWHM	8.930E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.457E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1325.068	N.A.	Pass	N.A.
5	662 keV FWHM	1.818	N.A.	Pass	N.A.
6	662 keV Efficiency	1.549E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.309	N.A.	Pass	N.A.
8	1332 keV FWHM	2.816	N.A.	<FAIL>	N.A.
9	1332 keV Efficiency	7.406E-03	N.A.	Pass	N.A.

141327D04.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 4 Detector Q.C. Analysis for 08/16/2014 09:07:46
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	121.915	N.A.	Pass	N.A.
2	60 keV FWHM	9.207E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.479E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1324.995	N.A.	Pass	N.A.
5	662 keV FWHM	1.843	N.A.	Pass	N.A.
6	662 keV Efficiency	1.521E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.485	N.A.	Pass	N.A.
8	1332 keV FWHM	2.742	N.A.	Pass	N.A.
9	1332 keV Efficiency	6.522E-03	N.A.	Pass	N.A.

140886D05.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 5 Detector Q.C. Analysis for 08/16/2014 08:45:35
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	120.329	N.A.	Pass	N.A.
2	60 keV FWHM	7.235E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.872E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1323.761	N.A.	Pass	N.A.
5	662 keV FWHM	1.377	N.A.	Pass	N.A.
6	662 keV Efficiency	2.020E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2664.598	N.A.	Pass	N.A.
8	1332 keV FWHM	1.855	N.A.	Pass	N.A.
9	1332 keV Efficiency	9.942E-03	N.A.	Pass	N.A.

140896D07.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 7 Detector Q.C. Analysis for 08/16/2014 08:45:51
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	123.059	N.A.	Pass	N.A.
2	60 keV FWHM	6.997E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.154E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1326.229	N.A.	Pass	N.A.
5	662 keV FWHM	1.568	N.A.	Pass	N.A.
6	662 keV Efficiency	1.798E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.426	N.A.	Pass	N.A.
8	1332 keV FWHM	2.710	N.A.	<FAIL>	N.A.
9	1332 keV Efficiency	9.835E-03	N.A.	Pass	N.A.

140897D07.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 7 Detector Q.C. Analysis for 08/16/2014 09:10:39
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	123.083	N.A.	Pass	N.A.
2	60 keV FWHM	6.935E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.113E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1326.227	N.A.	Pass	N.A.
5	662 keV FWHM	1.632	N.A.	Pass	N.A.
6	662 keV Efficiency	1.817E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.457	N.A.	Pass	N.A.
8	1332 keV FWHM	2.474	N.A.	Pass	N.A.
9	1332 keV Efficiency	9.516E-03	N.A.	Pass	N.A.

140834D08.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 8 Detector Q.C. Analysis for 08/16/2014 08:45:59
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.617	N.A.	Pass	N.A.
2	60 keV FWHM	6.991E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.806E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1325.104	N.A.	Pass	N.A.
5	662 keV FWHM	1.340	N.A.	Pass	N.A.
6	662 keV Efficiency	1.707E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.535	N.A.	Pass	N.A.
8	1332 keV FWHM	1.758	N.A.	Pass	N.A.
9	1332 keV Efficiency	9.664E-03	N.A.	Pass	N.A.

ALS

Gamma Spectrometer Calibration Log

Date: 8/17/14 Reviewed By/Date: JP 8/17/14

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.				JP	JP					
2.					JP					
3.					/	662 1332 FWHM	JP			
4.					JP					
5.					JP					
6.					/	662 1332 FWHM	JP			
7.					JP					
8.					JP					
9.	JP			/	/					
10.	JP			/	/					

.** **Corrective Action:**

*** Due to detector____ failing two different QC parameters on the first and second daily check, a third daily check was performed. All QC parameters passed for the third daily check. Detector ____ is online for the date of _____

444986 A

Form 754r15a.doc (10/27/11)

140924D01.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 1 Detector Q.C. Analysis for 08/17/2014 06:57:21
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.838	N.A.	Pass	N.A.
2	60 keV FWHM	9.188E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.943E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1325.653	N.A.	Pass	N.A.
5	662 keV FWHM	1.458	N.A.	Pass	N.A.
6	662 keV Efficiency	1.542E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.279	N.A.	Pass	N.A.
8	1332 keV FWHM	1.978	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.172E-03	N.A.	Pass	N.A.

141002D02.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 2 Detector Q.C. Analysis for 08/17/2014 06:57:29
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	121.680	N.A.	Pass	N.A.
2	60 keV FWHM	9.203E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	4.098E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1324.314	N.A.	Pass	N.A.
5	662 keV FWHM	1.573	N.A.	Pass	N.A.
6	662 keV Efficiency	1.838E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.760	N.A.	Pass	N.A.
8	1332 keV FWHM	2.204	N.A.	Pass	N.A.
9	1332 keV Efficiency	9.084E-03	N.A.	Pass	N.A.

140969D03.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 3 Detector Q.C. Analysis for 08/17/2014 06:57:38
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.117	N.A.	Pass	N.A.
2	60 keV FWHM	9.990E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.070E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.187	N.A.	Pass	N.A.
5	662 keV FWHM	1.785	N.A.	<FAIL>	N.A.
6	662 keV Efficiency	1.632E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2661.141	N.A.	Pass	N.A.
8	1332 keV FWHM	2.608	N.A.	<FAIL>	N.A.
9	1332 keV Efficiency	7.304E-03	N.A.	Pass	N.A.

140970D03.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 3 Detector Q.C. Analysis for 08/17/2014 07:16:41
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.145	N.A.	Pass	N.A.
2	60 keV FWHM	9.445E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.074E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.239	N.A.	Pass	N.A.
5	662 keV FWHM	1.728	N.A.	Pass	N.A.
6	662 keV Efficiency	1.688E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2661.312	N.A.	Pass	N.A.
8	1332 keV FWHM	2.295	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.874E-03	N.A.	Pass	N.A.

141333D04.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 4 Detector Q.C. Analysis for 08/17/2014 06:57:47
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.103	N.A.	Pass	N.A.
2	60 keV FWHM	9.110E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.496E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1325.516	N.A.	Pass	N.A.
5	662 keV FWHM	1.817	N.A.	Pass	N.A.
6	662 keV Efficiency	1.618E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2666.417	N.A.	Pass	N.A.
8	1332 keV FWHM	2.628	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.421E-03	N.A.	Pass	N.A.

140891D05.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 5 Detector Q.C. Analysis for 08/17/2014 06:57:55
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	120.457	N.A.	Pass	N.A.
2	60 keV FWHM	7.452E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	6.015E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1323.835	N.A.	Pass	N.A.
5	662 keV FWHM	1.315	N.A.	Pass	N.A.
6	662 keV Efficiency	2.110E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2664.647	N.A.	Pass	N.A.
8	1332 keV FWHM	1.913	N.A.	Pass	N.A.
9	1332 keV Efficiency	9.758E-03	N.A.	Pass	N.A.

140902D07.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 7 Detector Q.C. Analysis for 08/17/2014 06:58:09
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	123.200	N.A.	Pass	N.A.
2	60 keV FWHM	7.277E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.193E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1326.385	N.A.	Pass	N.A.
5	662 keV FWHM	1.659	N.A.	Pass	N.A.
6	662 keV Efficiency	1.829E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.671	N.A.	Pass	N.A.
8	1332 keV FWHM	2.440	N.A.	Pass	N.A.
9	1332 keV Efficiency	1.034E-02	N.A.	Pass	N.A.

140841D08.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 8 Detector Q.C. Analysis for 08/17/2014 06:58:16
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.690	N.A.	Pass	N.A.
2	60 keV FWHM	7.162E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	6.144E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1325.535	N.A.	Pass	N.A.
5	662 keV FWHM	1.332	N.A.	Pass	N.A.
6	662 keV Efficiency	1.675E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2664.609	N.A.	Pass	N.A.
8	1332 keV FWHM	1.771	N.A.	Pass	N.A.
9	1332 keV Efficiency	9.706E-03	N.A.	Pass	N.A.

ALS

Gamma Spectrometer Calibration Log

Date: 8/18/14 Reviewed By/Date: JP 8/18/14

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.				JP	JP					
2.					JP					
3.					/	1332 Fwhm	JP			
4.					JP					
5.					JP					
6.					/	1332 Cent 1332 Fwhm	JP			
7.					/	1332 Fwhm	JP			
8.					JP					
9.	JP			/	/					
10.	JP			/	/					

.** **Corrective Action:**

*** Due to detector____ failing two different QC parameters on the first and second daily check, a third daily check was performed. All QC parameters passed for the third daily check. Detector ____ is online for the date of _____

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Form 754r15a.doc (10/27/11)

140930D01.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 1 Detector Q.C. Analysis for 08/18/2014 07:04:43
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.773	N.A.	Pass	N.A.
2	60 keV FWHM	7.647E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.803E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1325.542	N.A.	Pass	N.A.
5	662 keV FWHM	1.391	N.A.	Pass	N.A.
6	662 keV Efficiency	1.554E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.217	N.A.	Pass	N.A.
8	1332 keV FWHM	1.846	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.854E-03	N.A.	Pass	N.A.

141008D02.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 2 Detector Q.C. Analysis for 08/18/2014 07:04:50
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	121.567	N.A.	Pass	N.A.
2	60 keV FWHM	9.023E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	4.026E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1323.985	N.A.	Pass	N.A.
5	662 keV FWHM	1.590	N.A.	Pass	N.A.
6	662 keV Efficiency	1.918E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.335	N.A.	Pass	N.A.
8	1332 keV FWHM	2.036	N.A.	Pass	N.A.
9	1332 keV Efficiency	8.637E-03	N.A.	Pass	N.A.

140976D03.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 3 Detector Q.C. Analysis for 08/18/2014 07:20:22
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.057	N.A.	Pass	N.A.
2	60 keV FWHM	9.767E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.049E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.102	N.A.	Pass	N.A.
5	662 keV FWHM	1.732	N.A.	Pass	N.A.
6	662 keV Efficiency	1.660E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2660.774	N.A.	Pass	N.A.
8	1332 keV FWHM	2.672	N.A.	<FAIL>	N.A.
9	1332 keV Efficiency	7.748E-03	N.A.	Pass	N.A.

140977D03.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 3 Detector Q.C. Analysis for 08/18/2014 07:31:28
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.044	N.A.	Pass	N.A.
2	60 keV FWHM	9.979E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.020E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.109	N.A.	Pass	N.A.
5	662 keV FWHM	1.707	N.A.	Pass	N.A.
6	662 keV Efficiency	1.700E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2661.029	N.A.	Pass	N.A.
8	1332 keV FWHM	2.423	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.369E-03	N.A.	Pass	N.A.

141339D04.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 4 Detector Q.C. Analysis for 08/18/2014 07:05:05
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	121.927	N.A.	Pass	N.A.
2	60 keV FWHM	8.913E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.470E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1324.973	N.A.	Pass	N.A.
5	662 keV FWHM	1.801	N.A.	Pass	N.A.
6	662 keV Efficiency	1.588E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.384	N.A.	Pass	N.A.
8	1332 keV FWHM	2.753	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.492E-03	N.A.	Pass	N.A.

140897D05.SPC Analyzed by

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 5 Detector Q.C. Analysis for 08/18/2014 07:05:11
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	120.377	N.A.	Pass	N.A.
2	60 keV FWHM	7.064E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.982E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1323.646	N.A.	Pass	N.A.
5	662 keV FWHM	1.369	N.A.	Pass	N.A.
6	662 keV Efficiency	2.089E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2664.311	N.A.	Pass	N.A.
8	1332 keV FWHM	1.908	N.A.	Pass	N.A.
9	1332 keV Efficiency	9.144E-03	N.A.	Pass	N.A.

140907D07.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 7 Detector Q.C. Analysis for 08/18/2014 07:05:28
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	123.053	N.A.	Pass	N.A.
2	60 keV FWHM	6.963E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.171E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1326.163	N.A.	Pass	N.A.
5	662 keV FWHM	1.640	N.A.	Pass	N.A.
6	662 keV Efficiency	1.811E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.458	N.A.	Pass	N.A.
8	1332 keV FWHM	2.664	N.A.	<FAIL>	N.A.
9	1332 keV Efficiency	9.517E-03	N.A.	Pass	N.A.

140908D07.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

****

ID: DAILY CHECK
Detector # 7 Detector Q.C. Analysis for 08/18/2014 07:24:07
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	123.048	N.A.	Pass	N.A.
2	60 keV FWHM	7.375E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.184E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1326.131	N.A.	Pass	N.A.
5	662 keV FWHM	1.572	N.A.	Pass	N.A.
6	662 keV Efficiency	1.818E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.320	N.A.	Pass	N.A.
8	1332 keV FWHM	2.484	N.A.	Pass	N.A.
9	1332 keV Efficiency	9.710E-03	N.A.	Pass	N.A.

140846D08.SPC Analyzed by JP

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SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

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ID: DAILY CHECK
Detector # 8 Detector Q.C. Analysis for 08/18/2014 07:05:36
Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T-Test
1	60 keV Centroid	122.496	N.A.	Pass	N.A.
2	60 keV FWHM	6.927E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.619E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1324.074	N.A.	Pass	N.A.
5	662 keV FWHM	1.307	N.A.	Pass	N.A.
6	662 keV Efficiency	1.630E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2661.516	N.A.	Pass	N.A.
8	1332 keV FWHM	2.020	N.A.	Pass	N.A.
9	1332 keV Efficiency	8.498E-03	N.A.	Pass	N.A.