

START

0032020

OCT 19 1993

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 140706

55 STA. 6

2. To: (Receiving Organization) Distribution		3. From: (Originating Organization) Program Support		4. Related EDT No.: NA	
5. Proj./Prog./Dept./Div.: 105 KE Basin/Waste Management/Program Support/Processing and Analytical Labs		6. Cog. Engr.: A. D. Rice		7. Purchase Order No.: NA	
8. Originator Remarks:				9. Equip./Component No.: NA	
				10. System/Bldg./Facility: NA	
11. Receiver Remarks:				12. Major Assm. Dwg. No.: NA	
				13. Permit/Permit Application No.: NA	
				14. Required Response Date: 10/04/93	

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-WM-DP-050	NA	0	105 KE BASIN	3Q	2	1	1

18. KEY					
Impact Level (F)		Reason for Transmittal (G)		Disposition (H) & (I)	
1, 2, 3, or 4 (see MRP 5.43)		1. Approval	4. Review	1. Approved	4. Reviewed no/comment
		2. Release	5. Post-Review	2. Approved w/comment	5. Reviewed w/comment
		3. Information	6. Diet. (Receipt Acknow. Required)	3. Disapproved w/comment	6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)											
(G)	(H)	(J) Name (K) Signature (L) Date (M) MSIN				(J) Name (K) Signature (L) Date (M) MSIN				(G)	(H)
Reason	Disp.									Reason	Disp.
2	1	Cog. Eng. A. D. Rice									
2	1	Cog. Mgr. J. G. Kristofzski									
2	1	QA J. C. Langford									
		Safety									
		Env.									

18. Signature of EDT Originator Date 10-4-93		19. Authorized Representative for Receiving Organization Date		20. J. G. Kristofzski Cognizant/Project Engineer's Manager Date 10-4-93		21. DOE APPROVAL (if required) Ltr. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
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BD-7400-172-1 (07/91)

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OCT 19 1993

10/14/93 KMB

INFORMATION RELEASE REQUEST

Reference:
WHC-CM-3-4

Complete for all Types of Release

Purpose		ID Number (include revision, volume, etc.) WHC-SD-WM-DP-050, REV 0
☐ Speech or Presentation ☐ Full Paper (Check only one suffix) ☐ Summary ☐ Abstract ☐ Visual Aid ☐ Speakers Bureau ☐ Poster Session ☐ Videotape	☐ Reference ☒ Technical Report ☐ Thesis or Dissertation ☐ Manual ☐ Brochure/Flier ☐ Software/Database ☐ Controlled Document ☐ Other	List attachments. Date Release Required 10/04/93

Title 222-S ANALYTICAL LABS 105 KE BASIN - DATA PACKAGE	Unclassified Category UC-	Impact Level 3Q
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New 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 NA		Group or Society Sponsoring NA	
Date(s) of Conference or Meeting NA	City/State NA	Will proceedings be published? ☐ Yes ☒ No Will material be handed out? ☐ Yes ☒ No	

Title of Journal NA

CHECKLIST FOR SIGNATORIES

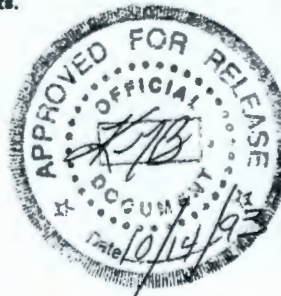
Review Required per WHC-CM-3-4	Yes	No	Reviewer - Signature Indicates Approval	
			Name (printed)	Signature Date
Classification/Unclassified Controlled Nuclear Information	☐	☒		
Patent - General Counsel	☒	☐	Per OGC memo 2-4-93	J. W. H. 10-14-93
Legal - General Counsel	☒	☐	Per OGC memo 2-4-93	J. W. H. 10-14-93
Applied Technology/Export Controlled Information or International Program	☐	☒		
WHC Program/Project	☐	☒		
Communications	☐	☒		
RL Program/Project	☒	☐	P. Clark does not want to see per telecon 10/28/93	
Publication Services	☒	☐	C.A. COLLINS C.A. Collins 10/14/93	J. W. H. 10-14-93
Other Program/Project	☐	☒		

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

References Available to Intended Audience ☒ Yes ☐ No	Transmit to DOE-HQ/Office of Scientific and Technical Information ☐ Yes ☒ No	Author/Requestor (Printed/Signature) K. K. Gramberardini 10-4-93	Date 10-4-93
Intended Audience ☐ Internal ☐ Sponsor ☒ External		Responsible Manager (Printed/Signature) K. K. Gramberardini 10-4-93	
Date Cancelled		Date Disapproved	

INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP

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



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SUPPORTING DOCUMENT

1. Total Pages **114**

2. Title

222-S ANALYTICAL LABS 105 KE BASIN DATA PACKAGE

3. Number

WHC-SD-WM-DP-050

4. Rev No.

0

5. Key Words

222-S LABS, 105 KE BASIN, DATA PACKAGE

6. Author

Name: **A. D. Rice**

A. D. Rice
Signature

Organization/Charge Code **12610/J120H**

**APPROVED FOR
PUBLIC RELEASE**

LMB 10/14/93

7. Abstract

Shaw 10/18/93

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10. **RELEASE STAMP**

**OFFICIAL RELEASE
BY WHC**

DATE **55 OCT 19 1993**
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9. Impact Level **3Q**

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**Westinghouse
Hanford Company**

WHC-SD-WM-DP-050
REV 0

P.O. Box 1970 Richland, WA 99352

105 KE BASIN

Date Printed: September 23, 1993

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TABLE OF CONTENTS

Narrative	1
Sampling and Custody Data	3
Sample Data Summary	5
Calibrations	14
ACID DIGESTION ANALYSES	26
Acid Digestion	27
Inductively Coupled Plasma Spectrographic	31
Uranium	42
Uranium	49
Plutonium	55
Americium	77
Gamma Energy Analysis	99

This report consists of pages 1 through 111.

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NARRATIVE

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105KE (0066WQL) NARRATIVE

Sample 0066WQL, a solid from the 105KE basin (laboratory ID E8607), was submitted for analysis on 8/25/93. The entire sample was to be acid digested and analyzed for gamma emitters, Pu-238/39/40, Am-241, Uranium, and metals by ICP. The Pu-238/39/40, Am-241, and Uranium determinations were to be performed in triplicate, the ICP was to be performed in duplicate, and the GEA was to be performed once. The RSA requested that any undissolved material be dried and weighed.

The sample results are summarized on pages 7-9 of the package. All required analyses were performed. All standards analyzed with the sample demonstrated acceptable recoveries. The spike recovery for the Uranium analysis was high for both the initial determination and the rerun. RPD values were not calculated. The residue remaining following the digestion was not weighed, but was set aside for possible fusion and reanalysis, as requested by the SAIC representative.



Andrew Rice
Project Coordinator
222-S Laboratory

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SAMPLING AND CUSTODY DATA

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SAMPLE DATA SUMMARY

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2021/08/18 14:30:00

105 KE Basin
CUSTOMER ID: 0044 WQL
TANK: 4/a

E8607

[illegible]

SAMPLE PREP.: Acid Digestion

SAMPLE RESULTS

E8607

105 KE Basin

CUSTOMER ID: 006600L

	Standard	Sample	Duplicate Sample	Triplicate Sample	Spike					
Lab. I.D.	R4295	E8607	N/A	N/A	N/A					
Acid Digestion 08-30-93	Dilution Factor 10	34.1372	3/1	N/A	N/A					
Lab I.D.	R4295	E8607-8740	E8607-8740	E8607-8740	N/A					
u 09-09-93	100.4	%	$6.42E^{-2}$	3/3	$6.78E^{-2}$	3/3	$7.56E^{-2}$	3/3	232.9	%
Lab I.D.	R4295	E8607-8750	E8607-8750	N/A	N/A					
ICP 09-01-93				N/A	N/A					
Zr	101.76	%	$1.35E^{+2}$	43/9	$1.37E^{+2}$	43/9	N/A		N/A	
Sr	101.86	%	$3.64E^{+1}$	43/9	$3.70E^{+1}$	43/9	N/A		N/A	
Si	96.42	%	$6.57E^{+2}$	43/9	$6.66E^{+2}$	43/9	N/A		N/A	
Qr	99.16	%	$2.29E^{+4}$	43/9	$2.33E^{+4}$	43/9	N/A		N/A	
Co	100.88	%	$8.83E^0$	43/9	$9.22E^0$	43/9	N/A		N/A	
Cu	99.28	%	$6.07E^{+2}$	43/9	$6.20E^{+2}$	43/9	N/A		N/A	
Li	101.54	%	$3.06E^0$	43/9	$3.45E^0$	43/9	N/A		N/A	
Zn	100.8	%	$7.75E^{+2}$	43/9	$7.91E^{+2}$	43/9	N/A		N/A	
Ni	102.66	%	$4.51E^{+1}$	43/9	$4.54E^{+1}$	43/9	N/A		N/A	
Fe	102.56	%	$5.05E^{+4}$	43/9	$5.15E^{+4}$	43/9	N/A		N/A	
Ce	103.70	%	$2.77E^{+3}$	43/9	$2.83E^{+3}$	43/9	N/A		N/A	
Cr	103.38	%	$1.95E^{+2}$	43/9	$1.99E^{+2}$	43/9	N/A		N/A	
Nd	104.98	%	$6.96E^{+1}$	43/9	$7.06E^{+1}$	43/9	N/A		N/A	
Sm	100.88	%	$4.26E^{+2}$	43/9	$4.40E^{+2}$	43/9	N/A		N/A	
Ba	103.54	%	$1.25E^{+2}$	43/9	$1.28E^{+2}$	43/9	N/A		N/A	

MHC-SQ-MN-DP-060
REV 0

SAMPLE PREP.: Geid Digestion105 KE Basin
CUSTOMER ID: 0066WQLSAMPLE RESULTS
E8407

	Standard		Sample		Duplicate Sample		Triplicate Sample		Spike				
Lab IJ	R4295		E8407-8750		E8407-8750		N/A		N/A				
ICP P	100.16	%	6.04 E ⁺²	43/9	5.13 E ⁺²	43/9	N/A		N/A				
S	96.48	%	3.56 E ⁺²	43/9	3.47 E ⁺²	43/9	N/A		N/A				
Hg	100.22	%	4.09 E ⁺²	43/9	4.17 E ⁺²	43/9	N/A		N/A				
As	99.50	%	1.05 E ⁺¹	43/9	1.05 E ⁺¹	43/9	N/A		N/A				
Ne	102.06	%	1.23 E ⁺²	43/9	1.23 E ⁺²	43/9	N/A		N/A				
Mo	101.76	%	5.44 E ⁰	43/9	5.70 E ⁰	43/9	N/A		N/A				
Ag	99.70	%	4.96 E ⁰	43/9	6.38 E ⁰	43/9	N/A		N/A				
Pb	104.14	%	3.27 E ⁺²	43/9	3.42 E ⁺²	43/9	N/A		N/A				
Ti	99.10	%	5.77 E ⁺¹	43/9	5.90 E ⁺¹	43/9	N/A		N/A				
Cl	103.04	%	1.59 E ⁺²	43/9	1.63 E ⁺²	43/9	N/A		N/A				
K	116.96	%	2.41 E ⁺²	43/9	2.15 E ⁺²	43/9	N/A		N/A				
Mn	101.54	%	7.53 E ⁺²	43/9	7.69 E ⁺²	43/9	N/A		N/A				
Sb	96.50	%	1.66 E ⁺²	43/9	1.87 E ⁺²	43/9	N/A		N/A				
V	99.66	%	1.77 E ⁺²	43/9	1.81 E ⁺²	43/9	N/A		N/A				
Bz	105.50	%	2.37 E ⁺¹	43/9	2.40 E ⁺¹	43/9	N/A		N/A				
Tl	95.44	%	2.26 E ⁺²	43/9	2.11 E ⁺²	43/9	N/A		N/A				
Lab I.D.	R4295		E8407-8750		N/A		N/A		N/A				
GEA 09-02-93					N/A		N/A		N/A				
Co 60	100.3	%	1.61 E ⁰	43/9	N/A		N/A		N/A				
Cs 137	99.3	%	2.87 E ⁺¹	43/9	N/A		N/A		N/A				

MHC-SD-WM-DP-050
REV 0

E8407

CUSTOMER ID: 0066WQL

HHQ-SO-WM-DP-050
REV 0

SAMPLE STATUS REPORT FOR R 4295. 105 KE BASIN STD TIME: 9/10/93 10:32
 DISPATCHED: 8/26/93 14:48 SAMPLE HAS NOT BEEN SLURPED
 RECEIVED: 9/ 1/93 10:54

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
8500	ACD DGST	D.F. 10			E11456
8530	GEA	9.93000E 01 % RECOVERY Cs-137	N	Y	E11456
8530	GEA	1.00300E 02 % RECOVERY Co-60	N	Y	E11456
8540	U	OUT FOR RERUN			E11456
8540	U	1.00400E 02 % RECOVERY	N	Y	E11456
8550	ICP	UNDIGESTED LMCS STD			E11456
8550	ICP	1.01760E 02 % RECOVERY Zr	N	Y	E11456
8550	ICP	1.01860E 02 % RECOVERY Sr	N	Y	E11456
8550	ICP	9.64200E 01 % RECOVERY Si	N	Y	E11456
8550	ICP	9.91600E 01 % RECOVERY Al	N	Y	E11456
8550	ICP	1.00880E 02 % RECOVERY Co	N	Y	E11456
8550	ICP	9.92800E 01 % RECOVERY Cu	N	Y	E11456
8550	ICP	1.01540E 02 % RECOVERY Li	N	Y	E11456
8550	ICP	1.00800E 02 % RECOVERY Zn	N	Y	E11456
8550	ICP	1.02660E 02 % RECOVERY Ni	N	Y	E11456
8550	ICP	1.02560E 02 % RECOVERY Fe	N	Y	E11456
8550	ICP	1.03700E 02 % RECOVERY Ca	N	Y	E11456
8550	ICP	1.03380E 02 % RECOVERY Cr	N	Y	E11456
8550	ICP	1.04980E 02 % RECOVERY Nd	N	Y	E11456
8550	ICP	1.00880E 02 % RECOVERY Sm	N	Y	E11456
8550	ICP	1.03540E 02 % RECOVERY Ba	N	Y	E11456
8550	ICP	1.00160E 02 % RECOVERY P	N	Y	E11456
8550	ICP	9.64800E 01 % RECOVERY S	N	Y	E11456
8550	ICP	1.00220E 02 % RECOVERY Mg	N	Y	E11456
8550	ICP	9.95000E 01 % RECOVERY As	N	Y	E11456
8550	ICP	1.02060E 02 % RECOVERY Na	N	Y	E11456
8550	ICP	1.01760E 02 % RECOVERY Mo	N	Y	E11456
8550	ICP	9.97000E 01 % RECOVERY Ag	N	Y	E11456
8550	ICP	1.04140E 02 % RECOVERY Pb	N	Y	E11456
8550	ICP	9.91000E 01 % RECOVERY Ti	N	Y	E11456
8550	ICP	1.03040E 02 % RECOVERY Cd	N	Y	E11456
8550	ICP	1.16960E 02 % RECOVERY K	N	Y	E11456
8550	ICP	1.01540E 02 % RECOVERY Mn	N	Y	E11456
8550	ICP	9.65000E 01 % RECOVERY Sb	N	Y	E11456
8550	ICP	9.96600E 01 % RECOVERY V	N	Y	E11456
8550	ICP	1.05500E 02 % RECOVERY Be	N	Y	E11456
8550	ICP	9.54400E 01 % RECOVERY Tl	N	Y	E11456
8581	Pu239/40	9.96000E 01 % RECOVERY	N	Y	E11456
8582	Am241	9.59000E 01 % RECOVERY	N	Y	E11456

END OF REPORT

SAMPLE STATUS REPORT FOR E 8607. H&RWC 0066WQL TIME: 9/14/93 10:24
DISPATCHED: 4/12/93 13: 2 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 4/14/93 11:51

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
1001	APPR/OTR	TOTAL WT 9.8164 GRAMS			PC41G
1283	AT-SOLDS	8.25E+1 UCI/G			PC41G
2172	GEA-SOIL	4.04000E 07 pCi/gWETwt Am-241	N	Y	PC41G
2172	GEA-SOIL	9.59000E 07 pCi/gWETwt Cs-137	N	Y	PC41G
2172	GEA-SOIL	5.75000E 06 pCi/gWETwt Co-60	N	Y	PC41G
2172	GEA-SOIL	7.95000E 06 pCi/gWETwt Eu-154	N	Y	PC41G
2172	GEA-SOIL	4.62000E 06 pCi/gWETwt Eu-155	N	Y	PC41G
2172	GEA-SOIL	9.88000E 05 pCi/gWETwt Sb-125	N	Y	PC41G
2172	GEA-SOIL	6.04000E 04 pCi/gWETwt Mn-54	N	Y	PC41G
3336	Pu239/40	PU238 8.31 & PU239 4.61E+1 UCI/G			VOGEL
3336	Pu239/40	PU238 UNABLE TO DETERMINE & PU239 2.73E+1 UCI/G			VOGEL
3801	Sr89/90	OUT FOR RERUN			VOGEL
3801	Sr89/90	7.08E+1 UCI/G			VOGEL
4461	U-SOIL	1.34000E-02 G/G	N	Y	PC41G
4822	Am241	3.65E+1 UCI/G			VOGEL
8700	ACD DGST	3.41372E 01 G/L	N	Y	E11456
8730	GEA	1.61000E 00 uCi/G Rec Co-60	N	Y	E11456
8730	GEA	2.87000E 01 uCi/G Rec Cs-137	N	Y	E11456
8730	GEA	2.40000E 00 uCi/G Rec Eu-154	N	Y	E11456
8730	GEA	1.23000E 01 uCi/G Rec Eu-155	N	Y	E11456
8740	U	OUT FOR RERUN			E11456
8740	U	OUT FOR RERUN			E11456
8740	U	OUT FOR RERUN			E11456
8740	U	6.41999E-02 G/G Rec	N	Y	E11456
8740	U	6.77999E-02 G/G Rec	N	Y	E11456
8740	U	7.56000E-02 G/G Rec	N	Y	E11456
8750	ICP-LIQ	SOLID SAMPLE GENERATED EXTENTION FOR UG/G REC			E11456
8750	ICP-LIQ	SOLID SAMPLE GENERATED EXTEN. FOR UG/G REC RESULT			E11456
8755	ICP-SOL	1.35000E 02 uG/G Rec Zr	N	Y	E11456
8755	ICP-SOL	3.64000E 01 uG/G Rec Sr	N	Y	E11456
8755	ICP-SOL	6.51000E 02 uG/G Rec Si	N	Y	E11456
8755	ICP-SOL	2.29000E 04 uG/G Rec Al	N	Y	E11456
8755	ICP-SOL	8.83000E 00 uG/G Rec Co	N	Y	E11456
8755	ICP-SOL	6.07000E 02 uG/G Rec Cu	N	Y	E11456
8755	ICP-SOL	3.06000E 00 uG/G Rec Li	N	Y	E11456
8755	ICP-SOL	7.75000E 02 uG/G Rec Zn	N	Y	E11456
8755	ICP-SOL	4.51000E 01 uG/G Rec Ni	N	Y	E11456
8755	ICP-SOL	5.05000E 04 uG/G Rec Fe	N	Y	E11456
8755	ICP-SOL	2.77000E 03 uG/G Rec Ca	N	Y	E11456
8755	ICP-SOL	1.95000E 02 uG/G Rec Cr	N	Y	E11456
8755	ICP-SOL	6.96000E 01 uG/G Rec Nd	N	Y	E11456
8755	ICP-SOL	4.26000E 02 uG/G Rec Sm	N	Y	E11456
8755	ICP-SOL	1.25000E 02 uG/G Rec Ba	N	Y	E11456
8755	ICP-SOL	6.04000E 02 uG/G Rec P	N	Y	E11456
8755	ICP-SOL	3.50000E 02 uG/G Rec S	N	Y	E11456
8755	ICP-SOL	4.09000E 02 uG/G Rec Mg	N	Y	E11456
8755	ICP-SOL	1.05000E 01 uG/G Rec As	N	Y	E11456
8755	ICP-SOL	1.23000E 02 uG/G Rec Na	N	Y	E11456
8755	ICP-SOL	5.44000E 00 uG/G Rec Mo	N	Y	E11456
8755	ICP-SOL	4.96000E 00 uG/G Rec Ag	N	Y	E11456
8755	ICP-SOL	3.27000E 02 uG/G Rec Pb	N	Y	E11456

8755 ICP-SOL 5.77000E 01 uG/G Rec Ti

N Y E11456

REPORT CONTINUED ON NEXT PAGE

WHC-SD-WM-DP-050
REV 0

9313090.1639

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WMC-SD-WM-DP-050
REV 0

SAMPLE STATUS REPORT FOR E 8607. H&RWC 0066WQL TIME: 9/14/93 10:24
DISPATCHED: 4/12/93 13: 2 SAMPLE HAS NOT BEEN SLURPED

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
8755	ICP-SOL	1.59000E 02 uG/G Rec Cd	N	Y	E11456
8755	ICP-SOL	2.41000E 02 uG/G Rec K	N	Y	E11456
8755	ICP-SOL	7.53000E 02 uG/G Rec Mn	N	Y	E11456
8755	ICP-SOL	1.66000E 02 uG/G Rec Sb	N	Y	E11456
8755	ICP-SOL	1.77000E 02 uG/G Rec V	N	Y	E11456
8755	ICP-SOL	2.37000E 01 uG/G Rec Be	N	Y	E11456
8755	ICP-SOL	2.26000E 02 uG/G Rec Tl	N	Y	E11456
8755	ICP-SOL	1.37000E 02 uG/G Rec Zr	N	Y	E11456
8755	ICP-SOL	3.70000E 01 uG/G Rec Sr	N	Y	E11456
8755	ICP-SOL	6.66000E 02 uG/G Rec Si	N	Y	E11456
8755	ICP-SOL	2.33000E 04 uG/G Rec Al	N	Y	E11456
8755	ICP-SOL	9.22000E 00 uG/G Rec Co	N	Y	E11456
8755	ICP-SOL	6.20000E 02 uG/G Rec Cu	N	Y	E11456
8755	ICP-SOL	3.45000E 00 uG/G Rec Li	N	Y	E11456
8755	ICP-SOL	7.91000E 02 uG/G Rec Zn	N	Y	E11456
8755	ICP-SOL	4.54000E 01 uG/G Rec Ni	N	Y	E11456
8755	ICP-SOL	5.15000E 04 uG/G Rec Fe	N	Y	E11456
8755	ICP-SOL	2.83000E 03 uG/G Rec Ca	N	Y	E11456
8755	ICP-SOL	1.99000E 02 uG/G Rec Cr	N	Y	E11456
8755	ICP-SOL	7.06000E 01 uG/G Rec Nd	N	Y	E11456
8755	ICP-SOL	4.40000E 02 uG/G Rec Sm	N	Y	E11456
8755	ICP-SOL	1.28000E 02 uG/G Rec Ba	N	Y	E11456
8755	ICP-SOL	5.13000E 02 uG/G Rec P	N	Y	E11456
8755	ICP-SOL	3.47000E 02 uG/G Rec S	N	Y	E11456
8755	ICP-SOL	4.17000E 02 uG/G Rec Mg	N	Y	E11456
8755	ICP-SOL	1.05000E 01 uG/G Rec As	N	Y	E11456
8755	ICP-SOL	1.23000E 02 uG/G Rec Na	N	Y	E11456
8755	ICP-SOL	5.70000E 00 uG/G Rec Mo	N	Y	E11456
8755	ICP-SOL	6.38000E 00 uG/G Rec Ag	N	Y	E11456
8755	ICP-SOL	3.42000E 02 uG/G Rec Pb	N	Y	E11456
8755	ICP-SOL	5.90000E 01 uG/G Rec Ti	N	Y	E11456
8755	ICP-SOL	1.63000E 02 uG/G Rec Cd	N	Y	E11456
8755	ICP-SOL	2.15000E 02 uG/G Rec K	N	Y	E11456
8755	ICP-SOL	7.69000E 02 uG/G Rec Mn	N	Y	E11456
8755	ICP-SOL	1.87000E 02 uG/G Rec Sb	N	Y	E11456
8755	ICP-SOL	1.81000E 02 uG/G Rec V	N	Y	E11456
8755	ICP-SOL	2.40000E 01 uG/G Rec Be	N	Y	E11456
8755	ICP-SOL	2.11000E 02 uG/G Rec Tl	N	Y	E11456
8781	Pu239/40	4.30000E 01 uCi/G Rec	N	Y	E11456
8781	Pu239/40	4.76000E 01 uCi/G Rec	N	Y	E11456
8781	Pu239/40	4.20000E 01 uCi/G Rec	N	Y	E11456
8782	Am241	3.24000E 01 uCi/G Rec	N	Y	E11456
8782	Am241	3.11000E 01 uCi/G Rec	N	Y	E11456
8782	Am241	3.43000E 01 uCi/G Rec	N	Y	E11456
8940	U	OUT FOR RERUN			E11456
8940	U	1.04200E 02 % RECOVERY	N	Y	E11456
8940	U	2.32900E 02 % RECOVERY	N	Y	E11456

END OF REPORT

CALIBRATIONS

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APC GEOMETRY STD 5816 (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

APC GEOMETRY STD 5816 (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: 2.551 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 <i>EMP B / A-C</i>	Np	82	152	149	149	151	145	152	149	149	150	151	149
	Pu	110	230	229	229	229	220	229	228	229	230	231	229
DATE 8-29-93	Am	136	302	300	301	293	301	300	301	303	303	300	
	Cm	160	369	369	368	363	369	368	371	372	372	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 <i>EMP B / A-C</i>	Np	81	151	148	148	152	142	147	148	150	149	150	152
	Pu	109	230	229	229	230	218	226	227	230	230	230	229
DATE 8-30-93	Am	135	302	300	302	300	299	299	303	302	302	301	
	Cm	159	369	368	368	371	362	367	367	372	372	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 <i>EMP B A-C</i>	Np	81	152	148	149	152		147	148	148	149	151	148
	Pu	109	231	228	229	230		227	224	228	229	231	228
DATE 8-31-93	Am	135	303	301	301	302		299	298	301	302	302	299
	Cm	159	370	368	368	369		367	366	370	371	371	368
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 <i>EMP B A-C</i>	Np	76	151	144	149	153	149	148	148	149	149	150	149
	Pu	104	229	223	229	231	225	226	227	239	229	230	228
DATE 9-1-93	Am	139	301	294	301	302	296	299	299	302	302	302	299
	Cm	153	369	362	369	370	367	366	366	371	371	371	368
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 <i>EMP B A-C</i>	Np	76	152	148	148	153	150	149	148	149	149	150	148
	Pu	104	229	227	229	231	227	227	227	229	229	230	227
DATE 9-2-93	Am	130	301	299	300	304	298	300	299	301	301	302	299
	Cm	153	369	367	368	371	372	368	367	371	371	371	367
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 <i>EMP B A-C</i>	Np	78	151	149	148	153	151	148	149	149	149	150	148
	Pu	105	230	228	229	231	227	226	227	229	229	230	227
DATE 9-3-93	Am	131	302	301	300	304	300	299	299	301	301	302	299
	Cm	155	368	369	368	371	371	366	367	371	371	371	367

RE: 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)

9313090-1645

APC GEOMETRY STD 5816 (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

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

APC GEOMETRY STD 5816 (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 <i>EMP B/A-C</i>	Np	82	152	149	149	151	145	152	149	149	150	151	149
	Pu	110	230	229	229	229	220	229	228	229	230	231	229
DATE 8-29-93	Am	136	302	300	301	293	301	300	301	303	303	300	
	Cm	160	369	369	368	363	369	368	371	372	372	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 <i>EMP A/C</i>	Np	81	151	148	149	152	142	147	148	150	149	150	152
	Pu	109	230	229	230	218	226	227	230	230	230	229	
DATE 8-30-93	Am	135	302	300	302	300	299	299	303	302	302	301	
	Cm	159	369	368	371	362	367	367	372	372	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 <i>EMP A-C</i>	Np	81	152	148	149	152		147	148	148	149	151	148
	Pu	109	231	228	229	230		227	226	228	229	231	228
DATE 8-31-93	Am	135	303	301	301	302		299	298	301	302	302	299
	Cm	159	370	368	368	369		367	366	370	371	371	368
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 <i>EMP A-C</i>	Np	76	151	144	149	152	149	148	148	149	149	150	149
	Pu	104	229	223	229	231	225	226	227	237	229	230	228
DATE 9-1-93	Am	129	301	294	301	302	296	299	299	302	302	302	299
	Cm	153	369	362	369	370	367	366	366	371	371	371	368
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 <i>EMP A/C</i>	Np	76	152	148	148	153	150	149	148	149	149	150	148
	Pu	104	229	227	229	231	227	227	227	229	229	230	227
DATE 9-2-93	Am	130	301	299	300	304	298	300	299	301	301	302	299
	Cm	153	369	367	368	371	372	368	367	371	371	371	367
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 <i>EMP A-C</i>	Np	78	151	149	148	153	151	148	149	149	149	150	148
	Pu	105	230	228	229	231	227	226	227	229	229	230	227
DATE 9-3-93	Am	131	302	301	300	304	300	299	299	301	301	302	299
	Cm	155	368	369	368	371	371	366	367	371	371	371	367

FE: 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)

SAMPLE		DENSITY
E8607.-8730		34.1372 G/L
RADIONUCLIDE	uCi/L	uCi/G
Co-60	5.50E+01	1.61E+00
Cs-137	9.80E+02	2.87E+01
Eu-154	8.20E+01	2.40E+00
Eu-155	4.19E+02	1.23E+01

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: 3.687000E+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 = 1.044077E-01 (+- 1.027744E-03)

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

PEAK 5 WHC-SD-WM-DP-050
 ENERGY: 391.668
 REV 0
 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)

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)

SYSTEM EFFICIENCY COEFFICIENTS, PART 2

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

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ACID DIGESTION ANALYSES

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WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

Batch 1772

WHC-SD-WM-DP-050

REV 0

Lab Segment Serial No.

E-8607

Customer ID:

00661WQL

Analysis:

Acid Digest

Sample Prep:

Direct

Instrument:

SAFO 21495

Procedure/ Rev:

LA-505-159/B-1

Technologist:

Bill Smith WMM-K

Date:

8/30/93

Starting Time:

0800

Temperature

95°C

Ending Time:

1500

Chemist:

Bert Guffin H

Comments:

	Description	Lab ID		Description	Lab ID
1	SAIn	E-8607-8700	11		
2	STD	R-4295-8500	12		
3			13		
4			14		
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
1 MCP	13N10-C/5ml	21B48-C/5ml	14N10-D/5ml	STD 50ml / 1250 SNA

4591 06031654

[illegible]

✓

Bertrand Griffin II

28

ACID DIGESTION ANALYSIS

Serial No E 8607.-8700	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination ACD DGST	Method/Standard LA-505-159	Result Units G/L	Charge Code E11456	Retuns 0
Sample Size ? 8.5343 g. into 250 ml			Customer ID 0066WQL	
Remarks, Calculations, Results JAR ID# GRAMS SAMPLE 8.5343 VOLUME ON COMPLETION 250 ml <i>8.5343</i> 8.5343 250 ml 34.1372 g/l				
Analyst - 1 <i>Will K</i>	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Mrs	Mrs	Mrs	Mrs
Date 8/30/93	Time Completed 1500	Lab Dir Mgr 8-31-93 <i>Bernard Griffin</i>		

54-800-061 (R-10-83)

E 8607-8700

SEQUENCE # : 173

WT 1: 0.0000

WT 2: 8.5343

NET WEIGHT:

---> 8.5343 GRAMS

08/29/93 @ 20:56:36

BEST AVAILABLE COPY

ACID DIGESTION ANALYSIS

Serial No	Sample Point	Date	Time Issued	Priority
R 4295.-8500	105 KE BASIN	8-26-93	14:47	26
Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD DGST	LA-505-159	% RECOVERY	E11456	0
Sample Size	Customer ID			
? 5m EACH into 50m!			STD	
Remarks Calculations Results				
LMCS CHECK SAMPLE				
LMCS ID				
13N10-C 14N10-D } 5m/EACH 21B48-C }				
$DF = \frac{50m}{5m} = 10$				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>Will Stett</i>				
Date	Time Completed	Lab Unit Mgr	8-31-93	
8/30/93	1500	Beth Ann Griffin	9/1	

54-5550-061 (R-10-83)

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9313090.1657

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-050
REV 0Lab Segment Serial No.
R4295, E8607Customer ID:
H&RWC 0066WQLAnalysis:
ICPSample Prep:
NONE

Instrument: WB39939

Procedure/ Rev: LA-505-151/D-0

Technologist: TA FRAZIER

Date: 09/01/93

Starting Time: 15:13

Temperature N/A

Ending Time: 15:40

Chemist: B. WELS

Comments:

	Description	Lab ID
1	INITIAL LMCS CHECK STD	R4295-8550
2	HNO3 REAGENT BLANK	----
3	Sample 0066WQL	E8607-8750
4	Duplicate 0066WQL	E8607-8750
5	HNO3 REAGENT BLANK	----
6	ENDING LMCS CHECK STD	----
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
ICPSST4	25N10B DIRECT			
				31

INDUCTIVELY COUPLED PLASMA ANALYSIS - ACID DIGESTION

Batch 1767

Serial No R 4295.-8550	Sample Point 105 KE BASIN	Date 8-26-93	Time Issued 14:47	Priority 26
Determination ICP	Method-Standard LA-505-151	Result Units % RECOVERY	Charge Code E11456	Reruns 0
Sample Size <i>? Direct</i> <i>ICP STD 4</i> <i>Undigested</i> <i>25N10B</i>			Customer ID STD	
Remarks, Calculations, Results				
1st STD Digested STD Zr 5.088 101.76% Sr 5.093 101.86% Si 4.821 96.42% Al 4.958 99.16% Co 5.044 100.88% Cu 4.964 99.28% Li 5.077 101.54% Zn 5.040 100.80% Ni 5.133 102.66% <i>over</i>				
Analyst - 1 <i>Jerry D. Figue</i>	Analyst - 2	Analyst - 3	Analyst - 4 <i>KLMS</i>	Analyst - 5
	Mrs	Mrs	Mrs	Mrs
				9/2/93
Date 9/1/93	Time Completed 15:40	Lab Unit Mgr <i>Brian Wells</i> <i>Jerry D. Figue</i>		

54-6600-061 (Rev. 10-83)

Fe 5.128 102.56%
 Ca 5.185 103.70%
 Cr 5.169 103.38%
 Nd 5.249 104.98%
 Sm 5.044 100.88%
 Ba 5.177 103.54%
 P 5.008 100.16%
 S 4.824 96.48%
 Mg 5.011 100.22%
 As 4.975 99.50%
 Na 5.103 102.06%
 Mo 5.088 101.76%
 Ag 4.985 99.70%
 Pb 5.207 104.14%
 Ti 4.955 99.10%
 Cd 5.152 103.04%
 K 5.848 116.96%
 Mn 5.077 101.54%
 Sb 4.825 96.50%
 V 4.983 99.66%
 Be 5.275 105.50%
 Tl 4.772 95.44%
 R4295-8550

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INDUCTIVELY COUPLED PLASMA ANALYSIS - ACID DIGESTION

Serial No E 8607.-8750	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination ICP-LIQ	Method Standard LA-505-151	Result Units uG/mL	Charge Code E11456	Reruns 0
Sample Size ? 34.1372g/l, -1ml in 10ml			Customer ID 0066WQL	
Remarks: Calculations: Results $Al (7.1249E4 \times 11) / 34.1372 = 2.27E4$ $Co (27.4 \times 11) / 34.1372 = 8.83$ $Cu (1.885E3 \times 11) / 34.1372 = 6.07E2$ $Li (9.51 \times 11) / 34.1372 = 3.06$ $Zn (2.406E3 \times 11) / 34.1372 = 7.75E2$ $Ni (140 \times 11) / 34.1372 = 4.51E1$ <i>James L. Frazier</i> → OVER				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Hrs	Hrs	Hrs	Hrs
				9/2/93
Date 9/1/93	Time Completed 15:40	Lab Unit Mgr <i>Brian Wells</i>		

54-8800-06 (10-83)

$Fe (1.5666E5 \times 11) / 34.1372 = 5.05E4$
 $Ca (8.586E3 \times 11) / 34.1372 = 2.77E3$
 $Cr (604 \times 11) / 34.1372 = 1.95E2$
 $Nd (216 \times 11) / 34.1372 = 6.96E1$
 $Sm (1321E3 \times 11) / 34.1372 = 4.26E2$
 $Ba (389 \times 11) / 34.1372 = 1.25E2$
 $P (1.873E3 \times 11) / 34.1372 = 6.04E2$
 $S (1.086E3 \times 11) / 34.1372 = 3.50E2$
 $Mg (1.270E3 \times 11) / 34.1372 = 4.09E2$
 $As (32.5 \times 11) / 34.1372 = 1.05E1$
 $Nb (382 \times 11) / 34.1372 = 1.23E2$
 $Mo (16.9 \times 11) / 34.1372 = 5.44$
 $Ag (15.4 \times 11) / 34.1372 = 4.96$

$Pb (1.016E3 \times 11) / 34.1372 = 3.27E2$
 $Ti (179 \times 11) / 34.1372 = 5.77E1$
 $Cd (495 \times 11) / 34.1372 = 1.59E2$
 $K (747 \times 11) / 34.1372 = 2.41E2$
 $Mn (2336 \times 11) / 34.1372 = 7.53E2$
 $Sb (515 \times 11) / 34.1372 = 1.66E2$
 $V (551 \times 11) / 34.1372 = 1.77E2$
 $Be (73.4 \times 11) / 34.1372 = 2.37E1$
 $Tl (701 \times 11) / 34.1372 = 2.26E2$

E 8607-8750

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INDUCTIVELY COUPLED PLASMA ANALYSIS - ACID DIGESTION

Serial No E 8607.-8750	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination ICP-LIQ	Method-Standard LA-505-151	Result Units uG/ML	Charge Code E11456	Reruns 0
Sample Size 34.1372g/18-1ml in 10.1			Customer ID 0066WQL	
Remarks, Calculations, Results Duplicate $Al (7.24084 \times 11) / 34.1372 = 2.33E4$ $Co (28.6 \times 11) / 34.1372 = 9.22$ $Cu (1.923E3 \times 11) / 34.1372 = 6.20E2$ $Zr (42L \times 11) / 34.1372 = 1.37E2$ $Li (10.7 \times 11) / 34.1372 = 3.45$ $Sr (115 \times 11) / 34.1372 = 3.70E1$ $Zn (2.454E3 \times 11) / 34.1372 = 7.91E2$ $Si (2.067E3 \times 11) / 34.1372 = 6.66E2$ $Ni (141 \times 11) / 34.1372 = 4.54E1$ >OVER... Analyst - 1 <i>[Signature]</i> Analyst - 2 Analyst - 3 Analyst - 4 Analyst - 5 Date 9/1/93 Time Completed 15:40 Lab Unit Mgr <i>[Signature]</i> <i>[Signature]</i> 54-6800-06 (TR 10-83)				

E 8607-8750

$Fe (1.59969E5 \times 11) / 34.1372 = 5.15E4$
 $Ca (8.795E3 \times 11) / 34.1372 = 2.83E3$
 $Cr (617 \times 11) / 34.1372 = 1.99E2$
 $Nd (219 \times 11) / 34.1372 = 7.06E1$
 $Sm (1.365E3 \times 11) / 34.1372 = 4.40E2$
 $Ba (398 \times 11) / 34.1372 = 1.28E2$
 $P (1.591E3 \times 11) / 34.1372 = 5.13E2$
 $S (1.078E3 \times 11) / 34.1372 = 3.47E2$
 $Mg (1.273E3 \times 11) / 34.1372 = 4.17E2$
 $As (32.7 \times 11) / 34.1372 = 1.05E1$
 $Ns (381 \times 11) / 34.1372 = 1.23E2$
 $Mo (17.7 \times 11) / 34.1372 = 5.70$
 $Ag (19.8 \times 11) / 34.1372 = 6.38$
 $Pb (1.061E3 \times 11) / 34.1372 = 3.42E2$
 $Ti (183 \times 11) / 34.1372 = 5.90E1$
 $Cd (507 \times 11) / 34.1372 = 1.63E2$
 $K (668 \times 11) / 34.1372 = 2.15E2$
 $Mn (2.386E3 \times 11) / 34.1372 = 7.69E2$
 $Sb (581 \times 11) / 34.1372 = 1.87E2$
 $V (562 \times 11) / 34.1372 = 1.8E2$
 $Be (74.5 \times 11) / 34.1372 = 2.40E1$
 $Tl (654 \times 11) / 34.1372 = 2.11E2$

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Identity 1: SST4 Identity 2: Quality Control 3:13 PM September 1, 1993

WHC-SD-WM-DP-050

Task name : TWC93

REV 0

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Mean	5087.581	5093.343	4912.847	4821.142	4958.041	5043.859	4964.302	5076.557
S.D.	4.760	14.814	22.527	9.763	8.986	14.047	10.656	30.485
% R.S.D.	0.094	0.291	0.459	0.203	0.181	0.278	0.215	0.601
	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Mean	5039.913	5133.299	5087.823	5127.649	5184.658	5168.938	5249.406	447.967
S.D.	8.147	8.185	7.993	15.238	11.355	7.190	25.410	1275.914
% R.S.D.	0.162	0.159	0.157	0.297	0.219	0.139	0.484	284.823
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Mean	5032.395	5043.945	5177.172	5008.377	4823.882	5011.435	4975.080	5103.279
S.D.	3.960	6.031	15.111	154.708	71.514	10.544	27.555	30.868
% R.S.D.	0.079	0.120	0.292	3.089	1.482	0.210	0.554	0.605
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Mean	5088.157	2875.805	4984.880	5207.222	4954.674	5152.409	5039.642	5848.441
S.D.	14.098	20.440	8.842	24.685	11.038	10.760	13.036	8.791
% R.S.D.	0.277	0.711	0.177	0.474	0.223	0.209	0.259	0.150
	Mn	Sb	V	Be	Tl			
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)			
Mean	5076.903	4825.013	4983.153	5274.797	4771.975			
S.D.	4.495	51.056	5.165	8.981	46.586			
% R.S.D.	0.089	1.058	0.104	0.170	0.976			

Tracy L. Craig
E8607 H+RWC
Acid Digest
9/1/93

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 35 TO 41.

Identity 1: HNO3 Reag Blank Identity 2: Direct

3:15 PM September 1, 1993

WMC-SD-WM-DP-050

Task name : TWC93

REV 0

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	6.881	2.725	39.882	20.928	2.343	-2.726	2.899	3.336
S.D.	1.144	0.451	17.066	1.025	3.106	1.129	0.594	0.418
% R.S.D.	16.631	16.564	42.791	4.898	132.582	41.419	20.508	12.526
	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	8.651	6.788	3.977	-3.596	5.341	-3.422	39.375	482.426
S.D.	0.899	3.779	0.031	4.415	0.708	1.384	13.695	745.462
% R.S.D.	10.389	55.672	0.787	122.766	13.252	40.438	34.782	154.524
	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	29.335	24.397	3.017	67.143	6.686	3.133	5.593	13.497
S.D.	14.076	11.398	0.492	38.151	10.399	0.600	8.742	4.423
% R.S.D.	47.983	46.717	16.321	56.820	155.522	19.155	156.288	32.772
	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-0.905	0.099	14.730	-24.405	1.939	2.210	11.655	804.841
S.D.	2.345	18.056	2.242	16.142	0.496	1.364	3.461	31.013
% R.S.D.	259.222	18288.675	15.218	66.140	25.574	61.715	29.695	3.853
	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)			
Mean	2.477	-34.811	4.549	3.116	54.927			
S.D.	1.231	37.508	1.041	0.246	8.638			
% R.S.D.	49.695	107.749	22.874	7.895	15.727			

Identity 1: E8607 Sam 0066WQL Identity 2: 34.1372g/l Acid Dig

3:21 PM September 1, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WMC-SD-WM-DP-050

On-Peak Integrations : 3 Off-Peak Integrations : 1

REV 0

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4177.265	1079.996	430.427	20616.954	210998.714	305.902	18075.372	110.868
S.D.	16.671	3.802	14.221	78.130	411078.733	1.851	65.300	0.490
% R.S.D.	0.399	0.352	3.304	0.379	194.825	0.605	0.361	0.442

	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	21738.992	1347.997	-116.453	-7751.743	74015.923	5640.809	2248.074	15932942.798
S.D.	85.225	9.003	12.937	0.000	266.467	41.536	16.075	55635.259
% R.S.D.	0.392	0.668	11.109	0.000	0.360	0.736	0.715	0.349

	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-1932.667	12950.910	3807.200	17813.001	10697.887	11471.277	386.683	3862.154
S.D.	36.226	27.196	13.342	303.279	199.363	42.775	4.385	36.300
% R.S.D.	1.874	0.210	0.350	1.703	1.864	0.373	1.134	0.940

	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	179.644	-148.074	504.321	9412.934	1816.157	4366.573	-1179.616	3972.107
S.D.	1.567	33.633	6.461	65.994	9.677	4.879	6.310	10.566
% R.S.D.	0.872	22.714	1.281	0.701	0.533	0.112	0.535	0.266

	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)
Mean	21313.538	4556.643	5785.513	672.387	8296.807
S.D.	59.936	62.722	39.625	3.006	80.237
% R.S.D.	0.281	1.377	0.685	0.447	0.967

Identity 1: E8607 Sam 0066WQL Identity 2: 34.1372g/l-1ml in 10

3:26 PM September 1, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-050
REV 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Mean	420.876	112.893	-0.601	2020.574	71249.398	27.384	1885.393	9.515
S.D.	2.623	0.247	10.774	6.004	190.182	2.332	0.806	0.881
% R.S.D.	0.623	0.219	1792.377	0.297	0.267	8.516	0.043	9.257
	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Mean	2406.490	140.455	-43.385	156660.746	8586.236	604.333	215.689	1635871.813
S.D.	6.888	2.501	2.318	412.147	8.866	7.032	11.612	926.556
% R.S.D.	0.286	1.781	5.342	0.263	0.103	1.164	5.384	0.057
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Mean	-414.761	1321.456	389.350	1873.299	1085.558	1269.592	32.489	381.618
S.D.	11.348	8.219	0.585	22.026	14.629	2.741	8.111	7.053
% R.S.D.	2.736	0.622	0.150	1.176	1.348	0.216	24.964	1.848
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Mean	16.890	-23.679	15.443	1015.646	178.685	494.530	-125.009	747.316
S.D.	1.217	9.589	1.423	4.898	1.314	1.333	2.319	13.429
% R.S.D.	7.205	40.494	9.214	0.482	0.735	0.269	1.855	1.797
	Mn	Sb	V	Be	Tl			
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)			
Mean	2335.902	515.541	551.081	73.389	700.555			
S.D.	2.546	52.615	4.135	0.619	18.812			
% R.S.D.	0.109	10.206	0.750	0.844	2.685			

Identity 1: E8607 Dup 0066WQL Identity 2: 34.1372g/l-1ml in 10

3:30 PM September 1, 1993

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	426.150	115.521	-5.407	2067.367	72408.239	28.628	1923.056	10.688
S.D.	3.081	0.891	3.376	17.206	547.948	2.862	16.598	1.139
% R.S.D.	0.723	0.771	62.439	0.832	0.757	9.996	0.863	10.654
	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	2454.430	140.969	-32.658	159968.629	8795.196	617.217	218.656	1673845.624
S.D.	16.343	0.743	4.046	1220.855	72.039	5.611	20.622	15130.167
% R.S.D.	0.666	0.527	12.390	0.763	0.819	0.909	9.431	0.904
	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	-381.919	1364.767	397.928	1590.629	1078.316	1293.233	32.743	380.750
S.D.	17.876	15.793	3.448	60.656	24.007	10.855	3.490	6.084
% R.S.D.	4.681	1.157	0.867	3.813	2.226	0.839	10.658	1.598
	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	17.678	21.554	19.846	1060.723	182.629	506.800	-125.894	667.796
S.D.	2.861	25.278	0.384	4.959	1.593	4.533	5.187	38.096
% R.S.D.	16.185	117.276	1.935	0.467	0.872	0.894	4.120	5.705
	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)			
Mean	2386.230	580.689	561.832	74.537	654.158			
S.D.	17.722	9.377	5.563	0.619	22.000			
% R.S.D.	0.743	1.615	0.990	0.831	3.363			

Identity 1: HNO3 Reag Blank Identity 2: Direct

3:36 PM September 1, 1993

WHC-SQ-WM-DP-050

Task name : TWC93

REV 0

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	1.007	-0.194	39.701	4.207	21.141	-5.097	-0.368	-0.834
S.D.	1.688	0.000	18.208	3.807	6.293	1.129	0.385	0.631
% R.S.D.	167.615	0.000	45.862	90.494	29.767	22.154	104.487	75.635
	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	5.252	3.307	-8.013	1.526	2.366	-3.623	1.952	-551.344
S.D.	0.566	3.860	4.013	3.714	0.143	1.663	13.815	206.754
% R.S.D.	10.781	116.716	50.088	243.333	6.063	45.900	707.817	37.500
	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	2.219	23.638	-0.361	30.432	20.083	0.285	-9.064	-25.460
S.D.	1.239	1.316	0.193	6.358	5.811	0.000	9.489	3.901
% R.S.D.	55.810	5.568	53.360	20.894	28.933	0.000	104.689	15.323
	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	-3.560	10.385	1.821	0.487	-1.398	-1.222	-1.574	419.084
S.D.	1.098	9.533	0.300	4.907	0.174	0.167	1.402	21.132
% R.S.D.	30.833	91.794	16.498	1007.933	12.430	13.652	89.104	5.042
	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)			
Mean	-0.570	-4.668	1.241	0.082	-4.277			
S.D.	0.118	36.434	1.041	0.376	22.962			
% R.S.D.	20.769	780.549	83.834	458.251	536.814			

Identity 1: SST4

Identity 2: Quality Control

3:37 PM September 1, 1993

WHC-SD-WM-DP-050

Task name : TWC93

REV 0

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppb)	Sr (ppb)	Bi (ppb)	Si (ppb)	Al (ppb)	Co (ppb)	Cu (ppb)	Li (ppb)
Mean	4956.161	4952.620	4828.665	4723.421	4863.335	4886.314	4869.065	5007.917
S.D.	22.581	27.669	41.114	23.926	45.826	15.831	21.940	31.793
% R.S.D.	0.456	0.559	0.851	0.507	0.942	0.324	0.451	0.635
	Zn (ppb)	Ni (ppb)	La (ppb)	Fe (ppb)	Ca (ppb)	Cr (ppb)	Nd (ppb)	U (ppb)
Mean	4989.815	4979.940	4949.968	5026.291	5169.038	5015.238	5100.831	-551.344
S.D.	25.750	16.884	31.202	30.667	25.124	14.173	33.603	473.733
% R.S.D.	0.516	0.339	0.630	0.610	0.486	0.283	0.659	85.923
	Ce (ppb)	Sm (ppb)	Ba (ppb)	P (ppb)	S (ppb)	Mg (ppb)	As (ppb)	Na (ppb)
Mean	4814.213	4958.842	5037.719	5658.153	4989.766	4875.572	4847.856	5000.603
S.D.	45.117	24.374	27.861	106.966	105.173	27.231	25.096	21.861
% R.S.D.	0.937	0.492	0.553	1.890	2.108	0.559	0.518	0.437
	Mo (ppb)	Se (ppb)	Ag (ppb)	Pb (ppb)	Ti (ppb)	Cd (ppb)	B (ppb)	K (ppb)
Mean	4925.851	2810.333	4944.524	5106.254	4811.533	4977.110	4942.468	5178.442
S.D.	27.279	53.018	24.568	20.245	27.806	25.140	28.299	18.301
% R.S.D.	0.554	1.887	0.497	0.396	0.578	0.505	0.573	0.353
	Mn (ppb)	Sb (ppb)	V (ppb)	Be (ppb)	Tl (ppb)			
Mean	4948.494	4796.814	4855.376	5096.942	4566.038			
S.D.	21.277	15.436	22.513	34.323	24.853			
% R.S.D.	0.430	0.322	0.464	0.673	0.544			

Teresa L. Triguera
9/1/93

[illegible]

Standard result is in G/L.

High %REC on matrix-spike probably due to sample interference

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

RERUN Batch 1854

Serial No. R 4295.-8540	Sample Point 105 KE BASIN	Time Issued 8-26-93	Priority 14:47
Determination U	Method-Standard LA-925-106	Result Units % RECOVERY	Charge Code E11456
Sample Size ? .100-10-100 ml		Customer ID STD	
Remarks Calculations. Results S267 UF1C STD# 144B38 STD VAL 386-2 SPIKE ID/VAL 146B38/5.04-4912 SPIKE VOL. 100 ml RESULT %REC=100.4 .22 .50			
Analyst - 1 <i>Deby Ole</i>	Analyst - 2	Analyst - 3	Analyst - 4
	Mrs	Mrs	Mrs
Date 9/9/93	Time Completed 08:15	Lab Unit Mgr <i>C. Baker</i>	

54-6000061 (R-10-83)

URANIUM : LA-925-106 (B-0) LIQUIDS

			STANDARD
Serial No.	Spike concentration (gU/L)	CSP	5.04E-04
R4295-8540	Volume of water (mL)		4.5
Batch ID	Volume of fluran (mL)		1
1854	Volume of sample (mL)	VSAM	0.1000
Rerun No.	Volume of liquid in cell	VSUB	5.60
1	(sample + fluran + water)		
Instrument	Deflection (sample + fluran)	DSAM	0.22
AL-10620	Volume of spike (mL)	VSP	0.1000
Analyst:	Volume of liquid in cell (mL)	VTOT	5.70
	(sample + fluran + water + spike)		
Date:	Deflection (sample + fluran + spike)	DS+S	0.5
09/09/93	Dilution factor of sample	DF	101
	Digestion Dilution Factor of Sample	DDF	1
	Preparation Factor	PF	1
	Concentration (gU/L)		3.8760E-02

$$gU/L = ((DSAM \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S)) - DSAM \cdot VSAM))$$

0.02 is used as the Sample Deflection Reading for Calculating Less Than Values & Detection Level

$$\text{Detection Level} = ((0.02 \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S)) - DSAM \cdot VSAM)$$

U in gU/L=	3.88E-02
U in µg/mL=	3.88E+01

DETECTION LEVEL G/L= 3.5E-03

Data Entry by: <i>C. Baker</i>	Date: 09-Sep-93
Approved by: <i>CA Clark</i>	Date: 9-Sep-93

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

RERUN				
Serial No.	Sample Point	Time Issued	Priority	
E 8607.-8740	H&RWC	4-12-93	13: 2	26
Determination	Method Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/G Rec	E11456	1
Sample Size	Customer ID			
? .100-10-.025	P.F=10		0066WQL	
Remarks, Calculations, Results				
Spike 70 - 141338/5.04 ⁻⁴ g/l Spike Vol - .100 ml (38)(5.04 ⁻⁴)(.1)(.010) = 6.798E-2 (5.2 x .72) = .38 (5.2 x .72) = .38 .025 (34.1372) = 6.42E-2 6.42E-2				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr		
9/9/93	08:25	C. Brown	9/10	

URANIUM : LA-925-106 (B-0) SOLIDS

SAMPLE		
Serial No.	Spike concentration (gU/L)	CSP
E8607-8740	Volume of water (ml)	4.5
Batch ID	Volume of fluran (ml)	1
1854	Volume of sample (ml)	VSAM
Rerun No.	Volume of liquid in cell (sample + fluran + water)	VSUB
2		5.53
Instrument	Deflection (sample + fluran)	DSAM
AL-10620	Volume of spike (ml)	VSP
Analyst	Volume of liquid in cell (ml) (sample + fluran + water + spike)	VTOT
		5.63
Date	Deflection (sample + fluran + spike)	DS+S
09/09/93		0.72
	Dilution factor of sample	DF
		101
	Digest Grams of Solids/Liter	D G/L
		34.1372
	Preparation factor of sample	PF
		10
	Concentration (gU/L) in Digest Solution	
		2.1917E+00
	Concentration (gU/g)	
		6.4203E-02

$$gU/L = (DSAM \cdot VSP \cdot CSP \cdot DF \cdot PF) / ((VTOT / VSUB \cdot DS + S - DSAM) \cdot VSAM)$$

$$gU/g = (DSAM \cdot VSP \cdot CSP \cdot DF \cdot PF) / ((VTOT / VSUB \cdot DS + S - DSAM) \cdot VSAM \cdot D \text{ G/L})$$

$$\text{Detection Level} = (0.02 \cdot VSP \cdot CSP \cdot DF \cdot PF \cdot 1000000) / ((VTOT / VSUB \cdot DS + S - DSAM) \cdot VSAM \cdot D \text{ G/L})$$

U in gU/g	=	6.42E-02
U in µg/g	=	6.42E+04

$$\text{DETECTION LEVEL in } \mu\text{g/g} = 3.38E+03$$

Data Entry by:	C. Brown	Date:	13-Sep-93
Approved by:	C. Brown	Date:	13 SEPT. 93

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

Serial No E 8607.-8740		Sample Point H&RWC		Time Issued 4-12-93		Priority 26
Determination U	Method Standard LA-925-106	Result Units G/G Rec	Charge Code E11456	Reruns 2		
Sample Size ? P.F. = 100 - 10.025				Customer ID 0066WQL		
Remarks Calculations Results						
Spike ID - 146B38 / 5.04-4 g/lr				Readings 2		
Spike Vol - 100 ml				.39		
(39)(5.04-4)(.1)(1010)				.72		
5.425 (5.72 x .72) - .39 (.025) (34.1372) = 6.785-2 g/g				6.78E-2 g/g		
Analyst - 1 Analyst - 2 Analyst - 3 Analyst - 4 Analyst - 5						
Mrs Mrs Mrs Mrs Mrs						
Date 9/6/93		Time Completed 08:35		Lab Unit Mgr C. Brown		

URANIUM : LA-925-106 (B-0) SOLIDS

		SAMPLE
Serial No.	Spike concentration (gU/L)	CSP
E8607-8740	Volume of water (ml)	4.5
Batch ID	Volume of fluran (ml)	1
1854	Volume of sample (ml)	VSAM
Rerun No.	Volume of liquid in cell	VSUB
2	(sample + fluran + water)	
Instrument	Deflection (sample + fluran)	DSAM
AL-10620	Volume of spike (ml)	VSP
Analyst	Volume of liquid in cell (ml)	VTOT
82579	(sample + fluran + water + spike)	
Date	Deflection (sample + fluran + spike)	DS+S
09/09/93	Dilution factor of sample	DF
	Digest Grams of Solids/Liter	D G/L
	Preparation factor of sample	PF
	Concentration (gU/L) in Digest Solution	
	Concentration (gU/g)	

$$gU/L = (DSAM * VSP * CSP * DF * PF) / ((VTOT / VSUB * DS + S - DSAM) * VSAM)$$

$$gU/g = (DSAM * VSP * CSP * DF * PF) / ((VTOT / VSUB * DS + S - DSAM) * VSAM * D G/L)$$

$$Detection Level = (0.02 * VSP * CSP * DF * PF * 1000000) / ((VTOT / VSUB * DS + S - DSAM) * VSAM * D G/L)$$

U in gU/g	=	6.78E-02
U in ug/g	=	6.78E+04

DETECTION LEVEL in ug/g = 3.48E+03

Data Entry by:	Date:	13-Sep-93
Approved by:	Date:	13 SEPT. 93

Form 3 Rev. 2

Page 1 of 1

Serial No. E 8607.-8740	Sample Point H&RWC	Time Issued 4-12-93		Priority 13: 2	26
Determination U	Method/Standard LA-925-106	Result Units G/G Rec	Charge Code E11456	Returns 3	
Sample Size ? P.F. = 10 - .100 - 10 - .025			Customer ID 0066WQL		
Remarks Calculations, Results					
Spike ID - 146B78/5.04-49/R .37 Spike Vol - .100 ml (.37)(5.04)(.1)(1010) = 2.518E-2 G/G 5.1657 / 5.3556 = .65 (.37)(.025)(34.1372) = 7.56E-2 <i>Poly Calc</i>					
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5	
Date 9/9/83	Time Completed 08:45	Lab. Unit Mgr. Chesser	9/10 54-6806-06 (4-10-83)		

URANIUM : LA-925-106 (B-0) SOLIDS

			SAMPLE
Serial No.	Spike concentration (gU/L)	CSP	5.04E-04
E8607-8740	Volume of water (ml)		4.5
Batch ID	Volume of fluran (ml)		1
1854	Volume of sample (ml)	VSAM	0.0250
Rerun No.	Volume of liquid in cell	VSUB	5.53
2	(sample + fluran + water)		
Instrument	Deflection (sample + fluran)	DSAM	0.37
AL-10620	Volume of spike (ml)	VSP	0.1000
Analyst	Volume of liquid in cell (ml)	VTOT	5.63
82579	(sample + fluran + water + spike)		
Date	Deflection (sample + fluran + spike)	DS+S	0.65
09/09/93	Dilution factor of sample	DF	101
	Digest Grams of Solids/Liter	D G/L	34.1372
	Preparation factor of sample	PF	10
	Concentration (gU/L) in Digest Solution		2.5821E+00
	Concentration (gU/g)		7.5640E-02

$$gU/L = (DSAM \cdot VSP \cdot CSP \cdot DF \cdot PF) / ((VTOT / VSUB \cdot DS + S - DSAM) \cdot VSAM)$$

$$gU/g = (DSAM \cdot VSP \cdot CSP \cdot DF \cdot PF) / ((VTOT / VSUB \cdot DS + S - DSAM) \cdot VSAM \cdot D \text{ G/L})$$

$$\text{Detection Level} = (0.02 \cdot VSP \cdot CSP \cdot DF \cdot PF \cdot 1000000) / ((VTOT / VSUB \cdot DS + S - DSAM) \cdot VSAM \cdot D \text{ G/L})$$

U in gU/g	=	7.56E-02
U in µg/g	=	7.56E+04

$$\text{DETECTION LEVEL in } \mu\text{g/g} = 4.09E+03$$

Data Entry by:	<i>[Signature]</i>	Date:	13-Sep-93
Approved by:	<i>[Signature]</i>	Date:	13 SEPT. 93

REV 0

Serial No. E 8607.-8940	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination U	Method Standard LA-925-106	Result Units % RECOVERY	Charge Code E11456	Refuns 2
Sample Size ? 50 ml/c .025 mL > 10 mL (IN CELL) STD .100 mL .05 mL			Customer ID 0066WQL	
Remarks, Calculations, Results SAMPLE SPIKED ID SPIKE ID 144838 SPIKE VOLUME .100 mL PF = 10 .40 .67 Spike ID - 14638 (5.04E-4 g/L) Spike Vol - .100 mL 232.9 % Rec.				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Mrs	Mrs	Mrs	Mrs
Date 9/9/93	Time Completed 0910	Lab Unit Mgr C. Swan		

54-6800-061 (R-10-83)

URANIUM : LA-925-106 (B-0) SPIKE			SPIKE
Serial No.	Spike concentration (gU/L)	CSP	5.04E-04
R4295-8940	Volume of water (mL)		4.5
Batch ID	Volume of fluran (mL)		1
1854	Volume of sample (mL)	VSAM	0.0500
Run No.	Volume of liquid in cell	VSUB	5.55
1	(sample + fluran + water)		
Instrument	Volume of spike (mL)	VSP	0.1000
AL-10620	Volume of liquid in cell	VTOT	5.65
Analyst:	(sample + fluran + water + spike)		
82579	Deflection (sample + fluran)	DSAM	0.4
Date:	Deflection (sample + fluran + spike)	DS+S	0.67
09/09/93	Dilution factor of sample	DF	405
	Dilution factor of spike	DFS	101.25
	Spike value (matrix) (gU/L)	SV	3.8600E-02
	Preparation factor of sample	PF	10
	Concentration (gU/L) Form 1 (SAMPLE)	gU/LI	2.1926E+00
	Concentration (gU/L)	gU/LS	5.789E+00
	% Recovery		232.9

$$gU/L = (DSAM \cdot VSP \cdot CSP \cdot DF \cdot PF) / (((VTOT/VSUB) \cdot DS+S - DSAM) \cdot VSAM)$$

$$\% Recovery = ((gU/LS - gU/LI) \cdot (DFS / (DF \cdot PF) / SV) \cdot 100$$

% RECOVERY =	232.94
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HIGH

Data Entry by:	Date:	09-Sep-93
Approved by:	Date:	9-Sep-93

9313090.1675

Batch 1770

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

WHC-SD-WM-DP-050
REV 0

Serial No.	Sample Point	Date	Time Issued	Priority
R 4295.-8540	105 KE BASIN	8-26-93	14:47	26
Determination	Method-Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	E11456	0
Sample Size	Customer ID			
? 100-10ml-100g	STD			
Remarks, Calculations, Results				
S267 UF1C STD# 14638 STD VAL 3.96 ⁻² RESULT 3.9 ⁻² .22 %REC 101.03 70 .50 SPIKE ID/VAL 14638/5.04 ⁻⁴ 9/e SPIKE VOL. 100ml OUT FOR RERUN				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr		
9/7/93	10:00			

54-6800-061 (R-10-B3)

URANIUM : LA-925-106 (B-0) LIQUIDS

STANDARD

Serial No.	Spike concentration (gU/L)	CSP	5.04E-04
R4295-8540	Volume of water (ml)		4.5
Batch ID	Volume of fluran (ml)		1
1770	Volume of sample (ml)	VSAM	0.1000
Rerun No.	Volume of liquid in cell	VSUB	5.60
0	(sample + fluran + water)		
Instrument	Deflection (sample + fluran)	DSAM	0.22
AL10620	Volume of spike (ml)	VSP	0.1000
Analyst:	Volume of liquid in cell (ml)	VTOT	5.70
	(sample + fluran + water + spike)		
Date:	Deflection (sample + fluran + spike)	DS+S	0.5
09/07/93	Dilution factor of sample	DF	101
	Digestion Dilution Factor of Sample	DDF	1
	Preparation Factor	PF	1
	Concentration (gU/L)		3.8760E-02

$$gU/L = ((DSAM \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S)) - DSAM \cdot VSAM)$$

0.02 is used as the Sample Deflection Reading for Calculating Less Than Values & Detection Level

$$\text{Detection Level} = ((0.02 \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S)) - DSAM \cdot VSAM)$$

U in gU/L=	3.88E-02
U in µg/ml=	3.88E+01

DETECTION LEVEL G/L= 3.5E-03

50

Data Entry by:	Date:	08-Sep-93
Approved by:	Date:	

9313090.1677

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

Serial No	Sample Point	Date	Time Issued	Priority
E 8607.-8740	H&RWC	4-12-93	13: 2	26
Determination	Method Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/G Rec	E11456	0
Sample Size	Customer ID			
? P.F. = 10 g/100 - 10 ml - .025 ml	0066WQL			
Remarks, Calculations, Results				
Sample Spike ID - 148B/5.04-49/e Spike vol - .100 ml 37.86A 7/7/93 .50 .80 OUT FOR RERUN				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Date	Time Completed	Lab Unit Mgr		
9/7/93	10:35			

54-6800-061 (R-10-83)

URANIUM : LA-925-106 (B-0) LIQUIDS

SAMPLE

Serial No.	Spike concentration (gU/L)	CSP	5.04E-04
E8607-8740	Volume of water (ml)		4.5
Batch ID	Volume of fluran (ml)		1
1770	Volume of sample (ml)	VSAM	0.0250
Rerun No.	Volume of liquid in cell	VSUB	5.53
0	(sample + fluran + water)		
Instrument	Deflection (sample + fluran)	DSAM	0.5
AL10620	Volume of spike (ml)	VSP	0.1000
Analyst:	Volume of liquid in cell (ml)	VTOT	5.63
	(sample + fluran + water + spike)		
Date:	Deflection (sample + fluran + spike)	DS+S	0.8
09/07/93	Dilution factor of sample	DF	101
	Digestion Dilution Factor of Sample	DDF	1
	Preparation Factor	PF	10
	Concentration (gU/L)		3.2373E+00

$$gU/L = ((DSAM \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S)) - DSAM \cdot VSAM))$$

0.02 is used as the Sample Deflection Reading for Calculating Less Than Values & Detection Level

$$\text{Detection Level} = ((0.02 \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S)) - DSAM \cdot VSAM)$$

U in gU/L=	3.24E+00
U in µg/mL=	3.24E+03

DETECTION LEVEL G/L= 1.3E-01

51

Data Entry by:	Date:	08-Sep-93
Approved by:	Date:	

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

Serial No. R 8607.-8740	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination U	Method Standard LA-925-106	Result Units G/G Rec	Charge Code E11456	Returns 0
Sample Size ? P.F. = 10 + 100ml - 10ml - 0.025ml			Customer ID 0066WQL	
Remarks, Calculations, Results Duplicate .44 SpK ID-146 B38/5.04-4, 1e .68 SpKs Vol. -.100ml OUT FOR RERUN				
Analyst - 1 	Analyst - 2 Hrs	Analyst - 3 Hrs	Analyst - 4 Hrs	Analyst - 5 Hrs
Date 9/7/93	Time Completed 13:00	Lab Unit Mgr 		

54-5600-061 (R-10-83)

URANIUM : LA-925-106 (B-0) LIQUIDS

URANIUM : LA-925-106 (B-0) LIQUIDS			SAMPLE
Serial No.	Spike concentration (gU/L)	CSP	5.04E-04
E8607-8740	Volume of water (ml)		4.5
Batch ID	Volume of fluran (ml)		1
1770	Volume of sample (ml)	VSAM	0.0250
Rerun No.	Volume of liquid in cell (sample + fluran + water)	VSUB	5.53
0			
Instrument	Deflection (sample + fluran)	DSAM	0.44
AL10620	Volume of spike (mL)	VSP	0.1000
Analyst:	Volume of liquid in cell (mL) (sample + fluran + water + spike)	VTOT	5.63
Date:	Deflection (sample + fluran + spike)	DS+S	0.68
09/07/93	Dilution factor of sample	DF	101
	Digestion Dilution Factor of Sample	DDF	1
	Preparation Factor	PF	10
	Concentration (gU/L)		3.5509E+00

$$gU/L = ((DSAM \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S)) - DSAM \cdot VSAM)$$

0.02 is used as the Sample Deflection Reading for Calculating Less Than Values & Detection Level

$$\text{Detection Level} = ((0.02 \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S)) - DSAM \cdot VSAM)$$

U in gU/L=	3.55E+00
U in µg/mL=	3.55E+03

DETECTION LEVEL G/L= 1.6E-01

Data Entry by:	Date: 08-Sep-93
Approved by:	Date:

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

Serial No. E 8607.-8740	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination U	Method/Standard LA-925-106	Result Units G/G Rec	Charge Code E11456	Retuns 0
Sample Size ? P.F. = 100 ml - 10 ml - 0.25 ml			Customer ID 0066WQL	
Remarks, Calculations, Results Triphate .48 Spike ID - 14838/5.04 - 4/2 .76 Spike Vol - 100 ml OUT FOR RERUN <i>Rocky Gale</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Mrs	Mrs	Mrs	Mrs
Date 9/7/93	Time Completed 13:50	Lab Unit Mgr <i>[Signature]</i>		

54-6000-061 (R-10-83)

URANIUM : LA-925-106 (B-0) LIQUIDS

URANIUM : LA-925-106 (B-0) LIQUIDS			SAMPLE
Serial No.	Spike concentration (gU/L)	CSP	5.04E-04
E8607-8740	Volume of water (ml)		4.5
Batch ID	Volume of fluran (ml)		1
1770	Volume of sample (ml)	VSAM	0.0250
Rerun No.	Volume of liquid in cell	VSUB	5.53
0	(sample + fluran + water)		
Instrument	Deflection (sample + fluran)	DSAM	0.48
AL10620	Volume of spike (ml)	VSP	0.1000
Analyst:	Volume of liquid in cell (ml)	VTOT	5.63
	(sample + fluran + water + spike)		
Date:	Deflection (sample + fluran + spike)	DS+S	0.76
09/07/93	Dilution factor of sample	DF	101
	Digestion Dilution Factor of Sample	DDF	1
	Preparation Factor	PF	10
	Concentration (gU/L)		3.3271E+00

$$gU/L = ((DSAM \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S) - DSAM \cdot VSAM))$$

0.02 is used as the Sample Deflection Reading for Calculating Less Than Values & Detection Level

$$\text{Detection Level} = ((0.02 \cdot VSP \cdot CSP \cdot DF \cdot DDF \cdot PF) / ((VTOT / VSUB) \cdot (DS+S) - DSAM \cdot VSAM))$$

U in gU/L=	3.33E+00
U in µg/mL=	3.33E+03

DETECTION LEVEL G/L= 1.4E-01

53

Data Entry by: <i>[Signature]</i>	Date: 08-Sep-93
Approved by:	Date:

WHC-SD-WM-DP-050
REV 0

URANIUM : LA-925-106 (B-0)		SPIKE	
Serial No.	Spike concentration (gU/L)	CSP	5.04E-04
E8607-8940	Volume of water (mL)		4.5
Batch ID	Volume of fluran (mL)		1
1770	Volume of sample (mL)	VSAM	0.0250
Run No.	Volume of liquid in cell	VSUB	5.53
0	(sample + fluran + water)		
Instrument	Volume of spike (mL)	VSP	0.1000
AL10620	Volume of liquid in cell	VTOT	5.63
Analyst:	(sample + fluran + water + spike)		
	Deflection (sample + fluran)	DSAM	0.34
Date:	Deflection (sample + fluran + spike)	DS+S	0.52
09/07/93	Dilution factor of sample	DF	10302
	Dilution factor of spike	DFS	102
	Spike value (matrix) (gU/L)	SV	3.8600E-02
	Preparation factor of sample	PF	10
	Concentration (gU/L) Form 1 (SAMPLE)	gU/LI	3.3300E+00
	Concentration (gU/L)	gU/LS	3.728E+02
	% Recovery		947.7

$$\% \text{Recovery} = ((gU/LS - gU/LI) \cdot (DFS / (DF \cdot PF) / SY) \cdot 100$$

54Form 2 Rev. 2

WESTINGHOUSE HANFORD COMPANY

REV 0

222-S LABORATORY

Batch 1768

ANALYTICAL BATCH

Lab Segment Serial No.

E 8607

Customer ID:

0066 WAL

Analysis:

PU 239/40

Sample Prep:

Prep: Acid 1.9015

Instrument: WB 57237

WB 57237

Procedure/ Rev: LA 503-156 D20

LA 503-156

120

Technologist:

TAM Lock P. C. Lock

Date: 9-3-93

9-3-93

Starting Time:

OK

Temperature 24°C

2400

Ending Time:

1400

Chemist: SA CATLOW

за сатвор

Comments:

	Description	Lab ID		Description	Lab ID
1	LMCS	R4295-8581	11		
2	SAM	E8607-8781	12		
3	SAM Dup	E8607-8781	13		
4	SAM Tripl.	E8607-8781	14		
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	631343 - .100ml			
S/ke	581343 - 14 93-93			
S/ke	741343 - .100ml			
				55

[illegible]

The results for the standard are in uCi/L.

WNC-SD-WM-DP-050

REV 0

8 8390

Serial No R 4295.-8581	Sample Point 105 KE BASIN	Date 8-26-93	Time Issued 14:47	Priority 26
Determination Pu239/40	Method Standard LA-503-156	Result Units % RECOVERY	Charge Code E11456	Reruns 0
Sample Size ? 100-10-100			Customer ID STD	
Remarks, Calculations, Results EDP R211 AROO1 STD# 63B43 RESULT 1.30 E+2 STD VAL. 1.30 E+2 %REC 99.6% 1ml 8m HNO ₃ .100 ml Pu 238-74B43 J. R. B.				
Analyst - 1	Analyst - 2 R. J. B. Hrs 9-3-93	Analyst - 3 D. H. Milia Hrs	Analyst - 4 Hrs 9-4-93 11:00	Analyst - 5 Hrs 8-4-93 11:00
Date 9-3-93	Time Completed 1400	Lab Unit Mgr H. J. B.		

54-6000-001 (R10/83)

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

LIQUIDS

STANDARD

Serial No.	Date Counted	09/04/93	Pu 236 AEA Frac (C236)	0.524
R4295-8581	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac (C238)	0.015
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac (C239)	0.412
1768	Tracer Volume in mL (SPKV)	0.1	Total AT Counts	8683
Rerun No.	Digest D.F. (DDF)	1	Time Counted (min)	30
0	Tracer Book No.	74B43	Background (cpm)	6
Analyst	Tracer Preparation Date	07/30/93	Pu 236 Counts	44.49
	Pu-236 Preparation Value	3712	Pu 238 Counts	1.29
Date	Pu-236 Decay Corr'd value	3624.08	Pu 239 Counts	34.97
09/03/93	Pu-238 Tracer Value	0	AEA Count Time (min)	480

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

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

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

Pu 239/240 $\mu\text{Ci/L}$ = (C239) (Tracer 236 Decay Corr'd Val) (SPKV) (DF) (DDF) (1000mL/L) / (C236) (SS) (2220000dpm/ μCi)

Pu 236 dpm = (Total AT Ct's / Time Ct'd - Bkg * (2) (C236)) - (Pu 236 dpm/mL in Tracer) (SPKV) (Pu236 Tracer Recovery / 100)

Pu 238 $\mu\text{Ci/mL}$ = (Pu 236 dpm) (DF) (DDF) / (Pu-236 Tracer Recovery / 100) (2220000dpm/ μCi) (SS)

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

Pu-239/240 $\mu\text{Ci/L}$ = 1.30E+02

NOTE: Tracer values are in dpm/mL.

Pu 239/240 $\mu\text{Ci/mL}$	=	1.30E-01
Relative Counting Error	=	1.0%
Pu 238 $\mu\text{Ci/mL}$	=	< 1.11E-02
Relative Counting Error	=	4.1%
Pu 236 Tracer Recovery	=	82.0%

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

Data Entry by: <i>[Signature]</i>	Date: 07-Sep-93
Approved by: <i>[Signature]</i>	Date: Sept 7, 1993

PLUTONIUM 239\240 ANALYSIS - ACID DIGESTION

#3 R 9.3.93
8683 - 6
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R4295-8581

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9313090-1224

WHC-SD-WM-DP-050

REV 0

12 4106

Serial No E 8607.-8781	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination Pu239/40	Method-Standard LA-503-156	Result Units uCi/G Rec	Charge Code E11456	Reruns 0
Sample Size ? .050ml - 10ml - .050 ml			Customer ID 0066WQL	
Remarks, Calculations, Results COUNT AS uCi/L Sample 1ml 8m HNU ₃ -050 ml CON HNU ₃ 100 ml Pu 236-741343 L. B. B. B. 4.30x10 ¹ uCi/EA - 480MIN ATTAG PRINTOUT				
Analyst - 1	Analyst - 2 Mrs 9-3-93	Analyst - 3 Mrs 9-4-93	Analyst - 4 Mrs 9-4-93	Analyst - 5 Mrs
Date 9-3-93	Time Completed 1400	Lab Upd L. B. B. B.	L. B. B. B.	

54-6800-061 (R110-83)

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

SOLIDS

			SAMPLE	
Serial No.	Date Counted	09/04/93	Pu 236 AEA Frac (C236)	0.276
E8607-8781	Sample Volume in mL (SS)	0.05	Pu 238 AEA Frac (C238)	0.102
Batch ID	Sample D.F. DF	201	Pu 239 AEA Frac (C239)	0.618
1768	Tracer Volume in ml(SPKV)	0.1	Total AT Counts	13107
Rerun No.	Digest Grams/Liter (D g/L)	34.1372	Time Counted (min)	30
0	Tracer Book No.	74B43	Background (cpm)	6
Analyst	Tracer Preparation Date	07/30/93	Pu 236 Counts	46.47
	Pu-236 Preparation Value	3712	Pu 238 Counts	17.12
Date	Pu-236 Decay Corr'd value	3624.08	Pu 239 Counts	103.87
09/03/93	Pu-238 Tracer Value	0	AEA Count Time (min)	480

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 - 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) / ((C236) (SS) (D g/L) (2220000dpm/uCi))

Pu 238 dpm = (Total AT Cl's / Time Cl'd - Bkg * (2) (C238)) - (Pu 238 dpm / mL in Tracer) (SPKV) (Pu236 Tracer Recovery / 100) |

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

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	=	4.30E+01
Relative Counting Error	=	0.8%
Pu 238 uCi/g	=	7.10E+00
Relative Counting Error	=	1.3%
Pu 236 Tracer Recovery	=	65.6%

Data Entry by: *PRG:th*

Date: 07-Sep-93

Approved by: *PRG:th*

Date: Sept 7, 1993

Form 2 Rev. 1.2

Page 1 of 1

59

9313090-1686

PLUTONIUM 239\240 ANALYSIS - ACID DIGESTION

#3 p 9.3.93
13/07
30 - 6

E 8607-8781

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WHC-SD-WM-DP-050

REV 0

10 2108

Serial No E 8607.-8781	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination Pu239/40	Method-Standard LA-503-156	Result Units uCi/G Rec	Charge Code E11456	Reruns 0
Sample Size ? .050 ml - 10 ml - .050 ml			Customer ID 0066WQL	
Remarks, Calculations, Results COUNT AS uCi/L Duplicate 1ml from HNO ₃ .050ml from HNO ₃ .100ml from 236-74B43 4.76 x 10 ¹ uCi/g "AEA" - 480MIN ATTACH PRINTOUT L. E. Phil				
Analyst - 1	Analyst - 2 H. J. Phil Hrs 9-3-93	Analyst - 3 D. H. Phil Hrs 9-4-93	Analyst - 4 H. J. Phil Hrs 9-4-93	Analyst - 5
Date 9-3-93	Time Completed 1400	Lab Unit Mgr L. E. Phil		

54-6800-25 (11-10-83)

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

SOLIDS

			SAMPLE	
Serial No.	Date Counted	09/04/93	Pu 236 AEA Frac (C236)	0.255
E8607-8781	Sample Volume in mL (SS)	0.05	Pu 238 AEA Frac (C238)	0.107
Batch ID	Sample D.F. DF	201	Pu 239 AEA Frac (C239)	0.632
1768	Tracer Volume in mL (SPKV)	0.1	Total AT Counts	17315
Rerun No.	Digest Grams/Liter (D g/L)	34.1372	Time Counted (min)	30
0	Tracer Book No.	74B43	Background (cpm)	6
Analyst	Tracer Preparation Date	07/30/93	Pu 236 Counts	64.82
	Pu-236 Preparation Value	3712	Pu 238 Counts	27.13
Date	Pu-236 Decay Corr'd value	3624.08	Pu 239 Counts	160.6
09/03/93	Pu-238 Tracer Value	0	AEA Count Time (min)	480

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 C'd - Bkg (2) (C236) (100) / Tracer 236 Decay Corr'd Value * mL added

Pu 239/240 $\mu\text{Ci/g}$ = (C239) (Tracer 236 Decay Corr'd Val) (Tracer Volume) (1000mL/L) (DF) / (C236) (SS) (D g/L) (2220000dpm/ μCi)

Pu 238 dpm = (Total AT C's / Time C'd - Bkg * (2) (C236)) - (Pu 238 dpm / mL in Tracer) (SPKV) (Pu236 Tracer Recovery / 100)

Pu 238 $\mu\text{Ci/g}$ = (Pu 238 dpm) (DF) (1000mL/L) / (Pu-236 Tracer Recovery / 100) (2220000dpm/ μCi) (D g/L) (SS)

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

NOTE: Tracer Values are in dpm/mL.

Pu 239/240 $\mu\text{Ci/g}$	=	4.76E+01
Relative Counting Error	=	0.7%
Pu 238 $\mu\text{Ci/g}$	=	8.07E+00
Relative Counting Error	=	1.0%
Pu 236 Tracer Recovery	=	80.4%

Data Entry by: <i>[Signature]</i>	Date: 07-Sep-93
Approved by: <i>[Signature]</i>	Date: <i>Sept 7, 1993</i>

Form 2 Rev. 1.2

Page 1 of 1

PLUTONIUM 239\240 ANALYSIS - ACID DIGESTION

#1 R 9.3.93
17315 - 6
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E8607-8781

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WHC-SD-WM-DP-050

REV 0

11 3107

Serial No E 8607.-8781	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination Pu239/40	Method Standard LA-503-156	Result Units uCi/G Rec	Charge Code E11456	Reruns 0
Sample Size ? .650 ml - 10 ml - .650 ml			Customer ID 0066WQL	
Remarks Calculations, Results COUNT AS uCi/L Triplicate 1 ml 8m HNO ₃ .650 ml Cal HNO ₃ .100 ml Pu 236-74BY3 4.20 x 10 ¹ uCi/g "AEA" - 480MIN ATTACH PRINTOUT L. Black				
Analyst - 1	Analyst - 2 Raymond D. Hamilton Mrs 9-3-93	Analyst - 3	Analyst - 4 Raymond Mrs 9-4-93	Analyst - 5
Date 9-3-93	Time Completed 1400	Lab Unit J. F. Little	9/7	

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

SOLIDS

SAMPLE

Serial No.	Date Counted	09/04/93	Pu 236 AEA Frac. (C236)	0.276
E8607-8781	Sample Volume in mL (SS)	0.05	Pu 238 AEA Frac. (C238)	0.101
Batch ID	Sample D.F. DF	201	Pu 239 AEA Frac. (C239)	0.603
1768	Tracer Volume in mL (SPKV)	0.1	Total AT Counts	16022
Rerun No.	Digest Grams/Liter (D g/L)	34.1372	Time Counted (min)	30
0	Tracer Book No.	74B43	Background (cpm)	2
Analyst	Tracer Preparation Date	07/30/93	Pu 236 Counts	61.29
	Pu-236 Preparation Value	3712	Pu 238 Counts	22.35
Date	Pu-236 Decay Corr'd value	3624.08	Pu 239 Counts	134.03
09/03/93	Pu-238 Tracer Value	0	AEA Count Time (min)	480

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) | 1

Pu 236 Tracer Recovery = (AT Counts / Time C'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) / (C236) (SS) (D g/L) (2220000dpm/uCi) |

Pu 236 dpm = (Total AT C's / Time C'd - Bkg * (2) (C238)) - (Pu 236 dpm / mL in Tracer) (SPKV) (Pu236 Tracer Recovery / 100) |

Pu 236 uCi/g = (Pu 236 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 Counts) + (1 / Pu 238 or 239/240 Total Counts) | * 100

NOTE: Tracer Values are in dpm/mL.

Pu 239/240 uCi/g	=	4.20E+01
Relative Counting Error	=	0.7%
Pu 238 uCi/g	=	7.03E+00
Relative Counting Error	=	1.1%
Pu 236 Tracer Recovery	=	81.0%

Data Entry by: J. F. Little	Date: 07-Sep-93
Approved by: J. F. Little	Date: Sept 7, 1993

Form 2 Rev. 1.2

Page 1 of 1

WHC-SD-WM-DP-050

REV 0

PLUTONIUM 239\240 ANALYSIS - ACID DIGESTION

#2 R 9.3.93
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E 8607-8781

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Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE

R4295-8581

File ID: 8a8390.CNF

Counted on: 9/ 4/93 @10:57
 Detector: AEA8
 Geometry number: 1
 Count time: 28800. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	1366.4	1366.4	360.219	360.219	14.000	6.727	7.000	3.063
2	33.7	33.7	300.756	300.670	16.000	9.508	8.000	3.756
3	49.0	49.0	252.419	252.390	8.000	0.914	4.000	0.062
4	1261.2	1261.2	228.193	228.180	14.000	6.368	7.000	4.418

PEAK RESULTS

Peak Error Limit: 15%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea	
1	Cm244	0.524	5.796	5.777	0.019	0.03	44.49	1.3	394.8	0.178E-03	
	Cm243		5.786	5.777	0.009				540.8	0.244E-03	
2	Am241	0.015	5.480	5.497	-0.017	0.04	1.29	8.4	12.2	0.548E-05	
	Pu238		5.499	5.497	0.002				15.9	0.716E-05	
3	Am243	0.066	5.276	5.271	0.005	0.00	5.62	3.8	50.4	0.227E-04	
4	Pu239	0.412	5.143	5.157	-0.014	0.03	34.97	1.6	310.3	0.140E-03	
	Pu240		5.144	5.157	-0.013				310.3	0.140E-03	
Totals:		1.017	<--valid peaks only-->				86.37				

DETECTOR CALIBRATION

Energy(MEV) = 4.084 + (0.0047)*Channel

Energy range (MeV): 4.084 TO 6.491

Efficiency = 0.1127 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	40772.0	100.000
Smoothed	41407.5	101.559
Composite fit	41459.9	101.687
Residuals	-687.9	-1.687

Analyzed by:

ALJ

931300.189

Raw Data Dump for AEA Spectrum: 8a8390.CNF										
1	28800.	0.	0.	210.	417.	1.	1.	0.	0.	0.
11	2.	0.	0.	2.	0.	1.	2.	2.	1.	0.
21	5.	1.	0.	2.	2.	0.	4.	1.	1.	2.
31	3.	1.	1.	3.	3.	2.	0.	1.	2.	1.
41	2.	3.	3.	0.	2.	1.	4.	1.	2.	1.
51	0.	0.	1.	1.	2.	2.	6.	4.	1.	4.
61	1.	2.	0.	1.	1.	5.	0.	0.	2.	3.
71	2.	0.	5.	1.	1.	2.	1.	0.	2.	1.
81	0.	1.	2.	3.	0.	2.	0.	1.	1.	4.
91	1.	0.	1.	2.	1.	0.	0.	0.	0.	0.
101	1.	0.	1.	1.	3.	0.	1.	0.	0.	4.
111	0.	2.	1.	0.	1.	2.	1.	0.	1.	1.
121	1.	0.	2.	6.	1.	2.	2.	2.	3.	3.
131	0.	1.	1.	1.	1.	2.	0.	1.	2.	1.
141	2.	0.	3.	1.	3.	3.	1.	5.	1.	2.
151	2.	2.	1.	1.	2.	0.	1.	3.	0.	3.
161	1.	2.	3.	1.	3.	2.	4.	2.	5.	4.
171	1.	2.	2.	4.	4.	4.	4.	3.	3.	4.
181	4.	4.	9.	5.	5.	5.	2.	7.	3.	6.
191	4.	3.	5.	7.	12.	13.	5.	8.	7.	10.
201	10.	16.	24.	30.	22.	26.	36.	49.	68.	64.
211	79.	105.	110.	148.	207.	236.	263.	379.	372.	503.
221	595.	702.	843.	1035.	1133.	1400.	1424.	1454.	1408.	1263.
231	1149.	894.	646.	452.	312.	174.	99.	46.	26.	19.
241	4.	7.	8.	10.	4.	7.	9.	17.	12.	24.
251	16.	22.	29.	21.	13.	19.	11.	15.	14.	6.
261	6.	6.	7.	8.	2.	5.	3.	2.	9.	5.
271	4.	2.	2.	3.	1.	2.	7.	0.	9.	5.
281	3.	5.	7.	10.	11.	11.	7.	13.	11.	18.
291	11.	13.	19.	28.	19.	23.	26.	26.	42.	38.
301	42.	33.	28.	35.	32.	25.	20.	12.	9.	10.
311	14.	6.	3.	3.	4.	1.	3.	5.	1.	6.
321	3.	4.	2.	7.	4.	7.	13.	18.	10.	14.
331	11.	20.	22.	24.	24.	24.	39.	41.	49.	55.
341	92.	96.	143.	171.	205.	296.	369.	453.	490.	578.
351	726.	744.	821.	877.	1014.	1097.	1253.	1394.	1404.	1547.
361	1460.	1362.	1177.	982.	660.	475.	270.	205.	75.	47.
371	21.	5.	2.	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.	1.
411	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
431	0.	0.	1.	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.	1.	0.	0.	0.	2.
471	2.	1.	1.	2.	0.	4.	1.	0.	2.	1.
481	0.	1.	0.	1.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WHC-SD-WM-DP-050
REV 0

W. Raymond
9-4-93

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-050
REV 0

SAMPLE
E-8607-8781
File ID: 12a4106.CNF

Counted on: 9/ 4/93 @ 7:14
Detector: AEA12
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	1939.3	1939.3	361.888	361.888	10.000	2.731	5.000	1.444
2	715.1	715.1	303.512	303.511	10.000	2.940	5.000	1.612
3	4441.4	4441.4	230.074	230.074	12.000	3.776	6.000	2.551

PEAK RESULTS

Peak Error Limit: 15%

Peak ID	Isotope	AEA Frac	Peak Centroid	Count Rate	%err	Activity	
			Exp. Obs. Diff. FWHM	c/m	@95	d/m uCi/ea	
1	Cm244	0.276	5.796 5.785 0.011	10.01	46.47	1.3	412.4 0.186E-03
	Cm243		5.786 5.785 0.001				564.9 0.254E-03
2	Pu238	0.102	5.499 5.511 -.012	20.01	17.12	2.2	210.9 0.950E-04
	Am241		5.480 5.511 -.031				161.6 0.728E-04
3	Pu239	0.618	5.143 5.166 -.023	30.02	103.87	0.9	921.7 0.415E-03
	Pu240		5.144 5.166 -.022				921.7 0.415E-03
Totals:		0.996	<--valid peaks only-->		167.46		

DETECTOR CALIBRATION

Energy(MEV) = 4.084 + (0.0047)*Channel
Energy range (MeV): 4.084 TO 6.491
Efficiency = 0.1127 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	80731.0	100.000
Smoothed	80843.5	100.139
Composite fit	80394.0	99.583
Residuals	337.0	0.417

Analyzed by: _____
DM

9313090.1895

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 28354.6

WHC-SD-WM-DP-050
REV 0

9313090.1896

3
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1
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Raw Data Dump for AEA Spectrum: 12a4106.CNF

26910603136

1	28804.	0.	0.	0.	0.	0.	0.	0.	0.	2.
11	0.	0.	2.	0.	2.	0.	0.	0.	0.	0.
21	1.	0.	1.	1.	1.	1.	1.	0.	0.	0.
31	2.	1.	2.	0.	1.	0.	1.	0.	0.	0.
41	0.	0.	2.	0.	0.	0.	1.	1.	0.	0.
51	1.	1.	0.	0.	0.	1.	0.	0.	0.	0.
61	0.	1.	0.	1.	2.	0.	0.	0.	1.	1.
71	0.	0.	1.	0.	3.	0.	0.	1.	1.	0.
81	0.	0.	0.	1.	0.	1.	0.	1.	0.	2.
91	1.	0.	0.	1.	1.	2.	0.	1.	0.	1.
101	1.	0.	0.	0.	0.	1.	1.	2.	0.	0.
111	2.	1.	2.	1.	3.	2.	0.	2.	3.	2.
121	3.	0.	0.	3.	1.	0.	0.	2.	2.	0.
131	2.	1.	1.	2.	1.	1.	1.	3.	0.	4.
141	2.	2.	2.	0.	4.	3.	0.	1.	1.	1.
151	3.	1.	3.	2.	2.	2.	0.	0.	3.	2.
161	7.	3.	6.	1.	2.	1.	3.	2.	5.	2.
171	3.	8.	6.	5.	3.	6.	7.	6.	5.	3.
181	4.	2.	17.	7.	14.	7.	13.	8.	10.	3.
191	14.	8.	7.	11.	14.	16.	12.	18.	23.	32.
201	28.	33.	22.	43.	32.	45.	47.	63.	72.	93.
211	123.	145.	172.	206.	315.	399.	550.	693.	915.	1078.
221	1295.	1491.	1697.	1815.	2241.	2700.	3457.	4274.	5045.	5439.
231	5045.	4190.	3009.	1817.	931.	340.	118.	26.	4.	2.
241	1.	2.	1.	1.	1.	1.	2.	4.	3.	2.
251	3.	10.	7.	10.	9.	9.	6.	8.	5.	6.
261	1.	3.	5.	2.	4.	6.	5.	5.	6.	3.
271	5.	4.	4.	2.	7.	7.	1.	8.	5.	15.
281	13.	19.	11.	22.	22.	34.	46.	56.	50.	104.
291	135.	159.	240.	281.	326.	361.	325.	332.	375.	449.
301	550.	725.	844.	913.	767.	539.	251.	83.	30.	6.
311	3.	1.	3.	3.	3.	2.	2.	1.	6.	3.
321	5.	5.	8.	5.	5.	12.	4.	9.	8.	11.
331	12.	14.	4.	13.	15.	10.	17.	23.	22.	32.
341	49.	52.	71.	91.	101.	152.	202.	267.	407.	529.
351	763.	874.	867.	871.	783.	798.	892.	992.	1323.	1751.
361	2175.	2508.	2238.	1693.	852.	304.	111.	21.	2.	0.
371	3.	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.	1.	1.	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.	0.								

WHC-SD-WM-DP-050
REV 0

Raymond
9-4-93

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
E-8607-8781
File ID: 10a2108.CNF

WHC-SD-WM-DP-050
REV 0

Counted on: 9/ 4/93 @ 7:13
Detector: AEA10
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	2662.4	2662.4	363.060	363.060	10.000	2.988	5.000	1.597
2	1106.3	1106.3	303.923	303.922	10.000	3.238	5.000	1.774
3?	63.1	63.1	255.666	255.576	8.000	0.019	4.000	1.686
4	6736.0	6736.0	229.464	229.464	10.000	4.093	5.000	2.813

PEAK RESULTS

Peak Error Limit: 15%

Peak ID	Isotope	AEA Frac	Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.255	5.796	5.791	0.0050	0.01	64.82	1.1	575.1	0.259E-03
	Cm243		5.786	5.791	-.005				787.9	0.355E-03
2	Pu238	0.107	5.499	5.513	-.0140	0.02	27.13	1.7	334.3	0.151E-03
	Am241		5.480	5.513	-.033				256.1	0.115E-03
3		????		5.286			0.05	48.0		
4	Pu239	0.632	5.143	5.163	-.0200	0.02	160.60	0.7	1425.0	0.642E-03
	Pu240		5.144	5.163	-.019				1425.0	0.642E-03
Totals:			0.994	<--valid peaks only-->			252.54			

DETECTOR CALIBRATION

Energy(MEV) = 4.084 + (0.0047)*Channel
Energy range (MeV): 4.084 TO 6.491
Efficiency = 0.1127 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	121921.0	100.000
Smoothed	122033.5	100.092
Composite fit	121255.7	99.454
Residuals	665.3	0.546

Analyzed by:

DM

.1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 45022.9

WHC-SD-WM-DP-050
REV 0

9313090.1699

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Raw Data Dump for AEA Spectrum: 10a2108.CNF

9313090.1700

1	28803.	0.	0.	0.	0.	0.	0.	0.	1.	1.
11	0.	0.	0.	1.	0.	0.	2.	0.	0.	1.
21	1.	0.	0.	0.	0.	0.	2.	0.	0.	0.
31	2.	1.	0.	0.	2.	0.	0.	2.	0.	1.
41	1.	0.	1.	2.	0.	2.	1.	2.	0.	1.
51	0.	2.	2.	0.	0.	2.	1.	0.	1.	1.
61	0.	1.	0.	1.	1.	1.	1.	1.	1.	1.
71	2.	2.	1.	1.	1.	0.	1.	0.	0.	1.
81	2.	1.	1.	0.	2.	1.	2.	1.	2.	0.
91	0.	0.	4.	3.	1.	0.	0.	0.	3.	2.
101	0.	2.	1.	3.	1.	0.	0.	1.	2.	2.
111	2.	2.	2.	0.	1.	1.	0.	0.	2.	0.
121	2.	0.	1.	4.	0.	6.	3.	0.	2.	2.
131	2.	3.	2.	0.	6.	2.	3.	1.	1.	4.
141	0.	3.	2.	1.	2.	3.	4.	1.	4.	2.
151	3.	3.	4.	1.	3.	2.	3.	2.	4.	6.
161	6.	3.	6.	3.	7.	3.	5.	13.	7.	4.
171	6.	11.	7.	8.	6.	11.	5.	7.	8.	9.
181	11.	10.	7.	8.	13.	13.	14.	8.	15.	13.
191	18.	17.	23.	15.	19.	19.	31.	23.	22.	35.
201	45.	40.	48.	43.	51.	59.	76.	98.	136.	156.
211	181.	252.	313.	424.	518.	711.	991.	1210.	1532.	1724.
221	1966.	2319.	2787.	3340.	4012.	4943.	6193.	7367.	8026.	8084.
231	6968.	5493.	3608.	2143.	1085.	343.	91.	22.	4.	3.
241	1.	4.	5.	6.	6.	5.	5.	7.	10.	9.
251	9.	7.	6.	15.	20.	21.	22.	11.	10.	6.
261	3.	5.	6.	2.	6.	3.	6.	3.	6.	6.
271	4.	5.	6.	11.	7.	7.	12.	10.	12.	14.
281	21.	20.	30.	28.	33.	46.	59.	53.	102.	128.
291	189.	231.	304.	434.	476.	500.	551.	481.	566.	698.
301	903.	1009.	1207.	1387.	1231.	1025.	603.	279.	117.	34.
311	15.	10.	8.	7.	8.	2.	5.	8.	2.	5.
321	5.	10.	3.	8.	4.	7.	5.	10.	7.	12.
331	13.	13.	10.	14.	12.	28.	28.	34.	29.	36.
341	41.	57.	63.	86.	113.	143.	198.	277.	354.	521.
351	686.	903.	1066.	1218.	1120.	1053.	1146.	1212.	1471.	1864.
361	2446.	2937.	3330.	3096.	2580.	1477.	685.	212.	52.	11.
371	3.	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.	1.	0.	0.	0.	0.
431	0.	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.	0.	0.	1.	1.	1.	0.	1.	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.	0.	0.	0.	0.	0.	0.	0.	0.	0.

WHC-SD-WM-DP-050
REV 0

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS

Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-050
REV 0

SAMPLE

E-8607-8781

File ID: 11a3107.CNF

Counted on: 9/ 4/93 @ 7:13
Detector: AEA11
Geometry number: 1
Count time: 28800. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	2760.1	2760.1	364.340	364.340	10.000	2.760	5.000	1.706
2	1012.8	1012.8	305.998	305.997	10.000	2.889	5.000	1.857
3?	142.0	142.0	255.844	255.599	8.000	0.000	4.000	0.074
4	6170.6	6170.6	232.222	232.222	12.000	3.672	6.000	3.001

PEAK RESULTS

Peak Error Limit: 15%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate	%err @95	d/m	Activity uCi/ea
1	Cm243	0.276	5.786	5.797	-.011	10.01	61.29	1.1	745.0	0.336E-03
	Cm244		5.796	5.797	-.001				543.8	0.245E-03
2	Pu238	0.101	5.499	5.522	-.023	10.01	22.35	1.9	275.5	0.124E-03
3	????			5.286			0.00	1000.		
4	Pu239	0.603	5.143	5.176	-.033	10.02	134.03	0.8	1189.2	0.536E-03
	Pu240		5.144	5.176	-.032				1189.2	0.536E-03
Totals:		0.980	<--valid peaks only-->				217.67			

DETECTOR CALIBRATION

Energy(MEV) = 4.084 + (0.0047)*Channel
Energy range (MeV): 4.084 TO 6.491
Efficiency = 0.1127 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	106638.0	100.000
Smoothed	106750.5	100.106
Composite fit	104481.4	97.978
Residuals	2156.6	2.022

Analyzed by:

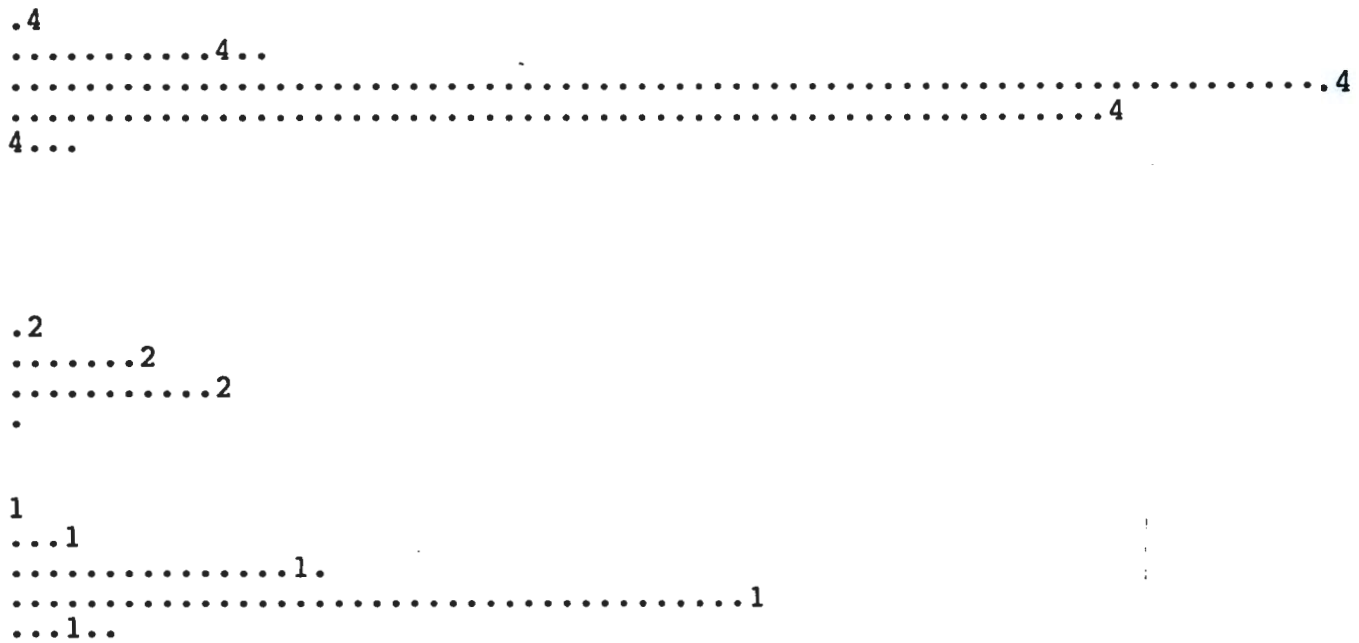
DM

Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 30482.5

WHC-SD-WM-DP-050
REV 0

9313090.1702



9313090.1203

Raw Data Dump for AEA Spectrum: 11a3107.CNF										
1	28800.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	1.	0.	0.	1.	0.	1.	2.	3.
21	2.	2.	0.	1.	1.	4.	1.	1.	0.	3.
31	1.	0.	0.	0.	4.	0.	2.	0.	1.	1.
41	0.	0.	1.	1.	0.	0.	0.	1.	2.	0.
51	0.	0.	1.	0.	0.	0.	0.	1.	2.	0.
61	0.	0.	0.	0.	0.	0.	2.	0.	1.	3.
71	0.	0.	2.	0.	1.	0.	0.	0.	1.	1.
81	0.	0.	1.	1.	1.	0.	1.	2.	2.	0.
91	0.	0.	1.	0.	0.	2.	0.	1.	0.	0.
101	0.	1.	0.	0.	1.	1.	0.	2.	1.	1.
111	1.	1.	0.	0.	3.	0.	2.	0.	2.	1.
121	3.	1.	2.	0.	0.	1.	0.	0.	1.	0.
131	2.	2.	2.	3.	1.	1.	0.	2.	2.	4.
141	2.	5.	1.	2.	0.	1.	1.	1.	2.	5.
151	3.	2.	1.	2.	1.	3.	1.	3.	2.	4.
161	6.	2.	4.	3.	2.	3.	4.	7.	8.	2.
171	7.	6.	6.	12.	11.	5.	8.	9.	6.	5.
181	9.	9.	9.	9.	14.	11.	12.	11.	13.	12.
191	11.	23.	14.	19.	17.	14.	27.	33.	22.	26.
201	24.	34.	42.	30.	39.	46.	65.	47.	56.	56.
211	72.	89.	97.	114.	173.	219.	252.	403.	558.	752.
221	925.	1161.	1256.	1507.	1745.	2087.	2565.	3488.	4591.	5830.
231	6987.	7641.	7288.	5892.	4396.	2711.	1343.	581.	197.	50.
241	10.	4.	3.	3.	8.	8.	10.	1.	5.	4.
251	5.	7.	7.	7.	9.	11.	19.	12.	8.	8.
261	5.	8.	6.	3.	8.	4.	13.	9.	5.	5.
271	4.	10.	3.	4.	9.	9.	4.	5.	10.	4.
281	6.	7.	11.	15.	21.	28.	20.	22.	45.	43.
291	58.	89.	103.	155.	245.	290.	411.	419.	373.	393.
301	456.	475.	695.	925.	1134.	1318.	1155.	935.	507.	219.
311	93.	24.	13.	2.	5.	4.	4.	7.	6.	5.
321	9.	3.	6.	1.	6.	6.	5.	13.	12.	13.
331	15.	26.	24.	15.	16.	19.	19.	23.	20.	24.
341	35.	30.	53.	44.	58.	48.	86.	92.	166.	215.
351	396.	555.	856.	1065.	1100.	1061.	974.	909.	921.	1194.
361	1567.	2193.	3016.	3519.	3552.	2781.	1704.	787.	286.	71.
371	15.	1.	1.	1.	0.	1.	1.	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.	1.
431	1.	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.	1.	0.
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.								

WHC-SD-WM-DP-050
REV 0

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

Batch 1769

WHC-SD-WM-DP-050

REV 0

Lab Segment Serial No.

E 8607

Customer ID:

0066WQL

Analysis:

Am 241

Sample Prep:

Acid digest

Instrument: WR57237

Procedure/ Rev: LA 503-186 D-0

Technologist: JAM Collich F. Collich

Date: 9-3-93

Starting Time: 0800

Temperature 240°C

Ending Time: 1400

Chemist: SA Carlow

Comments:

	Description	Lab ID
1	LMCS	R4295-8582
2	SAM	E8607-8782
3	SAM Dup	E8607-8782
4	SAM Tri.	E8607-8782
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	63343-1ml			
Spike	58343-100ml			

[illegible]

X

The results for the standard are in uCl/L.

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

WHC-SD-WM-DP-050

REV 0

4 4808

Serial No R 4295.-8582	Sample Point 105 KE BASIN	Date 8-26-93	Time Issued 14:47	Priority 26
Determination Am241	Method Standard LA-503-156	Result Units % RECOVERY	Charge Code E11456	Reruns 0
Sample Size ? 100 - 10 - 1ml			Customer ID STD	
Remarks, Calculations, Results EDP R201 AR001 "AEA" - 480MIN STD# 43843 RESULT 25.7 μ Ci/L ATTACH PRINTOUT STD VAL 26805 %REC 95.9% 100 ml Am 241 - SPB43 <i>Joe Collins</i>				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 <i>[Signature]</i> Mrs 9-3-93 1430	Analyst - 3 <i>[Signature]</i> Mrs	Analyst - 4 <i>[Signature]</i> Mrs 9-4-93 10:00	Analyst - 5 <i>[Signature]</i> Mrs
Date 9-3-93	Time Completed 1400	Lab Unit No <i>[Signature]</i> 9/7		

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

LIQUIDS

		STANDARD
Serial No.	Spike (Tracer) Book Number	58843
R4295-8582	Activity of Am243 Tracer in dpm/mL (SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL (SPKV)	0.1
1769	Volume of Sample in mL (SS)	1
Rerun No.	Dilution Factor (DF)	101
0	Digest Dilution Factor (DDF)	1
Analyst	Am-241 Area Peak Height from AEA (C241)	305
	Am-243 Area Peak Height from AEA (C243)	305
Date	Total AT Count (ATOT)	2882
09/03/93	AT Count Time in Minutes (MIN CTd)	30
	Background in CPM (BKG)	6

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

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

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

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

Am-241 μ Ci/L = 2.57E+01Am-241 μ Ci/mL = 2.57E-02

Relative counting error = 8.1%

Am-243 Tracer Recovery = 15.9%

Data Entry by: *[Signature]*

Date: 07-Sep-93

Approved by: *[Signature]*

Date: Sept 7, 1993

Form 3 Rev. 1.1

Page 1 of 1

AMERICIUM 241 ANALYSIS - ACID DIGESTION

#3. 9-3-93 AG

2882 - L
30

R 4295-8582

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WHC-SD-WM-DP-050

REV 0

5 5725

Serial No. E 8607.-8782	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination Am241	Method-Standard LA-503-156	Result Units uCi/G Rec	Charge Code E11456	Reruns 0
Sample Size ? .050 ml - 10 ml - .100 ml			Customer ID 0066WQL	
Remarks, Calculations, Results COUNT AS uCi/L 32.4 uCi/g Sample 1 ml 9m HNO ₃ .100 ml Con HNO ₃ .100 ml Am 241-54343 Lin. Blank "AEA" - 480MIN ATTACH PRINTOUT				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	8-3-93 1430		9-4-93 11:00	
Date 9-3-93	Time Completed 1400	Lab Unit Manager L. J. Little	Signature E. J. Little	

54-5800-207 (R-10-83)

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

SOLIDS

AM-241: LA-503-156 (D-0) SOLIDS		SAMPLE
Serial No.	Spike (Tracer) Book Number	58843
E8607-8782	Activity of Am243 Tracer in dpm/mL (SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL (SPKV)	0.1
1769	Volume of Sample in mL (SS)	0.1
Rerun No.	Dilution Factor (DF)	201
0	Digest Grams of Solids / Liter (D g/L)	34.1372
Analyst	Am-241 Area Peak Height from AEA (C241)	612
	Am-243 Area Peak Height from AEA (C243)	283
Date	Total AT Count (ATOT)	3273
	AT Count Time in Minutes (MIN CTd)	30
09/03/93	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 $\mu\text{Ci/g}$ = 3.24E+01

Relative Counting Error = 7.2%

Am-243 Tracer Recovery = 11.5%

Data Entry by: L. J. Little

Date: 07-Sep-93

Approved by: L. J. Little

Date: Sep 7, 1993

AMERICIUM 241 ANALYSIS - ACID DIGESTION

#1 9-3-93 AJ

3273 -6
30

E8607-8782

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

WHC-SD-WM-DP-050

REV 0

6 6643

Serial No E 8607.-8782	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination Am241	Method-Standard LA-503-156	Result Units uCi/G Rec	Charge Code E11456	Reruns 0
Sample Size ? -0.5u ml - 10ml - .10u ml			Customer ID 0066WQL	
Remarks, Calculations, Results COUNT AS uCi/L 1ml 8m HNO ₃ Duplicate .100 ml Con HNO ₃ .100 ml Am 243 - 51343 31.1 uCi/g "AEA" - 480MIN ATTACH PRINTOUT [Signature]				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[Signature] 9-3-93 14:30	[Signature] 9-3-93 11:00		
Date 9-3-93	Time Completed 1400	Lab Unit Mgr [Signature]	[Signature]	

AM-241: LA-503-156 (D-0) SOLIDS		SAMPLE
Serial No.	Spike (Tracer) Book Number	58B43
E8607-8782	Activity of Am243 Tracer in dpm/mL (SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL (SPKV)	0.1
1769	Volume of Sample in mL (SS)	0.1
Rerun No.	Dilution Factor (DF)	201
0	Digest Grams of Solids / Liter (D g/L)	34.1372
Analyst	Am-241 Area Peak Height from AEA (C241)	593
	Am-243 Area Peak Height from AEA (C243)	286
Date	Total AT Count (ATOT)	2885
	AT Count Time in Minutes (MIN CTd)	30
09/03/93	Background in CPM (BKG)	2

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

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

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

Am-241 $\mu\text{Ci/g}$ = 3.11E+01

Relative Counting Error = 7.2%

Am-243 Tracer Recovery = 10.8%

Data Entry by: [Signature]	Date: 07-Sep-93
Approved by: [Signature]	Date: Sept 7, 1993

AMERICIUM 241 ANALYSIS - ACID DIGESTION

#2 9-3-73 AG

$\frac{2885}{30} - 2$

E 8607-8782

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9313090.1711

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

WHC-SD-WM-DP-050
REV 0

7 7172

Serial No E 8607.-8782	Sample Point H&RWC	Date 4-12-93	Time Issued 13: 2	Priority 26
Determination Am241	Method-Standard LA-503-156	Result Units uCi/G Rec	Charge Code E11456	Reruns 0
Sample Size ? .050 ml - 10 ml - .100 ml			Customer ID 0066WQL	
Remarks, Calculations, Results COUNT AS uCi/L 1ml 8m HNO ₃ TriPLICATE -100 ml (w HNO ₃) -100 ml Am 243 - 51843 34.3 uCi/g "AEA" - 480MIN ATTACH PRINTOUT L. C. Clark				
Analyst - 1	Analyst - 2 Hrs 4-3-93	Analyst - 3 Hrs	Analyst - 4 Hrs	Analyst - 5 Hrs
Date 9-3-93	Time Completed 1400	Lab Unit Mgr Hrs		

54-6800-017 (10-10-83)

AM-241: LA-503-156 (D-0) SOLIDS		SAMPLE
Serial No.	Spike (Tracer) Book Number	58843
E8607-8782	Activity of Am243 Tracer in dpm/mL (SPKA)	5655
Batch ID	Spike (Tracer) Volume in mL (SPKV)	0.1
1769	Volume of Sample in mL (SS)	0.1
Rerun No.	Dilution Factor (DF)	201
0	Digest Grams of Solids / Liter (D g/L)	34.1372
Analyst	Am-241 Area Peak Height from AEA (C241)	245
	Am-243 Area Peak Height from AEA (C243)	107
Date	Total AT Count (ATOT)	1863
	AT Count Time in Minutes (MIN CTd)	30
09/03/93	Background in CPM (BKG)	6

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

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

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

Am-241 $\mu\text{Ci/g}$ = 3.43E+01

Relative Counting Error = 11.6%

Am-243 Tracer Recovery = 6.0%

Data Entry by: <i>[Signature]</i>	Date: 07-Sep-93
Approved by: <i>[Signature]</i>	Date: Sept 7, 1993

AMERICIUM 241 ANALYSIS - ACID DIGESTION

#1 R 9.3.93
1863 - 6
30

E 8607-8782

BEST AVAILABLE COPY

9-4-93
Al Johnson

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
R-4295-8582
File ID: 4a4808.CNF

Counted on: 9/ 4/93 @ 1: 9
Detector: AEA4
Geometry number: 1
Count time: 28805. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	262.3	262.3	301.717	301.717	12.000	5.527	6.000	3.504
2	243.7	243.7	256.187	256.185	12.000	5.076	6.000	3.207
3	338.1	338.1	230.462	230.426	14.000	4.850	7.000	2.974

PEAK RESULTS
Peak Error Limit: 15%

Peak ID	Isotope	AEA Frac	Peak Centroid	Count Rate	%err	d/m	Activity uCi/ea
			Exp. Obs. Diff. FWHM	c/m	@95		
1	Pu238	0.302	5.499 5.502 -.0030.03	7.10	3.4	87.5	0.394E-04
	Am241		5.480 5.502 -.022			67.0	0.302E-04
2	Am243	0.273	5.276 5.288 -.0120.02	6.42	3.5	57.5	0.259E-04
3	Pu239	0.378	5.143 5.167 -.0240.02	8.87	3.1	78.7	0.354E-04
	Pu240		5.144 5.167 -.023			78.7	0.354E-04
Totals:		0.953	<--valid peaks only-->		22.39		

DETECTOR CALIBRATION
Energy(MEV) = 4.084 + (0.0047)*Channel
Energy range (MeV): 4.084 TO 6.491
Efficiency = 0.1127 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	11271.0	100.000
Smoothed	11495.8	101.994
Composite fit	10746.8	95.349
Residuals	524.2	4.651

Analyzed by: _____
DM

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 2244.2

WHC-SD-WM-DP-050
REV 0

9313090.1715

3
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1.
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Raw Data Dump for AEA Spectrum:

4a4808.CNF

REV 0

9313090.1716

1	28805.	0.	0.	164.	29.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
21	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	2.	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.	0.	1.	0.	0.	0.
91	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
101	0.	0.	0.	1.	0.	0.	1.	1.	1.	0.
111	0.	1.	0.	0.	0.	3.	0.	1.	0.	0.
121	0.	0.	2.	0.	1.	0.	0.	1.	0.	0.
131	0.	1.	0.	2.	0.	0.	0.	0.	1.	0.
141	2.	0.	1.	0.	1.	0.	0.	1.	0.	1.
151	2.	1.	1.	0.	2.	1.	0.	1.	0.	0.
161	0.	4.	2.	0.	1.	2.	0.	1.	0.	1.
171	1.	2.	0.	2.	1.	2.	1.	0.	0.	0.
181	1.	3.	2.	1.	2.	2.	2.	3.	4.	1.
191	1.	1.	0.	1.	4.	4.	3.	2.	7.	2.
201	7.	8.	4.	6.	12.	10.	9.	8.	12.	13.
211	20.	14.	29.	29.	30.	44.	41.	67.	79.	78.
221	97.	124.	124.	158.	200.	204.	270.	334.	385.	415.
231	354.	383.	285.	219.	147.	82.	49.	30.	25.	24.
241	29.	20.	43.	35.	52.	59.	59.	66.	105.	103.
251	145.	150.	190.	222.	272.	305.	274.	215.	192.	144.
261	82.	58.	31.	25.	22.	15.	20.	14.	9.	11.
271	15.	14.	13.	7.	4.	11.	7.	12.	10.	16.
281	17.	17.	13.	13.	21.	29.	34.	31.	35.	58.
291	61.	78.	75.	86.	124.	139.	172.	183.	224.	285.
301	305.	305.	283.	241.	161.	113.	81.	49.	49.	30.
311	30.	21.	21.	14.	20.	10.	3.	0.	1.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
341	0.	2.	0.	0.	0.	1.	2.	2.	0.	0.
351	3.	3.	0.	1.	1.	0.	0.	1.	2.	0.
361	1.	1.	0.	3.	0.	1.	1.	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.	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.	1.	0.
471	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
481	3.	1.	1.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
E-8607-8782
File ID: 5a5725.CNFCounted on: 9/ 4/93 @ 1:10
Detector: AEA5
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	565.9	565.9	303.335	303.335	18.000	15.107	9.000	6.346
2	254.0	254.0	257.723	257.650	20.000	12.142	10.000	3.120

PEAK RESULTS

Peak Error Limit: 15%

Peak ID	Isotope	AEA Frac	Peak Centroid	Count Rate	%err	d/m	Activity
			Exp. Obs. Diff. FWHM	c/m	@95		uCi/ea
1	Am241	0.644	5.480 5.510 -.030	24.63	1.8	232.4	0.105E-03
	Pu238		5.499 5.510 -.011			303.5	0.137E-03
2	Am243	0.332	5.276 5.295 -.019	12.67	2.6	113.6	0.512E-04
Totals:		0.976	<--valid peaks only-->		37.30		

DETECTOR CALIBRATION

Energy(MEV) = 4.084 + (0.0047)*Channel
 Energy range (MeV): 4.084 TO 6.491
 Efficiency = 0.1127 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	18344.0	100.000
Smoothed	18456.9	100.616
Composite fit	17903.7	97.600
Residuals	440.3	2.400

Analyzed by:

DM

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.:

4109.1

WHC-SD-WM-DP-050
REV 0

9313090.1718

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1.

Raw Data Dump for AEA Spectrum: 5a5725.CNF

WHC-SD-WM-DP-050

REV 0

1	28802.	0.	0.	1.	0.	0.	0.	0.	0.	0.
11	1.	1.	2.	0.	1.	0.	0.	0.	0.	0.
21	0.	1.	1.	1.	1.	1.	0.	0.	2.	1.
31	0.	0.	1.	1.	1.	1.	0.	0.	1.	0.
41	0.	1.	1.	0.	0.	0.	0.	1.	1.	2.
51	0.	0.	0.	0.	2.	0.	0.	0.	1.	1.
61	1.	0.	1.	2.	1.	1.	0.	1.	1.	0.
71	1.	0.	2.	2.	0.	0.	2.	0.	0.	0.
81	1.	0.	1.	0.	0.	0.	1.	0.	1.	1.
91	0.	0.	1.	2.	1.	2.	2.	0.	3.	2.
101	3.	1.	1.	1.	3.	0.	0.	0.	0.	2.
111	2.	1.	2.	2.	2.	2.	0.	0.	3.	3.
121	1.	4.	1.	1.	0.	3.	2.	0.	2.	2.
131	0.	2.	3.	0.	0.	1.	4.	1.	1.	1.
141	4.	1.	0.	2.	0.	2.	2.	5.	2.	1.
151	1.	3.	1.	1.	3.	2.	3.	1.	4.	3.
161	2.	1.	2.	0.	2.	0.	0.	2.	1.	3.
171	2.	4.	5.	4.	3.	1.	0.	1.	1.	5.
181	2.	4.	1.	1.	5.	0.	4.	2.	3.	3.
191	6.	6.	4.	6.	1.	8.	8.	5.	4.	12.
201	3.	4.	7.	2.	6.	5.	9.	7.	8.	4.
211	7.	16.	13.	21.	17.	19.	19.	21.	24.	34.
221	38.	35.	44.	46.	57.	46.	59.	57.	52.	78.
231	70.	57.	65.	56.	55.	57.	73.	61.	60.	59.
241	61.	72.	79.	103.	90.	102.	136.	144.	167.	192.
251	195.	217.	225.	264.	243.	252.	283.	270.	274.	245.
261	210.	207.	167.	147.	99.	101.	98.	65.	63.	55.
271	51.	47.	33.	23.	49.	26.	38.	41.	39.	35.
281	53.	70.	67.	63.	95.	110.	128.	155.	189.	197.
291	218.	274.	273.	324.	354.	391.	433.	491.	531.	598.
301	612.	581.	571.	595.	567.	545.	522.	406.	367.	322.
311	278.	219.	174.	147.	94.	88.	72.	55.	53.	26.
321	14.	10.	14.	5.	4.	1.	3.	1.	1.	0.
331	0.	2.	0.	2.	0.	1.	1.	2.	1.	3.
341	1.	0.	1.	4.	0.	4.	1.	1.	2.	1.
351	3.	1.	1.	2.	2.	1.	0.	2.	1.	2.
361	2.	2.	1.	2.	4.	0.	3.	3.	1.	4.
371	3.	4.	1.	0.	2.	0.	0.	2.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	4.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	2.	1.	1.	0.	0.	0.	0.
441	1.	0.	0.	0.	2.	0.	1.	0.	0.	0.
451	0.	0.	0.	2.	1.	0.	0.	0.	0.	0.
461	0.	0.	1.	0.	0.	1.	0.	1.	0.	1.
471	2.	1.	0.	0.	1.	1.	2.	1.	1.	0.
481	2.	0.	2.	0.	1.	1.	2.	2.	0.	1.
491	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

AD Hansen

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE

E-8607-8782

File ID: 6a6643.CNF

Counted on: 9/ 4/93 @ 1:11
 Detector: AEA6
 Geometry number: 1
 Count time: 28806. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	557.7	557.7	299.254	299.254	24.000	22.194	12.000	7.589
2	249.9	249.9	251.534	251.215	24.000	20.480	12.000	5.507

PEAK RESULTS

Peak Error Limit: 15%

Peak ID	Isotope	AEA Frac	Peak Centroid			Count Rate c/m	%err @95	d/m	Activity uCi/ea
			Exp.	Obs.	Diff.				
1	Am241	0.669	5.480	5.491	-0.011	29.53	1.6	278.7	0.126E-03
	Pu238		5.499	5.491	0.008			363.9	0.164E-03
2	Am243	0.318	5.276	5.265	0.011	14.02	2.6	125.7	0.566E-04
	Pu240		5.144	5.265	-0.121			124.4	0.560E-04
Totals:		0.986	<--valid peaks only-->			43.55			

DETECTOR CALIBRATION

Energy(MEV) = 4.084 + (0.0047)*Channel
 Energy range (MeV): 4.084 TO 6.491
 Efficiency = 0.1127 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	21200.0	100.000
Smoothed	21315.2	100.544
Composite fit	20906.9	98.617
Residuals	293.1	1.383

Analyzed by: _____

DM

9313090.1720

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.:

4302.6

WHC-SD-WM-DP-050
REV 0

9313090.1721

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1

Raw Data Dump for AEA Spectrum: 6a6643.CNF

1	28806.	0.	0.	1.	0.	1.	1.	1.	0.	0.
11	0.	1.	0.	0.	0.	0.	0.	2.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
31	0.	2.	1.	0.	0.	0.	0.	0.	0.	2.
41	1.	1.	0.	1.	0.	0.	0.	0.	0.	1.
51	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
61	0.	0.	1.	0.	1.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
81	0.	2.	0.	0.	1.	1.	0.	1.	1.	0.
91	1.	1.	0.	1.	1.	0.	1.	0.	1.	1.
101	0.	0.	2.	0.	1.	1.	0.	0.	0.	0.
111	0.	1.	1.	0.	1.	0.	1.	1.	2.	0.
121	0.	2.	0.	0.	1.	0.	1.	1.	0.	0.
131	0.	1.	1.	3.	2.	2.	0.	0.	1.	2.
141	0.	1.	3.	0.	0.	3.	0.	0.	1.	1.
151	1.	3.	1.	3.	2.	0.	1.	0.	1.	0.
161	2.	0.	1.	3.	2.	0.	1.	0.	0.	0.
171	1.	2.	3.	2.	1.	1.	3.	2.	4.	2.
181	1.	1.	2.	2.	1.	2.	2.	1.	9.	6.
191	3.	8.	2.	1.	5.	8.	4.	9.	7.	7.
201	7.	3.	5.	7.	6.	13.	5.	13.	25.	11.
211	22.	16.	26.	18.	34.	36.	34.	37.	38.	33.
221	61.	50.	50.	64.	66.	65.	60.	70.	57.	76.
231	70.	58.	67.	84.	112.	81.	90.	82.	139.	128.
241	141.	148.	156.	216.	236.	212.	237.	255.	271.	254.
251	270.	286.	242.	235.	262.	250.	209.	220.	152.	171.
261	137.	118.	100.	112.	84.	89.	76.	66.	59.	60.
271	65.	61.	64.	61.	76.	86.	91.	95.	112.	151.
281	147.	175.	163.	197.	210.	273.	259.	356.	331.	412.
291	432.	463.	512.	486.	528.	564.	573.	570.	593.	549.
301	569.	528.	511.	510.	452.	379.	336.	308.	248.	231.
311	196.	152.	134.	84.	78.	56.	40.	35.	13.	22.
321	13.	10.	8.	9.	4.	3.	5.	0.	0.	0.
331	2.	1.	2.	1.	0.	0.	3.	0.	0.	1.
341	1.	0.	2.	3.	3.	1.	0.	0.	0.	4.
351	3.	2.	4.	2.	1.	4.	1.	2.	3.	1.
361	1.	3.	0.	3.	1.	2.	2.	2.	1.	3.
371	1.	4.	4.	0.	1.	2.	0.	1.	1.	0.
381	1.	0.	1.	1.	0.	0.	1.	0.	0.	0.
391	1.	0.	0.	0.	0.	0.	1.	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.	2.	1.	0.	0.	1.	0.
431	1.	0.	0.	3.	2.	0.	0.	1.	2.	0.
441	1.	1.	0.	0.	2.	2.	2.	0.	0.	0.
451	1.	0.	2.	1.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	1.	0.	0.	1.	1.	1.	1.
471	2.	2.	4.	1.	3.	4.	1.	0.	0.	0.
481	0.	0.	0.	0.	1.	0.	0.	1.	1.	0.
491	0.	0.	2.	1.	9.	6.	5.	0.	0.	0.
511	0.	0.								

WHC-SD-WM-DP-050
REV 0

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-050
REV 0

SAMPLE
E-8607-8782
File ID: 7a7172.CNF

Counted on: 9/ 4/93 @ 1:12
Detector: AEA7
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	227.1	227.1	299.298	299.298	28.000	26.333	14.000	10.091
2	95.1	95.1	253.542	253.236	26.000	21.608	13.000	3.703

PEAK RESULTS

Peak Error Limit: 15%

Peak ID	Isotope	AEA Frac	Exp.	Obs.	Diff.	FWHM	Count Rate	%err @95	d/m	Activity uCi/ea
1	Am241	0.651	5.480	5.491	-.011	10.12	12.46	2.5	117.6	0.530E-04
	Pu238		5.499	5.491	0.008				153.5	0.692E-04
2	Am243	0.353	5.276	5.275	0.001	10.10	6.75	3.7	60.5	0.272E-04
	Pu240		5.144	5.275	-.131				59.9	0.270E-04
Totals:		1.004	<--valid peaks only-->				19.20			

DETECTOR CALIBRATION

Energy(MEV) = 4.084 + (0.0047)*Channel
Energy range (MeV): 4.084 TO 6.491
Efficiency = 0.1127 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	9184.0	100.000
Smoothed	9295.8	101.218
Composite fit	9218.8	100.379
Residuals	-34.8	-0.379

Analyzed by:

DM

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 1764.2

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Raw Data Dump for AEA Spectrum: 7a7172.CNF

REV 0

1 28803. 0. 0. 0. 0. 1. 1. 0. 0. 0.
 11 0. 0. 1. 0. 2. 0. 2. 0. 0. 1.
 21 1. 0. 2. 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. 1. 0.
 51 0. 0. 1. 0. 0. 0. 1. 0. 0. 0.
 61 0. 0. 0. 0. 2. 0. 0. 0. 0. 0.
 71 2. 1. 1. 0. 1. 1. 1. 0. 0. 2.
 81 0. 1. 0. 0. 1. 0. 1. 0. 1. 1.
 91 0. 0. 0. 0. 0. 0. 0. 0. 1. 0.
 101 0. 2. 2. 4. 1. 0. 0. 0. 0. 1.
 111 0. 1. 0. 3. 2. 0. 1. 1. 0. 0.
 121 0. 1. 2. 1. 1. 3. 0. 0. 1. 1.
 131 1. 2. 0. 2. 0. 1. 5. 0. 1. 2.
 141 2. 1. 2. 0. 1. 1. 0. 1. 2. 1.
 151 0. 1. 0. 1. 0. 0. 0. 1. 1. 1.
 161 0. 0. 1. 0. 0. 0. 0. 1. 0. 2.
 171 1. 1. 0. 1. 1. 0. 1. 1. 4. 1.
 181 2. 1. 3. 1. 2. 1. 0. 1. 2. 5.
 191 2. 4. 2. 1. 4. 4. 4. 5. 1. 2.
 201 5. 1. 2. 6. 4. 11. 5. 4. 10. 5.
 211 15. 14. 18. 16. 28. 21. 21. 23. 27. 25.
 221 31. 21. 29. 37. 40. 30. 47. 47. 43. 48.
 231 34. 43. 42. 44. 37. 44. 50. 37. 51. 54.
 241 56. 52. 67. 61. 61. 81. 91. 98. 78. 87.
 251 102. 94. 107. 105. 91. 92. 92. 100. 74. 61.
 261 82. 62. 68. 51. 40. 47. 30. 26. 28. 20.
 271 31. 30. 37. 26. 28. 34. 48. 38. 49. 44.
 281 59. 61. 70. 79. 98. 103. 132. 114. 132. 165.
 291 168. 182. 181. 188. 215. 209. 233. 245. 241. 235.
 301 218. 221. 210. 219. 193. 184. 169. 136. 120. 95.
 311 113. 81. 62. 51. 61. 36. 43. 28. 21. 11.
 321 11. 12. 6. 6. 1. 5. 4. 2. 1. 1.
 331 1. 1. 0. 0. 1. 1. 0. 1. 0. 0.
 341 0. 0. 0. 0. 0. 1. 1. 1. 1. 2.
 351 0. 0. 3. 1. 3. 2. 2. 0. 1. 6.
 361 2. 2. 2. 1. 0. 2. 0. 4. 2. 1.
 371 0. 2. 1. 0. 0. 1. 2. 0. 1. 0.
 381 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 391 0. 0. 0. 0. 0. 0. 0. 0. 1. 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. 1. 1. 0. 0. 1.
 431 0. 0. 0. 0. 1. 0. 0. 0. 0. 0.
 441 0. 0. 1. 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. 1.
 471 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 481 0. 1. 0. 0. 0. 0. 1. 0. 0. 0.
 491 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 511 1. 0.

Batch 1846

E 8607

0066WQL

Analysis: Gea

Sample Prep: acid digestion

Instrument: WC38461

Procedure/ Rev: LA-548-121 (D-0)

Technologist: SUE LAI (Sue Lai)

Date: 9-1-93

Starting Time: 10:30

Temperature	25°C
-------------	------

Ending Time: 11:30

Chemist: A. K. Dasgupta

Comments: _____

	Description	Lab ID
1	STD	P4295-8530
2	Sample	E8607-8730
3		
4		
5		
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10		

	Description	Lab ID
11		
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20		

[illegible]

9313090-1726

GAMMA ENERGY ANALYSIS - ACID DIGESTION

4266

Serial No	Sample Point	Date	Time Issued	Priority
R 4295.-8530	105 KE BASIN	8-26-93	14:47	26
Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	E11456	0
Sample Size	Customer ID			
? 0.1ml	STD			
Remarks: Calculations, Results				
COLX STD# 32851	CO-60 1.05 E+02			
R901 STD VAL	CS-134 7.28 E+01			
RESULT % REC 99.3%	CS-137 1.31 E+02			
R905 STD VAL				
RESULT % REC 100.3				
Sue Li				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
	Hrs 9-2-93 14:30	Hrs	Hrs	Hrs
Date 9-2-93	Time Completed 11:30	Lab Unit Mgr <i>[Signature]</i>	<i>[Signature]</i>	

54-8800-061 (R-10-83)

4267

Serial No	Sample Point	Date	Time Issued	Priority
E 8607.-8730	H&RWC	4-12-93	13: 2	26
Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/L Rec <i>[Signature]</i>	E11456	0
Sample Size	Customer ID			
? 0.1ml -	0066WQL			
Remarks: Calculations, Results				
COUNT AS uCi/L		CO-60 5.50 E+01 uCi/L		
LASER PRINTOUT		CS-137 9.80 E+02 uCi/L		
60 1.61 E+00 uCi/g	EU-154 8.20 E+01 uCi/L			
137Cs 2.87 E+01 uCi/g	EU-155 4.19 E+01 uCi/L			
154Eu 2.40 E+00 uCi/g				
155Eu 1.23 E+01 uCi/g				
Sue Li				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	<i>[Signature]</i>			
	Hrs	Hrs	Hrs	Hrs
Date 9-2-93	Time Completed 11:30	Lab Unit Mgr <i>[Signature]</i>	<i>[Signature]</i>	

54-8800-061 (R-10-83)

BEST AVAILABLE COPY

*
* GAMMA SPECTRUM ANALYSIS *
*

CANBERRA SPECTRAN-F V2.06 SOFTWARE

02-SEP-9317:42:04

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

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

SAMPLE DESCRIPTION: E8607-8730
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANLOO0

COLLECT STARTED ON 2-SEP-93 AT 16:51:05

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3048. SECONDS
DEAD TIME: 1.57 %

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

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

02-SEP-9315:15:31

WHC-SD-WM-DP-050
REV 0

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	99.03	49.49	1.00	1663.	1147.	11.2	U-234
2	951.56	475.77	1.26	3726.	602.	30.9	CS-134
3C	1127.42	563.71	1.40	2164.	2463.	7.9	CS-134, EU-152
4C	1139.69	569.85	1.40	2167.	4310.	6.0	CS-134, BI-207
5C	1210.46	605.24	1.42	2068.	28606.	1.5	CS-134, SB-125
6	1324.34	662.19	1.52	1503.	45182.	1.0	CS-137
6B		661.44			159.	5.8	
7C	1592.69	796.39	1.58	1311.	21272.	1.7	CS-134
8C	1604.87	802.48	1.58	1256.	2107.	5.0	CS-134
9C	2336.95	1168.64	1.86	739.	348.	12.4	CS-134
10C	2347.32	1173.82	1.86	637.	25101.	1.4	CO-60
11	2665.69	1333.07	2.00	198.	22774.	1.3	CO-60
12	2731.01	1365.74	2.07	88.	535.	10.1	CS-134
13	2801.77	1401.14	1.70	73.	234.	17.3	BI-214
14	2922.50	1461.53	2.35	55.	859.	7.2	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

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

02-SEP-93 15:31

SAMPLE: R4295-8530

DATA COLLECTED ON 2-SEP-93 AT 14:25:01

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

RADIONUCLIDE ANALYSIS REPORT

NUCLIDE	ACTIVITY CONCENTRATION IN $\mu\text{Ci/LI}$				ENERGY COMPARISON	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	(KEV) EXPECT	DIFF
AM-241	LLD<1.56E+00		LLD<1.56E+00		59.54	
AM-243	LLD<4.22E-01		LLD<4.22E-01		74.67	
BA-133	LLD<4.80E-01		LLD<4.80E-01		356.02	
BA-140	LLD<1.36E+00		LLD<1.36E+00		537.27	
BI-212	LLD<2.73E+00		LLD<2.73E+00		727.20	
CEPR144	LLD<2.31E+00		LLD<2.31E+00		133.51	
CO-60	1.05E+02	+ -1.46E+00	1.05E+02	+ -1.46E+00	1332.50	0.57
					1173.24	0.58
CR-51	LLD<2.68E+00		LLD<2.68E+00		320.09	
CS-134	7.28E+01	+ -1.26E+00	7.28E+01	+ -1.26E+00	795.84	0.55
					604.70	0.54
CS-137	1.31E+02	+ -1.41E+00	1.31E+02	+ -1.41E+00	661.65	0.54
EU-152	LLD<7.76E-01		LLD<7.76E-01		1408.01	
EU-154	LLD<6.44E-01		LLD<6.44E-01		1274.45	
EU-154H	LLD<6.37E-01		LLD<6.37E-01		1274.80	
EU-155	LLD<7.16E-01		LLD<7.16E-01		105.31	
FE-59	LLD<8.64E-01		LLD<8.64E-01		1099.25	
I-131	LLD<3.79E-01		LLD<3.79E-01		364.48	
K-40	4.17E+00	+ 2.94E+00	4.17E+00	+ 2.94E+00	1460.75	0.78
LA-140	LLD<1.45E-01		LLD<1.45E-01		1596.20	
MN-54	LLD<3.76E-01		LLD<3.76E-01		834.83	
NA-22	LLD<2.20E-01		LLD<2.20E-01		1274.55	
NB-94	LLD<3.29E-01		LLD<3.29E-01		702.63	
NB-95	LLD<3.50E-01		LLD<3.50E-01		765.78	
NP-237	LLD<1.53E+00		LLD<1.53E+00		86.50	
PB-212	LLD<5.06E-01		LLD<5.06E-01		239.00	
PU-239	LLD<2.22E+03		LLD<2.22E+03		129.30	
PU-241	LLD<7.21E+04		LLD<7.21E+04		148.57	
RA-224	LLD<5.63E+00		LLD<5.63E+00		240.99	
RA-226	LLD<5.27E+00		LLD<5.27E+00		186.10	
RU-103	LLD<3.39E-01		LLD<3.39E-01		497.08	
RU103	LLD<3.57E-01		LLD<3.57E-01		497.08	
RURH106	LLD<6.43E+00		LLD<6.43E+00		621.80	
SB-125	LLD<1.14E+00		LLD<1.14E+00		427.89	
SB-125A	LLD<1.14E+00		LLD<1.14E+00		427.89	
SE-75	LLD<3.79E-01		LLD<3.79E-01		264.66	
SN-113	LLD<5.08E-01		LLD<5.08E-01		391.67	
SR-85	LLD<3.33E-01		LLD<3.33E-01		513.99	
TH-228	LLD<1.61E+01		LLD<1.61E+01		84.37	
TL-208	LLD<4.09E-01		LLD<4.09E-01		583.20	
U-235	LLD<3.18E-01		LLD<3.18E-01		185.71	
Y-88	LLD<1.31E-01		LLD<1.31E-01		1836.06	
ZN-65	LLD<9.68E-01		LLD<9.68E-01		1115.55	
ZR-95	LLD<6.44E-01		LLD<6.44E-01		756.73	
TOTAL	3.14E+02	+ -3.79E+00	3.14E+02	+ -3.79E+00		

9/7/93 PKG

EBAR = ***** MEV/DISINTEGRATION

MAXIMUM PERMISSABLE ACTIVITY = 1.40E-09 UC/LI

TOTAL MEASURED ACTIVITY = 3.14E+02 (+-3.79E+00) UC/LI

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

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
99.03	49.49	1147.	11.2	3.22E+01
951.56	475.77	602.	30.9	4.21E+00
1127.42	563.71	2463.	7.9	1.97E+01
1139.69	569.85	4310.	6.0	3.48E+01
1604.87	802.48	2107.	5.0	2.30E+01
2336.95	1168.64	348.	12.4	5.33E+00
2731.01	1365.74	535.	10.1	9.33E+00
2801.77	1401.14	234.	17.3	4.16E+00

*Em Bruck**9-2-93*

*
* GAMMA SPECTRUM ANALYSIS *
*

CANBERRA SPECTRAN-F V2.06 SOFTWARE

02-SEP-93 17:42:04

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

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

SAMPLE DESCRIPTION: E8607-8730
GEOMETRY DESCRIPTION: 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 2-SEP-93 AT 16:51:05

COLLECT LIVE TIME: 3000. SECONDS -
REAL TIME: 3048. SECONDS
DEAD TIME: 1.57 %

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

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

9313090.1732

02-SEP-9317:42:04

WHC-SD-WM-DP-050
REV 0

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	98.98	49.47	1.00	6938.	4838.	5.4	U-234
2	119.78	59.87	1.02	12408.	40812.	1.2	AM-241, U-237, <u>EU-155</u>
3	173.73	86.84	1.07	10735.	12843.	2.8	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
4E	211.35	105.65	1.08	23088.	10238.	5.4	EU-155, EU-155B, NP-239
5	246.90	123.42	1.07	9780.	33343.	1.3	CO-57, <u>EU-154A</u>
6	496.81	248.38	1.15	10343.	4231.	7.3	EU-154B, XE-135
7	1165.67	582.84	2.09	3226.	488.	35.4	EU-154,
7B		583.05			117.	7.9	TL-208
8	1184.60	592.31	1.50	3038.	1525.	11.8	EU-154C
9	1324.38	662.21	1.51	2553.	336073.	0.3	CS-137
9B		661.44			159.	5.8	
10	1386.02	693.04	1.60	1105.	473.	22.5	EU-154
11	1447.67	723.86	1.47	1086.	5569.	3.2	SB-124, I-131, <u>AG-108,</u> <u>EU-154D,</u> 20% ZR-95
12	1514.63	757.35	1.66	1094.	1200.	9.9	ZR-95, <u>EU-154</u> 4%
13	1592.57	796.33	1.80	1189.	290.	37.8	CS-134
14	1747.36	873.75	1.68	1145.	2918.	5.0	EU-154E, RH-106
15	1993.40	996.80	1.78	1033.	2361.	5.8	EU-154F
16	2010.43	1005.32	1.80	1051.	4124.	3.9	EU-154G, EU-152
17	2347.32	1173.82	1.87	483.	12929.	1.8	CO-60
18	2493.18	1246.78	1.57	250.	144.	38.6	EU-154, RB-89
19	2549.70	1275.05	1.95	197.	6538.	2.5	EU-154, EU-154H, NA-22
20	2665.74	1333.09	1.84	161.	11910.	1.8	CO-60
21	2795.96	1398.23	1.90	75.	134.	26.5	I-132
22	2922.49	1461.53	2.04	63.	788.	7.7	K-40
22B		1460.67			769.	1.7	
23	2989.30	1494.94	2.30	54.	93.	32.1	EU-154
24	3193.27	1596.98	2.03	49.	306.	13.3	LA-140, EU-154I
25	3528.97	1764.92	2.44	21.	91.	26.3	BI-214C
25B		1764.58			64.	7.3	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

E - MULTIPLE ANALYSIS ERROR
B - ENVIRONMENTAL BACKGROUND PEAK

WKC-SO-WM-DP-050
REV 0

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

9313090.1734

9313090.1734

02-SEP-9317:42:04

SAMPLE: E8607-8730

DATA COLLECTED ON 2-SEP-93 AT 16:51:05

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
AC-228	LLD<1.28E+00		LLD<1.28E+00		911.07	
AC-228A	LLD<1.28E+00		LLD<1.28E+00		911.10	
AC-228B	LLD<3.48E+00		LLD<3.48E+00		338.40	
AG-108M	LLD<6.68E-01		LLD<6.68E-01		433.94	
AG-110M	LLD<4.00E+00		LLD<4.00E+00		657.76	
AM-241	4.00E+02	+6.24E+00	4.00E+02	+6.24E+00	59.54	0.33
AM-243	LLD<7.60E-01		LLD<7.60E-01		74.67	
AM-243A	LLD<7.60E-01		LLD<7.60E-01		74.67	
AM-243B	LLD<3.79E+00		LLD<3.79E+00		43.10	
AR-41	LLD<2.39E-01		LLD<2.39E-01		1293.64	
AU-198	LLD<5.39E-01		LLD<5.39E-01		411.80	
BA-133	LLD<7.73E-01		LLD<7.73E-01		356.02	
BA-139	LLD<1.48E+00		LLD<1.48E+00		165.85	
BA-140	LLD<1.95E+00		LLD<1.95E+00		537.27	
BA-141	LLD<1.58E+00		LLD<1.58E+00		190.23	
BE-7	LLD<6.12E+00		LLD<6.12E+00		477.59	
BI-207	LLD<4.14E-01		LLD<4.14E-01		569.70	
BI-212	LLD<6.40E+00		LLD<6.40E+00		727.27	
BI-214	LLD<9.77E-01		LLD<9.77E-01		609.32	
BI-214A	LLD<9.77E-01		LLD<9.77E-01		609.32	
BI-214B	LLD<2.56E+00		LLD<2.56E+00		1120.28	
BI-214C	9.49E-01	+8.62E-01	9.49E-01	+8.62E-01	1764.51	0.41
CD-109	4.14E+02	+1.21E+01	4.14E+02	+1.21E+01	88.03	-1.19
CE-144	LLD<1.96E+00		LLD<1.96E+00		133.51	
CE-139	LLD<3.33E-01		LLD<3.33E-01		165.85	
CE-141	LLD<4.56E-01		LLD<4.56E-01		145.44	
CEPR144	LLD<3.93E+00		LLD<3.93E+00		133.51	
CO-56	LLD<3.49E-01		LLD<3.49E-01		846.76	
CO-57	3.11E+01	+4.98E-01	3.11E+01	+4.98E-01	122.06	1.36
CO-58	LLD<3.38E-01		LLD<3.38E-01		810.75	
CO-60	5.50E+01	+1.04E+00	5.50E+01	+1.04E+00	1332.50	0.59
					1173.24	0.59
CR-51	LLD<4.40E+00		LLD<4.40E+00		320.09	
CS-134	LLD<3.65E-01		LLD<3.65E-01		795.84	
CS-136	LLD<3.47E-01		LLD<3.47E-01		818.51	
CS-137	9.80E+02	+5.78E+00	9.80E+02	+5.78E+00	661.65	0.56
CS-138	LLD<2.70E-01		LLD<2.70E-01		1435.86	
EU-152	LLD<7.26E-01		LLD<7.26E-01		1408.01	
EU-154	8.20E+01	+2.09E+00	8.20E+01	+2.09E+00	1274.45	0.60
EU-154A	6.58E+01	+1.06E+00	6.58E+01	+1.06E+00	123.10	0.32
EU-155	4.19E+01	+2.29E+00	4.19E+01	+2.29E+00	105.31	0.34
					86.54	0.30
FE-59	LLD<7.40E-01		LLD<7.40E-01		1099.25	
HF-181	LLD<7.44E-01		LLD<7.44E-01		482.20	
HG-203	LLD<4.60E-01		LLD<4.60E-01		279.20	
I-131	LLD<6.02E-01		LLD<6.02E-01		364.48	
I-132	LLD<1.24E+00		LLD<1.24E+00		667.69	

reference 9-7-93
Eu-155 @ 1.21%
1.33% for Eu-155

no Ar 3 reference
9-7-93
Eu-155 reference
9-7-93

no 136 reference
9-7-93

I-133	LLD<5.40E-01	LLD<5.40E-01	529.69
I-134	LLD<5.05E-01	LLD<5.05E-01	847.03
I-135	LLD<7.81E-01	LLD<7.81E-01	1260.41
K-40	LLD<3.23E+00	LLD<3.23E+00	1460.75
KR-85	LLD<1.17E+02	LLD<1.17E+02	513.99
KR-85M	LLD<3.52E-01	LLD<3.52E-01	151.17
KR-87	LLD<1.35E+00	LLD<1.35E+00	402.58
KR-89	LLD<1.92E+01	LLD<1.92E+01	220.90
LA-140	LLD<1.48E-01	LLD<1.48E-01	1596.20
LA-142	LLD<1.07E+00	LLD<1.07E+00	641.83
MN-54	LLD<3.30E-01	LLD<3.30E-01	834.83
MN-56	LLD<3.95E-01	LLD<3.95E-01	846.76
NA-22	2.91E+01 + 7.43E-01	2.91E+01 + 7.43E-01	1274.55
NA-24	LLD<1.68E-01	LLD<1.68E-01	1368.60
NB-94	LLD<3.11E-01	LLD<3.11E-01	702.63
NB-95	LLD<3.26E-01	LLD<3.26E-01	765.78
NB-97	LLD<4.87E+00	LLD<4.87E+00	657.92
NP-237	1.23E+02 + 3.58E+00	1.23E+02 + 3.58E+00	86.50
NP-237A	LLD<1.45E+02	LLD<1.45E+02	195.00
NP-237B	LLD<1.45E+02	LLD<1.45E+02	213.00
NP-238	LLD<1.46E+00	LLD<1.46E+00	984.45
NP-239	LLD<2.63E+00	LLD<2.63E+00	277.60
PA-233	LLD<1.19E+00	LLD<1.19E+00	311.98
PA-234M	LLD<1.93E+02	LLD<1.93E+02	1001.03
PB-210	LLD<5.93E+01	LLD<5.93E+01	46.50
PB-212	LLD<8.45E-01	LLD<8.45E-01	239.00
PB-212A	LLD<8.41E-01	LLD<8.41E-01	239.00
PB-212B	LLD<1.32E+01	LLD<1.32E+01	300.10
PB-214	LLD<1.29E+00	LLD<1.29E+00	351.92
PB-214A	LLD<1.29E+00	LLD<1.29E+00	351.92
PB-214B	LLD<2.01E+00	LLD<2.01E+00	295.21
PO-210	LLD<2.73E+04	LLD<2.73E+04	804.00
PO-214	LLD<3.60E+03	LLD<3.60E+03	799.70
PO-216	LLD<1.63E+04	LLD<1.63E+04	804.90
PU-239	LLD<3.78E+03	LLD<3.78E+03	129.30
PU-241	LLD<1.20E+05	LLD<1.20E+05	148.57
RA-224	LLD<9.05E+00	LLD<9.05E+00	240.99
RA-226	LLD<8.96E+00	LLD<8.96E+00	186.10
RB-88	LLD<1.45E+00	LLD<1.45E+00	1836.00
RB-89	LLD<1.86E+00	LLD<1.86E+00	1031.88
RN-220	LLD<3.99E+02	LLD<3.99E+02	549.73
RU-103	LLD<5.72E-01	LLD<5.72E-01	497.08
RURH106	LLD<8.21E+00	LLD<8.21E+00	621.80
SB-124	LLD<4.33E-01	LLD<4.33E-01	602.72
SB-125	LLD<2.01E+00	LLD<2.01E+00	427.89
SB-125A	LLD<2.01E+00	LLD<2.01E+00	427.89
SC-46	LLD<3.85E-01	LLD<3.85E-01	1120.45
SE-75	LLD<6.25E-01	LLD<6.25E-01	264.66
SN-113	LLD<8.17E-01	LLD<8.17E-01	391.67
SR-85	LLD<5.14E-01	LLD<5.14E-01	513.99
SR-91	LLD<7.31E-01	LLD<7.31E-01	555.60
SR-92	LLD<2.16E-01	LLD<2.16E-01	1383.94
TA-182	LLD<1.15E+00	LLD<1.15E+00	1121.30
TC-99M	LLD<2.59E-01	LLD<2.59E-01	140.51
TE-123M	LLD<2.77E-01	LLD<2.77E-01	159.00
TE-125M	LLD<1.31E+02	LLD<1.31E+02	109.27
TE-132	LLD<4.03E-01	LLD<4.03E-01	228.16
TH-228	LLD<4.25E+01	LLD<4.25E+01	84.37
TH-229	5.17E+02 + 1.50E+01	5.17E+02 + 1.50E+01	86.44
TH-229B	LLD<1.38E+01	LLD<1.38E+01	137.02

WKC-SO-WM-DP-050
REV 0

Eu-155 *RAJANE*
9-7-73

Eu-155 *RAJANE*
9-7-73

109

0.40 Eu-155 *RAJANE*
9-7-73

9313090-1236

TH-229C	LLD<7.21E+00	LLD<7.21E+00	193.59
TH-234	LLD<5.67E+00	LLD<5.67E+00	92.50
TH-234A	LLD<5.67E+00	LLD<5.67E+00	92.50
TH-234B	LLD<3.87E+01	LLD<3.87E+01	63.30
TL-208	9.88E-01 + -4.60E-01	9.88E-01 + -4.60E-01	583.14 - 0.30
U-232	LLD<9.77E+02	LLD<9.77E+02	270.26
U-235	LLD<5.78E-01	LLD<5.78E-01	185.71
U-235A	LLD<5.78E-01	LLD<5.78E-01	185.71
U-235B	LLD<2.32E+00	LLD<2.32E+00	143.76
U-237	LLD<1.47E+00	LLD<1.47E+00	208.00
W-187	LLD<1.03E+00	LLD<1.03E+00	685.74
XE-131M	LLD<1.27E+01	LLD<1.27E+01	163.98
XE-133	LLD<1.09E+00	LLD<1.09E+00	81.00
XE-133M	LLD<3.56E+00	LLD<3.56E+00	233.21
XE-135	5.74E+00 + -4.63E-01	5.74E+00 + -4.63E-01	249.79 - 1.41
XE-138	LLD<3.19E+00	LLD<3.19E+00	258.41
Y-88	LLD<1.47E-01	LLD<1.47E-01	1836.06
Y-91	LLD<9.00E+01	LLD<9.00E+01	1204.90
Y-91M	LLD<5.55E-01	LLD<5.55E-01	555.60
ZN-65	LLD<7.88E-01	LLD<7.88E-01	1115.55
ZR-95	6.15E+00 + -6.09E-01	6.15E+00 + -6.09E-01	756.73 - 0.62
			724.20 - 0.33
ZR-97	LLD<3.05E-01	LLD<3.05E-01	743.33

TOTAL 2.75E+03 +-2.17E+01 2.75E+03 +-2.17E+01

STANDARD DEVIATION = 0.66

EBAR = ***** MEV/DISINTEGRATION

MAXIMUM PERMISSABLE ACTIVITY = 7.23E-12 UC/LI

TOTAL MEASURED ACTIVITY = 2.23E+03 (+-1.56E+01) UC/LI

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

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
98.98	49.47	4838.	5.4	1.36E+02
1184.60	592.31	1525.	11.8	1.27E+01
1386.02	693.04	473.	22.5	4.52E+00
1592.57	796.33	290.	37.8	3.13E+00
1747.36	873.75	2918.	5.0	3.44E+01
1993.40	996.80	2361.	5.8	3.13E+01
2010.43	1005.32	4124.	3.9	5.52E+01
2493.18	1246.78	144.	38.6	2.32E+00
2795.96	1398.23	134.	26.5	2.38E+00
2989.30	1494.94	93.	32.1	1.74E+00
3193.27	1596.98	306.	13.3	5.99E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.49	1461.53	788.	7.7	1.45E+01

WHC-SD-WM-DP-050
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