

ENGINEERING CHANGE NOTICE

Page 1 of 21. ECN **600901**Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedure ☐ Cancel/Void ☐		3. Originator's Name, Organization, MSIN, and Telephone No. K. K. Giamberardini, T6-06, 373-3076		4. Date 08/24/93	
		5. Project Title/No./Work Order No. 105 KE BASINS		6. Bldg./Sys./Fac. No. NA	
		8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-DP-044, REV-1		9. Related ECN No(s). NA	
				10. Related PO No. NA	
11a. Modification Work ☐ Yes (fill out Blk. 11b) ☒ No (NA Blks. 11b, 11c, 11d)		11b. Work Package No. NA		11c. Modification Work Complete NA	
		Cog. Engineer Signature & Date		11d. Restored to Original Condition (Temp. or Standby ECN only) NA	
		Cog. Engineer Signature & Date			
12. Description of Change The document WHC-SD-WM-DP-044 Revision 0, is being replaced with WHC-SD-WM-DP-044 Revision 1. This does not affect WHC-SD-WM-DP-044 Addendum 1A or 2A. ADDENDUM 1A WAS NOT USED ON REVISION 0. ADDENDUM 2A CONTAINS RAW DATA WHICH WAS EXCLUDED FROM REVISION 1.					
					
13a. Justification Criteria Change ☐ Design Improvement ☐ Environmental ☒ As-Found ☐ Facilitate Const. ☐ Const. Error/Omission ☐ Design Error/Omission ☐					
13b. Justification Details This revision reflects that sensitive information (payroll numbers) have been removed from this package. The data has not changed in any comparable form from revision 0. This revision is also publicly available.					
14. Distribution (include name, MSIN, and no. of copies) Please see attached distribution.					
RELEASE STAMP OFFICIAL RELEASE BY WHC DATE SEP 14 1993 <i>sta #6</i>					

ENGINEERING CHANGE NOTICE				Page 2 of 2	1. ECN (use no. from pg. 1) 600901																																																												
15. Design Verification Required ☐ Yes ☒ No	16. Cost Impact <table style="width: 100%; border: none;"> <tr> <th colspan="2" style="text-align: center; border-bottom: 1px solid black;">ENGINEERING</th> <th colspan="2" style="text-align: center; border-bottom: 1px solid black;">CONSTRUCTION</th> </tr> <tr> <td style="width: 15%;">Additional</td> <td style="width: 15%;">☐ \$</td> <td style="width: 15%;">Additional</td> <td style="width: 15%;">☐ \$</td> </tr> <tr> <td>Savings</td> <td>☐ \$</td> <td>Savings</td> <td>☐ \$</td> </tr> </table>			ENGINEERING		CONSTRUCTION		Additional	☐ \$	Additional	☐ \$	Savings	☐ \$	Savings	☐ \$	17. Schedule Impact (days) Improvement ☐ Delay ☐																																																	
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Savings	☐ \$	Savings	☐ \$																																																														
18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.																																																																	
SDD/DD ☐ Functional Design Criteria ☐ Operating Specification ☐ Criticality Specification ☐ Conceptual Design Report ☐ Equipment Spec. ☐ Const. Spec. ☐ Procurement Spec. ☐ Vendor Information ☐ OM Manual ☐ FSAR/SAR ☐ Safety Equipment List ☐ Radiation Work Permit ☐ Environmental Impact Statement ☐ Environmental Report ☐ Environmental Permit ☐	Seismic/Stress Analysis ☐ Stress/Design Report ☐ Interface Control Drawing ☐ Calibration Procedure ☐ Installation Procedure ☐ Maintenance Procedure ☐ Engineering Procedure ☐ Operating Instruction ☐ Operating Procedure ☐ Operational Safety Requirement ☐ IEFD Drawing ☐ Cell Arrangement Drawing ☐ Essential Material Specification ☐ Fac. Proc. Samp. Schedule ☐ Inspection Plan ☐ Inventory Adjustment Request ☐	Tank Calibration Manual ☐ Health Physics Procedure ☐ Spares Multiple Unit Listing ☐ Test Procedures/Specification ☐ Component Index ☐ ASME Coded Item ☐ Human Factor Consideration ☐ Computer Software ☐ Electric Circuit Schedule ☐ ICRS Procedure ☐ Process Control Manual/Plan ☐ Process Flow Chart ☐ Purchase Requisition ☐																																																															
19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.																																																																	
Document Number/Revision		Document Number/Revision		Document Number/Revision																																																													
20. Approvals <table style="width: 100%; border: none;"> <tr> <th style="width: 45%;">Signature</th> <th style="width: 10%;">Date</th> <th style="width: 45%;">Signature</th> <th style="width: 10%;">Date</th> </tr> <tr> <td colspan="4">OPERATIONS AND ENGINEERING</td> </tr> <tr> <td>Cog Engineer K. K. Giamberardini</td> <td>8-26-93</td> <td>ARCHITECT-ENGINEER</td> <td></td> </tr> <tr> <td>Cog. Mgr. K. K. Giamberardini</td> <td>8-26-93</td> <td>PE</td> <td></td> </tr> <tr> <td>QA J. C. Langford</td> <td>8/25/93</td> <td>QA</td> <td></td> </tr> <tr> <td>Safety</td> <td></td> <td>Safety</td> <td></td> </tr> <tr> <td>Security</td> <td></td> <td>Design</td> <td></td> </tr> <tr> <td>Environ.</td> <td></td> <td>Environ.</td> <td></td> </tr> <tr> <td>Projects/Programs</td> <td></td> <td>Other</td> <td></td> </tr> <tr> <td>Tank Waste Remediation System</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Facilities Operations</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Restoration & Remediation</td> <td></td> <td>DEPARTMENT OF ENERGY</td> <td></td> </tr> <tr> <td>Operations & Support Services</td> <td></td> <td>Signature or Letter No.</td> <td></td> </tr> <tr> <td>IRM</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Other</td> <td></td> <td>ADDITIONAL</td> <td></td> </tr> </table>						Signature	Date	Signature	Date	OPERATIONS AND ENGINEERING				Cog Engineer K. K. Giamberardini	8-26-93	ARCHITECT-ENGINEER		Cog. Mgr. K. K. Giamberardini	8-26-93	PE		QA J. C. Langford	8/25/93	QA		Safety		Safety		Security		Design		Environ.		Environ.		Projects/Programs		Other		Tank Waste Remediation System				Facilities Operations				Restoration & Remediation		DEPARTMENT OF ENERGY		Operations & Support Services		Signature or Letter No.		IRM				Other		ADDITIONAL	
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SEP 14 1993

Date Received:

8/26/93 KMB

INFORMATION RELEASE REQUEST

Reference:
WHC-CM-3-4

Complete for all Types of Release

Purpose		ID Number (include revision, volume, etc.)
☐ Speech or Presentation	☐ Reference	ECN-600901
☐ Full Paper (Check only one suffix)	☒ Technical Report	List attachments.
☐ Summary	☐ Thesis or Dissertation	WHC-SD-WM-DP-044, REV 1
☐ Abstract	☐ Manual	Date Release Required
☐ Visual Aid	☐ Brochure/Flier	08/25/93
☐ Speakers Bureau	☐ Software/Database	
☐ Poster Session	☐ Controlled Document	
☐ Videotape	☐ Other	

Title 222-S ANALYTICAL LABORATORIES PROJECT 105 KE AREA
- DATA PACKAGEUnclassified Category
UC-Impact
Level 3QNew or novel (patentable) subject matter? ☒ No ☐ Yes
If "Yes", has disclosure been submitted by WHC or other company?☐ No ☐ Yes Disclosure No(s).

Information received from others in confidence, such as proprietary data, trade secrets, and/or inventions?

☒ No ☐ Yes (Identify)Copyrights? ☒ No ☐ Yes
If "Yes", has written permission been granted?☐ No ☐ Yes (Attach Permission)

Trademarks?

☒ No ☐ Yes (Identify)

Complete for Speech or Presentation

Title of Conference or Meeting
NAGroup or Society Sponsoring
NADate(s) of Conference or Meeting
NACity/State
NAWill proceedings be published? ☐ Yes ☒ No
Will material be handed out? ☐ Yes ☒ NoTitle of Journal
NA

CHECKLIST FOR SIGNATORIES

Review Required per WHC-CM-3-4	Yes	No	Reviewer - Signature Indicates Approval
			Name (printed) Signature Date
Classification/Unclassified Controlled Nuclear Information	☐	☒	
Patent - General Counsel	☒	☐	PER OGC memo 2-4-93 Jennifer L. Wilkerson 8-26-93
Legal - General Counsel	☒	☐	PER OGC memo 2-4-93 Jennifer L. Wilkerson 8-26-93
Applied Technology/Export Controlled Information or International Program	☐	☒	
WHC Program/Project	☐	☒	
Communications	☐	☒	Jennifer L. Wilkerson 8-26-93
RL Program/Project	☒	☐	P. Clark does not need to review - per telecon 4-29-93
Publication Services	☒	☒	Clearance review only Date 7. Whitburn Jennifer L. Wilkerson 8-26-93
Other Program/Project	☐	☒	Per telecon 8-26-93

Information conforms to all applicable requirements. The above information is certified to be correct.

	Yes	No
References Available to Intended Audience	☒	☐
Transmit to DOE-HQ/Office of Scientific and Technical Information	☐	☒
Author/Requestor (Printed/Signature)		Date
K. K. Giamberardini		8-26-93

Intended Audience

☐ Internal ☐ Sponsor ☒ ExternalResponsible Manager (Printed/Signature) Date
K. K. Giamberardini 8-26-93

INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP

Stamp is required before release. Release is contingent upon resolution of mandatory comments.



Date Cancelled

Date Disapproved

SUPPORTING DOCUMENT

1. Total Pages 248
252

2. Title 222-S ANALYTICAL LABORATORIES PROJECT 105 KE AREA-DATA PACKAGE		3. Number WHC-SD-WM-DP-044	4. Rev No. 1
5. Key Words BASINS, DATA PACKAGE, ANALYTICAL LABS, 105 KE, 222-S LABS APPROVED FOR PUBLIC RELEASE <i>KINB 8/30/93</i>		6. Author Name: K. K. Giamberardini <i>K. K. Giamberardini</i> Signature <i>8-26-93</i> Organization/Charge Code 12610/J120H	
7. Abstract			
8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed. PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA. DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.		10. RELEASE STAMP OFFICIAL RELEASE BY WHC DATE SEP 14 1993 <i>Sta #6</i>	
9. Impact Level 3Q			



Westinghouse
Hanford Company

WHC-SD-WM-DP-044
REV 1

P.O. Box 1970 Richland, WA 99352

WESTINGHOUSE HANFORD COMPANY

222-S ANALYTICAL LABORATORIES

Project: 105 KE - Area

Customer ID. Number: 937046 L and 937046 S

Date Printed: August 10, 1993

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This report consists of pages 1 - 235.

NARRATIVE

Narrative for 105KE-NLOP samples

Results from two 105KE-NLOP basin samples submitted on 6/29/93 are presented. Analytical results for sample 937046 L and 937046 S are summarized on page 11 and 12. Supporting information is presented in the remainder of the document. The samples were run with an LMCS standard, a blank, a sample and a duplicate sample. All standards were within limits. All blanks are below detection limits except for AT for both samples and Cs for 937046 L. Relative percent difference between sample and sample duplicate are acceptable except for U analysis on sample R4110 (937046 L) which is high at 29.05%.

RE *8.11.93*
Dick Vogel
Project Manager
222-S Laboratory

SAMPLING AND CUSTODY DATA

LABELS MADE

REQUEST FOR SPECIAL ANALYSIS (RSA)

RSA No.

1584

Sample Origin

105KE - NLOP

2. Date Submitted

6/30/93

4. Requester Name

Vogel

6. Charge Code/Work Package

E11456

3. Submitted by

Vogel

5. Requester Phone/MSIN

7. Date Required

7/9/93

8. Customer ID

937046-S

Collected

Date

Time

9. Laboratory ID

R4107

12. Number of Samples

1

13. Volume of Samples

1 Gal

14. Protocols

☐ None☐ RCRA☐ NQA-1☐ Other☐ CERCLA

15. Sample Type

☒ Solid☐ Soil☐ Slurry☐ Gas☐ Water☐ Waste☐ Solution☐ Sludge☐ Oil☐ Other (specify) _____

16. Storage Requirements

☐ None☐ Specify

HOLD FOR RISK

INSTRUCTIONS

17. Process Knowledge/Known Listed Wastes

☐ Unknown☐ Known (Please attach list)☐ Previously submitted for this Project

10. Determination

ACID DIGEST

Pu 270/240

AM 041

AT/RAA

GEA

U:

11. Expected Range

18. Survey

Dose Rate

HPT Signature

19. Disposition of Waste

☐ Return to Client/Location☐ Dispose per 222-S Procedures☐ Other

20. Additional Information

STD
BLK
Samp
Dup

21. Chain of Custody

☐ No☒ Yes Number:

22. Assigned Custodial Group (select one)

☐ PCL☒ POSU☐ ENV☐ Process

6

23. Sample Received By:

Sandra Cole

24. Laboratory Manager (if required)

R Akita

Date: 06-30-93

Time: 1045

Date: 8/11/93

LABELS MADE

REQUEST FOR SPECIAL ANALYSIS (RSA)

RSA No.

Pa 8/11/53
158

1. Sample Origin 105KE-NLOP		2. Date Submitted 6/30/93		4. Requester Name VOGL		6. Charge Code/Work Package E11456	
		3. Submitted By VOGL		5. Requester Phone/MSIN		7. Date Required 7/9/93	
8. Customer ID 937046A		Collected Date Time 		9. Laboratory ID R4110		12. Number of Samples 1	
						13. Volume of Samples 100mL	
						14. Protocols ☐ None ☐ RCRA ☐ NQA-1 ☐ Other ☐ CERCLA	
						15. Sample Type ☐ Solid ☐ Soil ☐ Slurry ☐ Gas ☐ Water ☐ Waste ☒ Solution ☐ Sludge ☐ Oil ☐ Other (specify) _____	
						16. Storage Requirements ☐ None ☐ Specify HOLD FOR DISPOSAL INSTRUCTIONS	
						17. Process Knowledge/Known Listed Wastes ☐ Unknown ☐ Known (Please attach list) ☐ Previously submitted for this Project	
10. Determination PU 235/240 AM 241 AT/AEA CEA U		11. Expected Range		18. Survey		Dose Rate	
				HPT Signature			
				19. Disposition of Waste ☐ Return to Client/Location ☐ Dispose per 222-S Procedures ☐ Other			
				20. Additional Information SHO BIK Sam Dup			
21. Chain of Custody ☐ No ☒ Yes Number: _____		22. Assigned Custodial Group (select one) ☐ PCL ☒ PSDU ☐ ENV ☐ Process 7		23. Sample Received By: Shandra Cobb Date: 06-30-93 Time: 1045		24. Laboratory Manager (if required) R. Akita Date: 8/11/93	

Chain of Custody Number 20080/ED3024-1

SAMPLE DESCRIPTION 105 KE SAMPLES/PROJECT 20080/ED 3024

APPLICABLE TEST INSTRUCTION VERBAL INSTRUCTIONS FROM CRAIG BENNETT

ANALYSIS REQUESTED OR DEPARTMENT 222-S / SEE CRAIG BENNETT FOR INSTRUCTIONS

PREP METHOD NONE/DILUTION

Original - Project Management

Copy - Sender
Copy - Receiver

please send us a copy
your prayer
R. Strebin PP-08

PREP METHOD NONE/DILUTION

[illegible]

Original - Project Management

Copy - Sender

Copy - Receiver

please send us a report
your friend
R. Streibin PP-08

SAMPLE DATA SUMMARY

SAMPLE PREP.: UNOBTAINED

SAMPLE RESULTS

105K

CUSTOMER ID: 937046 D

[illegible]

MAC-SD-MM-DP-044
REV 1

SAMPLE PREP.: ACID DIEST

SAMPLE RESULTS

105K

CUSTOMER ID: 937046 S

	STANDARD		BLANK		SAMPLE		DUPLICATE SAMPLE		AVE		RPD %				
LAB ID	N/A		R4106-8600		R4107-8700		R4107-8800								
ACID DIESTION ^{07/07/93}	N/A		COMPLETE		10.376	g/L	DELETED								
LAB ID	R4105-1250		R4106-1250		R4107-1250		R4107-1250								
AT/MEA 7/9/93	102.6	%	$4.018E^{-4}$	uc/ml	$8.61E^1$	uc/gm	$7.32E^1$	uc/gm	$7.94E^1$	uc/gm	16.17				
LAB ID	R4105-8530		R4106-8630		R4107-8730		R4107-8830								
GEA 7/8/93															
Am 241	N/A		$4.55E^{-4}$	uc/ml	$4.07E^1$	uc/gm	$4.10E^1$	uc/gm	$4.09E^1$	uc/gm	.73				
CO 60	99.9	%	$1.61E^{-4}$	uc/ml	3.22	uc/gm	3.32	uc/gm	3.27	uc/gm	3.06				
CS 134	N/A		$1.73E^{-4}$	uc/ml	$2.16E^{-1}$	uc/gm	$2.57E^{-2}$	uc/gm	N/A		N/A				
CS 137	99.6	%	$1.48E^{-4}$	uc/ml	$2.16E^2$	uc/gm	$2.19E^2$	uc/gm	$2.18E^2$	uc/gm	1.38				
Eu 154	N/A		$5.04E^{-4}$	uc/ml	7.39	uc/gm	7.62	uc/gm	7.51	uc/gm	3.06				
Eu 154	N/A		$3.81E^{-4}$	uc/ml	4.18	uc/gm	4.16	uc/gm	4.17	uc/gm	.48				
Zr 95	N/A		$1.96E^{-4}$	uc/ml	$6.08E^{-1}$	uc/gm	$5.39E^{-1}$	uc/gm	$5.74E^{-1}$	uc/gm	12.03				
LAB ID	R4105-8540		R4106-8640		R4107-8740		R4107-8840								
U 7/13/93	100.99	%	$7.56E^{-1}$	ug/ml	$2.01E^{-1}$	G/G	$1.92E^{-1}$	G/G	$1.97E^{-1}$	g/g	4.58				
LAB ID	R4105-8581		R4106-8681		R4107-8781		R4107-8881								
PU 339/340 7/12/93	101.9	%	$6.72E^{-3}$	uc/ml	$5.64E^1$	uc/gm	$5.49E^1$	uc/gm	$5.57E^1$	uc/gm	2.70				
LAB ID	R4105-8582		R4106-8682		R4107-8782		R4107-8882								
Am 241	101.34	%	$1.29E^{-2}$	uc/ml	$3.58E^1$	uc/gm	$3.63E^1$	uc/gm	$3.61E^1$	uc/gm	1.39				

UNC-SD-UM-BF-04A
REV 1

SAMPLE STATUS REPORT FOR R 4108. VOGEL STD TIME: 8/ 2/93 15:19
DISPATCHED: 6/30/93 13:32 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 7/ 6/93 8:29

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
1250	AT/AEA	1.04500E 02 % RECOVERY			E11456
5530	GEA	1.01000E 02 % RECOVERY Cs-137	N	Y	E11456
5530	GEA	1.00000E 02 % RECOVERY Co-60	N	Y	E11456
5540	U	1.00990E 02 % RECOVERY	N	Y	E11456
5581	Pu239/40	OUT FOR RERUN			E11456
5581	Pu239/40	OUT FOR RERUN			E11456
5581	Pu239/40	1.01100E 02 % RECOVERY	N	Y	E11456
5582	Am241	OUT FOR RERUN			E11456
5582	Am241	1.14100E 02 % RECOVERY	N	Y	E11456

END OF REPORT

REV 1

SAMPLE STATUS REPORT FOR R 4109. VOGEL BLK TIME: 8/ 2/93 15:19
 DISPATCHED: 6/30/93 13:33 SAMPLE HAS NOT BEEN SLURPED
 RECEIVED: 7/ 6/93 8:29

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
1250	AT/AEA	4.56000E-06 uCi/ML			E11456
5630	GEA	2.42000E-04 uCi/ML	N	Y	E11456
5640	U	< 9.54000E-01 uG/ML	N	Y	E11456
5681	Pu239/40	OUT FOR RERUN			E11456
5681	Pu239/40	OUT FOR RERUN			E11456
5681	Pu239/40	< 2.65000E-04 uCi/ML	N	Y	E11456
5682	Am241	OUT FOR RERUN			E11456
5682	Am241	< 1.29000E-03 uCi/ML	N	Y	E11456

END OF REPORT

SAMPLE STATUS REPORT FOR R 4110. VOGEL 937046L TIME: 8/ 2/93 15:19
DISPATCHED: 6/30/93 13:37 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 7/ 6/93 8:29

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
1250	AT/AEA	4.79000E-03 uCi/ML			E11456
1250	AT/AEA	5.03000E-3 Uci/ML			E11456
5730	GEA	1.43000E-02 uCi/ML	N	Y	E11456
5740	U	7.12000E 00 uG/ML	N	Y	E11456
5781	Pu239/40	OUT FOR RERUN			E11456
5781	Pu239/40	OUT FOR RERUN			E11456
5781	Pu239/40	3.37000E-03 uCi/ML	N	Y	E11456
5782	Am241	OUT FOR RERUN			E11456
5782	Am241	2.36000E-03 uCi/ML	N	Y	E11456
5830	GEA	1.43000E-02 uCi/ML	N	Y	E11456
5840	U	9.54000E 00 uG/ML	N	Y	E11456
5881	Pu239/40	OUT FOR RERUN			E11456
5881	Pu239/40	OUT FOR RERUN			E11456
5881	Pu239/40	3.42000E-03 uCi/ML	N	Y	E11456
5882	Am241	OUT FOR RERUN			E11456
5882	Am241	2.73000E-03 uCi/ML	N	Y	E11456

END OF REPORT

SAMPLE STATUS REPORT FOR R 4105. VOGEL STD TIME: 7/30/93 9:46
DISPATCHED: 6/30/93 13:17 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 7/ 9/93 9:47

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
8530	GEA	9.96000E 01 % RECOVERY Cs-137	N	Y	E11456
8530	GEA	9.99000E 01 % RECOVERY Co-60	N	Y	E11456
8540	U	1.01000E 02 % RECOVERY	N	Y	E11456
8540	U	1.00990E 02 % RECOVERY	N	Y	E11456
8581	Pu239/40	OUT FOR RERUN			E11456
8581	Pu239/40	1.01900E 02 % RECOVERY	N	Y	E11456
8582	Am241	1.01340E 02 % RECOVERY	N	Y	E11456

END OF REPORT

SAMPLE STATUS REPORT FOR R 4106. VOGEL BLK TIME: 7/30/93 9:46
DISPATCHED: 6/30/93 13:24 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 7/ 9/93 9:47

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
1250	AT/AEA	1.22E-04Am241 2.50E-04PU239 3.01E-05uCi/ML	Np237		E11456
8600	ACD DGST	COMPLETED			E11456
8630	GEA	< 5.55000E-04 uCi/ML Am-241	N	Y	E11456
8630	GEA	< 1.61000E-04 uCi/ML Co-60	N	Y	E11456
8630	GEA	< 1.73000E-04 uCi/ML Cs-134	N	Y	E11456
8630	GEA	< 1.48000E-04 uCi/ML Cs-137	N	Y	E11456
8630	GEA	< 5.04000E-04 uCi/ML Eu-154	N	Y	E11456
8630	GEA	< 3.81000E-04 uCi/ML Eu-155	N	Y	E11456
8630	GEA	< 2.96000E-04 uCi/ML Zr-95	N	Y	E11456
8640	U	1.92000E 03 uG/ML	N	Y	E11456
8640	U	7.56000E 01 uG/ML < 7.56E+1 done	N	Y	E11456
8681	Pu239/40	OUT FOR RERUN			E11456
8681	Pu239/40	< 6.72000E-03 uCi/ML	N	Y	E11456
8682	AM241	< 1.29000E-02 uCi/ML	N	Y	E11456

END OF REPORT

SAMPLE STATUS REPORT FOR R 4107. VOGEL 937046S TIME: 7/30/93 9:46
DISPATCHED: 6/30/93 13:28 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 7/ 9/93 9:50

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
1250	AT/AEA	4.07E-01 uCi/ML PU239 3.28E-01 uCi/ML Am241			E11456
8700	ACD DGST	1.03760E 01 G/L	N	Y	E11456
8730	GEA	4.07000E 01 uCi/G Rec Am-241	N	Y	E11456
8730	GEA	3.22000E 00 uCi/G Rec Co-60	N	Y	E11456
8730	GEA	2.16000E-01 uCi/G Rec Cs-134	N	Y	E11456
8730	GEA	2.16000E 02 uCi/G Rec Cs-137	N	Y	E11456
8730	GEA	7.39000E 00 uCi/G Rec Eu-154	N	Y	E11456
8730	GEA	4.18000E 00 uCi/G Rec Eu-155	N	Y	E11456
8730	GEA	6.08000E-01 uCi/G Rec Zr-95	N	Y	E11456
8740	U	OUT FOR RERUN			E11456
8740	U	2.01000E-01 G/G Rec	N	Y	E11456
8781	Pu239/40	OUT FOR RERUN			E11456
8781	Pu239/40	5.64000E 01 uCi/G Rec	N	Y	E11456
8782	Am241	3.58000E 01 uCi/G Rec	N	Y	E11456
8830	GEA	4.10000E 01 uCi/G Rec Am-241	N	Y	E11456
8830	GEA	3.32000E 00 uCi/G Rec Co-60	N	Y	E11456
8830	GEA	< 5.27000E-02 uCi/G Rec Cs-134	N	Y	E11456
8830	GEA	2.19000E 02 uCi/G Rec Cs-137	N	Y	E11456
8830	GEA	7.62000E 00 uCi/G Rec Eu-154	N	Y	E11456
8830	GEA	4.16000E 00 uCi/G Rec Eu-155	N	Y	E11456
8830	GEA	5.39000E-01 uCi/G Rec Zr-95	N	Y	E11456
8840	U	OUT FOR RERUN			E11456
8840	U	1.92000E-01 G/G Rec	N	Y	E11456
8881	Pu239/40	OUT FOR RERUN			E11456
8881	Pu239/40	5.49000E 01 uCi/G Rec	N	Y	E11456
8882	Am241	3.63000E 01 uCi/G Rec	N	Y	E11456

END OF REPORT

From: John G Kristofzski at ~WHC168 8/9/95 12:28PM (819 bytes: 19 ln)
 To: Richard E Vogel at ~WHC32
 Subject: Procedures

----- Message Contents -----

Craig

Here is a list of the procedures you requested.

Acid Digest	LA-505-159
AT/AEA	LA-548-101
AM241	LA-503-156
GEA	LA-548-121
PU239/240	LA-503-156
U	LA-925-106

Just contact Document Control and ask for white copies of the above procedures. If you have any problems give me a call. (ODC number 373-4358)

Dick

Dick, Put this list in the "data package"

john

UNDIGESTED SAMPLE ANALYSES

ANALYTICAL BATCH

Batch 1143

R 4110

9370461

AT/AEA

Direct

Instrument: UB 57 237

Procedure/ Rev: LA-548-101 A-2

Technologist: TANIA BATES

Date: 7-6-93

Starting Time: 1230

Temperature 23°C

Ending Time: 1300

Chemist: S. CATLOW

Comments:

	Description	Lab ID
1	limes	R 4108-1250
2	Bulk	R 4109-1250
3	SAMPLE	R 4110-1250
4	SAMPLE Dup.	R 4110-1250
5		
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

[illegible]

James A. Ruten 7-6-93

REV 1

30

TOTAL ALPHA AND ALPHA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

411 5552

Serial No R 4109.-1250	Sample Point VOGEL	Date 8-30-93	Time Issued 13:32	Priority 28
Determination AT/AREA	Method/Standard LA-548-101	Result Units uCi/Sample	Charge Code E11456	Remarks 0
Sample Size ? .500 ml			Customer ID BLK	
Remarks, Calculations, Results $\frac{5.07(2)}{2.22 \times 10^6} = 4.56 \times 10^{-6} \text{ uCi/ml}$ <i>Dania Bates</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	<i>Carol J. Quinn</i>	<i>D. H. Williams</i>	<i>Em. B. ...</i>	
			7-8-93	
Date 7-6-93	Time Completed 1300	Lab Unit Mgr <i>S. H. ...</i>		

#2 7-6-93 QP

R 4109 - 1250

$\frac{166-3}{30}$

TOTAL ALPHA AND ALPHA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

44 8220

Serial No R 4110.-1250	Sample Point VOGEL	Date 6-30-93	Time Issued 13:34	Priority 20
Determination AT/AEA	Method/Standard LA-548-101	Result Units uCi/Sample	Charge Code E11458	Remarks 0
Sample Size 1 mL - 5 mL → ? .500 mL			Customer ID 937048L	
Remarks, Calculations, Results <u>Sample</u> $5.03 \times 10^{-3} \text{ uCi/L}$ 38% uCi/L, 25% 61% uCi/L <u>Daniel Bator</u>				
Analyst - 1	Analyst - 2 <i>DM Milian</i>	Analyst - 3 <i>Em Busch</i>	Analyst - 4	Analyst - 5
Ins	Ins	Ins 7-7-93	Ins	Ins
Date 7-6-93	Time Completed 1300	Lab Unit No <i>ACells</i> 7/9		

#2 7-6-93 DM
1 mL - 5 mL

R 4110 -1250

14042 -3
30

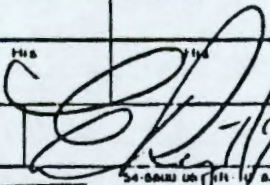
$$\frac{930.1 (12)}{2.224106} = 5.03 \times 10^{-3}$$

TOTAL ALPHA AND ALPHA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

4.3 7001

Serial No R 4110.-1250	Sample Point VOGEL	Date 8-30-93	Time Issued 13:34	Priority 20
Determination AT/AEA	Method/Standard LA-548-101	Result Units uCi/sample	Charge Code E11458	Reruns 0
Sample Size 1 mL - 5 mL → ? 1,500 mL			Customer ID 937046L	
Remarks, Calculations, Results Duplicate $4.79 \times 10^{-3} \text{ uCi/mL}$ 33% 22% 24% 54% 22% 14% 12% 11% Sanjour Ratio				
Analyst - 1	Analyst - 2 D. H. H. H.	Analyst - 3 E. H. H. H.	Analyst - 4	Analyst - 5
Ins	Ins	Ins	Ins	Ins
Date 7-6-93	Time Completed 13:08	Lab Unit Mgr S. H. H. H.		

T.B. 7-6-93

#1 7-6-93 DM
1 mL - 5 mL
 $\frac{13452}{30} = 5$

R 4110 - 1250

$$\frac{586.8 (12)}{2.2 \times 10^6} = 4.79 \times 10^{-3} \text{ uCi/mL}$$

AJ Johnson

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4108-1250
File ID: SD2033.SPC

BEST AVAILABLE COPY

Counted on: 7/ 7/93 @ 5: 0
Detector/Geometry number: 2/ 1
Count time: 7000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	14183.3	14356.7	301.350	301.350	24.000	20.609	12.000	7.398
2	89665.3	91073.2	228.100	228.100	24.000	19.046	12.000	6.626

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Th228	0.1383	5.430	5.474	-0.044	0.09	1505.56	11190.02	0.504E-02
	Am241		5.480	5.474	0.006				0.381E-02
2	Pu239	0.8617	5.143	5.137	0.006	0.09	9379.94	49498.34	0.223E-01
	Pu240		5.144	5.137	0.007				0.223E-01

DETECTOR CALIBRATION

Energy(MEV) = 4.088 + (0.0046)*Channel
Energy range (MeV): 4.088 TO 6.443
Efficiency = 0.1895 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	1288515.0	100.000
Smoothed	1288477.5	99.997
Composite fit	1269974.3	98.561
Residuals	18502.5	1.436

Analyzed by: _____

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 26 TO 37 .

BEST AVAILABLE COPY

The diagram consists of several horizontal lines. The top line has a '2' at the left end, followed by a dot, then another '2', and then a series of dots. Below this, there are more lines with dots and '2's, creating a pattern that suggests a sequence or a path. The lines are arranged in a way that they appear to be part of a larger structure, possibly a graph or a diagram of a process.

$$\begin{array}{ccccccccccc} 1 & & & & & & & & & & \\ ..1 & & & & & & & & & & \\1 & & & & & & & & & & \\1 & & & & & & & & & & 1 \\1 & & & & & & & & & & \\ .1 & & & & & & & & & & \end{array}$$

BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD2033.SPC

1	0.	0.	0.	0.	0.	38.	28.	38.	35.	40.
11	49.	48.	44.	47.	59.	45.	59.	49.	70.	63.
21	56.	58.	59.	54.	62.	58.	61.	70.	70.	66.
31	49.	68.	66.	67.	62.	71.	55.	66.	67.	63.
41	69.	68.	68.	84.	92.	87.	72.	77.	62.	77.
51	78.	78.	85.	89.	108.	79.	78.	75.	88.	89.
61	90.	72.	79.	78.	78.	93.	94.	91.	84.	102.
71	106.	103.	86.	107.	102.	106.	95.	108.	115.	103.
81	115.	96.	91.	99.	105.	99.	117.	112.	112.	109.
91	122.	129.	120.	141.	112.	135.	154.	125.	129.	117.
101	155.	112.	127.	140.	110.	150.	144.	142.	136.	144.
111	141.	144.	176.	131.	158.	167.	181.	168.	176.	183.
121	187.	157.	172.	184.	205.	192.	195.	180.	204.	179.
131	234.	182.	228.	225.	190.	214.	217.	238.	248.	249.
141	229.	229.	282.	259.	275.	262.	300.	271.	295.	346.
151	330.	311.	328.	340.	344.	416.	418.	395.	399.	397.
161	436.	438.	499.	494.	540.	521.	546.	575.	643.	663.
171	617.	647.	719.	742.	759.	792.	858.	879.	927.	968.
181	1013.	1059.	1145.	1183.	1247.	1344.	1382.	1455.	1625.	1649.
191	1810.	1967.	2172.	2355.	2478.	2768.	3128.	3359.	3729.	4161.
201	4657.	5206.	5818.	6474.	7337.	8177.	9317.	10535.	11929.	13377.
211	14981.	16793.	19124.	21231.	23787.	26277.	28700.	31368.	34197.	37291.
221	40030.	42804.	44924.	46586.	47715.	48359.	48646.	48208.	46178.	43867.
231	40483.	36911.	33070.	28280.	23991.	20114.	16099.	12540.	9616.	7257.
241	5223.	3629.	2472.	1759.	1106.	734.	543.	332.	282.	177.
251	148.	165.	157.	143.	141.	163.	211.	187.	236.	205.
261	224.	234.	255.	312.	306.	322.	352.	365.	438.	495.
271	563.	562.	650.	693.	777.	959.	962.	1098.	1237.	1462.
281	1619.	1721.	2095.	2289.	2582.	3006.	3349.	3544.	4066.	4585.
291	4943.	5330.	5830.	6257.	6647.	7045.	7262.	7653.	7653.	7667.
301	7633.	7385.	7036.	6559.	6124.	5459.	4773.	4103.	3495.	2909.
311	2355.	1907.	1411.	1088.	871.	618.	440.	327.	248.	163.
321	127.	82.	54.	21.	20.	12.	9.	4.	1.	0.
331	1.	0.	1.	1.	0.	0.	0.	0.	1.	0.
341	0.	0.	0.	1.	2.	1.	1.	0.	0.	0.
351	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
361	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
371	0.	0.	1.	0.	1.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
391	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.
401	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	1.	0.	0.	0.	0.	0.	0.	1.
431	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	2.	0.	1.	0.	0.	0.	0.	0.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	1.								

GENERAL ALPHA ENERGY ANALYSIS

Rev. 1.10

DATA REDUCTION REPORT

SAMPLE

R-4109-1250

File ID: SD5552.SPC

BEST AVAILABLE COPY

Counted on: 7/ 6/93 @18: 0
 Detector/Geometry number: 5/ 1
 Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	8.1	3.8	304.446	304.446	32.000	48.816	16.000	13.612
2	8.8	8.6	277.060	277.060	28.000	27.837	14.000	3.614
3	8.2	6.7	229.783	229.783	20.000	19.724	10.000	0.584
4	1.4	1.3	116.651	116.651	8.000	0.917	4.000	11.441

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity	
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	uCi/ea	
1	Am241	0.1078	5.480	5.472	0.008	0.22	0.14	0.00	0.958E-11	
	Pu238		5.499	5.472	0.027				0.125E-10	
2		0.2874		5.346		0.13	0.37	0.00	0.240E-10	
3	Pu239	0.6002	5.143	5.128	0.015	0.09	0.76	0.00	0.501E-10	
	Pu240		5.144	5.128	0.016				0.501E-10	
4		0.0046		4.608		0.00	0.01	0.00	0.384E-12	

DETECTOR CALIBRATION

Energy(MEV) = 4.071 + (0.0046)*Channel

Energy range (MeV): 4.071 TO 6.426

Efficiency = ***** CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	609.0	100.000
Smoothed	608.9	99.991
Composite fit	636.0	104.440
Residuals	-27.1	-4.452

Analyzed by: _____

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

38.7

WHC-SD-WM-DP-044
REV 1



BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD5552.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	1.	1.	1.	0.	0.	0.
31	0.	0.	0.	0.	0.	1.	0.	1.	0.	0.
41	1.	1.	1.	0.	1.	0.	0.	0.	1.	0.
51	0.	0.	0.	1.	1.	0.	0.	1.	1.	1.
61	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
71	0.	0.	0.	1.	1.	0.	1.	1.	0.	0.
81	0.	0.	0.	0.	1.	0.	0.	0.	1.	1.
91	0.	0.	1.	1.	0.	1.	2.	0.	1.	0.
101	1.	1.	2.	0.	0.	0.	0.	1.	1.	1.
111	0.	2.	1.	3.	4.	4.	1.	1.	1.	0.
121	1.	2.	1.	1.	1.	0.	0.	0.	0.	1.
131	0.	0.	0.	4.	2.	3.	1.	3.	0.	2.
141	1.	1.	1.	1.	3.	1.	1.	2.	1.	2.
151	1.	5.	3.	1.	2.	3.	1.	3.	5.	3.
161	2.	2.	1.	1.	2.	2.	2.	1.	5.	6.
171	0.	2.	3.	0.	2.	2.	1.	4.	3.	3.
181	4.	3.	1.	4.	4.	4.	3.	1.	2.	2.
191	5.	2.	3.	3.	3.	2.	4.	2.	2.	5.
201	0.	3.	5.	0.	7.	4.	3.	0.	2.	2.
211	2.	2.	6.	3.	5.	4.	3.	3.	5.	1.
221	1.	0.	4.	5.	5.	10.	7.	3.	2.	5.
231	10.	2.	7.	3.	2.	2.	3.	2.	1.	4.
241	3.	2.	3.	0.	2.	2.	1.	1.	3.	4.
251	2.	2.	0.	2.	5.	1.	2.	3.	5.	4.
261	3.	1.	2.	2.	4.	4.	3.	3.	2.	5.
271	4.	7.	7.	4.	5.	3.	4.	6.	7.	4.
281	4.	3.	2.	5.	3.	6.	2.	3.	3.	2.
291	3.	3.	2.	2.	1.	3.	1.	2.	0.	1.
301	2.	1.	3.	6.	0.	1.	3.	1.	1.	1.
311	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
331	0.	1.	0.	1.	1.	1.	0.	0.	0.	0.
341	2.	1.	0.	0.	0.	0.	1.	0.	0.	2.
351	2.	2.	2.	1.	3.	0.	0.	2.	2.	0.
361	1.	1.	1.	0.	0.	0.	0.	0.	0.	1.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
421	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.
431	0.	1.	2.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	1.	0.	0.	0.	1.	0.	0.	1.
481	0.	0.	1.	0.	4.	1.	0.	2.	1.	0.
491	0.	0.	1.	0.	0.	0.	1.	0.	0.	0.
511	0.	0.								

GENERAL ALPHA ENERGY ANALYSIS

Rev. 1.10

DATA REDUCTION REPORT

SAMPLE

R-4110-1250

File ID: SD8220.SPC

BEST AVAILABLE COPY

Counted on: 7/ 6/93 @18: 0
 Detector/Geometry number: 8/ 1
 Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	4.0	3.0	364.874	364.874	16.000	20.881	8.000	0.877
2	887.3	894.5	298.271	298.271	28.000	24.106	14.000	2.002
3	1135.4	1089.6	227.251	227.251	28.000	25.113	14.000	1.442

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Cm244	0.0022	5.796	5.780	0.016	0.10	0.29	1.39	0.624E-06
	Cm243		5.786	5.780	0.006				0.855E-06
2	Th228	0.3840	5.430	5.467	-0.037	0.11	50.51	345.18	0.155E-03
	Am241		5.480	5.467	0.013				0.117E-03
3	Pu239	0.6138	5.143	5.134	0.009	0.12	80.74	391.75	0.176E-03
	Pu240		5.144	5.134	0.010				0.176E-03

DETECTOR CALIBRATION

Energy(MEV) = 4.065 + (0.0047)*Channel

Energy range (MeV): 4.065 TO 6.472

Efficiency = 0.2061 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	71560.0	100.000
Smoothed	71560.0	100.000
Composite fit	65767.2	91.905
Residuals	5792.8	8.095

Analyzed by: _____

5148.5

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

3

[illegible]

A large, complex dot pattern forming a triangular shape, composed of many small dots arranged in rows. The pattern is dense and intricate, resembling a stylized letter 'A' or a large 'X' made of dots.

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Raw Data Dump for AEA Spectrum: SP:SD8220.SPC									
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	1.	26.	45.	54.	64.	68.	69.
21	70.	74.	72.	75.	73.	65.	65.	73.	75.
31	71.	68.	83.	87.	84.	65.	87.	83.	71.
41	85.	85.	87.	80.	86.	85.	75.	87.	82.
51	92.	82.	92.	87.	80.	89.	86.	105.	93.
61	93.	95.	102.	105.	96.	96.	102.	106.	111.
71	104.	95.	111.	111.	121.	105.	109.	99.	101.
81	137.	115.	119.	134.	106.	134.	120.	121.	113.
91	106.	137.	120.	112.	129.	116.	110.	127.	149.
101	127.	143.	121.	145.	134.	138.	134.	144.	130.
111	132.	152.	153.	153.	154.	143.	164.	168.	160.
121	132.	162.	144.	163.	171.	162.	152.	155.	162.
131	183.	190.	167.	186.	165.	199.	179.	190.	195.
141	172.	191.	207.	223.	208.	201.	193.	223.	214.
151	206.	192.	209.	205.	227.	208.	225.	233.	212.
161	224.	251.	261.	255.	240.	246.	258.	268.	240.
171	241.	270.	251.	280.	252.	283.	298.	285.	277.
181	302.	340.	303.	310.	298.	305.	317.	330.	356.
191	348.	369.	379.	342.	362.	391.	352.	378.	380.
201	406.	380.	421.	370.	473.	446.	493.	454.	498.
211	465.	469.	496.	519.	517.	503.	571.	589.	609.
221	638.	665.	637.	712.	680.	656.	712.	674.	657.
231	625.	603.	509.	498.	468.	368.	343.	305.	294.
241	190.	179.	202.	164.	174.	192.	158.	181.	179.
251	158.	207.	179.	196.	204.	204.	178.	211.	201.
261	220.	231.	220.	210.	212.	217.	239.	227.	233.
271	223.	261.	224.	266.	266.	267.	293.	324.	323.
281	309.	348.	332.	348.	352.	337.	389.	399.	374.
291	391.	437.	441.	432.	464.	451.	480.	475.	427.
301	418.	398.	406.	348.	311.	270.	201.	187.	166.
311	94.	67.	49.	30.	26.	24.	13.	5.	11.
321	0.	2.	1.	2.	0.	3.	1.	0.	1.
331	2.	0.	1.	0.	1.	3.	0.	4.	0.
341	0.	0.	0.	1.	0.	0.	1.	0.	2.
351	1.	1.	2.	1.	1.	2.	2.	1.	0.
361	2.	3.	1.	3.	4.	2.	2.	0.	0.
371	0.	0.	1.	1.	1.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	1.	0.	0.	0.	0.	0.	1.	0.
411	0.	0.	0.	0.	0.	1.	0.	1.	0.
421	1.	0.	0.	0.	0.	1.	1.	1.	2.
431	0.	1.	0.	0.	2.	0.	0.	1.	1.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	1.
481	1.	1.	0.	1.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.							

GENERAL ALPHA ENERGY ANALYSIS

Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R-4110-1250 DUP
File ID: SD7001.SPC

BEST AVAILABLE COPY

Counted on: 7/ 6/93 @18: 0
Detector/Geometry number: 7/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	752.2	765.0	297.755	297.755	28.000	24.582	14.000	2.225
2	950.0	930.4	226.916	226.916	28.000	25.536	14.000	1.527
3	135.7	122.2	94.103	94.103	100.000	444.073	50.000	4.871

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid			FWHM	Count Rate c/m	d/m	Activity uCi/ea
			Exp.	Obs.	Diff.				
1	Pu238	0.3292	5.499	5.499	-0.000	0.12	40.63	323.16	0.146E-03
	Am241		5.480	5.499	-0.019				0.111E-03
2	Pu239	0.5431	5.143	5.167	-0.024	0.12	67.02	383.87	0.173E-03
	Pu240		5.144	5.167	-0.023				0.173E-03
3	U 235	0.1277	4.396	4.542	-0.146	2.09	15.77	158.42	0.714E-04
	Np237		4.640	4.542	0.098				0.678E-03

DETECTOR CALIBRATION

Energy(MEV) = 4.100 + (0.0047)*Channel
Energy range (MeV): 4.100 TO 6.506
Efficiency = 0.1746 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	60317.0	100.000
Smoothed	60317.0	100.000
Composite fit	61707.3	102.305
Residuals	-1390.3	-2.305

Analyzed by: _____

BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD7001.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	1.	23.	41.	63.	69.	74.	74.	65.
21	64.	61.	75.	67.	82.	55.	69.	61.	64.	63.
31	67.	76.	64.	75.	56.	78.	68.	84.	68.	75.
41	76.	71.	77.	74.	72.	90.	83.	105.	92.	78.
51	80.	81.	73.	87.	74.	90.	82.	80.	86.	94.
61	90.	74.	90.	87.	99.	95.	102.	95.	90.	109.
71	76.	96.	89.	90.	115.	109.	105.	102.	83.	137.
81	106.	111.	106.	105.	109.	125.	116.	116.	104.	115.
91	148.	119.	133.	132.	109.	109.	124.	119.	106.	119.
101	115.	104.	126.	112.	131.	116.	129.	134.	147.	121.
111	131.	124.	130.	134.	142.	160.	130.	156.	138.	122.
121	123.	141.	147.	134.	159.	136.	144.	134.	141.	148.
131	131.	143.	149.	142.	177.	145.	169.	147.	150.	152.
141	151.	168.	151.	151.	152.	158.	166.	145.	164.	198.
151	174.	185.	195.	193.	190.	189.	164.	191.	197.	165.
161	184.	197.	197.	178.	223.	202.	240.	215.	200.	185.
171	207.	204.	222.	229.	202.	204.	234.	199.	222.	248.
181	239.	261.	252.	229.	230.	248.	263.	266.	253.	275.
191	261.	307.	286.	339.	297.	302.	298.	308.	326.	351.
201	354.	338.	368.	348.	353.	385.	377.	399.	358.	358.
211	389.	458.	434.	457.	470.	481.	479.	482.	519.	576.
221	493.	537.	569.	576.	528.	561.	547.	559.	553.	545.
231	507.	449.	469.	401.	334.	285.	325.	215.	197.	179.
241	195.	156.	142.	148.	160.	126.	127.	157.	127.	133.
251	138.	140.	153.	163.	154.	156.	144.	149.	174.	165.
261	168.	181.	171.	184.	196.	183.	204.	198.	184.	207.
271	195.	207.	230.	215.	222.	222.	252.	229.	239.	256.
281	268.	272.	297.	285.	315.	327.	282.	333.	320.	373.
291	377.	367.	382.	423.	341.	387.	386.	376.	392.	399.
301	353.	366.	283.	288.	230.	236.	168.	146.	106.	100.
311	65.	52.	36.	30.	28.	13.	15.	14.	9.	4.
321	1.	6.	2.	1.	1.	0.	1.	0.	0.	1.
331	2.	0.	1.	2.	1.	1.	0.	0.	2.	1.
341	1.	1.	1.	0.	0.	1.	0.	2.	0.	2.
351	1.	3.	1.	2.	0.	1.	3.	1.	3.	0.
361	2.	2.	1.	0.	2.	3.	2.	0.	2.	1.
371	0.	0.	1.	0.	0.	0.	1.	0.	1.	0.
381	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
391	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	1.	0.	0.	0.	1.	1.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	1.	0.	0.	0.	1.	1.	1.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 1
STD VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 10
TODAY'S DATE: 08/18/92
DECAY CORR'N: 2.552 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
243204	5	48631	307	48938	0.4987
243913	5	48773	309	49082	0.5002
244771	5	48944	311	49256	0.5020
243758	5	48742	309	49050	0.4999
243766	5	48743	309	49052	0.4999
243637	5	48717	309	49026	0.4996
243514	5	48693	308	49001	0.4994
243765	5	48743	309	49052	0.4999
243849	5	48760	309	49069	0.5001
244044	5	48799	310	49108	0.5005
FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5020				
MIN	0.4987	48754	309	49063	0.5000

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BEST AVAILABLE COPY

APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 2
STD VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 10
TODAY'S DATE: 08/20/92
DECAY CORR'N: 2.557 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242703	5	48531	306	48837	0.4977
243638	5	48718	309	49026	0.4996
243386	5	48667	308	48975	0.4991
243764	5	48743	309	49052	0.4999
244275	5	48845	310	49155	0.5009
244108	5	48812	310	49121	0.5006
244275	5	48845	310	49155	0.5009
243645	5	48719	309	49028	0.4996
243015	5	48593	307	48900	0.4983
244057	5	48801	310	49111	0.5005
243516	5	48693	308	49001	0.4994
243510	5	48692	308	49000	0.4994
243627	5	48715	309	49024	0.4996
243690	5	48728	309	49037	0.4997
243901	5	48770	309	49079	0.5002
244466	5	48883	311	49194	0.5013

FOR	16 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5013				
MIN	0.4977	48735	309	49043	0.4998

DET #	1	2	3	4	5	6	7	8	JUPITER II				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT EMB / G	Np	83	151		148	156		152	154		156		153
	Pu	111	231		228	235		231	232		233		231
DATE 7-3-93	Am	138	304		300	309		303	303		304		302
	Cm	162	371		368	376		370	370		371		370
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT EMB A/G	Np	83	152		149	153		151	154		156		153
	Pu	112	231		228	234		230	231		233		231
DATE 7-4-93	Am	138	304		301	308		302	302		304		302
	Cm	162	372		369	376		369	370		371		369
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT EMB A-G	Np	82	151		147	156		153	154		157		154
	Pu	111	230		227	235		231	232		234		232
DATE 7-5-93	Am	137	303		299	308		303	303		305		303
	Cm	161	372		367	377		370	370		371		370
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT EMB A-G	Np	83	152		149	153		146	153		156		152
	Pu	112	232		229	235		225	230		233		231
DATE 7-6-93	Am	138	305		301	309		297	302		304		302
	Cm	162	373		369	377		364	369		371		370
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT EMB A-G	Np	81	151		148	155		152	154		156	149	153
	Pu	109	231		228	235		231	232		233	229	231
DATE 7-7-93	Am	135	303		300	308		302	303		304	301	302
	Cm	159	371		368	377		368	370		371	371	369
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT EMB A-G	Np	83	151		146	156		152	154		153		150
	Pu	111	231		226	235		231	232		231		228
DATE 7-8-93	Am	138	304		298	309		303	303		301		299
	Cm	162	372		366	377		370	370		368		367

TE: Np (²³¹Np) peak must be at ch 150 +/- 10 (3.2 - 4.4) or ch 80 +/- 10 (3.1, 1.1 - 1.4)
 Pu (²³⁹Pu) peak must be at ch 229 +/- 10 (3.2 - 4.4) or ch 113 +/- 10 (3.1, 1.1 - 1.4)
 Am (²⁴¹Am) peak must be at ch 300 +/- 10 (3.2 - 4.4) or ch 139 +/- 10 (3.1, 1.1 - 1.4)
 Cm (²⁴⁴Cm) peak must be at ch 368 +/- 10 (3.2 - 4.4) or ch 160 +/- 10 (3.1, 1.1 - 1.4)

REV 1
WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-044

REV 1

Batch 1137

Lab Segment Serial No.

Customer ID:

937046 S

Analysis:

R 4107
AT/Aea

Sample Prep:

Direct

Instrument: WB57237

Procedure/ Rev: LA-548-101 (A-2)

Technologist: SUE LAI (Sue Lai)

Date: 7-9-93

Starting Time: 10:00

Temperature 25°C

Ending Time: 11:30

Chemist: S. catlow

Comments:

	Description	Lab ID
1	STD	R4105-1250
2	Blank	R4106-1250
3	Sample	R4107-1250
4	Duplicate sample	R4107-1250
5		
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LHC5	37B43 (100-10-25)			
				41

TOTAL ALPHA AND ALPHA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#1 7014 + 577015

Serial No. ①	Sample Point 1	Date	Time Issued	Priority
R 4105.-1250	VOGEL	6-30-93	13:16	28
Determination	Method Standard	Revised by	Charge Code	Returns
AT/AEA	LA-548-101	% R2 R-F-B AGI/Sample	E11456	0
Sample Size	Customer ID			
? 100-10-25	STD			
Remarks Calculations Results ST/VA 5.197 x 10 ¹⁰ STO: 37843 R952 Complete Deleted 2379 x 10 ¹⁰ nei/mL 2.38 x 10 ⁴ nei/L 1.340 LPE x 40400/1000 = 5.334E dpm/L 239 P, 85.9% 2.044 x 10 ¹⁰ nei/mL 241 Am 14.1% 3.354 nei/mL 5.334E 5.197E 102670				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	AT Johnson	Raymond	CHAMBERLAIN	
	7-9-93 1430	7-10-93		
Date	Time Completed	Lab Invt Mgt		
7-9-93	11:30	Rated	7/14	

34 6800-101 10-831

#1 7-9-93 AG R4105-1250

①

$$\frac{33226}{114365} - 6 = 6639.2 \text{ o/m} / .5 = 13278.4 \text{ o/m}$$

②

$$\frac{32848}{114365} - 6 = 6563.6 \text{ o/m} / .5 = 13127.2$$

AVG 13202.8
 4040
 D.F. = 4000/13202.8
 AVG. 13202.8 o/m 13202.8
 23.79 nei/mL
 23.788 nei/mL Ch 13202.8
 AVG. 13202.8 o/m 24.027 nei/mL

TOTAL ALPHA AND ALPHA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

***2 5526**

Serial No R 4106.-1250	Sample Point VOGEL	Date 6-30-93	Time Issued 13:18	Priority 20
Determination AT/AEA	Method Standard LA-548-101	Result Units uCi/sample	Charge Code E11456	Returns 0
Sample Size ? 252			Customer ID BLK	
Remarks Calculations Results Blank				
4.018 x 10⁻⁴ uCi/mL 30.3% ²⁴¹Am 1.22 x 10⁻⁴ uCi/mL 4.02 x 10⁻¹ uCi/L 62.2% ²³⁹Pu 2.50 x 10⁻⁴ uCi/mL 7.57% ²³⁹Np 3.01 x 10⁻⁴ uCi/mL See Lab				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
Pls	Pls	Pls	Pls	Pls
	7-9-93	7-10-93		
Date	Time Completed	Lab Unit Mgr		
7-7-93	11:30	<i>[Signature]</i>	7/14	

#2 7-7-93 AG R4106-1250

①

$$\frac{343}{30} - 3 = 8.433 \text{ c/m} / .5 = 16.87 \text{ d/m}$$

② ~~see~~

$$\frac{506}{30} - 3 = 13.867 \text{ c/m} / .5 = 27.733 \text{ d/m}$$

AVG. 22.301 d/m

4.018 x 10⁻⁴ uCi/mL

TOTAL ALPHA AND ALPHA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#1 2047		#2 4648			
Serial No	Sample Point	Date	Time Issued	Priority	
R 4107-1250	VOGEL	6-30-93	13:24	20	
Determination	Method Standard	Result Units	Charge Code	Returns	
AT/AEA	LA-548-101	uCi/gram	E11458	0	
Sample Size	Customer ID				
252	937046S				
Remarks Calculations Results					
<u>Sample</u> $8.937 \times 10^{-1} \mu\text{Ci/mL}$ $8.43 \times 10^2 \mu\text{Ci/L}$ $8.44 \times 10^2 \mu\text{Ci/L}$ <u>See Lab</u> $4.59 \times 10^{-1} \mu\text{Ci/mL}$ 51.4% Pu²³⁹ 47.5% Am²⁴¹ $4.25 \times 10^{-1} \mu\text{Ci/mL}$					
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5	
	AP Johnson	D.H. Kistner			
Pos	Pos	Pos	Pos	Pos	
	7-9-93				
	14:00				
Date	Time Completed	Lab Unit Mgr			
7-9-93	11:30	P. Seun			

#3 7-9-93 R4107-1250

$$\frac{114242}{5} - 6 = 22842.4 \text{ c/m} / .5 = 4.568 \times 10^4 \text{ d/m}$$

$$\frac{133838}{5} - 6 = 26761.6 \text{ c/m} / .5 = 5.352 \times 10^4 \text{ d/m}$$

Avg. $4.960 \times 10^4 \text{ d/m}$ $8.937 \times 10^{-1} \mu\text{Ci/mL}$

TOTAL ALPHA AND ALPHA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#8 8234 + #8 8235 #8 8237

Serial No R 4107.-1250	Sample Point VOGEL	Date 6-30-93	Time Issued 13:24	Priority 20
Determination AT/AEA	Method Standard LA-548-101	Result Units uCi/sample	Charge Code E11456	Returns 0
Sample Size ? 252			Customer ID 937046S	
Remarks Calculations Results Duplicate				
		$7.604 \times 10^{-1} \mu\text{Ci/mL}$	$4.07 \times 10^{-1} \mu\text{Ci/mL}$	
		$7.60 \times 10^2 \mu\text{Ci/L}$	53.5% Pu²³⁹	
			43.2% Am²⁴¹	
			$3.28 \times 10^{-1} \mu\text{Ci/mL}$	
Analyst - 1	Analyst - 2 <i>[Signature]</i>	Analyst - 3 <i>[Signature]</i>	Analyst - 4 <i>[Signature]</i>	Analyst - 5
	7-9-93	7-10-93		
	1430			
Date 7-9-93	Time Completed 11:30	Lab Unit Mgr <i>[Signature]</i>	<i>[Signature]</i>	

#3 7-9-93 *[Signature]*

R 4107-1250

① $\frac{136180}{5} - 6 = 26030 \text{ c/m} \quad 1.5 = 52060 \text{ d/m}$

② $\frac{80887}{5} - 6 = 16171.4 \text{ c/m} \quad 3.234 \times 10^4 \text{ d/m}$

At $4.22 \times 10^4 \text{ d/m} \quad 7.604 \times 10^{-1} \mu\text{Ci/mL}$

D. H. Milicia
7-11-93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4105-1250 VOGEL#1
File ID: SD7015.SPC

BEST AVAILABLE COPY

Counted on: 7/10/93 @22: 0
Detector/Geometry number: 7/ 1
Count time: 7000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	4381.5	4404.3	301.372	301.372	20.000	14.040	10.000	6.284
2	27717.9	28218.6	228.925	228.925	20.000	12.208	10.000	5.488
3	9.1	8.6	33.363	33.363	40.000	39.664	20.000	20.401

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid				Count		Activity uCi/ea
			Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Pu238	0.1410	5.499	5.486	0.013	0.07	378.15	2990.94	0.135E-02
	Am241		5.480	5.486	-0.006				0.103E-02
2	Pu239	0.8586	5.143	5.146	-0.003	0.06	2302.64	13113.01	0.591E-02
	Pu240		5.144	5.146	-0.002				0.591E-02
3	U 238	0.0004	4.200	4.227	-0.027	0.19	1.10	8.13	0.366E-05

DETECTOR CALIBRATION

Energy(MEV) = 4.070 + (0.0047)*Channel
Energy range (MeV): 4.070 TO 6.476
Efficiency = 0.1756 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	313360.0	100.000
Smoothed	313360.0	100.000
Composite fit	312887.7	99.849
Residuals	472.4	0.151

Analyzed by: _____
VR

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 46 TO 66.

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

WHC-SD-WM-DP-044
REV 1

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BEST AVAILABLE COPY

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD7015.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	1.	2.	1.	2.	3.	1.	6.
21	4.	7.	3.	6.	6.	7.	3.	2.	1.	6.
31	5.	3.	6.	2.	8.	4.	3.	4.	2.	1.
41	3.	1.	3.	0.	3.	1.	0.	1.	1.	0.
51	4.	0.	1.	3.	1.	3.	1.	0.	1.	3.
61	0.	1.	1.	1.	2.	2.	1.	0.	3.	3.
71	0.	2.	1.	9.	3.	5.	1.	4.	6.	3.
81	2.	5.	4.	6.	4.	0.	4.	3.	4.	4.
91	4.	4.	8.	3.	1.	4.	6.	5.	5.	4.
101	9.	4.	5.	5.	5.	4.	4.	5.	5.	7.
111	7.	3.	2.	10.	6.	10.	5.	6.	12.	6.
121	9.	11.	10.	10.	9.	6.	6.	13.	10.	12.
131	12.	8.	15.	12.	11.	23.	15.	13.	9.	10.
141	17.	20.	20.	21.	17.	12.	15.	13.	23.	25.
151	18.	23.	21.	26.	20.	22.	22.	35.	26.	32.
161	36.	31.	20.	26.	38.	42.	37.	46.	60.	51.
171	59.	59.	58.	60.	55.	53.	73.	77.	68.	94.
181	85.	99.	113.	121.	128.	133.	155.	145.	171.	175.
191	210.	239.	225.	258.	303.	361.	394.	423.	503.	525.
201	587.	709.	803.	869.	1000.	1158.	1336.	1501.	1788.	2182.
211	2574.	2999.	3442.	3935.	4671.	5346.	5964.	7024.	8098.	9041.
221	10157.	10958.	12642.	13538.	14534.	15462.	15880.	16001.	15455.	14584.
231	13380.	11593.	9654.	7493.	5789.	3898.	2626.	1644.	959.	561.
241	291.	155.	88.	39.	21.	23.	15.	15.	9.	13.
251	13.	17.	16.	15.	17.	16.	20.	17.	29.	25.
261	31.	32.	28.	33.	36.	49.	49.	54.	67.	73.
271	74.	89.	111.	104.	146.	161.	166.	186.	216.	264.
281	283.	340.	373.	462.	492.	612.	693.	861.	932.	1169.
291	1192.	1449.	1564.	1771.	1907.	2072.	2210.	2390.	2397.	2509.
301	2450.	2335.	2192.	2024.	1640.	1394.	1141.	849.	638.	479.
311	339.	234.	159.	108.	72.	50.	27.	21.	10.	8.
321	5.	2.	0.	1.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
341	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
351	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
361	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	2.	2.	0.	0.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

Raymond
7.10.93

GENERAL ALPHA ENERGY ANALYSIS

Rev. 1.10

DATA REDUCTION REPORT

SAMPLE

R4105-1250 VOGEL#2

File ID: SD7014.SPC

BEST AVAILABLE COPY

Counted on: 7/10/93 @20: 0
 Detector/Geometry number: 7/ 1
 Count time: 7000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	4489.5	4507.6	302.536	302.536	24.000	13.419	12.000	6.062
2	28844.2	29015.2	230.107	230.107	20.000	11.509	10.000	5.186
3	9.6	9.0	28.205	28.205	36.000	26.543	18.000	18.143

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity	
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	uCi/ea	
1	Pu238	0.1407	5.499	5.492	0.007	0.06	379.75	3003.60	0.135E-02	
	Am241		5.480	5.492	-0.012				0.104E-02	
2	Pu239	0.8589	5.143	5.151	-0.008	0.05	2318.06	13200.78	0.595E-02	
	Pu240		5.144	5.151	-0.007				0.595E-02	
3	U 238	0.0003	4.200	4.202	-0.002	0.12	0.94	6.94	0.312E-05	

DETECTOR CALIBRATION

Energy (MeV) = 4.070 + (0.0047)*Channel

Energy range (MeV): 4.070 TO 6.476

Efficiency = 0.1756 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	317894.0	100.000
Smoothed	317894.0	100.000
Composite fit	314853.8	99.044
Residuals	3040.3	0.956

Analyzed by: _____

VR

SPECTRUM SD7014.SPC

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

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COPY

Raw Data Dump for AEA Spectrum: SP:SD7014.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	1.	3.	2.	3.	2.	1.	4.
21	4.	2.	6.	4.	10.	6.	4.	4.	4.	2.
31	7.	4.	5.	3.	4.	3.	1.	1.	0.	4.
41	4.	2.	2.	0.	0.	1.	0.	1.	0.	1.
51	3.	0.	0.	0.	1.	0.	1.	1.	1.	0.
61	1.	1.	1.	2.	3.	2.	2.	2.	2.	1.
71	0.	3.	1.	2.	4.	2.	0.	5.	5.	4.
81	0.	2.	3.	4.	2.	3.	4.	1.	6.	6.
91	4.	7.	5.	7.	5.	0.	4.	3.	3.	4.
101	7.	3.	6.	3.	5.	3.	9.	4.	4.	6.
111	7.	5.	8.	8.	12.	8.	8.	7.	7.	8.
121	7.	5.	7.	13.	9.	5.	12.	8.	8.	13.
131	6.	13.	16.	19.	11.	5.	11.	21.	14.	15.
141	20.	10.	14.	22.	20.	15.	15.	20.	21.	32.
151	22.	34.	29.	29.	35.	38.	31.	37.	29.	39.
161	46.	33.	44.	61.	53.	50.	49.	57.	72.	62.
171	73.	81.	66.	87.	89.	87.	99.	98.	101.	127.
181	130.	138.	152.	150.	162.	179.	214.	215.	226.	226.
191	243.	283.	322.	296.	360.	367.	410.	409.	517.	560.
201	627.	703.	739.	842.	954.	1036.	1234.	1321.	1586.	1780.
211	2049.	2443.	2840.	3326.	3836.	4381.	5069.	5897.	6661.	7536.
221	8709.	9868.	10918.	12529.	13693.	14813.	15929.	16574.	16578.	16371.
231	15334.	13695.	12192.	9985.	7698.	5528.	3962.	2555.	1591.	907.
241	503.	247.	120.	60.	23.	16.	11.	13.	20.	12.
251	12.	23.	29.	20.	22.	25.	26.	18.	31.	38.
261	43.	31.	47.	48.	37.	64.	54.	58.	61.	75.
271	69.	84.	99.	118.	127.	122.	144.	168.	199.	219.
281	259.	272.	330.	375.	426.	545.	600.	698.	773.	881.
291	992.	1180.	1387.	1514.	1707.	1986.	2101.	2332.	2346.	2415.
301	2639.	2531.	2465.	2333.	1995.	1742.	1404.	1132.	884.	661.
311	462.	350.	238.	149.	95.	66.	48.	21.	19.	12.
321	9.	4.	0.	2.	0.	0.	1.	0.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
341	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
351	0.	1.	0.	0.	0.	0.	1.	0.	0.	0.
361	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

D. H. Milicia
7-11-93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4106-1250 VOGEL/AT
File ID: SD5566.SPC

BEST AVAILABLE COPY

Counted on: 7/10/93 @20: 0
Detector/Geometry number: 5/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	43.5	43.9	305.728	305.728	32.000	27.577	16.000	4.368
2	103.0	105.4	233.330	233.330	24.000	20.076	12.000	3.718
3	6.8	6.1	164.213	164.213	20.000	16.874	10.000	0.999

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count Rate c/m	d/m	Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM			
1	Am241	0.3030	5.480	5.469	0.011	0.13	1.65	0.00	0.117E-09
	Pu238		5.499	5.469	0.030				0.152E-09
2	Pu239	0.6220	5.143	5.136	0.007	0.09	3.39	0.00	0.225E-09
	Pu240		5.144	5.136	0.008				0.225E-09
3	Np237	0.0751	4.781	4.818	-0.037	0.08	0.41	0.00	0.313E-10

DETECTOR CALIBRATION

Energy(MEV) = 4.062 + (0.0046)*Channel
Energy range (MeV): 4.062 TO 6.418
Efficiency = ***** CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	2802.0	100.000
Smoothed	2801.9	99.998
Composite fit	2726.1	97.292
Residuals	75.8	2.705

Analyzed by: VR

378.0

BEST AVAILABLE COPY

[illegible]

BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD5566.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	1.	1.	0.	1.	2.	0.
21	1.	0.	0.	4.	0.	0.	0.	0.	1.	0.
31	1.	0.	1.	0.	0.	0.	2.	1.	1.	0.
41	1.	0.	0.	1.	0.	1.	0.	0.	1.	1.
51	0.	0.	0.	0.	1.	1.	4.	1.	0.	0.
61	3.	0.	1.	0.	0.	2.	0.	1.	0.	1.
71	1.	0.	0.	1.	1.	1.	1.	1.	2.	1.
81	2.	0.	1.	1.	1.	0.	2.	1.	4.	1.
91	2.	1.	2.	1.	2.	1.	2.	0.	0.	0.
101	2.	0.	1.	1.	1.	3.	0.	1.	1.	1.
111	3.	0.	0.	2.	2.	3.	3.	4.	0.	1.
121	0.	1.	1.	2.	2.	1.	4.	3.	2.	2.
131	3.	3.	3.	3.	2.	4.	0.	3.	4.	5.
141	4.	3.	3.	1.	1.	1.	5.	3.	1.	4.
151	5.	6.	2.	5.	7.	6.	1.	6.	3.	5.
161	3.	1.	11.	7.	5.	3.	5.	1.	3.	6.
171	4.	3.	2.	6.	5.	6.	6.	3.	6.	5.
181	3.	6.	2.	3.	8.	6.	6.	8.	5.	8.
191	9.	7.	12.	11.	9.	8.	7.	11.	9.	15.
201	12.	7.	13.	13.	9.	20.	16.	15.	14.	20.
211	15.	24.	24.	26.	32.	30.	34.	34.	25.	41.
221	35.	52.	40.	43.	53.	37.	54.	48.	57.	45.
231	51.	55.	61.	58.	54.	44.	52.	35.	37.	24.
241	28.	24.	23.	14.	19.	7.	5.	8.	5.	5.
251	4.	4.	4.	4.	2.	5.	4.	4.	7.	3.
261	7.	4.	11.	4.	4.	4.	7.	8.	6.	15.
271	7.	6.	5.	5.	10.	7.	6.	8.	12.	7.
281	3.	9.	8.	12.	9.	7.	6.	10.	10.	19.
291	10.	17.	13.	17.	22.	19.	14.	18.	17.	24.
301	25.	21.	25.	20.	23.	24.	22.	21.	16.	17.
311	25.	17.	18.	12.	13.	10.	10.	7.	3.	5.
321	0.	3.	0.	0.	1.	0.	1.	0.	2.	0.
331	0.	0.	0.	1.	1.	0.	1.	0.	1.	0.
341	2.	0.	0.	0.	0.	2.	1.	1.	1.	1.
351	1.	1.	2.	0.	1.	0.	2.	1.	0.	0.
361	0.	1.	1.	0.	0.	0.	0.	1.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	1.	0.	1.	1.	1.	0.	0.	0.
441	0.	0.	0.	1.	2.	0.	0.	0.	0.	1.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
471	0.	0.	1.	1.	0.	2.	1.	0.	0.	2.
481	0.	1.	2.	1.	0.	0.	0.	0.	1.	2.
491	1.	0.	0.	1.	0.	0.	1.	0.	0.	0.
511	0.	0.								

D. H. Milicia
7-11-93

GENERAL ALPHA ENERGY ANALYSIS

Rev. 1.10

DATA REDUCTION REPORT

SAMPLE

R-4107-1250 #1

File ID: SD2047.SPC

BEST AVAILABLE COPY

Counted on: 7/11/93 @ 4: 0
 Detector/Geometry number: 2/ 1
 Count time: 3000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	16.6	24.5	360.788	360.788	72.000	12.274	36.000	0.000
2	2642.6	2719.6	291.758	291.758	40.000	51.223	20.000	1.315
3	2917.6	2973.1	219.897	219.897	40.000	42.281	20.000	0.884

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count Rate c/m	d/m	Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM			
1	Pu236	0.0111	5.756	5.745	0.011	0.06	89.37	0.02	0.697E-08
2	Th228	0.4748	5.430	5.427	0.003	0.24	3823.51	0.91	0.411E-06
	Am241		5.480	5.427	0.053				0.311E-06
3	Pu239	0.5141	5.143	5.097	0.046	0.19	4139.58	0.70	0.316E-06
	Pu240		5.144	5.097	0.047				0.316E-06

DETECTOR CALIBRATION

Energy(MEV) = 4.085 + (0.0046)*Channel

Energy range (MeV): 4.085 to 6.440

Efficiency = ***** CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	398518.0	100.000
Smoothed	398107.7	99.897
Composite fit	402623.1	101.030
Residuals	-4515.4	-1.133

Analyzed by: _____

18249.2

[illegible]

WHC-SD-WM-DP-044
REV 1

BEST AVAILABLE COPY

AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD2047.SPC

1	0.	0.	0.	0.	0.	355.	436.	452.	469.	532.
11	527.	502.	533.	516.	584.	596.	611.	558.	675.	634.
21	650.	660.	640.	655.	688.	693.	719.	737.	720.	718.
31	736.	762.	692.	760.	721.	799.	712.	729.	759.	802.
41	795.	747.	819.	848.	850.	847.	838.	876.	877.	868.
51	864.	850.	918.	893.	841.	896.	907.	864.	872.	971.
61	943.	879.	974.	944.	926.	938.	946.	949.	945.	999.
71	1022.	1006.	1003.	1000.	992.	990.	1038.	1006.	1014.	1019.
81	998.	1035.	1031.	1062.	1055.	1026.	1051.	1049.	1086.	1114.
91	1074.	1080.	1114.	1142.	1125.	1152.	1072.	1171.	1173.	1135.
101	1153.	1179.	1139.	1117.	1134.	1202.	1151.	1203.	1241.	1209.
111	1244.	1224.	1205.	1283.	1217.	1218.	1280.	1290.	1255.	1297.
121	1325.	1310.	1286.	1368.	1322.	1288.	1322.	1342.	1345.	1316.
131	1386.	1380.	1472.	1385.	1402.	1407.	1414.	1397.	1435.	1442.
141	1450.	1398.	1398.	1458.	1457.	1513.	1538.	1480.	1497.	1511.
151	1543.	1530.	1591.	1540.	1542.	1663.	1613.	1587.	1655.	1568.
161	1642.	1659.	1679.	1674.	1660.	1642.	1615.	1675.	1745.	1707.
171	1737.	1741.	1759.	1726.	1820.	1843.	1830.	1788.	1815.	1892.
181	1801.	1878.	1851.	1848.	1951.	1906.	1879.	1902.	1959.	2022.
191	1943.	2012.	2021.	2022.	1998.	2015.	2049.	2043.	2235.	2181.
201	2087.	2077.	2067.	2096.	2079.	2154.	2292.	2129.	2271.	2189.
211	2249.	2260.	2244.	2282.	2186.	2417.	2336.	2236.	2314.	2367.
221	2270.	2313.	2209.	2258.	2259.	2152.	2128.	2016.	1990.	1906.
231	1843.	1726.	1632.	1557.	1495.	1380.	1334.	1288.	1207.	1116.
241	1142.	1004.	1060.	1060.	1069.	1069.	1043.	1059.	1032.	1104.
251	1103.	1100.	1106.	1114.	1091.	1090.	1119.	1083.	1094.	1108.
261	1129.	1132.	1167.	1155.	1145.	1158.	1100.	1108.	1209.	1228.
271	1166.	1199.	1188.	1186.	1273.	1196.	1220.	1254.	1258.	1306.
281	1290.	1315.	1282.	1325.	1301.	1389.	1288.	1345.	1354.	1327.
291	1344.	1364.	1318.	1332.	1319.	1318.	1287.	1249.	1220.	1134.
301	1105.	975.	942.	821.	809.	712.	630.	554.	471.	382.
311	310.	288.	212.	175.	142.	104.	106.	52.	61.	38.
321	34.	28.	24.	15.	15.	14.	9.	9.	7.	8.
331	13.	13.	13.	9.	13.	6.	4.	7.	7.	8.
341	10.	6.	5.	6.	9.	4.	10.	5.	10.	8.
351	6.	5.	4.	6.	8.	6.	4.	3.	8.	5.
361	10.	8.	5.	6.	5.	2.	5.	5.	6.	5.
371	5.	5.	4.	0.	1.	2.	1.	2.	2.	2.
381	2.	1.	4.	1.	0.	0.	1.	0.	0.	1.
391	0.	0.	0.	1.	3.	2.	1.	2.	2.	0.
401	1.	1.	3.	1.	1.	2.	1.	1.	1.	2.
411	0.	1.	1.	2.	3.	3.	0.	0.	2.	1.
421	2.	1.	1.	1.	1.	0.	1.	1.	1.	0.
431	1.	1.	1.	2.	0.	0.	0.	2.	1.	0.
441	1.	0.	3.	1.	1.	0.	1.	0.	0.	2.
451	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
461	0.	0.	0.	2.	1.	0.	0.	0.	0.	0.
471	0.	0.	1.	1.	0.	0.	0.	0.	0.	1.
481	1.	0.	0.	1.	1.	0.	0.	1.	0.	0.
491	0.	0.	1.	0.	0.	1.	1.	1.	1.	0.
511	1.	0.								

D.H. Milicia
7-11-93GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R-4107-1250 #2
File ID: SD4648.SPC

BEST AVAILABLE COPY

Counted on: 7/11/93 @ 4: 0
Detector/Geometry number: 4/ 1
Count time: 3000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	5.5	5.3	430.780	430.780	16.000	11.265	8.000	1.820
2	24.3	21.6	364.223	364.223	20.000	19.435	10.000	0.962
3	7784.2	7567.5	298.033	298.033	20.000	13.411	10.000	2.397
4	9608.3	9135.5	225.955	225.955	20.000	14.695	10.000	2.133

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid			FWHM	Count		Activity uCi/ea
			Exp.	Obs.	Diff.		Rate c/m	d/m	
1		0.0003		6.089		0.05	1.67	11.17	0.503E-05
2	Cm244	0.0033	5.796	5.783	0.013	0.09	18.10	121.28	0.546E-04
	Cm243		5.786	5.783	0.003				0.748E-04
3	Am241	0.4141	5.480	5.478	0.002	0.06	2291.70	16340.36	0.736E-02
4	Pu239	0.5823	5.143	5.147	-0.004	0.07	3222.28	21597.02	0.973E-02
	Pu240		5.144	5.147	-0.003				0.973E-02

DETECTOR CALIBRATION

Energy (MeV) = 4.108 + (0.0046)*Channel

Energy range (MeV): 4.108 TO 6.463

Efficiency = 0.1492 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	332280.0	100.000
Smoothed	332160.9	99.964
Composite fit	276687.1	83.269
Residuals	55473.9	16.695

Analyzed by: _____

BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD4648.SPC

1	0.	0.	0.	0.	0.	118.	105.	107.	116.	136.
11	138.	125.	152.	152.	147.	161.	163.	169.	155.	154.
21	187.	199.	190.	206.	189.	188.	185.	192.	208.	213.
31	197.	217.	228.	214.	216.	235.	240.	232.	214.	251.
41	218.	237.	241.	258.	279.	257.	266.	259.	237.	247.
51	281.	283.	288.	267.	269.	263.	304.	263.	285.	313.
61	287.	285.	284.	300.	274.	317.	272.	320.	292.	322.
71	340.	314.	344.	326.	302.	343.	355.	332.	355.	319.
81	359.	347.	372.	359.	368.	365.	368.	367.	361.	396.
91	339.	396.	395.	393.	367.	378.	429.	378.	451.	411.
101	437.	377.	400.	442.	420.	411.	418.	442.	422.	427.
111	488.	465.	480.	514.	442.	489.	450.	504.	515.	473.
121	502.	457.	539.	491.	454.	506.	518.	532.	552.	479.
131	546.	611.	539.	535.	539.	601.	546.	551.	625.	614.
141	583.	637.	599.	577.	608.	647.	632.	670.	587.	701.
151	690.	650.	695.	733.	680.	731.	723.	736.	755.	784.
161	759.	789.	838.	790.	889.	826.	924.	845.	871.	822.
171	930.	899.	870.	994.	1052.	1003.	1014.	1029.	1034.	1043.
181	1069.	1145.	1076.	1141.	1123.	1190.	1219.	1239.	1281.	1285.
191	1322.	1349.	1321.	1373.	1437.	1423.	1438.	1451.	1569.	1569.
201	1582.	1669.	1735.	1794.	1920.	1945.	2041.	2258.	2309.	2398.
211	2464.	2763.	2962.	3183.	3365.	3605.	3839.	4010.	4224.	4487.
221	4675.	4850.	5124.	5252.	5360.	5459.	5302.	4818.	4467.	3748.
231	2969.	2283.	1588.	1220.	908.	713.	614.	569.	561.	572.
241	549.	595.	636.	593.	675.	607.	654.	671.	656.	681.
251	686.	673.	750.	761.	756.	749.	757.	774.	810.	843.
261	876.	928.	862.	879.	918.	1025.	1015.	1060.	1110.	1078.
271	1184.	1129.	1200.	1267.	1261.	1292.	1353.	1436.	1533.	1525.
281	1653.	1731.	1830.	1929.	2099.	2215.	2505.	2620.	2876.	3099.
291	3398.	3439.	3651.	3841.	4062.	4262.	4308.	4273.	4196.	3990.
301	3529.	2859.	2155.	1657.	1177.	842.	601.	441.	329.	250.
311	182.	138.	90.	60.	44.	24.	14.	11.	8.	15.
321	9.	7.	19.	11.	9.	8.	8.	6.	10.	6.
331	7.	13.	8.	7.	11.	7.	5.	2.	6.	6.
341	8.	5.	7.	7.	4.	6.	7.	7.	8.	7.
351	10.	7.	7.	7.	12.	13.	9.	17.	13.	8.
361	12.	16.	6.	14.	11.	19.	11.	12.	4.	7.
371	6.	6.	3.	3.	4.	0.	2.	0.	2.	1.
381	1.	0.	0.	0.	2.	1.	1.	1.	1.	0.
391	0.	0.	0.	1.	1.	0.	1.	1.	3.	2.
401	1.	2.	0.	0.	0.	3.	0.	0.	2.	0.
411	2.	0.	0.	1.	0.	2.	2.	1.	4.	1.
421	3.	1.	4.	3.	1.	4.	2.	0.	3.	6.
431	1.	3.	4.	3.	1.	0.	0.	1.	1.	0.
441	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
481	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R-4107-1250 #1
File ID: SD8237.SPC

BEST AVAILABLE COPY

Counted on: 7/11/93 @ 1: 0
Detector/Geometry number: 8/ 1
Count time: 3000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	13.8	14.5	362.447	362.447	24.000	25.081	12.000	0.000
2	3808.0	3927.1	294.775	294.775	32.000	34.564	16.000	1.196
3	4274.5	2917.4	224.854	224.854	32.000	41.412	16.000	0.598
4	21.9	22.9	27.749	27.749	8.000	0.404	4.000	5.800

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Pu236	0.0058	5.756	5.756	0.000	0.12	53.40	263.51	0.119E-03
2	Th228	0.4812	5.430	5.437	-0.007	0.16	4440.17	30240.61	0.136E-01
3	Pu239	0.5129	5.143	5.109	0.034	0.19	4732.52	22884.54	0.103E-01
	Pu240		5.144	5.109	0.035				0.103E-01
4	U 238	0.0001	4.200	4.182	0.018	0.00	0.70	4.38	0.197E-05

DETECTOR CALIBRATION

Energy(MEV) = 4.052 + (0.0047)*Channel
Energy range (MeV): 4.052 TO 6.458
Efficiency = 0.2068 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	446727.0	100.000
Smoothed	446727.0	100.000
Composite fit	461339.7	103.271
Residuals	-14612.6	-3.271

Analyzed by: _____

WHC-SD-WM-DP-044
REV 1

BEST AVAILABLE COPY

[illegible]

Raw Data Dump for AEA Spectrum: SP:SD8237.SPC **BEST AVAILABLE COPY**

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	29.	385.	504.	562.	689.	666.	771.	774.
21	815.	849.	897.	928.	889.	878.	851.	900.	854.	809.
31	745.	698.	718.	631.	567.	477.	444.	385.	319.	335.
41	326.	312.	326.	322.	397.	398.	389.	456.	481.	475.
51	563.	568.	605.	638.	545.	591.	608.	650.	661.	606.
61	645.	670.	651.	658.	700.	737.	670.	691.	688.	726.
71	755.	788.	785.	776.	795.	802.	759.	771.	832.	786.
81	771.	797.	852.	812.	815.	836.	854.	911.	867.	883.
91	937.	945.	944.	896.	948.	986.	972.	933.	978.	984.
101	994.	1063.	1009.	1024.	1074.	1062.	1092.	1081.	1098.	1142.
111	1137.	1124.	1122.	1152.	1208.	1173.	1170.	1269.	1236.	1214.
121	1202.	1310.	1244.	1276.	1337.	1232.	1313.	1301.	1311.	1302.
131	1342.	1377.	1319.	1308.	1426.	1459.	1436.	1413.	1471.	1456.
141	1419.	1467.	1563.	1500.	1623.	1528.	1631.	1569.	1566.	1578.
151	1605.	1668.	1696.	1705.	1700.	1676.	1655.	1762.	1837.	1831.
161	1769.	1787.	1810.	1831.	1797.	1875.	1885.	1948.	1875.	1946.
171	1974.	1937.	1993.	1965.	1927.	2051.	1984.	2163.	2022.	2092.
181	2136.	2127.	2112.	2203.	2194.	2190.	2347.	2275.	2287.	2356.
191	2366.	2458.	2467.	2447.	2356.	2382.	2416.	2451.	2574.	2596.
201	2604.	2585.	2675.	2617.	2745.	2687.	2810.	2733.	2816.	2834.
211	2842.	2827.	2934.	2988.	2976.	3049.	3057.	3057.	3102.	3120.
221	3198.	3235.	3169.	3184.	3255.	3184.	3204.	3058.	2995.	2964.
231	2847.	2677.	2539.	2400.	2205.	1946.	1768.	1634.	1563.	1430.
241	1400.	1410.	1287.	1280.	1275.	1288.	1282.	1283.	1260.	1279.
251	1309.	1358.	1346.	1347.	1406.	1409.	1446.	1494.	1484.	1416.
261	1473.	1488.	1501.	1475.	1535.	1555.	1583.	1591.	1605.	1643.
271	1706.	1622.	1618.	1649.	1693.	1659.	1685.	1710.	1690.	1723.
281	1774.	1830.	1701.	1860.	1811.	1774.	1884.	1896.	1901.	1897.
291	1911.	1899.	1909.	1987.	1961.	1927.	1860.	1945.	1790.	1797.
301	1705.	1631.	1473.	1238.	1202.	1031.	851.	716.	559.	393.
311	361.	264.	197.	151.	98.	89.	54.	46.	15.	29.
321	13.	14.	11.	5.	5.	5.	4.	8.	10.	3.
331	3.	9.	6.	8.	6.	5.	5.	7.	5.	9.
341	8.	4.	5.	6.	3.	11.	8.	3.	5.	5.
351	6.	6.	8.	4.	11.	6.	7.	7.	7.	2.
361	5.	11.	8.	8.	6.	6.	4.	7.	3.	4.
371	2.	4.	3.	1.	3.	3.	1.	0.	0.	1.
381	0.	2.	0.	0.	0.	0.	1.	4.	2.	3.
391	2.	1.	1.	0.	2.	0.	0.	0.	3.	3.
401	1.	3.	1.	0.	0.	1.	1.	4.	1.	0.
411	1.	1.	2.	1.	0.	1.	0.	1.	1.	1.
421	1.	1.	2.	2.	1.	1.	0.	1.	2.	2.
431	1.	0.	3.	1.	0.	0.	0.	0.	0.	0.
441	0.	1.	0.	0.	1.	0.	0.	0.	0.	2.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
511	0.	0.								

Raymond
7-10-93GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4107-1250 VOGEL#2
File ID: SDB234.SPCCounted on: 7/10/93 @20: 0
Detector/Geometry number: 8/ 1
Count time: 7000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	11.7	10.1	368.056	368.056	24.000	33.187	12.000	2.276
2	35.2	45.3	347.642	347.642	12.000	0.007	6.000	2.276
3	3356.3	3481.2	292.727	292.727	40.000	42.179	20.000	1.045
4	3827.4	3853.7	222.317	222.317	40.000	36.727	20.000	0.543
5	2339.9	2487.4	28.370	28.370	24.000	9.756	12.000	14.060

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Cm244	0.0006	5.796	5.785	0.011	0.16	2.95	16.95	0.764E-05
	Cm243		5.786	5.785	0.001				0.105E-04
2	Ra224	0.0000	5.680	5.689	-0.009	0.00	0.03	0.20	0.901E-07
3	Th228	0.4320	5.430	5.431	-0.001	0.20	2119.50	17146.50	0.772E-02
	Am241		5.480	5.431	0.049				0.583E-02
4	Pu239	0.5349	5.143	5.100	0.043	0.17	2624.31	15073.57	0.679E-02
5	U 238	0.0325	4.200	4.189	0.011	0.05	159.33	1188.52	0.535E-03

DETECTOR CALIBRATION

Energy(MEV) = 4.055 + (0.0047)*Channel
Energy range (MeV): 4.055 TO 6.462 .
Efficiency = 0.1741 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	547400.0	100.000
Smoothed	547398.4	100.000
Composite fit	572380.4	104.563
Residuals	-24982.1	-4.564

Analyzed by: _____

VR

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23815.2

REV 1

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Raw Data Dump for AEA Spectrum: SP:SD8234.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	252.	1039.	1349.	1549.	1717.	1832.	2001.	2174.
21	2166.	2308.	2492.	2436.	2469.	2529.	2403.	2443.	2324.	2357.
31	2211.	2094.	1991.	1836.	1702.	1564.	1493.	1281.	1117.	937.
41	809.	600.	517.	504.	466.	440.	426.	492.	523.	573.
51	614.	727.	785.	856.	1033.	1071.	1083.	1168.	1176.	1238.
61	1139.	1198.	1200.	1181.	1231.	1308.	1288.	1293.	1338.	1314.
71	1292.	1359.	1455.	1471.	1420.	1443.	1422.	1514.	1502.	1437.
81	1516.	1486.	1477.	1427.	1503.	1468.	1539.	1544.	1556.	1620.
91	1546.	1473.	1635.	1566.	1616.	1611.	1719.	1675.	1614.	1697.
101	1615.	1679.	1753.	1679.	1740.	1835.	1806.	1762.	1721.	1782.
111	1751.	1775.	1776.	1806.	1788.	1792.	1796.	1825.	1838.	1802.
121	1909.	1855.	1805.	1901.	1914.	1837.	1898.	1928.	1965.	1967.
131	1963.	1989.	1982.	1983.	1963.	1961.	1991.	2100.	1959.	2010.
141	2028.	2072.	2045.	2115.	2071.	2053.	2060.	2107.	2176.	2115.
151	2110.	2167.	2093.	2166.	2124.	2209.	2135.	2230.	2212.	2277.
161	2213.	2199.	2246.	2197.	2380.	2257.	2315.	2349.	2287.	2353.
171	2304.	2404.	2267.	2319.	2387.	2381.	2399.	2387.	2402.	2426.
181	2402.	2475.	2391.	2462.	2444.	2532.	2548.	2457.	2473.	2598.
191	2565.	2639.	2596.	2687.	2703.	2638.	2715.	2711.	2573.	2666.
201	2669.	2755.	2831.	2819.	2735.	2791.	2849.	2891.	2954.	2738.
211	2779.	2982.	2856.	2950.	3044.	2915.	3030.	2903.	3001.	3086.
221	3010.	2941.	3075.	3009.	2929.	2976.	2911.	2862.	2708.	2700.
231	2665.	2555.	2348.	2273.	2051.	1971.	1798.	1567.	1601.	1429.
241	1380.	1348.	1242.	1362.	1283.	1281.	1254.	1313.	1313.	1323.
251	1391.	1409.	1497.	1420.	1342.	1428.	1403.	1419.	1360.	1356.
261	1481.	1344.	1454.	1466.	1435.	1510.	1473.	1505.	1455.	1501.
271	1510.	1471.	1549.	1508.	1534.	1542.	1570.	1567.	1638.	1594.
281	1622.	1643.	1663.	1651.	1703.	1629.	1691.	1692.	1626.	1673.
291	1738.	1701.	1692.	1652.	1675.	1678.	1687.	1607.	1584.	1508.
301	1449.	1274.	1268.	1112.	953.	848.	720.	539.	468.	355.
311	249.	196.	146.	118.	68.	59.	38.	35.	30.	17.
321	8.	17.	14.	6.	5.	5.	6.	7.	7.	2.
331	4.	4.	5.	4.	8.	2.	6.	9.	2.	5.
341	1.	1.	12.	2.	6.	7.	5.	5.	9.	2.
351	4.	7.	2.	3.	5.	4.	5.	1.	6.	2.
361	9.	5.	5.	4.	4.	5.	6.	12.	3.	7.
371	3.	4.	2.	4.	3.	3.	1.	2.	1.	2.
381	2.	4.	0.	0.	1.	0.	0.	1.	2.	1.
391	3.	2.	2.	1.	1.	1.	1.	0.	1.	1.
401	1.	0.	1.	1.	4.	1.	2.	0.	3.	1.
411	4.	2.	0.	3.	2.	0.	0.	1.	0.	0.
421	1.	2.	1.	1.	1.	1.	1.	1.	1.	1.
431	2.	1.	0.	1.	4.	0.	2.	1.	1.	0.
441	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
451	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 1
STD VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 10
TODAY'S DATE: 08/18/92
DECAY CORR'N: 2.552 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
243204	5	48631	307	48938	0.4987
243913	5	48773	309	49082	0.5002
244771	5	48944	311	49256	0.5020
243758	5	48742	309	49050	0.4999
243766	5	48743	309	49052	0.4999
243637	5	48717	309	49026	0.4996
243514	5	48693	308	49001	0.4994
243765	5	48743	309	49052	0.4999
243849	5	48760	309	49069	0.5001
244044	5	48799	310	49108	0.5005

FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5020				
MIN	0.4987	48754	309	49063	0.5000

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APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 2
STD VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 10
TODAY'S DATE: 08/20/92
DECAY CORR'N: 2.557 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242703	5	48531	306	48837	0.4977
243638	5	48718	309	49026	0.4996
243386	5	48667	308	48975	0.4991
243764	5	48743	309	49052	0.4999
244275	5	48845	310	49155	0.5009
244108	5	48812	310	49121	0.5006
244275	5	48845	310	49155	0.5009
243645	5	48719	309	49028	0.4996
243015	5	48593	307	48900	0.4983
244057	5	48801	310	49111	0.5005
243516	5	48693	308	49001	0.4994
243510	5	48692	308	49000	0.4994
243627	5	48715	309	49024	0.4996
243690	5	48728	309	49037	0.4997
243901	5	48770	309	49079	0.5002
244466	5	48883	311	49194	0.5013

FOR	16 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5013				
MIN	0.4977	48735	309	49043	0.4998

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APC GEOMETRY STD 5B16 (83-17)

COUNTED ON APC # 3

STD VALUE: 98530 D/M

TIME ZERO: 01/29/90

BKG: 9

TODAY'S DATE: 08/19/92

DECAY CORR'N: 2.554 YEARS

NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242920	5	48575	307	48882	0.4981
242932	5	48577	307	48884	0.4982
242052	5	48401	305	48706	0.4964
243038	5	48599	307	48906	0.4984
242907	5	48572	307	48879	0.4981
242795	5	48550	306	48856	0.4979
243214	5	48634	307	48941	0.4988
243707	5	48732	309	49041	0.4998
242647	5	48520	306	48826	0.4976
241653	5	48322	304	48625	0.4955

FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.4998				
MIN	0.4955	48548	306	48855	0.4979

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DET #	1	2	3	4	5	6	7	8	JUPITER II				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT SMB / G	Np	82	151		147	156		153	153				
	Pu	111	231		227	235		232	232				
DATE 7-9-93	Am	137	303		299	309		302	304				
	Cm	161	371		367	377		370	370				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT SMB / B-G	Np	82	151		145	156		152	154				
	Pu	110	230		225	236		231	232				
DATE 7-10-93	Am	136	303		297	310		303	303				
	Cm	160	371		365	378		370	370				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT SMB / B-G	Np	81	151		148	155		148	155				
	Pu	109	231		228	235		227	232				
DATE 7-11-93	Am	135	303		290	309		299	303				
	Cm	159	371		368	370		367	370				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT SMB / B-G	Np	80	151		147	157		153	155				
	Pu	109	230		227	231		232	232				
DATE 7-12-93	Am	135	302		299	304		303	304				
	Cm	159	370		366	372		371	371				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT SMB / B-G	Np	81	151		148	156		151	154				
	Pu	110	231		228	235		230	232				
DATE 7-13-93	Am	136	304		300	309		302	303				
	Cm	160	372		368	377		370	369				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT SMB / B-G	Np	83	150		147	153		152	153				
	Pu	111	230		227	233		231	231				
DATE 7-14-93	Am	137	303		299	307		303	302				
	Cm	162	371		368	375		370	369				

TE: Np (²³⁷Np) peak must be at ch 150 +/- 10 (3.2 - 4.4) or ch 80 +/- 10 (3.1, 1.1 - 1.4)
 Pu (²³⁹Pu) peak must be at ch 229 +/- 10 (3.2 - 4.4) or ch 113 +/- 10 (3.1, 1.1 - 1.4)
 Am (²⁴¹Am) peak must be at ch 300 +/- 10 (3.2 - 4.4) or ch 139 +/- 10 (3.1, 1.1 - 1.4)
 Cm (²⁴⁴Cm) peak must be at ch 368 +/- 10 (3.2 - 4.4) or ch 160 +/- 10 (3.1, 1.1 - 1.4)

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222-S LABORATORY

Butch 1145

Instrument: WC38461	Procedure/ Rev: LA-J48-121 (D-0)
Technologist: _____, SUE LAI (Sue Lai)	Date: 7-1-93
Starting Time: 10:10	Temperature 25°C
Ending Time: 11:00	Chemist: A. A. K. Dasgupta

	Description	Lab ID		Description	Lab ID
1	JK 7-30-13 L M C S	R 4108-5530	11		
2	B I K	R 4109-5630	12		
3	sample	R 4110-5730	13		
4	Duplicate sample	R 4110-5830	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

[illegible]

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

4502

Serial No R 4108.-5530	Sample Point VOGEL	Date 6-30-93	Time Issued 13:31	Priority 20
Determination GEA	Method Standard LA-548-121	Result Units % RECOVERY	Charge Code E11456	Returns 0
Sample Size ? 100 λ			Customer ID STD	
Remarks Calculations Results COLX STD# 32851 R901 134 μ C/L STD VAL 133.3 μ C/L RESULT $\times$ REC 101% R905 STD VAL 108.2 μ C/L RESULT 108 μ C/L $\times$ REC 100% Sue Li				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs
Date 7-1-93	Time Completed 11:00	Lab Unit A.K. Center 7/6/93 Sue Li		

34-5000-081 (R-10-83)

4504

Serial No R 4109.-5630	Sample Point VOGEL	Date 6-30-93	Time Issued 13:32	Priority 20
Determination GEA	Method Standard LA-548-121	Result Units μ C1/ML	Charge Code E11456	Returns 0
Sample Size ? 100 λ			Customer ID BLK	
Remarks Calculations Results COUNT AS μ C1/L CS-137 : 2.42×10^{-4} μ C/me LASER PRINTOUT Sue Li				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs
Date 7-1-93	Time Completed 11:00	Lab Unit A.K. Center 7/6/93 Sue Li		

34-5000-081 (R-10-83)

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

4505

Serial No	Sample Point	Date	Time Issued	Priority
R 4110.-5730	VOGEL	6-30-93	13:34	20
Determination	Method Standard	Result Units	Charge Code	Returns
GEA	LA-548-121	uCi/ML	E11458	0
Sample Size	Customer ID			
? 100 λ	937046L			
Remarks Calculations Results				
COUNT AS uCi/L LASER PRINTOUT CS-137: 1.43×10^{-2} uCi/ml				
Sue Li				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	R. Williams	D. H. Williams		
PLS	PLS	PLS	PLS	PLS
Date	Time Completed	Lab Unit		
7-1-93	11:00	A.K. Dambit 7/6/93	Sue Li	

54-8800-06 (R 10 83)

4506

Serial No	Sample Point	Date	Time Issued	Priority
R 4110.-5830	VOGEL	6-30-93	13:34	20
Determination	Method Standard	Result Units	Charge Code	Returns
GEA	LA-548-121	uCi/ML	E11458	0
Sample Size	Customer ID			
? 100 λ	937046L			
Remarks Calculations Results				
COUNT AS uCi/L LASER PRINTOUT CS-137: 1.43×10^{-2} uCi/ml				
Duplicate sample				
Sue Li				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D. H. Williams			
PLS	PLS	PLS	PLS	PLS
Date	Time Completed	Lab Unit		
7-1-93	11:00	A.K. Dambit 7/6/93	Sue Li	

54-8800-06 (R 10 83)

GAMMA SPECTRUM ANALYSIS

CANBERRA SPECTRAN-F V2.06 SOFTWARE

01-JUL-93 13:18:42

R. Williams
7-1-93

ANALYSIS PARAMETERS

MCA UNIT NUMBER: 1 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 4 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +/- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLY ANALYSIS PERFORMED

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SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AND:
ANALYZED BY:

SAMPLE DESCRIPTION: R4108-5530
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 1-JUL-93 AT 12:28:07

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3023. SECONDS
DEAD TIME: 0.76 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 30-MAR-93
EFFICIENCY CALIBRATION PERFORMED 1-APR-93

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 74 TO 89.

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	95.64	47.80	1.00	1741.	1212.	10.8	PB-210
2	950.30	475.14	1.34	3536.	634.	27.9	CS-134
3C	1125.96	562.99	1.40	2147.	2747.	4.7	CS-134, EU-152
4C	1138.15	569.08	1.40	2170.	-5053.	-4.4	CS-134, BI-207
5	1208.88	604.45	1.46	2368.	31320.	1.2	CS-134
6	1322.70	661.37	1.52	1609.	45941.	0.9	CS-137
6B		661.44			159.	5.8	
7C	1590.92	795.51	1.59	1247.	22883.	1.6	CS-134
8C	1603.02	801.56	1.59	1280.	2180.	5.2	CS-134
9C	2334.70	1167.51	1.88	753.	416.	18.8	CS-134
10C	2345.14	1172.73	1.88	664.	25617.	1.4	CO-60
11	2663.48	1331.96	2.09	198.	23350.	1.3	CO-60
12	2728.62	1364.54	2.12	94.	584.	9.7	CS-134
13	2799.72	1400.11	2.07	85.	246.	17.3	BI-214
14	2919.91	1460.23	2.04	65.	850.	7.4	K-40
14B		1460.67			769.	1.7	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

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BACKGROUND SUBTRACTION PERFORMED USING FILE BK0014
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 22-JUL-92 AT 14:00:00
BACKGROUND LIVE TIME: 60000. SECONDS

01-JUL-93 13:18:42

WNC-SD-WM-DP-044

REV 1

SAMPLE: R4108-5530

DATA COLLECTED ON 1-JUL-93 AT 12:28:07

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

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R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN $\mu\text{Ci/LI}$				ENERGY COMPARISON	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	(KEV) EXPECT	DIFF
AM-241	LLD<1.61E+00		LLD<1.61E+00		59.54	
AM-243	LLD<4.30E-01		LLD<4.30E-01		74.67	
BA-133	LLD<4.91E-01		LLD<4.91E-01		356.02	
BA-140	LLD<1.39E+00		LLD<1.39E+00		537.27	
BI-212	LLD<2.85E+00		LLD<2.85E+00		727.20	
CEPR144	LLD<2.38E+00		LLD<2.38E+00		133.51	
CO-60	1.08E+02	+/-1.48E+00	1.08E+02	+/-1.48E+00	1332.50	-0.54
					1173.24	-0.51
CR-51	LLD<2.77E+00		LLD<2.77E+00		320.09	
CS-134	7.83E+01	+/-1.29E+00	7.83E+01	+/-1.29E+00	795.84	-0.34
					604.70	-0.25
CS-137	1.34E+02	+/-1.43E+00	1.34E+02	+/-1.43E+00	661.65	-0.28
EU-152	LLD<7.69E-01		LLD<7.69E-01		1408.01	
EU-154	LLD<6.17E-01		LLD<6.17E-01		1274.45	
EU-154H	LLD<6.17E-01		LLD<6.17E-01		1274.80	
EU-155	LLD<7.45E-01		LLD<7.45E-01		105.31	
FE-59	LLD<9.04E-01		LLD<9.04E-01		1099.25	
I-131	LLD<3.81E-01		LLD<3.81E-01		364.48	
K-40	3.77E+00	+/-2.98E+00	3.77E+00	+/-2.98E+00	1460.75	-0.52
LA-140	LLD<1.91E-01		LLD<1.91E-01		1596.20	
MN-54	LLD<3.94E-01		LLD<3.94E-01		834.83	
NA-22	LLD<2.06E-01		LLD<2.06E-01		1274.55	
NB-94	LLD<3.35E-01		LLD<3.35E-01		702.63	
NB-95	LLD<3.49E-01		LLD<3.49E-01		765.78	
NP-237	LLD<1.60E+00		LLD<1.60E+00		86.50	
PB-212	LLD<5.15E-01		LLD<5.15E-01		239.00	
PU-239	LLD<2.29E+03		LLD<2.29E+03		129.30	
PU-241	LLD<7.33E+04		LLD<7.33E+04		148.57	
RA-224	LLD<5.81E+00		LLD<5.81E+00		240.99	
RA-226	LLD<5.55E+00		LLD<5.55E+00		186.10	
RU-103	LLD<3.48E-01		LLD<3.48E-01		497.08	
RU103	LLD<3.66E-01		LLD<3.66E-01		497.08	
RURH106	LLD<6.61E+00		LLD<6.61E+00		621.80	
SB-125	LLD<1.15E+00		LLD<1.15E+00		427.89	
SB-125A	LLD<1.15E+00		LLD<1.15E+00		427.89	
SE-75	LLD<3.93E-01		LLD<3.93E-01		264.66	
SN-113	LLD<5.20E-01		LLD<5.20E-01		391.67	
SR-85	LLD<3.41E-01		LLD<3.41E-01		513.99	
TH-228	LLD<1.65E+01		LLD<1.65E+01		84.37	
TL-208	LLD<4.17E-01		LLD<4.17E-01		583.20	
U-235	LLD<3.34E-01		LLD<3.34E-01		185.71	
Y-88	LLD<1.24E-01		LLD<1.24E-01		1836.06	
ZN-65	LLD<9.93E-01		LLD<9.93E-01		1115.55	
ZR-95	LLD<6.41E-01		LLD<6.41E-01		756.73	
TOTAL	3.24E+02	+/-3.84E+00	3.24E+02	+/-3.84E+00		

STANDARD DEVIATION = 0.13

EBAR = ***** MEV/DISINTEGRATION

WHC-SD-WM-DP-044

MAXIMUM PERMISSABLE ACTIVITY = 1.38E-09 UC/LI

REV 1

TOTAL MEASURED ACTIVITY = 3.24E+02 (+-3.84E+00) UC/LI

% TECH. SPEC. = ***** (+-*****)

ERROR QUOTATION AT 1.96 SIGMA

LLD CONFIDENCE LEVEL AT 85.0%

BEST AVAILABLE COPY

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
95.64	47.80	1212.	10.8	4.01E+01
950.30	475.14	634.	27.9	4.43E+00
1125.96	562.99	2747.	4.7	2.20E+01
1138.15	569.08	5053.	4.4	4.08E+01
1603.02	801.56	2180.	5.2	2.37E+01
2334.70	1167.51	416.	18.8	6.35E+00
2728.62	1364.54	584.	9.7	1.02E+01
2799.72	1400.11	246.	17.3	4.36E+00

***** W H C - S D - W M - D P - 0 4 4 *****
***** R E V 1 *****
*
* G A M M A S P E C T R U M A N A L Y S I S *
*

CANBERRA SPECTRAN-F V2.06 SOFTWARE

01-JUL-9315:17:52

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Fuller
7-1-93

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 1 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 4 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +/- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLY ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AND:
ANALYZED BY:

SAMPLE DESCRIPTION: R4109-5630
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 1-JUL-93 AT 14:27:42

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3002. SECONDS
DEAD TIME: 0.07 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 30-MAR-93
EFFICIENCY CALIBRATION PERFORMED 1-APR-93

P E A K A N A L Y S I S W H C - S D - W M - D P - 0 4 4
R E V 1

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	476.97	238.46	0.90	406.	105.	56.5	PB-212A
1B		238.52			79.	18.0	
2	703.50	351.73	1.44	229.	146.	33.0	PB-214A
2B		351.84			131.	8.8	
3C	1021.09	510.54	2.01	317.	334.	20.7	RN-222, I-133,
3B		510.83			317.	3.8	TL-208, NA-22, ZN-65, RH-106
4	1165.60	582.81	1.45	153.	104.	40.0	EU-154,
4B		583.05			117.	7.9	TL-208
5	1218.36	609.19	1.26	165.	176.	26.1	BI-214A,
5B		609.18			177.	5.7	RU-103
6	1322.77	661.41	1.39	115.	242.	18.1	CS-137
6B		661.44			159.	5.8	
7	1821.57	910.86	1.89	109.	73.	48.6	AC-228A
7B		910.95			101.	7.7	
8	2919.90	1460.23	2.16	35.	830.	7.2	K-40
8B		1460.67			769.	1.7	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

BEST AVAILABLE COPY

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0014
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 22-JUL-92 AT 14:00:00
BACKGROUND LIVE TIME: 60000. SECONDS

01-JUL-93 15:17:52

WMC-SD-WM-DP-044

REV 1

SAMPLE: R4109-5630

DATA COLLECTED ON 1-JUL-93 AT 14:27:42

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

BEST AVAILABLE COPY

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN $\mu\text{Ci/LI}$				ENERGY COMPARISON	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	(KEV) EXPECT	DIFF
AM-241	LLD<5.11E-01		LLD<5.11E-01		59.54	
AM-243	LLD<1.60E-01		LLD<1.60E-01		74.67	
BA-133	LLD<1.39E-01		LLD<1.39E-01		356.02	
BA-140	LLD<3.48E-01		LLD<3.48E-01		537.27	
BI-212	LLD<8.50E-01		LLD<8.50E-01		727.20	
CEPR144	LLD<8.04E-01		LLD<8.04E-01		133.51	
CO-60	LLD<1.02E-01		LLD<1.02E-01		1332.50	
CR-51	LLD<8.43E-01		LLD<8.43E-01		320.09	
CS-134	LLD<1.12E-01		LLD<1.12E-01		795.84	
CS-137	2.42E-01	+ -1.31E-01	2.42E-01	+ -1.31E-01	661.65	-0.24
EU-152	LLD<5.19E-01		LLD<5.19E-01		1408.01	
EU-154	LLD<3.35E-01		LLD<3.35E-01		1274.45	
EU-154H	LLD<3.53E-01		LLD<3.53E-01		1274.80	
EU-155	LLD<2.48E-01		LLD<2.48E-01		105.31	
FE-59	LLD<1.97E-01		LLD<1.97E-01		1099.25	
I-131	LLD<9.89E-02		LLD<9.89E-02		364.48	
K-40	2.84E+00	+ -2.83E+00	2.84E+00	+ -2.83E+00	1460.75	-0.52
LA-140	LLD<1.55E-01		LLD<1.55E-01		1596.20	
MN-54	LLD<1.09E-01		LLD<1.09E-01		834.83	
NA-22	LLD<1.15E-01		LLD<1.15E-01		1274.55	
NB-94	LLD<1.02E-01		LLD<1.02E-01		702.63	
NB-95	LLD<1.06E-01		LLD<1.06E-01		765.78	
NP-237	LLD<5.41E-01		LLD<5.41E-01		86.50	
PB-212	LLD<1.73E-01		LLD<1.73E-01		239.00	
PU-239	LLD<7.80E+02		LLD<7.80E+02		129.30	
PU-241	LLD<2.53E+04		LLD<2.53E+04		148.57	
RA-224	LLD<1.94E+00		LLD<1.94E+00		240.99	
RA-226	LLD<1.84E+00		LLD<1.84E+00		186.10	
RU-103	LLD<9.12E-02		LLD<9.12E-02		497.08	
RU103	LLD<9.60E-02		LLD<9.60E-02		497.08	
RURH106	LLD<1.77E+00		LLD<1.77E+00		621.80	
SB-125	LLD<2.73E-01		LLD<2.73E-01		427.89	
SB-125A	LLD<2.73E-01		LLD<2.73E-01		427.89	
SE-75	LLD<1.22E-01		LLD<1.22E-01		264.66	
SN-113	LLD<1.31E-01		LLD<1.31E-01		391.67	
SR-85	LLD<1.38E-01		LLD<1.38E-01		513.99	
TH-228	LLD<5.97E+00		LLD<5.97E+00		84.37	
TL-208	LLD<1.24E-01		LLD<1.24E-01		583.20	
U-235	LLD<1.15E-01		LLD<1.15E-01		185.71	
Y-88	LLD<9.23E-02		LLD<9.23E-02		1836.06	
ZN-65	LLD<3.57E-01		LLD<3.57E-01		1115.55	
ZR-95	LLD<1.87E-01		LLD<1.87E-01		756.73	

TOTAL	3.08E+00	+ -2.83E+00	3.08E+00	+ -2.83E+00		

STANDARD DEVIATION = 0.20

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.47E-07 UC/LI
TOTAL MEASURED ACTIVITY = 3.08E+00 (+-2.83E+00) UC/LI
% TECH. SPEC. = ***** (+-*****)

WHC-SD-WM-DP-044

REV 1

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

BEST AVAILABLE COPY

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
476.97	238.46	105.	56.5	4.45E-01
703.50	351.73	146.	33.0	8.16E-01
1021.09	510.54	334.	20.7	2.47E+00
1165.60	582.81	104.	40.0	8.52E-01
1218.36	609.19	176.	26.1	1.50E+00
1821.57	910.86	73.	48.6	8.97E-01

GAMMA SPECTRUM ANALYSIS

CANBERRA SPECTRAN-F V2.06 SOFTWARE

01-JUL-93 16:17:57

D. H. Milicia
7-1-93

ANALYSIS PARAMETERS

MCA UNIT NUMBER: 1 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 4 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: ± 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

BEST AVAILABLE COPY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLY ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AND:
ANALYZED BY:

SAMPLE DESCRIPTION: R4110-5730
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 1-JUL-93 AT 15:27:46

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3009. SECONDS
DEAD TIME: 0.30 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 30-MAR-93
EFFICIENCY CALIBRATION PERFORMED 1-APR-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	118.70	59.33	1.11	452.	265.	24.7	AM-241,U-237, EU-155
2	245.81	122.88	1.07	474.	223.	29.3	EU-152,CO-57, EU-154A
3	703.21	351.58	1.12	461.	48.	131.6	PB-214A
3B		351.84			131.	8.8	
4	1021.72	510.86	2.52	320.	340.	18.8	RN-222,I-133,
4B		510.83			317.	3.8	TL-208,NA-22, ZN-65,RH-106
5	1217.85	608.93	1.52	160.	220.	21.5	BI-214A,
5B		609.18			177.	5.7	RU-103
6	1322.66	661.35	1.52	178.	5046	2.9	CS-137
6B		661.44			159.	5.8	
7	1821.20	910.68	1.74	91.	126.	28.7	AC-228A
7B		910.95			101.	7.7	
8	2345.51	1172.92	2.07	83.	82.	40.8	CO-60
9	2919.86	1460.21	2.07	32.	822.	7.2	K-40
9B		1460.67			769.	1.7	
10	3527.14	1764.01	2.52	14.	79.	26.9	BI-214C
10B		1764.58			64.	7.3	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

BEST AVAILABLE COPY

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0014
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 22-JUL-92 AT 14:00:00
BACKGROUND LIVE TIME: 60000. SECONDS

01-JUL-93 16:17:57

WHC-SD-WM-DP-044

REV 1

BEST AVAILABLE COPY

SAMPLE: R4110-5730

DATA COLLECTED ON 1-JUL-93 AT 15:27:46

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN $\mu\text{Ci/LI}$				ENERGY COMPARISON	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	(KEV) EXPECT	DIFF
AM-241	2.59E+00	+6.41E-01	2.59E+00	+6.41E-01	59.54	-0.21
AM-243	LLD<1.81E-01		LLD<1.81E-01		74.67	
BA-133	LLD<1.63E-01		LLD<1.63E-01		356.02	
BA-140	LLD<4.23E-01		LLD<4.23E-01		537.27	
BI-212	LLD<1.03E+00		LLD<1.03E+00		727.20	
CEPR144	LLD<9.17E-01		LLD<9.17E-01		133.51	
CO-60	LLD<1.11E-01		LLD<1.11E-01		1332.50	
CR-51	LLD<9.16E-01		LLD<9.16E-01		320.09	
CS-134	LLD<1.05E-01		LLD<1.05E-01		795.84	
CS-137	1.43E+01	+4.28E-01	1.43E+01	+4.28E-01	661.65	-0.30
EU-152	LLD<5.78E-01		LLD<5.78E-01		1408.01	
EU-154	LLD<3.58E-01		LLD<3.58E-01		1274.45	
EU-154H	LLD<3.62E-01		LLD<3.62E-01		1274.80	
EU-155	LLD<2.80E-01		LLD<2.80E-01		105.31	
FE-59	LLD<2.21E-01		LLD<2.21E-01		1099.25	
I-131	LLD<1.19E-01		LLD<1.19E-01		364.48	
K-40	LLD<3.01E+00		LLD<3.01E+00		1460.75	
LA-140	LLD<1.50E-01		LLD<1.50E-01		1596.20	
MN-54	LLD<1.13E-01		LLD<1.13E-01		834.83	
NA-22	LLD<1.21E-01		LLD<1.21E-01		1274.55	
NB-94	LLD<1.00E-01		LLD<1.00E-01		702.63	
NB-95	LLD<1.06E-01		LLD<1.06E-01		765.78	
NP-237	LLD<6.32E-01		LLD<6.32E-01		86.50	
PB-212	LLD<2.03E-01		LLD<2.03E-01		239.00	
PU-239	LLD<8.38E+02		LLD<8.38E+02		129.30	
PU-241	LLD<2.81E+04		LLD<2.81E+04		148.57	
RA-224	LLD<2.23E+00		LLD<2.23E+00		240.99	
RA-226	LLD<2.10E+00		LLD<2.10E+00		186.10	
RU-103	LLD<1.09E-01		LLD<1.09E-01		497.08	
RU103	LLD<1.14E-01		LLD<1.14E-01		497.08	
RURH106	LLD<1.92E+00		LLD<1.92E+00		621.80	
SB-125	LLD<3.62E-01		LLD<3.62E-01		427.89	
SB-125A	LLD<3.62E-01		LLD<3.62E-01		427.89	
SE-75	LLD<1.43E-01		LLD<1.43E-01		264.66	
SN-113	LLD<1.52E-01		LLD<1.52E-01		391.67	
SR-85	LLD<1.46E-01		LLD<1.46E-01		513.99	
TH-228	LLD<6.89E+00		LLD<6.89E+00		84.37	
TL-208	LLD<1.33E-01		LLD<1.33E-01		583.20	
U-235	LLD<1.29E-01		LLD<1.29E-01		185.71	
Y-88	LLD<1.31E-01		LLD<1.31E-01		1836.06	
ZN-65	LLD<3.50E-01		LLD<3.50E-01		1115.55	
ZR-95	LLD<1.88E-01		LLD<1.88E-01		756.73	
TOTAL	1.69E+01	+7.71E-01	1.69E+01	+7.71E-01		

STANDARD DEVIATION = 0.06

EBAR = ***** MEV/DISINTEGRATION

MAXIMUM PERMISSABLE ACTIVITY = $1.36\text{E-}08$ UC/LITOTAL MEASURED ACTIVITY = $1.69\text{E+}01$ ($\pm 7.71\text{E-}01$) UC/LI% TECH. SPEC. = ***** ($\pm$ *****)

ERROR QUOTATION AT 1.96 SIGMA

LLD CONFIDENCE LEVEL AT 85.0%

BEST AVAILABLE COPY

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
245.81	122.88	223.	29.3	$6.58\text{E-}01$
2345.51	1172.92	82.	40.8	$1.25\text{E+}00$

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
703.21	351.58	48.	131.6	$2.67\text{E-}01$
1021.72	510.86	340.	18.8	$2.51\text{E+}00$
1217.85	608.93	220.	21.5	$1.88\text{E+}00$
1821.20	910.68	126.	28.7	$1.54\text{E+}00$
2919.86	1460.21	822.	7.2	$1.51\text{E+}01$
3527.14	1764.01	79.	26.9	$1.65\text{E+}00$

D.H. Milicia
7-1-93

*
* GAMMA SPECTRUM ANALYSIS *
*

CANBERRA SPECTRAN-F V2.06 SOFTWARE

01-JUL-93 17:28:05

BEST AVAILABLE COPY

ANALYSIS PARAMETERS.

MCA UNIT NUMBER: 1 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 4 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPEL ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AND:
ANALYZED BY:

SAMPLE DESCRIPTION: R-4110-5830
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 1-JUL-93 AT 16:37:53

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3011. SECONDS
DEAD TIME: 0.37 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 30-MAR-93
EFFICIENCY CALIBRATION PERFORMED 1-APR-93

PEAK ANALYSIS

BEST AVAILABLE COPY

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	118.53	59.24	1.05	577.	171.	41.7	AM-241,U-237, EU-155
2	245.62	122.79	1.11	565.	179.	39.6	EU-152,CO-57, EU-154A
3	703.58	351.77	1.40	342.	175.	32.8	PB-214A
3B		351.84			131.	8.3	
4	1021.62	510.81	2.12	286.	329.	18.6	RN-222,I-133,
4B		510.83			317.	2.8	TL-208,NA-22, ZN-65,RH-106
5	1166.03	583.02	0.96	190.	108.	42.0	EU-154,
5B		583.05			117.	7.9	TL-208
6	1218.33	609.18	1.52	159.	228.	20.8	BI-214A,
6B		609.18			177.	5.7	RU-103
7	1322.60	661.32	1.48	150.	5073.	2.8	CS-137
7B		661.44			159.	5.8	
8	1821.72	910.94	2.16	81.	122.	28.9	AC-228A
8B		910.95			101.	7.7	
9	2919.64	1460.10	1.99	33.	845.	7.1	K-40
9B		1460.67			769.	1.7	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0014
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 22-JUL-92 AT 14:00:00
BACKGROUND LIVE TIME: 60000. SECONDS

01-JUL-9317:28:05

WHC-SD-WM-DP-044

REV 1

SAMPLE: R-4110-5830

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DATA COLLECTED ON 1-JUL-93 AT 16:37:53

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

RADIONUCLIDE ANALYSIS REPORT

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI				ENERGY COMPARISON	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	(KEV) EXPECT	DIFF
AM-241	1.67E+00	+6.99E-01	1.67E+00	+6.99E-01	59.54	-0.30
AM-243	LLD<1.81E-01		LLD<1.81E-01		74.67	
BA-133	LLD<1.75E-01		LLD<1.75E-01		356.02	
BA-140	LLD<4.26E-01		LLD<4.26E-01		537.27	
BI-212	LLD<1.00E+00		LLD<1.00E+00		727.20	
CEPR144	LLD<9.19E-01		LLD<9.19E-01		133.51	
CO-60	LLD<1.18E-01		LLD<1.18E-01		1332.50	
CR-51	LLD<9.31E-01		LLD<9.31E-01		320.09	
CS-134	LLD<1.19E-01		LLD<1.19E-01		795.84	
CS-137	1.43E+01	+4.27E-01	1.43E+01	+4.27E-01	661.65	-0.33
EU-152	LLD<5.29E-01		LLD<5.29E-01		1408.01	
EU-154	LLD<3.25E-01		LLD<3.25E-01		1274.45	
EU-154H	LLD<3.25E-01		LLD<3.25E-01		1274.80	
EU-155	LLD<2.85E-01		LLD<2.85E-01		105.31	
FE-59	LLD<2.09E-01		LLD<2.09E-01		1099.25	
I-131	LLD<1.17E-01		LLD<1.17E-01		364.48	
K-40	3.51E+00	+2.84E+00	3.51E+00	+2.84E+00	1460.75	-0.65
LA-140	LLD<1.40E-01		LLD<1.40E-01		1596.20	
MN-54	LLD<1.04E-01		LLD<1.04E-01		834.83	
NA-22	LLD<1.09E-01		LLD<1.09E-01		1274.55	
NB-94	LLD<1.01E-01		LLD<1.01E-01		702.63	
NB-95	LLD<1.16E-01		LLD<1.16E-01		765.78	
NP-237	LLD<6.38E-01		LLD<6.38E-01		86.50	
PB-212	LLD<2.03E-01		LLD<2.03E-01		239.00	
PU-239	LLD<9.14E+02		LLD<9.14E+02		129.30	
PU-241	LLD<2.84E+04		LLD<2.84E+04		148.57	
RA-224	LLD<2.20E+00		LLD<2.20E+00		240.99	
RA-226	LLD<2.08E+00		LLD<2.08E+00		186.10	
RU-103	LLD<1.09E-01		LLD<1.09E-01		497.08	
RU103	LLD<1.15E-01		LLD<1.15E-01		497.08	
RURH106	LLD<2.15E+00		LLD<2.15E+00		621.80	
SB-125	LLD<3.70E-01		LLD<3.70E-01		427.89	
SB-125A	LLD<3.70E-01		LLD<3.70E-01		427.89	
SE-75	LLD<1.38E-01		LLD<1.38E-01		264.66	
SN-113	LLD<1.58E-01		LLD<1.58E-01		391.67	
SR-85	LLD<1.46E-01		LLD<1.46E-01		513.99	
TH-228	LLD<6.94E+00		LLD<6.94E+00		84.37	
TL-208	LLD<1.36E-01		LLD<1.36E-01		583.20	
U-235	LLD<1.26E-01		LLD<1.26E-01		185.71	
Y-88	LLD<8.74E-02		LLD<8.74E-02		1836.06	
ZN-65	LLD<3.80E-01		LLD<3.80E-01		1115.55	
ZR-95	LLD<1.85E-01		LLD<1.85E-01		756.73	
TOTAL	1.95E+01	+2.95E+00	1.95E+01	+2.95E+00		

STANDARD DEVIATION = 0.20

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.57E-08 UC/LI
TOTAL MEASURED ACTIVITY = 1.95E+01 (+2.95E+00) UC/LI
% TECH. SPEC. = ***** (+-*****)

WHC-SD-WM-DP-044
REV 1

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

BEST AVAILABLE COPY

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
245.62	122.79	179.	39.6	5.29E-01
1218.33	609.18	52.	94.0	4.41E-01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
703.58	351.77	175.	32.8	9.78E-01
1021.62	510.81	329.	18.6	2.43E+00
1166.03	583.02	108.	42.0	8.90E-01
1821.72	910.94	122.	28.9	1.49E+00

Efficiency performed
on 4/1/93
A. K. Daulton
4/1/93

222-S COUNTING ROOM WESTINGHOUSE HANFORD

CAL> EFF

MCA UNIT NUMBER (2): 1

ADC UNIT NUMBER (1.0): 1

DETECTOR NUMBER (12): 4

MCA MEMORY REGION (FULL):

DATE SPECTRUM COLLECTED: 1-APR-93

TIME COLLECT STARTED: 12:00

GEOMETRY NUMBER (12): 41

GEOMETRY DESCRIPTION: 22CC LIQ

ACTIVITY UNITS (uCi) :

CROSSOVER ENERGY: 165.853

CALIBRATION SOURCE ENTRY OPTIONS:

TYPE A CARRIAGE RETURN FOR MANUAL ENTRY,

TYPE AN INTEGER (0-999) TO USE A SOURCE LIBRARY,

TYPE A PLUS SIGN BEFORE THE INTEGER (+0 - +999)

TO CREATE A SOURCE LIBRARY DURING MANUAL ENTRY.

OPTION: 441

42B47-A 22CC LIQ

DO YOU WANT TO ENTER ANY EFFICIENCY POINTS MANUALLY (NO): N

DIMENSIONAL UNITS OF STANDARD: EA

SIZE OF STANDARD IN EA : 1.00000

NUMBER OF POINTS: 11

ACTIVITY IN MICROCURIES (YES/NO):

PEAK 1
ENERGY: 59.563
ACTIVITY: 3.487000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D158000
DECAY TIME (0.000000E-01 MINS.): 1-FEB-92
TIME OF SOURCE CALIBRATION: 12:00
DECAY TIME: 6.120000E+05 MINS
EFFICIENCY = 2.550463E-02 (+- 1.311758E-04)

PEAK 2
ENERGY: 88.034
ACTIVITY: 2.065000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D462.6
DECAY TIME (6.120000E+05 MINS.):
EFFICIENCY = 7.949910E-02 (+- 4.352131E-04)

PEAK 3
ENERGY: 122.061
ACTIVITY: 1.881000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D271.8
DECAY TIME (6.120000E+05 MINS.):
EFFICIENCY = 1.082324E-01 (+- 6.692147E-04)

PEAK 4
ENERGY: 165.853
ACTIVITY: 2.284000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D137.66
DECAY TIME (6.120000E+05 MINS.):
EFFICIENCY = 1.044277E-01 (+- 1.022744E-04)

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$$\text{LOG(EFF)} = -5.798443\text{E}+01 + 2.284603\text{E}+01*\text{LOG(E)} - 2.337798\text{E}+00*\text{LOG(E)}^2$$

PEAK 5
 ENERGY: 391.668
 ACTIVITY: 7.301000E+02
 ACTIVITY ONE SIGMA: 0.000000E-01
 HALF-LIFE: D115.09
 DECAY TIME (6.120000E+05 MINS.):
 EFFICIENCY = 5.422120E-02 (+- 5.866320E-04)

WHC-SD-WM-DP-044

REV 1

PEAK 6
 ENERGY: 513.990
 ACTIVITY: 1.252100E+03
 ACTIVITY ONE SIGMA: 0.000000E-01
 HALF-LIFE: D64.84
 DECAY TIME (6.120000E+05 MINS.):
 EFFICIENCY = 4.084660E-02 (+- 1.882325E-03)

PEAK 7
 ENERGY: 661.650
 ACTIVITY: 8.032000E+02
 ACTIVITY ONE SIGMA: 0.000000E-01
 HALF-LIFE: D11020
 DECAY TIME (6.120000E+05 MINS.):
 EFFICIENCY = 3.647674E-02 (+- 9.170283E-05)

PEAK 8
 ENERGY: 898.021
 ACTIVITY: 2.014700E+03
 ACTIVITY ONE SIGMA: 0.000000E-01
 HALF-LIFE: D106.61
 DECAY TIME (6.120000E+05 MINS.):
 EFFICIENCY = 2.626686E-02 (+- 2.552038E-04)

PEAK 9
 ENERGY: 1173.240
 ACTIVITY: 1.092600E+03
 ACTIVITY ONE SIGMA: 0.000000E-01
 HALF-LIFE: D1925.3
 DECAY TIME (6.120000E+05 MINS.):
 EFFICIENCY = 2.150980E-02 (+- 6.404292E-05)

PEAK 10
 ENERGY: 1332.500
 ACTIVITY: 1.093200E+03
 ACTIVITY ONE SIGMA: 0.000000E-01
 HALF-LIFE: D1925.3
 DECAY TIME (6.120000E+05 MINS.):
 EFFICIENCY = 1.974500E-02 (+- 6.005783E-05)

PEAK 11
 ENERGY: 1836.130
 ACTIVITY: 2.135300E+03
 ACTIVITY ONE SIGMA: 0.000000E-01
 HALF-LIFE: D106.61
 DECAY TIME (6.120000E+05 MINS.):
 EFFICIENCY = 1.537435E-02 (+- 1.418405E-04)

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SYSTEM EFFICIENCY COEFFICIENTS, PART 2

$$\text{LOG(EFF)} = 1.227066\text{E}+02 - 7.976722\text{E}+01*\text{LOG(E)} + 1.920272\text{E}+01*\text{LOG(E)}^2 - 2.059581\text{E}+00*\text{LOG(E)}^3 + 8.221420\text{E}-02*\text{LOG(E)}^4$$

Batch 1144

ANALYTICAL BATCH

R 4110

937046L

U

DIRECT

WB88807

2A-925-106 / B-0

TANIA BATES

7-6-93

1100

23^o 2

1200

S. CATLOW

[illegible]

Dania Bates 7-6-93

URANIUM ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

Serial No R 4108.-5540	Sample Point VOGEL	Date 6-30-93	Time Issued 13:31	Priority 20
Determination U	Method Standard LA-925-106	Result Units % RECOVERY	Charge Code E11456	Retuns 0
Sample Size ? .100-10 → .100 mL			Customer ID STD	
Remarks Calculations Results S267 UF1C STD# 2688 RESULT 3.07×10^{-2} STD VAL 3.04×10^{-2} XREC 100.99% SPIKE ID/VAL 90838/6.25 g/L SPIKE VOL. 100 mL $\frac{.14(1)(100)(6.25 \times 10^{-4})}{(5.2) \cdot 42 - .14} = 3.074 \times 10^{-2}$ Janis) Bator				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
MS	MS	MS	MS	MS
Date 7-6-93	Time Completed 1200	Lab Unit Mgr Pohle	Lab Unit Mgr Leslie Diaz	

34-8000-061 (R 10-83)

Serial No R 4109.-5640	Sample Point VOGEL	Date 6-30-93	Time Issued 13:32	Priority 20
Determination U	Method Standard LA-925-106	Result Units uG/ML	Charge Code E11456	Retuns 0
Sample Size ? .100-10 → .500 mL			Customer ID BLK	
Remarks Calculations Results REAGENT BLANK 90838/6.25 g/L .100 mL $\frac{(.02)(1)(200)(6.25 \times 10^{-4})}{(6.1) \cdot 28 - 102} = 9.54 \times 10^{-4} \text{ g/L } \left(\frac{1000 \text{ uG}}{1 \text{ g}} \right) = 9.54 \times 10^{-1} \text{ uG/mL} \cdot 100 = 95.4$ Janis) Bator				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
MS	MS	MS	MS	MS
Date 7-6-93	Time Completed 1200	Lab Unit Mgr Pohle	Lab Unit Mgr Leslie Diaz	

34-8000-061 (R 10-83)

URANIUM ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

Serial No R 4110.-5740	Sample Point VOGEL	Date 6-30-93	Time Issued 13:34	Priority 20
Determination U	Method Standard LA-925-106	Result Units uG/ML	Charge Code E11456	Returns 0
Sample Size ? .100-10 → .500 ml			Customer ID 937046L	
Remarks, Calculations, Results $\frac{90838}{6.25 \text{ g/L}} \cdot \frac{.11}{.100 \text{ ml}} = 7.122 \times 10^{-3} \frac{\text{g}}{\text{L}} \cdot \frac{.11}{.100} = 7.12 \text{ uG/ml}$ $\frac{.11(1)(6.25)(6.25 \times 10^{-4})}{(.61) \cdot 3} = .11$ <i>Jamie Bates</i> .11 .30				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
hrs	hrs	hrs	hrs	hrs
Date 7-6-93	Time Completed 1200	Lab Unit Mgr <i>Raketa</i>		

34-8800-061 (R 10-93)

Serial No R 4110.-5840	Sample Point VOGEL	Date 6-30-93	Time Issued 13:34	Priority 20
Determination U	Method Standard LA-925-106	Result Units uG/ML	Charge Code E11456	Returns 0
Sample Size ? .100-10 → .500 ml			Customer ID 937046L	
Remarks, Calculations, Results DUPLICATE SAMPLE $\frac{90838}{6.25 \text{ g/L}} \cdot \frac{.14}{.100 \text{ ml}} = 9.537 \times 10^{-3} \frac{\text{g}}{\text{L}} \cdot \frac{.14}{.100} = 9.54 \text{ uG/ml}$ $\frac{.14(1)(202)(6.25 \times 10^{-4})}{(.61) \cdot 3} = .14$ <i>Jamie Bates</i> .14 .32				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
hrs	hrs	hrs	hrs	hrs
Date 7-6-93	Time Completed 1200	Lab Unit Mgr <i>Raketa</i>		

34-8800-061 (R 10-93)

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

Batch # 1175

Lab Segment Serial No.

R4110

Customer ID:

937046L

Analysis:

R4 239/40

Sample Prep:

DIRECT

Instrument: WB57237

Procedure/ Rev: 2A503-156 D-5

Technologist:

TAM Colwell / [Signature]

Date: 7-12-92

Starting Time:

0800

Temperature 24°C

Ending Time:

1400

Chemist: SA CATLOW

Comments:

	Description	Lab ID
1	Lmcs	R4108.-5581
2	Bik	R4109.-5681
3	SAM	R4110.-5781
4	SAM Dup	R4110.-5881
5		
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
Lmcs	63B43-.100ml			
Spike	70B43-.100ml			
				95

ANALYTICAL BATCH SUMMARY SHEET

METHOD:

LA-503-156

DATE START:

July 12, 1993

PREPARED BY:

L. L. Fritts

DATE COMPLETE:

July 13, 1993

[illegible]

NARRATIVE:

X

NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The samples were treated with concentrated nitric acid and 30% hydrogen peroxide prior to analysis. A factor of ten dilution was made by the pretreatment.

REV 1

44 4656

Serial No	Sample Point	Time Issued		Priority
R 4108.-5581	VOGEL	6-30-93	13:31	20
Determination	Method Standard	Result Units	Charge Code	Remarks
Pu239/40	LA-503-156	% RECOVERY	E11456	2
Sample Size	Customer ID			
7 100-10-100	STD			
Remarks, Calculations, Results				
EDP R211 AROO1		SUPER RUSH		
STD# 63843		RESULT 132		
STD VAL. 130.5		XREC 101.1%		
1 ml from HNB		ATTACH PRINTOUT		
100 ml Pu 236-70843		AREA - 480MIN		
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond A. Millican			
Date	Time Completed	Lab Unit Mgr		
7-12-93	1400	22 J. Fitts		

Pu 238 & 239/240: LA-503-156 (D-0)

LIQUIDS

STANDARD

Serial No.	Date Counted	07/12/93	Pu 236 AFA Frac. (C236)	0.4674
R4108-5581	Sample Volume in mL (SS)	0.1	Pu 238 AFA Frac. (C238)	0.0327
Batch ID	Sample D.F. (DIF)	101	Pu 239 AFA Frac. (C239)	0.4955
1175	Tracer Volume in mL (SPKV)	0.1	Total AT Counts	7080
Roron No.	Digest D.F. (DIF)	1	Time Counted (min)	30
2	Tracer Hook No.	70843	Background (cpm)	3
Analyst	Tracer Preparation Date	06/11/93	Pu 236 Counts	31.05
	Pu-236 Preparation Value	2786	Pu 238 Counts	2.17
Date	Pu-236 Decay Corr'd value	2729.08	Pu 239 Counts	32.92
07/12/93	Pu-238 Tracer Value	660	AFA Count Time	500

Decay Time = Counting Date No. - Preparation Date No.

Pu 236 Decay Correction = Tracer Prep Value * $e^{-\lambda t}$ (to the power of) $-\ln 2 \cdot \text{Decay Time}$ / 1040.95 (1)Pu 236 Tracer Recovery = 1 AT Counts / Time C'd - $\ln 2$ (2) (C236) (100) / Tracer 236 Decay Corr'd Value * mL addedPu 239/240 $\mu\text{Ci/L}$ = (C239) (Tracer 236 Decay Corr'd Val) (SPKV) (DIF) (DIF) (1000 mL/L) / 1 (C236) (SS) (2220000 dpm/ μCi) (1)Pu 238 dpm = 1 (Total AT C's / Time C'd) - $\ln 2$ (2) (C238) - (Pu 238 dpm/mL in Tracer) (SPKV) (Pu 236 Tracer Recovery / 100) (1)Pu 238 $\mu\text{Ci/mL}$ = 1 (Pu 238 dpm) (DIF) (DIF) (1) / 1 (Pu-236 Tracer Recovery / 100) (2220000 dpm/ μCi) (SS) (1)

Relative Counting Error = Square Root of 1 / (1 / Pu 236 Total Counts) + (1 / Pu 238 or 239/240 Total Counts) * 100

Pu-239/240 $\mu\text{Ci/L}$ = 1.32E+02

NOTE: Tracer values are in dpm/mL.

Pu 239/240 $\mu\text{Ci/mL}$ = 1.32E-01

Relative Counting Error = 1.1%

Pu 238 $\mu\text{Ci/mL}$ = < 1.14E-02

Relative Counting Error = 3.1%

Pu 236 Tracer Recovery = 79.8%

NOTE: Pu 238 Reported result is a LESS THAN value using 20 dpm for the Pu-238 sample activity.

Data Entry by: C.A. Clark Date: 13-Jul-93

Approved by: 22 J. Fitts Date: July 13, 1993

PLUTONIUM 239/240 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#2 V- 7-12-93

7080 - 3
30

R4108-5581

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

4.4 8732

Serial No R 4108.-5581	Sample Point VOGEL	Date 6-30-93	Time Issued 13:31	Priority 20
Determination Pu239/40	Method-Standard LA-503-156	Result Units % RECOVERY	Charge Code E11456	Retung 1
Sample Size ? 100-10-50 + .1 ml Spike			Customer ID STD	
Remarks, Calculations, Results EDP R211 AROO1 STD# 63843 RESULT 61142 STD VAL. %REC 86.1 % Acid Ads 1 ml 8 ml H403 70843				
RERUN				
OUT FOR RERUN				
Analyst - 1 Mrs	Analyst - 2 Mrs	Analyst - 3 Mrs	Analyst - 4 Mrs	Analyst - 5 Mrs
	9-9-93 0830		9-10-93 1100	
Date 7-9-93	Time Completed 1530	Lab Unit Mgr		

54-5500-06 (R-10-93)

#1 7-9-93 5 " R4108-5581

648 - 6
30

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

3.2 2036

Serial No R 4108.-5581	Sample Point VOGEL	Date 6-30-93	Time Issued 13:31	Priority 20
Determination Pu239/40	Method Standard LA-503-156	Result Units % RECOVERY	Charge Code E11456	Reruns 0
Sample Size 50 100 ¹⁰⁰ + .1 ml SPIKE # 70B43			Customer ID STD	
Remarks Calculations Results EDP R211. AROO1 STD# 56843 ^{63B43} RESULT OUT FOR RERUN STD VAL. %REC ACID ADJ. 1 ml 8M HNO ₃ <i>Link Cord</i>				
Analyst - 1 <i>LA</i>	Analyst - 2 <i>Em Busch</i>	Analyst - 3 <i>D. A. Miller</i>	Analyst - 4 <i>Ad. Blum</i>	Analyst - 5
Mrs	Mrs	Mrs	Mrs 7-8-93 0850	Mrs
Date 7-6-93	Time Completed 2400	Lab Unit Mgr <i>EL</i> 7/12		

54-6630-061 (R-10-83)

#1 7-7-93

R4108-5581

$$\frac{4598}{30} - 6$$

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32 2055

Serial No R 4109.-5681	Sample Point VOGEL	Time Issued 6-30-93		Priority 20
Determination Pu239/40	Method-Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Remarks 2
Sample Size ? .025 ml	Customer ID BLK			
Remarks Calculations Results REAGENT BLANK COUNT AS uCi/L .100 ml Pu 236 - 70BY3 $< 2.65 \times 10^{-4}$ SUPER RUSH MCI/ml "AEA" - 480K IN ATTACH PRINTOUT				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 <i>Raymond D. H. Medina</i>	Analyst - 3	Analyst - 4	Analyst - 5
Date 7-12-93	Time Completed 1400	Lab Unit Mgr <i>[Signature]</i>	<i>[Signature]</i> 7/15	

54-8800-06 (Rev. 10-83)

Pu 238 & 239/240: LA-503-156 (D-0)

LIQUIDS

BLANK

Serial No.	Date Counted	07/13/93	Pu 236 AFA Frac. (C236)	0.9282
R4109-5681	Sample Volume in ml. (SS)	0.025	Pu 238 AFA Frac. (C238)	0.0584
Batch ID	Sample D.F. (DF)	1	Pu 239 AFA Frac. (C239)	0.002
1175	Tracer Volume in ml. (SPKV)	0.1	Total AT Counts	4012
Rrun No.	Digest D.F. (DDF)	1	Time Counted (min)	30
2	Tracer Book No.	70B43	Background (cpm)	5
Analyst	Tracer Preparation Date	06/11/93	Pu 236 Counts	48.35
	Pu-236 Preparation Value	2786	Pu 238 Counts	3.04
Date	Pu-236 Decay Corr'd value	2727.26	Pu 239 Counts	0.11
07/12/93	Pu-238 Tracer Value	660	AFA Count Time	267.9167

Decay Time = Counting Date No. - Preparation Date No.

Pu 236 Decay Correction = Tracer Prep Value * $e^{-(\lambda \cdot \text{Decay Time})} / 1040.95$ | 1Pu 236 Tracer Recovery = 1 AT Counts / Time C'd - $\text{dkg} \cdot (2) \cdot (C236) (100) / \text{Tracer 236 Decay Corr'd Value} \cdot \text{ml added}$ Pu 239/240 uCi/l = $(C239) (\text{Tracer 236 Decay Corr'd Val}) (SPKV) (DF) (DDF) (1000 \text{ ml/L}) / 1 (C236) (SS) (2220000 \text{ dpm/uCi})$ |Pu 238 dpm = $1 (\text{Total AT C's} / \text{Time C'd}) - \text{dkg} \cdot (2) \cdot (C238) - (Pu 238 \text{ dpm/ml in Tracer}) (SPKV) (Pu 236 \text{ Tracer Recovery} / 100)$ |Pu 238 uCi/mL = $1 (Pu 238 \text{ dpm}) (DF) (DDF) / 1 (Pu-236 \text{ Tracer Recovery} / 100) (2220000 \text{ dpm/uCi}) (SS)$ |Relative Counting Error = Square Root of $1 / (1 / Pu 236 \text{ Total Counts}) + (1 / Pu 238 \text{ or } 239/240 \text{ Total Counts}) \cdot 100$

Pu-239/240 uCi/l. = < 2.65E-01

NOTE: Tracer values are in dpm/mL.

Pu 239/240 uCi/mL = < 2.65E-04

NOTE: Pu 239/240 Reported result is a LESS THAN value using 0.05 for the Pu-239/240 peak height.

Relative Counting Error = 18.4%

NOTE: Pu 238 Reported result is a LESS THAN value using 20 dpm for the Pu-238 sample activity.

Pu 238 uCi/mL = < 4.11E-04

Relative Counting Error = 3.6%

Pu 236 Tracer Recovery = 87.6%

Data Entry by: *CA Clark*

Date: 13-Jul-93

Approved by: *AB Jitts*

Date: July 13, 1993

PLUTONIUM 239/240 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#1 R 7-12-73

4012 - 5

30

R 4109-5681

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

3.2 2044

Serial No R 4109.-5681	Sample Point VOGEL	Date 6-30-93	Time Issued 13:32	Priority 20
Determination Pu239/40	Method Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Reruns 1
Sample Size 7-100-10-50 <i>7/1/93</i> <i>100 ml Sp. 12</i>			Customer ID BLK	
Remarks, Calculations, Results 70843 REAGENT BLANK COUNT AS uCi/L RERUN				
OUT FOR RERUN				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 <i>Em. B. [Signature]</i>	Analyst - 3 <i>[Signature]</i>	Analyst - 4 <i>Reynold</i>	Analyst - 5
Mrs	Mrs	Mrs 7-10-93 11:00	Mrs 7-10-93	Mrs
Date 7-9-93	Time Completed 1530	Lab Unit Mgr	<i>[Signature]</i> 7/12	

54-6800-061 (Rev 10-83)

#2 7-9-93

R4109-5681

$$\frac{3112}{30} - 3$$

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

4/1 5557

Serial No R 4109.-5681	Sample Point VOGEL	Date 6-30-93	Time Issued 13:32	Priority 20
Determination Pu239/40	Method-Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Reruns 0
Sample Size ? .050 ml H ₂ O + .1 ml SPIKE # 70843			Customer ID BLK	
Remarks, Calculations, Results REAGENT BLANK COUNT AS uCi/L ACID ADJ <u>1 ml 8M HNO₃</u> OUT FOR RERUN <i>Jim Louie</i>				
Analyst - 1 7	Analyst - 2 <i>Em Bara</i>	Analyst - 3 <i>D Hamilton</i>	Analyst - 4 <i>[Signature]</i>	Analyst - 5
Mrs	Mrs	Mrs	Mrs 7-8-93 0850	Mrs
Date 7-6-93	Time Completed 2400	Lab Unit Mgr <i>[Signature]</i>		

54-6800-006 (M-10-83)

#3 7-7-93

R4109-5681

4811
30 -6

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2053

Serial No R 4110.-5781	Sample Point VOGEL	RERUN		Time Issued 6-30-93	Priority 13:34
Determination Pu239/40	Method Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Returns 2	
Sample Size ? .025 ml			Customer ID 937046L		
Remarks Calculations Results COUNT AS uCi/L 1 ml 8m HNO₃ .100 ml Pu 236 - 70843 337 x 10⁻³ uCi/ml SUPER RUSH "AEA" - 480MIN ATTACH PRINTOUT					
Analyst - 1 <i>Labelf</i>	Analyst - 2 <i>Raymond</i>	Analyst - 3 <i>W. H. H. H.</i>	Analyst - 4	Analyst - 5	
Date 7-12-93	Time Completed 1400	Lab Unit Mgr <i>W. H. H. H.</i>	<i>7/15</i>		

54 6800-001 (R-10-93)

Pu 238 & 239/240: LA-503-156 (D-0)			LIQUIDS	SAMPLE
Serial No.	Date Counted	07/12/93	Pu 236 AEA Fac. (C236)	0.5359
R4110-5781	Sample Volume in ml. (SS)	0.025	Pu 238 AEA Fac. (C238)	0.0918
Batch ID	Sample D.F. (DF)	1	Pu 239 AEA Fac. (C239)	0.3678
1175	Tracer Volume in ml. (S*KV)	0.1	Total AT Counts	6818
Run No.	Digest D.F. (DDF)	1	Time Counted (min)	30
2	Tracer Hook No.	70843	Background (cpm)	3
Analyst	Tracer Preparation Date	06/11/93	Pu 236 Counts	51.72
	Pu-236 Preparation Value	2786	Pu 238 Counts	8.86
Date	Pu-236 Decay Corr'd value	2729.08	Pu 239 Counts	35.51
07/12/93	Pu-238 Tracer Value	660	AEA Count Time	500

Decay Time = Counting Date No. - Preparation Date No.

Pu 236 Decay Correction = Tracer Prep Value * 1 e to the power of (- ln 2 * Decay Time) / 1040.95 | 1

Pu 236 Tracer Recovery = 1 AT Counts / Time CL'd - 1kg (2) (C236) (100) / Tracer 236 Decay Corr'd Value * ml. added.

Pu 239/240 uCi/L = (C239) (Tracer 236 Decay Corr'd Val) (S*KV) (DF) (DDF) (1000ml/L) / 1 (C236) (SS) (2220000dpm/μCi) |

Pu 238 dpm = 1 (Total AT CL's / Time CL'd) - 1kg * (2) (C238) - (Pu 238 dpm/ml in Tracer) (S*KV) (Pu 236 Tracer Recovery / 100) |

Pu 238 uCi/mL = 1 (Pu 238 dpm) (DF) (DDF) / 1 (Pu-238 Tracer Recovery / 100) (2220000dpm/μCi) (SS) |

Relative Counting Error = Square Root of 1 / (1/Pu 236 Total Counts) + (1 / Pu 238 or 239/240 Total Counts) | * 100

Pu-239/240 uCi/L = 3.37E+00

NOTE: Tracer values are in dpm/mL.

Pu 239/240 uCi/mL	=	3.37E-03
Relative Counting Error	=	1.0%
Pu 238 uCi/mL	=	< 4.09E-04
Relative Counting Error	=	1.6%
Pu 236 Tracer Recovery	=	88.1%

NOTE: Pu 238 Reported result is a LESS THAN value using 20 dpm for the Pu-238 sample activity.

Data Entry by:	<i>W. H. H. H.</i>	Date:	13-Jul-93
Approved by:	<i>W. H. H. H.</i>	Date:	July 12, 1993

Form 1 Rev. 1

PLUTONIUM 239/240 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#2 R 7-12-73
6818 - 3
30

R 4110-5781

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

3.4 4645

Serial No R 4110.-5781	Sample Point VOGEL	Date 6-30-93	Time Issued 13:34	Priority 20
Determination Pu239/40	Method/Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Retuns 1
Sample Size ? 100-10-50 & .100 ml Spike			Customer ID 937046L	
Remarks, Calculations, Results COUNT AS uCi/L 70843				
RERUN				
OUT FOR RERUN				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 <i>[Signature]</i>	Analyst - 3 <i>[Signature]</i>	Analyst - 4 <i>[Signature]</i>	Analyst - 5 <i>[Signature]</i>
hrs	hrs	hrs 7-10-93 11:00	hrs 7-10-93	hrs
Date 7-9-93	Time Completed 1530	Lab Unit Mgr <i>[Signature]</i> 7/12		

54-5600-061 (R-10-93)

#3 7-9-93 R. 4110-5781

2918
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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

Serial No R 4110.-5781		Sample Point VOGEL		Date 6-30-93	Time Issued 13:34	Priority 20
Determination Pu239/40	Method/Standard LA-503-156	Result Units uCi/ML		Charge Code E11456	Retuns 0	
Sample Size ? 50-10-50 + .1 ml SPIKE #7DB43				Customer ID 937046L		
Remarks, Calculations, Results: COUNT AS uCi/L ACID ADJ <u>1 mL 8M HNO3</u> <i>Sample size too small</i> <i>Timothy Conley</i>						
Analyst - 1 <i>Timothy Conley</i>	Analyst - 2 <i>Em. Buehler</i>	Analyst - 3 <i>W. J. Blanton</i>	Analyst - 4	Analyst - 5		
hrs	hrs	hrs 7-8-93 14:45	hrs	hrs		
Date 7-6-93	Time Completed 2400	Lab Unit Mgr		<i>ER</i> 7/12 54-6200-061 (R-10-83)		

#3 7-7-93

R4110-5781

$$\frac{4860}{30} - 4$$

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81 7022

Serial No	Sample Point	Date	Time Issued	Priority
R 4110-5881	VOGEL	6-30-93	13:34	20
Determination	Method Standard	Result Units	Charge Code	Returns
Pu239/40	LA-503-156	uCi/ML	E11456	2
Sample Size	Customer ID			
7 .025 ml	937046L			
Remarks Calculations Results				
DUPLICATE SAMPLE 3.42×10^{-3} SUPER RUSH COUNT AS uCi/L mCi/ml 1 ml 8u HNO ₃ .10 ml Pu 236-7022 "AEA" - 480MIN ATTACH PRINTOUT				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond	D. Hamilton		
Date	Time Completed	Lab Unit Mgr.		
7-12-93	1400	JEFF	E. 7/1/93	

Pu 238 & 239/240: LA-503-156 (D-0)

LIQUIDS

DUPLICATE

Serial No.	Date Counted	07/12/93	Pu 236 AEA Frac. (C236)	0.5411
R4110-5881	Sample Volume in mL (SS)	0.025	Pu 238 AEA Frac. (C238)	0.0831
Batch ID	Sample D.F. (DP)	1	Pu 239 AEA Frac. (C239)	0.3758
1175	Tracer Volume in mL (SPKV)	0.1	Total AT Counts	5997
Rerun No.	Digest D.F. (DDF)	1	Time Counted (min)	30
2	Tracer Hook No.	70B43	Background (cpm)	5
Analyst	Tracer Preparation Date	06/11/93	Pu 236 Counts	37.98
	Pu-236 Preparation Value	2786	Pu 238 Counts	5.83
Date	Pu-236 Decay Cor'd value	2729.08	Pu 239 Counts	26.38
07/12/93	Pu-238 Tracer Value	660	AEA Count Time	500

Decay Time = Counting Date No. - Preparation Date No.

Pu 236 Decay Correction = Tracer Prep Value * $1 - \ln(2) \cdot \text{Decay Time}$ / 1040.95 (1)Pu 236 Tracer Recovery = 1 AT Counts / Time C'd - $\ln(2)$ (C236) (100) / Tracer 236 Decay Cor'd Value * mL added

Pu 239/240 uCi/L = (C239) (Tracer 236 Decay Cor'd Val) (SPKV) (DP) (DDF) (1000mL/L) / 1 (C236) (SS) (2220000dpm/uCi) (1)

Pu 238 dpm = 1 (Total AT C's / Time C'd) - $\ln(2)$ (C238) - (Pu 238 dpm/mL in Tracer) (SPKV) (Pu 236 Tracer Recovery / 100) (1)

Pu 238 uCi/mL = 1 (Pu 238 dpm) (DP) (DDF) (1) / 1 (Pu-236 Tracer Recovery / 100) (2220000dpm/uCi) (SS) (1)

Relative Counting Error = Square Root of 1 (1/Pu 236 Total Counts) + (1 / Pu 238 or 239/240 Total Counts) (1) * 100

Pu-239/240 uCi/L = 3.42E+00

NOTE: Tracer values are in dpm/mL.

Pu 239/240 uCi/mL	=	3.42E-03
Relative Counting Error	=	1.1%
Pu 238 uCi/mL	=	< 4.66E-04
Relative Counting Error	=	2.0%
Pu 236 Tracer Recovery	=	77.3%

NOTE: Pu 238 Reported result is a LESS THAN value using 20 dpm for the Pu-238 sample activity.

Data Entry by: PA Clark

Date: 13-Jul-93

Approved by: J. F. Fitts

Date: July 13, 1993

PLUTONIUM 239/240 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

*157.12.93

5997-5

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R4110-5881

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

4.1 5525

Serial No R 4110.-5881	Sample Point VOGEL	Date 6-30-93	Time Issued 13:34	Priority 20
Determination Pu239/40	Method/Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Reruns 1
Sample Size ? 100-10-50 + .100 ml Spike			Customer ID 937046L	
Remarks, Calculations, Results 70843 DUPLICATE SAMPLE COUNT AS uCi/L RERUN				
OUT FOR RERUN				
Analyst - 1 <i>Jeff Sellmick</i>	Analyst - 2 <i>Emilia</i>	Analyst - 3 <i>Alphano</i>	Analyst - 4 <i>Raymond</i>	Analyst - 5
Mrs	Mrs	Mrs 7-10-93 11:00	Mrs 7-10-93	Mrs
Date 7-9-93	Time Completed 1530	Lab Unit Mgr <i>[Signature]</i>		

54-6800-064 (10-10-83)

#1 7-9-93

R4110-5881

2533 -4
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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

1-4		4135		
Serial No R 4110.-5881	Sample Point VOGEL	Date 6-30-93	Time Issued 13:34	Priority 20
Determination Pu239/40	Method: Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Reruns 0
Sample Size ? 50-10-50 + .1 ml SPIKE # 70843			Customer ID 937046L	
Remarks, Calculations, Results DUPLICATE SAMPLE COUNT AS uCi/L ACID ADJ. 1 ml 8M HNO ₃ <i>Jim Conlin</i> Sample size too small				
Analyst - 1 <i>Jim Conlin</i>	Analyst - 2 <i>Em Bell</i>	Analyst - 3 <i>Jim Conlin</i>	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs 7-8-93 14.50	Mrs	Mrs
Date 7-6-93	Time Completed 2400	Lab Unit Mgr	<i>[Signature]</i>	

52-000-061 (R-10-83)

#2 7-7-93

R4110-5881

4319
30 -3

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D. H. Milicia
7-15-93GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R-4108-5581
File ID: SD4656.SPC

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Counted on: 7/12/93 @20: 0
Detector/Geometry number: 4/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	2053.4	2015.3	362.062	362.062	16.000	6.924	8.000	3.357
2	137.2	135.2	303.656	303.656	16.000	7.047	8.000	3.117
3	103.4	20.1	265.050	265.050	12.000	6.183	6.000	3.237
4	2438.2	2387.3	229.493	229.493	16.000	6.878	8.000	4.689

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Pu236	0.4674	5.756	5.763	-0.007	0.03	31.05	212.07	0.955E-04
2	Pu238	0.0327	5.499	5.494	0.005	0.03	2.17	20.21	0.910E-05
	Am241		5.480	5.494	-0.014				0.697E-05
3		0.0044		5.317		0.03	0.29	1.94	0.874E-06
4	Pu239	0.4955	5.143	5.153	-0.010	0.03	32.92	220.32	0.992E-04
	Pu240		5.144	5.153	-0.009				0.992E-04

DETECTOR CALIBRATION

Energy(MEV) = 4.097 + (0.0046)*Channel

Energy range (MeV): 4.097 TO 6.453

Efficiency = 0.1494 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	33657.0	100.000
Smoothed	33656.3	99.998
Composite fit	33214.5	98.685
Residuals	441.9	1.313

Analyzed by: _____

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 105 TO 116.

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Raw Data Dump for AEA Spectrum: SP:SD4656.SPC

1	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	1.	0.	0.	0.	0.	1.	0.	0.	1.	0.
51	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
71	2.	0.	0.	0.	0.	0.	0.	1.	0.	1.
81	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
91	2.	0.	1.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
111	1.	1.	3.	1.	0.	0.	1.	1.	0.	2.
121	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
131	0.	1.	1.	1.	0.	2.	0.	1.	1.	1.
141	1.	1.	1.	0.	1.	0.	3.	2.	2.	2.
151	3.	0.	2.	0.	0.	3.	0.	0.	1.	1.
161	2.	0.	5.	0.	0.	2.	3.	2.	1.	0.
171	1.	3.	0.	2.	1.	3.	5.	2.	4.	2.
181	5.	1.	8.	3.	5.	2.	6.	4.	2.	5.
191	8.	3.	5.	5.	11.	10.	12.	17.	15.	19.
201	15.	21.	12.	21.	28.	46.	35.	27.	44.	55.
211	72.	96.	100.	139.	200.	243.	263.	313.	334.	377.
221	465.	552.	642.	837.	1014.	1316.	1531.	1708.	1537.	1487.
231	1238.	869.	530.	285.	153.	62.	20.	10.	1.	2.
241	1.	0.	2.	1.	1.	2.	4.	3.	6.	5.
251	2.	1.	5.	6.	9.	3.	3.	12.	7.	6.
261	10.	5.	14.	12.	13.	7.	9.	7.	8.	2.
271	3.	6.	1.	4.	4.	2.	3.	2.	1.	5.
281	6.	6.	8.	7.	16.	17.	10.	6.	10.	18.
291	22.	27.	32.	37.	52.	44.	46.	43.	52.	55.
301	80.	82.	100.	74.	85.	61.	31.	24.	4.	2.
311	5.	5.	4.	2.	3.	1.	4.	4.	3.	4.
321	3.	4.	7.	7.	11.	10.	12.	8.	14.	10.
331	13.	16.	10.	21.	17.	18.	17.	34.	29.	40.
341	47.	56.	56.	96.	130.	158.	214.	256.	355.	449.
351	487.	587.	600.	553.	525.	585.	708.	856.	1054.	1246.
361	1385.	1372.	1194.	934.	593.	347.	164.	67.	22.	4.
371	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	1.	2.	1.	0.	1.	1.	1.	0.	0.
411	2.	0.	1.	0.	0.	1.	0.	0.	1.	0.
421	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
431	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	1.	1.	0.	1.	1.	1.	1.	1.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4109-5681
File ID: SD2055.SPC*Puller*
7-13-93Counted on: 7/13/93 @ 3: 0
Detector/Geometry number: 2/ 1
Count time: 16075. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	1192.8	1212.2	365.075	365.075	24.000	17.192	12.000	8.073
2	65.1	66.5	307.185	307.185	20.000	15.562	10.000	4.374
3	7.6	8.0	267.650	267.650	28.000	5.842	14.000	0.636
4	2.9	2.5	232.269	232.269	20.000	5.296	10.000	1.161

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity	
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	uCi/ea	
1	Pu236	0.9282	5.756	5.765	-0.009	0.08	48.35	0.01	0.377E-08	
2	Pu238	0.0584	5.499	5.498	0.001	0.07	3.04	0.00	0.323E-09	
	Am241		5.480	5.498	-0.018				0.247E-09	
3		0.0113		5.316		0.03	0.59	0.00	0.451E-10	
4	Pu239	0.0020	5.143	5.154	-0.011	0.02	0.11	0.00	0.810E-11	
	Pu240		5.144	5.154	-0.010				0.810E-11	

DETECTOR CALIBRATION

Energy(MEV) = 4.085 + (0.0046)*Channel

Energy range (MeV): 4.085 TO 6.441

Efficiency = ***** CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	13934.0	100.000
Smoothed	13933.7	99.998
Composite fit	13955.6	100.155
Residuals	-22.9	-0.164

Analyzed by: _____

DM

BEST AVAILABLE COPY

WHC-SD-WM-DP-044
REV 1

BEST AVAILABLE COPY

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD2055.SPC

1	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
11	1.	1.	1.	0.	0.	0.	0.	0.	0.	2.
21	0.	0.	2.	0.	1.	1.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	2.	1.	1.	0.	1.
41	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	1.	0.	2.
61	1.	1.	0.	1.	1.	0.	0.	0.	0.	2.
71	0.	0.	1.	0.	0.	0.	3.	0.	1.	0.
81	0.	0.	1.	1.	0.	0.	1.	0.	0.	0.
91	1.	0.	2.	0.	0.	1.	0.	0.	0.	1.
101	1.	1.	0.	0.	0.	0.	1.	2.	1.	2.
111	0.	3.	1.	1.	0.	0.	0.	2.	1.	1.
121	1.	1.	0.	0.	2.	0.	2.	1.	0.	2.
131	1.	0.	0.	1.	0.	1.	1.	0.	0.	1.
141	0.	0.	1.	0.	0.	0.	2.	0.	0.	0.
151	0.	1.	0.	2.	1.	1.	1.	0.	1.	0.
161	2.	1.	2.	0.	1.	0.	2.	2.	0.	1.
171	0.	1.	0.	0.	1.	0.	0.	0.	1.	0.
181	0.	2.	1.	1.	0.	0.	1.	0.	0.	3.
191	0.	0.	0.	2.	1.	1.	0.	2.	0.	1.
201	0.	0.	0.	2.	2.	2.	2.	0.	1.	0.
211	1.	1.	1.	3.	1.	1.	3.	1.	3.	0.
221	2.	0.	0.	2.	1.	3.	5.	3.	3.	3.
231	5.	2.	2.	3.	5.	0.	2.	3.	2.	2.
241	2.	2.	0.	2.	1.	3.	3.	1.	3.	3.
251	3.	3.	3.	8.	4.	5.	5.	4.	8.	1.
261	4.	8.	5.	5.	7.	3.	8.	2.	7.	10.
271	3.	1.	5.	6.	6.	2.	6.	2.	2.	3.
281	9.	4.	6.	7.	8.	10.	5.	7.	14.	11.
291	13.	17.	21.	22.	14.	23.	18.	28.	24.	30.
301	30.	33.	39.	31.	31.	49.	28.	30.	43.	26.
311	29.	27.	16.	10.	10.	8.	10.	10.	12.	7.
321	9.	7.	8.	5.	10.	5.	9.	9.	2.	10.
331	8.	13.	13.	11.	16.	21.	29.	21.	33.	37.
341	43.	43.	62.	66.	77.	101.	123.	150.	170.	214.
351	222.	261.	326.	354.	424.	443.	487.	509.	583.	584.
361	636.	637.	650.	629.	681.	616.	609.	473.	495.	431.
371	357.	294.	230.	184.	100.	89.	71.	34.	28.	20.
381	4.	7.	1.	1.	0.	1.	0.	0.	0.	0.
391	0.	0.	1.	0.	0.	0.	0.	0.	1.	0.
401	1.	0.	0.	0.	0.	0.	1.	0.	1.	0.
411	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
421	1.	0.	0.	0.	0.	2.	0.	0.	0.	0.
431	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
461	0.	0.	1.	1.	0.	0.	0.	0.	0.	1.
471	0.	0.	1.	2.	0.	0.	0.	1.	1.	1.
481	1.	0.	0.	0.	0.	1.	1.	0.	2.	0.
491	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

D. H. Milicia
7-13-93GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R-4110-5781
File ID: SD2053.SPC

BEST AVAILABLE COPY

Counted on: 7/12/93 @18: 0
Detector/Geometry number: 2/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	2220.0	2264.7	364.108	364.108	24.000	18.115	12.000	7.046
2	370.9	371.4	305.343	305.343	24.000	17.540	12.000	5.759
3	445.3	0.0	264.284	264.284	12.000	12.123	6.000	6.102
4	1566.3	1596.3	231.639	231.639	24.000	17.350	12.000	7.017
5	7.9	7.5	122.236	122.236	112.000	2.000	56.000	0.200
6	3.4	2.6	47.696	47.696	28.000	81.050	14.000	3.397

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count Rate c/m	d/m	Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM			
1	Pu236	0.5359	5.756	5.759	-0.003	0.08	51.72	0.01	0.406E-08
2	Pu238	0.0918	5.499	5.489	0.010	0.08	8.86	0.00	0.947E-09
	Am241		5.480	5.489	-0.009				0.725E-09
3		0.0000		5.300		0.06	0.00	0.00	0.000E+00
4	Pu239	0.3678	5.143	5.150	-0.007	0.08	35.51	0.01	0.273E-08
	Pu240		5.144	5.150	-0.006				0.273E-08
5	Np237	0.0030	4.640	4.647	-0.007	0.01	0.29	0.00	0.372E-09
6	U 238	0.0015	4.200	4.304	-0.104	0.37	0.15	0.00	0.146E-10
	U 235		4.396	4.304	0.092				0.198E-10

DETECTOR CALIBRATION

Energy(MEV) = 4.084 + (0.0046)*Channel

Energy range (MeV): 4.084 TO 6.440

Efficiency = ***** CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	48518.0	100.000
Smoothed	48518.0	100.000
Composite fit	48261.3	99.471
Residuals	256.7	0.529

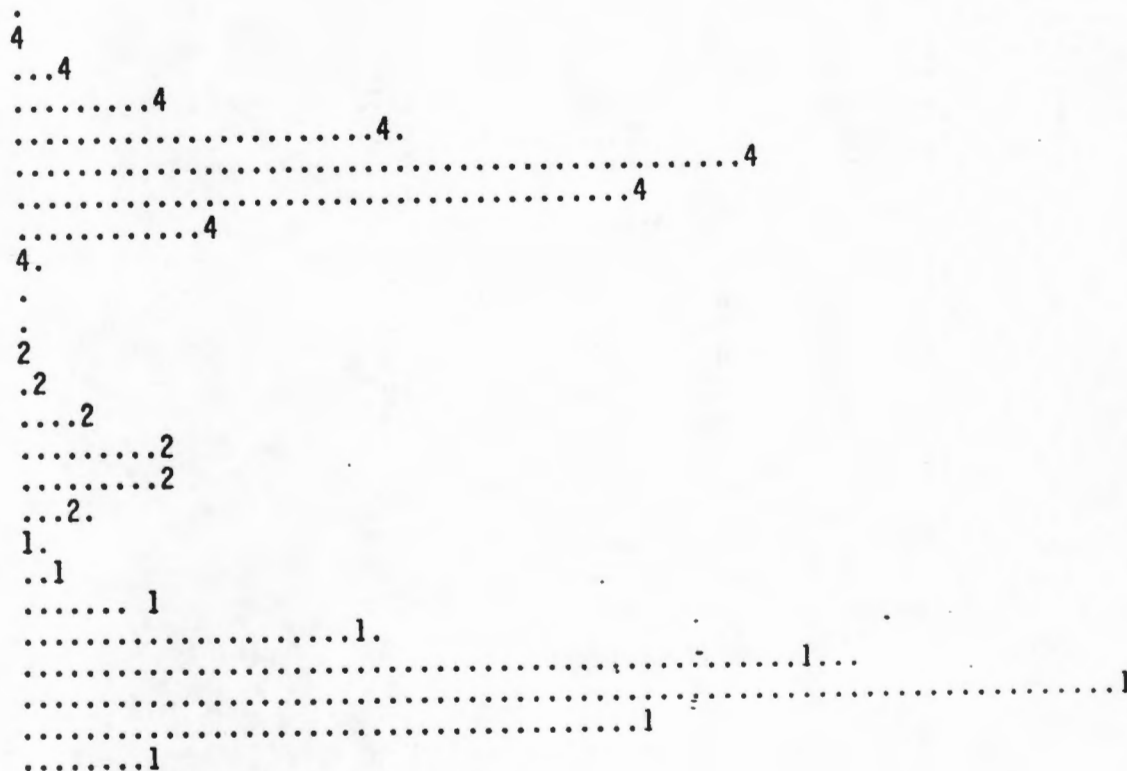
Analyzed by: _____

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

8555.9

WHC-SD-WM-DP-044
REV 1

BEST AVAILABLE COPY



BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD2053.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	1.	2.	0.	0.	0.	1.	2.	0.	0.	3.
21	1.	1.	4.	0.	3.	1.	4.	0.	2.	1.
31	1.	0.	0.	0.	2.	0.	1.	3.	1.	1.
41	3.	1.	1.	5.	3.	1.	2.	2.	3.	3.
51	1.	2.	1.	1.	2.	3.	0.	2.	1.	1.
61	1.	2.	3.	0.	0.	3.	2.	1.	2.	4.
71	0.	1.	2.	0.	1.	3.	1.	1.	3.	3.
81	5.	2.	0.	1.	2.	2.	2.	1.	1.	5.
91	1.	0.	1.	2.	0.	0.	3.	3.	2.	2.
101	3.	3.	0.	1.	3.	4.	1.	3.	1.	3.
111	2.	3.	4.	2.	4.	2.	3.	4.	4.	1.
121	4.	6.	4.	2.	3.	3.	2.	2.	2.	4.
131	4.	1.	0.	4.	2.	2.	4.	3.	7.	4.
141	3.	8.	1.	5.	1.	2.	5.	1.	6.	4.
151	6.	7.	4.	4.	4.	5.	3.	3.	7.	5.
161	6.	4.	7.	3.	2.	11.	8.	8.	3.	6.
171	13.	7.	13.	9.	11.	9.	11.	15.	12.	14.
181	14.	19.	16.	12.	13.	14.	9.	18.	14.	19.
191	21.	23.	22.	25.	21.	32.	31.	21.	27.	23.
201	39.	34.	42.	62.	58.	83.	67.	84.	93.	117.
211	131.	136.	203.	202.	242.	255.	307.	333.	391.	419.
221	521.	535.	617.	651.	707.	757.	837.	849.	856.	899.
231	803.	828.	753.	781.	691.	639.	520.	400.	358.	257.
241	200.	158.	107.	77.	67.	43.	22.	19.	18.	15.
251	12.	14.	17.	11.	11.	18.	22.	25.	21.	17.
261	17.	21.	21.	23.	23.	16.	21.	23.	16.	20.
271	24.	20.	14.	21.	16.	19.	26.	25.	14.	28.
281	22.	30.	16.	43.	46.	48.	61.	52.	64.	69.
291	97.	99.	96.	112.	132.	136.	145.	162.	183.	168.
301	195.	189.	202.	207.	207.	213.	192.	158.	147.	137.
311	119.	76.	94.	73.	65.	58.	52.	22.	37.	27.
321	33.	25.	23.	19.	33.	36.	47.	24.	36.	35.
331	42.	40.	54.	51.	63.	66.	80.	105.	123.	129.
341	141.	144.	198.	250.	238.	241.	325.	384.	509.	500.
351	522.	601.	707.	796.	870.	887.	993.	1040.	1103.	1161.
361	1240.	1168.	1225.	1216.	1079.	1076.	1066.	908.	794.	708.
371	578.	466.	382.	259.	200.	158.	101.	54.	47.	27.
381	11.	7.	7.	8.	2.	0.	1.	0.	0.	0.
391	0.	1.	0.	0.	0.	0.	0.	0.	0.	1.
401	1.	1.	0.	1.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	1.	1.	1.	0.
421	0.	0.	1.	2.	1.	1.	0.	0.	2.	0.
431	0.	2.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	2.	1.	1.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
461	0.	0.	0.	0.	0.	0.	1.	0.	1.	1.
471	1.	0.	2.	0.	0.	0.	2.	0.	1.	0.
481	1.	0.	0.	1.	1.	1.	1.	0.	2.	1.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

D. H. McElvira
7-13-93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R-4110-5881
File ID: SD7022.SPC

BEST AVAILABLE COPY

Counted on: 7/12/93 @19: 0
Detector/Geometry number: 7/1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	2345.4	2335.8	364.240	364.240	20.000	9.060	10.000	4.870
2	359.8	363.6	306.181	306.181	20.000	9.228	10.000	5.342
3	199.8	0.0	267.943	267.943	12.000	12.123	6.000	6.102
4	1739.3	1717.5	233.498	233.498	20.000	9.185	10.000	6.428

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Cm244	0.5411	5.796	5.782	0.014	0.04	37.98	187.63	0.845E-04
	Cm243		5.786	5.782	0.004				0.116E-03
2	Pu238	0.0831	5.499	5.509	-0.010	0.04	5.83	40.02	0.180E-04
	Am241		5.480	5.509	-0.029				0.133E-04
3		0.0000		5.329		0.06	0.00	0.00	0.000E+00
4	Pu239	0.3758	5.143	5.167	-0.024	0.04	26.38	130.34	0.587E-04
	Pu240		5.144	5.167	-0.023				0.587E-04

DETECTOR CALIBRATION

Energy(MEV) = 4.070 + (0.0047)*Channel
Energy range (MeV): 4.070 TO 6.476
Efficiency = 0.2024 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	35323.0	100.000
Smoothed	35323.0	100.000
Composite fit	35093.8	99.351
Residuals	229.2	0.649

Analyzed by: _____

WHC-SD-WM-DP-044
REV. 1

BEST AVAILABLE COPY

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD7022.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	1.	0.	1.	0.	2.	0.	0.	0.	2.
31	0.	0.	0.	1.	1.	1.	0.	0.	1.	0.
41	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
81	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.
91	0.	0.	1.	0.	1.	0.	1.	0.	0.	0.
101	0.	0.	0.	0.	0.	2.	1.	1.	0.	0.
111	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
121	0.	1.	0.	0.	0.	0.	1.	2.	0.	0.
131	0.	0.	1.	2.	0.	2.	0.	0.	0.	0.
141	0.	2.	1.	1.	0.	2.	2.	4.	1.	3.
151	2.	1.	0.	0.	0.	0.	1.	2.	1.	0.
161	0.	0.	1.	0.	1.	1.	1.	0.	0.	1.
171	0.	0.	2.	0.	2.	1.	5.	0.	1.	1.
181	1.	1.	3.	2.	0.	0.	2.	1.	1.	0.
191	0.	4.	3.	2.	4.	2.	5.	4.	5.	2.
201	2.	3.	1.	5.	11.	7.	15.	9.	15.	19.
211	20.	23.	26.	48.	44.	79.	70.	120.	134.	167.
221	201.	257.	278.	334.	425.	518.	602.	695.	895.	942.
231	1062.	1076.	1046.	1003.	871.	683.	539.	375.	280.	170.
241	90.	49.	27.	12.	8.	3.	1.	2.	3.	5.
251	5.	4.	1.	5.	5.	6.	6.	4.	7.	4.
261	9.	6.	7.	8.	14.	16.	11.	9.	13.	7.
271	3.	10.	9.	4.	4.	3.	5.	4.	4.	5.
281	6.	7.	2.	8.	7.	6.	13.	15.	16.	27.
291	28.	32.	44.	61.	68.	81.	104.	90.	139.	153.
301	151.	181.	213.	215.	209.	190.	209.	191.	161.	93.
311	70.	48.	30.	13.	4.	4.	2.	0.	3.	2.
321	1.	2.	5.	6.	2.	5.	10.	6.	8.	10.
331	15.	10.	10.	16.	16.	17.	12.	21.	16.	26.
341	31.	34.	45.	54.	62.	85.	116.	148.	240.	259.
351	377.	420.	566.	576.	630.	713.	719.	836.	987.	1063.
361	1262.	1462.	1422.	1419.	1313.	1151.	902.	661.	436.	282.
371	168.	94.	54.	19.	10.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	1.	0.	1.	0.	0.	0.	0.	1.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	1.	0.	0.	0.	0.	1.	0.	1.	1.
481	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

BEST AVAILABLE COPY

APC GEOMETRY STD 5B16 (83-17)

COUNTED ON APC # 2

STD VALUE: 98530 D/M

TIME ZERO: 01/29/90

BKG: 10

TODAY'S DATE: 08/20/92

DECAY CORR'N: 2.557 YEARS

NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242703	5	48531	306	48837	0.4977
243638	5	48718	309	49026	0.4996
243386	5	48667	308	48975	0.4991
243764	5	48743	309	49052	0.4999
244275	5	48845	310	49155	0.5009
244108	5	48812	310	49121	0.5006
244275	5	48845	310	49155	0.5009
243645	5	48719	309	49028	0.4996
243015	5	48593	307	48900	0.4983
244057	5	48801	310	49111	0.5005
243516	5	48693	308	49001	0.4994
243510	5	48692	308	49000	0.4994
243627	5	48715	309	49024	0.4996
243690	5	48728	309	49037	0.4997
243901	5	48770	309	49079	0.5002
244466	5	48883	311	49194	0.5013
FOR	16 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5013				
MIN	0.4977	48735	309	49043	0.4998

BEST AVAILABLE COPY

APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 1
STD VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 10
TODAY'S DATE: 08/18/92
DECAY CORR'N: 2.552 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
243204	5	48631	307	48938	0.4987
243913	5	48773	309	49082	0.5002
244771	5	48944	311	49256	0.5020
243758	5	48742	309	49050	0.4999
243766	5	48743	309	49052	0.4999
243637	5	48717	309	49026	0.4996
243514	5	48693	308	49001	0.4994
243765	5	48743	309	49052	0.4999
243849	5	48760	309	49069	0.5001
244044	5	48799	310	49108	0.5005

FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5020				
MIN	0.4987	48754	309	49063	0.5000

DET #	1	2	3	4	5	6	7	8	JUPITER II				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT EMB / G	Np	82	151		147	156		152	153				
	Pu	111	231		227	235		232	232				
DATE 7-9-93	Am	137	303		299	309		302	304				
	Cm	161	371		367	377		370	370				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT DM / B-G	Np	82	151		145	156		152	154				
	Pu	110	230		225	236		231	232				
DATE 7-10-93	Am	136	303		297	310		303	303				
	Cm	160	371		365	378		370	370				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT DM / B-G	Np	81	151		148	155		148	155				
	Pu	109	231		228	235		227	232				
DATE 7-11-93	Am	135	303		300	309		299	303				
	Cm	159	371		368	376		367	370				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT DM / B-G	Np	80	151		147	157		153	155				
	Pu	109	230		227	231		232	232				
DATE 7-12-93	Am	135	302		299	304		303	304				
	Cm	159	370		366	372		371	371				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT DM / B-G	Np	81	151		148	156		151	154				
	Pu	110	231		228	235		230	232				
DATE 7-13-93	Am	136	304		300	309		302	303				
	Cm	160	372		368	377		370	369				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT DM / B-G	Np	83	150		147	153		152	153				
	Pu	111	230		227	233		231	231				
DATE 7-14-93	Am	137	303		299	307		303	302				
	Cm	162	371		368	375		370	369				

TE: Np (^{231}Np) peak must be at ch 150 +/- 10 (3.2 - 4.4) or ch 80 +/- 10 (3.1, 1.1 - 1.4)
 Pu (^{239}Pu) peak must be at ch 229 +/- 10 (3.2 - 4.4) or ch 113 +/- 10 (3.1, 1.1 - 1.4)
 Am (^{241}Am) peak must be at ch 300 +/- 10 (3.2 - 4.4) or ch 139 +/- 10 (3.1, 1.1 - 1.4)
 Cm (^{244}Cm) peak must be at ch 368 +/- 10 (3.2 - 4.4) or ch 160 +/- 10 (3.1, 1.1 - 1.4)

Batch # 1188

Instrument: ^{AK 7-14-93} WBSB7237	Procedure/ Rev: LA-503-156 J-0
Technologist: L. Conlin 60949 <i>Linda Conlin</i>	Date: 7-14-93
Starting Time: 1800 7-13-93	Temperature N/A
Ending Time: 0430 7-14-93	Chemist: S. CATLOW

Comments: _____

	Description	Lab ID
1	LMCS	R4108-5582
2	REAGENT BLANK	R4109-5682
3	SAMPLE	R4110-5782
4	SAMPLE DUP	R4110-5882
5		
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
AR001 LMS	63B43 / .1 ml			
Am 243 spike	58B43 / .1 ml			
243				
				120

3.4 4662

Serial No R 4108.-5582	Sample Point VOGEL	Date 6-30-93	Time Issued 13:31	Priority 20
Determination Am241	Method Standard LA-503-156	Result Units % RECOVERY	Charge Code E11456	Returns 1
Sample Size ?.100ml-10ml-1ml + .1 ml SPIKE #58B43			Customer ID STD	
Remarks Calculations Results EDP R201 AR001 acid adj: 1ml 8 M HNO ₃ STD# 63B43 RESULT 30.6 30.6 8.2.93 8.2.93 STD VAL 26.811 XREC-H3, 744 114.1 8.2.93 8.2.93 30.6 $\frac{133(2.475 \cdot 3) \cdot 1}{112} = 3.06 \cdot 10^1$ 112 Find Cont.				
Analyst - 1 Mrs	Analyst - 2 DH Gertie	Analyst - 3 Pulle	Analyst - 4 Raymond	Analyst - 5 Mrs
Date 7-14-93	Time Completed 0430	Lab Unit Mgr J. J. Smith	7/15	

AM-241: LA-503-156 (D-0)

LIQUIDS

STANDARD

Serial No.	Spike (Tracer) Book Number	58B43
R4108-5582	Activity of Am243 Tracer in dpm/mL (SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL (SPKV)	0.1
1188	Volume of Sample in mL (SS)	1
Run No.	Dilution Factor (DF)	101
1	Digest Dilution Factor (DDF)	1
Analyst	Am-241 Area Peak Height from AEA (C241)	133
	Am-243 Area Peak Height from AEA (C243)	112
Date	Total AT Count (ATOT)	807
07/14/93	AT Count Time in Minutes (MIN CTd)	30
	Background in CPM (HKC)	6

$$\text{Am-241 } \mu\text{Ci/L} = ((C241 \cdot SPKA \cdot SPKV \cdot DF \cdot DDF \cdot (1000\text{mL/L})) / ((C243 \cdot SS \cdot (2220000\text{dpm/mL})))$$

$$\mu\text{Ci/mL} = \mu\text{Ci/L} / (1000\text{mL/L})$$

$$\text{Tracer \% Rec} = ((ATOT / \text{MIN CTd} - \text{HKC}) \cdot 2 \cdot (C243 / (C241 + C243)) / (SPKA \cdot SPKV)) \cdot 100$$

$$\text{Relative Counting Error} = \text{Square Root of } ((1 / C241) + (1 / C243)) \cdot 100$$

$$\text{Am-241 } \mu\text{Ci/L} = 3.06\text{E}+01$$

$$\text{Am-241 } \mu\text{Ci/mL} = 3.06\text{E}-02$$

$$\text{Relative counting error} = 12.8\%$$

$$\text{Am-243 Tracer Recovery} = 3.4\%$$

Data Entry by: <i>C. A. Clark</i>	Date: 15-Jul-93
Approved by: <i>J. J. Smith</i>	Date: July 15, 1993

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#3 7-14-93 DM 0 0643

807

30 - 6

R4108-5582

3.2 **2060**

Serial No R 4109.-5682	Sample Point VOGEL	Date 6-30-93	Time Issued 13:32	Priority 20
Determination Am241	Method Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Remarks 1
Sample Size ? .1 ml - 10% - 1 ml H₂O + .1 ml SPIKE			Customer ID BLK	
Remarks Calculations Results REAGENT BLANK + .1 ml SPIKE # 58B43 COUNT AS uCi/L < 1.29 x 10⁻³ uCi/ml 1 mL CON HN03 ACID ADJ.				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 <i>[Signature]</i>	Analyst - 3 <i>[Signature]</i>	Analyst - 4 <i>[Signature]</i>	Analyst - 5 <i>[Signature]</i>
PMS	PMS	PMS	7/14/93	
Date 7-14-93	Time Completed 0430	Lab Unit No. <i>[Signature]</i>	<i>[Signature]</i> 7/15	

AM-241: LA-503-156 (D-0)		LIQUIDS	BLANK
Serial No.	Spike (Tracer) Book Number		58B43
R4109-5682	Activity of Am243 Tracer in dpm/ml.	(SPKA)	5655
Batch ID	Spike (Tracer) Volume in ml.	(SPKV)	0.1
1188	Volume of Sample in ml.	(SS)	1
Run No.	Dilution Factor	(DF)	101
1	Digest Dilution Factor	(DDF)	1
Analyst	Am-241 Area Peak Height from AEA	(C241)	10
	Am-243 Area Peak Height from AEA	(C243)	1100
Date	Total AT Count	(ATVT)	6468
07/14/93	AT Count Time in Minutes	(MIN CPM)	30
	Background in CPM	(BKG)	4

$$\text{Am-241 } \mu\text{Ci/L} = ((C241 \cdot SPKA \cdot SPKV \cdot DF \cdot DDF \cdot (1000\text{mL/L})) / ((C243 \cdot SS \cdot (2220000\text{dpm/mL})))$$
$$\mu\text{Ci/mL} = \mu\text{Ci/L} / (1000\text{mL/L})$$
$$\text{Tracer \% Rec} = ((\text{ATOT} / \text{MIN CTd} - \text{BKG}) \cdot 2 \cdot (\text{C243} / (\text{C241} + \text{C243}))) / (\text{SPKA} \cdot \text{SPKV}) \cdot 100$$

Relative Counting Error = Square Root of $((1 / 1241) + (1 / 1243)) \times 100$

NOTE: Reported result is a LESS THAN value using 5% of the Am-243 peak as the Am-241 peak.

Am-241	µCi/l.	=	< 1.29E+00
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Am-241 $\mu\text{Ci/ml.}$	=	< 1.29E-03
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Relative counting error	=	31.8%
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Am-243 Target Recovery	=	74.2%
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Data Entry by:	PA Clark	Date:	15-Jul 93
Approved by:	<i>[Signature]</i>	Date:	July 15, 1993
Form 3 Rev. 1			Page 1 of 1

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#1 7-14-93 DM @ 0715

R4109-5682

6468
30 -4

41 5580

Serial No R 4110.-5782	Sample Point VOGEL	Date 6-30-93	Time Issued 13:34	Priority 20
Determination Am241	Method Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Return 1
Sample Size 7.100 ml - 10 ml - 1ml			Customer ID 937046L	
Remarks Calculations, Results COUNT AS uCi/L + .1 ml SPIKE #58B43 acid adj 2.36 x 10 ⁻³ uCi/ml 1 ml con HNO ₃ 187(2547E-3)(114ml) 2035 2035				
Analyst - 1 <i>Franklin</i>	Analyst - 2 <i>D.H. Wilson</i>	Analyst - 3 <i>Z. J. J. J.</i>	Analyst - 4 <i>Raymond</i>	Analyst - 5 <i>7/15</i>
Date 7-14-93	Time Completed 0430	Lab Unit Mgr <i>2035</i>		

AM-241: LA-503-156 (D-0) LIQUIDS		SAMPLE
Serial No.	Spike (Tracer) Book Number	58B43
R4110-5782	Activity of Am241 Tracer in dpm/mL (SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL (SPKV)	0.1
1188	Volume of Sample in mL (SS)	1
Run No.	Dilution Factor (DF)	101
1	Digest Dilution Factor (DDF)	1
Analyst	Am-241 Area Peak Height from AEA (C241)	187
	Am-243 Area Peak Height from AEA (C243)	2035
Date	Total AT Count (ATOT)	6850
07/14/93	AT Count Time in Minutes (MIN CTd)	30
	Background in CPM (BKG)	4

$$\text{Am-241 } \mu\text{Ci/L} = ((C241 \cdot SPKA \cdot SPKV \cdot DF \cdot DDF \cdot (1000\text{mL/L})) / ((C243 \cdot SS \cdot (2220000\text{dpm/mL})))$$

$$\mu\text{Ci/mL} = \mu\text{Ci/L} / (1000\text{mL/L})$$

$$\text{Tracer \% Rec} = ((ATOT / \text{MIN CTd} - \text{BKG}) \cdot 2 \cdot (C243 / (C241 + C243)) / (SPKA \cdot SPKV)) \cdot 100$$

$$\text{Relative Counting Error} = \text{Square Root of } ((1 / C241) + (1 / C243)) \cdot 100$$

Am-241 $\mu\text{Ci/L}$	=	2.36E+00
Am-241 $\mu\text{Ci/mL}$	=	2.36E-03
Relative counting error	=	7.6%
Am-243 Tracer Recovery	=	72.7%

Data Entry by:	<i>C. A. Clark</i>	Date:	15-Jul-93
Approved by:	<i>2035</i>	Date:	July 15, 1993

Form 3 Rev. 1 Page 1 of 1

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#1 7-14-93 DM @ 0643

R4110-5782

6850
30 - 4

4.3 7027

Serial No R 4110.-5882	Sample Point VOGEL	Date 6-30-93	Time Issued 13:34	Priority 20
Determination Am241	Method Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Reruns 1
Sample Size 7.100ml - 10ml - 1ml			Customer ID 937046L	
Remarks Calculations Results +.1 ml spike #58B43 DUPLICATE SAMPLE COUNT AS uCi/L 2.73×10^{-3} uCi/ml Acid add 1ml Con HNO3 Find Conk				
Analyst - 1 HIS	Analyst - 2 D.H. Nelson	Analyst - 3 P. J. Little	Analyst - 4 Raymond	Analyst - 5 HIS
Date 7-14-93	Time Completed 0430	Lab Unit Mgr R. J. Little	7.14.93	

AM-241: LA-503-156 (D-0)

LIQUIDS

DUPLICATE

Serial No.	Spike (Tracer) Book Number	58B43
R4110-5882	Activity of Am243 Tracer in dpm/mL	(SPKA) 5655
Batch ID	Spike (Tracer) Volume in mL	(SPKV) 0.1
1188	Volume of Sample in mL	(SS) 1
Run No.	Dilution Factor	(DF) 101
1	Digest Dilution Factor	(DDF) 1
Analyst	Am-241 Area Peak Height from AFA	(C241) 145
	Am-243 Area Peak Height from AFA	(C243) 1368
Date	Total AT Count	(ATOT) 7420
07/14/93	AT Count Time in Minutes	(MIN CTd) 30
	Background in CPM	(BKG) 3

$$\text{Am-241 } \mu\text{Ci/L} = ((C241 \cdot SPKA \cdot SPKV \cdot DF \cdot DDF \cdot (1000\text{mL/L})) / ((C243 \cdot SS \cdot (2220000\text{dpm/mL})))$$

$$\mu\text{Ci/mL} = \mu\text{Ci/L} / (1000\text{mL/L})$$

$$\text{Tracer \% Rec} = ((ATOT / \text{MIN CTd} - \text{BKG}) \cdot 2 \cdot (C243 / (C241 + C243)) / (SPKA \cdot SPKV)) \cdot 100$$

$$\text{Relative Counting Error} = \text{Square Root of } ((1 / C241) + (1 / C243)) \cdot 100$$

Am-241 $\mu\text{Ci/L}$ = 2.73E+00

Am-241 $\mu\text{Ci/mL}$ = 2.73E-03

Relative counting error = 8.7%

Am-243 Tracer Recovery = 78.1%

Data Entry by: P.A. Clark Date: 15-Jul-93
 Approved by: R. J. Little Date: July 15, 1993

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-044

REV 1

#2 7-14-93 DM @ 0643 " " R4110-5882
7420 -3
30

Raymond
7-14-93GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4108-5582
File ID: SD4662.SPC

BEST AVAILABLE COPY

Counted on: 7/14/93 @10: 0
Detector/Geometry number: 4/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	155.9	149.3	296.995	296.995	20.000	9.049	10.000	5.497
2	149.7	142.0	251.783	251.783	16.000	7.715	8.000	5.597
3	23.6	23.2	225.751	225.751	16.000	7.534	8.000	2.939

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid			FWHM	Count Rate c/m	d/m	Activity uCi/ea
			Exp.	Obs.	Diff.				
1	Th228	0.4927	5.430	5.465	-0.035	0.04	2.35	24.47	0.110E-04
	Am241		5.480	5.465	0.015				0.833E-05
2	Am243	0.4232	5.234	5.257	-0.023	0.04	2.02	135.70	0.611E-04
3	Pu239	0.0841	5.143	5.138	0.005	0.03	0.40	2.97	0.134E-05
	Pu240		5.144	5.138	0.006				0.134E-05

DETECTOR CALIBRATION

Energy(MEV) = 4.099 + (0.0046)*Channel
Energy range (MeV): 4.099 TO 6.455
Efficiency = 0.1352 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	2529.0	100.000
Smoothed	2529.0	100.000
Composite fit	2384.3	94.280
Residuals	144.7	5.720

Analyzed by: _____

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 130 TO 141

WMC-SD-WM-DP-044

REV 1

BEST AVAILABLE COPY

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..... 22..
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1....
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.....1...
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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD4662.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
21	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
81	0.	1.	1.	0.	0.	0.	0.	0.	1.	0.
91	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
101	0.	0.	1.	0.	0.	0.	0.	1.	1.	0.
111	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.
121	0.	1.	0.	0.	0.	0.	0.	0.	2.	0.
131	0.	0.	1.	0.	0.	3.	2.	0.	0.	2.
141	1.	0.	0.	0.	0.	2.	1.	1.	0.	0.
151	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
161	0.	0.	3.	0.	0.	1.	1.	0.	0.	0.
171	0.	0.	1.	1.	1.	1.	1.	0.	1.	1.
181	0.	0.	0.	1.	0.	0.	0.	2.	1.	0.
191	0.	0.	0.	2.	0.	0.	0.	2.	1.	1.
201	1.	0.	2.	1.	1.	2.	3.	3.	7.	3.
211	5.	3.	5.	3.	5.	4.	4.	5.	10.	6.
221	12.	17.	10.	18.	23.	10.	10.	11.	8.	4.
231	6.	8.	7.	4.	3.	7.	11.	4.	16.	18.
241	23.	20.	24.	25.	42.	50.	52.	70.	87.	112.
251	108.	89.	76.	57.	30.	22.	14.	7.	7.	9.
261	9.	5.	5.	5.	5.	3.	1.	4.	3.	3.
271	2.	1.	4.	8.	4.	2.	4.	9.	10.	8.
281	10.	11.	17.	15.	23.	29.	31.	20.	38.	47.
291	49.	56.	79.	85.	98.	133.	84.	80.	66.	40.
301	33.	23.	20.	16.	9.	7.	5.	8.	2.	2.
311	0.	1.	1.	0.	0.	0.	2.	0.	0.	0.
321	0.	0.	0.	0.	1.	0.	2.	0.	0.	0.
331	0.	0.	1.	0.	0.	0.	1.	0.	1.	3.
341	1.	2.	1.	1.	1.	0.	1.	0.	1.	0.
351	0.	2.	1.	1.	3.	0.	0.	0.	0.	0.
361	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	1.	0.	0.	0.	0.	0.	0.	2.	0.	0.
421	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
431	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	2.	1.	0.	1.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond
7.14.93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4109-5682
File ID: SD2060.SPC

BEST AVAILABLE COPY

Counted on: 7/14/93 @12: 0
Detector/Geometry number: 2/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	10.9	11.2	358.372	358.372	20.000	12.120	10.000	1.897
2	105.4	40.2	294.925	294.925	12.000	0.110	6.000	1.897
3	2037.2	2055.1	250.583	250.583	28.000	24.032	14.000	2.965
4	13.4	11.4	46.515	46.515	292.000	2.000	146.000	0.200

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count Rate c/m	d/m	Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM			
1	Pu236	0.0041	5.756	5.737	0.019	0.06	0.37	0.00	0.287E-10
2	Th228	0.0005	5.430	5.445	-0.015	0.00	0.05	0.00	0.503E-11
3	Am243	0.9917	5.234	5.241	-0.007	0.11	87.65	0.14	0.613E-07
4		0.0036		4.302		0.01	0.32	0.00	0.247E-10

DETECTOR CALIBRATION

Energy(MEV) = 4.088 + (0.0046)*Channel
Energy range (MeV): 4.088 TO 6.443
Efficiency = ***** CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	46020.0	100.000
Smoothed	46017.0	99.993
Composite fit	44190.9	96.025
Residuals	1825.1	3.966

Analyzed by: _____

1 LEGEND: 'RAW' = MODELED PEAKS = 1,2,..., ETC

7788.3

~~WUC-SD-WM-DP-044~~
REV 1

BEST AVAILABLE COPY

134

BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum:					SP:SD2060.SPC					
1	0.	0.	0.	0.	0.	3.	3.	2.	2.	3.
11	5.	4.	2.	3.	6.	2.	2.	3.	4.	2.
21	1.	5.	2.	4.	5.	6.	9.	3.	5.	8.
31	6.	6.	3.	4.	2.	8.	3.	8.	8.	6.
41	10.	6.	9.	8.	7.	6.	11.	5.	8.	6.
51	8.	6.	4.	9.	9.	2.	10.	6.	11.	7.
61	14.	12.	4.	0.	5.	7.	8.	14.	5.	14.
71	13.	13.	7.	12.	13.	7.	8.	10.	11.	16.
81	10.	15.	10.	12.	12.	12.	12.	11.	14.	10.
91	13.	13.	12.	13.	14.	8.	22.	17.	36.	20.
101	17.	20.	14.	17.	14.	17.	13.	24.	20.	25.
111	17.	20.	24.	27.	24.	29.	34.	26.	29.	25.
121	33.	34.	29.	21.	33.	31.	42.	22.	24.	28.
131	30.	29.	34.	36.	37.	54.	51.	45.	49.	39.
141	35.	47.	48.	54.	51.	63.	51.	59.	59.	69.
151	54.	53.	76.	63.	66.	71.	74.	63.	64.	70.
161	72.	77.	80.	75.	83.	99.	82.	96.	99.	87.
171	93.	124.	89.	100.	109.	115.	99.	137.	117.	134.
181	128.	118.	150.	122.	147.	121.	142.	154.	161.	165.
191	189.	172.	157.	177.	192.	175.	241.	172.	218.	226.
201	220.	232.	215.	233.	256.	243.	242.	265.	280.	284.
211	276.	292.	301.	341.	352.	367.	373.	379.	367.	379.
221	413.	390.	430.	484.	516.	483.	492.	539.	575.	539.
231	554.	596.	590.	638.	696.	735.	744.	755.	817.	870.
241	886.	890.	897.	950.	951.	1046.	1021.	1089.	1077.	1058.
251	1100.	1012.	991.	960.	828.	847.	641.	649.	523.	424.
261	340.	279.	237.	173.	143.	131.	84.	85.	57.	38.
271	40.	33.	21.	12.	17.	8.	7.	5.	5.	4.
281	6.	5.	2.	5.	1.	3.	3.	4.	7.	7.
291	3.	2.	4.	10.	5.	5.	6.	3.	3.	5.
301	5.	3.	2.	1.	1.	3.	1.	0.	2.	5.
311	2.	0.	1.	0.	4.	2.	0.	1.	1.	0.
321	0.	0.	0.	0.	1.	0.	1.	0.	2.	1.
331	2.	3.	1.	4.	5.	0.	5.	2.	3.	5.
341	3.	3.	3.	3.	7.	3.	5.	4.	4.	8.
351	4.	3.	6.	3.	7.	4.	4.	5.	9.	8.
361	3.	4.	1.	4.	4.	0.	1.	0.	0.	0.
371	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
391	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
401	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	2.	0.	0.	0.	1.
421	0.	1.	0.	0.	1.	0.	0.	0.	0.	0.
431	0.	1.	0.	0.	0.	0.	0.	1.	0.	0.
441	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
451	0.	1.	0.	0.	0.	0.	0.	0.	1.	0.
461	1.	0.	0.	1.	0.	0.	2.	2.	1.	0.
471	3.	0.	2.	1.	0.	0.	0.	2.	1.	1.
481	2.	1.	1.	1.	1.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond
7.14.93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4110-5782
File ID: SD5580.SPC

BEST AVAILABLE COPY

Counted on: 7/14/93 @10:0
Detector/Geometry number: 57 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	331.9	327.7	303.119	303.119	24.000	20.335	12.000	3.798
2	3550.0	3556.4	256.469	256.469	24.000	17.759	12.000	5.978
3	7.2	5.6	80.084	80.084	260.000	2.000	130.000	0.200

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Th228	0.1106	5.430	5.471	-0.041	0.09	10.52	76.28	0.344E-04
	Am241		5.480	5.471	0.009				0.260E-04
2	Am243	0.8873	5.234	5.257	-0.023	0.08	84.40	3948.84	0.178E-02
3		0.0021		4.445		0.01	0.20	1.01	0.455E-06

DETECTOR CALIBRATION

Energy(MEV) = 4.077 + (0.0046)*Channel
Energy range (MeV): 4.077 TO 6.432
Efficiency = 0.1943 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	49679.0	100.000
Smoothed	49678.9	100.000
Composite fit	47558.7	95.732
Residuals	2120.2	4.268

Analyzed by: _____

SPECTRUM SD5580.SPC
1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

12761.9

~~WHC-SD-MM-DP-044~~
REV. 1

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD5580.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	1.	3.
21	1.	1.	3.	1.	1.	1.	2.	1.	3.	4.
31	0.	1.	1.	3.	2.	1.	0.	0.	2.	0.
41	1.	0.	0.	1.	1.	1.	1.	2.	3.	3.
51	4.	0.	1.	3.	1.	1.	3.	3.	2.	1.
61	1.	0.	0.	2.	4.	3.	1.	1.	2.	3.
71	1.	5.	3.	1.	4.	0.	4.	5.	3.	5.
81	2.	2.	2.	3.	1.	5.	2.	3.	0.	3.
91	1.	2.	4.	1.	3.	2.	6.	3.	5.	4.
101	5.	2.	2.	3.	2.	4.	1.	5.	8.	8.
111	4.	3.	5.	3.	9.	5.	7.	4.	2.	9.
121	5.	5.	6.	7.	5.	8.	5.	5.	6.	5.
131	13.	6.	9.	10.	6.	11.	11.	9.	9.	8.
141	9.	12.	5.	10.	4.	8.	19.	13.	12.	15.
151	14.	11.	14.	17.	8.	12.	11.	16.	20.	15.
161	16.	18.	17.	22.	11.	13.	11.	28.	10.	29.
171	17.	23.	22.	23.	32.	22.	30.	38.	26.	29.
181	21.	35.	34.	34.	31.	37.	29.	41.	43.	46.
191	54.	30.	50.	39.	42.	39.	44.	48.	52.	62.
201	73.	68.	54.	60.	72.	62.	65.	68.	69.	63.
211	79.	76.	95.	103.	104.	90.	78.	112.	123.	135.
221	103.	147.	113.	143.	144.	175.	164.	219.	214.	231.
231	236.	264.	280.	300.	347.	377.	435.	472.	534.	617.
241	624.	728.	868.	936.	1001.	1142.	1241.	1355.	1489.	1660.
251	1704.	1863.	1877.	2035.	1940.	1927.	1943.	1836.	1569.	1486.
261	1351.	1097.	956.	785.	648.	515.	369.	327.	260.	231.
271	167.	138.	127.	107.	69.	65.	58.	48.	41.	37.
281	32.	42.	39.	53.	42.	60.	49.	75.	72.	75.
291	97.	109.	122.	123.	145.	147.	172.	175.	171.	180.
301	185.	162.	187.	158.	161.	183.	127.	129.	118.	82.
311	79.	62.	58.	37.	33.	24.	14.	9.	5.	7.
321	8.	5.	7.	6.	4.	0.	0.	0.	0.	0.
331	1.	2.	2.	2.	0.	4.	0.	0.	2.	2.
341	3.	0.	1.	1.	2.	3.	0.	0.	6.	4.
351	3.	2.	4.	4.	3.	10.	3.	7.	7.	3.
361	4.	5.	4.	5.	5.	7.	2.	2.	1.	6.
371	4.	2.	1.	1.	0.	0.	0.	0.	0.	1.
381	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	1.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	1.	0.	0.	1.	0.	0.	2.	0.
421	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	1.	0.	0.	1.	1.
441	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
471	0.	1.	0.	1.	2.	1.	1.	0.	0.	1.
481	1.	1.	0.	0.	0.	2.	0.	1.	1.	0.
491	1.	0.	2.	0.	0.	0.	0.	1.	0.	0.
511	0.	0.								

VRaymond
7.14.93GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4110-5882
File ID: SD7027.SPC

BEST AVAILABLE COPY

Counted on: 7/14/93 @10: 0
Detector/Geometry number: 7/1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	14.3	15.0	411.258	411.258	24.000	15.813	12.000	4.011
2	235.1	228.8	344.158	344.158	24.000	17.678	12.000	3.145
3	2391.3	2295.3	291.880	291.880	24.000	16.171	12.000	2.878
4	24.5	23.7	143.012	143.012	208.000	2.000	104.000	0.200
5	3.6	3.8	29.052	29.052	28.000	10.312	14.000	16.895

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid		Count		Activity	
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	uCi/ea
1		0.0048		6.008		0.07	0.39	1.91	0.859E-06
2	Ra224	0.0906	5.680	5.693	-0.013	0.08	7.33	38.38	0.173E-04
3	Th228	0.8925	5.430	5.447	-0.017	0.08	72.22	500.58	0.225E-03
4		0.0114		4.748		0.01	0.93	4.56	0.205E-05
5	U 238	0.0007	4.200	4.212	-0.012	0.05	0.06	0.37	0.168E-06

DETECTOR CALIBRATION

Energy(MEV) = 4.076 + (0.0047)*Channel
Energy range (MeV): 4.076 TO 6.482
Efficiency = 0.2032 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	42668.0	100.000
Smoothed	42667.9	100.000
Composite fit	40461.2	94.828
Residuals	2206.6	5.172

Analyzed by: _____

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

WHC-SD-WM-DP-044
REV 1

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Raw Data Dump for AEA Spectrum: SP:SD7027.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	1.	1.	1.	0.	0.	2.	0.
21	1.	1.	4.	3.	5.	2.	2.	2.	1.	2.
31	4.	3.	1.	2.	2.	0.	2.	1.	1.	0.
41	0.	1.	1.	0.	3.	3.	2.	2.	1.	1.
51	0.	5.	1.	0.	1.	3.	3.	0.	0.	2.
61	0.	1.	3.	2.	1.	3.	2.	2.	2.	5.
71	6.	3.	5.	1.	4.	3.	3.	2.	4.	2.
81	4.	0.	5.	2.	0.	3.	4.	4.	10.	2.
91	7.	5.	1.	5.	2.	6.	2.	2.	4.	4.
101	4.	3.	6.	4.	4.	5.	4.	4.	5.	4.
111	7.	5.	5.	4.	5.	8.	6.	6.	5.	6.
121	7.	5.	8.	12.	12.	6.	8.	3.	10.	8.
131	13.	9.	4.	7.	8.	13.	12.	11.	11.	12.
141	16.	10.	14.	14.	7.	8.	15.	8.	5.	16.
151	12.	8.	5.	15.	10.	15.	20.	10.	14.	15.
161	16.	13.	18.	16.	15.	12.	15.	24.	13.	11.
171	12.	18.	22.	16.	22.	30.	23.	20.	16.	28.
181	24.	18.	24.	28.	27.	22.	33.	26.	35.	36.
191	36.	25.	22.	38.	46.	43.	30.	37.	41.	32.
201	40.	40.	37.	45.	53.	46.	51.	53.	42.	44.
211	42.	54.	56.	42.	61.	66.	68.	57.	65.	75.
221	56.	90.	76.	79.	65.	77.	86.	97.	101.	99.
231	98.	86.	109.	105.	106.	106.	137.	116.	139.	164.
241	145.	148.	155.	172.	184.	188.	204.	227.	224.	218.
251	251.	238.	293.	281.	277.	277.	295.	307.	329.	273.
261	327.	284.	283.	324.	309.	289.	334.	326.	376.	419.
271	430.	397.	494.	485.	538.	559.	621.	669.	704.	726.
281	812.	830.	864.	991.	963.	1099.	1128.	1189.	1281.	1316.
291	1368	1358.	1238.	1154.	1013.	884.	712.	595.	487.	343.
301	290.	228.	177.	137.	140.	121.	84.	81.	75.	66.
311	60.	60.	43.	47.	30.	41.	29.	29.	35.	34.
321	44.	38.	43.	57.	33.	41.	52.	65.	61.	53.
331	59.	57.	70.	88.	75.	100.	95.	109.	111.	119.
341	130.	145.	118.	138.	117.	100.	91.	126.	90.	67.
351	45.	39.	31.	30.	21.	21.	10.	13.	8.	7.
361	5.	3.	4.	1.	4.	3.	1.	0.	2.	1.
371	0.	1.	0.	0.	2.	1.	2.	4.	0.	1.
381	0.	0.	1.	2.	2.	0.	3.	0.	0.	2.
391	2.	1.	3.	4.	2.	3.	2.	6.	6.	6.
401	6.	9.	7.	6.	9.	7.	5.	5.	5.	10.
411	10.	9.	5.	4.	7.	6.	8.	1.	2.	2.
421	1.	1.	0.	1.	0.	2.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	1.	0.	0.	1.	0.	0.	0.	0.	1.
511	0.	0.								

BEST AVAILABLE COPY

APC GEOMETRY STD 5B16 (83-17)

COUNTED ON APC # 1

STD VALUE: 98530 D/M

TIME ZERO: 01/29/90

BKG: 10

TODAY'S DATE: 08/18/92

DECAY CORR'N: 2.552 YEARS

NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
243204	5	48631	307	48938	0.4987
243913	5	48773	309	49082	0.5002
244771	5	48944	311	49256	0.5020
243758	5	48742	309	49050	0.4999
243766	5	48743	309	49052	0.4999
243637	5	48717	309	49026	0.4996
243514	5	48693	308	49001	0.4994
243765	5	48743	309	49052	0.4999
243849	5	48760	309	49069	0.5001
244044	5	48799	310	49108	0.5005
FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5020				
MIN	0.4987	48754	309	49063	0.5000

BEST AVAILABLE COPY

APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 2
STD VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 10
TODAY'S DATE: 08/20/92
DECAY CORR'N: 2.557 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242703	5	48531	306	48837	0.4977
243638	5	48718	309	49026	0.4996
243386	5	48667	308	48975	0.4991
243764	5	48743	309	49052	0.4999
244275	5	48845	310	49155	0.5009
244108	5	48812	310	49121	0.5006
244275	5	48845	310	49155	0.5009
243645	5	48719	309	49028	0.4996
243015	5	48593	307	48900	0.4983
244057	5	48801	310	49111	0.5005
243516	5	48693	308	49001	0.4994
243510	5	48692	308	49000	0.4994
243627	5	48715	309	49024	0.4996
243690	5	48728	309	49037	0.4997
243901	5	48770	309	49079	0.5002
244466	5	48883	311	49194	0.5013
FOR	16 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5013				
MIN	0.4977	48735	309	49043	0.4998

BEST AVAILABLE COPY

APC GEOMETRY STD 5B16 (83-17)
 COUNTED ON APC # 3
 STD VALUE: 98530 D/M
 TIME ZERO: 01/29/90
 BKG: 9
 TODAY'S DATE: 08/19/92
 DECAY CORR'N: 2.554 YEARS
 NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242920	5	48575	307	48882	0.4981
242932	5	48577	307	48884	0.4982
242052	5	48401	305	48706	0.4964
243038	5	48599	307	48906	0.4984
242907	5	48572	307	48879	0.4981
242795	5	48550	306	48856	0.4979
243214	5	48634	307	48941	0.4988
243707	5	48732	309	49041	0.4998
242647	5	48520	306	48826	0.4976
241653	5	48322	304	48625	0.4955

FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.4998				
MIN	0.4955	48548	306	48855	0.4979

DET #	1	2	3	4	5	6	7	8	JUPITER II				
JUP. AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT	Np	82	151		147	156		152	155	X			
EMB/G	Pu	111	231		227	235		232	232				
DATE	Am	137	303		299	309		302	304				
7-9-93	Cm	161	371		367	377		370	370				
JUP. AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT	Np	82	151		145	156		152	154	X			
DM/B-G	Pu	110	230		225	236		231	232				
DATE	Am	136	303		297	310		303	303				
7-10-93	Cm	160	371		365	378		370	370				
JUP. AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT	Np	81	151		148	155		148	155	X			
DM/B-G	Pu	109	231		228	235		227	232				
DATE	Am	135	303		300	309		299	303				
7-11-93	Cm	159	371		368	376		367	370				
JUP. AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT	Np	80	151		147	151		153	155	X			
DM/B-G	Pu	109	230		227	231		232	232				
DATE	Am	135	302		299	304		303	304				
7-12-93	Cm	159	370		366	372		371	371				
JUP. AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT	Np	81	151		148	156		151	154	X			
DM/B-G	Pu	110	231		228	235		230	232				
DATE	Am	136	304		300	309		302	303				
7-13-93	Cm	160	372		368	377		370	369				
JUP. AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT	Np	83	150		147	153		152	153	X			
DM/B-G	Pu	111	230		227	233		231	231				
DATE	Am	137	303		299	307		303	302				
7-14-93	Cm	162	371		368	375		370	369				

RE: Np (^{235}Np) peak must be at ch 150 $\pm$ 10 (3.2 - 4.4) or ch 80 $\pm$ 10 (3.1, 1.1 - 1.4)
 Pu (^{239}Pu) peak must be at ch 229 $\pm$ 10 (3.2 - 4.4) or ch 113 $\pm$ 10 (3.1, 1.1 - 1.4)
 Am (^{241}Am) peak must be at ch 300 $\pm$ 10 (3.2 - 4.4) or ch 139 $\pm$ 10 (3.1, 1.1 - 1.4)
 Cm (^{247}Cm) peak must be at ch 368 $\pm$ 10 (3.2 - 4.4) or ch 160 $\pm$ 10 (3.1, 1.1 - 1.4)

AICD DIGESTION SAMPLE ANALYSES

Batch 1142

Comments: _____

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
L M C S	N A			
	.			
		w		
	r			
				.
				147
	-			

[illegible]

Bertrand Griffin II

7-8-93

Serial No	Sample Point	Date	Time Issued	Priority
R 4106.-8600	VOGEL	6-30-93	13:18	20
Determination	Method Standard	Result Units	Charge Code	Returns
ACD DGST	LA-505-159	uG/ML	E11456	0
Sample Size			Customer ID	
? 100% TOTAL VOLUME			BLK	
Remarks Calculations Results				
REAGENT BLANK				
complete				
Miss K.H.				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Date	Time Completed	Lab Unit Mgr	7-8-93	
7/8/93	1500	BUTLER	Hoffman II	

LA-505-159 (B-0)

LA-505-159 (B-0)		ICP	HYDRIDE	MERCURY
Serial No.	Grams of Sample (g)	0.0000	0.0000	0.0000
R4106-B600	Volume on Completion (mL)	100.00	100.00	100.00
Batch ID				
1142		ICP	HYDRIDE	MERCURY
Run No.	Grams of Duplicate Sample (g)			
0	Volume on Completion (mL)			
Balance ID:				
F0449b				
Calibration Date		ICP	HYDRIDE	MERCURY
07/01/93	Grams of Spike Sample (g)			
Analyt	Volume on Completion (mL)			
	Volume of Spike (mL)			
Date:	Spike Book Number			
07/08/93	Spike Dilution Factor	ERR	ERR	ERR

	SAMPLE	DUPLICATE	SPIKE
ICP Dilution Factor (g/L)	0.0000	ERR	ERR
Hydride Dilution Factor (g/L)	0.0000	ERR	ERR
Mercury Dilution Factor (g/L)	0.0000	ERR	ERR

Data Entry by: <i>Berhard Hiffin II</i>	Date: 08-Jul-93
Approved by: <i>Berhard Hiffin II</i>	Date: 7-8-93

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No R 4107.-8700	Sample Point VOGEL	Date 6-30-93	Time Issued 13:24	Priority 20
Determination ACD DGST	Method Standard LA-505-159	Result Units G/L	Charge Code E11456	Reruns 0
Sample Size ? 1.0376g into 100 ml			Customer ID 937046S	
Remarks Calculations/Results JAR ID# GRAMS SAMPLE 1.0376g VOLUME ON COMPLETION .100L $\frac{1.0376}{.100L} = 10.376g/L$ WT 1: -0.0004 WT 2: 1.0372 NET WEIGHT: ---> 1.0376 GRAMS				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 <i>[Signature]</i>	Analyst - 3 <i>[Signature]</i>	07/07/93 @ 01:44:54	
Date 7/8/93	Time Completed 1500	Lab Unit Mgr 7-8-93	<i>[Signature]</i>	

ACID DIGESTION OF SEDIMENTS, SLUDGE, AND SOLIDS FOR ICP AND AA ANALYSIS

LA-505-159 (B-0)

	ICP	HYDRIDE	MERCURY
Serial No.			
Grams of Sample (g)	1.0376	1.0376	1.0376
R4107-8700			
Volume on Completion (mL)	100.00	100.00	100.00
Batch ID			
1142			
Run No.			
Grams of Duplicate Sample (g)			
0			
Volume on Completion (mL)			
Balance ID:			
F04496			
Calibration Date			
07/01/93			
Grams of Spike Sample (g)			
Analyst			
Volume on Completion (mL)			
Volume of Spike (mL)			
Date:			
07/08/93			
Spike Dilution Factor	ERR	ERR	ERR

Spike Dilution Factor = Vol on Completion/Volume of Spike

	SAMPLE	DUPLICATE	SPIKE
ICP Dilution Factor (g/L)	10.3760	ERR	ERR
Hydride Dilution Factor (g/L)	10.3760	ERR	ERR
Mercury Dilution Factor (g/L)	10.3760	ERR	ERR

Dilution Factor (Solid Sample) = (Grams of Sample)/(Volume on Completion) * 1000mL/L

Data Entry by: <i>Bethel Hiff II</i>	Date: 08-Jul-93
Approved by: <i>Bethel Hiff II</i>	Date: 7-8-93

ANALYTICAL BATCH

Butch 1141

R 4107

937044 S

GEA

acid digestion

Instrument: WBL8198

LA-548-121 (D-1)

Technologist: SUE LAI (Sue Li)

7-8-93

Starting Time: 14:30

25'c

Ending Time: ~~15:15~~ 1520 7-31-93

A. K. Deshpande

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

GAMMA ENERGY ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-044

REV 1

1446

Serial No R 4105.-8530	Sample Point VOGEL	Date 6-30-93	Time Issued 13:16	Priority 26
Determination GEA	Method Standard LA-548-121	Result Units % RECOVERY	Charge Code E11456	Returns 0
Sample Size ? 100λ			Customer ID STD	
Remarks Calculations Results COLX STD# 32851 R901 STD VAL 132.47 RESULT 132 % REC 99.6% R905 STD VAL 107.09 RESULT 107 % REC 99.9% <i>Sum L.</i>				
Analyst - 1	Analyst - 2 <i>Em Bueck</i>	Analyst - 3	Analyst - 4	Analyst - 5
PLS	PLS 7-9-93	PLS	PLS	PLS
Date 7-8-93	Time Completed 15:20	Lab Unit Mgr <i>R. White</i>	<i>[Signature]</i> 7/9/93	

54-6000-06 (R 10 83)

1447

Serial No R 4106.-8630	Sample Point VOGEL	Date 6-30-93	Time Issued 13:18	Priority 20
Determination GEA	Method Standard LA-548-121	Result Units uCi/ML	Charge Code E11456	Returns 0
Sample Size ? 100λ			Customer ID BLK	
Remarks Calculations Results COUNT AS uCi/L LASER PRINTOUT <i>Am²⁴¹: 45.55 x 10⁻⁴ uCi/ml</i> <i>Am²⁴⁰: 4.14 x 10⁻⁴ "</i> <i>Am²⁴²: 1.73 x 10⁻⁴ "</i> <i>Am²⁴³: 1.48 x 10⁻⁴ "</i> <i>Am²⁴⁴: 45.04 x 10⁻⁴ "</i> <i>Am²⁴⁵: 3.81 x 10⁻⁴ "</i> <i>Am²⁴⁶: 2.96 x 10⁻⁴ "</i> <i>Sum L.</i>				
Analyst - 1	Analyst - 2 <i>Em Bueck</i>	Analyst - 3	Analyst - 4	Analyst - 5
PLS	PLS 7-9-93	PLS	PLS	PLS
Date 7-8-93	Time Completed 15:20	Lab Unit Mgr <i>R. White</i>	<i>[Signature]</i> 7/9/93	

54-6000-06 (R 10 83)

REV 1

5-000000 000000 000000

SA-AND-21 (M10-03)

Em. Balle
*7-9-93******
* GAMMA SPECTRUM ANALYSIS *

CANBERRA SPECTRAN-F V2.06 SOFTWARE

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09-JUL-9301:51:11

ANALYSIS PARAMETERS

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +/- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLY ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: R4105-8530
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 9-JUL-93 AT 01:00:47

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3015. SECONDS
DEAD TIME: 0.50 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 24-AUG-92
EFFICIENCY CALIBRATION PERFORMED 3-SEP-92

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 154 TO 171.

09-JUL-9301:51:11

PEAK ANALYSIS

WHC-SD-WM-DP-044
REV 1

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1C	1127.48	563.96	1.45	762.	1144.	7.5	CS-134, EU-152
2C	1139.71	570.07	1.45	776.	2122.	6.5	CS-134, BI-207
3	1210.50	605.47	1.55	794.	13112.	1.8	CS-134, SB-125
4	1324.35	662.39	1.54	535.	19268.	1.5	CS-137
5C	1592.74	796.59	1.54	450.	9725.	2.3	CS-134
6C	1604.96	802.70	1.54	417.	975.	7.0	CS-134, PO-210
7C	2337.38	1169.00	1.74	275.	175.	22.4	CS-134
8C	2347.47	1174.04	1.74	233.	11666.	2.0	CO-60
9	2666.01	1333.38	1.83	68.	10786.	1.9	CO-60
10	2731.44	1366.12	1.96	50.	258.	15.0	CS-134
11	2802.40	1401.62	1.88	41.	188.	17.9	BI-214
12	2922.72	1461.81	2.06	18.	334.	11.4	K-40
12B		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

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C - MULTIPEL ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

09-JUL-9301:51:11

BEST AVAILABLE COPY

SAMPLE: R4105-8530

DATA COLLECTED ON 9-JUL-93 AT 01:00:47

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN $\mu\text{Ci/LI}$				ENERGY COMPARISON	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	(KEV) EXPECT	DIFF
AM-241	LLD<1.83E+00		LLD<1.83E+00		59.54	
AM-243	LLD<6.04E-01		LLD<6.04E-01		74.67	
BA-133	LLD<7.42E-01		LLD<7.42E-01		356.02	
BA-140	LLD<1.87E+00		LLD<1.87E+00		537.27	
BI-212	LLD<3.56E+00		LLD<3.56E+00		727.20	
CEPR144	LLD<4.63E+00		LLD<4.63E+00		133.51	
CO-60	1.07E+02 +-2.22E+00		1.07E+02 +-2.22E+00		1332.50	0.88
					1173.24	0.81
CR-51	LLD<3.92E+00		LLD<3.92E+00		320.09	
CS-134	7.61E+01 +-1.88E+00		7.61E+01 +-1.88E+00		795.84	0.74
					604.70	0.77
CS-137	1.32E+02 +-2.27E+00		1.32E+02 +-2.27E+00		661.65	0.74
EU-152	LLD<1.37E+00		LLD<1.37E+00		1408.01	
EU-154	LLD<1.01E+00		LLD<1.01E+00		1274.45	
EU-154H	LLD<9.18E-01		LLD<9.18E-01		1274.80	
EU-155	LLD<1.20E+00		LLD<1.20E+00		105.31	
FE-59	LLD<1.20E+00		LLD<1.20E+00		1099.25	
I-131	LLD<5.45E-01		LLD<5.45E-01		364.48	
K-40	LLD<6.02E+00		LLD<6.02E+00		1460.75	
LA-140	LLD<1.98E-01		LLD<1.98E-01		1596.20	
MN-54	LLD<5.03E-01		LLD<5.03E-01		834.83	
NA-22	LLD<3.26E-01		LLD<3.26E-01		1274.55	
NB-94	LLD<4.30E-01		LLD<4.30E-01		702.63	
NB-95	LLD<4.83E-01		LLD<4.83E-01		765.78	
NP-237	LLD<2.50E+00		LLD<2.50E+00		86.50	
PB-212	LLD<8.60E-01		LLD<8.60E-01		239.00	
PU-239	LLD<3.91E+03		LLD<3.91E+03		129.30	
PU-241	LLD<1.41E+05		LLD<1.41E+05		148.57	
RA-224	LLD<9.44E+00		LLD<9.44E+00		240.99	
RA-226	LLD<9.22E+00		LLD<9.22E+00		186.10	
RU-103	LLD<5.65E-01		LLD<5.65E-01		497.08	
RU103	LLD<5.95E-01		LLD<5.95E-01		497.08	
RURH106	LLD<8.18E+00		LLD<8.18E+00		621.80	
SB-125	LLD<1.71E+00		LLD<1.71E+00		427.89	
SB-125A	LLD<1.71E+00		LLD<1.71E+00		427.89	
SE-75	LLD<6.40E-01		LLD<6.40E-01		264.66	
SN-113	LLD<7.52E-01		LLD<7.52E-01		391.67	
SR-85	LLD<5.12E-01		LLD<5.12E-01		513.99	
TH-228	LLD<2.34E+01		LLD<2.34E+01		84.37	
TL-208	LLD<5.90E-01		LLD<5.90E-01		583.20	
U-235	LLD<5.58E-01		LLD<5.58E-01		185.71	
Y-88	LLD<1.75E-01		LLD<1.75E-01		1836.06	
ZN-65	LLD<1.29E+00		LLD<1.29E+00		1115.55	
ZR-95	LLD<8.64E-01		LLD<8.64E-01		756.73	
TOTAL	3.15E+02 +-3.69E+00		3.15E+02 +-3.69E+00			

EBAR = ***** MEV/DISINTEGRATION

MAXIMUM PERMISSABLE ACTIVITY = $1.36\text{E-}09$ UC/LITOTAL MEASURED ACTIVITY = $3.15\text{E+}02$ (+ $3.69\text{E+}00$) UC/LI

% TECH. SPEC. = ***** (+-*****)

WHC-SD-WM-DP-044

REV 1

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

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PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1127.48	563.96	1144.	7.5	$2.20\text{E+}01$
1139.71	570.07	2122.	6.5	$4.10\text{E+}01$
1604.96	802.70	975.	7.0	$2.43\text{E+}01$
2337.38	1169.00	175.	22.4	$5.81\text{E+}00$
2731.44	1366.12	258.	15.0	$9.59\text{E+}00$
2802.40	1401.62	188.	17.9	$7.14\text{E+}00$

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.72	1461.81	334.	11.4	$1.30\text{E+}01$

***** WHC-SD-WM-DP-044 *****
* REV 1 *
* GAMMA SPECTRUM ANALYSIS *

7-9-93

CANBERRA SPECTRAN-F V2.06 SOFTWARE

09-JUL-9302:46:24

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ANALYSIS PARAMETERS

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +/- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLER ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: R4106-8630
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 9-JUL-93 AT 01:56:11

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3006. SECONDS
DEAD TIME: 0.20 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 24-AUG-92
EFFICIENCY CALIBRATION PERFORMED 3-SEP-92

09-JUL-9302:46:24

I WHC-SD-WM-DP-044
REV 1

PEAK ANALYSIS

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	1023.01	511.73	2.70	68.	146.	22.9	I-133, TL-208,
1B		511.04			139.	25.0	NA-22, ZN-65, RH-106
2	1219.71	610.07	1.11	53.	59.	44.5	BI-214A,
2B		609.34			87.	30.3	RU-103
3	2922.56	1461.73	1.89	8.	308.	11.6	K-40
3B		1460.83			344.	10.8	
4	3530.06	1765.70	1.14	2.	50.	28.9	BI-214C

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

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BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

09-JUL-9302:46:24

WHC-SD-WM-DP-044
REV 1

SAMPLE: R4106-8630

DATA COLLECTED ON 9-JUL-93 AT 01:56:11

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

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RADIONUCLIDE ANALYSIS REPORT

NUCLIDE	ACTIVITY CONCENTRATION IN $\mu\text{Ci/LI}$				ENERGY COMPARISON	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	(KEV) EXPECT	DIFF
AM-241	LLD<5.55E-01		LLD<5.55E-01		59.54	
AM-243	LLD<1.99E-01		LLD<1.99E-01		74.67	
BA-133	LLD<2.15E-01		LLD<2.15E-01		356.02	
BA-140	LLD<4.66E-01		LLD<4.66E-01		537.27	
BI-212	LLD<1.22E+00		LLD<1.22E+00		727.20	
CEPR144	LLD<1.36E+00		LLD<1.36E+00		133.51	
CO-60	LLD<1.61E-01		LLD<1.61E-01		1332.50	
CR-51	LLD<1.10E+00		LLD<1.10E+00		320.09	
CS-134	LLD<1.73E-01		LLD<1.73E-01		795.84	
CS-137	LLD<1.48E-01		LLD<1.48E-01		661.65	
EU-152	LLD<7.39E-01		LLD<7.39E-01		1408.01	
EU-154	LLD<5.04E-01		LLD<5.04E-01		1274.45	
EU-154H	LLD<4.74E-01		LLD<4.74E-01		1274.80	
EU-155	LLD<3.81E-01		LLD<3.81E-01		105.31	
FE-59	LLD<2.59E-01		LLD<2.59E-01		1099.25	
I-131	LLD<1.41E-01		LLD<1.41E-01		364.48	
K-40	LLD<5.84E+00		LLD<5.84E+00		1460.75	
LA-140	LLD<1.16E-01		LLD<1.16E-01		1596.20	
MN-54	LLD<1.47E-01		LLD<1.47E-01		834.83	
NA-22	LLD<1.68E-01		LLD<1.68E-01		1274.55	
NB-94	LLD<1.55E-01		LLD<1.55E-01		702.63	
NB-95	LLD<1.59E-01		LLD<1.59E-01		765.78	
NP-237	LLD<8.16E-01		LLD<8.16E-01		86.50	
PB-212	LLD<2.55E-01		LLD<2.55E-01		239.00	
PU-239	LLD<1.31E+03		LLD<1.31E+03		129.30	
PU-241	LLD<4.34E+04		LLD<4.34E+04		148.57	
RA-224	LLD<2.70E+00		LLD<2.70E+00		240.99	
RA-226	LLD<2.79E+00		LLD<2.79E+00		186.10	
RU-103	LLD<1.38E-01		LLD<1.38E-01		497.08	
RU103	LLD<1.45E-01		LLD<1.45E-01		497.08	
RURH106	LLD<2.66E+00		LLD<2.66E+00		621.80	
SB-125	LLD<4.27E-01		LLD<4.27E-01		427.89	
SB-125A	LLD<4.27E-01		LLD<4.27E-01		427.89	
SE-75	LLD<1.76E-01		LLD<1.76E-01		264.66	
SN-113	LLD<1.85E-01		LLD<1.85E-01		391.67	
SR-85	LLD<1.92E-01		LLD<1.92E-01		513.99	
TH-228	LLD<8.29E+00		LLD<8.29E+00		84.37	
TL-208	LLD<1.58E-01		LLD<1.58E-01		583.20	
U-235	LLD<1.66E-01		LLD<1.66E-01		185.71	
Y-88	LLD<1.38E-02		LLD<1.38E-02		1836.06	
ZN-65	LLD<4.58E-01		LLD<4.58E-01		1115.55	
ZR-95	LLD<2.96E-01		LLD<2.96E-01		756.73	

TOTAL	0.00E-01	+ -0.00E-01	0.00E-01	+ -0.00E-01		

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
3530.06	1765.70	50.	28.9	2.21E+00

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PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1023.01	511.73	146.	22.9	2.61E+00
1219.71	610.07	59.	44.5	1.19E+00
2922.56	1461.73	308.	11.6	1.20E+01

*
* GAMMA SPECTRUM ANALYSIS *
*

CANBERRA SPECTRAN-F V2.06 SOFTWARE

09-JUL-9303:44:46

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ANALYSIS PARAMETERS

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLY ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: R4107-8730
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 9-JUL-93 AT 02:53:23

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3053. SECONDS
DEAD TIME: 1.74 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 24-AUG-92
EFFICIENCY CALIBRATION PERFORMED 3-SEP-92

PEAK ANALYSIS

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PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	98.14	49.42	1.06	8138.	462.	53.2	U-234
2?	119.52	60.11	1.20	8908.	25315.	1.6	AM-241, U-237, EU-155, NP-239
3	173.65	87.16	1.16	8220.	5375.	5.4	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
4	211.28	105.97	1.15	7958.	4062.	6.8	EU-155, EU-155B, NP-239
5	246.79	123.72	1.15	8087.	13231.	2.5	EU-154A
6	496.76	248.66	1.38	7921.	1788.	14.6	EU-154B, XE-135
7	1184.39	592.41	1.46	1971.	681.	20.6	EU-154C
8C	1202.40	601.41	1.45	1677.	278.	38.7	SB-125, SB-125D, SB-124
9C	1210.44	605.43	1.45	1736.	384.	35.7	CS-134, SB-125
10	1324.38	662.40	1.54	1620.	327615.	0.3	CS-137
11	1447.65	724.04	1.63	384.	2341.	4.7	SB-124, I-131, AG-108, EU-154D, ZR-95
12	1514.67	757.55	1.52	386.	535.	13.7	ZR-95, EU-154
13	1592.42	796.43	1.99	411.	286.	24.4	CS-134
14	1670.51	835.48	1.31	386.	83.	75.0	MN-54
15	1747.37	873.91	1.90	338.	1281.	7.0	EU-154E, RH-106, I-133
16	1993.53	997.02	1.76	339.	1043.	8.2	EU-154F
17	2010.49	1005.50	1.82	316.	1733.	5.6	EU-154G, EU-152
18	2347.50	1174.06	1.88	161.	3763.	3.4	CO-60
19	2549.89	1275.29	1.80	65.	2846.	3.8	EU-154, EU-154H, NA-22
20	2665.97	1333.36	1.82	49.	3375.	3.4	CO-60
21	2796.48	1398.66	1.35	50.	53.	50.5	I-132
22	2922.60	1461.75	1.82	28.	358.	11.4	K-40
22B		1460.83			344.	10.8	
23	2989.16	1495.05	2.02	28.	52.	41.8	EU-154
24	3193.60	1597.34	2.14	21.	142.	19.5	LA-140, EU-154I

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY

? - MULTIPLE ANALYSIS CONVERGED BUT GFIT > 4
B - ENVIRONMENTAL BACKGROUND PEAK

~~WHC-SD-WM-DP-044~~
REV 1

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

BEST AVAILABLE COPY

09-JUL-9303:44:46

SAMPLE: R4107-8730

DATA COLLECTED ON 9-JUL-93 AT 02:53:23

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN $\mu\text{Ci/LI}$				ENERGY COMPARISON	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	(KEV) EXPECT	DIFF
AM-241	4.22E+02	+/-1.03E+01	4.22E+02	+/-1.03E+01	59.54	0.57
AM-243	LLD<1.45E+00		LLD<1.45E+00		74.67	
BA-133	LLD<1.61E+00		LLD<1.61E+00		356.02	
BA-140	LLD<3.61E+00		LLD<3.61E+00		537.27	
BI-212	LLD<8.57E+00		LLD<8.57E+00		727.20	
CEPR144	LLD<1.03E+01		LLD<1.03E+01		133.51	
CO-60	3.34E+01	+/-1.18E+00	3.34E+01	+/-1.18E+00	1332.50	0.86
					1173.24	0.82
CR-51	LLD<8.61E+00		LLD<8.61E+00		320.09	
CS-134	2.24E+00	+/-5.45E-01	2.24E+00	+/-5.45E-01	795.84	0.59
					604.70	0.73
CS-137	2.24E+03	+/-2.21E+01	2.24E+03	+/-2.21E+01	661.65	0.75
EU-152	LLD<1.14E+00		LLD<1.14E+00		1408.01	
EU-154	7.67E+01	+/-2.97E+00	7.67E+01	+/-2.97E+00	1274.45	0.84
					123.07	0.65
					1004.76	0.74
EU-154H	7.67E+01	+/-2.97E+00	7.67E+01	+/-2.97E+00	1274.80	0.49
EU-155	4.34E+01	+/-3.04E+00	4.34E+01	+/-3.04E+00	105.31	0.67
					86.54	0.62
FE-59	LLD<9.08E-01		LLD<9.08E-01		1099.25	
I-131	LLD<1.28E+00		LLD<1.28E+00		364.48	
K-40	LLD<6.00E+00		LLD<6.00E+00		1460.75	
LA-140	LLD<2.65E-01		LLD<2.65E-01		1596.20	
MN-54	5.74E-01	+/-4.31E-01	5.74E-01	+/-4.31E-01	834.83	0.65
NA-22	2.73E+01	+/-1.05E+00	2.73E+01	+/-1.05E+00	1274.55	0.74
NB-94	LLD<4.24E-01		LLD<4.24E-01		702.63	
NB-95	LLD<4.33E-01		LLD<4.33E-01		765.78	
NP-237	1.22E+02	+/-6.84E+00	1.22E+02	+/-6.84E+00	86.50	0.66
PB-212	LLD<1.88E+00		LLD<1.88E+00		239.00	
PU-239	LLD<8.98E+03		LLD<8.98E+03		129.30	
PU-241	LLD<3.14E+05		LLD<3.14E+05		148.57	
RA-224	LLD<2.09E+01		LLD<2.09E+01		240.99	
RA-226	LLD<2.11E+01		LLD<2.11E+01		186.10	
RU-103	LLD<1.29E+00		LLD<1.29E+00		497.08	
RU103	LLD<1.36E+00		LLD<1.36E+00		497.08	
RURH106	LLD<1.46E+01		LLD<1.46E+01		621.80	
SB-125	LLD<4.22E+00		LLD<4.22E+00		427.89	
SB-125A	LLD<4.22E+00		LLD<4.22E+00		427.89	
SE-75	LLD<1.41E+00		LLD<1.41E+00		264.66	
SN-113	LLD<1.72E+00		LLD<1.72E+00		391.67	
SR-85	LLD<1.11E+00		LLD<1.11E+00		513.99	
TH-228	LLD<7.34E+01		LLD<7.34E+01		84.37	
TL-208	LLD<8.94E-01		LLD<8.94E-01		583.20	
U-235	LLD<1.27E+00		LLD<1.27E+00		185.71	
Y-88	LLD<1.75E-01		LLD<1.75E-01		1836.06	
ZN-65	LLD<9.91E-01		LLD<9.91E-01		1115.55	
ZR-95	6.31E+00	+/-8.69E-01	6.31E+00	+/-8.69E-01	756.73	0.82

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TOTAL	3.05E+03 +-2.59E+01	3.05E+03 +-2.59E+01
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STANDARD DEVIATION = 0.23

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 5.06E-09 UC/LI
TOTAL MEASURED ACTIVITY = 2.98E+03 (+-2.58E+01) UC/LI
% TECH. SPEC. = ***** (+-*****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

BEST AVAILABLE COPY

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
98.14	49.42	462.	53.2	1.75E+01
496.76	248.66	1788.	14.6	2.03E+01
1184.39	592.41	681.	20.6	1.35E+01
1202.40	601.41	278.	38.7	5.59E+00
1747.37	873.91	1281.	7.0	3.40E+01
1993.53	997.02	1043.	8.2	3.07E+01
2796.48	1398.66	53.	50.6	1.99E+00
2989.16	1495.05	52.	41.8	2.07E+00
3193.60	1597.34	142.	19.5	5.87E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.60	1461.75	358.	11.4	1.40E+01

Em Bavelle
7-9-93

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GAMMA SPECTRUM ANALYSIS

CANBERRA SPECTRAN-F V2.06 SOFTWARE

09-JUL-9306:02:56

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ANALYSIS PARAMETERS

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +/- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLY ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: R4107-8830
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 9-JUL-93 AT 05:11:56

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3054. SECONDS
DEAD TIME: 1.77 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 24-AUG-92
EFFICIENCY CALIBRATION PERFORMED 3-SEP-92

PEAK ANALYSIS

BEST AVAILABLE COPY

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	98.38	49.55	1.06	9292.	753.	36.2	U-234
2	119.54	60.12	1.21	9027.	25518.	1.6	AM-241, U-237, EU-155, NP-239
3	173.63	87.16	1.18	8228.	5346.	5.4	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
4	211.28	105.97	1.08	7933.	4047.	6.8	EU-155, EU-155B, NP-239
5	246.79	123.72	1.19	8208.	13609.	2.5	EU-154A
6\$	371.90	186.25	1.87	15039.	603.	55.0	U-235, RA-226
7\$	376.44	188.52	1.87	16001.	495.	57.7	
8	496.88	248.72	1.31	8111.	1711.	15.3	EU-154B, XE-135
9	856.41	428.44	1.20	8789.	591.	46.1	SB-125, SB-125B
10	1184.57	592.50	1.60	1985.	737.	19.2	EU-154C
11	1324.40	662.41	1.54	1581.	331620.	0.3	CS-137
12	1386.12	693.27	1.69	473.	195.	36.5	EU-154
13	1447.66	724.04	1.64	416.	2332.	4.8	SB-124, I-131, AG-108, EU-154D, ZR-95
14	1514.45	757.44	1.70	403.	474.	15.4	ZR-95, EU-154
15	1592.72	796.58	1.64	370.	282.	23.2	CS-134
16	1670.84	835.64	1.00	330.	137.	43.4	MN-54
17	1747.46	873.96	1.83	369.	1185.	7.5	EU-154E, RH-106, I-133
18	1993.40	996.96	1.49	315.	1084.	7.7	EU-154F
19	2010.53	1005.52	1.66	327.	1782.	5.6	EU-154G, EU-152
20	2347.43	1174.03	1.86	140.	3885.	3.3	CO-60
21	2549.96	1275.33	1.76	71.	2933.	3.7	EU-154, EU-154H, NA-22
22	2666.08	1333.42	1.87	72.	3487.	3.4	CO-60
23	2922.62	1461.76	2.00	36.	343.	11.9	K-40
23B		1460.83			344.	10.8	
24	3193.89	1597.48	1.56	32.	148.	20.3	LA-140, EU-154I

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

\$ - MULTIPEL ANALYSIS CONVERGED DUE TO LACK OF CHI-SQ IMPROVEMENT
B - ENVIRONMENTAL BACKGROUND PEAK

WMC-SD-WM-DP-044
REV 1

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

BEST AVAILABLE COPY

09-JUL-9306:02:56

BEST AVAILABLE COPY

SAMPLE: R4107-8830

DATA COLLECTED ON 9-JUL-93 AT 05:11:56

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN $\mu\text{Ci/LI}$				ENERGY COMPARISON	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	(KEV) EXPECT	DIFF
AM-241	4.25E+02	+/-1.03E+01	4.25E+02	+/-1.03E+01	59.54	0.58
AM-243	LLD<1.47E+00		LLD<1.47E+00		74.67	
BA-133	LLD<1.64E+00		LLD<1.64E+00		356.02	
BA-140	LLD<3.61E+00		LLD<3.61E+00		537.27	
BI-212	LLD<8.52E+00		LLD<8.52E+00		727.20	
CEPR144	LLD<1.04E+01		LLD<1.04E+01		133.51	
CO-60	3.45E+01	+/-1.21E+00	3.45E+01	+/-1.21E+00	1332.50	0.92
					1173.24	0.79
CR-51	LLD<8.76E+00		LLD<8.76E+00		320.09	
CS-134	LLD<5.47E-01		LLD<5.47E-01		795.84	
CS-137	2.27E+03	+/-2.24E+01	2.27E+03	+/-2.24E+01	661.65	0.76
EU-152	LLD<9.47E-01		LLD<9.47E-01		1408.01	
EU-154	7.91E+01	+/-3.02E+00	7.91E+01	+/-3.02E+00	1274.45	0.88
					123.07	0.65
					1004.76	0.76
EU-154H	7.91E+01	+/-3.02E+00	7.91E+01	+/-3.02E+00	1274.80	0.53
EU-155	4.32E+01	+/-3.03E+00	4.32E+01	+/-3.03E+00	105.31	0.66
					86.54	0.61
FE-59	LLD<9.06E-01		LLD<9.06E-01		1099.25	
I-131	LLD<1.27E+00		LLD<1.27E+00		364.48	
K-40	LLD<5.99E+00		LLD<5.99E+00		1460.75	
LA-140	LLD<2.19E-01		LLD<2.19E-01		1596.20	
MN-54	9.53E-01	+/-4.14E-01	9.53E-01	+/-4.14E-01	834.83	0.82
NA-22	2.81E+01	+/-1.07E+00	2.81E+01	+/-1.07E+00	1274.55	0.78
NB-94	LLD<4.18E-01		LLD<4.18E-01		702.63	
NB-95	LLD<4.64E-01		LLD<4.64E-01		765.78	
NP-237	1.21E+02	+/-6.83E+00	1.21E+02	+/-6.83E+00	86.50	0.65
PB-212	LLD<1.91E+00		LLD<1.91E+00		239.00	
PU-239	LLD<9.15E+03		LLD<9.15E+03		129.30	
PU-241	LLD<3.18E+05		LLD<3.18E+05		148.57	
RA-224	LLD<2.08E+01		LLD<2.08E+01		240.99	
RA-226	4.37E+01	+/-2.41E+01	4.37E+01	+/-2.41E+01	186.10	0.15
RU-103	LLD<1.31E+00		LLD<1.31E+00		497.08	
RU103	LLD<1.38E+00		LLD<1.38E+00		497.08	
RURH106	LLD<1.44E+01		LLD<1.44E+01		621.80	
SB-125	LLD<4.25E+00		LLD<4.25E+00		427.89	
SB-125A	8.63E+00	+/-3.98E+00	8.63E+00	+/-3.98E+00	427.89	0.55
SE-75	LLD<1.41E+00		LLD<1.41E+00		264.66	
SN-113	LLD<1.73E+00		LLD<1.73E+00		391.67	
SR-85	LLD<1.12E+00		LLD<1.12E+00		513.99	
TH-228	LLD<7.29E+01		LLD<7.29E+01		84.37	
TL-208	LLD<9.13E-01		LLD<9.13E-01		583.20	
U-235	LLD<1.29E+00		LLD<1.29E+00		185.71	
Y-88	LLD<1.75E-01		LLD<1.75E-01		1836.06	
ZN-65	LLD<9.78E-01		LLD<9.78E-01		1115.55	
ZR-95	5.59E+00	+/-8.61E-01	5.59E+00	+/-8.61E-01	756.73	0.71
					724.20	-0.15

TOTAL

3.14E+03 +-3.58E+01

3.14E+03 +-3.58E+01

WHC-SD-WM-DP-044

REV 1

STANDARD DEVIATION = 0.27

EBAR = ***** MEV/DISINTEGRATION

MAXIMUM PERMISSABLE ACTIVITY = 5.24E-09 UC/LI

TOTAL MEASURED ACTIVITY = 3.05E+03 (+-3.54E+01) UC/LI

% TECH. SPEC. = ***** (+-*****)

ERROR QUOTATION AT 1.96 SIGMA

LLD CONFIDENCE LEVEL AT 85.0%

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PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
98.38	49.55	753.	36.2	2.84E+01
376.44	188.52	495.	57.7	4.69E+00
496.88	248.72	1711.	15.3	1.94E+01
1184.57	592.50	737.	19.2	1.46E+01
1386.12	693.27	195.	36.5	4.35E+00
1592.72	796.58	282.	23.2	6.98E+00
1747.46	873.96	1185.	7.5	3.15E+01
1993.40	996.96	1084.	7.7	3.19E+01
3193.89	1597.48	148.	20.3	6.10E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.62	1461.76	343.	11.9	1.34E+01

EFF
MCA UNIT NUMBER (2):
ADC UNIT NUMBER (1.0):
MCA MEMORY REGION (FULL):

J. Oakman
11-13-92

WMC-SD-WM-DP-044
REV 1

DATE SPECTRUM COLLECTED: 24-AUG-92

TIME COLLECT STARTED: 15:03

GEOMETRY DESCRIPTION: 22CC LIQ

ACTIVITY UNITS (UCI):

CROSSOVER ENERGY: 165.853

CALIBRATION SOURCE ENTRY OPTIONS:

TYPE A CARRIAGE RETURN FOR MANUAL ENTRY,

TYPE AN INTEGER (0-999) TO USE A SOURCE LIBRARY,

TYPE A PLUS SIGN BEFORE THE INTEGER (+0 - +999)

TO CREATE A SOURCE LIBRARY DURING MANUAL ENTRY.

OPTION: 142

22CC LIQ

DO YOU WANT TO ENTER ANY EFFICIENCY POINTS MANUALLY (NO):

DIMENSIONAL UNITS OF STANDARD: EA

SIZE OF STANDARD IN EA : 1.00000

NUMBER OF POINTS: 12

ACTIVITY IN MICROCURIES (YES/NO):

Calibration Source ID: 42B47-A

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PEAK 1
ENERGY: 59.536
ACTIVITY: 3.687000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: 0158000
DECAY TIME (0.000000E-01 MINS.): 1-FEB-92
TIME OF SOURCE CALIBRATION: 12:00
DECAY TIME: 2.953830E+05 MINS
EFFICIENCY = 1.495966E-02 (+- 1.457409E-04)

PEAK 2
ENERGY: 88.035
ACTIVITY: 2.065000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: 0462.6
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 3.328336E-02 (+- 3.404008E-04)

PEAK 3
ENERGY: 122.061
ACTIVITY: 1.881000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: 0271.8
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 3.992001E-02 (+- 4.346472E-04)

PEAK 4
ENERGY: 165.853
ACTIVITY: 2.284000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: 0137.66
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 3.869252E-02 (+- 5.240505E-04)

SYSTEM EFFICIENCY COEFFICIENTS, PART 1

$\text{LOG(EFF)} = -4.252798\text{E}+01 + 1.616063\text{E}+01 \text{LOG(E)} - 1.659189\text{E}+00 \text{LOG(E)}^2$

PEAK 5
ENERGY: 220.192

DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 2.862727E-02 (+- 1.054006E-03)

PEAK 6
ENERGY: 391.668
ACTIVITY: 7.301000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D115.09
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 2.205499E-02 (+- 2.154050E-04)

PEAK 7
ENERGY: 513.990
ACTIVITY: 1.252100E+03
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D64.84
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 1.812006E-02 (+- 2.663545E-04)

PEAK 8
ENERGY: 661.650
ACTIVITY: 8.032000E+02
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D110.20
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 1.560478E-02 (+- 8.495761E-05)

PEAK 9
ENERGY: 898.021
ACTIVITY: 2.014000E+03
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D106.61
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 1.210588E-02 (+- 9.562018E-05)

PEAK 10
ENERGY: 1173.240
ACTIVITY: 1.092600E+03
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D1925.3
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 1.001542E-02 (+- 5.929491E-05)

PEAK 11
ENERGY: 1332.500
ACTIVITY: 1.093200E+03
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D1925.3
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 9.134423E-03 (+- 5.595209E-05)

PEAK 12
ENERGY: 1836.130
ACTIVITY: 2.135300E+03
ACTIVITY ONE SIGMA: 0.000000E-01
HALF-LIFE: D106.61
DECAY TIME (2.953830E+05 MINS.):
EFFICIENCY = 7.415293E-03 (+- 6.714016E-05)

SYSTEM EFFICIENCY COEFFICIENTS, PART 2

LOG(EFF) = 7.888321E+01 - 5.214094E+01*LOG(E) + 1.252259E+01*LOG(E)^2
- 1.343061E+00*LOG(E)^3 + 5.356648E-02*LOG(E)^4

WHC-SD-WM-DP-044
REV 1

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URANIUM ANALYSIS - ACID DIGESTION

WRC-SD-WM-DP-044
REV 1

RUSH RERUN				
Serial No	Sample Point	Date	Time Issued	Priority
R 4105.-8540	VOGEL	6-30-93	13:18	28
Determination	Method/Standard	Result Units	Charge Code	Remarks
U	LA-925-108	% RECOVERY	E11456	1
Sample Size			Customer ID	
? .100-10-.100 ml			STD	
Remarks, Calculations, Results S267 UFI STD VAL 638 RESULT 3.07E-2 STD VAL 3.04E-2 XREC 100.99% SPIKE ID/VAL 90838/6.25 g/L SPIKE VOL. 100 ml $\frac{.14(.1 \times 1010)(6.25E-4)}{(.57) \cdot 42} = .14 = 3.0739 \times 10^{-2} \cdot 14$ Dania Batia				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Date	Time Completed	Lab Unit Mgr		
7-13-93	1430	Rafida	7/15	

RUSH RERUN				
Serial No	Sample Point	Date	Time Issued	Priority
R 4106.-8640	VOGEL	6-30-93	13:18	20
Determination	Method/Standard	Result Units	Charge Code	Remarks
U	LA-925-108	ug/ML	E11456	1
Sample Size			Customer ID	
? .025-10-.025 ml			BLK	
Remarks, Calculations, Results REAGENT BLANK 70838/6.25 g/L .100 ml $\frac{(.02(.1)(16040)(6.25E-4))}{(.57) \cdot 28} = 57.56 \times 10^{-2} \left(\frac{100,000}{16040} \right) = 57.56 \times 10^{-2}$ Dania Batia				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Date	Time Completed	Lab Unit Mgr		
7-13-93	1430	Rafida	7/15	

URANIUM ANALYSIS - ACID DIGESTION

Serial No	Sample Point		Time Issued	Priority
R 4105.-8540	VOGEL		6-30-93 13:18	26
Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	E11456	0
Sample Size	Customer ID			
? 100-10-100	STD			
Remarks, Calculations, Results				
S267 UF1C STD# 126838 STD VAL 3.04×10^{-2} %REC SPIKE ID/VAL 90838/16.25-4 SPIKE VOL. 100 ml 10190 $\frac{0.12(1.11010)(16.25 \times 10^{-4})}{(5.7)(5.6)} = 3.074 \times 10^{-2}$ $(5.7)(5.6) = 31.92$ Amanda Hallaby				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Date	Time Completed	Lab Unit Mgr		
07-12-93	15:00	Rakela		

54 6800-061 (R-10-83)

Serial No.	Sample Point		Time Issued	Priority
R 4106.-8640	VOGEL		6-30-93 13:18	20
Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	ug/ML	E11456	0
Sample Size	Customer ID			
? 100-10-100-10-25	BLK			
Remarks, Calculations, Results				
REAGENT BLANK 90838/16.25-4 g/L 100 ml $\frac{1.02(408040)(1)(16.25 \times 10^{-4})}{(5.625)(5.525)} = 1.926 \times 10^{-3}$ $(5.625)(5.525) = 31.08$ $1.92 \times 10^{-3} \text{ ug/ml}$ Amanda Hallaby				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Date	Time Completed	Lab Unit Mgr		
07-12-93	15:00	Rakela		

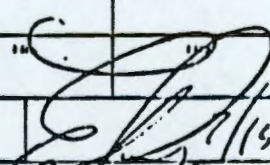
54 6800-061 (R-10-83)

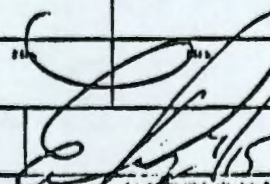
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URANIUM ANALYSIS - ACID DIGESTION

WUC-SD-WM-DP-044

REV 1

Serial No		Sample Point		Date	Time Issued	Priority
R 4107.-8740		VOGEL		6-30-93	13:24	20
Determination	Method/Standard	Result Units	Charge Code	Remarks		
U	LA-925-106	G/G Rec	E11456	1		
Sample Size				Customer ID		
7.025-10-.025 ml				937046S		
Remarks, Calculations, Results						
90888/6.25-4 g/l .100 ml $.44(1)(16040)(6.25-4) = \frac{2.8548}{10.514} = .2016/6$ $(\frac{5.615}{5.515}) \cdot 44 = .44$ <i>Isotopic Ratio</i>				OUT FOR RERUN RERUN .44 .64		
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5		
Date	Time Completed	Lab Unit Mgr				
7-13-93	1430	R. White				

Serial No		Sample Point		Date	Time Issued	Priority
R 4107.-8840		VOGEL		6-30-93	13:24	20
Determination	Method/Standard	Result Units	Charge Code	Remarks		
U	LA-925-106	G/G Rec	E11456	1		
Sample Size				Customer ID		
7.025-10-.025 ml				937046S		
Remarks, Calculations, Results						
DUPLICATE SAMPLE 90888/6.25-4 g/l .100 ml $.42(1)(16040)(6.25-4) = \frac{1.9934}{10.576} = .192$ $(\frac{5.615}{5.515}) \cdot 62 = .42$ <i>Isotopic Ratio</i>				OUT FOR RERUN RERUN .42 .62		
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5		
Date	Time Completed	Lab Unit Mgr				
7-13-93	1430	R. White				

URANIUM ANALYSIS - ACID DIGESTION

Serial No. R 4107.-8740	Sample Point VOGEL	OUT FOR RERUN		Time Issued 6-30-93	Priority 13:24
Determination U	Method/Standard LA-925-106	Result Units G/G Rec	Charge Code E11456	Retuns 0	
Sample Size ? 100-10-100-10-25			Customer ID 937046S		
Remarks, Calculations, Results: 90638/6.25-4g/l 100 ml $\frac{.16(1)(6.25-4)(408040)}{(5.625)(5.825) \cdot 361 - .16} = \frac{21.92611}{10.376} = \boxed{2.116/G}$:16 :34 <i>Amenda Therese</i>					
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5	
Mrs	Mrs	Mrs	Mrs	Mrs	
Date 07-12-93	Time Completed 15:00	Lab Unit Mgr <i>Raketa</i>		<i>ELH</i>	

54-9800-001 (R-10-83)

Serial No. R 4107.-8840	Sample Point VOGEL	OUT FOR RERUN		Time Issued 6-30-93	Priority 13:24
Determination U	Method/Standard LA-925-106	Result Units G/G Rec	Charge Code E11456	Retuns 0	
Sample Size ? 100-10-100-10-25			Customer ID 937046S		
Remarks, Calculations, Results: DUPLICATE SAMPLE 90638/6.25-4g/l 100 ml $\frac{.18(1)(6.25-4)(408040)}{(5.625)(5.825) \cdot 36 - .18} = \frac{24.412611}{10.376} = \boxed{2.376/G}$:18 :30 <i>Amenda Therese</i>					
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5	
Mrs	Mrs	Mrs	Mrs	Mrs	
Date 07-12-93	Time Completed 15:00	Lab Unit Mgr <i>Raketa</i>		<i>ELH</i>	

54-9800-001 (R-10-83)

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Customer ID:

R4107

9370465

Analysis:

Am 241

Sample Prep:

Acid Digest

Instrument:

WB 57237

Procedure/ Rev:

LA 503-156

D-C

Technologist:-

Wm. C. Collins

Date:

7-9-95

Starting Time:

0850

Temperature 24.2

2402

Ending Time:

1400

Chemist:

SA Cotton

Comments:

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

[illegible]

[illegible]

The results for the standard are in uCi/L.

Blank is reported in uCi/g. (uCi/L divided by 10.376g/L)

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-044
REV 1

#4 4646

Serial No R 4105.-8582	Sample Point VOGEL	Date 6-30-93	Time Issued 13:17	Priority 20
Determination Am241	Method Standard LA-503-156	Result Units % RECOVERY	Charge Code E11456	Returns 0
Sample Size ? 100-10-1ml			Customer ID STD	
Remarks Calculations Results EDP R201 ARO01 STD# 63B43 RESULT 27.17 STD VAL 26.512 %REC 101.34% .100 ml Am 241- 58B43 $\frac{809(1)(101)(2.5470-3)(1000)}{766} = 27.1698$ "AEA" - 480N... ATTACH PRINTOUT <i>For Baller</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	<i>R. Johnson</i>	<i>Raymond</i>	<i>D.A. Wilson</i>	
	7-7-93 1535	7-10-93		
Date 7-7-93	Time Completed 1400	Laboratory		

AM-241: LA-503-156 (D-0)

LIQUIDS

STANDARD

Serial No.	Spike (Tracer) Hook Number	58B43
R4105-8582	Activity of Am241 Tracer in dpm/mL (SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL (SPKV)	0.1
1138	Volume of Sample in mL (SS)	1
Run No.	Dilution Factor (DF)	101
0	Digest Dilution Factor (DDF)	1
Analyst	Am-241 Area Peak Height from AEA (C241)	809
	Am-243 Area Peak Height from AEA (C243)	766
Date	Total AT Count (ATOT)	7924
07/09/93	AT Count Time in Minutes (MIN CTd)	30
	Background in CPM (BKG)	6

$$\text{Am-241 } \mu\text{Ci/L} = ((C241 \cdot SPKA \cdot SPKV \cdot DF \cdot DDF \cdot (1000\text{mL/L})) / ((C243 \cdot SS \cdot (2220000\text{dpm/mL})))$$

$$\mu\text{Ci/mL} = \mu\text{Ci/L} / (1000\text{mL/L})$$

$$\text{Tracer \% Rec} = ((ATOT / \text{MIN CTd} - \text{BKG}) \cdot 2 \cdot (C243 / (C241 + C243)) / (SPKA \cdot SPKV)) \cdot 100$$

$$\text{Relative Counting Error} = \text{Square Root of } ((1 / C241) + (1 / C243)) \cdot 100$$

Am-241 $\mu\text{Ci/L}$ = 2.72E+01Am-241 $\mu\text{Ci/mL}$ = 2.72E-02

Relative counting error = 5.0%

Am-241 Tracer Recovery = 44.4%

Data Entry by:	<i>W.C. Plunk</i>	Date:	12-Jul-93
Approved by:	<i>W.C. Plunk</i>	Date:	July 13, 1993

AMERICIUM 241 ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-044

REV 1

#3 7-9-93 ~~AD~~ . . . R4105-8582
7924 - 6
30

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

KRC-SD-WM-DP-044

REV 1

#2 2045

Serial No R 4106.-8682	Sample Point VOGEL	Date 6-30-93	Time Issued 13:18	Priority 20
Determination AM241	Method Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Returns 0
Sample Size ? 100-10-110			Customer ID BLK	
Remarks Calculations Results REAGENT BLANK COUNT AS uCi/L .100 uCi Am 243- 58843 <i>P. C. Clark</i> $< 1.29 \times 10^{-2} \text{ uCi/ "AEA" - 480MIN}$ ATTACH PRINTOUT				
Analyst - 1	Analyst - 2 <i>AD Pham</i>	Analyst - 3 <i>Raymond</i>	Analyst - 4 <i>D. H. Martin</i>	Analyst - 5
MS	MS 7-9-93	MS 7-10-93	MS	MS
Date 7-9-93	Time Completed 1400	Lab. Line No. <i>H. Fitts</i>	<i>P. C. Clark</i> 7/14	

54-6000-100 (R 10 83)

AM-241: LA-503-156 (D-0)

LIQUIDS

BLANK

Serial No.	Spike (Tracer) Book Number	58843
R4106-8682	Activity of Am-243 Tracer in dpm/mL (SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL (SPKV)	0.1
1138	Volume of Sample in mL (SS)	0.1
Run No.	Dilution Factor (DF)	101
0	Digest Dilution Factor (DDF)	1
Analyst	Am-241 Area Peak Height from AEA (C241)	5
	Am-243 Area Peak Height from AEA (C243)	284
Date	Total AT Count (ATOT)	1201
07/09/93	AT Count Time in Minutes (MIN CT'd)	30
	Background in CPM (BKG)	3

$$\text{Am-241 } \mu\text{Ci/L} = ((C241 \cdot SPKA \cdot SPKV \cdot DF \cdot DDF \cdot (1000\text{mL/L})) / ((C243 \cdot SS \cdot (2220000\text{dpm/mL})))$$

$$\mu\text{Ci/mL} = \mu\text{Ci/L} / (1000\text{mL/L})$$

$$\text{Tracer \% Rec} = ((ATOT / \text{MIN CT'd} - \text{BKG}) \cdot 2 \cdot (C243 / (C241 + C243)) / (SPKA \cdot SPKV)) \cdot 100$$

$$\text{Relative Counting Error} = \text{Square Root of } ((1 / C241) + (1 / C243)) \cdot 100$$

NOTE: Reported result is a LESS THAN value using
5% of the Am-243 peak as the Am-241 peak.

Am-241 $\mu\text{Ci/L}$	=	< 1.29E+01
-------------------------	---	------------

Am-241 $\mu\text{Ci/mL}$	=	< 1.29E-02
--------------------------	---	------------

Relative counting error	=	45.1%
-------------------------	---	-------

Am-243 Tracer Recovery	=	12.9%
------------------------	---	-------

Data Entry by: <i>P. C. Clark</i>	Date: 12-Jul-93
Approved by: <i>H. Fitts</i>	Date: July 13/1993

AMERICIUM 241 ANALYSIS - ACID DIGESTION

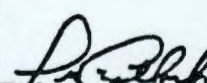
WHC-SD-WM-DP-044
REV. 1

2 ~~7-9-93~~ AD
7-9-93

R4106-8682

1201
30 - 3

4.3 7013

Serial No R 4107.-8782	Sample Pos. VOGEL	Date 6-30-93	Time Issued 13:24	Priority 20
Determination Am241	Method Standard LA-503-156	Result Units uCi/G Rec	Charge Code E11456	Returns 0
Sample Size ? 100-10-100	Customer ID 937046S			
Remarks Calculations Results COUNT AS uCi/L 3.58×10^1 1ml 8m HNO ₃ uCi/g .100 ml Am 243-58B43 "AEA" - 480MIN ATTACH PRINTOUT 				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
7-9-93	7-10-93	7-10-93	7-10-93	
1515	11:00			
Date 7-9-93	Time Completed 1400	Lab Unit Mgr J. J. Fitts	7/14	

AM-241: LA-503-156 (D-0)

SOLIDS

SAMPLE		
Serial No.	Spike (Tracer) Book Number	58B43
R4107-8782	Activity of Am243 Tracer in dpm/mL (SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL (SPKV)	0.1
1138	Volume of Sample in mL (SS)	0.1
Run No.	Dilution Factor (DF)	101
0	Digest Grams of Solids / Liter (D g/L)	10.376
Analyst	Am-241 Area Peak Height from AEA (C241)	494
	Am-243 Area Peak Height from AEA (C243)	342
Date	Total AT Count (ATOT)	4017
07/09/93	AT Count Time in Minutes (MIN CTd)	30
	Background in CPM (BK)	6

$$\text{Am-241 } \mu\text{Ci/g} = (C241 \cdot \text{SPKA} \cdot \text{SPKV} \cdot \text{DF} \cdot (1000\text{mL/L})) / (C243 \cdot \text{SS} \cdot (D \text{ g/L}) \cdot (2220000\text{dpm/uCi}))$$

$$\text{Tracer \% Rec} = ((\text{ATOT}/\text{MIN CTd} - \text{BK}) \cdot 2 \cdot (C243 / (C241 + C243))) / (\text{SPKA} \cdot \text{SPKV}) \cdot 100$$

$$\text{Relative Counting Error} = \text{Square Root of } ((1/C241) + (1/C243)) \cdot 100$$

Am-241 $\mu\text{Ci/g}$	=	3.58E+01
-------------------------	---	----------

Relative Counting Error	=	7.0%
-------------------------	---	------

Am-243 Tracer Recovery	=	18.5%
------------------------	---	-------

Data Entry by: CA Clark

Date: 13-Jul-93

Approved by: J. J. Fitts

Date: July 13, 1993

AMERICIUM 241 ANALYSIS - ACID DIGESTION

WHC-SO-WM-DP-044

REV. 1

#3 7-9-93 AG . . . - R4107-8782

$\frac{4012}{30} - 6$

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-044

REV. 1

4.4 8233

Serial No R 4107.-8882	Sample Point VOGEL	Date 6-30-93	Time Issued 13:24	Priority 20
Determination Am241	Method Standard LA-503-156	Result Units uCi/G Rec	Charge Code E11456	Returns 0
Sample Size ? 100-10-100	Customer ID 937046S			
Remarks Calculations Results DUPLICATE SAMPLE COUNT AS uCi/L 1ml 8m HNO ₃ .100 ml Am 243 - 51B43 3.63 x 10 ¹ uCi/g "AEA" - 480MIN ATTACH PRINTOUT <i>[Signature]</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	<i>[Signature]</i> 7-9-93 1545	<i>[Signature]</i> 7-10-93 11:00	<i>[Signature]</i> 7-10-93	
Date 7-9-93	Time Completed 1400	Lab Unit Initials <i>[Signature]</i>	<i>[Signature]</i>	

AM-241: LA-503-156 (D-0) SOLIDS			DUPLICATE
Serial No.	Spike (Tracer) Book Number		58B43
R4107-8882	Activity of Am243 Tracer in dpm/mL	(SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL	(SPKV)	0.1
1138	Volume of Sample in mL	(SS)	0.1
Run No.	Dilution Factor	(DF)	101
0	Digest Grams of Solids / Liter	(D g/L)	10.376
Analyst	Am-241 Area Peak Height from AEA	(C241)	545
	Am-243 Area Peak Height from AEA	(C243)	372
Date	Total AT Count	(ATOT)	2295
07/09/93	AT Count Time in Minutes	(MIN CTd)	30
	Background in CPM	(BKG)	6

$$\text{Am-241 } \mu\text{Ci/g} = (\text{C241} \cdot \text{SPKA} \cdot \text{SPKV} \cdot \text{DF} \cdot (1000 \text{ mL/L})) / (\text{C243} \cdot \text{SS} \cdot (\text{D g/L}) \cdot (2220000 \text{ dpm/uCi}))$$

$$\text{Tracer \% Rec} = ((\text{ATOT}/\text{MIN CTd} - \text{BKG}) \cdot 2 \cdot (\text{C243} / (\text{C241} + \text{C243}))) / (\text{SPKA} \cdot \text{SPKV}) \cdot 100$$

$$\text{Relative Counting Error} = \text{Square Root of } ((1/\text{C241}) + (1/\text{C243})) \cdot 100$$

Am-241 $\mu\text{Ci/g}$	=	3.63E+01
-------------------------	---	----------

Relative Counting Error	=	6.7%
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Am-243 Tracer Recovery	=	10.1%
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Data Entry by: <i>[Signature]</i>	Date: 13-Jul 93
Approved by: <i>[Signature]</i>	Date: July 13, 1993

#1 7-9-93 AG RH107-8882
2295-6
 30

D.H. Milne
7-11-93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4105-8582 VOGEL/AM
File ID: SD4646.SPC

BEST AVAILABLE COPY

Counted on: 7/10/93 @19:00
Detector/Geometry number: 4/1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	1431.0	1480.4	297.096	297.096	20.000	13.602	10.000	3.409
2	1216.1	1316.2	251.911	251.911	20.000	8.894	10.000	2.253
3	6.6	4.8	99.516	99.516	188.000	2.000	94.000	0.200

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity	
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	uCi/ea	
1	Am241	0.5529	5.480	5.474	0.006	0.06	37.00	263.84	0.119E-03	
2	Am243	0.4444	5.234	5.266	-0.032	0.04	29.74	1812.30	0.816E-03	
3		0.0027		4.565		0.01	0.18	1.20	0.539E-06	

DETECTOR CALIBRATION

Energy(MEV) = 4.108 + (0.0046)*Channel
Energy range (MeV): 4.108 TO 6.463
Efficiency = 0.1492 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	33322.0	100.000
Smoothed	33321.9	100.000
Composite fit	33462.8	100.423
Residuals	-140.9	-0.423

Analyzed by: VR

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 187 TO 198.

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

5038.2

WHC-SD-WM-DP-044
REV 1

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Raw Data Dump for AEA Spectrum: SP:SD4646.SPC

1	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
11	0.	0.	1.	1.	0.	0.	0.	1.	1.	0.
21	0.	1.	3.	0.	1.	0.	1.	1.	0.	1.
31	1.	0.	0.	1.	0.	2.	2.	1.	1.	1.
41	0.	2.	0.	1.	0.	1.	1.	2.	2.	0.
51	2.	2.	1.	0.	2.	0.	2.	0.	0.	0.
61	0.	0.	1.	2.	1.	0.	2.	0.	1.	0.
71	1.	1.	5.	2.	1.	2.	2.	1.	2.	4.
81	0.	1.	1.	1.	4.	2.	2.	1.	3.	0.
91	3.	3.	1.	3.	5.	3.	2.	3.	5.	4.
101	2.	6.	1.	1.	1.	0.	2.	5.	2.	3.
111	2.	4.	4.	1.	0.	5.	3.	0.	4.	1.
121	3.	2.	6.	3.	4.	5.	6.	1.	6.	3.
131	3.	3.	3.	4.	4.	6.	5.	6.	5.	6.
141	5.	2.	11.	5.	3.	4.	5.	2.	3.	5.
151	9.	3.	11.	6.	9.	5.	2.	7.	4.	8.
161	7.	5.	4.	8.	9.	5.	13.	8.	9.	6.
171	10.	6.	10.	9.	8.	8.	12.	10.	9.	2.
181	10.	14.	14.	10.	8.	9.	10.	17.	12.	15.
191	9.	19.	9.	15.	14.	20.	11.	23.	15.	20.
201	17.	20.	11.	21.	22.	36.	16.	29.	28.	26.
211	33.	34.	29.	31.	48.	41.	35.	34.	55.	55.
221	60.	65.	73.	70.	92.	105.	88.	138.	154.	169.
231	169.	193.	226.	259.	265.	350.	390.	405.	464.	549.
241	544.	529.	586.	580.	590.	537.	581.	586.	570.	672.
251	686.	766.	725.	694.	587.	419.	313.	230.	174.	103.
261	95.	81.	86.	78.	85.	67.	86.	73.	86.	76.
271	100.	99.	123.	121.	138.	165.	203.	242.	265.	327.
281	342.	376.	400.	494.	515.	533.	642.	630.	611.	629.
291	663.	658.	635.	713.	697.	749.	774.	809.	785.	688.
301	542.	433.	307.	237.	167.	135.	97.	73.	52.	54.
311	37.	22.	17.	11.	3.	1.	1.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
331	0.	2.	0.	0.	0.	0.	1.	1.	0.	0.
341	0.	0.	2.	0.	0.	3.	0.	1.	1.	0.
351	2.	1.	1.	0.	1.	0.	0.	2.	0.	1.
361	0.	1.	2.	1.	1.	0.	0.	0.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

D. H. Milbrin
7-11-93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4106-8682 VOGEL/AM
File ID: SD2045.SPC

BEST AVAILABLE COPY

Counted on: 7/10/93 @19: 0
Detector/Geometry number: 2/1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		lau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	4.1	3.2	343.403	343.403	44.000	46.574	22.000	22.554
2	9.3	8.1	304.229	304.229	60.000	13.836	30.000	22.554
3	493.7	498.3	256.691	256.691	28.000	19.012	14.000	4.855

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count Rate c/m	d/m	Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM			
1	Ra224	0.0076	5.680	5.663	0.017	0.21	0.10	0.00	0.852E-11
2	Pu238	0.0105	5.499	5.483	0.016	0.06	0.14	0.00	0.153E-10
	Am241		5.480	5.483	-0.003				0.117E-10
3	Am243	0.9819	5.234	5.264	-0.030	0.09	13.47	0.02	0.936E-08

DETECTOR CALIBRATION

Energy(MEV) = 4.083 + (0.0046)*Channel
Energy range (MeV): 4.083 TO 6.438
Efficiency = ***** CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	7280.0	100.000
Smoothed	7279.8	99.997
Composite fit	6857.3	94.194
Residuals	422.4	5.803

Analyzed by: _____

VR

1782.1

BEST AVAILABLE COPY

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD2045.SPC

1	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
11	0.	1.	1.	1.	1.	0.	0.	0.	1.	0.
21	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
31	1.	0.	0.	0.	0.	1.	0.	0.	0.	0.
41	0.	2.	1.	0.	0.	1.	0.	2.	0.	0.
51	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
61	2.	1.	0.	1.	0.	2.	1.	0.	1.	2.
71	0.	1.	1.	0.	0.	0.	0.	1.	1.	1.
81	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91	0.	1.	0.	1.	0.	2.	0.	0.	1.	0.
101	1.	2.	0.	0.	1.	1.	1.	0.	0.	1.
111	3.	0.	0.	0.	1.	2.	0.	2.	0.	4.
121	1.	0.	1.	1.	2.	1.	0.	1.	3.	0.
131	0.	0.	2.	0.	3.	0.	1.	1.	3.	1.
141	1.	0.	1.	5.	1.	4.	1.	4.	0.	2.
151	5.	4.	4.	1.	2.	1.	0.	4.	5.	5.
161	6.	6.	2.	3.	3.	3.	5.	1.	3.	3.
171	5.	3.	5.	7.	4.	7.	5.	3.	9.	5.
181	3.	9.	4.	5.	8.	9.	6.	3.	7.	5.
191	9.	12.	8.	9.	9.	11.	8.	9.	12.	14.
201	13.	19.	13.	17.	15.	22.	11.	8.	17.	16.
211	23.	15.	16.	24.	19.	18.	25.	34.	24.	29.
221	41.	25.	33.	30.	37.	33.	37.	56.	46.	30.
231	58.	52.	48.	66.	81.	79.	82.	80.	99.	85.
241	98.	124.	129.	150.	168.	152.	178.	193.	220.	210.
251	258.	245.	277.	258.	245.	284.	264.	255.	216.	255.
261	192.	153.	132.	137.	98.	71.	58.	41.	32.	33.
271	22.	27.	15.	10.	6.	11.	6.	8.	5.	6.
281	3.	2.	2.	1.	1.	3.	3.	5.	5.	3.
291	1.	3.	4.	3.	3.	2.	3.	2.	2.	3.
301	4.	5.	3.	4.	3.	3.	2.	4.	3.	2.
311	2.	1.	2.	1.	1.	1.	1.	0.	0.	1.
321	0.	1.	0.	1.	0.	0.	1.	0.	1.	0.
331	0.	0.	1.	0.	0.	0.	2.	1.	3.	3.
341	2.	3.	3.	2.	2.	0.	1.	1.	1.	3.
351	3.	3.	1.	0.	0.	0.	2.	1.	2.	1.
361	1.	0.	0.	0.	1.	1.	0.	0.	0.	0.
371	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
381	0.	0.	0.	0.	0.	1.	0.	1.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	1.	0.	0.	1.	1.	0.	0.	0.	0.
421	1.	1.	0.	1.	0.	1.	0.	0.	1.	1.
431	0.	1.	0.	2.	1.	0.	1.	1.	0.	0.
441	0.	0.	1.	1.	1.	0.	0.	0.	0.	0.
451	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
471	0.	0.	0.	1.	3.	0.	0.	1.	1.	1.
481	1.	1.	0.	1.	0.	0.	0.	0.	1.	1.
491	0.	1.	0.	0.	1.	0.	0.	0.	0.	1.
511	0.	0.								

W. Raymond
7-10-93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4107-8782
File ID: SD7013.SPC

BEST AVAILABLE COPY

Counted on: 7/10/93 @10: 0
Detector/Geometry number: 7/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	5.6	4.3	368.160	368.160	20.000	16.188	10.000	2.185
2	787.3	774.5	302.811	302.811	24.000	14.326	12.000	3.980
3	551.2	518.7	257.470	257.470	20.000	15.086	10.000	2.875
4	6.9	7.1	151.397	151.397	176.000	2.000	88.000	0.200
5	5.2	5.0	36.704	36.704	20.000	16.068	10.000	2.696

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count Rate c/m	d/m	Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM			
1	Cm243	0.0047	5.786	5.800	-0.014	0.08	0.16	1.26	0.569E-06
	Cm244		5.796	5.800	-0.004				0.415E-06
2	Pu238	0.5378	5.499	5.493	0.006	0.07	18.65	147.48	0.664E-04
	Am241		5.480	5.493	-0.013				0.509E-04
3		0.4456		5.280		0.07	15.45	87.98	0.396E-04
4	Np237	0.0080	4.781	4.781	-0.000	0.01	0.28	1.81	0.816E-06
5		0.0039		4.242		0.08	0.14	0.77	0.347E-06

DETECTOR CALIBRATION

Energy(MEV) = 4.070 + (0.0047)*Channel
Energy range (MeV): 4.070 TO 6.476
Efficiency = 0.1756 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	17706.0	100.000
Smoothed	17706.0	100.000
Composite fit	17334.6	97.902
Residuals	371.4	2.098

Analyzed by: _____

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

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Raw Data Dump for AEA Spectrum: SP:SD7013.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	0.	1.	2.
21	2.	3.	2.	2.	3.	2.	3.	1.	3.	3.
31	3.	0.	3.	1.	3.	5.	3.	2.	5.	1.
41	0.	0.	3.	0.	2.	2.	0.	0.	0.	0.
51	2.	0.	2.	1.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
71	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.
81	0.	0.	2.	2.	2.	0.	1.	1.	0.	4.
91	3.	1.	1.	0.	2.	1.	0.	2.	1.	2.
101	0.	1.	5.	0.	0.	1.	1.	0.	2.	2.
111	3.	3.	3.	0.	1.	2.	0.	2.	1.	1.
121	1.	3.	3.	3.	3.	5.	3.	3.	2.	1.
131	1.	3.	1.	4.	5.	6.	7.	2.	5.	1.
141	2.	4.	5.	4.	5.	6.	3.	4.	4.	5.
151	7.	2.	4.	5.	5.	4.	2.	5.	3.	3.
161	5.	6.	1.	5.	5.	7.	2.	6.	7.	9.
171	9.	5.	4.	8.	8.	7.	9.	8.	12.	10.
181	6.	12.	11.	12.	13.	12.	11.	12.	9.	12.
191	13.	15.	11.	18.	8.	14.	12.	18.	25.	24.
201	18.	18.	20.	31.	34.	18.	31.	26.	26.	33.
211	38.	42.	37.	43.	40.	39.	48.	49.	46.	59.
221	43.	69.	69.	70.	72.	79.	65.	88.	61.	93.
231	97.	82.	105.	96.	76.	94.	105.	110.	93.	93.
241	114.	118.	110.	142.	134.	147.	187.	200.	205.	226.
251	234.	249.	285.	323.	319.	307.	333.	342.	279.	253.
261	219.	197.	145.	126.	103.	81.	105.	68.	64.	66.
271	77.	71.	93.	78.	84.	84.	91.	61.	105.	91.
281	93.	118.	126.	138.	122.	125.	134.	146.	174.	191.
291	214.	227.	214.	258.	288.	341.	353.	344.	389.	439.
301	467.	494.	426.	383.	364.	333.	261.	195.	177.	144.
311	100.	73.	64.	59.	30.	21.	22.	13.	6.	7.
321	2.	3.	0.	0.	1.	1.	0.	2.	0.	1.
331	0.	0.	0.	0.	0.	2.	0.	1.	1.	0.
341	1.	0.	1.	1.	5.	0.	3.	4.	0.	1.
351	1.	0.	0.	3.	0.	1.	0.	0.	0.	2.
361	2.	2.	2.	2.	2.	2.	8.	3.	2.	2.
371	0.	2.	1.	1.	1.	2.	0.	0.	0.	0.
381	0.	1.	0.	0.	1.	0.	0.	0.	0.	0.
391	0.	1.	1.	0.	1.	0.	0.	0.	0.	1.
401	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
421	0.	0.	0.	0.	0.	0.	1.	2.	1.	0.
431	3.	0.	0.	1.	0.	1.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Waymond
7.10.93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4107-8882
File ID: SD8233.SPC

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Counted on: 7/10/93 @10: 0
Detector/Geometry number: 8/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	5.0	4.7	366.761	366.761	24.000	19.648	12.000	6.773
2	852.4	834.9	303.956	303.956	24.000	15.035	12.000	7.014
3	601.0	577.7	258.716	258.716	24.000	13.607	12.000	5.565

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Cm244	0.0039	5.796	5.779	0.017	0.09	0.11	0.65	0.295E-06
	Cm243		5.786	5.779	0.007				0.404E-06
2	Pu238	0.5884	5.499	5.484	0.015	0.07	16.97	135.39	0.610E-04
	Am241		5.480	5.484	-0.004				0.467E-04
3	Am243	0.4077	5.234	5.271	-0.037	0.06	11.76	613.97	0.277E-03

DETECTOR CALIBRATION

Energy(MEV) = 4.055 + (0.0047)*Channel
Energy range (MeV): 4.055 TO 6.462
Efficiency = 0.1741 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	14954.0	100.000
Smoothed	14954.0	100.000
Composite fit	14421.8	96.441
Residuals	532.2	3.559

Analyzed by: _____

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

2977.3

WHC-SD-WM-DP-044
REV 1

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Raw Data Dump for AEA Spectrum: SP:SD8233.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
21	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
31	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
41	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	1.	0.	0.	0.	2.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
91	1.	0.	0.	0.	0.	1.	0.	0.	0.	1.
101	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.
111	0.	2.	0.	0.	1.	0.	0.	0.	0.	1.
121	0.	0.	0.	0.	1.	0.	0.	0.	3.	1.
131	1.	0.	2.	0.	1.	0.	1.	0.	2.	0.
141	2.	1.	1.	0.	1.	0.	1.	2.	1.	0.
151	0.	1.	1.	2.	1.	0.	1.	2.	1.	0.
161	4.	1.	0.	1.	2.	0.	0.	1.	2.	0.
171	1.	3.	1.	1.	1.	4.	0.	1.	5.	6.
181	5.	2.	2.	1.	4.	5.	2.	3.	1.	3.
191	5.	4.	8.	2.	2.	4.	4.	4.	6.	6.
201	5.	11.	7.	5.	8.	12.	6.	8.	9.	9.
211	7.	10.	13.	12.	11.	11.	9.	14.	16.	13.
221	17.	16.	27.	17.	29.	19.	29.	23.	28.	33.
231	39.	40.	31.	46.	37.	53.	44.	37.	47.	61.
241	38.	54.	57.	102.	89.	98.	102.	129.	164.	166.
251	205.	233.	257.	282.	324.	361.	372.	338.	369.	290.
261	269.	196.	185.	155.	112.	97.	68.	59.	72.	32.
271	49.	47.	36.	38.	29.	31.	38.	39.	40.	36.
281	61.	53.	57.	53.	64.	73.	84.	86.	117.	153.
291	154.	159.	209.	223.	232.	280.	375.	387.	372.	471.
301	475.	484.	545.	464.	398.	399.	334.	292.	269.	198.
311	166.	146.	99.	79.	56.	36.	40.	22.	20.	12.
321	4.	1.	0.	1.	0.	0.	0.	0.	0.	1.
331	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
341	0.	0.	2.	0.	1.	1.	0.	0.	0.	1.
351	0.	1.	1.	0.	2.	1.	3.	1.	0.	3.
361	3.	1.	5.	2.	1.	3.	4.	2.	4.	0.
371	2.	1.	1.	2.	1.	0.	2.	0.	0.	2.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
431	0.	0.	2.	1.	0.	1.	0.	0.	0.	1.
441	0.	1.	0.	0.	0.	0.	0.	0.	1.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 1
STD VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 10
TODAY'S DATE: 08/18/92
DECAY CORR'N: 2.552 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
243204	5	48631	307	48938	0.4987
243913	5	48773	309	49082	0.5002
244771	5	48944	311	49256	0.5020
243758	5	48742	309	49050	0.4999
243766	5	48743	309	49052	0.4999
243637	5	48717	309	49026	0.4996
243514	5	48693	308	49001	0.4994
243765	5	48743	309	49052	0.4999
243849	5	48760	309	49069	0.5001
244044	5	48799	310	49108	0.5005

FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5020				
MIN	0.4987	48754	309	49063	0.5000

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APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 2
STD VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 10
TODAY'S DATE: 08/20/92
DECAY CORR'N: 2.557 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242703	5	48531	306	48837	0.4977
243638	5	48718	309	49026	0.4996
243386	5	48667	308	48975	0.4991
243764	5	48743	309	49052	0.4999
244275	5	48845	310	49155	0.5009
244108	5	48812	310	49121	0.5006
244275	5	48845	310	49155	0.5009
243645	5	48719	309	49028	0.4996
243015	5	48593	307	48900	0.4983
244057	5	48801	310	49111	0.5005
243516	5	48693	308	49001	0.4994
243510	5	48692	308	49000	0.4994
243627	5	48715	309	49024	0.4996
243690	5	48728	309	49037	0.4997
243901	5	48770	309	49079	0.5002
244466	5	48883	311	49194	0.5013
FOR	16 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5013				
MIN	0.4977	48735	309	49043	0.4998

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APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 3
STD. VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 9
TODAY'S DATE: 08/19/92
DECAY CORR'N: 2.554 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242920	5	48575	307	48882	0.4981
242932	5	48577	307	48884	0.4982
242052	5	48401	305	48706	0.4964
243038	5	48599	307	48906	0.4984
242907	5	48572	307	48879	0.4981
242795	5	48550	306	48856	0.4979
243214	5	48634	307	48941	0.4988
243707	5	48732	309	49041	0.4998
242647	5	48520	306	48826	0.4976
241653	5	48322	304	48625	0.4955
FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.4998				
MIN	0.4955	48548	306	48855	0.4979

DET #		1	2	3	4	5	6	7	8	JUPITER II			
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT 5mB / G	Np	82	151		147	156		152	153				
	Pu	111	231		227	235		232	232				
DATE 7-9-93	Am	137	303		299	309		302	304				
	Cm	161	371		367	377		371	370				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT 9m / B-G	Np	82	151		145	156		152	154				
	Pu	110	230		225	236		231	232				
DATE 7-10-93	Am	136	303		297	310		303	303				
	Cm	160	371		365	378		370	370				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT 9m / B-G	Np	81	151		148	155		148	155				
	Pu	109	231		228	235		227	232				
DATE 7-11-93	Am	135	303		299	309		299	303				
	Cm	159	371		368	376		367	370				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT 8m / B-G	Np	80	151		147	157		153	155				
	Pu	109	230		227	231		232	232				
DATE 7-12-93	Am	135	303		299	304		303	304				
	Cm	159	370		366	372		371	371				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT 9m / B-G	Np	81	151		148	156		151	154				
	Pu	110	231		228	235		230	232				
DATE 7-13-93	Am	136	304		300	309		302	303				
	Cm	160	372		368	377		370	369				
JUP AEA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT 9m / B-G	Np	83	150		147	153		152	153				
	Pu	111	230		227	233		231	231				
DATE 7-14-93	Am	137	303		299	307		303	302				
	Cm	162	371		368	375		370	369				

RE: Np (^{237}Np) peak must be at ch 150 +/- 10 (3.2 - 4.4) or ch 80 +/- 10 (3.1, 1.1 - 1.4)
 Pu (^{239}Pu) peak must be at ch 229 +/- 10 (3.2 - 4.4) or ch 113 +/- 10 (3.1, 1.1 - 1.4)
 Am (^{241}Am) peak must be at ch 300 +/- 10 (3.2 - 4.4) or ch 139 +/- 10 (3.1, 1.1 - 1.4)
 Cm (^{244}Cm) peak must be at ch 368 +/- 10 (3.2 - 4.4) or ch 160 +/- 10 (3.1, 1.1 - 1.4)

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WESTINGHOUSE HARTFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

Batch #1174

Lab Segment Serial No. R4107	Customer ID: 9370465
Analysis: Pu 239/40	Sample Prep: Acid Digest

Instrument: WB57237	Procedure/ Rev: LA503-156 D-0
Technologist: AM C. L. L. L.	Date: 7-12-93
Starting Time: 0800	Temperature 24°C
Ending Time: 1400	Chemist: SA CARLOW

Comments: _____

	Description	Lab ID		Description	Lab ID
1	Lmcs	R4105-8581	11		
2	BK	R4106-8681	12		
3	SAM	R4107-8781	13		
4	SAM Dmg	R4107-8881	14	OUT FOR RERUN	
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
Lmcs	63B43-.100 ml			
spike	70B43-.100 ml			
				203

METHOD:

LA-503-156

DATE START:

July 12, 1993

PREPARED BY:

L. L. Fritts

DATE COMPLETE:

July 13, 1993

[illegible]

NARRATIVE: ☐ NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH
LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The samples were treated with concentrated nitric acid and 30% hydrogen peroxide prior to analysis. A factor of ten dilution was made by the pretreatment.

Rerun requested: Tracer recovery on blank is beyond acceptable limits.

***2 8243**

Serial No	Sample Point	Date	Time Issued	Priority
R 4105.-8581	VOGEL	6-30-93	13-17	20
Determination	Method/Standard	Result Units	Charge Code	Reprints
Pu239/40	LA-503-156	% RECOVERY	E11456	1
Sample Size	Customer ID			
? 100-10-100	STD			
Remarks/Calculations/Results				
EDP R211 AROO1				
STD# 63843 RESULT 133				
STD VAL. 130.5 %REC 101.9 %				
1st 8m HNO ₃				
100 ml Pu-238-70843				
P. B. B. B.				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond D. Martin			
	7-12-93			
Date	Time Completed	Lab Unit No.	7/15	
7-12-93	1400	222		

RE RUN SUPER RUSH

OUT FOR RERUN

ATTACH PRINTOUT

7-12-93

7/15

Pu 238 & 239/240: LA-503-156 (D-0)

SOLIDS

STANDARD

Serial No.	Date Counted	07/12/93	Pu 238 AEA Frac. (C238)	0.4608
R4105-8581	Sample Volume in ml. (SS)	0.1	Pu 238 AEA Frac. (C238)	0.0326
Batch ID	Sample D.F.	101	Pu 239 AEA Frac. (C239)	0.4947
1174	Tracer Volume in ml (SPKV)	0.1	Total AT Counts	6901
Rerun No.	Digest Grams/Liter (D g/L)	1	Time Counted (min)	30
1	Tracer Hook No.	70843	Background (cpm)	3
Analyst	Tracer Preparation Date	06/11/93	Pu 238 Counts	44.6
	Pu-238 Preparation Value	2786	Pu 238 Counts	3.15
Date	Pu-238 Decay Corr'd value	2729.08	Pu 239 Counts	47.88
07/12/93	Pu-238 Tracer Value	660	AEA Count Time	500

Decay Time = Counting Date No. - Preparation Date No.

Pu 238 Decay Correction = Tracer Prep Value * 1 e to the Power of (- ln 2 * Decay Time) / 1040.95 (1)

Pu 238 Tracer Recovery = (AT Counts / Time CL'd - 10g) (2) (C238) (100) / Tracer 238 Decay Corr'd Value * mL added

Pu 239/240 uCi/g = (C239) (Tracer 238 Decay Corr'd Val) (Tracer Volume) (1000ml/L) (DM) / (C238) (SS) (D g/L) (2220000dpm/uCi) (1)

Pu 238 dpm = (Total AT CL's / Time CL'd - 10g * (2) (C238) - (Pu 238 dpm / mL in Tracer) (SPKV) (Pu-238 Tracer Recovery / 100) (1)

Pu 238 uCi/g = (Pu 238 dpm) (DM) (1000ml/L) (1) / (Pu-238 Tracer Recovery / 100) (2220000dpm/uCi) (D g/L) (SS) (1)

Relative Counting Error = Square Root of (1 / Pu 238 Total Counts) + (1 / Pu 238 or 239/240 Total Counts) * 100

NOTE: Tracer Values are in dpm/mL.

Pu 239/240 uCi/g	=	1.33E+02
Relative Counting Error	=	0.9%
Pu 238 uCi/g	=	< 1.19E+01
Relative Counting Error	=	2.6%
Pu 238 Tracer Recovery	=	76.7%

NOTE: Pu 238 Reported result is a LESS THAN value using 20 dpm for the Pu-238 sample activity.

Data Entry by:	C. A. Bland	Date:	13-Jul-93
Approved by:	[Signature]	Date:	July 13, 1993
Form 2 Rev. 1		Page 1 of 1	

PLUTONIUM 239/240 ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-044

REV 1

*2 R 7-12-93

6901-3

30

R4105-8581

*5 5575

Serial No	Sample Point	Date	Time Issued	Priority
R 4106.-8681	VOGEL	6-30-93	13:18	20
Determination	Method Standard	Result Units	Charge Code	Remarks
Pu239/40	LA-503-156	uCi/ML	E11456	1
Sample Size	Customer ID			
? 100-10-100	BLK			
Remarks Calculations Results				
REAGENT BLANK $< 6.72 \times 10^{-3}$ RERUN				
COUNT AS uCi/L uCi/ML SUPER RUSH				
.100 ml Pu 236 - 70847				
"AEA" - 480MIN				
OUT FOR RERUN				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond	049		
	7-12-93			
Date	Time Completed	Lab Unit Mgr		
7-12-93	1400	RTT	7/15	

Pu 238 & 239/240: LA-503-156 (D-0)

LIQUIDS

BLANK

Serial No.	Date Counted	07/12/93	Pu 236 AEA Frac. (C236)	0.9242
R4106-8681	Sample Volume in ml. (SS)	0.1	Pu 238 AEA Frac. (C238)	0.0604
Batch ID	Sample D.E. (DP)	101	Pu 239 AEA Frac. (C239)	0.0055
1174	Tracer Volume in ml. (SPKV)	0.1	Total AT Counts	11472
Run No.	Digest D.E. (DDP)	1	Time Counted (min)	30
1	Tracer Book No.	70843	Background (cpm)	6
Analyst	Tracer Preparation Date	06/11/93	Pu 236 Counts	42.39
	Pu-236 Preparation Value	2786	Pu 238 Counts	2.77
Date	Pu-236 Decay Corr'd value	2729.08	Pu 239 Counts	0.25
07/12/93	Pu-238 Tracer Value	660	AEA Count Time	500

Decay Time = Counting Date No. - Preparation Date No.

Pu 236 Decay Correction = Tracer Prep Value * $1 - \ln(2) \cdot \text{Decay Time} / 1040.95$ Pu 236 Tracer Recovery = 1 AT Counts / Time C'd - $\ln(2) \cdot (C236) (100) / \text{Tracer 236 Decay Corr'd Value} \cdot \text{ml added}$ Pu 239/240 uCi/L = $(C239) (\text{Tracer 236 Decay Corr'd Val}) (SPKV) (DP) (DDP) (1000 \text{ mL/L}) / 1 (C236) (SS) (2220000 \text{ dpm/uCi})$ Pu 238 dpm = $(\text{Total AT C's} / \text{Time C'd} - \ln(2) \cdot (C238) - (\text{Pu 238 dpm/mL in Tracer}) (SPKV) (\text{Pu 236 Tracer Recovery} / 100))$ Pu 238 uCi/mL = $(\text{Pu 238 dpm}) (DP) (DDP) / 1 (\text{Pu-238 Tracer Recovery} / 100) (2220000 \text{ dpm/uCi}) (SS)$ Relative Counting Error = Square Root of $1 / (1 / \text{Pu 236 Total Counts}) + (1 / \text{Pu 238 or 239/240 Total Counts}) \cdot 100$ Pu-239/240 uCi/L = $< 6.72\text{E}+00$

NOTE: Tracer values are in dpm/mL.

Pu 239/240 uCi/mL = $< 6.72\text{E}-03$

NOTE: Pu 239/240 Reported result is a LESS THAN value using 0.05 for the Pu-239/240 peak height.

Relative Counting Error = 9.0%

Pu 238 uCi/mL = $< 3.57\text{E}-03$

NOTE: Pu 238 Reported result is a LESS THAN value using 20 dpm for the Pu-238 sample activity.

Relative Counting Error = 2.8%

Pu 236 Tracer Recovery = 254.9%

Data Entry by:

Date: 13-Jul-93

Approved by:

Date: July 13, 1993

Form 1 Rev. 1

Page 1 of 1

PLUTONIUM 239/240 ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-044

REV 1

#3 7-12-93

11472 6
30

RH106-8681

PLUTONIUM 239\240 ANALYSIS - ACID DIGESTION

3# 4644

Serial No R 4106.-8681	Sample Port VOGEL	Date 6-30-93	Time Issued 13:18	Priority 20
Determination Pu239/40	Method/Standard LA-503-156	Result Units uCi/ML	Charge Code E11456	Reruns 0
Sample Size ? 100ml. 70B43			Customer ID BLK	
Remarks, Calculations, Results REAGENT BLANK COUNT AS uCi/L OUT FOR RERUN				
Analyst - 1 <i>Jeff Solman</i>	Analyst - 2 <i>7-9-93 08:30</i>	Analyst - 3 <i>D.H. M... 7-10-93 16:00</i>	Analyst - 4 <i>7-10-93 16:00</i>	Analyst - 5
Date 7-9-93	Time Completed 1530	Lab Unit Mgr <i>[Signature]</i>	7/12	

#3 7-9-93 AD R4106-8681
3532 - 6
30

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*** 5573 + 5574**

Serial No	Sample Point	Date	Time Issued	Priority
R 4107-8781	VOGEL	6-30-93	13-24	20
Determination	Method Standard	Result Units	Charge Code	Remarks
Pu239/40	LA-503-156	uCi/G Rec	E11456	1
Sample Size	Customer ID			
2 / 100-10-100	937046S			
Remarks, Calculations, Results				
COUNT AS uCi/L 1 ml Pu H ₂ O .100 ml Pu 236-70843 5.64 x 10 ¹ uCi/g RERUN SUPER RUSH!				
AEA - 480 MIN ATTACH PRINTOUT				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond			
	7-12-93			
Date	Time Completed	Lab Unit Mgr		
7-12-93	1400	7/15		

Pu 238 & 239/240: LA-503-156 (D-0)

SOLIDS

SAMPLE

Serial No.	Date Counted	07/12/93	Pu 236 AFA Frac. (C236)	0.1549
R4107-8781	Sample Volume in ml. (SS)	0.1	Pu 238 AFA Frac. (C238)	0.1154
Batch ID	Sample D.F. DF	101	Pu 239 AFA Frac. (C239)	0.7296
1174	Tracer Volume in ml(SPKV)	0.1	Total AT Counts	32817
Rerun No.	Digest Grams/Liter (D g/L)	10.376	Time Counted (min)	30
1	Tracer Hook No.	70843	Background (cpm)	6
Analyst	Tracer Preparation Date	06/11/93	Pu 236 Counts	56.37
	Pu-236 Preparation Value	2786	Pu 238 Counts	42
Date	Pu-236 Decay Corr'd value	2729.08	Pu 239 Counts	265.42
07/12/93	Pu-238 Tracer Value	660	AFA Count Time	16.6667

Decay Time = Counting Date No. - Preparation Date No.

Pu 236 Decay Correction = Tracer Prep Value * (e to the Power of (-ln2 * Decay Time) / 1040.95) |

Pu 236 Tracer Recovery = (AT Counts / Time CL'd - Hkg (2) (C236) (100) / Tracer 236 Decay Corr'd Value * ml. added)

Pu 239/240 uCi/g = (C239) (Tracer 236 Decay Corr'd Val) (Tracer Volume) (1000ml/L) (DF) / (C236) (SS) (D g/L) (2220000dpm/uCi) |

Pu 238 dpm = (Total AT CL's / Time CL'd) - Hkg * (2) (C238) - (Pu 238 dpm / ml. in Tracer) (SPKV) (Pu-236 Tracer Recovery / 100) |

Pu 238 uCi/g = (Pu 238 dpm) (DF) (1000ml/L) / (Pu-236 Tracer Recovery / 100) (2220000dpm/uCi) (D g/L) (SS) |

Relative Counting Error = Square Root of (1 / Pu 236 Total Count) + (1 / Pu 238 or 239/240 Total Count) * 100

NOTE: Tracer Values are in dpm/mL.

Pu 239/240 uCi/g	=	5.64E+01
Relative Counting Error	=	3.6%
Pu 238 uCi/g	=	6.02E+00
Relative Counting Error	=	5.0%
Pu 236 Tracer Recovery	=	123.5%

Data Entry by:	CG Mack	Date:	13-Jul-93
Approved by:	7/15/93	Date:	July 13, 1993
Form 2 Rev. 1		Page	1 of 1

PLUTONIUM 239/240 ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-044

REV 1

#3 R 7-12-93

32817 - 6

30

2.1 - RH107-8781

4654 + 4655

Serial No	Sample Point	Date	Time Issued	Priority
R 4107-8881	VOGEL	6-30-93	13:24	20
Determination	Method Standard	Result Units	Charge Code	Retuns
Pu239/40	LA-503-156	uCi/G Rec	E11456	1
Sample Size	Customer ID			
? 100 - 10 - 100	937046S			
Remarks Calculations Results				
DUPLICATE SAMPLE COUNT AS uCi/L 1 ml in HNO ₃ 100 ml Pu 236-70843 5.49 x 10 ¹ uCi/g RERUN SUPER RUSH "AEA" - 480MIN ATTACH PRINTOUT 83-93 OUT FOR RERUN				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond			
	7-12-93			
Date	Time Completed	Lab Unit Mgr		
7-12-93	1400	AKF:to	EK 7/15	

Pu 238 & 239/240: LA-503-156 (D-0)

SOLIDS

DUPLICATE

Serial No.	Date Counted	07/12/93	Pu 236 AEA Frac. (C236)	0.1574
R4107-8881	Sample Volume in ml. (SS)	0.1	Pu 238 AEA Frac. (C238)	0.1207
Batch ID	Sample D.F. DF	101	Pu 239 AEA Frac. (C239)	0.722
1174	Tracer Volume in ml (S/KV)	0.1	Total AT Counts	24376
Rerun No.	Digest Grams/Liter (D g/L)	10.376	Time Counted (min)	30
1	Tracer Hook No.	70843	Background (cpm)	5
Analyst	Tracer Preparation Date	06/11/93	Pu 236 Counts	36.33
	Pu-236 Preparation Value	2786	Pu 238 Counts	27.86
Date	Pu-236 Decay Corr'd value	2729.08	Pu 239 Counts	166.66
07/12/93	Pu-238 Tracer Value	660	AEA Count Time	50

Decay Time = Counting Date No. - Preparation Date No.

Pu 236 Decay Correction = Tracer Prep Value * 1 e to the Power of (- ln2 * Decay Time) / 1040.95 |

Pu 236 Tracer Recovery = 1 AT Counts / Time CL'd - Bkg (2) (C236) (100) / Tracer 236 Decay Corr'd Value * mL added

Pu 239/240 uCi/g = (C239) (Tracer 236 Decay Corr'd Val) (Tracer Volume) (1000ml/L) (DF) / 1 (C236) (SS) (D g/L) (2220000dpm/uCi) |

Pu 238 dpm = 1 (Total AT CL'd / Time CL'd) - Bkg * (2) (C238) - ((Pu 238 dpm / mL in Tracer) (S/KV) (Pu-236 Tracer Recovery / 100) |

Pu 238 uCi/g = 1 (Pu 238 dpm) (DF) (1000ml/L) 1 / (Pu-236 Tracer Recovery / 100) (2220000dpm/uCi) (D g/L) (SS) |

Relative Counting Error = Square Root of 1 (1 / Pu 236 Total Counts) + (1 / Pu 238 or 239/240 Total Counts) * 100

NOTE: Tracer Values are in dpm/mL.

Pu 239/240 uCi/g	=	5.49E+01
Relative Counting Error	=	2.6%
Pu 238 uCi/g	=	6.28E+00
Relative Counting Error	=	3.6%
Pu 236 Tracer Recovery	=	93.1%

Data Entry by:	CO Blank	Date:	13-Jul-93
Approved by:	AKF:to	Date:	July 13, 1993

PLUTONIUM 239/240 ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-044

REV 1

#1 A 7-12-93
24376-5
30

R4107-8881

D. H. Milia
7-13-93GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R-4105-8581
File ID: SD8243.SPC

BEST AVAILABLE COPY

Counted on: 7/12/93 @19: 0
Detector/Geometry number: 8/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	2670.1	2664.9	364.233	364.233	20.000	10.082	10.000	5.621
2	171.4	172.9	306.602	306.602	20.000	10.476	10.000	4.598
3	255.7	0.0	268.948	268.948	12.000	12.123	6.000	6.102
4	3153.6	3095.5	234.089	234.089	20.000	9.379	10.000	6.623
5	14.4	13.2	146.708	146.708	88.000	2.000	44.000	0.200
6	5.6	7.4	125.229	125.229	56.000	2.000	28.000	0.200
7	1.4	0.0	119.727	119.727	12.000	12.123	6.000	6.271
8	4.2	4.1	79.285	79.285	16.000	4.432	8.000	1.564
9	5.3	2.5	60.951	60.951	12.000	3.676	6.000	3.897
10	12.3	11.5	27.028	27.028	28.000	23.768	14.000	15.884

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count Rate c/m	d/m	Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM			
1	Pu236	0.4608	5.756	5.764	-0.008	0.05	44.60	252.40	0.114E-03
2	Pu238	0.0326	5.499	5.494	0.005	0.05	3.15	24.27	0.109E-04
	Am241		5.480	5.494	-0.014				0.837E-05
3		0.0000		5.317		0.06	0.00	0.00	0.000E+00
4	Pu239	0.4947	5.143	5.153	-0.010	0.04	47.88	265.56	0.120E-03
	Pu240		5.144	5.153	-0.009				0.120E-03
5		0.0053		4.742		0.01	0.52	2.86	0.129E-05
6	Np237	0.0029	4.640	4.641	-0.001	0.01	0.28	26.25	0.118E-04
7		0.0000		4.615		0.06	0.00	0.00	0.000E+00
8	U 235	0.0007	4.396	4.425	-0.029	0.02	0.07	0.65	0.291E-06
9		0.0003		4.339		0.02	0.02	0.14	0.615E-07
10	U 238	0.0027	4.200	4.180	0.020	0.11	0.27	1.91	0.861E-06

DETECTOR CALIBRATION

Energy (MEV) = 4.052 + (0.0047)*Channel

Energy range (MeV): 4.052 TO 6.459

Efficiency = 0.1803 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	48986.0	100.000
Smoothed	48986.0	100.000

Composite fit
Residuals

48392.7
593.3

98.789
1.211

Analyzed by: _____

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1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

10336.0

WHC-SD-WM-DP-044
REV 1

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD8243.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	5.	1.	11.	5.	4.	8.	6.
21	7.	7.	2.	4.	9.	10.	9.	5.	4.	3.
31	10.	3.	4.	3.	1.	3.	7.	1.	4.	4.
41	3.	0.	1.	2.	0.	2.	2.	4.	2.	2.
51	2.	2.	2.	4.	4.	1.	1.	4.	3.	6.
61	3.	3.	0.	2.	3.	6.	0.	1.	2.	4.
71	3.	2.	3.	2.	5.	6.	4.	5.	6.	3.
81	2.	5.	4.	3.	0.	3.	3.	4.	3.	0.
91	2.	3.	3.	3.	2.	2.	5.	6.	4.	3.
101	4.	4.	5.	8.	5.	6.	4.	2.	7.	5.
111	2.	5.	5.	4.	6.	7.	8.	7.	2.	6.
121	3.	5.	5.	9.	7.	3.	5.	6.	7.	4.
131	3.	2.	7.	1.	5.	4.	4.	2.	2.	5.
141	9.	7.	5.	8.	8.	7.	3.	8.	6.	6.
151	2.	6.	7.	4.	4.	2.	7.	2.	9.	7.
161	7.	2.	7.	8.	6.	12.	8.	7.	8.	5.
171	5.	7.	5.	4.	6.	8.	7.	10.	5.	8.
181	7.	12.	11.	11.	12.	7.	9.	12.	11.	4.
191	5.	8.	13.	6.	14.	8.	6.	17.	20.	13.
201	13.	12.	17.	16.	18.	27.	15.	26.	24.	26.
211	45.	41.	49.	67.	81.	103.	121.	166.	196.	251.
221	294.	417.	451.	606.	705.	840.	992.	1190.	1415.	1653.
231	1794.	1874.	1948.	1944.	1685.	1390.	1122.	875.	616.	396.
241	249.	162.	89.	50.	25.	14.	13.	11.	4.	4.
251	6.	4.	4.	11.	8.	4.	9.	7.	3.	12.
261	7.	9.	4.	3.	8.	11.	6.	12.	17.	10.
271	5.	6.	5.	7.	6.	3.	5.	6.	2.	7.
281	5.	5.	5.	9.	10.	6.	11.	11.	11.	23.
291	24.	23.	27.	37.	45.	34.	43.	48.	68.	82.
301	76.	70.	89.	105.	86.	115.	95.	90.	77.	60.
311	49.	34.	23.	15.	13.	7.	7.	3.	2.	2.
321	4.	1.	8.	5.	4.	1.	5.	7.	7.	9.
331	5.	13.	9.	10.	10.	19.	16.	19.	25.	18.
341	28.	49.	52.	70.	87.	102.	149.	218.	274.	330.
351	416.	467.	554.	623.	737.	821.	914.	1063.	1197.	1299.
361	1473.	1580.	1500.	1608.	1533.	1306.	1019.	835.	597.	445.
371	259.	152.	82.	35.	21.	6.	4.	2.	1.	1.
381	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
401	0.	0.	0.	0.	0.	1.	0.	2.	0.	2.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	1.	0.	1.	2.	0.	0.	0.	1.	0.
431	0.	0.	0.	0.	1.	0.	1.	1.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	2.	0.	0.	0.	1.
471	0.	1.	2.	0.	3.	0.	0.	1.	1.	1.
481	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

D. H. Millican
7-13-93

GENERAL ALPHA ENERGY ANALYSIS

Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R-4106-8681
File ID: SD5575.SPC

Counted on: 7/12/93 @20: 0
Detector/Geometry number: 5/-1
Count time: 30000. Sec

BEST AVAILABLE COPY

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	1900.4	1942.8	369.249	369.249	24.000	17.003	12.000	7.188
2	118.7	119.6	310.270	310.270	24.000	17.003	12.000	5.901
3	13.8	13.2	274.292	274.292	16.000	6.413	8.000	0.827
4	10.5	10.0	238.800	238.800	20.000	8.724	10.000	1.849

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid			FWHM	Count Rate c/m	d/m	Activity uCi/ea
1	Cm244	0.9242	Exp.	Obs.	Diff.	FWHM			
	Cm243		5.796	5.784	0.012	0.08	42.39	217.74	0.981E-04
2	Pu238	0.0604	5.786	5.784	0.002				0.134E-03
	Am241		5.499	5.512	-0.013	0.08	2.77	19.75	0.890E-05
3		0.0100	5.480	5.512	-0.032				0.682E-05
				5.347		0.03	0.46	2.35	0.106E-05
4	Pu240	0.0055				0.04	0.25	1.30	0.584E-06

DETECTOR CALIBRATION

Energy(MEV) = 4.085 + (0.0046)*Channel
Energy range (MeV): 4.085 TO 6.440
Efficiency = 0.1947 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	22847.0	100.000
Smoothed	22846.7	99.999
Composite fit	22935.8	100.389
Residuals	-89.3	-0.391

Analyzed by: _____

• SPECTRUM SD5575.SPC

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

6659.8

WHC-SD-WM-DP-044
REV 1

BEST AVAILABLE COPY

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD5575.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	1.	0.	1.	0.	2.	0.	1.
21	0.	0.	0.	2.	3.	0.	0.	0.	1.	0.
31	0.	0.	0.	0.	0.	1.	0.	1.	0.	0.
41	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	1.	1.	0.	1.
61	0.	0.	0.	3.	0.	0.	0.	1.	2.	2.
71	0.	0.	2.	0.	0.	0.	2.	0.	1.	0.
81	3.	1.	0.	1.	0.	0.	0.	1.	0.	0.
91	1.	1.	0.	0.	0.	0.	1.	0.	0.	1.
101	1.	1.	0.	0.	0.	2.	0.	1.	0.	0.
111	0.	1.	2.	1.	2.	0.	1.	1.	1.	1.
121	0.	0.	1.	0.	0.	2.	0.	0.	0.	1.
131	0.	2.	2.	0.	0.	0.	2.	0.	0.	0.
141	0.	2.	0.	1.	0.	0.	2.	2.	0.	1.
151	0.	0.	0.	3.	1.	0.	0.	0.	0.	1.
161	2.	0.	0.	0.	1.	1.	2.	1.	1.	0.
171	2.	3.	1.	0.	0.	0.	0.	2.	1.	0.
181	0.	0.	6.	1.	0.	0.	0.	1.	2.	0.
191	3.	1.	0.	1.	1.	1.	3.	1.	2.	4.
201	0.	1.	0.	0.	4.	3.	1.	1.	1.	3.
211	0.	0.	2.	2.	0.	5.	0.	5.	1.	1.
221	1.	5.	6.	5.	1.	5.	3.	5.	6.	7.
231	7.	5.	6.	4.	6.	9.	9.	7.	10.	9.
241	3.	4.	7.	4.	5.	3.	3.	2.	6.	2.
251	5.	3.	3.	3.	4.	4.	2.	8.	9.	3.
261	2.	4.	7.	5.	9.	9.	8.	5.	7.	7.
271	11.	10.	14.	13.	8.	3.	10.	9.	6.	4.
281	4.	6.	10.	12.	10.	11.	10.	4.	7.	15.
291	17.	24.	16.	19.	22.	24.	27.	28.	27.	37.
301	36.	44.	49.	76.	48.	72.	68.	69.	62.	56.
311	75.	63.	50.	50.	41.	41.	39.	29.	28.	19.
321	23.	12.	8.	16.	17.	19.	11.	7.	19.	17.
331	22.	19.	15.	18.	18.	28.	34.	32.	41.	28.
341	54.	63.	53.	70.	71.	100.	103.	132.	147.	168.
351	220.	268.	274.	355.	393.	450.	497.	576.	660.	726.
361	752.	832.	861.	933.	991.	1048.	1049.	1037.	1021.	980.
371	945.	871.	792.	709.	597.	473.	367.	266.	215.	133.
381	114.	71.	46.	39.	16.	6.	6.	2.	1.	0.
391	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	1.	0.	0.	0.	0.	0.	1.
421	2.	0.	0.	0.	0.	1.	1.	2.	0.	0.
431	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
441	1.	1.	0.	1.	0.	0.	1.	0.	1.	0.
451	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
471	0.	0.	1.	0.	0.	0.	0.	1.	1.	0.
481	0.	1.	0.	1.	1.	0.	2.	3.	0.	0.
491	2.	1.	1.	0.	0.	2.	1.	0.	2.	1.
511	0.	0.								

Wymona
7.12.93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4107-8781 PU/VOGEL
File ID: SD5573.SPC

Counted on: 7/12/93 @18: 0
Detector/Geometry number: 5/ 1-
Count time: 1000. Sec

BEST AVAILABLE COPY

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	89.4	90.5	368.579	368.579	24.000	17.091	12.000	9.267
2	66.9	65.3	309.709	309.709	24.000	16.455	12.000	7.090
3	422.7	431.0	235.955	235.955	24.000	16.214	12.000	8.279

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid			FWHM	Count Rate c/m	d/m	Activity uCi/ea
			Exp.	Obs.	Diff.				
1	Cm244	0.1549	5.796	5.781	0.015	0.08	56.37	289.52	0.130E-03
	Cm243		5.786	5.781	0.005				0.179E-03
2	Pu238	0.1154	5.499	5.510	-0.011	0.08	42.00	299.57	0.135E-03
	Am241		5.480	5.510	-0.030				0.103E-03
3	Pu239	0.7296	5.143	5.171	-0.028	0.07	265.42	1363.24	0.614E-03
	Pu240		5.144	5.171	-0.027				0.614E-03

DETECTOR CALIBRATION

Energy(MEV) = 4.085 + (0.0046)*Channel
Energy range (MeV): 4.085 TO 6.440
Efficiency = 0.1947 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	6141.0	100.000
Smoothed	6141.0	100.000
Composite fit	6063.1	98.732
Residuals	77.9	1.268

Analyzed by: _____
VR

WMC-SD-WM-DP-044
REV 1

BEST AVAILABLE COPY

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD5573.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	1.	0.	0.	0.	0.	0.	2.	1.	0.	0.
91	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	0.	0.	1.	0.	0.	1.	0.	0.
111	0.	0.	0.	0.	1.	1.	0.	0.	0.	1.
121	0.	0.	1.	0.	0.	0.	1.	0.	0.	0.
131	0.	3.	0.	2.	0.	0.	0.	0.	0.	1.
141	2.	0.	0.	1.	2.	0.	1.	0.	0.	0.
151	0.	0.	3.	2.	1.	2.	2.	0.	0.	1.
161	1.	3.	0.	1.	3.	1.	0.	1.	3.	1.
171	2.	0.	1.	0.	2.	2.	1.	3.	1.	1.
181	2.	1.	2.	1.	1.	3.	2.	5.	1.	2.
191	4.	3.	1.	3.	2.	2.	2.	1.	4.	5.
201	5.	5.	5.	5.	3.	10.	5.	7.	11.	11.
211	10.	15.	10.	24.	17.	22.	20.	45.	47.	48.
221	82.	81.	86.	102.	113.	115.	142.	167.	167.	225.
231	221.	242.	231.	262.	206.	209.	221.	217.	190.	164.
241	155.	125.	88.	85.	56.	33.	16.	17.	13.	14.
251	2.	5.	3.	3.	2.	1.	1.	3.	0.	0.
261	2.	1.	3.	1.	0.	1.	1.	0.	2.	0.
271	0.	0.	0.	2.	2.	1.	1.	2.	2.	1.
281	2.	0.	1.	2.	2.	3.	2.	6.	2.	2.
291	11.	3.	13.	14.	10.	17.	15.	14.	24.	16.
301	20.	26.	25.	29.	38.	33.	35.	36.	36.	47.
311	32.	23.	25.	23.	20.	21.	13.	12.	6.	9.
321	4.	3.	3.	1.	2.	0.	1.	1.	0.	1.
331	0.	0.	0.	1.	0.	0.	1.	1.	1.	0.
341	2.	1.	1.	0.	3.	7.	7.	4.	6.	4.
351	7.	6.	12.	15.	25.	25.	22.	22.	24.	27.
361	34.	38.	54.	57.	49.	40.	51.	47.	51.	42.
371	40.	43.	35.	27.	26.	19.	12.	14.	10.	4.
381	6.	3.	3.	0.	0.	2.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

7.12.93

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4107-8781 PU/VOGEL
File ID: SD5574.SPC

BEST AVAILABLE COPY

Counted on: 7/12/93 @19: 0
Detector/Geometry number: 5/1
Count time: 3000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	271.9	278.4	368.657	368.657	24.000	17.360	12.000	8.343
2	206.4	207.3	310.116	310.116	24.000	15.565	12.000	7.445
3	1267.8	1274.0	236.013	236.013	24.000	17.085	12.000	8.420

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Cm244	0.1603	5.796	5.781	0.015	0.08	59.43	305.25	0.138E-03
	Cm243		5.786	5.781	0.005				0.188E-03
2	Pu238	0.1145	5.499	5.512	-0.013	0.07	42.44	302.77	0.136E-03
	Am241		5.480	5.512	-0.032				0.104E-03
3	Pu239	0.7253	5.143	5.171	-0.028	0.08	268.93	1381.27	0.622E-03
	Pu240		5.144	5.171	-0.027				0.622E-03

DETECTOR CALIBRATION

Energy(MEV) = 4.085 + (0.0046)*Channel
Energy range (MeV): 4.085 TO 6.440
Efficiency = 0.1947 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	18688.0	100.000
Smoothed	18688.0	100.000
Composite fit	18540.5	99.211
Residuals	147.5	0.789

Analyzed by: _____
VR

SPECTRUM SD5574.SPC
1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

4833.3

~~WHC-SD-WM-UF-J44~~
REV 1

BEST AVAILABLE COPY

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD5574.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.
21	0.	0.	0.	0.	1.	0.	1.	1.	0.	0.
31	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.
41	1.	0.	1.	0.	0.	0.	1.	0.	0.	0.
51	0.	2.	0.	0.	0.	1.	0.	0.	1.	0.
61	0.	0.	0.	0.	2.	1.	0.	0.	1.	0.
71	0.	1.	0.	0.	0.	1.	0.	1.	0.	1.
81	1.	2.	0.	1.	0.	1.	0.	0.	0.	1.
91	1.	0.	0.	1.	1.	0.	3.	1.	0.	1.
101	0.	0.	0.	2.	1.	2.	0.	0.	0.	0.
111	3.	0.	2.	2.	1.	1.	2.	0.	0.	3.
121	0.	0.	0.	2.	1.	1.	2.	0.	3.	3.
131	4.	0.	1.	7.	0.	0.	3.	2.	1.	1.
141	1.	2.	4.	2.	3.	0.	1.	2.	2.	1.
151	2.	0.	2.	3.	4.	3.	2.	2.	4.	3.
161	5.	2.	1.	5.	3.	2.	4.	3.	6.	6.
171	3.	3.	2.	6.	3.	5.	7.	2.	4.	12.
181	4.	5.	6.	5.	4.	2.	16.	5.	5.	8.
191	6.	6.	4.	9.	6.	4.	7.	8.	9.	12.
201	13.	10.	18.	16.	15.	15.	18.	27.	22.	16.
211	27.	38.	38.	67.	67.	79.	109.	130.	146.	167.
221	219.	234.	315.	287.	342.	405.	457.	524.	568.	600.
231	655.	667.	655.	700.	672.	706.	653.	638.	568.	457.
241	424.	341.	279.	262.	170.	143.	111.	55.	43.	40.
251	19.	6.	9.	4.	3.	1.	2.	2.	1.	3.
261	1.	0.	3.	0.	2.	2.	0.	2.	1.	0.
271	1.	1.	0.	0.	0.	1.	2.	2.	3.	6.
281	3.	6.	6.	3.	6.	6.	9.	7.	10.	13.
291	13.	12.	31.	29.	35.	34.	40.	49.	55.	67.
301	66.	75.	93.	105.	99.	106.	116.	101.	119.	113.
311	107.	113.	82.	82.	62.	51.	40.	42.	21.	26.
321	9.	9.	9.	3.	2.	3.	4.	3.	1.	6.
331	1.	3.	3.	2.	2.	6.	3.	3.	0.	9.
341	2.	8.	7.	10.	9.	8.	18.	11.	12.	23.
351	32.	39.	42.	58.	65.	55.	73.	79.	109.	114.
361	113.	116.	146.	148.	137.	145.	147.	152.	144.	129.
371	139.	126.	99.	93.	70.	63.	52.	27.	23.	19.
381	12.	10.	4.	2.	3.	1.	1.	1.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
431	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
481	0.	0.	1.	0.	1.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4107-8881 PU/VOGEL
File ID: SD4655.SPC

BEST AVAILABLE COPY

Counted on: 7/12/93 @19: 0
Detector/Geometry number: 4/ 1
Count time: 3000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	247.9	243.4	362.317	362.317	16.000	6.543	8.000	3.295
2	192.1	188.6	304.236	304.236	16.000	6.722	8.000	3.561
3	1229.8	1206.2	230.395	230.395	20.000	7.046	10.000	4.950

PEAK RESULTS

Peak ID	Isotope	AEA		Peak Centroid			Count		Activity uCi/ea
		Fract.	Exp.	Obs.	Diff.	FWHM	Rate c/m	d/m	
1	Pu236	0.1574	5.756	5.764	-0.008	0.03	36.33	243.11	0.112E-03
2	Pu238	0.1207	5.499	5.497	0.002	0.03	27.86	258.98	0.117E-03
	Am241		5.480	5.497	-0.017				0.894E-04
3	Pu239	0.7220	5.143	5.157	-0.014	0.03	166.66	1115.51	0.502E-03
	Pu240		5.144	5.157	-0.013				0.502E-03

DETECTOR CALIBRATION

Energy(MEV) = 4.097 + (0.0046)*Channel
 Energy range (MeV): 4.097 TO 6.453
 Efficiency = 0.1494 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	11658.0	100.000
Smoothed	11658.0	100.000
Composite fit	11542.0	99.005
Residuals	116.0	0.995

Analyzed by: _____

VR

BEST AVAILABLE COPY

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD4655.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	1.	0.	1.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	1.	1.	0.	0.	1.	0.
51	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	1.	0.	0.	0.	0.	1.	0.	0.
91	0.	0.	0.	0.	0.	0.	2.	0.	0.	0.
101	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
111	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
121	1.	0.	1.	0.	0.	1.	0.	0.	0.	1.
131	0.	0.	0.	0.	0.	0.	2.	0.	0.	0.
141	0.	0.	1.	0.	0.	1.	0.	0.	2.	0.
151	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
161	0.	0.	1.	0.	0.	2.	0.	1.	0.	0.
171	0.	0.	2.	1.	1.	0.	1.	0.	0.	0.
181	0.	0.	0.	0.	0.	1.	0.	0.	0.	4.
191	3.	2.	1.	2.	4.	1.	3.	2.	1.	4.
201	2.	2.	6.	6.	9.	8.	8.	13.	10.	12.
211	25.	29.	36.	50.	77.	80.	107.	135.	149.	184.
221	225.	247.	302.	351.	453.	549.	700.	730.	791.	834.
231	748.	565.	430.	274.	151.	60.	30.	15.	2.	0.
241	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
251	0.	0.	1.	0.	0.	1.	0.	1.	1.	0.
261	1.	0.	1.	0.	0.	1.	2.	0.	1.	0.
271	0.	0.	0.	0.	2.	1.	1.	6.	1.	1.
281	1.	1.	1.	8.	4.	3.	8.	10.	11.	12.
291	31.	18.	43.	60.	71.	54.	54.	55.	64.	60.
301	92.	125.	120.	143.	114.	86.	62.	31.	16.	5.
311	4.	0.	0.	0.	0.	1.	0.	0.	0.	0.
321	0.	0.	1.	0.	0.	0.	1.	0.	1.	1.
331	0.	0.	1.	0.	1.	0.	1.	4.	1.	3.
341	4.	3.	8.	11.	15.	15.	21.	32.	46.	52.
351	58.	60.	62.	60.	60.	75.	69.	93.	128.	144.
361	181.	165.	138.	144.	71.	39.	20.	6.	2.	1.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

GENERAL ALPHA ENERGY ANALYSIS
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R4107-8881 PU/VOGEL
File ID: SD4654.SPC

BEST AVAILABLE COPY

Counted on: 7/12/93 @18: 0
Detector/Geometry number: 4/1
Count time: 1000. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	80.1	78.5	362.384	362.384	16.000	6.532	8.000	3.230
2	56.7	56.3	304.173	304.173	16.000	6.880	8.000	3.425
3	421.9	402.4	230.451	230.451	20.000	8.391	10.000	12.862

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid			FWHM	Count		Activity uCi/ea
			Exp.	Obs.	Diff.		Rate	c/m	
1	Pu236	0.1548	5.756	5.764	-0.008	0.03	35.36	241.50	0.109E-03
2	Pu238	0.1124	5.499	5.497	0.002	0.03	25.69	238.81	0.108E-03
	Am241		5.480	5.497	-0.017				0.824E-04
3	Pu239	0.7328	5.143	5.158	-0.015	0.04	167.42	1120.58	0.505E-03
	Pu240		5.144	5.158	-0.014				0.505E-03

DETECTOR CALIBRATION

Energy(MEV) = 4.097 + (0.0046)*Channel
 Energy range (MeV): 4.097 TO 6.453
 Efficiency = 0.1494 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	3938.0	100.000
Smoothed	3938.0	100.000
Composite fit	3607.7	96.691
Residuals	130.3	3.308

Analyzed by: _____

VR

1 LEGEND: RAW = MODELED PEAKS = 1,2,..., ETC

1466.5

WHC-SD-WM-DP-044
REV 1

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BEST AVAILABLE COPY

Raw Data Dump for AEA Spectrum: SP:SD4654.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
91	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
121	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
131	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
141	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
151	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
161	0.	1.	0.	0.	0.	1.	0.	0.	1.	0.
171	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
181	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.
191	0.	0.	0.	3.	1.	0.	1.	0.	1.	0.
201	0.	2.	1.	3.	1.	3.	5.	4.	5.	4.
211	1.	10.	11.	19.	30.	33.	37.	54.	53.	63.
221	79.	98.	94.	123.	145.	190.	234.	251.	280.	272.
231	265.	206.	146.	92.	51.	37.	10.	0.	2.	0.
241	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
251	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
261	0.	0.	1.	2.	0.	0.	0.	0.	0.	0.
271	0.	1.	0.	0.	0.	0.	0.	0.	0.	1.
281	0.	0.	0.	1.	1.	1.	5.	2.	6.	8.
291	5.	10.	19.	19.	25.	11.	9.	19.	20.	22.
301	23.	40.	43.	34.	29.	32.	16.	11.	5.	2.
311	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
341	0.	2.	4.	2.	6.	3.	6.	10.	12.	21.
351	25.	24.	11.	21.	21.	21.	25.	29.	33.	52.
361	58.	53.	52.	36.	26.	17.	3.	5.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

BEST AVAILABLE COPY

APC GEOMETRY STD 5B16 (83-17)

COUNTED ON APC # 1

STD VALUE: 98530 D/M

TIME ZERO: 01/29/90

BKG: 10

TODAY'S DATE: 08/18/92

DECAY CORR'N: 2.552 YEARS

NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
243204	5	48631	307	48938	0.4987
243913	5	48773	309	49082	0.5002
244771	5	48944	311	49256	0.5020
243758	5	48742	309	49050	0.4999
243766	5	48743	309	49052	0.4999
243637	5	48717	309	49026	0.4996
243514	5	48693	308	49001	0.4994
243765	5	48743	309	49052	0.4999
243849	5	48760	309	49069	0.5001
244044	5	48799	310	49108	0.5005

FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5020				
MIN	0.4987	48754	309	49063	0.5000

BEST AVAILABLE COPY

APC GEOMETRY STD 5B16 (83-17)

COUNTED ON APC # 2

STD VALUE: 98530 D/M

TIME ZERO: 01/29/90

BKG: 10

TODAY'S DATE: 08/20/92

DECAY CORR'N: 2.557 YEARS

NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242703	5	48531	306	48837	0.4977
243638	5	48718	309	49026	0.4996
243386	5	48667	308	48975	0.4991
243764	5	48743	309	49052	0.4999
244275	5	48845	310	49155	0.5009
244108	5	48812	310	49121	0.5006
244275	5	48845	310	49155	0.5009
243645	5	48719	309	49028	0.4996
243015	5	48593	307	48900	0.4983
244057	5	48801	310	49111	0.5005
243516	5	48693	308	49001	0.4994
243510	5	48692	308	49000	0.4994
243627	5	48715	309	49024	0.4996
243690	5	48728	309	49037	0.4997
243901	5	48770	309	49079	0.5002
244466	5	48883	311	49194	0.5013

FOR	16 TRIALS	AVG	AVG	AVG	AVG
MAX	0.5013				
MIN	0.4977	48735	309	49043	0.4998

BEST AVAILABLE COPY

APC GEOMETRY STD 5B16 (83-17)
COUNTED ON APC # 3
STD VALUE: 98530 D/M
TIME ZERO: 01/29/90
BKG: 9
TODAY'S DATE: 08/19/92
DECAY CORR'N: 2.554 YEARS
NEW STD VALUE: 98127

COUNTS	CNT TIME	C/M	COINC CORR	CORR C/M	GEOM
242920	5	48575	307	48882	0.4981
242932	5	48577	307	48884	0.4982
242052	5	48401	305	48706	0.4964
243038	5	48599	307	48906	0.4984
242907	5	48572	307	48879	0.4981
242795	5	48550	306	48856	0.4979
243214	5	48634	307	48941	0.4988
243707	5	48732	309	49041	0.4998
242647	5	48520	306	48826	0.4976
241653	5	48322	304	48625	0.4955
FOR	10 TRIALS	AVG	AVG	AVG	AVG
MAX	0.4998				
MIN	0.4955	48548	306	48855	0.4979

DET #	1	2	3	4	5	6	7	8	JUPITER II				
JUP AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT <i>SmB / G</i>	Np	82	151		147	156		152	153	X			
	Pu	111	231		227	235		232	232				
DATE <i>7-9-93</i>	Am	137	303		249	309		302	304				
	Cm	161	371		367	377		370	370				
JUP AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT <i>SmB / G</i>	Np	82	151		145	156		152	154				
	Pu	110	230		225	236		231	232				
DATE <i>7-10-93</i>	Am	136	303		297	310		303	303				
	Cm	160	371		365	378		370	370				
JUP AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT <i>SmB / G</i>	Np	81	151		148	155		148	155				
	Pu	109	231		228	235		227	232				
DATE <i>7-11-93</i>	Am	135	303		200	309		249	303				
	Cm	159	371		368	376		367	370				
JUP AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT <i>SmB / G</i>	Np	80	151		147	151		153	155				
	Pu	109	230		227	231		232	232				
DATE <i>7-12-93</i>	Am	135	302		299	304		303	304				
	Cm	159	370		366	372		371	371				
JUP AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT <i>SmB / G</i>	Np	81	151		148	156		151	154				
	Pu	110	231		228	235		230	232				
DATE <i>7-13-93</i>	Am	136	304		300	309		302	303				
	Cm	160	372		368	377		370	369				
JUP AREA #	PK	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	1.1	1.2	1.3	1.4
SCT/SHIFT <i>SmB / G</i>	Np	83	150		147	153		152	153				
	Pu	111	230		227	233		231	231				
DATE <i>7-14-93</i>	Am	137	303		244	307		303	302				
	Cm	162	371		368	375		370	369				

TE: Np (²³⁷Np) peak must be at ch 150 +/- 10 (3.2 - 4.4) or ch 80 +/- 10 (3.1, 1.1 - 1.4)
 Pu (²³⁹Pu) peak must be at ch 229 +/- 10 (3.2 - 4.4) or ch 113 +/- 10 (3.1, 1.1 - 1.4)
 Am (²⁴¹Am) peak must be at ch 300 +/- 10 (3.2 - 4.4) or ch 139 +/- 10 (3.1, 1.1 - 1.4)
 Cm (²⁴⁴Cm) peak must be at ch 368 +/- 10 (3.2 - 4.4) or ch 160 +/- 10 (3.1, 1.1 - 1.4)

DISTRIBUTION SHEET

To DISTRIBUTION	From PROCESSING AND ANALYTICAL LABORATORIES	Page 1 of 1
		Date August 24, 1993
Project Title/Work Order		EDT No.
222-S ANALYTICAL LABORATORIES PROJECT 105 KE AREA - DATA PACKAGE (WHC-SD-WM-DP-044, REV 1)		ECN NO. 600901

Name	MSIN	Text With all Attach	Addendum NA	EDT/ECN Only
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ONSITE

C. L. Bennett	X0-44			2
D. A. Dodd	T6-50			X
R. E. Vogel	T6-20			X
J. L. Wilkerson	T6-06			X
Central Files	L8-04	2		
EDMC	H6-08	X		